

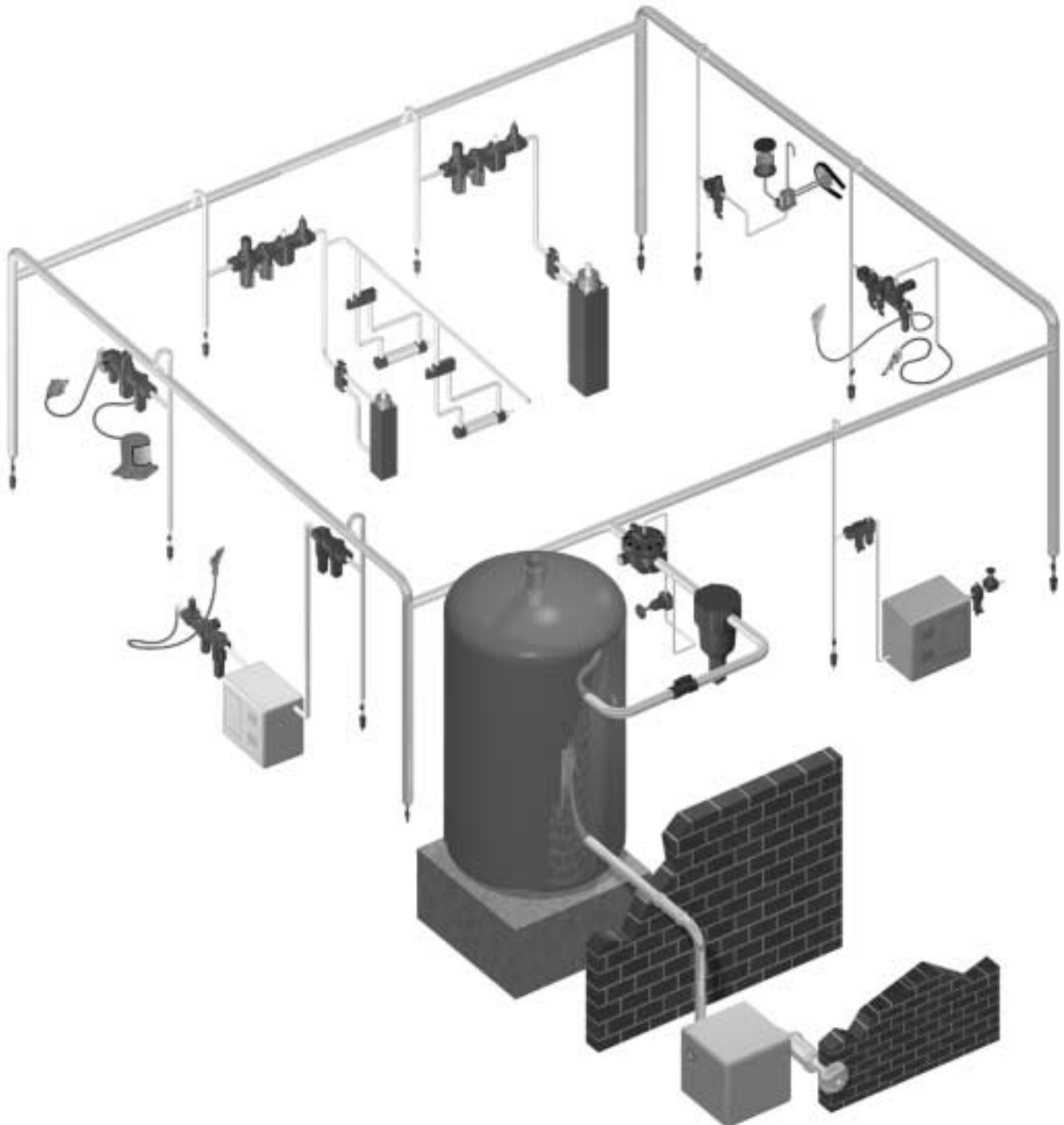
Norgren Air Preparation Products and Accessories

Compressed Air Systems	ALE-0-2
Filters	ALE-1-A
Oil Removal (Coalescing) Filters	ALE-2-1
Oil Vapor Removal (Adsorbing) Filters	ALE-3-1
Membrane Dryers	ALE-4-1
Regulators	ALE-5-A
Specialty Regulators	ALE-6-1
Manifold Regulators	ALE-7-1
Precision and Instrument Regulators	ALE-8-1
Pilot Regulators	ALE-9-1
Pilot Operated Regulators	ALE-10-1
U.L. Listed Cylinder Gas Regulators for Industrial Use	ALE-11-1
U.L. Listed Beverage Regulators	ALE-12-1
Filter/Regulators	ALE-13-1
Lubricators	ALE-14-A
Pressure Relief Valves	ALE-15-1
Shut-Off and Lockout Valves	ALE-16-1
Stainless Steel Products	ALE-17-1
Smooth Start, and Directional Control Valves	ALE-18-1
Additional Products	ALE-19-1
Filter-Filter Combination Units	ALE-20-1
Filter/Regulator-Lubricator Combination Units	ALE-21-1
Filter-Regulator-Lubricator Combination Units	ALE-22-1
Filter-Lubricator Combination Units	ALE-23-1
Modular Components	ALE-24-1
Accessories for Filters, Regulators, and Lubricators	ALE-25-1
Watson Smith Electronic Products	ALE-26-1
Compressed Air Dryers	ALE-27-1
Fittings and Accessories	ALE-28-1
Appendix/Technical Information	ALE-29-1
Part Index	ALE-29-18



Norgren Air Preparation Products: Protecting your pneumatic system from the hazards of contaminated air.

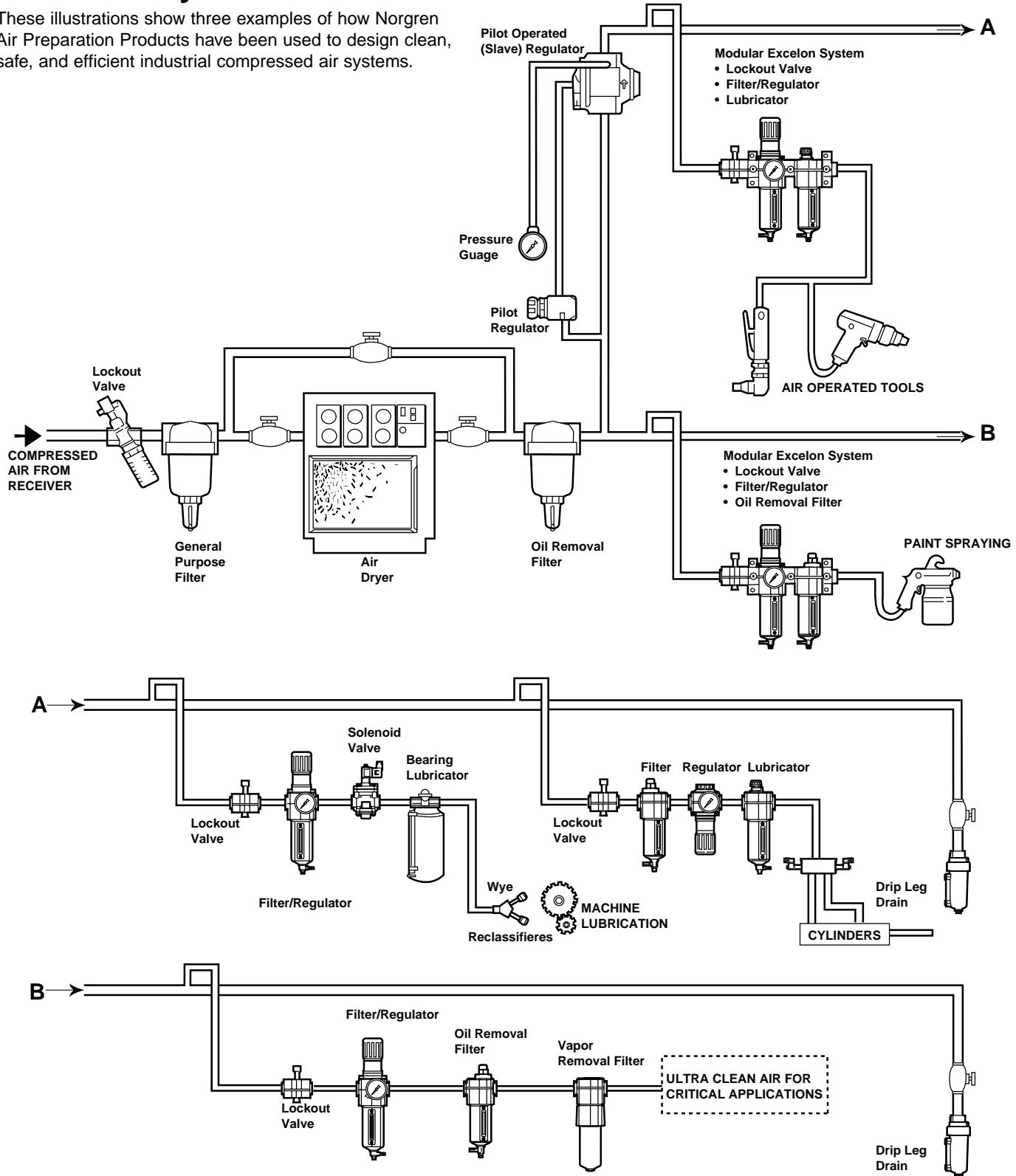
The air leaving a compressor is hot, dirty, wet and generally at a higher pressure than the downstream equipment requires. A typical 100 scfm (50 dm³/sec) compressor will push 1200 gallons (4500 liters) of water and 2 gallons (8 liters) of degraded compressor oil into the system in a year along with considerable amounts of dirt particles. Before this air can be used it needs to be treated to remove the contaminants, have its pressure reduced to the right level, and in many cases have oil added to lubricate downstream equipment.





Build Your System!

These illustrations show three examples of how Norgren Air Preparation Products have been used to design clean, safe, and efficient industrial compressed air systems.





Norgren knowledge and products save you money

Compressed air is often wrongly assumed to be a cheap or even 'free' source of power. In fact it can be 10 times as expensive as electricity by the time all generation, transmission, treatment and system costs are taken into account. Good air preparation must therefore consider the energy consumption of the system and air treatment equipment.

The process of air preparation has been at the core of Norgren's business for over 70 years. The aim of this booklet is to offer guidance on the correct, economic and safe treatment of compressed air in industrial applications. Here we can only provide a brief summary of the extensive experience Norgren has as a world leader in FRL technology.

APPLICATIONS

The following section shows several typical systems of a generic type and the equipment normally used for the application. Remember every system should be treated on its merits and broken down into several elements to ensure optimum installation, running and maintenance costs are achieved.

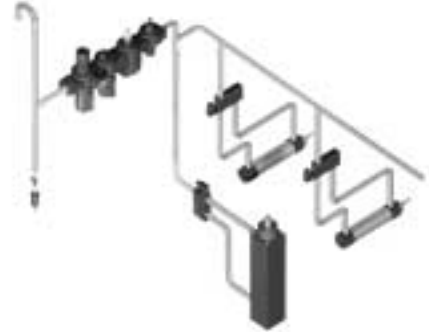
The applications below are typically branches taken off a large works distribution mains and isolating valves are usually placed in front of all branches to permit isolation from the mains to allow for maintenance to take place without recourse to complete plant shut-down.

General Pneumatic Circuits:

eg: directional control valves and cylinders, in multi-valve circuits, machine cleaning, air motors and high speed tools.

A Micro-Fog lubricator is required for the several varying flow paths to ensure full lubrication. (Figure 2)

Figure 2.



Shut-off valve, filter/reg, Micro-Fog lubricator, soft start/dump, relief valve.

Multiple Simple Applications:

eg: OEM machines.

It is often a case that with fairly simple machines, lubricated air is required for valving and pneumatic circuitry and oil-free air for air bearings. To keep costs low two separate lines are unnecessary and a typical arrangement from one air supply only can be arranged as shown.

Other elements such as pressure switches and check valves may be made available within modular systems. (Figure 3).

Figure 2



Shut-off valve, filter/regulator, oil removal filter, porting block, Micro-Fog lubricator.



Oil-Free Applications:

eg paint spraying, foodstuffs, film processing, powders.

These applications need to be free from any water deposits in the downstream system. For many installations this will require air drying. The drying medium (for desiccant or deliquescent dryers) will need protecting from oil to allow it to work efficiently and the downstream system will also need protection from accidental migration of the material into it. A typical arrangement would be as figure 26 and in some instances it might be worth considering an oil vapour removal filter too. (Figure 4)

Figure 4.



Shut-off valve, general purpose filter, oil removal filter, drier, oil removal filter, regulator, relief valve.

Heavy Duty Lubrication:

eg: large slow moving cylinders.

In such applications large amounts of lubricant are required for effective lubrication. Again a soft start/dump valve is shown but is dependent upon the application. (Figure 5).

Figure 5.



Shut-off valve, filter/reg, Oil-Fog lubricator, soft start/dump valve, relief valve.

Critical Pressure Control (Instrumentation):

eg: precision regulation, fluidic systems, air gauging, process control.

A typical arrangement is shown, where oil aerosols which can prevent fast response of downstream devices, need to be removed. Dependant upon air quality drying may not be required. (Figure 6)

Figure 6.



Shut-off valve, general purpose filter, oil removal filter, drier, oil removal filter, precision regulator.

Direct Injection Lubrication:

eg: conveyor chains.

The application does not allow for 'fog' type lubrication because of the surrounding environment and absence of a lubrication chamber. (Figure 7).

Figure 7.



Shut-off valve, filter/reg + direct injection lubricator.

Continuous Processes

Another facet of Norgren's Olympian Plus is the ability to make duplex systems. This is invaluable for systems which cannot be shut-down, such as continuous process plant. Two identical air sets are joined together and one may be isolated (and serviced) whilst the other set is in operation. (Figure 8)

Figure 8.



Duplex system: shut-off valve, filter/reg, lubricator, porting block, oil removal filter and shut-off valve x 2 with manifold block connectors.

Filters

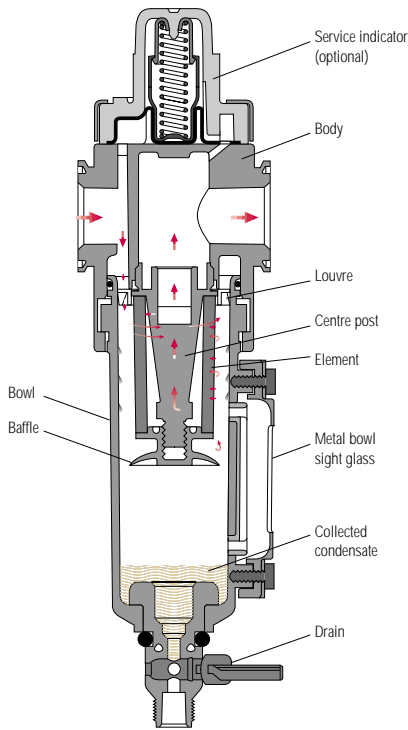
General Purpose Filters, Oil Removal (Coalescing) Filters, Oil Vapor Removal (Adsorbing) Filters, and Compressed Air Membrane Dryers

Filter OverviewALE-1-B
Rating Filter Elements and ISO Standard 8573-1ALE-1-G
General Purpose FiltersALE-1
Oil Removal (Coalescing) FiltersALE-2
Oil Vapor Removal (Adsorbing) FiltersALE-3
Compressed Air Membrane DryersALE-4



1.1 GENERAL OVERVIEW

GENERAL PURPOSE FILTER



Three main types of filters exist: The general purpose filter for water and particles, the coalescing oil removal filter for oil aerosols and the activated carbon filter for the removal of oil vapors.

The general purpose filter is used for most filter applications and is available from 1/8" to 2" pipe sizes. Uses are main headers, branch lines, tools, cylinders, valves and valve circuits, air agitators etc. Oil removal filters are used where very clean, oil-free air is required, such as for the supply to fluidic devices, instrumentation, air gauging equipment and air bearings.

Activated Carbon filters are used for systems where the oil vapors in the air are not acceptable; such as instrumentation and paint spraying.

1.1.1 How Do General Purpose Filters Work?

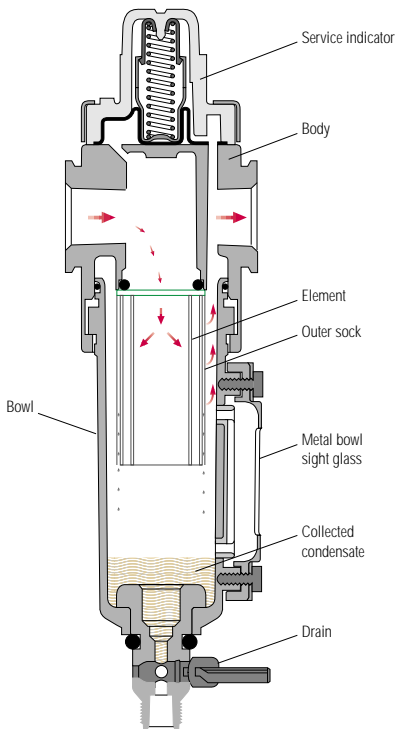
The dirt and moisture-laden air enters the inlet port and is directed into the louvers which centrifugally separate the entrained liquids and dirt which fall to the bottom of the bowl. Near the bottom of the bowl a baffle creates a quiet zone, preventing the turbulent air re-entraining the contaminants. The air, now free of water droplets and large dirt particles, passes through the filter element which removes small dirt particles. Solid particles eventually plug the element necessitating replacement.

1.1.2 How Do Oil Removal Filters Work?

Air enters the filter and passes through the element from inside to outside, where oil aerosols impinge on the borosilicate micro-fibers and are coalesced into larger drops. The drops are carried through the element until they reach the outer porous sock. The outer sock, because of its cellular construction, retains these liquids and allows them to drain by gravity to the bottom of the bowl.

Solid particles are retained in the element and cause the pressure drop to slowly increase through the working life of the element. When the pressure drop across the element reaches 10 psid, the service life indicator on top of the filter will show more red than green and the element should be replaced.

COALESCING FILTER



1.1.3 How do Vapor removal Filters Work?

Carbon filters are used to remove oil vapors and odors. The activated carbon has a porous structure which results in a large surface area. The oil vapors are attracted and adhere to this surface. There is usually a small sintered medium included in an activated carbon element to prevent the carbon particles from migrating downstream. The carbon filter reduces the maximum oil content of air leaving the filter to 0.003ppm at 70°F, i.e. To ISO 8573 class 1.7.1. If protected upstream by general and oil removal filters life is between 400 and 1000 hours.

1.1.4 Why use a Pre-Filter?

A pre-filter is simply a general purpose filter placed upstream of a higher grade filter to remove the majority of the water and larger particle contaminants and thus lengthen the life of the higher grade filter element.

A 5 micron pre-filter should always be used ahead of an oil removal filter.

An oil removal (coalescing) filter must be used ahead of a vapor removal adsorbing filter.

1.2 AIR QUALITY

1.2.1 What is ISO 8573?

(See ALE-1-G for specification)

This is an international standard on air quality. It covers compressed air for general industrial use.

The air quality is specified using a 3 digit code expressing the remaining content of a specific contaminant after the filter (or dryer).

1.2.2 Air Classes for Norgren Filters:

Particulate filters condition compressed air to different degrees, dependent on the micron rating of the filter. The finer filter, 5 µm, will achieve ISO 8573 class 3.7. or class 3. Applying a 40 µm filter will result in ISO 8573 class 5.7. or class 5 air.

Coalescing filters improve the quality of downstream air to ISO 8573 class 1.7.2, the particle size is reduced down to 0.01µm, with a remaining oil content of less than 0.01ppm. Coalescing filters cannot remove oil which is in the vapor state in the supply air. One way to remove vapor is to reduce the temperature of the air flow allowing the vapor to condense, alternatively remove the vapor chemically using an activated carbon filter.



1.2.3 What Micron Ratings are Available?

The standard Norgren general purpose elements are 40 and 5 microns, with 40 microns being suitable for most industrial applications. Certain industries have 25 or 75 micron as a standard and some product ranges have these options available.

For a given element size, the smaller the micron rating the higher the pressure drop across the filter. The service life between cleaning is also less for the smaller micron filters, as small holes plug more quickly than bigger holes.

Figure 1.

RECOMMENDED FILTRATION LEVELS.

Application	Typical Quality Classes	
	Oil	Dirt
Air agitation	1	3
Air bearings	2	2
Air gauging	2	2
Air motors	4	4
Brick and glass machines	5	4
Cleaning of machine parts	3	4
Construction	4	5
Conveying, granular products	2	4
Conveying, powder products	1	3
Fluidics, power circuits	2	5
Fluidics, sensors	2	3
Foundry machines	4	5
Food and beverages	1	1
Hand operated air tools	5	5
Machine tools	5	4
Mining	5	5
Micro-electronics manufacture	1	1
Packaging and textile machines	5	3
Photographic film processing	1	2
Pneumatic cylinders	3	5
Pneumatic tools	5	4
Pneumatic tools (high speed)	4	3
Process control instruments	2	3
Paint spraying	1	1
Sand Blasting	4	5
Welding machines	5	5
General Workshop air	5	4

1.2.4 How do Service Life Indicators Work?

The service life (pressure drop) indicator found on top of coalescing or general purpose filters is green when the filter is new. As a pressure differential develops across the filter element with use, a spring biased red outer sleeve is pushed up. When more red is visible than green, then the pressure differential across the element is in excess of 10 psi (0.7 bar) and the element should be replaced.

1.2.5 When does the Carbon Pack Indicator Turn Pink?

The white ring around the base of the vapor removal carbon pack turns pink in the presence of liquid oil. Therefore if the ring turns pink the coalescing filter is passing liquid oil and needs replacing. If this occurs soon after the filter has been installed then it usually indicates a seal failure in the coalescing filter. Remember that visual detection is not a substitute for scheduled maintenance.

1.2.6 How Long does an Element Last?

This depends entirely on the quality of the inlet air. If it is very poor the elements will need replacing more frequently.

In general, air service equipment should be maintained annually. Use, quality of air and condition at examination may indicate adjustment of the maintenance interval.

The following guidelines can be given:

General Purpose Filter: Replace/maintain annually. The element can lose 15% efficiency each time it is cleaned. Elements are low cost, so it is advisable to replace them.

Coalescing: Evaluate after 12 months of servicing. If the pressure drop across the element exceeds 10 psig (0.7bar) then the element requires changing.

Activated Carbon Packs: Should be changed every 1,000 hours usage or when odor is detected. The life depends significantly on ambient temperature.

1.3 PLASTIC BOWLS

Norgren transparent plastic bowls are made from polycarbonate. Some competitors use other materials such as Grilamid.

Both these materials are extremely resilient and have an excellent safety record. However these transparent plastics will degrade when subjected to excessive heat, solvents and some chemicals, which can lead to crazing and finally bowl failure.

Over the last few years metal bowls and guarded plastic bowls have become increasingly popular driven by the emergence of guidelines recommending the use of guards.

Some organizations have their own internal standards which call for guarded plastic or metal bowl and the general market trend is away from plastic bowls in the 1/2" or above port size units. This trend is reflected in our latest Excelon 74 and Olympian Plus product ranges. Plastic bowls remain the most common option for 1/4" and smaller units.

Never use polycarbonate bowls at conditions which exceed the maximum rated pressure and temperature of 150 psig (10 bar) and 125°F (50°C).

Certain chemicals, common in some oils and solvents, can attack polycarbonate and cause the bowl to burst. If the compressor intake is located in an area containing incompatible vapors, these contaminants can be drawn into the compressor and conveyed to the bowl in the compressed air. This can result in bowl failure.

Synthetic compressor oils may be drawn in from the compressor and can also result in bowl failure.

If doubt exists as to the compatibility of certain fluids with polycarbonate, please contact Applications Engineering.

Metal bowls should be used where temperatures exceed 125°F (50°C) and/or pressures exceed 150 psig (10 bar), or when materials are present which are incompatible with polycarbonate. Maximum rated operating conditions for metal bowls depend on the range; check APC-104.



1.4 DRAINS

1.4.1 Semi Automatic:

A semi-auto drain is one which operates when the air-line is depressurized eg at the end of a shift. It is a normally open two-way valve which is held closed by 7-10 psig (0.7-0.8 bar). When the filter is pressurized, the drain may be operated manually by pushing the tube, which protrudes outside the bowl, upwards.

1.4.2 Automatic:

An automatic drain is a two-way valve, which will close when the system is pressurized. The drain opens when the float rises due to accumulated liquid and on depressurization.

1.4.3 Where should an Automatic Drain be Used?

Automatic Drains should be used where the filter location may make servicing difficult, where filters may be hidden from view and consequently be overlooked or where equipment is in continual use. Areas where large quantities of liquid may accumulate over a short period of time should also be equipped with auto-drain filters. High labor costs for draining a large number of filters manually will generally justify the use of auto-drains.

Machines which have been shut down for a long period of time, such as over a weekend, can draw slugs of water during start-up which can overload a filter unless drained immediately. (This situation can normally be handled by a drip leg drain, see.)

Norgren float type automatic drains are 'normally open' type drains. During periods when the air line pressure is shut off, the automatic drain will open allowing liquids to drain rather than flood the air line piping system. When re-pressurizing the air line, the automatic drain valve will close when pressure reaches approximately 10 psig (0.7bar). This results in a flow through the drain to atmosphere of about 1.77 scfm (0.84dm³/s) until the valve automatically closes. (See 1.4.4 below.)

1.4.4 Where should a Low Flow Automatic Drain be used?

In systems where the compressor capacity is insufficient to close a number of standard auto drains a 'low flow' drain is available which requires only 0.5 scfm flow before closing. An ultra low flow auto drain is also available. 'Low flow' drains have less clearance around the valve for expelling contaminants, so should only be used where the standard unit cannot be used. 'Low flow' drains can be identified by red plastic parts.

1.4.5 07 Automatic (spitter) Drain:

When a rapid increase in flow occurs through the filter it results in the pressure above the drain's diaphragm being less than that below it. This differential pressure causes the drain to momentarily lift and 'spit' out the condensate collected underneath the drain.

1.4.6 Where should a Drip Leg Drain be Used?

The drip leg drain is a system protection device. Most compressed air distribution systems have varying flows and/or are shut down at the end of a working day. As the system cools, water in the compressed air condenses and collects in the distribution pipe work. This water will run along the pipe work and settle at the low point(s). On start up of the plant this water can be pushed under pressure into the nearest device or process and cause malfunction or damage.

By running a vertical pipe down from these low points water will flow into the drip leg drain where the automatic drain will expel it.

A filter screen within the drip leg drain prevents particles interfering with the auto-drain operation. A ball valve should be included above the drip leg drain to allow for maintenance when the system is running.

1.5 PERFORMANCE

1.5.1 Performance of General Purpose Filters

Filters have their flow measured in terms of the pressure drop across them. As the flow increases then the pressure drop also increases. These pressure drops are energy losses in the system.

A well designed filter not only removes water and particles efficiently, but also has a low pressure drop at a given flow. The flow figures quoted in Norgren catalogues for general purpose filters are at a pressure drop of 5 psig (0.3 bar), from a 100 psig (7 bar) inlet pressure.

Beware! not all competitors quote their flows under the same conditions. If a higher inlet pressure is used or a higher pressure drop is quoted then the apparent flow will be higher. This does not mean it is a better unit, simply that a different point on the curve has been selected. Often the only way to compare units is to test them under the same laboratory conditions.

1.5.2 Performance of Coalescing Filters:

The maximum flow of an oil removal filter is usually determined by the oil removal efficiency under saturated conditions. In the catalog there are maximum flows quoted 'to maintain stated oil removal characteristics.' These are the steady state flows which should not be exceeded to guarantee that the oil in the outlet air remains below the 0.01ppm (parts per million) quoted. Cyclic or pulsating flows will result in oil carry over, as will elevated temperatures.

If a higher oil carry over is acceptable (or there is no oil in the air-line) then higher flows are achievable, and will be determined by the 'acceptable' pressure drop. For a new (dry) element a flow which gives a pressure drop of less than 5 psid (0.3 bar) is recommended.



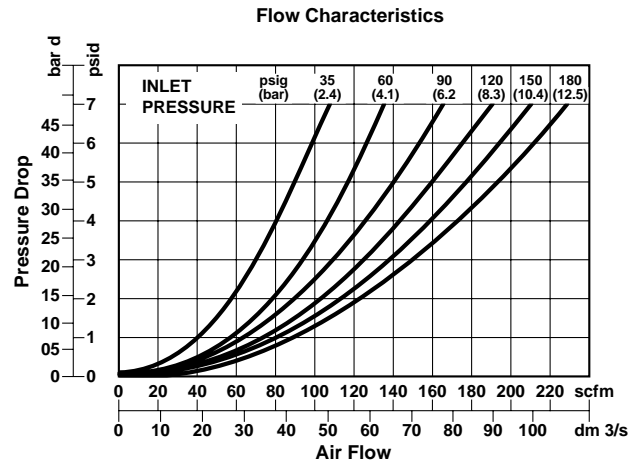
1.6 FILTER SIZING

Selecting the proper size of filter for any application should be done by determining the maximum allowable pressure drop which can be caused by the filter. The pressure drop can be determined by referring to flow curves provided by the manufacturer.

The flow characteristic curves should relate to the fluid used, pressure, pipe port size and micron rating of the filter element. Often the parameters of pressure and flow are labeled in metric and imperial units. The vertical axis is the pressure drop across the filter, and the horizontal axis is the air flow through the filter. Each curved line represents the filter flow and pressure drop characteristics for different operating pressures.

Example Find the pressure drop across the filter when operating at 90 psig (6.2 bar) and when 50 scfm (24 dm³/s) is flowing through the filter.

Answer Locate 50 scfm (24 dm³/s) on the horizontal axis. Read up to the intersecting point on the 90 psig (6.2 bar) operating curve. The pressure drop (or Δ p) is approximately .6 psid (.04bar) on the vertical axis on the left of the graph. (See graph)



1.7 MEMBRANE DRYERS

For those applications where a low-pressure dewpoint and low installation/operational cost are required, Norgren provides an Excelon® Membrane Dryer. This new product can provide dewpoint suppression up to 800F (260C) below ambient temperature and is available with nominal flows of 2, 5, 10, 20, and 30 scfm.

The Membrane Dryer is a variable dew point suppression device constructed of an anodized aluminum body with end caps. Inside the body are bundles of special hollow fibers (membranes) which are semi-permeable. Moisture-laden air enters the fibers and water vapor permeates through the walls to the outside of the fibers. Dry air exits the device through the outlet port. A small percentage of dry air is diverted across the outside of the fibers to sweep away and vent water vapor to atmosphere.

This device provides variable dew point suppression inversely related to flow. Lower flows through a unit will increase contact time with the membrane fibers, resulting in greater dew point suppression. Higher flows will result in a decreased level of dew point suppression. Additionally, dew point suppression is directly related to operating pressure. Increasing the pressure applied will result in a greater level of dew point suppression. Therefore, it is always recommend placing regulators downstream of a membrane dryer to ensure the highest pressure possible through the membrane dryer.

Typical Flows for Membrane Dryers

Model	Port	Outlet Flow	Inlet Flow	Purge Flow	Press. Drop
W07M2ANNNA	1/4"	2 scfm	2.2 scfm	0.2 scfm	0.4 psid
W72M2ANNNB	1/4"	5 scfm	5.6 scfm	0.6 scfm	0.32 psid
W72M2ANNNC	1/4"	10 scfm	11.2 scfm	1.2 scfm	0.90 psid
W74M4ANNND	1/2"	20 scfm	22.2 scfm	2.2 scfm	0.65 psid
W74M4ANNNE	1/2"	30 scfm	33.4 scfm	3.4 scfm	1.35 psid



1.7 SIMPLE FILTER TROUBLESHOOTING

Malfunction	Possible cause	Remedy
Excessive pressure drop.	Micron rating of element too small	Use larger micron element size for application.
	Filter element blocked.	1. Clean element (not coalescing element). Note: Some residual contamination will remain. 2. Replace with new element.
	Flow requirement greater than filter capacity.	Use larger filter.
Dirt passing through filter.	Element seals missing or defective. (N.B. Seals not required on some units).	1. Replace seal 2. Tighten element.
	Damaged element.	Replace element.
Water passing through filter.	Water level in bowl above baffle.	Drain water.
	Flow capacity of filter exceeded.	Maintain flow within capacity of filter or change to filter capable of handling desired flows.
Crazing of Polycarbonate bowl or milky appearance.	Bowl has been cleaned with incompatible fluid.	Replace bowl. (Clean only in clean warm water and soap.)
	Bowl is being used in an area containing fumes or vapors incompatible with polycarbonate.	Replace bowl. Eliminate source of problem or convert from plastic to metal bowls.
	Compressor oil vapor may be causing problem.	Replace bowl. Eliminate source of problem or convert from plastic to metal bowls.
	Air intake to compressor may contain fumes or vapor	Replace bowl. Eliminate source of problem or incompatible with polycarbonate.convert from plastic to metal bowls.
Water beyond the filter	Inlet air has a high temperature and as it cools downstream, moisture condenses to water.	Fit dryer, pre-cool air or fit filter immediately prior to application.



Absence of an Industrial Standard for Rating Pneumatic Filter Elements

There is not an industry wide standard for establishing the micron rating of pneumatic filter elements. Standards by various industry associations, including the National Fluid Power Association (NFPA) and International Standard Organization (ISO), are in discussion. In the absence of an industry standard, some manufacturers of pneumatic filters make claims concerning the micron rating of their so called “standard” element which can not be substantiated and are probably not valid.

Norgren’s Method of Rating and Testing Pneumatic Filter Elements

Norgren particle removal filter elements are rated by the size of the particle they will trap (i.e., a 40-micron element will remove particles 40-microns and larger). Norgren tests filter elements by using **standard coarse** and **fine** test dusts of known particle size distribution. **Coarse** dust consists of 12% particles smaller than 5-microns; **fine** grain dust consists of 39% particles smaller than 5-microns. Test results show that a Norgren filter element rated at 40-microns actually removes over 98% of particles 5-microns and larger.

How to Size a Filter Element

The downstream equipment being protected determines the micron rating of the filter element. Industrial tools, such as air hammers and drills, typically require only a 40-micron element. Air operated instruments and small, high speed tools typically require a 5-micron element. Always consult the equipment manufacturer for filtration requirements.

Generally, the smaller the micron rating of the element,

- the higher the pressure drop across the filter,
- the shorter the element service life.

Therefore, the use of a 5-micron element where a 40-micron is adequate penalizes the customer in increased pressure losses and frequent down time for changing or cleaning the filter element.

ISO Standard 8573-1. Compressed Air for General Use

Contaminant’s found in industrial compressed air systems include solid particles, water, and oil. ISO 8573-1:1991 provides a simple method of classifying these contaminant’s. A quality class required for a particular application can be defined by listing, in order, the class required for solids, water, and oil.

Table 1. Summary of ISO 8573-1:1991 Air Quality Classes *

Quality Class	Solid Particle Maximum Size μm	Water Maximum Pressure Dewpoint $^{\circ}\text{F}$ ($^{\circ}\text{C}$)	Oil Maximum Remaining Oil Content mg/m^3 ** (ppm)
1	0.1	-94 (-70)	0.01 (.0084)
2	1	-40 (-40)	0.1 (.084)
3	5	-4 (-20)	1 (.84)
4	15	38 (3)	5 (4.2)
5	40	45 (7)	25 (21)
6	—	50 (10)	—

* See ISO standard 8573-1 for complete information.

** At 1 bar absolute pressure.

Examples:

Air of Quality Class 2.2.2 is filtered to 1 μm solid particle size, dried to -40 $^{\circ}\text{F}$ (-40 $^{\circ}\text{C}$) pressure dewpoint, and filtered to an oil concentration of 0.1 mg/m^3 .

Air of Quality Class 5.3.4 is filtered to 40 μm solid particle size, dried to -4 $^{\circ}\text{F}$ (-20 $^{\circ}\text{C}$) pressure dewpoint, and filtered to an oil concentration of 5 mg/m^3 .

When a class for a particular contaminant solid, water, or oil is not specified, the number designating the class is replaced with a hyphen.

Example: Air of Quality Class 1.-.1 does not specify the pressure dewpoint.

General Purpose Filters

Compressed air, general purpose filters are available in modular or inline models, in port sizes from 1/8" to 2".

F07 Miniature General Purpose Filter 1/8" and 1/4" Ports	.....ALE-1-2
F72G Excelon General Purpose Filter 1/4" and 3/8" Ports	.....ALE-1-4
F73G Excelon General Purpose Filter 1/4" to 1/2" Ports	.....ALE-1-6
F74G Excelon General Purpose Filter 1/4" to 3/4" Ports	.....ALE-1-8
F64G Olympian Plus General Purpose Filter 1/4" to 3/4" Ports	...ALE-1-10
F68G Olympian Plus General Purpose Filter 3/4" to 1-1/2" Ports	..ALE-1-12
F17 General Purpose Filter 3/4" to 1-1/2" Ports	.....ALE-1-14
F18 General Purpose Filter 1-1/2" and 2" Ports	.....ALE-1-16



F07



F72G



F73G



F74G



F64G



F17



F18

Product available 1st quarter of 2001

F68

**Miniature Series 07 General Purpose Filter
1/8" and 1/4" Port Sizes**

- **Compact design**
- **Protects air operated devices by removing liquid and solid contaminants**
- **Screw-on bowl reduces maintenance time**
- **Can be disassembled without the use of tools or removal from the air line**



Ordering Information. Models listed include PTF threads, automatic drain, transparent bowl and 5 μm element.

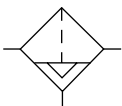
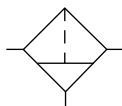
Port Size	Model Numbers	Flow scfm (dm ³ /s) *	Weight lbs (kg)
1/8"	F07-100-A1TA	19 (9)	0.28 (0.13)
1/4"	F07-200-A1TA	24 (11.5)	0.28 (0.13)

* Approximate flow at 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop.

Alternative Models

Port Size		Option		Threads		Bowl		Element		Drain	
Port Size	Substitute	Option	Substitute	Threads	Substitute	Bowl	Substitute	Element	Substitute	Drain	Substitute
1/8"	1	Not applicable	0	PTF	A	Transparent	T	5 μm	1	Automatic	A
1/4"	2	Not applicable	0	ISO Rc taper	B	Metal	M	40 μm	3	Manual	M
				ISO G parallel	G						

F 0 7 - ★ ★ ★ - ★ ★ ★ ★

ISO Symbols

Auto Drain

Manual Drain

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure:

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature:*

Transparent bowl: -30° to 125°F (-34° to 50°C)

Metal bowl: -30° to 175°F (-34° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)

Particle removal: 5 µm or 40 µm filter element

Air quality: Within ISO 8573-1, Class 3 and Class 5 (particulates)

Typical flow at 90 psig (6.3 bar) inlet pressure at 5 psig (0.35 bar) pressure drop:

1/8" Ports, 5 µm element: 19 scfm (9 dm³/s)

1/4" Ports, 5 µm element: 24 scfm (11.5 dm³/s)

Nominal bowl size: 1 fluid ounce (31 ml)

Drain connection: 1/8" pipe thread

Automatic drain operation: Spitter type drain operates momentarily when a rapid change in air flow occurs or when the supply pressure is reduced.

Materials

Body: Zinc

Bowl

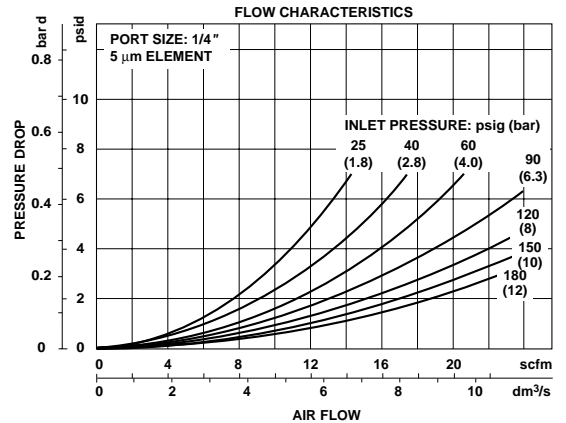
Transparent: Polycarbonate

Metal: Zinc (without sight glass)

Element: Sintered polypropylene

Elastomers: Neoprene & nitrile

Typical Performance Characteristics

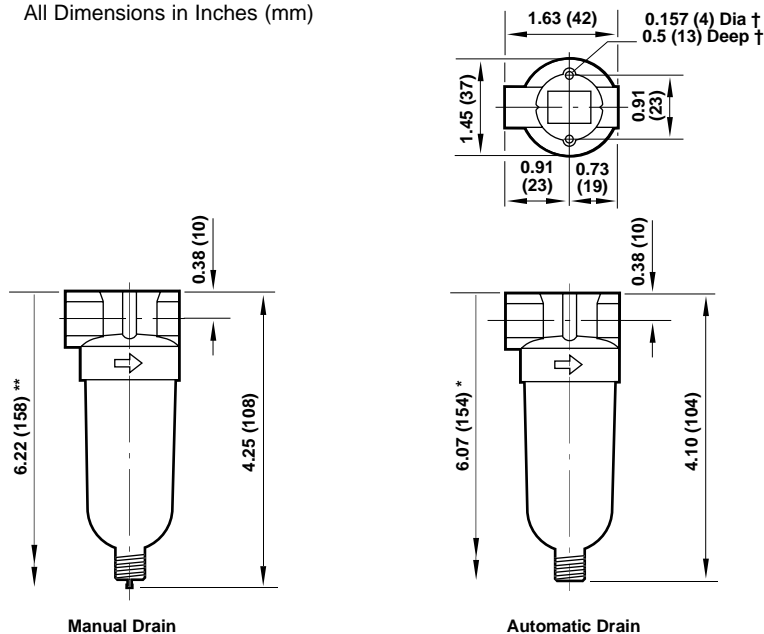


Service Kits

Item	Type	Part number
Service kit	5 µm element	3652-17
	40 µm element	3652-18
Replacement drains	Manual	773-03
	Automatic	3654-02

Service kit includes element, element gasket, and bowl o-ring.

All Dimensions in Inches (mm)



** Minimum clearance to remove bowl.
† Mounting holes.

**Excelon 72 General Purpose Filter
1/4" and 3/8" Port Sizes**

- Excelon design allows in-line or modular installation
- High efficiency water and particle removal
- Quick release bayonet bowl
- Highly visible, prismatic liquid level indicator lens on metal bowls
- Optional service indicator turns from green to red when the filter element needs to be replaced
- Optional electrical service indicator also available
- Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications



Ordering Information. Models listed include PTF threads, automatic drain, long transparent bowl without guard, 40 µm element. Models do not include the service life indicator.

Port Size	Model	Flow† scfm (dm³/s)	Weight lb (kg)
1/4"	F72G-2AN-AL3	55 (26)	1.15 (0.52)
3/8"	F72G-3AN-AL3	55 (26)	1.15 (0.52)

† Typical flow with a 40µm element at 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop.

Alternative Models

F 7 2 G - ★ ★ ★ - ★ ★ ★

Port Size	Substitute
1/4"	2
3/8"	3

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

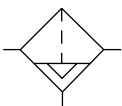
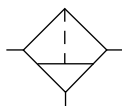
Service Life Indicator	Substitute
With (visual)	D
With (electrical)	E
Without	N

Element	Substitute
5 µm	1
25 µm	2
40 µm	3

Bowl	Substitute
Short metal with liquid level indicator	D
Long metal with liquid level indicator	E
Short transparent without guard	T
Long transparent without guard	L
Long transparent with guard	W

Drain	Substitute
1/4 turn manual	Q
Semi automatic	S
Auto drain*	A

* Supplied in long bowl options only

ISO Symbols

Auto Drain

Manual Drain
See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure:

Transparent bowl: 150 psig (10 bar)

Metal bowl:

Manual or semi automatic drain: 250 psig (17 bar)

Automatic drain: 150 psig (10 bar)

Operating temperature*:

Transparent bowl: -30° to 125°F (-34° to 50°C)

Metal bowl: -30° to 150°F (-34° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5 µm, 25 µm or 40 µm. Within ISO 8573-1, Class 3 and Class 5

Typical flow at 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop:

5 µm element: 47 scfm (22 dm³/s)

40 µm element: 55 scfm (26 dm³/s)

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread.

Semi automatic drain connection: Push on 5/16" (8 mm) ID tube

Semi automatic drain operating conditions (pressure operated):

Bowl pressure required to close drain: Greater than 1.5 psig (0.1 bar)

Bowl pressure required to open drain: Less than 1.5 psig (0.1 bar)

Minimum air flow required to close drain: 1 scfm (0.5 dm³/s)

Manual operation: Lift stem to drain bowl

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread. - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.

Automatic drain operating conditions (float operated):

Bowl pressure required to close drain: Greater than 5 psig (0.35 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 0.2 scfm (0.1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size:

Short bowl: 1.9 fluid ounce (56 ml)

Long bowl: 2.2 fluid ounce (65 ml)

Materials

Body: Zinc

Bowl

Transparent: Polycarbonate

Guard for transparent bowl: Zinc

Metal: Zinc

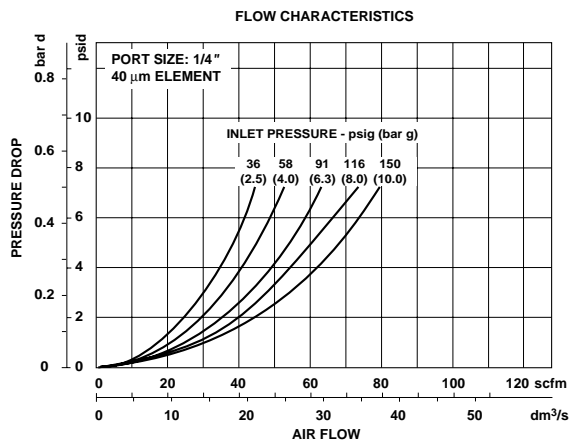
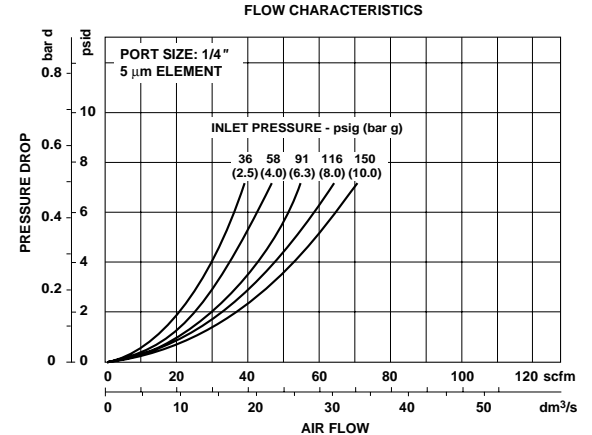
Metal bowl liquid level indicator lens:

Transparent nylon

Element: Sintered polypropylene

Elastomers: Neoprene and nitrile

Typical Performance Characteristics

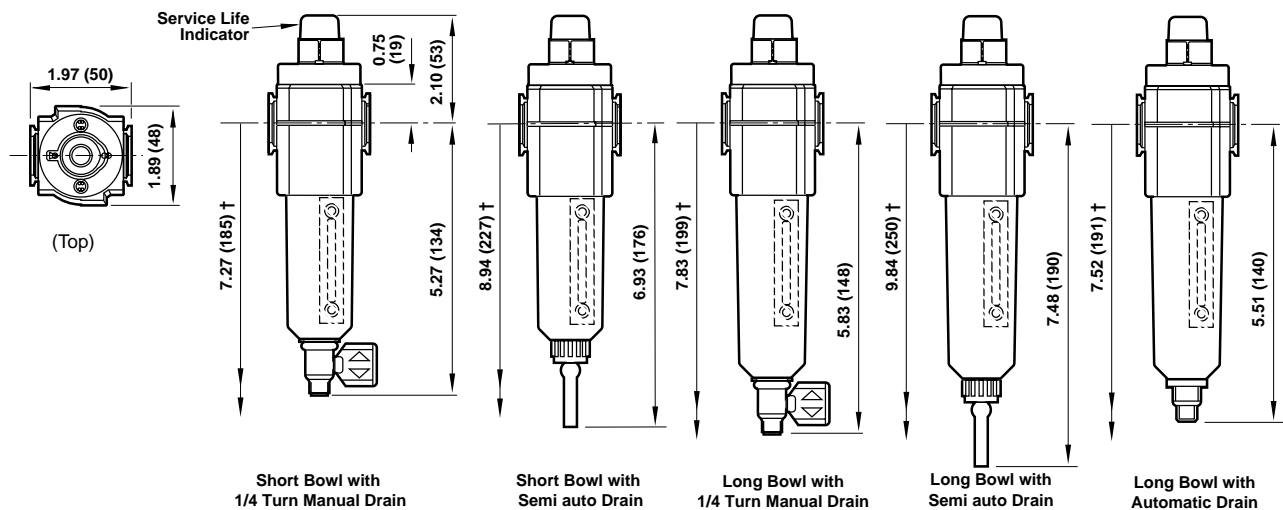


Service Kits

Item	Type	Part Number
Service kit	Seal and gasket	4380-500
Elements	5 µm	5925-03
	25 µm	5925-01
	40 µm	5925-02
Liquid level lens kit	Prismatic	4380-030
Replacement drains	1/4 turn manual	619-50
	Semi automatic	5379-RK
	Automatic	4000-50R

Service kit includes drain and bowl o-rings.

All Dimensions in Inches (mm)



† Minimum clearance required to remove bowl.

Excelon 73 General Purpose Filter
1/4", 3/8", 1/2" Port Sizes

- **Excelon design allows in-line or modular installation**
- **Quick release bayonet bowl**
- **Highly visible, prismatic liquid level indicator lens**
- **Optional mechanical service indicator turns from green to red when the filter element needs to be replaced**
- **Optional electrical service indicator provides electrical output when the filter element needs to be replaced**
- **Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications**



Ordering information. Models listed include PTF threads, automatic drain, metal bowl with liquid level indicator, and a 40 µm element.

Port Size	Model	Flow* scfm (dm ³ /s)	Weight lb (kg)
1/4"	F73G-2AN-AD3	53 (25)	1.1 (0.50)
3/8"	F73G-3AN-AD3	65 (31)	1.1 (0.50)
1/2"	F73G-4AN-AD3	69 (33)	1.1 (0.50)

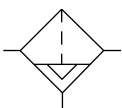
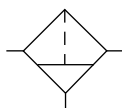
* Typical flow with a 40 µm element at 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop.

Alternative Models

Port Size		Substitute		Element		Substitute	
1/4"		2		5 µm		1	
3/8"		3		25 µm		2	
1/2"		4		40 µm		3	

Threads		Substitute		Bowl		Substitute	
PTF		A		Metal with liquid level indicator		D	
ISO Rc taper		B		Transparent with guard		P	
ISO G parallel		G		Transparent		T	

Service Indicator		Substitute		Drain		Substitute	
With electrical service indicator *		E		Automatic		A	
With mechanical service indicator		D		Manual, 1/4 turn		Q	
Without		N					

ISO Symbols

Auto Drain

Manual Drain

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure:

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*:

Transparent bowl: -30° to 125°F (-34° to 50°C)

Metal bowl: -30° to 175°F (-34° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5 µm, 25 µm, or 40 µm filter element

Air quality: Within ISO 8573-1, Class 3 and Class 5 (particulates)

Typical flow with a 40 µm element at 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop: 65 scfm (31 dm³/s)

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread.

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread. - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.

Automatic drain operating conditions (float operated):

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 0.2 scfm (0.1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size: 3.5 fluid ounce (0.1 liter)

Materials

Body: Aluminum

Bowl

Transparent: Polycarbonate

Transparent with guard: Polycarbonate, steel guard

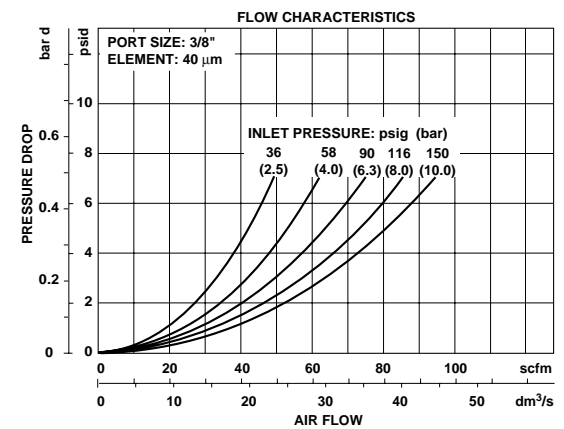
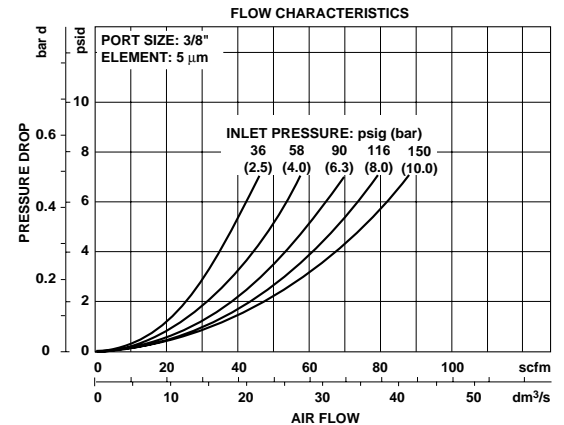
Metal: Aluminum

Metal bowl liquid level indicator lens: Transparent nylon

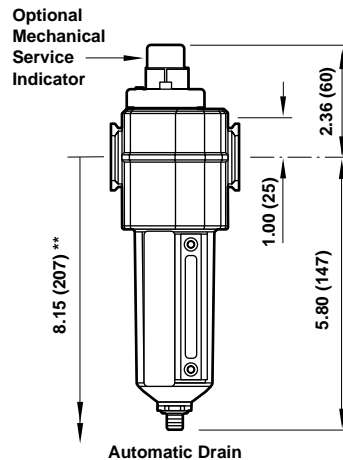
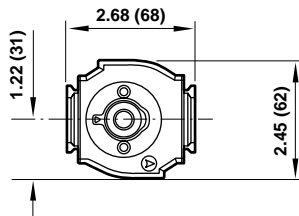
Element: Sintered polypropylene

Elastomers: Neoprene and nitrile

Typical Performance Characteristics



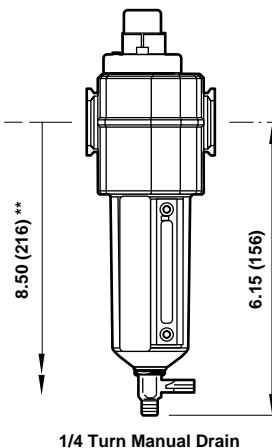
All Dimensions in Inches (mm)



Service Kits

Item	Type	Part Number
Service kit	Seal & Gasket	4380-600
Replacement elements	5 µm	4438-01
	25 µm	4438-02
	40 µm	4438-03
Liquid level lens kit	Prismatic	4380-020
Replacement drains	Automatic	4000-51R
	Manual quarter turn	619-50

Service kit includes automatic drain seal and bowl seal.



** Minimum clearance required to remove bowl.

**Excelon 74 General Purpose Filter
3/8", 1/2", 3/4" Port Sizes**

- Excelon design allows in-line or modular installation
- Quick release bayonet bowl
- Highly visible, prismatic liquid level indicator lens
- Optional mechanical service indicator turns from green to red when the filter element needs to be replaced
- Optional electrical service indicator provides electrical output when the filter element needs to be replaced
- Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications



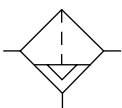
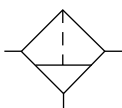
Ordering information. Models listed include PTF threads, automatic drain, metal bowl with liquid level indicator, and a 40 µm element.

Port Size	Model	Flow* scfm (dm ³ /s)	Weight lb (kg)
3/8"	F74G-3AN-AD3	112 (53)	1.82 (0.83)
1/2"	F74G-4AN-AD3	140 (66)	1.79 (0.81)
3/4"	F74G-6AN-AD3	140 (66)	1.75 (0.79)

* Typical flow with a 40 µm element at 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop.

Alternative Models

		F 7 4 G - ★ ★ ★ - ★ ★ ★		
Port Size	Substitute	|	Element	Substitute
3/8"	3		5 µm	1
1/2"	4		25 µm	2
3/4"	6	|	40 µm	3
Threads	Substitute		Bowl	Substitute
PTF	A		Metal with liquid level indicator	D
ISO Rc taper	B	|	Transparent with guard	P
ISO G parallel	G		Drain	Substitute
Service Life Indicator	Substitute		Automatic	A
With (visual)	D	|	Manual, 1/4 turn	Q
With (electrical)	E			
Without	N			

ISO Symbols

Auto Drain

Manual Drain

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*:

Transparent bowl: -34° to 125°F (-30° to 50°C)

Metal bowl: -34° to 175°F (-30° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5, 25, or 40 µm filter element

Air quality: Within ISO 8573-1, Class 3 and Class 5 (particulates)

Typical flow with a 40 µm element at 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop: 140 scfm (66 dm³/s)

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread. - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.

Automatic drain operating conditions (float operated):

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 2 scfm (1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size: 7 fluid ounce (0.2 liter)

Materials

Body: Aluminum

Bowl

Transparent: Polycarbonate with steel bowl guard

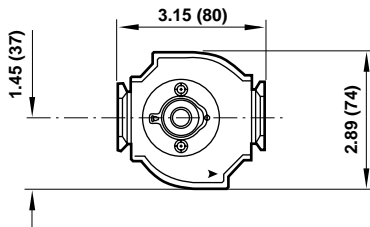
Metal: Aluminum

Metal bowl liquid level indicator lens: Transparent nylon

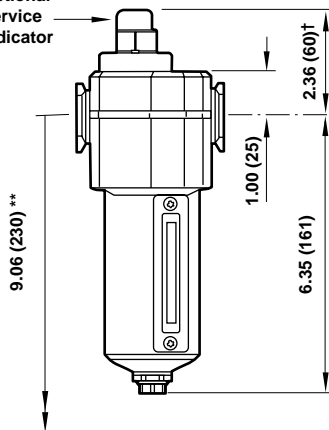
Element: Sintered plastic

Elastomers: Neoprene and Nitrile

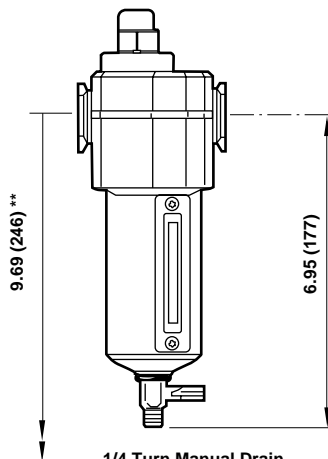
All Dimensions in Inches (mm)



Optional Service Indicator



Automatic Drain

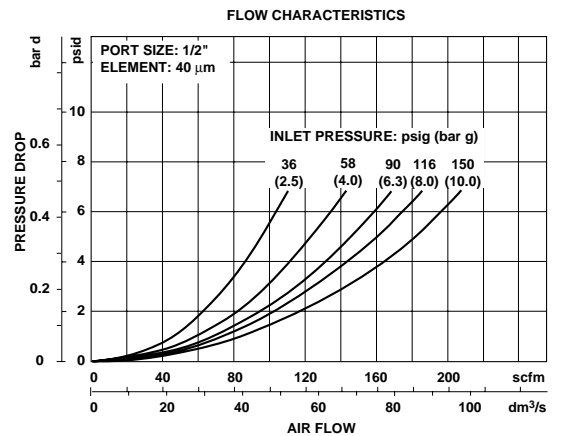
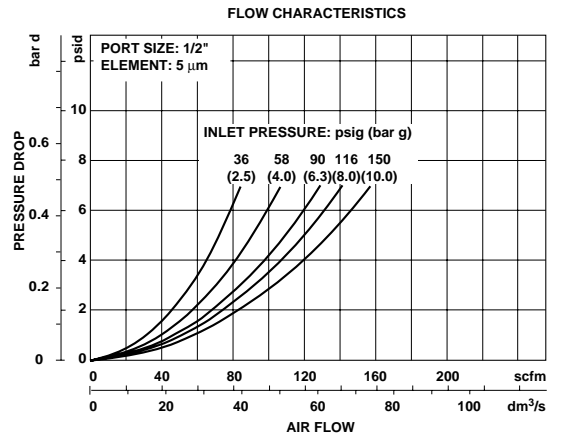


1/4 Turn Manual Drain

* Minimum clearance required to remove bowl.

† Dimension for alternative electrical service indicator is 1.98" (50.4 mm)

Typical Performance Characteristics



Service Kits

Item	Type	Part Number
Service kit	Seal & gasket	4380-700
Replacement elements	5 µm	4338-04
	25 µm	4338-07
	40 µm	4338-05
Liquid level lens kit	Prismatic	4380-050
Replacement drains	Automatic (1/8 NPT outlet)	3000-10
	Manual quarter turn	619-50

Service kit includes louvre/element seal, drain seal, bowl seal.

Olympian Plus General Purpose Filter
1/4", 3/8", 1/2", 3/4" Port Sizes

- Olympian Plus plug in design
- High efficiency water and particle removal
- Quick release bayonet bowl
- High visibility prismatic sight glass
- Optional service indicator



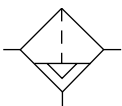
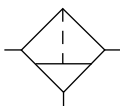
Ordering Information. Models listed include PTF threads, yoke, automatic drain, metal bowl, 40 µm element. Models do not include the service life indicator.

Port Size	Model	Flow [†] scfm (dm ³ /s)	Weight lb (kg)
1/4"	F64G-2AN-AD3	59 (28)	3.13 (1.42)
3/8"	F64G-3AN-AD3	118 (56)	3.13 (1.42)
1/2"	F64G-4AN-AD3	125 (59)	2.91 (1.32)
3/4"	F64G-6AN-AD3	125 (59)	3.79 (1.72)

† Typical flow with a 40 µm element at 90 psig (6.3 bar) inlet pressure and a 5 psig (0.35 bar) pressure drop.

Alternative Models

F 6 4 G - ★ ★ ★ - ★ ★ ★		Element	Substitute
Port Size	Substitute	5 µm	1
1/4"	2	25 µm	2
3/8"	3	40 µm	3
1/2"	4		
3/4"	6		
No yoke	N		
Threads	Substitute	Bowl	Substitute
PTF	A	Metal with liquid level indicator	D
ISO Rc taper	B	Transparent with guard	P
ISO G parallel	G		
No yoke	N		
Service Life Indicator	Substitute	Drain	Substitute
With (visual)	D	Auto drain	A
With (electrical)	E	Manual, 1/4 turn	Q
Without	N		

ISO Symbols

Auto Drain

Manual Drain

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure

Guarded transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*:

Guarded transparent bowl: -30° to 125°F (-34° to 50°C)

Metal bowl: -30° to 175°F (-34° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
 Partical removal: 5 µm, 25 µm or 40 µm. Within ISO 8573-1, Class 3 and Class 5
 Typical flow with 40 µm element at 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop: 125 scfm (59 dm³/s)

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread.

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread. - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.

Automatic drain operating conditions (float operated):

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 2 scfm (1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size: 7 fluid ounce (0.2 liter)

Materials

Body: Zinc

Yoke: Zinc

Metal bowl: Aluminum

Standard metal bowl prismatic liquid level indicator lens: Grilamid

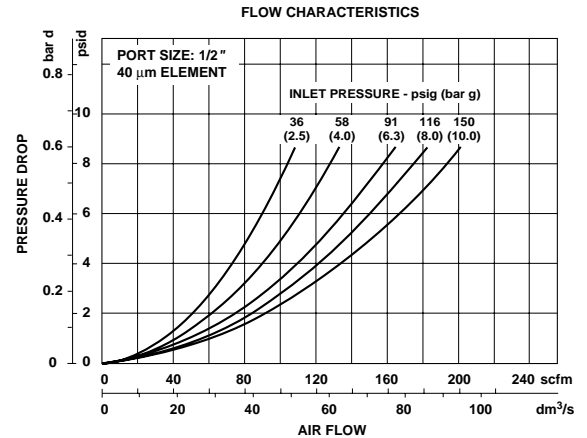
Optional metal bowl sight glass: Pyrex

Optional transparent bowl: Polycarbonate

Element: Sintered plastic

Elastomers: Synthetic rubber

Typical Performance Characteristics

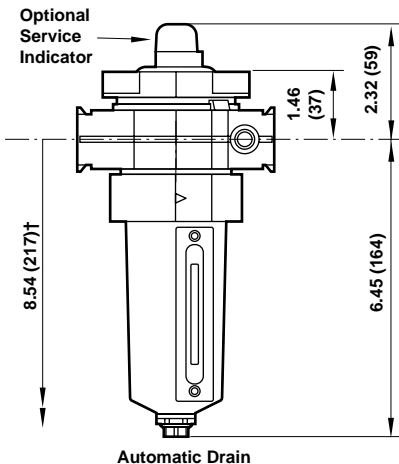
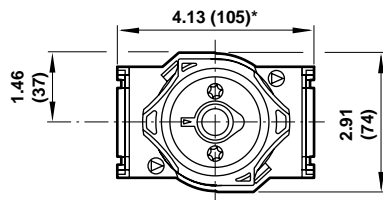


Service Kits

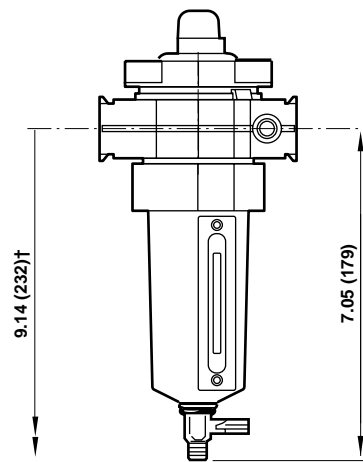
Item	Type	Part Number
Service kit	Seal and gasket	4380-200
Elements	5 µm	4338-01
	25 µm	4338-99
	40 µm	4338-02
Liquid level lens kit	Prismatic	4380-040
	Pyrex	4380-041
Replacement drains	Automatic	3000-10
	Manual	684-84

Service kit includes port seals, louver o-ring, bowl o-ring and drain gasket.

All Dimensions in Inches (mm)



Automatic Drain

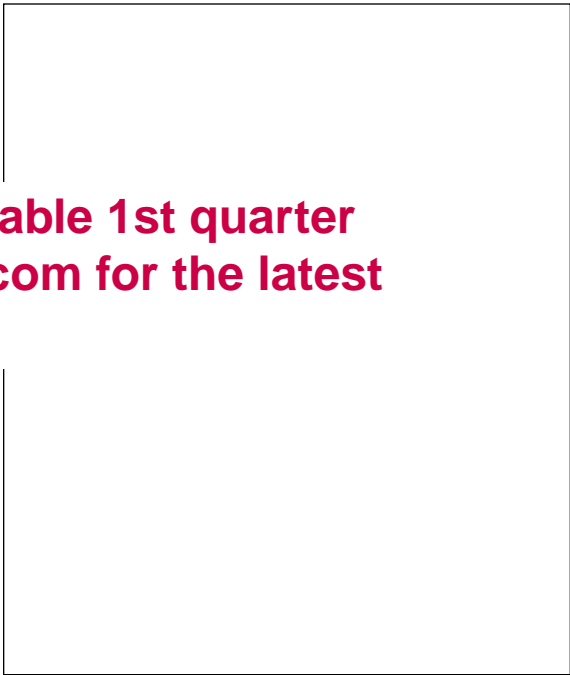


1/4 Turn Manual Drain

* 6.18" (157 mm) for 3/4" models

† Minimum clearance required to remove bowl.

- Olympian plug in design
- High efficiency water and particle removal



68 Series products are available 1st quarter of 2001. Visit www.norgren.com for the latest data on this series.

Ordering Information. Models listed include PTF threads, automatic drain, 50 µm element and 0.5 liter bowl.

Port Size	Model	Weight lb (kg)
3/4"	F68-6AN-AR3	6.04 (2.72)
1"	F68-8AN-AR3	5.78 (2.60)
1-1/4"	F68-AAN-AR3	6.00 (2.70)
1-1/2"	F68-BAN-AR3	5.64 (2.54)

Alternative Models

F 6 8 G - ★ ★ ★ - ★ ★ ★

Port Size	Substitute
3/4"	6
1"	8
1-1/4"	A
1-1/2"	B
None	N

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G
None	N

Service Life Indicator	Substitute
With mechanical service indicator	D
With electrical service indicator**	E
Without	N

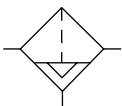
Element	Substitute
5 µm	1
25 µm	2
50 µm	3

Bowl	Substitute
1 quart (1 liter) without liquid level indicator	C
1 pint (0.5 liter) without liquid level indicator	M
1 pint (0.5 liter) with liquid level indicator	R
1 quart (1 liter) with liquid level indicator	U

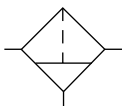
Drain	Substitute
Manual	M
Auto drain	A
Closed bowl	E

** See Accessories for description and specifications.

ISO Symbols



Auto Drain



Manual Drain



Technical Data

Fluid: Compressed air

Maximum pressure

Metal bowl: 250 psig (17 bar)

Operating temperature*

Metal bowl: 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5, 25 or 50 µm.

Air quality: Within

ISO 8573-1, Class 3 and Class 5 (particulates).

Typical flow at 90 psig (6.3 bar) inlet pressure and a droop of 5 psig (0.35 bar):

50 µm element: 393 scfm (185 dm³/s) **TBA from Lab Test**

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread. - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.

Automatic drain operating conditions

Minimum pressure: 10 psig (0.7 bar).

Drain opens when bowl pressure drops below 3 psig (0.2 bar).

Minimum air flow: 2 scfm (1 dm³/s) required to close drain.

Nominal bowl size:

1 pint US (0.5 liter)

Materials

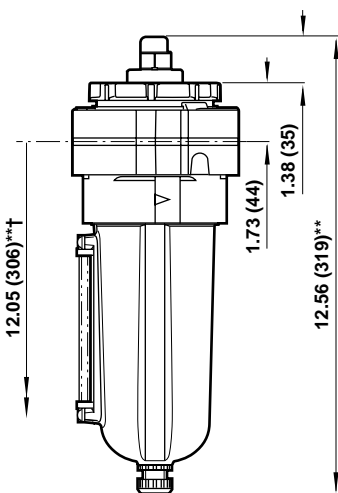
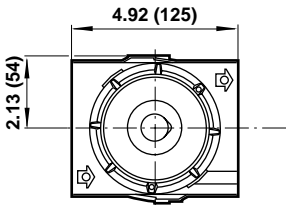
Body: Aluminum

Yoke: Aluminum

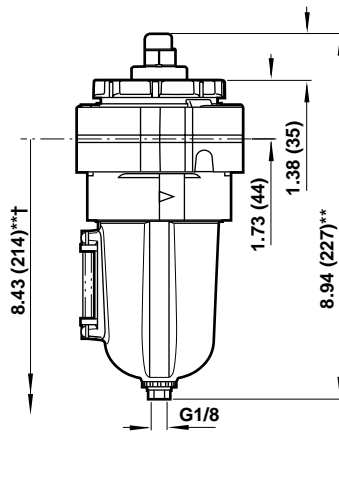
Metal bowl: Aluminum

Sight glass: Pyrex

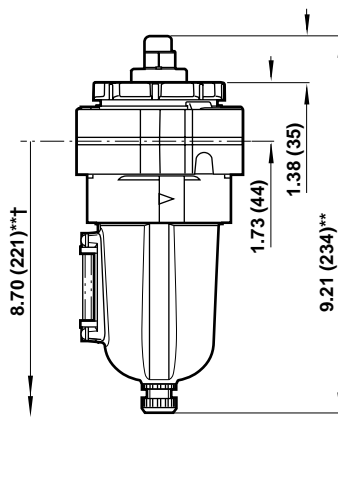
All Dimensions in Inches (mm)



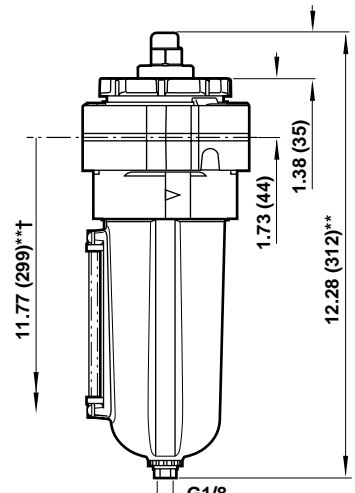
1 liter, manual drain



0.5 liter, automatic drain



0,5 liter, manual drain



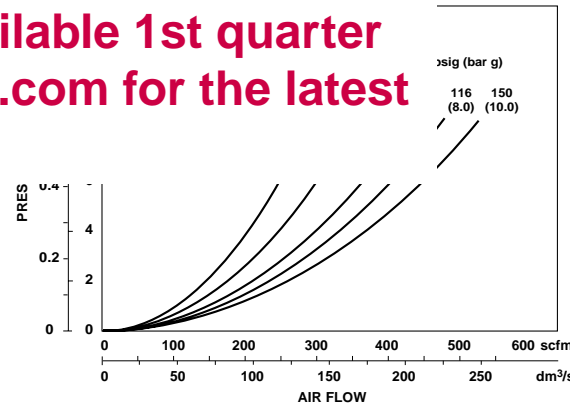
1 liter, automatic drain

** For mechanical service indicator add 1.38" (35 mm). For electrical service indicator add 1.98" (50.4 mm)
For closed bowl subtract 0.35" (9 mm) from auto drain dimension.

† Minimum clearance required to remove bowl.

Typical Performance Characteristics

FLOW CHARACTERISTICS



Service Kits

Item	Type	Part Number
Service Kit		4380-300
Replacement Elements	5 µm	5576-97
	25 µm	5576-98
	50 µm	5576-99
Replacement Sight Glass	1 pint US (0.5 liter)	4380-060
	1 quart US (1 liter)	4380-062
Replacement Drains	Automatic	3000-97
	Manual	684-84
Service Life	Mechanical	5797-50
Indicators	Electrical	4020-51R

Service kit Includes: **TBA**.

**17 Series General Purpose Filter
3/4", 1", 1-1/4", 1-1/2" Port Sizes**

- Protects air operated devices by removing liquid and solid contaminants from compressed air
- Screw-on bowl reduces maintenance time
- Can be serviced without the use of tools or removal from the air line
- Optional visual service indicator turns from green to red when the filter element needs to be cleaned or replaced
- Optional electrical service indicator also available



Ordering Information. Models listed include automatic drain, 40 µm element, metal bowl with sight glass, and PTF threads.

Port Size	Model Numbers	Flow scfm (dm ³ /s)*	Weight lbs (kg)
3/4"	F17-600-A3DA	325 (153)	4.26 (1.93)
1"	F17-800-A3DA	425 (201)	4.15 (1.88)
1-1/4"	F17-A00-A3DA	425 (201)	4.39 (1.99)
1-1/2"	F17-B00-A3DA	425 (201)	4.30 (1.95)

* Typical flow with a 40 µm element at 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop.

Alternative Models

F 1 7 - ★ ★ ★ - ★ ★ ★ ★

Port Size	Substitute
3/4"	6
1"	8
1-1/4"	A
1-1/2"	B

Option	Substitute
Not applicable	0

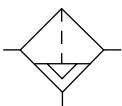
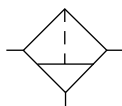
Service Indicator	Substitute
With (visual)	1
With (electrical)	4
Without	0

Threads	Substitute
PTF	A
ISO Rc taper	B
BSPG (1-1/2" ported units only)	C
ISO G parallel (not available with 1-1/2" ported units)	G

Bowl	Substitute
1 quart (1 liter) metal with sight glass	D
1 quart (1 liter) metal	M

Element	Substitute
5 µm	1
25 µm	2
40 µm	3
75 µm	4

Drain	Substitute
Automatic	A
Manual	M

ISO Symbols

Auto Drain

Manual Drain

See Section ALE-25 for Accessories



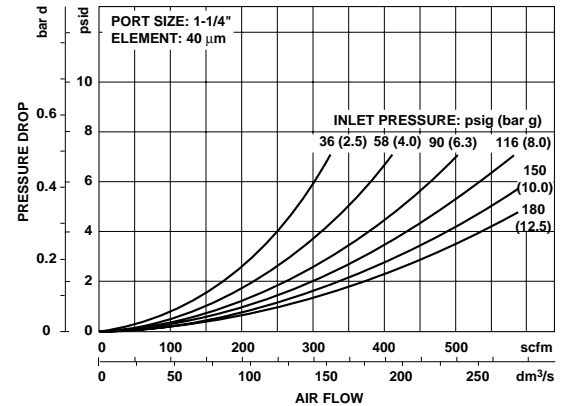
Technical Data

Fluid: Compressed air
 Maximum pressure: 250 psig (17 bar)
 Operating temperature: * -30° to 175°F (-34° to 80°C)
 * Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)
 Particle removal: 5 µm, 25 µm, 40 µm, or 75 µm filter element
 Air quality: Within ISO 8573-1, Class 3 and Class 5 (particulates)
 Typical flow with a 40 µm element at 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop: 425 scfm (201 dm³/s)
 Nominal bowl size: 1 quart (1 liter)
 Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread.
 Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread. - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.
 Automatic drain operating conditions (float operated):
 Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
 Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
 Minimum air flow required to close drain: 2 scfm (1 dm³/s)
 Manual operation: Depress pin inside drain outlet to drain bowl

Materials

- Body: Aluminum
- Bowl: Aluminum
- Bowl sight glass: Pyrex
- Elastomers: Neoprene and nitrile
- Filter element
 - 5 µm: Sintered bronze
 - 25 µm: Sintered bronze
 - 40 µm: Sintered bronze
 - 75 µm: Stainless steel screen

Typical Performance Characteristics

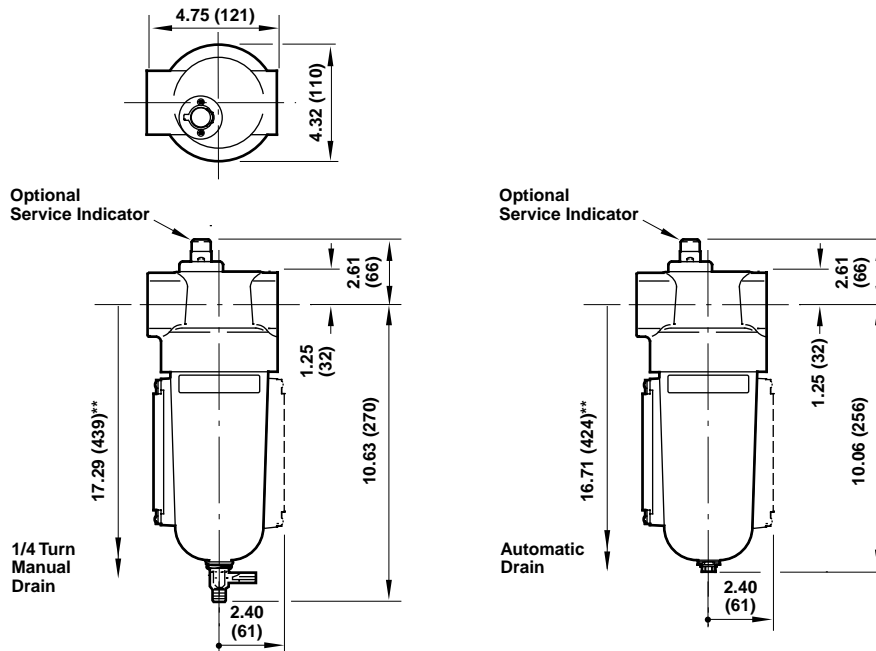


Service Kits

Item	Type	Part number
Service kits	All filters	5578-05
Replacement elements	5 µm	5311-01
	25 µm	5311-02
	40 µm	5311-03
Replacement drain	75 µm	5656-01
	Automatic	3000-10
	Manual (1/4 turn)	619-50

Service kit 5778-05 includes bowl o-ring, drain gasket, and element gasket.

All Dimensions in Inches (mm)



** Minimum clearance required to remove bowl

**18 Series General Purpose Filter
1-1/2" and 2" Port Sizes**

- Protects air operated devices by removing liquid and solid contaminants
- Highly visible, prismatic liquid level indicator lens
- Can be disassembled without removal from the air line
- Optional visual service indicator turns from green to red when the filter element needs to be cleaned or replaced
- Optional electrical service indicator also available



Ordering Information. Models listed include automatic drain, 40 µm element, metal bowl with sight glass, and PTF threads.

Port Size	Model Numbers	Flow scfm (dm ³ /s) *	Weight lbs (kg)
1-1/2"	F18-B00-A3DA	1400 (661)	14.90 (6.76)
2"	F18-C00-A3DA	1400 (661)	14.65 (6.65)

* Typical flow with a 40 µm element at 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop.

Alternative Models

F 1 8 - ★ ★ ★ - ★ ★ ★ ★

Port Size	Substitute
1-1/2"	B
2"	C

Option	Substitute
Not applicable	0

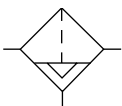
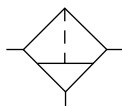
Service Indicator	Substitute
Without	0
With pneumatic	1
With electrical	4

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Bowl	Substitute
Metal with sight glass	D
Metal	M

Element	Substitute
5 µm	1
25 µm	2
40 µm	3
100 µm	4

Drain	Substitute
Automatic	A
Manual 1/4 turn	M

ISO Symbols

Auto Drain

Manual Drain

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air
 Maximum pressure: 250 psig (17 bar)
 Operating temperature*: -30° to 175°F (-34° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5 µm, 25 µm, 40 µm or 100 µm filter element

Air quality: Within ISO 8573-1, Class 3 and Class 5 (particulates)

Typical flow with a 40 µm element at 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop: 1300 scfm (614 dm³/s) Nominal bowl size: 7 fluid ounce (0.2 liter)

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread.

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread. - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.

Automatic drain operating conditions (float operated):

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 2 scfm (1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

Materials

Body: Aluminum

Intermediate body: Aluminum

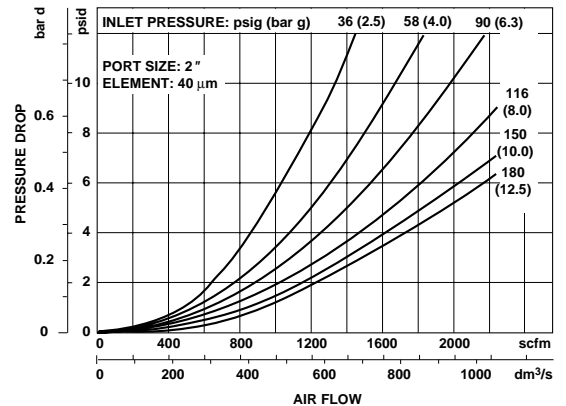
Bowl: Aluminum

Metal bowl liquid level indicator: Transparent nylon

Filter element: Sintered bronze

Elastomers: Neoprene and nitrile

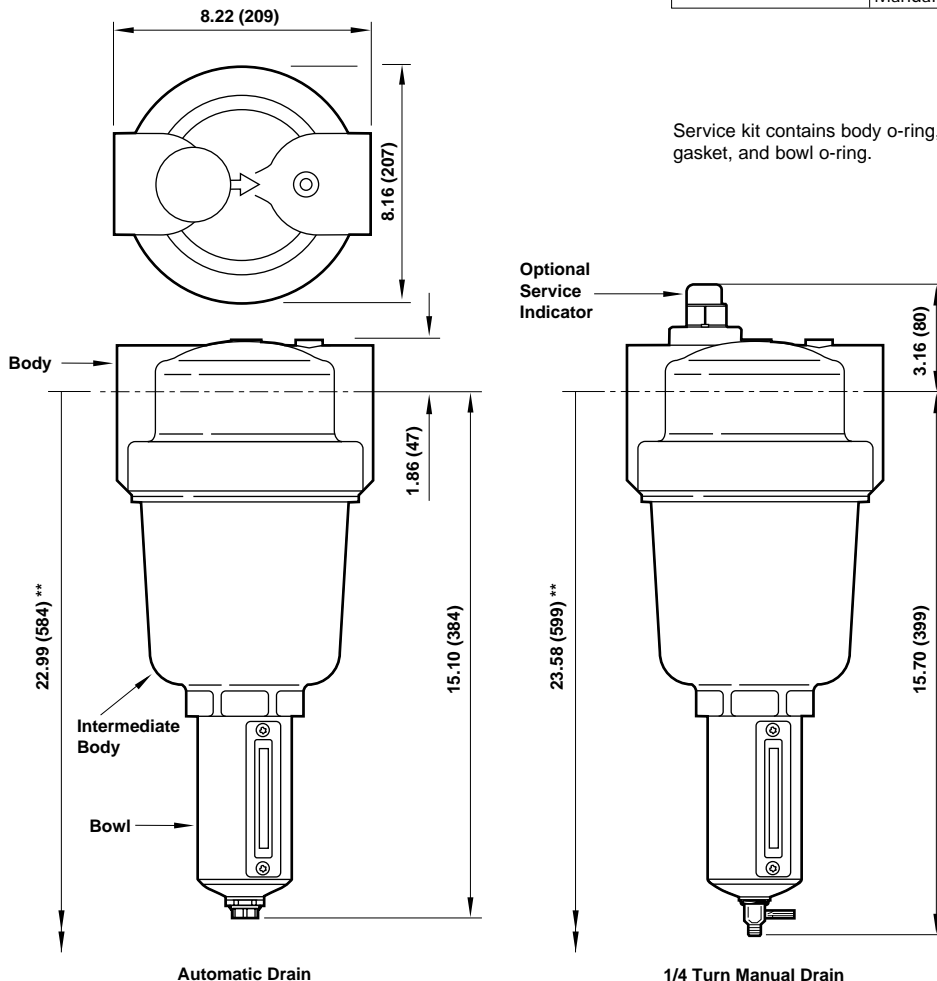
Typical Performance Characteristics



Service Kits

Item	Type	Part Number
Service kit	Seal & Gasket	4945-50
Replacement elements	5 µm	5882-11
	25 µm	5882-12
	40 µm	5882-13
	100 µm	5882-14
Liquid level lens kit	Prismatic	4380-050
Replacement drains	Automatic	3000-10
	Manual quarter turn	619-50

All Dimensions in Inches (mm)



Service kit contains body o-ring, element gasket, automatic drain gasket, and bowl o-ring.

** Minimum clearance required to remove intermediate body and bowl.

Oil Removal (Coalescing) Filters

Port sizes from 1/8" to 2"

F39 Miniature Oil Removal Filter 1/8" and 1/4" Ports	.....	ALE-2-2
F72C Excelon Oil Removal Filter 1/4" and 3/8" Ports	.....	ALE-2-4
F73C Excelon Oil Removal Filter 1/4", 3/8", and 1/2" Ports	..	ALE-2-6
F74C/H Excelon Oil Removal Filter 3/8", 1/2", and 3/4" Ports	.....	ALE-2-8
F64C/H Olympian Plus Oil Removal Filter 1/4", 3/8", 1/2", and 3/4" Ports	.....	ALE-2-10
F68C/H Olympian Plus Oil Removal Filter 1/2", 3/4", and 1" Ports	.....	ALE-2-12
F46 Oil Removal Filter 3/4", 1", and 1-1/4" Ports	.....	ALE-2-14
F47 Oil Removal Filter 1-1/2" and 2" Ports	.....	ALE-2-16



F39



F72C



F73C



F74C/H



F64C/H

Product available
1st quarter of 2001



F46



F47

**Miniature Series 07 Oil Removal
(Coalescing) Filter 1/8" and 1/4" Port Sizes**

- **Compact design**
- **High efficiency oil and particle removal**
- **Screw-on bowl reduces maintenance time**
- **Can be disassembled without the use of tools or removal from the air line**



Ordering Information. Models listed include PTF threads, automatic drain and transparent bowl.

Port Size	Model Numbers	Saturated Flow* Flow scfm (dm ³ /s)	Dry Flow Flow scfm (dm ³ /s)	Weight lbs (kg)
1/8"	F39-100-A0TA	6.0 (2.8)	11.2 (5.3)	0.28 (0.13)
1/4"	F39-200-A0TA	6.4 (3.0)	12.2 (5.8)	0.28 (0.13)

* Maximum flow at 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance.

Alternative Models

F 3 9 - ★ ★ ★ - ★ ★ ★ ★

Port Size	Substitute
1/8"	1
1/4"	2

Option	Substitute
Not applicable	0

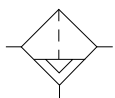
Option	Substitute
Not applicable	0

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

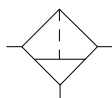
Bowl	Substitute
Transparent	T
Metal	M

Element	Substitute
Coalescing	0

Drain	Substitute
Automatic	A
Manual	M

ISO Symbols


Automatic and
Semi Automatic Drain



Manual Drain

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure:

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature:*

Transparent bowl: -30° to 125°F (-34° to 50°C)

Metal bowl: -30° to 150°F (-34° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 2°C (35°F)

Particle removal: Down to 0.01 µm

Air quality: Within ISO 8573-1, Class 1 (particulates) and Class 2 (oil content)

Maximum remaining oil content of air leaving the filter: 0.01ppm at 70°F (21°C) with an inlet oil concentration of 17 ppm.

Maximum flow with 90 psig (6.3 bar) inlet pressure†:

1/8 ports, 6.0 scfm (2.8 dm³/s)

1/4 ports, 6.4 scfm (3 dm³/s)

† Maximum flow to maintain stated oil removal performance.

Nominal bowl size: 1 fluid ounce (31 ml)

Drain connection: 1/8" pipe thread

Automatic drain operation: Spitter type drain operates momentarily when a rapid change in air flow occurs or when the supply pressure is reduced.

Materials:

Body: Zinc

Bowl:

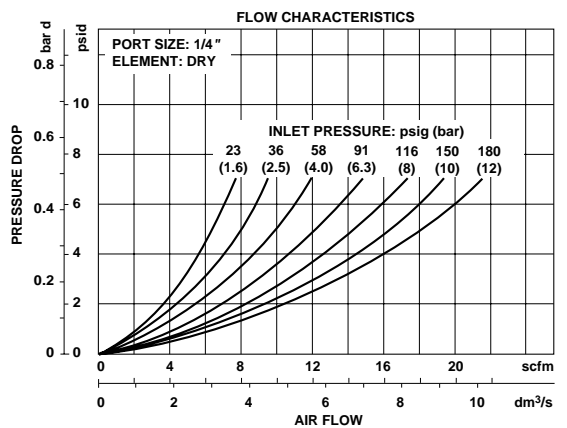
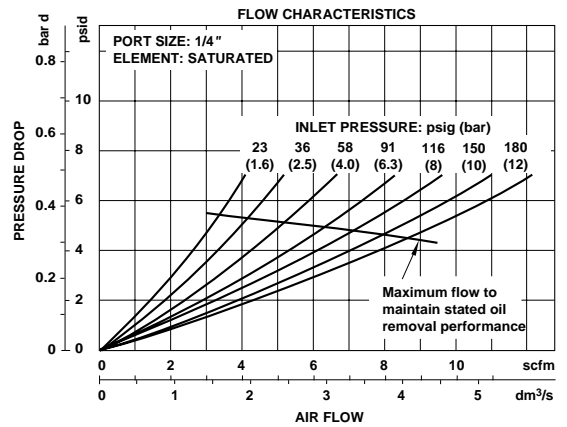
Transparent: Polycarbonate

Metal: Zinc

Element: Synthetic fiber and polyurethane foam

Elastomers: Neoprene & nitrile

Typical Performance Characteristics

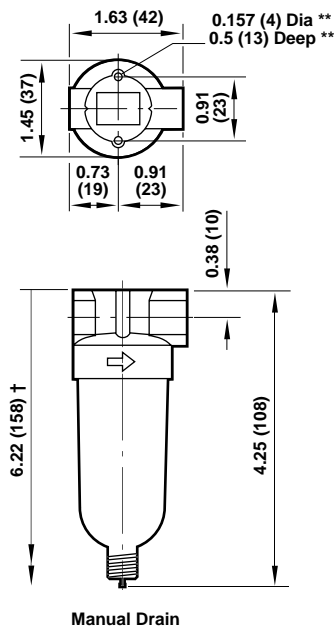


Service Kits

Item	Type	Part number
Service kit	All models	4141-10
Replacement drains	Manual	773-03
	Automatic	3654-02

Service kit includes element, element o-ring, and bowl o-ring.

All Dimensions in Inches (mm)



** Mounting holes

† Minimum clearance to remove bowl

Excelon F72C Oil Removal Filter (Coalescing) 1/4" and 3/8" Port Sizes

- Excelon design allows in-line or modular installation
- High efficiency oil and particle removal
- Quick release bayonet bowl
- Highly visible, prismatic liquid level indicator lens on metal bowls
- Standard visual service life indicator turns from green to red when the filter element needs to be replaced
- Optional electrical service indicator also available
- Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications

Install an F72G filter with a 5 µm filter element upstream of the F72C filter for optimum coalescing element life.



Ordering Information. Models listed include PTF threads, service life indicator, automatic drain, long transparent bowl without guard.

Port Size	Model	Flow [†] scfm (dm ³ /s)	Weight lb (kg)
1/4"	F72C-2AD-ALO	9.5 (4.5)	1.2 (0.54)
3/8"	F72C-3AD-ALO	9.5 (4.5)	1.2 (0.54)

† Maximum flow with 90 psig (6.3 bar) inlet pressure, to maintain stated oil removal performance.

Alternative Models

F 7 2 C - ★ ★ ★ - ★ ★ ★

Port Size	Substitute
1/4"	2
3/8"	3

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Service Life Indicator	Substitute
With (visual)	D
With (electrical)	E
Without	N

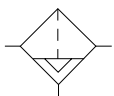
Element	Substitute
Coalescing	0

Bowl	Substitute
Short metal with liquid level indicator	D
Long metal with liquid level indicator	E
Short transparent without guard	T
Long transparent without guard	L
Long transparent with guard	W

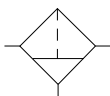
Drain	Substitute
1/4 turn manual	Q
Semi automatic	S
Auto drain*	A

* Supplied in long bowl options only

ISO Symbols



Automatic and Semi Automatic Drain



Manual Drain

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure:

Transparent bowl: Manual or semi automatic drain: 150 psig (10 bar)
Automatic drain: 116 psig (8 bar)

Metal bowl: Manual or semi automatic drain: 250 psig (17 bar)
Automatic drain: 116 psig (8 bar)

Operating temperature*: Transparent bowl: -30° to 125°F (-34° to 50°C)
Metal bowl: -30° to 150°F (-34° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 0.01 µm

Air quality: Within ISO 8573-1, Class 1 (particulates) and Class 2 (oil content)

Maximum remaining oil content in outlet air:

0.01 ppm at 70°F (21°C) with an inlet concentration of 17 ppm.

Maximum flow with 90 psig (6.3 bar) inlet pressure**: 9.5 scfm (4.5 dm³/s)

** Maximum flow to maintain stated oil removal performance.

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread.

Semi automatic drain connection: Push on 5/16" (8 mm) ID tube

Semi automatic drain operating conditions (pressure operated):

Bowl pressure required to close drain: Greater than 1.5 psig (0.1 bar)

Bowl pressure required to open drain: Less than 1.5 psig (0.1 bar)

Minimum air flow required to close drain: 1 scfm (0.5 dm³/s)

Manual operation: Lift stem to drain bowl

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread. - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.

Automatic drain operating conditions (float operated):

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 0.2 scfm (0.1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size

Short bowl: 1.9 fluid ounce (56 ml)

Long bowl: 2.2 fluid ounce (65 ml)

Materials

Body: Zinc

Bowl

Transparent: Polycarbonate

Guard for transparent bowl: Zinc

Metal: Zinc

Metal bowl liquid level indicator lens: Transparent nylon

Element: Synthetic fiber and polyurethane foam

Elastomers: Neoprene and nitrile

Service life indicator

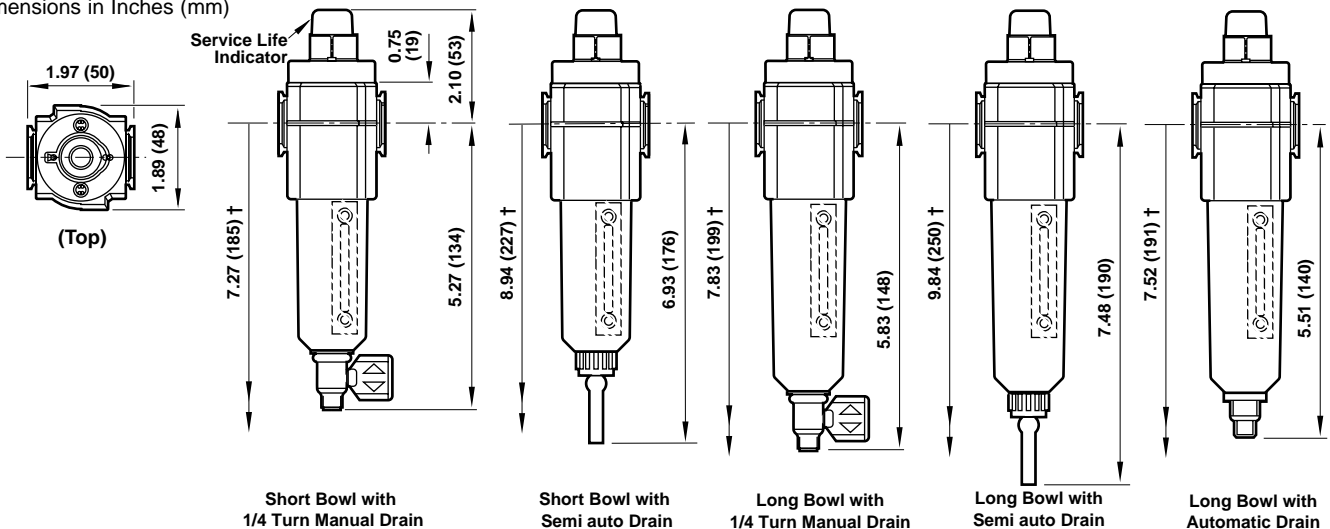
Body: transparent nylon.

Internal parts: acetal.

Spring: stainless steel.

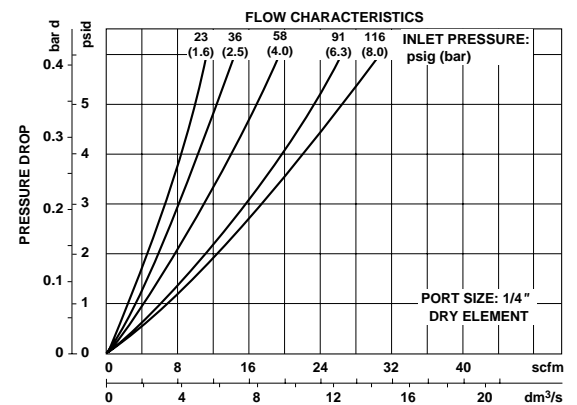
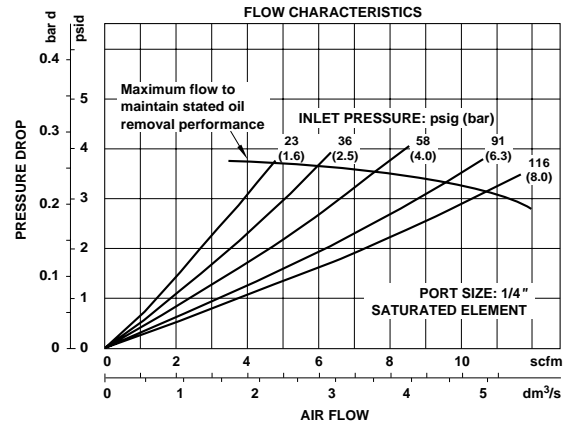
Elastomers nitrile

All Dimensions in Inches (mm)



† Minimum clearance required to remove bowl.

Typical Performance Characteristics



Service Kits

Item	Type	Part Number
Service kit	Seal and gasket	4380-500
Element	Coalescing	5925-09
Liquid level lens kit	Prismatic	4380-030
Replacement drains	1/4 turn manual	619-50
	Semi automatic	5379-RK
	Automatic	4000-50R

Service kit includes bowl o-rings.

**Excelon 73C Oil Removal Filter
(Coalescing) 1/4", 3/8", and 1/2" Port Sizes**

- Excelon design allows in-line or modular installation
- Quick release bayonet bowl
- Highly visible, prismatic liquid level indicator lens
- Standard mechanical service indicator turns from green to red when the filter element needs to be replaced
- Optional electrical service indicator provides electrical output when the filter element needs to be replaced
- Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications

Install an F73G pre-filter with a 5 µm filter element upstream of the F73C filter for optimum coalescing element life.



Ordering Information. Models listed include PTF threads, service indicator, automatic drain, and a metal bowl with liquid level indicator.

Port Size	Model	Flow† scfm (dm ³ /s)	Weight lb (kg)
1/4"	F73C-2AD-AD0	21.2 (10.0)	1.2 (0.54)
3/8"	F73C-3AD-AD0	21.2 (10.0)	1.2 (0.54)
1/2"	F73C-4AD-AD0	21.2 (10.0)	1.2 (0.54)

† Maximum flow with 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance.

Alternative Models

F 7 3 C - ★ ★ ★ - ★ ★ ★

Port Size	Substitute
1/4"	2
3/8"	3
1/2"	4

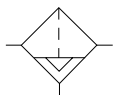
Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Service Indicator	Substitute
With electrical service indicator	E
With mechanical service indicator	D
Without	N

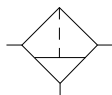
Element	Substitute
Coalescing	0

Bowl	Substitute
Metal with liquid level indicator	D
Transparent with guard	P
Transparent	T

Drain	Substitute
Automatic	A
Manual, 1/4 turn	Q

ISO Symbols


Automatic and Semi Automatic Drain



Manual Drain

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*

Transparent bowl: -30° to 125°F (-34° to 50°C)

Metal bowl: -30° to 150°F (-34° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: Down to 0.01 µm

Air quality: Within ISO 8573-1, Class 1 (particulates) and Class 2 (oil content)

Maximum remaining oil content in outlet air: 0.01 ppm at 70°F (20°C) with an inlet concentration of 17 ppm

Maximum flow at 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance: 21.2 scfm (10 dm³/s)

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread.

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread. - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.

Automatic drain operating conditions (float operated)

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 0.2 scfm (0.1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size: 3.5 fluid ounce (0.1 liter)

Filter materials

Body: Aluminum

Bowl

Transparent: Polycarbonate

Transparent with guard: Polycarbonate, steel guard

Metal: Aluminum

Metal bowl liquid level indicator lens: Transparent nylon

Element: Synthetic fiber and polyurethane foam

Elastomers: Neoprene and nitrile

Mechanical service indicator materials

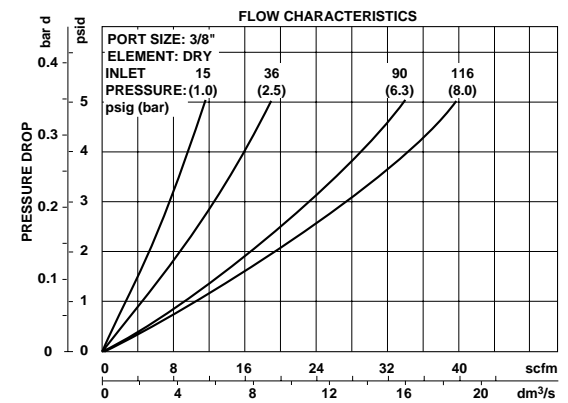
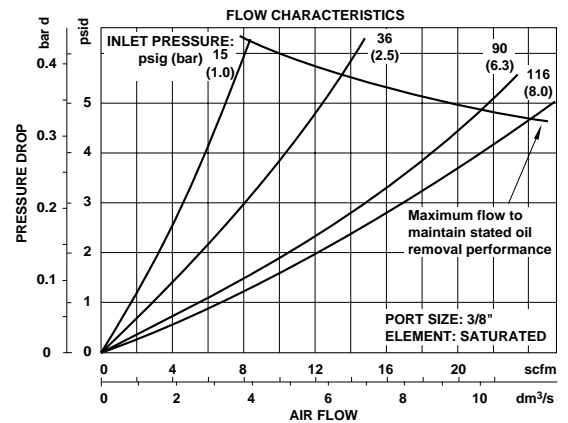
Body: Transparent nylon

Internal parts: Acetal

Spring: Stainless steel

Elastomers: Nitrile

Typical Performance Characteristics

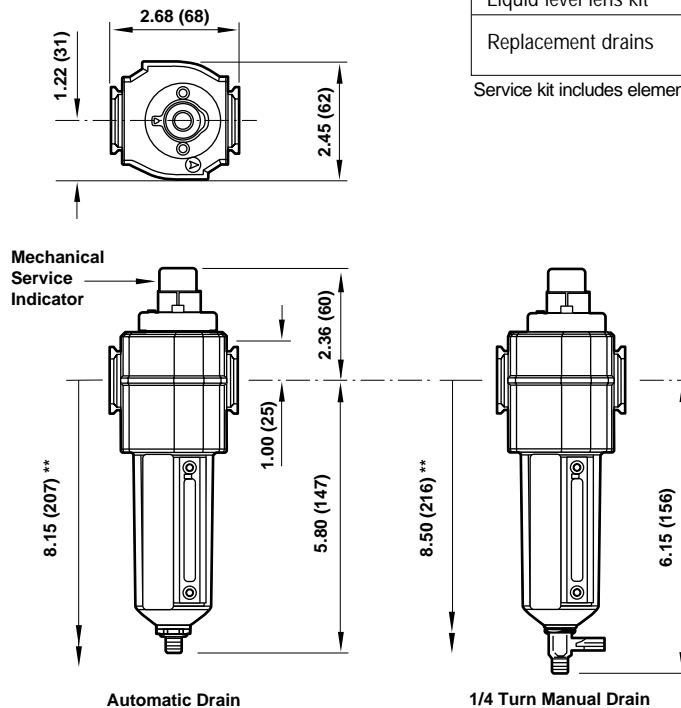


Service Kits

Item	Type	Part Number
Service kit	Seal & Gasket	4380-602
Replacement elements	Coalescing	4444-01
Liquid level lens kit	Prismatic	4380-020
Replacement drains	Automatic	4000-51R
	Manual quarter turn	619-50

Service kit includes element o-ring, automatic drain seal and bowl o-ring.

All Dimensions in Inches (mm)



** Minimum clearance required to remove bowl.

Excelon 74 Oil Removal Filters (Coalescing) 3/8", 1/2", and 3/4" Port Sizes

- Excelon design allows in-line or modular installation
- Quick release bayonet bowl
- Highly visible, prismatic liquid level indicator lens
- Standard visual service indicator turns from green to red when the filter element needs to be replaced
- Optional electrical service indicator provides electrical output when the filter element needs to be replaced
- Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications



Install an F74G pre-filter with a 5 µm filter element upstream of the F74C and F74H filters for optimum coalescing element life.

Ordering Information. Models listed include PTF threads, service indicator, automatic drain, and a metal bowl with liquid level indicator.

Main Port Size	Body and Element	Model Number	Maximum Flow* scfm (dm ³ /s)	Weight lb (kg)
3/8"	Standard	F74C-3AD-AD0	33.9 (16.0)	1.88 (0.85)
1/2"	Standard	F74C-4AD-AD0	33.9 (16.0)	1.84 (0.83)
1/2"	High Flow	F74H-4AD-AD0	59.3 (28.0)	2.45 (1.11)
3/4"	High Flow	F74H-6AD-AD0	59.3 (28.0)	2.40 (1.10)

* Maximum flow with 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance.

Alternative Models

F 7 4 ★ - ★ ★ ★ - ★ ★ ★

Body and Element	Substitute
Standard*	C
High Flow**	H

Port Size	Substitute
3/8"	3
1/2"	4
3/4"	6

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Service Life Indicator	Substitute
With (visual)	D
With (electrical)	E
Without	N

* available with 3/8" or 1/2" ports
** available with 1/2" or 3/4" ports

Element	Substitute
Coalescing	0

Bowl	Substitute
Metal with liquid level indicator	D
Transparent with guard	P

Drain	Substitute
Automatic	A
Manual 1/4 turn	Q

Service Kits

Item	Type	Part Number
Service kit	Seal and gasket	4380-730
Replacement elements	Standard	4344-01
	High flow	4344-02
Liquid level kit	Prismatic	4380-050
Replacement drains	Automatic (1/8 NPT outlet)	3000-10
	Manual quarter turn	619-50

Service kits include element seal, bowl seal and drain seal.

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*

Transparent bowl: -30° to 125°F (-34° to 50°C)

Metal bowl: -30° to 150°F (-34° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: Down to 0.01 μm

Air quality: Within ISO 8573-1, Class 1 (particulates) and Class 2 (oil content)

Maximum remaining oil content in outlet air: 0.01 ppm at 70°F (20°C) with an inlet concentration of 17 ppm

Maximum flow at 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance

F74C: 33.9 scfm (16 dm³/s)

F74H: 59.3 scfm (28 dm³/s)

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread.

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread. - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.

Automatic drain operating conditions (float operated)

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 2 scfm (1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size: 7 fluid ounce (0.2 liter)

Materials

Body: Aluminum

Bowl

Transparent: Polycarbonate with steel bowl guard

Metal: Aluminum

Metal bowl liquid level indicator lens: Transparent nylon

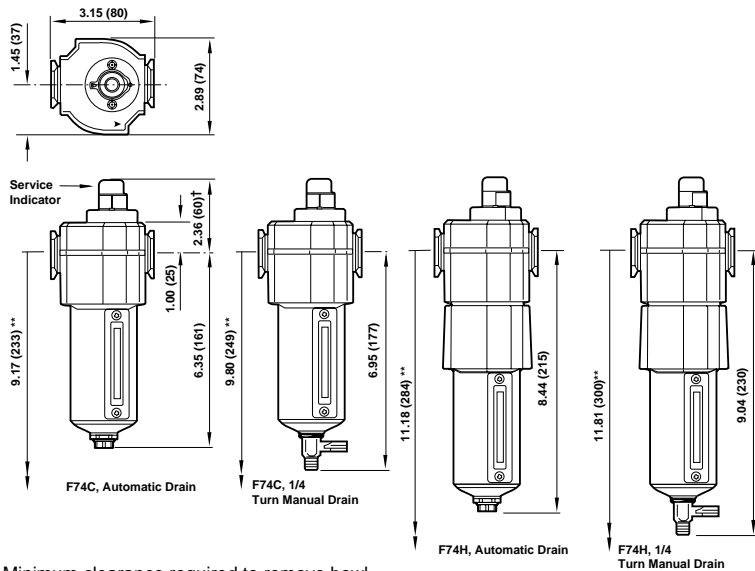
Element: Synthetic fiber and polyurethane foam

Elastomers: Neoprene and Nitrile

Service indicator

Body: Transparent nylon

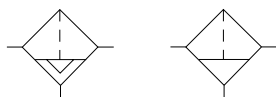
All Dimensions in Inches (mm)



** Minimum clearance required to remove bowl.

† Dimension for alternative electrical service indicator is 1.98" (50.4 mm)

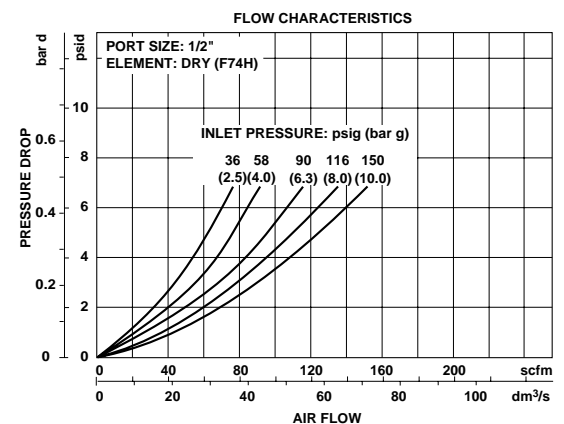
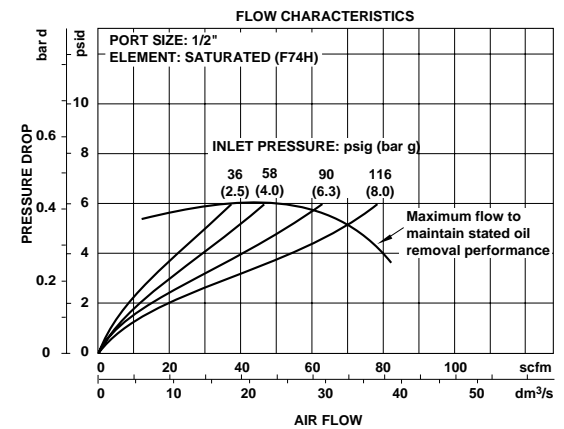
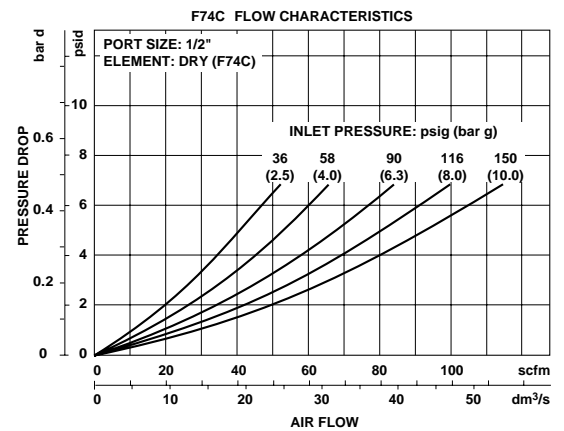
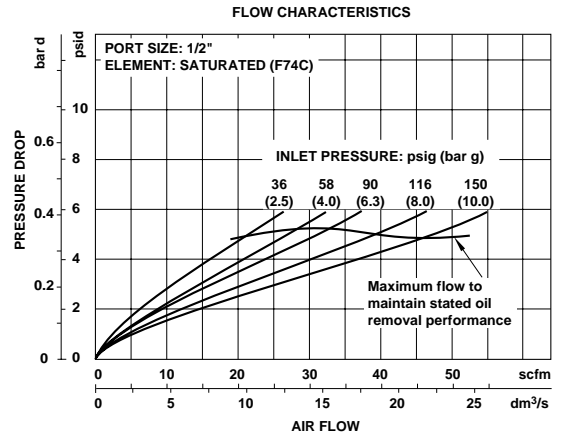
ISO Symbols



Automatic and Semi Automatic Drain

Manual Drain

Typical Performance Characteristics



Olympian Plus Puraire High Efficiency Oil Removal Filter 1/4", 3/8", 1/2", and 3/4" Port Sizes

- Olympian Plus plug in design
- High efficiency oil and particle removal
- Quick release bayonet bowl
- High visibility prismatic sight glass
- Coalescing element service indicator

Install an F64G pre-filter with a 5 µm filter element upstream of the F64C filter for optimum coalescing element life.



Ordering Information. Models listed include PTF threads, service indicator, automatic drain, and metal bowl.

Drain Type	Port Size	F64C/H (only) Model	Maximum Flow* scfm (dm ³ /s)	Weight lb (kg)	With 5µm F64G Pre-filter Model	Weight lb (kg)
Automatic	1/4"	F64C-2AD-ADO	34 (16)	3.26 (1.48)	FFC64-208	5.45 (2.47)
	3/8"	F64H-3AD-ADO	60 (28)	3.75 (1.70)	FFC64-308	5.93 (2.69)
	1/2"	F64H-4AD-ADO	60 (28)	3.68 (1.67)	FFC64-408	5.86 (2.66)
	3/4"	F64H-6AD-ADO	60 (28)	4.43 (2.01)	FFC64-608	6.66 (3.02)

For replacement Filter (without yoke or pre-filter) substitute 'N' at the 5th and 6th digits eg: F64H-**NND**-ADO.

* Maximum flow with 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance.

Alternative Models

F 6 4 ★ - ★ ★ ★ - ★ ★ ★

Body type	Substitute
For 1/4"	C
For 3/8", 1/2", 3/4"	H

Port Size	Substitute
1/4"	2
3/8"	3
1/2"	4
3/4"	6

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

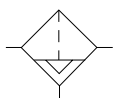
Element	Substitute
Coalescing	0

Bowl	Substitute
Metal with liquid level indicator	D
Transparent with guard	P

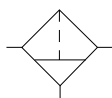
Drain	Substitute
Manual, 1/4 turn	Q
Auto drain	A

Service Life Indicator	Substitute
With (visual)	D
Without	N
With (electrical)†	E

ISO Symbols



Automatic and Semi Automatic Drain



Manual Drain

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure:

Guarded transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*:

Guarded transparent bowl: -30° to 125°F (-34° to 50°C)

Metal bowl: -30° to 150°F (-34° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 0.01 µm.

Air quality: Within ISO 8573-1, Class 1 (particulates) and Class 2 (oil content)

Maximum remaining oil content in outlet air:

0.01 ppm at 70°C (21°C) with an inlet concentration of 17 ppm

Maximum flow at 90 psig (6.3 bar) inlet pressure**:

34 scfm (16dm³/s) F64C, 60 scfm (28 dm³/s) F64H

** To maintain stated oil removal performance

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread. - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.

Automatic drain operating conditions (float operated)

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 2 scfm (1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size:

7 fluid ounce (0.2 liter)

Materials:

Body: Zinc

Yoke: Zinc

Metal bowl: Aluminum

Standard metal bowl prismatic liquid level indicator lens: Grilamid

Optional metal bowl sight glass: Pyrex

Optional transparent bowl: Polycarbonate

Element: Composite materials

Elastomers: Synthetic rubber

Service life indicator:

Body: Transparent nylon.

Internal parts: Acetal.

Spring: Stainless steel.

Elastomers: Nitrile.

Typical Performance Characteristics

Inlet Pressure		Maximum Flow [†]			
		F64C		F64H	
psig	(bar)	scfm	(dm ³ /s)	scfm	(dm ³ /s)
15	(1)	14	(6.4)	24	(11.2)
45	(3)	23	(11.0)	41	(19.3)
70	(5)	30	(14.3)	53	(24.9)
90	(6.3)	34	(16.0)	59	(28.0)
100	(7)	36	(16.9)	63	(29.5)
130	(9)	40	(19.1)	71	(33.5)

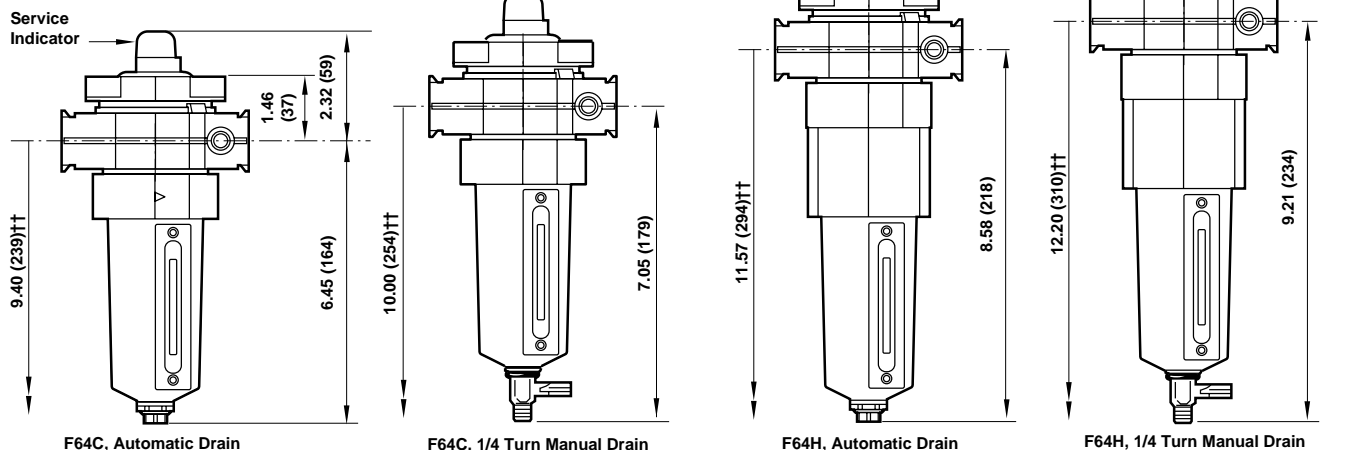
[†] Maximum flow to maintain stated oil removal performance.

Service Kits

Item	Type	Part Number
Service kit	F64C/H	4380-200
Service kit (pre-filter)	F64G	4380-200
Element F64G (pre-filter)	5 µm	4338-01
Element F64C	Coalescing	4344-01
Element F64H	Coalescing	4344-02
Replacement sight glass	Prismatic (standard)	4380-040
	Pyrex	4380-041
Replacement drains	Automatic	3000-97
	Manual	684-84

Service kit includes port seals, louver o-ring, bowl o-ring and drain gasket.

All Dimensions in Inches (mm)

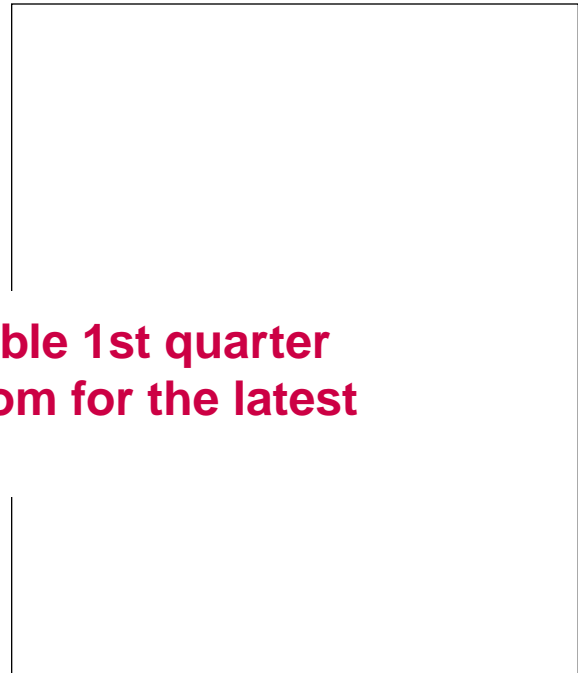


† 6.18" (157) for 3/4" ports.

†† Minimum clearance required to remove unit.

**68 Series Oil Removal (Coalescing) Filter
1/2", 3/4", and 1" Port Sizes**

- Olympian plug-in design
- Coalescing element removes sub-micron particles and converts oil and water mist to liquid form to drain away
- Automatic drain is operated by liquid level and also opens on depressurization
-



68 Series products are available 1st quarter of 2001. Visit www.norgren.com for the latest data on this series.

Oil and dirt contamination in outlet air within ISO 8573.1 Quality Class 1.7.2

Ordering Information. Models listed include PTF threads, automatic drain.

Port Size	Model	Weight lb (kg)
1/2"	F68C-4AN-ARO	5.29 (2.38)
3/4"	F68H-6AN-AUO	6.04 (2.72)
1"	F68H-8AN-AUO	5.91 (2.66)

Alternative Models

F 6 8 ★ - ★ ★ ★ - ★ ★ ★

Flow	Substitute
Standard flow	C*
High flow	H

Port Size	Substitute
1/2"	4*
3/4"	6
1"	8
None	N

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G
None	N

Service Life Indicator	Substitute
With mechanical service indicator	D
With electrical service indicator**	E
Without	N

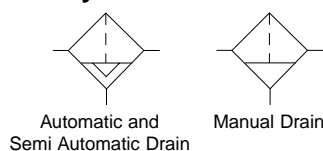
Element	Substitute
Coalescing	0

Bowl	Substitute
1 quart (1 liter) without liquid level indicator	C
1 pint (0.5 liter) without liquid level indicator	M*
1 pint (0.5 liter) with liquid level indicator	R*
1 quart (1 liter) with liquid level indicator	U

Drain	Substitute
Auto drain	A
Closed bowl	E
Manual	M

* 1/2" only available with F68C and 1 pint US (1/2 liter) bowl.

** See page ALE-?-? for description and specifications.

ISO Symbols




Technical Data

Fluid: Compressed air
 Maximum pressure

Metal bowl: 250 psig (17 bar)

Operating temperature*

Metal bowl: 0° to 150°F (-20° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 0.01 µm

Air quality: Within ISO 8573-1, Class 1 (particulates) and

Typical Performance Characteristics

Inlet Pressure	Maximum Flow*					
	G1/2 CDS15		G3/4 CDS25		G1 CDS25	
psig (bar)	scfm (dm³/s)	scfm (dm³/s)	scfm (dm³/s)	scfm (dm³/s)	scfm (dm³/s)	scfm (dm³/s)
						15
						(1) 30
						(14) 30
						(14) 51
						(24)
						45

68 Series products are available 1st quarter of 2001. Visit www.norgren.com for the latest data on this series.

Class 2 (oil content).

Maximum remaining oil content: 0.01mg/m³ at 70°F (21°C) with an inlet concentration of 17 mg/m³.

Maximum flow at 90 psig (6.3 bar) inlet pressure**

G1/2, CDS15 element: 74 scfm (35 dm³/s) *TBA from Lab Test*

G3/4, CDS25 element: 74 scfm (35 dm³/s) *TBA from Lab Test*

G1, CDS25 element: 127 scfm (60 dm³/s) *TBA from Lab Test*

** To maintain stated oil removal performance

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread. - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.

Automatic drain operating conditions

Minimum pressure: 10 psig (0.7 bar).

Drain opens when bowl pressure drops below 3 psig (0.2 bar).

Minimum air flow: 2 scfm (1 dm³/s) required to close drain.

Nominal bowl sizes:

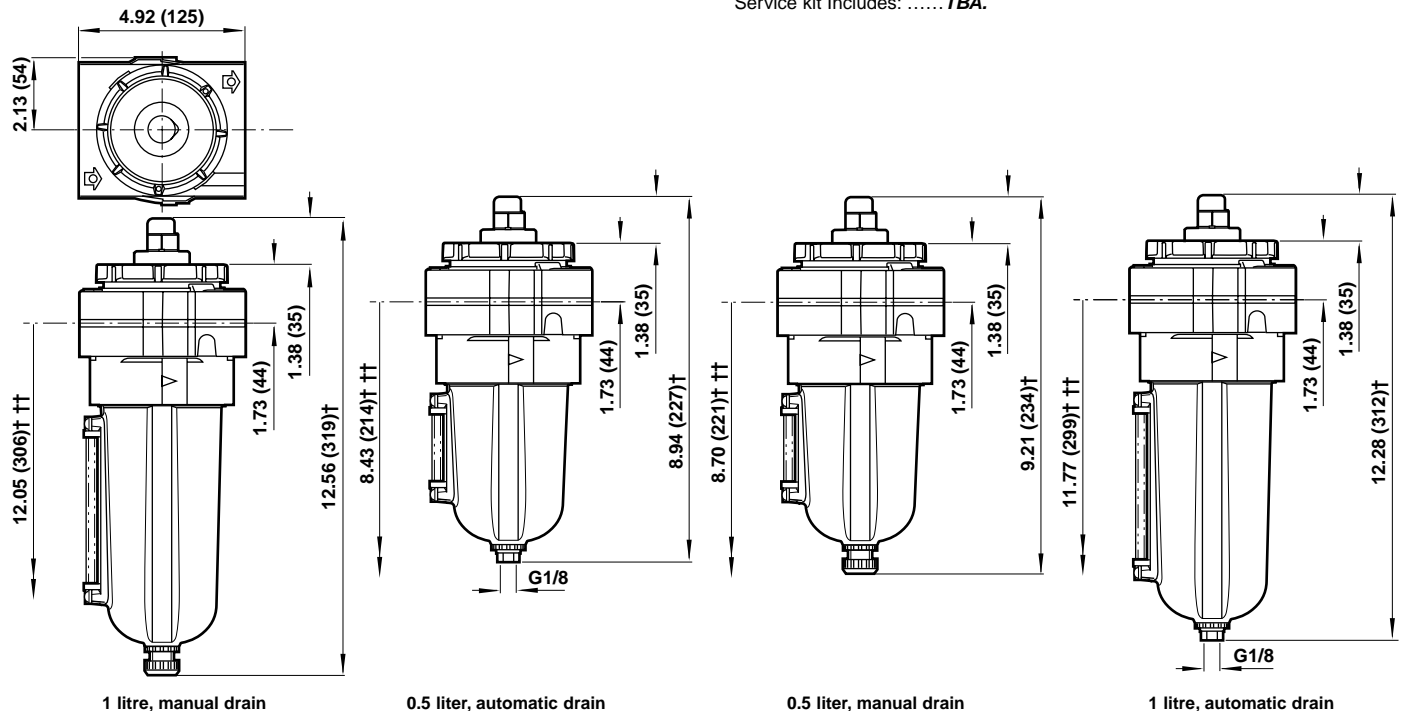
1 quart (1 liter)

All Dimensions in Inches (mm)

Service Kits

Item	Type	Part Number
Service Kit		4380-301
Replacement Elements	CDS15	5351-98
	CDS25	5351-99
Replacement Sight Glass	1 pint (0.5 liter)	4380-060
	1 quart (1 liter)	4380-062
Replacement Drains	Automatic	3000-04
	Manual	684-84
Service Life Indicators	Mechanical	5797-50
	Electrical	4020-51R

Service kit Includes: *TBA*.



† For mechanical service indicator add 1.38" (35 mm). For electrical service indicator add 1.98" (50.4 mm).

For closed bowl subtract 0.35" (9 mm) from auto drain dimension.

†† Minimum clearance required to remove bowl.

F46 Oil Removal (Coalescing) Filter 3/4", 1", and 1-1/4" Port Sizes

- High efficiency oil and particle removal
- Screw-on bowl reduces maintenance time
- Can be disassembled without the use of tools or removal from the air line
- Standard service indicator turns from green to red when the filter element needs to be replaced

NOTE: Install an F17 filter with a 5 µm filter element upstream of the F46 filter for maximum service life.



Ordering Information. Models listed include service indicator, automatic drain, metal bowl with sight glass, and PTF threads.

Port Size	Model Numbers	Maximum Flow* scfm (dm ³ /s)	Weight lbs (kg)
3/4"	F46-601-A0DA	90 (42)	4.11 (1.86)
1"	F46-801-A0DA	125 (59)	4.05 (1.84)
1-1/4"	F46-A01-A0DA	125 (59)	4.29 (1.95)

* Maximum flow for oil-saturated element at 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance.

Alternative Models

F 4 6 - ★ ★ ★ - ★ ★ ★ ★

Port Size	Substitute
3/4"	6
1"	8
1-1/4"	A

Option	Substitute
Not applicable	0

Service Life Indicator	Substitute
Without	0
With (visual)	1
With (electrical)	4

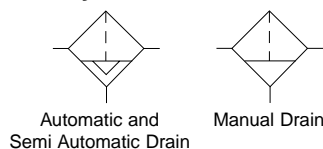
Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Bowl	Substitute
Metal with sight glass	D
Metal	M

Element	Substitute
Coalescing	0

Drain	Substitute
Automatic	A
Manual	M

ISO Symbols



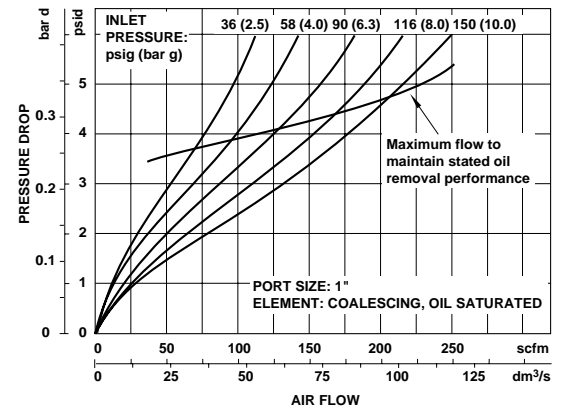
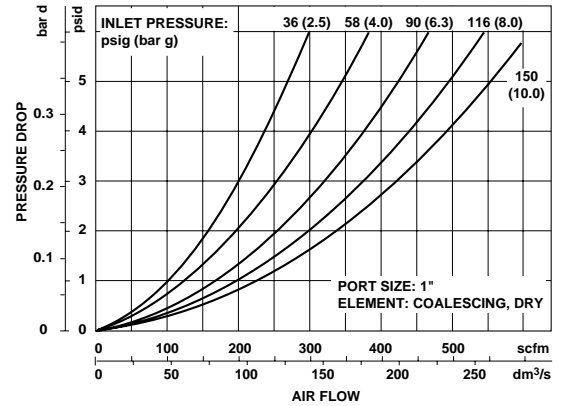
See Section ALE-25 for Accessories



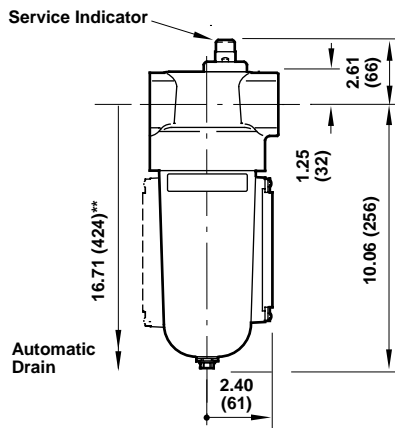
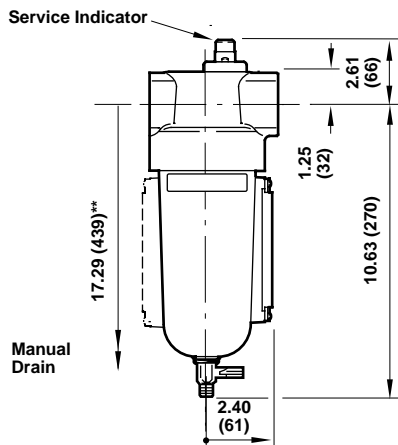
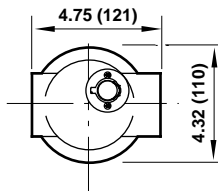
Technical Data

Fluid: Compressed air
 Maximum pressure: 250 psig (17 bar)
 Operating temperature: * -30° to 150°F (-34° to 65°C)
 * Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)
 Particle removal: Down to 0.01 µm
 Air quality: Within ISO 8573-1, Class 1 (particulates) and Class 2 (oil content)
 Maximum remaining oil content in outlet air: 0.01ppm at 70°F (20°C) with an inlet oil concentration of 17 ppm.
 Maximum flow at 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance:
 3/4" ports: 90 scfm (42 dm³/s)
 1" ports: 125 scfm (59 dm³/s)
 1-1/4" ports: 125 scfm (59 dm³/s)
 Nominal bowl size: 1 quart US (1 liter)
 Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread.
 Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread. - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.
 Automatic drain operating conditions (float operated)
 Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
 Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
 Minimum air flow required to close drain: 2 scfm (1 dm³/s)
 Manual operation: Depress pin inside drain outlet to drain bowl
Materials
 Body: Aluminum
 Bowl: Aluminum
 Bowl sight glass: Pyrex
 Elastomers: Neoprene and nitrile
 Filter element: Synthetic fiber and polyurethane foam

Typical Performance Characteristic



All Dimensions in Inches (mm)



** Minimum clearance required to remove bowl.

Service Kits

Item	Type	Part number
Service kit	O-ring & gaskets	5351-04
Replacement drains	Automatic (1/8 NPT outlet)	3000-18
	Manual (1/4 Turn)	619-50

Service kit contains coalescing element, element o-ring, bowl o-ring, and drain gasket.

**18 Series Oil Removal Filter
(Coalescing) 1-1/2" and 2" Port Sizes**

- High efficiency oil and particle removal
- Highly visible, prismatic liquid level indicator lens
- Patented quarter turn manual drain
- Can be disassembled without removal from the air line
- Standard service indicator turns from green to red when the filter element needs to be replaced
- Optional electrical service indicator also available



Ordering Information. Models listed include service indicator, automatic drain, metal bowl with sight glass, and PTF threads.

Port Size	Body and Element	Model Numbers	Flow scfm (dm ³ /s)*	Weight lbs (kg)
1-1/2"	Standard	F47-B01-A0DA	250 (118)	15.51 (7.04)
2"	Standard	F47-C01-A0DA	300 (142)	14.26 (6.47)
2"	High Flow	F47-C21-A0DA	600 (283)	22.17 (10.06)

* Maximum flow at 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance.

Alternative Models

F 4 7 - ★ ★ ★ - ★ ★ ★ ★

Port Size	Substitute
1-1/2"	B
2"	C

Option	Substitute
Standard body and element	0
High flow body and element (use only with 2" ports)	2

Service Indicator	Substitute
Without	0
With (visual)	1
With (electrical)	4

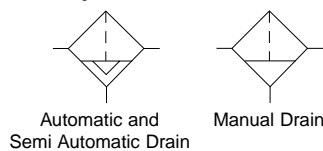
Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Bowl	Substitute
Metal with sight glass	D
Metal	M

Element	Substitute
Coalescing	0

Drain	Substitute
Automatic	A
Manual, 1/4 turn	M

ISO Symbols



See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air
 Maximum pressure: 250 psig (17 bar)
 Operating temperature: * -30° to 150°F (-34° to 65°C)
 * Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
 Particle removal: Down to 0.01 µm
 Air quality: Within ISO 8573-1, Class 1 (particulates) and Class 2 (oil content)
 Maximum remaining oil content in outlet air: 0.01 ppm at 70°F (20°C) with an inlet concentration of 17 ppm
 Maximum flow for oil-saturated element at 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance
 1-1/2" Ports: 250 scfm (118 dm³/s)
 2" Ports: 300 scfm (142 dm³/s)
 2" Ports, high flow element: 600 scfm (283 dm³/s)
 Typical flow for dry element at 90 psig (6.3 bar) inlet pressure and 5 psid (0.3 bar) pressure drop
 1-1/2" Ports: 780 scfm (368 dm³/s)
 2" Ports: 830 scfm (392 dm³/s)
 2" Ports, high flow element: 2300 scfm (1086 dm³/s)

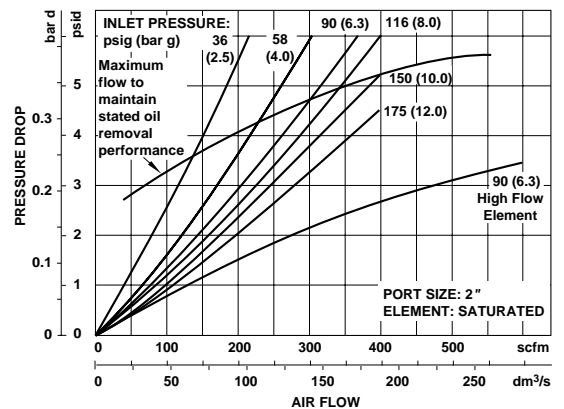
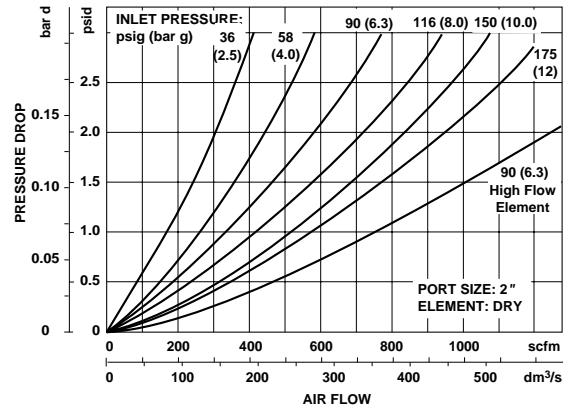
Nominal bowl size: 7 fluid ounce (0.2 liter)
 Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread.
 Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread. - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.

Automatic drain operating conditions (float operated)
 Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
 Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
 Minimum air flow required to close drain: 2 scfm (1 dm³/s)
 Manual operation: Depress pin inside drain outlet to drain bowl

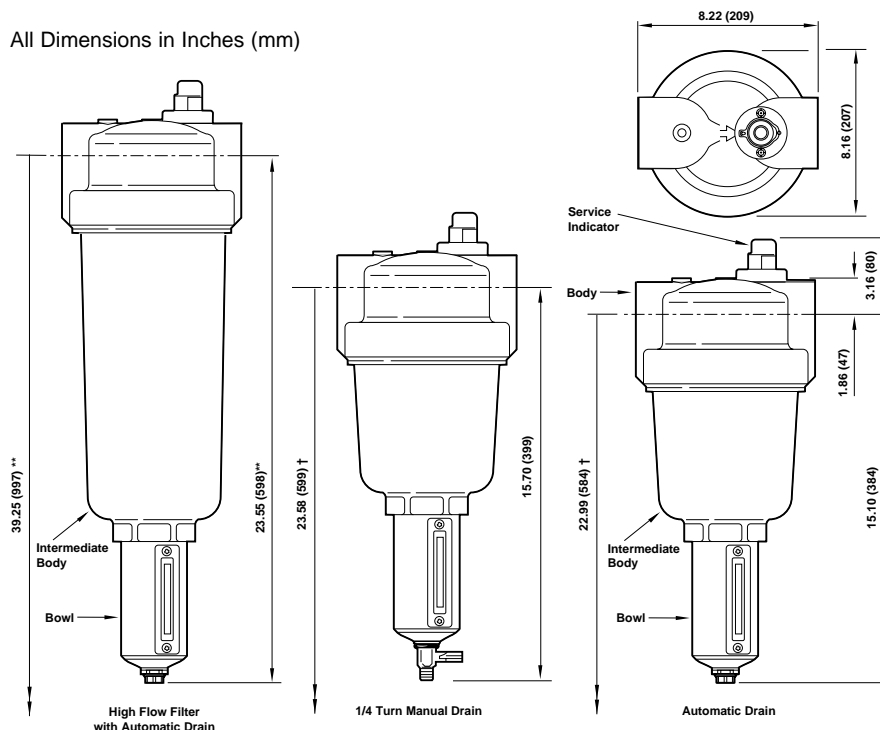
Materials

Body, intermediate body, bowl: Aluminum
 Metal bowl liquid level indicator lens: Transparent nylon
 Filter element: Synthetic fiber and polyurethane foam
 Elastomers: Neoprene and nitrile
 Service indicator
 Body: Transparent nylon
 Internal parts: Acetal
 Spring: Stainless steel
 Elastomers: Nitrile

Typical Performance Characteristics



All Dimensions in Inches (mm)



** Minimum clearance required to remove intermediate body and bowl. Add 0.59" (15 mm) for 1/4 turn manual drain.

† Minimum clearance required to remove intermediate body and bowl.

Oil Vapor Removal (Adsorbing) Filters

available in port sizes 1/4" to 1".

F72V Excelon Oil Vapor Removal Filter 1/4" and 3/8" Ports	ALE-3-2
F74V Excelon Oil Vapor Removal Filter 3/8", 1/2", and 3/4" Ports	ALE-3-4
F64B/L Coalescing/Oil Vapor Removal Filter 1/4", 3/8", 1/2", and 3/4" Ports . . .	ALE-3-6
F68V/Y Olympian Plus Oil Vapor Removal Filter 1/2", 3/4", and 1" Ports	ALE-3-8
F46 Oil Vapor Removal Filter 3/8", 1/2", and 3/4" Ports	ALE-3-10



F72V



F74V



F64 B/L

Product available 1st
quarter of 2001



F68

F46

**Excelon 72 Oil Vapor Removal
Filter 1/4", 3/8" Port Sizes**

- Excelon design allows in-line or modular installation
- Adsorbing type activated carbon element removes oil vapors and most hydrocarbon odors
- Quick release bayonet bowl
- Long service life of filter element.
- Color indicator for oil presence.
- Modular installations with EXCELON 72, 73, and 74 series can be made to suit particular applications



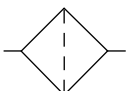
Ordering Information. Models listed include PTF threads and a long transparent bowl without guard and closed bottom.

Port Size	Model	Flow* scfm (dm ³ /s)	Weight lb (kg)
1/4"	F72V-2AN-ELC	3.4 (1.6)	0.88 (0.40)
3/8"	F72V-3AN-ELC	3.4 (1.6)	0.88 (0.40)

* Maximum flow at 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance.

Alternative Models

		F 7 2 V - ★ ★ N - E ★ C		
Port Size	Substitute	┌───┴───┐	Bowl	Substitute
1/4"	2		Long metal	C
3/8"	3	└───┬───┘	Short metal	M
			Short transparent without guard	T
			Long transparent without guard	L
			Long transparent with guard	W
Threads	Substitute	┌───┴───┐		
PTF	A			
ISO Rc taper	B			
ISO G parallel	G			

ISO Symbols

Auto Drain
See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*

Transparent bowl: 0° to 125°F (-20° to 50°C)

Metal bowl: 0° to 150°F (-20° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Required prefilter: Norgren oil removal filter with equivalent pipe size and flow capacity equal to or greater than the vapor removal filter.

Air quality: Within ISO 8573-1, Class 1** (oil content) when installed downstream of an oil removal filter

** See ALE-1-G for specification details.

Maximum remaining oil content in outlet air: 0.003 ppm at 70°F (20°C)

Maximum flow at 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance: 3.4 scfm (1.6 dm³/s)

Nominal bowl size

Short bowl: 1.9 fluid ounce (56 ml)

Long bowl: 2.2 fluid ounce (65 ml)

Materials

Body: Zinc

Bowl

Transparent: Polycarbonate

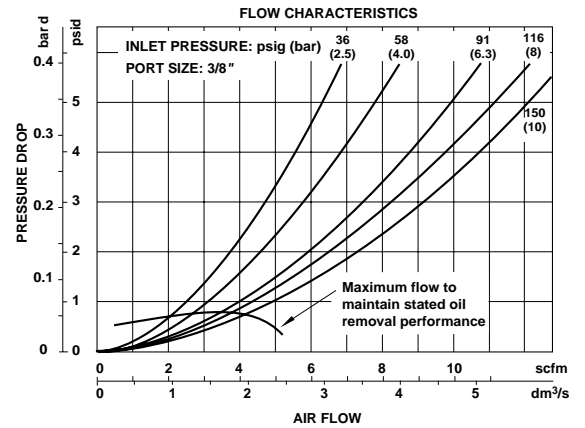
Guard for transparent bowl: Zinc

Metal: Zinc

Element: Activated carbon and polycarbonate

Elastomers: Nitrile

Typical Performance Characteristics

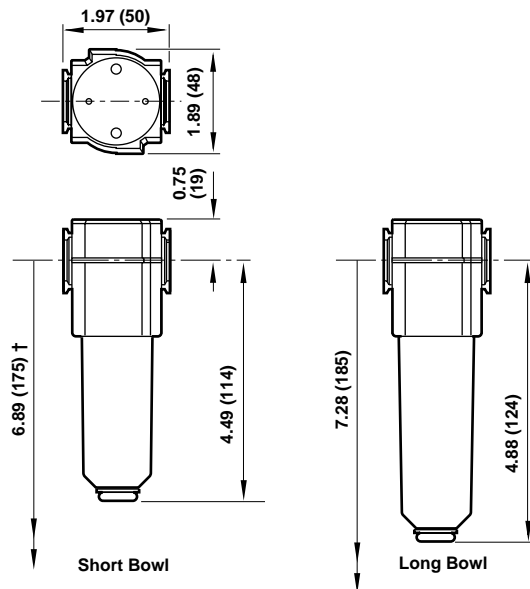


Service Kits

Item	Type	Part Number
Service kit	Seal and Gasket	4380-500
Replacement element	Adsorbing	4241-01

Service kit includes element seal and bowl seal.

All Dimensions in Inches (mm)



† Minimum clearance required to remove bowl.

Excelon 74 Oil Vapor Removal Filter 3/8", 1/2", 3/4" Port Sizes

- Excelon design allows in-line or modular installation
- Adsorbing type activated carbon element removes oil vapors and most hydrocarbon odors
- Quick release bayonet bowl
- Long service life of filter element. Minimum life of 400 hours when an oil removal filter is installed upstream and the filtration temperature is in the region of 70° to 80°F (20° to 26°C).
- Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications



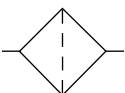
Ordering Information. Models listed include PTF threads and a closed bottom metal bowl.

Port Size	Model	Flow* scfm (dm ³ /s)	Weight lb (kg)
3/8"	F74V-3AN-EMA	27 (13)	2.54 (1.15)
1/2"	F74V-4AN-EMA	27 (13)	2.51 (1.14)
3/4"	F74V-6AN-EMA	27 (13)	2.46 (1.12)

* Maximum flow with 90 psig (6.3 bar) inlet pressure to maintain stated oil vapor removal performance.

Alternative Models

		F 7 4 V - ★ ★ ★ - ★ ★ ★				
Port Size	Substitute	|	|	|	Element	Substitute
3/8"	3				Adsorbing (Activated carbon without color indicator)	A
1/2"	4					
3/4"	6					
Threads	Substitute	|	|	|	Bowl	Substitute
PTF	A				Metal	M
ISO Rc taper	B				Transparent with guard	P
ISO G parallel	G					
Options	Substitute	|	|	|	Drain	Substitute
No options	N				Closed bottom (no drain)	E

ISO Symbols

Auto Drain
See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure:

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*:

Transparent bowl: 0° to 125°F (-20° to 50°C)

Metal bowl: 0° to 150°F (-20° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)

Air quality: Within ISO 8573-1, Class 1 ** (oil content) when installed downstream of an oil removal filter

** See ALE-1-G for specification details.

Maximum remaining oil content in outlet air: 0.003 ppm at 70°F (20°C)

Maximum flow at 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance: 27 scfm (13 dm³/s)

Nominal bowl size: 7 fluid ounce (0.2 liter)

Required prefilter: Oil removal filter with equivalent pipe size and flow capacity equal to or greater than the vapour removal filter.

Materials

Body: Aluminum

Bowl:

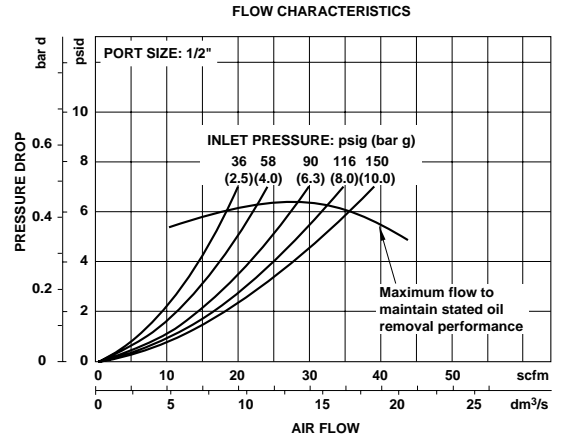
Transparent: Polycarbonate with steel bowl guard

Metal: Aluminum

Element: Activated carbon and aluminum

Elastomers: Neoprene and Nitrile

Typical Performance Characteristics

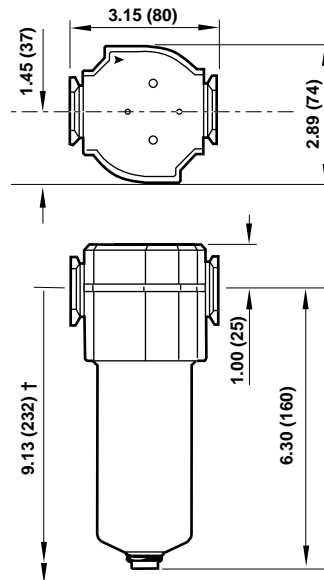


Service Kits

Item	Type	Part Number
Service kit	Seal and Gasket	4380-750
Replacement element	Adsorbing	4341-01

Service kit includes element seal and bowl seal.

All Dimensions in Inches (mm)



† Minimum clearance required to remove bowl.

Olympian Plus Coalescing/Adsorbing Filter 1/4", 3/8", 1/2", 3/4" Port Sizes

- Olympian Plus plug in design
- Combined oil and vapor removal filter
- Oil and dirt contamination in outlet air within ISO 8573-1: Quality class 1.7.1

For optimum coalescing filter element life install a 5 µm F64G pre-filter upstream.



Ordering Information. Models listed include PTF threads, automatic drain and metal bowl.

Drain Type	Port Size	F64B/L (only) Model	Weight lb (kg)	With 5 µm F64G Pre-filter Model	Weight lb (kg)
Automatic	1/4"	F64B-2AN-ARO	4.07 (1.83)	FFB64-208	7.11 (3.20)
	3/8"	F64L-3AN-ARO	4.91 (2.21)	FFB64-308	7.93 (3.57)
	1/2"	F64L-4AN-ARO	5.56 (2.50)	FFB64-408	8.00 (3.60)
	3/4"	F64L-6AN-ARO	6.40 (2.88)	FFB64-608	8.84 (3.98)

For replacement Filter (without yoke or pre-filter) substitute 'N' at the 5th and 6th digits eg: F64L-NNN-ARO.

Alternative Models

F 6 4 ★ - ★ ★ ★ - ★ ★ ★

Body type	Substitute
For 1/4" ports	B
For 3/8", 1/2", 3/4" ports	L

Port Size	Substitute
1/4"	2
3/8"	3
1/2"	4
3/4"	6

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

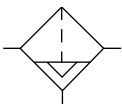
Element	Substitute
Coalescing	0

Bowl	Substitute
Metal with liquid level indicator	D
Transparent with guard	P

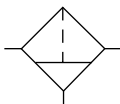
Drain	Substitute
Manual	M
Auto drain	A

Option	Substitute
None	N

ISO Symbols



Auto Drain



Manual Drain

See Section ALE-25 for Accessories

F64 B/L Coalescing/Vapor Removal Filters



Technical Data

Fluid: Compressed air

Maximum pressure:

Guarded transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*:

Guarded transparent bowl: 0° to 125°F (-20° to 50°C)

Metal bowl: 0° to 150°F (-20° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Partial removal: 0.01 µm.

Air quality: Within ISO 8573-1, Class 1.7.1**

** See ALE-1-G for specification details.

Maximum remaining oil content in outlet air:

0.003 ppm at 70°C (21°C) with an inlet concentration of 17 ppm

Maximum flow at 90 psig (6.3 bar) inlet pressure†:

15 scfm (7 dm³/s) F64B, 23 scfm (11 dm³/s) F64L

Automatic drain connection: 1/8" pipe thread

Automatic drain operating conditions (float operated)

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 2 scfm (1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

For F64G pre-filter technical data please refer to separate sheet.

Materials

Body: Zinc

Yoke: Zinc

Metal bowl: Zinc

Optional transparent bowl: Polycarbonate

Integral pre-filter element: Sintered bronze

Main filter element and activated carbon pack: Composite materials

Elastomers: Synthetic rubber

Standard sight glass for metal bowl: Pyrex

Typical Performance Characteristics

Inlet Pressure		Maximum Flow†			
		F64B		F64L	
psig	(bar)	scfm	(dm³/s)	scfm	(dm³/s)
15	(1)	6	(2.8)	9.3	(4.4)
45	(3)	10	(4.8)	16	(7.6)
70	(5)	13	(6.2)	20.8	(9.8)
90	(6.3)	15	(7.0)	23.3	(11.0)
100	(7)	15.5	(7.3)	24.4	(11.5)
130	(9)	17.8	(8.4)	28	(13.2)

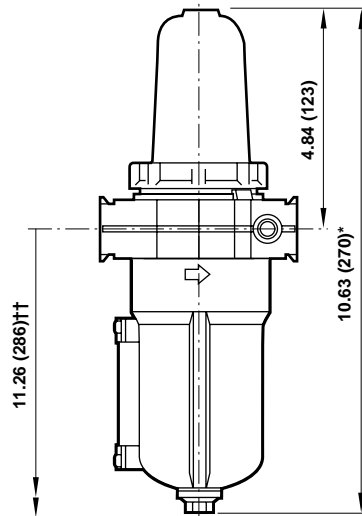
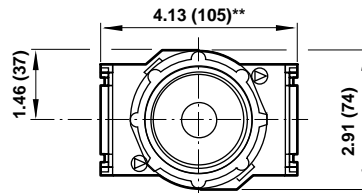
† Maximum flow to maintain stated oil removal performance.

Service Kits

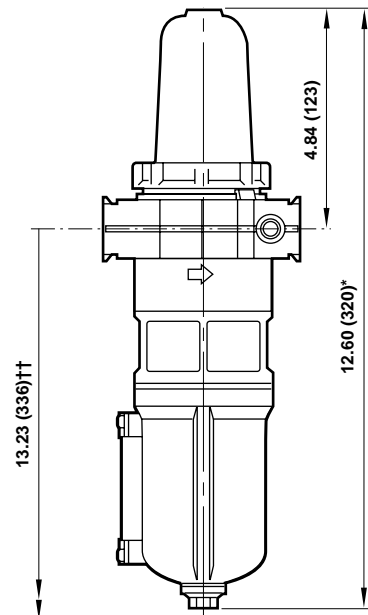
Item	Type	Part Number
Service kit	F64B/L	4380-201
Service kit (pre-filter)	F64G	4380-200
Element F64G (pre-filter)	5 µm	4338-01
Elements (F64B/L)	Coalescing (F64B)	5350-99
	Coalescing (F64L)	5350-98
	Integral pre-filter (F64B/L)	3698-02
	Activated carbon (F64B/L)	5568-01
Replacement sight glass	Prismatic (F64G)	4380-040
	Pyrex (F64G option)	4380-041
Replacement drains	Pyrex (F64B/L)	2273-97
	Automatic	3000-10
	Manual	684-84

Service kit includes port seals, bowl o-ring and drain gasket.

All Dimensions in Inches (mm)



F64B (automatic drain)



F64L (automatic drain)

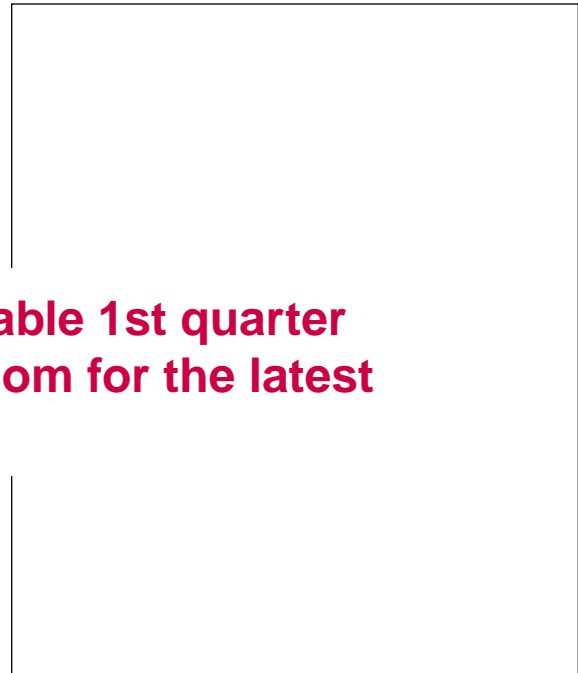
* Automatic drain shown.

Add 0.39" (10 mm) for manual drain

†† Minimum clearance required to remove bowl.

** 6.18" (157 mm) for models with 3/4" ports

- Olympian plug in design
- Adsorbing type activated carbon element removes oil vapors and most hydrocarbon odours



68 Series products are available 1st quarter of 2001. Visit www.norgren.com for the latest data on this series.

Ordering Information. Models listed include PTF parallel threads and a closed bottom metal bowl.

Port Size	Model	Flow* scfm (dm ³ /s)	Weight lb (kg)
1/2"	F68V-4AN-EMA	53 (25)	2.54 (1.15)
3/4"	F68V-6AN-EMA	74 (35)	2.51 (1.14)
1"	F68V-8AN-EMA	127 (60)	2.46 (1.12)

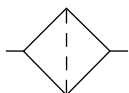
* Maximum flow with 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance.

Alternative Models

		F 6 8 ★ - ★ ★ N - E M A			
Flow	Substitute	|	|	Bowls	Substitute
Standard flow	V*			1 pint (1/2 liter)	M*
High flow	Y			1 quart (1 liter)	C
Port Size	Substitute	|	|	Threads	Substitute
1/2"	4*			PTF	A
3/4"	6			ISO Rc taper	B
1"	8			ISO G parallel	G
None	N			None	N

* 1/2" only available with F68V and 1/2 liter (1 pint US) bowl.

ISO Symbols



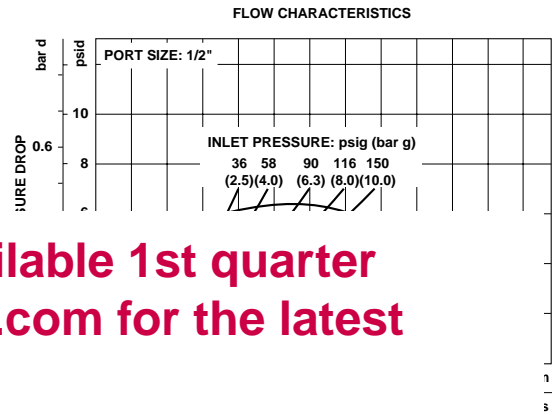
Closed Bottom



Technical Data

Fluid: Compressed air
 Maximum pressure: 250 psig (17 bar)
 Temperature range*: 0° to 150°F (-20° to 65°C)
 * Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
 Air quality: Within ISO 8573-1, Class 1** (oil content) when installed downstream of an oil removal filter
 ** See ALE-?-? for specification details.

Typical Performance Characteristics



68 Series products are available 1st quarter of 2001. Visit www.norgren.com for the latest data on this series.

Maximum remaining oil content in outlet air: 0.003 mg/m³ at 70°F (20°C)
 Required pre-filter: Oil removal filter with equivalent pipe size and flow capacity equal to or greater than the vapour removal filter.

Approximate flow at 90 psig (6.3 bar) inlet pressure†:

- 1/2, CDS15 element: 53 scfm (25 dm³/s)
- 3/4, CDS25 element: 74 scfm (35 dm³/s)
- 1, CDS25 element: 127 scfm (60 dm³/s)

† To maintain stated oil removal performance

Nominal bowl sizes:

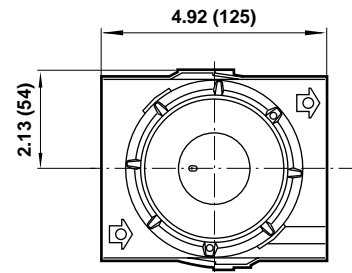
- 1 quart US (1 liter)
- 1 pint US (0.5 liter)

Materials:

Body: Aluminum

Inlet Pressure		Maximum Flow†	
psig	(bar)	scfm	(dm ³ /s)
36	(2.5)	19	(8.7)
58	(4)	23	(10.7)
90	(6.3)	28	(13.3)
116	(8)	33	(15.6)
150	(10)	38	(17.6)

† Maximum flow to maintain stated oil removal performance.

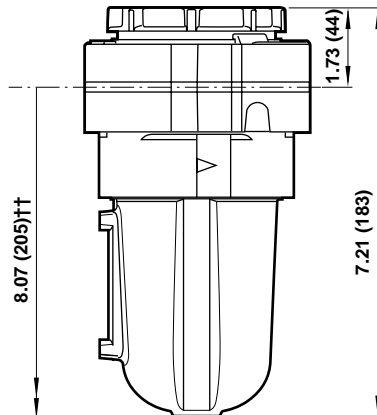


All Dimensions in Inches (mm)

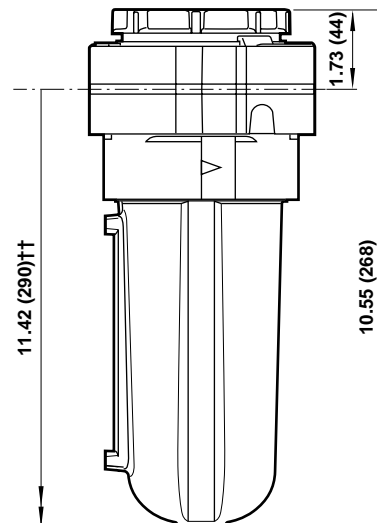
Unported units.

For ported unit dimensions see Bracket Mounting dimensions below.

F15V (short bowl)



F15V (long bowl)



†† Minimum clearance required to remove bowl.

F46 Oil Vapor Removal Filter

17 Series Oil Vapor Removal (Adsorbing)
Filter 3/8", 1/2", and 3/4" Port Sizes

- Adsorbing type activated-carbon filter element removes oil vapors
- Long service life of filter element. Minimum life of 1000 hours when an oil removal filter is installed upstream and filtration temperature is in the range of 70° to 80°F (21° to 26°C).
- Use in critical industrial applications that require compressed air virtually free of oil vapors
- Typical applications include precision pneumatic instrumentation, temperature control, paper separation, film processing, and production of electronic equipment
- Screw-on bowl reduces maintenance time
- Can be disassembled without the use of tools or removal from the air line



Ordering Information. Models listed include manual drain, metal bowl, and PTF threads.

Type	Port Size	Model Numbers	Flow* scfm (dm ³ /s)	Weight lbs (kg)
F46 Compact bowl	3/8"	F46-323-MAGA	60 (28)	3.62 (1.64)
	1/2"	F46-423-MAGA	60 (28)	3.53 (1.60)
F46 Standard bowl	1/2"	F46-424-MAMA	60 (28)	4.01 (4.01)
	3/4"	F46-624-MAMA	60 (28)	3.92 (1.78)

* Maximum flow at 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance.

Alternative Models

F 4 6 - ★ ★ ★ - ★ ★ ★ ★

Port Size	Substitute
3/8"	3
1/2"	4
3/4"	6

Element	Substitute
Compact	23 **
Standard	24 **

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

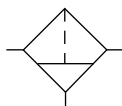
Bowl	Substitute
Metal, Compact	G **
Metal, Standard	M **

Element	Substitute
Adsorbing	A

Drain	Substitute
Manual	M

** A 23 requires a G in the 9th position of the model number, and a 24 requires an M.

ISO Symbols



Manual Drain

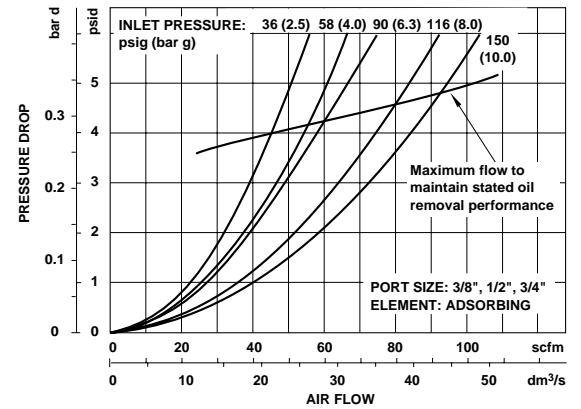
See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air
 Maximum pressure: 250 psig (17 bar)
 Operating temperature: *0° to 150°F (-20° to 65°C)
 * Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)
 Air quality: Within ISO 8573-1, Class 1** (oil content) when air is prefiltered with a Norgren oil removal filter
 ** See ALE-1-G for specification details.
 Maximum remaining oil content of air leaving the filter: 0.003 ppm at 70°F (20°C) when air is prefiltered with a Norgren oil removal filter
 Maximum flow at 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance: 60 scfm (28 dm³/s)
 Required prefilter: Oil removal filter with equivalent pipe size and flow capacity equal to or greater than the vapor removal filter.
 Materials:
 Body: Aluminum
 Bowl: Aluminum
 Filter element: Activated carbon, nylon, aluminum
 Elastomers: Neoprene and nitrile

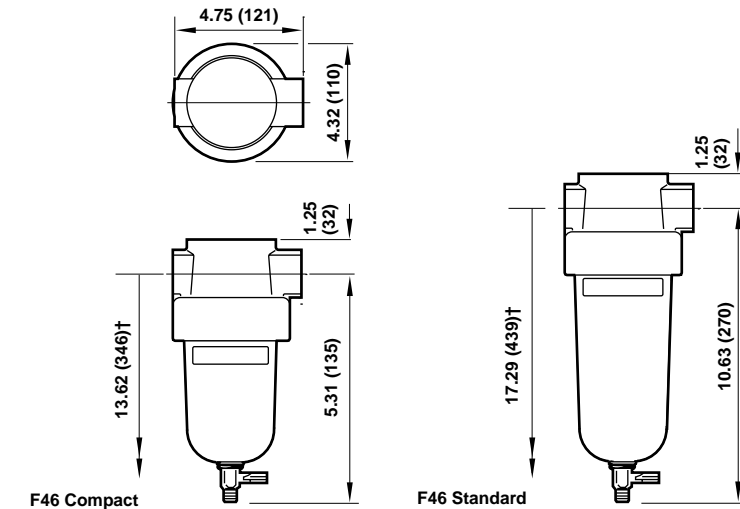
Typical Performance Characteristics



Service Kit

Item	Type	Part number
Service kit	Element and element o-ring	665-08
Replacement drain	Manual (1/4 Turn)	619-50

All Dimensions in Inches (mm)



† Minimum clearance required to remove bowl.

Membrane Dryers

Removes water vapor from compressed air providing dewpoint suppression.

W07 Series Membrane Dryer	
1/4" Port Sizes	ALE-4-2
W72 Series Membrane Dryer	
1/4" Port Sizes	ALE-4-4
W74 Series Membrane Dryer	
1/2" Port Sizes	ALE-4-6

Membrane Dryer



**W07M Series Membrane Dryer
1/4" Port Size**

- Removes water vapor from compressed air providing condensate-free air at the point of application.
- Provides dewpoint suppression up to 80°F (44°C) depending on air flow through the membrane
- Dewpoint suppression of 20°F (11°C) below the inlet temperature is suitable for most industrial applications.
- Utilizes the latest membrane technology to achieve optimal water vapor removal rates.
- W07 available for in-line installation only
- Easy installation, no power required
- Maintenance free with proper prefiltration
- Extremely low pressure drops



Ordering Information. Models listed include NPT threads.

Port Size	Model	Nominal Flow* scfm (dm ³ /s)		Differential Pressure ** psid (bar)	Weight lb (kg)
		Outlet	Inlet		
1/4	W07M-2AN-NNA	2 (1.00)	2.2 (1.06)	0.40 (0.028)	0.88 (0.39)

* Maximum flow with 20°F (11°C) dewpoint suppression.

** Differential pressure at 100 psig (7 bar) inlet pressure at stated flows.

Alternative Models

W ★ ★ M - ★ ★ N - N ★ ★

Threads	Substitute
NPT	A
ISO G parallel	G

How to Size a Membrane Dryer

1. Enter the application requirements below:

- Maximum air flow required: _____
- Inlet pressure: _____
- Dewpoint suppression required:* _____

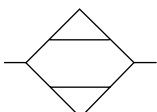
2. Select a chart by matching the maximum air flow required to the flow range in the chart title.

3. Follow the appropriate inlet pressure curve downward until it crosses the maximum air flow required. Trace a horizontal line to the *DEWPOINT SUPPRESSION* axis and note the degrees of suppression.
Degrees Of Suppression: _____

4. If the degrees of suppression is less than the application requirement, check the membrane dryer with the next higher flow range. The inlet pressure of the smaller membrane dryer may also be increased to provide greater suppression.

5. If the degrees of suppression is greater than the application requirement, check the membrane dryer with next smaller maximum flow.

* Typically, a dewpoint suppression of 20°F (11°C) below the inlet temperature provides dry air suitable for most industrial applications.

ISO Symbol


W07M Membrane Dryers

All Dimensions in Inches (mm)



Technical Data

Fluid: Compressed air, prefiltered to 0.01 micron and oil free (ISO 8573-1, 1.7.2) with noncycling supply.

Maximum pressure: 150 psig (10 bar)

Operating temperature: 0° to 175°F (-20° to 80°C)*

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Nominal flow at 100 psig (7 bar) inlet pressure, 100°F (38°C) inlet temperature, and a dew point suppression of 20°F (11°C). Flow demand affects dew point suppression.

Model W07M-2AN-NNA: 2 scfm (1.00 dm³/s)

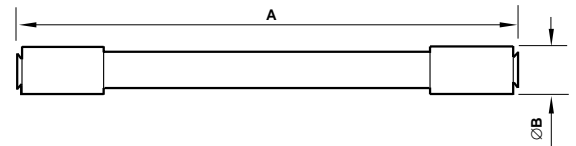
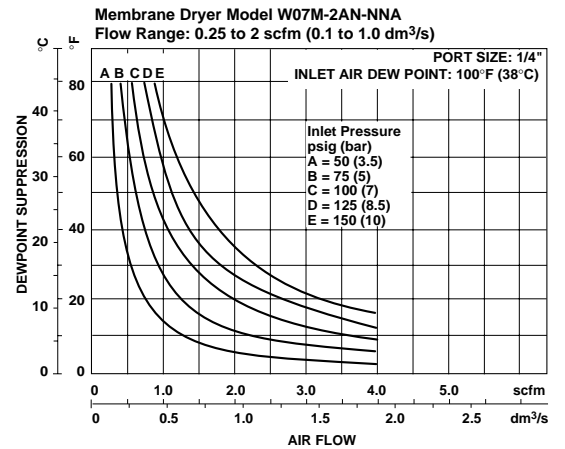
Materials

Body and end caps: Anodized aluminum

Membrane: Polymeric materials

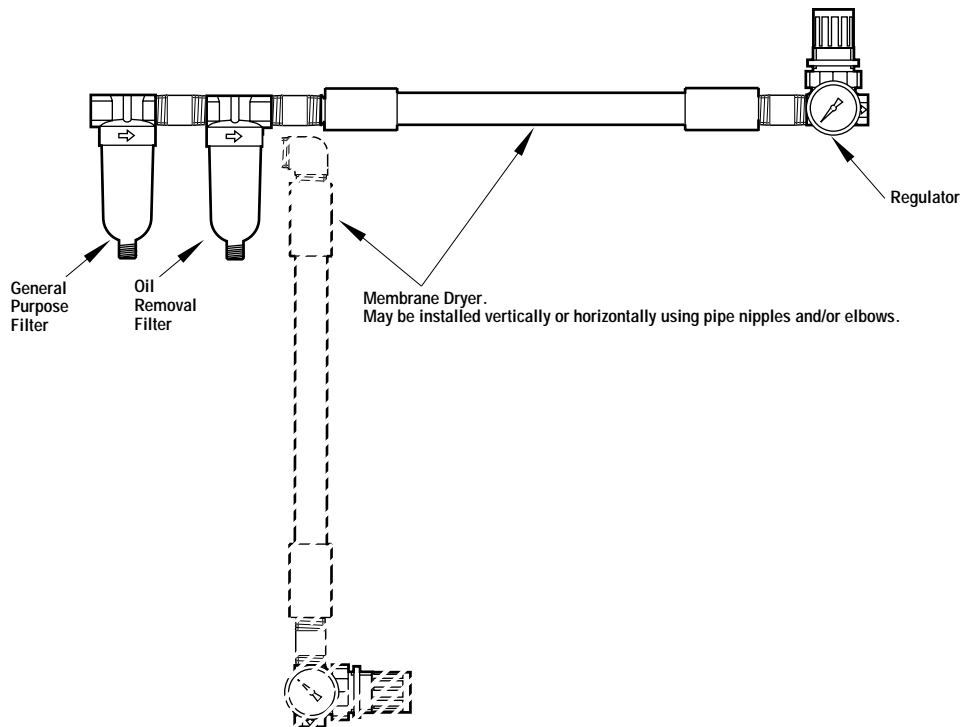
NOTE - Required prefiltration: General purpose filter (5 micron element) and an oil removal filter (0.01 micron particle removal) with equivalent pipe size and flow capacity equal to or greater than the membrane air dryer, (automatic drains advised).

Typical Dew Point Suppression Characteristics



Model	Dimension A	Diameter B
W07M-2AN-NNA	16.0 (406)	1.18 (30)

Typical Installation. W07 installation uses pipe fittings in conjunction with Miniature 07 Series products



- Removes water vapor from compressed air providing condensate-free air at the point of application.
- Provides dewpoint suppression up to 80°F (44°C) depending on air flow through the membrane
- Dewpoint suppression of 20°F (11°C) or below the inlet temperature is suitable for most industrial applications.
- Utilizes the latest membrane technology to achieve optimal water vapor removal rates.
- W72 utilizes the Excelon Quikclamp™ design to provide in-line or modular installation with 72, 73 and 74 Series products.
- Easy installation, no power required
- Maintenance free with proper prefiltration
- Extremely low pressure drops



Ordering Information. Models listed include ISO G parallel threads.

Port Size	Model	Nominal Flow* scfm (dm ³ /s)		Differential Pressure ** psid (bar)	Weight lb (kg)
		Outlet	Inlet		
1/4	W72M-2AN-NNB	5 (2.40)	5.6 (2.65)	0.32 (0.023)	1.80 (0.82)
1/4	W72M-2AN-NNC	10 (4.75)	11.2 (5.27)	0.90 (0.062)	1.86 (0.84)

* Maximum flow with 20°F (11°C) dewpoint suppression.

** Differential pressure at 100 psig (7 bar) inlet pressure at stated flows.

Alternative Models

W ★ ★ M - ★ ★ N - N ★ ★

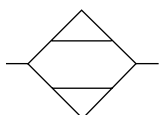
Threads	Substitute
NPT	A
ISO G parallel	G

How to Size a Membrane Dryer

- Enter the application requirements below:
 - Maximum air flow required: _____
 - Inlet pressure: _____
 - Dewpoint suppression required:* _____
- Select a chart by matching the maximum air flow required to the flow range in the chart title.
- Follow the appropriate inlet pressure curve downward until it crosses the maximum air flow required. Trace a horizontal line to the *DEWPOINT SUPPRESSION* axis and note the degrees of suppression. Degrees Of Suppression: _____
- If the degrees of suppression is less than the application requirement, check the membrane dryer with the next higher flow range. The inlet pressure of the smaller membrane dryer may also be increased to provide greater suppression.
- If the degrees of suppression is greater than the application requirement, check the membrane dryer with next smaller maximum flow.

* Typically, a dewpoint suppression of 20°F (11°C) below the inlet temperature provides dry air suitable for most industrial applications.

ISO Symbol



W72M Membrane Dryers

All Dimensions in Inches (mm)



Technical Data

Fluid: Compressed air, prefiltered to 0.01 micron and oil free (ISO 8573-1, 1.7.2) with noncycling supply.

Maximum pressure: 150 psig (10 bar)

Operating temperature: 0 to 175°F (-20 to 80°C)*

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Nominal flow at 7 bar (100 psig) inlet pressure, 100°F (38°C) inlet temperature, and a dew point suppression of 20°F (11°C). Flow demand affects dew point suppression.

Model W72M-2AN-NNB: 5 scfm (2.40 dm³/s)

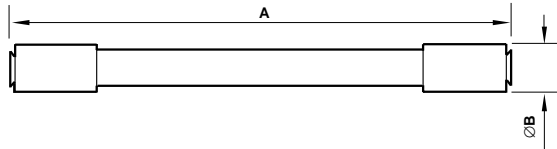
Model W72M-2AN-NNC: 10 scfm (4.75 dm³/s)

Materials

Body and end caps: Anodized aluminum

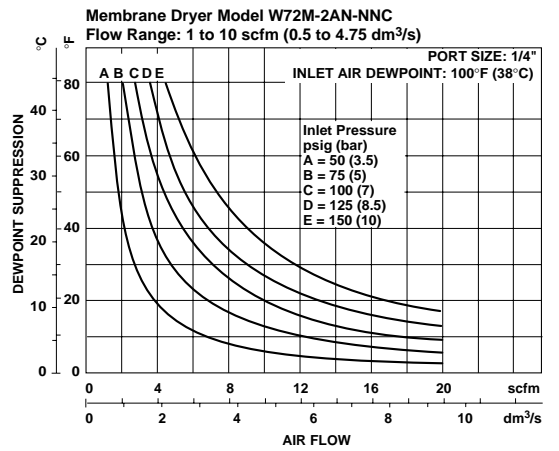
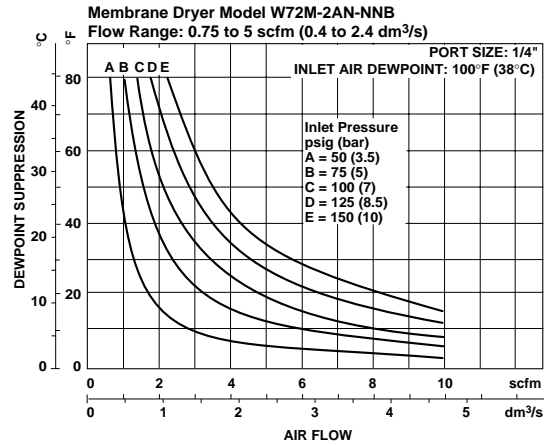
Membrane: Polymeric materials

NOTE - Required prefiltration: General purpose filter (5 micron element) and an oil removal filter (0.01 micron particle removal) with equivalent pipe size and flow capacity equal to or greater than the membrane air dryer, (automatic drains advised).

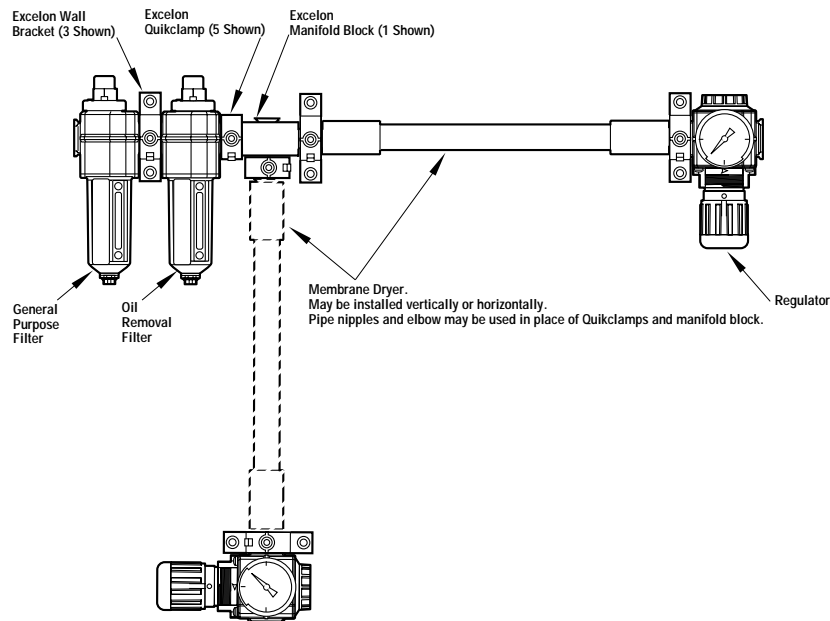


Model	Dimension A	Diameter B
W72M-2AN-NNB	18.0 (457)	1.74 (44)
W72M-2AN-NNC	19.0 (483)	1.74 (44)

Typical Dew Point Suppression Characteristics



Typical Installation. W72 membrane dryer shown with Excelon products, Quikclamps and manifold block.



- Removes water vapor from compressed air providing condensate-free air at the point of application.
- Provides dewpoint suppression up to 80°F (44°C) depending on air flow through the membrane
- Dewpoint suppression of 20°F (11°C) below the inlet temperature is suitable for most industrial applications.
- Utilizes the latest membrane technology to achieve optimal water vapor removal rates.
- W74 utilizes the Excelon Quikclamp™ design to provide in-line or modular installation with 72, 73 and 74 Series products.
- Easy installation, no power required
- Maintenance free with proper prefiltration
- Extremely low pressure drops



Ordering Information. Models listed include ISO G parallel threads.

Port Size	Model	Nominal Flow* scfm (dm³/s)		Differential Pressure **		Weight lb (kg)
		Outlet	Inlet	psid (bar)		
1/2	W74M-4AN-NND	20 (9.50)	22.2 (10.47)	0.65 (.045)		3.53 (1.60)
1/2	W74M-4AN-NNE	30 (14.20)	33.4 (15.76)	1.35 (.093)		3.94 (1.79)

* Maximum flow with 20°F (11°C) dewpoint suppression.

** Differential pressure at 100 psig (7 bar) inlet pressure at stated flows.

Alternative Models

W ★ ★ M - ★ ★ N - N ★ ★

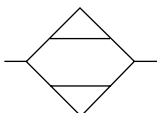
Threads	Substitute
NPT	A
ISO G parallel	G

How to Size a Membrane Dryer

- Enter the application requirements below:
 - Maximum air flow required: _____
 - Inlet pressure: _____
 - Dewpoint suppression required:* _____
- Select a chart by matching the maximum air flow required to the flow range in the chart title.
- Follow the appropriate inlet pressure curve downward until it crosses the maximum air flow required. Trace a horizontal line to the *DEWPOINT SUPPRESSION* axis and note the degrees of suppression. Degrees Of Suppression: _____
- If the degrees of suppression is less than the application requirement, check the membrane dryer with the next higher flow range. The inlet pressure of the smaller membrane dryer may also be increased to provide greater suppression.
- If the degrees of suppression is greater than the application requirement, check the membrane dryer with next smaller maximum flow.

* Typically, a dewpoint suppression of 20°F (11°C) below the inlet temperature provides dry air suitable for most industrial applications.

ISO Symbol



W74M Membrane Dryers

All Dimensions in Inches (mm)



Technical Data

Fluid: Compressed air, prefiltered to 0,01 micron and oil free (ISO 8573-1, 1.7.2) with noncycling supply.

Maximum pressure: 150 psig (10 bar)

Operating temperature: 0 to 175°F (-20 to 80°C)*

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Nominal flow at 100 psig (7 bar) inlet pressure, 100°F (38°C) inlet temperature, and a dew point suppression of 20°F (11°C). Flow demand affects dew point suppression.

Model W74M-4AN-NND: 20 scfm (9.50 dm³/s)

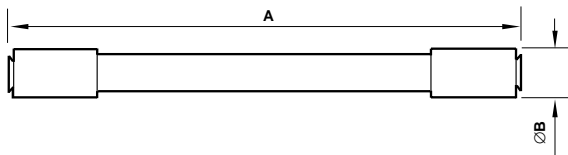
Model W74M-4AN-NNE: 30 scfm (14.20 dm³/s)

Materials

Body and end caps: Anodized aluminum

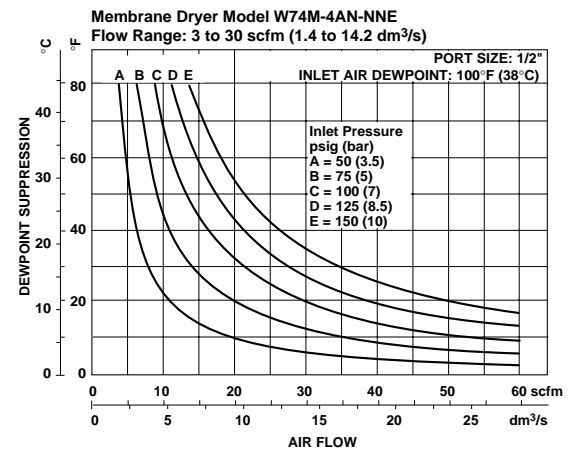
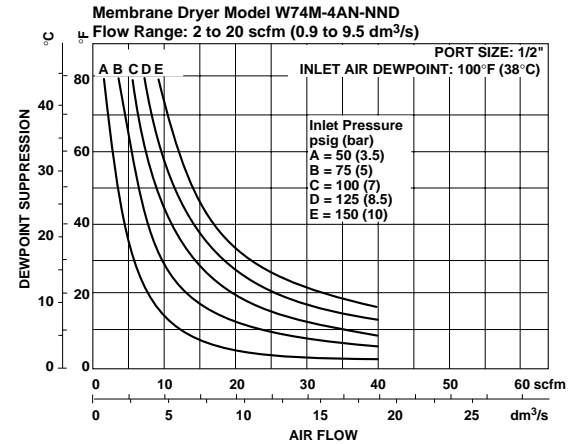
Membrane: Polymeric materials

NOTE - Required prefiltration: General purpose filter (5 micron element) and an oil removal filter (0.01 micron particle removal) with equivalent pipe size and flow capacity equal to or greater than the membrane air dryer, (automatic drains advised).

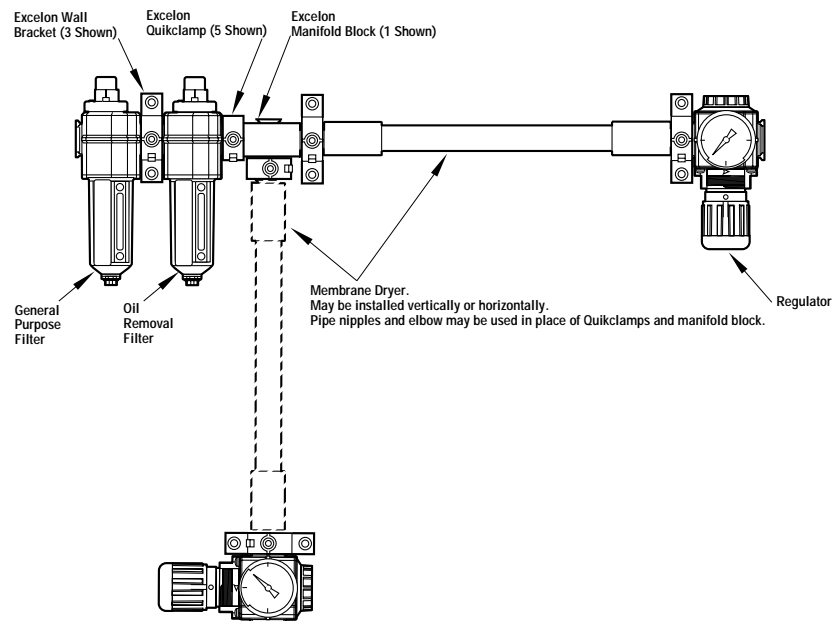


Model	Dimension A	Diameter B
W74M-4AN-NND	21.0 (533)	2.49 (63)
W74M-4AN-NNE	26.0 (660)	2.49 (63)

Typical Dew Point Suppression Characteristics



Typical Installation. W74 membrane dryer shown with Excelon products, Quikclamps and manifold block.



Regulators

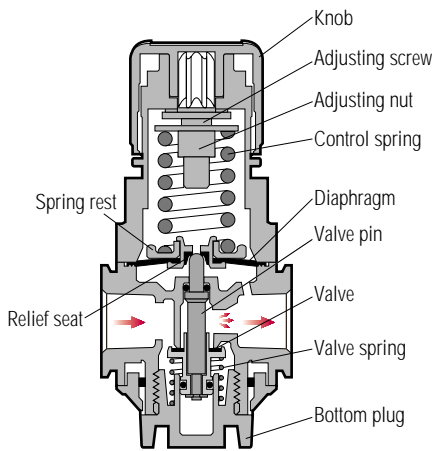
General Purpose Regulators, Specialty Regulators, Manifolding Regulators, Precision and Instrument Regulators, Pilot Regulators, Pilot Operated Regulators, U.L. Listed Industrial, and Beverage Regulators

- Regulator OverviewALE-5-B**
- General Purpose RegulatorsALE-5-1**
- Specialty Regulators (Air or Water, Tube Connection,
Factory Preset Pressure, Large Diaphragm, High
Relief Flow, Field Adjustable Pressure LimitsALE-6-1**
- Manifolding RegulatorsALE-7-1**
- Precision and Instrument RegulatorsALE-8-1**
- Pilot RegulatorsALE-9-1**
- Pilot Operated RegulatorsALE-10-1**
- U.L. Listed Industrial Service RegulatorsALE-11-1**
- U.L. Listed Beverage RegulatorsALE-12-1**



Regulator Overview

GENERAL PURPOSE REGULATOR



General purpose regulators have a control spring which acts on a diaphragm to regulate the air pressure. The rating of this control spring determines the adjustment range of the regulator. The outlet pressure setting is obtained by turning the knob (or T handle) clockwise to increase pressure, counter clockwise to decrease pressure.

1.1 GENERAL OVERVIEW

Regulators ideally provide a constant outlet pressure independent of variations in inlet pressure or flow. Regulators are typically used to:

- i. reduce pressure to the level required for downstream equipment.
- ii. limit the force of cylinders.
- iii. minimize pressure variation at the point of use.

The range of different regulators and options within each type are wide and varied, but each can broadly be put into one of 3 categories.

- General Purpose Regulators
- Pilot Operated Regulators
- Application Specific Regulators

1.1.1 General Purpose Regulators:

General purpose regulators are designed to give the maximum flow capacity (for their size) while maintaining, to a reasonable accuracy, the outlet pressure to the set level.

They are used to control pressures in compressed air line installations to different parts of machines or to pneumatic tools and motors.

General purpose regulators are available in relieving or non-relieving types. Relieving regulators can be adjusted from a high pressure to a low pressure. Even in a dead end situation relieving regulators will allow the excess downstream pressure to be exhausted. This causes a loud hissing sound which is perfectly normal.

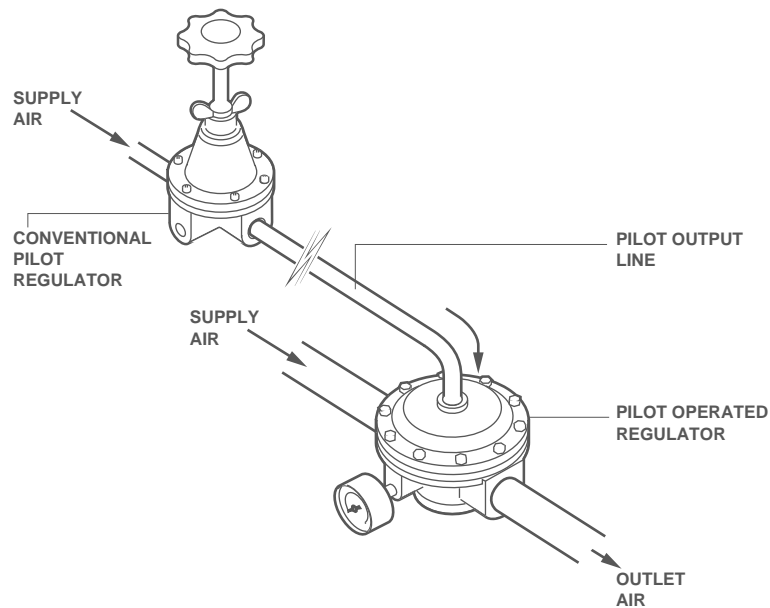
Non relieving regulators when similarly adjusted will not allow the downstream pressure to escape. The trapped air will need to be released in some other way, e.g. by operating a downstream valve.

1.1.2 Pilot Operated Regulators:

Pilot operated regulators are used in high flow applications and where access to the main regulator is limited or difficult. This type of regulator does not have a control spring to regulate, instead an air pilot signal is used to control the outlet pressure of the main regulator.

This air pilot signal is controlled by a small 'pilot operator' regulator typically of a precision type eg 11-018. The flow through the pilot operator is negligible. The better the pilot, the better the performance from the main regulator.

Typical Pilot Operation



The pilot signal for the main regulator valve is usually onto a large diaphragm area. This results in pilot operated regulators having better regulation characteristics than spring operated general purpose regulators.



1.1.3 Feedback Pilot Regulators:

For even greater control of the outlet pressure a 'feedback' pilot operator can be used. Here the outlet pressure from the pressure critical point in the system can be fed back to the controlling pilot operated regulator.

Feedback systems are very responsive to downstream pressure requirements. If performance does not meet expectations, consult with Application Engineering.

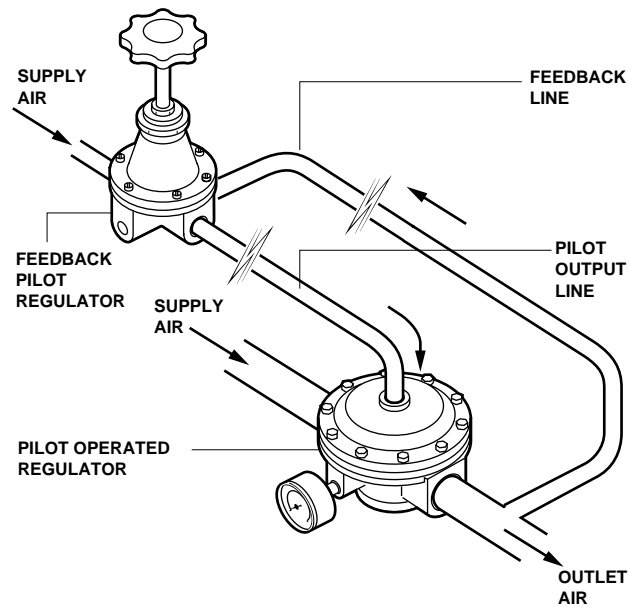
Very few applications require feedback and it is usually better to recommend a standard 11-400 or a general purpose regulator as a pilot operator.

1.1.4 Application Specific Regulators:

Norgren produces a wide range of application specific regulators, each having some enhanced feature over a general purpose regulator. Some of them are listed below.

-
- | | |
|-------------|--|
| 11-018/-118 | - extremely accurate outlet pressure control, with high flow for a precision regulator.
Requires oil-free air, pre-filtered to 5µm. |
|-------------|--|
-
- | | |
|-----|--|
| R38 | - Instrument regulator, aluminum body (also available in stainless steel to NACE standard), excellent regulation, no constant bleed to atmosphere. |
|-----|--|
-
- | | |
|-----|--|
| R24 | - Good regulation, extremely high relief capacity. Available in spring or pilot operated versions. |
|-----|--|
-
- | | |
|---------|---|
| R05/R22 | - General purpose regulators with stainless steel bodies to NACE specification. |
|---------|---|
-
- | | |
|---------|--|
| R06/R91 | - Brass or plastic bodied specifically for water. Potable and non potable water options available. |
|---------|--|
-
- | | |
|----------------------|---|
| Miniature Regulators | - Generally based around a modification to a basic R07 including low flow (with improved regulation), plastic bodied (for water), different elastomeric materials (for fluid compatibility) |
|----------------------|---|
-

Feedback Operation



Feedback Pilot Regulator Warning

The feedback line must sense the pilot operated regulator outlet pressure and must be connected before turning on the air supply. If the feedback line is not connected, the pilot operated regulator outlet pressure will rapidly increase to the inlet pressure when the adjusting knob on the pilot regulator is turned clockwise.



1.2 WHAT CAN WE PRODUCE?

1.2.1 Do Norgren Produce Regulators for Inlet Pressure above 400 psig?

The R38, R43 and R18 can accept inlet pressures of up to 450 psig. Norgren has higher pressure regulators for industrial gases up to 3000 psi. Consult Application Engineering for details.

1.2.2 Do we Produce Units for Low/High Temperatures?

Low or high temperature units may be possible in some ranges. Material selection is critical. Consult Air Line for details.

Note: changing to viton elastomers does not in itself make a unit suitable for higher temperatures.

1.2.3 Can we Produce Sub-Base Regulators?

The USA R40/R41 pilot and feedback pilot regulators are available. A sub-base R06 is also available.

1.2.4 Can we Produce Manifolding Regulators?

Manifolding regulators are designed to have a straight through primary pressure with secondary outlets at 90 degrees. Norgren has:

- Excelon 72 R72M - manifold using Quikclamps.
- R30M Plastic R91 style with integral PIF. Manifold using adapters.
- R06 type brass bodied R06, manifold using fittings.

1.2.5 Do we Produce Liquid (water) Regulators?

Norgren has regulators suitable for liquids, primarily water.

These include plastic bodied miniature regulators eg R91G/W and 11-044, as well as brass R06's and R43's.

All are suitable for non potable water some for potable water. Check catalogue sheets for details.

A number of units already have the approval of some water control bodies eg WRC (Water Research Council) UK and NSF USA.

Water regulators can be used with other liquids but it is necessary to check corrosion resistance and material compatibility. Differences in viscosity may effect performance.

Water regulators can be used on air but normally have poorer performance characteristics than air regulators.

1.2.6 Can we do 11-818 Precision Regulators with Gauges?

Yes, we do have some special models, contact Application Engineering for details.

1.2.7 Can we Produce Back Pressure Regulators?

Yes, a back pressure regulator behaves as a very precise relief valve and so controls the rate of relief. With automatic adjustment of its outlet flow to atmosphere the system pressure remains substantially constant. These can be produced as specials.

1.2.8 Can we Produce Reverse Flow Regulators?

Reverse flow regulators allow the outlet pressure to flow back, through the regulator (via an internal check valve) when the inlet pressure is switched off. This is important when the regulator is placed between a valve and cylinder.

This option is available in Excelon 74, 73 and 72 Series and Olympian Plus. The R07, being an unbalanced valve regulator can also be reverse flowed.

1.3 ADJUSTMENT MECHANISMS

1.3.1 What Different Adjustment Mechanisms are Available?

A non-rising knob is the standard adjustment mechanism for most general purpose regulators. A T-handle will provide added leverage and is standard for regulators with 250 psig springs. They are also a common alternative to a knob in applications where the operator is wearing gloves, or has greasy hands.

A slotted adjusting screw enables the customer to adjust using a screwdriver and a hexagon-headed screw is also available. Handwheels can be fitted to most units and are standard on precision regulators.

1.3.2 What is the Difference between Tamper Resistant, Tamper Evident, and Tamperproof?

Tamper Resistant: a device which makes alterations of set pressure difficult.

Units which normally have a T-bar can have the T-bar replaced by a screw driver slotted adjusting screw over which a metal cap is fitted. In this way the set pressure can be protected from accidental adjustment.

Units with adjusting knobs are made tamper resistant by preventing the knob being pulled into its unlocked position for example:-

- R07 insert self tapping screw through the top of the knob.
- R72/73/74/64 use tamper resistant kit and seal with a padlock or seal wire.

Tamper Evident: shows if the set pressure has been altered by the breaking of a seal.

Tamperproof: something which cannot be tampered with at all. It is difficult to describe anything as tamper proof because if someone is intent on making regulator adjustments then they can always find a way. As a result we do not call our regulators tamper proof.

1.3.3 What Presetting Options are Available?

Most regulators can be 'set' in some way, if in doubt contact Air Line Division as this is generally a factory operation.

- Max Set: unit is modified to prevent the regulator being adjusted above a specified maximum.
- Min Set: unit is modified to prevent the regulator being adjusted below a specified minimum.
- Min/Max Set: unit can only be adjusted between two specified upper and lower units.
- Preset (Factory Set): unit outlet pressure is set and locked prior to despatch. These units are not tamper resistant (unless requested).



1.4 REGULATORS IN APPLICATIONS

1.4.1 Can the Regulators be Adjusted Outside the Recommended Range?

The recommended range is that at which the regulator will perform at its optimum. These are not the maximum and minimum values. Regulators can be set outside these limits. For units which cannot be set outside of a specified range see 1.3.3.

1.4.2 Will Regulators Shut Off?

Yes, screwing the adjustment 'up' (counterclockwise) closes the valve. It is possible to achieve zero psig with a regulator, however they are not designed to fulfill this function. If shut off is required use a shut off valve.

1.4.3 Will Regulators Work Mounted Upside Down?

Regulators can be mounted in any orientation without affecting their function.

1.4.4 How do you Set a Regulator?

Always set on a rising pressure, i.e. on an increasing spring load.

To adjust a regulator from 100 psig to 70 psig, back the regulator off to below 70 psig and adjust back up to the required pressure.

1.4.5 Can Air Regulators be used on Water?

Generally the answer is no for air regulators with balanced valves. It is possible with the R06 type which does not have a balanced valve and is considered dual service. See 1.2.5.

1.4.6 Can we use Air Regulators on other Gases?

Air regulators are generally suitable for use with CO₂, argon, nitrogen or other inert gases. However units are designed and tested to compressed air standards only (unless specified in the literature) and external leakage rates may vary depending on the gas involved.

Compressed air regulators should never be used with flammable or noxious gases eg LPG, hydrogen etc.

1.4.7 Instability - what is it and how can it be prevented?

Instability (humming or whistling) is the rapid cyclic fluctuation of the outlet pressure from around the set pressure.

Instability is ultimately a problem occurring due to the flow path through the regulator or system. The usual solution is to change the regulator characteristics by replacing the control spring with one of a higher rating to increase the force on the diaphragm or changing the diaphragm material.

There is no magic answer, it is a case of trial and error in those applications where instability occurs.

1.4.8 What is a Constant Bleed Regulator?

Constant bleed in regulators is designed to provide improved response. A hissing noise is normal. R24 and 11-018 are all constant bleed regulators.

1.5 PERFORMANCE

1.5.1 Flow Quoted?

Flow characteristic is the measurement of the flow through the unit for a given deviation from the set outlet pressure.

For example, take a regulator and set the pressure at 90 psig under no flow conditions. As the flow through the unit is increased then the actual outlet pressure falls away from the set pressure. This is called droop (from set). Normally Norgren quotes regulator flow measured under the following conditions: Inlet pressure = 150 psig, set pressure = 90 psig and a 15 psig droop from set.

1.5.2 What are Regulation Characteristics?

Regulation characteristics show how the outlet pressure from the regulator varies when the inlet pressure varies (under constant or no flow conditions).

For example, take a regulator set at 60 psig outlet pressure, with 150 psig at the inlet. If the inlet pressure reduces, ideally the outlet pressure would remain the same.

However, in regulators with an unbalanced valve (eg R07) the outlet pressure actually increases slightly as the inlet pressure decreases. In regulators with balanced valves this variation is reduced.

Standard regulators have an acceptable deviation for most pneumatic application and customers tend to be interested in regulation characteristics in critical applications only. Where this is so, consider using a precision regulator, or consult Application Engineering about ways to improve the performance of standard regulators.

1.5.3 What is the Repeatability of a Regulator?

Repeatability can be defined in terms of changes in flow, inlet pressure or time. It is important to understand which the customer requires.

- a. *Repeatability with Respect to Changes in Flow:* ie the ability of a regulator to hold a set pressure with increasing or decreasing flow.
- b. *Repeatability with Respect to Time Changes:* ie the ability of a regulator to hold a set pressure over a time period.
- c. *Repeatability with Respect to Inlet Pressure Changes:* ie the ability of a regulator to hold a set pressure with changes in supply pressure.

For more information refer to catalogue graphs, or consult Application Engineering.



1.6 SIMPLE REGULATOR TROUBLESHOOTING

Problem	Problem Cause	Remedy
Regulator creep (increase in secondary pressure due to leak from primary).	Dirty or cut valve elastomers. Nick in valve seat.	Replace or clean valve. If body or valve seat is damaged it can be replaced on some models. On others replacement of complete regulator is required.
Won't relieve secondary pressure.	Non-relieving diaphragm assembly.	If this feature is required, replace with relieving type diaphragm assembly.
Won't reach desired pressure.	Regulating spring with low spring rate.	Use regulating spring with spring rate designed to cover desired range.
Excessive leak from relief hole.	Damaged relief seat. Ruptured diaphragm.	Replace diaphragm assembly.
	Leakage past valve causing secondary to increase somewhat and open relief seat.	Replace or clean valve.
Regulator chatter.	A resonant condition is generally only encountered under a certain set of conditions of flow and pressure and then only in some applications in which regulator couples with other system components.	Replace spring with a higher pressure range spring. Replace with a piston type regulator since they have less tendency to chatter.
Regulator difficult to adjust.	Adjusting screw or knob locking device in locked position.	Pull to unlock knob and adjust; push knob to lock Threaded adjusting screws: loosen lock nut, remove adjusting screw, clean thread and lubricate.
	Contaminants in adjusting screw threads.	Place some lubricant on tip of screw.

Regulators

Compressed air regulators are available in modular or inline models, in port sizes from 1/8" to 2".

Contents

R07 Miniature General Purpose Filter 1/8" and 1/4" ports	.....ALE-5-2
R46 Miniature, Non-repairable General Purpose Filter 1/4" to 3/8" ports	.....ALE-5-4
R72G/R Excelon General Purpose Filter 1/4" to 3/8" ports	.....ALE-5-6
R73G/R Excelon General Purpose Filter 1/4" to 1/2" ports	.....ALE-5-8
R74G/R Excelon General Purpose Filter 3/8" to 3/4" ports	.....ALE-5-10
R64G/R Olympian Plus General Purpose Filter 1/4" to 3/4" ports	.....ALE-5-12
R68G Olympian Plus General Purpose Filter 3/4" to 1-1/2" ports	.....ALE-5-14
R17G General Purpose Filter 3/4" to 1-1/2" ports	.....ALE-5-16
R18G General Purpose Filter 1-1/2" and 2" ports	.....ALE-5-18



R07



R46



R72G/R



R73G/R



R74G/R



R64G/R

Product available
1st quarter of 2001



R68



R17



R18

Miniature Series 07 General Purpose Regulator 1/8" and 1/4" Port Sizes

- **Compact design**
- **Full flow gauge ports**
- **Low torque, non-rising adjusting knob**
- **Snap action knob locks pressure setting when pushed in**
- **Standard relieving models allow reduction of outlet pressure even when the system is dead-ended**
- **Can be disassembled without the use of tools or removal from the air line**



Ordering Information. Models listed include PTF threads, relieving diaphragm, 5 to 100 psig (0.3 to 7 bar) outlet pressure adjustment range*, with gauge.

Port Size	Model Number	Flow† scfm (dm ³ /s)	Weight lbs (kg)
1/8"	R07-100-RGKA	14 (6.5)	0.31 (0.19)
1/4"	R07-200-RGKA	15 (7)	0.31 (0.19)

† Approximate flow at 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 14.5 psig (1 bar) from set.

Alternative Models



Port Size	Substitute
1/8"	1
1/4"	2

Option	Substitute
Not applicable	0

Option	Substitute
Standard	0
Low flow seat	2

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

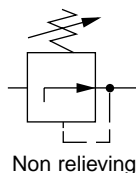
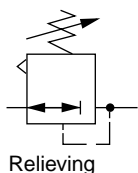
Outlet Pressure Adjustment Ranges*	Substitute
1 to 10 psig (0.1 to 0.7 bar)	A
5 to 50 psig (0.3 to 3.5 bar)	E
5 to 100 psig (0.3 to 7 bar)	K

Gauges	Substitute
With	G
Without	N

Diaphragm	Substitute
Relieving	R
Non relieving	N

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

ISO Symbols



See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure: 300 psig (20 bar)

Operating temperature: -34° to 150°F (-35° to 65°C) *

* Air supply must be dry enough to avoid ice formation at temperatures below 2°C (35°F).

Typical flow at 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set:

1/8" ports: 14 scfm (6.5 dm³/s)

1/4" ports: 15 scfm (7 dm³/s)

Gauge ports:

1/8" PTF with PTF main ports

1/8" ISO Rc with ISO Rc main ports

1/8" ISO Rc with ISO G main ports

Materials:

Body: Zinc

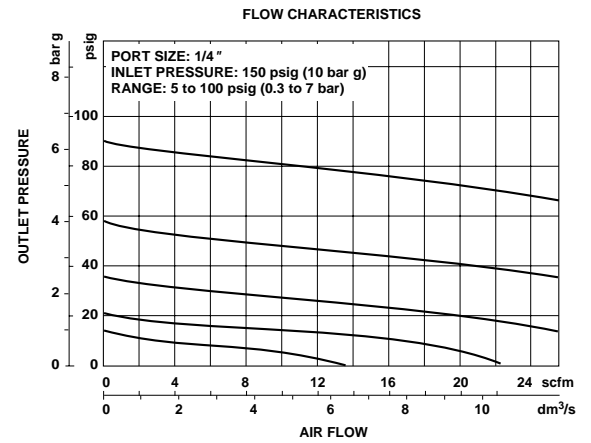
Bonnet: Acetal

Valve: Brass/nitrile

Valve seat: Acetal

Elastomers: Nitrile

Typical Performance Characteristics

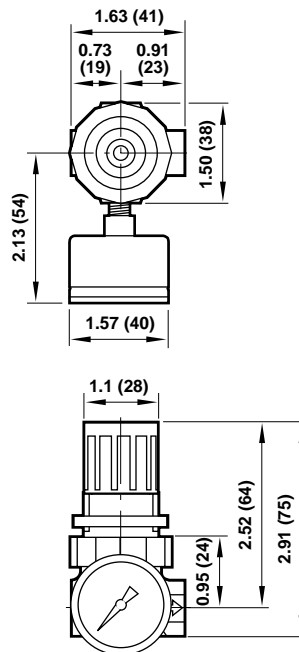


Service Kits

Item	Type	Part number
Service kit	Relieving	3407-02
	Non relieving	3407-01

Service kit includes slip ring, diaphragm, standard valve seat with o-ring, valve, valve spring.

All Dimensions in Inches (mm)



Panel mounting hole diameter 1.19" (30 mm)
Maximum panel thickness 0.25" (6 mm)

Miniature Non-repairable Pressure Regulator 1/4" Port Size

- Reliable pressure regulation at air flows up to 13 scfm (6 dm³/s)
- Compact design and light weight construction
- Wrench flats for easy installation
- Relieving piston design allows reduction of downstream pressure when the system is dead-ended
- Choice of left to right or right to left flow



Ordering Information. Model listed has left to right flow, 5 to 125 psig (0.3 to 8.5 bar) outlet pressure adjustment range*, and PTF threads. Gauge is not included.

Port Size	Model	Flow [†] scfm (dm ³ /s)	Weight lb (kg)
1/4"	R46-200-RNLA	13 (6)	0.2 (0.09)

† Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from set.

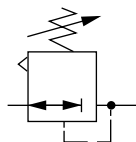
Alternative Models

R 4 6 - ★ ★ ★ - ★ ★ ★ ★

Port Size	Substitute	Threads	Substitute
1/4"	2	PTF	A
		ISO Rc taper	B
		ISO G parallel	G
Flow Direction With Knob Up and Gauge Visible	Substitute	Outlet Pressure Adjustment Ranges*	Substitute
Left to Right	00	5 to 50 psig (0.3 to 3.5 bar)	E
Right to Left	02	5 to 125 psig (0.3 to 8.5 bar)	L
		5 to 150 psig (0.3 to 10 bar)	M
Piston Type	Substitute	Gauge	Substitute
Relieving	R	With	G
		Without	N

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

ISO Symbols



Relieving

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure: 250 psig (17 bar)

Operating temperature*: -30° to 150°F (-34° to 65°C)

*Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from from set: 13 scfm (6 dm³/s)

Gauge ports:

1/8 PTF with PTF main ports

Rc1/8 with ISO G and ISO Rc main ports

Materials

Body: Zinc

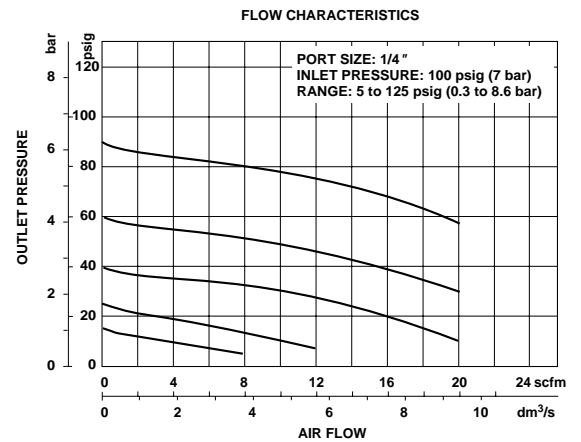
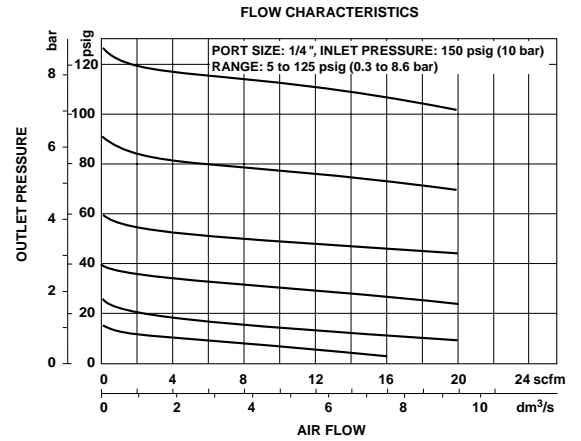
Knob: Nylon

Valve: Nitrile compound

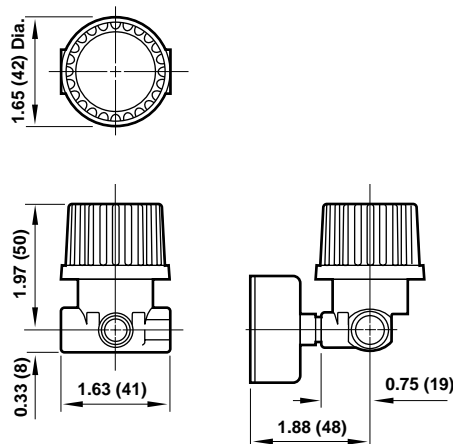
Valve seat: Acetal

Elastomers: Nitrile

Typical Performance Characteristics



All Dimensions in Inches (mm)



- Excelon design allows in-line or modular installation
- Full flow gauge ports
- Balanced valve design for optimum pressure control
- Push to lock adjusting knob with tamper resistant accessory
- R72R reverse flow option
- Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications



Ordering Information. Models listed include unidirectional flow, PTF threads, knob adjustment, relieving diaphragm, 5 to 150 psig (0.3 to 10 bar) outlet pressure adjustment range* with gauge.

Port Size	Model	Flow [†] scfm (dm ³ /s)	Weight lb (kg)
1/4"	R72G-2AK-RMG	70 (33)	0.79 (0.36)
3/8"	R72G-3AK-RMG	70 (33)	0.79 (0.36)

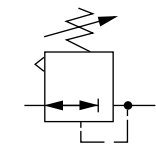
† Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a 15 psig (1 bar) droop from set.

Alternative Models

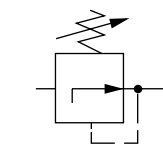
		R 7 2 ★ - ★ ★ ★ - ★ ★ ★				
Flow Type	Substitute	|	|	|	Gauge	Substitute
Standard	G				With	G
Reverse flow	R				Without	N
Port Size	Substitute	|	|	|	Outlet Pressure Adjustment Range*	Substitute
1/4"	2				5 to 30 psig (0.3 to 2 bar)	C
3/8"	3				5 to 60 psig (0.3 to 4 bar)	F
		|	|	|	5 to 150 psig (0.3 to 10 bar)	M
Threads	Substitute				Diaphragm	Substitute
PTF	A				Relieving	R
ISO Rc taper	B		Non relieving	N		
ISO G parallel	G					
		|	|	|	Adjustment	Substitute
					Knob	K
					T-bar	T

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

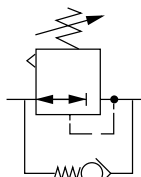
ISO Symbols



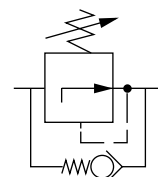
R72G Relieving



R72G Non Relieving



R72R Relieving



R72R Non Relieving

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure: 300 psig (20 bar)

Operating temperature*: -30° to 150°F (-34° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Approximate flow at 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set: 70 scfm (33 dm³/s)

Gauge ports:

1/8" PTF with PTF main ports

1/8" ISO Rc with ISO Rc main ports

1/8" ISO Rc with ISO G main ports

Materials:

Body: Zinc

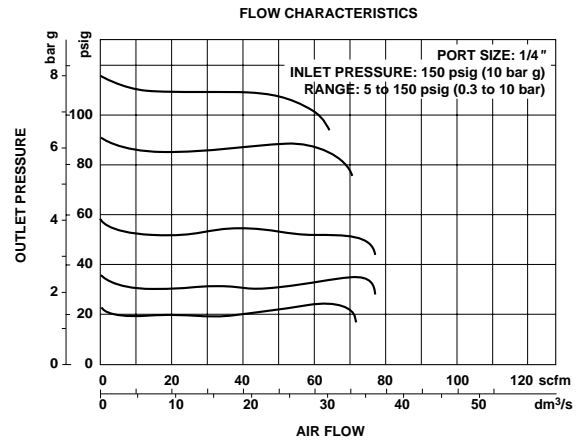
Bonnet: Acetal

Valve: Brass

Elastomers: Nitrile

Bottom plug: Acetal

Typical Performance Characteristics



Service Kits

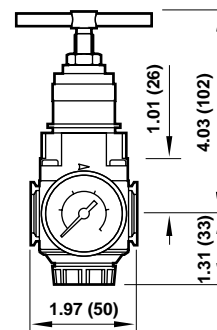
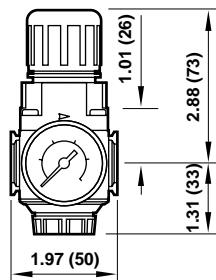
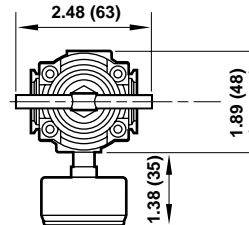
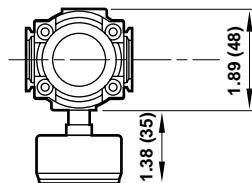
Item	Type	Part Number
Service kit	Relieving	4381-500
	Non relieving	4381-501

Service kit includes diaphragm assembly, valve assembly, valve spring and o-rings.

All Dimensions in Inches (mm)

Panel mounting hole diameter: 1.57" (40 mm)

Maximum panel thickness: 0.16" (4 mm)



- Excelon design allows in-line or modular installation
- Full flow gauge ports
- Balanced valve design minimizes effect of variation in the inlet pressure on the outlet pressure
- Standard relieving models allow reduction of downstream pressure when the system is dead-ended
- Optional reverse flow models available for use downstream of directional control valves
- Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications



Ordering Information. Models listed include uni-directional flow, PTF threads, knob adjustment, relieving diaphragm, 5 to 150 psig (0.3 to 10 bar) outlet pressure adjustment range*, with gauge.

Port Size	Model	Flow [†] scfm (dm ³ /s)	Weight lb (kg)
1/4"	R73G-2AK-RMG	91 (43)	1.36 (0.6)
3/8"	R73G-3AK-RMG	144 (68)	1.36 (0.6)
1/2"	R73G-4AK-RMG	144 (68)	1.36 (0.6)

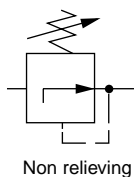
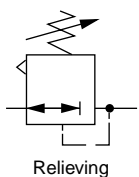
† Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from set.

Alternative Models

Flow Type	Substitute	R 7 3 ★ - ★ ★ ★ - ★ ★ ★	Gauge	Substitute	
Uni-directional	G		|	With	G
Reverse	R	Without		N	
Port Size	Substitute	|	Outlet Pressure Adjustment Range*	Substitute	
1/4"	2		5 to 60 psig (0.3 to 4 bar)	F	
3/8"	3		5 to 150 psig (0.3 to 10 bar)	M	
1/2"	4	|	10 to 250 psig (0.7 to 17 bar)	S	
Threads	Substitute		|	Diaphragm	Substitute
PTF	A			Relieving	R
ISO Rc taper	B	Non relieving		N	
ISO G parallel	G	|			
Adjustment	Substitute		|		
Knob	K				
T-bar	T				

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

ISO Symbols



See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure: 300 psig (20 bar)

Operating temperature*: -30° to 175°F (-34° to 80°C)

*Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from from set: 144 scfm (68 dm³/s)

Gauge ports:

1/4 PTF with PTF main ports

Rc1/4 with ISO Rc main ports

Rc1/8 with ISO G main ports

Materials

Body: Aluminum

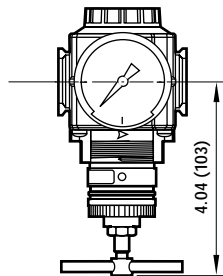
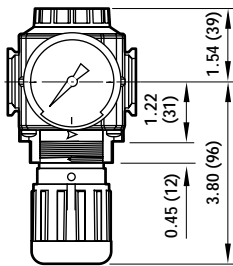
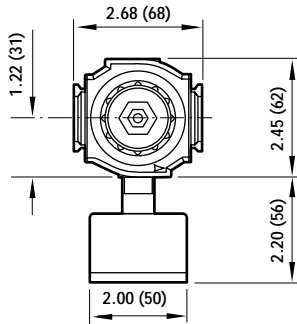
Bonnet: Aluminum or Zinc

Valve: Brass

Elastomers: Nitrile

Bottom plug: Acetal

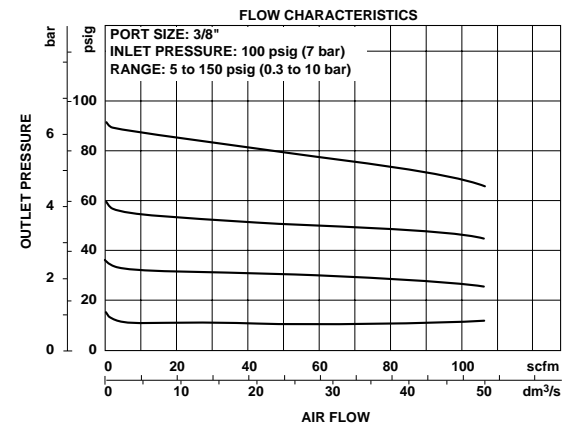
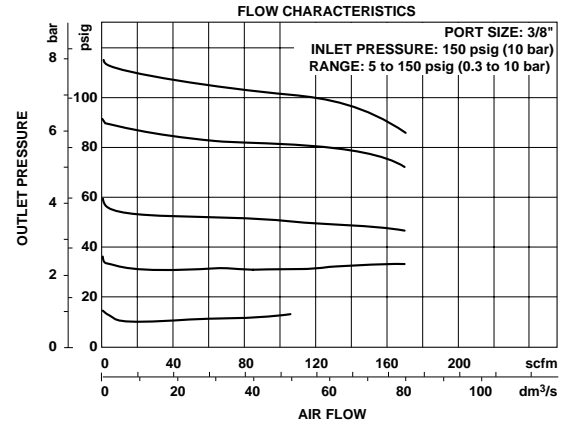
All Dimensions in Inches (mm)



Panel mounting hole diameter: 1.89" (48 mm)

Panel thickness: 0.06" to 0.25" (2 to 6 mm)

Typical Performance Characteristics



Service Kits

Item	Type	Part Number
Service kit	Relieving	4381-600
	Non-relieving	4381-601

Service kit includes diaphragm assembly, valve assembly, valve spring, bottom plug o-ring.

Excelon 74 Pressure Regulator
3/8", 1/2", 3/4" Port Sizes

- Excelon design allows in-line or modular installation
- Full flow gauge ports
- Balanced valve design minimizes effect of variation in the inlet pressure on the outlet pressure
- Standard relieving models allow reduction of downstream pressure when the system is dead-ended
- Optional reverse flow models available for use downstream of directional control valves
- Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications



Ordering Information. Models listed include uni-directional flow, PTF threads, knob adjustment, relieving diaphragm, 5 to 150 psig (0.3 to 10 bar) outlet pressure adjustment range*, with gauge.

Port Size	Model	Flow [†] scfm (dm ³ /s)	Weight lb (kg)
3/8"	R74G-3AK-RMG	208 (98)	1.80 (0.82)
1/2"	R74G-4AK-RMG	220 (105)	1.77 (0.80)
3/4"	R74G-6AK-RMG	220 (105)	1.73 (0.78)

† Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set.

Alternative Models

R 7 4 ★ - ★ ★ ★ - ★ ★ ★

Flow Type	Substitute
Uni-directional	G
Reverse	R

Port Size	Substitute
3/8"	3
1/2"	4
3/4"	6

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Adjustment	Substitute
Knob	K
T-bar	T

Gauge	Substitute
With	G
Without	N

Outlet Pressure Adjustment Range*	Substitute
5 to 60 psig (0.3 to 4 bar)	F
5 to 150 psig (0.3 to 10 bar)	M
10 to 250 psig (0.7 to 17 bar)**	S

Diaphragm	Substitute
Relieving	R
Non relieving	N

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

** Units with 250 psig (17 bar) outlet pressure range are available only with the T-bar adjustment; therefore substitute **T** at the 7th position and **S** at the 9th position.

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure: 300 psig (20 bar)

Operating temperature*: -30° to 175°F (-34° to 80°C)

*Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set: 220 scfm (105 dm³/s)

Gauge ports:

1/4 PTF with PTF main ports

Rc1/4 with ISO Rc main ports

Rc1/8 with ISO G main ports

Materials:

Body: Aluminum

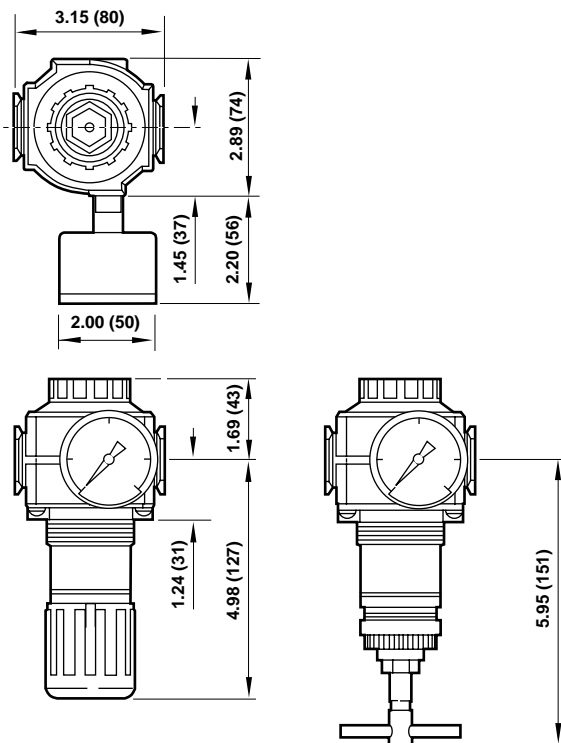
Bonnet : Aluminum

Valve: Brass

Elastomers: Nitrile

Bottom plug: Acetal

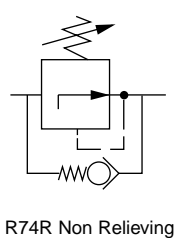
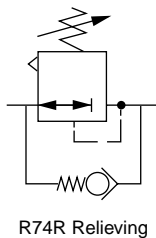
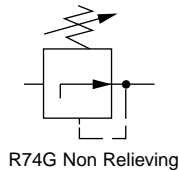
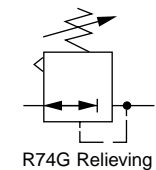
All Dimensions in Inches (mm)



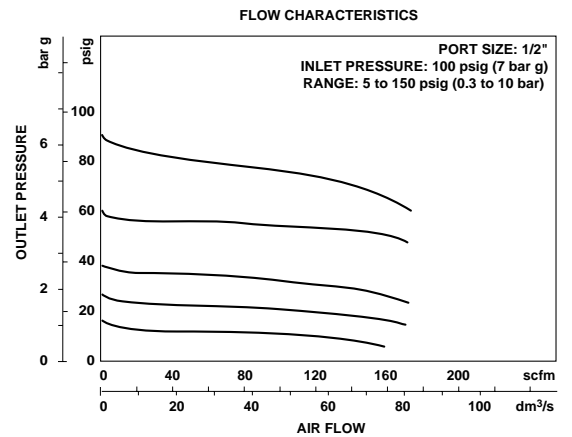
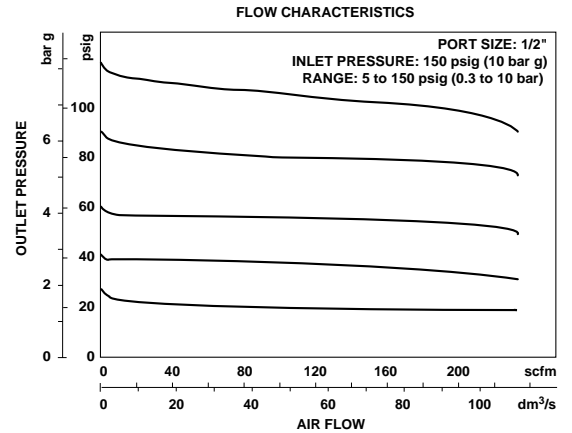
Panel mounting hole diameter: 2.06" (52 mm)

Panel thickness: 0.06" to 0.25" (2 to 6 mm)

ISO Symbols



Typical Performance Characteristics



Service Kits

Item	Type	Part Number
Service kit	Relieving	4381-700
	Non relieving	4381-701

Service kit includes diaphragm assembly, valve assembly, valve spring, bottom plug o-ring.

Olympian Plus Regulator
1/4", 3/8", 1/2", 3/4" Port Sizes

- Olympian Plus plug in design
- High flow general purpose regulator
- Push to lock adjusting knob with tamper resistant option
- Mount in any orientation



Ordering Information. Models listed include unidirectional flow, PTF threads, knob adjustment, relieving diaphragm, 5 to 150 psig (0.3 to 10 bar) outlet pressure adjustment range* with gauge.

Port Size	Model	Flow [†] scfm (dm ³ /s)	Weight lb (kg)
1/4"	R64G-2AK-RMG	74 (35)	3.42 (1.54)
3/8"	R64G-3AK-RMG	170 (80)	3.38 (1.52)
1/2"	R64G-4AK-RMG	254 (120)	3.31 (1.49)
3/4"	R64G-6AK-RMG	N.A.	4.11 (1.85)

† Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a 15 psig (1 bar) droop from set.

For replacement regulator (without yoke) substitute 'N' at the 5th and 6th digits eg: R64G-NNK-RMN.

Alternative Models

R 6 4 ★ - ★ ★ ★ - ★ ★ ★

Flow Type	Substitute
Standard	G
Reverse flow	R

Port Size	Substitute
1/4"	2
3/8"	3
1/2"	4
3/4"	6

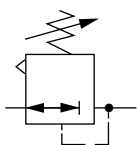
Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Gauge	Substitute
With	G
Without	N

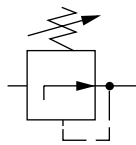
Outlet Pressure Adjustment Range*	Substitute
5 to 60 psig (0.3 to 4 bar)	F
5 to 150 psig (0.3 to 10 bar)	M
10 to 250 psig (0.7 to 17 bar)	S**

Diaphragm	Substitute
Relieving	R
Non relieving	N

Adjustment	Substitute
Knob	K
T-bar	T

ISO Symbols


Relieving



Non Relieving

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

** Units with 250 psig (17 bar) outlet pressure range are available only with the T-bar adjustment; therefore substitute **T** at the 7th digit and **S** at the 9th position.

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure: 250 psig (17 bar)

Operating temperature*: -30° to 175°F (-34° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow at 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set: 254 scfm (120 dm³/s)

Gauge Ports:

1/8" PTF with PTF main ports

1/8" ISO Rc with ISO Rc main ports

1/8" ISO Rc with ISO G main ports

Materials:

Body: Zinc

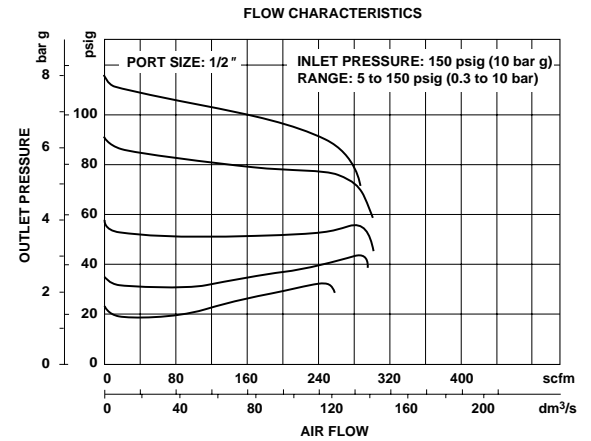
Bonnet: Aluminium

Yoke: Zinc

Valve: Brass

Elastomers: Synthetic rubber

Typical Performance Characteristics



Service Kits

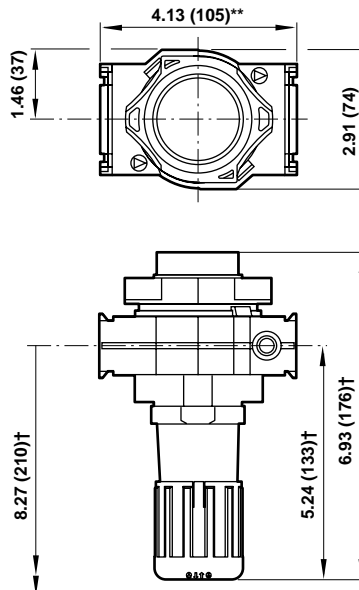
Item	Type	Part Number
Service kit	Relieving	4381-200
	Non relieving	4381-201

Service kit includes port and bottom plug 'O' rings, valve assembly, valve spring and diaphragm.

All Dimensions in Inches (mm)

Panel mounting hole diameter: 2.06" (52 mm)

Maximum panel thickness: 0.25" (6 mm)



† Reduces by 4 mm with knob in locked position. Add 37 mm for unit with 'T' handle.

** 6.18" (157 mm) for models with 3/4" ports

- Olympian plug in design
- Robust and compact
- High flow unit with large valve and diaphragm
- Push to lock adjusting knob with tamper resistant option
-



68 Series products are available 1st quarter of 2001. Visit www.norgren.com for the latest data on this series.

Excellent flow and regulation characteristics



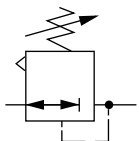
Ordering Information. Models listed include PTF threads, knob adjustment, relieving diaphragm, 5 to 120 psig (0.4 to 8 bar) outlet pressure adjustment range* without gauge.

Port Size	Model	Weight lb (kg)
3/4"	R68G-6AK-RLN	4.53 (2.04)
1"	R68G-8AK-RLN	4.53 (2.04)
1-1/4"	R68G-AAK-RLN	4.62 (2.08)
1-1/2"	R68G-BAK-RLN	4.71 (2.12)

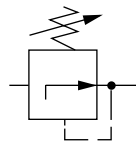
Alternative Models

Port Size	Substitute	Threads	Substitute	Option	Substitute	Gauge	Substitute	Outlet Pressure Adjustment Range*	Substitute	Type	Substitute
3/4"	6	PTF	A	Adjusting knob	K	With	G	0 to 60 psig (0 to 4 bar)	F	Relieving	R
1"	8	ISO Rc taper	B	T-bar	T	Without	N	5 to 120 psig (0.4 to 8 bar)	L	Non relieving	N
1-1/4"	A	ISO G parallel	G					10 to 250 psig (0.7 to 17 bar)	S**	Relieving, Viton option	F
1-1/2"	B	None	N							Non relieving, Viton option	E
None	N										

ISO Symbol



Relieving



Non Relieving

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

** Units with 250 psig (17 bar) adjustment range are available only with the T-bar adjustment; therefore substitute **T** at the 7th digit and **S** at the 9th position.



Technical Data

Fluid: Compressed air

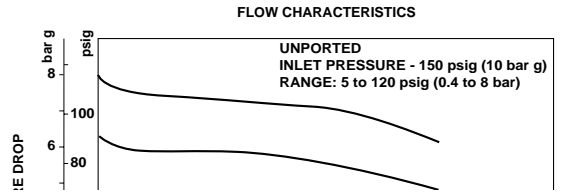
Maximum pressure:
290 psig (20 bar)

Operating temperature*:
0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow at 150 psig (10 bar) inlet pressure, 95 psig (6.3 bar)
(90 psig) set pressure and a droop of 15 psig (1 bar) from set:
381

Typical Performance Characteristics



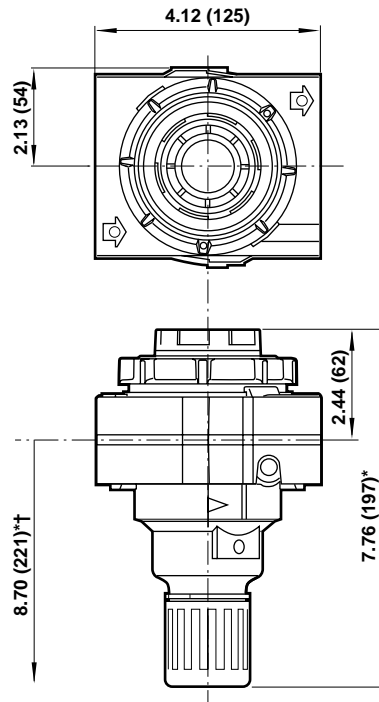
68 Series products are available 1st quarter of 2001. Visit www.norgren.com for the latest data on this series.

scfm (180 dm³/s) *TBA from Lab Tests*
Gauge ports: PTF 1/8

AIR FLOW

m
/s

All Dimensions in Inches (mm)



- * Reduces by 0.16" (4 mm) with knob in locked position. Add 1.46" (37 mm) for unit with T-handle
- † Minimum clearance required to remove unit.

17 Series General Purpose Regulator
3/4", 1", 1-1/4", and 1-1/2" Port Sizes

- Accurate and quick response to changes in flow demand and line pressure variations
- Balanced valve minimizes effect of changes in inlet pressure on outlet pressure
- Standard relieving models allow reduction of outlet pressure even when the system is dead-ended
- Full flow gauge ports
- Low torque, non-rising adjusting knob
- Integral locking device on knob adjustment
- Can be serviced without removal from the air line



Ordering Information. Models listed are knob adjustment, relieving type with gauge, 5 to 125 psig (0.3 to 8.5 bar) outlet pressure adjustment range*, and PTF threads.

Port Size	Model Number	Flow† scfm (dm ³ /s)	Weight lbs (kg)
3/4"	R17-600-RGLA	440 (208)	2.31 (1.05)
1"	R17-800-RGLA	480 (227)	2.02 (0.92)
1-1/4"	R17-A00-RGLA	400 (189)	2.68 (1.22)
1-1/2"	R17-B00-RGLA	440 (208)	2.59 (1.18)

† Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a 15 psig (1 bar) droop from set.

Alternative Models



Port Size	Substitute
3/4"	6
1"	8
1-1/4"	A
1-1/2"	B

Option	Substitute
Not applicable	0
Adjustment	Substitute
Knob	0
T-bar	1

Diaphragm	Substitute
Relieving	R
Non relieving	N

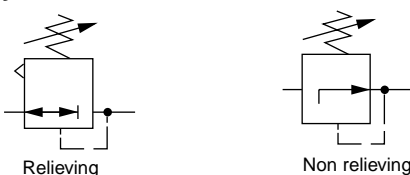
Threads	Substitute
PTF	A
ISO Rc taper	B
BSPP (1-1/2" ported units only)	C
ISO G parallel (not available with 1-1/2" ported units)	G

Outlet Pressure Adjustment Ranges*	Substitute
5 to 50 psig (0.3 to 3.5 bar)	E
5 to 125 psig (0.3 to 8.5 bar)	L
10 to 250 psig (0.7 to 17 bar)	S

Gauge	Substitute
With	G
Without	N

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

ISO Symbols



See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air
 Maximum pressure: 300 psig (20 bar)
 Operating temperature: -30° to 175°F (-34° to 80°C)*
 * Air supply must be dry enough to avoid ice formation at temperatures 35°F (2°C).
 Typical flow at 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure, and a droop of 15 psig (1 bar) from set: 480 scfm (227 dm³/s)

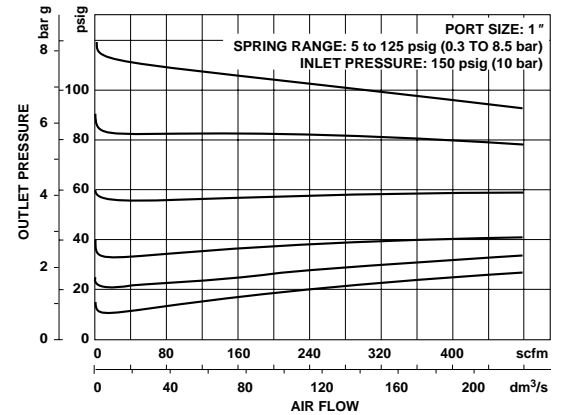
Gauge ports:

- 1/4" PTF with PTF main ports
- R1/4 with ISO Rc, ISO G, and BSPP main ports

Materials

- Body: Aluminum
- Bonnet: Aluminum
- Bottom plug: Acetal
- Valve: Aluminum and nylon
- Elastomers: Nitrile

Typical Performance Characteristics

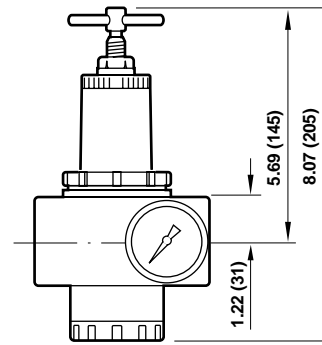
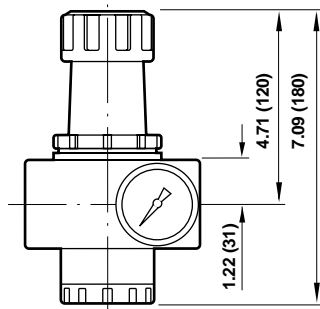
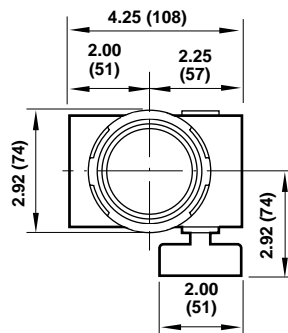


Service Kits

Item	Type	Part number
Service kit	Relieving	5578-02
	Non relieving	5578-01

Service kit contains, diaphragm, all o-rings, valve, and valve spring.

All Dimensions in Inches (mm)



Panel mounting hole diameter: 2.28" (58 mm)
 Panel thickness: 0.06" to 0.16" (2 to 4 mm)

18 Series General Purpose Pressure Regulator 1-1/2" and 2" Port Sizes

- The R18 with the conventional integral pilot provides good pressure regulation, rapid response to changing flow demands, and excellent stability.
- The R18 with the feedback integral pilot provides superior pressure regulation under changing flow demands where changes in flow demand are not sudden or cyclic.
- Balanced valve minimizes effect of changes in inlet pressure on outlet pressure
- Constant bleed feature in pilot regulator provides quick response and minimum dead-band
- Exceptionally high relief flow
- Full flow gauge ports
- Low torque, non-rising adjusting knob
- Integral locking device on knob adjustment



Ordering Information. Models listed include R40 conventional integral pilot, relieving diaphragm, with gauge, 5 to 125 psig (0.3 to 8.5 bar) outlet pressure adjustment range*, and PTF threads.

Port Size	Model	Flow [†] scfm (dm ³ /s)	Weight lb (kg)
1-1/2"	R18-B05-RGLA	2000 (944)	8.48 (3.85)
2"	R18-C05-RGLA	2000 (944)	8.27 (3.75)

† Typical flow with 100 psig (0.7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set.

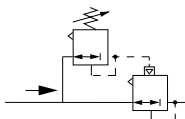
Alternative Models

Port Size	Substitute	Pilot Regulator Type	Substitute	Port Threads	Substitute	Outlet Pressure Adjustment Ranges*	Substitute	Gauge	Substitute	Diaphragm	Substitute
1-1/2"	B	R40 Conventional	05	PTF	A	5 to 50 psig (0.3 to 3.5 bar)	E	With	G	Relieving	R
2"	C	R41 Feedback **	06	ISO Rc taper	B	5 to 125 psig (0.3 to 8.5 bar)	L	Without	N	Non relieving	N
				ISO G parallel	G	10 to 250 psig (0.7 to 17 bar)	S				

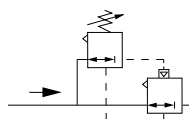
* Outlet pressures can be adjusted to pressures in excess or, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

** Requires relieving diaphragm and 250 psig (17 bar) spring (R in 7th position and S in 9th position) e.g. R18-B06-RNSG.

ISO Symbols



R18 with Conventional Pilot Regulator



R18 with Feedback Pilot Regulator

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Inlet pressure range: 10 psig (0.7 bar) minimum to 450 psig (31 bar) maximum

Operating temperature: -30° to 175°F (-34° to 80°C) *

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)

Typical flow with 100 psig (0.7 bar) inlet pressure, 90 psig (6.3 bar) set pressure, and a droop of 115 psig (bar) from set: 2000 scfm (944 dm³/s)

Gauge ports:

1/4" PTF with PTF main ports

G1/4 with ISO G main ports

R1/4 with ISO Rc main ports

Exhaust port:

3/4" PTF with PTF main ports

G3/4 with ISO G main ports

R3/4 with ISO Rc main ports

Maximum bleed rate: 0.25 scfm (0.12 dm³/s) at 50 psig (3.5 bar) outlet pressure.

Materials

Body: Aluminum

Bonnet: Aluminum

Bottom Plug: Aluminum

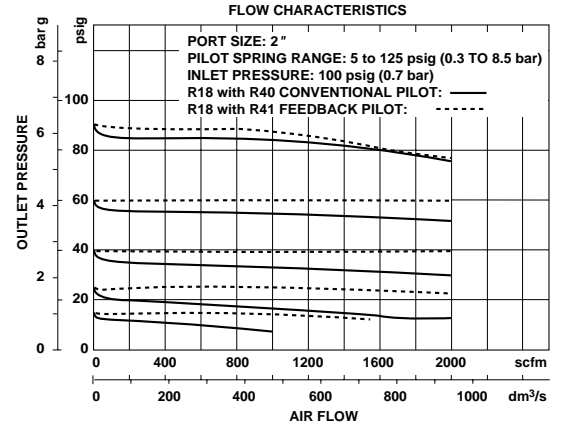
Valve

Integral Pilot Regulator: Teflon

Pilot Operated Regulator: Aluminum

Elastomers: Nitrile

Typical Performance Characteristics



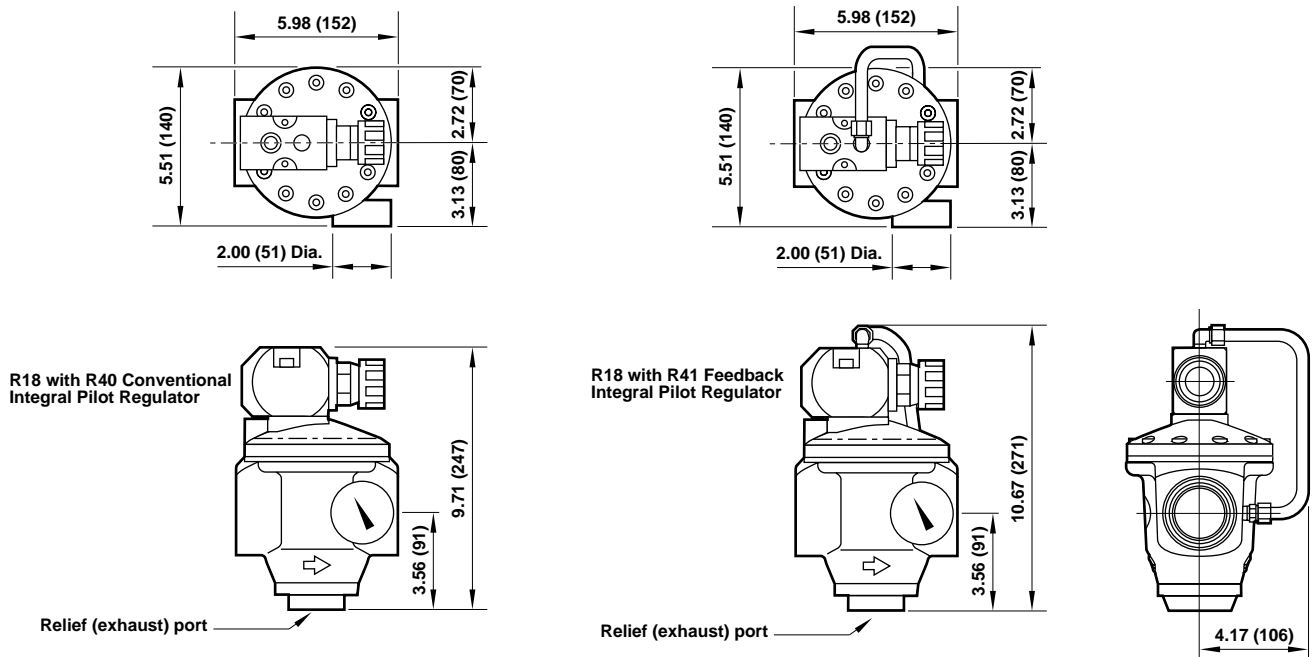
Service Kits

Item	Type	Part number
Service kits	R18 Pilot operated regulator**	5945-40
	R40 and R41 Pilot regulators†	5945-41

** Contains filter screen and all o-rings for R18 pilot operated regulator.

† Contains diaphragm, valve spring, valve, guide bushing, filter screen, and all o-rings for R40 and R41 pilot regulators.

All Dimensions in Inches (mm)



Specialty Regulators

Specialty regulators for air or water, tube connection, factory preset pressure, large diaphragm, high relief flow, and field adjustable pressure limits, 1/8" to 1-1/4".

Contents

R06 Air or Water Regulator 1/8" and 1/4" ports	ALE-6-2
11-044 Air or Water 1/4" OD tube ports	ALE-6-4
R91 Air or Water 1/4" ports	ALE-6-6
R14 and R16 Air or Water, Factory Preset, Non-Adjustable 1/8" and 1/4" ports	ALE-6-8
R43 Air or Water 1/4", 3/8", and 1/2" ports	ALE-6-10
11-009 Air or Water 3/4" and 1" ports	ALE-6-12
11-002 Air Only, Large Diaphragm 1/4" and 1/2" ports	ALE-6-14
R24 Air Only, High Relief Flow, Field Adjustable pressure limit 1/4" and 1-1/8" ports	ALE-6-16



R06



11-044



R91



R14 and R16



R43



11-009



11-002



R24

**Miniature Brass Body Regulator
Water and Compressed Air Service
1/8" and 1/4" PTF Port Sizes**

- Compact design, corrosion resistant construction
- Brass body with choice of plastic or brass bonnet
- Plastic bonnet equipped with low torque, non-rising pressure adjusting knob. Snap action knob locks pressure setting when pushed in
- Brass bonnet equipped with pressure adjusting screw
- Non-relieving models for air and water service
- Relieving models for air service allow reduction of outlet pressure even when the system is dead-ended
- Can be disassembled without the use of tools or removal from the air or water line



Ordering Information. Models listed include PTF threads, plastic bonnet with knob adjustment, non-relieving diaphragm, 5 to 100 psig (0.3 to 7 bar) outlet pressure adjustment range†, and without gauge.

Port	Model	Flow* scfm (dm ³ /s)	Flow** gpm (lpm)	Weight lb (kg)
1/8" PTF	R06-121-NNKA	12 (5.7)	1.3 (4.9)	0.2 (0.09)
1/4" PTF	R06-221-NNKA	12 (5.7)	1.3 (4.9)	0.2 (0.09)

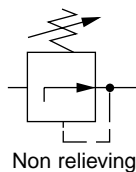
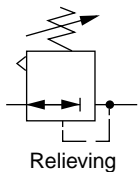
* Approximate flow with 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a 15 psig (1 bar) droop from set.

** Approximate flow with 100 psig (7 bar) inlet pressure, 60 psig (4 bar) set pressure and a 15 psig (1 bar) droop from set.

Alternative Models

R 0 6 - ★ ★ ★ - ★ ★ ★ ★			
Port Size	Substitute	Threads	Substitute
1/8"	1	PTF	A
1/4"	2	Outlet Pressure Adjustment Range†	Substitute
Bonnet	Substitute	1 to 10 psig (0.1 to 0.7 bar)	A
Plastic	21	5 to 50 psig (0.3 to 3.5 bar)	E
Brass	22	5 to 100 psig (0.3 to 7 bar)	K
Diaphragm	Substitute	Gauges	Substitute
Relieving	R	With	G
Non relieving	N	Without	N

† Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

ISO Symbols


See Section ALE-25 for Accessories



Technical Data

Fluid: Water and compressed air
 Maximum pressure: 400 psig (27 bar)
 Operating temperature

Water service: 35° to 150°F (2° to 65°C)
 Air service: -30° to 150°F (-34° to 65°C) *

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow for water service at 100 psig (7 bar) inlet pressure, 60 psig (4 bar) set pressure and a droop of 15 psig (1 bar) from set: 1.3 gpm (4.9 lpm)

Typical flow for compressed air service at 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set: 12 scfm (5.7 dm³/s)

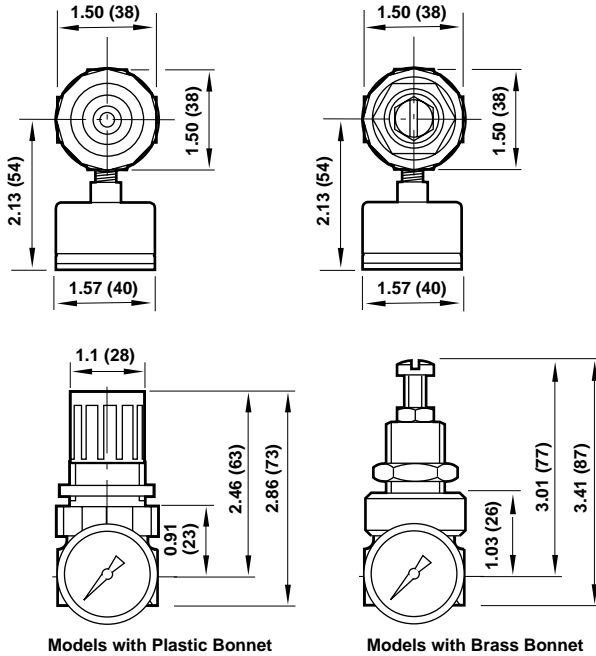
Gauge ports: 1/8" PTF

Materials

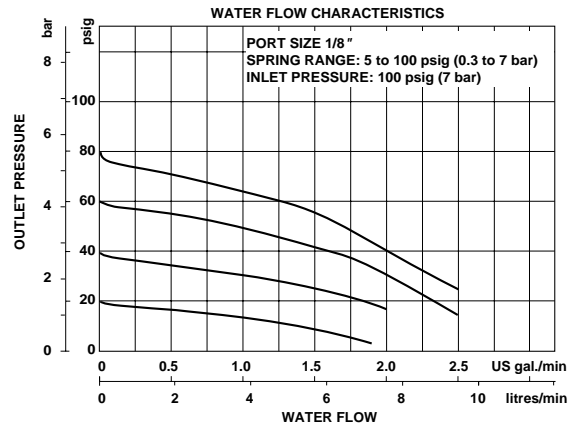
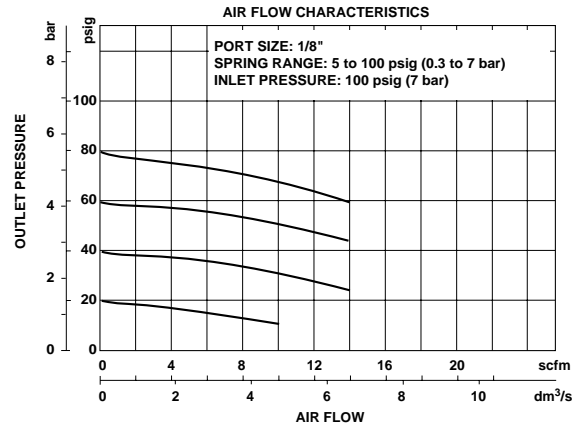
- Body: Brass
- Bonnet
 - Standard: Acetal resin
 - Optional: Brass
- Valve: Brass/nitrile
- Valve seat: Acetal resin
- Elastomers: Nitrile

All Dimensions in Inches (mm)

Panel mounting hole diameter:
 Models with plastic bonnet: 1.19" (30 mm)
 Models with brass bonnet: 0.81" (21mm)
 Maximum panel thickness: 0.25" (6 mm)



Typical Performance Characteristics



Service Kits

Item	Type	Part number
Service kit	Relieving	3407-18
	Non relieving	3407-17

Service kit includes slip ring, diaphragm, standard valve seat with o-ring, valve, valve spring.

**Water and Compressed Air Service
Pressure Regulator 1/4" Tube Connection**

- **Non-relieving models.**
- **Acetal plastic, corrosion resistant construction**
- **Low torque, non-rising adjusting knob.**
- **Snap action knob locks pressure setting when pushed down.**
- **Designed for use with deionized water and potable water systems. Plastics and metals in contact with fluid are approved by the National Sanitation Foundation (NSF) for use in potable water systems. Elastomers are food grade.**
- **Can be disassembled without the use of tools or removal from the air or water line.**



Ordering Information. Models listed include non-relieving diaphragm, and 5 to 100 psig (0.3 to 7 bar) outlet pressure adjustment range †.

Port Connection	Model	Flow* scfm (dm ³ /s)	Flow** U.S. gpm (lpm)	Weight lb (kg)
1/4" tube nut and ferrule	11-044-003	3.0 (1.4)	0.7 (2.65)	0.16 (0.08)

Alternative Models

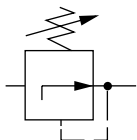
1 1 - 0 4 4 - ★ ★ ★

Outlet Pressure Adjustment Range†	Substitute
1 to 10 psig (0.1 to 0.7 bar)	001
2 to 50 psig (0.3 to 3.5 bar)	002
5 to 100 psig (0.3 to 7 bar)	003

* Approximate flow with 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a 15 psig (1 bar) droop from set.

** Approximate flow with 100 psig (7 bar) inlet pressure, 60 psig (4 bar) set pressure and a 15 psig (1 bar) droop from set.

† Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

ISO Symbols


Non relieving

See Section ALE-25 for Accessories



Technical Data

Fluid: Water and compressed air

Maximum pressure: 250 psig (17 bar)

Operating temperature:

Water service: 35° to 150°F (2° to 66°C)

Air service: -30° to 150°F (-34° to 66°C) *

* When used in air service, air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Port connections: 1/4" OD tube (brass nut and plastic ferrule supplied)

Recommended tubing: 1/4" soft PVC or Polyethylene tubing. Avoid aluminum, copper, and hard plastic tubing.

Typical flow:

Compressed air service at 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set: 3.0 scfm (1.4 dm³/s)

Water service at 100 psig (7 bar) inlet pressure, 60 psig (4 bar) set pressure and a droop of 15 psig (1 bar) from set:

0.7 U.S. gpm (2.65 liters per minute)

No gauge ports

Materials

Body: Acetal

Bonnet: Acetal

Valve: Stainless steel with EPDM seal (NSF approved)

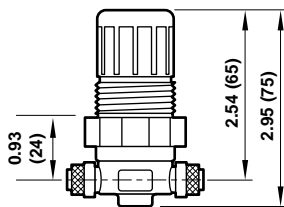
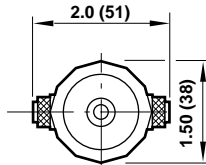
Valve seat: Acetal

Diaphragm: Stainless steel and nitrile (NSF approved)

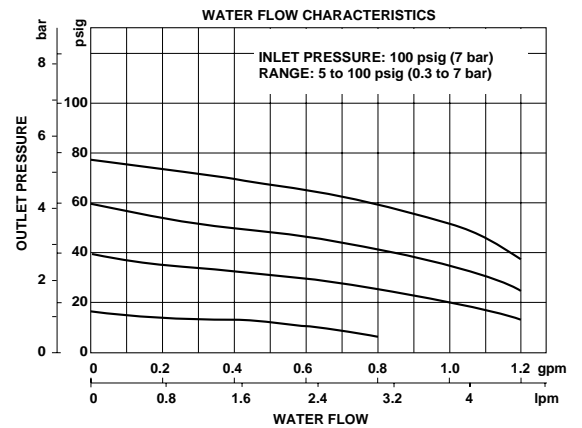
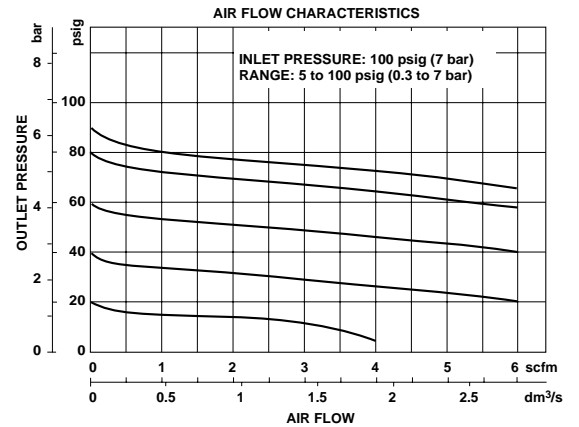
All Dimensions in Inches (mm)

Panel mounting hole diameter: 1.19" (30 mm)

Maximum panel thickness: 0.25" (6 mm)



Typical Performance Characteristics



Service Kits

Type	Part number
Non-relieving	3407-59

Service kit includes slip ring, valve seat, valve, valve spring, and diaphragm.

Water or Compressed Air Pressure Regulator 1/4" Port Size

- Bonnet and body made from acetal plastic.
- R91W designed for use with deionized water and potable water systems. Plastics and metals in contact with fluid are approved by the National Sanitation Foundation (NSF) or the Food And Drug Administration (FDA) for use in potable water systems. Elastomers are food grade. Non relieving models only.
- R91G designed for use with non-potable water and compressed air systems. Non relieving and relieving models.
- Low torque, non-rising adjusting knob.
- Snap action knob locks pressure setting when pushed down.
- Can be disassembled without the use of tools or removal from the air or water line.



Ordering Information. Models listed include PTF threads, knob adjustment, non relieving diaphragm, 5 to 125 psig (0.3 to 8.6 bar) outlet pressure adjustment range†, and without gauge.

Inlet Port	Application	Model	Flow* scfm (dm ³ /s)	Flow** gpm (lpm)	Weight lb (kg)
1/4"	Industrial air and non-potable water	R91G-2AK-NLN	24 (11)	1.75 (6.6)	0.15 (0.07)
1/4"	Potable water and deionized water	R91W-2AK-NLN	24 (11)	1.75 (6.6)	0.15 (0.07)

Alternative Models

Application	Substitute
Industrial air, non-potable water	G
Potable water, deionized water	W

Port Size	Substitute
1/4"	2

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Adjustment	Substitute
Knob	K

R 9 1 ★ - ★ ★ ★ - ★ ★ ★

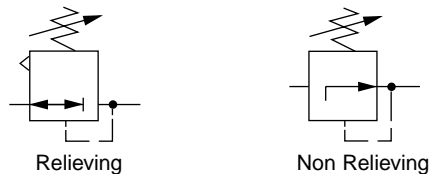
Gauge	Substitute
With	G ††
Without	N

Outlet Pressure Adjustment Range†	Substitute
5 to 50 psig (0.3 to 3.5 bar)	E
5 to 125 psig (0.3 to 8.6 bar)	L

Diaphragm	Substitute
Non relieving	N
Relieving ††	R

* Approximate flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a 15 psig (1 bar) droop from set.
 ** Approximate flow with 100 psig (7 bar) inlet pressure, 60 psig (4 bar) set pressure and a 15 psig (1 bar) droop from set.
 † Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.
 †† Gauge with NSF approved materials not available.
 †† Relieving diaphragm only available with the R91G regulator.

ISO Symbols



See Section ALE-25 for Accessories



Technical Data

Fluid

R91G: Compressed air and non-potable water
 R91W: Potable water, deionized water

Maximum pressure: 150 psig (10 bar)

Operating temperature

Water service: 35° to 125°F (2° to 52°C)

Air service: 0° to 125°F (-20° to 52°C) *

* When used in air service, air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow for compressed air service at 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set: 24 scfm (11 dm³/s).

Typical flow for water service at 100 psig (7 bar) inlet pressure, 60 psig (4 bar) set pressure and a droop of 15 psig (1 bar) from set: 1.75 US gpm per minute (6.6 liters).

Gauge ports:

- 1/8 PTF with PTF main ports
- R1/8 with ISO Rc main ports
- R1/8 with ISO G main ports

Materials

Body and bonnet: Acetal

Valve

R91G: Brass/nitrile

R91W: Stainless steel/food grade EPDM

Valve seat: Acetal

Valve seat o-ring

R91G: Nitrile

R91W: Food grade EPDM

Diaphragm

R91G: Acetal/nylon inserted nitrile

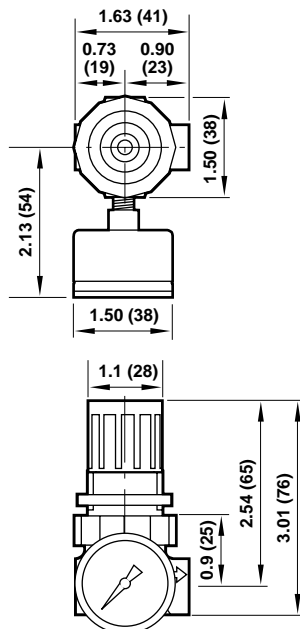
R91W: Acetal/nylon inserted nitrile, food grade

Gauge port plugs: Polypropylene (furnished only with PTF-ported units)

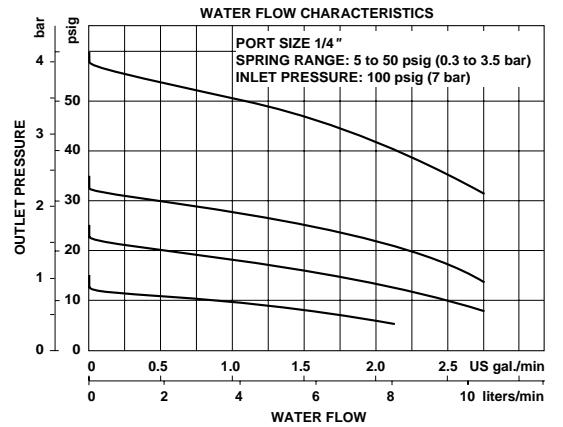
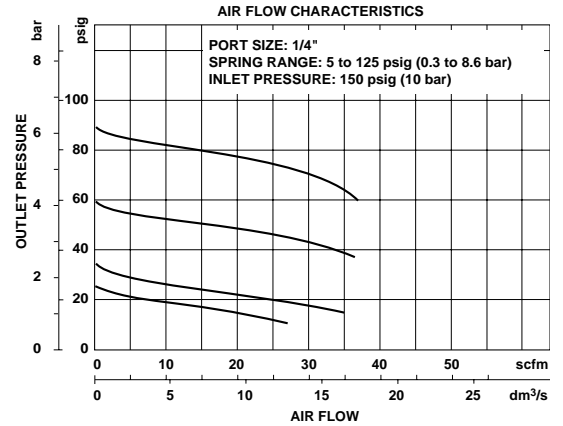
All Dimensions in Inches (mm)

Panel mounting hole diameter 1.19" (30 mm)

Maximum panel thickness 0.25" (6 mm)



Typical Performance Characteristics



Service Kits

Item	Type	Part number
Service kit	R91W, non relieving	3407-93
	R91G, non relieving	3407-94
	R91G, relieving	3407-95

Service kit contains slip ring, diaphragm, valve seat with o-ring, valve, and valve spring.

Miniature, Preset, Nonadjustable Pressure Regulator Water and Compressed Air Service 1/8" or 1/4" PTF Port Sizes

- Non-relieving models for air and water service
- Relieving models for air service allow reduction of outlet pressure even when the system is dead-ended
- R14 has aluminum body and bonnet
- R16 has brass body and bonnet
- Factory preset, tamper resistant pressure setting
- Non-repairable



Ordering Information. Models listed are relieving type for compressed air service with PTF threads and with gauge ports

Port	Model	Flow [†] scfm (dm ³ /s)	Flow ^{††} U.S. gpm (lpm)	Weight lb (kg)
1/8" PTF	R14-100-R**A	12 (5.7)	1.3 (4.9)	0.2 (0.09)
1/8" PTF	R16-100-R**A	12 (5.7)	1.3 (4.9)	0.7 (0.32)
1/4" PTF	R14-200-R**A	12 (5.7)	1.3 (4.9)	0.2 (0.09)
1/4" PTF	R16-200-R**A	12 (5.7)	1.3 (4.9)	0.7 (0.32)

† Approximate flow with 100 psig (7 bar) inlet pressure, 80 psig (5.5 bar) set pressure and a 15 psig (1 bar) droop from set.

†† Approximate flow with 100 psig (7 bar) inlet pressure, 60 psig (4 bar) set pressure and a 15 psig (1 bar) droop from set.

Alternative Models

R ★ ★ - ★ ★ ★ - ★ ★ ★ ★

Type/Service	Substitute
Piston; air service only	14
Diaphragm; air and water service	16

Port Size	Substitute
1/8"	1
1/4"	2

Gauge ports in body	Substitute
With gauge ports	00
Without gauge ports	01

Diaphragm	Substitute
Relieving	R
Non relieving	N

Threads	Substitute
PTF	A

** The 8th and 9th positions of the model number contain the **Modified Outlet Pressure Setting**. The **Modified Outlet Pressure Setting** is the desired outlet pressure, modified to allow for inlet pressures other than 100 psig, and for flows other than zero. Insert the modified outlet pressure setting in positions 8 and 9 as described below.

- Write down the desired outlet pressure and the flow through the regulator. EXAMPLE: **30 psig outlet pressure at 10 scfm flow.**
- Modifications for inlet pressures other than 100 psig:
 - If inlet pressure exceeds 100 psig*, add 1 psig to the desired outlet pressure for each 20 psig the inlet pressure is above 100 psig*.
 - EXAMPLE: If the inlet pressure is 180 psig, add 4 to the desired outlet pressure. Following through with the example in step 1, add 4 to 30 for a modified outlet pressure setting of **34 psig.**
 - If inlet pressure is less than 100 psig*, subtract 1 psig from the desired outlet pressure for each 20 psig the inlet pressure is below 100 psig*.
 - EXAMPLE: If the inlet pressure is 60 psig, subtract 2 from the desired outlet pressure. Following through with the example in step 1, subtract 2 from 30 for a modified outlet pressure setting of **28 psig.**
- Modifications for flows other than zero:
 - Determine the pressure drop from the appropriate flow curve above. Add the pressure drop to the modified outlet pressure setting.
 - EXAMPLE: If the desired outlet pressure is 30 psig at a flow of 10 scfm, add 10 to the modified outlet pressure setting. The quantity of 10 is the difference between the outlet pressure (30 psig) at the desired flow (10 scfm) and outlet pressure (40 psig) at no flow. See dashed lines on the air flow curve for example. Following through with the first example in Step 2 above, add 10 to the 34 to obtain a modified outlet pressure setting of **44**. Enter **44** in the 8th and 9th positions of the model number.

* 125 psig for outlet pressure settings of 95 through 99 psig.



Technical Data

Fluid

R14: Compressed air

R16: Water and compressed air

Maximum pressure: 400 psig (27 bar)

Operating temperature

Water service: 35° to 175°F (2° to 79°C)

Air service: -30° to 175°F (-34° to 79°C) *

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Type

R14: Piston, relieving or non-relieving

R16: Diaphragm, relieving or non-relieving

Typical flow for water service at 100 psig (7 bar) inlet pressure, 60 psig (4 bar) set pressure and a droop of 15 psig (1 bar) from set: 1.3 U.S. gpm (4.9 liters per minute)

Typical flow for compressed air service at 100 psig (7 bar) inlet pressure, 80 psig (5.5 bar) set pressure and a droop of 15 psig (1 bar) from set: 12 scfm (5.7 dm³/s)

Gauge ports: 1/8" PTF

Factory preset outlet pressure settings: 0,2 to 6,8 bar (3 to 99 psig)

Outlet pressure tolerance:

Outlet pressure setting - psig (bar)	Tolerance - psig (bar) **
3 to 20 psig (0.21 to 1.38 bar)	± 1.0 psig (0.07 bar)
21 to 50 psig (1.45 to 3.45 bar)	± 2.0 psig (0.14 bar)
51 to 99 psig (3.52 to 6.84 bar)	± 3.0 psig (0.21 bar)

** When outlet pressure is preset at the factory, the following conditions exist

Flow thru regulator: No flow

Inlet pressure:

100 psig (6.9 bar) for outlet pressures up through 95 psig (6.6 bar)

125 psig (8.6 bar) for outlet pressures of 96 through 99 psig (6.7 through 6.8 bar)

Materials

Body and bonnet

R14: Aluminum

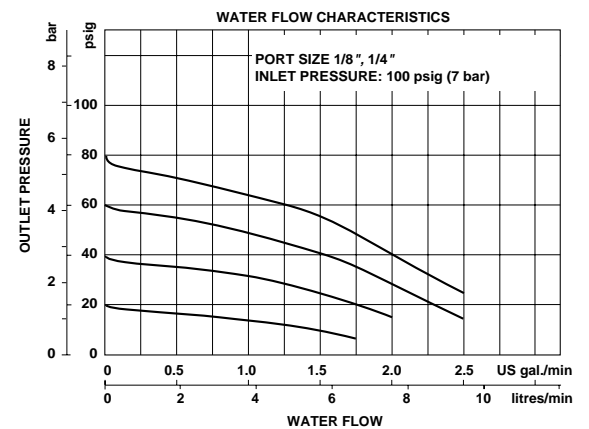
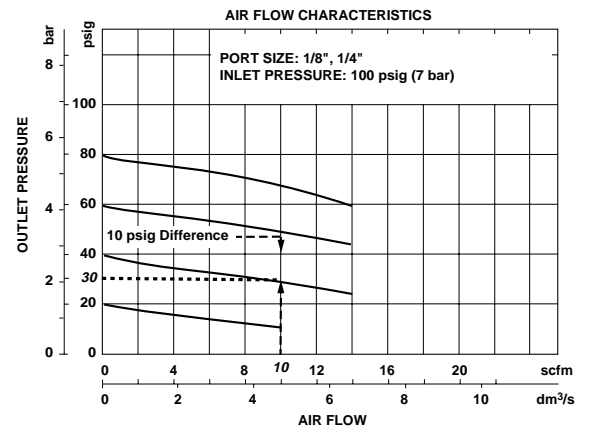
R16: Brass

Valve: Brass

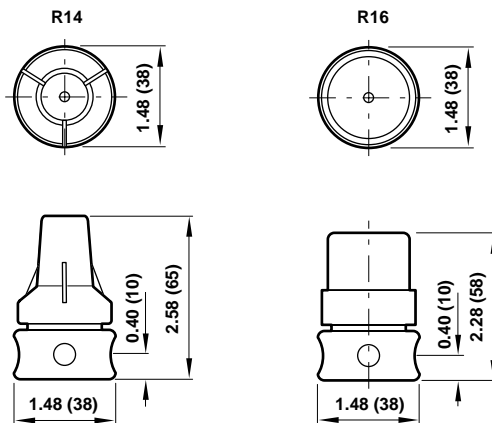
Valve seat: Acetal resin

Elastomers: Nitrile

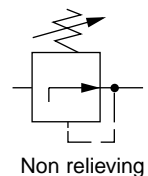
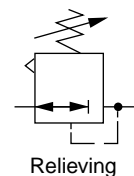
Typical Performance Characteristics



All Dimensions in Inches (mm)



ISO Symbols



See Section ALE-25 for Accessories

Water and Compressed Air Service Pressure Regulator 1/4", 3/8" and 1/2" Port Sizes

- Non-relieving models
- Brass body, corrosion resistant construction
- Balanced valve minimizes effects of inlet pressure variations on outlet pressure
- T-bar adjustment standard, nonrising knob adjustment optional
- Full flow gauge ports can be used as auxiliary outlets
- Panel mounting nut standard
- Can be disassembled without the use of tools or removal from the air or water line.



Ordering Information. Models listed have T-handle adjustment, 5 to 125 psig (0.3 to 8.5 bar) outlet pressure adjustment range*, and PTF threads. A gauge is not included.

Port	Model	Flow† U.S. gpm (lpm)	Weight lb (kg)
1/4"	R43-201-NNLA	6 (23)	2.4 (1.09)
3/8"	R43-301-NNLA	6 (23)	2.4 (1.09)
1/2"	R43-406-NNLA	9 (34)	2.4 (1.09)

Alternative Models

R 4 3 - ★ ★ ★ - ★ ★ ★ ★

Port Size	Substitute
1/4"	2
3/8"	3
1/2"	4

Adjustment	Substitute
Knob	00
T-handle with 1/4" and 3/8" ports	01
T-handle with 1/2" ports	06

Diaphragm	Substitute
Non relieving	N

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

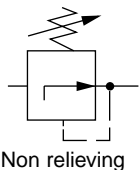
Outlet Pressure Adjustment Range*	Substitute
5 to 50 psig (0.3 to 3.5 bar)	E
5 to 125 psig (0.3 to 8.6 bar)	L
15 to 250 psig (1 to 17 bar)	S

Gauges	Substitute
With	G
Without	N

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

† Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from set.

ISO Symbols



See Section ALE-25 for Accessories



Technical Data

Fluid: Water and compressed air
 Maximum pressure: 400 psig (27 bar)
 Operating temperature:
 Water service: 35° to 200°F (2° to 93°C)
 Air service: -30° to 200°F (-34° to 93°C) *

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
 Typical flow for water service at 150 psig (10.3 bar) inlet pressure, 60 psig (4 bar) set pressure and a droop of less than 5 psig (0.35 bar) from set:
 1/4", 3/8" Ports: 6 U.S. gpm (22 liters per minute)
 1/2" Ports: 9 U.S. gpm (45 liters per minute)

Gauge ports

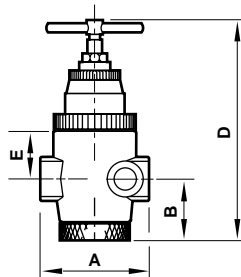
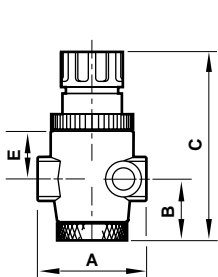
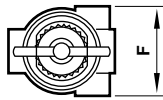
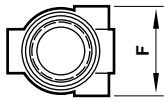
- 1/4" PTF with PTF main ports
- 1/4" ISO G with ISO G main ports
- 1/4" ISO Rc with ISO Rc main ports

Materials:

- Body: Brass
- Bonnet: Aluminum
- Valve: Brass
- Bottom plug: Brass
- Elastomers: Nitrile

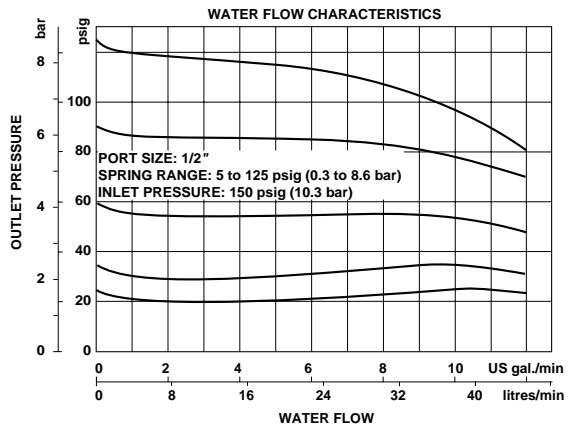
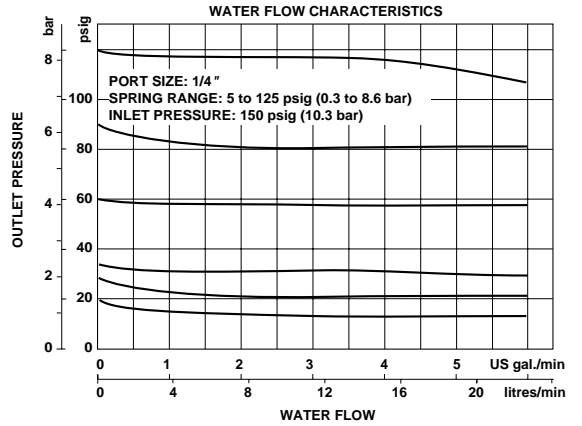
All Dimensions in Inches (mm)

Panel mounting hole diameter: 1.89" (48 mm)
 Maximum panel thickness: 0.19" (5 mm)



Port Size	A	B	C	D	E	F
1/4", 3/8"	2.76 (70)	1.52 (39)	4.86 (124)	5.75 (146)	1.21 (31)	2.31 (59)
1/2"	3.34 (85)	1.59 (41)	5.01 (127)	5.90 (150)	1.28 (33)	2.44 (62)

Typical Performance Characteristics



Service Kits

Item	Type	Part number
Service kit	For 1/4" and 3/8" ported units	5298-03
	For 1/2" ported units	5298-10

Service kit includes diaphragm, o-rings, valve, valve spring.

**Water and Compressed Air Service
Pressure Regulator 3/4", 1" Port Sizes**

- **Non-relieving models**
- **Brass body, corrosion resistant construction**
- **Balanced valve minimizes effects of inlet pressure variations on outlet pressure**
- **T-bar adjustment standard, screw adjustment optional**
- **Large diaphragm provides accurate and quick response to changes in line pressure and varying flow demands**
- **Can be disassembled without removal from the air or water line.**



Ordering Information. Models listed have PTF threads, T-bar adjustment, non-relieving diaphragm, and 5 to 125 psig (0.3 to 8.5 bar) outlet pressure adjustment range*. A gauge is not included.

Port Size	Model Number	Flow † U.S. gpm (lpm)	Weight lbs (kg)
3/4"	11-009-065	27.5 (104)	3.54 (7.8)
1"	11-009-081	27.5 (104)	3.40 (7.5)

*Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

† Typical flow with 100 psig (6.9 bar) inlet pressure, 60 psig (4 bar) set pressure and 15 psig (1 bar) droop from set.

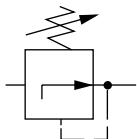
Alternative Models

Threads	Substitute
PTF	0
ISO G parallel	8
ISO G Rc	9

1 1 - ★ 0 9 - ★ ★ ★ - ★ ★

Option	Substitute
Screw adjustment	7G
Mounting bracket assembled to unit	1D

With Gauge	Substitute
3/4" Ported Unit	073
1" Ported Unit	089

ISO Symbols


Non relieving

See Section ALE-25 for Accessories



Technical Data

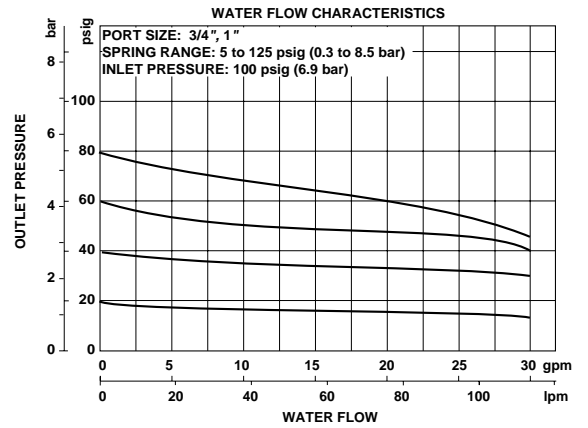
Fluid: Water and compressed air
 Maximum pressure: 400 psig (28 bar)
 Operating temperature
 Water service: 35° to 200°F (2° to 93°C)
 Air service: -30° to 200°F (-34° to 93°C) *

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
 Typical flow at 100 psig (6.9 bar) inlet pressure, 60 psig (4 bar) set pressure and a 15 psig (1 bar) droop from set:
 27.5 U.S. gpm (104 liters per minute)

Gauge ports:
 1/8" PTF with PTF main ports
 G1/8 with ISO G main ports
 Rc1/4 with ISO Rc main ports

Materials
 Body: Brass
 Bonnet: Aluminum and steel
 Valve: Brass
 Bottom plug: Brass
 Elastomers: Nitrile

Typical Performance Characteristics

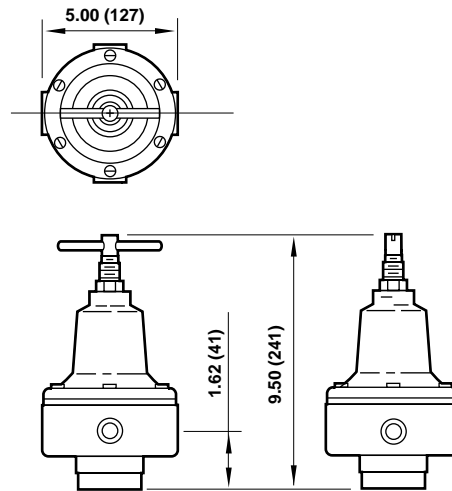


Service Kits

Type	Part number
Non-relieving	2436-03

Service kit includes diaphragm, valve seat, valve pin, valve pin gasket, valve, valve spring, and o-rings.

All Dimensions in Inches (mm)



Pressure Regulator
1/4", 3/8", 1/2" Port Sizes

- Large diaphragm provides accurate and quick response to changing flow demands and line pressure
- Floating valve pin provides positive valve seating
- Balanced valve minimizes effect of variations in inlet pressure on outlet pressure
- Standard relieving models allow reduction of downstream pressure when the system is dead-ended



Ordering Information. Models listed have PTF threads, T-bar adjustment, relieving diaphragm, and 5 to 125 psig (0.3 to 8.5 bar) outlet pressure adjustment range*.

Port Size	Model Number	Flow [†] scfm (dm ³ /s)	Weight lbs (kg)
1/4"	11-002-013	110 (52)	1.9 (0.86)
3/8"	11-002-037	110 (52)	1.9 (0.86)
1/2"	11-002-061	260 (123)	2.0 (0.91)

† Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from set.

*Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

Alternative Models

1 1 - ★ 0 2 - ★ ★ ★ - ★ ★

Threads	Substitute
PTF	0
ISO G parallel	8
ISO G Rc	9

Option	Substitute
Handwheel adjustment	8C
Screw adjustment	8B
Mounting bracket assembled to unit	1A
Threaded bonnet for panel mounting, hand wheel adjustment	2A
Threaded bonnet for panel mounting, T-bar adjustment	2B
Threaded bonnet for panel mounting, screw adjustment	2C

Outlet Pressure Adjustment Range* 5 to 50 psig (0.3 to 3.5 bar)			
Port Size	Relief Type	Gauge	Substitute
1/4"	Non-relieving	Without	003
1/4"	Relieving	Without	015
3/8"	Non-relieving	Without	027
3/8"	Relieving	Without	039
1/2"	Non-relieving	Without	051
1/2"	Relieving	Without	063
1/4"	Non-relieving	With	009
1/4"	Relieving	With	021
3/8"	Non-relieving	With	033
3/8"	Relieving	With	045
1/2"	Non-relieving	With	057
1/2"	Relieving	With	069

Outlet Pressure Adjustment Range* 5 to 125 psig (0.3 to 8.5 bar)			
Port Size	Relief Type	Gauge	Substitute
1/4"	Non-relieving	Without	001
1/4"	Relieving	Without	013
3/8"	Non-relieving	Without	025
3/8"	Relieving	Without	037
1/2"	Non-relieving	Without	049
1/2"	Relieving	Without	061
1/4"	Non-relieving	With	007
1/4"	Relieving	With	019
3/8"	Non-relieving	With	031
3/8"	Relieving	With	043
1/2"	Non-relieving	With	055
1/2"	Relieving	With	067

Outlet Pressure Adjustment Range* 5 to 250 psig (0.3 to 17 bar)			
Port Size	Relief Type	Gauge	Substitute
1/4"	Non-relieving	Without	005
1/4"	Relieving	Without	017
3/8"	Non-relieving	Without	029
3/8"	Relieving	Without	041
1/2"	Non-relieving	Without	053
1/2"	Relieving	Without	065
1/4"	Non-relieving	With	011
1/4"	Relieving	With	023
3/8"	Non-relieving	With	035
3/8"	Relieving	With	047
1/2"	Non-relieving	With	059
1/2"	Relieving	With	071

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air
 Maximum pressure: 400 psig (28 bar)
 Operating temperature*: -30° to 175°F (-34° to 80°C)
 *Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)
 Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from from set:

1/4" and 3/8" ports: 110 scfm (52 dm³/s)

1/2" ports: 260 scfm (123 dm³/s)

Gauge ports

1/8" PTF with PTF main ports

Rc1/8 with ISO G and ISO Rc main ports

Materials

Body: Zinc

Bonnet: Aluminum

Valve: Brass and nitrile

Valve seat: Brass

Elastomers: Nitrile

Bottom plug

1/4" and 3/8" Ports: Brass

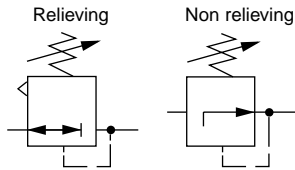
1/2" Ports: Nylon

Service Kits

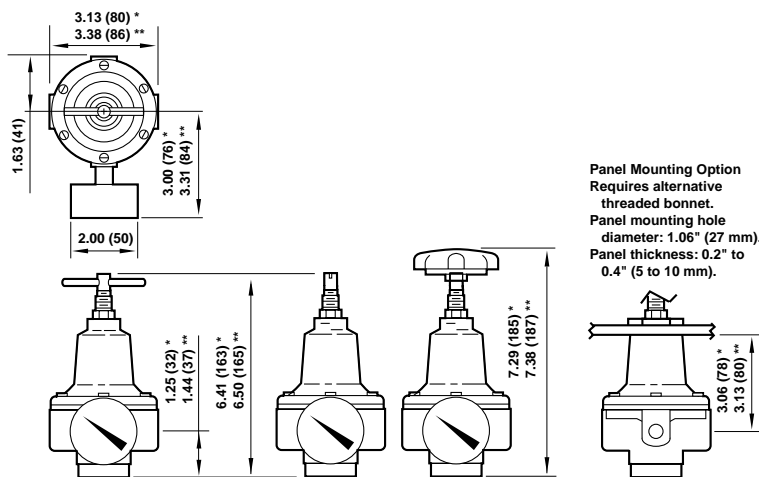
Type	Part number
Relieving, 1/4" and 3/8" ports	529-03
Relieving, 1/2" ports	535-03
Non-relieving, 1/4" and 3/8" ports	529-01
Non-relieving, 1/2" ports	535-01

Service kit includes diaphragm, valve, valve spring, and o-rings.

ISO Symbols



All Dimensions in Inches (mm)

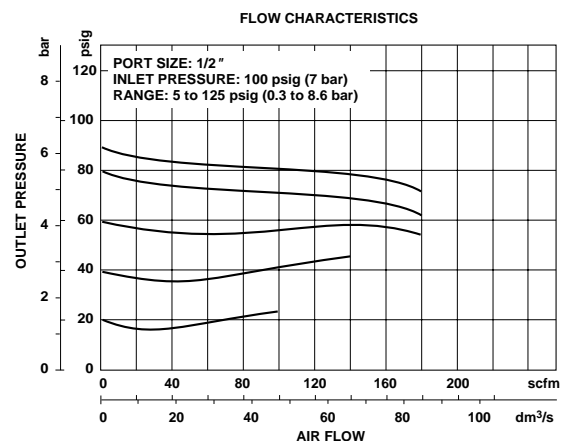
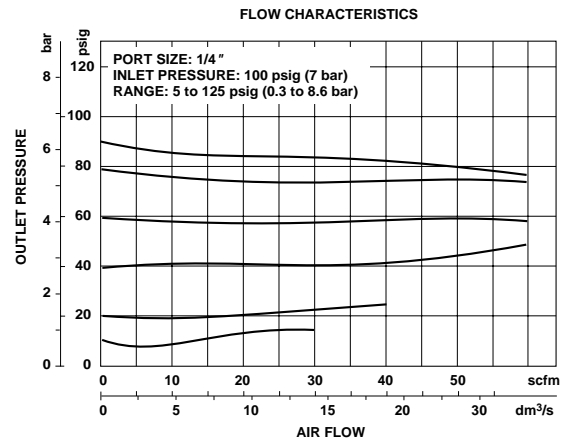
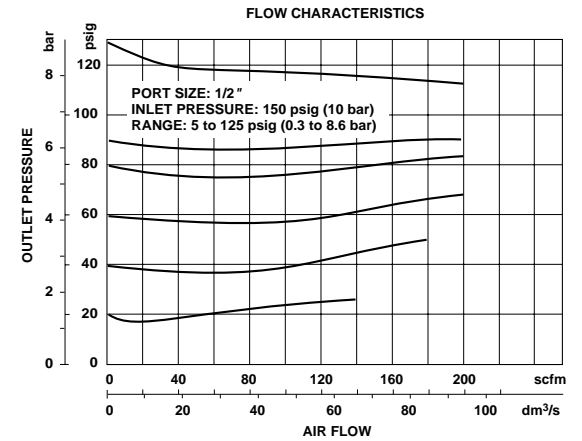
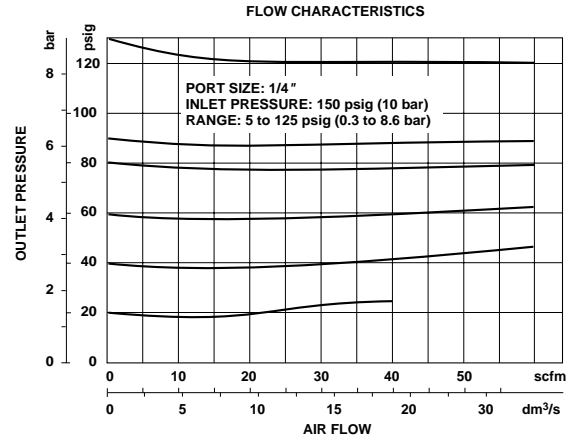


Panel Mounting Option
 Requires alternative threaded bonnet.
 Panel mounting hole diameter: 1.06" (27 mm).
 Panel thickness: 0.2" to 0.4" (5 to 10 mm).

* Regulators with 1/4" and 3/8" ports.

** Regulators with 1/2" ports.

Typical Performance Characteristics



Micro Trol Pressure Regulator 1/4" to 1-1/4" Port Sizes

- High flow regulator with exceptional high relief flow
- Adjusting knob can be set in the field to stop at some maximum pressure setting or some minimum pressure setting
- Easy to adjust even at high output pressures
- Balanced valve minimizes effect of variations in inlet pressure on outlet pressure
- Constant bleed feature provides maximum sensitivity to system changes
- Relieving feature allows reduction of downstream pressure when the system is dead-ended
- Full flow gauge ports



Ordering Information. Models listed are constant bleed units with relieving diaphragm, 10 to 125 psig (0.7 to 8 bar) outlet pressure adjustment range, and PTF threads.

Port Size	Model	Weight lb (kg)
1/4"	R24-200-RGLA	1.90 (0.86)
3/8"	R24-300-RGLA	1.83 (0.83)
1/2"	R24-400-RGLA	1.79 (0.81)
3/4"	R24-600-RGLA	2.73 (1.24)
1"	R24-800-RGLA	2.73 (1.24)
1-1/4"	R24-A00-RGLA	2.65 (1.20)

Alternative Models

Port Size	Substitute
1/4"	2
3/8"	3
1/2"	4
3/4"	6
1"	8
1-1/4"	A

Option	Substitute
Not applicable	0

Type	Substitute
Knob adjusting	0

R 2 4 - ★ ★ ★ - ★ ★ ★ ★

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Outlet Pressure Adjustment Ranges*	Substitute
5 to 30 psig (0.3 to 2 bar)	C
5 to 60 psig (0.3 to 4 bar)	F
10 to 125 psig (0.7 to 8 bar)	L
10 to 250 psig (0.7 to 17 bar)	S

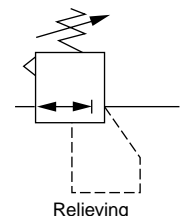
Gauge	Substitute
With	G**
Without	N

Diaphragm	Substitute
Relieving	R

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

** A factory installed gauge is only available with PTF threads (**A** in last position of model number). If a gauge is desired with ISO threads (**B** or **G** in last position), order the desired gauge and appropriate reducing bushing from **Accessories**.

ISO Symbol



See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum inlet pressure: 300 psig (20 bar)

Operating temperature: 0° to 150°F (-20° to 80°C)*

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from from set

1/2" ports: 200 scfm (94 dm³/s)

1-1/4" ports: 700 scfm (330 dm³/s)

Maximum bleed rate at 50 psig (3.5 bar) outlet pressure: 0.031 scfm (0.016 dm³/s) †

† Maximum bleed rate occurs under dead-end (no flow) conditions.

Port sizes:

Main	Gauge
1/4"	1/4"
3/8"	3/8"
1/2", 3/4", 1", 1-1/4"	1/2"

Thread type: PTF, ISO G, or Rc

Materials

Body, top cap: Zinc

Main valve, adjusting screw: Brass

Pilot valve, relief valve: Acetal

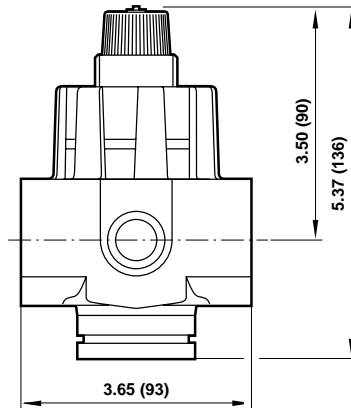
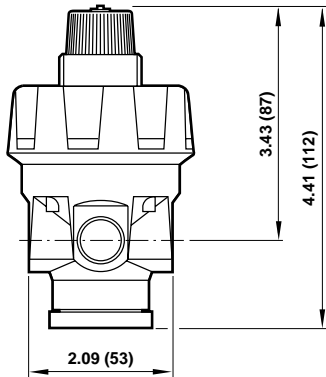
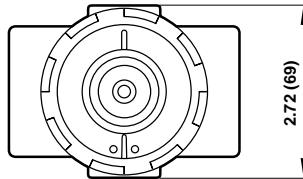
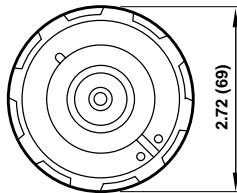
Elastomers: Nitrile

Bottom Plug: Acetal

All Dimensions in Inches (mm)

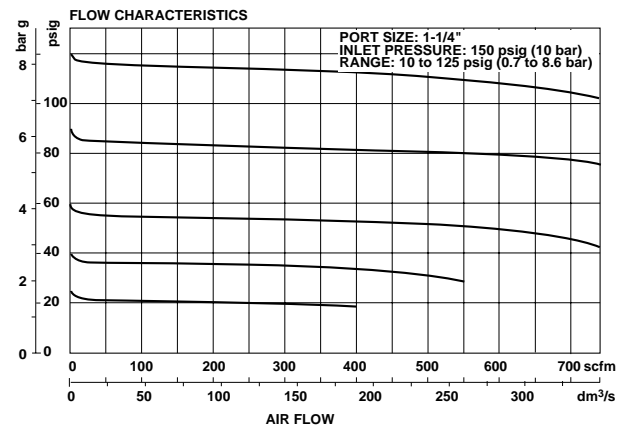
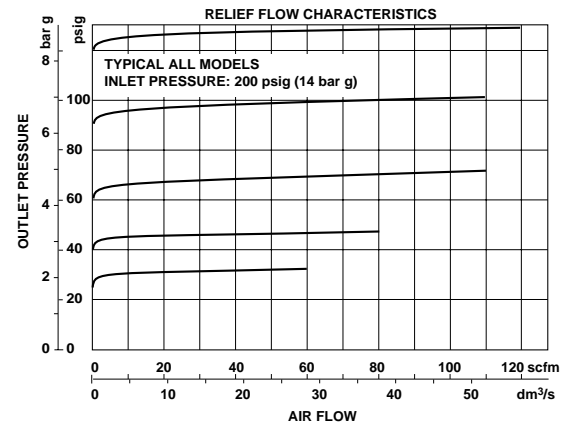
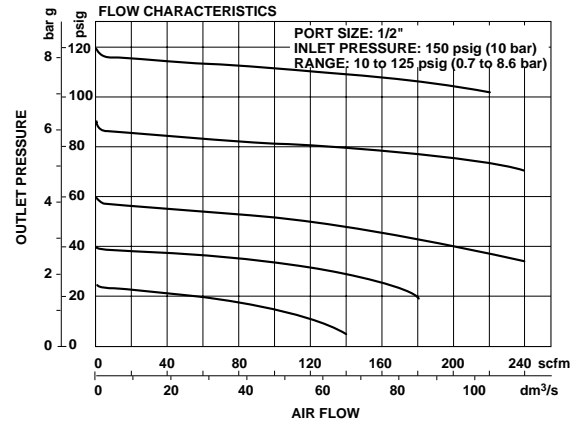
Panel mounting hole diameter: 1.26" (32 mm)

Maximum panel thickness: 0 to 0.12" (3 mm)



Typical Performance Characteristics

RANGE: 10 to 232 psi (0.7 to 16 bar)



Service Kits

Item	Type	Part number
Service kit	1/4, 3/8, 1/2	5292-52
Service kit	3/4, 1, 1-1/4	5292-53

Service kits include seals, main valve and spring.

Manifold Regulators

8mm, 10mm, 1/4" and 3/8" port sizes.

Contents

R30M Manifold Regulator 8mm and 10mm ports	ALE-7-2
R72M Manifold Regulator 1/4" and 3/8" ports	ALE-7-4



R30M



R72M

- Push-in fittings in ports. No need for threaded connectors and fittings
- Push to lock adjusting knob with tamper resistant accessory
- Integral base mounting
- Water or compressed air only



Ordering Information. Models listed include 10 mm push-in fittings, knob adjustment, relieving diaphragm, 0 to 70 psig (0 to 4.8 bar) outlet pressure adjustment range* with gauge, with porting plug.

Port	Model	Flow† scfm (dm ³ /s)	Weight lb (kg)
8 mm	R30M-8DK-RGG	17 (8)	0.22 (0.10)
10 mm	R30M-ADK-RGG	17 (8)	0.22 (0.10)

† Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a 15 psig (1 bar) droop from set.

Alternative Models

R 3 0 M - ★ D K - ★ ★ ★

Port Size	Substitute
8 mm	8
10 mm	A

Push-In Form	Substitute
Metric	D

Adjustment	Substitute
Knob	K

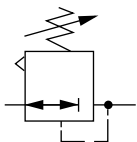
Gauge	Substitute
With	G
Without	N

Outlet Pressure Adjustment Ranges*	Substitute
0 to 70 psig (0 to 4.8 bar)	G
5 to 100 psig (0.3 to 7 bar)	K

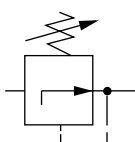
Type	Substitute
Relieving	R
Non relieving	N

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

ISO Symbols



Relieving



Non relieving

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air or water

Maximum pressure: 150 psig (10 bar)

Operating temperature*: 23° to 104°F (-5° to 40°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Approximate flow at 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set: 17 scfm (8 dm³/s)

Gauge port:

(can be used as additional outlet port)

10 mm OD tube with 10 mm OD tube main ports

8 mm OD tube with 8 mm OD tube main ports

Two inlet ports:

10 mm OD tube or 8 mm o/d tube

One outlet port:

10 mm OD tube with 10 mm OD tube inlet

8 mm OD tube with 8 mm OD tube inlet

Materials:

Body: Acetal

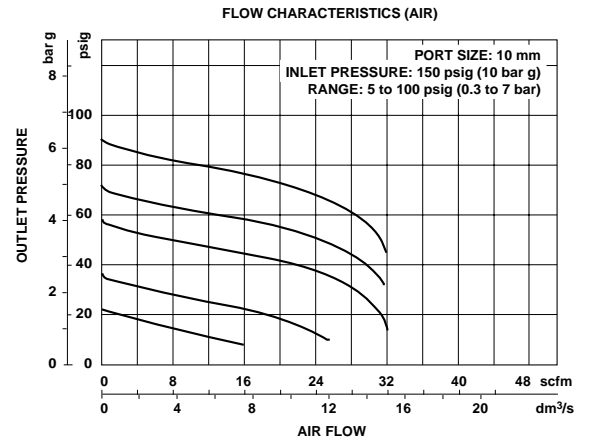
Bonnet: Acetal

Valve: Brass/nitrile

Elastomers: Nitrile

Valve seat: Acetal

Typical Performance Characteristics

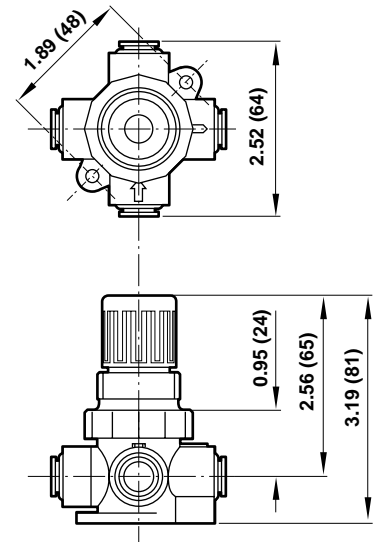
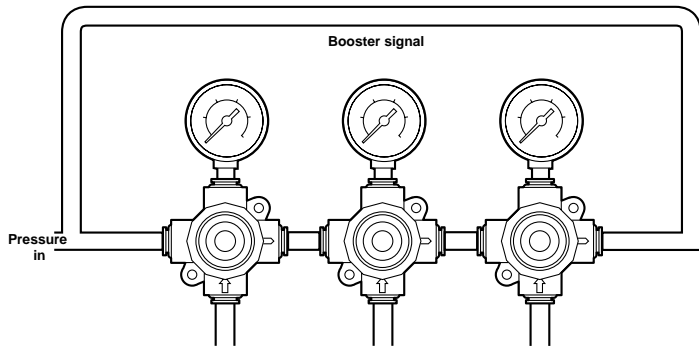


All Dimensions in Inches (mm)

Panel mounting hole diameter: 1.19" (30 mm)

Maximum panel thickness: 0.25" (6 mm)

Typical Manifold Regulator Application



Excelon 72 Manifold Regulator
1/4", 3/8" Port Sizes

- Excelon design allows in-line or modular installation
- Manifold typically up to six regulators without booster signal
- Balanced valve design for optimum pressure control
- Push to lock adjusting knob with tamper resistant accessory
- Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications



Ordering Information. Models listed include PTF threads, knob adjustment, relieving diaphragm, 5 to 150 psig (0.3 to 10 bar) outlet pressure adjustment range* with gauge.

Inlet Port (2)	Outlet Port (1)	Model	Flow [†] scfm (dm ³ /s)	Weight lb (kg)
1/4"	1/4"	R72M-2AK-RMG	83 (39)	0.79 (0.36)
3/8"	1/4"	R72M-3AK-RMG	83 (39)	0.79 (0.36)

† Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a 15 psig (1 bar) droop from set.

Alternative Models

R 7 2 ★ - ★ ★ ★ - ★ ★ ★

Type	Substitute
Manifold	M

Inlet Port Size	Substitute
1/4"	2
3/8"	3

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

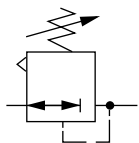
Gauge	Substitute
With	G
Without	N

Outlet Pressure Adjustment Range*	Substitute
5 to 30 psig (0.3 to 2 bar)	C
5 to 60 psig (0.3 to 4 bar)	F
5 to 150 psig (0.3 to 10 bar)	M

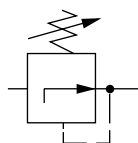
Diaphragm	Substitute
Relieving	R
Non relieving	N

Adjustment	Substitute
Knob	K
T-bar	T

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

ISO Symbols


Relieving



Non Relieving

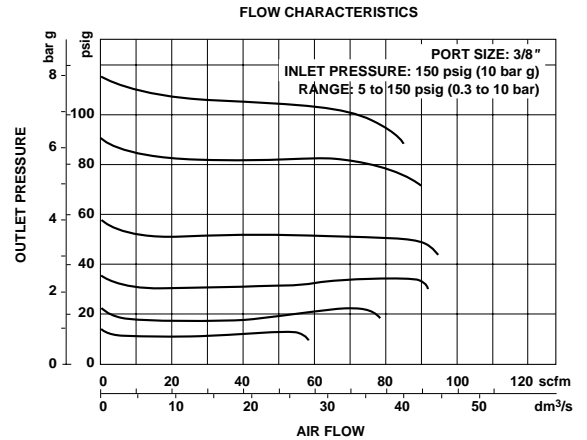
See Section ALE-25 for Accessories



Technical Data

- Fluid: Compressed air
- Maximum pressure: 290 psig (20 bar)
- Operating temperature*: -30° to 150°F (-34° to 65°C)
- * Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
- Typical flow at 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set: 83 scfm (39 dm³/s)
- Two inlet ports:
 - 1/4" or 3/8" PTF
 - 1/4" or 3/8" ISO Rc
 - 1/4" or 3/8" ISO G
- One outlet port:
 - 1/4" PTF with PTF inlet ports
 - 1/4" ISO Rc with ISO Rc inlet ports
 - 1/4" ISO Rc with ISO G inlet ports
- One gauge port:
 - 1/8" PTF with PTF inlet ports
 - 1/8" ISO Rc with ISO Rc inlet ports
 - 1/8" ISO Rc with ISO G inlet ports
- Materials
 - Body: Zinc
 - Bonnet: Acetal
 - Valve: Brass
 - Elastomers: Nitrile
 - Bottom plug: Acetal

Typical Performance Characteristics

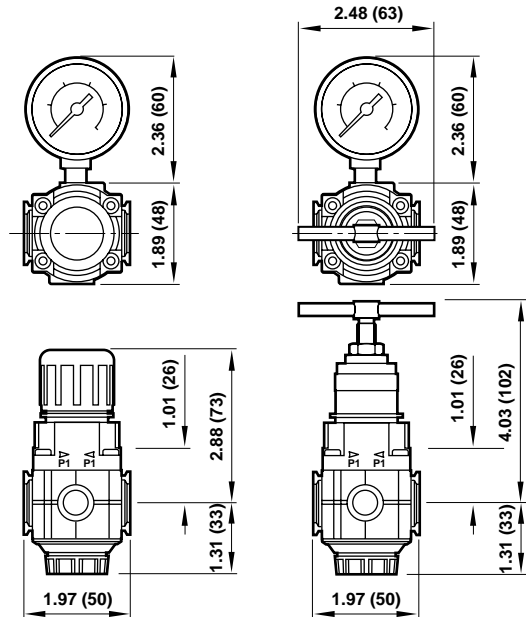
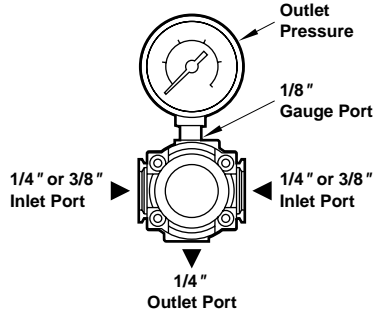


Service Kits

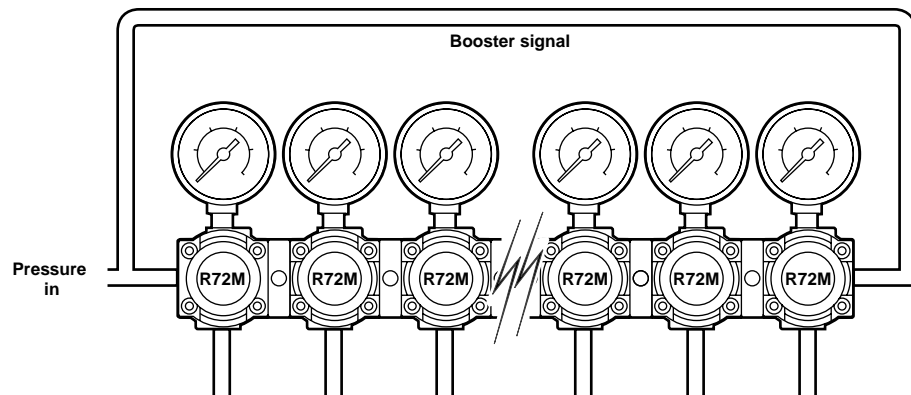
Item	Type	Part Number
Service kit	Relieving	4381-500
	Non relieving	4381-501

Service kit includes diaphragm assembly, valve assembly, valve spring and o-rings.

All Dimensions in Inches (mm)
 Panel mounting hole diameter: 1.57" (40 mm)
 Maximum panel thickness: 0.16" (4 mm)



Typical Manifold Regulator Application



Precision and Instrument Regulators

1/4" port size

Contents

11-018 Precision Air Pressure Regulator 1/4" portsALE-8-2
R38 Instrument Regulator Aluminum Model 1/4" portsALE-8-4



11-018



R38

**Precision Air Pressure Regulator
1/4" Port Size**

- **Fast response**
- **Minimum overshoot during flow changes**
- **Precision regulation obtained by pilot valve design - small change in the pilot valve position results in a large change in the main valve position**
- **Constant bleed feature provides maximum sensitivity to system changes**
- **Relieving feature allows reduction of downstream pressure when the system is dead-ended**



Ordering Information. Models listed have PTF threads, hand wheel adjustment, and relieving diaphragm. A gauge is not included.

Port Size	Outlet Pressure Adjustment Range*	Model Number	Flow scfm (dm ³ /s)	Weight lbs (kg)
1/4"	0.4 to 10 psig (0.03 to 0.69 bar)	11-018-146	12 (5.66)†	1.4 (0.64)
1/4"	1.0 to 60 psig (0.1 to 4.1 bar)	11-018-100	12 (5.66)†	1.4 (0.64)
1/4"	3 to 150 psig (0.2 to 10.3 bar)	11-018-110	12 (5.66)††	1.4 (0.64)

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

† Typical flow with 100 psig (7 bar) inlet pressure, 60 psig (4.1 bar) set pressure and 0.125 psig (0.009 bar) droop from set.

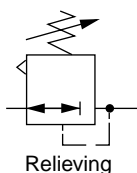
†† Typical flow with 200 psig (14 bar) inlet pressure, 60 psig (4.1 bar) set pressure and 0.250 psig (0.017 bar) droop from set.

Alternative Models

Threads	Substitute
PTF	0
ISO G parallel	8
ISO G Rc	9

1 1 - ★ 1 8 - ★ ★ ★

Screw Adjustment	Substitute
-100 with slotted screw adjustment	101
-110 with slotted screw adjustment	112

ISO Symbols

Service Kits

Type	Part number
Low Pressure Models	2787-01
High Pressure Models	2787-02
Special tool to install main valve seat	681-01

Service kit includes o-rings, seals, pilot diaphragm, pilot spring, main diaphragm, main valve, main valve seat, diffuser screen, constant bleed orifice and orifice filter

See Section ALE-25 for Accessories



Typical Performance Characteristics

Technical Data

Fluid: Compressed air

Low Pressure Models:

11-018-100 and 11-018-146

High Pressure Models:

11-018-110

Inlet pressure range*

Low Pressure Models: 8 to 150 psig (0.55 to 10.3 bar)

High Pressure Models: 10 to 200 psig (0.7 to 13.8 bar)

* Inlet pressure must be at least 7 psig (0.5 bar) greater than the adjusted outlet pressure for proper operation.

Operating temperature*: 32° to 160°F (0° to 70°C)

** Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Flow capacity with 100 psig (6.9 bar) inlet pressure

11-018-146: 12 scfm (5.7 dm³/s) with set pressure of 10 psig (0.7 bar)

11-018-100 and 11-018-110: 20 scfm (9.4 dm³/s) with set pressure of 20 psig (1.4 bar). A small pressure droop occurs at flows above 12 scfm (5.7 dm³/s).

Repeatability

Low Pressure Models: 0.02 psig (0.001 bar) for flow change; 0.05 psig (0.004 bar) when turning supply off and on

High Pressure Models: 0.08 psig (0.006 bar) for flow change; 0.16 psig (0.011 bar) when turning supply off and on

Constant bleed feature: Under dead-end conditions, a small, constant bleed of pilot air will escape thru the relief passage in the bottom plug. This will be accompanied by a slight residual outlet pressure of 1 to 4 inches H₂O (2.5 to 10 millibar).

Gauge ports:

1/4" PTF with PTF main ports

Rc1/4 with ISO G and ISO Rc main ports

Materials

Body: Zinc

Bonnet: Zinc

Main valve: Polycarbonate

Main valve seat: Teflon

Pilot valve: Stainless steel

Pilot valve seat: Aluminum

Main diaphragm: Nitrile

Pilot diaphragm

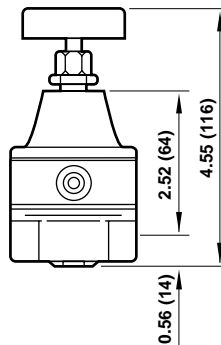
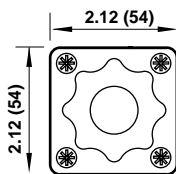
Low Pressure Models: Beryllium copper

High Pressure Models: Nitrile

Bottom plug: Brass

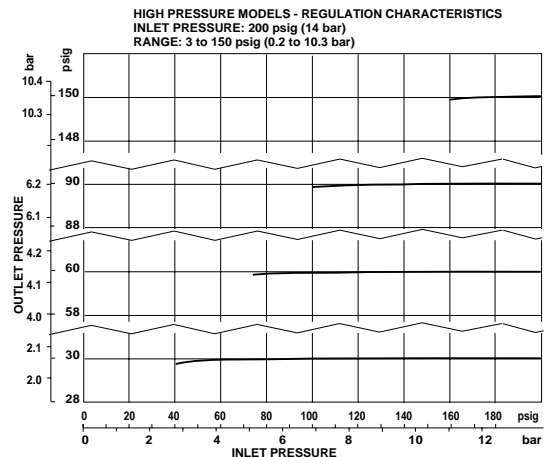
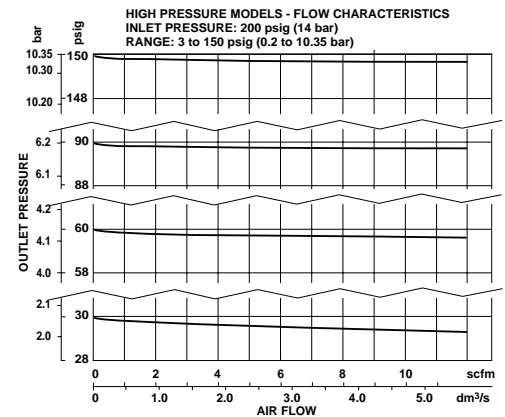
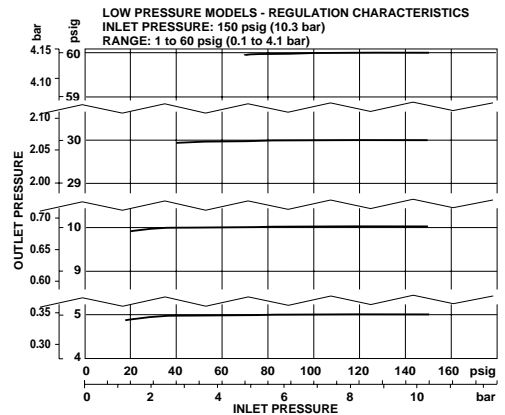
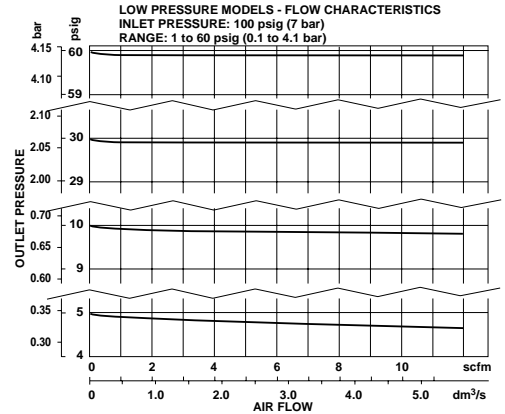
Elastomers: Nitrile, neoprene, polyurethane

All Dimensions in Inches (mm)



Panel mounting hole diameter: 0.47" (12 mm)

Maximum panel thickness: 0.094" (2.4 mm)



**Instrument Regulator
Aluminum Model 1/4" Port Size**

- Compact instrument units with high performance
- Stable regulation with temperature compensation
- Excellent flow and regulation characteristics
- Panel Mounting facility



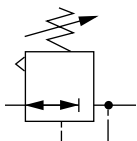
Ordering Information. Models listed are relieving type with 0.6 to 30 psig (0.04 to 2 bar) outlet pressure adjustment range *, and PTF threads. A gauge is not included.

Port Size	Model Number	Flow [†] scfm (dm ³ /s)	Weight lbs (kg)
1/4" PTF	R38-200-RNCA	17 (8)	1.06 (0.48)

† Typical flow with 100 psig (7 bar) inlet pressure, 15 psig (1 bar) set pressure and 1 psig (0.05 bar) droop from set.

R 3 8 - ★ ★ ★ - ★ ★ ★ ★			
Port Size	Substitute	Threads	Substitute
1/4" PTF	2	PTF	A
Material	Substitute	ISO Rc taper	B
Aluminum, nitrile elastomers	0	ISO G parallel	D
Aluminum, Viton elastomers	1	API.LP.INT	K
Mounting Option	Substitute	Outlet Pressure Adjustment Ranges*	Substitute
Without	0	0.6 to 30 psig (0.04 to 2 bar)	C
With bracket and nut	1	1 to 60 psig (0.07 to 4 bar)	F
With panel nut only	2	3.6 to 100 psig (0.25 to 7 bar)	K
With handwheel and nut	3	Gauges	Substitute
With handwheel, bracket and nut	4	Without	N
With handwheel only	5	Diaphragm	Substitute
		Relieving	R
		Non relieving	N

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

ISO Symbol


See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure: 290 psig (20 bar)

Operating temperature: -40° to 175°F (-40° to 80°C) *

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow at 100 psig (7 bar) inlet pressure, 15 psig (1 bar) set pressure and a droop of 1 psig (0.07 bar) from set: 17 scfm (8 dm³/s)

Typical relief differential at 30 psig (2 bar) outlet pressure:

2.3 psig (0.16 bar)

Maximum bleed flow at 30 psig (2 bar) outlet pressure (relieving types only):

0.003 scfm (1.5 cm³/s)†

† Maximum bleed rate occurs under dead-end (noflow) conditions.

Gauge ports:

1/4 NPT

Materials

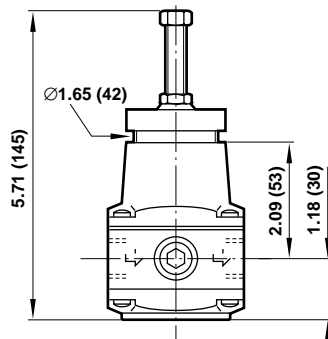
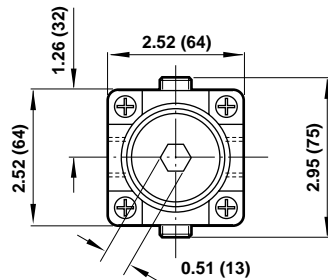
Body: Aluminum

Bonnet: Aluminum

Adjusting screw: Steel

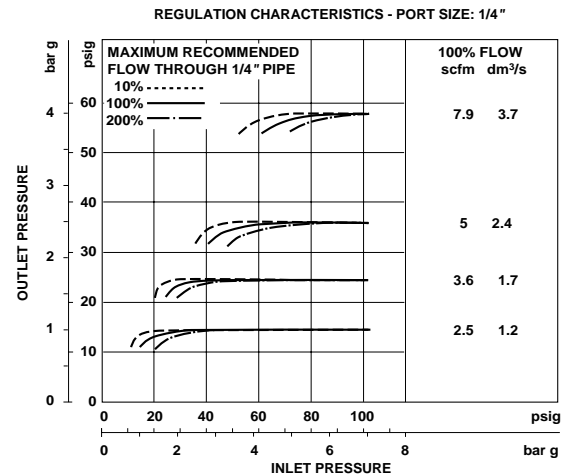
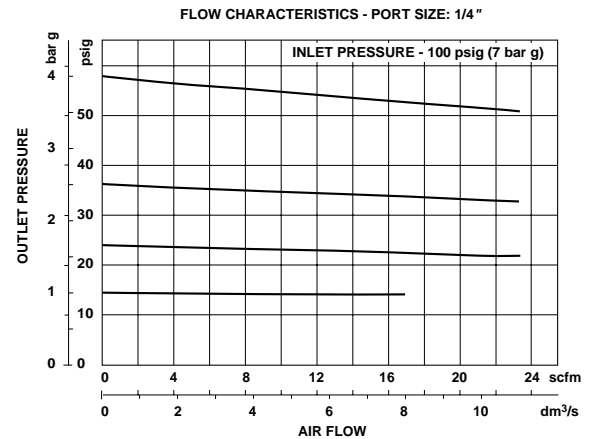
Elastomeric materials: Nitrile

All Dimensions in Inches (mm)



Panel mounting hole diameter: 1.65" (42 mm)
Panel thickness: 0" to 0.24" (0 to 6 mm)

Typical Performance Characteristics



Service Kits

Item	Type	Part number
30 psig (2 bar) Range	Relieving	R38-100-R
	Non relieving	R38-100-NR
60, 105 psig (4 bar, 7 bar) Range	Relieving	R38-101-R
	Non relieving	R38-101-NR

Service kit includes diaphragm assembly, o-ring, valve, valve spring and 8 pan head screws.

Pilot Regulators

Pressure control for Pilot Operated Regulators 1/4" port size

Contents

R40 Conventional and R41 Feedback Pilot Regulators 1/4" Port Size	ALE-9-2
11-400 and 20AL Conventional Pilot Regulator 1/4" Port Size	ALE-9-4
11-104 Feedback Pilot Regulator 1/4" Port Size	ALE-9-6



R40 and R41



11-400 and 20AL



11-104

- Pilot regulators are used to control the outlet pressure of a pilot operated regulator (ordered separately)
- The pilot regulator is installed in an accessible location in the compressed air system; pilot operated regulator is installed at any point without regard to accessibility
- Conventional pilot regulator provides good pressure regulation, rapid response to changing flow demands, and excellent stability.
- Feedback pilot regulator provides superior pressure regulation under changing flow demands where changes in flow demand are not sudden or cyclic.
- Constant bleed feature provides maximum sensitivity to system changes
- Relief feature allows reduction of downstream pressure when the system is dead-ended



Ordering Information. Models listed are relieving with constant bleed, 10 to 250 psig (0.7 to 17 bar) outlet pressure adjustment range *, PTF ports.

Port Size	Type	Model	Flow [†] scfm (dm ³ /s)	Weight lb (kg)
1/4"	Conventional Pilot	R40-200-BNSA	6.4 (3)	1.66 (0.75)
1/4"	Feedback Pilot	R41-204-BNSA††	6.4 (3)	1.66 (0.75)

† Typical flow with 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from set.

†† Do not use the R41 feedback pilot regulator to control outlet pressures at or less than 100 psig (7 bar). Use the 11-104 feedback pilot regulator at those pressures.

Alternative Models

Type	Substitute	Threads	Substitute
R40 Conventional	40	PTF	A
R41 Feedback	41	ISO Rc taper	B
		ISO G parallel	G

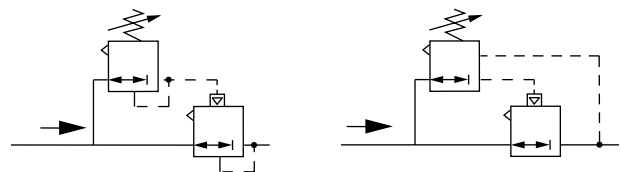
Mounting/Type	Substitute	Outlet Pressure Adjustment Ranges*	Substitute
Remote/R40 Conventional	00	2 to 50 psig (0.1 to 3.5 bar) R40 only	E
Remote/R41 Feedback	04	5 to 125 psig (0.3 to 8.5 bar) R40 only	L
		10 to 250 psig (0.7 to 17 bar)	S

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

Feedback Pilot Regulator Warning

The feedback line must sense the pilot operated regulator outlet pressure and must be connected before turning on the air supply. If the feedback line is not connected, the pilot operated regulator outlet pressure will rapidly increase to the inlet pressure when the adjusting knob on the pilot regulator is turned clockwise.

ISO Symbols



R40 Conventional Pilot Regulator with Pilot Operated Regulator

R41 Feedback Pilot Regulator with Pilot Operated Regulator

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Inlet pressure range: 10 psig (0.7 bar) to 450 psig (31 bar) maximum*

* For best performance, inlet pressure should be at least 10 psig (0.7 bar) greater than the desired regulated pressure, but must not exceed the specified maximum.

Operating temperature: 0° to 175°F (-20° to 80°C) **

** Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow with 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from from set: 6.4 scfm (3 dm³/s)

Maximum bleed rate at 50 psig (3.5 bar) outlet pressure: 0.25 scfm (0.12 dm³/s)†

†Maximum bleed rate occurs under dead-end (no flow) conditions.

Pilot ports: 1/4" PTF, ISO G, or ISO Rc

R41 feedback port: 1/8" PTF, ISO G, or ISO Rc

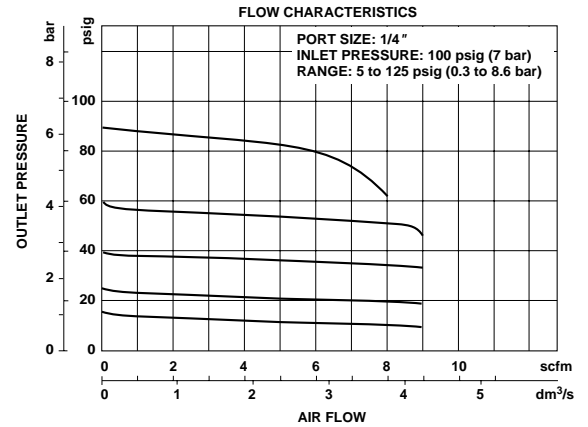
Materials

Body, bonnet: Aluminum

Valve: Teflon

Elastomers: Nitrile

Typical Performance Characteristics



Service Kits

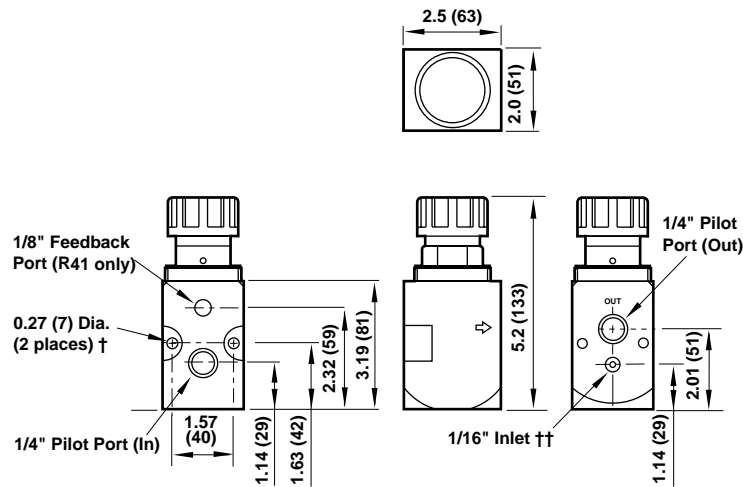
Type	Part number
R40, R41	5945-41

Service kit contains diaphragm, valve spring, guide bushing, valve, valve spring, filter screen, and all o-rings.

All Dimensions in Inches (mm)

Panel mounting hole diameter: 1.89" (48 mm)

Maximum panel thickness: 0.13" (3 mm)



† Mounting holes for subbase mounting.

†† Air inlet for subbase mounting.

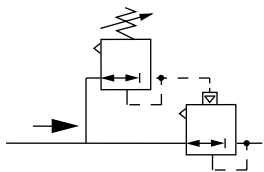
- Pilot regulators are used to control the outlet pressure of a pilot operated regulator (ordered separately)
- The pilot regulator is installed in an accessible location in the compressed air system; pilot operated regulator is installed at any point without regard to accessibility
- Conventional pilot regulator provides good pressure regulation, rapid response to changing flow demands, and excellent stability.
- Constant bleed feature provides maximum sensitivity to system changes
- Relief feature allows reduction of downstream pressure when the system is dead-ended



Ordering Information. Models listed are relieving with constant bleed, PTF threads, without gauge.

Port Size	Model Number	Range psig (bar)	Weight lbs (kg)
1/4"	11-400-2G/AC103	1 to 30 (0.06 to 2)	1.98 (0.90)
1/4"	11-400-2G/AE103	1 to 60 (0.06 to 4)	2.07 (0.94)
1/4"	11-400-2G/AG103	2 to 100 (0.16 to 7)	2.2 (1.00)
1/4"	20AL-X2G/AK103	100 to 300 (7 to 20)	2.3 (1.05)

ISO Symbol



Conventional Pilot Regulator
with Pilot Operated Regulator

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air filtered to 5µm

Maximum inlet pressure: 360 psig (25 bar)

Operating temperature: 0° to 175°F (-20° to 80°C) *

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow with 100 psig (7 bar) inlet pressure, 23 psig (1.6 bar) set pressure and 1.5 psig (0.1 bar) droop from from set: 4.2 scfm (2 dm³/s)

Gauge ports: 1/8" PTF

Materials:

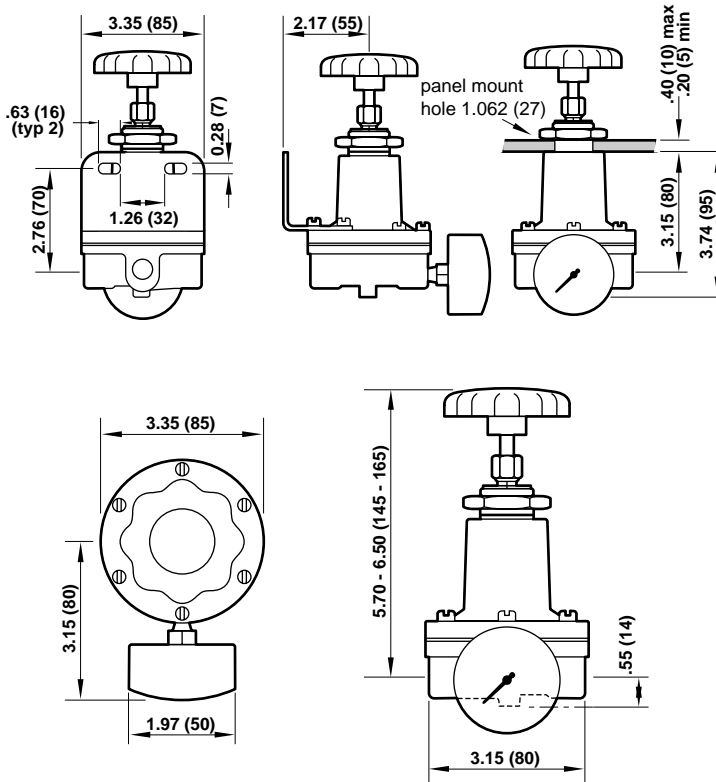
Body, bonnet: Zinc

Elastomers: Nitrile

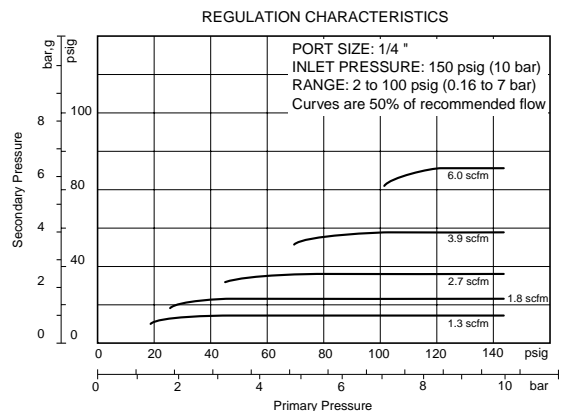
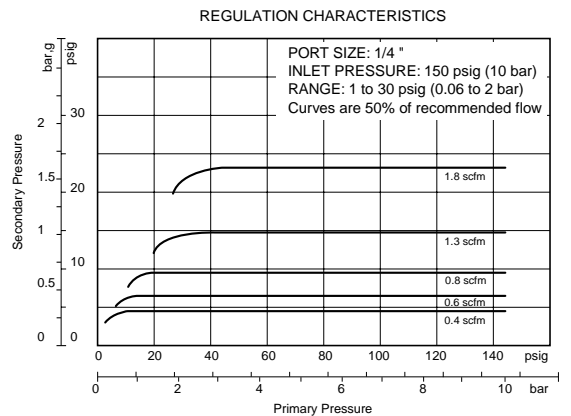
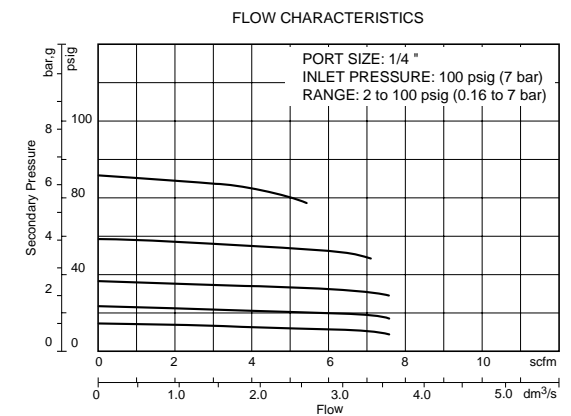
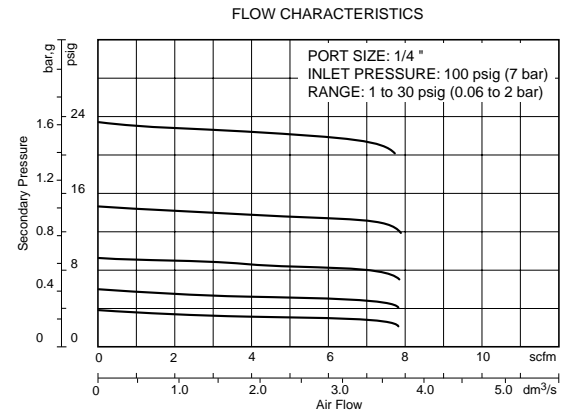
All Dimensions in Inches (mm)

Mounting Dimensions

(Shown with optional gauge and mounting bracket)



Typical Performance Characteristics



Service Kits

Type	Part number
11 400-20AL-X	11 400-100

Service kit includes: diaphragm assemblies, valve assembly, valve spring o-rings and valve seats for pilots.

- Pilot regulators are used to control the outlet pressure of a pilot operated regulator (ordered separately)
- The pilot regulator is installed in an accessible location in the compressed air system; pilot operated regulator is installed at any point without regard to accessibility
- Feedback pilot regulator provides superior pressure regulation under changing flow demands where changes in flow demand are not sudden or cyclic.
- Constant bleed feature provides maximum sensitivity to system changes
- Relief feature allows reduction of downstream pressure when the system is dead-ended



Ordering Information Model listed is relieving, constant bleed, 5 to 100 psig (0.3 to 7 bar) outlet pressure adjustment range†, with PTF ports.

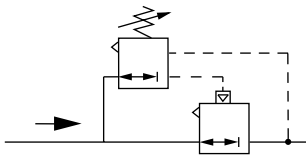
Port Size	Type	Model	Weight lb (kg)
1/4" PTF	Feedback Pilot	11-104-001	3.38 (1.53)

† Outlet pressures can be adjusted to pressures in excess or, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

Feedback Pilot Regulator Warning

The feedback line must sense the pilot operated regulator outlet pressure and must be connected before turning on the air supply. If the feedback line is not connected, the pilot operated regulator outlet pressure will rapidly increase to the inlet pressure when the adjusting knob on the pilot regulator is turned clockwise.

ISO Symbols



11-104 Feedback Pilot Regulator
with Pilot Operated Regulator

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Inlet pressure range: 10 psig (0.7 bar) to 400 psig (27.6 bar) maximum*

* For best performance, inlet pressure should be at least 10 psig (0.7 bar) greater than the desired regulated pressure, but must not exceed the specified maximum.

Operating temperature: 0 to 175°F (-20° to 80°C) **

** Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Maximum bleed rate at 50 psig (3.5 bar) outlet pressure:

0.25 scfm (0.12 dm³/s)†

†Maximum bleed rate occurs under dead-end (no flow) conditons.

Pilot ports: 1/4" PTF

Feedback port: 1/8" PTF

Materials

Body, bonnet: Zinc

Valve seat: Brass

Valve ball: Stainless steal

Elastomers: Nitrile

Service Kits

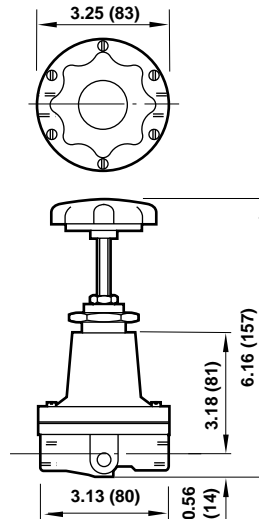
Type	Part number
11-104	1970-11

Service kit contains diaphragm, valve pin, valve springs, valve seat, valve ball, and all o-rings.

All Dimensions in Inches (mm)

Panel mounting hole diameter: 1.06" (27 mm)

Maximum panel thickness: 0.38" (10 mm)



Pilot Operated Regulators

1/4" to 2" port sizes.

Contents

11-042 Pilot Operated Regulator 1/4" to 1-1/4" ports	.....ALE-10-2
11-008 Pilot Operated Regulator 1/2", 3/4", and 1" ports	.....ALE-10-4
R18 Pilot Operated Pressure Regulator 1-1/2" and 2" ports	.....ALE-10-6
R24 Pilot Operated 'MicroTrol Regulator 1/4" to 1-1/4" ports	.....ALE-10-8



R24



11-042



11-008



R18

**Pilot Operated Regulator
1/4", 3/8", 1/2", 3/4", 1" and 1-1/4" Port Sizes**

- Designed for systems that require high flow or pressure regulation at an inaccessible location.
- A pilot regulator (ordered separately) controls the outlet pressure of the pilot operated regulator.
- For general purpose applications, order an R72 or R07 pilot regulator.
- For precision applications, order an R40, R41, or 11-104 pilot regulator.
- Exceptionally high relief flow.


11-042 Pilot Operated Regulator Ordering Information

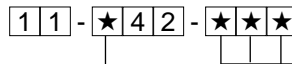
Models listed include relieving diaphragm and PTF threads. Also order a pilot regulator.

Port Size	Model	Flow* scfm (dm ³ /s)	Weight lb (kg)
1/4"	11-042-001	120 (57)	2.8 (1.3)
3/8"	11-042-002	120 (57)	2.7 (1.2)
1/2"	11-042-003	120 (57)	2.6 (1.2)
3/4"	11-042-007	300 (142)	4.8 (2.2)
1"	11-042-008	300 (142)	4.6 (2.1)
1-1/4"	11-042-009	300 (142)	4.3 (2.0)

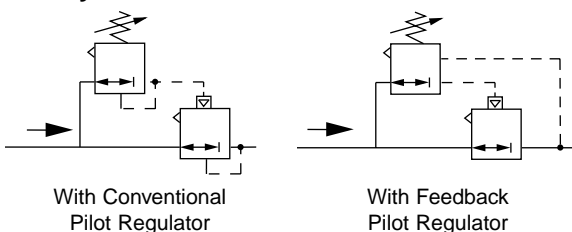
* Typical flow with 100 psig (0.7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 5 psig (0.35 bar) from set.

11-042 Alternative Models

Threads	Substitute
PTF	0
ISO G parallel	8
ISO G Rc	9



With Gauge	Substitute
1/4" main ports	004
3/8" main ports	005
1/2" main ports	006
3/4" main ports	010
1" main ports	011
1-1/4" main ports	012

ISO Symbols

Warning - Feedback Pilot Regulators

The feedback line must sense the pilot operated regulator outlet pressure and must be connected before turning on the air supply. If it is not connected, the pilot operated regulator outlet pressure will rapidly increase to the inlet pressure when the adjusting knob on the pilot operator is turned clockwise.

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Inlet pressure range: 10 psig (0.7 bar) to 400 psig (27.6 bar) *

* For best performance, inlet pressure should be at least 10 psig (0.7 bar) greater than the desired regulated pressure, but must not exceed the specified maximum.

Operating temperature: 0° to 175°F (-20° to 80°C) **

** Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow with a conventional pilot regulator at 100 psig (6.9 bar) inlet pressure,

90 psig (6.3 bar) set pressure, and a droop of 5 psig (0.35 bar) from set:

1/2" ports: 120 scfm (57 dm³/s)

1" ports: 300 scfm (142 dm³/s)

Port sizes:

Main	Gauge	Pilot	Exhaust
1/4"	1/4"	1/4"	3/4"
3/8"	3/8"	1/4"	3/4"
1/2", 3/4", 1", 1-1/4"	1/2"	1/4"	3/4"

Thread type

Main and gauge ports: PTF, ISO G, or ISO Rc

Pilot port: PTF with PTF main ports, ISO G with ISO G and ISO Rc main ports

Exhaust port: PTF with PTF main ports, ISO G with ISO G and ISO Rc main ports

Materials

Body: Zinc

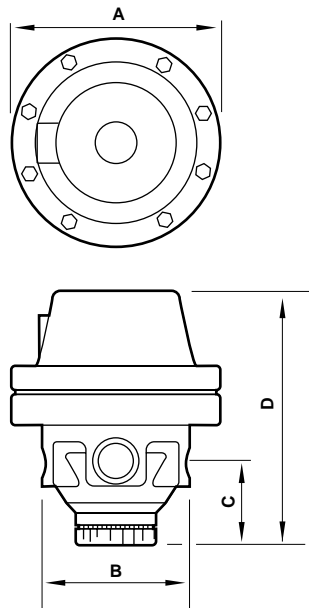
Bonnet: Aluminum

Bottom plug: Acetal

Valve: Brass

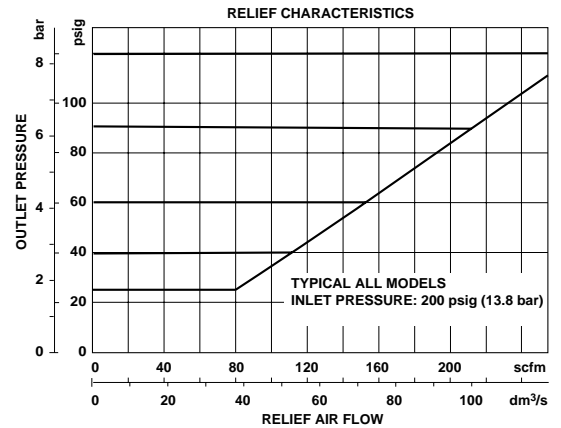
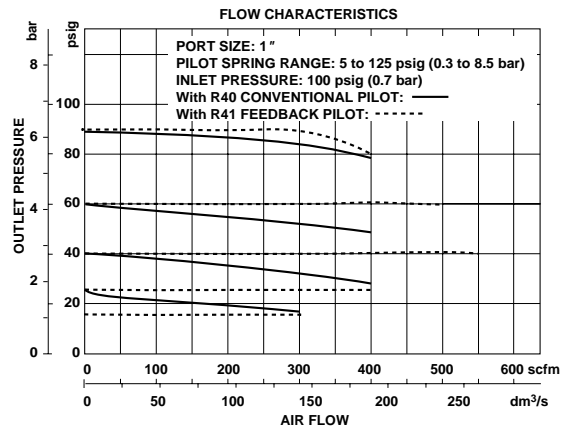
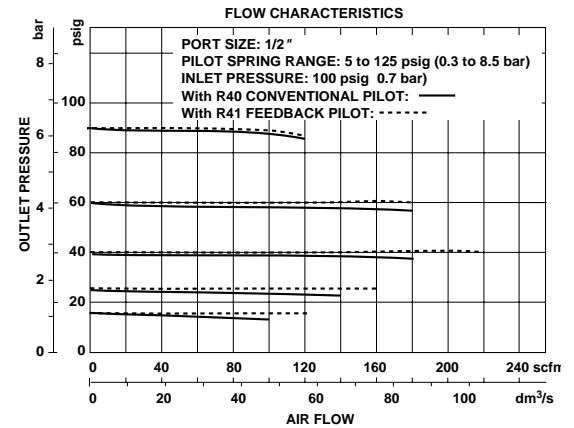
Elastomers: Nitrile

All Dimensions in Inches (mm)



Port Size	A	B	C	D
1/4", 3/8", 1/2"	4.16 (106)	2.71 (69)	1.48 (38)	5.07 (129)
3/4", 1", 1-1/4"	4.16 (106)	3.65 (93)	1.86 (47)	5.97 (152)

Typical Performance Characteristics



Service Kits

Type	Part number
Major kit for 1/4", 3/8", 1/2" ported units	4158-01
Major kit for 3/4", 1", 1-1/4" ported units	4158-02
O-ring kit for 1/4", 3/8", 1/2" ported units	4158-03
O-ring kit for 3/4", 1", 1-1/4" ported units	4158-04

Major kit contains filter screen, diaphragm, and all o-rings.
 O-ring kit contains filter screen and all o-rings.

**Pilot Operated Regulator
1/2", 3/4" and 1" Port Sizes**

- Designed for systems that require pressure regulation at an inaccessible location.
- A pilot regulator (ordered separately) controls the outlet pressure of the pilot operated regulator.
- For general purpose applications, order an R72 or R07 pilot regulator.
- For precision applications, order an R40, R41, or 11-104 pilot regulator.
- Constant bleed feature provides quick maximum sensitivity to system changes


Pilot Operated Regulator Ordering Information

Models listed include relieving diaphragm and PTF threads. Also order a pilot regulator.

Port Size	Model	Flow* scfm (dm ³ /s)	Weight lb (kg)
1/2"	11-008-130	70 (33)	1.6 (0.7)
3/4"	11-008-009	110 (52)	4.9 (2.2)
1"	11-008-110	180 (85)	4.6 (2.1)

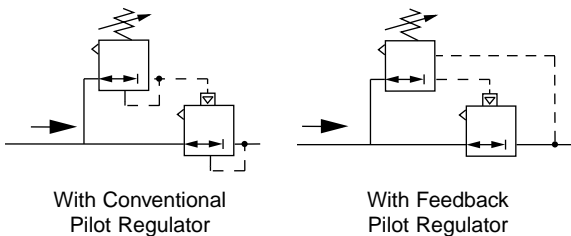
* Typical flow with a conventional pilot at 150 psig (10.3 bar) inlet pressure, 100 psig (6.9 bar) set pressure and a droop of less than 5 psig (0.35 bar) from set.

Alternative Models

Threads	Substitute
PTF	0
ISO G parallel	8
ISO G Rc	9

1 1 - ★ 0 8 - ★ ★ ★

With 150 psig (10 bar) Gauge	Substitute
1/2" main ports	142
3/4" main ports	021
1" main ports	122

ISO Symbols

Feedback Pilot Regulator Warning

The feedback line must sense the pilot operated regulator outlet pressure and must be connected before turning on the air supply. If the feedback line is not connected, the pilot operated regulator outlet pressure will rapidly increase to the inlet pressure when the adjusting knob on the pilot regulator is turned clockwise.

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Inlet pressure range: 10 psig (0.7 bar) to 400 psig (27.6 bar)*

* For best performance, inlet pressure should be at least 10 psig (0.7 bar) greater than the desired regulated pressure, but must not exceed the specified maximum.

Operating temperature: 0° to 175°F (-20° to 80°C)**

** Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow with a conventional pilot regulator at 150 psig (10.3 bar) inlet pressure, 100 psig (6.9 bar) set pressure, and a droop of less than 5 psig (0.35 bar) from set:

1/2" ports: 70 scfm (33 dm³/s)

3/4" ports: 110 scfm (52 dm³/s)

1" ports: 180 scfm (85 dm³/s)

Maximum bleed rate at 50 psig (3.5 bar) outlet pressure: 0.34 scfm (0.16 dm³/s)†

†Maximum bleed rate occurs under dead-end (no flow) conditions.

Port sizes

Main: 1/2", 3/4", 1"

Gauge: 1/8"

Pilot: 1/4"

Thread type

Main and gauge ports: PTF, ISO G, or ISO Rc

Pilot port: PTF with PTF main ports, ISO G with ISO G and ISO Rc main ports

Materials

Body: Zinc

Bonnet: Aluminum

Bottom plug:

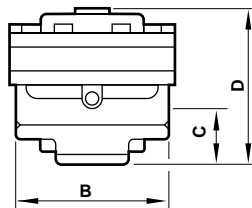
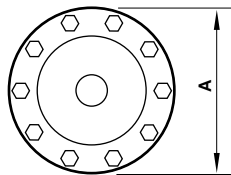
1/2", 3/4 ports: Brass

1" ports: Glass filled nylon

Valve: Brass

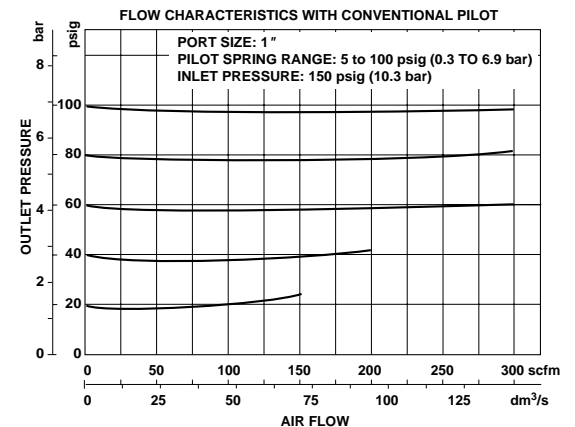
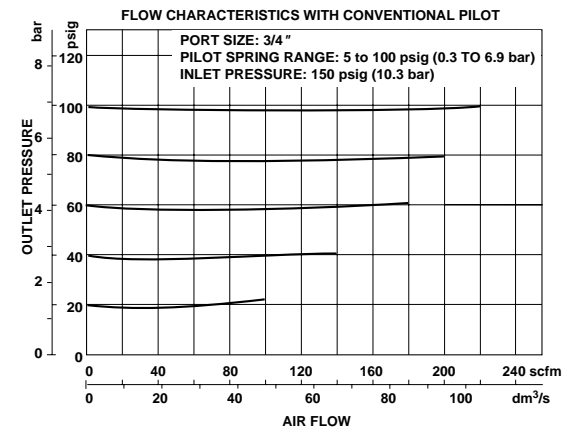
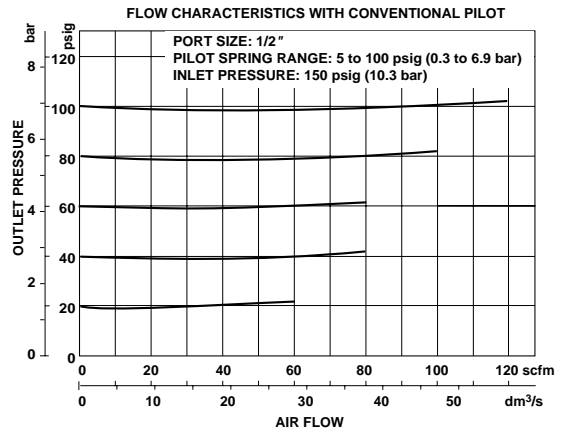
Elastomers: Nitrile

All Dimensions in Inches (mm)



Port Size	A	B	C	D
1/2"	3.34 (85)	3.38 (86)	1.50 (38)	3.30 (84)
3/4", 1"	4.91 (125)	4.63 (118)	1.69 (43)	4.36 (111)

Typical Performance Characteristics



Service Kits

Type	Part number
1/2" ported units	695-01
3/4", 1" ported units	696-01

Kit contains diaphragm, valve, and all o-rings.

**18 Series Pilot Operated Regulator
1-1/2" and 2" Port Sizes**

- Designed for systems that require high flow or pressure regulation at an inaccessible location.
- A pilot regulator (ordered separately) controls the outlet pressure of the pilot operated regulator.
- For general purpose applications, order an R72 or R07 pilot regulator.
- For precision applications, refer to R40, R41, or 11-104 pilot regulator (ALE-9).
- Exceptionally high relief flow.



Ordering Information. Models listed include relieving diaphragm and PTF threads. Also order a pilot regulator.

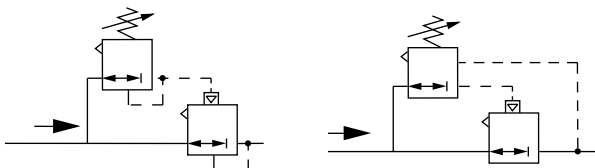
Port Size	Model	Flow [*] scfm (dm ³ /s)	Weight lb (kg)
1-1/2"	R18-B00-RNXA	2000 (944)	6.82 (3.09)
2"	R18-C00-RNXA	2000 (944)	6.61 (2.99)

* Typical flow with 100 psig (0.7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set.

Alternative Models - R18

Port Size	Substitute	Threads	Substitute
1-1/2"	B	PTF	A
2"	C	ISO Rc taper	B
		ISO G parallel	G
Diaphragm	Substitute	Gauge	Substitute
Relieving	R	With	G
Non relieving (do not use with a feedback pilot regulator)	N	Without	N

R 1 8 - ★ 0 0 - ★ ★ X ★

ISO Symbols


R18 with Conventional Pilot Regulator

R18 with Feedback Pilot Regulator

Warning - Feedback Pilot Regulators

The feedback line must sense the pilot operated regulator outlet pressure and must be connected before turning on the air supply. If it is not connected, the pilot operated regulator outlet pressure will rapidly increase to the inlet pressure when the adjusting knob on the pilot operator is turned clockwise.

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Inlet pressure range: 10 psig (0.7 bar) minimum to 450 psig (31 bar) maximum

Operating temperature: 0° to 175°F (-18° to 80°C)*

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow with 100 psig (0.7 bar) inlet pressure, 90 psig (6.3 bar) set pressure, and a droop of 15 psig (1 bar) from set:
2000 scfm (950 dm³/s)

Main ports: 1-1/2" or 2" PTF, ISO G, or ISO Rc

Pilot and gauge ports: 1/4" PTF, ISO G, or ISO Rc

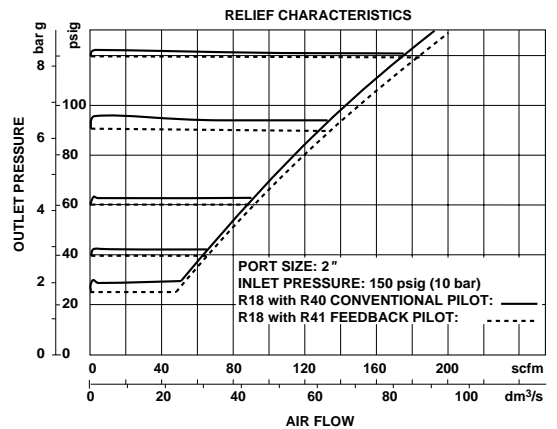
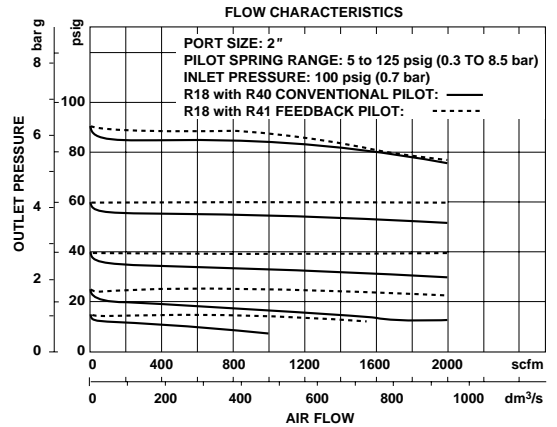
Exhaust port: 3/4" PTF, ISO G, or ISO Rc

Materials

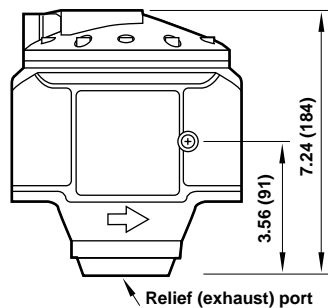
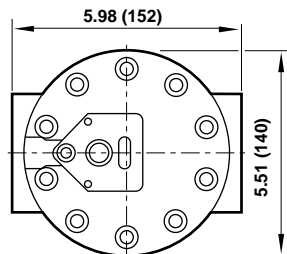
Body, bonnet, bottom plug, valve: Aluminium

Elastomers: Nitrile

Typical Performance Characteristics



All Dimensions in Inches (mm)



Service Kits

Type	Part number
R18	5945-40

R18 service kit contains filter screen and all o-rings.

Pilot Operated 'Micro Trol'
Regulator 1/4" to 1-1/4"

- High flow and relief flow characteristics
- Easy to adjust even at high output pressures
- Balanced valve minimizes effect of variations in inlet pressure on outlet pressure
- Relieving feature allows outlet pressure reduction even when the system is dead ended
- Full flow gauge ports
- Panel mounting facility



Ordering Information. Models listed are constant bleed units with relieving diaphragm, and PTF threads. A gauge is not included. Also order a pilot operator.

Port Size	Model	Weight lb (kg)
1/4"	R24-201-RNXA	1.16 (0.73)
3/8"	R24-301-RNXA	1.54 (0.70)
1/2"	R24-401-RNXA	1.50 (0.68)
3/4"	R24-601-RNXA	2.60 (1.18)
1"	R24-801-RNXA	2.60 (1.18)
1-1/4"	R24-A01-RNXA	2.51 (1.14)

Alternative Models

R 2 4 - ★ ★ ★ - ★ ★ ★ ★

Port Size	Substitute
1/4"	2
3/8"	3
1/2"	4
3/4"	6
1"	8
1-1/4"	A

Option	Substitute
Not applicable	0

Type	Substitute
Pilot operated	1

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

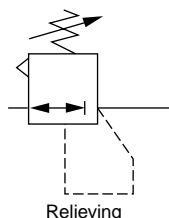
Spring	Substitute
None	X

Gauge	Substitute
With	G
Without	N

Diaphragm	Substitute
Relieving	R

* A factory installed gauge is only available with PTF threads (A in last position of model number). If a gauge is desired with ISO threads (B or G in last position), order the desired gauge and appropriate reducing bushing from **Accessories** on page 3.

ISO Symbol



Feedback Pilot Regulator Warning

The feedback line must sense the pilot operated regulator outlet pressure and must be connected before turning on the air supply. If the feedback line is not connected, the pilot operated regulator outlet pressure will rapidly increase to the inlet pressure when the adjusting knob on the pilot regulator is turned clockwise.

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Inlet pressure range: 10 psig (0.7 bar) to 300 psig (20 bar)*

* For best performance, inlet pressure should be at least 10 psig (0.7 bar) greater than the desired regulated pressure, but must not exceed the specified maximum.

Operating temperature: 0° to 175°F (-20° to 80°C)**

** Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from set:

1/2 ports: 220 scfm (104 dm³/s)

1-1/4 ports: 700 scfm (330 dm³/s)

Maximum bleed rate at 50 psig (3.5 bar) outlet pressure: 0.031 scfm (0.016 dm³/s) †

† Maximum bleed rate occurs under dead-end (no flow) conditions.

Port sizes

Main	Gauge	Pilot
1/4"	1/4"	1/4"
3/8"	3/8"	1/4"
1/2", 3/4", 1", 1-1/4"	1/2"	1/4"

Thread type

Main ports: PTF, ISO G, or Rc

Gauge ports: PTF, ISO G, or Rc

Pilot port: PTF with PTF main ports, ISO G with ISO G and Rc main ports

Materials

Body, top cap: Zinc

Main valve, adjusting screw: Brass

Pilot valve, relief valve: Acetal

Elastomers: Nitrile

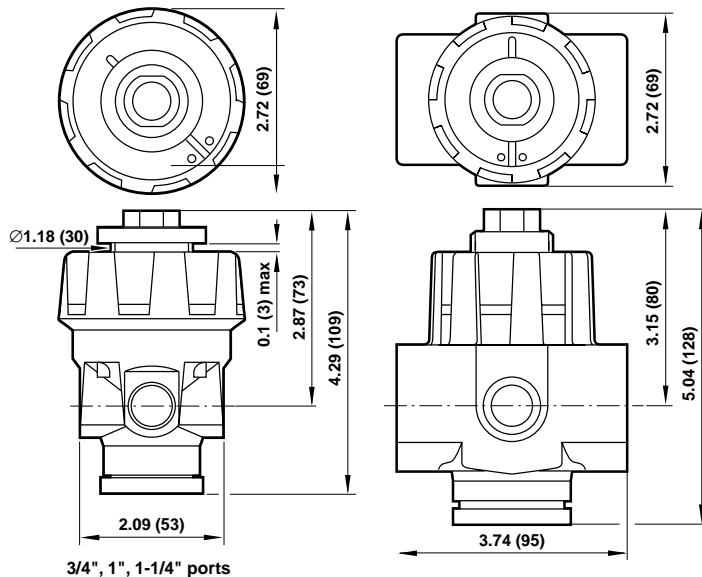
Bottom Plug: Acetal

Service Kits

Item	Port Size	Part number
Service kit	1/4", 3/8", 1/2"	5292-54
Service kit	3/4", 1", 1-1/4"	5292-55

Service kits include seals, main valve and spring.

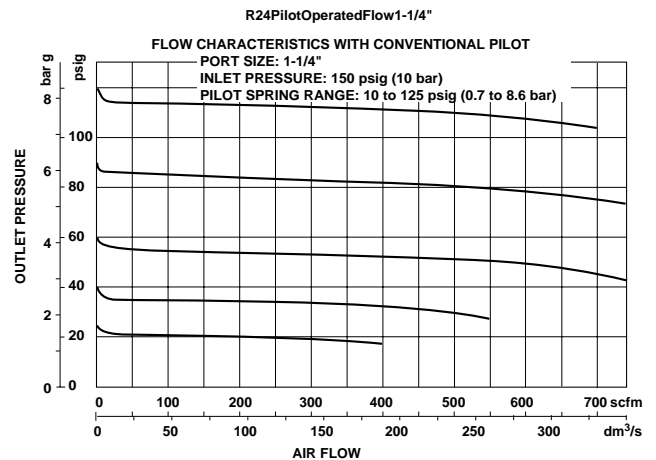
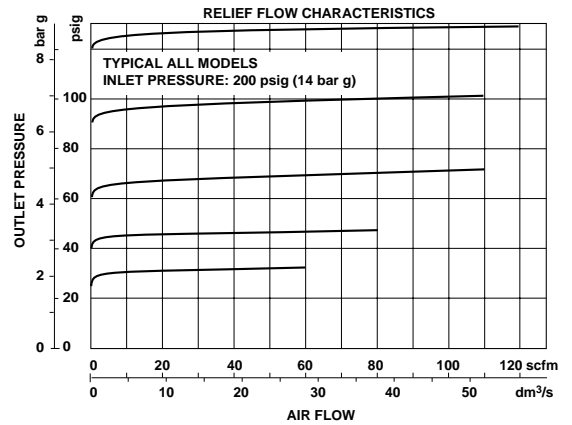
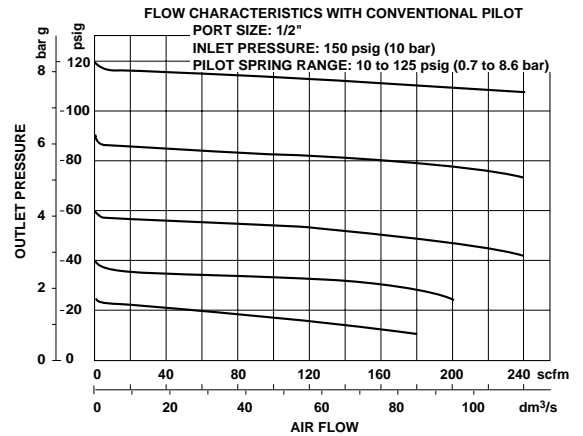
All Dimensions in Inches (mm)



3/4", 1", 1-1/4" ports

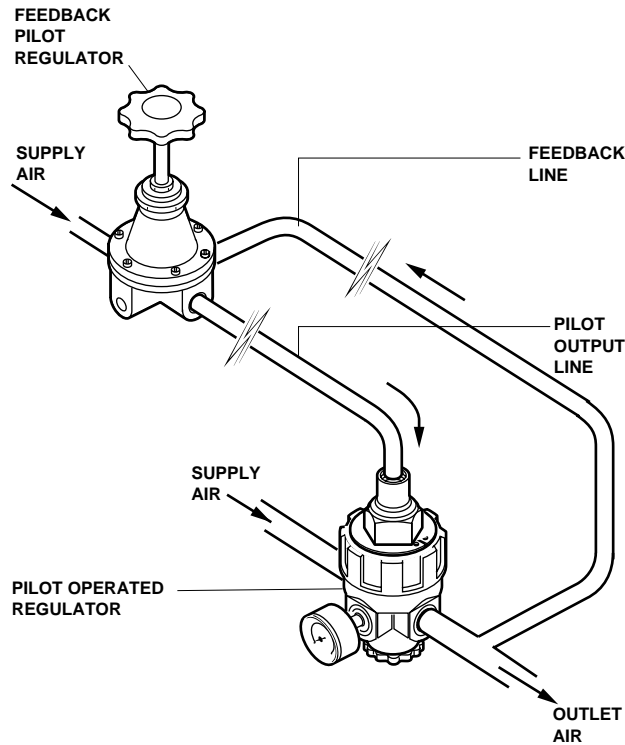
Typical Performance Characteristics

RANGE: 10 to 232 psi (0.7 to 16 bar)





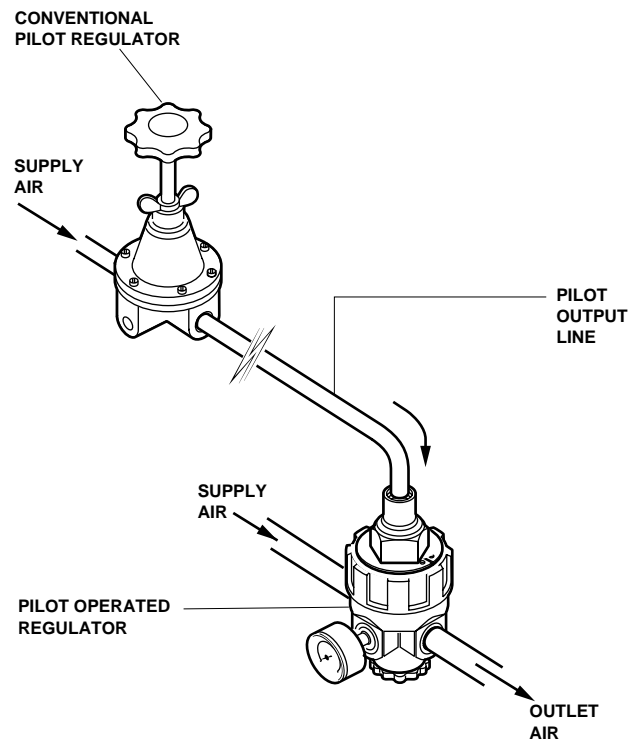
Typical Installation - Feedback Pilot and Pilot Operated Regulator



Feedback Pilot Regulator Warning

The feedback line must sense the pilot operated regulator outlet pressure and must be connected before turning on the air supply. If the feedback line is not connected, the pilot operated regulator outlet pressure will rapidly increase to the inlet pressure when the adjusting knob on the pilot regulator is turned clockwise.

Typical Installation - Conventional Pilot and Pilot Operated Regulator



UL Listed Cylinder Gas Regulators for Industrial Service

Regulators for use with compressed air, and inert gases such as carbon dioxide, argon helium, krypton, neon, nitrogen, and xenon.

Contents

R44 Miniature Pressure Regulator, 250 psig max.pressure, 1/8" and 1/4" PTF Port Sizes	ALE-11-2
R83 Pressure Regulator, 3000 psig max. pressure, 1/4" PTF Port Size	ALE-11-4



R44
Low pressure,
secondary regulator



R83
High pressure, primary
regulator

UL Listed Miniature Pressure Regulator Compressed Air, Carbon Dioxide, Inert Gases 1/8" or 1/4" PTF Port Sizes

- Underwriters Laboratories, Inc. listed (file number SA1089) for use with air, carbon dioxide, and inert gases. For use with other gases, including oxygen, consult Norgren.
- Compact design
- Brass, zinc, or aluminum bodies with plastic bonnet; brass body also available with brass bonnet
- Plastic bonnet equipped with low torque, non-rising pressure adjusting knob. Snap action knob locks pressure setting when pushed in. Brass bonnet equipped with pressure adjusting screw
- Non-relieving and relieving models. Relieving models allow reduction of outlet pressure even when the system is dead-ended
- Can be disassembled without the use of tools or removal from the air line



Ordering Information. Models listed include PTF threads, relieving diaphragm, 5 to 100 psig (0.3 to 7 bar) outlet pressure adjustment range†, and without gauge.

Body	Bonnet	Medium	Port PTF	Model	Flow* scfm (dm ³ /s)	Weight lb (kg)
Aluminum	Plastic	Air, inert gases	1/8"	R44-100-RNKA	10 (4.7)	0.23 (0.11)
			1/4"	R44-200-RNKA	10 (4.7)	0.23 (0.11)
Brass	Plastic	Air, CO ₂ , inert gases	1/8"	R44-121-RNKA	10 (4.7)	0.45 (0.21)
			1/4"	R44-221-RNKA	10 (4.7)	0.45 (0.21)
Zinc	Plastic	Air, inert gases	1/8"	R44-122-RNKA	10 (4.7)	0.31 (0.14)
			1/4"	R44-222-RNKA	10 (4.7)	0.31 (0.14)
Brass	Brass	Air, CO ₂ , inert gases	1/8"	R44-133-RNKA	10 (4.7)	0.54 (0.25)
			1/4"	R44-233-RNKA	10 (4.7)	0.54 (0.25)

Alternative Models

R 4 4 - ★ ★ ★ - ★ ★ ★ ★

Port Size	Substitute
1/8"	1
1/4"	2

Body/Bonnet	Substitute
Aluminum/Plastic	00
Brass/Plastic	21
Zinc/Plastic	22
Brass/Brass	33

Threads	Substitute
PTF	A

Outlet Pressure Adjustment Range†	Substitute
1 to 10 psig (0.1 to 0.7 bar)	A
5 to 50 psig (0.3 to 3.5 bar)	E
5 to 100 psig (0.3 to 7 bar)	K

Gauges	Substitute
With	G
Without	N

Diaphragm	Substitute
Relieving	R
Non relieving	N

* Approximate flow with 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a 15 psig (1 bar) droop from set.

† Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air, carbon dioxide, inert gases

Maximum pressure: 250 psig (17 bar)

Operating temperature: -30° to 150°F (-34° to 66°C) *

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow at 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig 1 bar() from set: 10 scfm (4.7 dm³/s)

Gauge ports: 1/8" PTF

Materials

Body and bonnet

R44-100/-200: Aluminum body; acetal plastic bonnet

R44-121/-221: Brass body; acetal plastic bonnet

R44-122/-222: Zinc body; acetal plastic bonnet

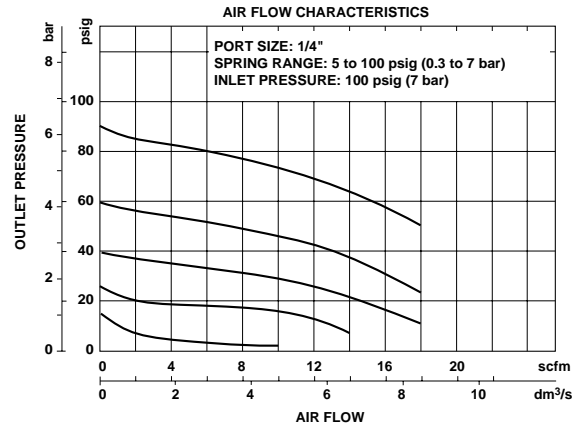
R44-133/-233: Brass body; brass bonnet

Valve: Brass/nitrile

Valve seat: Acetal

Elastomers: Nitrile

Typical Performance Characteristics



Service Kits

Item	Type	Part number
Service kit	Relieving	3407-02
	Non relieving	3407-01

Service kit includes slip ring, diaphragm, standard valve seat with seal, valve, valve spring.

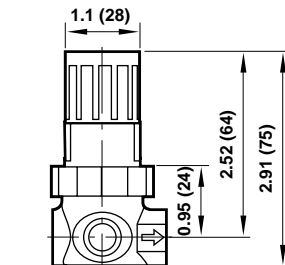
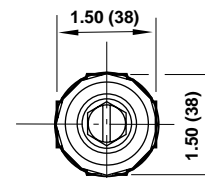
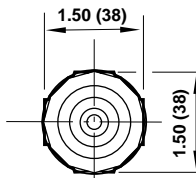
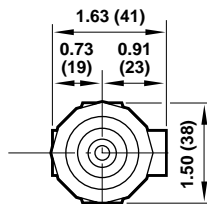
All Dimensions in Inches (mm)

Panel mounting hole diameter:

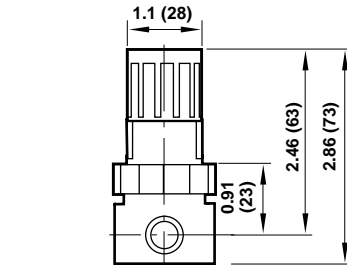
Models with plastic bonnet: 1.19" (30 mm)

Models with brass bonnet: 0.81" (21mm)

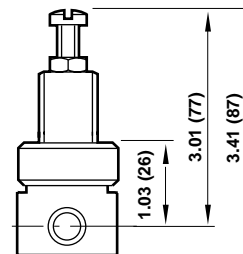
Maximum panel thickness: 0.25" (6 mm)



Models R44-122/-222
(Zinc Body and Plastic Bonnet)



Models R44-100/-200 and R44-121/-221
(Aluminum or Brass Body and Plastic Bonnet)



Models R44-133/-233
(Brass Body and Brass Bonnet)

UL Listed Pressure Regulator for Industrial Cylinder Gas 1/4" PTF Port Size

- Underwriters Laboratories, Inc. listed (file number SA1089) for use with air, argon, carbon dioxide, helium, krypton, neon, nitrogen, xenon. For use with other gases, including oxygen, consult Norgren.
- Non-relieving and relieving models. Relieving models allow reduction of outlet pressure even when the system is dead-ended
- Two high pressure inlet ports and two regulated pressure outlet ports
- Diametrically opposite inlet ports provide easy manifolding of several regulators
- Easily replaceable valve cartridge contains valve, valve seat, valve spring, and filter element



Ordering Information. Models listed include PTF threads, relieving diaphragm, 5 to 125 psig (0.3 to 8.5 bar) outlet pressure adjustment range[†], and without gauge.

Port	Model	Flow * scfm dm ³ /s()	Weight lb (kg)
1/4"	R83-200-RNLA	11 (5.2)	1.3 (0.59)

Alternative Models
R 8 3 - 2 0 0 - ★ N ★ A

Diaphragm	Substitute
Relieving	R
Non relieving	N

Outlet Pressure Adjustment Ranges [†]	Substitute
2 to 50 psig (0.1 to 3.5 bar)	E
5 to 125 psig (0.3 to 8.5 bar)	L
10 to 175 psig (0.7 to 12 bar)	N

* Approximate flow with 1000 psig (69 bar) inlet pressure, 60 psig (4 bar) set pressure and a 5 psig (0.35 bar) droop from set.

† Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

See Section ALE-25 for Accessories



Technical Data

Fluid: Air, argon, carbon dioxide, helium, krypton, neon, nitrogen, and xenon. For use with other gases, including oxygen, consult Norgren. Do not use the R83 regulator in beverage dispensing applications. Other Norgren regulators (R81 for soft drink, R82 for beer, R84 for carbonators) are available for use in dispensing systems.

Maximum pressure: 3000 psig (207 bar)

Operating temperature: -30° to 140°F (-34° to 60°C) *

* Fluid must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow at 1000 psig (69 bar) inlet pressure, 60 psig (4 bar) set pressure and a droop of 5 psig (0.35 bar) from set: 11 scfm (5.2 dm³/s)

Materials

Body: Brass

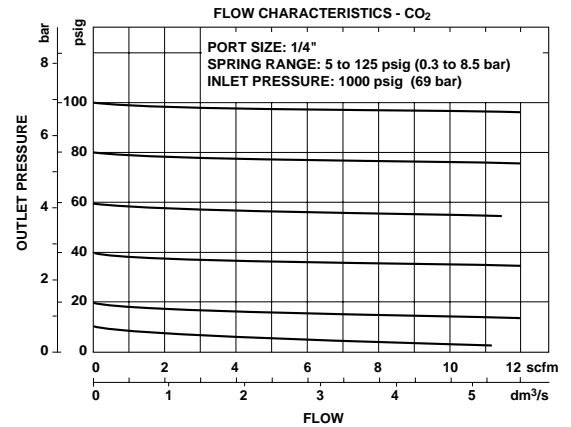
Bonnet: Zinc

Cartridge valve: Teflon, brass, stainless steel

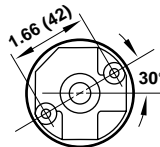
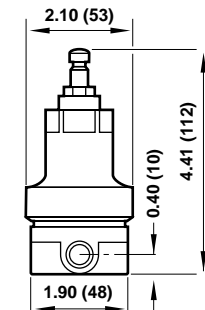
Diaphragm: Acetal and nitrile

Seals: Nitrile

Typical Performance Characteristics



All Dimensions in Inches (mm)



Mounting Holes (2 Places)
0.18" (4.6mm) dia. by 0.39 (10mm) deep.
Use 10-32 thread forming screws.

Service Kits

Item	Type	Part number
Service kits	Diaphragm, relieving	570-51
	Diaphragm, non relieving	570-10
	Valve cartridge	5086-55

Valve cartridge includes the sealed cartridge and cartridge o-ring.

Warning

These products are intended for use with industrial compressed air, argon, carbon dioxide, helium, krypton, neon, nitrogen, and xenon. Do not use these products where pressures and temperatures can exceed those listed under 'Technical Data'.

Before using these products with fluids other than those specified, for non-industrial applications, life-support systems, or other applications not within published specifications, consult Norgren.

Through misuse, age, or malfunction, components used in fluid power systems can fail in various modes. The system designer is warned to consider the failure modes of all component parts used in fluid power systems and to provide adequate safeguards to prevent personal injury or damage to equipment in the event of such failure.

System designers must provide a warning to end users in the system instructional manual if protection against a failure mode cannot be adequately provided.

System designers and end users are cautioned to review specific warnings found in instruction sheets packed and shipped with these products.

U.L. Listed Beverage Regulators

Cylinder Gas Pressure (CO₂)
Regulators for Soft Drink and
Beer dispensing systems.

R84 Regulator and C84 Regulator Configurations for Soft Drink Carbonator Service, 1/4" PTF	ALE-12-2
R81 Regulator and C81 Regulator Configurations for Soft Drink Dispensing Systems, 1/4" PTF	ALE-12-6
R82 Regulator for Beer Dispensing Systems, 1/4" PTF . .	ALE-12-12



R84



R81



R82

- Underwriters Laboratories, Inc. listed (file number SA1089)
- Integral relief valve easily replaced without disassembly of regulator and without affecting relief pressure setting
- Back flow check valve, or manifold with integral check valve at each outlet, can be installed in regulator outlet port. Manifolds available with 3 or 5 outlets and include one outlet cap.
- Relieving diaphragm allows outlet pressure setting to be reduced even though the system is dead-ended. Pressure downstream of check valves will not be reduced.
- Easily replaceable valve cartridge contains valve, valve seat, valve spring, and filter element
- Two high pressure ports (inlet and primary gauge) and two regulated pressure ports (outlet and secondary gauge)
- Bonnet wrench hex same size as tank adapter - one wrench fits both



Technical Data

Fluid: Carbon dioxide. The R84 regulator is designed to be used exclusively as a carbonator regulator in soft drink dispensing systems to control cylinder gas (carbon dioxide) pressure to the carbonator tank. Other Norgren regulators (R81 for soft drink syrup containers, R82 for beer, R83 for industrial cylinder gases) are available for use in other systems.

Maximum pressure: 3000 psig (207 bar)

Operating temperature: 0° to 140°F (-18° to 60°C)

Integral relief valve cracking pressure:

150 ± 5 psig (10.4 ± 0.33 bar)

Materials:

Body: Brass

Bonnet: Zinc

Valve cartridge: Teflon, brass, stainless steel

Diaphragm: Acetal and nitrile

Relief valve: Brass, polycarbonate, nitrile, aluminum

Seals: Nitrile

NOTE

The integral relief valve on the R84 regulator does not meet the requirements of Paragraph 4.5c of NSDA Pamphlet TD02, **Installation and Operational Procedures for Pressurized Soft Drink Dispensing Systems**, dated July, 1980. The end cap on the relief valve is color coded red for visual identification and is for use only on the Norgren R84 regulator.

See Section ALE-25 for Accessories

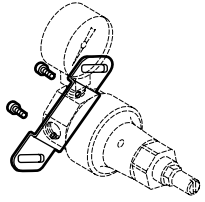






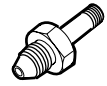
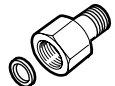
Ordering Information. Models listed include integral relief valve with cracking pressure of 150 ± 5 psig (10.4 ± 0.33 bar), PTF threads, relieving diaphragm, 5 to 125 psig (0.34 to 8.6 bar) outlet pressure adjustment range†. A gauge is not included.


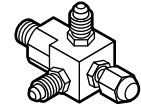
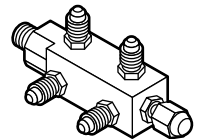

Port	Model	Weight lb (kg)
1/4"	R84-200-MNLA	1.3 (0.59)

† Outlet pressure can be adjusted to pressures in excess of, and less than, that specified. Do not use these units to control pressures outside of the specified range.

Accessories

			
Wall Mounting Bracket	Pipe Plug, Hex Socket 1/4" PTF	Hex Nipple 1/4" PTF male	Union Adapter with Cap 1/4" PTF to 1/4" tube (45° flare)
Strap Type: 5095-51	2891-97	18-006-067	18-006-068
			Adapter only: 18-006-027
			Cap only: 3302-50

	Inlet Fittings	
		
2" (Ø 50 mm) diameter, 1/4" PTF connection	Nitrogen Service Cylinder Connector 0.906-14 RH external thread	Carbon Dioxide Service Cylinder Connector 0.830-14 RH internal thread
15 psig (1 bar): 18-013-082	CGA No. 580: 18-008-004	1.44" (37 mm) long nipple CGA No. 320: 18-008-002
30 psig (2 bar), UL Listed: 18-013-030		2.25" (57 mm) long nipple 18-008-015
60 psig (4 bar), UL Listed: 18-013-083		Replacement gasket: 1390-02
100 psig (7 bar), UL Listed: 18-013-084		
160 psig (11 bar), UL Listed: 18-013-085		
300 psig (20 bar), UL Listed: 18-013-086		
2000 psig (135 bar), UL Listed: 18-013-244		
3000 psig (205 bar), UL Listed: 18-013-087		

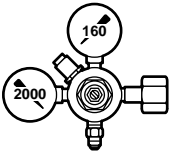
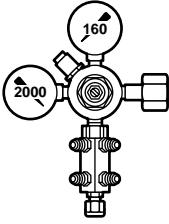
Single Outlet Fittings - Check Valves ††	Multiple Outlet Fittings - Manifolds with integral check valves ††
	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  2 or 3 Port </div> <div style="text-align: center;">  4 or 5 Port </div> <div style="text-align: center;">  Manifold Extension </div> </div>
Check Valve, 1/4" PTF male to 1/4" tube (45° flare): 16-009-001	2 or 3 outlets, 1/4" PTF male to 1/4" tube (45° flare): 3228-54
Check Valve, 1/4" PTF male to 1/2-16 BSF: 16-009-002	2 or 3 outlets, 1/4" PTF male to 1/2-16 BSF: 3228-55
Check Valve, 1/4" PTF male to 1/4" PTF female: 16-009-003	4 or 5 outlets, 1/4" PTF male to 1/4" tube (45° flare): 3228-60
	4 or 5 outlets, 1/4" PTF male to 1/2-16 BSF: 3228-61
	Manifold extension, 1/4" PTF male to 1/4" PTF female: 2340-50

†† The listed check valves and manifolds with integral check valves are designed for use with Norgren R84 regulators and C84 regulator configurations. They are not recommended for use with other regulators and regulator configurations unless separate pressure relief protection is provided in each of the outlet lines.



R84, C84 Beverage Regulators

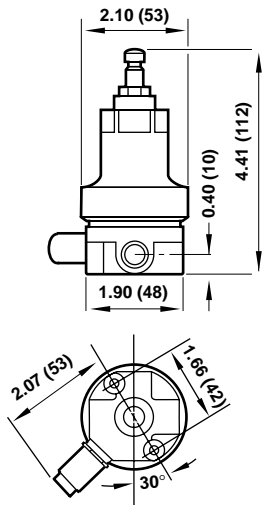
Ordering Information - C84 Regulator Configurations. Models listed include PTF threads, relieving diaphragm, 5 to 125 psig (0.3 to 8.5 bar) outlet pressure adjustment range†.

One Outlet Model C84-700	Four or Five Outlets Model C84-666
	
<p>Model C84-700 Includes:</p> <ul style="list-style-type: none"> ● R84-200-MNLA regulator with 150 psig (10.4 bar) integral relief valve (1) ● 18-013-244 inlet pressure gauge (1) ● 18-013-085 outlet pressure gauge (1) ● 18-008-002 cylinder connector (1) ● 16-009-001 check valve (1) 	<p>Model C84-666 Includes:</p> <ul style="list-style-type: none"> ● R84-200-MNLA regulator with 150 psig (10.4 bar) integral relief valve (1) ● 18-013-244 inlet pressure gauge (1) ● 18-013-085 outlet pressure gauge (1) ● 18-008-002 cylinder connector (1) ● 3228-60 manifold (1)

† Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

All Dimensions in Inches (mm)

R84 Regulator



Mounting Holes (2 Places)
0.18" (4.6mm) dia. by 0.39 (10mm) deep.
Use 10-32 thread forming screws.

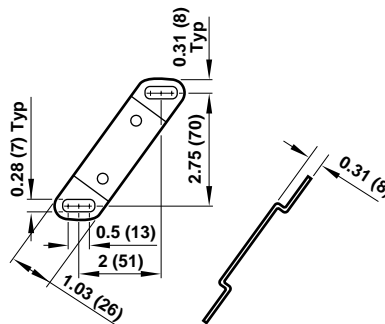
Service Kits

Item	Type	Part number
Service kits	Diaphragm, relieving	570-51
	Valve cartridge and seal	5086-55
	Kit, major	6309-04 *
	Relief valve and seal	5779-54 ††

* Kit contains diaphragm, slip ring, valve cartridge, and o-rings.

†† Relief valve is marked 150 PSIG RELIEF VALVE and has a brass body with a red end cap.

5095-51 Strap Type Bracket





WARNING

For safety in systems using Norgren Model R84 regulators, the following procedures must be followed.

1. Pressure relief valves of sufficient capacity must always be used in the secondary (outlet) lines downstream of each pressure regulator, whether as an integral part of the regulator, as is the case with Norgren Model R84 Regulator, or separately installed elsewhere in the outlet lines. Do not remove or attempt to adjust, plug, block or otherwise defeat the purpose of the relief valve. Do not replace a relief valve with any but an identical model. The relief valve used on the R84 regulator is preset and marked **150 PSIG RELIEF VALVE**. Replace only with the same 150 psig relief valve, part number 5779-54. The end cap on the 5779-54 relief valve is color coded red for visual identification. Failure to provide a pressure relief valve of sufficient capacity to hold outlet pressure below the lowest working pressure rating of any piece of equipment installed in the outlet lines can result in equipment damage and/or personal injury.
2. A back flow check valve must always be installed at the regulator or at each manifold outlet in liquid dispensing applications to prevent reverse flow through the regulator and possible introduction of liquids and other contaminants into the regulator.
3. Regulators must not be used where temperature or pressure may exceed those specified in the **Technical Data** paragraph.
4. The accuracy of the indication of pressure gauges can change, both during shipment (despite care in packaging) and during the service life. If a pressure gauge is to be used in conjunction with these products and if inaccurate indications may be hazardous to personnel or property, the gauge should be calibrated before initial installation and at regular intervals during use. For gauge standards refer to ANSI B40.1.
5. These regulators are not intended for use in life support systems, beer dispensing systems, with soft drink product (syrup) containers, or industrial cylinder gas systems.

- Underwriters Laboratories, Inc. listed (file number SA1089)
- The R81 regulator and C81 regulator configurations with integral relief valve and outlet check valves meet the requirements of paragraphs 4.5 and 4.6 of NSDA Pamphlet TD02, *Installation and Operational Procedures for Pressurized Soft Drink Dispensing Systems*, dated July, 1980.
- Integral relief valve easily replaced without disassembly of regulator and without affecting relief pressure setting
- Back flow check valve, or manifold with integral check valve at each outlet, can be installed in regulator outlet port. Manifolds available with 3 or 5 outlets and include one outlet cap.
- Relieving diaphragm allows outlet pressure setting to be reduced even though the system is dead-ended. Pressure downstream of check valves will not be reduced.
- Easily replaceable valve cartridge contains valve, valve seat, valve spring, and filter element
- Two high pressure ports (inlet and primary gauge) and two regulated pressure ports (outlet and secondary gauge)
- Diametrically opposite inlet ports facilitate manifolding for multiple dispensing applications. Each manifolded regulator operates independently as though attached directly to the gas supply source.
- Bonnet wrench hex same size as tank adapter - one wrench fits both



Materials:

Body: Brass

Bonnet: Zinc

Valve cartridge: Teflon, brass, stainless steel

Diaphragm: Acetal and nitrile

Relief valve: Brass, polycarbonate, nitrile, aluminum

Seals: Nitrile

Technical Data

Fluid: Carbon dioxide. The R81 regulator is designed for use in soft drink dispensing systems to control cylinder gas (carbon dioxide, nitrogen, air) pressure to the product containers. Other Norgren regulators (R84 for soft drink carbonators, R82 for beer, R83 for industrial cylinder gases) are available for use in other systems.

Maximum pressure: 3000 psig (207 bar)

Operating temperature: 0° to 140°F (-18° to 60°C)

Integral relief valve cracking pressure:

130 ± 4 psig (9.0 ± 0.28 bar)

See Section ALE-25 for Accessories



Ordering Information. Models listed include integral relief valve with cracking pressure of 130 ± 4 psig (9.0 ± 0.28 bar), PTF threads, relieving diaphragm, 5 to 100 psig (0.34 to 6.9 bar) outlet pressure adjustment range†. A gauge is not included.

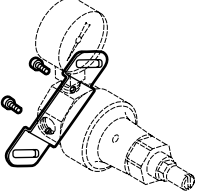



Port	Model	Weight lb (kg)
1/4"	R81-200-LNKA	1.3 (0.59)

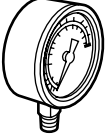

Alternative Models





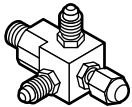
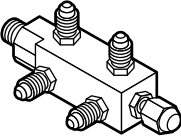
R 8 1 - 2 0 0 - L N ★ A

Outlet Pressure Adjustment Ranges †	Substitute
1 to 25 psig (0.07 to 1.7 bar)	T
2 to 50 psig (0.14 to 3.4 bar)	E
5 to 100 psig (0.34 to 6.9 bar)	K

Accessories

			
Wall Mounting Bracket	Pipe Plug, Hex Socket 1/4" PTF	Hex Nipple 1/4" PTF male	Union Adapter with Cap 1/4" PTF to 1/4" tube (45° flare)
Strap Type: 5095-51	2891-97	18-006-067	18-006-068
			Adapter only: 18-006-027 Cap only: 3302-50

	Inlet Fittings	
	2" (50 mm) diameter, 1/4 PTF connection	 Nitrogen Service Cylinder Connector 0.906-14 RH external thread CGA No. 580: 18-008-004	Carbon Dioxide Service Cylinder Connector 0.830-14 RH internal thread
15 psig (1 bar): 18-013-082		1.44" (27 mm) long nipple CGA No. 320: 18-008-002
30 psig (2 bar), UL Listed: 18-013-030		2.25" (57 mm) long nipple 18-008-015
60 psig (4 bar), UL Listed: 18-013-083		Replacement gasket: 1390-02
100 psig (7 bar), UL Listed: 18-013-084		
160 psig (11 bar), UL Listed: 18-013-085		
300 psig (20 bar), UL Listed: 18-013-086		
2000 psig (135 bar), UL Listed: 18-013-244		
3000 psig (205 bar), UL Listed: 18-013-087		

Single Outlet Fittings			Multiple Outlet Fittings		
Check Valve††	Check Valve††	Check and Relief Valve, * Relief cracking pressure: 130 ± 4 psig (9.0 ± 0.28 bar)	2 or 3 Port	4 or 5 Port Manifold Extension	
					
Check Valve, 1/4" PTF male to 1/4" tube (45° flare): 16-009-001	Check Valve, 1/4" PTF male to 1/2-16 BSF: 16-009-002	Check and Relief Valve, 1/4" PTF male to 1/4" tube (45° flare): 16-006-107	Manifolds with integral check valves ††		Streamline Wye **
Check Valve, 1/4" PTF male to 1/4" PTF female: 16-009-003			2 or 3 outlets, 1/4" PTF male to 1/4" tube (45° flare): 3228-54	2 or 3 outlets, 1/4" PTF male to 1/2-16 BSF: 3228-55	1/4" NPT male to 1/4" NPT female: 16-006-107
			4 or 5 outlets, 1/4" PTF male to 1/4" tube (45° flare): 3228-60	4 or 5 outlets, 1/4" PTF male to 1/2-16 BSF: 3228-61	
			Manifold extension, 1/4" PTF male to 1/4" PTF female: 2340-50		

† Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

†† The listed check valves and manifolds with integral check valves are designed for use with Norgren R81 regulators and C81 regulator configurations. They are not recommended for use with other regulators and regulator configurations unless separate pressure relief protection is provided in each of the outlet lines.

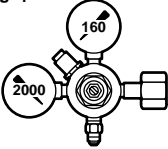
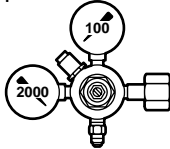
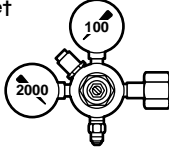
* The 16-006-107 check and relief valve meets the pressure and flow requirements of paragraphs 4.5 and 4.6 of NSDA Pamphlet TD02, **Installation and Operational Procedures for Pressurized Soft Drink Dispensing Systems**, dated July, 1980.

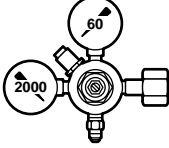
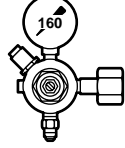
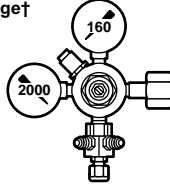
** Check valves, or manifolds with integral check valves, must be installed in the outlet ports of the wye when the wye is installed in the outlet port of the Norgren R81 regulator.



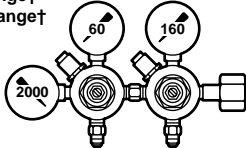
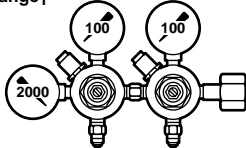
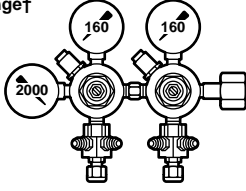
R81, C81 Beverage Regulators

Cylinder Connected, One Regulator Configurations

<p>Model C81-700 (One Outlet) 5 to 100 psig range†</p> 	<p>Model C81-702 (One Outlet) 5 to 100 psig range†</p> 	<p>Model C81-651 (One Outlet) 5 to 100 psig range†</p> 
<p>Model C81-700 Includes:</p> <ul style="list-style-type: none"> ● R81-200-LNKA regulator (1) ● 18-013-244 (2000 psi) inlet pressure gauge (1) ● 18-013-085 (160 psi) outlet pressure gauge (1) ● 18-008-002 cylinder connector (1) ● 16-009-001 check valve (1) 	<p>Model C81-702 Includes:</p> <ul style="list-style-type: none"> ● R81-200-LNKA regulator (1) ● 18-013-244 (2000 psi) inlet pressure gauge (1) ● 18-013-084 (100 psi) outlet pressure gauge (1) ● 18-008-002 cylinder connector (1) ● 16-009-001 check valve (1) 	<p>Model C81-651 Includes:</p> <ul style="list-style-type: none"> ● R81-200-LNKA regulator (1) ● 18-013-244 (2000 psi) inlet pressure gauge (1) ● 18-013-084 (100 psi) outlet pressure gauge (1) ● 18-008-002 cylinder connector (1) ● 16-009-002 check valve (1)

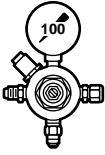
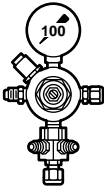
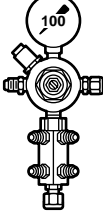
<p>Model C81-269 (One Outlet) 2 to 50 psig range†</p> 	<p>Model C81-684 (One Outlet) 5 to 100 psig range†</p> 	<p>Model C81-685 (Two or Three Outlets) 5 to 100 psig range†</p> 
<p>Model C81-269 Includes:</p> <ul style="list-style-type: none"> ● R81-200-LNEA regulator (1) ● 18-013-244 (2000 psi) inlet pressure gauge (1) ● 18-013-083 (60 psi) outlet pressure gauge (1) ● 18-008-002 cylinder connector (1) ● 16-009-001 check valve (1) 	<p>Model C81-684 Includes:</p> <ul style="list-style-type: none"> ● R81-200-LNKA regulator (1) ● 2891-97 pipe plug (1) ● 18-013-085 (160 psi) outlet pressure gauge (1) ● 18-008-002 cylinder connector (1) ● 16-009-001 check valve (1) 	<p>Model C81-685 Includes:</p> <ul style="list-style-type: none"> ● R81-200-LNKA regulator (1) ● 18-013-244 (2000 psi) inlet pressure gauge (1) ● 18-013-085 (160 psi) outlet pressure gauge (1) ● 18-008-002 cylinder connector (1) ● 3228-54 manifold (1)

Cylinder Connected, Two Regulator Configurations

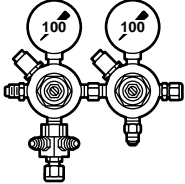
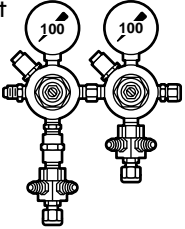
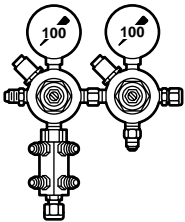
<p>Model C81-254 (Two Outlets) 2 to 50 psig range† 5 to 100 psig range†</p> 	<p>Model C81-652 (Two Outlets) 5 to 100 psig range†</p> 	<p>Model C81-573 (Four to Six Outlets) 5 to 100 psig range†</p> 
<p>Model C81-254 Includes:</p> <ul style="list-style-type: none"> ● R81-200-LNEA regulator (1) ● R81-200-LNKA regulator (1) ● 18-013-244 (2000 psi) inlet pressure gauge (1) ● 18-013-083 (60 psi) outlet pressure gauge (1) ● 18-013-085 (160 psi) outlet pressure gauge (1) ● 18-006-067 hex nipple (1) ● 18-008-002 cylinder connector (1) ● 16-009-001 check valve (2) 	<p>Model C81-652 Includes:</p> <ul style="list-style-type: none"> ● R81-200-LNKA regulator (2) ● 18-013-244 (2000 psi) inlet pressure gauge (1) ● 18-013-084 (100 psi) outlet pressure gauge (2) ● 18-006-067 hex nipple (1) ● 18-008-002 cylinder connector (1) ● 16-009-002 check valve (2) 	<p>Model C81-573 Includes:</p> <ul style="list-style-type: none"> ● R81-200-LNKA regulator (2) ● 18-013-244 (2000 psi) inlet pressure gauge (1) ● 18-013-085 (160 psi) outlet pressure gauge (2) ● 18-006-067 hex nipple (1) ● 18-008-002 cylinder connector (1) ● 3228-55 manifold (2)



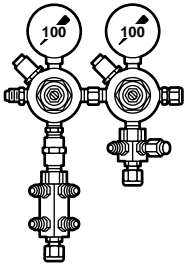
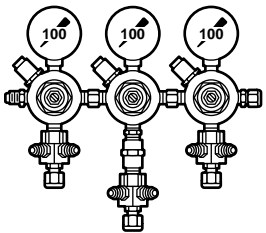
Wall Mounted, One Regulator Configurations

<p>Model C81-541 (One Outlet)</p> <p>5 to 100 psig range†</p> 	<p>Model C81-554 (Two or Three Outlets)</p> <p>5 to 100 psig range†</p> 	<p>Model C81-559 (Four or Five Outlets)</p> <p>5 to 100 psig range†</p> 
<p>Model C81-541 Includes:</p> <ul style="list-style-type: none"> ● R81-200-LNKA regulator with 9,0 bar (130 psig) integral relief valve (1) ● 18-013-084 (100 psi) outlet pressure gauge (1) ● 18-006-027 half-union adapter (1) ● 18-006-068 half-union adapter with cap (1) ● 16-009-001 check valve (1) ● 5095-51 mounting bracket (1) 	<p>Model C81-554 Includes:</p> <ul style="list-style-type: none"> ● R81-200-LNKA regulator with 9,0 bar (130 psig) integral relief valve (1) ● 18-013-084 (100 psi) outlet pressure gauge (1) ● 18-006-027 half-union adapter (1) ● 18-006-068 half-union adapter with cap (1) ● 3228-54 manifold (1) ● 5095-51 mounting bracket (1) 	<p>Model C81-559 Includes:</p> <ul style="list-style-type: none"> ● R81-200-LNKA regulator with 9,0 bar (130 psig) integral relief valve (1) ● 18-013-084 (100 psi) outlet pressure gauge (1) ● 18-006-027 half-union adapter (1) ● 18-006-068 half-union adapter with cap (1) ● 3228-60 manifold (1) ● 5095-51 mounting bracket (1)

Wall Mounted, Two Regulator Configurations

<p>Model C81-540 (Three or Four Outlets)</p> <p>5 to 100 psig range†</p> 	<p>Model C81-570 (Four to Six Outlets)</p> <p>5 to 100 psig range†</p> 	<p>Model C81-657 (Five or Six Outlets)</p> <p>5 to 100 psig range†</p> 
<p>Model C81-540 Includes:</p> <ul style="list-style-type: none"> ● R81-200-LNKA regulator (2) ● 18-013-084 (100 psi) outlet pressure gauge (2) ● 18-006-067 hex nipple (1) ● 18-006-027 half-union adapter (1) ● 18-006-068 half-union adapter with cap (1) ● 16-009-001 check valve (1) ● 3228-54 manifold (1) ● 5095-51 mounting bracket (2) 	<p>Model C81-570 Includes:</p> <ul style="list-style-type: none"> ● R81-200-LNKA regulator (2) ● 18-013-084 (100 psi) outlet pressure gauge (2) ● 18-006-067 hex nipple (1) ● 18-006-027 half-union adapter (1) ● 18-006-068 half-union adapter with cap (1) ● 2340-50 manifold extension (1) ● 3228-54 manifold (2) ● 5095-51 mounting bracket (2) 	<p>Model C81-657 Includes:</p> <ul style="list-style-type: none"> ● R81-200-LNKA regulator (2) ● 18-013-084 (100 psi) outlet pressure gauge (2) ● 18-006-067 hex nipple (1) ● 18-006-027 half-union adapter (1) ● 18-006-068 half-union adapter with cap (1) ● 16-009-001 check valve (1) ● 3228-60 manifold (1) ● 5095-51 mounting bracket (2)

Wall Mounted, Three Regulator Configuration

<p>Model C81-724 (Five to Eight Outlets)</p> <p>5 to 100 psig range†</p> 	<p>Model C81-324 (Six to Nine Outlets)</p> <p>5 to 100 psig range†</p> 
<p>Model C81-724 Includes:</p> <ul style="list-style-type: none"> ● R81-200-LNKA regulator (2) ● 18-013-084 (100 psi) outlet pressure gauge (2) ● 18-006-067 hex nipple (1) ● 18-006-027 half-union adapter (1) ● 18-006-068 half-union adapter (1) ● 2340-50 manifold extension (1) ● 3228-56 manifold (1) - Same as 3228-54 but includes two caps ● 3228-60 manifold (1) ● 5095-51 mounting bracket (2) 	<p>Model C81-324 Includes:</p> <ul style="list-style-type: none"> ● R81-200-LNKA regulator (3) ● 18-013-084 (100 psi) outlet pressure gauge (3) ● 18-006-067 hex nipple (2) ● 18-006-027 half-union adapter (1) ● 18-006-068 half-union adapter (1) ● 2340-50 manifold extension (1) ● 3228-54 manifold (3) ● 5095-51 mounting bracket (2)

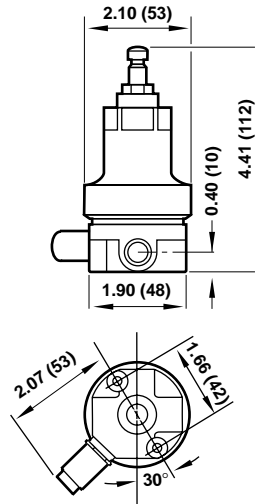
† Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.



R81, C81 Beverage Regulators

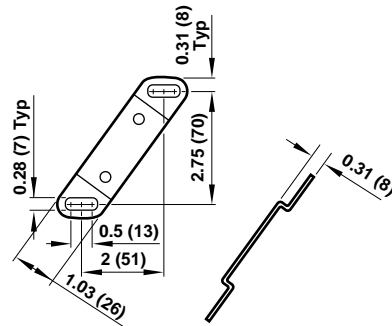
All Dimensions in Inches (mm)

R81 Regulator



Mounting Holes (2 Places)
 0.18" (4.6 mm) dia. by 0.39 (10 mm) deep.
 Use 10-32 thread forming screws.

5095-51 Strap Type Bracket



Service Kits

Item	Type	Part number
Service kits	Diaphragm, relieving	570-51
	Valve cartridge and seal	5086-55
	Kit, major	6309-04 *
	Relief valve and seal	5779-55 †

* Kit contains diaphragm, slip ring, valve cartridge, and o-rings.

† Relief valve is marked 130 PSIG RELIEF VALVE and has a brass body with a black end cap.



WARNING

Soft drink dispensing systems must be designed, installed, and operated in accordance with the guidelines set forth in NSDA pamphlet TD02, *Installation and Operational Procedures for Pressurized Soft Drink Dispensing Systems*, dated July, 1980 or subsequent revisions.

1. Pressure relief valves of sufficient capacity must always be used in the secondary (outlet) lines downstream of each pressure regulator, whether as an integral part of the regulator, as is the case with Norgren Model R81 Regulator, or separately installed elsewhere in the outlet lines. Do not remove or attempt to adjust, plug, block or otherwise defeat the purpose of the relief valve. Do not replace a relief valve with any but an identical model. The relief valve used on the R81 regulator is preset and marked **130 PSIG RELIEF VALVE**. Replace only with the same 130 psig relief valve, part number 5779-55. The end cap on the 5779-55 relief valve is color coded black for visual identification. Failure to provide a pressure relief valve of sufficient capacity to hold outlet pressure below the lowest working pressure rating of any piece of equipment installed in the outlet lines can result in equipment damage and/or personal injury.
2. A back flow check valve must always be installed at the regulator or at each manifold outlet in liquid dispensing applications to prevent reverse flow through the regulator and possible introduction of liquids and other contaminants into the regulator.
3. Regulators must not be used where temperature or pressure may exceed those specified in the **Technical Data** paragraph.
4. The accuracy of the indication of pressure gauges can change, both during shipment (despite care in packaging) and during the service life. If a pressure gauge is to be used in conjunction with these products and if inaccurate indications may be hazardous to personnel or property, the gauge should be calibrated before initial installation and at regular intervals during use. For gauge standards refer to ANSI B40.1.
5. These regulators are not intended for use in life support systems, beer dispensing systems, soft drink carbonator systems, or industrial cylinder gas systems.

- Underwriters Laboratories, Inc. listed (file number SA1089)
- The R82 regulator with integral relief valve meets the requirements of Proposed Section 9.7, *Draught Beer Dispensing Equipment and Related Components* (Seventh Draft dated October 17, 1980), of ANSI-ASME F2.1-1975, Food, Drug, and Beverage Equipment.
- Integral relief valve easily replaced without disassembly of regulator and without affecting relief pressure setting
- Back flow check valve, or manifold with integral check valve at each outlet, can be installed in regulator outlet port. Manifolds available with 3 or 5 outlets and include one outlet cap.
- Relieving diaphragm allows outlet pressure setting to be reduced even though the system is dead-ended. Pressure downstream of check valves will not be reduced.
- Easily replaceable valve cartridge contains valve, valve seat, valve spring, and filter element
- Two high pressure ports (inlet and primary gauge) and two regulated pressure ports (outlet and secondary gauge)
- Diametrically opposite inlet ports facilitate manifolding for multiple dispensing applications. Each manifolded regulator operates independently as though attached directly to the gas supply source.
- Bonnet wrench hex same size as tank adapter - one wrench fits both



Materials:

Body: Brass

Bonnet: Zinc

Valve cartridge: Teflon, brass, stainless steel

Diaphragm: Acetal and nitrile

Relief valve: Brass, polycarbonate, nitrile, aluminum

Seals: Nitrile

Technical Data

Fluid: Carbon dioxide. The R82 regulator is designed for use in beer dispensing systems to control cylinder gas (carbon dioxide) pressure to the beer keg. Other Norgren regulators (R81 for soft drink syrup containers, R84 for soft drink carbonators, R83 for industrial cylinder gases) are available for use in other systems.

Maximum pressure: 3000 psig (207 bar)

Operating temperature: 0° to 140°F (-18° to 60°C)

Maximum outlet pressure adjustment limit: Factory set at 40 to 45 psig (2.8 to 3.1 bar)

Integral relief valve cracking pressure:

60 ± 4 psig (4.1 ± 0.28 bar)

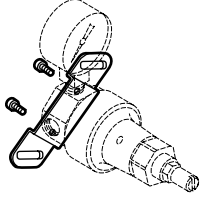



See Section ALE-25 for Accessories

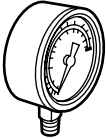

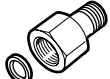



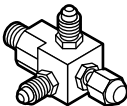
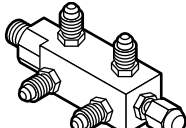

Ordering Information. Models listed include integral relief valve with cracking pressure of 60 ± 4 psig (4.1 ± 0.28 bar), PTF threads, relieving diaphragm, 2 to 45 psig (0.14 to 3.1 bar) outlet pressure adjustment range†. A gauge is not included.

Port	Model	Weight lb (kg)
1/4"	R82-200-ENEA	1.3 (0.59)

Accessories

			
Wall Mounting Bracket	Pipe Plug, Hex Socket 1/4" PTF	Hex Nipple 1/4" PTF male	Union Adapter with Cap 1/4" PTF to 1/4" tube (45° flare)
Strap Type: 5095-51	2891-97	18-006-067	18-006-068
			Adapter only: 18-006-027 Cap only: 3302-50

	Inlet Fittings	
		
Ø 50 mm (2") diameter, 1/4" PTF connection	Nitrogen Service Cylinder Connector 0.906-14 RH external thread CGA No. 580: 18-008-004	Carbon Dioxide Service Cylinder Connector 0.830-14 RH internal thread
15 psig (1 bar): 18-013-082		1.44" (37 mm) long nipple CGA No. 320: 18-008-002
30 psig (2 bar), UL Listed: 18-013-030		2.25" (57 mm) long nipple 18-008-015
60 psig (4 bar), UL Listed: 18-013-083		Replacement gasket: 1390-02
100 psig (7 bar), UL Listed: 18-013-084		
160 psig (11 bar), UL Listed: 18-013-085		
300 psig (20 bar), UL Listed: 18-013-086		
2000 psig (135 bar), UL Listed: 18-013-244		
3000 psig (205 bar), UL Listed: 18-013-087		

Single Outlet Fittings - Check Valves ††	Multiple Outlet Fittings - Manifolds with integral check valves ††		
	2 or 3 Port	4 or 5 Port	Manifold Extension
			
Check Valve, 1/4" PTF male to 1/4" tube (45° flare): 16-009-001	2 or 3 outlets, 1/4" PTF male to 1/4" tube (45° flare): 3228-54		
Check Valve, 1/4" PTF male to 1/2-16 BSF: 16-009-002	2 or 3 outlets, 1/4" PTF male to 1/2-16 BSF: 3228-55		
Check Valve, 1/4" PTF male to 1/4" PTF female: 16-009-003	4 or 5 outlets, 1/4" PTF male to 1/4" tube (45° flare): 3228-60		
	4 or 5 outlets, 1/4" PTF male to 1/2-16 BSF: 3228-61		
	Manifold extension, 1/4" PTF male to 1/4" PTF female: 2340-50		

† Outlet pressure can be adjusted to pressures in excess of, and less than, that specified. Do not use these units to control pressures outside of the specified range.

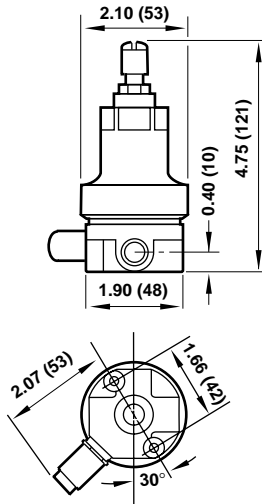
†† The listed check valves and manifolds with integral check valves are designed for use with Norgren R82 regulators. They are not recommended for use with other regulators unless separate pressure relief protection is provided in each of the outlet lines.



R82 Beverage Regulators

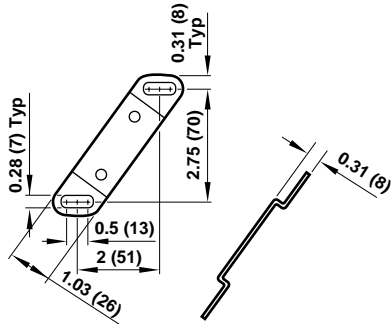
All Dimensions in Inches (mm)

R82 Regulator



Mounting Holes (2 Places)
0.18" (4.6 mm) dia. by 0.39" (10 mm) deep.
Use 10-32 thread forming screws.

5095-51 Strap Type Bracket



Service Kits

Item	Type	Part number
Service kits	Diaphragm, relieving	570-51
	Valve cartridge and seal	5086-55
	Kit, major	6309-04 *
	Relief valve and seal	5779-56 †

* Kit contains diaphragm, slip ring, valve cartridge, and o-rings.

† Relief valve is marked **60 PSIG RELIEF VALVE** and has a brass body with a natural (silver colored) aluminum end cap.

WARNING

Beer dispensing systems must be designed, installed, and operated in accordance with the applicable guidelines such as the proposed Section 9.7, **Draught Beer Dispensing Equipment and Related Components** (Seventh Draft dated October 17, 1980), of ANSI-ASME F2.1-1975, Food, Drug and Beverage Equipment or subsequent revisions.

1. Pressure relief valves of sufficient capacity must always be used in the secondary (outlet) lines downstream of each pressure regulator, whether as an integral part of the regulator, as is the case with Norgren Model R82 Regulator, or separately installed elsewhere in the outlet lines. Do not remove or attempt to adjust, plug, block or otherwise defeat the purpose of the relief valve. Do not replace a relief valve with any but an identical model. The relief valve used on the R82 regulator is preset and marked **60 PSIG RELIEF VALVE**. Replace only with the same 60 psig relief valve, part number 5779-56. The end cap on the 5779-56 relief valve is color coded silver for visual identification. Failure to provide a pressure relief valve of sufficient capacity to hold outlet pressure below the lowest working pressure rating of any piece of equipment installed in the outlet lines can result in equipment damage and/or personal injury.
2. A back flow check valve must always be installed at the regulator or at each manifold outlet in liquid dispensing applications to prevent reverse flow through the regulator and possible introduction of liquids and other contaminants into the regulator.
3. Regulators must not be used where temperature or pressure may exceed those specified in the **Technical Data** paragraph.
4. The accuracy of the indication of pressure gauges can change, both during shipment (despite care in packaging) and during the service life. If a pressure gauge is to be used in conjunction with these products and if inaccurate indications may be hazardous to personnel or property, the gauge should be calibrated before initial installation and at regular intervals during use. For gauge standards refer to ANSI B40.1.
5. These regulators are not intended for use in life support systems, soft drink carbonator systems, with soft drink product (syrup) containers, or industrial cylinder gas systems.

Filter/Regulators

Compressed air, general purpose,
and Instrument Filter/Regulators
1/8" to 1-1/2" port sizes

B07 Miniature General Purpose Filter/Regulator 1/8" and 1/4" ports	ALE-13-2
B72G Excelon General Purpose Filter/Regulator 1/4" and 3/8" ports	ALE-13-4
B73G Excelon General Purpose Filter/Regulator 1/4", 3/8", and 1/2" ports	ALE-13-6
B74G Excelon General Purpose Filter/Regulator 3/8", 1/2", and 3/4" ports	ALE-13-8
B64G Olympian Plus General Purpose Filter/Regulator 1/4", 3/8", 1/2", and 3/4" ports	ALE-13-10
B68G Olympian Plus General Purpose Filter/Regulator 3/4", 1", 1-1/4", and 1-1/2" ports	ALE-13-12
B39 Miniature Oil Removal Filter/Regulator 1/8" and 1/4" ports	ALE-13-14
B38 Instrument Filter/Regulator Aluminum 1/4" ports	ALE-13-16
Filter/Regulator Overview and FAQ's	ALE-13-18



B07



B72G



B73G



B74G



B64G

Product available
1st quarter of 2001

B68G



B39



B38

Series 07 General Purpose Filter/Regulator
1/8" and 1/4" Port Sizes

- **Compact design**
- **Full flow gauge ports**
- **Low torque, non-rising adjusting knob**
- **Snap action knob locks pressure setting when pushed in**
- **Standard relieving models allow reduction of outlet pressure even when the system is dead-ended**
- **Protects air operated devices by removing liquid and solids contaminants**
- **Screw-on bowl reduces maintenance time**
- **Can be disassembled without the use of tools or removal from the air line**



Ordering Information. Models listed include PTF threads, transparent bowl, relieving diaphragm, gauge, automatic drain, 5 µm element, 5 to 100 psig (0.3 to 7 bar) outlet pressure adjustment range* .

Port Size	Model Number	Flow† scfm (dm ³ /s)	Weight lbs (kg)
1/8"	B07-101-A1KA	13 (6.2 dm ³ /s)	0.57 (0.26)
1/4"	B07-201-A1KA	14 (6.5 dm ³ /s)	0.57 (0.26)

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

† Typical flow with 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a 15 psig (1 bar) drop from set.

Alternative Models



Port Size	Substitute
1/8"	1
1/4"	2

Bowl	Relief Type	Gauge	Substitute
Transparent	Relieving	Without	01
Transparent	Relieving	With	02
Transparent	Non-relieving	Without	03
Transparent	Non-relieving	With	23
Metal	Relieving	Without	33
Metal	Relieving	With	34
Metal	Non-relieving	Without	35
Metal	Non-relieving	With	36

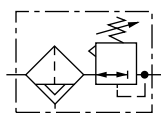
Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Outlet Pressure Adjustment Ranges*	Substitute
1 to 10 psig (0.1 to 0.7 bar)	A
5 to 50 psig (0.3 to 3.5 bar)	E
5 to 100 psig (0.3 to 7 bar)	K

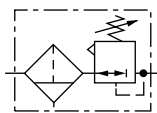
Element	Substitute
5 µm	1
40 µm	3

Drain	Substitute
Automatic	A
Manual	M

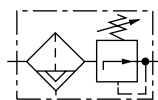
ISO Symbols



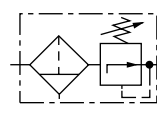
Automatic Drain Relieving



Manual Drain Relieving



Automatic Drain Non Relieving



Manual Drain Non Relieving

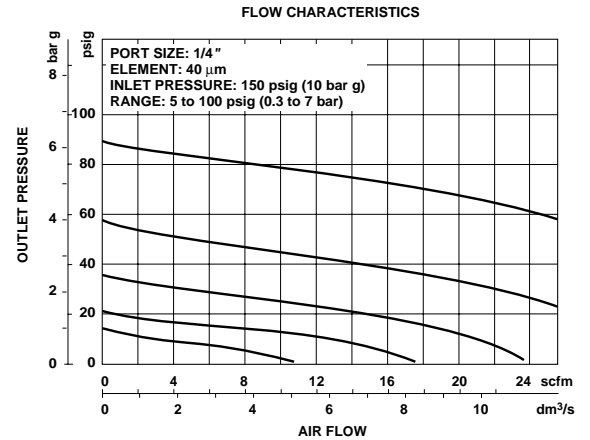
See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air
 Maximum pressure
 Transparent bowl: 150 psig (10 bar)
 Metal bowl: 250 psig (17 bar)
 Operating temperature*
 Transparent bowl: 30° to 125°F (-34° to 50°C)
 Metal bowl: -30° to 150°F (-34° to 65°C)
 * Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)
 Particle removal: 5 µm or 40 µm filter element
 Air quality: Within ISO 8573-1, Class 3 and Class 5 (particulates)
 Typical flow at 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a drop of 15 psig (1 bar) from set
 1/8" Ports: 13 scfm (6.2 dm³/s) with 5 µm element
 1/4" Ports: 14 scfm (6.5 dm³/s) with 5 µm element
 Nominal bowl size: 1 fluid ounce (31 ml)
 Gauge ports:
 1/8" PTF with PTF main ports
 1/8" ISO Rc with ISO Rc main ports
 1/8" ISO Rc with ISO G main ports
 Drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
 Automatic drain operation: Spitter type drain operates momentarily when a rapid change in air flow occurs or when the supply pressure is reduced.
 Materials:
 Body: Zinc
 Bonnet: Acetal
 Valve: Brass/nitrile
 Valve seat: Acetal
 Bowl
 Transparent: Polycarbonate
 Metal: Zinc
 Element: Sintered polypropylene
 Elastomers: Nitrile

Typical Performance Characteristics

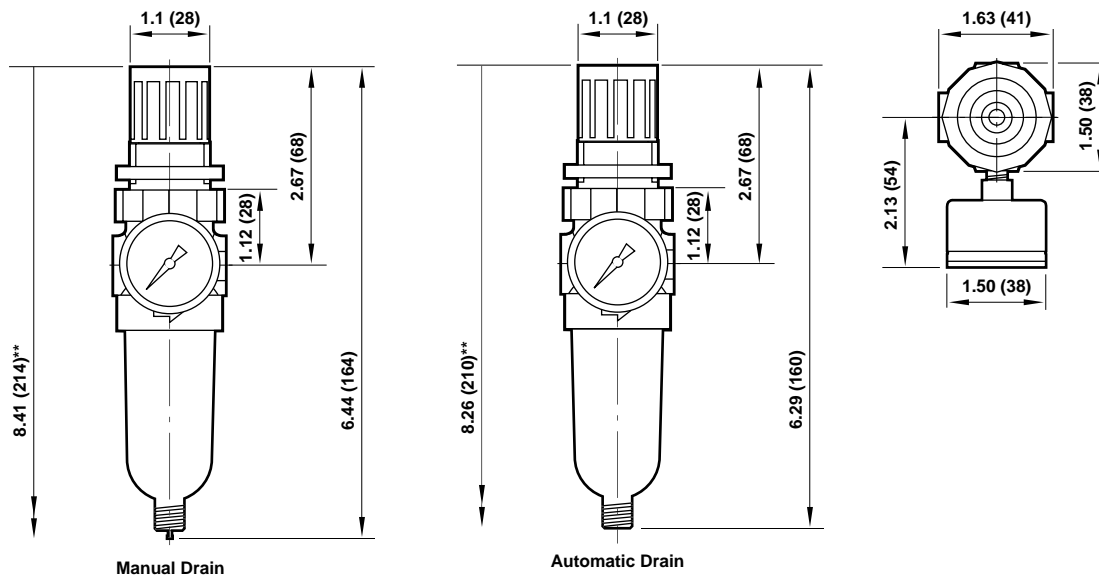


Service Kits

Item	Type	Part number
Service kit	Relieving models, 40 µm element	3820-14
	Non relieving models, 40 µm element	3820-13
Replacement drains	Manual	773-03
	Automatic	3654-02

Service kit includes slip ring, diaphragm, valve seat with o-ring, valve, valve spring, element, element gasket, and bowl o-ring.

All Dimensions in Inches (mm)



** Minimum clearance to remove bowl
 Panel mounting hole diameter 1.19" (30 mm)
 Panel thickness: 0.25" (6 mm)

Excelon® 72 Series Filter/Regulator 1/4" and 3/8" Port Sizes

- EXCELRON design allows in-line or modular installation
- High efficiency water and particle removal
- Quick release bayonet bowl
- Highly visible, prismatic liquid level indicator lens on metal bowls
- Full flow gauge ports
- Balanced valve design for optimum pressure control
- Push to lock adjusting knob with tamper resistant accessory
- Modular installations with EXCELRON 72, 73, and 74 series can be made to suit particular applications



Ordering Information. Models listed include PTF threads, knob adjustment, automatic drain, long transparent bowl without guard, 40 µm element, relieving diaphragm, 5 to 150 psig (0.3 to 10 bar) outlet pressure adjustment range*, with gauge.

Port Size	Model	Flow† scfm (dm³/s)	Weight lb (kg)
1/4"	B72G-2AK-AL3-RMG	80 (38)	1.3 (0.59)
3/8"	B72G-3AK-AL3-RMG	80 (38)	1.3 (0.59)

† Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a 15 psig (1 bar) droop from set.

Alternative Models

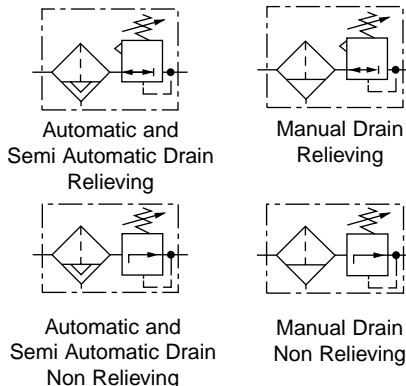
B 7 2 G - ★ ★ ★ - ★ ★ ★ - ★ ★ ★

Port Size	Substitute	Gauge	Substitute
1/4"	2	With	G
3/8"	3	Without	N
Threads	Substitute	Outlet Pressure Adjustment Range*	Substitute
PTF	A	5 to 30 psig (0.3 to 2 bar)	C
ISO Rc taper	B	5 to 60 psig (0.3 to 4 bar)	F
ISO G parallel	G	5 to 150 psig (0.3 to 10 bar)	M
Adjustment	Substitute	Diaphragm	Substitute
Knob	K	Relieving	R
T-bar	T	Non relieving	N
		Element	Substitute
		5 µm	1
		25 µm	2
		40 µm	3
		Bowl	Substitute
		Short metal with liquid level indicator	D
		Long metal with liquid level indicator	E
		Short transparent without guard	T
		Long transparent without guard	L
		Long transparent with guard	W
		Drain	Substitute
		1/4 turn manual	Q
		Semi automatic	S
		Auto drain**	A

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

** Supplied in long bowl options only

ISO Symbols



See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure: Transparent bowl: 150 psig (10 bar)

Metal bowl: Manual or semi automatic drain: 250 psig (17 bar)

Automatic drain: 150 psig (10 bar)

Operating temperature*: Transparent bowl: -30° to 125°F (-34° to 50°C)

Metal bowl: -30° to 150°F (-34° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5 µm, 25 µm or 40 µm. Within ISO 8573-1, Class 3 and Class 5
 Typical flow at 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 1 bar (15 psig) from set: 80 scfm (38 dm³/s)

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Semi automatic drain connection: Push on 5/16" (8 mm) ID tube

Semi automatic drain operating conditions (pressure operated):

Bowl pressure required to close drain: Greater than 1.5 psig (0.1 bar)

Bowl pressure required to open drain: Less than 1.5 psig (0.1 bar)

Minimum air flow required to close drain: 1 scfm (0.5 dm³/s)

Manual operation: Lift stem to drain bowl

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.

Automatic drain operating conditions (float operated):

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 0.2 scfm (0.1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

Gauge ports: 1/8" PTF with PTF main ports

1/8" ISO Rc with ISO Rc main ports

1/8" ISO Rc with ISO G main ports

Nominal bowl size: Short bowl: 1.9 fluid ounce (56 ml)

Long bowl: 2.2 fluid ounce (65 ml)

Materials

Body: Zinc

Bonnet: Acetal

Valve: Brass

Bowl

Transparent: Polycarbonate

Guard for transparent bowl: Zinc

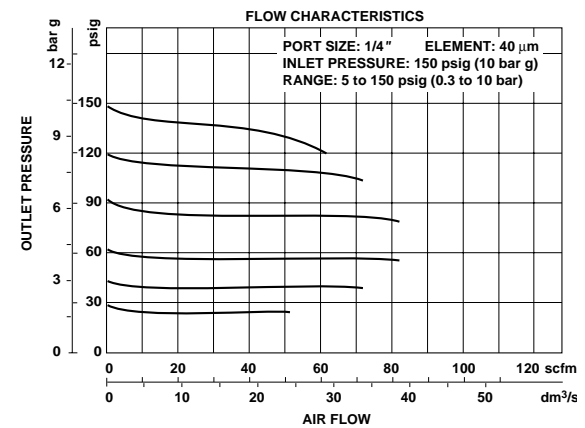
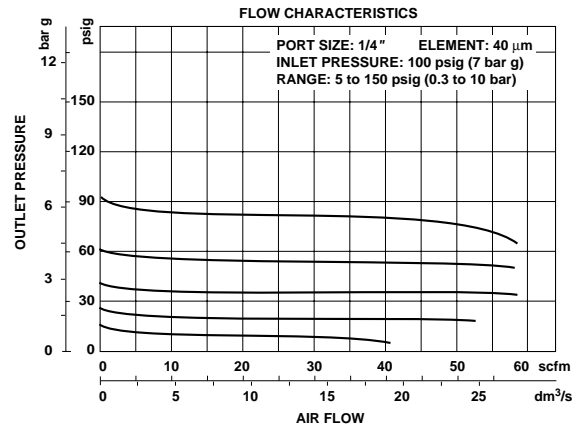
Metal bowl liquid level indicator lens:

Transparent nylon

Element: Sintered polypropylene

Elastomers: Neoprene and nitrile

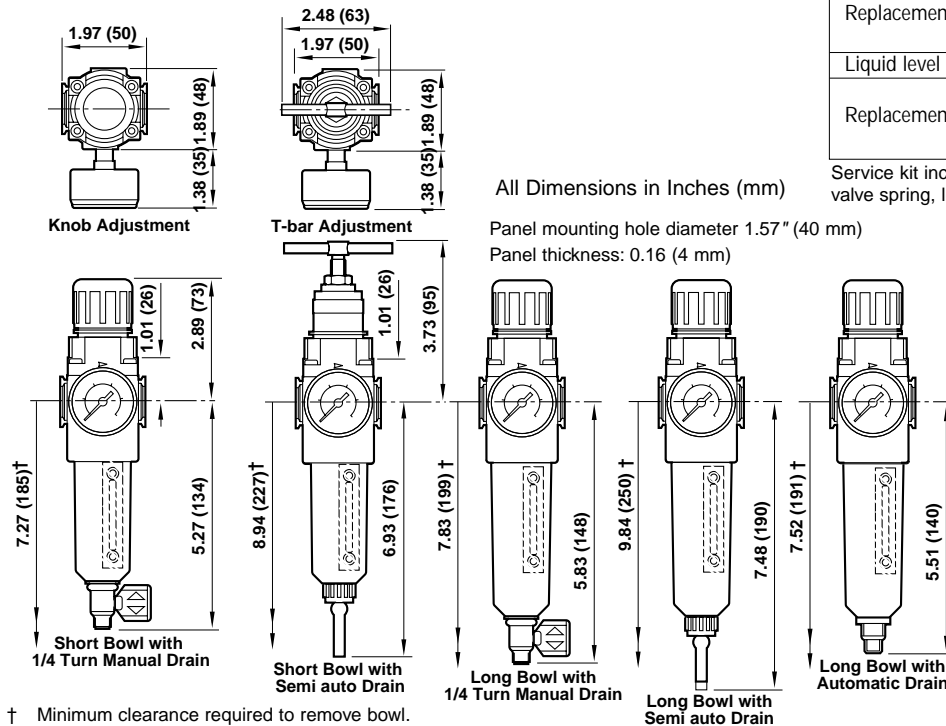
Typical Performance Characteristics



Service Kits

Item	Type	Part Number
Service kit	Relieving	4383-500
	Non relieving	4383-501
Replacement elements	5 µm	5925-03
	25 µm	5925-01
	40 µm	5925-02
Liquid level lens kit	Prismatic	4380-030
Replacement drains	1/4 turn manual	619-50
	Semi automatic	5379-RK
	Automatic	4000-50R

Service kit includes diaphragm assembly, valve assembly, valve spring, louvre o-ring, bowl o-ring, drain seal.



All Dimensions in Inches (mm)

Panel mounting hole diameter 1.57" (40 mm)

Panel thickness: 0.16 (4 mm)

Excelon[®] 73 Series Filter/Regulator
1/4", 3/8", 1/2" Port Sizes

- Excelon design allows in-line or modular installation
- Quick release bayonet bowl
- Highly visible, prismatic liquid level indicator lens
- Full flow gauge ports
- Balanced valve design minimizes effect of variation in the inlet pressure on the outlet pressure
- Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications



Ordering Information. Models listed include PTF threads, knob adjustment, automatic drain, metal bowl with liquid level indicator, 40 µm element, relieving diaphragm, 5 to 150 psig (0.3 to 10 bar) outlet pressure adjustment range* with gauge.

Main Port Size	Model Number	Flow [†] scfm (dm ³ /s)	Weight lb (kg)
1/4"	B73G-2AK-AD3-RMG	78 (37)	1.76 (0.82)
3/8"	B73G-3AK-AD3-RMG	123 (58)	1.76 (0.82)
1/2"	B73G-4AK-AD3-RMG	123 (58)	1.76 (0.82)

† Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from set.

Alternative Models

B 7 3 G - ★ ★ ★ - ★ ★ ★ - ★ ★ ★

Port Size	Substitute
1/4"	2
3/8"	3
1/2"	4

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Adjustment	Substitute
Knob	K
T-bar	T

Drain	Substitute
Automatic	A
Manual, 1/4 turn	Q

Bowl	Substitute
Metal with liquid level indicator	D
Transparent with guard	P
Transparent	T

Gauge	Substitute
With	G
Without	N

Outlet Pressure Adjustment Range*	Substitute
5 to 60 psig (0.3 to 4 bar)	F
5 to 150 psig (0.3 to 10 bar)	M
10 to 250 psig (0.7 to 17 bar)**	S

Diaphragm	Substitute
Relieving	R
Non relieving	N

Element	Substitute
5 µm	1
25 µm	2
40 µm	3

*Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

**Units with 250 psig (17 bar) outlet pressure range are available only with the standard metal bowl.

See Section ALE-25 for Accessories



B73G Filter/Regulators

All Dimensions in Inches (mm)

Technical Data

Fluid: Compressed air

Maximum pressure

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*

Transparent bowl: -30° to 125°F (-34° to 50°C)

Metal bowl: -30° to 175°F (-34° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5 µm, 25 µm or 40 µm filter element

Air quality: Within ISO 8573-1, Class 3 and Class 5 (particulates)

Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from set: 123 scfm (58 dm³/s)

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.

Automatic drain operating conditions (float operated):

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 0.2 scfm (0.1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size: 3.5 fluid ounce (0.1 liter)

Gauge ports:

1/4" PTF with PTF main ports

Rc1/4 with ISO Rc main ports

Rc1/8 with ISO G main ports

Materials

Body: Aluminum

Bonnet: Aluminum or Zinc

Valve: Brass

Bowl:

Transparent: Polycarbonate

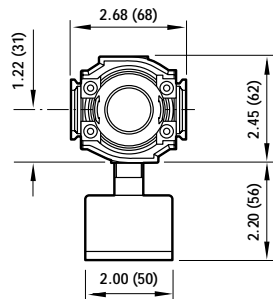
Transparent with guard: Polycarbonate, steel guard

Metal: Aluminum

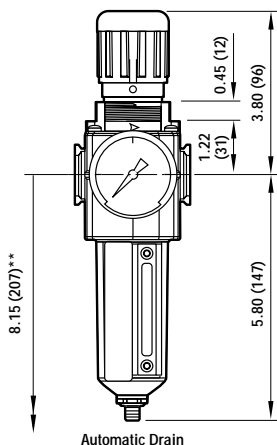
Metal bowl liquid level indicator lens: Transparent nylon

Element: Sintered polypropylene

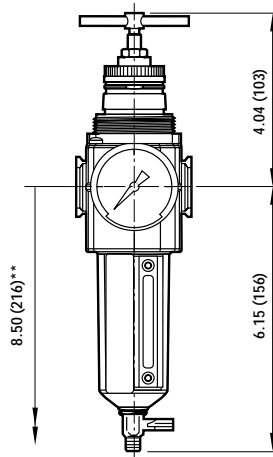
Elastomers: Neoprene and nitrile



Panel mounting hole diameter 1.89" (48 mm)
Panel thickness: 0.25 (6 mm)



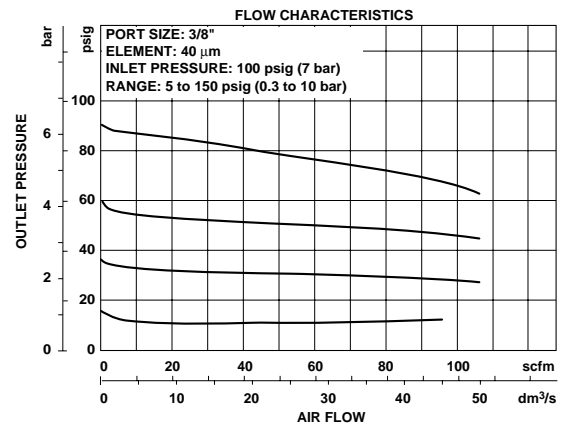
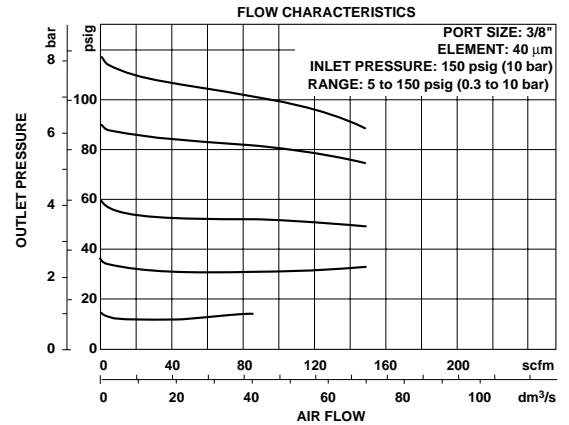
Automatic Drain



1/4 Turn Manual Drain

** Minimum clearance to remove bowl.

Typical Performance Characteristics

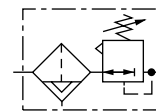


Service Kits

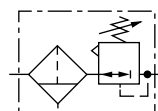
Item	Type	Part Number
Service kit	Relieving	4383-600
	Non-relieving	4383-601
Replacement elements	5 µm	4438-01
	25 µm	4438-02
	40 µm	4438-03
Liquid level lens kit	Prismatic	4380-020
Replacement drains	Automatic	4000-51R
	Manual quarter turn	619-50

Service kit includes diaphragm assembly, valve assembly, valve spring, bowl o-ring, and automatic drain seal.

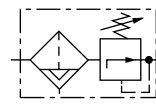
ISO Symbols



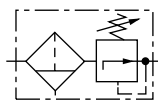
Automatic Drain, Relieving



Manual Drain, Relieving



Automatic Drain, Non-Relieving



Manual Drain, Non-Relieving

Excelon[®] 74 Series Filter/Regulator 3/8", 1/2", 3/4" Port Sizes

- EXCELRON design allows in-line or modular installation
- Quick release bayonet bowl
- Highly visible, prismatic liquid level indicator lens
- Full flow gauge ports
- Balanced valve design minimizes effect of variation in the inlet pressure on the outlet pressure
- Modular installations with EXCELRON 72, 73, and 74 series can be made to suit particular applications



Ordering Information. Models listed include PTF threads, knob adjustment, automatic drain, metal bowl with liquid level indicator, 40 µm element, relieving diaphragm, 5 to 150 psig (0.3 to 10 bar) outlet pressure adjustment range*, with gauge.

Main Port Size	Model Number	Flow [†] scfm (dm ³ /s)	Weight lb (kg)
3/8"	B74G-3AK-AD3-RMG	163 (77)	2.62 (1.19)
1/2"	B74G-4AK-AD3-RMG	212 (100)	2.59 (1.17)
3/4"	B74G-6AK-AD3-RMG	212 (100)	2.55 (1.16)

[†] Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a 15 psig (1 bar) droop from set.

Alternative Models

B 7 4 G - ★ ★ ★ - ★ ★ ★ - ★ ★ ★

Port Size	Substitute
3/8"	3
1/2"	4
3/4"	6

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Adjustment	Substitute
Knob	K
T-bar	T

Drain	Substitute
Automatic	A
Manual, 1/4 turn	Q

Gauge	Substitute
With	G
Without	N
Outlet Pressure Adjustment Range*	Substitute
5 to 60 psig (0.3 to 4 bar)	F
5 to 150 psig (0.3 to 10 bar)	M
10 to 250 psig (0.7 to 17 bar)**	S
Diaphragm	Substitute
Relieving	R
Non relieving	N
Element	Substitute
5 µm	1
25 µm	2
40 µm	3
Bowl	Substitute
Metal with liquid level indicator	D
Transparent with guard	P

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

** Units with 250 psig (17 bar) outlet pressure range are available only with the T-bar adjustment; therefore substitute **T** at the 7th digit and **S** at the 12th position.

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure:

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*:

Transparent bowl: -30° to 125°F (-34° to 50°C)

Metal bowl: -30° to 175°F (-34° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5, 25 or 40 µm filter element

Air quality: Within ISO 8573-1, Class 3 and Class 5 (particulates)

Typical flow with 150 psig (10 bar) inlet pressure, 6.3 (90 psig) set pressure and a droop of 15 psig (1 bar) from set: 212 scfm (100 dm³/s)

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Automatic drain operating conditions (float operated):

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 2 scfm (1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size: 7 fluid ounce (0.2 liter)

Gauge ports:

1/4" PTF with PTF main ports

Rc1/4 with ISO Rc main ports

Rc1/8 with ISO G main ports

Materials

Body: Aluminum

Bonnet: Aluminum

Valve: Brass

Bowl

Transparent: Polycarbonate with steel bowl guard

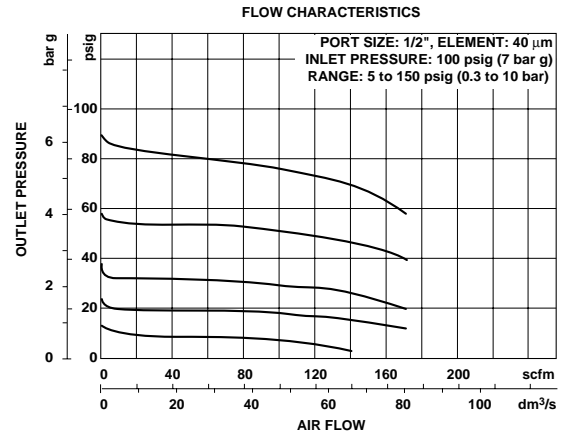
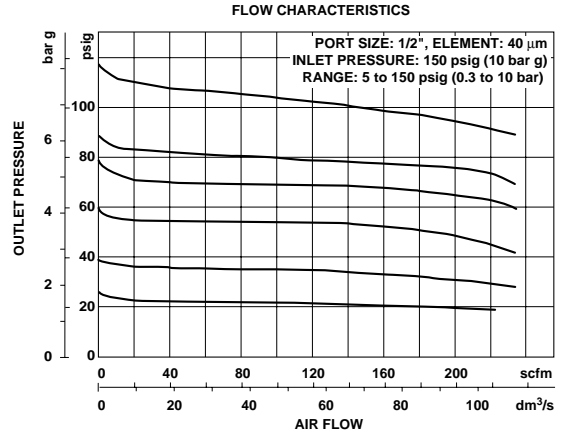
Metal: Aluminum

Metal bowl liquid level indicator lens: Transparent nylon

Element: Sintered plastic

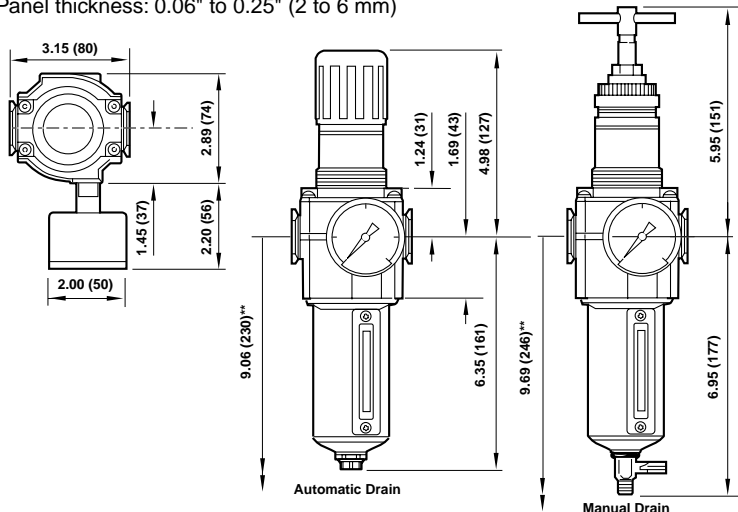
Elastomers: Neoprene and Nitrile

Typical Performance Characteristics



Panel mounting hole diameter: 2.06" (52 mm)

Panel thickness: 0.06" to 0.25" (2 to 6 mm)



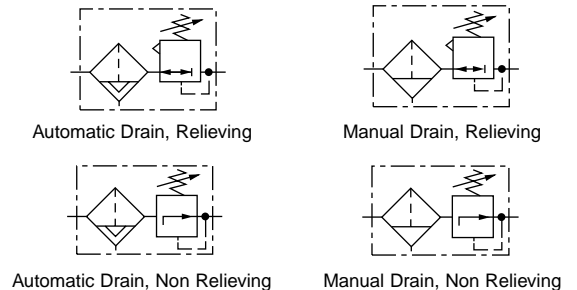
** Minimum clearance to remove bowl.

Service Kits

Item	Type	Part Number
Service kit	Relieving	4383-700
	Non relieving	4383-701
Replacement elements	5 µm	4338-04
	25 µm	4338-07
	40 µm	4338-05
Liquid level lens kit	Prismatic	4380-050
Replacement drains	Automatic (1/8 NPT outlet)	3000-10
	Manual quarter turn	619-50

Service kit includes diaphragm assembly, valve assembly, valve spring, louvre o-ring, bowl o-ring, drain seal.

ISO Symbols



Olympian Plus Filter/Regulator
1/4", 3/8", 1/2", 3/4" Port Sizes

- Olympian Plus plug in design
- High Efficiency water and particle removal
- Quick release bayonet bowl
- High visibility prismatic sight glass
- Push to lock adjusting knob with tamper resistant option



Ordering Information. Models listed include PTF threads, knob adjustment, automatic drain, metal bowl, 40 µm element, relieving diaphragm, 5 to 150 psig (0.3 to 10 bar) outlet pressure adjustment range* with gauge.

Port Size	Model	Flow [†] scfm (dm ³ /s)	Weight lb (kg)
1/4"	B64G-2AK-AD3-RMG	64 (30)	3.80 (1.71)
3/8"	B64G-3AK-AD3-RMG	161 (76)	3.76 (1.69)
1/2"	B64G-4AK-AD3-RMG	225 (106)	3.69 (1.66)
3/4"	B64G-6AK-AD3-RMG	225 (106)	4.49 (2.02)

† Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a 15 psig (1 bar) droop from set.

Alternative Models

		B	6	4	G	-	★	★	★	-	★	★	★	-	★	★	★		
Port Size	Substitute															Gauge	Substitute		
1/4"	2															With	G		
3/8"	3															Without	N		
1/2"	4															Outlet Pressure Adjustment Range*	Substitute		
3/4"	6															5 to 60 psig (0.3 to 4 bar)	F		
Threads	Substitute															5 to 150 psig (0.3 to 10 bar)	M		
PTF	A															10 to 250 psig (0.7 to 17 bar)	S**		
ISO Rc taper	B															Diaphragm	Substitute		
ISO G parallel	G															Relieving	R		
Adjustment	Substitute															Non relieving	N		
Knob	K															Element	Substitute		
T-bar	T															5 µm	1		
																25 µm	2		
																40 µm	3		
																Bowl	Substitute		
																Metal with liquid level indicator	D		
																Guarded Transparent	P		
																Drain	Substitute		
																1/4 turn manual	Q		
																Automatic	A		

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

** Units with 250 psig (17 bar) adjustment range are available only with the T-bar adjustment; therefore substitute **T** at the 7th digit and **S** at the 12th position.

See Section ALE-25 for Accessories

B64G Filter/Regulators

All Dimensions in Inches (mm)



Technical Data

Fluid: Compressed air

Maximum pressure

Guarded transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*

Guarded transparent bowl: -30° to 125°F (-34° to 50°C)

Metal bowl: -30° to 175°F (-34° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5, 25 or 40 µm. Within ISO 8573-1, Class 3 and Class 5

Typical flow at 90 psig (6.3 bar) inlet pressure:

225 scfm (106 dm³/s)

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Automatic drain operating conditions:

Minimum pressure: 10 psig (0.7 bar).

Drain opens when bowl pressure drops below 3 psig (0.2 bar).

Minimum air flow: 2 scfm (1 dm³/s) required to close drain.

Gauge Ports:

1/8" PTF with PTF main ports

1/8" ISO Rc with ISO Rc main ports

1/8" ISO Rc with ISO G main ports

Nominal bowl size:

7 fluid ounce (0.2 liter)

Materials:

Body: Zinc

Bonnet: Aluminum

Valve: Brass

Yoke: Zinc

Metal bowl: Aluminum

Standard metal bowl prismatic liquid level indicator lens: Grilamid

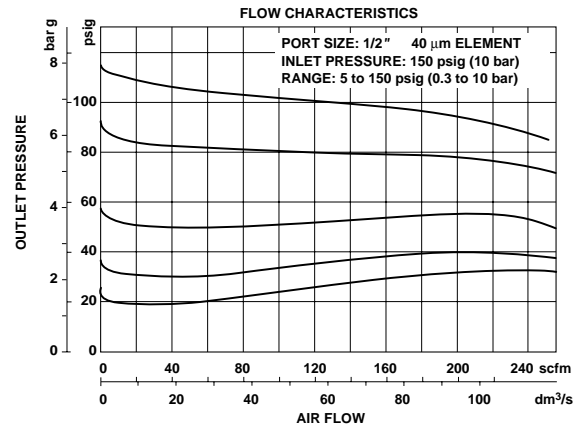
Optional metal bowl sight glass: Pyrex

Optional transparent bowl: Polycarbonate

Element: Sintered plastic

Elastomers: Synthetic rubber

Typical Performance Characteristics

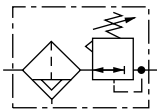


Service Kits

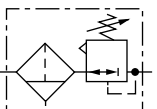
Item	Type	Part Number
Service kit	Relieving	4383-200
	Non relieving	4383-201
Replacement elements	5 µm	4338-01
	25 µm	4338-99
	40 µm	4338-02
Replacement Sight Glass	Prismatic (standard)	4380-040
	Pyrex	4380-041
Replacement Drains	Automatic	3000-10
	Manual	684-84

Service kit includes diaphragm assembly, valve assembly, valve spring, louver o-ring, bowl o-ring, drain seal.

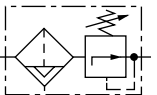
ISO Symbols



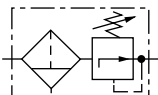
Automatic Drain Relieving



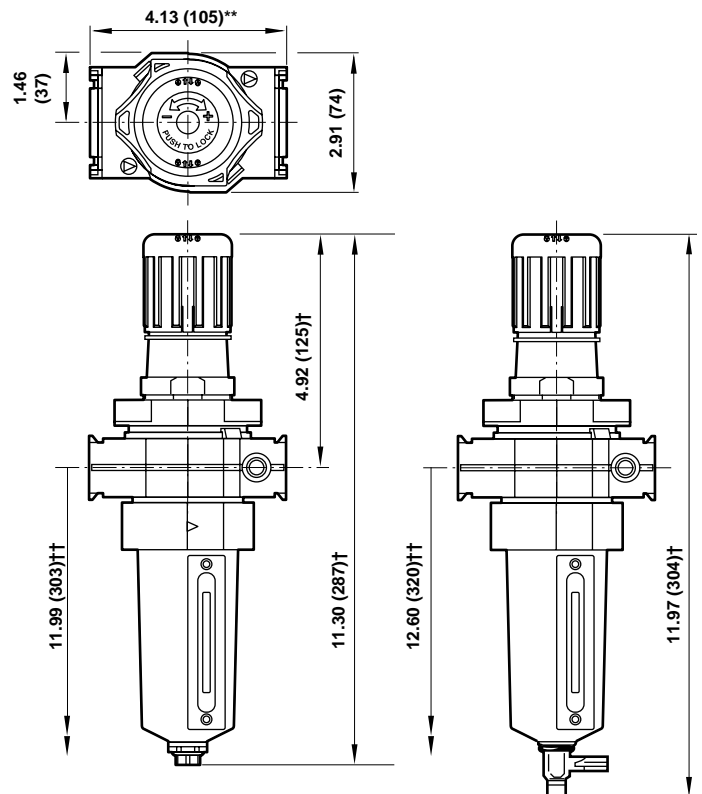
Manual Drain Relieving



Automatic Drain Non Relieving



Manual Drain Non Relieving



** 4.13 (105) for 1/4", 3/8", and 1/2" ported yokes.

6.18" (157) for 3/4" ported yokes.

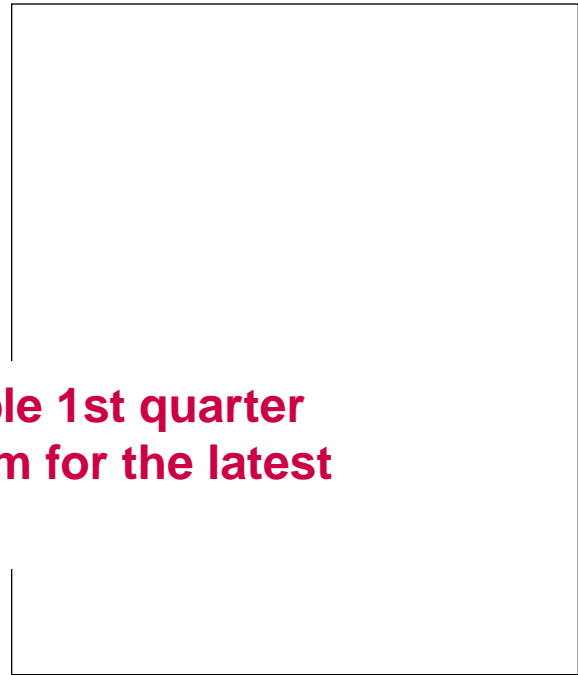
† Add 1.46 (37) for units with T-handle adjustment.

†† Minimum clearance required to remove unit.

Add 1.46 (37) for units with T-handle adjustment.

Olympian Plus Filter/Regulator
3/4", 1", 1-1/4", 1-1/2" Port Sizes

- Olympian plug in design
- High efficiency water and particle removal
- Push to lock adjusting knob with tamper resistant option



68 Series products are available 1st quarter of 2001. Visit www.norgren.com for the latest data on this series.

Ordering Information. Models listed include PTF threads, automatic drain, 50 µm element.

Port Size	Model	Weight lb (kg)
3/4"	B68-6AK-AU3-RMN	6.04 (2.72)
1"	B68-8AK-AU3-RMN	5.78 (2.60)
1-1/4"	B68-AAK-AU3-RMN	6.00 (2.70)
1-1/2"	B68-BAK-AU3-RMN	5.64 (2.54)

Alternative Models

B 6 4 G - ★ ★ ★ - ★ ★ ★ - ★ ★ ★

Port Size	Substitute
3/4"	6
1"	8
1 1/4"	A
1 1/2"	B
None	N

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G
None	N

Adjustment	Substitute
Knob	K
T-bar	T

Gauge	Substitute
With	G
Without	N

Outlet Pressure Adjustment Range*	Substitute
0 to 60 psig (0 to 4 bar)	F
5 to 120 psig (0.4 to 8 bar)	L
10 to 250 psig (0.7 to 17 bar)	S**

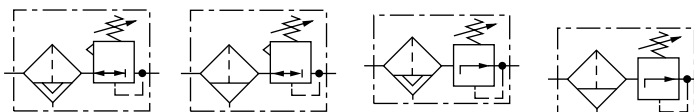
Diaphragm	Substitute
Relieving	R
Non relieving	N

Element	Substitute
5 µm	1
25 µm	2
50 µm	3

Bowl	Substitute
1 quart (1 liter) without liquid level indicator	C
1 pint (0.5 liter) without liquid level indicator	M
1 pint (0.5 liter) with liquid level indicator	R
1 quart (1 liter) with liquid level indicator	U

Drain	Substitute
Automatic	A
Closed bowl	E
Manual	M

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.
 ** Units with 250 psig (17 bar) adjustment range are available only with the T-bar adjustment; therefore substitute **T** at the 7th digit and **S** at the 12th position.

ISO Symbols


Automatic Drain Relieving Manual Drain Relieving Automatic Drain Non Relieving Manual Drain Non Relieving

See Section ALE-25 for Accessories

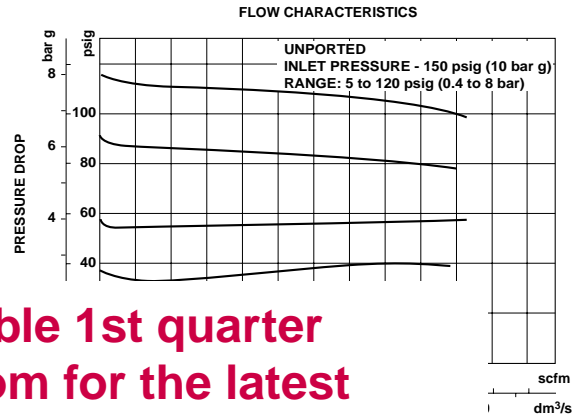


Technical Data

Fluid: Compressed air
 Maximum pressure
 Metal bowl: 250 psig (17 bar)
 Operating temperature*
 Metal bowl: 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
 Particle removal: 5, 25 or 50 µm. Within ISO 8573-1, Class 3 and Class 5
 Typical flow at 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set:
 487 scfm (230 dm³/s) **TBA from Lab Test**
 Automatic drain connection: 1/8"
 Automatic drain operating conditions:

Typical Performance Characteristics



68 Series products are available 1st quarter of 2001. Visit www.norgren.com for the latest data on this series.

Minimum pressure: 10 psig (0.7 bar).
 Drain opens when bowl pressure drops below 3 psig (0.2 bar).
 Minimum air flow: 2 scfm (1 dm³/s) required to close drain.

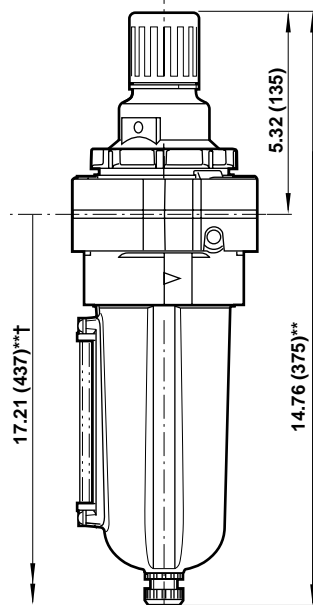
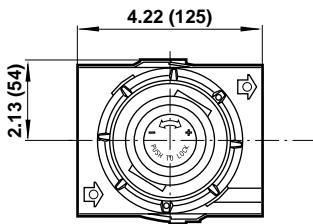
Nominal bowl size:
 1 pint US (0.5 litre)
 Gauge ports: ISO G1/8
 Materials
 Body: Aluminum
 Bonnet: Aluminum

Adjusting knob: Acetal resin

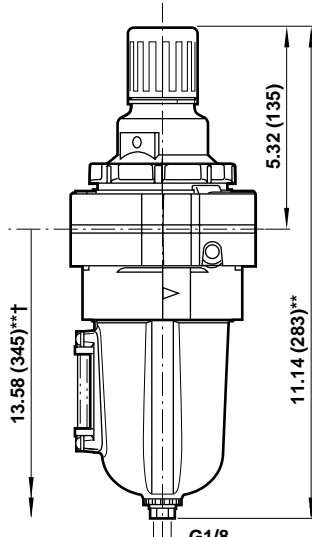
Service Kits

Item	Type	Part Number
Service kit	Relieving	4383-300
	Non relieving	4383-301
Replacement elements	5 µm	5576-97
	25 µm	5576-98
	50 µm	5576-99
Replacement sight glass kit	1 pint US (0.5 litre)	4380-060
	1 quart US (1 litre)	4380-062
Replacement drains	Automatic	3000-97
	Manual	684-84

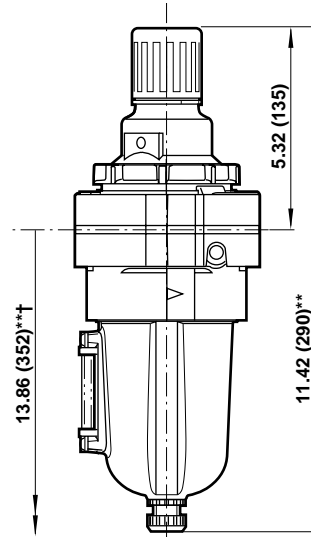
Service kit Includes: **TBA**.



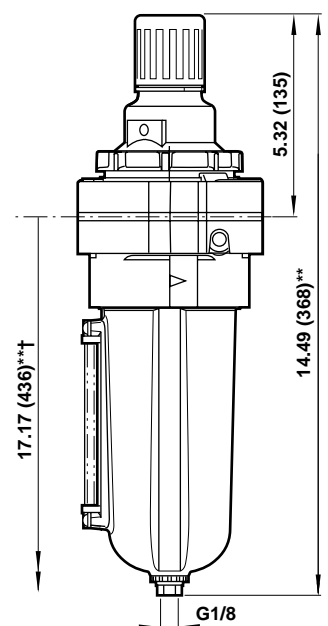
0.5 litre, manual drain



0.5 litre, automatic drain



0.5 litre, manual drain



0.5 litre, automatic drain

** Reduces by 0.16" (4 mm) with knob in locked position. Add 1.46" (37 mm) for unit with 'T' handle. For closed bowl subtract 0.35" (9 mm) from auto drain dimension.

† Minimum clearance required to remove bowl.

Miniature Series 07 Oil Removal Filter/Regulator 1/8" and 1/4" Port Sizes

- **Compact design**
- **High efficiency oil and particle removal**
- **Low torque, non-rising adjusting knob**
- **Snap action knob locks pressure setting when pushed in**
- **Standard relieving models allow reduction of outlet pressure even when the system is dead-ended**



Ordering Information. Models listed include PTF threads, transparent bowl, relieving diaphragm, gauge, automatic drain, 5 to 100 psig (0.3 to 7 bar) outlet pressure adjustment range* .

Port Size	Model Number	Flow† scfm (dm ³ /s)	Weight lbs (kg)
1/8"	B39-102-A0KA	4.0 (1.9)	0.57 (0.26)
1/4"	B39-202-A0KA	4.0 (1.9)	0.57 (0.26)

† Maximum flow with 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance.

Alternative Models

B 3 9 - ★ ★ ★ - ★ ★ ★ ★

Port Size	Substitute
1/8"	1
1/4"	2

Bowl	Relief Type	Gauge	Substitute
Transparent	Relieving	Without	01
Transparent	Relieving	With	02
Transparent	Non-relieving	Without	03
Transparent	Non-relieving	With	23
Metal	Relieving	Without	33
Metal	Relieving	With	34
Metal	Non-relieving	Without	35
Metal	Non-relieving	With	36

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

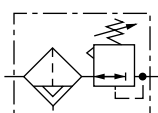
Outlet Pressure Adjustment Ranges*	Substitute
1 to 10 psig (0.1 to 0.7 bar)	A
5 to 50 psig (0.3 to 3.5 bar)	E
5 to 100 psig (0.3 to 7 bar)	K

Element	Substitute
Coalescing	0

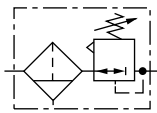
Drain	Substitute
Automatic	A
Manual	M

* Do not use these units to control pressures outside of the specified ranges.

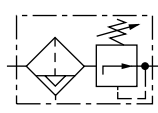
ISO Symbols



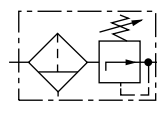
Automatic Drain Relieving



Manual Drain Relieving



Automatic Drain Non Relieving



Manual Drain Non Relieving

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*

Transparent bowl: -30° to 125°F (-34° to 50°C)

Metal bowl: -30° to 150°F (-34° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)

Particle removal: Down to 0.01 µm

Air quality: Within ISO 8573-1, Class 1 (particulates) and Class 2 (oil content)

Maximum remaining oil content in outlet air: 0.01 ppm at 70°F (21°C) with an inlet concentration of 17 ppm.

Maximum flow with 90 psig (6.3 bar) inlet pressure†:

4.0 scfm (1.9 dm³/s)

† Maximum flow to maintain stated oil removal performance.

Nominal bowl size: 1 fluid ounce (31 ml)

Gauge ports:

1/8" PTF with PTF main ports

1/8" ISO Rc with ISO Rc main ports

1/8" ISO Rc with ISO G main ports

Drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Automatic drain operation: Spitter type drain operates momentarily when a rapid change in air flow occurs or when the supply pressure is reduced.

Materials

Body: Zinc

Bonnet: Acetal

Valve: Brass/nitrile

Valve seat: Acetal

Bowl

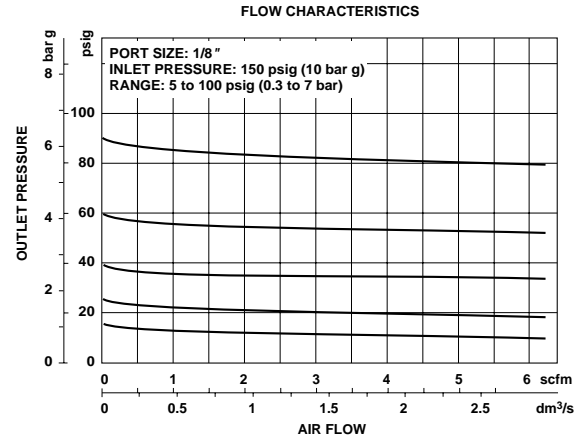
Transparent: Polycarbonate

Metal: Zinc

Element: Synthetic fiber and polyurethane foam

Elastomers: Nitrile

Typical Performance Characteristics



Service Kits

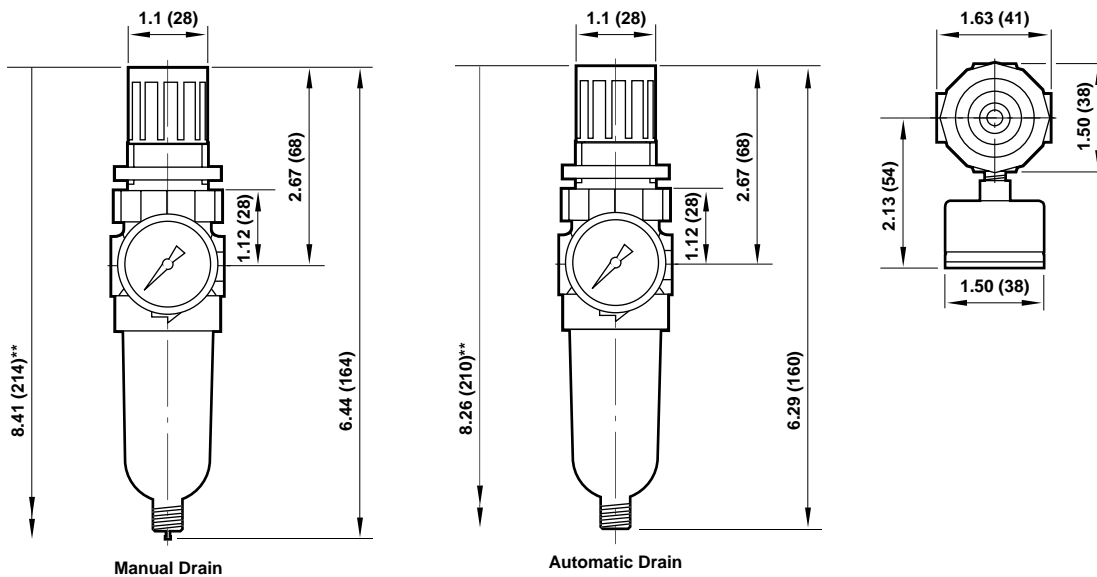
Item	Type	Part number
Service kit	Relieving models	3407-66
	Non relieving models	3407-65
	Element	4141-10
Replacement drains	Manual	773-03
	Automatic	3654-02

Relieving and non-relieving service kits include slip ring, diaphragm, valve seat with o-ring, valve, and valve spring. Element kit contains element, element gasket, and bowl o-ring.

All Dimensions in Inches (mm)

Panel mounting hole diameter: 1.19" (30 mm)

Maximum panel thickness: 0.25" (6 mm)



** Minimum clearance to remove bowl

**Instrument Filter/Regulator
Aluminum Model 1/4" PTF**

- Compact instrument units with high performance
- Stable regulation and temperature compensation
- Excellent flow and regulation characteristics



Ordering Information. Models listed are relieving type with PTF threads, manual drain, 25 µm element, screw adjustment, 0.6 to 30 psig (0.04 to 2 bar) outlet pressure adjustment range and without gauge.

Port Size	Model Number	Flow† scfm (dm³/s)	Weight lbs (kg)
1/4" PTF	B38-200-B2CA	17 (8)	1.18 (0.53)

† Typical flow 100 psig (7bar) inlet pressure, 15 psig (1 bar) set pressure, and a droop of 1 psig (0.05 bar) from set.

Alternative Models

B 3 8 - ★ ★ ★ - ★ ★ ★ ★

Port Size	Substitute
1/4" PTF	2

Type	Substitute
Aluminum	0

Diaphragm	Substitute
Relieving	0
Non relieving	1
Relieving, bracket and nut	2
Non relieving, bracket and nut	3
Relieving with nut	4
Non relieving with nut	5

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	D
API.LP.INT	K

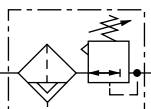
Outlet Pressure Adjustment Ranges*	Substitute
0.6 to 30 psig (0.04 to 2 bar)	C
1 to 60 psig (0.07 to 4 bar)	F
3.6 to 100 psig (0.25 to 7 bar)	K

Element	Substitute
5 µm	1
25 µm	2

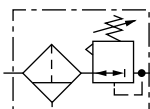
Drain	Substitute
Manual	B

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

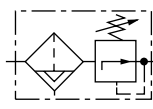
ISO Symbols



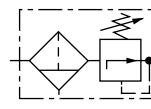
Automatic Drain, Relieving



Manual Drain, Relieving



Automatic Drain, Non Relieving



Manual Drain, Non Relieving

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure

Manual drain: 300 psig (20 bar)

Operating temperature: -40° to 175°F (-40° to 80°C) *

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5 µm or 25 µm filter element

Air quality: Within ISO 8573-1, Class 3 and Class 5 (particulates)

Typical flow with 100 psig (7 bar) inlet pressure, 15 psig (1 bar) set pressure and a droop of 1 psig (0.05 bar) from set:

17 scfm (8 dm³/s)

Manual Drain

Nominal bowl size:

2.4 fluid ounce (70 ml)

Gauge ports:

1/4" PTF

Materials

Body: Aluminum

Bonnet: Aluminum

Bowl: Aluminum

Adjusting screw: Steel

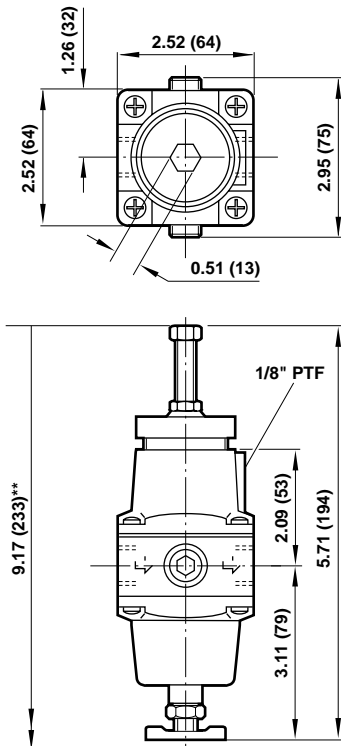
Elements

25 µm: High density polyethylene

5 µm: Ceramic pyrolyth

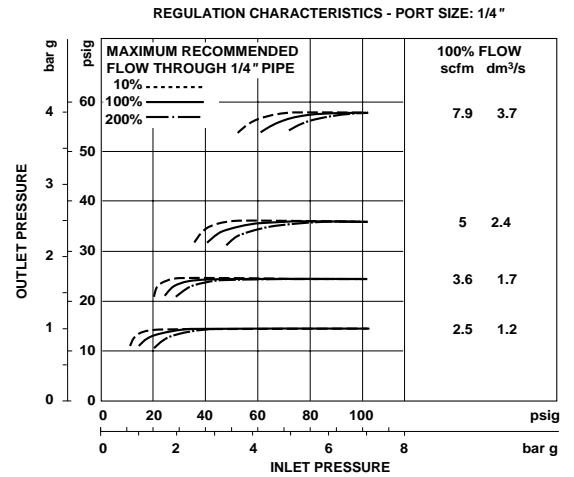
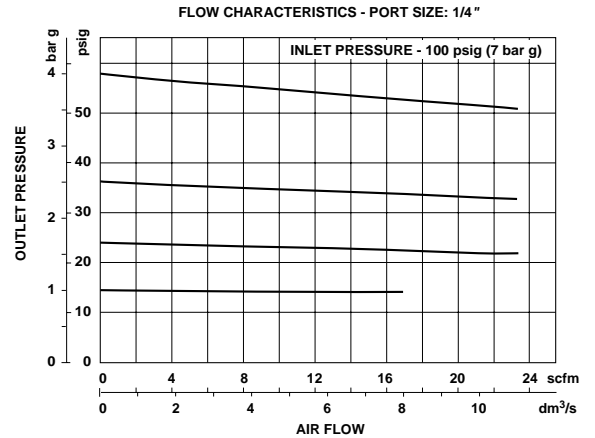
Elastomeric materials: Synthetic rubber

All Dimensions in Inches (mm)



** Minimum clearance required to remove bowl.
 Panel mounting hole diameter: 1.65" (42 mm)
 Maximum panel thickness: 0.24" (6 mm)

Typical Performance Characteristics



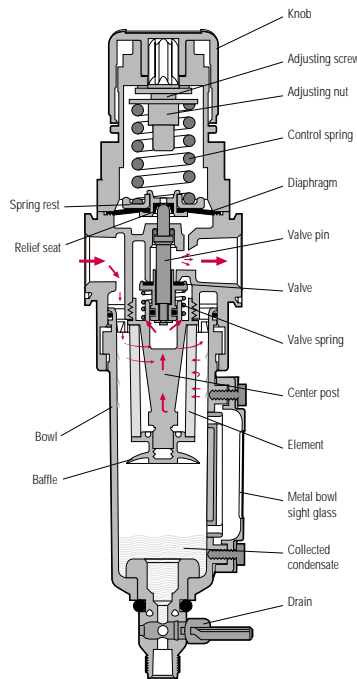
Service Kits

Item	Type	Part number
30 psig (2 bar) range	Relieving	R38-100R
	Non relieving	R38-100NR
60 and 100 psig (4 bar and 7 bar) range	Relieving	R38-101R
	Non relieving	R38-101NR

Service kits includes diaphragm assembly, o-ring, valve, valve spring and 8 pan head screws.



GENERAL PURPOSE FILTER/REGULATOR



1.1 GENERAL OVERVIEW

Filter/regulators combine the features of a filter and regulator with a single compact body.

Air passes through the filter section first removing water and particle contaminants, and is then regulated by the top regulator section.

See individual filter and regulator sections for details.

1.2 PERFORMANCE CHARACTERISTICS

The regulator section of the filter/regulator determines the flow and regulation characteristics of the unit.

Flow is therefore measured in terms of pressure droop from set pressure (see regulators) and not flow versus pressure drop as in a filter.

Regulation characteristics are determined in the same way as regulators.

1.3 SPECIALS

1.3.1 Can we do a Coalescing Filter/Regulator?

Yes. We have a B39 unit in the 07 Series. Other sizes could be considered for volume customers.

1.3.2 Can we do special materials?

Units are available in stainless steel (B05 and B38) for harsh environments and process applications.

Lubricators

Compressed air tool lubricators are available in modular or inline models in port sizes from 1/8" to 2". Machine bearing lubricators are available in 8 to 32 inch ratings.

Contents

Lubricator Overview	ALE-14-B
L07 Miniature Micro-Fog® Lubricator 1/8" and 1/4" Ports	ALE-14-2
L72 Excelon Micro-Fog and Oil-Fog Lubricator 1/4" and 3/8" Ports	ALE-14-4
L73 Excelon Micro-Fog and Oil-Fog Lubricators 1/4", 3/8", and 1/2" Ports	ALE-14-6
L74 Excelon Micro-Fog and Oil-Fog Lubricators 3/8", 1/2", and 3/4" Ports	ALE-14-8
L64 Olympian Plus Micro-Fog and Oil-Fog Lubricators 1/4", 3/8", 1/2", and 3/4" Ports	ALE-14-10
L68 Olympian Micro-Fog and Oil-Fog Lubricator 3/4", 1, 1-1/4", and 1-1/2" Ports	ALE-14-12
L17 Micro-Fog and Oil-Fog Lubricators 3/4", 1", 1-1/4" and 1-1/2" Ports	ALE-14-14
10-028 Oil-Fog Lubricator 1-1/2" Port	ALE-14-16
10-076 Oil-Fog Lubricator 2" Port	ALE-14-18
10-015 Micro-Fog Machine Bearing Lubricator, 8 to 32 Bearing Inch Ratings, 1/4" Port	ALE-14-20



L07



L72M/C



L73M/C



L74M/C



L64M/C



L68

L17



10-028



10-076



10-015

Product available
1st quarter of 2001



1.1 GENERAL OVERVIEW

Norgren manufactures two main types of lubricators: Oil-Fog and Micro-Fog. These are mounted directly into the pipe and add small amounts of oil to the air flowing through them.

Oil Fog-Lubricators:

All the oil droplets seen in the sight dome are added directly into the air flow. This results in relatively large oil droplets passing downstream, suitable for heavy lubrication applications eg single cylinders and tools. Most competitive in line lubricators are of the Oil-Fog type.

Micro-Fog Lubricators:

The oil droplets seen in the sight dome are atomized and collected in the area above the oil in the bowl. The smaller lighter particles are drawn into the air flow and pass downstream.

As a result typically only 10% of the oil seen as drops in the sight dome is passed downstream. The remainder falls back into the oil reservoir. Consequently, drip rate settings are somewhat higher than their Oil-Fog equivalent. This makes setting much easier, particularly in low flow applications.

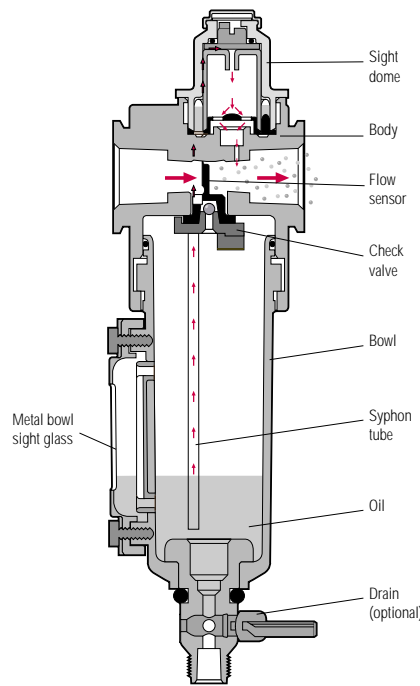
The fine Micro-Fog oil particles can travel long distances through complex pipe work making Micro-Fog lubricators suitable for multiple valve and cylinder circuits.

1.2 WHAT ARE THE DIFFERENCES BETWEEN MICRO-FOG AND OIL-FOG?

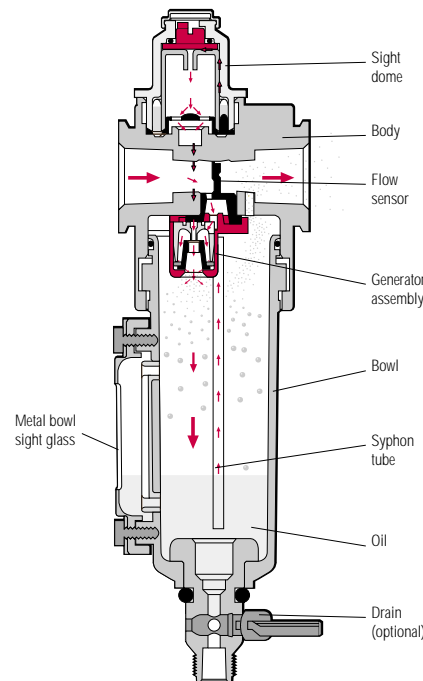
1.2.1 Oil-Fog:

- Large oil particles not as fine as micro-fog.
- All oil drips seen in sight domes are delivered downstream.
- For applications over short distances.
- Should be mounted at same level or higher than device being lubricated.
- Standard bowls can be filled under pressure. (Not on rapid cycle units).
- Suitable for heavy lubrication applications eg single large cylinders and tools.
- Has a flow sensor which provides constant oil output density for varying flows.

OIL-FOG LUBRICATOR



MICRO-FOG LUBRICATOR



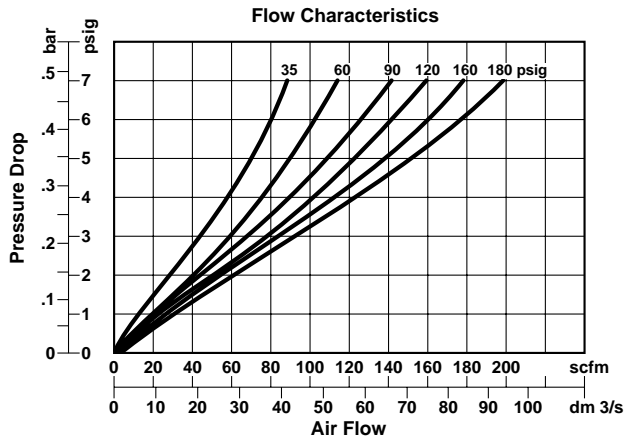
1.2.2 Micro-Fog:

- Small oil particles; less than 2 micron.
- Only 10% of 'drip rate' is delivered downstream as active lubricant (remainder is returned to main oil reservoir).
- High drip rates make drip setting easier in low flow applications.
- Can be mounted above or below the point of application.
- Cannot be filled without shutting off upstream air (unless a quick fill cap or remote fill device is used).
- For use with lengthy air lines, multiple valve and cylinder circuits.
- Has a flow sensor to provide an almost constant oil output density for varying flows.

1.2.3 Can Oil-Fog and Micro-Fog Units be Converted?

Generally not, simply changing a green (Oil-Fog) sight dome for a red (Micro-Fog) sight dome does not change the function.

Some lubricators are designed around a cartridge insert. In this case it may be possible to swap the cartridge and sight domes to change the function.



1.3 LUBRICATOR SIZING

Lubricators are sized by downstream flow requirements. An analysis of air flow use must be made. After determining how much air flow is needed, a lubricator can be chosen. Manufacturers' curves will be like the one shown. For example, 50 scfm of 90 psig lubricated air is required. Enter the curve on the horizontal axis at the required flow. Read up to intersect the 90 psig line. Read the pressure drop on left, vertical axis as approximately 2.3 psid. Pressure drop should be less than 5 psid. If pressure drop is more than 5 psid, choose a larger lubricator.

Always be sure that the lubricants in your system are compatible with the materials in the lubricator you choose. This is especially important for plastic lubricator reservoirs. If in doubt, check with the factory or use a metal reservoir.

1.4 SETTING LUBRICATOR DRIP RATES

1.4.1 What is the Correct Drip Rate Setting?

The drip rate will depend on the application, the amount of lubrication required, the flow through the lubricator and the lubricator type. In Micro-Fog lubricators only 10% of the droplets in the sight dome are carried downstream. The drip rate in Micro-Fog lubricators therefore tends to be much higher.

The following table can be used to estimate drip rate for required flow. This is very much a rule of thumb. In practice it is necessary to fine tune the oil drip rate in each application.

Typical Drip Rate per Minute Micro-Fog	Typical Drip Rate per Minute Oil-Fog	Approx Flow scfm (dm ³ /s)
20	2	10 (5)
40	4	20 (10)
60	6	30 (15)
80	8	40 (20)
100	10	50 (25)
120	12	60 (30)

1.3.2 Can the Drip Rate be Shut Off?

In lubricators with needle valve type sight dome, yes.

Some Norgren sight domes use a felt pad which is soaked in oil at the point where the drops are formed. With this type of sight dome the oil droplets cease once the felt pad dries out.

With the new style dome (L72/73/74 and L07) complete shut off is not possible. Minimum adjustment for the drip rate is around 1 drop per minute.

1.5 FILLING METHODS

1.5.1 Oil-Fog and Micro-Fog Lubricators:

The standard Oil-Fog lubricators can be filled under pressure ie without switching off the upstream air. When a fill plug is removed a check valve in the lubricator body isolates the inlet pressure from the bowl and the reservoir will depressurize. The lubricator can then be filled with oil. When the fill plug is replaced, the reservoir will re-pressurize.

The standard Micro-Fog unit can only be filled without isolating the upstream pressure if a remote fill or quick fill nipple accessory is fitted. To remove the fill plug of a Micro-Fog lubricator whilst under pressure can be dangerous. If in doubt shut off the upstream air!

1.5.2 Remote Fill Devices:

The remote oil fill system provides a means of filling from a remote fill point, a single lubricator or a bank of lubricators manifolded together. The remote fill point may be connected to a portable reservoir or to a centralized, permanent reservoir. A portable reservoir permits the use of different lubricants in different groups of lubricators to suit the requirements of the machinery being lubricated. The lubrication oil must be fed in at a higher pressure than exists in the bowl.

The devices are NOT intended for connection to an oil feed line which is under constant pressure from a pump or pressurized reservoir. The device cannot reset until the pressure is removed. Such lines are a potential safety hazard if they should leak or become broken.

1.5.3 Quick Fill Nipples:

The quick fill system is an alternative which allows ease of filling a single Micro-Fog or Oil-Fog lubricator without switching off the mains air (on some units the quick fill nipple replaces the filler plug).

To fill the lubricator, a quick fill connector piped to a portable oil reservoir is snapped in place over the quick fill nipple. The main oil reservoir can now be pumped (or pressurized) to a pressure greater than the lubricator bowl and the lubricator filled.



1.6 OPTIONS AND ACCESSORIES

1.6.1 Where can Liquid Level Switches be Fitted?

Liquid level detection methods can be attached to the 1 quart bowl and 2 & 5 gallon tanks.

1.6.2 Where can Remote Fill and Liquid Level Switches be Fitted?

The smaller bowls, L73 and up, are all capable of either remote fill or liquid level detection (but not both at the same time!). The 2 quart and 2 & 5 gallon tanks only can have the liquid level switches fitted.

1.6.3 How do Liquid Level Switches Work?

Liquid level switches are bipolar reed switches which change state when the float rises and falls.

Liquid level switches are normally connected to give an electrical signal when the float falls (ie when the liquid level is too low). In critical applications the logic could be reversed. Maximum and minimum settings are possible too.

1.7 LARGE TANKS/RESERVOIRS

1.7.1 Which Units have Large Tanks/Reservoirs?

All units in basic 1/2" and above have optional larger bowls/tanks.

Olympian Plus and Excelon 74 are limited to 1 quart as standard. For 2 and 5 gallon capacity use 15/17 Series, or the 10-028/-076 (2") lubricators.

1.8 APPLICATION SPECIFIC UNITS

1.8.1 Do we Make Bearing Lubricators?

These are aerosol type lubricators. These lubricators use air to get the oil to the point of lubrication, however the tool or application is not powered by the air. Although produced by Norgren, systems for their application are designed and sold by Engineering and General Lubrication Systems.

1.8.2 What is a Fixed Venturi (Bi-Directional) Lubricator?

Standard Norgren lubricators use a flow sensor to achieve constant oil density with varying flows. In some applications high flow is more important than constant density and a fixed venturi can be used instead of a flow sensor. It may also be useful in systems with rapid cycling. Consult Air Line for more details.

1.9 OILS

1.9.1 What Oils are Recommended?

Recommended oils fall into 2 categories:-

- 1 Oils recommended for use with all Norgren units (valves, cylinders, fittings and FRLs).
- 2 Oils which can be used with Norgren lubricators but not necessarily with other Norgren equipment.

Refer to ALE-29-2 for recommended lubricants.

1.9.2 Can Non-Recommended Oils be Used?

Some oils can be tested for suitability, but Norgren cannot be responsible for use of non-recommended lubricants.



1.10 SIMPLE LUBRICATOR TROUBLESHOOTING

Problem	Possible Cause	Remedy
No Drip Rate	Oil adjustment knob fully clockwise.	Readjust knob.
	Low oil level.	Check oil level.
	Airflow through lubricator too low.	Use smaller size lubricator.
		Remove bowl and sight feed adjustment dome and clear syphon tube.
	Blocked oil filter screen.	Remove sight feed adjustment dome and clean or replace screen located in dome assembly.
	Air leaks.	Check bowl, filler plug and sight dome seals. Tighten if necessary.
Oil Foaming	Over aeration.	Check bowl seals for slight leaks.
Oil Emulsified	Water in lubricator.	Fit filter immediately upstream.
Drip Rate changes after setting	Fade.	Readjust drip rate.

**Miniature Series 07 Micro-Fog
Lubricator 1/8" and 1/4" Port Sizes**

- **Compact design**
- **Provides air line lubrication to one or more air driven tools or other devices**
- **Nearly constant oil density output with varying air flow**
- **All around (360°) visibility of the sight-feed dome simplifies installation and adjustment**
- **Screw-on bowl reduces maintenance time**
- **Can be disassembled without the use of tools or removal from the air line**



Ordering Information. Models listed include PTF threads and transparent bowl with manual drain.

Port Size	Model Numbers	Flow scfm (dm ³ /s)*	Weight lbs (kg)
1/8"	L07-100-MPAA	10 (5.0 dm ³ /s)	0.28 (0.13)
1/4"	L07-200-MPAA	14 (6.7 dm ³ /s)	0.28 (0.13)

* Approximate flow at 90 psig (6.3 bar) inlet pressure and 7 psig (0.5 bar) pressure drop.

Alternative Models

L 0 7 - ★ ★ ★ - M P ★ ★

Port Size	Substitute
1/8"	1
1/4"	2

Option	Substitute
Not applicable	0

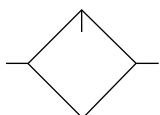
Option	Substitute
Not applicable	0

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

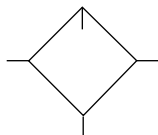
Bowl and Drain	Substitute
Transparent without drain	Q
Metal with drain	M
Transparent with drain	A

Flow	Substitute
Unidirection	P

Lubricator Type	Substitute
Micro-Fog	M

ISO Symbols


No drain



Manual drain

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*

Transparent bowl: 0° to 125°F (-20° to 50°C)

Metal bowl: 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)

Start point (i.e. minimum flow required for lubricator operation): 0.5 scfm

(0.24 dm³/s) at 90 psig (6.3 bar) inlet pressure

Typical flow at 90 psig (6.3 bar) inlet pressure at 7 psig (0.5 bar) pressure drop:

1/8" ports: 10 scfm (5 dm³/s)

1/4" ports: 14 scfm (6.7 dm³/s)

Nominal bowl size: 1 fluid ounce (31 ml)

Drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Recommended lubricants: See Section ALE-29.

Materials

Body: Zinc

Bowl

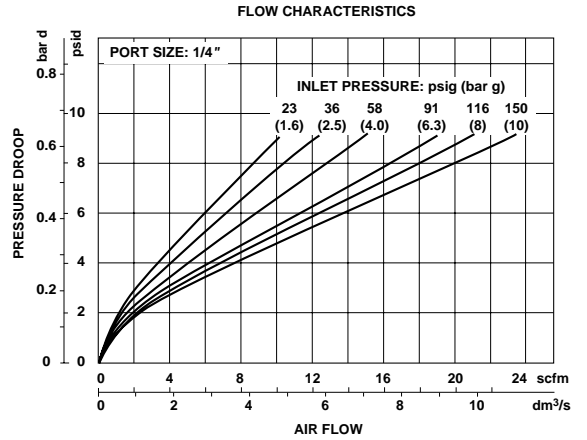
Transparent: Polycarbonate

Metal: Zinc

Sight-feed dome: Transparent nylon

Elastomers: Neoprene & nitrile

Typical Performance Characteristics



Service Kits

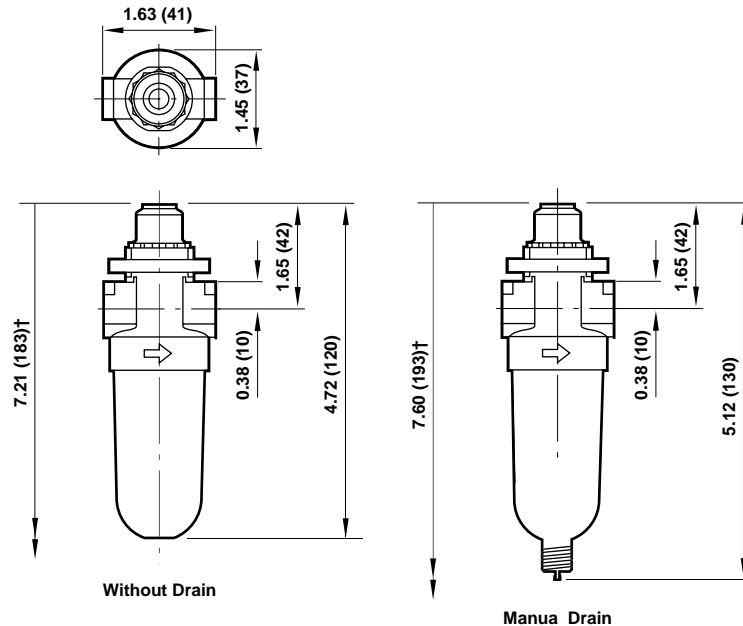
Item	Type	Part number
Service kit	Seal and o-ring	3795-03
Replacement drain	Manual	773-03

Service kit includes o-ring, seal, and bowl o-ring.

All Dimensions in Inches (mm)

Panel mounting hole diameter: 1.9" (30 mm)

Maximum panel thickness: 0.25" (6 mm)



† Minimum clearance to remove bowl.

**Excelon 72 Micro-Fog and Oil-Fog
Lubricator 1/4", 3/8" Port Sizes**

- Excelon design allows in-line or modular installation
- Quick release bayonet bowl
- Flow sensor provides a consistent oil/air ratio over a wide range of flows
- Highly visible, prismatic liquid level indicator lens on metal bowls
- All round (360°) visibility of sight-feed dome for ease of drip rate setting
- Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications

Use Micro-Fog models in applications with one or more points of lubrication.

Use Oil-Fog models to lubricate a single tool, cylinder or other air driven device.



Ordering Information. Models listed include PTF threads, manual drain, and long transparent bowl without guard.

Type	Main Port Size	Model Number	Flow* scfm (dm ³ /s)	Weight lb (kg) [†]
Micro-Fog	1/4"	L72M-2AP-QLN	51 (24)	1.1 (0.49)
	3/8"	L72M-3AP-QLN	51 (24)	1.1 (0.49)
Oil-Fog	1/4"	L72C-2AP-QLN	51 (24)	1.1 (0.49)
	3/8"	L72C-3AP-QLN	51 (24)	1.1 (0.49)

* Typical flow with 90 psig (6.3 bar) inlet pressure and a pressure drop of 7 psig (0.5 bar).

Alternative Models

L 7 2 ★ - ★ ★ P - ★ ★ ★

Type	Substitute
Oil-Fog	C
Micro-Fog	M

Port Size	Substitute
1/4"	2
3/8"	3

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Options	Substitute
None	N
Pyrex dome	P†

Bowl	Substitute
Short metal with plastic liquid level indicator	D
Short metal with Pyrex liquid level indicator	R
Long metal with plastic liquid level indicator	E
Long metal with Pyrex liquid level indicator	U
Short transparent without guard	T
Long transparent without guard	L
Long transparent with guard	W

Drain	Substitute
Closed bottom bowl	E
1/4 turn manual	Q

† For use with metal bowl with Pyrex sight glass

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure:

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*:

Transparent bowl: 0° to 125°F (-20° to 50°C)

Metal bowl: 0° to 150°F (-20° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Start point (i.e. minimum flow required for lubricator operation) at 90 psig (6.3 bar)

inlet pressure:

Micro-Fog: 2.0 scfm (0.94 dm³/s)

Oil-Fog: 1.0 scfm (0.47 dm³/s)

Typical flow at 90 psig (6.3 bar) inlet pressure and 7 psig

(0.5 bar) pressure drop: 51 scfm (24 dm³/s)

Nominal reservoir capacity:

Short bowl: 1.9 fluid ounce (56 ml)

Long bowl: 2.2 fluid ounce (65 ml)

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Recommended lubricants: See Section ALE-29.

Materials:

Body: Zinc

Reservoir:

Transparent: Polycarbonate

Guard for transparent reservoir: Zinc

Metal: Zinc

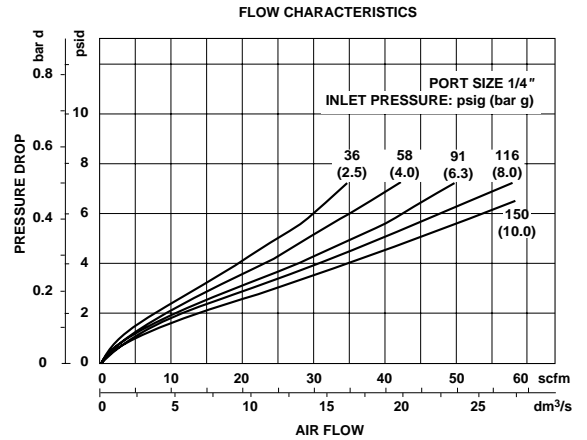
Metal reservoir liquid level indicator lens:

Transparent nylon

Sight-feed dome: Transparent nylon

Elastomers: Neoprene, nitrile, and Geolast®

Typical Performance Characteristics

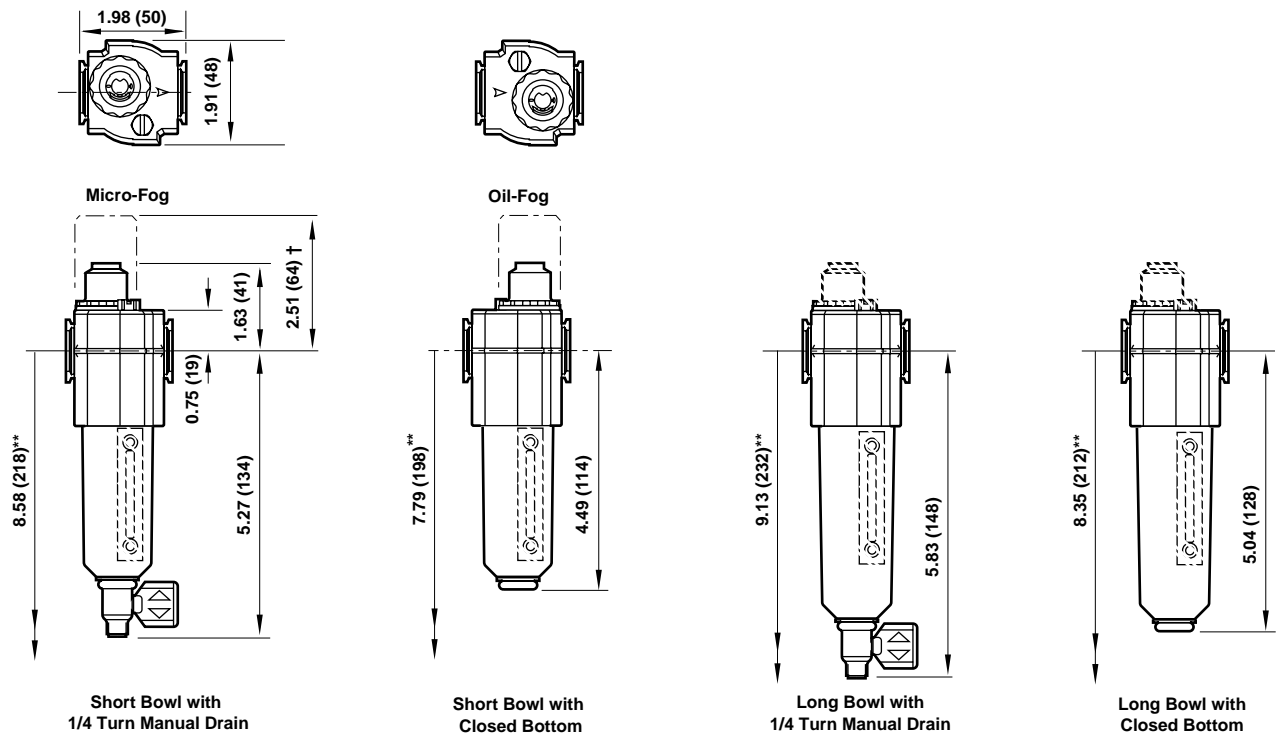


Service Kits

Item	Type	Part Number
Service kit	Seal and gasket	4382-500
Liquid level lens kit	Prismatic	4380-030
Replacement drains	1/4 turn manual	619-50

Service kit includes plug o-ring, sight-feed dome seal, manual drain o-ring and bowl o-ring.

All Dimensions in Inches (mm)



** Minimum clearance required to remove bowl.

† Optional pyrex sight-feed dome.

Excelon 73 Micro-Fog and Oil-Fog Lubricators 1/4", 3/8", 1/2" Port Sizes

- Excelon design allows in-line or modular installation
- Quick release bayonet bowl
- Flow sensor design provides a nearly constant oil/air ratio over a wide range of air flows
- Highly visible, prismatic liquid level indicator lens
- All around (360°) visibility of the sight-feed dome simplifies installation and adjustment
- Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications

Use Micro-Fog models in applications containing one or more points of lubrication.

Use Oil-Fog models to lubricate a single tool, cylinder, or other air driven device.



Ordering Information. Models listed include PTF threads, manual drain, and metal bowl with plastic liquid level indicator.

Type	Main Port Size	Model Number	Flow* scfm (dm ³ /s)	Weight lb (kg)
Micro-Fog	1/4"	L73M-2AP-QDN	60 (28)	1.1 (0.50)
	3/8"	L73M-3AP-QDN	60 (28)	1.1 (0.50)
	1/2"	L73M-4AP-QDN	60 (28)	1.1 (0.50)
Oil-Fog	1/4"	L73C-2AP-QDN	60 (28)	1.1 (0.50)
	3/8"	L73C-3AP-QDN	60 (28)	1.1 (0.50)
	1/2"	L73C-4AP-QDN	60 (28)	1.1 (0.50)

* Maximum recommended air flow. Higher flows create excessive air velocity, turbulence, and pressure losses.

Alternative Models

L 7 3 ★ - ★ ★ ★ - ★ ★ ★

Type	Substitute
Oil-Fog	C
Micro-Fog	M

Port Size	Substitute
1/4"	2
3/8"	3
1/2"	4

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Air Flow Direction	Substitute
Uni-directional	P

Options	Substitute
None	N
Pyrex sight-feed dome †	P
Quick fill nipple	Q

Bowl	Substitute
Metal with plastic liquid level indicator	D
Transparent with guard	P
Metal with Pyrex liquid level indicator †	R
Transparent	T

Drain	Substitute
Closed bottom	E
Manual 1/4 turn	Q

† Order optional Pyrex sight-feed dome when ordering metal bowl with Pyrex liquid level indicator.

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*

Transparent bowl: 0° to 125°F (-20° to 50°C)

Metal bowl: 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Start point (minimum flow required for lubricator operation): 1.5 scfm (0.71 dm³/s) at 90 psig (6.3 bar) inlet pressure

Typical flow with 90 psig (6.3 bar) inlet pressure and 3.5 psig (0.25 bar) pressure drop: 80 scfm (38 dm³/s)

Maximum recommended flow: 60 scfm (28 dm³/s). Air flows above 60 scfm (28 dm³/s) create excessive air velocity, turbulence, and pressure losses. In addition, the fog produced by the lubricator will wet out on the pipe walls and will not be carried by the compressed air to the point of application.

Nominal bowl size: 3.5 fluid ounce (0.1 liter)

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Recommended lubricants: See Section ALE-29.

Materials

Body: Aluminum

Bowl

Transparent: Polycarbonate

Transparent with guard: Polycarbonate, steel guard

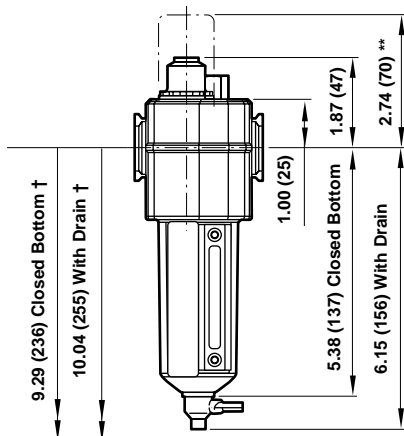
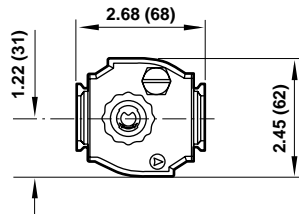
Metal: Aluminum

Metal bowl liquid level indicator lens: Transparent nylon

Sight-Feed dome: Transparent nylon

Elastomers: Neoprene and nitrile

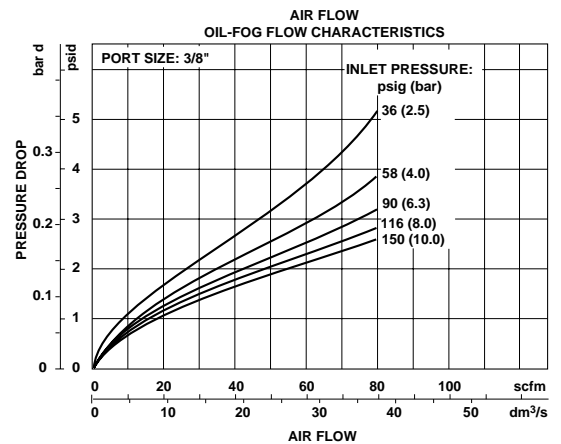
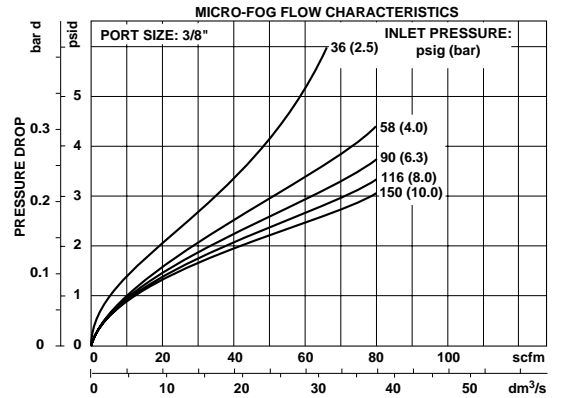
All Dimensions in Inches (mm)



** Optional pyrex sight-feed dome.

† Minimum clearance to remove bowl.

Typical Performance Characteristics



Service Kits

Item	Type	Part Number
Service kit	Seal & Gasket	4382-600
Liquid level lens kit	Prismatic	4380-020
Replacement drain	Manual 1/4 turn	619-50

Service kit includes dome seal, drain seal, bowl seal and fill plug seal.

Excelon 74 Micro-Fog and Oil-Fog Lubricators 3/8", 1/2", 3/4" Port Sizes

- Excelon design allows in-line or modular installation
- Quick release bayonet bowl
- Highly visible, prismatic liquid level indicator lens
- Flow sensor design provides a nearly constant oil/air ratio over a wide range of air flows
- All around (360°) visibility of the sight-feed dome simplifies installation and adjustment
- Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications



Use Micro-Fog models in applications with one or more points of lubrication.

Use Oil-Fog models to lubricate a single tool, cylinder, or other air driven device.

Ordering Information. Models listed include PTF threads, manual drain, and 7 fluid ounce (0.2 liter) metal bowl with plastic liquid level indicator.

Type	Main Port Size	Model Number *	Flow** scfm (dm ³ /s)	Weight lb (kg) [†]
Micro-Fog	3/8"	L74M-3AP-QDN	114 (54)	1.70 (0.77)
	1/2"	L74M-4AP-QDN	154 (73)	1.61 (0.73)
	3/4"	L74M-6AP-QDN	142 (67)	1.55 (0.71)
Oil-Fog	3/8"	L74C-3AP-QDN	118 (56)	1.70 (0.77)
	1/2"	L74C-4AP-QDN	192 (91)	1.61 (0.73)
	3/4"	L74C-6AP-QDN	186 (88)	1.55 (0.71)

* Models listed in the order table must not be located downstream of frequently cycling directional control valves. Order the optional bi-directional Oil-Fog Lubricator for use under such conditions.

** Typical flow with 90 psig (6.3 bar) inlet pressure and a pressure drop of 7 psig (0.5 bar).

† Lubricators with 1 quart (1 litre) metal bowl: Add 2.01 lbs (0.91 kg).

Alternative Models

L 7 4 ★ - ★ ★ ★ - ★ ★ ★

Type	Substitute
Oil-Fog	C
Micro-Fog	M

Port Size	Substitute
3/8"	3
1/2"	4
3/4"	6

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Air Flow Direction	Substitute
Bi-directional (Oil-Fog only)	E
Uni-directional	P

Options	Substitute
Low oil level switch ***	L
None	N
Pyrex dome *†	P
Quick fill nipple	Q

Bowl	Substitute
1 quart US (1 liter) metal with Pyrex liquid level indicator ††	A
7 fluid oz. (0.2 liter) metal with plastic liquid level indicator	D
7 fluid oz. (0.2 liter) transparent with guard	P
7 fluid oz. (0.2 liter) metal with Pyrex liquid level indicator††	R

Drain	Substitute
Closed bottom	E
Manual 1/4 turn	Q
Remote fill device - Use only with 7 fluid oz. (0.2 liter) bowl.	R

*** Low oil level switch requires 1 litre bowl, type 'A' at 9th digit.

*† Pyrex dome used only with bowl type 'A' or 'R' at 9th digit.

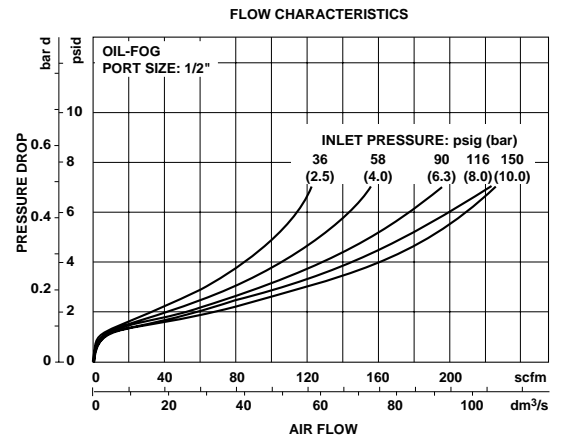
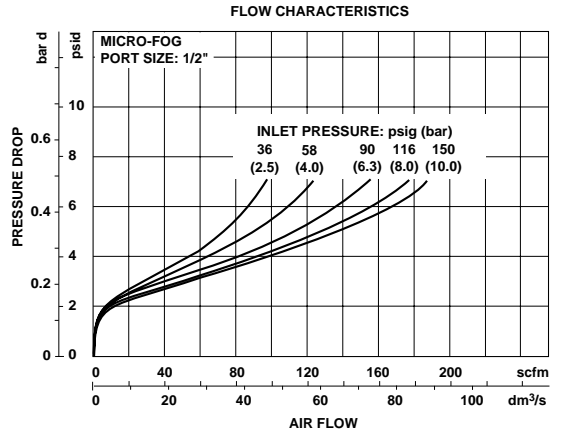
†† Pyrex liquid level indicator used only with option 'P' at 10th digit.



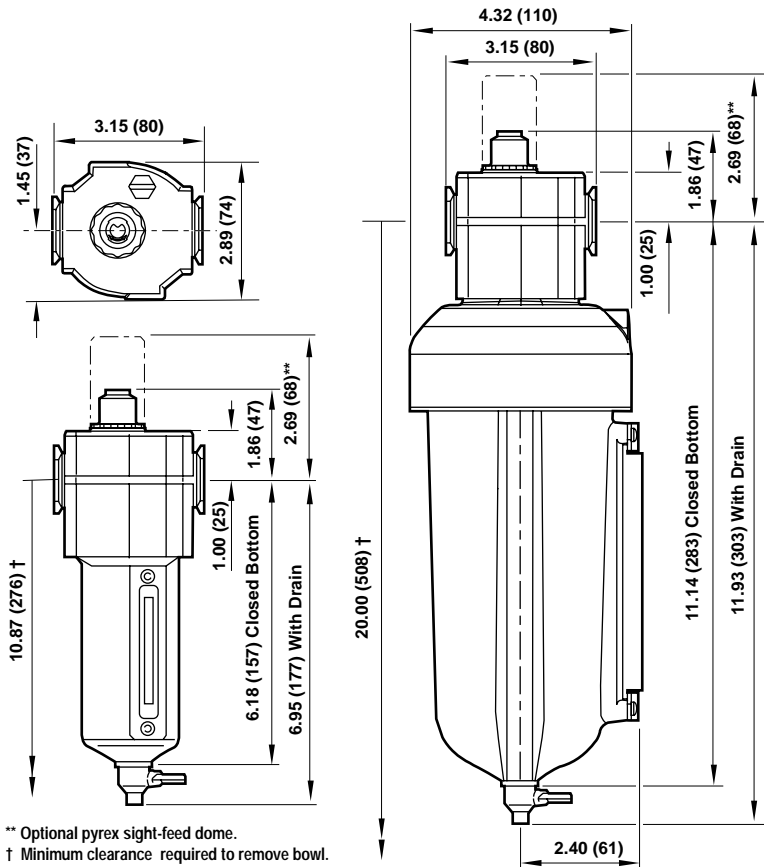
Technical Data

Fluid: Compressed air
 Maximum pressure:
 Transparent bowl: 150 psig (10 bar)
 Metal bowl: 250 psig (17 bar)
 Operating temperature*:
 Transparent bowl: 0° to 125°F (-20° to 50°C)
 Metal bowl: 0° to 175°F (-20° to 80°C)
 * Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
 Start point (i.e. minimum flow required for lubricator operation): 2.5 scfm (0.94 dm³/s) at 90 psig (6.3 bar) inlet pressure
 Typical flow with 90 psig (6.3 bar) inlet pressure and 7 psig (0.5 bar) pressure drop
 Micro-fog: 154 scfm (73 dm³/s)
 Oil-fog: 92 scfm (91 dm³/s)
 Nominal bowl size:
 Standard: 7 fluid ounce (0.2 liter)
 Optional: 1 quart US (1 liter)
 Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
 Recommended lubricants: See Section ALE-29.
 Materials
 Body: Aluminum
 Bowl
 Transparent: Polycarbonate with steel bowl guard
 Metal: Aluminum
 Metal bowl liquid level indicator lens:
 7 fluid ounce (0.2 liter): Transparent nylon
 1 quart US (1 liter): Pyrex
 Sight-feed dome: Transparent nylon
 Elastomers: Neoprene and Nitrile

Typical Performance Characteristics



All Dimensions in Inches (mm)



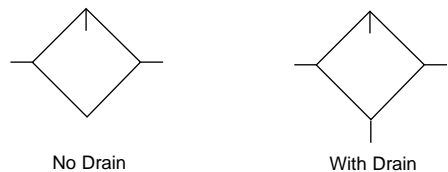
** Optional pyrex sight-feed dome.
 † Minimum clearance required to remove bowl.

Service Kits

Item	Type	Part Number
Service kit	Seal & Gasket	4382-700
Liquid level lens kit	7 fluid ounce (0.2 liter) bowl	4380-050
	1 quart US (1 liter) bowl	2273-22
Replacement drain	Manual 1/4 turn	619-50

Service kit includes dome seal, drain seal, bowl seal and fill plug seal

ISO Symbols



See Section ALE-25 for Accessories

Olympian Plus Micro-Fog and Oil-Fog Lubricators 1/4", 3/8", 1/2", 3/4" Port Sizes

- Olympian Plus plug in design
- Constant oil density output with varying flow
- Easy fill with quick release bayonet bowl
- High visibility prismatic sight glass

Use Micro-Fog models in applications with one or more points of lubrication.

Use Oil-Fog models to lubricate a single tool, cylinder or other air driven device.



Ordering Information. Models listed include PTF threads and 7 fluid ounce (0.2 liter) metal reservoir with drain.

Type	Port Size	Model	Weight lb (kg)
Micro-Fog	1/4"	L64M-2AP-QDN	3.13 (1.42)
	3/8"	L64M-3AP-QDN	3.09 (1.40)
	1/2"	L64M-4AP-QDN	3.02 (1.37)
	3/4"	L64M-6AP-QDN	3.81 (1.73)

Alternative Models

L 6 4 ★ - ★ ★ P - ★ ★ ★

Type	Substitute
Oil-Fog	C
Micro-Fog	M

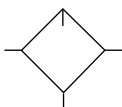
Port Size	Substitute
1/4"	2
3/8"	3
1/2"	4
3/4"	6
No yoke	N

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G
No yoke	N

Options	Substitute
None	N
Quick fill device	Q

Bowl	Substitute
7 oz. Metal with liquid level indicator	D
7 oz. Transparent with guard	P
1 qt. metal with pyrex liquid level indicator	A

Drain	Substitute
Closed bottom bowl	E
Manual 1/4 turn	Q
Remote fill device Use only with 7 oz. (0.2 liter) bowl.	R

ISO Symbol


See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure:

Guarded transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*

Guarded transparent bowl: 0° to 125°F (-20° to 50°C)

Metal bowl: 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Start point (i.e. minimum flow required for lubricator operation) at 90 psig (6.3 bar) inlet pressure

Micro-Fog: 3.2 scfm (1.5 dm³/s)

Oil-Fog: 3.2 scfm (1.5 dm³/s)

Typical flow at 90 psig (6.3 bar) inlet pressure and 7 psig (0.5 bar) pressure drop: 153 scfm (72 dm³/s)

Nominal bowl capacity

Transparent bowl without guard: 7 fluid ounce (0.2 liter)

Metal bowl: 7 fluid ounce (0.2 liter) standard, 1 quart US (1 liter) optional

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Recommended lubricants: See Section ALE-29.

Materials

Body: Zinc

Yoke: Zinc

Metal bowl: Aluminium

Standard metal bowl prismatic liquid level indicator lens: Grilamid

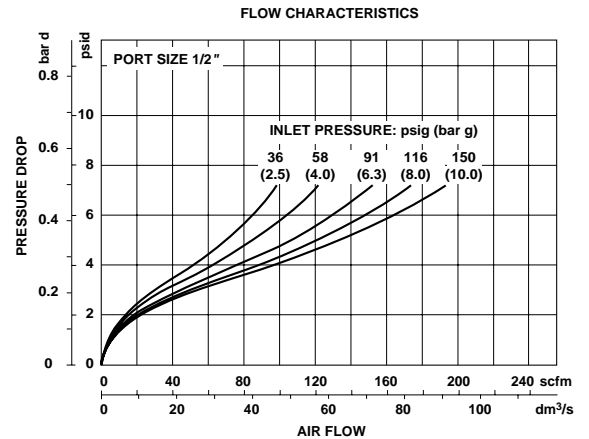
Optional metal bowl sight glass [standard on 1 quart (1 liter bowl)]: Pyrex

Optional transparent bowl: Polycarbonate

Sight-feed dome: Polycarbonate

Elastomeric materials: Synthetic rubber

Typical Performance Characteristics

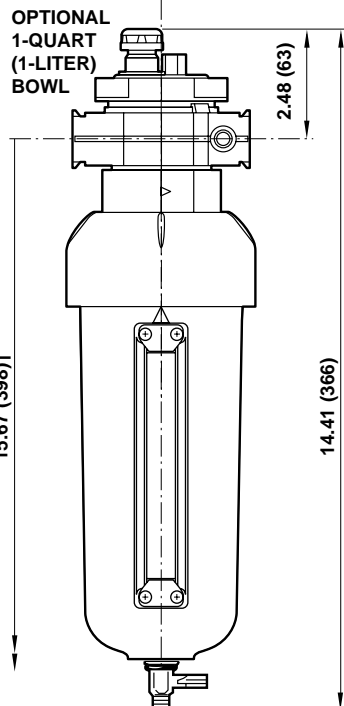
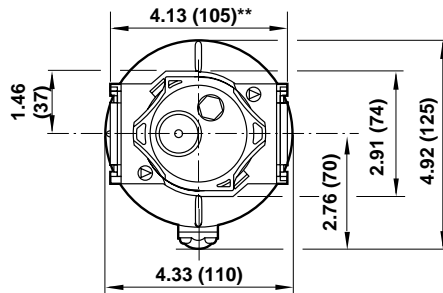


Service Kits

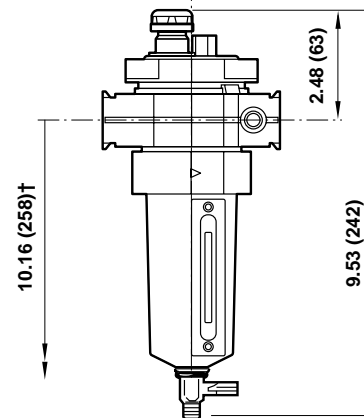
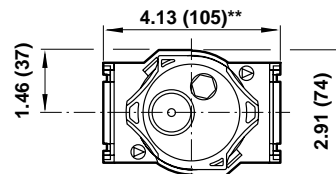
Item	Type	Part Number
Service kit	All models	4382-200
Replacement sight glass 7 fluid oz. (0.2 liter bowl)	Prismatic (standard)	4380-042
	Pyrex (optional)	4380-041
Replacement sight glass 1 quart US (1 liter)	Pyrex	2273-22

Service kit includes all seals, flow sensor, eyelet, dome screen, ball and spring.

Optional 1 quart US (1 liter) bowl



Standard 7 fluid ounce (0.2 liter) bowl



**6.18" (157) for models with 3/4" ports.

† Minimum clearance required to remove unit.

- Olympian plug-in design
- Built in flow sensor gives almost constant oil/air ratio over a wide range of flows
- 1 pint and 1 quart US (0.5 and 1 liter) models can be filled under pressure
- Simple and accurate drip rate adjustment, snap action lock

68 Series products are available 1st quarter of 2001. Visit www.norgren.com for the latest data on this series.

Ideal for general lubrication applications

Ordering Information. Models listed include PTF threads, 1 quart US (1.0 liter) reservoir without drain.

Type	Port Size	Model	Weight lb (kg)
Micro-Fog	3/4"	L68M-6AP-EUN	5.13 (2.31)
	1"	L68M-8AP-EUN	5.00 (2.25)
	1-1/4"	L68M-AAP-EUN	5.09 (2.29)
	1-1/2"	L68M-BAP-EUN	5.18 (2.33)

Alternative Models

L 6 8 ★ - ★ ★ ★ - ★ ★ ★

Type	Substitute
Oil-Fog	C
Micro-Fog	M

Port Size	Substitute
3/4"	6
1"	8
1-1/4"	A
1-1/2"	B
None	N

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G
None	N

Type	Substitute
Uni directional	P
Fixed venturi (Oil-Fog)	E

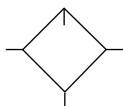
Options	Substitute
None	N
Quick fill device	Q

Bowl	Substitute
1 quart US (1 liter), without sight glass	C*
2 gallons US (8 liter)	J
5 gallons US (20 liter)	K
1 pint US (0.5 liter), without sight glass	M*
1 pint US (0.5 liter) with sight glass	R*
1 quart US (1 liter) with sight glass	U*

Drain	Substitute
Closed bottom bowl	E
Manual	M
No drain	N
Remote fill	R*

* Remote fill only available with 1 pint and 1 quart US. (1/2 and 1 liter bowls)

ISO Symbol



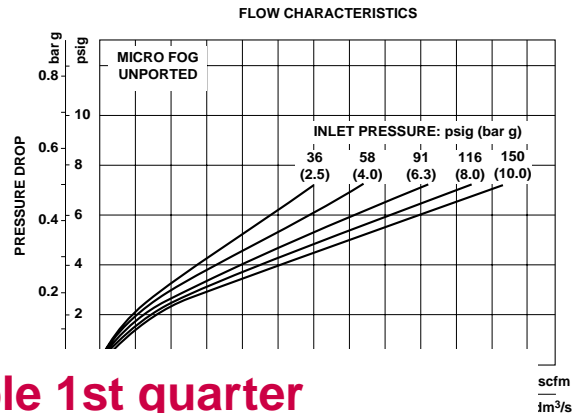
See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air
 Maximum pressure: 250 psig (17 bar)
 Operating temperature*: 0° to 175°F (-20° to 80°C)
 * Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
 Start point (i.e. minimum flow required for lubricator operation) at 90 psig (6.3 bar) inlet pressure:
 Micro-Fog: 13 scfm (6 dm³/s)
 Oil-Fog: 13 scfm (6 dm³/s)
 Fixed venturi: 110 scfm (52 dm³/s)
 Typical flow at 90 psig (6.3 bar) inlet pressure and 7 psig (0.5 bar) pressure drop:
 Micro-Fog and Oil-Fog: 370 scfm (175 dm³/s)
 Fixed venturi: 848 scfm (400 dm³/s)
 Nominal bowl sizes:
 1 pint US (0.5 liter)

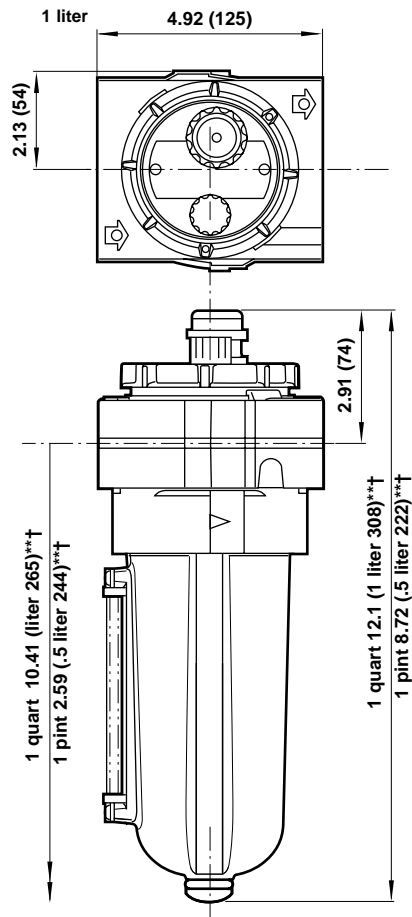
Typical Performance Characteristics



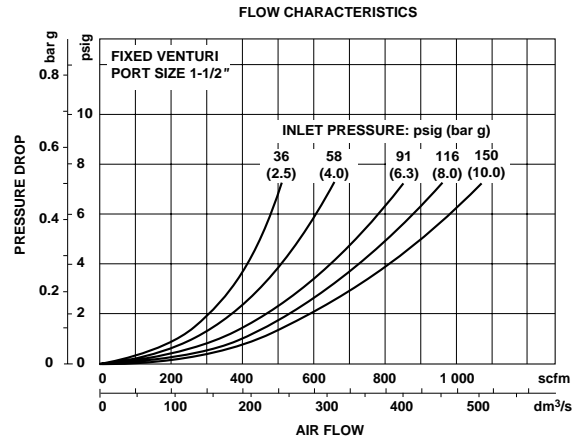
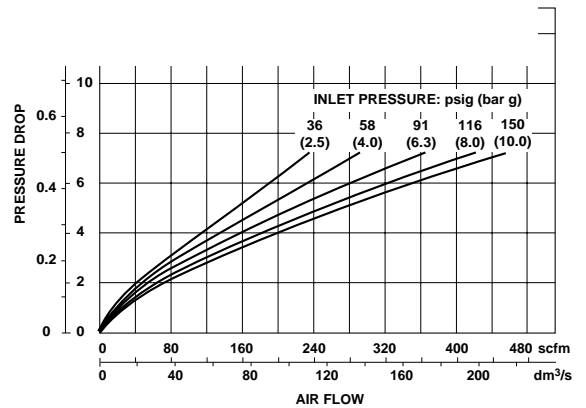
68 Series products are available 1st quarter of 2001. Visit www.norgren.com for the latest data on this series.

1 quart US (1 liter)
 2 gallons US (8 liter)

All Dimensions in Inches (mm)



** For manual drain add 0.32" (8 mm) on 0.5 and 1 liter bowls.
 † Minimum clearance required to remove bowl.



Service Kits

Item	Type	Part Number
Service kit	Micro-Fog	4382-301
	Oil-Fog	4382-300
Replacement sight glass	1 pint US (0.5 liter)	4380-060
	1 quart US (1 liter)	4380-062
Replacement drain	Manual	684-84

Service kit includes sight dome assembly, screen, filler plug, ball, threaded cap and necessary seals and o-rings. Oil-Fog service kit also contains spring. **TBA.**

17 Series Micro-Fog and Oil-Fog Lubricators
3/4", 1", 1-1/4" and 1-1/2" Port Sizes

- All around (360°) visibility of the sight-feed dome simplifies installation and adjustment
- Screw-on bowl reduces maintenance time
- Can be serviced without the use of tools or removal from the air line
- Flow sensor design provides a nearly constant oil/air ratio over a wide range of air flows



Use Micro-Fog models in applications containing one or more points of lubrication

Use Oil-Fog models to lubricate a single tool, cylinder, or other air driven device

Ordering Information. Models listed are uni-directional and include a 1 quart US (1 liter) metal bowl with drain, sight glass, and PTF threads.

Port Size	Micro-Fog Models*	Oil-Fog Models*	Flow† scfm (dm3/s)	Weight lbs (kg)
3/4"	L17-600-MPDA	L17-600-OPDA	160 (76)	3.73 (1.69)
1"	L17-800-MPDA	L17-800-OPDA	275 (130)	3.56 (1.62)
1-1/4"	L17-A00-MPDA	L17-A00-OPDA	275 (130)	4.65 (2.11)
1-1/2"	L17-B00-MPDA	L17-B00-OPDA	275 (130)	3.67 (1.67)

* Models listed in the order table must not be located downstream of frequently cycling directional control valves. Order the optional bi-directional Oil-Fog Lubricator for use under such conditions.

† Typical flow with 90 psig (6.3 bar) inlet pressure and a pressure drop of 5 psig (0.35 bar).

Alternative Models



Port Size	Substitute
3/4"	6
1"	8
1-1/4"	A
1-1/2"	B

Option	Substitute
Not applicable	00

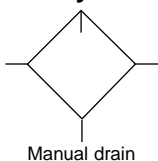
Lubricator Type	Substitute
Micro-Fog	M
Oil-Fog	O

Flow	Substitute
Bi-directional (Oil-Fog only)	E
Uni-directional	P

Threads	Substitute
PTF	A
ISO Rc taper	B
BSPP (1-1/2" ported units)	C
ISO G parallel (not available with 1-1/2" ported units)	G

Reservoir	Substitute
1 quart US (1 liter) metal, drain, sight glass	D
1 quart US (1 liter) metal, remote fill, sight glass	4
2 quart US (2 liter) metal, drain, sight glass	H
2 gallon US (8 liter) metal, drain, sight glass	J
5 gallon US (20 liter) metal, drain, sight glass	K

ISO Symbol



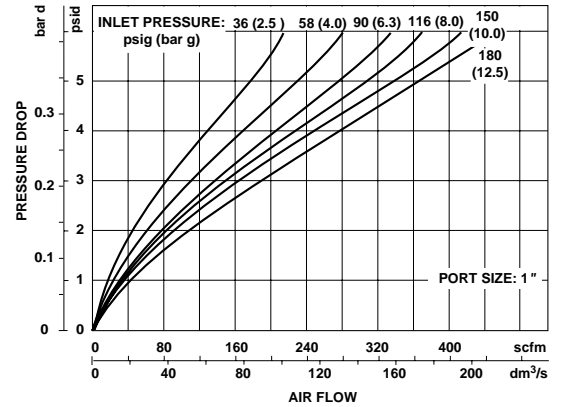
See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air
 Maximum pressure: 250 psig (17 bar)
 Operating temperature*: 0° to 175°F (-20° to 80°C)
 * Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
 Start point (minimum flow required for lubricator operation): 8 scfm (3.8 dm³/s) at 90 psig (6.3 bar) inlet pressure
 Typical flow with 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop:
 1" ports: 275 scfm (130 dm³/s)
 Nominal reservoir size
 Standard: 1 quart US (1 liter)
 Optional: 2 quart US (2 liter)
 2 gallon US (8 liter)
 5 gallon US (20 liter)
 Manual drain connection on 1 quart reservoir: Will fit 1/8-27 and 1/8-28 pipe thread
 Recommended lubricants: See Section ALE-29.
 Materials
 Body: Aluminum
 Reservoir:
 1 quart US (1 liter): Aluminum
 2 quart US (2 liter) and larger: Steel**
 Reservoir sight glass: Pyrex
 Sight-feed dome
 Standard: Transparent nylon
 Optional: Pyrex and aluminum
 Elastomers: Neoprene and nitrile
 ** The 2 and 5 gallon (8 and 20 liter) steel reservoirs are ASME rated according to the ASME Pressure Vessel Code, Section VIII

Typical Performance Characteristics

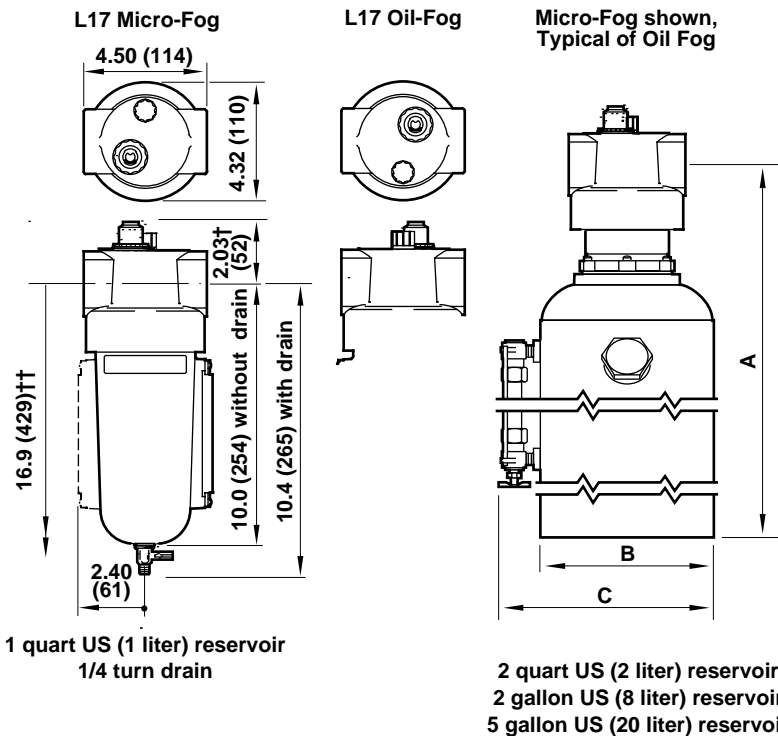


Service Kits

Item	Type	Part Number
Service kit	Oil-Fog and Micro-Fog	5771-02
Reservoir sight glass kit	1 quart US (1 liter)	2273-22
	2 quart US (2 liter)	2273-04
	2/5 gallon US (8/20 liter)	2274-01
Replacement drain	1/4 Turn	619-50

Service kit 5771-02 includes o-rings, seals and gaskets.
 Reservoir sight glass kits, include all o-rings, seals, glass, guard, and sight glass hardware.

All Dimensions in Inches (mm)



Reservoir	A	B Ø	C
2 quart US (2 liter)	13.1 (333)	4.63 (118)	5.38 (137)
2 gallon US (8 liter)	21.2 (538)	6.25 (159)	7.44 (189)
5 gallon US (20 liter)	24.2 (614)	10.3 (260)	11.4 (291)

† Standard dome: 2.03" (52 mm)
 Pyrex dome: 2.72" (69 mm)
 †† Minimum clearance required to remove bowl.

- Designed to lubricate a single tool, valve, cylinder, air motor, or other air driven device.
- One Oil-Fog lubricator should be provided for each device requiring lubrication
- All around (360°) visibility of the sight-feed dome simplifies installation and adjustment
- Lubricators equipped with 1 and 2 quart (1 and 2 liter) reservoirs can be filled under pressure
- The 2 and 5 U.S. gallon (8 and 20 liter) reservoirs are rated to ASME Pressure Vessel Code, Section VIII



Ordering Information. Models listed have 1-1/2" PTF parallel threads.

Model Number	Reservoir Nominal Size	Reservoir Working Capacity Fluid Ounce (Liter)	Recommended Operating Flow Range** scfm (dm ³ /s)	Weight lbs (kg)
10-028-045	1 quart (1 liter) *	19 (0.56)	110 to 590 (52 to 278)	5 (0.91)
10-028-046	2 quart (2 liter) *	45 (1.33)	110 to 590 (52 to 278)	6 (2.72)
10-028-047	2 U.S. gallon (8 liter)	113 (3.34)	110 to 590 (52 to 278)	16 (7.26)
10-028-048	5 U.S. gallon (20 liter)	316 (9.34)	110 to 590 (52 to 278)	28 (12.70)

* Models with 1 and 2 quart reservoirs must not be located downstream of frequently cycling directional control valves. Models with the 2 and 5 gallon reservoirs may be located downstream of frequently cycling directional control valves.

** At 100 psig (6.9 bar) inlet pressure and pressure drop of 5 psid (0.35 bar).

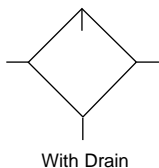
Alternative Models

1 0 - ★ 2 8 - ★ ★ ★ - ★ ★

Threads	Substitute
PTF	0
ISO G parallel	8

Option	Add
Factory installed quick fill nipple	-2J
Factory installed sight feed dome	-8W

ISO Symbol



See Section ALE-25 for Accessories



Technical Data

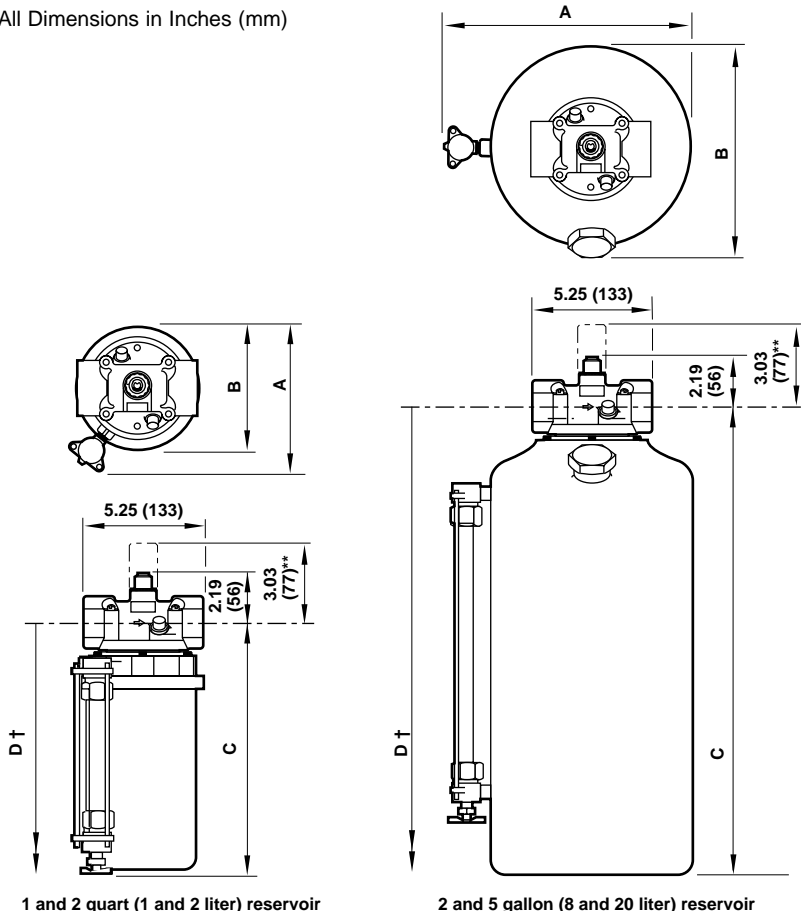
Fluid: Compressed air
 Maximum pressure: 250 psig (17 bar)
 Operating temperature*: 0° to 175°F (-20° to 80°C)
 * Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
 Start point (minimum flow required for lubricator operation) at 90 psig (6.3 bar)
 inlet pressure: 103 scfm (49 dm³/s)
 Typical flow at 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop:
 568 scfm (268 dm³/s)
 Nominal reservoir sizes:
 1 quart (1 liter)
 2 quart (2 liter)
 2 U.S. gallon (8 liter)
 5 U.S. gallon (20 liter)
 Recommended lubricants: See Section ALE-29.

Materials

- Body: Aluminum
- Reservoir: Steel
- Reservoir liquid level indicator lens: Pyrex
- Sight-feed dome
 - Standard: Transparent nylon
 - Optional: Pyrex and aluminum
- Elastomers: Neoprene and Nitrile

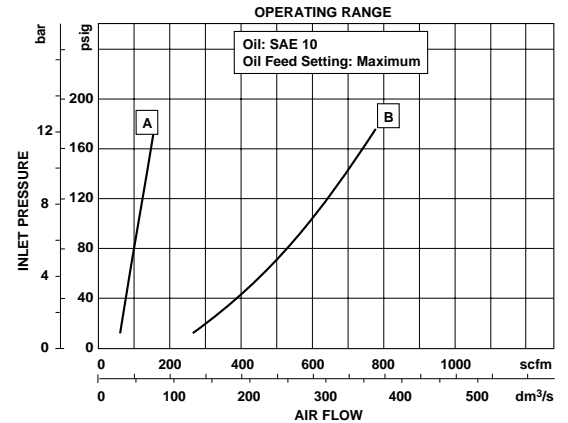
Reservoir	A	B	C	D
1 quart (1 liter)	4.72 (120)	4.06 (103)	8.27 (210)	15 (376)
2 quart (2 liter)	5.28 (134)	4.63 (118)	10.52 (267)	19 (477)
2 gallon (8 liter)	7.81 (198)	7.18 (182)	18.34 (466)	32 (813)
5 gallon (20 liter)	11.81 (300)	11.18 (284)	21.59 (548)	37 (940)

All Dimensions in Inches (mm)



** Optional pyrex sight-feed dome.
 † Minimum clearance required to remove bowl.

Typical Performance Characteristics



Service Kits

Item	Type	Part Number
Liquid level lens kit	1 quart reservoir	2272-02
	2 quart reservoir	2273-04
	2 and 5 gallon reservoir	2274-01
Replacement drain	Manual petcock	684-01

Liquid level lens kit include sight glass, sight glass guards, seals, and hardware.

- Designed to lubricate a single tool, valve, cylinder, air motor, or other air driven device
- One Oil-Fog lubricator should be provided for each device requiring lubrication
- All around (360°) visibility of the sight-feed dome simplifies installation and adjustment
- The 2 and 5 U.S. gallon (8 and 20 liter) reservoirs are rated to ASME Pressure Vessel Code, Section VIII



Ordering Information. Models listed have 2" PTF threads.

Model Number	Reservoir Nominal Size	Reservoir Working Capacity Fluid Ounce (Liter)	Recommended Operating Flow Range* scfm (dm ³ /s)	Weight lbs (kg)
10-076-004	2 U.S. gallon (8 liter)	113 (3.34)	250 to 1000 (118 to 472)	19 (8.6)
10-076-005	5 U.S. gallon (20 liter)	316 (9.34)	250 to 1000 (118 to 472)	32 (14.5)

* At 100 psig (6.9 bar) inlet pressure and pressure drop of 5 psid (0.35 bar).

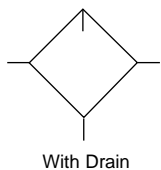
Alternative Models

1 0 - ★ 7 6 - ★ ★ ★ - ★ ★

Threads	Substitute
PTF	0
ISO G parallel	8

Option	Add
Factory installed pyrex sight feed dome	8W

ISO Symbol



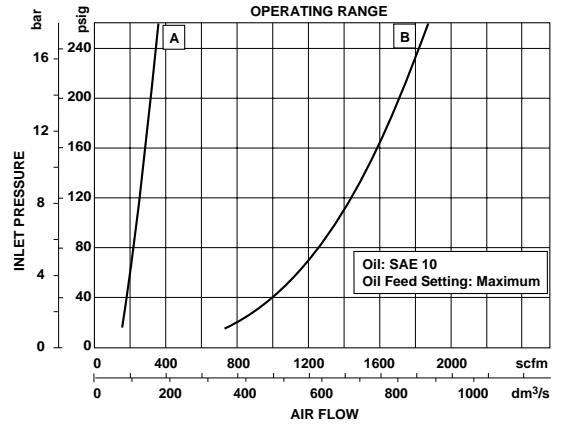
See Section ALE-25 for Accessories



Technical Data

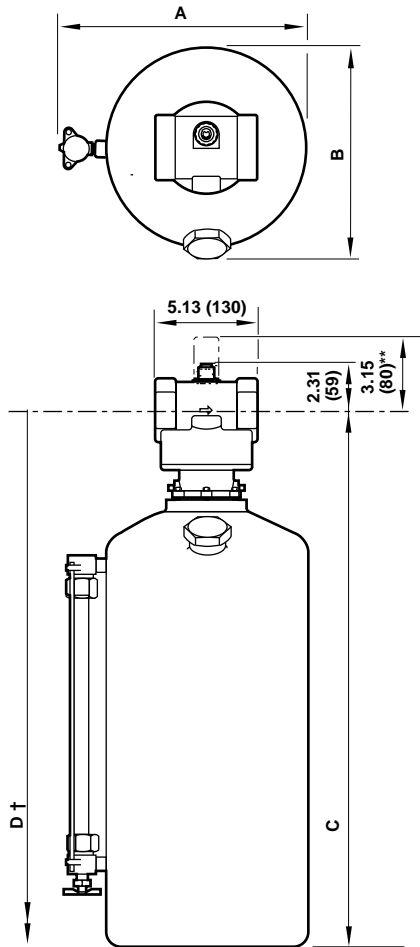
Fluid: Compressed air
 Maximum pressure: 250 psig (17 bar)
 Operating temperature*: 0° to 175°F (-20° to 80°C)
 * Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
 Start point (minimum flow required for lubricator operation) at 90 psig (6.3 bar)
 inlet pressure: 240 scfm (123 dm³/s)
 Typical flow with 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop: 1300 scfm (614 dm³/s)
 Nominal reservoir sizes:
 2 U.S. gallon (8 liter)
 5 U.S. gallon (20 liter)
 Recommended lubricants: See Section ALE-29.
Materials
 Body and adapter: Aluminum
 Reservoir: Steel
 Reservoir liquid level indicator lens: Pyrex
 Sight-feed dome
 Standard: Transparent nylon
 Optional: Pyrex and aluminum
 Elastomers: Nitrile

Typical Performance Characteristics



A: Minimum flow based on oil drip rate of 5 drops per minute.
 B: Maximum flow based on pressure drop of 5 psid (0.35 bar).

All Dimensions in Inches (mm)



2 and 5 gallon (8 and 20 liter) reservoir

** Optional pyrex sight-feed dome.
 † Minimum clearance required to remove bowl.

Reservoir	A	B	C	D
2 gallon (8 liter)	7.81 (198)	7.18 (182)	21.53 (547)	35 (887)
5 gallon (20 liter)	11.81 (300)	11.18 (284)	24.78 (629)	40 (1014)

Service Kits

Item	Type	Part Number
Liquid level lens kit	8 and 20 liter reservoir	2274-01
Replacement drain	Manual petcock	684-01

Reservoir sight glass kits include sight glass, sight glass guards, seals, and hardware.

**Micro-Fog® Machine Bearing Lubricator
8 to 32 Bearing Inch Ratings 1/4" Port Size**

- Provides centralized air-borne lubrication for machine bearings, gears, chains, slides, ways, etc
- Controls can be installed to start-up and shut-down the lubricator with the machine
- Delivers a fog of oil to the application points, coating bearing surfaces with a thin oil film and reducing oil consumption
- Air carrying the lubricants passes through the bearing housing, reducing bearing temperature and contamination, providing longer bearing life
- The 2 and 5 U.S. gallon (8 and 20 liter) reservoirs are rated to ASME Pressure Vessel Code, Section VIII
- Refer to Norgren Publication NT-1 for system design, bearing-inch ratings, and reclassifier selection



Ordering Information. Models listed have 1/4" PTF threads and are rated from 8 to 32 bearing inches.

Model Number	Reservoir - Nominal Size	Reservoir - Working Capacity	Weight lbs (kg)
10-015-100 *	1/2 pint (0.25 liter)	—	2 (0.91)
10-015-002	1/2 pint (0.25 liter)	5 fluid ounce (0.15 liter)	2 (0.91)
10-015-004	1 quart (1 liter)	19 fluid ounce (0.56 liter)	4.2 (1.9)
10-015-005	2 quart (2 liter)	45 fluid ounce (1.33 liter)	6 (2.72)
10-065-006	2 U.S. gallon (8 liter)	113 fluid ounce (3.34 liter)	15.4 (7.0)
10-065-007	5 U.S. gallon (20 liter)	316 fluid ounce (9.34 liter)	28 (12.7)

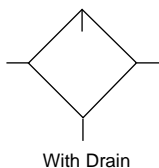
* Equipped with factory installed remote fill device.

Alternative Models

1 0 - 0 ★ ★ - ★ ★ ★ - ★ ★

Option	Add
Wall bracket attached to 10-015 models	-1B
Quick fill	-2H
Pyrex sight feed dome	-7C
Low oil level switch with 10-015-004	-3C
Low oil level switch with 10-015-005	-3A
Low oil level switch with 10-065-006	-3D
Low oil level switch with 10-065-007	-3E
Bowl guard for 0.5 pint reservoir	-2U

ISO Symbol



See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*

Transparent bowl: 0° to 125°F (-20° to 50°C)

Metal bowl: 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Nominal reservoir sizes

10-015-002: 1/2 pint (0.25 liter)

10-015-100: 1/2 pint (0.25 liter)

10-015-004: 1 quart (1 liter)

10-015-005: 2 quart (2 liter)

10-065-006: 2 U.S. gallon (8 liter)

10-065-007: 5 U.S. gallon (20 liter)

Recommended lubricants: See Section ALE-29.

Materials

Body: Zinc

Bowl

Transparent 1/2 pint (0.25 liter): Polycarbonate

Metal 1 and 2 quart, 2 and 5 gallon (1, 2, 8, 20 liter): Steel

Metal bowl liquid level indicator lens: Pyrex

Sight-feed dome

Standard: Polycarbonate

Optional: Pyrex and brass

Elastomers: Neoprene and nitrile

Service Kits

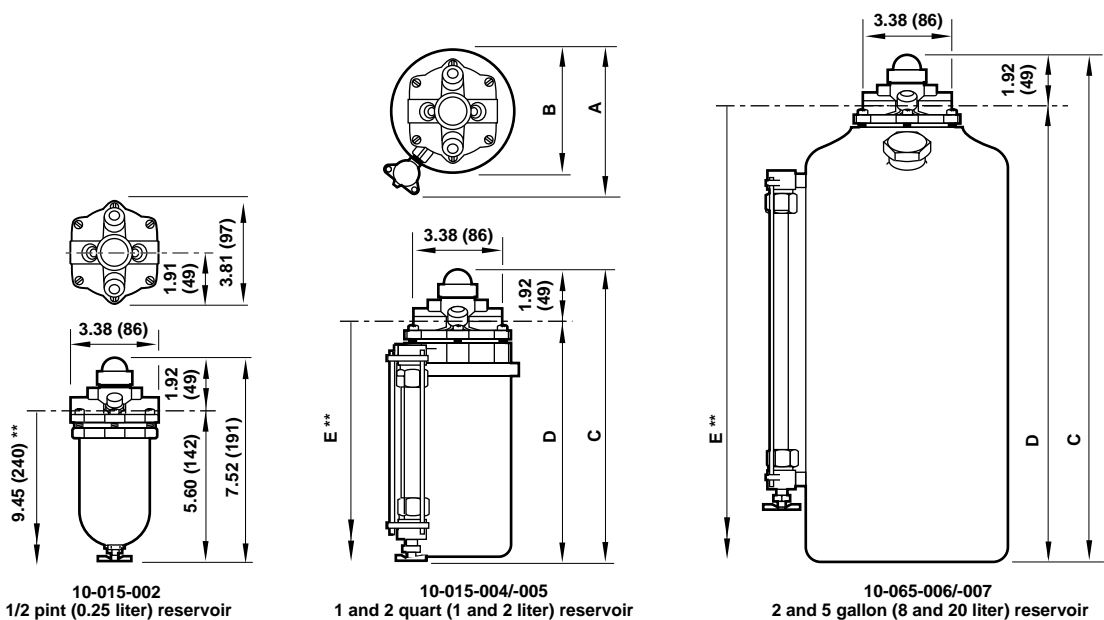
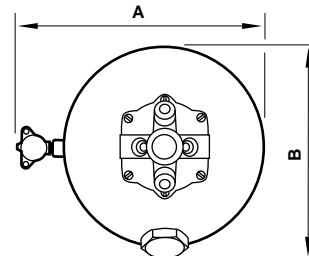
Item	Type	Part Number
Service kit	Seal & Gasket	714-01
Liquid level lens kit	1 quart reservoir	2272-02
	2 quart reservoir	2273-04
	2 and 5 gallon reservoir	2274-01
Replacement drain	Manual petcock	684-01

Service kit 714-01 includes dome, o-rings, gaskets, siphon tube filter, siphon tube check ball.

Reservoir sight glass kits include sight glass, sight glass guards, seals, and hardware.

All Dimensions in Inches (mm)

Reservoir	A	B	C	D	E
1 quart (1 liter)	4.72 (120)	4.06 (103)	9.44 (240)	7.52 (191)	14 (356)
2 quart (2 liter)	5.28 (134)	4.63 (118)	11.69 (297)	9.77 (248)	18 (457)
2 gallon (8 liter)	7.81 (198)	7.18 (182)	19.51 (496)	17.59 (447)	31 (787)
5 gallon (20 liter)	11.81 (300)	11.18 (284)	22.76 (578)	20.84 (529)	36 (914)



** Minimum clearance required to remove bowl.



Machine Bearing Lubricators

Machine bearing lubricators deliver a fog of small oil particles through a manifold system to various machine elements (bearings, gears, chains, etc). At the machine elements a nozzle-like fitting, called a reclassifier, causes the small oil particles to combine into larger particles. The larger particles cover the bearing surfaces with a protective film of clean oil. An air line filter and pressure regulator must be installed immediately upstream of the lubricator.

How to Select

Selection requires a careful analysis of the lubrication requirements of the machine. After the analysis, the proper lubricator, reservoir, and reclassifiers may be ordered. The following is an abbreviated summary of the steps required to analysis lubrication requirements of the machine. See Norgren Publications NT-1, *Design Manual for Machine Lubrication*, for complete details.

1. Determine the bearing inch requirement.
 - a. List and identify the bearing-inch rating of all machine elements requiring lubrication.
 - b. List the reclassifier ratings required at each point of lubrication.
 - c. Total the reclassifier ratings. This is the bearing-inch requirement to use in selecting the lubricator.
2. Determine reservoir capacity required.
 - a. Calculate rate of oil usage based on bearing-inch rating.
 - b. Determine how often the reservoir can be refilled.
 - c. Select reservoir capacity.

3. Determine the air flow required. See the *Operating Ranges and Air Flow Requirements* chart for air flow requirements of the lubricator.
4. Determine any accessories required.

Operating Ranges and Air Flow Requirements

Bearing Inch Requirement	Lubricator Inlet Pressure psig (bar)	Air Flow scfm (dm ³ /s)	Manifold Pressure Inches H ₂ O
16 24 32	8 (0.6) 17 (1.2) 26 (1.8)	1.6 (0.76) 2.4 (1.13) 3.1 (1.46)	8
16 24 32	10 (0.7) 20 (1.4) 31 (2.2)	1.8 (0.85) 2.7 (1.27) 3.6 (1.70)	10
16 24 32	12 (0.8) 23 (1.7) 35 (2.4)	2.0 (0.94) 3.0 (1.42) 4.0 (1.89)	12
8 16 24 32	6 (0.4) 15 (1.0) 26 (1.8) 40 (2.8)	1.1 (0.52) 2.2 (1.04) 3.3 (1.56) 4.5 (2.12)	15

Reclassifiers with Bearing Inch (BI) Ratings - Dimensions in mm (inches)

Straight, compression tube		Elbow, compression tube		Pressure jet, compression tube		Straight, pipe thread*		1/4 OD copper tube, solder	
Model	BI Rating	Model	BI Rating	Model	BI Rating	Model	BI Rating	Model	BI Rating
18-009-003	0 to 1	18-009-008	0 to 1	18-009-030	0 to 1	18-009-001	0 to 1	18-009-029	2 to 4
18-009-010	1 to 2	18-009-011	1 to 2	18-009-031	1 to 2	18-009-002	0 to 1		
18-009-012	2 to 4	18-009-013	2 to 4	18-009-032	2 to 4	18-009-005	2 to 4		
18-009-014	4 to 8	18-009-015	4 to 8			18-009-006	2 to 4		
						18-009-007	4 to 8		

* 1/4 NPT female x 1/8 NPT male threads all models except 18-009-002 and -006, which have 1/4 NPT female and male threads.

Pressure Relief Valves

Compressed air Relief Valves from 1/8" to 1-1/2" port size.
Water Relief Valve in 1/8" and 1/4" port.
Tank Relief Valve in 1/8" and 1/4" port size.

V07 Miniature Pressure Relief Valve	
1/8" and 1/4" Port Sizes	.....ALE-15-2
V72 Excelon Pressure Relief Valve	
1/4" and 3/8" Port Sizes	.....ALE-15-4
V74 Excelon Pressure Relief Valve	
3/8", 1/2", and 3/4" Port Sizes	.....ALE-15-6
V64 Olympian Plus Pressure Relief Valve	
1/4", 3/8", 1/2", and 3/4" Port Sizes	.....ALE-15-8
V68H Olympian Plus Pressure Relief Valve	
3/4", 1", 1-1/4", and 1-1/2" Port Sizes	.....ALE-15-10
16-004 Miniature Brass Body Tank Relief Valve	
1/8" and 1/4" Port Sizes	.....ALE-15-12
V06 Miniature Brass Body Relief Valve for Water and	
Compressed Air 1/8" and 1/4" Port Sizes	.....ALE-15-14
Function and Sizing	.....ALE-15-16



V07



V72G



V74G



V64H

Product available
1st quarter of 2001

V68H



16-004



V06



**07 Series Pressure Relief Valve
1/8" and 1/4" Port Sizes**

- **Compact design**
- **Low torque, non-rising adjusting knob**
- **Helps protect air operated equipment from over pressure by retarding excessive pressure build up**
- **Snap action knob locks pressure setting when pushed in**
- **Can be factory preset**
- **Can be disassembled without the use of tools or removal from the air line**

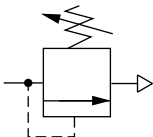


Ordering information. Models listed include PTF threads and 5 to 100 psig (0.3 to 7 bar) relief pressure adjustment range.

Port Size	Model Number	Weight lbs (kg)
1/8"	V07-100-NNKA	0.28 (0.13)
1/4"	V07-200-NNKA	0.28 (0.13)

Alternative Models

Port Size		Threads		Relief Pressure Adjustment Ranges		Gauges		Factory Preset Relief Pressure	
Port Size	Substitute	Threads	Substitute	Relief Pressure Adjustment Ranges	Substitute	Gauges	Substitute	Factory Preset Relief Pressure	Substitute
1/8"	1	PTF	A	1 to 10 psig (0.1 to 0.7 bar)	A	With	G	Not factory preset	N
1/4"	2	ISO Rc taper	B	5 to 50 psig (0.3 to 3.5 bar)	E	Without	N	Factory set, non adjustable relief pressure. Also specify desired relief pressure on order.	P
		ISO G parallel	G	5 to 100 psig (0.3 to 7 bar)	K				
				5 to 150 psig (0.3 to 10 bar)	M				

ISO Symbol


See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air
 Maximum pressure: 300 psig (20 bar)
 Operating temperature: -30° to 150°F (-34° to 65°C) *
 * Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

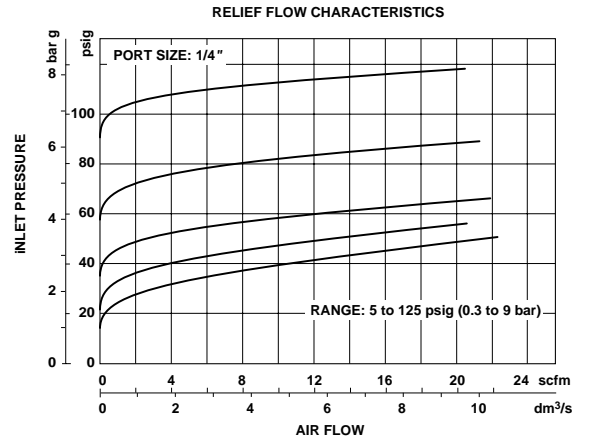
Gauge ports:

- 1/8" PTF with PTF main ports
- 1/8" ISO Rc with ISO Rc main ports
- 1/8" ISO Rc with ISO G main ports

Materials:

- Body: Zinc
- Bonnet: Acetal
- Valve seat: Polyphenylene
- Elastomers: Nitrile

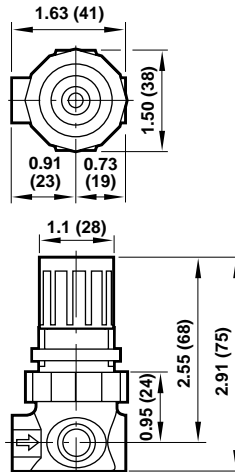
Typical Performance Characteristics



Service Kits

Item	Type	Part number
Service kits	Diaphragm and valve seat seal	3407-80
	Valve seat and valve seat seal	3439-11
	Diaphragm seat and seal	3407-19

All Dimensions in Inches (mm)



Panel mounting hole diameter: 1.19" (30 mm)
 Maximum panel thickness: 0.25" (6 mm)

- Excelon design allows in-line or modular installation
- Push to lock adjusting knob with tamper resistant accessory
- Helps protect air operated equipment from over pressure by retarding excessive pressure build up
- Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications
- Relief port located on bottom allows easy installation



Ordering Information. Models listed include PTF threads, knob adjustment, and a 5 to 150 psig (0.3 to 10 bar) outlet pressure adjustment range*.

Port Size	Model	Weight lb (kg)
1/4"	V72G-2AK-NMN	0.73 (0.33)
3/8"	V72G-3AK-NMN	0.73 (0.33)

Alternative Models

Port Size	Substitute
1/4"	2
3/8"	3

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

V 7 2 G - ★ ★ ★ - N ★ ★

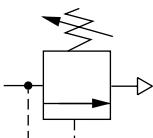
Gauge	Substitute
With	G
Without	N

Outlet Pressure Adjustment Range*	Substitute
5 to 30 psig (0.3 to 2 bar)	C
5 to 60 psig (0.3 to 4 bar)	F
5 to 150 psig (0.3 to 10 bar)	M

Adjustment	Substitute
Knob	K
T-bar	T

* Relief valve can be adjusted to pressures in excess of and less than those specified. Do not use these units to control pressures outside of the specified ranges.

ISO Symbol



See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure: 300 psig (20 bar)

Operating Temperature*: -30° to 150°F (-34° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Gauge Ports:

1/8" PTF with PTF main ports

1/8" ISO Rc with ISO Rc main ports

1/8" ISO Rc with ISO G main ports

Exhaust Port:

1/4" PTF with PTF main ports

1/4" ISO Rc with ISO Rc main ports

1/4" ISO Rc with ISO G main ports

Materials

Body: Zinc

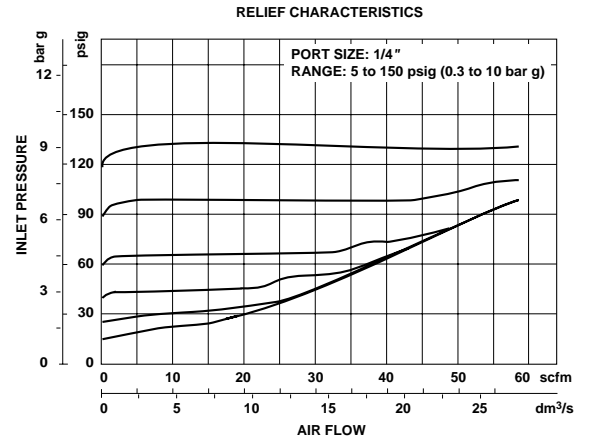
Bonnet: Acetal

Valve: Brass

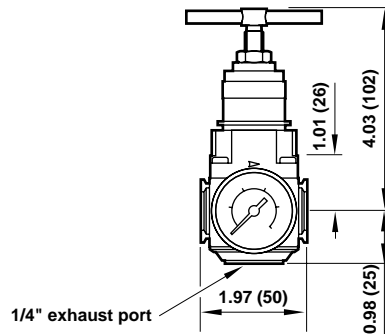
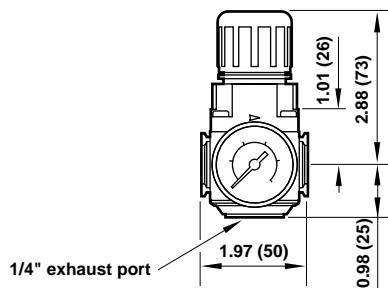
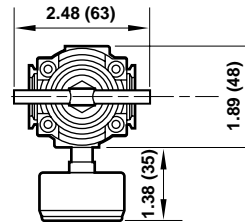
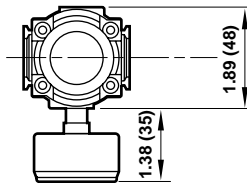
Elastomers: Neoprene

Bottom Plug: Acetal

Typical Performance Characteristics



All Dimensions in Inches (mm)



Panel mounting hole diameter: 1.57" (40 mm)
Maximum panel thickness: 0.16" (4 mm)

**74 Series Pressure Relief Valve
3/8", 1/2", 3/4" Port Sizes**

- Excelon design allows in-line or modular installation
- Push to lock adjusting knob with tamper resistant accessory
- Easily disassembled for servicing without removal from air line
- Helps protect air operated equipment from over pressure by retarding excessive pressure build up
- Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications



Ordering Information. Models listed include PTF threads, knob adjustment, and a 5 to 150 psig (0.3 to 10 bar) relief pressure adjustment range*.

Port Size	Model	Weight lb (kg)
3/8"	V74G-3AK-NMN	0.69 (1.53)
1/2"	V74G-4AK-NMN	0.68 (1.50)
3/4"	V74G-6AK-NMN	0.67 (1.47)

Alternative Models

Port Size	Substitute
3/8"	3
1/2"	4
3/4"	6

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Adjustment	Substitute
Knob	K
T-bar	T

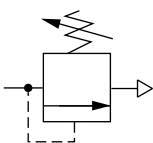
V 7 4 G - ★ ★ ★ - N ★ ★

Gauge	Substitute
With	G
Without	N

Relief Pressure Adjustment Range*	Substitute
5 to 60 psig (0.3 to 4 bar)	F
5 to 150 psig (0.3 to 10 bar)	M
10 to 250 psig (0.7 to 17 bar)**	S

* Relief valve can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

** Units with 250 psig (17 bar) relief pressure range are available only with the T-bar adjustment; therefore substitute **T** at the 7th position and **S** at the 9th position.

ISO Symbol


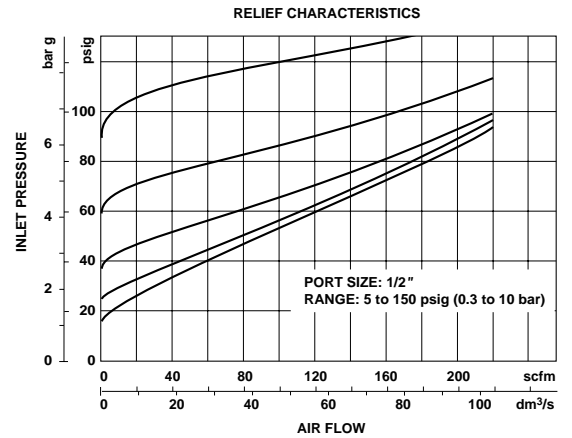
See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air
 Maximum pressure: 300 psig (20 bar)
 Operating temperature*: -30° to 175°F (-34° to 80°C)
 * Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
 Gauge ports:
 1/4" PTF with PTF main ports
 Rc1/4 with ISO Rc main ports
 Rc1/8 with ISO G main ports
 Materials
 Body: Aluminum
 Bonnet: Aluminum
 Valve: Aluminum and Nitrile
 Elastomers: Nitrile
 Bottom plug: Acetal

Typical Performance Characteristics

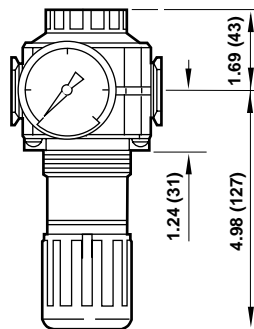
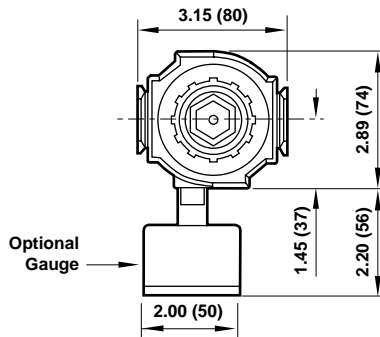


Service Kits

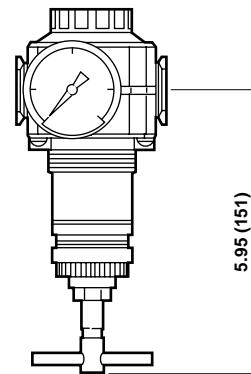
Item	Type	Part Number
Service kit	Diaphragm & Seal	4384-700

Service kit includes diaphragm, bottom plug o-ring.

All Dimensions in Inches (mm)



Panel mounting hole diameter: 2.06" (52 mm)
 Maximum panel thickness: 0.25" (6 mm)



Olympian Plus Pressure Relief Valve 1/4", 3/8", 1/2", 3/4" Port Sizes

- Olympian Plus plug in design
- Helps protect air operated equipment from over pressure by retarding excessive pressure build up
- High relief capacity
- Threaded relief port for silencer or piped exhaust
- Relief port located on bottom allows easy installation



Ordering Information. Models listed include PTF threads, 5 to 150 psig (0.3 to 10 bar) operating pressure range* without gauge.

Port Size	Model	Weight lb (kg)
1/4"	V64H-2AD-RMN	3.73 (1.68)
3/8"	V64H-3AD-RMN	3.69 (1.66)
1/2"	V64H-4AD-RMN	3.62 (1.63)
3/4"	V64H-6AD-RMN	4.42 (1.99)

For replacement relief valve (without yoke) substitute 'N' at the 5th and 6th digits eg: V64H-NND-RMN.

Alternative Models

V 6 4 H - ★ ★ ★ - R ★ ★

Port Size	Substitute
1/4"	2
3/8"	3
1/2"	4
3/4"	6

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

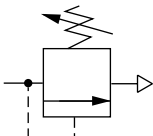
Gauge	Substitute
With	G
Without	N

Outlet Pressure Adjustment Range*	Substitute
5 to 60 psig (0.3 to 4 bar)	F
15 to 150 psig (1 to 10 bar)	M
10 to 250 psig (0.7 to 17 bar)	S

Adjustment	Substitute
Slotted screw	D

* Relief valve can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

ISO Symbol



See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure: 300 psig (20 bar)

Operating temperature*: -30° to 175°F (-34° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Gauge ports:

1/8" PTF with PTF main ports

1/8" ISO Rc with ISO Rc main ports

1/8" ISO Rc with ISO G main ports

Exhaust port:

1/2" PTF with PTF main ports

1/2" ISO Rc with ISO Rc main ports

1/2" ISO Rc with ISO G main ports

Materials

Body: Zinc

Bonnet: Zinc

Bottom plug: Aluminum alloy

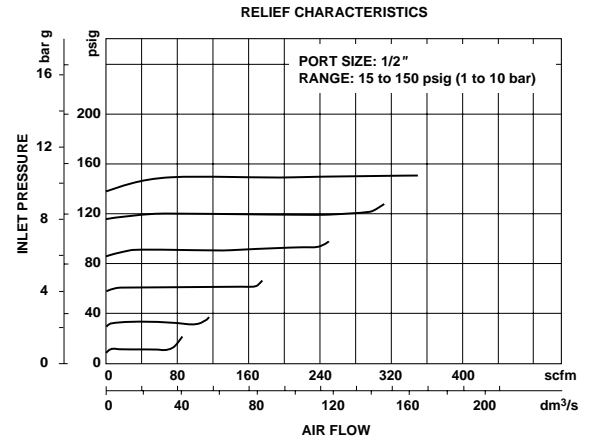
Yoke: Zinc

Adjusting screw: Steel

Valve: Brass

Elastomers: Synthetic rubber

Typical Performance Characteristics

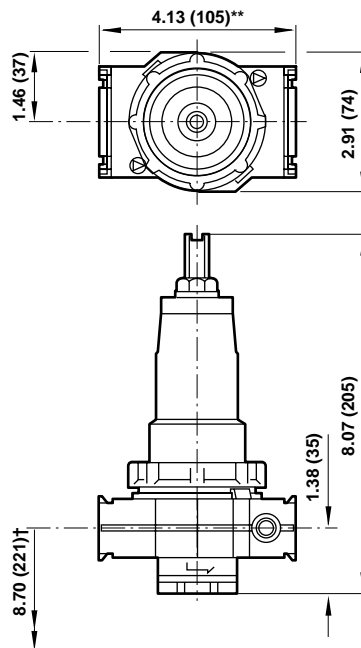


Service Kits

Item	Type	Part Number
Service kit	All models	4384-200
Gasket kit	All models	V13-GK

Service kit includes port and bottom plug o-rings, gasket, slip ring, valve assembly, valve spring, diaphragm, diaphragm stop and pilot valve assembly.

All Dimensions in Inches (mm)



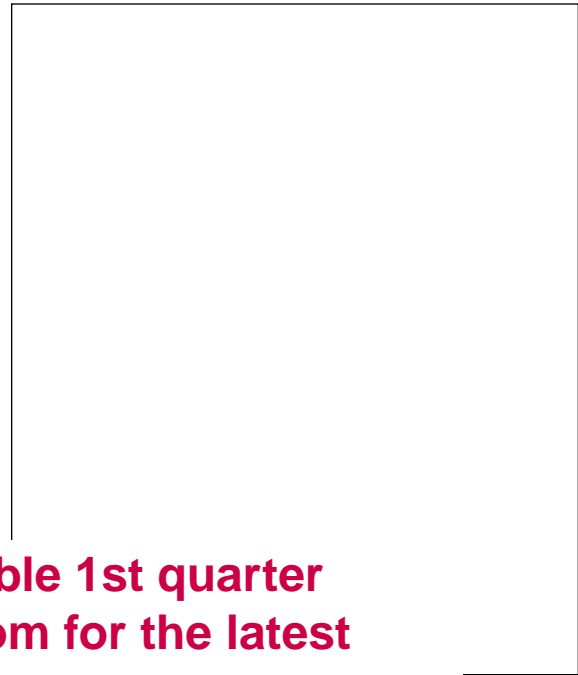
Panel mounting hole diameter: 2.06" (52 mm)
Maximum panel thickness: 0.16" (4 mm)

** 6.18" (157 mm) for models with 3/4" ports

† Minimum clearance required to remove unit.

**Olympian Pressure Relief Valve
3/4", 1", 1-1/4", 1-1/2", Port Sizes**

- Olympian plug in design
- Helps protect compressed air systems from over pressure by retarding excessive pressure build up
- High relief capacity, sensitive and accurate
- Integral pilot operated design, suitable for in-line or indirect mounting
- Threaded relief port for silencer or piped exhaust



68 Series products are available 1st quarter of 2001. Visit www.norgren.com for the latest data on this series.

Ordering Information. Models listed include PTF threads, 1 to 10 bar (15 to 150 psig) operating adjustment range* without gauge.

Port Size	Model	Weight kg (lb)
3/4"	V68H-6AD-RMN	2,21 (4.91)
1"	V68H-8AD-RMN	2,20 (4.89)
1-1/4"	V68H-AAD-RMN	2,22 (4.93)
1-1/2"	V68H-BAD-RMN	2,26 (5.02)

Alternative Models

V68H - ★★★ - R ★★

Port Size	Substitute
3/4"	6
1"	8
1 1/4"	A
1 1/2"	B

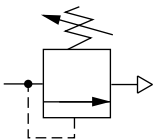
Thread	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Adjustment	Substitute
Slotted screw	D

Gauge	Substitute
With	G
Without	N

Outlet Pressure Adjustment Range*	Substitute
0,4 to 4 bar (0 to 60 psig)	F
1 to 10 bar (15 to 150 psig)	M
0.7 to 17 bar (10 to 250 psig)	S

* Relief valve can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

ISO Symbol




Technical Data

Fluid: Compressed air
 Operating temperature*:
 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

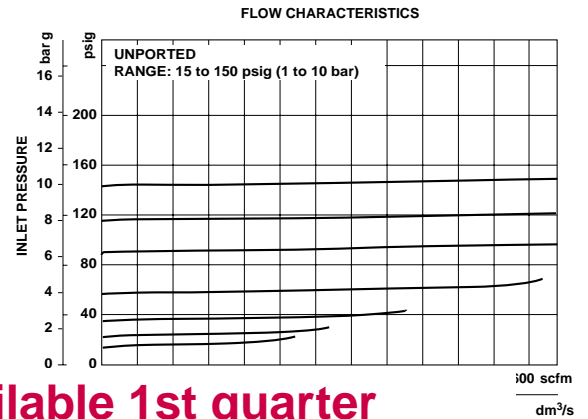
Gauge ports: 1/8" PTF

Exhaust port: 1" PTF

Materials

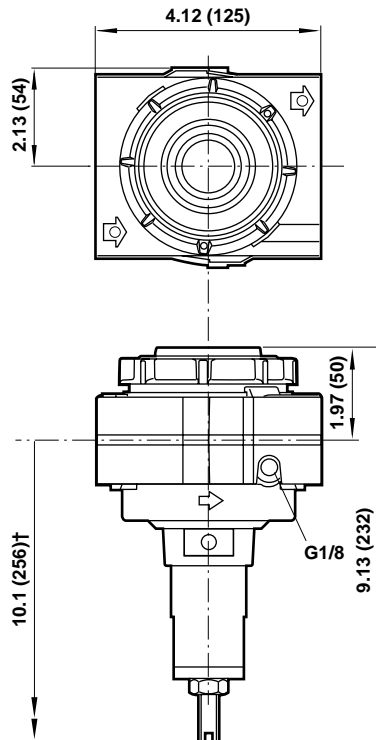
- Body: Aluminium
- Intermediate body: Aluminium
- Bonnet: Aluminium
- Bottom plug: Aluminium
- Adjusting screw: Steel
- Elastomers: Synthetic rubber
- Yoke: Aluminium

Typical Performance Characteristics



68 Series products are available 1st quarter of 2001. Visit www.norgren.com for the latest data on this series.

All Dimensions in Inches (mm)



* Reduces by 4 mm (0.16") with knob in locked position. Add 37 mm (1.46") for unit with T-handle

† Minimum clearance required to remove unit.

**Miniature Brass Body Tank Relief Valve
Compressed Air Service
1/8" and 1/4" PTF Port Sizes**

- Used in low-volume air tanks to retard excessive pressure buildup
- If pressure exceeds the relief pressure setting, the valve opens and air from the tank is vented to atmosphere. Valve closes when pressure is reduced to the relief pressure setting.
- Compact design, corrosion resistant construction
- Constructed of brass and stainless steel for compressed air and water service
- Available with adjustable or non-adjustable, factory preset, relief pressure setting


Ordering information

Port Size	Model Numbers - Relief Pressure Adjustment Ranges *				Weight lbs (kg)
	25 to 50 psig (1.7 to 3.5 bar)	25 to 75 psig (1.7 to 5.2 bar)	70 to 150 psig (5 to 10.4 bar)	125 to 300 psig (8.6 to 20.7 bar)	
1/8"	16-004-001	16-004-002	16-004-003	16-004-004	0.11 (0.05)
1/4"	16-004-009	16-004-010	16-004-011	16-004-012	0.11 (0.05)

Alternative Models

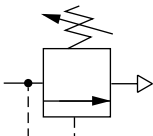
1 6 - 0 0 4 - ★ ★ ★ - ★ ★ ★ ★

Factory set, non adjustable pressure	Add **
Locktite adjusting cap	Z

Factory Set Relief Pressure Setting	Add **
Insert desired relief pressure setting in psig	025 through 300

* Relief valves can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

** Example: 16-004-001-**Z025**
Locking method: Locktite cap
Relief pressure setting: 25 psig

ISO Symbol


See Section ALE-25 for Accessories



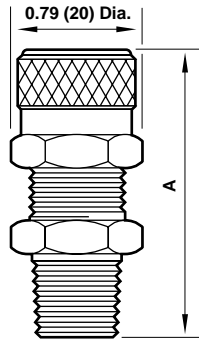
Technical Data

Fluid: Compressed air and water
 Maximum pressure: 300 psig (20 bar)
 Operating temperature*: -30° to 200°F (-34° to 93°C)
 *Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
 Repeatability: ± 20% of relief pressure setting

Materials

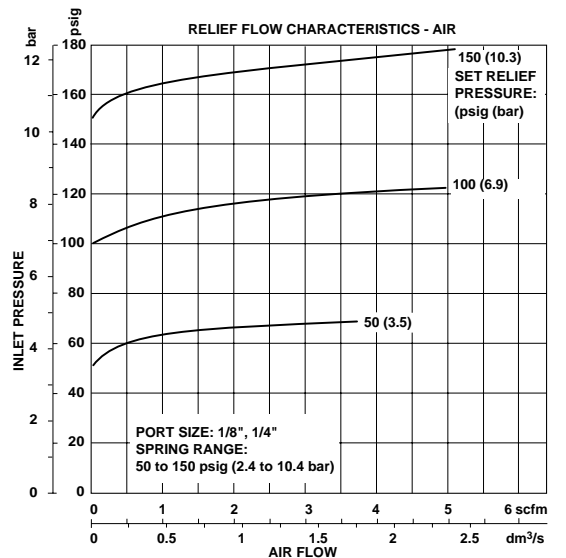
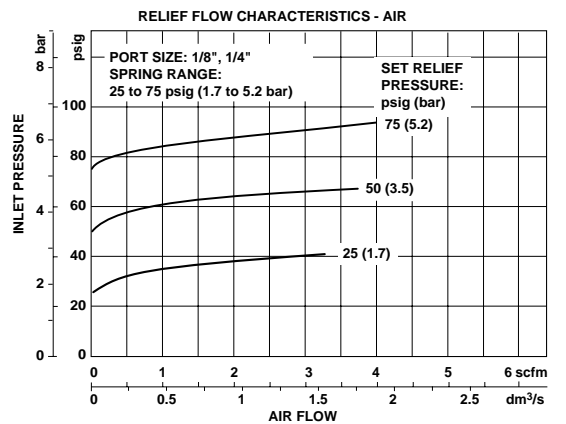
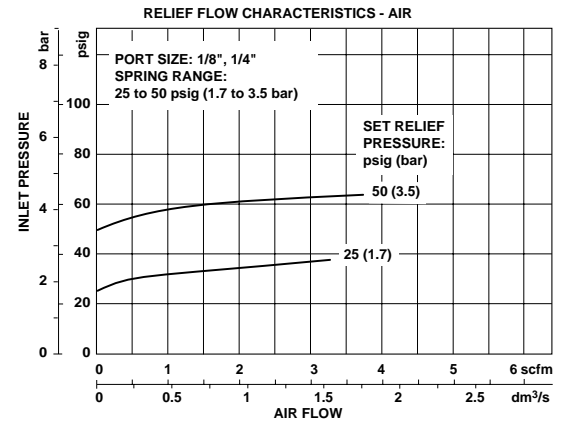
- Body, cap, springrest: Brass
- Valve: Brass and nitrile
- Regulating spring: Stainless steel

All Dimensions in Inches (mm)



A: 1.56 (62) for 1/8" pipe size
 1.75 (44) for 1/4" pipe size

Typical Performance Characteristics



**Miniature Brass Body Relief Valve
Water and Compressed Air Service
1/8" and 1/4" PTF Port Sizes**

- Helps protect water systems from excessive pressure buildup by venting water when pressure exceeds setting of the relief valve. Relief valve closes when pressure is reduced to the relief pressure setting.
- Compact design, corrosion resistant construction
- Brass body with choice of plastic or brass bonnet
- Plastic bonnet equipped with low torque, non-rising pressure adjusting knob. Snap action knob locks pressure setting when pushed in
- Brass bonnet equipped with pressure adjusting screw and locknut
- Can be disassembled without the use of tools or removal from the air line
- Can be factory preset



Ordering information. Models listed include PTF threads, plastic bonnet with knob adjustment, and 5 to 100 psig (0.3 to 7 bar) relief pressure adjustment range.† A gauge is not included.

Port Size	Model Number	Weight lbs (kg)
1/8"	V06-121-NNKA	0.2 (0.09)
1/4"	V06-221-NNKA	0.2 (0.09)

Alternative Models

V 0 6 - ★ ★ ★ - ★ ★ ★ ★

Port Size	Substitute
1/8"	1
1/4"	2

Bonnet	Substitute
Plastic	21
Brass	22

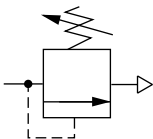
Factory Set Relief Pressure	Substitute
Not factory set	N
Factory set, non adjustable relief pressure. Also specify desired relief pressure on order.	P

Threads	Substitute
PTF	A

Relief Pressure Adjustment Range†	Substitute
1 to 10 psig (0.1 to 0.7 bar)	A
5 to 50 psig (0.3 to 3.5 bar)	E
5 to 100 psig (0.3 to 7 bar)	K

Gauges	Substitute
With	G
Without	N

† Relief valve can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

ISO Symbol


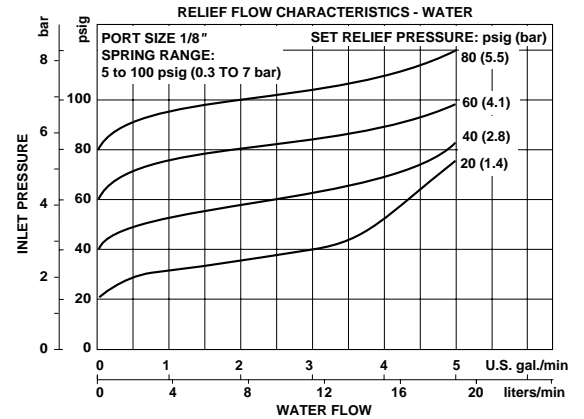
See Section ALE-25 for Accessories



Technical Data

Fluid: Water and compressed air
 Maximum pressure: 400 psig (27.6 bar)
 Operating temperature:
 Plastic bonnet: 35° to 150°F (2° to 65°C)
 Brass bonnet: 35° to 175°F (2° to 79°C)
 Gauge ports: 1/8" PTF
Materials
 Body: Brass
 Bonnet
 Standard: Acetal resin
 Optional: Brass
 Valve seat: Acetal resin
 Elastomers: Nitrile

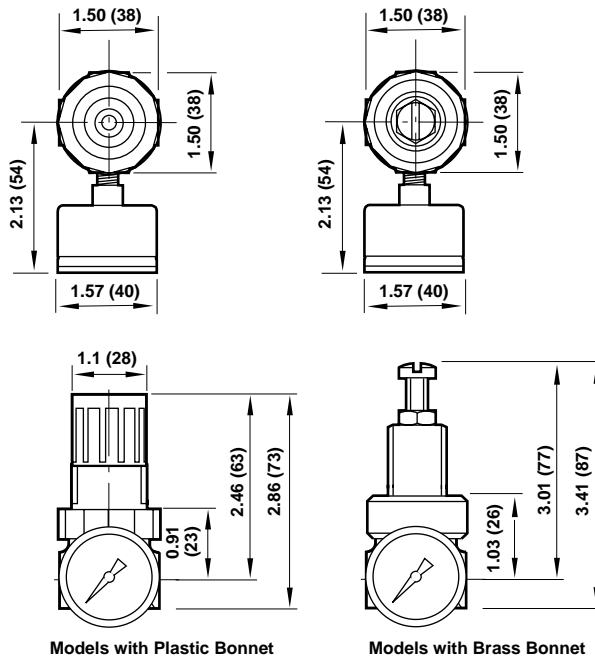
Typical Performance Characteristics



Service Kits

Item	Type	Part number
Service kit	Valve seat and seal	3439-11
	Diaphragm	3440-03

All Dimensions in Inches (mm)



Panel mounting hole diameter:
 Models with plastic bonnet: 1.19" (30 mm)
 Models with brass bonnet: 0.81" (21mm)
 Maximum panel thickness: 0.25" (6 mm)



Pressure Relief Valves - Function and Sizing

1.1.2 How do they Work?

The inlet port is connected to the system and the valve limits the downstream pressure by exhausting when the system pressure exceeds the preset pressure of the valve. The valve is normally closed, only opening when unusual system conditions prevail.

1.1.3 Are they Safety Valves?

No. Safety valves are covered by a variety of national standards eg BS 1123. Norgren relief valves are not designed to these standards.

1.2 SIZING

1.2.1 How do I Size a Relief Valve?

If the relief valve is to be fitted to prevent excess pressure then it needs to be sized to cope with the maximum flow that the system can see - often the output flow capacity of the compressor.

The relief valve needs to be able to cope with this flow within acceptable pressure limits. See catalogue data sheets for relief flow characteristics.

1.2.2 Should the Relief Valve be the same Size as the Regulator?

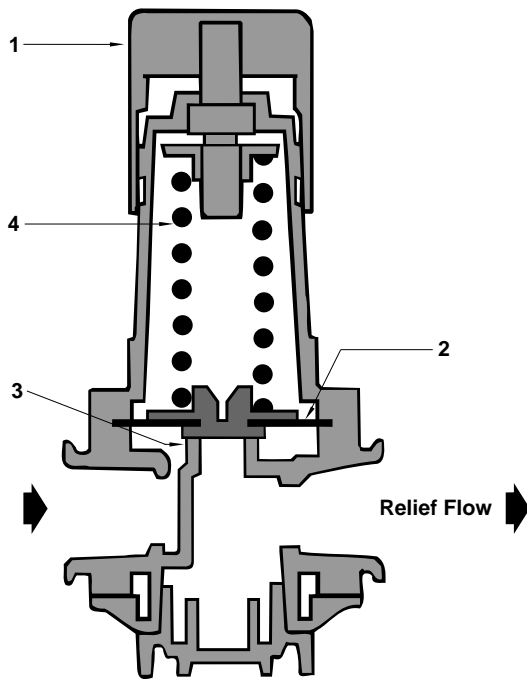
Not necessarily. In general the failure flow of a regulator will require use of a relief valve of larger basic size. Detailed graphs are available for sizing - please call Application Engineering.

1.2.3 What is Failure Flow?

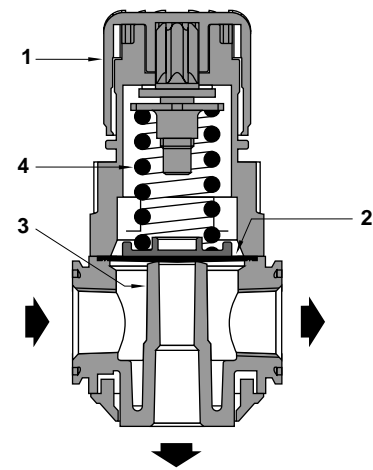
This is the maximum flow that will pass through a regulator in the event of its total failure.

It varies with system pressure and the test results on all Norgren regulators are available from Application Engineering.

The failure flow is used for sizing relief valves downstream of regulators.



"T" Installation (Type V07, V74, 16-001)



Relief Flow
Inline Installation (Type V72 Only)

Shut-off & Lockout Valves

1/4" to 1-1/2" port size

Contents

T72 Excelon Shut-off & Lockout Valves	
1/4", 3/8" Port Sizes	.....ALE-16-2
T73 Excelon Shut-Off & Lockout Valves	
1/4", 3/8", 1/2" Port Sizes	.....ALE-16-4
T74 Excelon Shut-Off & Lockout Valves	
3/8", 1/2", 3/4" Port Sizes	.....ALE-16-6
T64 Olympian Plus Shut-off & Lockout Valves	
1/4", 3/8", 1/2", 3/4" Port Sizes	.....ALE-16-8
T68 Olympian Plus Shut-off & Lockout Valves	
3/4", 1", 1 1/4", 1 1/2" Port Sizes	.....ALE-16-10
C00 Lockout Valves 1/4" through 1-1/2" Port Sizes	.....ALE-16-12
Option and FAQ's	.....ALE-16-14



T72



T73



T74



T64

Product available
1st quarter of 2001



C00

**Excelon T72 Shut-off & Lockout Valves
1/4", 3/8" Port Sizes**

- **EXCELRON** design allows in-line installation or modular installation
- T72B 2-port/2-position shut-off valves no exhaust
- T72T 3-port/2-position shut-off valves with 10-32 tapped exhaust
- T72E 3-port/2-position lockout valves help conform to OSHA Lockout Regulations in USA market. Exhaust outlet is not tapped.
- Valves can be locked in closed position only
- Modular installations with EXCELRON 72, 73, and 74 series can be made to suit particular applications



Ordering Information. Models listed have PTF threads.

Port Size	2-Port/2-Position No Exhaust Outlet	3-Port/2-Position (OSHA) Exhaust Port not tapped	3-Port/2-Position Threaded Exhaust Port	Weight lbs (kg)
1/4"	T72B-2AA-P1N	T72E-2AA-P1N	T72T-2AA-P1N	0.79 (0.36)
3/8"	T72B-3AA-P1N	T72E-2AA-P1N	T72T-3AA-P1N	0.86 (0.39)

Alternative Models

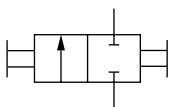
T
7
2
★
-
★
★
A
-
P
1
★

Valve Type	Substitute
2-port/2-position Black slide, No exhaust outlet	B
3-port/2-position Yellow slide, Unthreaded exhaust outlet	E
3-port/2-position Red slide, Threaded exhaust port	T

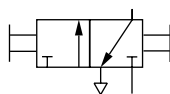
Options	Substitute
None	N
T73T with exhaust silencer	S
T73T with exhaust diffuser	D

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Port Size	Substitute
1/4"	2
3/8"	3

ISO Symbols


2-Port/2-Position



3-Port/2-Position

See Section ALE-25 for Accessories



Technical Data

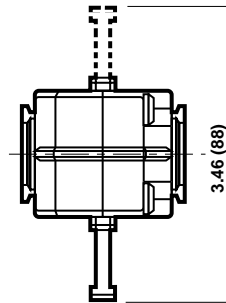
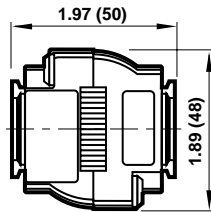
Fluid: Compressed air
 Maximum Pressure: 250 psig (17 bar)
 Operating Temperature*: 0° to 150°F (-20° to 65°C)
 * Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
 Cv factor from IN to OUT ports
 1/4" ports: 4.0
 3/8" ports: 8.0
 Cv factor from OUT to EXHAUST ports on 3-port/2-position valves: 0.2.
 Exhaust port threads on T72T models: 10-32
 Hole diameter in slide for padlock: 5/16" (8 mm)
 Materials
 Body: Zinc
 Slide: Acetal plastic
 Elastomers: Nitrile

Service Kits

Item	Type	Part Number
Service kit	Actuator seals and slide	4384-510

Service kit includes actuator seals and slide.

All Dimensions in Inches (mm)



Excelon T73 Shut-Off & Lockout Valves 1/4", 3/8", 1/2" Port Sizes

- EXCELRON design allows in-line or modular installation
- T73B 2-port/2-position shut-off valves no exhaust
- T73T 3-port/2-position shut-off valves with 10-32 tapped exhaust
- T73E 3-port/2-position lockout valves help conform to OSHA Lockout Regulations in USA market. Exhaust outlet is not tapped.
- Valves can be locked in closed position only.
- Modular installations with EXCELRON 72, 73, and 74 series can be made to suit particular applications



Ordering Information. Models listed have PTF parallel threads.

Port Size	2-Port/2-Position No exhaust outlet	3-Port/2-Position Unthreaded exhaust outlet	3-Port/2-Position Threaded exhaust port	Weight lbs (kg)
1/4"	T73B-2AA-P1N	T73E-2AA-P1N	T73T-2AA-P1N	0.7 (0.3)
3/8"	T73B-3AA-P1N	T73E-3AA-P1N	T73T-3AA-P1N	0.7 (0.3)
1/2"	T73B-4AA-P1N	T73E-4AA-P1N	T73T-4AA-P1N	0.7 (0.3)

Alternative Models

T 7 3 ★ - ★ ★ A - P 1 ★

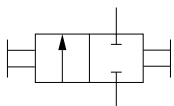
Valve Type	Substitute
2-port/2-position Black slide, No exhaust outlet	B
3-port/2-position Yellow slide, Unthreaded exhaust outlet	E
3-port/2-position Red slide, Threaded exhaust port	T

Port Size	Substitute
1/4"	2
3/8"	3
1/2"	4

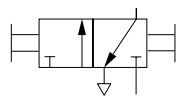
Options	Substitute
None	N
T73T with exhaust silencer	S
T73T with exhaust diffuser	D

Threads	Substitute
PTF	A
ISO R _c taper	B
ISO G parallel	G

ISO Symbols



2-Port/2-Position



3-Port/2-Position

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air
 Maximum pressure: 250 psig (17 bar)
 Operating temperature: 0° to 150°F (-20° to 65°C)
 * Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Cv factor

IN to OUT ports:

1/4" ports: 4.0

3/8" ports: 8.0

1/2" ports: 7.8

OUT to EXHAUST ports on 3-port/2-position valves: 0.2

Exhaust port threads on T73T models: 10-32

Hole diameter in slide for padlock: 5/16" (8 mm)

Materials

Body: Zinc

Slide: Acetal plastic

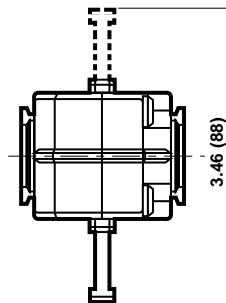
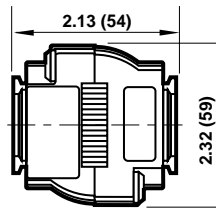
Elastomers: Nitrile

Service Kits

Item	Type	Part Number
Service kit	T73B (black slide)	4384-610
	T73E (yellow slide)	4384-611
	T73T (red slide)	4384-612

Service kit includes seals and slide.

All Dimensions in Inches (mm)



**Excelon T74 Shut-Off & Lockout Valves
3/8", 1/2", 3/4" Port Sizes**

- **EXCELON design allows in-line or modular installation**
- **T74B 2-port/2-position shut-off valves no exhaust**
- **T74T 3-port/2-position shut-off valves with 1/8" tapped exhaust**
- **T74E 3-port/2-position lockout valves help conform to OSHA Lockout Regulations in USA market. Exhaust outlet is not tapped.**
- **Valves can be locked in the closed position only**
- **Modular installations with EXCELON 72, 73, and 74 series can be made to suit particular applications**

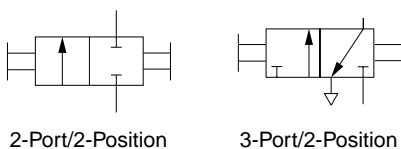


Ordering Information. Models listed have PTF threads.

Port Size	2-Port/2-Position Padlock closed only. No exhaust outlet.	3-Port/2-Position OSHA Padlock closed only. Unthreaded exhaust outlet.	3-Port/2-Position Padlock closed only. Threaded exhaust port.	Weight lbs (kg)
3/8"	T74B-3AA-P1N	T74E-3AA-P1N	T74T-3AA-P1N	0.69 (0.32)
1/2"	T74B-4AA-P1N	T74E-4AA-P1N	T74T-4AA-P1N	0.65 (0.30)
3/4"	T74B-6AA-P1N	T74E-6AA-P1N	T74T-6AA-P1N	0.62 (0.28)

Alternative Models

Valve Type	Substitute	T 7 4 ★ - ★ ★ A - P 1 ★		Options	Substitute										
2-port/2-position Black slide, No exhaust outlet	B	T	7	4	★	-	★	★	A	-	P	1	★	None	N
3-port/2-position Yellow slide, Unthreaded exhaust outlet	E													Silencer installed in T74T exhaust port	S
3-port/2-position Red slide, Threaded exhaust port	T														
														Threads	Substitute
														PTF	A
														ISO R _c taper	B
														ISO G parallel	G
														Port Size	Substitute
														3/8"	3
														1/2"	4
														3/4"	6

ISO Symbols


See Section ALE-25 for Accessories



Technical Data

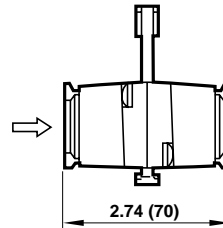
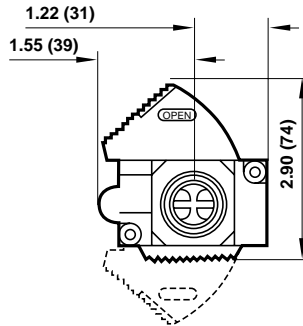
Fluid: Compressed air
 Maximum pressure: 250 psig (17 bar)
 Temperature range: 0° to 150°F (-20° to 65°C)
 * Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
 Cv factor
 IN to OUT ports:
 3/8" ports: 7.1
 1/2" ports: 8.1
 3/4" ports: 7.7
 OUT to EXHAUST ports on 3-port/2-position valves: 0.2
 Exhaust port threads on T74T models:
 1/8 PTF with PTF main ports
 1/8" ISO R_C with ISO G and ISO R_C main ports
 Hole diameter in slide for padlock: 0.29" (7.5 mm)
 Materials
 Body: Zinc
 Slide: Acetal plastic
 Elastomers: Nitrile

Service Kits

Item	Type	Part Number
Service kit	T74B (black slide)	4384-711
	T74E (yellow slide)	4384-710
	T74T (red slide)	4384-713

Service kit includes seals and slide.

All Dimensions in Inches (mm)



Olympian Plus T64 Shut-off & Lockout Valves
1/4", 3/8", 1/2", 3/4" Port Sizes

- Olympian Plus plug in design
- T64B 2-port/2-position shut-off valves no exhaust
- T64T 3-port/2-position shut-off valves with 1/8" tapped exhaust
- T64E 3-port/2-position lockout valves help conform to OSHA Lockout Regulations in USA market. Exhaust outlet is not tapped.
- Valves can be locked in closed position only
- Attaches to yoke, upstream or downstream of air processing units



Ordering Information. Models listed have PTF threads.

Port Size	2-Port/2-Position No exhaust outlet	3-Port/2-Position OSHA Unthreaded exhaust port	3-Port/2-Position Threaded exhaust port	Weight lbs (kg)
1/4"	T64B-2AB-P1N	T64E-2AB-P1N	T64T-2AB-P1N	0.89 (0.40)
3/8"	T64B-3AB-P1N	T64E-3AB-P1N	T64T-3AB-P1N	0.88 (0.40)
1/2"	T64B-4AB-P1N	T64E-4AB-P1N	T64T-4AB-P1N	0.84 (0.38)
3/4"	T64B-6AB-P1N	T64E-6AB-P1N	T64T-6AB-P1N	0.84 (0.38)

Alternative Models

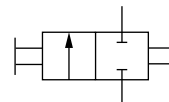
T 6 4 ★ - ★ ★ ★ - P 1 N

Valve Type	Substitute
2-port/2-position Black slide, No exhaust outlet	B
3-port/2-position Yellow slide, Unthreaded exhaust outlet	E
3-port/2-position Red slide, Threaded exhaust port	T

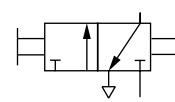
Port Size	Substitute
1/4"	2
3/8"	3
1/2"	4
3/4"	6

Porting	Substitute
Threaded inlet only	B
Threaded outlet only	C

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

ISO Symbols


2-Port/2-Position



3-Port/2-Position

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air
 Maximum pressure: 250 psig (17 bar)
 Operating temperature*: 0° to 175°F (-20° to 80°C)
 * Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
 Cv factor from IN to OUT ports
 1/4 port size: 2.6
 3/8 port size: 5.5
 1/2 port size: 6.7
 3/4 port size: 7.5
 Exhaust port threads on T64T models:
 1/8 PTF with PTF main ports
 1/8 ISO Rc with ISO G and ISO Rc main ports

Materials

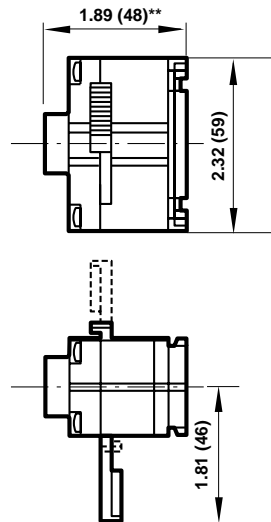
Body: Zinc
 Slide: Acetal plastic
 Elastomers: Nitrile

Service Kits

Item	Type	Part Number
Service kit	T74B (black slide)	
	T74E (yellow slide)	
	T74T (red slide)	

Service kit includes seals and slide.

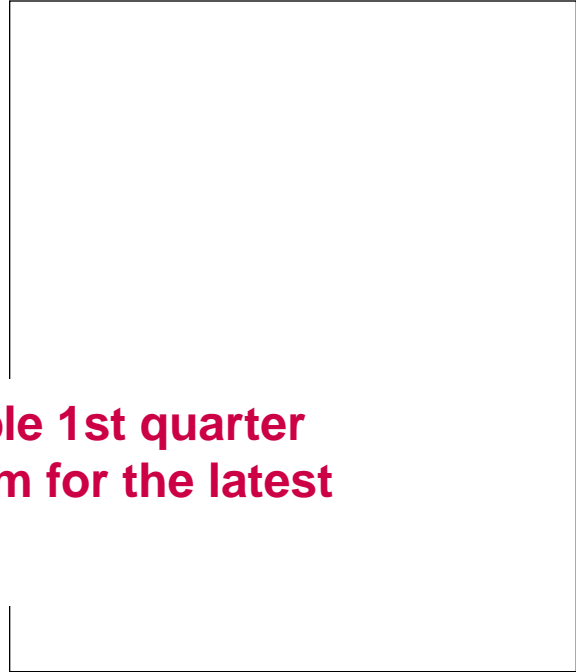
All Dimensions in Inches (mm)



** Models with 3/4" ports

**Olympian Plus T68 Shut-off & Lockout Valves
3/4", 1", 1-1/4", 1-1/2" Port Sizes**

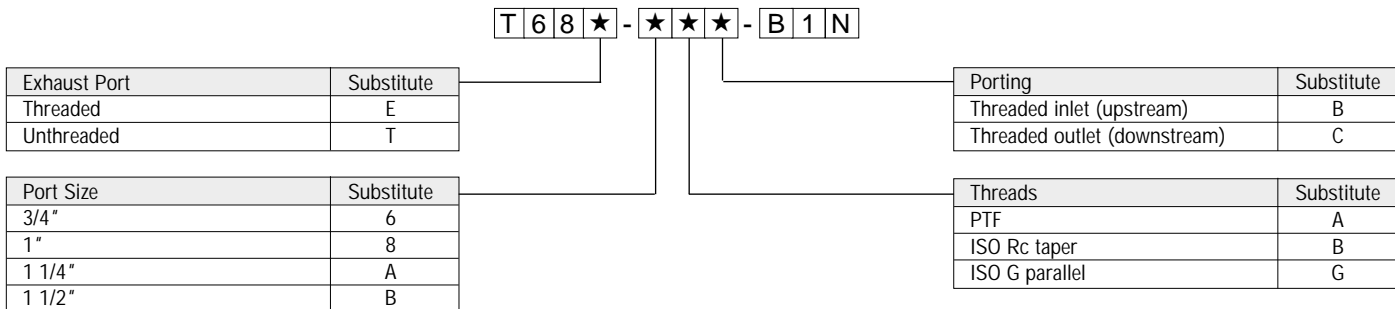
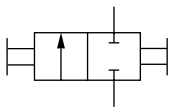
- Olympian plug in design
- Quick action 1/4 turn from full flow to exhaust
- T68 3-port/2-position shut-off valves with exhaust
- Valves can be locked in open or closed position
- Use upstream or downstream of air processing units
- Low pressure drop ball valve design



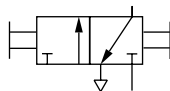
68 Series products are available 1st quarter of 2001. Visit www.norgren.com for the latest data on this series.

Ordering Information. Models listed have PTF threads and include screws and seals for yoke connection.

Port Size	3-Port/2-Position Threaded Exhaust Port (G1/4)	Weight lbs (kg)	2-Port/2-Position No Exhaust Outlet	Weight lbs (kg)
3/4"	T68T-6AB-B1N	2.21 (1.00)	T68E-6AB-B1N	2.21 (1.00)
1"	T68T-8AB-B1N	2.12 (0.96)	T68E-8AB-B1N	1.92 (0.87)
1-1/4"	T68T-AAB-B1N	2.07 (0.94)	T68E-AAB-B1N	2.21 (1.00)
1-1/2"	T68T-BAB-B1N	2.16 (0.98)	T68E-BAB-B1N	2.16 (0.98)

Alternative Models

ISO Symbols


2-Port/2-Position



3-Port/2-Position

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air
 Maximum Pressure: 250 psig (17 bar)
 Operating Temperature*: 0° to 175°F (-20° to 80°C)
 * Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
 Cv factor from IN to OUT ports: 27.5

Materials

Body: Aluminium
 Handle: Zinc
 Seals: PTFE
 Ball: Brass

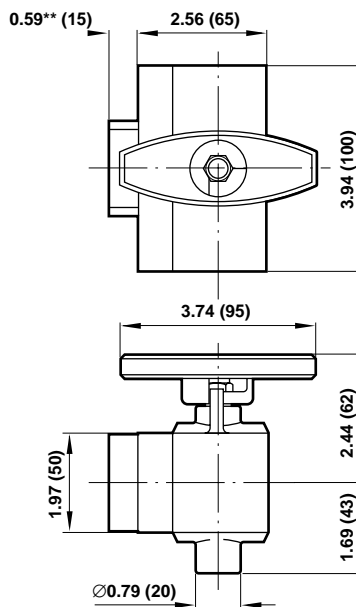
Service Kits

Item	Part Number
Service kit	4384-310

Service kit includes thrust bearing, Teflon seats, stem seal, gland, stem nut, and necessary o-rings.

68 Series products are available 1st quarter of 2001. Visit www.norgren.com for the latest data on this series.

All Dimensions in Inches (mm)



** 0.79" (20 mm) for G1 1/2 model.

For installation in 1/4" through 1-1/2" air lines.

- 3-way, manually operated, full flow lockout valves can be locked in the closed position with a customer supplied padlock.
- In the closed position, these valves shut off the flow of air between the inlet and outlet ports and exhaust the downstream air.
- Helps you comply to OSHA regulations, as they relate to OSHA regulation 29 CFR Part 1910, standard for lockout/tagout procedures.



Options

C0021A/D and C0023A/D Valves with fluorocarbon elastomers: Specify **1FA** after the desired valve model number.

C0022A/D and C0024A/D Valves with fluorocarbon elastomers: Specify **1EX** after the desired valve model number.

C0021A/D Valves with tapped muffler base that accepts a muffler with 3/4" NPT male threads: Specify **1M2** after the desired valve model number.
Recommended muffler: **MB006A**.

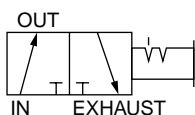
C0022A/D Valves with tapped muffler base that accepts a muffler with 1" NPT male threads: Specify **1M1** after the desired valve model number.
Recommended muffler **MB008A**.

Note: Standard valves have a black handle. To order valves with a red handle, change the second position of the model number to an R (e.g., C0021A would change to CR021A).

Order Information

Basic Size	Port Size PTF	Model Numbers		Basic Size	Port Size ISO G	Model Numbers		Cv Factor	
		Without Muffler	With Muffler			Without Muffler	With Muffler	In-Out Ports	Out-Exhaust Ports
1/2"	1/4"	C0021A	C0023A	1/2"	G1/4	C0041A	C0043A	4.2	6.0
	3/8"	C0021B	C0023B		G3/8	C0041B	C0043B	6.6	6.6
	1/2"	C0021C	C0023C		G1/2	C0041C	C0043C	9.3	7.9
	3/4"	C0021D	C0023D		G3/4	C0041D	C0043D	12.6	8.6
1"	3/4"	C0022A	C0024A	1"	G3/4	C0042A	C0044A	10.6	8.0
	1"	C0022B	C0024B		G1	C0042B	C0044B	16.2	9.2
	1-1/4"	C0022C	C0024C		G1-1/4	C0042C	C0044C	25.3	8.9
	1-1/2"	C0022D	C0024D		-	-	-	22.4	10.0

Graphic Symbol





Technical Data

Fluid: Compressed air
 Maximum Pressure: 300 psig (20.4 bar)
 Temperature Range: -20° to 175°F* (-29° to 79°C).
 *With a dew point of supply air less than air temperature below 35°F (2°C).
 Maximum Diameter of Lock Shackle: 5/16" (8mm)

Materials of Construction

- Valve Body: Aluminum
- Muffler Base: Zinc
- Spool, T-Handle, Muffler Shell: Aluminum
- Spring Detent: Stainless Steel
- Elastomers
 - Standard: Nitrile and Polyurethane
 - Optional: Fluorocarbon

Repair Kits

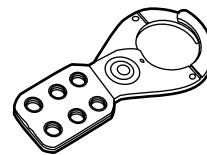
- C0021A/D and C0023A/D Valves:
 - Standard Elastomers: 53474-43
 - Fluorocarbon Elastomers: 53474-44
- C0022A/D and C0024A/D Valves:
 - Standard Elastomers: 53475-34
 - Fluorocarbon Elastomers: 53475-36
- Replacement Mufflers* for C0021A/C0024D Valves
 - C0021A/D and C0023A/D Valves: ML004F
 - C0022A/D and C0024A/D Valves: ML008F

*Contains all bolts and washers required to flange mount with the respective sized lockout valve.

Lockout Hasp

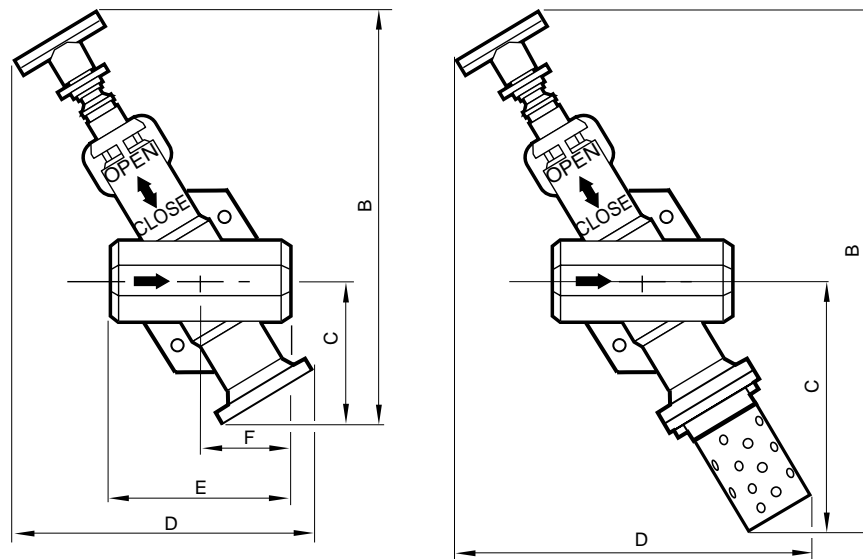
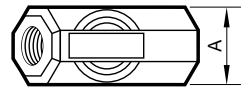
Part Number: 54547-01

The 1-1/2" diameter jaws can be used with all Norgren Inline, Olympian, and Poppet Lockout Valves except the T15. High-tensile steel affords extra protection against unauthorized access. Red vinyl coated and plated to resist rust. Locking holes accommodate padlocks up to 11/32" shackle diameter.



Lockout Hasp

All Dimensions in Inches (mm)



Valve Type	A	B		C		D		E	F
		Without Muffler	With Muffler	Without Muffler	With Muffler	Without Muffler	With Muffler		
All 1/2" basic	1.87 (48)	9.33 (237)	11.78 (299)	2.90 (74)	5.35 (136)	6.97 (177)	7.97 (202)	4.00 (102)	2.00 (51)
All 1" basic	2.26 (57)	12.07 (307)	15.72 (399)	4.13 (105)	7.78 (198)	8.65 (220)	10.46 (266)	5.00 (127)	2.50 (64)



1.3.1 What Options are Available?

The Olympian 1" product line has a ball valve (T15), but recent products have moved to the slide type. They are generally available in 2/2 (non-exhausting) and 3/2 types, for use upstream or optionally downstream of FRL units.

1.3.2 Can they be Locked?

All the slide valves in Excelon and Olympian Plus can be locked closed using the padlock hole provided in the blade. For certain applications where it is vital that the air is not turned off, a lock open and closed option is possible (eg T64A or T64C). The T15 can be locked by dropping in the lock ring and fitting a padlock.

1.3.3 What is Patented about the T64/T74?

The design of a slide valve where the exhaust air is captured rather than venting to atmosphere past the slide is the patented feature.

1.3.4 Why are the Blades Different Colors?

The colour of the slide depends on the valve function and the market in which it is sold.

Yellow = 3/2 exhaust not tapped OSHA (USA)

Black = 2/2 Excelon 74

Red = 3/2 exhaust tapped (Europe)

1.3.5 Do we have Downstream Shut Off Valves?

Yes. The Excelon valves can be used either upstream or downstream, and will always vent the downstream system. In Olympian Plus you need to use a special downstream version.

1.3.6 Is there a Shut Off which Fits Between Yokes in Olympian Plus?

Yes. This can be used within a build, or in Duplex assemblies.

1.3.7 Can I Use an Upstream Shut Off Downstream?

The Excelon family valves can be used either upstream or downstream. If used downstream, remember that the FRL units remain pressurized - the valve vents the downstream system.

There are special versions of the Olympian Plus and 15 Series valves for downstream use.

Stainless Steel Products

Products for use in offshore,
instrumentation, and
compatibility applications.

Contents

F22 General Purpose Stainless Steel Filter 1/2" Port Size	ALE-17-2
R05 Miniature Stainless Steel Regulator 1/4" Port Size . . .	ALE-17-4
R22 Stainless Steel Regulator 1/2" Port Size	ALE-17-6
R38 Instrument Stainless Steel Regulator Aluminum Model 1/4" Port Size	ALE-17-8
B05 Miniature Stainless Steel Filter/Regulator 1/4" Port Size	ALE-17-10
B38 Instrument Stainless Steel Filter/Regulator 1/4" or 1/2" Port Size	ALE-17-12
L22 Stainless Steel Oil-Fog Lubricator 1/2" Port Size	ALE-17-14



F22



R05



R22



R38



B05



B38



L22

- **Designed for use in corrosive environments**
- **Metallic parts meet NACE[†] Standard MR-01-75***
- **Provides effective liquid removal and positive solid filtration**
- **Large filter element area for minimum pressure drop**
- **Automatic Drain is operated by liquid level and also opens upon depressurization**
- **Meets certain requirements of Military Specifications****



* National Association of Corrosion Engineers (NACE) MR-01-75 defines requirements for sulphide stress cracking resistant materials used in well-head and other corrosive environments.

** Meets certain requirements of MIL-S-901C (Navy) 15 Jan 1963: Military Specifications Shock Test H.I. (High Impact); Shipboard Machinery, Equipment and Systems and MIL-STD-167-1 (Ships) Military Standard Mechanical Vibrations of Shipboard Equipment.

Ordering Information. Model listed has PTF threads, automatic drain and 25 µm element.

Port Size	Model Number	Flow† scfm (dm ³ /s)	Weight lbs (kg)
1/2 PTF	F22-405-A2DA	98 (46)	4.18 (1.88)

† Typical flow with 25 µm element at 90 psig (6.3 bar) inlet pressure, and 5 psig (0.35 bar) pressure drop.

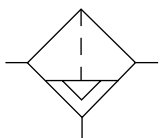
Alternative Models

Port Size	Substitute	Modification	Substitute	Thread	Substitute	Element	Substitute	Drain	Substitute
1/2"	4	1/8" thread auto-drain fitting	0	PTF	A	5 µm	1	Automatic	A
Special	6**	1/4" thread auto-drain fitting	5	ISO G	D	25 µm	2	Manual	M
		Special	7**	Special	S**				

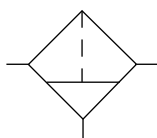
** 3/4" body (3/4 x 16 UNF) F22-6X7-XXXS

Please contact our technical service for details of non standard models.

ISO Symbols



Automatic Drain



Manual Drain

See Section ALE-25 for Accessories



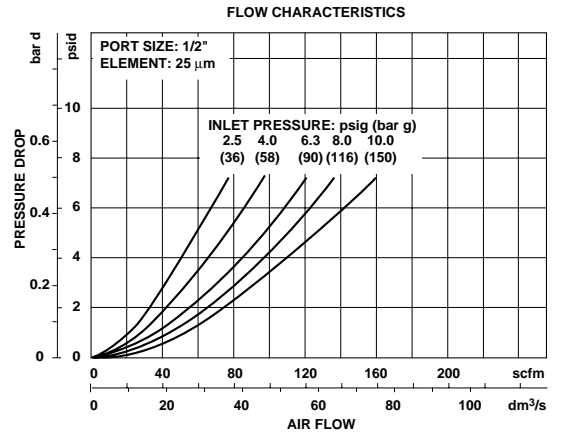
Technical Data

Fluid: Compressed air
 Maximum pressure: 250 psig (17 bar)
 Operating temperature: 0° to 175°F (-20° to 80°C) *
 * Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
 Particle removal:
 25 µm standard
 5 µm optional
 Air quality: Within ISO 8573-1, Class 3 and Class 5 (particulates)
 Typical flow with 25 µm element at 90 psig (6.3 bar) inlet pressure, and 5 psig (0.35 bar) pressure droop: 98 scfm (46 dm³/s)
 Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
 Automatic drain operating conditions (float operated):
 Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
 Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
 Minimum air flow required to close drain: 2 scfm (1 dm³/s)
 Manual operation: Depress pin inside drain outlet to drain bowl
 Nominal bowl size: 8 fluid ounce (0.24 liter)

Materials

- Body: Stainless steel
- Bowl: Stainless steel
- Element: Sintered stainless steel
- Elastomers: Synthetic rubber

Typical Performance Characteristics

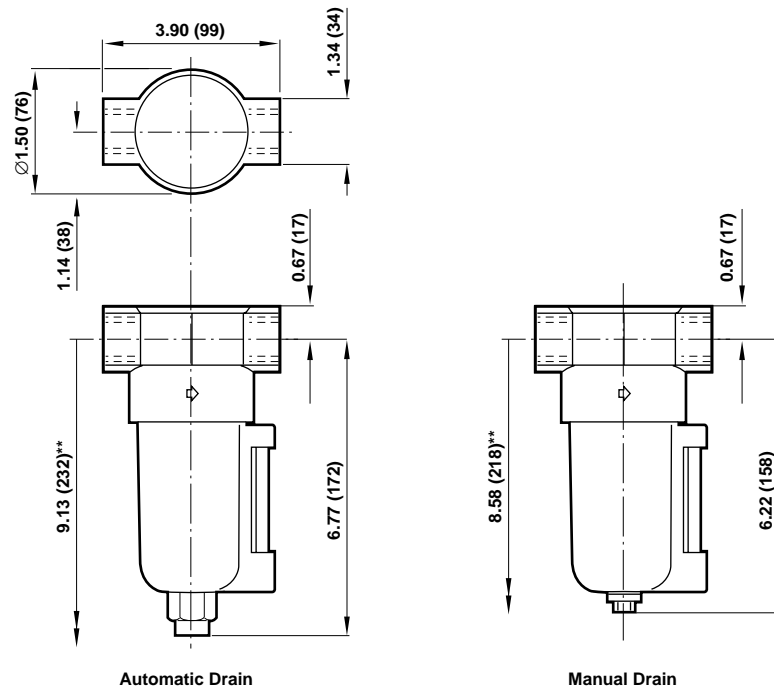


Service Kits

Item	Type	Part number
Service kits	25 µm, automatic drain	F22-100A
	5 µm, automatic drain	F22-100A(5)
	25 µm, manual drain	F22-100M
	5 µm, manual drain	F22-100M(5)
Replacement drains	Automatic	3000-90
	Manual	2273-18
Service kit	Orientable metal bowl	5860-RK

Service kits include o-rings, gaskets, specified filter elements, drain strainer and strainer cap.

All Dimensions in Inches (mm)



**Minimum clearance required to remove bowl

**Miniature Stainless Steel Regulator
1/4" PTF Ports**

- **Designed for use in corrosive environments**
- **Metallic parts meet NACE Standard MR-01-75***
- **Applications include marine environments, oil and gas production, chemical and food processing, medical analysis**
- **Relieving or non relieving models. Relieving models allow reduction of outlet pressure even when the system is dead-ended**
- **Can be disassembled without the use of tools or removal from the air line**

* National Association of Corrosion Engineers (NACE) MR-01-75 defines requirements for sulphide stress cracking resistant materials used in well-head and other corrosive environments.



Ordering Information. Model listed is relieving type with 5 to 125 psig (0.3 to 8.5 bar) outlet pressure adjustment range** and PTF threads. A gauge is not included.

Port Size	Model	Flow [†] scfm (dm ³ /s)	Weight lb (kg)
1/4" PTF	R05-200-RNLA	7 (3.3)	0.41 (0.19)

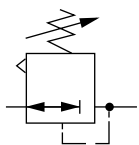
Alternative Models
R 0 5 - 2 0 0 - ★ N ★ A

Outlet Pressure Adjustment Ranges*	Substitute
5 to 50 psig (0.3 to 3.5 bar)	E
5 to 125 psig (0.3 to 8.5 bar)	L

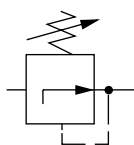
Diaphragm	Substitute
Relieving	R
Non relieving	N

† Typical flow with 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from set.

** Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

ISO Symbols


Relieving



Non Relieving

See Section ALE-25 for Accessories



Technical Data

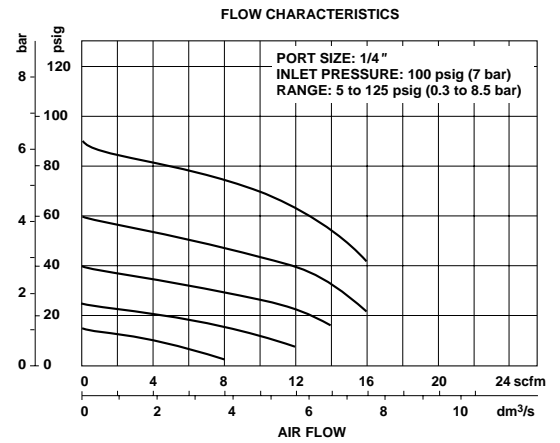
Fluid: Compressed air
 Maximum pressure: 250 psig (17 bar)
 Operating temperature: -30° to 150°F (-34° to 66°C) *
 * Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
 Typical flow with 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set: 7 scfm (3.3 dm³/s)

Gauge ports:
 1/8 PTF

Materials

- Body: 316 stainless steel
- Bonnet: Acetal with stainless steel adjusting screw
- Valve: Stainless steel with fluorocarbon elastomer
- Valve seat: Acetal
- Springs: Stainless steel
- Elastomers: Fluorocarbon

Typical Performance Characteristics

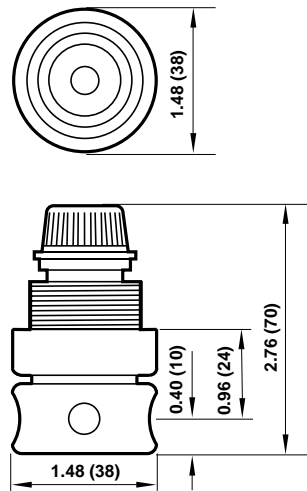


Service Kits

Item	Type	Part number
Service kit	Relieving	3407-71
	Non relieving	3407-72

Service kit includes slip ring, diaphragm, valve seat with seal, valve, valve spring.

All Dimensions in Inches (mm)



Panel mounting hole diameter: 1.19" (30 mm)
 Panel thickness: .25" (6 mm)

R22 Stainless Steel Regulator
1/2 PTF

- Designed for use in corrosive environments
- Metallic parts meet NACE Standard MR-01-75*
- Compact instrument units with high performance
- Stable regulation and temperature compensation
- Excellent flow and regulation characteristics

* National Association of Corrosion Engineers (NACE) MR-01-75 defines requirements for sulphide stress cracking resistant materials used in well-head and other corrosive environments.



Ordering Information. Models listed have T-bar adjustment, relieving diaphragm, 5 to 150 psig (0.4 to 10 bar) outlet pressure adjustment range and PTF threads. A gauge is not included.

Port Size	Model Number	Flow** scfm (dm ³ /s)	Weight lbs (kg)
1/2 PTF	R22-405-RNMA	106 (50)	3.35 (1.52)

** Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3) set pressure, and a 15 psig (1 bar) drop from set.

Alternative Models



Port Size	Substitute
1/2"	4
Special**	6

Option	Substitute
Standard	0
Oxygen degreased	1

Modification	Substitute
T-bar adjustment	1
Plastic handwheel	5
Viton	6
Special**	7

Threads	Substitute
PTF	A
ISO G	D
Special**	S

Outlet Pressure Adjustment Ranges*	Substitute
5 to 150 psig (0.3 to 10 bar)	M
5 to 60 psig (0.3 to 4 bar)	F
10 to 250 psig (0.7 to 17 bar)	S

Gauges	Substitute
Without	N

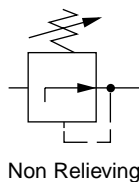
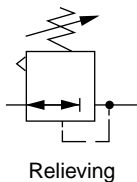
Diaphragm	Substitute
Relieving	R
Non relieving	N

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

** 3/4" body (3/4 x 16 UNF) R22-6XZ-XXXS

Please contact our technical service for details of non standard models including maximum pressure stop, etc.

ISO Symbols



See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure: 290 psig (20 bar)

Operating temperature: -4° to 175°F (-20° to 80°C) *

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set: 106 scfm (50 dm³/s)

Gauge ports:

1/4 PTF

Materials

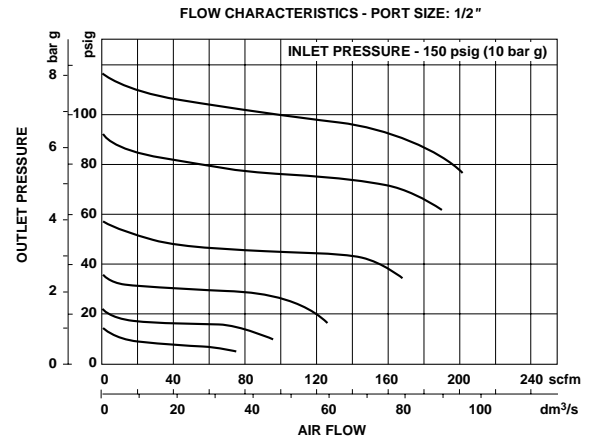
Body: Stainless steel

Bonnet: Stainless steel

Adjusting screw: Stainless steel

Elastomers: Synthetic rubber

Typical Performance Characteristics

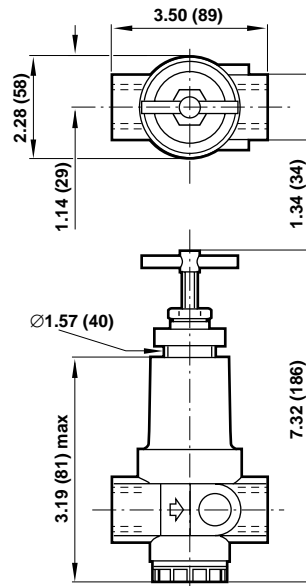


Standard Service Kits

Item	Type	Part number
30 psi (2 bar)	Relieving	R22-100R
	Non relieving	R22-100NR
60 psi, 105 psi (4 bar, 7 bar)	Relieving	R22-101R
	Non relieving	R22-101NR
150 psi (10 bar)	Relieving	R22-102R
	Non relieving	R22-102NR

Service kits includes diaphragm assembly, o-ring, valve, valve spring.

All Dimensions in Inches (mm)



Panel mounting hole diameter: 1.65" (42 mm)

Maximum Panel thickness: 0.37" (9.5 mm)

**Stainless Steel Instrument Regulator
1/4 NPT**

- Compact instrument units with high performance
- Stable regulation with temperature compensation
- Excellent flow and regulation characteristics
- Panel Mounting facility
- Designed for use in corrosive environments
- Metallic parts meet NACE Standard MR-01-75*
- Applications include marine environments, oil and gas production, chemical and food processing, medical analysis
- Relieving or non relieving models. Relieving models allow reduction of outlet pressure even when the system is dead-ended



* National Association of Corrosion Engineers (NACE) MR-01-75 defines requirements for sulphide stress cracking resistant materials used in well-head and other corrosive environments.

Ordering Information. Models listed are relieving type with 0.6 to 30 psig (0.04 to 2 bar) outlet pressure adjustment range **, and PTF threads. A gauge is not included.

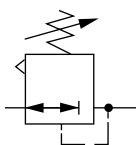
Port Size	Model Number	Flow [†] scfm (dm ³ /s)	Weight lbs (kg)
1/4" PTF	R38-240-RNCA	17 (8)	1.56 (0.71)

** Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

† Typical flow with 100 psig (7 bar) inlet pressure, 15 psig (1 bar) set pressure and 1 psig (0.05 bar) droop from set.

R 3 8 - ★ ★ ★ - ★ ★ ★ ★		Threads	Substitute																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>Port Size</th><th>Substitute</th></tr> <tr><td>1/4" PTF</td><td>2</td></tr> </table>	Port Size	Substitute	1/4" PTF	2		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>PTF</td><td>A</td></tr> <tr><td>ISO Rc taper</td><td>B</td></tr> <tr><td>ISO G parallel</td><td>D</td></tr> <tr><td>API.LP.INT</td><td>K</td></tr> </table>	PTF	A	ISO Rc taper	B	ISO G parallel	D	API.LP.INT	K							
Port Size	Substitute																				
1/4" PTF	2																				
PTF	A																				
ISO Rc taper	B																				
ISO G parallel	D																				
API.LP.INT	K																				
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>Materials</th><th>Substitute</th></tr> <tr><td>Stainless Steel, nitrile elastomers</td><td>4</td></tr> <tr><td>Stainless Steel, Viton elastomers</td><td>5</td></tr> <tr><td>Stainless Steel, fluorosilicon elastomers</td><td>6</td></tr> </table>	Materials	Substitute	Stainless Steel, nitrile elastomers	4	Stainless Steel, Viton elastomers	5	Stainless Steel, fluorosilicon elastomers	6		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>Outlet Pressure Adjustment Ranges*</th><th>Substitute</th></tr> <tr><td>0.6 to 30 psig (0.04 to 2 bar)</td><td>C</td></tr> <tr><td>1 to 60 psig (0.07 to 4 bar)</td><td>F</td></tr> <tr><td>3.6 to 100 psig (0.25 to 7 bar)</td><td>K</td></tr> <tr><td>7.2 to 150 psig (0.50 to 10 bar)</td><td>M</td></tr> </table>	Outlet Pressure Adjustment Ranges*	Substitute	0.6 to 30 psig (0.04 to 2 bar)	C	1 to 60 psig (0.07 to 4 bar)	F	3.6 to 100 psig (0.25 to 7 bar)	K	7.2 to 150 psig (0.50 to 10 bar)	M	
Materials	Substitute																				
Stainless Steel, nitrile elastomers	4																				
Stainless Steel, Viton elastomers	5																				
Stainless Steel, fluorosilicon elastomers	6																				
Outlet Pressure Adjustment Ranges*	Substitute																				
0.6 to 30 psig (0.04 to 2 bar)	C																				
1 to 60 psig (0.07 to 4 bar)	F																				
3.6 to 100 psig (0.25 to 7 bar)	K																				
7.2 to 150 psig (0.50 to 10 bar)	M																				
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>Mounting Option</th><th>Substitute</th></tr> <tr><td>Without</td><td>0</td></tr> <tr><td>With bracket and nut</td><td>1</td></tr> <tr><td>With panel nut only</td><td>2</td></tr> <tr><td>With handwheel and nut</td><td>3</td></tr> <tr><td>With handwheel, bracket and nut</td><td>4</td></tr> <tr><td>With handwheel only</td><td>5</td></tr> </table>	Mounting Option	Substitute	Without	0	With bracket and nut	1	With panel nut only	2	With handwheel and nut	3	With handwheel, bracket and nut	4	With handwheel only	5		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>Gauges</th><th>Substitute</th></tr> <tr><td>Without</td><td>N</td></tr> </table>	Gauges	Substitute	Without	N	
Mounting Option	Substitute																				
Without	0																				
With bracket and nut	1																				
With panel nut only	2																				
With handwheel and nut	3																				
With handwheel, bracket and nut	4																				
With handwheel only	5																				
Gauges	Substitute																				
Without	N																				
		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>Diaphragm</th><th>Substitute</th></tr> <tr><td>Relieving</td><td>R</td></tr> <tr><td>Non relieving</td><td>N</td></tr> </table>	Diaphragm	Substitute	Relieving	R	Non relieving	N													
Diaphragm	Substitute																				
Relieving	R																				
Non relieving	N																				

ISO Symbol



See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air
 Maximum pressure: 451 psig (31 bar)
 Operating temperature: -40° to 175°F (-40° to 80°C) *

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
 Typical flow at 100 psig (7 bar) inlet pressure, 15 psig (1 bar) set pressure and a droop of 1 psig (0.07 bar) from set: 17 scfm (8 dm³/s)
 Typical relief differential at 30 psig (2 bar) outlet pressure: 2.3 psig (0.16 bar)
 Maximum bleed flow at 30 psig (2 bar) outlet pressure (relieving types only): 0.003 scfm (1.5 cm³/s)†

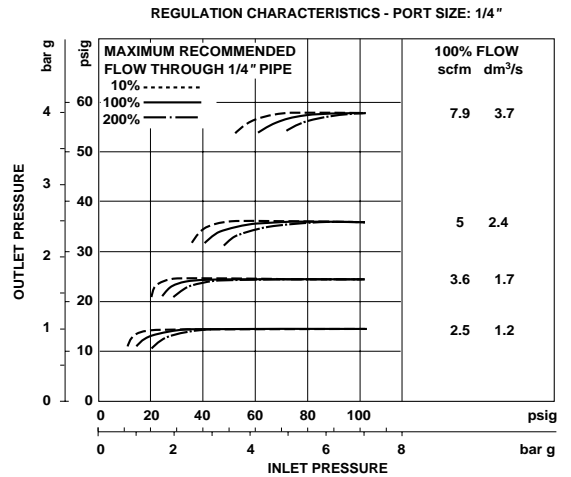
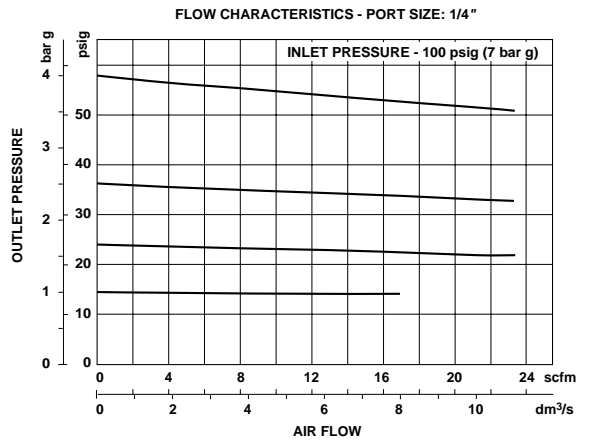
Gauge ports: 1/4" PTF
 Relief Port: 1/8" PTF

Materials

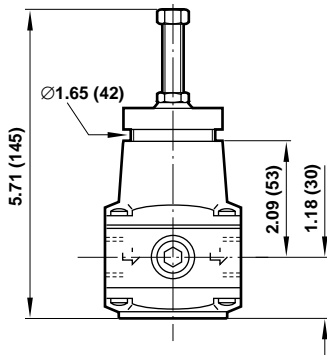
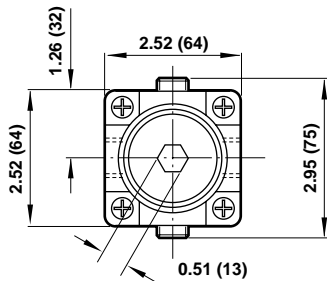
- Body: Stainless steel
- Bonnet: Stainless steel
- Adjusting screw: Stainless steel
- Elastomeric materials: Synthetic rubber

† Maximum bleed rate occurs under dead-end (no flow) conditions.

Typical Performance Characteristics



All Dimensions in Inches (mm)



Panel mounting hole diameter: 1.65" (42 mm)
 Maximum panel thickness: 0.24" (6 mm)

Service Kits

Item	Type	Part number
30 psig (2 bar) range	Relieving	R38-100-R
	Non relieving	R38-100-NR
60 & 100 psig (4 & 7 bar) range	Relieving	R38-101-R
	Non relieving	R38-101-NR

Service kits includes diaphragm assembly, o-ring, valve, valve spring and 8 pan head screws.

**Miniature Stainless Steel Filter/Regulator
1/4 PTF Ports**

- **Designed to filter and regulate compressed air in corrosive environments**
- **Metallic parts meet NACE Standard MR-01-75***
- **Applications include marine environments, oil and gas production, chemical and food processing, medical analysis**
- **Relieving or non relieving models. Relieving models allow reduction of outlet pressure even when the system is dead-ended**
- **Can be disassembled without the use of tools or removal from the air line**



* National Association of Corrosion Engineers (NACE) MR-01-75 defines requirements for sulphide stress cracking resistant materials used in well-head and other corrosive environments.

Ordering Information. Model listed includes a relieving diaphragm, manual drain, 40 µm element, 5 to 125 psig (0.3 to 8.5 bar) outlet pressure adjustment range** and PTF threads. A gauge is not included.

Port Size	Model	Flow [†] scfm (dm ³ /s)	Weight lb (kg)
1/4 PTF	B05-233-M2LA	7 (3.3)	0.99 (0.45)

** Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.
[†] Typical flow with 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from set.

Alternative Models

B 0 5 - ★ ★ ★ - ★ ★ ★ ★

Port Size	Substitute
1/4"	2

Diaphragm	Substitute
Relieving	33
Non relieving	35

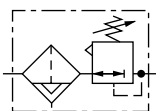
Drain	Substitute
Automatic	A
Manual	M

Threads	Substitute
PTF	A

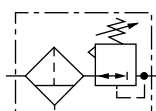
Outlet Pressure Adjustment Ranges*	Substitute
5 to 50 psig (0.3 to 3.5 bar)	E
5 to 125 psig (0.3 to 8.5 bar)	L

Element	Substitute
5 µm	1
40 µm	2

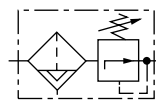
ISO Symbols



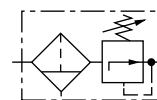
Automatic Drain, Relieving



Manual Drain, Relieving



Automatic Drain, Non-Relieving



Manual Drain, Non-Relieving

See Section ALE-25 for Accessories



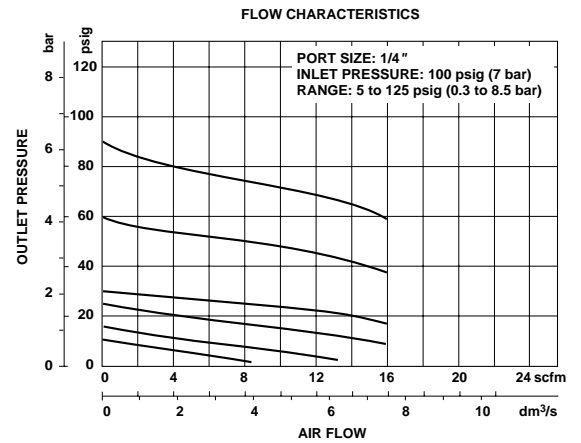
Technical Data

Fluid: Compressed air
 Maximum pressure: 250 psig (17 bar)
 Operating temperature: -30° to 150°F (-34° to 66°C) *
 * Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)
 Particle removal: 5 µm or 40 µm filter element
 Air quality: Within ISO 8573-1, Class 3 and Class 5 (particulates)
 Typical flow with 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set: 7 scfm (3.3 dm³/s)
 Nominal bowl size: 1 fluid ounce (31 ml)
 Gauge ports: 1/8 PTF
 Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread.
 Automatic drain operation: Spitter type drain operates momentarily when a rapid change in air flow occurs or when the supply pressure is reduced.

Materials

Body and bowl: 316 stainless steel
 Bonnet: Acetal with stainless steel adjusting screw
 Valve: Stainless steel with fluorocarbon elastomer
 Valve seat: Acetal
 Springs: Stainless steel
 Drain: Acetal
 Element: Sintered polypropylene
 Elastomers: Fluorocarbon

Typical Performance Characteristics

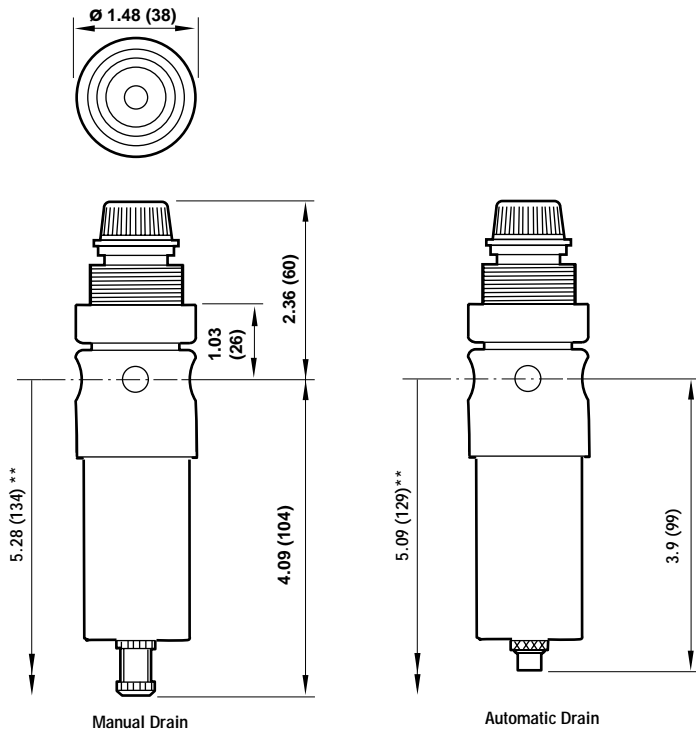


Service Kits

Item	Type	Part number
Service kit	Relieving	3820-08
	Non relieving	3820-09
Drain	Manual	684-51

Service kit includes diaphragm, seals, o-rings, and valve.

All Dimensions in Inches (mm)



** Minimum clearance required to remove bowl.
 Panel mounting hole diameter: 1.19" (30 mm)
 Panel thickness: .25" (6 mm)

**Filter/Regulator Stainless Steel Model
1/4 or 1/2" PTF**

- Compact instrument units with high performance
- Stable regulation with temperature compensation
- Excellent flow and regulation characteristics
- Panel Mounting facility
- Designed for use in corrosive environments
- Metallic parts meet NACE Standard MR-01-75*
- Applications include marine environments, oil and gas production, chemical and food processing, medical analysis
- Relieving or non relieving models. Relieving models allow reduction of outlet pressure even when the system is dead-ended



* National Association of Corrosion Engineers (NACE) MR-01-75 defines requirements for sulphide stress cracking resistant materials used in well-head and other corrosive environments.

Ordering Information. Models listed are relieving type with manual drain, 5µm element, and PTF threads. A gauge is not included.

Port Size	Model Number	Outlet pressure range psig (bar)	Flow** scfm (dm ³ /s)	Weight kg (lbs)
1/4" PTF	B38-240-B1KA	4 to 100 (0.3 to 7)	15 (7)	3.11 (1.4)
1/2" PTF	B38-440-M1LA	4 to 125 (0.3 to 9)	106 (50)	4.75 (2.2)

** Typical flow with 175 psig (12 bar) inlet pressure, 115 psig (8 bar) set pressure and 15 psig (1 bar) droop from set.

Alternative Models

Port Size	Substitute
1/4" PTF	2
1/2" PTF	4

Materials	Substitute
Stainless steel, nitrile elastomers	4
Stainless steel, Viton elastomers	5 †

Diaphragm	Substitute
Relieving	0
Non relieving	1
Relieving, bracket and nut	2
Non relieving, bracket and nut	3
Relieving with nut	4
Non relieving with nut	5
Relieving with handwheel and nut	6
Non relieving with handwheel and nut	7
Relieving with handwheel, bracket and nut	8
Non relieving with handwheel, bracket and nut	9

B 3 8 - ★ ★ ★ - ★ ★ ★ ★

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	D
API.LP.INT	K

Outlet Pressure Adjustment Ranges*	Substitute
0.6 to 30 psig (0.04 to 2 bar)	C
1 to 60 psig (0.07 to 4 bar)	F
3.6 to 100 psig (0.25 to 7 bar)	K †
4 to 125 psig (0.3 to 9 bar)	L ††
7.2 to 150 psig (0.5 to 10 bar)	M †
10 to 250 psig (0.7 to 17 bar)	S ††

Element	Substitute
5 µm	1
25 µm	2

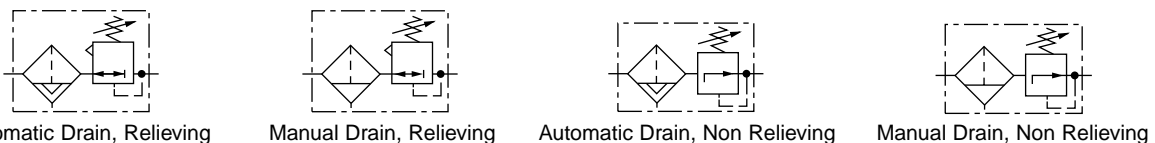
Bowl/Drain	Substitute
Long bowl with automatic drain	A
Short bowl with manual drain	B
Long bowl with manual drain	M

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

† 1/4" ported units only.
†† 1/2" ported units only.

See Section ALE-25 for Accessories

ISO Symbols





Technical Data

Fluid: Compressed air

Maximum pressure

Manual drain: 450 psig (31 bar)

Automatic drain: 250 psig (17 bar)

Operating temperature: -40° to 175°F (-40° to 80°C) *

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5 µm or 25 µm filter element

Air quality: Within ISO 8573-1, Class 3 and Class 5 (particulates)

Typical flow with 175 psig (12 bar) inlet pressure, 115 psig (8 bar) set pressure and a droop of 15 psig (1.0 bar) from set

1/4": 15 scfm (7 dm³/s)

1/2": 106 scfm (50 dm³/s)

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Automatic drain operating conditions (float operated)

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain 2 scfm (1 dm³/s)

Nominal bowl size

Short bowl with manual drain: 25 ml (1 fluid ounce)

Long bowl with manual drain: 3 fluid ounce (90 ml)

Long bowl with automatic drain: 1 fluid ounce (25 ml)

Gauge ports:

1/4" PTF

Relief port:

1/8" PTF

Materials (standard option)

Body: Stainless steel

Bonnet: Stainless steel

Bowl: Stainless steel

Adjusting screw: Stainless steel

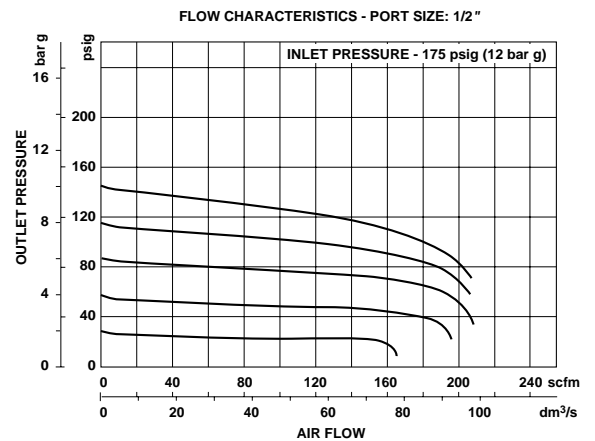
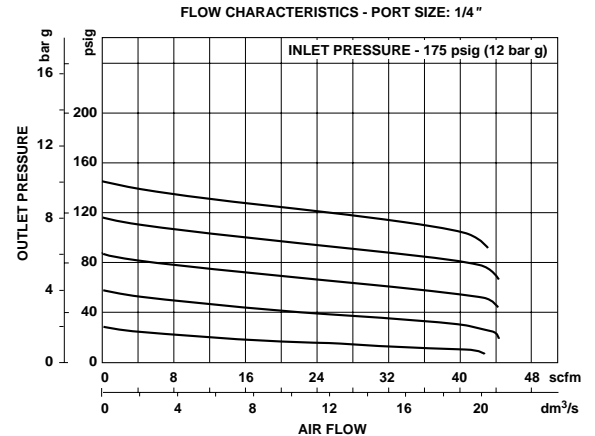
Elements

5 µm & 25 µm: High density polyethylene

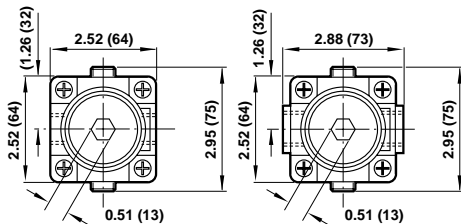
1/4" only 5 µm: Ceramic pyrolyth

Elastomeric materials: Synthetic rubber

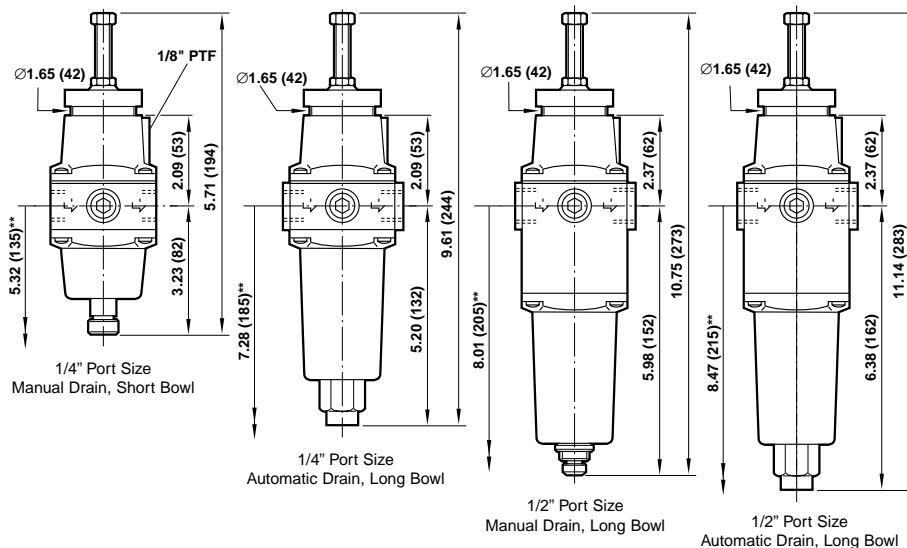
Typical Performance Characteristics



All Dimensions in Inches (mm)



Panel mounting hole diameter: 1.65" (42 mm)
Maximum panel thickness: 0.24" (6 mm)



** Minimum clearance required to remove bowl.

Service Kits (standard option)

1/4" Filter

Item	Part number
5 µm	B38-100S (5)
25 µm	B38-100S (25)

1/2" Filter

Item	Part number
5 µm	2787-43
25 µm	2787-44

Filter service kits include element, seals and screws.

Automatic Drain Assembly

Item	Part number
Automatic Drain Assembly	3000-90

1/4" Regulator

Item	Type	Part number
30 psig spring	Relieving	R38-100R
	Non relieving	R38-100NR
60 & 100 psig spring	Relieving	R38-101R
	Non relieving	R38-101NR
150 psig spring	Relieving	R38-102R
	Non relieving	R38-102NR

1/2" Regulator

Item	Type	Part number
All available spring ranges	Relieving	2787-41
	Non relieving	2787-42

Regulator service kits include diaphragm assembly, o-ring, valve, valve spring and 8 pan head screws.

**L22 Stainless Steel Oil-Fog Lubricator
1/2 PTF**

- **Metallic parts meet NACE Standard MR-01-75***
- **Low flow start point**
- **Built-in flow sensor gives almost constant oil/air ratio over a wide range of flows**
- **Can be filled under pressure**
- **Simple and accurate drip rate adjustment**
- **Ideal for general lubrication applications**
- **Meets certain requirements of Military Specifications****



* National Association of Corrosion Engineers (NACE) MR-01-75 defines requirements for sulphide stress cracking resistant materials used in well-head and other corrosive environments.

** Meets certain requirements of MIL-S-901C (Navy) 15 Jan 1963: Military Specifications Shock Test H.I. (High Impact); Shipboard Machinery, Equipment and Systems and MIL-STD-167-1 (Ships) Military Standard Mechanical Vibrations of Shipboard Equipment.

Ordering Information. Models listed are oil-fog units with closed bowl (no drain) and PTF threads.

Type	Model Number	Flow [†] scfm (dm ³ /s)	Weight lbs (kg)
Oil-Fog	L22-405-OP8A	102 scfm (48 dm ³ /s)	4.29 (1.93)

†Typical flow with 90 psig (6.3 bar) inlet pressure and 7 psig (0.5 bar) pressure drop.

Alternative Models

L 2 2 - ★ 0 ★ - O P ★ ★

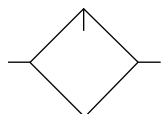
Port Size	Substitute
1/2"	4
Special	6**

Modification	Substitute
Closed bowl	0
Plugged closed bowl	5
Special	7*

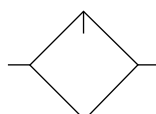
Thread	Substitute
PTF	A
ISO G	D
Special	S*

Bowl	Substitute
Closed bowl	8
Manual drain	D

** 3/4" body (3/4 x 16 UNF) L22-6X7-OPXS

ISO Symbols


No Drain



With Drain

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air
 Maximum pressure: 250 psig (17 bar)
 Operating temperature: -4° to 175°F (-20° to 80°C)*
 * Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Start point (i.e. minimum flow required for lubricator operation) at 90 psig (6.3 bar) inlet pressure:
 3.5 scfm (1.7 dm³/s)

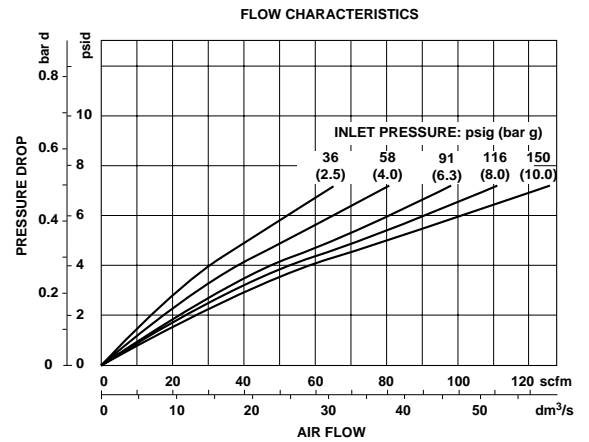
Typical flow with 90 psig (6.3 bar) inlet pressure and 7 psig (0.5 bar) pressure drop:
 102 scfm (48 dm³/s)

Nominal bowl size:
 7 fluid ounce (0.2 liter)

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
 Recommended lubricants: See Section ALE-29.

Materials:
 Body: Stainless steel
 Bowl: Stainless steel
 Elastomers: Synthetic rubber

Typical Performance Characteristics

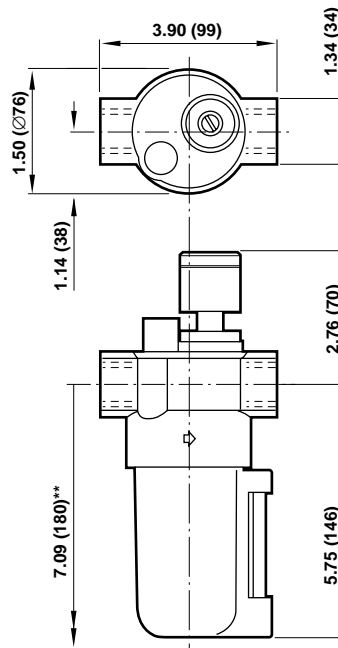


Service Kits

Item	Part number
Service kit	L22-100A

Service kits includes all seals, check valve ball and spring, sight dome and filter plug assemblies.

All Dimensions in Inches (mm)



** Minimum clearance required to remove bowl.

Valves

Smooth Start, Soft Start/Exhaust, Directional Control, Directional Control with Lockout 1/4" to 1-1/2" Port Sizes

Smooth Start Valves

- P72E (1/4", 3/8" threaded ports in valve body)ALE-18-2
- P74E Quikclamp Mounted (1/4", 3/8", 1/2", 3/4" threaded ports in Quikclamp pipe adapter)ALE-18-4

Smooth Start/Exhaust Valves

- P72F (1/4", 3/8" threaded ports in valve body)ALE-18-6
- P74F (3/8", 1/2", 3/4" threaded ports in valve body)ALE-18-8
- P64F Yoke Mounted (1/4", 3/8", 1/2", 3/4" ports in yoke)ALE-18-10
- P68F Yoke Mounted (3/4", 1", 1-1/4", 1-1/2" ports in yoke)ALE-18-12

Directional Control Valves

- P72C (air and solenoid operated, 3-way valve, 1/4", 3/8" threaded ports in valve body)ALE-18-14
- P74 Quikclamp Mounted (air operated, 2 and 3-way valves, 1/4", 3/8", 1/2", 3/4" threaded ports in Quikclamp pipe adapter)ALE-18-16
- P74 Quikclamp Mounted (solenoid operated, 2 and 3-way valves, 1/4", 3/8", 1/2", 3/4" threaded ports in Quikclamp pipe adapter)ALE-18-18

Directional Control Valve with Lockout Slide

- P74 Quikclamp Mounted (solenoid operated, 3-way valves, 1/4", 3/8", 1/2", 3/4" threaded ports in Quikclamp pipe adapter)ALE-18-20

- FAQ'sALE-18-22



P72E



P74E



P72C
P72F



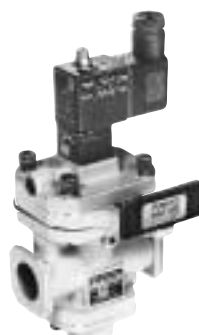
P74 Air Operated



P74F



P74 Solenoid Operated



P74 Solenoid w/lockout



P64 Soft Start/ Dump

Product available
1st quarter of 2001

P68F Smooth Start/ Exhaust Valve

- Excelon design allows in-line or modular installation
- High-flow, spring return, 2 port/2 position normally closed valves
- Reduces rate of downstream air pressure buildup at system start up
- Cylinders and other air operated devices are eased into normal starting positions, reducing the possibility of equipment damage and hazards to the user.
- Adjustable rate of pressure increase
- Cushioned poppets for long service life
- Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications



Ordering Information. Models listed are with PTF threads.

Port Size	Model	Weight lb (kg)
1/4"	P72E-2AN-NNN	1.86 (0.84)
3/8"	P72E-3AN-NNN	1.80 (0.82)

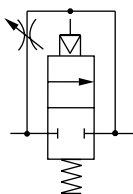
Alternative Models

P 7 2 E - ★ ★ N - N N N

Port Size	Substitute
1/4"	2
3/8"	3

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G taper	G

ISO Symbol



See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air
 Maximum pressure: 250 psig (17 bar)
 Minimum operating pressure: 44 psig (3 bar)
 Temperature range*: -0° to 150°F (-20° to 65°C)

* Air supply must be dry enough to avoid ice formaton at temperatures below 35°F (2°C).

Ports:

- PTF ports
- ISO G ports
- ISO Rc ports

Maximum flow with 90 psig (6.3 bar) inlet pressure and pressure drop of 7 psig (0.5 bar): 45 scfm (21 dm³/s)

Snap pressure:

Full flow when downstream pressure reaches 50 – 80% of inlet pressure

Charge time:

For 0.53 gallon US (2 liter) downstream volume and 90 psig (6.3 bar) inlet pressure

0.8 sec. minimum

76 sec. maximum

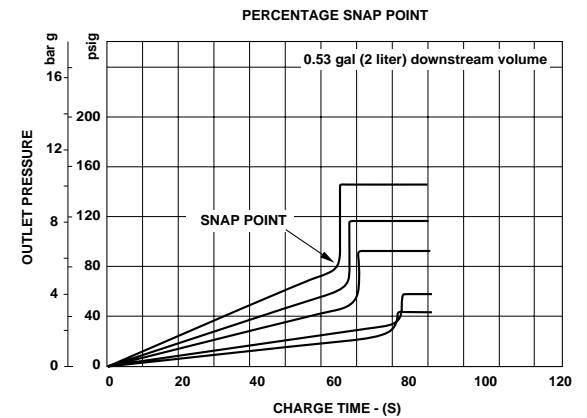
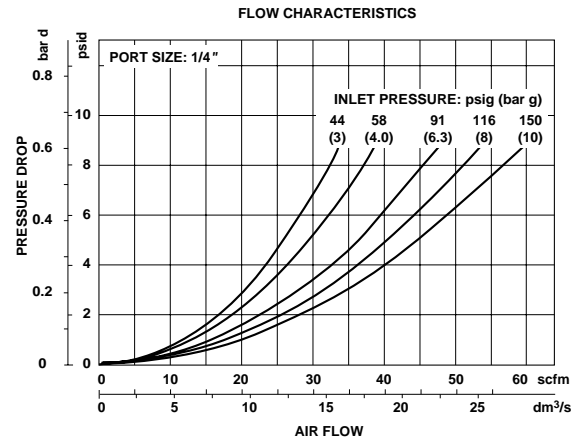
Average flow factor (Cv): 1.35

Materials

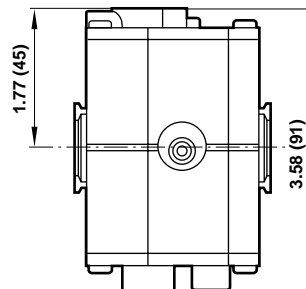
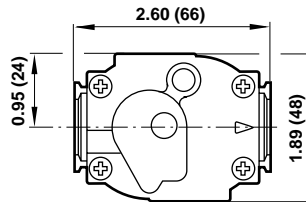
- Body: Zinc alloy
- Elastomers: Synthetic materials
- Internal components: Brass/steel

Note: Smooth start valves never shut off completely, and must be installed downstream of a directional control valve such as a Norgren Poppet or Lockout Valve.

Ordering Information



All Dimensions in Inches (mm)



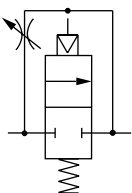
**Excelon 74 Smooth Start Valves
Unthreaded Ports, 1/2" Basic Size**

- **Modular installation only**
- **High-flow, spring return, 2-port/2-position normally closed valves.**
- **Reduces rate of downstream air pressure buildup at system start up**
- **Cylinders and other air operated devices are eased into normal starting positions, reducing the possibility of equipment damage and hazards to the user.**
- **Adjustable rate of pressure increase**
- **Cushioned poppets for long service life**


Ordering Information

Installation Type	2 Port/2 Position Normally Closed	Weight lb (kg)
Modular	P74E-NNN-NNN	1.17 (0.53)

* Valve ports are unthreaded. To install in air line use Quikclamp™ and Quikclamp pipe adapters or connect to other Excelon 74 units.

ISO Symbol


See Section ALE-25 for Accessories



Technical Data

Fluid: Filtered and lubricated compressed air
 Inlet pressure range: 30 to 250 psig (2 to 17 bar)
 Temperature range*: -20° to 175°F (-30° to 80°C)
 * Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
 Time delay: Application of full downstream pressure can be delayed for as long as 50 seconds, depending on the setting of the adjustable needle valve and downstream air volume.
 Average flow factor (Cv): 4.0
 Materials:
 Body: Zinc
 Pistons, poppets: Aluminum
 Elastomers: Nitrile


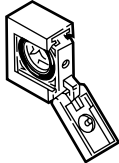
Service Kit

Item	Type	Part Number
Service kit	Seal & Gasket	53474-37
Quikclamp service kit	2 o-rings	4384-770

Service kit includes all o-rings, head gasket and seals.

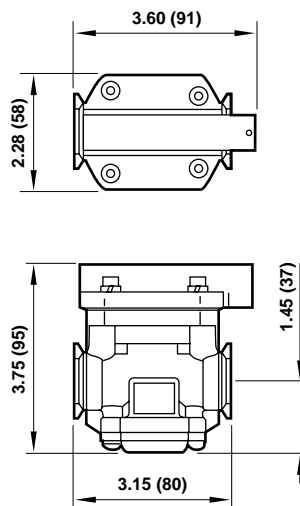
Note: Smooth start valves never shut off completely, and must be installed downstream of a directional control valve such as a Norgren Poppet or Lockout Valve.

Modular Components (necessary for using this valve)

				 Quikclamp † 4314-51
Quikmount Pipe Adapters (each kit contains one adapter) **				
Size	PTF Threads	ISO Rc Threads	ISO G Threads	
1/4"	4315-01	4315-05	4315-09	
3/8"	4315-01	4315-06	4315-10	
1/2"	4315-03	4315-07	4315-11	
3/4"	4315-04	4315-08	4315-12	

** Each pipe adapter adds 0.71" (18 mm) to the overall length of a valve.
 † Each Quikclamp adds 0.7" (13.6 mm) to the overall length of a valve.

All Dimensions in Inches (mm)



Excelon 72 Smooth Start/Exhaust Valve 1/4", 3/8" Port Sizes

- Excelon design allows in-line or modular installation
- Controls increase of downstream pressure on start up. Cylinders and other air operated devices are eased into normal operating positions, reducing the possibility of equipment damage and hazards to the user.
- 3 port/2 position, normally closed, soft start valve with optional manual lockout slide
- Blocks inlet air and exhausts downstream air when pilot signal is removed or when the optional manual lockout slide is closed
- Optional manual slide can be padlocked in closed position
- Solenoid pilot or air pilot operation
- Designed primarily for use in start-up and shutdown of equipment, not as a frequently cycling directional control valve. Norgren offers a wide variety of valves designed for frequent cycling and other applications. Please refer to the P72C and P74C valves, and to other Norgren valve catalogs.



Ordering Information. Models listed are with PTF threads. Solenoid operated models include 24 VDC coil and plug without indicator.

Port Size	Solenoid Operated* Model	Weight lb (kg)	Air Pilot Operated Model	Weight lb (kg)
1/4"	P72F-2AC-PFA	2.00 (0.91)	P72F-2AA-NNN	1.93 (0.88)
3/8"	P72F-3AC-PFA	1.98 (0.90)	P72F-3AA-NNN	1.91 (0.87)

* To select other solenoid type and coil voltage refer to alternative models table below.

Alternative Models

P 7 2 F - ★ ★ ★ - ★ ★ ★

Port Size	Substitute
1/4"	2
3/8"	3

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Operator	Substitute
Air pilot**	A
22 mm miniature solenoid	C
CNOMO	L

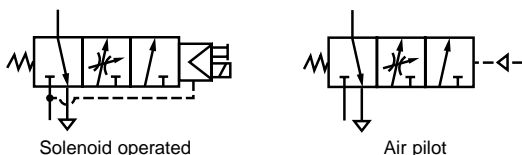
Solenoid Manual Operator	Substitute
Shrouded push button	P
None	N

Connectors	Substitute
3 pin plug with cable gland, no indicator	A
Without	N

Coil Voltage	Nominal Power Rating	Substitute
24 V d.c.	2 W	F
12 V d.c.	2 W	E
6 V d.c.	2 W	D
220/240 V 50/60 Hz	4/2.5 VA	B
110/120 V 50/60 Hz	4/2.5 VA	A
No coil	2 W	Z
No solenoid		N

** to order air pilot models also substitute 'NNN' at digits 8, 9 and 10 e.g. P72F-2GA-NNN.

ISO Symbols



See Section ALE-25 for Accessories



Technical Data

System air supply: Turn on system air supply prior to applying pilot signal to operator. Failure to do so may cause valve to continuously exhaust.

Fluid: Compressed air

Maximum pressure solenoid operated:

Dependant on solenoid rating
[must not exceed 250 psig (17 bar)]

Maximum pressure pilot operated: 250 psig (17 bar) max.

Minimum operating pressure: 44 psig (3 bar)

Operating temperature solenoid operated:

Dependant on solenoid rating
[must be within range 0°* to 150°F (-20°* to 65°C)]

Operating temperature pilot operated:

0°* to 150°F (-20°* to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Air Pilot Port:

10-32 UNF with PTF main ports

M5 with ISO main ports

Exhaust Port:

1/4" PTF with PTF main ports

1/4" ISO Rc with ISO Rc main ports

1/4" ISO Rc with ISO G main ports

Maximum flow with 90 psig (6.3 bar) inlet pressure and pressure drop of 7 psig (0.5 bar): 45 scfm (21 dm³/s) [P₁ to P₂ = Cv 1.59] [P₂ to P₃ = Cv 1.72]

Snap pressure:

Full flow when downstream pressure reaches 50 – 80% of inlet pressure

Charge time:

For 0.53 gallon US (2 liter) downstream volume and 90 psig (6.3 bar) inlet pressure

Minimum 0.8 sec.

Typical maximum 99 sec.

Materials

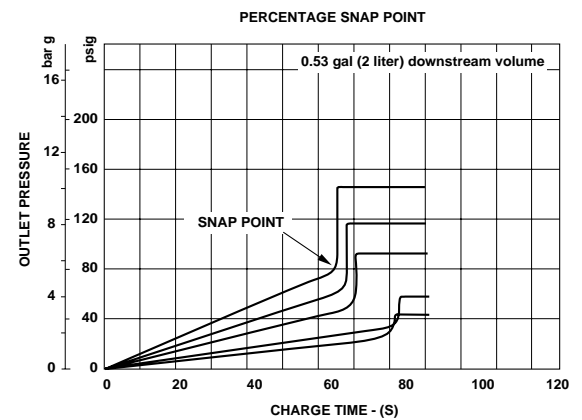
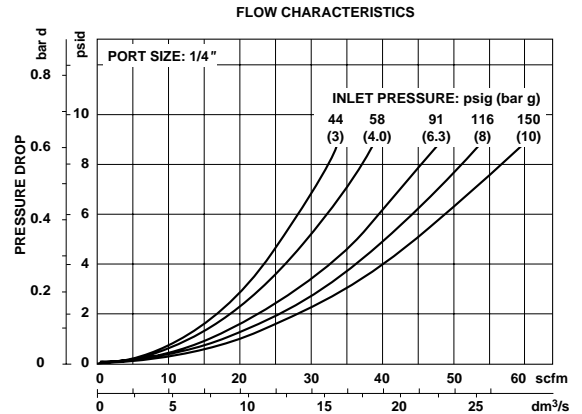
Body: Zinc alloy

Elastomers: Synthetic materials

Filter discs: Sintered plastic

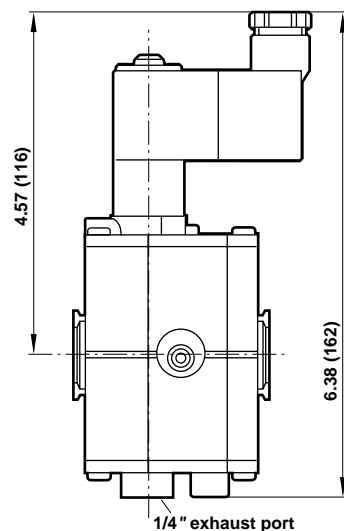
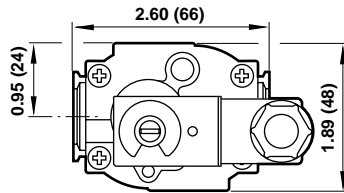
Internal components: Brass/steel

Typical Performance Characteristics

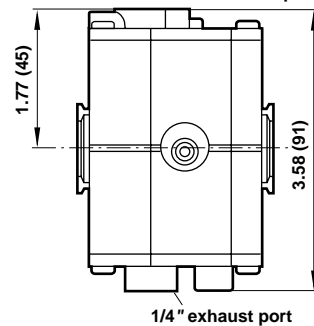
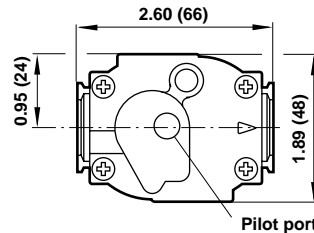


All Dimensions in Inches (mm)

Solenoid operated



Air pilot operated



Excelon 74 Smooth Start/Exhaust Valve 3/8", 1/2", 3/4" Port Size

- Excelon design allows in-line or modular installation
- Controls increase of downstream pressure on start up. Cylinders and other air operated devices are eased into normal operating positions, reducing the possibility of equipment damage and hazards to the user.
- 3 port/2 position, normally closed, soft start valve with optional manual lockout slide
- Blocks inlet air and exhausts downstream air when pilot signal is removed or when the optional manual lockout slide is closed
- Optional manual slide can be padlocked in closed position
- Solenoid pilot or air pilot operation
- Designed primarily for use in start-up and shutdown of equipment, not as a frequently cycling directional control valve. Norgren offers a wide variety of valves designed for frequent cycling and other applications. Please refer to the P72C and P74C valves, and to other Norgren valve catalogs.



Ordering Information. Models listed are with PTF ports. Solenoid operated models include 24 V d.c. coil and plug without indicator.

Port Size	Solenoid Operated* Model	Weight lb (kg)	Air Pilot Operated Model	Weight lb (kg)
3/8"	P74F-3AC-PFA	2.4 (1.08)	P74F-3AA-NNN	2.3 (1.05)
1/2"	P74F-4AC-PFA	2.3 (1.05)	P74F-4AA-NNN	2.2 (1.02)
3/4"	P74F-6AC-PFA	3.1 (1.41)	P74F-6AA-NNN	3.0 (1.35)

* To select other solenoid type and coil voltage refer to alternative models table below.

Alternative Models

Port Size	Substitute
3/8"	3
1/2"	4
3/4"	6

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Operator	Substitute
Air pilot**	A
Air pilot with manual lockout slide**	B
22 mm miniature solenoid	C
22 mm miniature solenoid with manual lockout slide	D
CNOMO solenoid	L
CNOMO solenoid with manual lockout slide	M

P 7 4 F - ★ ★ ★ - ★ ★ ★

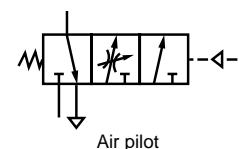
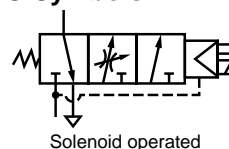
Connectors	Substitute
3 pin plug with cable gland, no indicator	A
Without	N

Coil Voltage	Nominal Power Rating	Substitute
24 V d.c.	2 W	F
12 V d.c.	2 W	E
6 V d.c.	2 W	D
220/240 V 50/60 Hz	4/2.5 VA	B
110/120 V 50/60 Hz	4/2.5 VA	A
No coil	2 W	Z
No solenoid		N

Solenoid Manual Operator	Substitute
Shrouded push button	P
None	N

** To order air pilot models also substitute 'NNN' at digits 8, 9 and 10 e.g. P74F-4AA-NNN.

ISO Symbols



See Section ALE-25 for Accessories



Technical Data

System air supply: Turn on system air supply prior to applying pilot signal to operator. Failure to do so may cause valve to continuously exhaust.

Fluid: Compressed air

Maximum pressure solenoid operated:

Dependant on solenoid rating
[must not exceed 250 psig (17 bar)]

Maximum pressure pilot operated: 250 psig (17 bar) max.

Minimum operating pressure: 44 psig (3 bar)

Operating temperature solenoid operated:

Dependant on solenoid rating
[must be within range 0°* to 175°F (-20°* to 80°C)]

Operating temperature pilot operated:

0°* to 175°F (-20°* to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Air pilot port:

- ISO Rc1/4 with ISO Rc main ports
- ISO Rc1/4 with ISO G main ports
- 1/4" PTF with PTF main ports

Exhaust port:

- ISO G1/2 with ISO G main ports
- ISO G1/2 with ISO Rc main ports
- 1/2" PTF with PTF main ports

Typical flow with 90 psig (6.3 bar) inlet pressure and pressure drop of 7 psig (0.5 bar):
57 dm³/s (P₁ to P₂ = Cv 4.4) (P₂ to P₃ = Cv 5.6)

Snap pressure:

Full flow when downstream pressure reaches 50 – 80% of inlet pressure

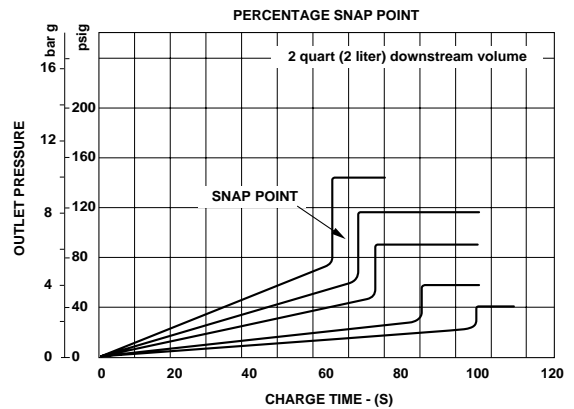
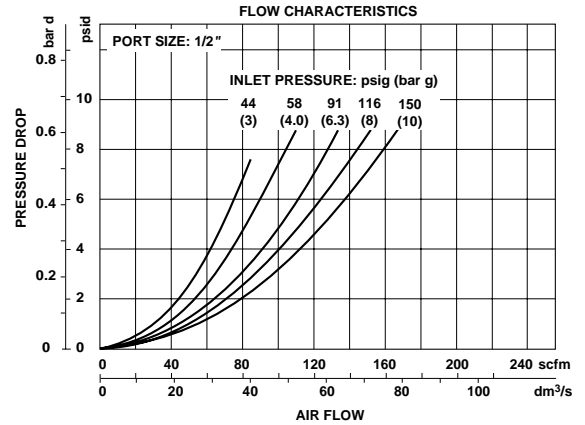
Charge time:

For 2 liter downstream volume and 90 psig (6.3 bar) inlet pressure:
0.2 sec. minimum
76 sec. maximum

Materials

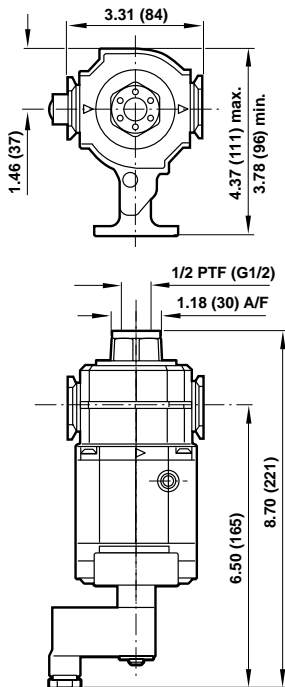
- Body: Aluminium
- Intermediate body: Aluminium
- Elastomers: Synthetic materials
- Filter discs: Sintered plastic
- Internal components: Brass/steel
- Top plate: Zinc
- Exhaust bonnet: Zinc

Typical Performance Characteristics

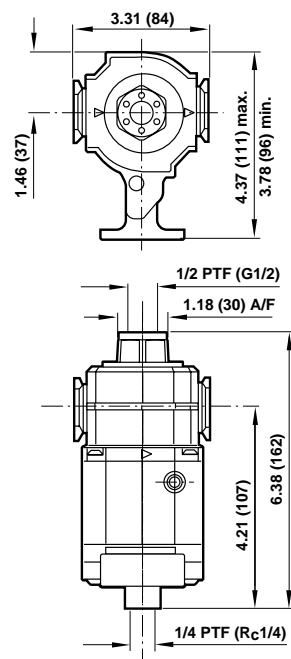


All Dimensions in Inches (mm)

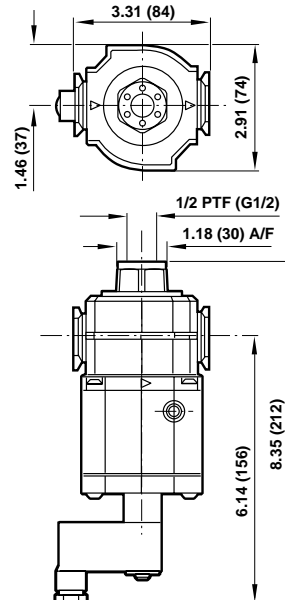
Solenoid operated plus manual shut-off with lockout



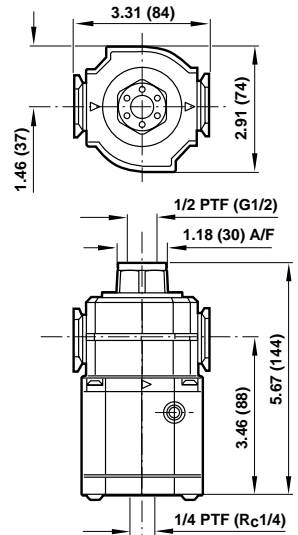
Air pilot operated plus manual shut-off with lockout



Solenoid operated



Air pilot operated



Olympian Plus 64 Smooth Start/Exhaust Valve 1/4", 3/8", 1/2", 3/4" Port Sizes

- Olympian Plus plug in design
- Controls increase of downstream pressure on start up. Cylinders and other air operated devices are eased into normal operating positions, reducing the possibility of equipment damage and hazards to the user.
- 3 port/2 position, normally closed, soft start valve with optional manual lockout slide
- Blocks inlet air and exhausts downstream air when pilot signal is removed or when the optional manual lockout slide is closed
- Optional manual slide can be padlocked in closed position
- Solenoid pilot or air pilot operation
- Designed primarily for use in start-up and shutdown of equipment, not as a frequently cycling directional control valve. Norgren offers a wide variety of valves designed for frequent cycling and other applications. Please refer to the P72C and P74C valves, and to other Norgren valve catalogs.



Ordering Information. Models listed are with PTF threads. Solenoid operated models include 24 v.d.c. coil and plug without indicator.

Port Size	Solenoid Operated* Model	Weight lb (kg)	Air Pilot Operated Model	Weight lb (kg)
1/4"	P64F-2AC-PFA	4.6 (2.07)	P64F-2AA-NNN	4.3 (1.96)
3/8"	P64F-3AC-PFA	4.5 (2.05)	P64F-3AA-NNN	4.3 (1.94)
1/2"	P64F-4AC-PFA	4.4 (2.02)	P64F-4AA-NNN	4.2 (1.91)
3/4"	P64F-6AC-PFA	5.2 (2.38)	P64F-6AA-NNN	5.0 (2.27)

* Solenoid operated models are supplied with solenoids but without solenoid coils. To select solenoid type and coil voltage refer to alternative models table below. For replacement soft start/exhaust valve, without yoke substitute 'NN' at 5th and 6th digit eg. P64F-NNC-PZN.

Alternative Models

P 6 4 F - ★ ★ ★ - ★ ★ ★

Port Size	Substitute
1/4"	2
3/8"	3
1/2"	4
3/4"	6

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Operator	Substitute
Air pilot**	A
Air pilot with manual shut-off**	B
22 mm miniature solenoid	C
22 mm miniature solenoid with manual shut-off	D
CNOMO solenoid	L
CNOMO solenoid with manual lockout slide	M

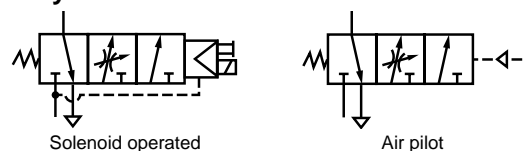
Connectors	Substitute
3 pin plug with cable gland, no indicator	A
Without	N

Coil Voltage	Nominal Power Rating	Substitute
24 V d.c.	2 W	F
12 V d.c.	2 W	E
6 V d.c.	2 W	D
220/240 V 50/60 Hz	4/2.5 VA	B
110/120 V 50/60 Hz	4/2.5 VA	A
No coil	2 W	Z
No solenoid		N

Solenoid Manual Operator	Substitute
Shrouded push button	P
None	N

** to order air pilot models also substitute 'NNN' at digits 8, 9 and 10 e.g. P64F-2GA-NNN.

ISO Symbols



See Section ALE-25 for Accessories



Technical Data

System air supply: Turn on system air supply prior to applying pilot signal to operator. Failure to do so may cause valve to continuously exhaust.

Fluid: Compressed air

Maximum pressure solenoid operated:

Dependant on solenoid rating
[must not exceed 250 psig (17 bar)]

Maximum pressure pilot operated: 250 psig (17 bar)

Minimum operating pressure: 44 psig (3 bar)

Operating temperature solenoid operated: Dependant on solenoid rating
[must be within range 0°* to 125°F (-20°* to 50°C)]

Operating temperature pilot operated:

0°* to 175°F (-20°* to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Gauge ports: 1/8" (PTF with PTF main ports, Rc with ISO G and ISO Rc main ports)

Air pilot port: 1/4" (PTF with PTF main ports, Rc with ISO G and ISO Rc main ports)

Exhaust port: 1/2" (PTF with PTF main ports, G1/2 with ISO G and ISO Rc main ports)

Typical flow with 90 psig (6.3 bar) inlet pressure and pressure drop of 7 psig (0.5 bar): 57 dm³/s (120 scfm) (P₁ to P₂ = Cv 4.2) (P₂ to P₃ = Cv 5.6)

Snap pressure:

Full flow when downstream pressure reaches 50 – 80% of inlet pressure

Charge time:

For 2 liter downstream volume and 90 psig (6.3 bar) inlet pressure

Minimum 0.2 sec.

Typical maximum 58 sec.

Materials:

Body: Zinc alloy

Intermediate body and top plate: Aluminium

Exhaust bonnet: Zinc alloy

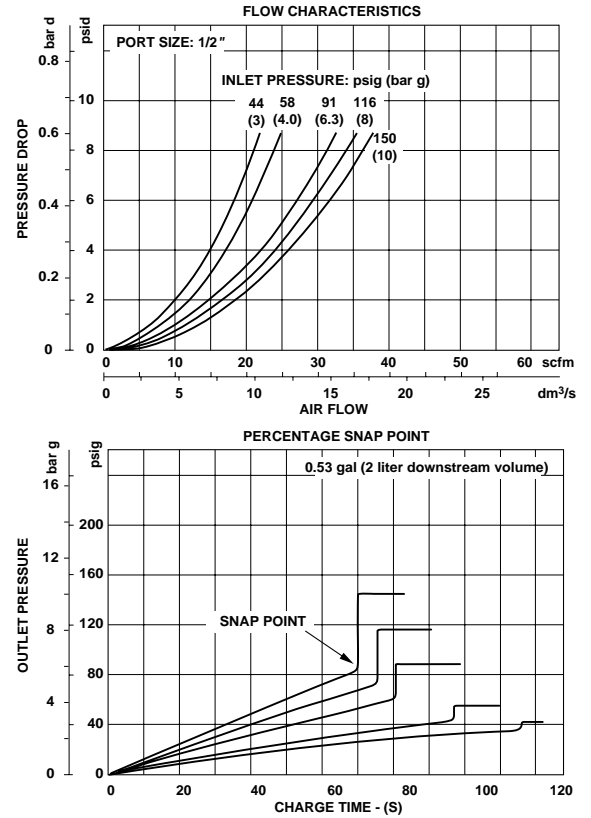
Yoke: Zinc alloy

Elastomers: Synthetic materials

Filter discs: Sintered plastic

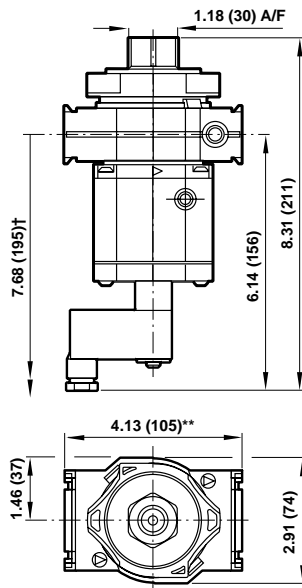
Internal components: Brass/steel

Typical Performance Characteristics

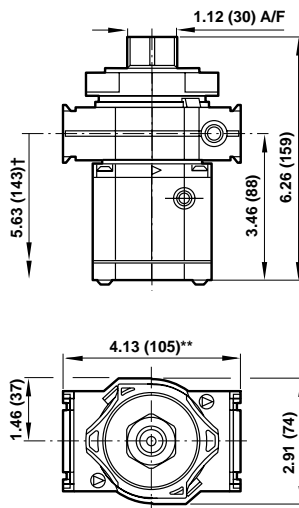


All Dimensions in Inches (mm)

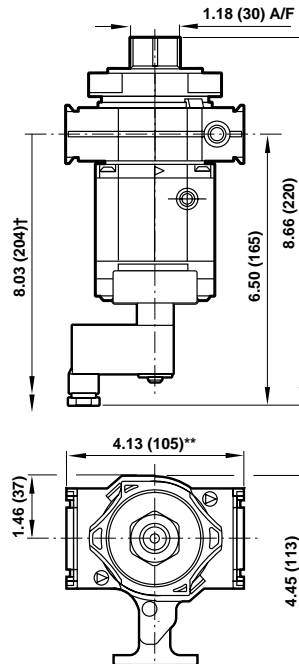
Solenoid operated



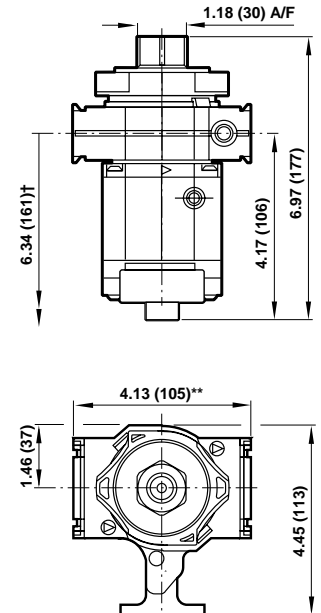
Air pilot operated



Solenoid operated plus manual shut-off with lockout



Air pilot operated plus manual shut-off with lockout



** 6.18" (157 mm) for models with 3/4" ports.

† Minimum clearance required to remove unit.

**Olympian Plus 68 Smooth Start/Exhaust Valve
3/4", 1", 1-1/4", 1-1/2" Port Sizes**

- **Olympian plug in design**
- **Controls increase of downstream pressure on start up. Cylinders and other air operated devices are eased into normal operating positions, reducing the possibility of equipment damage and hazards to the user.**
- **3 port/2 position, normally closed, soft start valve with optional manual lockout slide**
- **Blocks inlet air and exhausts downstream air when pilot signal is removed or when the optional manual lockout slide is closed**
- **Optional manual slide can be padlocked in closed position**
- **Solenoid pilot or air pilot operation**



68 Series products are available 1st quarter of 2001. Visit www.norgren.com for the latest data on this series.

Port Size	Solenoid Operated*	Weight lb (kg)	Model	Air Pilot Operated	Weight lb (kg)	Model
3/4"			P68F-6AH-PFA	6.56 (2.95)		P68F-6AB-PNN
1"			P68F-8AH-PFA	6.51 (2.93)		P68F-8AB-PNN

* To select other solenoid type and coil voltage refer to alternative models table below.

Alternative Models

P 6 8 F - ★ ★ ★ - ★ ★ ★

Port Size	Substitute
3/4"	6
1"	8
1 1/4"	A
1 1/2"	B
Unported	N

Threads	Substitute
PTF	A
ISO Rc	B
ISO G	G

Operator	Substitute
Air pilot**	A
Air pilot with manual lockout**	B
22 mm miniature solenoid	C
22 mm miniature solenoid with manual lockout	D
32 mm solenoid	G
32 mm solenoid with manual lockout	H
CNOMO solenoid	L
CNOMO solenoid with manual lockout	M
Direct ported bottom plate	N

Connectors	Substitute
3 pin plug with cable gland, no indicator	A
Without	N

Coil Voltage	Nominal Power Rating	Substitute
24 V d.c.	2 W	F
12 V d.c.	2 W	E
6 V d.c.	2 W	D
220/240 V 50/60 Hz	4/2.5 VA	B
110/120 V 50/60 Hz	4/2.5 VA	A
No coil	2 W	Z
No solenoid		N

Solenoid Manual Operator	Substitute
Shrouded push button	P
None	N

** to order air pilot models also substitute 'NNN' at digits 8, 9 and 10 e.g. P68F-4GA-NNN.

See Section ALE-25 for Accessories



Technical Data

System air supply: Turn on system air supply prior to applying pilot signal to operator. Failure to do so may cause valve to continuously exhaust.

Fluid: Compressed air

Maximum pressure solenoid operated:

Dependent on solenoid rating
[must not exceed 250 psig (17 bar)]

Maximum pressure pilot operated: 250 psig (17 bar) max.

Minimum operating pressure: 44 psig (3 bar)

Operating temperature solenoid operated:

Dependent on solenoid rating
[must be within range 0°* to 175°F (-20°* to 80°C)]

Operating temperature pilot operated:

0°* to +175°F (-20°* to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

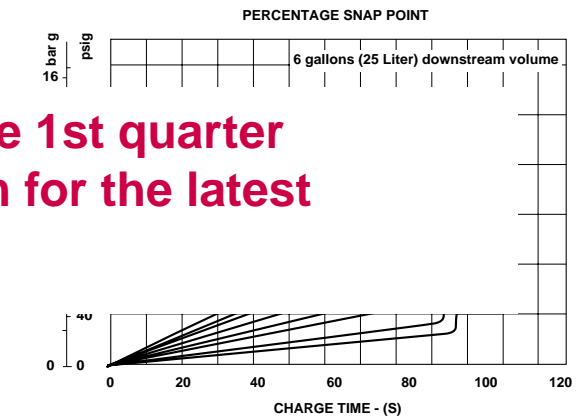
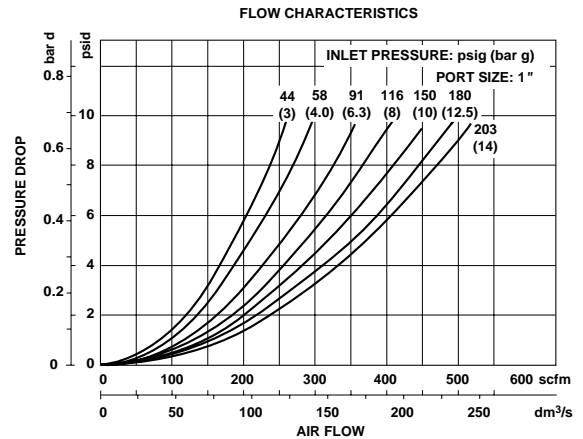
Air pilot port:

- ISO G1/4 with ISO Rc main ports
- ISO G1/4 with ISO G main ports
- 1/4 PTF with PTF main ports

Exhaust port:

- ISO G1 with ISO G main ports
- ISO G1 with ISO Rc main ports

Typical Performance Characteristics



68 Series products are available 1st quarter of 2001. Visit www.norgren.com for the latest data on this series.

1" PTF with PTF main ports

Typical flow with 90 psig (6.3 bar) inlet pressure and pressure drop of 7 psig (0.5 bar):

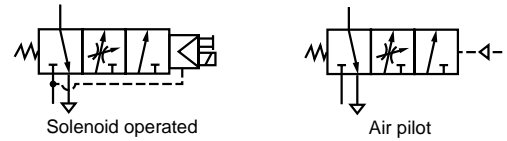
147 dm³/s (P₁ to P₂ = Cv 11.2) (P₂ to P₃ = Cv >11)

Snap pressure:

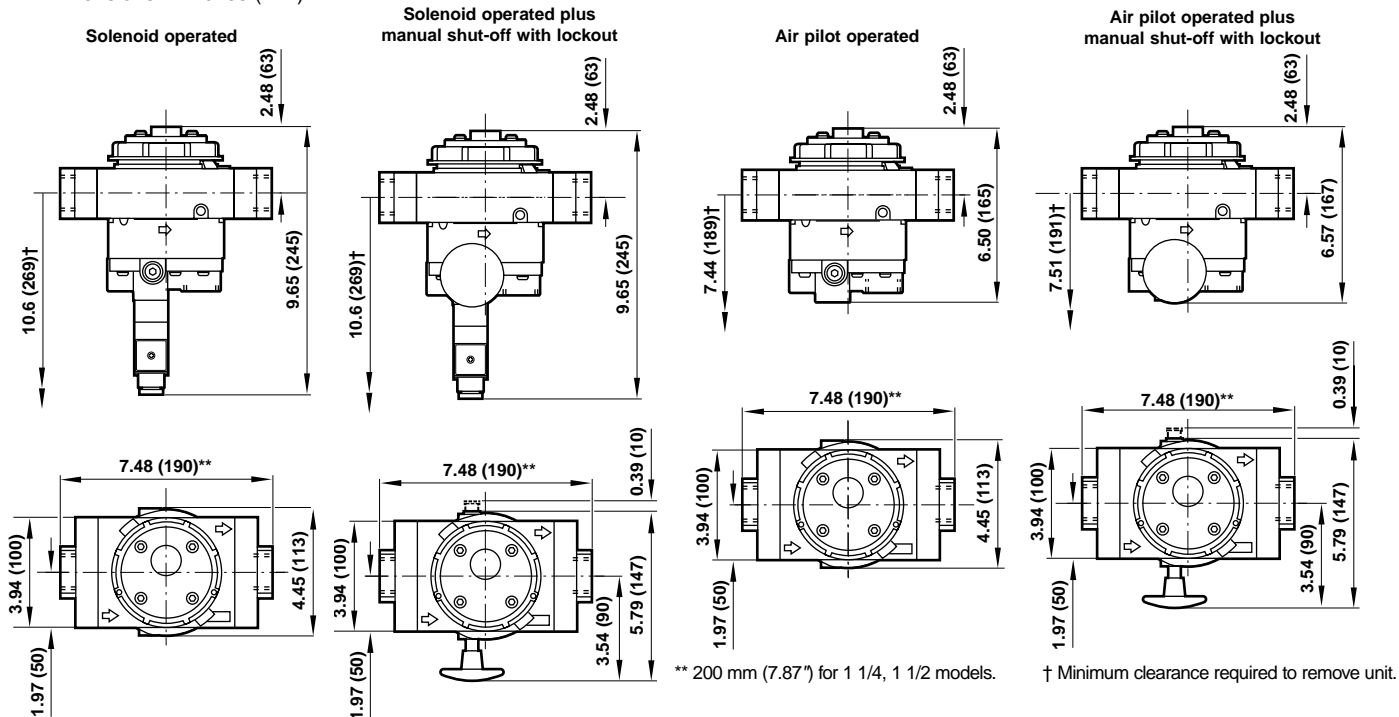
Full flow when downstream pressure reaches
50 – 80% of inlet pressure

Charge time

ISO Symbols



All Dimensions in Inches (mm)



Excelon 72 Air or Solenoid Operated Directional Control Valves 1/4", 3/8" Port Sizes

- Excelon design allows in-line or modular installation
- 3 port/2 position valves, normally closed
- Solenoid or air pilot operated
- Customised poppets for long service life
- High flow spring return
- Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications



Ordering Information. Models listed are with PTF threads. Solenoid operated models include 24 V d.c. coil and plug without indicator.

Port Size	Solenoid Operated* Model	Weight lb (kg)	Air Pilot Operated Model	Weight lb (kg)
1/4"	P72C-2AC-PFA	2.11 (0.96)	P72C-2AA-NNN	1.86 (0.84)
3/8"	P72C-3AC-PFA	2.05 (0.93)	P72C-3AA-NNN	1.80 (0.82)

* To select other solenoid type and coil voltage refer to alternative models table below.

Alternative Models

P 7 2 C - ★ ★ ★ - ★ ★ ★

Port Size	Substitute
1/4"	2
3/8"	3

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Operator	Substitute
Air pilot**	A
22 mm miniature solenoid	C
CNOMO	L

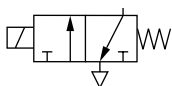
Solenoid Manual Operator	Substitute
Shrouded push button	P
None	N

Connectors	Substitute
3 pin plug with cable gland, no indicator	A
Without	N

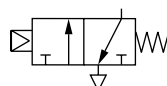
Coil Voltage	Nominal Power Rating	Substitute
24 V d.c.	2 W	F
12 V d.c.	2 W	E
6 V d.c.	2 W	D
220/240 V 50/60 Hz	4/2.5 VA	B
110/120 V 50/60 Hz	4/2.5 VA	A
No coil	2 W	Z
No solenoid		N

** To order air pilot models also substitute 'NNN' at digits 8, 9 and 10 e.g. P72C-2AA-NNN.

ISO Symbols



Solenoid operated



Air pilot

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air
 Maximum pressure solenoid operated: Dependant on solenoid rating [must not exceed 150 psig (10 bar)]
 Maximum pressure pilot operated: 150 psig (10 bar)
 Minimum operating pressure: 15 psig (1 bar)
 Operating temperature solenoid operated:
 Dependant on solenoid rating [must be within range 0°* to 150°F (-20°* to 65°C)]
 Operating temperature pilot operated:
 0°* to 150°F (-20°* to 65°C)
 * Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
 Air Pilot Port:
 10-32 UNF with PTF main ports
 M5 with ISO main ports
 Exhaust Port:
 1/4" PTF with PTF main ports
 1/4" ISO Rc with ISO Rc main ports
 1/4" ISO Rc with ISO G main ports
 Average flow factor (Cv)
 IN to OUT ports: 1.31
 OUT to EXHAUST ports: 1.27
 Materials
 Body: Zinc alloy
 Elastomers: Synthetic materials
 Filter discs: Sintered plastic
 Internal components: Brass/steel

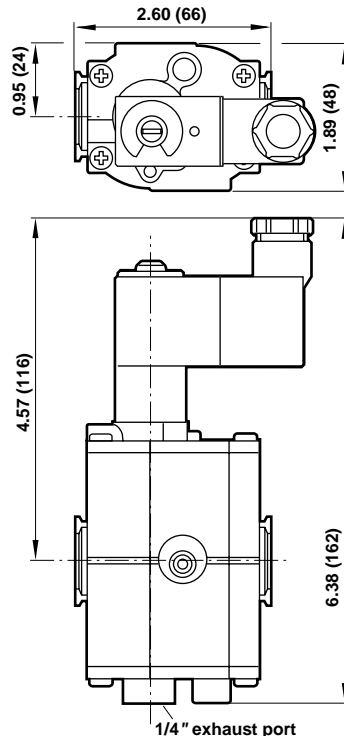
Service Kits

Item	Type	Part number
Service kit	All models	4384-520

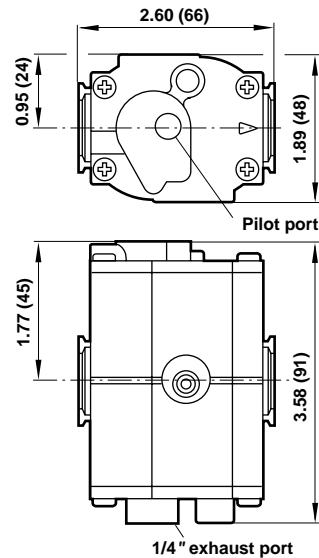
Service kit includes all seals, valve assembly and tamper resistant plug.

All Dimensions in Inches (mm)

Solenoid operated



Air pilot operated



- Modular installation only
- High-flow, spring return valves
- 2-port/2-position valves available as normally closed or normally open valves
- 3-port/2-position valves available as normally closed valves.
- Cushioned poppets for long life



Ordering Information. Models listed include PTF threads in the pilot and exhaust ports.

Installation Type	2 Port/2 Position Normally Closed	2 Port/2 Position Normally Open	3 Port/2 Position Normally Closed	Weight lb (kg)
Modular*	P74A-NAA-NNN	P74B-NAA-NNN	P74C-NAA-NNN	1.20 (0.54)

* Valve main ports are unthreaded. To install in air line use Quikclamp™ and Quikclamp pipe adapters or connect to other Excelon 74 units.

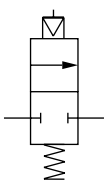
Alternative Models

Type	Substitute
2-port/2-position, NC	A
2-port/2-position, NO	B
3-port/2-position, NC	C
Main Port Threads	Substitute
No threaded ports	N
Pilot and Exhaust Port Threads	Substitute
PTF	A
ISO Rc	B
ISO G	G

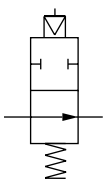
P 7 4 ★ - ★ ★ ★ - ★ ★ ★

Connector	Substitute
None	N
Coil	Substitute
None	N
Manual Override	Substitute
None	N
Operator	Substitute
Air	A

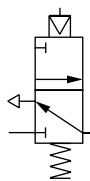
ISO Symbols



2-Port/2-Position
Normally Closed



2-Port/2-Position
Normally Open



3-Port/2-Position
Normally Closed

See Section ALE-25 for Accessories

P74 Air Operated Directional Control Valve



Technical Data

Fluid: Filtered and lubricated compressed air
 Main valve inlet pressure range: 0 to 250 psig (0 to 17 bar)
 Pilot supply inlet pressure range: Equal to or greater than main valve inlet pressure, but not less than 30 psig (2 bar) and not greater than 250 psig (17 bar).

Temperature range*: -20° to 175°F (-30° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Average flow factor (Cv) of 2-port valves: 4.0

Average flow factor (Cv) of 3-port valves

In-out ports: 3.2

Out-exhaust ports: 5.3

Pilot port: 1/4 PTF, ISO G, or ISO Rc

Exhaust port on 3 port/2 position valves: 1/2 PTF, ISO G, or ISO Rc

Materials

Body: Zinc

Pistons, poppets: Aluminum

Elastomers: Nitrile


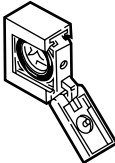
Operator: Aluminum

Service Kit

Item	Type	Part Number
Service kit	Seal & Gasket	53474-37
Quikclamp service kit	2 o-rings	4384-770

Service kit includes all o-rings, head gasket and seals.

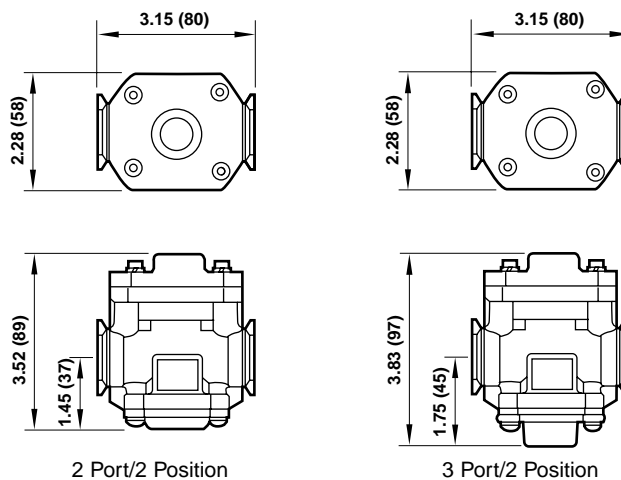
Modular Components (necessary for using this valve)

				 Quikclamp † 4314-51
Quikmount Pipe Adapters (each kit contains one adapter) **				
Size	PTF Threads	ISO Rc Threads	ISO G Threads	
1/4"	4315-01	4315-05	4315-09	
3/8"	4315-01	4315-06	4315-10	
1/2"	4315-03	4315-07	4315-11	
3/4"	4315-04	4315-08	4315-12	

** Each pipe adapter adds 0.71" (18 mm) to the overall length of a valve.

† Each Quikclamp adds 0.7" (13.6 mm) to the overall length of a valve.

All Dimensions in Inches (mm)



P74 Solenoid Operated Valve

Excelon 74 Solenoid Operated Directional Control Valve
Unthreaded Ports, 1/2" Basic Size

- Modular installation only
- High-flow, spring return valves
- 2-port/2-position valves available as normally closed or normally open valves
- 3-port/2-position valves available only as normally closed valves.
- Cushioned poppets for long life



Ordering Information. Models listed include ISO G exhaust port threads, non-locking override, 110/120Vac standard coil, and cable grip connector.

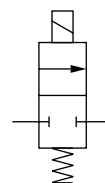
Installation Type	2 Port/2 Position Normally Closed	2 Port/2 Position Normally Open	3 Port/2 Position Normally Closed	Weight lb (kg)
Modular*	P74A-NAC-PJA	P74B-NAC-PJA	P74C-NAC-PJA	1.63 (0.74)

* Valve ports are unthreaded. To install in air line use Quikclamp™ and Quikclamp pipe adapters or connect to other Excelon 74 units.

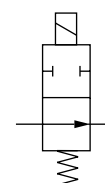
Alternative Models

Type	Substitute	<table border="1"> <tr> <td>Connector</td> <td>Substitute</td> </tr> <tr> <td>Cable grip</td> <td>A</td> </tr> <tr> <td>Cable grip with indicator lights and surge protection. Use only with A, F, J and P coils.</td> <td>B</td> </tr> <tr> <td>No connector</td> <td>N</td> </tr> </table>	Connector	Substitute	Cable grip	A	Cable grip with indicator lights and surge protection. Use only with A, F, J and P coils.	B	No connector	N																						
Connector	Substitute																															
Cable grip	A																															
Cable grip with indicator lights and surge protection. Use only with A, F, J and P coils.	B																															
No connector	N																															
2-port/2-position, NC	A	<table border="1"> <tr> <th>Solenoid Operator</th> <th colspan="2">Substitute Standard Low Watt</th> </tr> <tr> <th>Coil Voltage</th> <th>Coil</th> <th>Coil</th> </tr> <tr> <td>6 Vdc</td> <td>—</td> <td>D</td> </tr> <tr> <td>12 Vdc</td> <td>Q</td> <td>E</td> </tr> <tr> <td>24 Vdc</td> <td>P</td> <td>F</td> </tr> <tr> <td>24 Vac</td> <td>L</td> <td>C</td> </tr> <tr> <td>110/120 Vac</td> <td>J</td> <td>A</td> </tr> <tr> <td>220/240 Vac</td> <td>K</td> <td>—</td> </tr> <tr> <td>No coil</td> <td>Y</td> <td>Z</td> </tr> <tr> <td>No solenoid operator</td> <td>N</td> <td>N</td> </tr> </table>	Solenoid Operator	Substitute Standard Low Watt		Coil Voltage	Coil	Coil	6 Vdc	—	D	12 Vdc	Q	E	24 Vdc	P	F	24 Vac	L	C	110/120 Vac	J	A	220/240 Vac	K	—	No coil	Y	Z	No solenoid operator	N	N
Solenoid Operator	Substitute Standard Low Watt																															
Coil Voltage	Coil		Coil																													
6 Vdc	—		D																													
12 Vdc	Q	E																														
24 Vdc	P	F																														
24 Vac	L	C																														
110/120 Vac	J	A																														
220/240 Vac	K	—																														
No coil	Y	Z																														
No solenoid operator	N	N																														
2-port/2-position, NO	B																															
3-port/2-position, NC	C																															
Main Port Threads	Substitute																															
No threaded ports	N																															
Exhaust Port Threads	Substitute																															
PTF	A																															
ISO Rc	B																															
ISO G	G																															
No exhaust port (2/2 valves)	N																															
Operator	Substitute																															
Solenoid, internal air pilot	C																															
Solenoid Operator Override	Substitute																															
Non-locking, push button	P																															
Locking, screwdriver slot	S																															
No solenoid operator	N																															

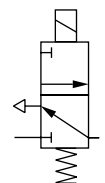
ISO Symbols



2-Port/2-Position Normally Closed



2-Port/2-Position Normally Open



3-Port/2-Position Normally Closed

See Section ALE-25 for Accessories



Technical Data

Fluid: Filtered and lubricated compressed air
 Main valve inlet pressure range: 30 to 150 psig (2 to 10 bar)
 Temperature range*: -20° to 130°F (-30° to 55°C)
 * Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
 Average flow factor (Cv) of 2-port valves: 4.0
 Average flow factor (Cv) of 3-port valves:
 In-out ports: 3.2
 Out-exhaust ports: 5.3
 Response times of 3 port/2 position valve (elapsed time from solenoid energized to an increase in the main valve pressure):
 Standard operator: 11 ms at 90 psig (6.3 bar) inlet pressure
 Low wattage operator: 13.5 ms at 90 psig (6.3 bar) inlet pressure
 Exhaust port on 3-port/2-position valves: 1/2 PTF, ISO G, or ISO Rc
 Solenoid operator specifications

Voltage and power requirements:

Voltage	Standard Coil	Low Watt Coil
6Vdc	—	2W
12Vdc	7.5W	2W
24Vdc	7.5W	3.5W
24V 50/60Hz	7.5W	3.5W
110/120V 50/60Hz	7.5W	3.5W
220/240V 50/60Hz	7.5W	—

Duty: Continuous at 90% to 110% of rated voltage.
 Coil Type: Molded with three pin plug-in connector.
 Enclosure Classification: NEMA 1, NEMA 4 and IP 65.
 Connector Plug: Cable grip for cables 1/4" to 5/16" (6 to 8 mm) diameter. Electrical connectors conform to *Industry Standard Form B for Three-Pin Electrical Plug Connectors, 11 mm spacing*.

Override: Manual, locking or non-locking

Materials

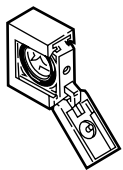
Body: Zinc
 Pistons, poppets: Aluminum
 Elastomers: Nitrile
 Operator housing: PPS plastic
 Operator base: Aluminum
 Plunger, spring: Stainless steel

Service Kit

Item	Type	Part Number
Service kit	Seal & Gasket	53474-37
Quikclamp service kit	2 o-rings	4384-770

Service kit includes all o-rings, head gasket and seals.

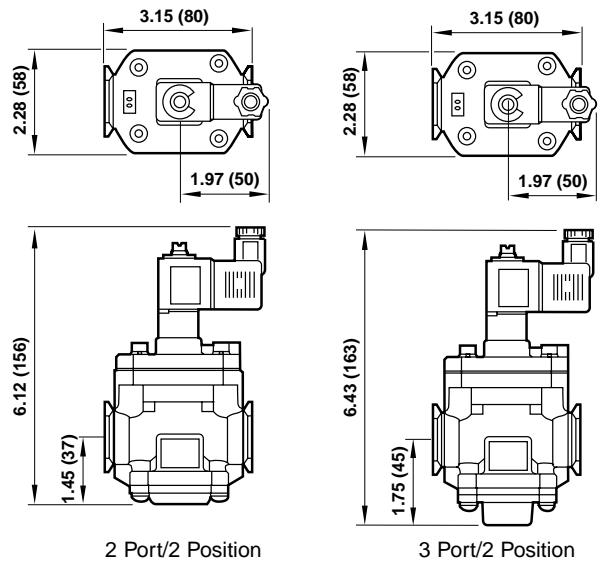
Modular Components (necessary for using this valve)

Quikmount Pipe Adapters (each kit contains one adapter) **				 Quikclamp † 4314-51
Size	PTF Threads	ISO Rc Threads	ISO G Threads	
1/4"	4315-01	4315-05	4315-09	
3/8"	4315-01	4315-06	4315-10	
1/2"	4315-03	4315-07	4315-11	
3/4"	4315-04	4315-08	4315-12	

** Each pipe adapter adds 0.71" (18 mm) to the overall length of a valve.

† Each Quikclamp adds 0.7" (13.6 mm) to the overall length of a valve.

All Dimensions in Inches (mm)



- **Modular installation only**
- **High-flow, 3-port/2-position, normally closed**
- **Manually operated lockout slide can be locked in the closed position with a customer supplied padlock.**
- **Coloured yellow for easy identification as a lockout valve**
- **Cushioned poppets for long life**



Ordering Information. Models listed include PTF exhaust port threads, non-locking override, 110/120Vac coil, and cable grip connector.

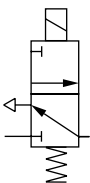
Installation Type	3 Port/2 Position Normally Closed	Weight lb (kg)
Modular*	P74C-NAD-PJA	2.03 (0.92)

* Valve ports are unthreaded. To install in air line use Quikclamp™ and Quikclamp pipe adapters or connect to other Excelon 74 units.

Alternative Models

Type	Substitute	Connector	Substitute
3-port/2-position, NC	C	Cable grip	A
Main Port Threads	Substitute	Cable grip with indicator lights and surge protection. Use only with A, F, J and P coils.	B
No threaded ports	N	No connector	N
Exhaust Port Threads	Substitute	Solenoid Operator	Substitute
PTF	A	Coil Voltage	Standard Low Watt
ISO Rc	B	6 Vdc	Coil Coil
ISO G	G	12 Vdc	— D
Operator	Substitute	24 Vdc	Q E
Solenoid, internal air pilot with lockout slide	D	24 Vac	P F
Solenoid Operator Override	Substitute	110/120 Vac	L C
Non-locking, push button	P	220/240 Vac	J A
		No coil	K —
		No solenoid operator	Y Z
			N N

ISO Symbol



3-Port/2-Position
Normally Closed

See Section ALE-25 for Accessories



Technical Data

Fluid: Filtered and lubricated compressed air
 Main valve inlet pressure range: 30 to 150 psig (2 to 10 bar)
 Temperature range*: -20° to 130°F (-30° to 55°C)
 * Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Average flow factor (Cv):

In-out ports: 3.2
 Out-exhaust ports: 5.3

Response times (elapsed time from solenoid energized to an increase in the main valve pressure): 11 ms at 90 psig (6.3 bar) inlet pressure

Maximum diameter of customer supplied padlock shackle: 5/16" (8 mm)

Exhaust port: 1/2 PTF, ISO G, or ISO Rc

Solenoid operator specifications

Voltage and power requirements:

Voltage	Standard Coil	Low Watt Coil
6Vdc	—	2W
12Vdc	7.5W	2W
24Vdc	7.5W	3.5W
24V 50/60Hz	7.5W	3.5W
110/120V 50/60Hz	7.5W	3.5W
220/240V 50/60Hz	7.5W	—

Duty: Continuous at 90% to 110% of rated voltage.

Coil Type: Molded with three pin plug-in connector.

Enclosure Classification: NEMA 1, NEMA 4 and IP 65.

Connector Plug: Cable grip for cables 6 to 8 mm (1/4" to 5/16") diameter. Electrical connectors conform to *Industry Standard Form B for Three-Pin Electrical Plug Connectors, 11 mm spacing.*

Override: Manual, non-locking

Materials:

Body: Zinc
 Pistons, poppets: Aluminum
 Elastomers: Nitrile
 Operator housing: PPS plastic
 Operator base: Aluminum
 Plunger, spring: Stainless steel

Service Kit

Item	Type	Part Number
Service kit	Seal & Gasket	53474-40
Quikclamp service kit	2 o-rings	4384-770

Service kit includes all o-rings, lockout slide spring, head gasket and seals.

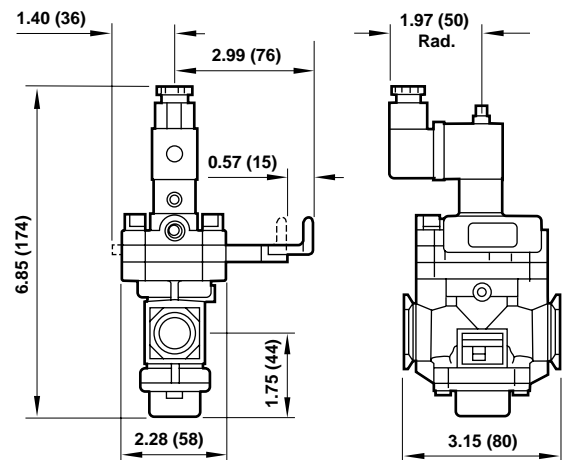
Modular Components (necessary for using this valve)

Size	PTF Threads	ISO Rc Threads	ISO G Threads	Quikclamp †
1/4"	4315-01	4315-05	4315-09	4314-51
3/8"	4315-01	4315-06	4315-10	
1/2"	4315-03	4315-07	4315-11	
3/4"	4315-04	4315-08	4315-12	

** Each pipe adapter adds 0.71" (18 mm) to the overall length of a valve.

† Each Quikclamp adds 0.7" (13.6 mm) to the overall length of a valve.

All Dimensions in Inches (mm)





1.1 SOFT START/DUMP VALVES

1.1.1 What Sizes are Available?

We can do units in 1/4" through 1 1/2" actual port size, based on Excelon 72 (1/4 - 3/8), Olympian Plus 64 (1/4 - 3/4), Excelon 74 (3/8 - 3/4) or the new P68F (3/4 - 1 1/2").

1.1.2 What Operators are Available?

All valves have air pilot, 22mm solenoid and CNOMO solenoid options. In addition the P68F can use the Webber Excel 32mm solenoid.

1.1.3 Do we have an Emergency Dump?

Yes. The P64F/P74F have an optional dump slide with a yellow handle, used to break the pilot signal and dump the downstream system. The slide can be locked out using a standard 8mm padlock or lockout hasp. The P68F has a dump handle as standard (optional without). Again this can be locked out.

1.1.4 How Fast/Slow can it go?

The snap point where full pressure kicks in is fixed for a given line pressure. You can control the time between signalling the valve and the snap by using the needle valve adjuster. Refer to catalogue sheet for minimum/maximum times, which will depend on the downstream system volume.

1.1.5 What is the Minimum Operating Pressure?

The snap action requires a minimum line pressure of 44 psig (3 bar).

1.1.6 Will the Unit Soft Start Only?

The combined function valves are not intended for use as soft start only. If you need such a valve use the Excelon 74 individual valves, or the AOY poppet valves for Olympian.

1.1.7 Will the Unit Dump Only?

The combined function valves are not intended for use as dump only. If you need such a valve use the Excelon 74 individual valves, or the DYO poppet valves for Olympian.

1.2 EXCELON VALVES

1.2.1 What Versions are Available?

The individual valves for use in Excelon 74 are 2/2 and 3/2 poppet valves P74A and P74B. There is a 2/2 soft start (P74E) and 3/2 on-off valves with solenoid or pilot operator (P74C). The 3/2 valves have optional lockout slides.

1.2.2 Are the Excelon Valves Direct Ported?

The valves in the Excelon 74 range are intended for modular installation only. If you need a threaded inlet/outlet use a Quikclamp and pipe adapter.

Additional Compressed Air Products

Exhaust Silencers, Drip Leg Drains, Gauges, Needle Valves, and Blow guns.

Contents

Olympian CS13 Coalescing Exhaust Silencers	
1/4", 3/8", 1/2", and 3/4" ports	.ALE-19-2
Olympian CS15 Coalescing Exhaust Silencers	
3/4", 1", 1-1/4", and 1-1/2" ports	.ALE-19-4
17-016 Drip Leg Drain 1/2" ports	.ALE-19-6
Air Pressure Gauges 1/8" and 1/4" ports	.ALE-19-8
High Pressure Needle Valves 1/8" and 1/4" ports	.ALE-19-11
Regulated Blow Gun 1/4" port	.ALE-19-12



CS15



CS13



17-016



Gauges



Needle Valves



Blow Gun

Olympian Plus Coalescing Exhaust Silencers
1/4", 3/8", 1/2", 3/4" Port Sizes

- Olympian plug in design
- Reduces noise from multi valve and cylinder circuits
- Removes oil mist and sub micron particles from exhausting air
- Flow in either direction
- Helps to meet noise at work directive

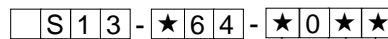


Ordering Information. Models listed include PTF threads.

Port Size	Model	Weight lb (kg)
1/4"	CS13-264-10AA	2.98 (1.35)
3/8"	CS13-364-10AA	2.93 (1.33)
1/2"	CS13-464-10AA	2.87 (1.30)
3/4"	CS13-664-10AA	3.66 (1.66)

For single silencer with one main outlet plugged substitute 'X' for 'G' at the 11th digit eg: CS13-464-10GX.

Alternative Models



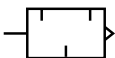
Port Size	Substitute
1/4"	2
3/8"	3
1/2"	4
3/4"	6

Option	Substitute
With yoke	1
Without yoke*	0

Port Option	Substitute
PTF threaded	A A
ISO G threaded	D D
ISO Rc threaded	B B
One main outlet plugged (PTF)	A X
One main outlet plugged (ISO G)	D X
One main outlet plugged (ISO Rc)	B X

* For replacement Silencer (without yoke) substitute '0' at the 5th, 8th, 10th and 11th digits eg: CS13-064-0000.

ISO Symbol



See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure:

0** to 122°F (-20** to 50°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Materials

Body: Zinc

Yoke: Zinc

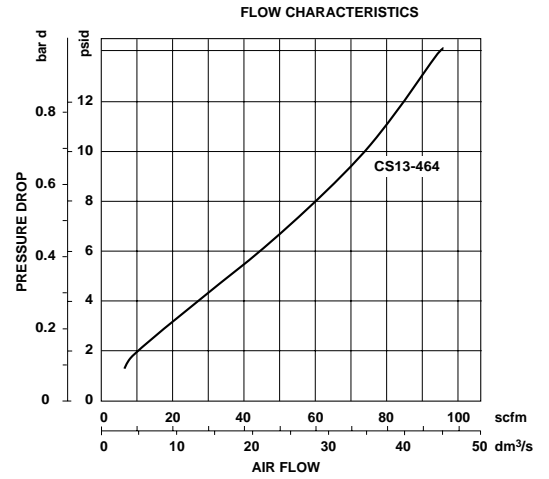
Cage: Aluminum

Element: Composite materials

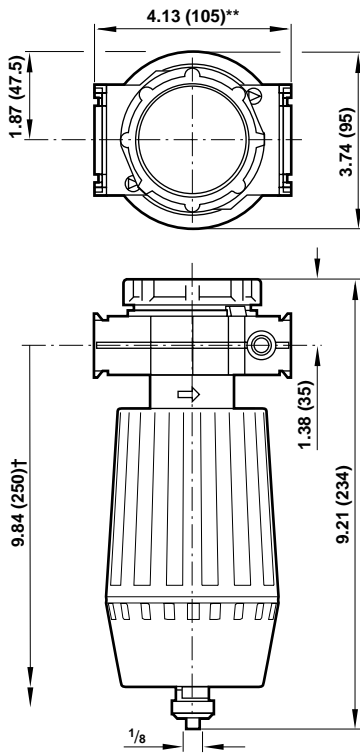
Elastomers: Synthetic rubber

Bowl: Polypropylene

Typical Performance Characteristics



All Dimensions in Inches (mm)



** 6.18" (157 mm) for 3/4 models

† Minimum clearance required to remove bowl.

Service Kits

Item	Part Number
Service kit	CS13RK
Replacement element	3236-01

Service kit includes bowl, drain plug and drain retainer.

Olympian Coalescing Exhaust Silencers
3/4", 1", 1-1/4", 1-1/2" Port Sizes

- Olympian plug in design
- Effectively reduce noise emission of multi valve and cylinder systems
- Remove oil mist and sub-micron particles from exhaust air
- Single or double units for high flow rates
- Flow in either direction
- Helps to meet noise at work directive



Ordering Information. Models listed include PTF threads.

Port Size	Single	Weight lb (kg)	Double	Weight lb (kg)
3/4"	CS15-600-10AA	5.20 (2.34)	CS15-600-20AA	9.47 (4.26)
1"	CS15-800-10AA	5.09 (2.29)	CS15-800-20AA	9.36 (4.21)
1-1/4"	–		CS15-A00-20AA	9.49 (4.27)
1-1/2"	–		CS15-B00-20AA	9.51 (4.28)

For replacement silencer without yoke substitute '0' at the 5th, 8th, 10th and 11th digits eg:CS15-000-0000.

Alternative Models

C S 1 5 - ★ 0 0 - ★ 0 ★ ★

Port Size	Substitute
3/4"	6
1"	8
1-1/4"	A
1-1/2"	B

Option	Substitute
Single yoke	1
Double yoke	2

Port Option	Substitute
PTF threaded	A A
ISO G threaded	D D
ISO Rc threaded	B B
One main outlet plugged (PTF)	A X
One main outlet plugged (ISO G)	D X
One main outlet plugged (ISO Rc)	B X

ISO Symbol


Automatic Drain

See Section ALE-25 for Accessories

CS15 Coalescing Exhaust Silencers



All Dimensions in Inches (mm)

Typical Performance Characteristics

Technical Data

Fluid: Compressed air
Operating temperature*

Metal bowl: 0° to 122°F (-20° to 50°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

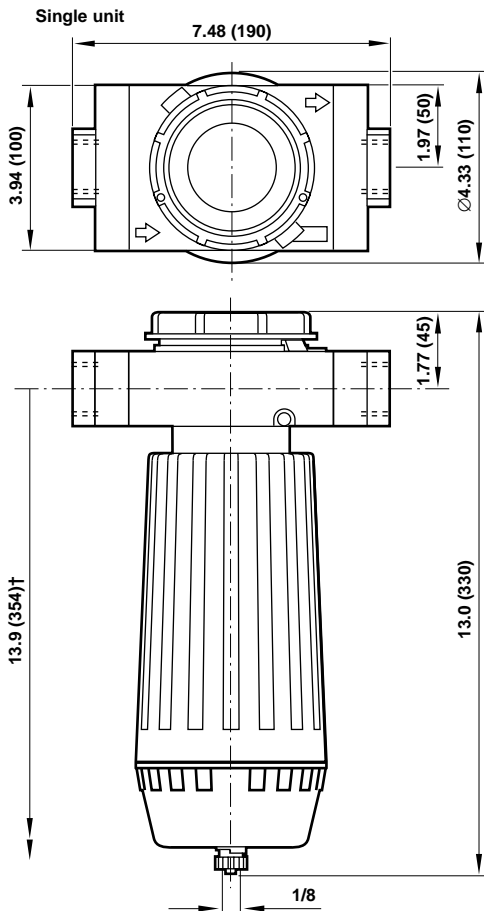
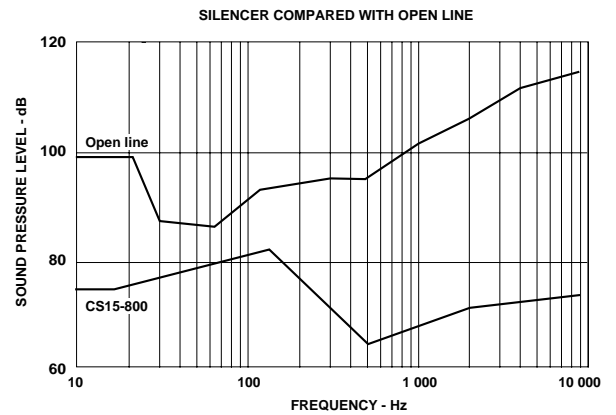
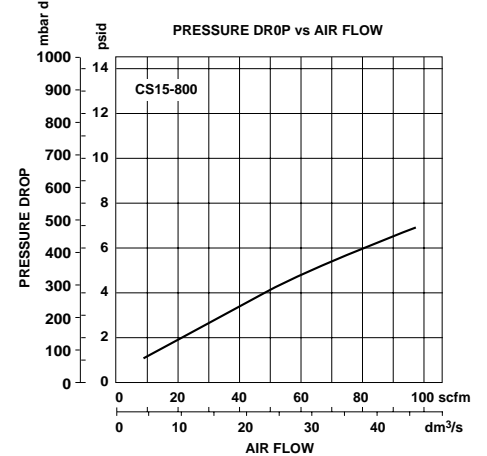
Materials

- Body: Aluminum
- Yoke: Aluminum
- Cage: Aluminum
- Bowl: Polypropylene
- Element: Composite materials
- Elastomers: Synthetic rubber

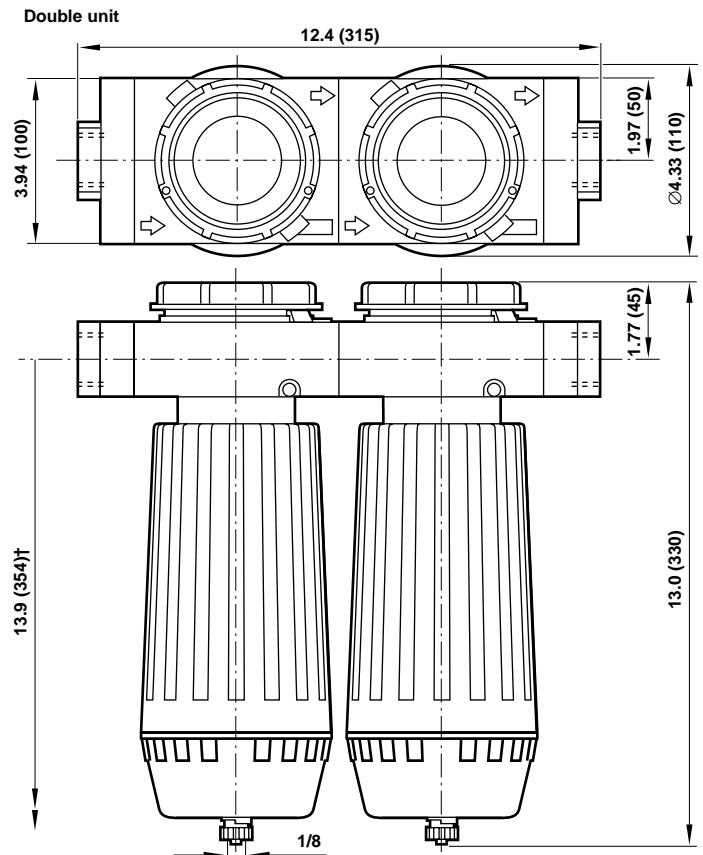
Service Kits

Item	Part Number
Service kit	CS15RK
Replacement elements	5576-97

Service kit includes: bowl, drain plug and drain retainer.



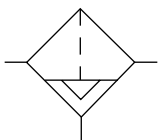
† Minimum clearance required to remove bowl.



- Automatically expels liquids from the piping network
- Can be disassembled without the use of tools or removal from the air line
- Automatic drain valve opens when system is unpressurized, allowing water to escape by gravity
- Automatic drain valve is float operated when system is pressurized
- Install at low points and at far end of piping network


Ordering Information.

Port Size	Bowl Type	Bowl Size	Model Number	Weight lbs (kg)
1/2" PTF	Transparent	1/3 pint (0.16 liter)	17-016-104	0.8 (0.38)
1/2" PTF	Metal with sight glass	1/3 pint (0.16 liter)	17-016-107	1.3 (0.59)
1/2" PTF	Transparent	3 fluid ounce (0.09 liter)	17-016-102	0.8 (0.38)

ISO Symbol


Automatic Drain



Technical Data

Fluid: Compressed air

Maximum pressure

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*

Transparent bowl: 0° to 125°F (-20° to 50°C)

Metal bowl: 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Automatic drain connection: 1/8" pipe thread

Automatic drain operating conditions (float operated):

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Minimum air flow thru drain required to close drain: 2 scfm (1 dm³/s).

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Manual operation: Depress pin inside drain outlet to drain bowl

Flexible tube with 0.125" (3mm) minimum I.D. can be connected to the drain.

Avoid restrictions in the tube.

Nominal bowl size

Standard: 1/3 pint (0.16 liter)

Optional: 3 fluid ounce (0.09 liter)

Materials

Body: Zinc

Bowl

Transparent: Polycarbonate

Metal: Zinc

Drain mechanism: Acetal, Nitrile, stainless steel

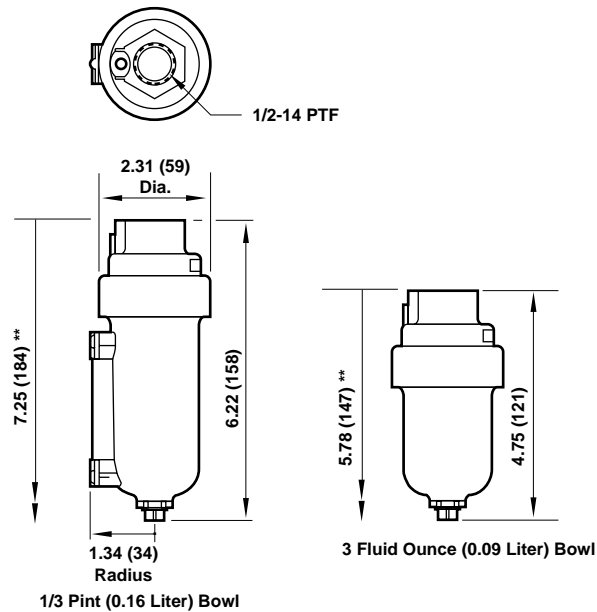
Metal bowl liquid level indicator lens: Pyrex

Elastomers: Nitrile

Service Kits

Item	Type	Part Number
Replacement drain	Automatic	3000-10
Liquid level lens kit	Pyrex	2273-20

All Dimensions in Inches (mm)



** Minimum clearance required to remove bowl.

- **Monitor pressures in compressed air systems for optimum efficiency**
- **Triple calibrated scale indicates pressure in psi, bar, and Mpa (megapascal)**
- **Back or bottom connection**
- **Panel mount, stainless steel, and Underwriters Laboratories, Inc. listed gauges available**

**Technical Data**

Fluid: Compressed air and inert gasses

Maximum pressure: 100% of full scale on gauge

Operating temperature: -30° to 175°F (-34° to 80°C)*

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Accuracy:

2% of full scale at midrange

3% of full scale at other ranges

Materials**Body**

Standard: Gauges may have a steel or plastic body

Optional: Stainless steel

Crystal:

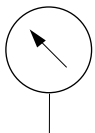
Standard steel and plastic bodies have plastic crystal

Optional stainless steel body has glass crystal

Connector:

Standard steel and plastic bodies have brass connector

Optional stainless steel body has stainless steel connector

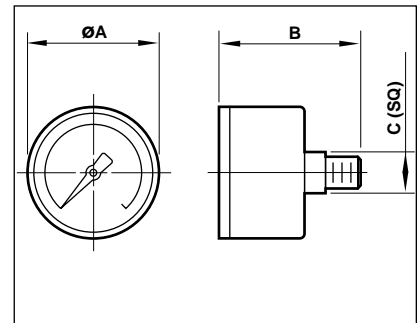
ISO Symbol



Ordering Information, Black Face Gauges - psi outer scale, bar middle scale, Mpa inner scale

Center Back Connection

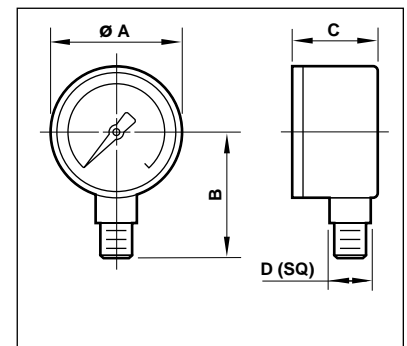
Outer Scale psig	Scale Range		1/8 NPT 1.5" (40mm) Diameter	1/8 NPT 2" (50mm) Diameter	1/4 NPT 2" (50mm) Diameter	R1/4 2" (50mm) Diameter
	Middle Scale bar	Inner Scale Mpa				
0 to 30	0 to 2	0 to 0.2	18-013-214	18-013-201	18-013-207	—
0 to 60	0 to 4	0 to 0.4	18-013-211	18-013-202	18-013-208	18-013-268
0 to 100	0 to 7	0 to 0.7	—	18-013-203	18-013-235	—
0 to 160	0 to 11	0 to 1.1	18-013-212	18-013-204	18-013-209	18-013-269
0 to 300	0 to 20	0 to 2.1	—	18-013-205	18-013-210	18-013-270
0 to 400	0 to 28	0 to 2.8	—	18-013-206	—	—



A	B	C
1.5 (40)	1.60 (41)	0.47 (12)
2.0 (50)	1.85 (47)	0.55 (14)

Bottom Connection - 2" (50 mm) diameter gauges do not have the Mpa scale

Outer Scale psig	Scale Range		1/8 NPT 1.5" (40mm) Diameter	1/4 NPT 2" (50mm) Diameter
	Middle Scale bar	Inner Scale Mpa		
0 to 15	0 to 1	—	—	18-013-082
0 to 30	0 to 2	0 to 0.2	18-013-224	18-013-030 *
0 to 60	0 to 4	0 to 0.4	18-013-225	18-013-083 *
0 to 100	0 to 7	0 to 0.7	18-013-265	18-013-084 *
0 to 160	0 to 11	0 to 1.1	18-013-273	18-013-085 *
0 to 300	0 to 20	—	—	18-013-086 *
0 to 2000	0 to 135	—	—	18-013-244 *†
0 to 3000	0 to 205	—	—	18-013-087 *†



A	B	C	D
1.5 (40)	1.42 (36)	0.90 (23)	0.47 (12)
2.0 (50)	1.73 (44)	1.03 (26)	0.55 (14)

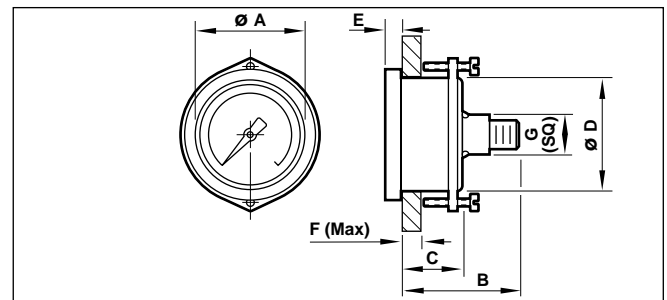
* Underwriters Laboratories Inc. Listed

† Shipped with pulsation dampener installed.

Center Back Connection, Panel Mounted

Outer Scale psig	Scale Range		1/4 NPT Male and 10-32 Female 1.5" (40mm) Diameter
	Middle Scale bar	Inner Scale Mpa	
0 to 30	0 to 2	0 to 0.2	5PG-306-000 **
0 to 60	0 to 4	0 to 0.4	5PG-312-000 **
0 to 100	0 to 7	0 to 0.7	5PG-320-000 **

** Requires 1.63" (41 mm) diameter panel hole.



A	B	C	D	E	F (Max)	G
1.5 (40)	1.51 (38)	0.86 (22)	1.61 (41)	0.18 (5)	0.5 (13)	0.55 (14)

Alternative Models

Pulsation Dampener: Add **-9D** to the end of the model number.



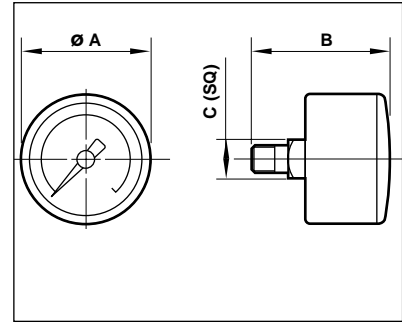
Air Pressure Gauges

All Dimensions in Inches (mm)

Ordering Information, White Face Gauges - bar outer scale, Mpa middle scale, psi inner scale

Center Back Connection

Scale Range			R1/8 1.5" (40mm) Diameter	R1/8 2" (50mm) Diameter	R1/8 2.5" (63mm) Diameter
Outer Scale bar	Middle Scale Mpa	Inner Scale psi			
0 to 1.6	0 to 0.16	0 to 23	18-013-991	18-013-010	—
0 to 4	0 to 0.4	0 to 56	18-013-990	18-013-011	—
0 to 6	0 to 0.6	0 to 84	—	18-013-012	—
0 to 10	0 to 1.0	0 to 140	18-013-989	18-013-013	18-013-856
0 to 16	0 to 1.6	0 to 240	—	—	18-013-855
0 to 25	0 to 2.5	0 to 360	18-013-908	18-013-014	—



A	B	C
1.5 (40)	1.77 (45)*	0.55 (14)
2.0 (50)	1.93 (49)	0.55 (14)
2.5 (63)	1.89 (48)	0.55 (14)

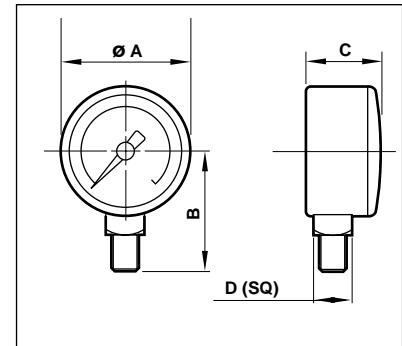
* 1.57 (40) on 1/8 PTF stainless steel gauges
1.85 (47) on 1/4 PTF stainless steel gauges

Stainless Steel Gauges - gauges do not have the Mpa scale

Scale Range		1/8 PTF 1.5" (40mm) Diameter	1/4 PTF 1.5" (40mm) Diameter
Outer Scale bar	Inner Scale psi		
0 to 6	0 to 84	—	18-013-913
0 to 10	0 to 140	18-013-844	18-013-909
0 to 25	0 to 360	—	18-013-905

Bottom Connection

Scale Range			R1/8 2" (50mm) Diameter	G1/4A 2.5" (63mm) Diameter
Outer Scale bar	Middle Scale Mpa	Inner Scale psi		
0 to 1.6	0 to 0.16	0 to 23	18-013-024	—
0 to 4	0 to 0.4	0 to 56	18-013-025	—
0 to 6	0 to 0.6	0 to 84	18-013-026	—
0 to 10	0 to 1.0	0 to 140	18-013-027	18-013-854
0 to 16	0 to 1.6	0 to 240	—	18-013-853
0 to 25	0 to 2.5	0 to 360	18-013-028	—



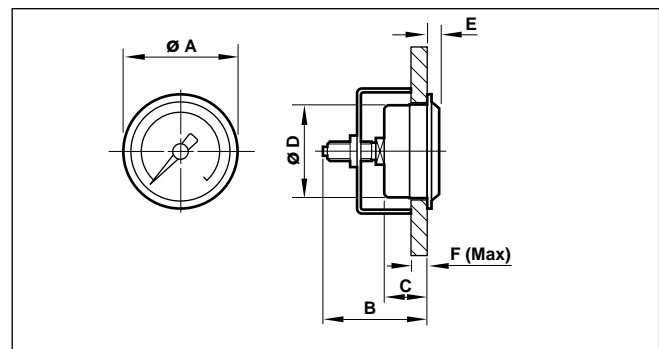
A	B	C	D
2.0 (50)	1.77 (45)	1.10 (28)	0.55 (14)
2.5 (63)	2.09 (53)	1.10 (28)	0.55 (14)

Center Back Connection, Panel Mount

Scale Range			G1/8A 2" (50mm) Diameter	G1/8A 2.5" (63mm) Diameter
Outer Scale bar	Middle Scale Mpa	Inner Scale psi		
0 to 6	0 to 0.6	0 to 84	18-013-858 *	—
0 to 10	0 to 1.0	0 to 140	18-013-857 *	18-013-852 †
0 to 16	0 to 1.6	0 to 240	—	18-013-851 †

* Requires 2.01" (51 mm) diameter panel hole.

† Requires 2.52" (64 mm) diameter panel hole.



A	B	C	D	E	F
2.0 (50)	2.17 (55)	1.02 (26)	1.93 (49)	0.20 (5)	0.37 (9.5)
2.5 (63)	2.20 (56)	1.06 (27)	2.44 (62)	0.24 (6)	0.37 (9.5)

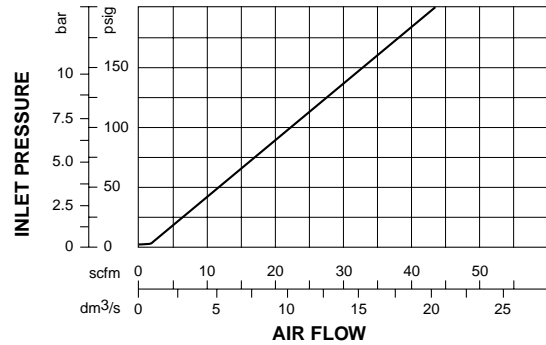
High Pressure Needle Valves

1/8" and 1/4" Port Sizes

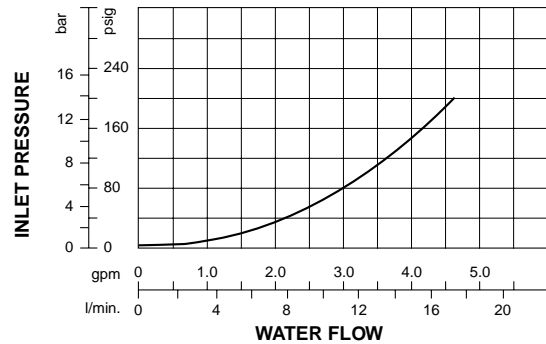


- Bar stock machined brass body
- Tapered brass needle
- Adjustable stem packing nut with Teflon® seal
- Retained adjustment stem
- Metal to metal sealing surfaces
- Accurate metering of fluids
- 3,000 psig inlet pressure

Fluid: Air
 Outlet Pressure: Atmosphere
 Adjustment Knob: Full Open



Fluid: Water
 Outlet Pressure: Atmosphere
 Adjustment Knob: Full Open



Specifications

Fluid: Compressed air, water, steam, and other non-flammable, inert gases and liquids
 Max. Inlet Pressure: 3,000 psig (207 bar)
 Temperature Range: -40° to 500°F (-40° to 260°C)
 Maximum Differential Pressure: 15 psid (1 bar d)
 Ports: 1/8 or 1/4 NPT
 Orifice Size: Ø0.187" (5 mm)
 CV: 0.401

Materials of Construction

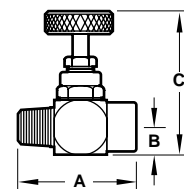
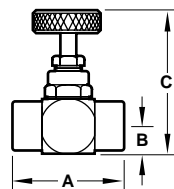
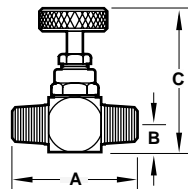
Body, needle, packing nut, knob: Brass
 Stem Seal: Teflon®

Size (NPT)	Port		Part Number	Dimensions			
	In	Out		A	B	C Closed	C Open
1/8"	Male	Male	17-001-106	1.63 (41)	0.38 (10)	2.13 (54)	2.25 (57)
	Female	Female	17-001-109	1.63 (41)	0.38 (10)	2.13 (54)	2.25 (57)
	Female	Male	17-001-112	1.63 (41)	0.38 (10)	2.13 (54)	2.25 (57)
1/4"	Male	Male	17-001-107	1.81 (46)	0.38 (10)	2.13 (54)	2.25 (57)
	Female	Female	17-001-110	1.63 (41)	0.38 (10)	2.13 (54)	2.25 (57)
	Male	Female	17-001-114	1.72 (44)	0.38 (10)	2.13 (54)	2.25 (57)

17-001-106
17-001-107

17-001-109
17-001-110

17-001-112
17-001-114



- Nozzle pressure regulated to below 30 psig (2.1 bar) even if nozzle is obstructed
- OSHA compliant
- Large lever for comfort and easy actuation
- Permanently assembled, tamper resistant construction
- Surface scratching reduced by ordering model with rubber tipped nozzle
- Replaceable nozzle tip
- 10" extension nozzle available



Specifications

Fluid: Compressed air
 Maximum Inlet Pressure: 250 psig (17.2 bar)
 Temperature Range: 32° to 175°F (0° to 79°C)
 Outlet (Regulated) Pressure: Below 30 psig (2.1 bar)
 Nozzle Orifice: Ø0.16" (Ø4 mm)
 Port Size: 1/4 PTF (female)

Materials of Construction

Body: Polyester
 Nozzle Tip: Metal (aluminum or brass) or Rubber
 Elastomers: Nitrile

Accessories

Hanging Hook: 5320-01
 10" Extension Nozzle: 5363-50

Replacement Parts

Nozzle with Air Shield: 1135-05
 Nozzle without Air Shield: 1135-06
 Nozzle Rubber Tip: 1135-07

Port (PTF)	Part Number	Nozzle Type
1/4	17-104-302	Metal Tip with Air Shield
1/4	17-104-304	Metal Tip
1/4	17-104-306	Rubber Tip

Filter-Filter

Modular prefilter and oil removal filter combination units in port size from 1/4" to 3/4"

Excelon 72 Filter Combination Units 1/4" and 3/8" Port Sizes	ALE-20-2
Excelon 73 Filter Combination Units 1/4", 3/8", 1/2" Port Sizes	ALE-20-4
Excelon 74 Filter Combination Units 3/8", 1/2", 3/4" Port Sizes	ALE-20-6



**F72 Filter-Filter
Combination Unit**



**F73 Filter-Filter
Combination Unit**



**F74 Filter-Filter
Combination Unit**

- True modularity with Norgren Quikclamp™ connections
- F72G prefilter and F72C oil removal filter provide high efficiency oil removal and particle removal down to 0.01 µm
- Quick release bayonet bowl
- Highly visible, prismatic liquid level indicator lens
- Service indicator turns from green to red when the filter element needs to be replaced



Ordering information. Models listed include PTF threads, service indicator, automatic drain, and long transparent bowl without guard on both filters.

Port Size	Model	Weight lb (kg)
1/4"	H72A-2AB-AL1-NNN-LNN	2 (0.91)
3/8"	H72A-3AB-AL1-NNN-LNN	2 (0.91)

Alternative Models

★ 7 2 A - ★ ★ ★ - ★ ★ ★ - N N N - ★ N ★

Shutoff/Lockout Valve, Quikmount	Substitute
Standard Combination (No Shutoff/Lockout Valve, no Quikmount)	H
With Shutoff/Lockout valve on inlet	J
With Quikmount pipe adapters on inlet and outlet	M
With Shutoff/Lockout Valve on inlet and Quikmount pipe adapter on outlet	N

Combination Unit Type	Substitute
F72G general purpose filter and F72C coalescing filter	A

Port Size	Substitute
1/4"	2
3/8"	3

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Mechanical Service Indicator	Substitute
Indicator on F72G and F72C	B
Indicator only on F72C	C
Indicator only on F72G	D
No indicator	N

F72G and F72C Drain	Substitute
Automatic**	A
Manual, 1/4 turn	Q
Semi automatic	S

Quikclamp Wall Brackets	Substitute
With	B
Without	N
Adsorbing Filter Bowl	Substitute
No Adsorbing filter	N

F72C Bowl	Substitute
Short metal with liquid level indicator	D
Long metal with liquid level indicator	E
Short transparent without guard	T
Long transparent without guard	L
Long transparent with guard	W

Regulator Option	Substitute
Non Applicable	N

Regulator Option	Substitute
Non Applicable	N

Regulator Option	Substitute
Non Applicable	N

F72G Filter Element	Substitute
5 µm	1

F72G Bowl	Substitute
Short metal with liquid level indicator	D
Long metal with liquid level indicator	E
Short transparent without guard	T
Long transparent without guard	L
Long transparent with guard	W

See Section ALE-25 for Accessories

** Supplied in long bowl options only.



Technical Data

Fluid: Compressed air

Maximum pressure:

Transparent bowl: Manual or semi automatic drain: 150 psig (10 bar)

Automatic drain: 116 psig (8 bar)

Metal bowl: Manual or semi automatic drain: 250 psig (17 bar)

Automatic drain: 116 psig (8 bar)

Operating temperature*: Transparent bowl: -30° to 125°F (-34° to 50°C)

Metal bowl: -30° to 150°F (-34 to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: Down to 0.01 µm

Air quality: Within ISO 8573-1, Class 1 (particulates) and Class 2 (oil content)

Maximum remaining oil content in outlet air: 0.01 ppm at 70°F (20°C) with an inlet concentration of 17 ppm

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Semi automatic drain connection: Push on 5/16" (8 mm) ID tube

Semi automatic drain operating conditions (pressure operated)

Bowl pressure required to close drain: Greater than 1.5 psig (0.1 bar)

Bowl pressure required to open drain: Less than 1.5 psig (0.1 bar)

Minimum air flow required to close drain: 1 scfm (0.5 dm³/s)

Manual operation: Lift stem to drain bowl

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Flexible tube with 3/16" (5 mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5 mm). Avoid restrictions in the tube.

Automatic drain operating conditions (float operated)

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 0.2 scfm (0.1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size

Short bowl: 1.9 fluid ounce (56 ml)

Long bowl: 2.2 fluid ounce (65 ml)

Materials

Body: Zinc

Bowl

Transparent: Polycarbonate

Transparent with guard: Polycarbonate, zinc guard

Metal: Zinc

Metal bowl liquid level indicator lens: Transparent nylon

F72G element: Sintered polypropylene

F72C element: Synthetic fiber and polyurethane foam

Elastomers: Neoprene and nitrile

Service indicator materials

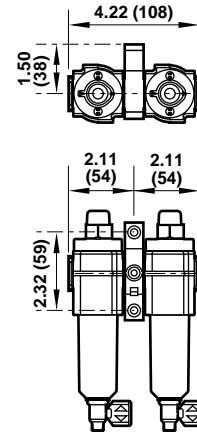
Body: Transparent nylon

Internal parts: Acetal

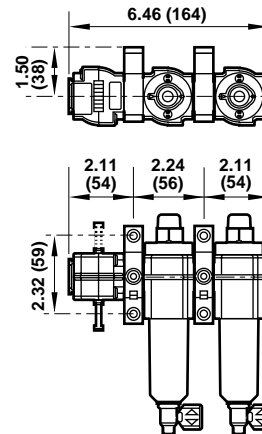
Spring: Stainless steel

Elastomers: Nitrile

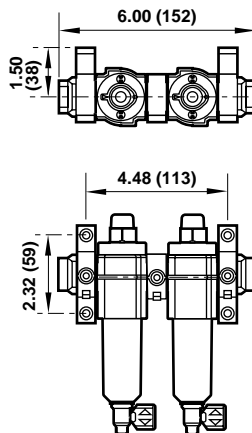
Standard Type H72A-
Shown with optional Quikclamp wall bracket.



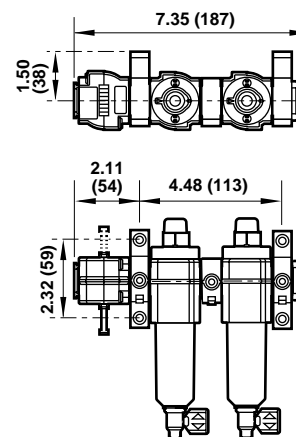
Alternative Type J72A-
Includes Shutoff/Lockout valve.
Shown with optional Quikclamp wall brackets.



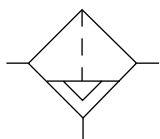
Alternative Type M72A-
Includes Quikmount pipe adapters.
Shown with optional Quikclamp wall brackets.



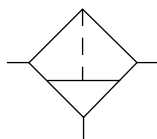
Alternative Type N72A-
Includes Shutoff/Lockout valve and Quikmount pipe adapter.
Shown with optional Quikclamp wall brackets.



ISO Symbols



Automatic and Semi Automatic Drain



Manual Drain

- True modularity with Norgren Quikclamp connections
- F73G prefilter and F73C oil removal filter provide high efficiency oil removal and particle removal down to 0.01 µm
- Quick release bayonet bowl
- Highly visible, prismatic liquid level indicator lens
- Service indicator turns from green to red when the filter element needs to be replaced



Ordering information. Models listed include PTF parallel threads, service indicator, automatic drain, and metal bowl with liquid level indicator on both filters.

Port Size	Model	Weight lb (kg)
1/4"	H73A-2AB-AD1-NNN-DNN	2.7 (1.22)
3/8"	H73A-3AB-AD1-NNN-DNN	2.7 (1.22)
1/2"	H73A-4AB-AD1-NNN-DNN	2.7 (1.22)

Alternative Models

★ 7 3 A - ★ ★ ★ - ★ ★ ★ - N N N - ★ N ★

Lockout Valve/Quikmount	Substitute
Standard Combination (No Lockout Valve, no Quikmount)	H
With Lockout valve on inlet	J
With Quikmount pipe adapters on inlet and outlet	M
With Lockout Valve on inlet and Quikmount pipe adapter on outlet	N
Combination Unit Type	Substitute
F73G general purpose filter and F73C coalescing filter	A
Port Size	Substitute
1/4"	2
3/8"	3
1/2"	4
Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G
Mechanical Service Indicator	Substitute
Indicator on F73G and F73C	B
Indicator only on F73C	C
Indicator only on F73G	D
No indicator	N

Quikclamp Wall Brackets	Substitute
With	B
Without	N
Adsorbing Filter Bowl	Substitute
No Adsorbing filter	N
F73C Bowl	Substitute
Metal with liquid level indicator	D
Transparent with guard	P
Transparent	T
Regulator Option	Substitute
Non Applicable	N
Regulator Option	Substitute
Non Applicable	N
Regulator Option	Substitute
Non Applicable	N
F73G Filter Element	Substitute
5 µm	1
F73G Bowl	Substitute
Metal with liquid level indicator	D
Transparent with guard	P
Transparent	T
F73G and F73C Drain	Substitute
Automatic	A
Manual, 1/4 turn	Q



Technical Data

Fluid: Compressed air

Maximum pressure:

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*:

Transparent bowl: -30° to 125°F (-34° to 50°C)

Metal bowl: -30° to 150°F (-34° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: Down to 0.01 µm

Air quality: Within ISO 8573-1, Class 1 (particulates) and Class 2 (oil content)

Maximum remaining oil content in outlet air: 0.01 ppm at 70°F (20°C) with an inlet concentration of 17 ppm

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Flexible tube with 3/16" (5 mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5 mm). Avoid restrictions in the tube.

Automatic drain operating conditions (float operated):

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 0.2 scfm (0.1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size: 3.5 fluid ounce (0.1 liter)

Materials

Body: Aluminum

Bowl

Transparent: Polycarbonate

Transparent with guard: Polycarbonate, steel guard

Metal: Aluminum

Metal bowl liquid level indicator lens: Transparent nylon

F73G element: Sintered polypropylene

F73C element: Synthetic fiber and polyurethane foam

Elastomers: Neoprene and nitrile

Service indicator materials

Body: Transparent nylon

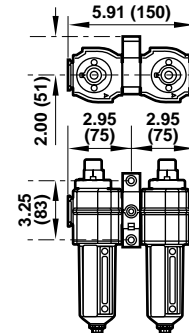
Internal parts: Acetal

Spring: Stainless steel

Elastomers: Nitrile

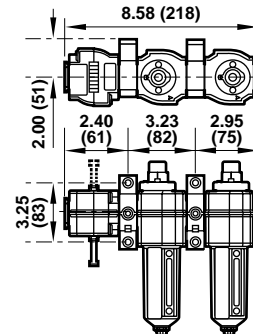
Standard Type H73A-

Shown with optional Quikclamp wall bracket.



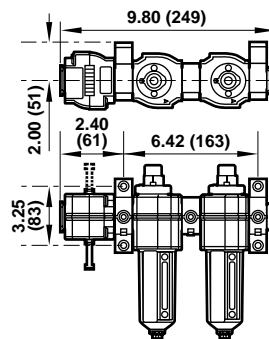
Alternative Type J73A- Includes Lockout Valve

Shown with optional Quikclamp wall brackets.



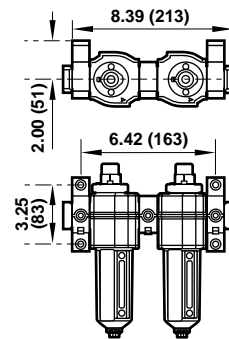
Alternative Type N73A- Includes Lockout Valve and Quikmount Pipe Adapters

Shown with optional Quikclamp wall brackets.

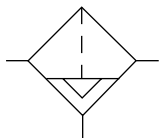


Alternative Type M73A- Includes Quikmount Pipe Adapters

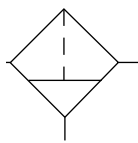
Shown with optional Quikclamp wall brackets.



ISO Symbols



Automatic Drain



Manual Drain

See Section ALE-25 for Accessories

- **True modularity with Norgren Quikclamp™ connections**
- **F74G prefilter and F74C oil removal filter provide high efficiency oil removal and particle removal down to 0.01 µm**
- **F74V oil vapor removal filter uses an adsorbing type activated carbon element to remove oil vapors and most hydrocarbon odors**
- **Quick release bayonet bowl**
- **Highly visible, prismatic liquid level indicator lens**
- **Service indicator turns from green to red when the filter element needs to be replaced**



Technical Data

Fluid: Compressed air

Maximum pressure

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

F74G and F74C/H operating temperature*:

Transparent bowl: -30° to 125°F (-34° to 50°C)

Metal bowl: -30° to 150°F (-34° to 65°C)

F74V temperature range*: -30° to 150°F (-34° to 65°C).

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: Down to 0.01 µm

Air quality:

F74G, F74C/H: Within ISO 8573-1, Class 1 (particulates) and Class 2 (oil content)

F74G, F74C, F74V: Within ISO 8573-1, Class 1 (particulates) and Class 1 (oil content)

Maximum remaining oil content in outlet air with an inlet concentration of 17 ppm

F74G, F74C/H: 0.01 ppm at 70°F (20°C)

F74G, F74H, F74V: 0.003 ppm at 70°F (20°C)

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Automatic drain operating conditions (float operated)

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 2 scfm (1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size: 7 fluid ounce (0.2 liter)

Materials

Body: Aluminum

Bowl

Transparent: Polycarbonate with steel bowl guard

Metal: Aluminum

Metal bowl liquid level indicator lens: Transparent nylon

F74G element: Sintered polypropylene

F74C/H element: Synthetic fiber and polyurethane foam

F74V element: Activated carbon and aluminum

Elastomers: Neoprene and nitrile

Service indicator materials:

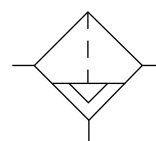
Body: Transparent nylon

Internal parts: Acetal

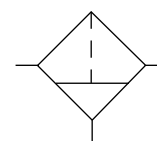
Spring: Stainless steel

Elastomers: Nitrile

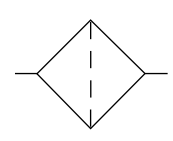
ISO Symbols



Automatic Drain



Manual Drain



Closed Bottom

See Section ALE-25 for Accessories



Ordering information. Models listed include PTF parallel threads, service indicator on the general purpose and coalescing filters, automatic drain and metal bowl with liquid level indicator on the general purpose and coalescing filters.

Combination Unit	Type	Port Size	Model	Weight lb (kg)
General Purpose and Coalescing Filters	Standard	3/8"	H74A-3AB-AD1-NNN-DNN	4.15 (1.88)
	Standard	1/2"	H74A-4AB-AD1-NNN-DNN	4.06 (1.84)
	High Flow	1/2"	H74B-4AB-AD1-NNN-DNN	4.67 (2.12)
	High Flow	3/4"	H74B-6AB-AD1-NNN-DNN	4.61 (2.09)
General Purpose, Coalescing, and Adsorbing Filters	Standard	3/8"	H74F-3AB-AD1-NNN-DMN	7.12 (3.23)
	Standard	1/2"	H74F-4AB-AD1-NNN-DMN	7.01 (3.18)

Alternative Models



Lockout Valve/ Quikmount	Substitute
Standard combination (no lockout valve or Quikmount)	H
With lockout valve on inlet	J
With Quikmount pipe adapters on inlet and outlet	M
With lockout valve on inlet and Quikmount pipe adapter on outlet	N

Combination Unit Type	Substitute
General purpose filter and standard coalescing filter	A
General purpose filter and high flow coalescing filter	B
General purpose filter, standard coalescing filter, and adsorbing filter	F

Port Size	Substitute
3/8"	3
1/2"	4
3/4"	6

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Service Indicator	Substitute
On general purpose and coalescing filters	B
Only on coalescing filter	C
Only on general purpose filter	D
No service Indicator	N

Quikclamp Wall Brackets	Substitute
With	B
Without	N

Adsorbing Filter Bowl	Substitute
Metal, closed bottom	M
No adsorbing filter	N

Coalescing Filter Bowl	Substitute
Metal with liquid level indicator	D
Transparent with metal guard	P

Regulator Option	Substitute
Non applicable	N

Regulator Option	Substitute
Non applicable	N

Regulator Option	Substitute
Non applicable	N

General Purpose Filter Element	Substitute
5 µm	1

General Purpose Filter Bowl	Substitute
Metal with liquid level indicator	D
Transparent with guard	P

General Purpose Filter and Coalescing Filter Drain	Substitute
Automatic	A
Manual, 1/4 turn	Q

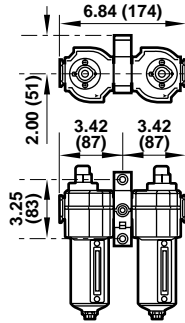


F74G, F74C/H, F74V Filter-Filter

All Dimensions in Inches (mm)

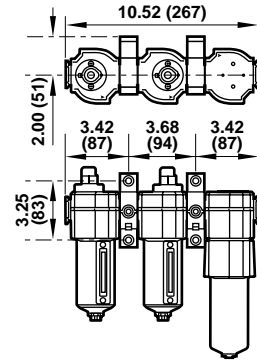
Standard Type H74A Shown (H74B Similar)

Shown with optional Quikclamp wall bracket.



Standard Type H74F

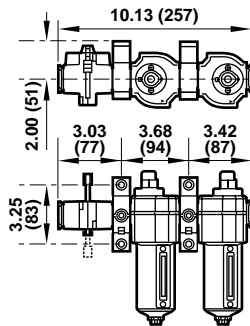
Shown with optional Quikclamp wall bracket.



Standard Type J74A Shown (J74B Similar)

Includes Shutoff/Lockout valve

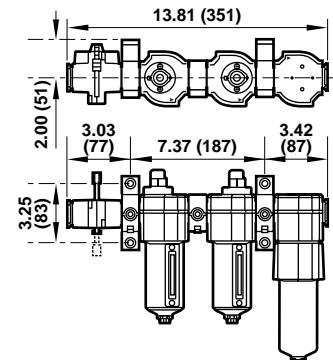
Shown with optional Quikclamp wall brackets.



Alternative Type J74F-

Includes Shutoff/Lockout valve

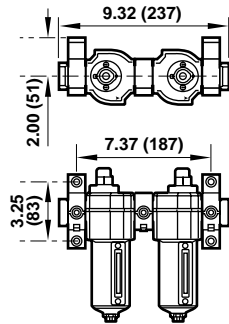
Shown with optional Quikclamp wall brackets.



Standard Type M74A Shown (M74B Similar)

Includes Quikmount pipe adapters.

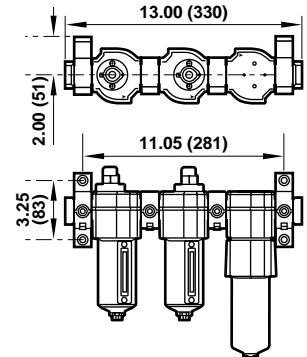
Shown with optional Quikclamp wall bracket.



Alternative Type M74F-

Includes Quikmount pipe adapters.

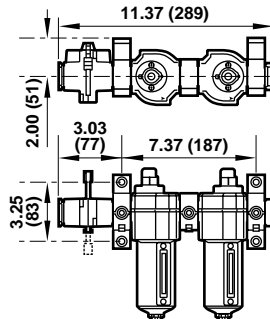
Shown with optional Quikclamp wall brackets.



Standard Type N74A Shown (N74B Similar)

Includes Shutoff/Lockout valve and Quikmount pipe adapter.

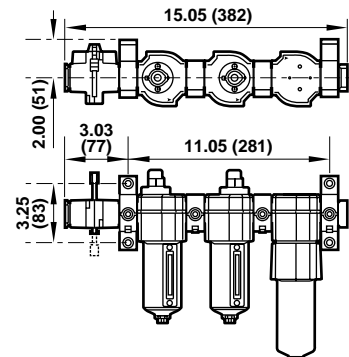
Shown with optional Quikclamp wall brackets.



Alternative Type N74F-

Includes Shutoff/Lockout valve and Quikmount pipe adapter.

Shown with optional Quikclamp wall brackets.



Filter/Regulator-Lubricator Combination units in port sizes from 1/8" to 3/4".

07 Series Filter/Regulator-Lubricator Combination	
Units 1/8" and 1/4" port sizes	ALE-21-2
Excelon 72 Filter/Regulator-Lubricator Combination	
Units 1/4" and 3/8" port sizes	ALE-21-4
Excelon 73 Filter/Regulator-Lubricator Combination	
Units 1/4", 3/8", and 1/2" port sizes	ALE-21-8
Excelon 74 Filter/Regulator-Lubricator Combination	
Units 3/8", 1/2", and 3/4" port sizes	ALE-21-12
Olympian 64 Filter/Regulator-Lubricator Combination	
Units 1/4", 3/8", 1/2", and 3/4" port sizes	ALE-21-16



07 Series F/R-L



72 Series F/R-L



73 Series F/R-L



74 Series F/R-L



64 Series F/R-L

P1H, PTH Combination Unit

07 Series Filter/Regulator-Lubricator
1/8" and 1/4" Port Sizes

- Compact design
- Filter removes liquids and solid particles down to 5 µm
- Push to lock adjusting knob with tamper resistant option
- Micro-Fog lubricator provides air line lubrication to one or more air driven tools or other devices
- Nearly constant oil density output with varying air flow
- Can be disassembled without the use of tools or removal from the air line



Ordering Information. Models listed include PTF threads, transparent bowls, filter/regulator with relieving diaphragm, automatic drain, 5 µm element, 5 to 100 psig (0.3 to 7 bar) outlet pressure adjustment range*, gauge, and lubricator with manual drain.

Port Size	Model Number	Weight lbs (kg)
1/8"	P1H-100-A1AA	0.87 (40)
1/4"	P1H-200-A1AA	0.87 (40)

Alternative Models

Integral Wall Bracket	Substitute
Without (P1H Combination Unit)	1
With (PTH Combination Unit)	T

Port Size	Substitute
1/8"	1
1/4"	2

Filter/Regulator Bowl	Outlet Pressure Adjustment Range* bar psig	Relief Type	Gauge	Substitute
Transparent	5 to 100 0.3 to 7	Relieving	With	00
Transparent	5 to 100 0.3 to 7	Relieving	Without	01
Transparent	5 to 100 0.3 to 7	Non-relieving	Without	02
Transparent	5 to 100 0.3 to 7	Non-relieving	With	03
Transparent	5 to 50 0.3 to 3.5	Relieving	Without	04
Transparent	5 to 50 0.3 to 3.5	Relieving	With	05
Transparent	5 to 50 0.3 to 3.5	Non-relieving	Without	06
Transparent	5 to 50 0.3 to 3.5	Non-relieving	With	07
Metal / no sight glass	5 to 100 0.3 to 7	Relieving	With	40
Metal / no sight glass	5 to 100 0.3 to 7	Relieving	Without	41
Metal / no sight glass	5 to 100 0.3 to 7	Non-relieving	Without	42
Metal / no sight glass	5 to 100 0.3 to 7	Non-relieving	With	43
Metal / no sight glass	5 to 50 0.3 to 3.5	Relieving	Without	44
Metal / no sight glass	5 to 50 0.3 to 3.5	Relieving	With	45
Metal / no sight glass	5 to 50 0.3 to 3.5	Non-relieving	Without	46
Metal / no sight glass	5 to 50 0.3 to 3.5	Non-relieving	With	47

P ★ H - ★ ★ ★ - ★ ★ ★ ★

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Lubricator Reservoir	Substitute
Transparent with drain	A
Transparent without drain	Q
Metal with drain	M
Metal without drain	F

Filter/Regulator Element	Substitute
5 µm	1
40 µm	3

Filter/Regulator Drain	Substitute
Automatic	A
Manual	M

See Section ALE-25 for Accessories

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.



Technical Data

Fluid: Compressed air

Maximum pressure

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*

Transparent bowl: 0° to 125°F (-20° to 50°C)

Metal bowl: 0° to 150°F (-20° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)

Typical flow at 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set:

1/8" ports: T.B.A.

1/4" ports: 6 scfm (3 dm³/s)

Drain connection: 1/8" pipe

Filter/Regulator

Particle removal: 5 µm or 40 µm. Within ISO 8573-1, Class 3 and Class 5

Gauge ports:

1/8" PTF with PTF main ports

1/8" ISO Rc with ISO Rc main ports

1/8" ISO Rc with ISO G main ports

Automatic drain operation: Spitter type drain operates momentarily when a rapid change in air flow occurs or when the supply pressure is reduced.

Lubricator

Start point (i.e., minimum flow required for lubricator operation): 0.5 scfm (0.24 dm³/s) at 90 psig (6.3 bar) inlet pressure

Nominal bowl capacity: 1 fluid ounce (31 ml)

Recommended lubricants: See Section ALE-29.

Materials

Bodies: Zinc

Filter/Regulator bonnet: Acetal

Filter/Regulator valve: Brass/nitrile

Filter/Regulator valve seat: Acetal

Bowls

Transparent: Polycarbonate

Metal: Zinc

Lubricator sight-feed dome: Transparent nylon

Filter element: Sintered polypropylene

Elastomers: Nitrile

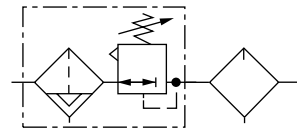
Service Kits

Item	Type	Part number
Service kits, filter/regulator	relieving, 5 µm element	3820-02
	non relieving, 5 µm element	3820-01
Service kit, lubricator		3795-03
Replacement drains	Manual	773-03
	Automatic	3654-02
Replacement wall bracket for PTH unit	Integral 2 piece	6700-30

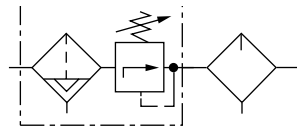
Filter/regulator service kit contains slip ring, diaphragm, valve seat with o-ring, valve, valve spring, element, element gasket, and bowl o-ring.

Lubricator service kit contains sight-feed dome seal, cartridge o-ring, and bowl o-ring.

ISO Symbols

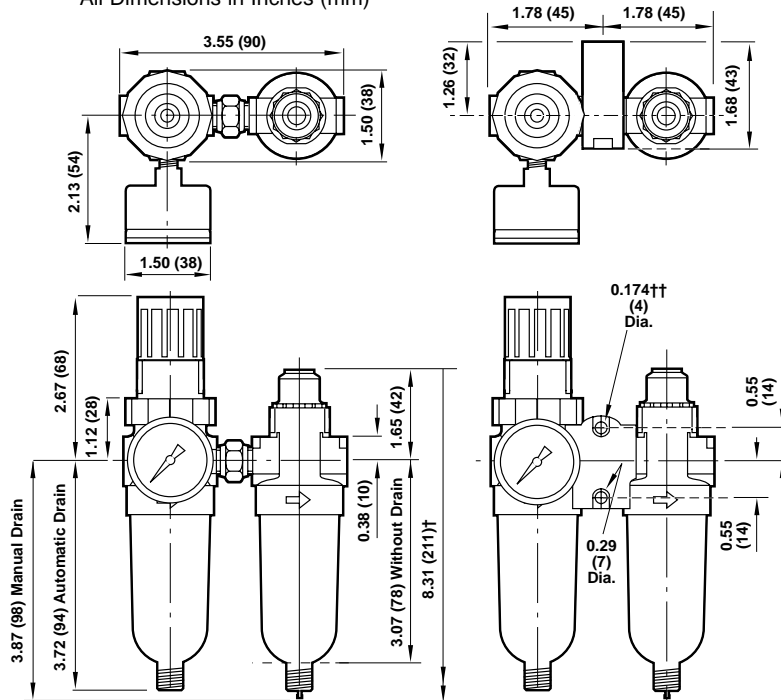


Relieving filter/regulator with automatic drain, lubricator with manual drain



Non relieving filter/regulator with automatic drain, lubricator with manual drain

All Dimensions in Inches (mm)



†Minimum distance required to remove bowl
 †† Mounting holes

- True modularity with Norgren Quikclamp™ connections
- Quick release bayonet bowl
- Lubricator flow sensor provides a nearly constant oil/air ratio over a wide range of air flows
- All around (360°) visibility of the lubricator sight-feed dome simplifies installation and adjustment
- Regulator balanced valve minimizes effect of variation in the inlet pressure on the outlet pressure

Use Micro-Fog models in applications containing one or more points of lubrication.
Use Oil-Fog models to lubricate a single tool, cylinder, or other air driven device.



Technical Data

Fluid: Compressed air

Maximum pressure:

Transparent bowl: 150 psig (10 bar)

Metal bowl (manual or semi automatic drain): 250 psig (17 bar)

Automatic drain: 150 psig (10 bar)

Operating temperature*:

Transparent bowl: 0° to 125°F (-20° to 50°C)

Metal bowl: 0° to 150°F (-20° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5 µm, 25 µm, or 40 µm filter element

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Semi automatic drain connection: Push on 5/16" (8 mm) ID tube

Semi automatic drain operating conditions (pressure operated)

Bowl pressure required to close drain: Greater than 1.5 psig (0.1 bar)

Bowl pressure required to open drain: Less than 1.5 psig (0.1 bar)

Minimum air flow required to close drain: 1 scfm (0.5 dm³/s)

Manual operation: Lift stem to drain bowl

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Automatic drain operating conditions (float operated):

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 0.2 scfm (0.1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size

Short bowl: 1.9 fluid ounce (56 ml)

Long bowl: 2.2 fluid ounce (65 ml)

Gauge ports: 1/8 PTF with PTF main ports

Rc 1/8 with ISO Rc and ISO G main ports

Recommended lubricants: See Section ALE-29.

Materials

Body: Zinc

Bonnet: Acetal

Filter/Regulator valve: Brass

Bowl: Transparent: Polycarbonate

Transparent with guard: Polycarbonate, zinc guard

Metal: Zinc

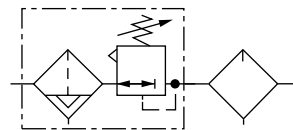
Metal bowl liquid level indicator lens: Transparent nylon

Sight-Feed dome: Transparent nylon

Element: Sintered polypropylene

Elastomers: Neoprene, nitrile

ISO Symbol



Filter with automatic drain, Regulator with relieving diaphragm,
Lubricator with manual drain

See Section ALE-25 for Accessories



Ordering information. Models include PTF threads. Filter/Regulator (F/R) has knob adjustment, automatic drain, long transparent bowl with guard, 40 µm element, relieving diaphragm, and 150 psig (10 bar) regulating spring, and gauge. Lubricator (L) is a Micro-Fog model with 1/4 turn manual drain and long transparent bowl with guard.

Combination Unit Type	Port Size	Model	Weight lb (kg)
Filter/Regulator-Lubricator (F/R-L)	1/4"	C72H-2AK-AW3-RMG-QWN	2.37 (1.08)
	3/8"	C72H-3AK-AW3-RMG-QWN	2.37 (1.08)

Alternative Models

★ 7 2 ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★

Shutoff/Lockout Valve, Quikmount	Substitute		Accessories	Substitute
Standard Combination (No Shutoff/Lockout Valve, no Quikmount)	C		Quikclamp wall brackets	B
With Shutoff/Lockout valve on inlet	D		No accessories	N
With Quikmount pipe adapters on inlet and outlet	E			
With Shutoff/Lockout Valve on inlet and Quikmount pipe adapter on outlet	G		Lubricator Bowl	Substitute
			Short metal with liquid level indicator	D
			Long metal with liquid level indicator	E
			Short transparent without guard	T
			Long transparent without guard	L
			Long transparent with guard	W
Combination Unit Type	Substitute		Lubricator Drain	Substitute
Standard Micro-Fog F/R-L	H		Closed bottom	E
Standard Oil-Fog F/R-L	J		Manual, 1/4 turn	Q
Micro-Fog F/R-L with porting block between filter/regulator and lubricator	K			
Oil-Fog F/R-L with porting block between filter/regulator and lubricator	L		Regulator Gauge	Substitute
			With gauge	G
			No gauge	N
Port Size	Substitute		Regulation spring **	Substitute
1/4"	2		5 to 30 psig (0.3 to 2 bar)	C
3/8"	3		5 to 60 psig (0.3 to 4 bar)	F
			5 to 150 psig (0.3 to 10 bar)	M
Threads	Substitute		Regulator Diaphragm	Substitute
PTF	A		Non-relieving	N
ISO Rc taper	B		Relieving	R
ISO G parallel	G			
Pressure Adjustment	Substitute		Filter Element	Substitute
Knob	K		5 µm	1
T-bar	T		25 µm	2
			40 µm	3
Filter Drain	Substitute			
Automatic †	A			
Manual, 1/4 turn	Q			
Semi automatic	S			
Filter Bowl	Substitute			
Short metal with liquid level indicator	D			
Long metal with liquid level indicator	E			
Short transparent without guard	T			
Long transparent without guard	L			
Long transparent with guard	W			

** Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

† Supplied in long bowl options only.

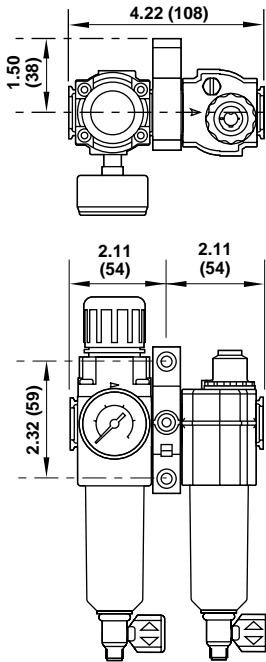


72 Series Filter/Regulator-Lubricator

All Dimensions in Inches (mm)

Standard Micro-Fog Type C72H- Standard Oil-Fog Type C72J-

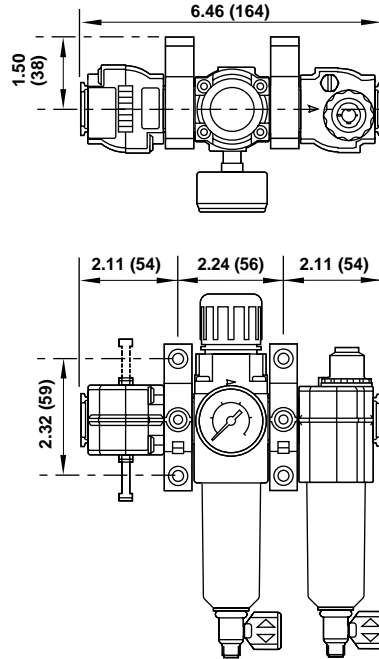
Shown with optional Quikclamp wall bracket.



Alternative Micro-Fog Type D72H- Alternative Oil-Fog Type D72J-

Includes Shutoff/Lockout valve.

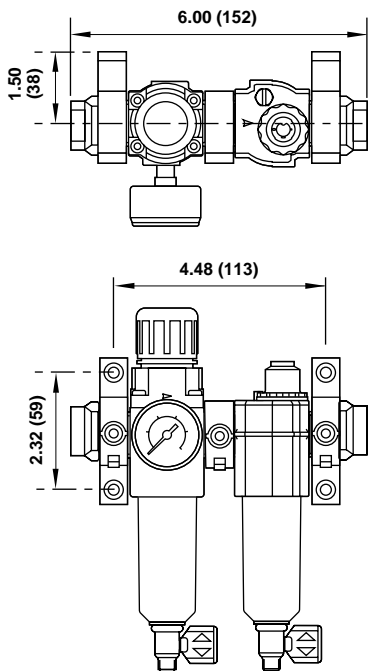
Shown with optional Quikclamp wall brackets.



Alternative Micro-Fog Type E72H- Alternative Oil-Fog Type E72J-

Includes Quikmount pipe adapters.

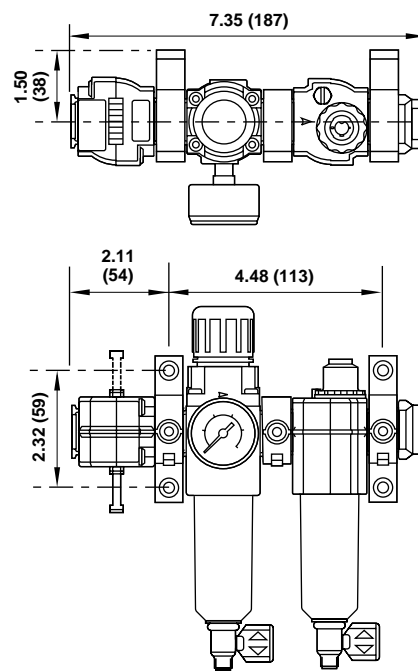
Shown with optional Quikclamp wall brackets.



Alternative Micro-Fog Type G72H- Alternative Oil-Fog Type G72J-

Includes Shutoff/Lockout valve and Quikmount pipe adapter.

Shown with optional Quikclamp wall brackets.



Excelon 72 Filter/Regulator-Lubricator

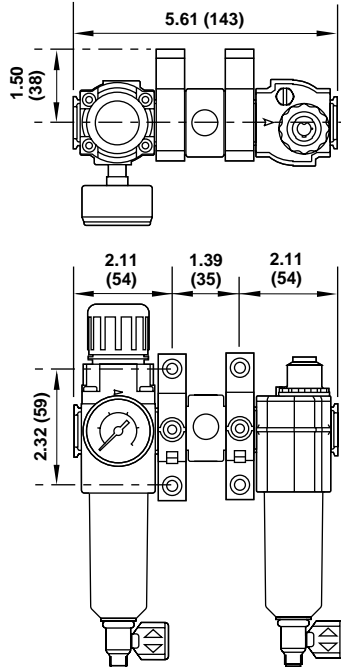
All Dimensions in Inches (mm)



Alternative Micro-Fog Type C72K- Alternative Oil-Fog Type C72L-

Includes porting block.

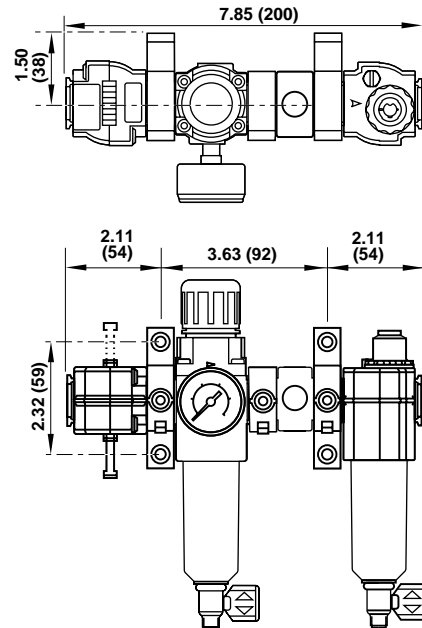
Shown with optional Quikclamp wall brackets.



Alternative Micro-Fog Type D72K- Alternative Oil-Fog Type D72L-

Includes Shutoff/Lockout valve and porting block.

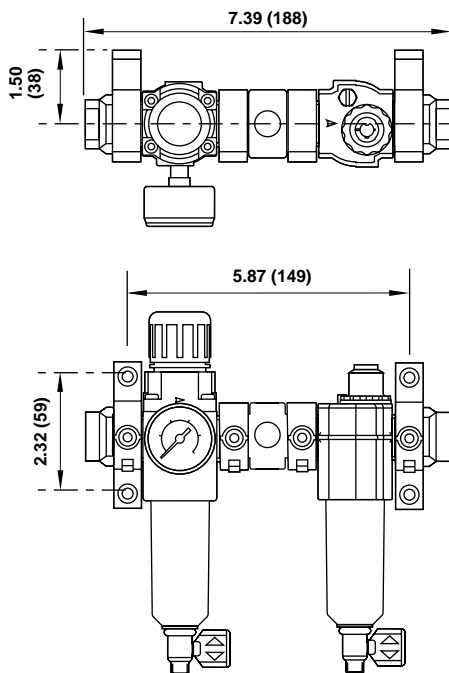
Shown with optional Quikclamp wall brackets.



Alternative Micro-Fog Type E72K- Alternative Oil-Fog Type E72L-

Includes Quikmount pipe adapters and porting block.

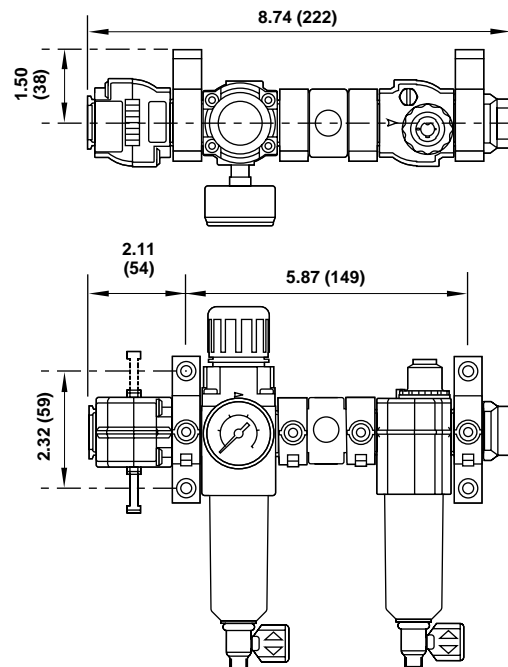
Shown with optional Quikclamp wall brackets.



Alternative Micro-Fog Type G72K- Alternative Oil-Fog Type G72L-

Includes Shutoff/Lockout valve, Quikmount pipe adapter, and porting block.

Shown with optional Quikclamp wall brackets.



- True modularity with Norgren Quikclamp™ connections
- Quick release bayonet bowl
- Lubricator flow sensor provides a nearly constant oil/air ratio over a wide range of air flows
- All around (360°) visibility of the lubricator sight-feed dome simplifies installation and adjustment
- Regulator balanced valve minimizes effect of variation in the inlet pressure on the outlet pressure

Use Micro-Fog models in applications containing one or more points of lubrication.
Use Oil-Fog models to lubricate a single tool, cylinder, or other air driven device.



Technical Data

Fluid: Compressed air

Maximum pressure:

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*:

Transparent bowl: 0° to 125°F (-20° to 50°C)

Metal bowl: 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5 µm, 25 µm, or 40 µm filter element

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Automatic drain operating conditions (float operated)

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 0.2 scfm (0.1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size: 3.5 fluid ounce (0.1 liter)

Gauge ports:

1/4 PTF with PTF main ports

ISO Rc1/4 with ISO Rc main ports

ISO Rc1/8 with ISO G main ports

Recommended lubricants: See Section ALE-29.

Materials

Body: Aluminum

Bonnet: Aluminum

Filter/Regulator valve: Brass

Bowl

Transparent: Polycarbonate

Transparent with guard: Polycarbonate, steel guard

Metal: Aluminum or Zinc

Metal bowl liquid level indicator lens: Transparent nylon

Sight-Feed dome: Transparent nylon

Element: Sintered plastic

Elastomers: Neoprene and nitrile

See Section ALE-25 for Accessories



Ordering information

Models listed in order table have PTF parallel threads. Filter/Regulator (F/R) has knob adjustment, automatic drain, metal bowl with liquid level indicator, 40 µm element, relieving diaphragm, and 150 psig (10 bar) regulating spring, with gauge. Lubricator (L) is a Micro-Fog model with 1/4 turn manual drain and metal bowl with liquid level indicator.

Combination Unit Type	Port Size	Model	Weight lb (kg)
Filter/Regulator-Lubricator (F/R-L)	1/4"	C73H-2AK-AD3-RMG-QDN	3.0 (1.36)
	3/8"	C73H-3AK-AD3-RMG-QDN	3.0 (1.36)
	1/2"	C73H-4AK-AD3-RMG-QDN	3.0 (1.36)

Alternative Models

★ 7 3 ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★

Lockout Valve/ Quikmount	Substitute
Standard Combination (No Lockout Valve, no Quikmount)	C
With Lockout valve on inlet	D
With Quikmount pipe adapters on inlet and outlet	E
With Lockout valve on inlet and Quikmount pipe adapter on outlet	G

Combination Unit Type	Substitute
Standard Micro-Fog F/R-L	H
Standard Oil-Fog F/R-L	J
Micro-Fog F/R-L with porting block between filter/regulator and lubricator	K
Oil-Fog F/R-L with porting block between filter/regulator and lubricator	L

Port Size	Substitute
1/4"	2
3/8"	3
1/2"	4

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Pressure Adjustment	Substitute
Knob	K
T-bar	T

Accessories	Substitute
Quikclamp wall brackets	B
Accessories <i>B</i> and <i>Q</i>	C
No accessories	N
Lubricator quick fill nipple	Q

Lubricator Bowl	Substitute
Metal with liquid level indicator	D
Transparent with guard	P
Transparent	T

Lubricator Drain	Substitute
Closed bottom	E
Manual, 1/4 turn	Q

Filter/Regulator Gauge	Substitute
With gauge	G
No gauge	N

Regulation Spring *	Substitute
5 to 60 psig (0.3 to 4 bar)	F
5 to 150 psig (0.3 to 10 bar)	M
10 to 250 psig (0.7 to 17 bar)**	S

Filter/Regulator Diaphragm	Substitute
Non-relieving	N
Relieving	R

Filter Element	Substitute
5 µm	1
25 µm	2
40 µm	3

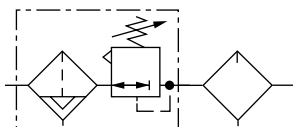
Filter Bowl	Substitute
Metal with liquid level indicator	D
Transparent with steel guard	P
Transparent	T

Filter Drain	Substitute
Automatic	A
Manual, 1/4 turn	Q

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

** Units with 250 psig (17 bar) outlet pressure range are available only with the standard metal bowl.

ISO Symbol



Relieving, automatic drain on filter, manual drain on lubricator

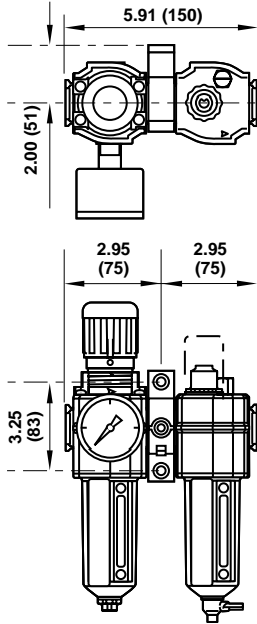


Excelon 73 Filter/Regulator-Lubricator

All Dimensions in Inches (mm)

Standard Micro-Fog Type C73H- Standard Oil-Fog Type C73J-

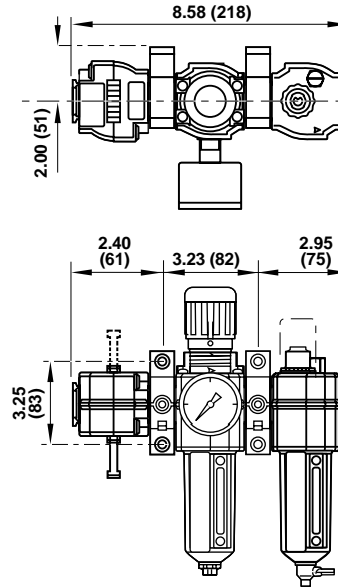
Shown with optional Quikclamp wall bracket.



Alternative Micro-Fog Type D73H- Alternative Oil-Fog Type D73J-

Includes lockout valve.

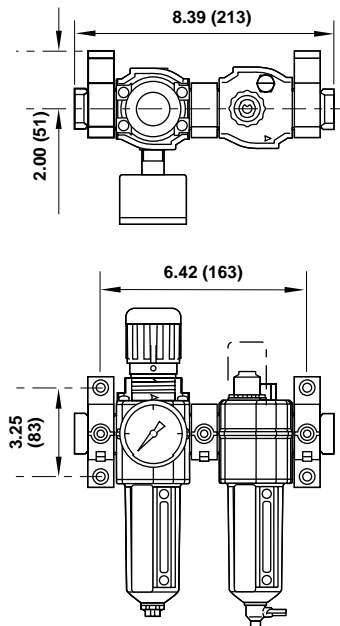
Shown with optional Quikclamp wall brackets.



Alternative Micro-Fog Type E73H- Alternative Oil-Fog Type E73J-

Includes Quikmount pipe adapters.

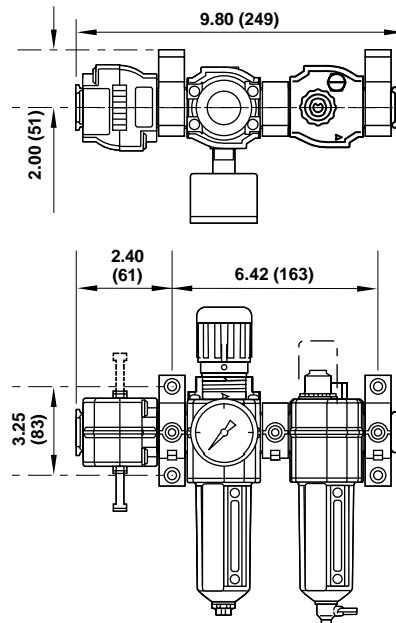
Shown with optional Quikclamp wall brackets.



Alternative Micro-Fog Type G73H- Alternative Oil-Fog Type G73J-

Includes lockout valve and Quikmount pipe adapter.

Shown with optional Quikclamp wall brackets.



Excelon 73 Filter/Regulator-Lubricator

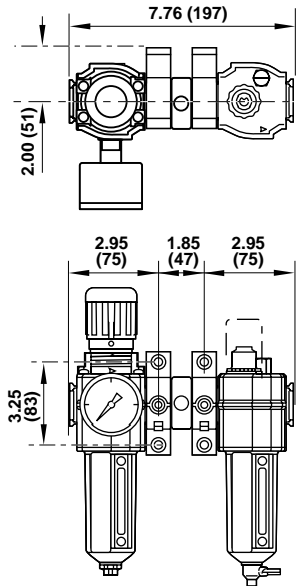
All Dimensions in Inches (mm)



Alternative Micro-Fog Type C73K- Alternative Oil-Fog Type C73L-

Includes porting block.

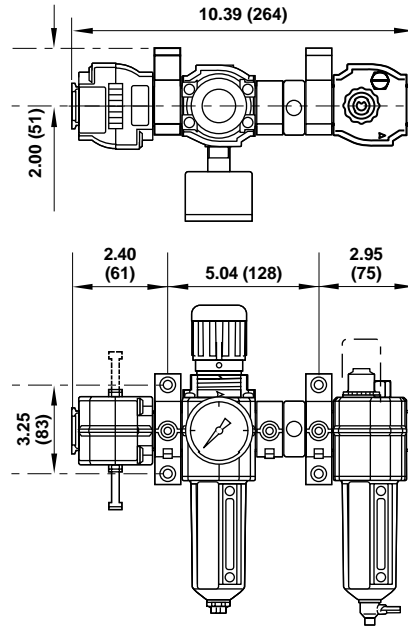
Shown with optional Quikclamp wall brackets.



Alternative Micro-Fog Type D73K- Alternative Oil-Fog Type D73L-

Includes lockout valve and porting block.

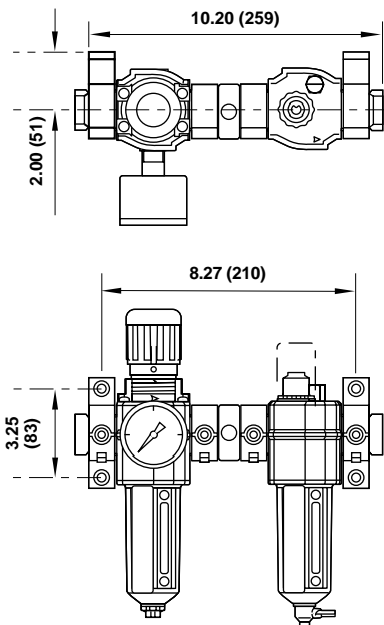
Shown with optional Quikclamp wall brackets.



Alternative Micro-Fog Type E73K- Alternative Oil-Fog Type E73L-

Includes Quikmount pipe adapters and porting block.

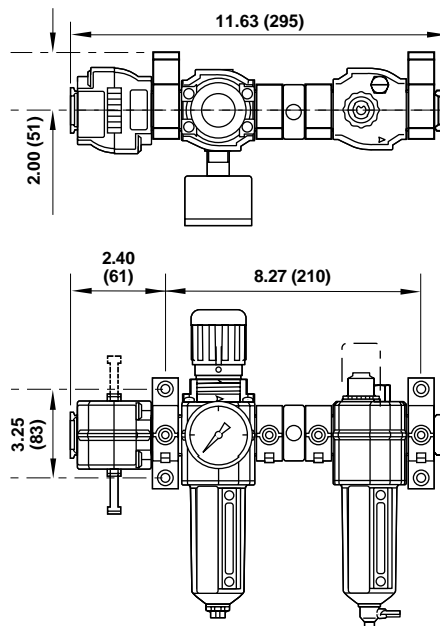
Shown with optional Quikclamp wall brackets.



Alternative Micro-Fog Type G73K- Alternative Oil-Fog Type G73L-

Includes lockout valve, Quikmount pipe adapter, and porting block.

Shown with optional Quikclamp wall brackets.



B74, L74 Combination Units

74 Series Filter/Regulator-Lubricator
3/8", 1/2", and 3/4" Port Sizes

- True modularity with Norgren Quikclamp™ connections
- Quick release bayonet bowl
- Lubricator flow sensor provides a nearly constant oil/air ratio over a wide range of air flows
- All around (360°) visibility of the lubricator sight-feed dome simplifies installation and adjustment
- Regulator balanced valve minimizes effect of variation in the inlet pressure on the outlet pressure

Use Micro-Fog models in applications containing one or more points of lubrication.
Use Oil-Fog models to lubricate a single tool, cylinder, or other air driven device.



Technical Data

Fluid: Compressed air

Maximum pressure:

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*:

Transparent bowl: 0° to 125°F (-20° to 50°C)

Metal bowl: 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5 µm, 25 µm, or 40 µm filter element

Manual drain connection: 1/8"

Automatic drain connection: 1/8"

Automatic drain operating conditions (float operated)

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 2 scfm (1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size:

Standard: 7 fluid ounce (0.2 liter)

Optional size for lubricator: 1 quart US (1 liter)

Gauge Ports:

1/4" PTF with PTF main ports

Rc 1/4 with ISO Rc main ports

Rc 1/8 with ISO G main ports

Recommended lubricants: See Section ALE-29.

Materials:

Body: Aluminum

Bonnet: Aluminum

Filter/Regulator valve: Brass

Bowl

Transparent: Polycarbonate with steel bowl guard

Metal: Aluminum

Metal bowl liquid level indicator lens:

7 fluid ounce (0.2 liter): Transparent nylon

1 quart US (1 liter): Pyrex

Sight-Feed dome: Transparent nylon

Element: Sintered polypropylene

Elastomers: Neoprene and nitrile

See Section ALE-25 for Accessories



Ordering information. Models listed include Micro-Fog lubricator, PTF threads, knob pressure adjustment, metal filter bowl with liquid level indicator and automatic drain, 40 µm filter element, relieving diaphragm, 150 psig (10 bar) regulating spring, with gauge, 7 fluid oz. (0.2 liter) metal lubricator bowl with liquid level indicator and 1/4 turn manual drain.

Combination Unit Type	Port Size	Model	Weight lb (kg)
Filter/Regulator-Lubricator (F/R-L)	3/8"	C74H-3AK-AD3-RMG-QDN	5.20 (2.36)
	1/2"	C74H-4AK-AD3-RMG-QDN	5.07 (2.30)
	3/4"	C74H-6AK-AD3-RMG-QDN	5.00 (2.27)

Alternative Models

★ 7 4 ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★

Lockout Valve/ Quikmount	Substitute
Standard combination (no lockout valve or Quikmount)	C
With lockout valve on inlet	D
With Quikmount pipe adapters on inlet and outlet	E
With lockout valve on inlet and Quikmount pipe adapter on outlet	G

Combination Unit Type	Substitute
Standard Micro-Fog F/R-L	H
Standard Oil-Fog F/R-L	J
Micro-Fog F/R-L with porting block between filter/regulator and lubricator	K
Oil-Fog F/R-L with porting block between filter/regulator and lubricator	L

Port Size	Substitute
3/8"	3
1/2"	4
3/4"	6

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Pressure Adjustment	Substitute
Knob	K
T-bar	T

Accessories	Substitute
Quikclamp wall brackets	B
Quikclamp wall brackets and lubricator quick fill nipple	C
No accessories	N
Lubricator quick fill nipple	Q

Lubricator Bowl	Substitute
1 quart US (1 liter) metal with liquid level indicator	A
7 fluid oz. (0.2 liter) metal with liquid level indicator	D
7 fluid oz. (0.2 liter) transparent with zinc guard	P

Lubricator Drain	Substitute
Closed bottom	E
Manual, 1/4 turn	Q
Remote fill ††	R

Filter/Regulator Gauge	Substitute
With gauge	G
No gauge	N

Regulation spring **	Substitute
5 to 60 psig (0.3 to 4 bar)	F
5 to 150 psig (0.3 to 10 bar)	M
10 to 250 psig (0.7 to 17 bar)†	S

Filter/Regulator Diaphragm	Substitute
Non relieving	N
Relieving	R

Filter Element	Substitute
5 µm	1
25 µm	2
40 µm	3

Filter Bowl	Substitute
Metal with liquid level indicator	D
Transparent with guard	P

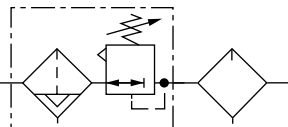
Filter Drain	Substitute
Automatic	A
Manual, 1/4 turn	Q

** Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

† Units with 250 psig (17 bar) outlet pressure range are available only with the T-bar adjustment; therefore substitute **T** at the 7th position and **S** at the 12th position.

†† Use remote fill only with 7 fluid oz. (0.2 liter) bowls.

ISO Symbol



Filter with automatic drain, Regulator with relieving diaphragm, Lubricator with manual drain

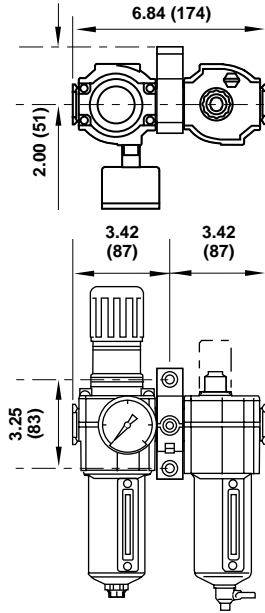


74 Series Filter/Regulator-Lubricator

All Dimensions in Inches (mm)

Standard Micro-Fog Type C74H- Standard Oil-Fog Type C74J-

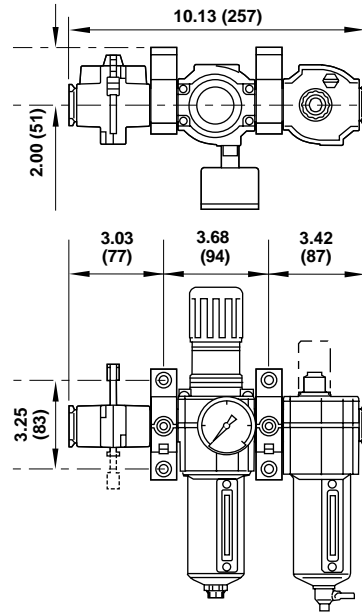
Shown with optional Quikclamp wall bracket.



Alternative Micro-Fog Type D74H- Alternative Oil-Fog Type D74J-

Includes lockout valve.

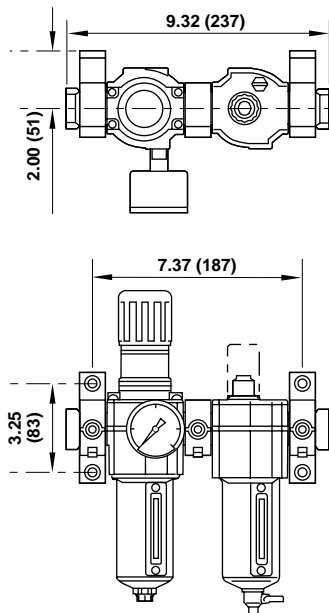
Shown with optional Quikclamp wall brackets.



Alternative Micro-Fog Type E74H- Alternative Oil-Fog Type E74J-

Includes Quikmount pipe adapters.

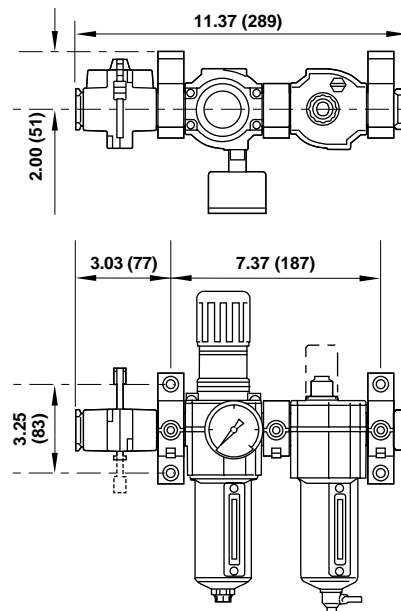
Shown with optional Quikclamp wall brackets.



Alternative Micro-Fog Type G74H- Alternative Oil-Fog Type G74J-

Includes lockout valve and
Quikmount pipe adapter.

Shown with optional Quikclamp wall brackets.



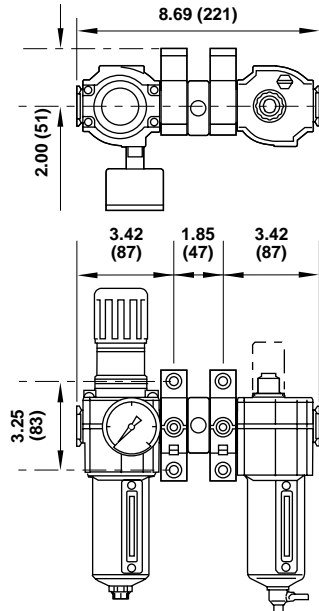
74 Series Filter/Regulator-Lubricator

All Dimensions in Inches (mm)



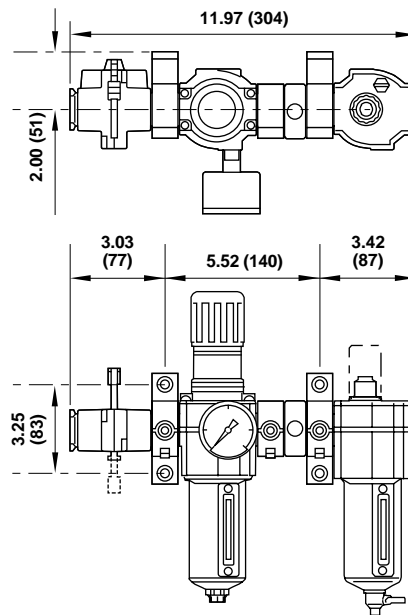
Alternative Micro-Fog Type C74K- Alternative Oil-Fog Type C74L- Includes porting block.

Shown with optional Quikclamp wall brackets.



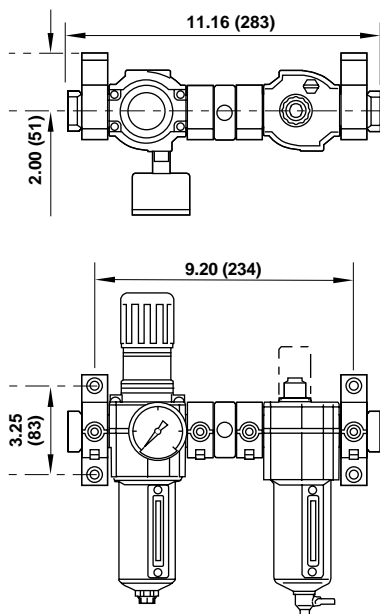
Alternative Micro-Fog Type D74K- Alternative Oil-Fog Type D74L- Includes lockout valve and porting block.

Shown with optional Quikclamp wall brackets.



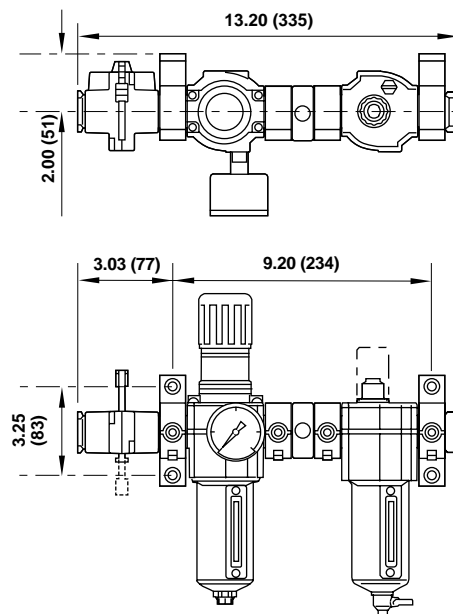
Alternative Micro-Fog Type E74K- Alternative Oil-Fog Type E74L- Includes Quikmount pipe adapters and porting block.

Shown with optional Quikclamp wall brackets.



Alternative Micro-Fog Type G74K- Alternative Oil-Fog Type G74L- Includes lockout valve, Quikmount pipe adapter, and porting block.

Shown with optional Quikclamp wall brackets.



- **Olympian Plus plug in design**
- **High Efficiency water and particle removal**
- **Quick release bayonet bowls**
- **High visibility prismatic sight glass**
- **Push to lock adjusting knob with tamper resistant option**
- **Constant oil density output with varying flow**



Technical Data

Fluid: Compressed air

Maximum pressure:

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*:

Transparent bowl: 0° to 125°F (-20° to 50°C)

Metal bowl: 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5 µm, 25 µm, or 40 µm filter element

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Automatic drain operating conditions (float operated):

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 2 scfm (1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size:

Standard: 7 fluid ounce (0.2 liter)

Optional size for lubricator: 1 quart (1 liter)

Gauge Ports:

1/4" PTF with PTF main ports

Rc 1/8 with ISO Rc main ports

Rc 1/8 with ISO G main ports

Recommended lubricants: See Section ALE-29.

Materials:

Body and yoke: Zinc

Bonnet: Aluminum

Filter/Regulator valve: Brass

Bowl:

Transparent: Polycarbonate

Metal: Aluminum

Metal bowl liquid level indicator lens:

7 fluid ounce (0.2 liter): Transparent nylon

1 quart (1 liter): Pyrex

Sight-Feed dome: Polycarbonate

Element: Sintered polypropylene

Elastomers: Neoprene and nitrile

See Section ALE-25 for Accessories

64 Series Filter/Regulator-Lubricator



Ordering information. Models listed include Micro-Fog lubricator, yoke with PTF threads, filter/regulator with knob adjustment, auto drain, metal bowl with liquid level indicator, 40 µm element, relieving diaphragm, 10 bar (150 psig) regulating spring, gauge; lubricator with 1/4 turn manual drain, 7 fluid ounce (0.2 liter) metal bowl with liquid level indicator.

Combination Unit Type	Port Size	Model	Weight kg (lb)
Filter/Regulator-Lubricator (F/R-L)	1/4	C64H-2AK-AD3-RMG-QDN	7.4 (5.20)
	3/8	C64H-3AK-AD3-RMG-QDN	6.9 (5.07)
	1/2	C64H-4AK-AD3-RMG-QDN	6.9 (5.00)
	3/4	C64H-6AK-AD3-RMG-QDN	6.0 (2.73)

Alternative Models

★ 6 4 ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★

Lockout Valve	Substitute
No lockout valve	C
With lockout valve on inlet	D

Combination Unit Type	Substitute
Standard Micro-Fog F/R-L	H
Standard Oil-Fog F/R-L	J
Micro-Fog F/R-L with porting block between filter/regulator and lubricator	K
Oil-Fog F/R-L with porting block between filter/regulator and lubricator	L

Port Size	Substitute
1/4"	2
3/8"	3
1/2"	4
3/4"	6

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Pressure Adjustment	Substitute
Knob	K
T-bar	T

Filter Drain	Substitute
Automatic	A
Manual, petcock	D
Manual, 1/4 turn	Q

Filter Bowl	Substitute
Metal with liquid level indicator	D
Metal, no liquid level indicator	M
Transparent with guard	P
Metal with pyrex liquid level indicator	R

Filter Element	Substitute
5 µm	1
25 µm	2
40 µm	3
75 µm	4

Accessories	Substitute
Wall brackets	B
B and Q	C
B and L *	F
Lubricator low oil level switch *	L
No accessories	N
Lubricator quick fill cap	Q

Lubricator Bowl	Substitute
1 quart (1 liter) metal with pyrex liquid level indicator	A
7 fluid oz. (0.2 liter) metal with plastic liquid level indicator	D
7 fluid oz. (0.2 liter) metal without liquid level indicator	M
7 fluid oz. (0.2 liter) transparent with guard	P
7 fluid oz. (0.2 liter) metal with pyrex liquid level indicator	R

Lubricator Drain	Substitute
Manual, petcock	D
Closed bottom	E
Manual, 1/4 turn	Q
Remote fill ††	R

Filter/Regulator Gauge	Substitute
With gauge	G
No gauge	N

Regulation spring **	Substitute
0,3 to 4 bar (5 to 60 psig)	F
0,3 to 10 bar (5 to 150 psig)	M
0,7 to 17 bar (10 to 250 psig)†	S

Filter/Regulator Diaphragm	Substitute
Non relieving	N
Relieving	R

* Lubricator low oil level switch available only with 1 quart (1 liter) bowl.

** Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

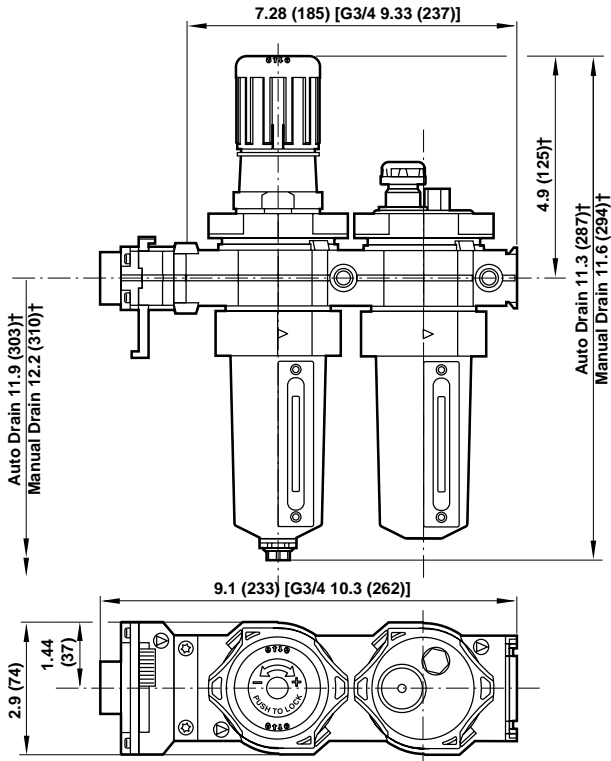
† Filter/regulator with 250 psig (17 bar) regulating spring available only the T-bar adjustment .

†† Lubricator with remote fill available only with 0,2 litre (7 fluid oz.) bowls.



Filter/Regulator-Lubricator

All Dimensions in Inches (mm)



† Reduces by .16 (4mm) with knob in locked position.
Add .15 (37mm) for unit with T-handle.

Service Kits

Item	Type	Part number
Service kit	Relieving Filter-Regulator	4383-200
Service kit	Non-relieving Filter-Regulator	4383-201
Service kit	Lubricator	4382-200
Replacement elements	5 µm	4338-01
	25 µm	4338-99
	40 µm	4338-02
Replacement sight glass	B64, plastic	4380-040
	L64, plastic	4380-042
	B64 and L64, Pyrex	4380-041
	L64, 1 quart bowl, Pyrex	2273-22
Replacement drains	Automatic	3000-10
	Manual, 1/4 turn	619-50

Filter-Regulator service kit includes port seals, louver 'O' ring, bowl 'O' ring and drain gasket, slip ring, valve assembly, valve spring and diaphragm.
Lubricator service kit includes all seals, flow sensor, eyelet, dome screen, ball and spring.

Filter-Regulator-Lubricator Combination units in ports sizes from 1/8" to 1-1/2".

- 07 Series Filter-Regulator-Lubricator
Combination Units 1/8" and 1/4" port sizesALE-22-2**
- Excelon 72 Filter-Regulator-Lubricator
Combination Units 1/4" and 3/8" port sizesALE-22-4**
- Excelon 73 Filter-Regulator-Lubricator Combination
Units 1/4", 3/8", and 1/2" port sizesALE-22-8**
- Excelon 74 Filter-Regulator-Lubricator Combination
Units 3/8", 1/2", and 3/4" port sizesALE-22-12**
- 17 Series Filter-Regulator-Lubricator Combination
Units 3/4", 1", 1-1/4", and 1-1/2" Port SizesALE-23-16**
- Olympian 64 Filter-Regulator-Lubricator Combination
Units 1/4, 3/8", 1/2", and 3/4" Port SizesALE-22-18**



**07 Series
F-R-L**



**72 Series
F-R-L**



**73 Series
F-R-L**



**74 Series
F-R-L**



**64 Series
F-R-L**



**17 Series
F-R-L**

P1A Combination Unit

07 Series Filter-Regulator-Lubricator 1/8" and 1/4" Port Sizes

- **Compact design**
- **Filter removes liquids and solid particles down to 5 µm**
- **Push to lock adjusting knob with tamper resistant option**
- **Micro-Fog lubricator provides air line lubrication to one or more air driven tools or other devices**
- **Nearly constant oil density output with varying air flow**
- **Can be disassembled without the use of tools or removal from the air line**



Ordering Information. Models listed include PTF threads, transparent bowls, filter with automatic drain, 5 µm element; regulator with relieving diaphragm, 5 to 100 psig (0.3 to 7 bar) outlet pressure adjustment range*, gauge; lubricator with manual drain.

Port Size	Model Numbers	Weight lbs (kg)
1/8"	P1A-100-A1AA	1.17 (0.53)
1/4"	P1A-200-A1AA	1.17 (0.53)

Alternative Models

P 1 A - ★ ★ ★ - ★ ★ ★ ★

Port Size	Substitute
1/8"	1
1/4"	2

Filter Bowl	Outlet Pressure Adjustment Range*		Relief Type	Gauge	Substitute
	psig	bar			
Transparent	5 to 100	0.3 to 7	Relieving	With	00
Transparent	5 to 100	0.3 to 7	Relieving	Without	01
Transparent	5 to 100	0.3 to 7	Non-relieving	Without	02
Transparent	5 to 100	0.3 to 7	Non-relieving	With	03
Transparent	5 to 50	0.3 to 3.5	Relieving	Without	04
Transparent	5 to 50	0.3 to 3.5	Relieving	With	05
Transparent	5 to 50	0.3 to 3.5	Non-relieving	Without	06
Transparent	5 to 50	0.3 to 3.5	Non-relieving	With	07
Metal / no sight glass	5 to 100	0.3 to 7	Relieving	With	40
Metal / no sight glass	5 to 100	0.3 to 7	Relieving	Without	41
Metal / no sight glass	5 to 100	0.3 to 7	Non-relieving	Without	42
Metal / no sight glass	5 to 100	0.3 to 7	Non-relieving	With	43
Metal / no sight glass	5 to 50	0.3 to 3.5	Relieving	Without	44
Metal / no sight glass	5 to 50	0.3 to 3.5	Relieving	With	45
Metal / no sight glass	5 to 50	0.3 to 3.5	Non-relieving	Without	46
Metal / no sight glass	5 to 50	0.3 to 3.5	Non-relieving	With	47

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Lubricator Reservoir	Substitute
Transparent with drain	A
Transparent without drain	Q
Metal with drain	M
Metal without drain	F

Filter Element	Substitute
5 µm	1
100 µm	5

Filter Drain	Substitute
Automatic	A
Manual	M

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*

Transparent bowl: 0° to 125°F (-20° to 50°C)

Metal bowl: 0° to 150°F (-20° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)

Drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Filter

Partical removal: 5 µm or 40 µm. Within ISO 8573-1, Class 3 and Class 5

Automatic drain operation: Spitter type drain operates momentarily when a rapid change in air flow occurs or when the supply pressure is reduced.

Regulator

Recommended regulating pressure ranges†:

5 to 100 psig (0.3 to 7 bar) standard

5 to 50 psig (0.3 to 3.5 bar) optional

† Outlet pressures can be adjusted to pressures in excess of, and less than those specified.

Do not use these units to control pressures outside of the specified ranges.

Gauge ports:

1/8" PTF with PTF main ports

1/8" ISO Rc with ISO Rc main ports

1/8" ISO Rc with ISO G main ports

Lubricator

Start point (i.e. minimum flow required for lubricator operation): 0.5 scfm (0.24

dm³/s) at 90 psig (6.3 bar) inlet pressure

Nominal bowl size: 1 fluid ounce (31 ml)

Recommended lubricants: See Section ALE-29.

Materials

Bodies: Zinc

Filter/Regulator bonnet: Acetal

Filter/Regulator valve: Brass/nitrile

Filter/Regulator valve seat: Acetal

Bowls

Transparent: Polycarbonate

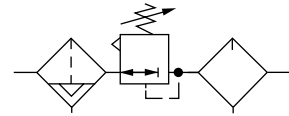
Metal: Zinc

Lubricator sight-feed dome: Transparent nylon

Filter element: Sintered polypropylene

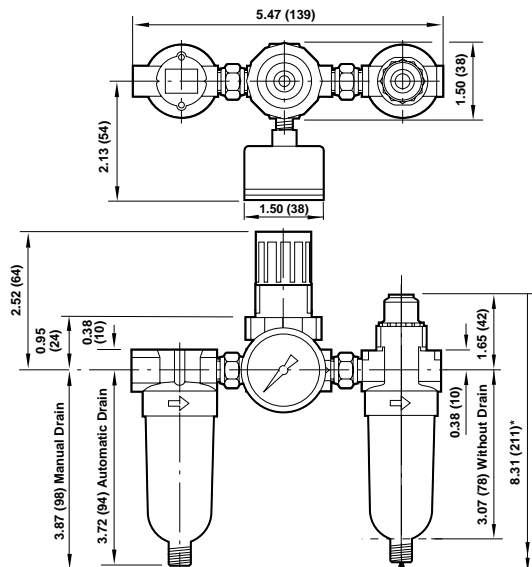
Elastomers: Nitrile

ISO Symbols



Filter with automatic drain, relieving regulator, lubricator with manual drain.

All Dimensions in Inches (mm)



* Minimum clearance to remove bowl.

** Use 2" (51 mm) long screws, 5/32" diameter, to mount PTA Unit to wall.

- **True modularity with Norgren Quikclamp™ connections**
- **Quick release bayonet bowl**
- **Lubricator flow sensor provides a nearly constant oil/air ratio over a wide range of air flows**
- **All around (360°) visibility of the lubricator sight-feed dome simplifies installation and adjustment**
- **Regulator balanced valve minimizes effect of variation in the inlet pressure on the outlet pressure**

Use Micro-Fog models in applications containing one or more points of lubrication.

Use Oil-Fog models to lubricate a single tool, cylinder, or other air driven device.

Technical Data

Fluid: Compressed air

Maximum pressure

Transparent bowl: 150 psig (10 bar)

Metal bowl (Manual or semi automatic drain): 250 psig (17 bar)

Automatic drain: 150 psig (10 bar)

Operating temperature*

Transparent bowl: 0° to 125°F (-20° to 50°C)

Metal bowl: 0° to 150°F (-20° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5 µm, 25 µm, or 40 µm filter element

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Semi automatic drain connection: Push on 5/16" (8 mm) ID tube

Semi automatic drain operating conditions (pressure operated)

Bowl pressure required to close drain: Greater than 1.5 psig (0.1 bar)

Bowl pressure required to open drain: Less than 1.5 psig (0.1 bar)

Minimum air flow required to close drain: 1 scfm (0.5 dm³/s)

Manual operation: Lift stem to drain bowl

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Automatic drain operating conditions (float operated)

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 0.2 scfm (0.1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size

Short bowl: 1.9 fluid ounce (56 ml)

Long bowl: 2.2 fluid ounce (65 ml)

Gauge ports: 1/8 PTF with PTF main ports

Rc1/8 with ISO Rc main ports

Rc1/8 with ISO G main ports

Recommended lubricants: See Section ALE-29.

Materials

Body: Zinc

Bonnet: Acetal

Regulator valve: Brass

Regulator bottom plug: Acetal

Bowl

Transparent: Polycarbonate

Transparent with guard: Polycarbonate, zinc guard

Metal: Zinc

Metal bowl liquid level indicator lens: Transparent nylon

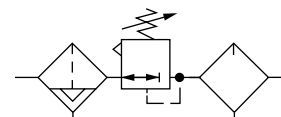
Sight-Feed dome: Transparent nylon

Element: Sintered polypropylene

Elastomers: Neoprene, nitrile



ISO Symbols



Filter with automatic drain, relieving regulator, lubricator with manual drain.

See Section ALE-25 for Accessories



Ordering information. Models listed include PTF threads. Filter (F) includes automatic drain, long transparent bowl without guard, and a 40µm element. Regulator (R) is relieving type with knob adjustment, 150 psig (10 bar) regulating spring, and gauge. Lubricator (L) is a Micro-Fog model with 1/4 turn manual drain and long transparent bowl without guard.

Combination Unit Type	Port Size	Model	Weight lb (kg)
Filter-Regulator-Lubricator (F-R-L)	1/4"	C72A-2AK-AL3-RMG-QLN	3.23 (1.47)
	3/8"	C72A-3AK-AL3-RMG-QLN	3.23 (1.47)

Alternative Models



Shutoff/Lockout Valve, Quikmount	Substitute	Accessories	Substitute
Standard Combination (No Shutoff/Lockout Valve, no Quikmount)	C	Quikclamp wall brackets	B
With Shutoff/Lockout valve on inlet	D	No accessories	N
With Quikmount pipe adapters on inlet and outlet	E	Lubricator Bowl	Substitute
With Shutoff/Lockout Valve on inlet and Quikmount pipe adapter on outlet	G	Short metal with liquid level indicator	D
		Long metal with liquid level indicator	E
		Short transparent without guard	T
		Long transparent without guard	L
		Long transparent with guard	W
Combination Unit Type	Substitute	Lubricator Drain	Substitute
Micro-Fog F-R-L	A	Closed bottom	E
Oil-Fog F-R-L	B	Manual, 1/4 turn	Q
Port Size	Substitute	Regulator Gauge	Substitute
1/4"	2	With gauge	G
3/8"	3	No gauge	N
Threads	Substitute	Regulation spring **	Substitute
PTF	A	5 to 30 psig (0.3 to 2 bar)	C
ISO Rc taper	B	5 to 60 psig (0.3 to 4 bar)	F
ISO G parallel	G	5 to 150 psig (0.3 to 10 bar)	M
Pressure Adjustment	Substitute	Regulator Diaphragm	Substitute
Knob	K	Non-relieving	N
T-bar	T	Relieving	R
Filter Drain	Substitute	Filter Element	Substitute
Automatic †	A	5 µm	1
Manual, 1/4 turn	Q	25 µm	2
Semi automatic	S	40 µm	3
Filter Bowl	Substitute		
Short metal with liquid level indicator	D		
Long metal with liquid level indicator	E		
Short transparent without guard	T		
Long transparent without guard	L		
Long transparent with guard	W		

** Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.
 † Supplied in long bowl options only.

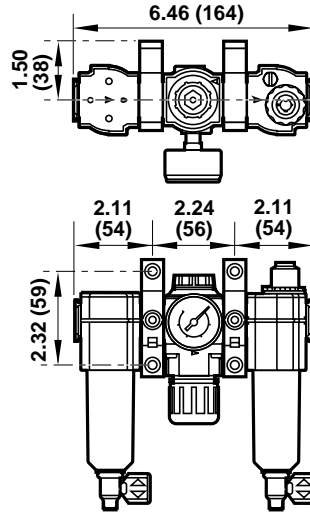


F72G-R72-L72 Combination Unit

All Dimensions in Inches (mm)

Standard Micro-Fog Type C72A- Standard Oil-Fog Type C72B-

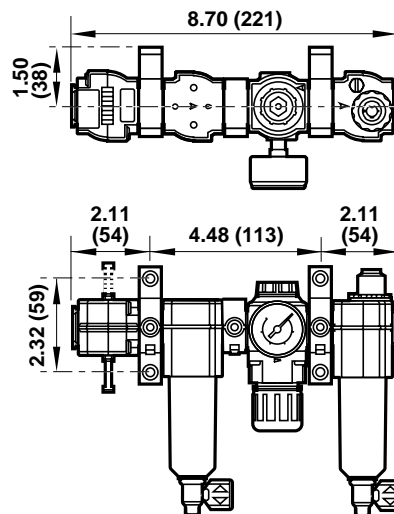
Shown with optionala Quikclamp wall
bracket.



Alternative Micro-Fog Type D72A- Alternative Oil-Fog Type D72B-

Includes Shutoff/Lockout valve.

Shown with optional Quikclamp wall
brackets.



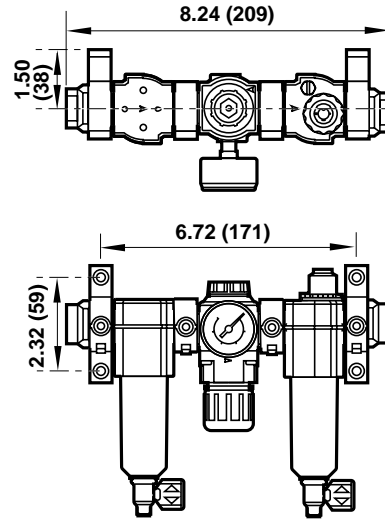
F72G-R72-L72 Combination Unit

All Dimensions in Inches (mm)



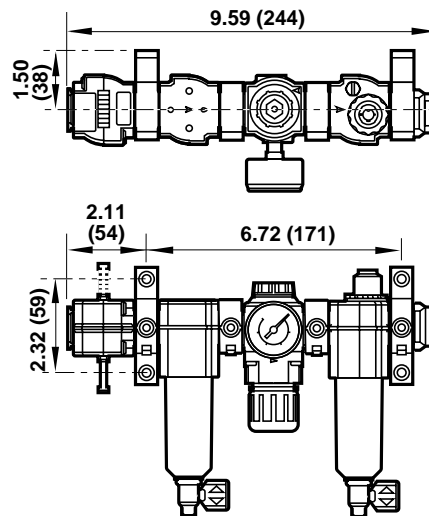
**Alternative Micro-Fog Type E72A-
Alternative Oil-Fog Type E72B-
Includes Quikmount pipe adapters.**

Shown with optional gauge and
Quikclamp wall brackets.



**Alternative Micro-Fog Type G72A-
Alternative Oil-Fog Type G72B-**

Includes Shutoff/Lockout valve and Quikmount pipe adapter.
Shown with optional gauge and
Quikclamp wall brackets.



- True modularity with Norgren Quikclamp™ connections
- Quick release bayonet bowl
- Lubricator flow sensor provides a nearly constant oil/air ratio over a wide range of air flows
- All around (360°) visibility of the lubricator sight-feed dome simplifies installation and adjustment
- Regulator balanced valve minimizes effect of variation in the inlet pressure on the outlet pressure

Use Micro-Fog models in applications containing one or more points of lubrication.

Use Oil-Fog models to lubricate a single tool, cylinder, or other air driven device.



Technical Data

Fluid: Compressed air

Maximum pressure

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*

Transparent bowl: 0° to 125°F (-20° to 50°C)

Metal bowl: 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5 µm, 25 µm, or 40 µm filter element

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Automatic drain operating conditions (float operated)

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 0.2 scfm (0.1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size: 3.5 fluid ounce (0.1 liter)

Gauge ports:

1/4 PTF with PTF main ports

ISO Rc1/4 with ISO Rc main ports

ISO Rc1/8 with ISO G main ports

Recommended lubricants: See Section ALE-29.

Materials

Body: Aluminum

Bonnet: Aluminum or Zinc

Regulator valve: Brass

Regulator bottom plug: Acetal

Bowl

Transparent: Polycarbonate

Transparent with guard: Polycarbonate, steel guard

Metal: Aluminum

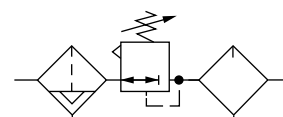
Metal bowl liquid level indicator lens: Transparent nylon

Sight-Feed dome: Transparent nylon

Element: Sintered plastic

Elastomers: Neoprene and nitrile

ISO Symbols



Filter with automatic drain, relieving regulator,
lubricator with manual drain.

See Section ALE-25 for Accessories



Ordering information

Models listed in order table have PTF threads. Filter (F) has automatic drain, metal bowl with liquid level indicator, and a 40 µm element. Regulator (R) has knob adjustment, relieving diaphragm, 150 psig (10 bar) regulating spring, and gauge. Lubricator (L) is a Micro-Fog model with 1/4 turn manual drain and metal bowl with liquid level indicator.

Combination Unit Type	Port Size	Model	Weight lb (kg)
Filter-Regulator-Lubricator (F-R-L)	1/4"	C73A-2AK-AD3-RMG-QDN	4.36 (1.98)
	3/8"	C73A-3AK-AD3-RMG-QDN	4.36 (1.98)
	1/2"	C73A-4AK-AD3-RMG-QDN	4.36 (1.98)

Alternative Models



Lockout Valve/ Quikmount	Substitute	Accessories	Substitute
Standard Combination (No Lockout Valve, no Quikmount)	C	Accessories B and D	A
With Lockout valve on inlet	D	Quikclamp wall brackets	B
With Quikmount pipe adapters on inlet and outlet	E	Accessories B and Q	C
With Lockout valve on inlet and Quikmount pipe adapter on outlet	G	Filter service indicator	D
		Accessories B , D , and Q	H
		No accessories	N
		Lubricator quick fill nipple	Q
Combination Unit Type	Substitute	Lubricator Bowl	Substitute
Micro-Fog F-R-L	A	Metal with liquid level indicator	D
Oil-Fog F-R-L	B	Transparent with guard	P
		Transparent	T
Port Size	Substitute	Lubricator Drain	Substitute
1/4"	2	Closed bottom	E
3/8"	3	Manual, 1/4 turn	Q
1/2"	4		
Threads	Substitute	Regulator Gauge	Substitute
PTF	A	With gauge	G
ISO Rc taper	B	No gauge	N
ISO G parallel	G		
Pressure Adjustment	Substitute	Regulation spring *	Substitute
Knob	K	5 to 60 psig (0.3 to 4 bar)	F
T-bar	T	5 to 150 psig (0.3 to 10 bar)	M
		10 to 250 psig (0.7 to 17 bar)**	S
Filter Drain	Substitute	Regulator Diaphragm	Substitute
Automatic	A	Non-relieving	N
Manual, 1/4 turn	Q	Relieving	R
Filter Bowl	Substitute	Filter Element	Substitute
Metal with liquid level indicator	D	5 µm	1
Transparent with steel guard	P	25 µm	2
Transparent	T	40 µm	3

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

** Units with 250 psig (17 bar) outlet pressure range are available only with the standard metal bowl.

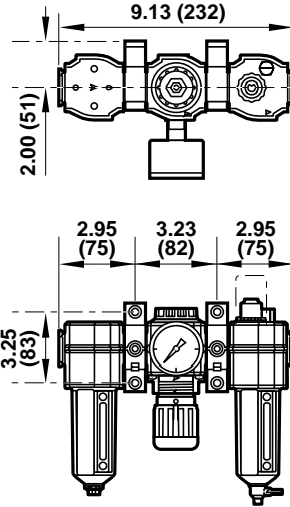


F73G-R73-L73 Combination Unit

All Dimensions in Inches (mm)

Standard Micro-Fog Type C73A- Standard Oil-Fog Type C73B-

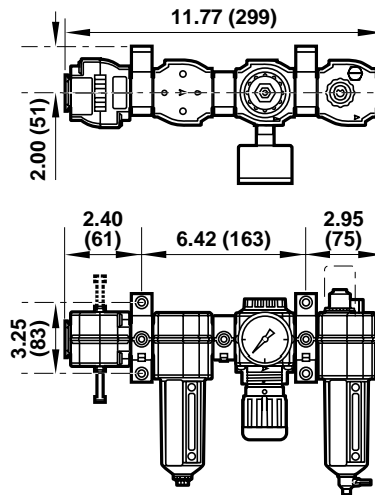
Shown with optional Quikclamp
wall bracket.



Alternative Micro-Fog Type D73A- Alternative Oil-Fog Type D73B-

Includes lockout valve.

Shown with optional
Quikclamp wall bracket.



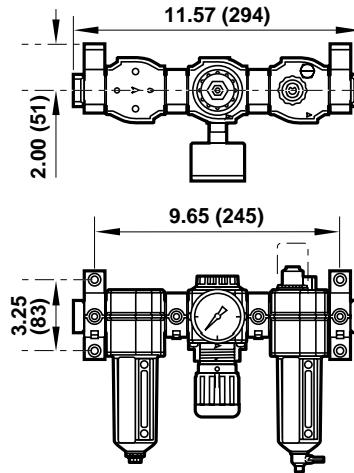
F73G-R73-L73 Combination Unit

All Dimensions in Inches (mm)



**Alternative Micro-Fog Type E73A-
Alternative Oil-Fog Type E73B-
Includes Quikmount pipe adapters.**

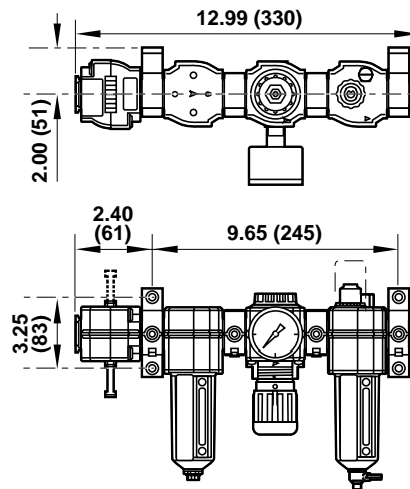
Shown with optional
Quikclamp wall bracket.



**Alternative Micro-Fog Type G73A-
Alternative Oil-Fog Type G73B-**

**Includes lockout valve and
Quikmount pipe adapter.**

Shown with optional
Quikclamp wall bracket.



- True modularity with Norgren Quikclamp™ connections
- Quick release bayonet bowl
- Lubricator flow sensor provides a nearly constant oil/air ratio over a wide range of air flows
- All around (360°) visibility of the lubricator sight-feed dome simplifies installation and adjustment
- Regulator balanced valve minimizes effect of variation in the inlet pressure on the outlet pressure

Use Micro-Fog models in applications containing one or more points of lubrication.

Use Oil-Fog models to lubricate a single tool, cylinder, or other air driven device.



Technical Data

Fluid: Compressed air

Maximum pressure

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*

Transparent bowl: 0° to 125°F (-20° to 50°C)

Metal bowl: 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5 µm, 25 µm, or 40 µm filter element

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Automatic drain operating conditions (float operated)

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 2 scfm (1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size:

Standard: 7 fluid ounce (0.2 liter)

Optional size for lubricator: 1 quart US (1 liter)

Gauge Ports:

1/4" PTF with PTF main ports

Rc 1/4 with ISO Rc main ports

Rc 1/8 with ISO G main ports

Recommended lubricants: See Section ALE-29.

Materials

Body: Aluminum

Bonnet: Aluminum

Regulator valve: Brass

Regulator bottom plug: Acetal

Bowl

Transparent: Polycarbonate with steel bowl guard

Metal: Aluminum

Metal bowl liquid level indicator lens:

7 fluid ounce (0.2 liter): Transparent nylon

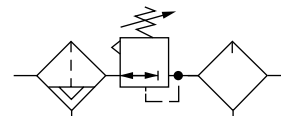
1 quart US (1 liter): Pyrex

Sight-Feed dome: Transparent nylon

Element: Sintered polypropylene

Elastomers: Neoprene and nitrile

ISO Symbols



Filter with automatic drain, relieving regulator, lubricator with manual drain.

See Section ALE-25 for Accessories



Ordering information. Models listed include Micro-Fog lubricator, PTF threads, knob pressure adjustment, metal filter bowl with liquid level indicator and automatic drain, 40 µm filter element, relieving diaphragm, 150 psig (10 bar) regulating spring, gauge, 7 fluid oz. (0.2 liter) metal lubricator bowl with liquid level indicator and 1/4 turn manual drain.

Combination Unit Type	Port Size	Model	Weight lb (kg)
Filter-Regulator-Lubricator (F-R-L)	3/8"	C74A-3AK-AD3-RMG-QDN	6.22 (2.82)
	1/2"	C74A-4AK-AD3-RMG-QDN	6.04 (2.74)
	3/4"	C74A-6AK-AD3-RMG-QDN	5.91 (2.68)

Alternative Models



Lockout Valve/ Quikmount	Substitute
Standard combination (no lockout valve or Quikmount)	C
With lockout valve on inlet	D
With Quikmount pipe adapters on inlet and outlet	E
With Lockout valve on inlet and Quikmount pipe adapter on outlet	G

Combination Unit Type	Substitute
Micro-Fog F-R-L	A
Oil-Fog F-R-L	B

Port Size	Substitute
3/8"	3
1/2"	4
3/4"	6

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Pressure Adjustment	Substitute
Knob	K
T-bar	T

Filter Drain	Substitute
Automatic	A
Manual, 1/4 turn	Q

Filter Bowl	Substitute
Metal with liquid level indicator	D
Transparent with guard	P

Filter Element	Substitute
5 µm	1
25 µm	2
40 µm	3

Accessories	Substitute
Quikclamp wall brackets and filter service indicator	A
Quikclamp wall brackets	B
Quikclamp wall brackets and lubricator quick fill nipple	C
Filter service indicator	D
Quikclamp wall brackets, filter service indicator and lubricator quick fill nipple	H
No accessories	N
Lubricator quick fill nipple	Q

Lubricator Bowl	Substitute
1 quart US (1 liter) metal with liquid level indicator	A
7 fluid oz. (0.2 liter) metal with liquid level indicator	D
7 fluid oz. (0.2 liter) transparent with zinc guard	P

Lubricator Drain	Substitute
Closed bottom	E
Manual, 1/4 turn	Q
Remote fill ††	R

Regulator Gauge	Substitute
With gauge	G
No gauge	N

Regulation spring **	Substitute
5 to 60 psig (0.3 to 4 bar)	F
5 to 150 psig (0.3 to 10 bar)	M
10 to 250 psig (0.7 to 17 bar)†	S

Regulator Diaphragm	Substitute
Non relieving	N
Relieving	R

** Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.
 † Units with 250 psig (17 bar) outlet pressure range are available only with the T-bar adjustment; therefore substitute **T** at the 7th position and **S** at the 12th position.
 †† Use remote fill only with 7 fluid oz. (0.2 liter) bowls.

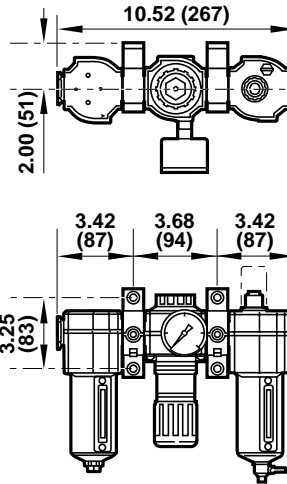


F74G-R74-L74 Combination Unit

All Dimensions in Inches (mm)

Standard Micro-Fog Type C74A- Standard Oil-Fog Type C74B-

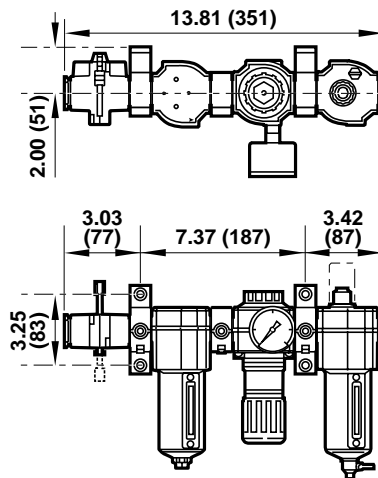
Shown with optional Quikclamp
wall bracket.



Alternative Micro-Fog Type D74A- Alternative Oil-Fog Type D74B-

Includes Shutoff/Lockout valve.

Shown with optional Quikclamp wall
brackets.

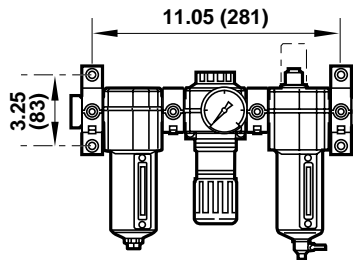
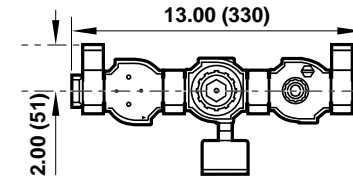


F74G-R74-L74 Combination Unit

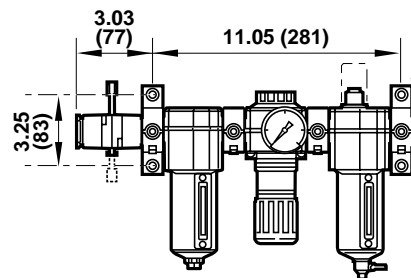
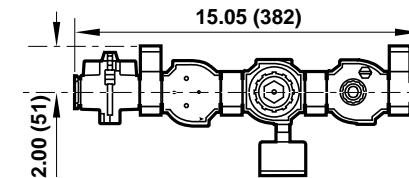
All Dimensions in Inches (mm)



**Alternative Micro-Fog Type E74A-
Alternative Oil-Fog Type E74B-
Includes Quikmount pipe adapters.**
Shown with optional Quikclamp wall
brackets.



**Alternative Micro-Fog Type G74A-
Alternative Oil-Fog Type G74B-
Includes Shutoff/Lockout valve
and Quikmount pipe adapter.**
Shown with optional Quikclamp wall
brackets.



P8A, P8B Combination Units

17 Series Filter-Regulator-Lubricator
3/4", 1", 1-1/4" and 1-1/2" Port Sizes

- Depth type, 40 µm filter element
- Balanced regulator valve minimizes effect of changes in inlet pressure on outlet pressure
- Low torque, non-rising regulator pressure adjusting knob
- All around (360°) visibility of the lubricator sight-feed dome simplifies installation and adjustment
- Lubricator flow sensor provides a nearly constant oil/air ratio over a wide range of air flows

Use Micro-Fog combinations in applications containing one or more points of lubrication

Use Oil-Fog combinations to lubricate a single tool, cylinder, or other air driven device



Technical Data

Fluid: Compressed air

Maximum pressure: 250 psig (17 bar)

Operating temperature*: 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Start point (minimum flow required for lubricator operation): 8 scfm (3.8 dm³/s) at 90 psig (6.3 bar) inlet pressure

Regulator gauge ports:

1/4" PTF with PTF main ports

R1/4 with ISO Rc, ISO G, and BSPP main ports

Nominal bowl size: 1 quart US (1 liter)

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Automatic drain operating conditions (float operated)

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 2 scfm (1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

Recommended lubricants: See Section ALE-29.

Materials

Bodies, bowls, regulator bonnet: Aluminum

Bowl sight glass: Pyrex

Filter element: Sintered bronze

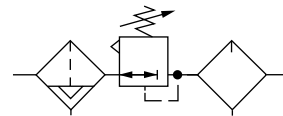
Regulator bottom plug: Acetal

Regulator valve: Aluminum and nylon

Lubricator sight-feed dome: Transparent nylon

Elastomers: Neoprene and nitrile

ISO Symbols



Filter with automatic drain, relieving regulator, lubricator with manual drain

See Section ALE-25 for Accessories



Ordering Information. Models listed have PTF port threads. Filters and lubricators have metal bowl with sight glass. Filters have 40 µm element and automatic drain. Lubricators have manual drain. Regulators are relieving type with gauge, knob adjustment, and outlet pressure adjustment range of 5 to 125 psig (0.3 to 8.5 bar)*.

Port Size	Micro-Fog Models	Oil-Fog Models	Weight lbs (kg)
3/4"	P8A-660-A3DA	P8B-660-A3DA	6.69 (3.03)
1"	P8A-860-A3DA	P8B-860-A3DA	6.29 (2.85)
1-1/4"	P8A-A60-A3DA	P8B-A60-A3DA	7.51 (3.41)
1-1/2"	P8A-B60-A3DA	P8B-B60-A3DA	6.88 (3.12)

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

Alternative Models

★ 8 ★ - ★ ★ ★ - ★ ★ ★ ★

Regulator Adjustment	Substitute
T-bar	H
Knob	P

Lubricator Type	Substitute
Micro-Fog	A
Oil-Fog	B

Port Size	Substitute
3/4"	6
1"	8
1-1/4"	A
1-1/2"	B

Threads	Substitute
PTF	A
ISO Rc taper	B
BSP (1-1/2" ported units only)	C
ISO G parallel (not available with 1-1/2" ported units)	G

Lubricator Reservoir	Substitute
1 quart US (1 liter) metal, drain, sight glass	D

Filter Element	Substitute
40 µm	3

Filter Drain	Substitute
Automatic	A
Manual	M

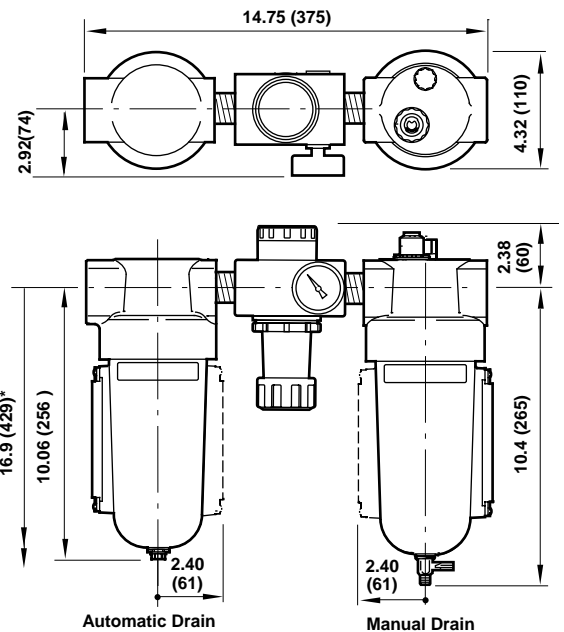
Filter Bowl	Outlet Pressure Adjustment Range*		Relief Type	Gauge	Substitute
	psig	bar			
Metal, sight glass	5 to 125	0.3 to 8.5	Relieving	With	60
Metal, sight glass	5 to 125	0.3 to 8.5	Relieving	Without	61
Metal, sight glass	5 to 125	0.3 to 8.5	Non relieving	Without	62
Metal, sight glass	5 to 125	0.3 to 8.5	Non relieving	With	63
Metal, sight glass	5 to 50	0.3 to 3.5	Relieving	Without	64
Metal, sight glass	5 to 50	0.3 to 3.5	Relieving	With	65
Metal, sight glass	5 to 50	0.3 to 3.5	Non relieving	Without	66
Metal, sight glass	5 to 50	0.3 to 3.5	Non relieving	With	67
Metal, sight glass	10 to 250	0.7 to 17	Relieving	Without	76
Metal, sight glass	10 to 250	0.7 to 17	Relieving	With	77
Metal, sight glass	10 to 250	0.7 to 17	Non relieving	Without	76
Metal, sight glass	10 to 250	0.7 to 17	Non relieving	With	79

Service Kits

Item	Type	Part Number
Lubricator service kit	All o-rings, seals, gaskets	5771-02
Filter service kit	All o-rings, seals, gaskets	5578-05
	40 µm element	5311-03
Replacement drain	Automatic	3000-10
Sight glass kit *	Pyrex	2273-22
Regulator service kit **	Relieving	5578-02
	Non relieving	5578-01
Replacement drain	1/4 Turn	619-50

* Sight glass kit contains bowl o-ring plus all o-rings, seals, screws, glass, and glass guard.
 ** Regulator service kit contains, diaphragm, all o-rings, valve, and valve spring.

All Dimensions in Inches (mm)



* Minimum clearance required to remove bowl.

64 Series F-R-L Combination Units

64 Series Filter-Regulator-Lubricator
1/4", 3/8", 1/2", and 3/4" Port Sizes

- **Olympian Plus plug in design**
- **High Efficiency water and particle removal**
- **Quick release bayonet bowls**
- **High visibility prismatic sight glass**
- **Push to lock adjusting knob with tamper resistant option**
- **Constant oil density output with varying flow**



Technical Data

Fluid: Compressed air

Maximum pressure:

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*:

Transparent bowl: 0° to 125°F (-20° to 50°C)

Metal bowl: 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5 µm, 25 µm, or 40 µm filter element

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Automatic drain operating conditions (float operated):

Bowl pressure required to close drain: Greater than 5 psig
(0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 2 scfm (1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size:

Standard: 7 fluid ounce (0.2 liter)

Optional size for lubricator: 1 quart (1 liter)

Gauge Ports:

1/4" PTF with PTF main ports

Rc 1/8 with ISO Rc main ports

Rc 1/8 with ISO G main ports

Recommended lubricants: See Section ALE-29.

Materials

Body and yoke: Zinc

Bonnet: Aluminum

Regulator valve: Brass

Bowl:

Transparent: Polycarbonate

Metal: Aluminum

Metal bowl liquid level indicator lens:

7 fluid ounce (0.2 liter): Transparent nylon

1 quart (1 liter): Pyrex

Sight-Feed dome: Polycarbonate

Element: Sintered polypropylene

Elastomers: Neoprene and nitrile

See Section ALE-25 for Accessories



Ordering information. Models listed include Micro-Fog lubricator, yoke with PTF threads, knob adjustment, filter with auto drain, metal bowl with liquid level indicator, 40 µm element; regulator with relieving diaphragm, 10 bar (150 psig) regulating spring, gauge; lubricator with 1/4 turn manual drain, 7 fluid ounce (0.2 liter) metal bowl with liquid level indicator.

Combination Unit Type	Port Size	Model	Weight lb (kg)
Filter-Regulator-Lubricator (F-R-L)	1/4"	C64A-2AK-AD3-RMG-QDN	10.2 (4.61)
	3/8"	C64A-3AK-AD3-RMG-QDN	9.7 (4.42)
	1/2"	C64A-4AK-AD3-RMG-QDN	9.6 (4.35)
	3/4"	C64A-6AK-AD3-RMG-QDN	8.8 (3.97)

Alternative Models



Lockout Valve	Substitute
No lockout valve	C
With lockout valve on inlet	D

Combination Unit Type	Substitute
Standard Micro-Fog F-R-L	A
Standard Oil-Fog F-R-L	B

Port Size	Substitute
1/4"	2
3/8"	3
1/2"	4
3/4"	6

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Pressure Adjustment	Substitute
Knob	K
T-bar	T

Filter Drain	Substitute
Automatic	A
Manual, petcock	D
Manual, 1/4 turn	Q

Filter Bowl	Substitute
Metal with liquid level indicator	D
Metal, no liquid level indicator	M
Transparent with guard	P
Metal with pyrex liquid level indicator	R

Filter Element	Substitute
5 µm	1
25 µm	2
40 µm	3
75 µm	4

Accessories	Substitute
B and D	A
Wall brackets	B
B and Q	C
Filter service indicator	D
B and L *	F
B, D, and Q	H
B, D, and L	K
Lubricator low oil level switch *	L
No accessories	N
Lubricator quick fill cap	Q

Lubricator Bowl	Substitute
1 quart (1 liter) metal with pyrex liquid level indicator	A
7 fluid oz. (0.2 liter) metal with plastic liquid level indicator	D
7 fluid oz. (0.2 liter) metal without liquid level indicator	M
7 fluid oz. (0.2 liter) transparent with guard	P
7 fluid oz. (0.2 liter) metal with pyrex liquid level indicator	R

Lubricator Drain	Substitute
Manual, petcock	D
Closed bottom	E
Manual, 1/4 turn	Q
Remote fill ††	R

Regulator Gauge	Substitute
With gauge	G
No gauge	N

Regulation spring **	Substitute
5 to 60 psig (0.3 to 4 bar)	F
5 to 150 psig (0.3 to 10 bar)	M
10 to 250 psig (0.7 to 17 bar)†	S

Regulator Diaphragm	Substitute
Non relieving	N
Relieving	R

* Lubricator low oil level switch available only with 1 quart (1 liter) bowl.
 ** Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.
 † Regulator with 250 psig (17 bar) regulating spring available only the T-bar adjustment .
 †† Lubricator with remote fill available only with 7 fluid oz. (0.2 liter) bowls.



64 Series F-R-L Combination Unit

All Dimensions in Inches (mm)

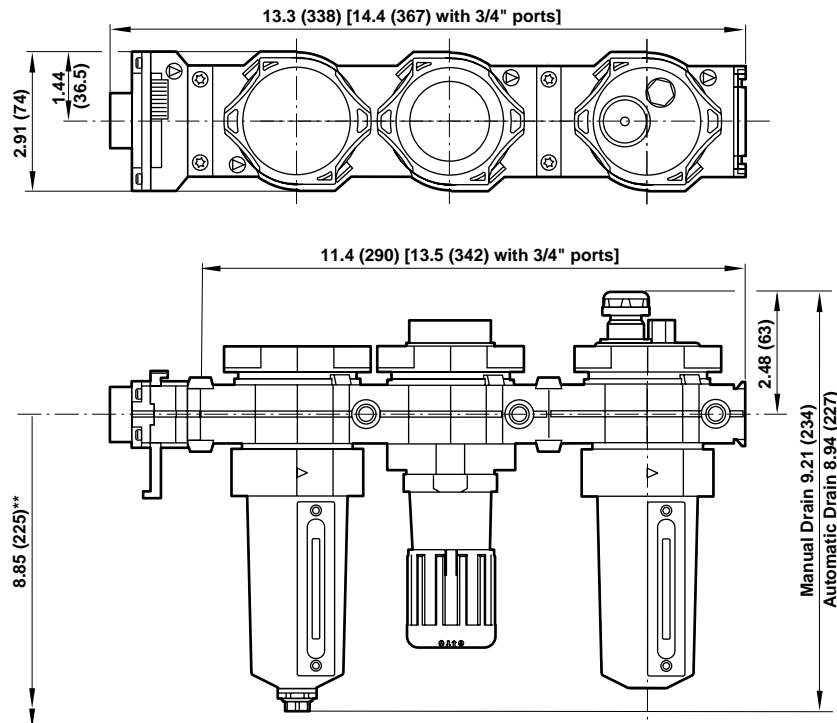
Service Kits

Item	Type	Part number
Service kit	Filter	4380-200
Service kit	Relieving Regulator	4381-200
Service kit	Non-relieving Regulator	4381-201
Service kit	Lubricator	4382-200
Replacement elements	40 µm	4338-02
	5 µm	4338-01
Replacement sight glass	B64, plastic	4380-040
	L64, plastic	4380-042
	B64 & L64, pyrex	4380-041
	L64, 1 quart, pyrex	2273-22
Replacement drains	Automatic	3000-10
	Manual, 1/4 turn	619-50
Filter service indicator		5797-50

Filter service kit includes port seals, louver 'O' ring, bowl 'O' ring and drain gasket.

Regulator service kit includes port and bottom plug, 'O' rings, valve assembly, valve spring and diaphragm.

Lubricator service kit includes all seals, flow sensor, eyelet, dome screen, ball and spring.



**Minimum clearance required to remove bowl.

Filter-Lubricators

Combination units from 1/8" to 1-1/2".

07 Series Filter-Lubricator 1/8" and 1/4" Port Sizes	ALE-23-2
Excelon 72 Filter-Lubricator Combination Units 1/4" and 3/8" Port Sizes	ALE-23-4
Excelon 73 Filter-Lubricator Combination Units 1/4", 3/8", 1/2" Port Sizes	ALE-23-8
Excelon 74 Filter-Lubricator Combination Units 3/8", 1/2", 3/4" Port Sizes	ALE-23-12
17 Series Filter-Lubricator Combination Units 3/4", 1", 1-1/4", 1-1/2" Port Sizes	ALE-23-16
Olympian 64 Filter-Lubricator Combination Units 1/4", 3/8", 1/2", and 3/4" Port Sizes	ALE-23-18



07 Series



72 Series



73 Series



74 Series



64 Series



17 Series

P1C, PTC Combination Unit

07 Series Filter-Lubricator
1/8" and 1/4" Port Sizes

- Compact design
- Filter removes liquids and solid particles down to 5 µm
- Micro-Fog lubricator provides air line lubrication to one or more air driven tools or other devices
- Nearly constant oil density output with varying air flow
- Can be disassembled without the use of tools or removal from the air line



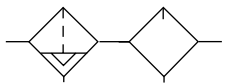
Ordering information. Models listed include PTF threads, filter with transparent bowl, automatic drain, 5 µm element, lubricator with transparent reservoir and manual drain.

Port Size	Model Numbers	Weight lb (kg)
1/8"	P1C-100-A1AA	0.58 (0.26)
1/4"	P1C-200-A1AA	0.58 (0.26)

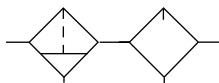
Alternative Models

Port Size		Substitute		Threads		Substitute	
1/8"	1	1	1	PTF	A		
1/4"	2	2	2	ISO Rc taper	B		
				ISO G parallel	G		
Filter Bowl		Substitute		Lubricator Reservoir		Substitute	
Transparent	00	00	00	Transparent with drain	A		
Metal	40	40	40	Transparent without drain	Q		
				Metal with drain / no sight glass	M		
				Metal without drain / no sight glass	F		
Filter Element		Substitute		Filter Drain		Substitute	
5 µm	1	1	1	Automatic	A		
40 µm	3	3	3	Manual	M		

ISO Symbols



Filter with automatic drain,
lubricator with manual drain



Filter manual drain, lubricator
with manual drain

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air

Maximum pressure:

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature *

Transparent bowl: 0° to 125°F (-20° to 50°C)

Metal bowl: 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Nominal bowl size: 1 fluid ounce (31 ml)

Drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Filter

Automatic drain operation: Spitter type drain operates momentarily when a rapid change in air flow occurs or when the supply pressure is reduced.

Lubricator

Start point (i.e. minimum flow required for lubricator operation): 0.5 scfm (0.24 dm³/s) at 90 psig (6.3 bar) inlet pressure

Nominal bowl size: 1 fluid ounce (31 ml)

Recommended lubricants: See Section ALE-29.

Materials:

Body: Zinc

Bowl

Transparent: Polycarbonate

Metal: Zinc

Filter element: Sintered polypropylene

Sight feed dome: Transparent nylon

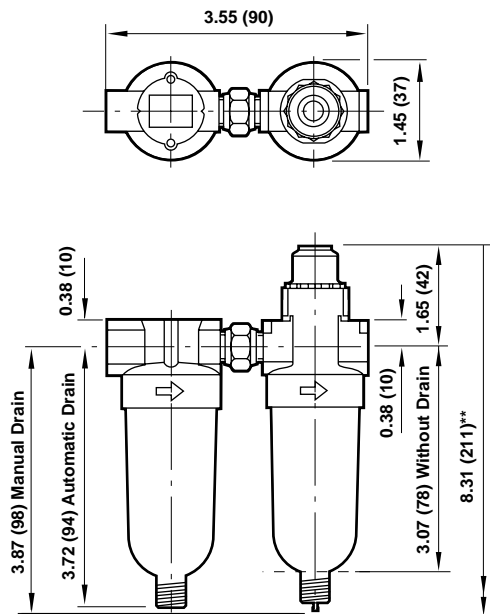
Elastomers: Neoprene and nitrile

Service Kits

Item	Type	Part number
Service kits, filter	5 µm element	3652-17
	40 µm element	3852-18
Service kit, lubricator		3795-03
Replacement drains	Manual	773-03
	Automatic	3654-02

Filter service kit contains element, element gasket, and bowl o-ring. Lubricator service kit contains sight-feed dome seal, cartridge o-ring, and bowl o-ring.

All Dimensions in Inches (mm)



** Minimum clearance to remove bowl

- True modularity with Norgren Quikclamp™ connections
- Quick release bayonet bowl
- Flow sensor design provides a nearly constant oil/air ratio over a wide range of air flows
- Highly visible, prismatic liquid level indicator lens
- All around (360°) visibility of the sight-feed dome simplifies installation and adjustment

Use Micro-Fog models in applications containing one or more points of lubrication.

Use Oil-Fog models to lubricate a single tool, cylinder, or other air driven device.



Technical Data

Fluid: Compressed air

Maximum pressure:

Transparent bowl: 150 psig (10 bar)

Metal bowl:

Manual or semi automatic drain: 250 psig (17 bar)

Automatic drain: 150 psig (10 bar)

Operating temperature*:

Transparent bowl: 0° to 125°F (-20° to 50°C)

Metal bowl: 0° to 150°F (-20° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5 µm, 25 µm, or 40 µm filter element

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Semi automatic drain connection: Push on 5/16" (8 mm) ID tube

Semi automatic drain operating conditions (pressure operated)

Bowl pressure required to close drain: Greater than 1.5 psig (0.1 bar)

Bowl pressure required to open drain: Less than 1.5 psig (0.1 bar)

Minimum air flow required to close drain: 1 scfm (0.5 dm³/s)

Manual operation: Lift stem to drain bowl

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Automatic drain operating conditions (float operated)

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 0.2 scfm (0.1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size

Short bowl: 1.9 fluid ounce (56 ml)

Long bowl: 2.2 fluid ounce (65 ml)

Recommended lubricants: See Section ALE-29.

Materials

Body: Zinc

Bowl

Transparent: Polycarbonate

Transparent with guard: Polycarbonate, Zinc guard

Metal: Zinc

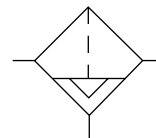
Metal bowl liquid level indicator lens: Transparent nylon

Element: Sintered polypropylene

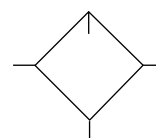
Sight-Feed dome: Transparent nylon

Elastomers: Neoprene, nitrile

ISO Symbols



Filter with Automatic Drain



Lubricator with Drain

See Section ALE-25 for Accessories



Ordering information. Models listed include PTF threads. Filter (F) has automatic drain, long transparent bowl without guard, and a 40 µm element. Lubricator (L) is a Micro-Fog model with 1/4 turn manual drain and long transparent bowl with guard.

Combination Unit Type	Port Size	Model	Weight lb (kg)
Filter-Lubricator (F-L)	1/4"	C72C-2AN-AL3-NNN-QLN	2.3 (1.04)
	3/8"	C72C-3AN-AL3-NNN-QLN	2.3 (1.04)

Alternative Models



Shutoff/Lockout Valve, Quikmount Standard Combination (No Shutoff/Lockout Valve, no Quikmount)	Substitute
	C
With Shutoff/Lockout valve on inlet	D
With Quikmount pipe adapters on inlet and outlet	E
With Shutoff/Lockout Valve on inlet and Quikmount pipe adapter on outlet	G

Combination Unit Type	Substitute
Micro-Fog F-L	C
Oil-Fog F-L	D

Port Size	Substitute
1/4"	2
3/8"	3

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Regulator Option	Substitute
Non Applicable	N

Filter Drain	Substitute
Automatic †	A
Manual, 1/4 turn	Q
Semi automatic	S

Filter Bowl	Substitute
Short metal with liquid level indicator	D
Long metal with liquid level indicator	E
Short transparent without guard	T
Long transparent without guard	L

† Available only with long bowl. Long transparent with

Accessories	Substitute
Quikclamp wall brackets	B
No accessories	N

Lubricator Bowl	Substitute
Short metal with liquid level indicator	D
Long metal with liquid level indicator	E
Short transparent without guard	T
Long transparent without guard	L
Long transparent with guard	W

Lubricator Drain	Substitute
Closed bottom	E
Manual, 1/4 turn	Q

Regulator Option	Substitute
Non Applicable	N

Regulator Option	Substitute
Non Applicable	N

Regulator Option	Substitute
Non Applicable	N

Filter Element	Substitute
5 µm	1
25 µm	2
40 µm	3

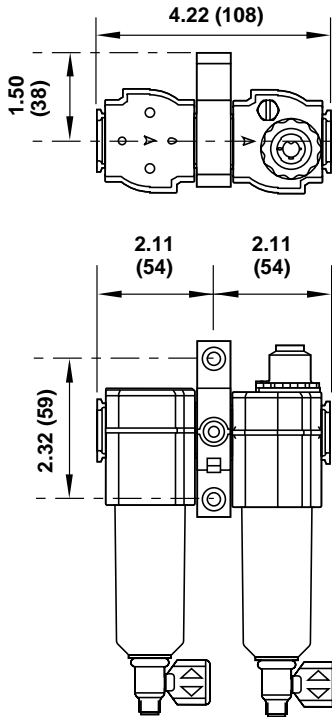


F72-L72 Combination Unit

All Dimensions in Inches (mm)

Standard Micro-Fog Type C72C- Standard Oil-Fog Type C72D-

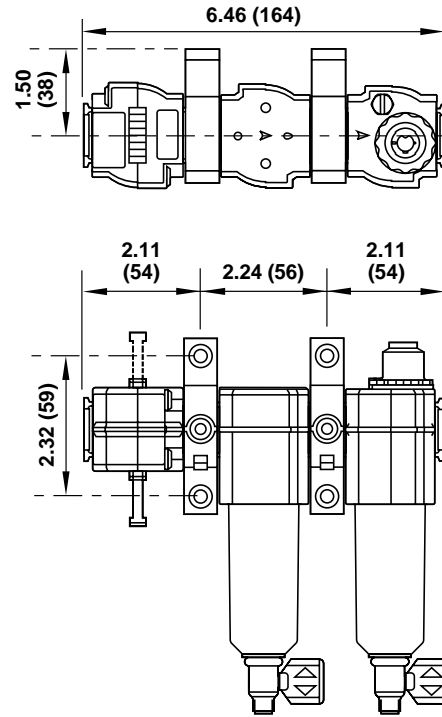
Shown with optional Quikclamp wall bracket.



Alternative Micro-Fog Type D72C- Alternative Oil-Fog Type D72D-

Includes Shutoff/Lockout valve.

Shown with optional Quikclamp wall brackets.



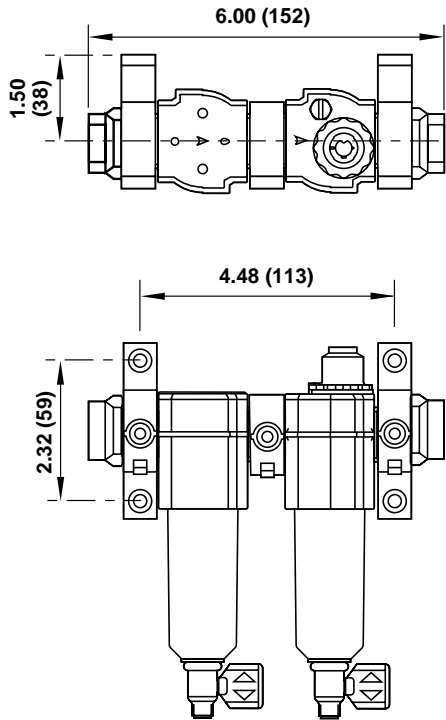
F72-L72 Combination Unit

All Dimensions in Inches (mm)



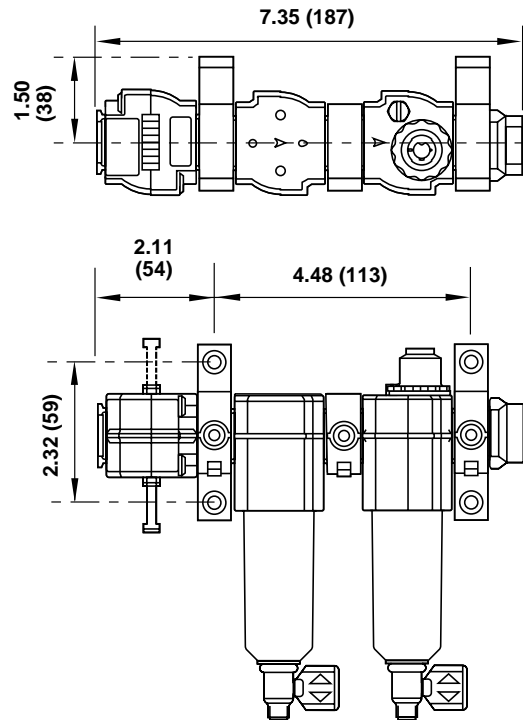
**Alternative Micro-Fog Type E72C-
Alternative Oil-Fog Type E72D-
Includes Quikmount pipe adapters.**

Shown with optional Quikclamp wall brackets.



**Alternative Micro-Fog Type G72C-
Alternative Oil-Fog Type G72D-
Includes Shutoff/Lockout valve and Quikmount pipe adapter.**

Shown with optional Quikclamp wall brackets.



- True modularity with Norgren Quikclamp™ connections
- Quick release bayonet bowl
- Flow sensor design provides a nearly constant oil/air ratio over a wide range of air flows
- Highly visible, prismatic liquid level indicator lens
- All around (360°) visibility of the sight-feed dome simplifies installation and adjustment

Use Micro-Fog models in applications containing one or more points of lubrication.

Use Oil-Fog models to lubricate a single tool, cylinder, or other air driven device.



Technical Data

Fluid: Compressed air

Maximum pressure

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*

Transparent bowl: 0° to 125°F (-20° to 50°C)

Metal bowl: 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5 µm, 25 µm, or 40 µm filter element

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe threads

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe threads

Automatic drain operating conditions (float operated):

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 0.2 scfm (0.1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size: 3.5 fluid ounce (0.1 liter)

Recommended lubricants: See Section ALE-29.

Materials

Body: Aluminum

Bowl

Transparent: Polycarbonate

Transparent with guard: Polycarbonate, steel guard

Metal: Aluminum

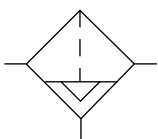
Metal bowl liquid level indicator lens: Transparent nylon

Element: Sintered polypropylene

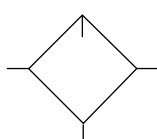
Sight-Feed dome: Transparent nylon

Elastomers: Neoprene and nitrile

ISO Symbols



Filter with Automatic Drain



Lubricator with Drain

See Section ALE-25 for Accessories



Ordering information

Models listed in order table have PTF threads. Filter (F) has automatic drain, metal bowl with liquid level indicator, and a 40 µm element. Lubricator (L) is a Micro-Fog model with 1/4 turn manual drain and metal bowl with liquid level indicator.

Combination Unit Type	Port Size	Model	Weight lb (kg)
Filter-Lubricator (F-L)	1/4"	C73C-2AN-AD3-NNN-QDN	2.6 (1.18)
	3/8"	C73C-3AN-AD3-NNN-QDN	2.6 (1.18)
	1/2"	C73C-4AN-AD3-NNN-QDN	2.6 (1.18)

Alternative Models

★ 7 3 ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★

Lockout Valve/ Quikmount	Substitute	Accessories	Substitute
Standard Combination (No Lockout Valve, no Quikmount)	C	Accessories B and D	A
With Lockout valve on inlet	D	Quikclamp wall brackets	B
With Quikmount pipe adapters on inlet and outlet	E	Accessories B and Q	C
With Lockout valve on inlet and Quikmount pipe adapter on outlet	G	Filter service indicator	D
		Accessories B , D , and Q	H
		No accessories	N
		Lubricator quick fill nipple	Q
Combination Unit Type	Substitute	Lubricator Bowl	Substitute
Micro-Fog F-L	C	Metal with liquid level indicator	D
Oil-Fog F-L	D	Transparent with guard	P
		Transparent	T
Port Size	Substitute	Lubricator Drain	Substitute
1/4"	2	Closed bottom	E
3/8"	3	Manual, 1/4 turn	Q
1/2"	4		
Threads	Substitute	Regulator Option	Substitute
PTF	A	Non Applicable	N
ISO Rc taper	B		
ISO G parallel	G	Regulator Option	Substitute
		Non Applicable	N
Regulator Option	Substitute	Regulator Option	Substitute
Non Applicable	N	Non Applicable	N
Filter Drain	Substitute	Filter Element	Substitute
Automatic	A	5 µm	1
Manual, 1/4 turn	Q	25 µm	2
		40 µm	3
Filter Bowl	Substitute		
Metal with liquid level indicator	D		
Transparent with zinc guard	P		
Transparent	T		

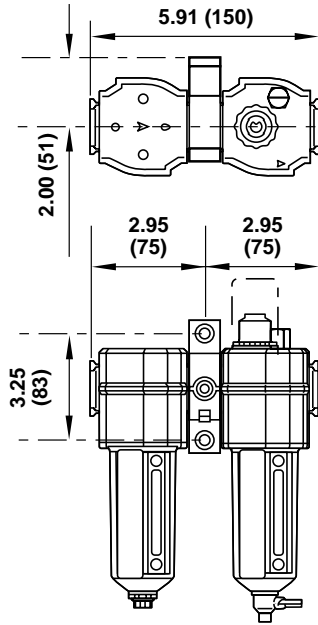


F73-L73 Combination Unit

All Dimensions in Inches (mm)

**Standard Micro-Fog Type C73C-
Standard Oil-Fog Type C73D-**

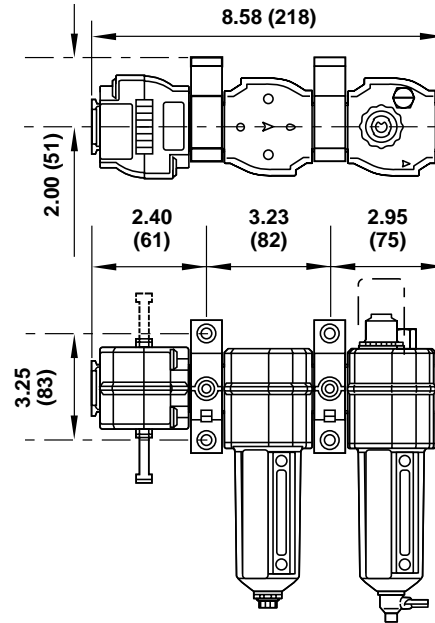
Shown with optional Quikclamp wall bracket.



**Alternative Micro-Fog Type D73C-
Alternative Oil-Fog Type D73D-**

Includes lockout valve.

Shown with optional Quikclamp wall bracket.

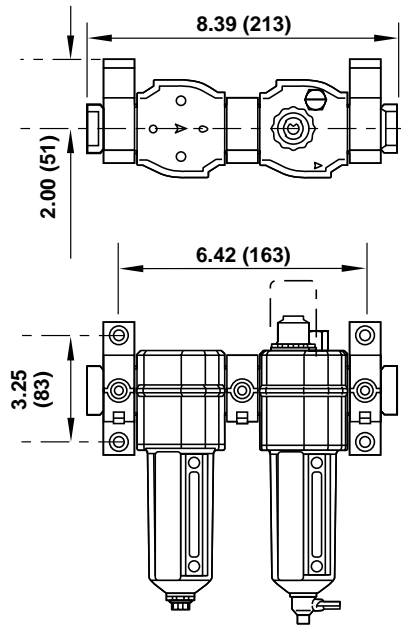


F73-L73 Combination Unit

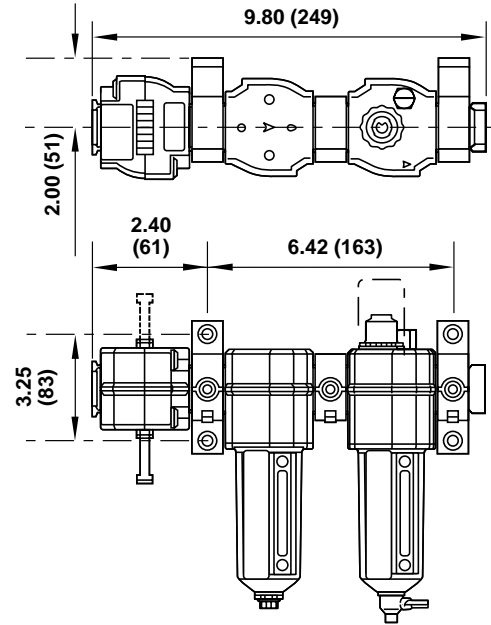
All Dimensions in Inches (mm)



**Alternative Micro-Fog Type E73C-
Alternative Oil-Fog Type E73D-**
Includes Quikmount pipe adapters.
Shown with optional Quikclamp wall bracket.



**Alternative Micro-Fog Type G73C-
Alternative Oil-Fog Type G73D-**
Includes lockout valve and Quikmount
pipe adapter.
Shown with optional Quikclamp wall bracket.



- True modularity with Norgren Quikclamp™ connections
- Quick release bayonet bowl
- Flow sensor design provides a nearly constant oil/air ratio over a wide range of air flows
- Highly visible, prismatic liquid level indicator lens
- All around (360°) visibility of the sight-feed dome simplifies installation and adjustment

Use Micro-Fog models in applications containing one or more points of lubrication.

Use Oil-Fog models to lubricate a single tool, cylinder, or other air driven device.



Technical Data

Fluid: Compressed air

Maximum pressure:

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*:

Transparent bowl: 0° to 125°F (-20° to 50°C)

Metal bowl: 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5 µm, 25 µm, or 40 µm filter element

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe threads

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe threads

Automatic drain operating conditions (float operated):

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 2 scfm (1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size:

Standard: 7 fluid ounce (0.2 liter)

Optional size for lubricator: 1 quart US (1 liter)

Recommended lubricants: See Section ALE-29.

Materials

Body: Aluminum

Bowl

Transparent: Polycarbonate with steel bowl guard

Metal: Aluminum

Metal bowl liquid level indicator lens

7 fluid ounce (0.2 liter): Transparent nylon

1 quart US (1 liter): Pyrex

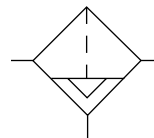
Sight-Feed dome: Transparent nylon

Elastomers: Neoprene and Nitrile

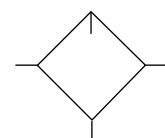
Element: Sintered polypropylene

Elastomers: Neoprene and Nitrile

ISO Symbols



Filter with Automatic Drain



Lubricator with Drain

See Section ALE-25 for Accessories



Ordering information. Models listed include Micro-Fog lubricator, PTF threads, metal filter bowl with liquid level indicator and automatic drain, 40 µm filter element, 7 fluid oz. (0.2 liter) metal lubricator bowl with liquid level indicator and 1/4 turn manual drain.

Combination Unit Type	Port Size	Model	Weight lb (kg)
Filter-Lubricator (F-L)	3/8"	C74C-3AN-AD3-NNN-QDN	3.97 (1.80)
	1/2"	C74C-4AN-AD3-NNN-QDN	3.84 (1.74)
	3/4"	C74C-6AN-AD3-NNN-QDN	3.75 (1.70)

Alternative Models



Lockout Valve/ Quikmount	Substitute
Standard combination (no lockout valve or Quikmount)	C
With lockout valve on inlet	D
With Quikmount pipe adapters on inlet and outlet	E
With lockout valve on inlet and Quikmount pipe adapter on outlet	G

Combination Unit Type	Substitute
Micro-Fog F-L	C
Oil-Fog F-L	D

Port Size	Substitute
3/8"	3
1/2"	4
3/4"	6

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Regulator Option	Substitute
Non applicable	N

Filter Drain	Substitute
Automatic	A
Manual, 1/4 turn	Q

Filter Bowl	Substitute
Metal with liquid level indicator	D
Transparent with guard	P

Filter Element	Substitute
5 µm	1
25 µm	2
40 µm	3

Accessories	Substitute
Quikclamp wall brackets and filter service indicator	A
Quikclamp wall brackets	B
Quikclamp wall brackets and lubricator quick fill nipple	C
Filter service indicator	D
Quikclamp wall brackets, filter service indicator and lubricator quick fill nipple	H
No accessories	N
Lubricator quick fill nipple	Q

Lubricator Bowl	Substitute
1 quart US (1 liter) metal with liquid level indicator	A
7 fluid oz. (0.2 liter) metal with liquid level indicator	D
7 fluid oz. (0.2 liter) transparent with zinc guard	P

Lubricator Drain	Substitute
Closed bottom	E
Manual, 1/4 turn	Q
Remote fill *	R

Regulator Option	Substitute
Non applicable	N

Regulator Option	Substitute
Non applicable	N

Regulator Option	Substitute
Non applicable	N

* Use remote fill only with 7 fluid oz. (0.2 liter) bowls.

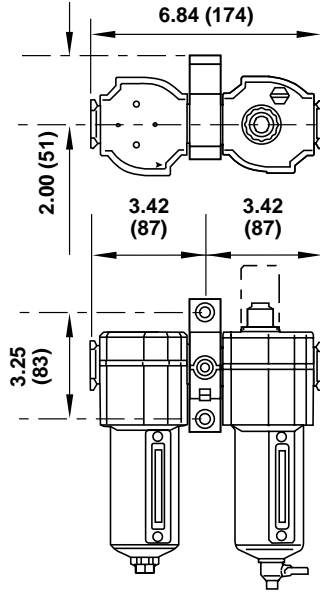


F74-L74 Combination Unit

All Dimensions in Inches (mm)

Standard Micro-Fog Type C74C- Standard Oil-Fog Type C74D-

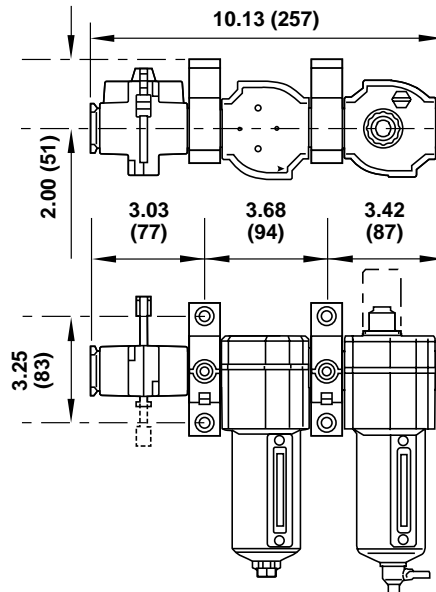
Shown with optional Quikclamp wall bracket.



Alternative Micro-Fog Type D74C- Alternative Oil-Fog Type D74D-

Includes Shutoff/Lockout valve.

Shown with optional Quikclamp wall brackets.



F74-L74 Combination Unit

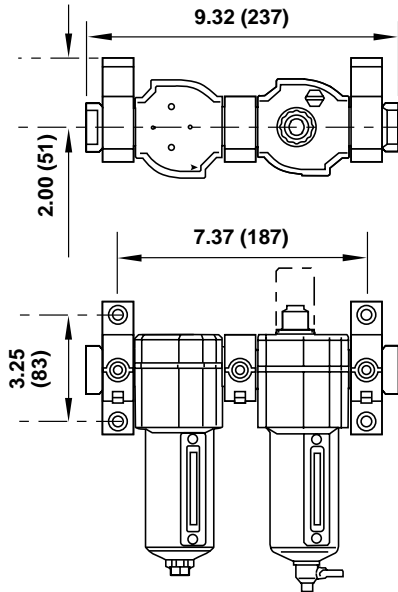
All Dimensions in Inches (mm)



Alternative Micro-Fog Type E74C- Alternative Oil-Fog Type E74D-

Includes Quikmount pipe adapters.

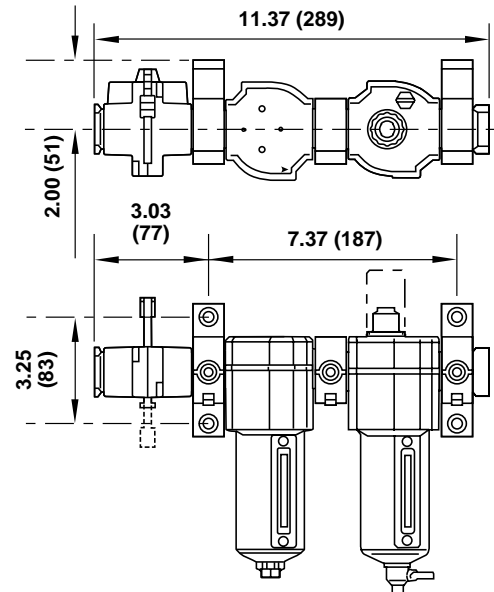
Shown with optional Quikclamp wall brackets.



Alternative Micro-Fog Type G74C- Alternative Oil-Fog Type G74D-

Includes Shutoff/Lockout valve and Quikmount pipe adapter.

Shown with optional Quikclamp wall brackets.



- Combines outstanding features of the Norgren F17 filters and L17 lubricators
- All around (360°) visibility of the lubricator sight-feed dome simplifies installation and adjustment
- Screw-on bowl reduces maintenance time
- Can be disassembled without the use of tools or removal from the air line
- Lubricator flow sensor design provides a nearly constant oil/air ratio over a wide range of air flows



Use Micro-Fog combinations in applications containing one or more points of lubrication

Use Oil-Fog combinations to lubricate a single tool, cylinder, or other air driven device

Ordering Information. Models listed include 1 quart (1 liter) metal bowls with sight glass, automatic drain on filter, manual drain on lubricator, and PTF.

Port Size	Micro-Fog Models	Oil-Fog Models	Weight lbs (kg)
3/4"	P8C-660-A3DA	P8D-660-A3DA	8.49 (3.85)
1"	P8C-860-A3DA	P8D-860-A3DA	8.32 (3.77)
1-1/4"	P8C-A60-A3DA	P8D-A60-A3DA	9.54 (4.33)
1-1/2"	P8C-B60-A3DA	P8D-B60-A3DA	8.36 (3.79)

Alternative Models

P 8 ★ - ★ ★ ★ - ★ ★ ★ ★

Lubricator Type	Substitute
Micro-Fog	C
Oil-Fog	D

Port Size	Substitute
3/4"	6
1"	8
1-1/4"	A
1-1/2"	B

Filter Bowl	Substitute
Metal with sight glass	60

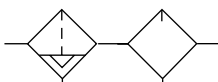
Threads	Substitute
PTF	A
ISO Rc taper	B
BSPP (1-1/2" ported units only)	C
ISO G parallel (not available with 1-1/2" ported units)	G

Lubricator Reservoir	Substitute
1 quart (1 liter) metal, drain, sight glass	D

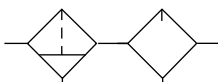
Filter Element	Substitute
40 µm	3

Filter Drain	Substitute
Automatic	A
Manual	M

ISO Symbols



Filter with automatic drain, Lubricator with manual drain



Filter manual drain, Lubricator with manual drain

See Section ALE-25 for Accessories



Technical Data

Fluid: Compressed air
 Maximum pressure: 250 psig (17 bar)
 Operating temperature*: 0° to 175°F (-20° to 80°C)
 * Air supply must be dry enough to avoid ice formation at temperatures below 2°C (35°F).
 Start point (minimum flow required for lubricator operation): 8 scfm (3.8 dm³/s) at 90 psig (6.3 bar) inlet pressure
 Typical flow with 90 psig (6.3 bar) inlet pressure and 7 psig (0.5 bar) pressure drop:
 1" Ports: 250 scfm (118 dm³/s)
 Nominal bowl size: 1 quart US (1 liter)
 Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
 Automatic drain operating conditions
 Minimum pressure: 10 psig (0.7 bar).
 Drain opens when bowl pressure drops below 3 psig (0.2 bar).
 Minimum air flow: 2 scfm (1 dm³/s) required to close drain.

Recommended lubricants: See Section ALE-29.

Materials

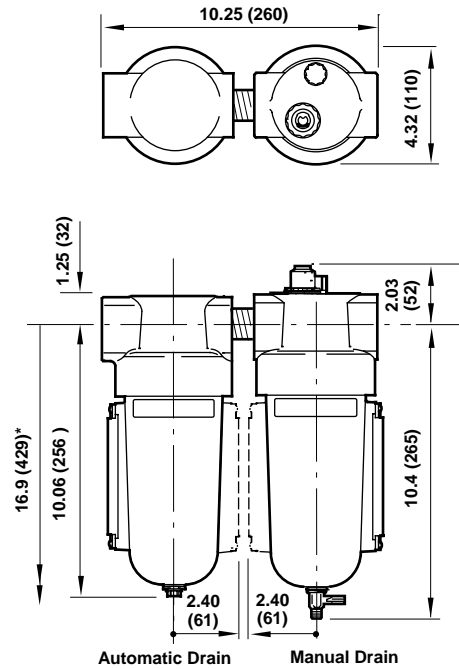
- Body: Aluminum
- Bowls: Aluminum
- Bowl sight glass: Pyrex
- Sight-feed dome: Transparent nylon
- Elastomers: Neoprene and nitrile

Service Kits

Item	Type	Part Number
Lubricator service kit	All o-rings, seals, gaskets	5771-02
Filter service kit	All o-rings, seals, gaskets	5578-05
	40 µm element	5311-03
Replacement drain	Automatic	3000-10
	Manual (1/4 Turn)	619-50
Sight glass kit	All o-rings, seals, gaskets	2273-22

Sight glass kit contains bowl o-ring plus all o-rings, seals, screws, glass, and glass guard.

All Dimensions in Inches (mm)



* Minimum clearance required to remove bowl.

FL64 Combination Units

Olympian Plus 64 Filter and Lubricator
1/4", 3/8", 1/2", and 3/4" Port Sizes

- Olympian Plus plug in design
- High Efficiency water and particle removal
- Easy fill lubricator with quick release bayonet bowls
- High visibility prismatic sight glass
- Constant oil density output with varying flow



Technical Data

Fluid: Compressed air

Maximum pressure:

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*

Transparent bowl: 0° to 125°F (-20° to 50°C)

Metal bowl: 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5 µm, 25 µm, or 40 µm filter element

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Automatic drain operating conditions (float operated):

Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)

Bowl pressure required to open drain: Less than 3 psig (0.2 bar)

Minimum air flow required to close drain: 2 scfm (1 dm³/s)

Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size

Standard: 7 fluid ounce (0.2 liter)

Optional size for lubricator: 1 quart (1 liter)

Recommended lubricants: See Section ALE-29.

Materials

Body and yoke: Zinc

Bowl:

Transparent: Polycarbonate

Metal: Aluminum

Metal bowl liquid level indicator lens:

7 fluid ounce (0.2 liter): Transparent nylon

1 quart (1 liter): Pyrex

Sight-Feed dome: Polycarbonate

Element: Sintered polypropylene

Elastomers: Neoprene and nitrile

Service Kits

Item	Type	Part number
Service kit	Filter	4380-200
Service kit	Lubricator	4382-200
Replacement elements	40 µm	4338-02
	5 µm	4338-01
Replacement sight glass	F64, plastic	4380-040
	L64, plastic	4380-042
	F64, L64, pyrex	4380-041
	L64, 1 quart, pyrex	2273-22
Replacement drains	Automatic	3000-10
	Manual, 1/4 turn	619-50
Service Indicator		5797-50

Filter service kit includes port seals, louver 'O' ring, bowl 'O' ring and drain gasket.

Lubricator service kit includes all seals, flow sensor, eyelet, dome screen, ball and spring.

See Section ALE-25 for Accessories



Ordering information. Models listed include Micro-Fog lubricator, yoke with PTF threads, filter with auto drain, metal bowl with liquid level indicator, 40 µm element; lubricator with 1/4 turn manual drain, 7 fluid ounce (0.2 liter) metal bowl with liquid level indicator.

Combination Unit Type	Port Size	Model	Weight lb (kg)
Filter-Lubricator (F-L)	1/4"	C64C-2AN-AD3-NNN-QDN	10.2 (4.61)
	3/8"	C64C-3AN-AD3-NNN-QDN	9.7 (4.42)
	1/2"	C64C-4AN-AD3-NNN-QDN	9.6 (4.35)
	3/4"	C64C-6AN-AD3-NNN-QDN	8.8 (3.97)

Alternative Models

★ 6 4 ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★

Lockout Valve	Substitute
No lockout valve	C
With lockout valve on inlet	D

Combination Unit Type	Substitute
Standard Micro-Fog F-L	C
Standard Oil-Fog F-L	D

Port Size	Substitute
1/4"	2
3/8"	3
1/2"	4
3/4"	6

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Regulator Option	Substitute
Not Applicable	N

Filter Drain	Substitute
Automatic	A
Manual, petcock	D
Manual, 1/4 turn	Q

Filter Bowl	Substitute
Metal with liquid level indicator	D
Metal, no liquid level indicator	M
Transparent with guard	P
Metal with pyrex liquid level indicator	R

Filter Element	Substitute
5 µm	1
25 µm	2
40 µm	3
75 µm	4

Accessories	Substitute
B and D	A
Wall brackets	B
B and Q	C
Filter service indicator	D
B and L *	F
B, D, and Q	H
B, D, and L	K
Lubricator low oil level switch *	L
No accessories	N
Lubricator quick fill cap	Q

Lubricator Bowl	Substitute
1 quart (1 liter) metal with pyrex liquid level indicator	A
7 fluid oz. (0.2 liter) metal with plastic liquid level indicator	D
7 fluid oz. (0.2 liter) metal without liquid level indicator	M
7 fluid oz. (0.2 liter) transparent with guard	P
7 fluid oz. (0.2 liter) metal with pyrex liquid level indicator	R

Lubricator Drain	Substitute
Manual, petcock	D
Closed bottom	E
Manual, 1/4 turn	Q
Remote fill **	R

Regulator Option	Substitute
Not Applicable	N

Regulator Option	Substitute
Not Applicable	N

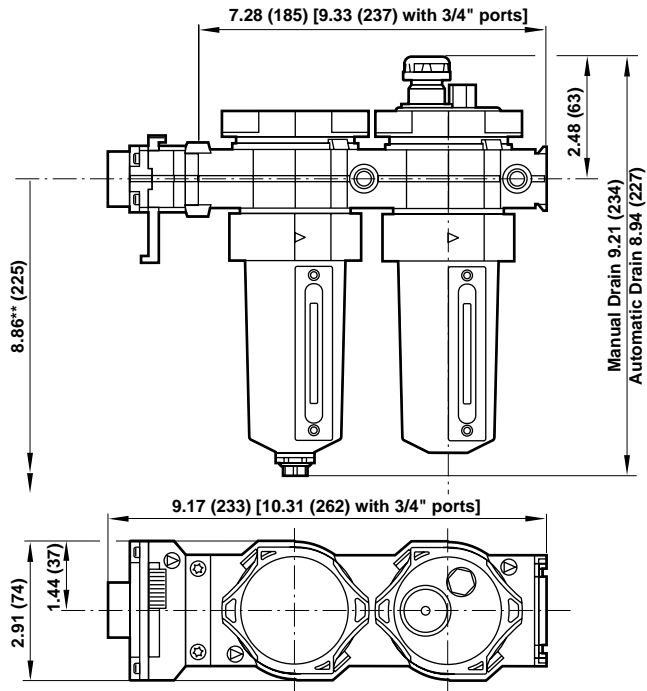
Regulator Option	Substitute
Not Applicable	N

* Lubricator low oil level switch available only with 1 quart (1 liter) bowl.
 ** Lubricator with remote fill available only with 7 fluid oz. (0.2 litre) bowls.



64 Series Filter-Lubricator

All Dimensions in Inches (mm)

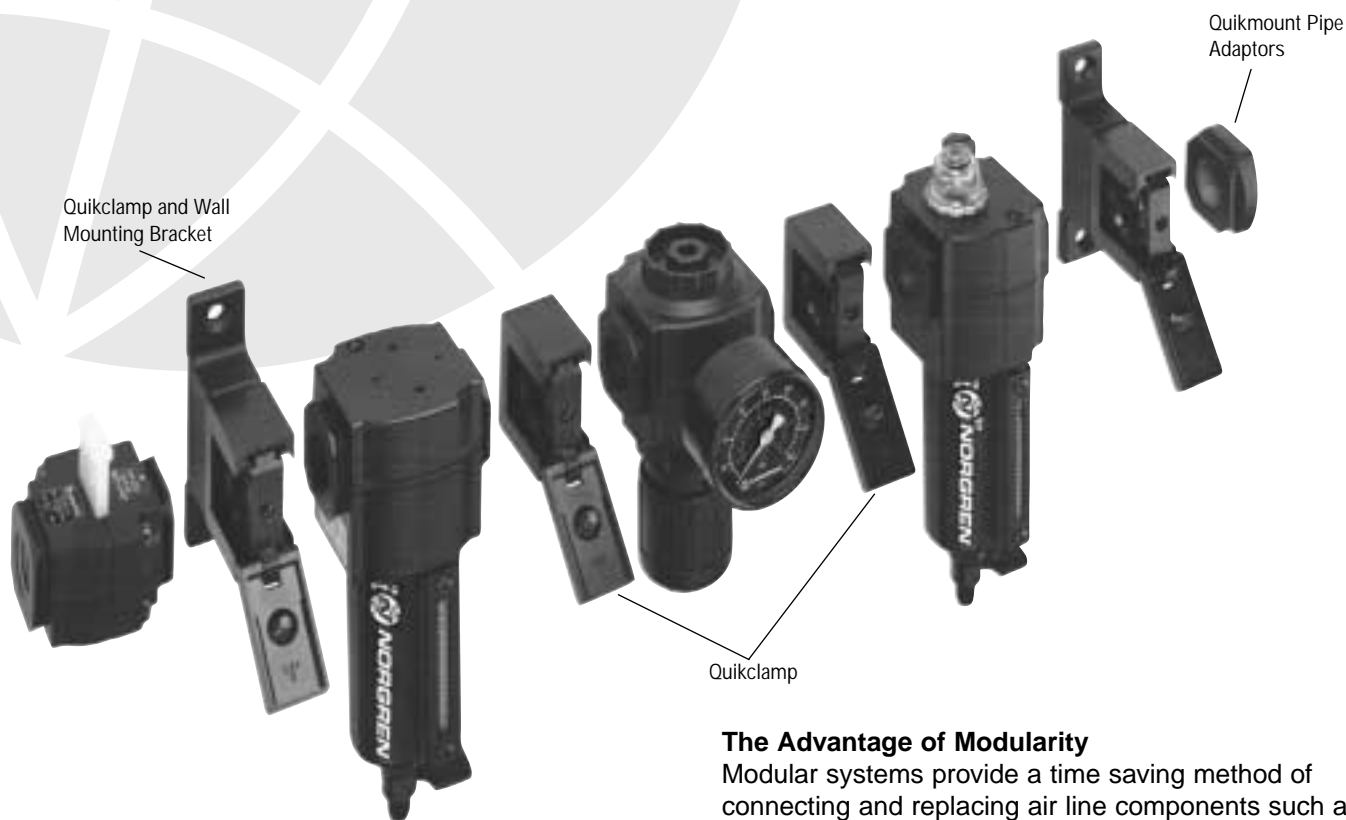


** Minimum clearance required to remove bowl.

Modular Components

Modular combination unit components for Excelon 72, 73, and 74 Series, and Olympian Plus.

Excelon 72 Series Modular Components	ALE-24-2
Excelon 73 Series Modular Components	ALE-24-3
Excelon 73 Series Modular Components	ALE-24-4
Olympus 64 Modular Components	ALE-24-5



The Advantage of Modularity

Modular systems provide a time saving method of connecting and replacing air line components such as filters, regulators, lubricators, and safety lockout valves.

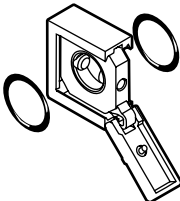
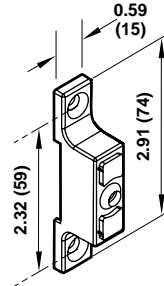
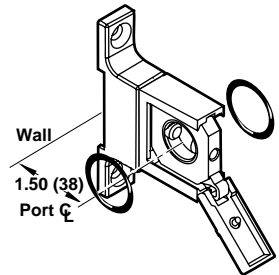
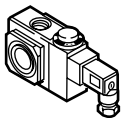
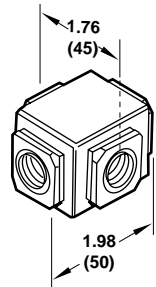
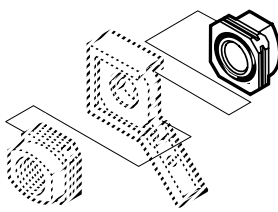
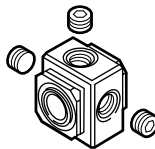

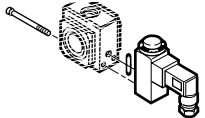
The heart of the Excelon system is the simple, one-piece Quikclamp that allows installation and removal of Excelon air preparation components and accessories without breaking a pipe connection.

All Excelon 72, 73, and 74 products are designed with integral flanges that slide into V-grooves on the Quikclamp. Two face sealing o-rings provide a positive seal when the clamp is closed and the captive screw is tightened.



72 Series Modular Components

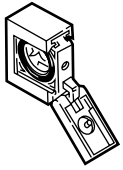
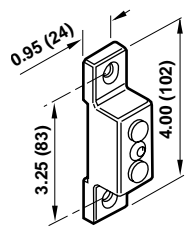
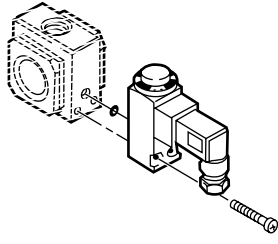
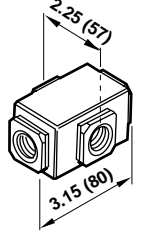
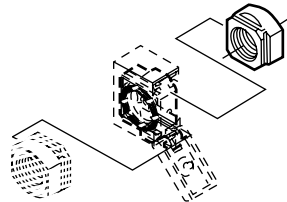
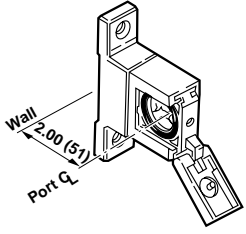
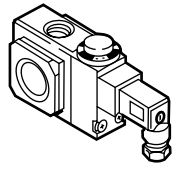

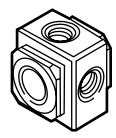
All Dimensions in Inches (mm)

<p align="center">Quikclamp</p> <p>Maximum Pressure: 17 bar (250 psig) Maximum Temperature: 65°C (150°F)</p> <p>Use with all Excelon 72 Products to provide modular installation capability. Flanges on the products slide into V grooves in the Quikclamp. Two face-sealing o-rings in the Quikclamp provide a positive seal when the clamp is closed and the captive screw is tightened.</p> <p>Tighten screw with a 3 mm hex wrench or a T15 Torx wrench.</p> <p>Quikclamp Service Kit (contains 2 Nitrile o-rings): 4384-570 A Quikclamp adds 0.26" (6.5 mm) to the overall length of a combination unit.</p>  <p>Part Number: 4214-51</p>	<p align="center">Quikclamp Wall Mounting Bracket</p> <p>Use with the Quikclamp to provide secure mounting to a wall, machine panel or other flat surface. Use 3/16" (5 mm) screws to mount bracket to wall.</p>  <p>Part Number 4213-89</p>	<p align="center">Quikclamp and Wall Mounting Bracket</p> <p>See Quikclamp paragraph for descriptions and dimensions. Use 3/16" (5 mm) screws to mount bracket to wall.</p>  <p>Part Number 4214-52</p>	<p align="center">Sub-base Mounted Pressure Switch</p> <p>Monitors air pressure and provides an electrical output when the pressure drops below or exceeds an adjustable preset pressure. Installs between two Quikclamps. Also provides two additional 1/4" outlets for auxilliary air.</p> <p>P₁max: 250 psig (17 bar) Temperature: 14° to 150°F (-10° to 65°C) Adjustable: 30 to 150 psig (2 to 10 bar). Shipped from factory preset at 90 psig (6.3 bar)</p> <p>Max. Voltage: 250 V a.c./d.c. Max. Current: 5 Amp Hysteresis at Midpoint: 12%</p> <p>A Sub-base Mounted Pressure Switch adds 1.13" (29 mm) to the overall length of a combination unit.</p>  <p>Auxiliary Port</p> <table border="1"> <thead> <tr> <th>Threads</th> <th>Part Number</th> </tr> </thead> <tbody> <tr> <td>1/4" PTF</td> <td>4246-50</td> </tr> <tr> <td>1/4" ISO Rc</td> <td>4246-51</td> </tr> <tr> <td>1/4" ISO G</td> <td>4246-52</td> </tr> </tbody> </table>	Threads	Part Number	1/4" PTF	4246-50	1/4" ISO Rc	4246-51	1/4" ISO G	4246-52																						
Threads	Part Number																																
1/4" PTF	4246-50																																
1/4" ISO Rc	4246-51																																
1/4" ISO G	4246-52																																
<p align="center">Manifold Block</p> <p>Installs with Quikclamps. Ports are threaded 3/8" pipe to provide manifolding capability for up to three components.</p>  <p>Side</p> <table border="1"> <thead> <tr> <th>Port Threads</th> <th>Part Number</th> </tr> </thead> <tbody> <tr> <td>3/8" PTF</td> <td>4228-01</td> </tr> <tr> <td>3/8" ISO Rc</td> <td>4228-02</td> </tr> <tr> <td>3/8" ISO G</td> <td>4228-03</td> </tr> </tbody> </table>	Port Threads	Part Number	3/8" PTF	4228-01	3/8" ISO Rc	4228-02	3/8" ISO G	4228-03	<p align="center">Quikmount Pipe Adaptors</p> <p>Use with the Quikclamp to provide threaded connections to the system piping.</p>  <p>A pipe adaptor adds 0.63" (16 mm) to the overall length of a combination unit.</p> <table border="1"> <thead> <tr> <th>Port Size and Thread</th> <th>Part No. (Quantity of 1)</th> </tr> </thead> <tbody> <tr> <td>1/4" PTF</td> <td>4215-02</td> </tr> <tr> <td>3/8" PTF</td> <td>4215-03</td> </tr> <tr> <td>1/4" ISO Rc</td> <td>4215-05</td> </tr> <tr> <td>3/8" ISO Rc</td> <td>4215-06</td> </tr> <tr> <td>1/4" ISO G</td> <td>4215-08</td> </tr> <tr> <td>3/8" ISO G</td> <td>4215-09</td> </tr> </tbody> </table>	Port Size and Thread	Part No. (Quantity of 1)	1/4" PTF	4215-02	3/8" PTF	4215-03	1/4" ISO Rc	4215-05	3/8" ISO Rc	4215-06	1/4" ISO G	4215-08	3/8" ISO G	4215-09	<p align="center">Porting Block</p> <p>Installs between two Quikclamps to provide three additional 1/4" outlets for auxiliary air. A Porting Block adds 1.13" (28.5 mm) to the overall length of a combination unit.</p>  <p>Auxiliary Port</p> <table border="1"> <thead> <tr> <th>Size & Thread</th> <th>Part Number</th> </tr> </thead> <tbody> <tr> <td>1/4" NPT</td> <td>4216-50</td> </tr> <tr> <td>1/4" ISO Rc</td> <td>4216-51</td> </tr> <tr> <td>1/4" ISO G</td> <td>4216-52</td> </tr> </tbody> </table>	Size & Thread	Part Number	1/4" NPT	4216-50	1/4" ISO Rc	4216-51	1/4" ISO G	4216-52	<p align="center">Transition Connector</p> <p>Enables connection of Excelon 72 to 74 units. Typically this will allow F74C/H high grade coalescing filters to be flow matched with R72 regulators.</p>  <p>Part Number: 4417-01</p>
Port Threads	Part Number																																
3/8" PTF	4228-01																																
3/8" ISO Rc	4228-02																																
3/8" ISO G	4228-03																																
Port Size and Thread	Part No. (Quantity of 1)																																
1/4" PTF	4215-02																																
3/8" PTF	4215-03																																
1/4" ISO Rc	4215-05																																
3/8" ISO Rc	4215-06																																
1/4" ISO G	4215-08																																
3/8" ISO G	4215-09																																
Size & Thread	Part Number																																
1/4" NPT	4216-50																																
1/4" ISO Rc	4216-51																																
1/4" ISO G	4216-52																																
		<p align="center">Replacement Pressure Switch</p> <p>Use only with pressure switch sub-base. Cannot be used with the standard porting block.</p>  <p>Part Number: 4246-01</p>																															

73 and 74 Series Modular Components

All Dimensions in Inches (mm)

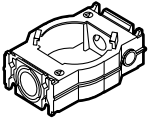
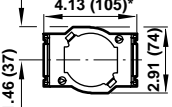
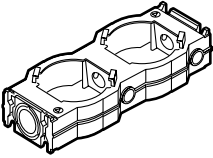
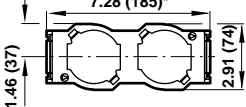
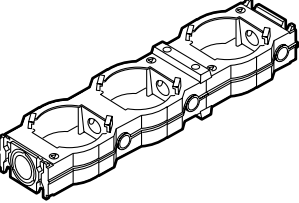
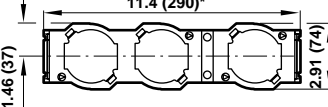
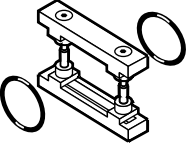


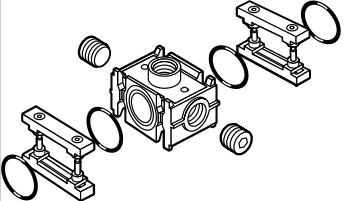
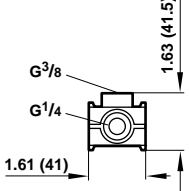
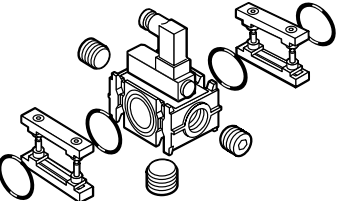
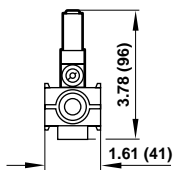
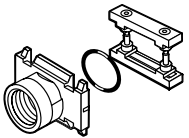
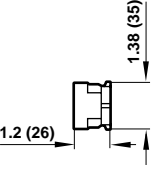
<p>Quikclamp</p> <p>Use with all 73 and 74 Series Products to provide modular installation capability. Flanges on the products slide into V grooves in the Quikclamp. Two face-sealing o-rings in the Quikclamp provide a positive seal when the clamp is closed and the captive screw is tightened. A Quikclamp adds 0.54" (13.6 mm) to the overall length of a combination unit. Tighten screw with a 5/32" (4 mm) hex or T25 Torx wrench.</p>  <p>Material: Zinc Quikclamp part number: 4314-51 O-ring kit part number: 4384-770</p>	<p>Quikclamp Wall Mounting Bracket</p> <p>Use with the Quikclamp to provide secure mounting to a wall, machine panel or other flat surface. Use No. 12 (6 mm) screws to mount bracket to wall.</p>  <p>Material: Zinc Part number: 4313-50</p>	<p>Replacement Pressure Switch</p> <p>Use only with the pressure switch subbase. Cannot be used with the standard porting block.</p>  <p>Material: Aluminum Pressure switch part number: 4346-01 Replacement connector: 4346-01R</p>	<p>Manifold Block</p> <p>Installs with Quikclamps. Ports are threaded 3/4" pipe to provide manifolding capability for up to three components.</p>  <p>Material: Zinc Part number Side port threads 4328-51 3/4" PTF 4328-53 3/4" ISO G 4328-52 3/4" ISO Rc</p>
<p>Quikmount Pipe Adapters</p> <p>Use with the Quikclamp to provide threaded connections to the system piping. Each pipe adapter adds 0.71" (18 mm) to the overall length of a combination unit (each kit contains one adapter).</p>  <p>Material: Aluminum Part number Port size and thread (Qty 1)</p>	<p>Quikclamp and Wall Mounting Bracket</p> <p>See preceding paragraphs for descriptions and dimensions.</p>  <p>Material: Zinc Part number: 4314-52 L74 1 quart 4314-55</p>	<p>Subbase Mounted Pressure Switch</p> <p>Monitors air pressure and provides an electrical output when the pressure drops below or exceeds an adjustable preset pressure. Installs between two Quikclamps. Also provides three additional 1/4" outlets for auxiliary air. A Subbase Mounted Pressure Switch adds 1.30" (33 mm) to the overall length of a combination unit.</p>  <p>Specifications Maximum Pressure: 300 psig (20 bar) Maximum Temperature: 175°F (80°C) Adjustable Range: 30 to 150 psig (2 to 10 bar) Shipped from factory preset at 90 psig (6.2 bar). Maximum Voltage: 240V ac/dc Maximum Current: 5 Amp Hysteresis at Midpoint: 12%</p> <p>Materials: Zinc subbase, Aluminum switch Part number Auxiliary port thread 4346-50 1/4" PTF 4346-51 1/4" ISO Rc 4346-52 1/4" ISO G</p>	<p>Transition Connector</p> <p>Enables connection of Excelon 72 to 74 units. A transition connector adds 0.06" (1.5mm) to the overall length of a combination unit.</p>  <p>Material: Aluminum Part Number: 4417-01</p>
<p>4315-01 1/4" PTF 4315-02 3/8" PTF 4315-03 1/2" PTF 4315-04 3/4" PTF 4315-05 1/4" ISO Rc 4315-06 3/8" ISO Rc 4315-07 1/2" ISO Rc 4315-08 3/4" ISO Rc 4315-09 1/4" ISO G 4315-10 3/8" ISO G 4315-11 1/2" ISO G 4315-12 3/4" ISO G</p>	<p>Porting Block</p> <p>Installs between two Quikclamps to provide three additional 1/4" outlets for auxiliary air. A Porting Block adds 1.30" (33 mm) to the overall length of a combination unit.</p>  <p>Material: Zinc Part number Auxiliary port size and thread 4316-50 1/4" PTF 4316-51 1/4" ISO Rc 4316-52 1/4" ISO G</p>		

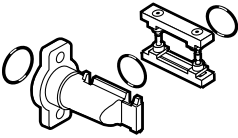
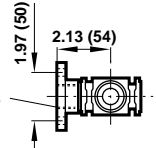
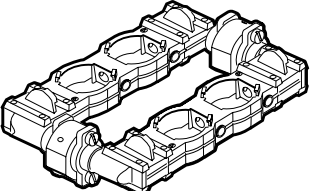


64 Series Modular Components

All Dimensions in Inches (mm)

Single Yoke	Double Yoke	Triple Yoke	Yoke Connector
  * 3/4 = 6.18 (157)	  * 3/4 = 9.33 (237)	  * 3/4 = 13.46 (342)	 74503-51
1/4 Y64A-2AA-N1N	1/4 Y64A-2AA-N2N	1/4 Y64A-2AA-N3N	
3/8 Y64A-3AA-N1N	3/8 Y64A-3AA-N2N	3/8 Y64A-3AA-N3N	
1/2 Y64A-4AA-N1N	1/2 Y64A-4AA-N2N	1/2 Y64A-4AA-N3N	
3/4 Y64A-6AA-N1N	3/4 Y64A-6AA-N2N	3/4 Y64A-6AA-N3N	

Porting Block	Adjustable Pressure Switch	End Connector
 <ul style="list-style-type: none"> ● (2) 1/4 outlets ● (1) 3/8 outlet  P ₁ max. = 250 psi (17 bar) T max. = 175°F (80°C)	 <ul style="list-style-type: none"> ● 30-150 psi (2-10 bar) adjustable ● Porting block mounted ● DIN 43650 form C connector  P ₁ max. = 250 psi (17 bar) T max. = 175°F (80°C) I max. = 5 A V max. = 240 V Reset differential = 15 psi (1 bar) nominal	 <ul style="list-style-type: none"> ● For use with end mounted porting block ● 1/2 or 3/4 over porting  1/2 74505-50 3/4 74505-53
74507-50	4346-99	

Rear Entry Bracket Kit	Duplex Kit
  18-026-981	 18-026-978

Accessories for Filters, Regulators, and Lubricators

Contents	
Filters	ALE-25-2
Regulators	ALE-25-4
Filter/Regulators	ALE-25-12
Lubricators	ALE-25-15
Relief Valves	ALE-25-19
Shut-Off Valves	ALE-25-21
Smooth Start & Directional Control Valves	ALE-25-22

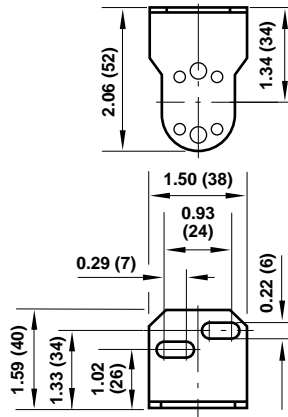


Filter Accessories

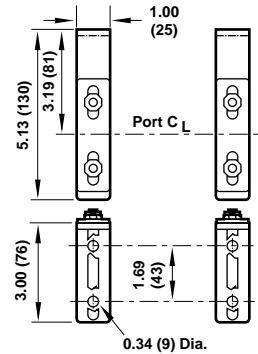
Product	Accessory	Part No.
F07	Wall bracket	5939-06
F17	Wall bracket	3/4", 1" Ports: 6212-50 1-1/4", 1-1/2" Ports: 6212-51
F22	Wall bracket	18-001-962
F39	Wall bracket	5939-06
F46	Wall bracket	3/4", 1" Ports: 6212-50 1-1/4", 1-1/2" Ports: 6212-51
F64	Wall bracket	74504-50

All Dimensions in Inches (mm)

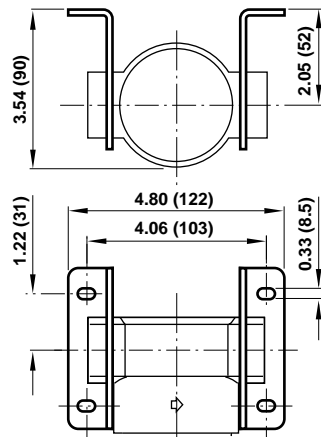
F07, F39 Bracket (5939-06)



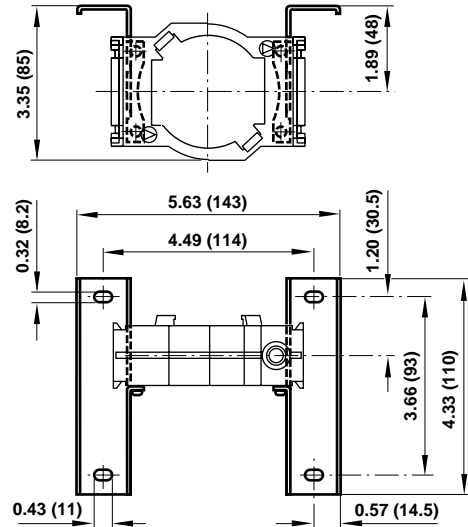
F17, F46 Bracket (6212-50, 6212-51)



F22 Bracket (18-001-962)



F64 Bracket (74504-50)

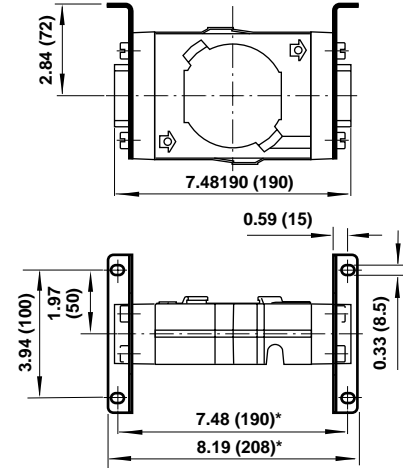




Product	Accessory	Part No.
F68	Wall bracket 1/2", 3/4", 1", 1-1/4" Ports: 18-001-978 1-1/2" Ports: Not Available	
F72	Wall bracket	4224-50
F73	Wall Bracket	4424-50
	Electric service indicator Provides electrical signal when element needs to be replaced.	4020-51R
	Visual service indicator Turns from green to red when element needs to be replaced.	5797-50
F74	Wall bracket	4324-50
	Electric service indicator Provides electrical signal when element needs to be replaced.	4020-51R
	Visual service indicator Turns from green to red when element needs to be replaced.	5797-50

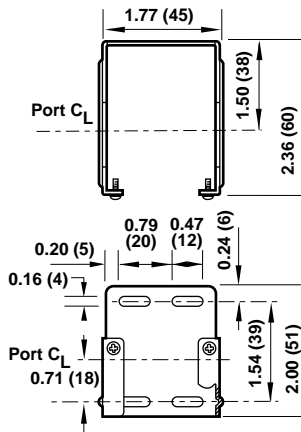
All Dimensions in Inches (mm)

F68 Bracket (18-001-978)

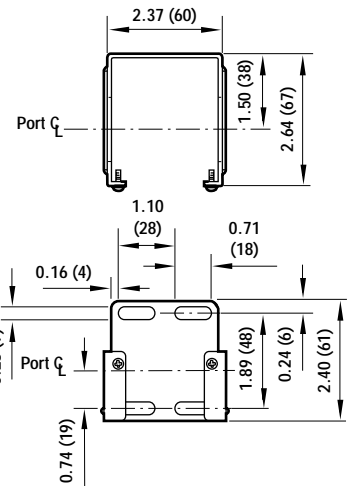


* Add 0.39" (10) for 1-1/4" ported yokes.

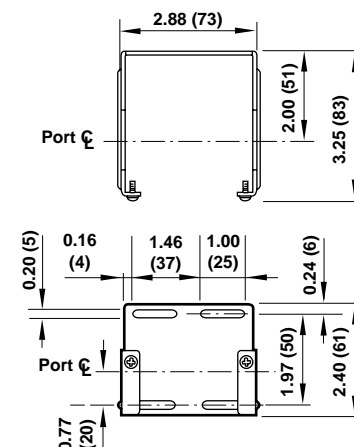
F72 Bracket (4224-50)



F73 Bracket (4424-50)



F74 Bracket (4324-50)



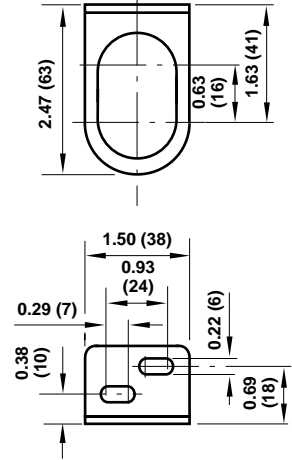


Regulator Accessories

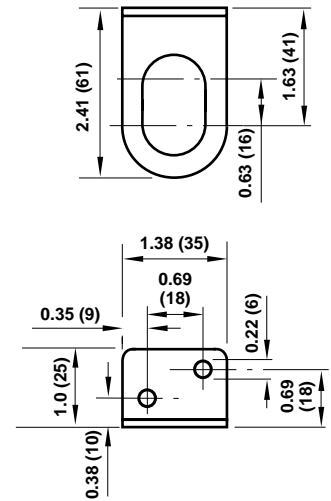
Product	Accessory	Part No.
R05	Plastic panel nut	2962-89
R06	Wall bracket for R06 with plastic bonnet	Bracket and plastic nut: 18-025-003 Plastic nut: 2962-89 Metal nut: 2962-04
	Wall bracket for R06 with brass bonnet	Bracket and metal nut: 18-001-021 Metal nut: 616-01
	Tamper resistant knob	18-001-092
R07	Wall bracket with plastic nut	Bracket and plastic nut: 18-025-003 Plastic nut: 2962-89 Metal nut: 2962-04
	Tamper resistant knob	18-001-092
R17	Wall bracket with plastic nut	Bracket and plastic nut: 5570-04 Plastic nut: 5226-89 Metal nut: 5226-97
	Tamper resistant seal wire	2117-01
R18	Muffler	3/4 PTF: MB006A R 3/4: MB006B

All Dimensions in Inches (mm)

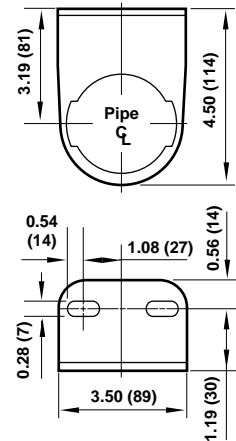
R06, R07 Bracket (18-025-003)



R06 Bracket for Brass Bonnet (18-001-021)



R17 Bracket (5570-04)

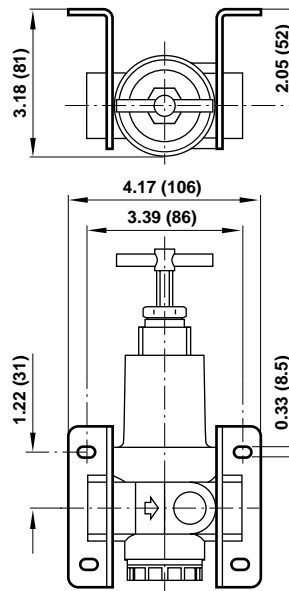




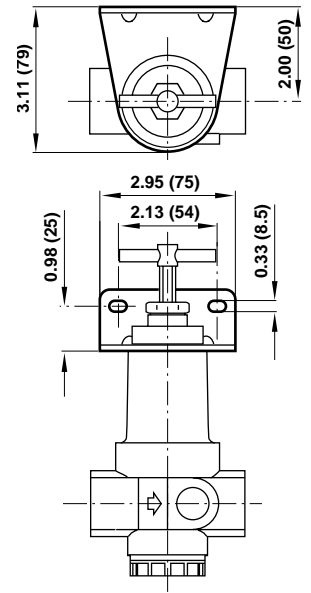
Product	Accessory	Part No.
R22	Wall bracket	18-001-962
	Wall bracket (neck mount)	Bracket and metal nut: 18-001-959 Metal nut: 5988-02
R24	Wall bracket with metal nut	Bracket and metal nut: 18-999-412 Plastic nut: 2962-89 Metal nut: 2962-04
	Reducing bushing for gauge ports	3/8 to 1/4 PTF: 5950-01 1/2 to 1/4 PTF: 2339-04 R1/4 to G1/8: 150232818 R3/8 to G1/8: 150233818 R1/2 to G1/8: 150234818
R30M	Plastic panel nut	2962-89
	Metal panel nut	2962-04
	Tamper resistant knob	18-001-092
	Push-in connector	8 mm: 11-002-0800 10 mm: 11-002-1000
	Push-in plug	8 mm: 11-004-0800 10 mm: 11-004-1000
	Push-in gauge adapter	8 mm: 74679-02 10 mm: 74679-03

All Dimensions in Inches (mm)

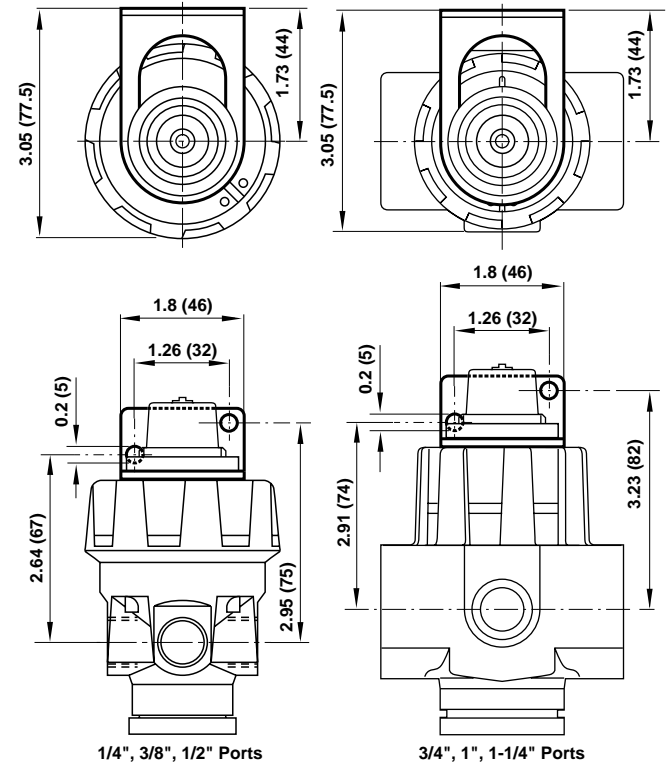
R22 Bracket (18-001-962)



R22 Neck Bracket (18-001-959)





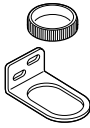
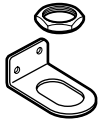



R24 Bracket (18-999-412)



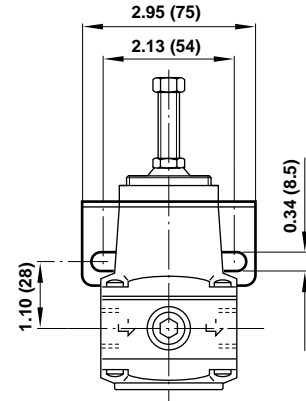
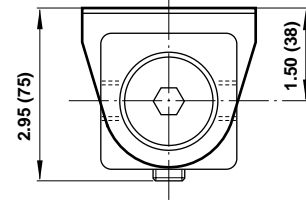


Regulator Accessories

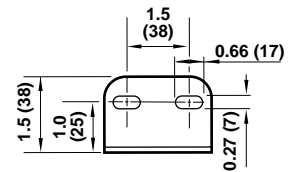
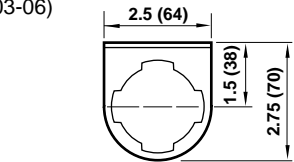
Product	Accessory	Part No.	
R38	Aluminum wall bracket and nut: 18-001-974 Aluminum nut: 5988-01		
	Stainless steel wall bracket and nut: 18-001-973 Stainless steel nut: 5988-02		
	Plastic adjusting knob		655-97
	Tamper resistant cap	18-004-987	
R40 R41 R43	Wall bracket with metal nut	Bracket and metal nut: 5203-06 Plastic nut: 5198-89 Metal nut: 5191-88	
	Tamper resistant seal wire	2117-01	
R44	Wall bracket for R44 with plastic bonnet	Bracket and plastic nut: 18-025-003 Plastic nut: 2962-89 Metal nut: 2962-04	
	Wall bracket for R44 with brass bonnet	Bracket and metal nut: 18-001-021 Metal nut: 616-01	
	Tamper resistant knob	18-001-092	

All Dimensions in Inches (mm)

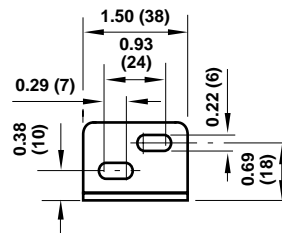
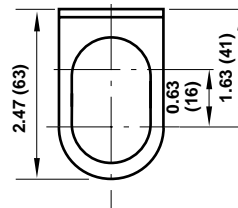
R38 Bracket (18-001-974)



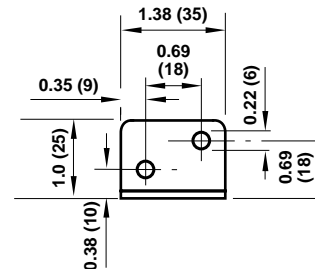
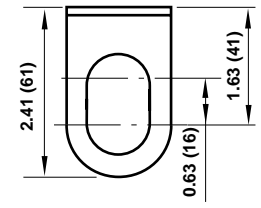
R40, R41, R43 Bracket (5203-06)



R44 Bracket (18-025-003)



R44 Bracket for Brass Bonnet (18-001-021)

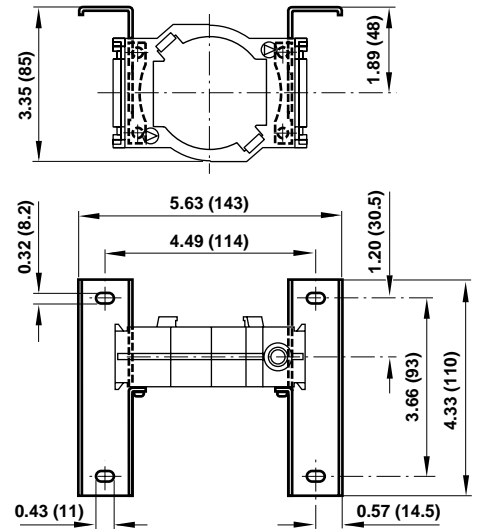




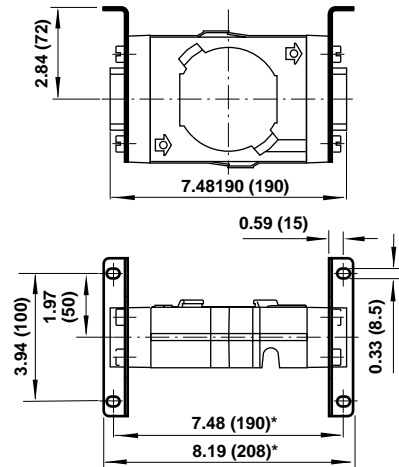
Product	Accessory	Part No.
R64	Wall bracket	74504-50
	Metal panel nut	4348-89
	Tamper resistant cover and wire. Install over knob to help prevent tampering of pressure setting. Use up to 4 padlocks with 5/16" (8mm) diameter shackle to secure cover. Lockout hasp may also be used.	Cover and wire: 4355-51 Wire: 2117-01
	Lockout hasp. Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.	54547-01
R68	Wall bracket	1/2", 3/4", 1", 1-1/4" Ports: 18-001-978 1-1/2" Ports: Not Available
	Tamper resistant cover and wire. Install over knob to help prevent tampering of pressure setting. Use up to 4 padlocks with 5/16" (8mm) diameter shackle to secure cover. Lockout hasp may also be used.	Cover and wire: 4355-51 Wire: 2117-01
	Lockout hasp. Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.	54547-01
R72	Wall bracket	4224-50
	Wall bracket/plastic nut	Bracket and plastic nut: 74316-50 Plastic nut: 4248-89 Metal Nut: 4248-01
	Tamper resistant cover and wire. Install over knob to help prevent tampering of pressure setting. Use up to 2 padlocks with 5/16" (8mm) diameter shackle to secure cover. Lockout hasp may also be used.	Cover and wire: 4255-51 Wire: 2117-01
	Lockout hasp. Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.	54547-01

All Dimensions in Inches (mm)

R64 Bracket (74504-50)

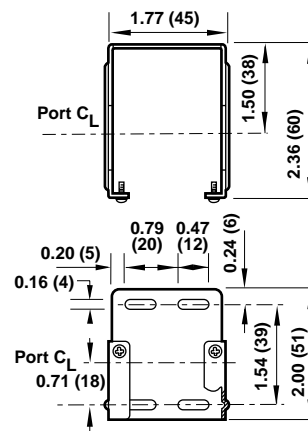


R68 Bracket (18-001-978)

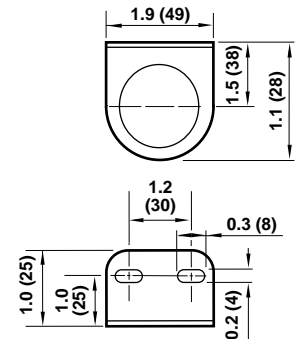


* Add 0.39" (10) for 1-1/4" ported yokes.

R72 Bracket (4224-50)



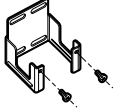
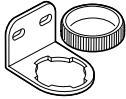


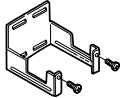
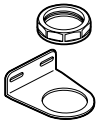
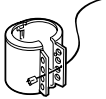

R72 Neck Bracket (74316-50)



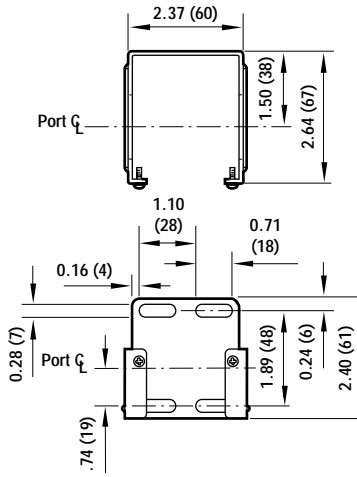


Regulator Accessories

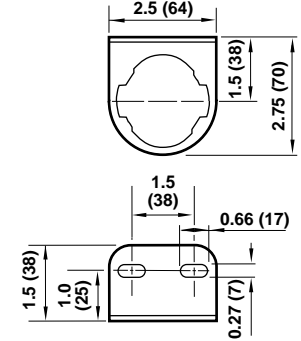
All Dimensions in Inches (mm)

Product	Accessory	Part No.
R73	Wall bracket	4424-50
		
	Wall bracket/metal nut Bracket and metal nut: 4461-50 Metal Nut: 5191-88 Plastic Nut: 5191-89 	
	Tamper resistant cover and wire. Install over knob to help prevent tampering of pressure setting. Use up to 4 padlocks with 5/16" (8mm) diameter shackle to secure cover. Lockout hasp may also be used. Cover and wire: 4455-51 Wire: 2117-01 	
	Lockout hasp. Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle. 	54547-01
R74	Wall bracket	4324-50
		
	Wall bracket/metal nut Bracket and metal nut: 4368-51 Metal Nut: 4348-89 	
	Tamper resistant cover and wire. Install over knob to help prevent tampering of pressure setting. Use up to 4 padlocks with 5/16" (8mm) diameter shackle to secure cover. Lockout hasp may also be used. Cover and wire: 4355-51 Wire: 2117-01 	
	Lockout hasp. Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle. 	54547-01

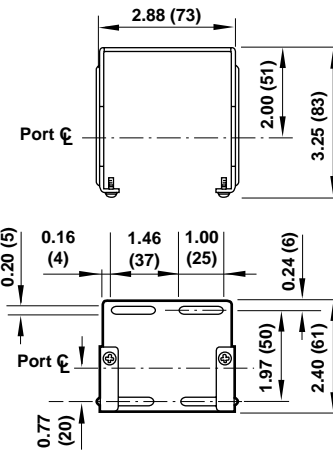
R73 Bracket (4424-50)



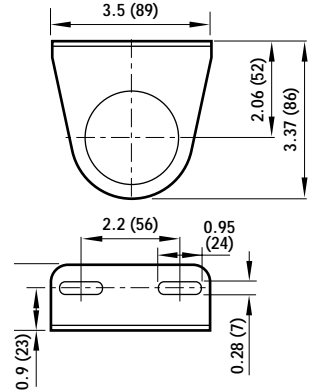
R73 Neck Bracket (4461-50)



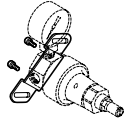










R74 Bracket (4324-50)



R74 Neck Bracket (4368-51)

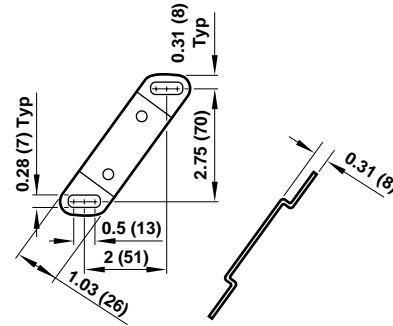




Product	Accessory	Part No.
R81 R82 R83 R84	 Wall bracket	5095-51
	 Pipe plug, hex socket	1/4 PTF: 2891-97
	 Nipple	1/4 PTF male: 18-006-067
	 Union adapter with cap 1/4 PTF to 1/4 tube (45° flare): 18-006-068 Adapter only: 18-006-027 Cap only: 3302-50	
	 Cylinder connector, nitrogen service, 0.906-14 RH external thread	CGA No. 580: 18-008-004
	 Cylinder connector, carbon dioxide service, 0.830-14 RH internal thread	CGA No 320: 18-008-002 With 2.25" (57mm) long nipple: 18-008-015 Replacement gasket: 1390-02
	 Check valves * 1/4 PTF male to 1/4 tube (45° flare): 16-009-001 1/4 PTF male to 1/2-16 BSF: 16-009-002 1/4 PTF male to 1/4 PTF female: 16-009-003	
	 Check and relief valve ** Relief cracking pressure: 130±4 psig (9 ±0.28 bar)	1/4 PTF male to 1/4 tube (45° flare): 16-006-107
	 Manifolds with integral check valve * 2 or 3 outlets, 1/4 PTF male to 1/4 tube (45° flare): 3228-54 2 or 3 outlets, 1/4 PTF male to 1/2-16 BSF: 3228-55 4 or 5 outlets, 1/4 PTF male to 1/4 tube (45° flare): 3228-60 4 or 5 outlets, 1/4 PTF male to 1/2-16 BSF: 3228-61	
	 Manifold extension	1/4 PTF male to 1/4 PTF female: 2340-50
	 Streamline wye †	1/4 PTF male to 1/4 PTF female: 18-006-016

All Dimensions in Inches (mm)

R81, R82, R83, R84 Bracket (5095-51)



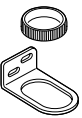

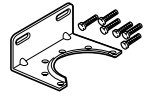


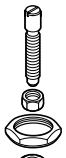
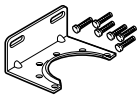
* The listed check valves and manifolds with integral check valves are designed for use with Norgren beverage regulators (R81, R82, R84) to help prevent the back flow of liquids into the regulator.

** The 16-006-107 check and relief valve meets the pressure and flow requirements of paragraphs 4.5 and 4.6 of NSDA Pamphlet TD02, **Installation and Operational Procedures for Pressurized Soft Drink Dispensing Systems**, dated July, 1980.

† Check valves, or manifolds with integral check valves, must be installed in the outlet ports of the wye when the wye is installed in the outlet port of Norgren beverage regulators.

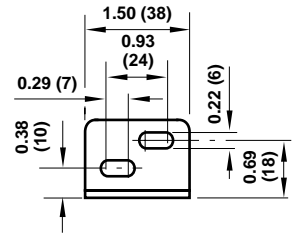
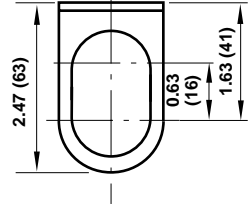


Regulator Accessories

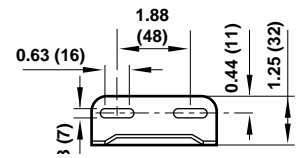
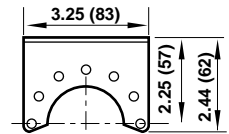
Product	Accessory	Part No.
R91	Wall bracket with plastic nut 	Bracket and plastic nut: 18-025-003 Plastic nut: 2962-89 Metal nut: 2962-04
	Tamper resistant knob 	18-001-092
11-002	Wall bracket 	18-001-003
	Panel mount kit with T-bar adjustment 	18-003-004
	Panel mount kit with hand wheel adjustment 	18-003-002
	Panel mount kit with screw adjustment 	18-003-006
11-008	Wall bracket 	Units with 1/2" ports: 18-001-003 Units with 3/4" and 1" ports: 18-001-027

All Dimensions in Inches (mm)

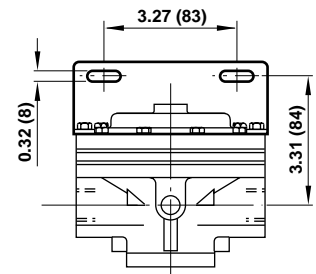
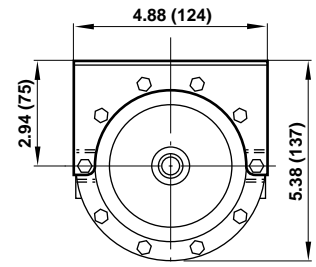
R91 Bracket (18-025-003)



11-002 Bracket 11-008 Bracket (Units with 1/2" Ports) (18-001-003)



11-008 Bracket (Units with 3/4" and 1" Ports) (18-001-027)

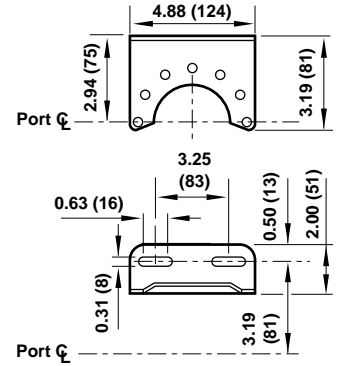




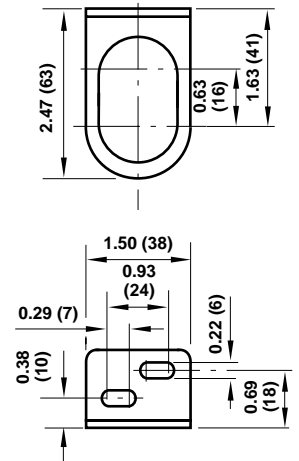
Product	Accessory	Part No.
11-009	Wall bracket	18-001-029
	Screw adjustment	1095-02
11-018	Tamper resistant cap	639-02
11-042	Muffler	3/4 PTF: MB006A R3/4: MB006B
11-044	Wall bracket with plastic nut	Bracket and plastic nut: 18-025-003 Plastic nut: 2962-89 Metal nut: 2962-04
	Tamper resistant knob	18-001-092
11400-20AL	Wall bracket	18-001-003

All Dimensions in Inches (mm)

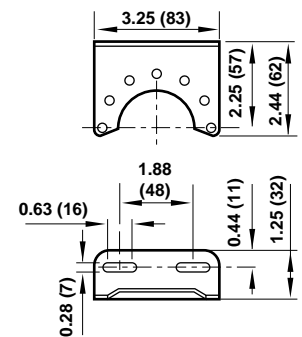
11-009 Bracket (18-001-029)



11-044 Bracket (18-025-003)



**11400- Bracket
20AL Bracket
(18-001-003)**

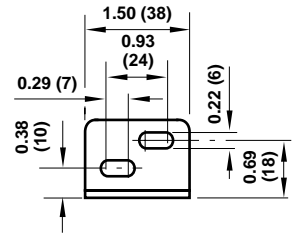
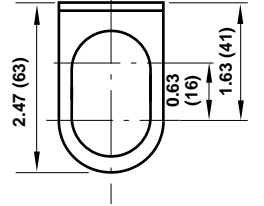




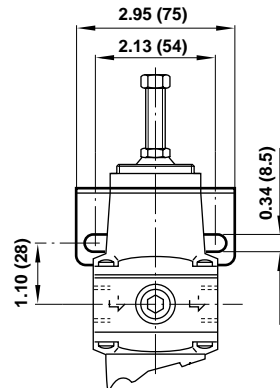
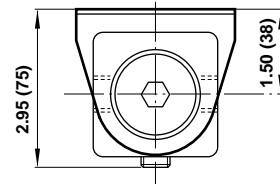
Filter/Regulator Accessories

All Dimensions in Inches (mm)

B07, B39 Bracket (18-025-003)


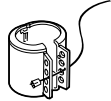

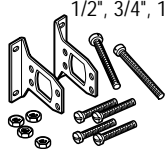
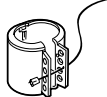



B38 Bracket (18-001-974)



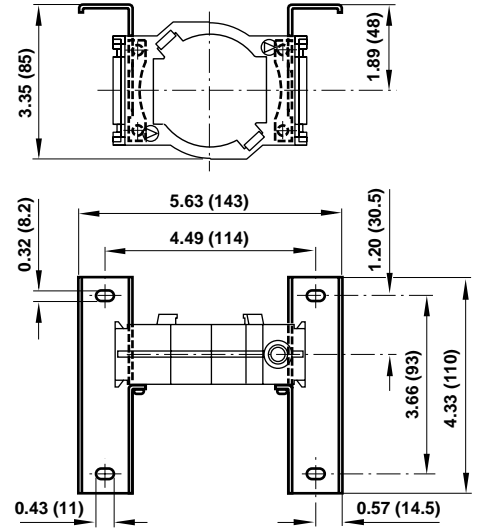
Product	Accessory	Part No.
B05	Plastic Panel Nut	2962-89
B07	Wall bracket with plastic nut	Bracket and plastic nut: 18-025-003 Plastic nut: 2962-89 Metal nut: 2962-04
	Tamper resistant knob	18-001-092
B38	Aluminum wall bracket and nut	18-001-974 Aluminum nut: 5988-01
	Stainless steel wall bracket and nut	18-001-973 Stainless steel nut: 5988-02
	Plastic adjusting knob	655-97
	Tamper resistant cap	18-004-987
B39	Wall bracket with plastic nut	Bracket and plastic nut: 18-025-003 Plastic nut: 2962-89 Metal nut: 2962-04
	Tamper resistant knob	18-001-092



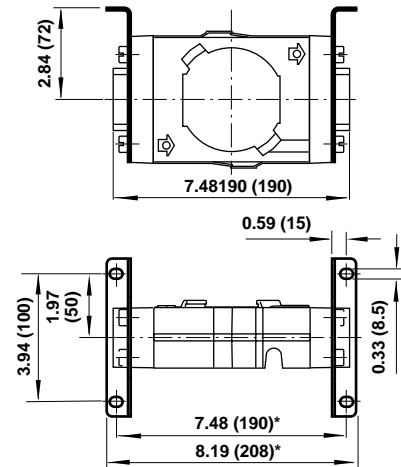
Product	Accessory	Part No.
B64	Wall bracket	74504-50
	 <p>Tamper resistant cover and wire. Cover and wire: 4355-51 Install over knob to help prevent Wire: 2117-01 tampering of pressure setting. Use up to 4 padlocks with 5/16" (8mm) diameter shackle to secure cover. Lockout hasp may also be used.</p>  <p>Lockout hasp. 54547-01 Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.</p> 	
B68	Wall bracket	1/2", 3/4", 1", 1-1/4" Ports: 18-001-978 1-1/2" Ports: Not Available
	 <p>Tamper resistant cover and wire. Cover and wire: 4355-51 Install over knob to help prevent Wire: 2117-01 tampering of pressure setting. Use up to 4 padlocks with 5/16" (8mm) diameter shackle to secure cover. Lockout hasp may also be used.</p>  <p>Lockout hasp. 54547-01 Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.</p> 	

All Dimensions in Inches (mm)

B64 Bracket (74504-50)



B68 Bracket (18-001-978)

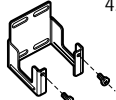

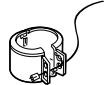

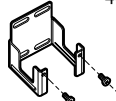



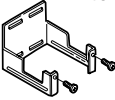





* Add 0.39" (10) for 1-1/4" ported yokes.

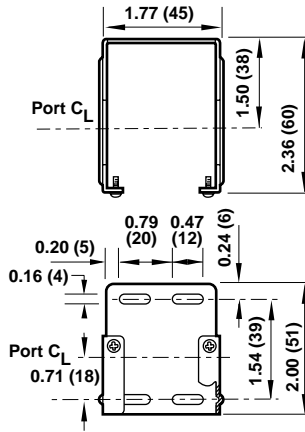


Filter/Regulator Accessories

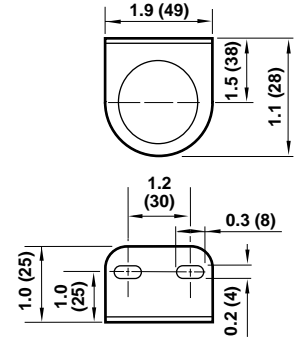
All Dimensions in Inches (mm)

Product	Accessory	Part No.
B72	Wall bracket	4224-50
	 Wall bracket/plastic nut Bracket and plastic nut: 74316-50 Plastic nut: 4248-89 Metal Nut: 4248-01 	
	Tamper resistant cover and wire. Cover and wire: 4255-51 Install over knob to help prevent Wire: 2117-01 tampering of pressure setting. Use up to 2 padlocks with 5/16" (8mm) diameter shackle to secure cover. Lockout hasp may also be used. 	
	Lockout hasp. 54547-01 Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle. 	
B73	Wall bracket	4424-50
	 Wall bracket/metal nut Bracket and metal nut: 4461-50 Metal Nut: 5191-88 Plastic Nut: 5191-89 	
	Tamper resistant cover and wire. Cover and wire: 4455-51 Install over knob to help prevent Wire: 2117-01 tampering of pressure setting. Use up to 4 padlocks with 5/16" (8mm) diameter shackle to secure cover. Lockout hasp may also be used. 	
	Lockout hasp. 54547-01 Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle. 	
B74	Wall bracket	4324-50
	 Wall bracket/metal nut Bracket and metal nut: 4368-51 Metal Nut: 4348-89 	
	Tamper resistant cover and wire. Cover and wire: 4355-51 Install over knob to help prevent Wire: 2117-01 tampering of pressure setting. Use up to 4 padlocks with 5/16" (8mm) diameter shackle to secure cover. Lockout hasp may also be used. 	
	Lockout hasp. 54547-01 Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle. 	

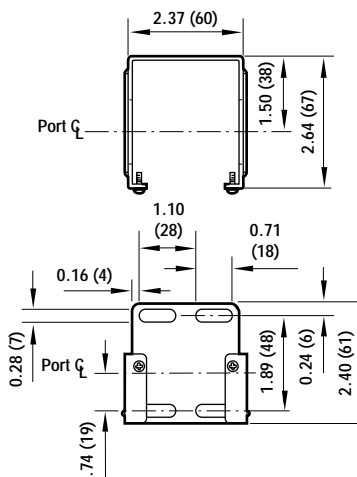
B72 Bracket (4224-50)



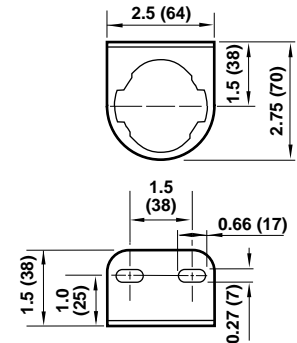
B72 Neck Bracket (74316-50)



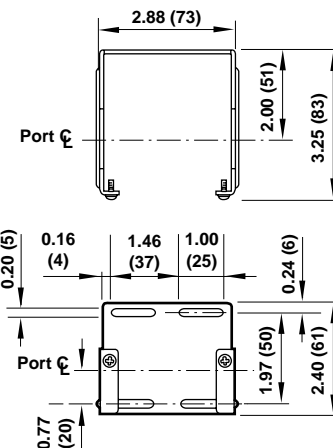
B73 Bracket (4424-50)



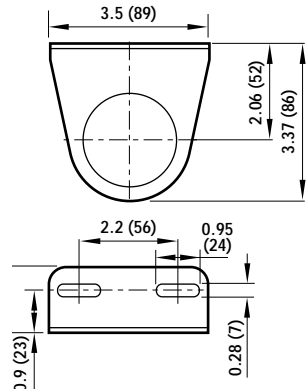
B73 Neck Bracket (4461-50)



B74 Bracket (4324-50)



B74 Neck Bracket (4368-51)

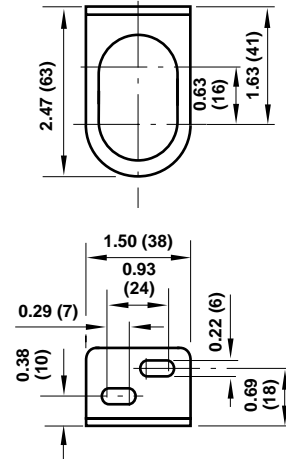




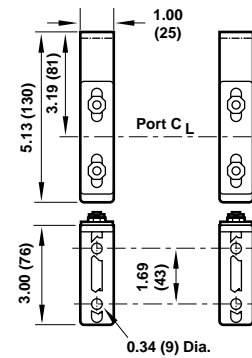
Product	Accessory	Part No.
L07	Wall bracket with plastic nut	Bracket and plastic nut: 18-025-003 Plastic nut: 2962-89 Metal nut: 2962-04
L17	Wall bracket - use with 1 and 2 quart reservoirs only	3/4", 1" Ports: 6212-50 1-1/4", 1-1/2" Ports: 6212-51
	Wall strap - use with 2 and 5 gal reservoirs only	2 gal reservoir: 18-001-056 5 gal reservoir: 18-001-039
	Low oil level switch. Provides electrical signal for warning or shut-down when oil level is low.	2 qt reservoir: 18-023-612 2 gal reservoir: 18-023-614 5 gal reservoir: 18-023-616
	High/Low oil level switch. Provides electrical signal for warning or shut-down when oil level is full or low.	2 gal reservoir: 18-023-656 5 gal reservoir: 18-023-658
	Pyrex dome and metal fill plug	5605-60
L22	Quick fill cap. Use with Norgren 18-010-003 oil pump, pail, and hose assembly (see catalog sheet NC-26) to refill reservoir without shutting off air supply. Replaces fill plug.	18-011-021
	Fill plug with 1/8 PTF tapped hole. Use with customer supplied pressurized oil source to refill reservoir without shutting off air supply. Replaces standard fill plug.	5301-52
L22	Wall bracket	18-001-962

All Dimensions in Inches (mm)

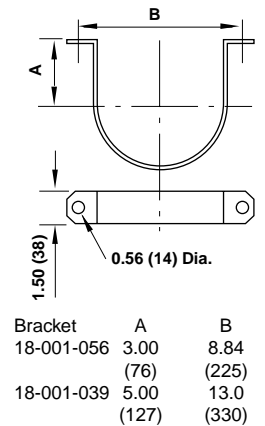
L07 Bracket (18-025-003)



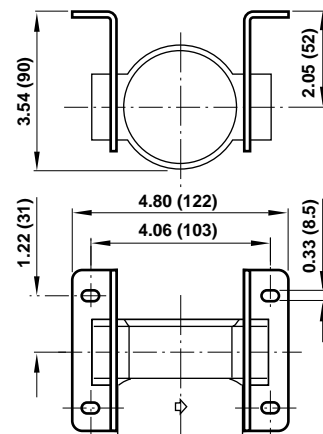
L17 Bracket (6212-50, 6212-51)



L17 Strap (18-001-039/056)



L22 Bracket (18-001-962)



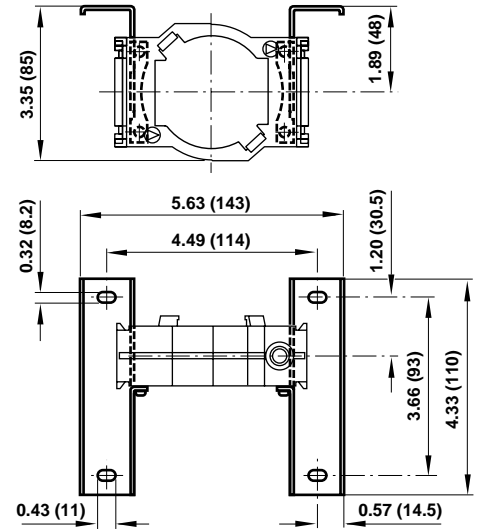


Lubricator Accessories

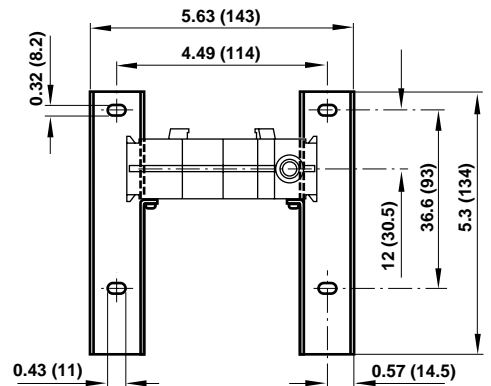
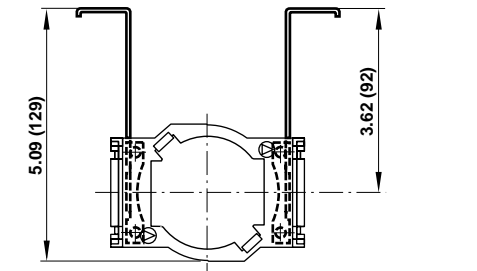
All Dimensions in Inches (mm)

Product	Accessory	Part No.
L64	Wall bracket	7 ounce bowl: 74504-50 1 quart bowl: 74504-52
	Tamper resistant seal wire for sight-feed dome	2117-01
	Low oil level switch. Provides electrical signal for warning or shut-down when oil level is low.	1 qt reservoir: 18-023-610
	Quick fill cap. Use with Norgren 18-010-003 oil pump, pail, and hose assembly (see catalog sheet NC-26) to refill reservoir without shutting off air supply. Replaces fill plug.	18-011-024
	Remote fill - use with 7 ounce reservoir only. Use with customer supplied pressurized oil source to automatically refill reservoir.	5335-50
L68	Wall bracket	1/2", 3/4", 1", 1-1/4" Ports: 18-001-978 1-1/2" Ports: Not Available
	Tamper resistant seal wire for sight-feed dome	2117-01
	Low oil level switch. Provides electrical signal for warning or shut-down when oil level is low.	2 gal reservoir: 18-007-975 5 gal reservoir: 18-007-974
	Quick fill cap. Use with Norgren 18-010-003 oil pump, pail, and hose assembly (see catalog sheet NC-26) to refill reservoir without shutting off air supply. Replaces fill plug.	18-011-021
	Remote fill - use with 1 qt reservoirs only. Use with customer supplied pressurized oil source to automatically refill reservoir.	5335-52

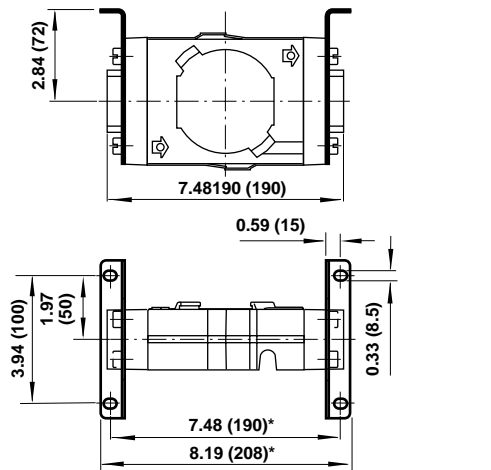
L64 Bracket (74504-50)



L64 Bracket (74504-52)



L68 Bracket (18-001-978)

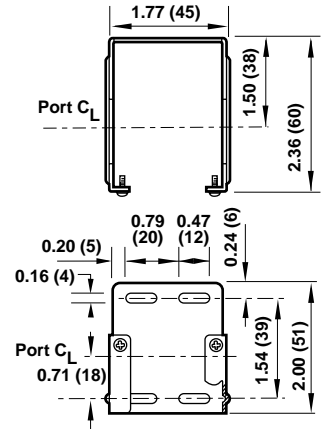




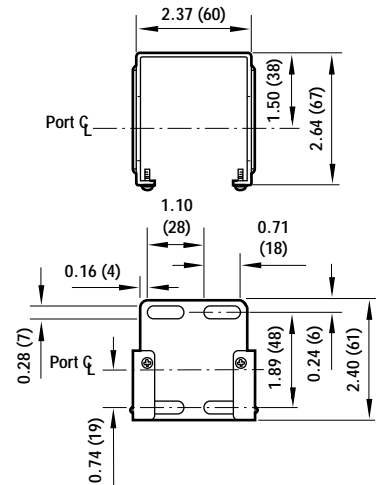
Product	Accessory	Part No.
L72	Wall bracket	4224-50
L73	Wall bracket	4424-50
	Quick fill cap. Use with Norgren 18-010-003 oil pump, pail, and hose assembly (see catalog sheet NC-26) to refill reservoir without shutting off air supply. Replaces fill plug.	18-011-024
L74	Wall bracket	7 ounce bowl: 4324-50 1 quart bowl: 4324-51
	Low oil level switch - use with 1 qt reservoir only Provides electrical signal for warning or shut-down when oil level is low.	18-023-610
	Quick fill cap. Use with Norgren 18-010-003 oil pump, pail, and hose assembly (see catalog sheet NC-26) to refill reservoir without shutting off air supply. Replaces fill plug.	18-011-024
	Remote fill - use with 7 ounce reservoir only Use with customer supplied pressurized oil source to automatically refill reservoir.	5335-50

All Dimensions in Inches (mm)

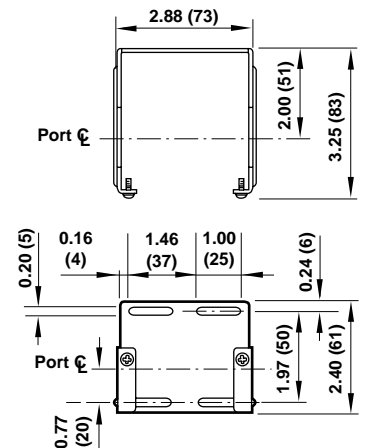
L72 Bracket (4224-50)



L73 Bracket (4424-50)



L74 Bracket (4324-50)

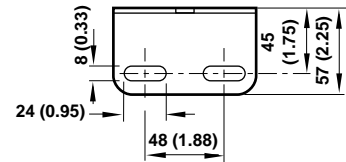
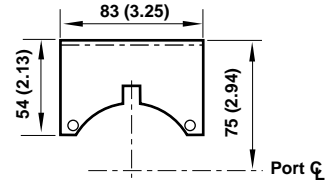




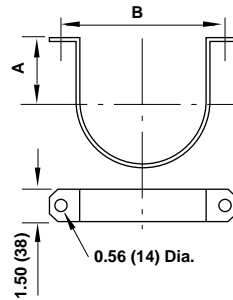
Lubricator Accessories

All Dimensions in Inches (mm)

10-015 Bracket (18-001-009)



10-028, 10-065, 10-076 Strap (18-001-039/056)



Bracket	A	B
18-001-056	3.00 (76)	8.84 (225)
18-001-039	5.00 (127)	13.0 (330)

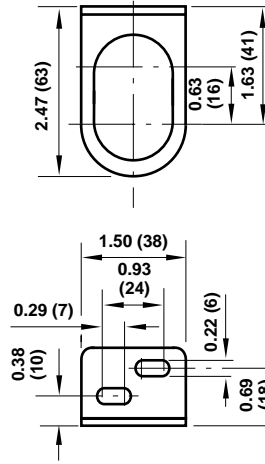
Product	Accessory	Part No.
10-015 and 10-065	Wall bracket kit - use with 10-015 only. Includes screws to attach lubricator	18-001-009
	Wall strap - use with 10-065	10-065-006: 18-001-056 10-065-007: 18-001-039
	Low oil level switch. Provides electrical signal for warning or shut-down when oil level is low.	10-015-004: 18-023-020 10-005-005: 18-023-018 10-065-006: 18-023-022 10-065-007: 18-023-024
	Pyrex dome kit	1804-03
	Quick fill cap. Use with Norgren 18-010-003 oil pump, pail, and hose assembly (see catalog sheet NC-26) to refill reservoir without shutting off air supply. Replaces fill plug.	18-011-006
	Bowl guard for 10-015-002 and 10-015-100	18-012-002
	Streamline wye 1/4 PTF male to 1/4 PTF female:	18-006-016
10-028	Wall strap	2 gal reservoir: 18-001-056 5 gal reservoir: 18-001-039
	Quick fill cap. Use with Norgren 18-010-003 oil pump, pail, and hose assembly (see catalog sheet NC-26) to refill reservoir without shutting off air supply. Replaces fill plug.	18-011-008
	Pyrex/aluminum dome	5605-50
10-076	Wall strap	2 gal reservoir: 18-001-056 5 gal reservoir: 18-001-039
	Pyrex/aluminum dome	5605-50



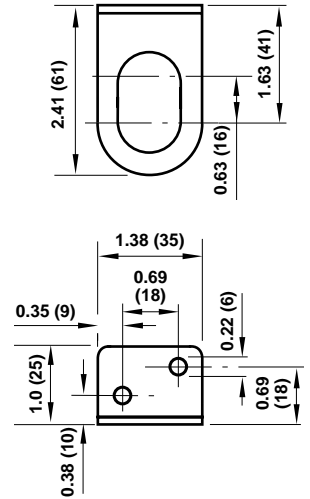
Product	Accessory	Part No.
V06	Wall bracket for V06 with plastic bonnet	Bracket and plastic nut: 18-025-003 Plastic nut: 2962-89 Metal nut: 2962-04
	Wall bracket for V06 with brass bonnet	Bracket and metal nut: 18-001-021 Metal nut: 616-01
	Tamper resistant knob	18-001-092
V07	Wall bracket with plastic nut	Bracket and plastic nut: 18-025-003 Plastic nut: 2962-89 Metal nut: 2962-04
	Tamper resistant knob	18-001-092
V64	Wall bracket	74504-50
	Muffler	1/2 PTF: MB004A R1/2: MB004B
	Tamper resistant cap	1581-90
V68	Wall bracket	3/4", 1", 1-1/4" Ports: 18-001-978 1-1/2" Ports: Not Available
	Muffler	1/2 PTF: MB008A R1/2: MB008B

All Dimensions in Inches (mm)

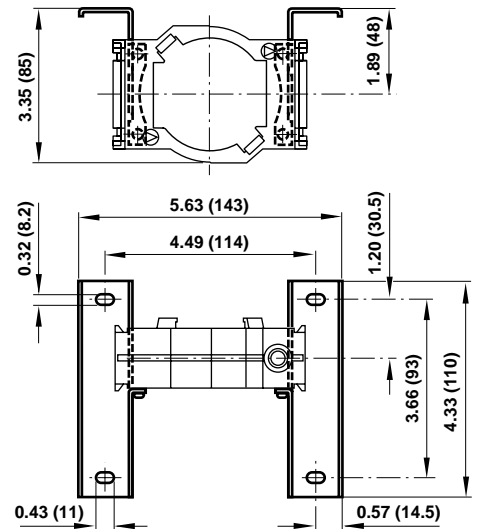
V06, V07 Bracket
(18-025-003)



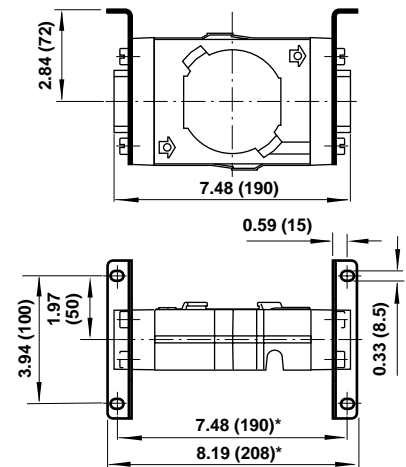
V06 Bracket for Brass Bonnet
(18-001-021)



V64 Bracket (74504-50)



V68 Bracket (18-001-978)



* Add 0.39" (10) for 1-1/4" ported yokes.

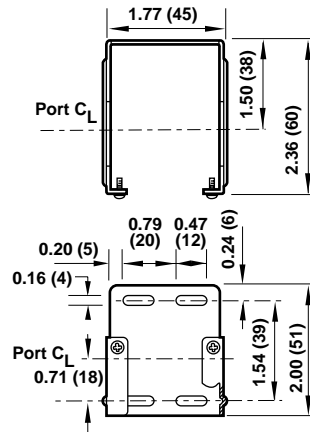


Relief Valve Accessories

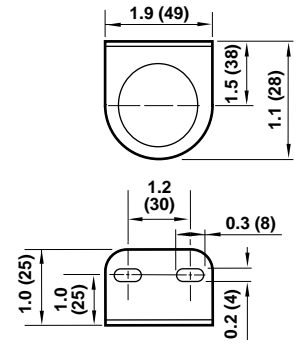
Product	Accessory	Part No.
V72	Wall bracket	4224-50
	Wall bracket/plastic nut	Bracket and plastic nut: 74316-50 Plastic nut: 4248-89 Metal Nut: 4248-01
	Tamper resistant cover and wire.	Cover and wire: 4255-51 Wire: 2117-01
	Lockout hasp.	54547-01
V74	Wall bracket	4324-50
	Wall bracket/metal nut	Bracket and metal nut: 4368-51 Metal Nut: 4348-89
	Tamper resistant cover and wire.	Cover and wire: 4355-51 Wire: 2117-01
	Lockout hasp.	54547-01

All Dimensions in Inches (mm)

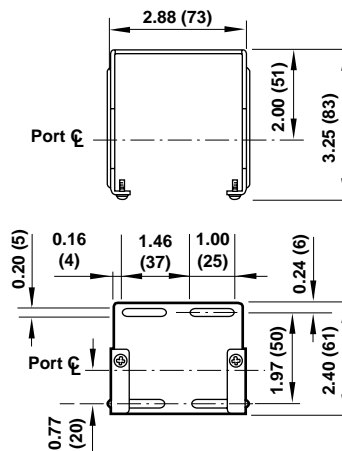
V72 Bracket (4224-50)



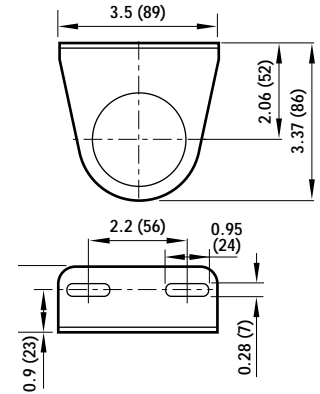
V72 Neck Bracket (74316-50)







V74 Bracket (4324-50)



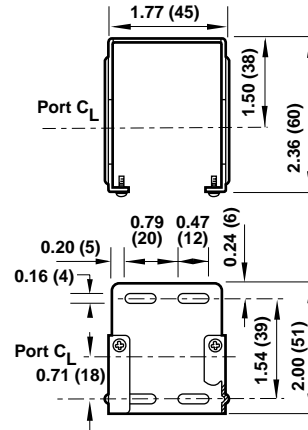
V74 Neck Bracket (4368-51)





Product	Accessory	Part No.
T72	Wall bracket	4224-50
	Mufflers (T72T)  Diffuser (10-32 and M5): 54463-01 Muffler (10-32): MS000A Muffler (M5): T40M0500	
	Lockout hasp. (use only with T72E and T72T) Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.	54547-01
T64	Muffler (T64T) 	Muffler (1/8 PTF): MS001A Muffler (R1/8): T40B1800
	Lockout hasp. Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.	54547-01
T68	Lockout hasp. Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.	54547-01
T73	Mufflers (T73T)  Diffuser (10-32 and M5): 54463-01 Muffler (10-32): MS000A Muffler (M5): T40M0500	
	Lockout hasp. Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.	54547-01
T74	Muffler (T74T) 	Muffler (1/8 PTF): MS001A Muffler (R1/8): T40B1800
	Lockout hasp. Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.	54547-01

All Dimensions in Inches (mm)
T72 Bracket (4224-50)



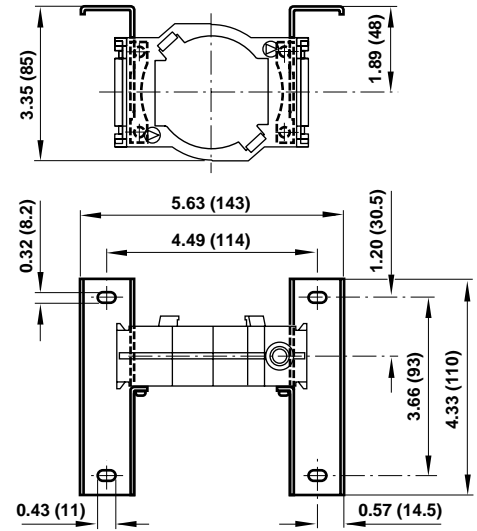


Smooth Start and Directional Control Valve Accessories

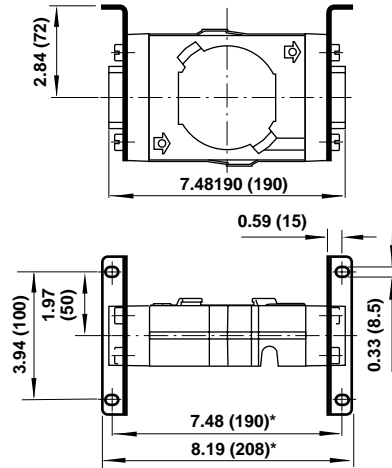
Product	Accessory	Part No.
P72	Mufflers for P72C and P72F	1/4 PTF: MB002A R1/4: MB002B
	Lockout hasp for P72F. Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.	54547-01
P64F	Wall bracket	74504-50
	Muffler	1/2 PTF: MB004A R1/2: MB004B
P68F	Wall bracket	3/4", 1", 1-1/4" Ports: 18-001-978 1-1/2" Ports: Not Available
	Muffler	1" PTF: MB008A R1: MB008B
P74	Wall bracket	4324-50
	Mufflers for P74C and P74F	1/2 PTF: MB004A R1/2: MB004B
	Lockout hasp for P74F and P74C with lockout slide: Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.	54547-01

All Dimensions in Inches (mm)

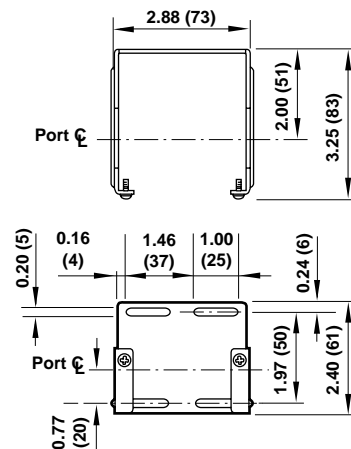
P64 Bracket
(74504-50)



P68 Bracket
(18-001-978)



P74 Bracket (4324-50)



Watson Smith Series

Electronic, Air Pressure, Electronic Converters and Manual/Mechanical Regulators for compressed air systems.

Contents

VP10 Electronic Pressure Regulators	ALE-26-2
VP50 Proportional Control Valve	ALE-26-4
R26 Pneu-Stat Electronic Pressure Regulators	ALE-26-6
Manostat Precision Air Pressure Regulators	ALE-26-8
P/I and P/E Transmitters and Converters	ALE-26-10
Type 421 Compact Failsafe I/P Converters	ALE-26-12
Type 422 Failfreeze Electronic Converters	ALE-26-14
Type 423 Failsafe Electronic I/P Converters	ALE-26-16
Type 425 Electronic I/P Converters	ALE-26-18



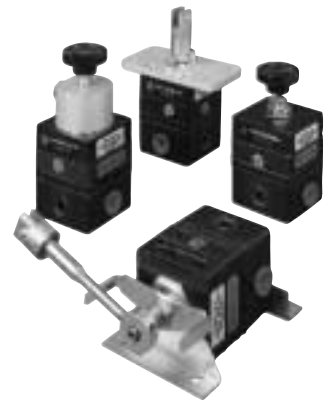
VP10



VP50



R26



Manostat



P/E & P/I



Type 421



Type 422 & 423



Type 425

- Reliable, rugged proportional I/P and E/P converters
- Suitable for a wide range of applications
- Excellent accuracy
- High flow versions
- NEMA4 environmental protection in normal operation



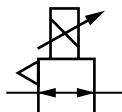
General Information

Part Number	Pressure range and input signal options	
	Control signal	Output pressure
VP1001100A00	0-10 V	3-15 psi (0.2-1 bar)
VP1001400A00	4-20 mA	3-15 psi (0.2-1 bar)
VP1002100A00	0-10 V	3-30 psi (0.2-2 bar)
VP1002400A00	4-20 mA	3-30 psi (0.2-2 bar)
VP1004100A00	0-10 V	3-60 psi (0.2-4 bar)
VP1004400A00	4-20 mA	3-60 psi (0.2-4 bar)
VP1006101A00	0-10 V	3-90 psi (0.2-6 bar)
VP1006401A00	4-20 mA	3-90 psi (0.2-6 bar)
VP1008101A00	0-10 V	3-120 psi (0.2-8 bar)
VP1008401A00	4-20 mA	3-120 psi (0.2-8 bar)

Electrical Information

Electromagnetic compatibility	This is a passive electromagnetic instrument and is unaffected by interfering high frequency signals
Electrical signal	Two wire version 4-20 mA or 0-10 V Three wire version requires 12-24 V d.c. supply
Connections	30 mm square connector DIN 43650 provided, mountable in four directions (alternative connections available)

ISO Symbols





Technical data

Medium:
 Oil free, dry air, filtered to 5 micron

Output pressure:
 3-15 psig (0.2-1.0 bar), 3-30 psig (0.2-2.0 bar),
 3-60 psig (0.2-4.0 bar), 2-120 psig (0.14-8 bar) three wire version

Flow capacity: Up to 10 scfm (300 l/min)

Air consumption
 <60 psig (<4 bar): 0.03 scfm (0.85 l/min) typical
 >60 psig (>4 bar): 0.06 scfm (1.75 l/min) typical

Operating pressure:
 At least 10 psig (0.7 bar) above maximum required output pressure

Connections: NPT 1/4"

Operating temperature: -4° to 160°F (-20°C to 70°C)

Response time
 <30 psig (<2 bar): less than 0.5 seconds for 10-90% step change
 >30 psig (>2 bar): 2 seconds for 10-90% step change

Total error:
 ±0.5% of span (typical, independent error includes the combined effect of non-linearity, hysteresis, deadzone and repeatability)

Temperature effect:
 Typically 0.1% of span/°F for span and zero over operating range

Supply sensitivity:
 >0.025% span output change per % supply pressure change

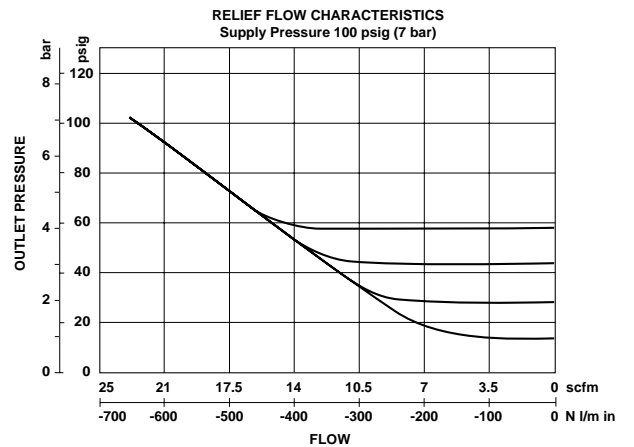
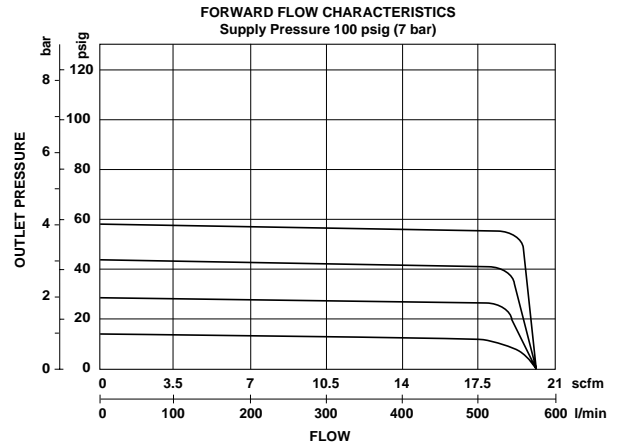
Failure mode:
 Signal falls to bleed pressure when electrical supply fails

Mounting:
 Integral surface mounting bracket provided for preferred vertical mounting.
 50 mm pipe mounting kit available

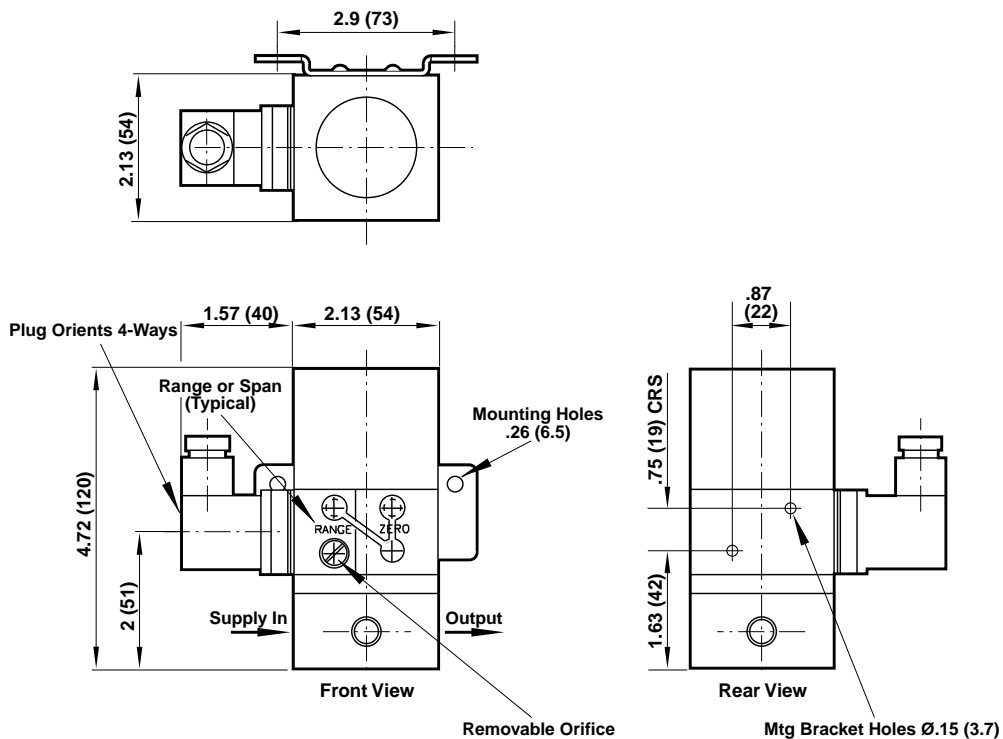
Material of construction:
 Zinc die-casting passivated and epoxy paint, nitrile diaphragms, stainless steel/nylon flapper nozzle and supply valve

Mass: 3.3 lbs (1500g) approx.

Typical Performance Characteristics



All Dimensions in Inches (mm)



- Air piloted proportional pressure control valve
- Fully user adjustable for a wide range of applications
- High speed
- Lower power consumption
- High flow capacity



Electrical information

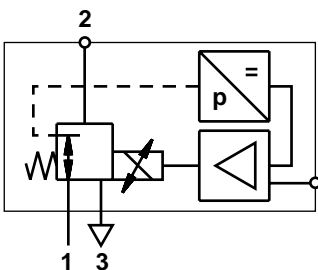
Electromagnetic Compatibility	CE marked: conforms to E.C. requirements EN 50081-2 (1994) and EN 50082-2 (1995)
Electrical Input Signal	4-20mA or 0-10V factory set
Electrical Power Input	24V dc $\pm 25\%$ (power consumption < 1W)
Output Pressure Feedback Signal	0-10V full range
Connections	DIN 43650 or Brad Harrison connection for feedback output

General Information

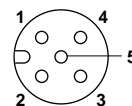
Part Number*	Pressure Range and Input Signal Options		Port Size
	Control Signal	Output Pressure in psig (bar)	
VP5010PK111H00	0-10V	0-145 (0-10)	1/4" PTF
VP5010PK411H00	4-20mA	0-145 (0-10)	1/4" PTF
VP5006PK111H00	0-10V	0-90 (0-6)	1/4" PTF
VP5006PK411H00	4-20mA	0-90 (0-6)	1/4" PTF
VP5002PK111H00	0-10V	0-30 (0-2)	1/4" PTF
VP5002PK411H00	4-20mA	0-30 (0-2)	1/4" PTF

* To specify regulator calibration in BAR use "B" in the 7th position For 1/4" ISO G ports use "J" in the 8th position.

Symbol



Instrument pin configuration



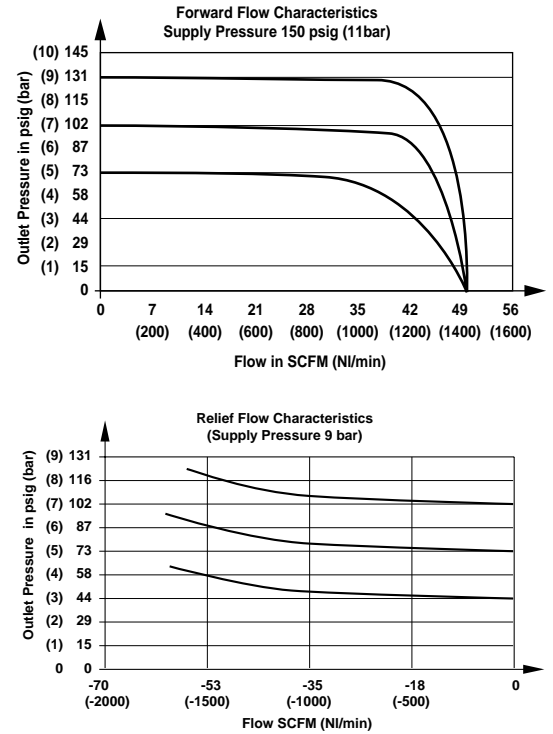
- 1 +24V d.c. supply
- 2 0-10 full range
- 3 Control signal (+ve)
- 4 Common (DC supply, signal and feedback return)
- 5 Chassis (earth)



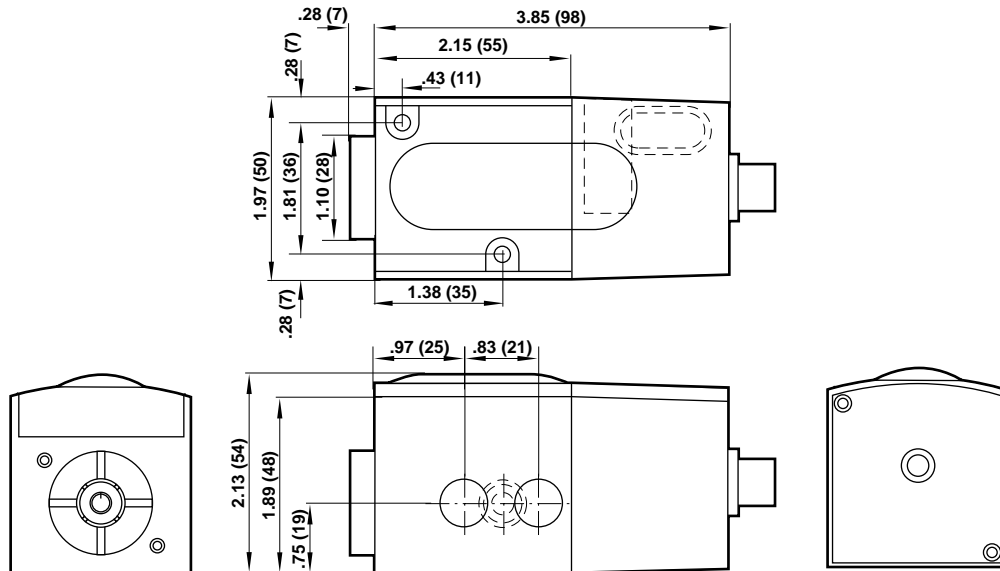
Technical Data

Medium: Compressed air, filtered to 50micron, non-lubricated
 Operation: Proportional, direct acting air piloted spool
 Output Pressure: See general information p. 2
 Supply Pressure: 200 psig (14 bar) max
 Supply Sensitivity: Better than 0.75% span output change per bar supply pressure change
 Flow Capacity: Up to 50 scfm (1400 NI/min)
 Response Time: < 80 mS (from 10-90% of output pressure into a 0.1 litre load)
 Air Consumption: < .177 scfm (5 l/min)
 Port Size: 1/4 PTF (G1/4)
 Total Error: Max. error < ±1% of span (independent error includes the combined effect of non-linearity, hysteresis, deadzone and repeatability)
 Operating Temperature: 23° to 120°F (-5° to 50°C)
 Temperature Effect: Typically better than 0.03% of span/°C for span and zero over operating range
 Degree of protection: NEMA 4 (IP65) in normal operation
 Vibration Immunity: < 3% output shift for 3g 10-2000Hz
 Mounting Position: Any screw mounting
 Material of Construction: Aluminum body, zinc diecast lid and end cover
 Weight: 1.76 lbs. (800g) approx

Characteristic Curves



All Dimensions in Inches (mm)



- Fully programmable pressure regulation up to 120 psi (8 bar)
- Can be used with any standard industrial PLC
- Rapid acting - 120 psi (8 bar) step change in one second
- Tough, accurate and reliable



Ordering Information. The standard stock range is 120 psi (0-8 bar), 0-10V., 1/4" NPT. Customer calibration to other ranges and control signals is a simple adjustment. Alternative versions available ex-works are as follows:

Port Size	Model Number	Range psi (bar)	Control Signal
1/4 NPT	R26-200-RNLG	0-120 (0-8)	0-10V
1/4 NPT	R26-201-RNLG	0-120 (0-8)	0-5V
1/4 NPT	R26-202-RNLG	0-120 (0-8)	4-20mA



Technical Data

Supply:

Clean dry air (filtered to 5 μ non-condensing, oil free)
Up to 150 psi (10 bar)

Output:

0-120 psi (0-8 bar) [user adjustable down to 0-60 psi (0-4 bar)]
At zero control signal, < 0.05 bar.

Electrical supply:

Nominal 24V dc, limits 15-30V dc. Max current 100 mA

Control signal:

4-20 mA; 250 ohms 0-5V; 10 k ohms 0-10V; 10k ohms

Connections:

3 wire connection, 1.24V dc supply 2. Control Signal 3. Common

Air flow:

Consumption < 2 scfm (< 5 l/m), Capacity > 20 scfm (> 600 l/min) forward at 60 psi (4 bar), 10 scfm (300 l/min) relief at 60 psi (4 bar)

Material

Enclosure:

Case manufactured from zinc and reinforced plastic, finished with a black epoxy paint finish.

Mounting:

The Pneu-Stat can be mounted in any orientation, a mounting bracket is provided.

Pneumatic connections:

1/4 NPT. Front and rear facing Ports 1/4 NPT

Electrical connections:

30 mm square connector to DIN 43650. Orientable in four ways at 90°. Mating connector supplied.

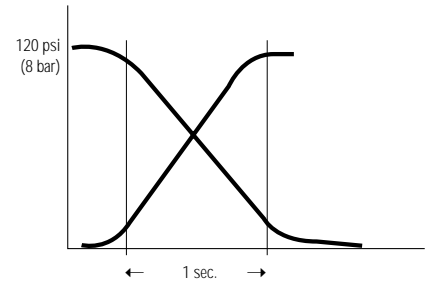
Controls:

Span and zero - external

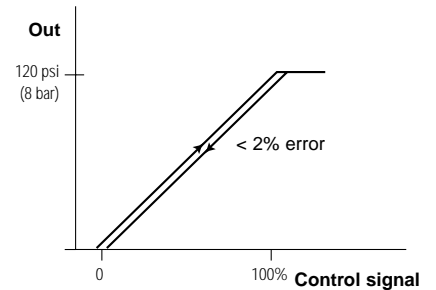
Range select switches - internal

Weight: 1.75 lbs (800g)

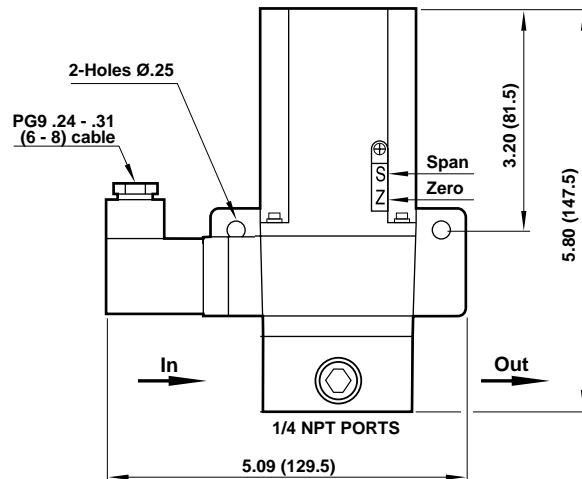
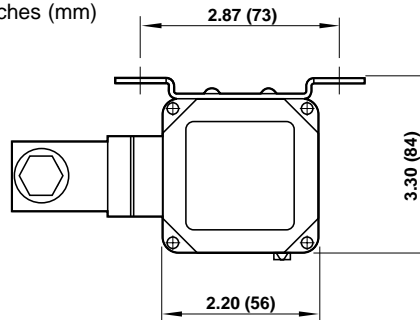
Response time into a 1 liter load



Accuracy



All Dimensions in Inches (mm)



- High precision pressure regulators
- Suitable for dead end or flow applications
- Excellent long term stability
- Handwheel, lever, plunger or pilot operated



Ordering Information.

Description	Model	Control Type	Output Pressure Range psig (bar)	Air Consumption scfm (l/m)	Weight lbs (kg)
Standard regulator	53-1002-00R	Handwheel 2.5-3 turns	2-25 (.14-2)	.01 (.3)	1.59 (.72)
Standard regulator	53-1003-00R	Handwheel 2.5-3 turns	2-60 (.14-4)	.02 (.6)	1.59 (.72)
Standard regulator	53-1004-00R	Handwheel 2.5-3 turns	2-120 (.14-8)	.04 (1.2)	1.59 (.72)
Lever operated regulator	53-1802-00R	Lever control 125° Rotation	2-25 (.14-2)	.01 (.3)	1.59 (.72)
Lever operated regulator	53-1803-00R	Lever control 125° Rotation	2-60 (.14-4)	.02 (.6)	1.59 (.72)
Lever operated regulator	53-1804-00R	Lever control 125° Rotation	2-120 (.14-8)	.04 (1.2)	1.59 (.72)
Plunger operated regulator	53-1404-00R	Plunger travel .065 (1.65)	2-60 (.14-4)	.02 (.6)	1.59 (.72)
Plunger operated regulator	53-1604-00R	Plunger travel .065 (1.65)	2-120 (.14-8)	.04 (1.2)	1.59 (.72)
Pilot operated relay	53-1904-00R	Pilot pressure signal	2-120 (.14-8)	.04 (1.2)	1.59 (.72)
Pilot operated relay with manual bias	53-2204-00R	Pilot pressure signal Handwheel controlled bias	2-120 (.14-8) bias of up to 30 (2)	.04 (1.2)	1.59 (.72)

Technical Data

Medium:

Dry, oil free air filter to 25 microns

Operation:

Two stage servo mechanized regulator with integral precision measuring capsule

Mounting:

Any position. Panel mounting or through mounting holes on the unit (lever, plunger and pilot versions)

Port sizes:

G 1/4

Output pressure ranges:

See individual details overleaf

Supply pressure:

Minimum at least 2.9 psig (0.2 bar) above output pressure.

Maximum 145 psig (10 bar)

Flow capacity:

Up to 10.6 scfm (300 l/m)

Hysteresis and repeatability:

Less than 0.005% setting at midrange

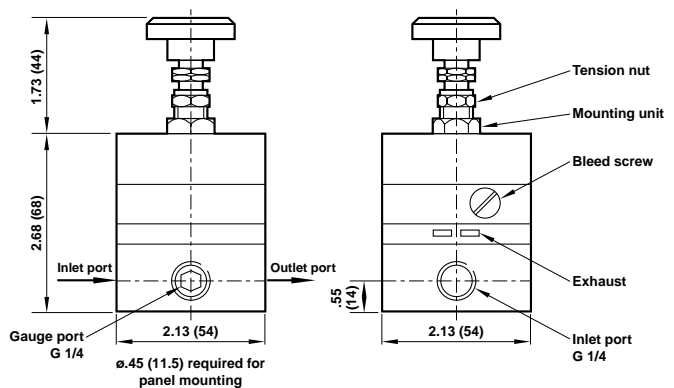
Sensitivity:

Better than 0.3 mbar

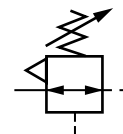
Air consumption:

See individual details

Handwheel Operated



ISO Symbols

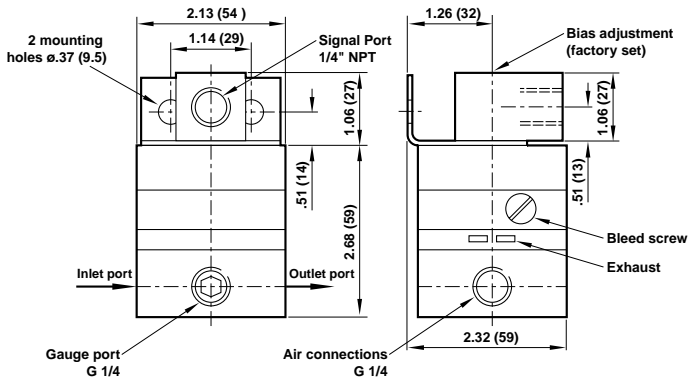


R27 Series Precision Air Pressure Regulators

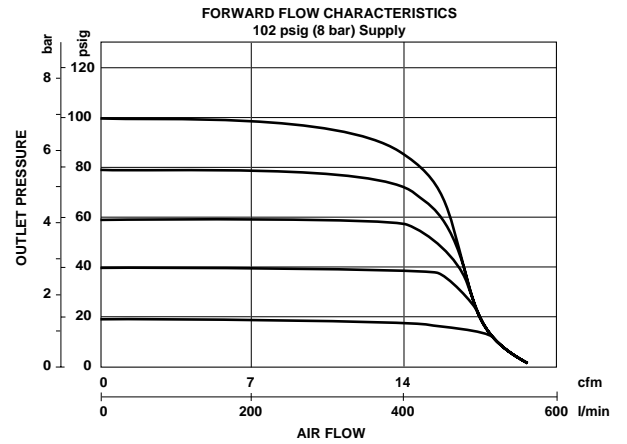


All Dimensions in Inches (mm)

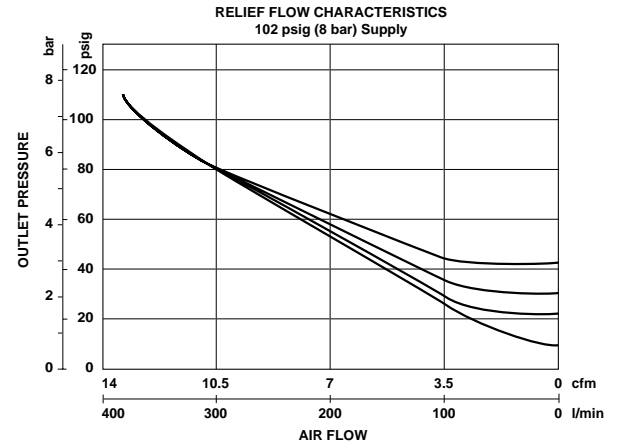
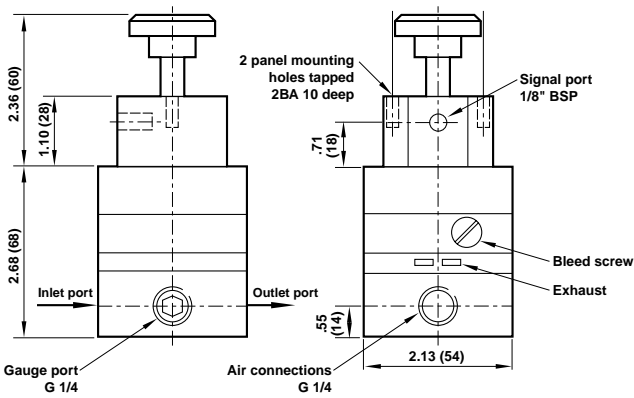
Pilot Operated



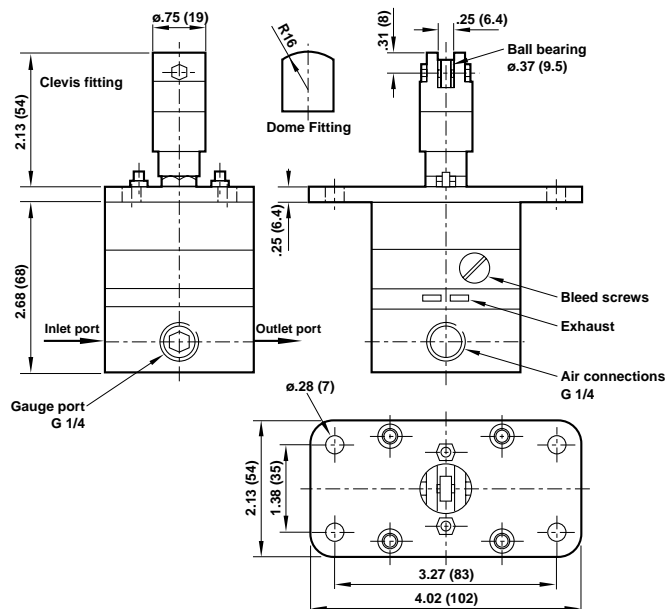
Typical Performance Characteristics



Pilot Operated with Bias



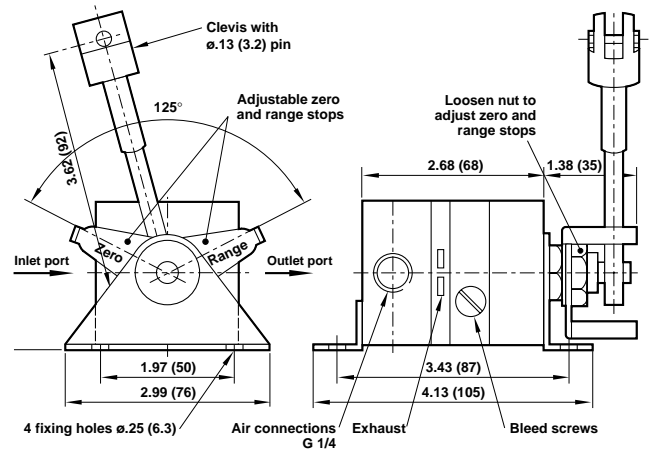
Plunger Operated



Diaphragm Repair Kits

Type	Part number
Units up to 25 psig	53 1000 95R
Units up to 60 psig	53 1000 99R
Units up to 120 psig	53 1000 98R
Tamperproof Nut	53 1000 97R
Wall Mounting Bracket	53 ABR 00700

Lever Operated



- These instruments convert pneumatic pressures into electrical signals for use with data loggers, computers and microprocessors
- Type 68 is a two-wire pressure/current device
- Type 69 a three-wire pressure/voltage type
- Both use only non-critical power supplies and can be supplied weatherproof to IP65


Ordering Information.

P/I Type 68		P/E Type 69		Range
Standard	Weatherproof	Standard	Weatherproof	
536801 00	536801 10	536901 00	536901 11	3-15 psig
536815 00	536815 10	536915 00	536915 11	0-150 psig
536816 00	536816 10	536916 00	536916 11	0-100 psig
536896 00	536896 10	536996 00	536996 11	0-200m bar
536893 00	536893 10	536993 00	536993 11	0-200m bar
536821 00	536821 10	536921 00	536921 11	0.2-1 bar
536833 00	536833 10	536933 00	536933 11	0-4 bar
536835 00	536835 10	536935 00	536935 11	0-10 bar
536836 00	536836 10	536936 00	536936 11	0-7 bar
536837 00	536837 10	536937 00	536937 11	0-6 bar
536841 00	536841 10	536941 00	536941 11	20-100 kPa
536855 00	536855 10	536955 00	536955 11	0-1000 kPa
536856 00	536856 10	536956 00	536956 11	0-700 kPa
536886 00	536886 10	536986 00	536986 11	0-100 in wg
536888 00	536888 10	536988 00	536988 11	0-200 in wg

Intrinsically Safe

P/I Type 68		P/E Type 69		Range
Standard	Weatherproof	Standard	Weatherproof	
536801 01	536801 11	536901 01	536901 11	3-15 psig
536821 01	536821 11	536921 01	536921 11	0-150 psig

- NOTE:
1. Intrinsically safe models are available for all standard and weather proof instruments.
 2. Other pressure ranges between 50millibar and 10 bar are available to order. Please consult factory for availability.
 3. Type 69 P/E models - voltage ranges other than 0-10V are available to special order.
 4. All models supplied complete with DIN rail clip and mounting plate.
 5. Low pressure models within the ranges 0-25inwg to 0-50in wg. 0-1 psig to 0-2 psig and 0-70mbar to 0-150mbar are also available please ask for further details.
 6. A range of models with temperature compensation -4° to 104°F (-20° to 40°C) are available for natural gas applications to special order.



Technical Data

Pneumatic:

Pressure media:

Dry, non corrosive air or gas. The units are not suitable for continuous liquid exposure

Pressure ranges:

See ordering information Units with Full Scale ranges between 1 psig (70m bar) and 150 psig (10 bar) are available to special order

Over pressure:

At least 100% with negligible calibration error, except for 150 psig models which are 200 psig maximum

Consumption: Nil Ø

Temperature range: 15° to 140°F (-10° to 60°C)

Electrical:

Maximum Supply

Voltage: 35V for 1 second

Reverse voltage: -50V continuous

Protection: 500V d.c. (components to case)

Type 68 P/I

Supply voltage: 9-30V continuous

Output: 4-20mA

Voltage drop: 9V minute (across unit)

Load resistance: 750 ohm maximum (24V supply)

Type 69 P/E

Supply voltage: 12-30 V continuous

Output: 0-10V Other voltage ranges to special order

Current: 5mA nominal

Load resistance: 2000 ohm minimum

Materials

Casing: Extruded aluminum, zinc diecast end plates

PCB: Epoxy glass fiber

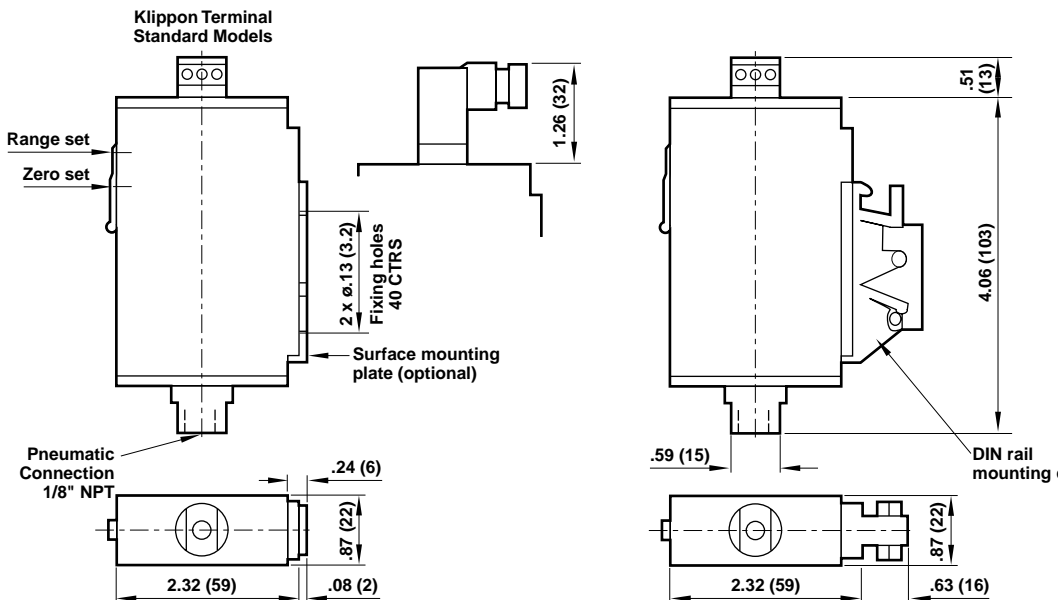
Pneumatic connection: 1/8" NPT

Transducer: Composite construction, mainly nickel, aluminum, Kovar, silicon rubber/gel

Weight: 200g

Finish: Black stove enamel

All Dimensions in Inches (mm)



- **A rugged, electronic I/P converter designed for high density rail or manifold mounting, at a spacing of only 1" (25mm)**
- **Advanced electronic control using surface mount electronics and a precision pressure transducer and offers excellent performance characteristics**
- **Unlike most I/P converters which use fragile electromechanical pressure control devices, the 421 employs a high sensitivity microminiature Reedex valve for pressure control**
- **Great reliability, long life, freedom from vibration effects, and are significantly less prone to mechanical derangement than older conventional designs**
- **Can be conveniently mounted on DIN rail, or surface mounted, or onto a high density manifold, which eliminates much plumbing**



Ordering Information

Standard models:

4-20mA input, forward action, Terminal connector

Outputs	Model Number
0.2-1 bar	53AB2100
3-15 psig	53AB0100

Options to special order:

Other pressure ranges

Manifold mounting system

Certification

All instruments are tested on the Watson Smith ATE system. An individual test certificate is provided at no extra charge.

Accuracy

Control characteristics*:

Linear, pressure proportional to signal

Maximum error*:

(Combined effect of non-linearity, hysteresis, deadzone & repeatability)

Within $\pm 0.5\%$ span of a terminally based straight line

Hysteresis + resolution*: Less than 0.1% span

Supply pressure effect*: See graph

Temperature effect: (span & zero)

Typically less than 1% FS over compensated range

Long term stability:

Typically $< 0.5\%$ span per annum

* Parameters marked with * are tested on every unit by computer controlled test equipment. Other parameters are typical.



Electrical

Input signal*: 4-20mA two wire

Load*:

Presents a constant voltage drop to the current source of 10V ±0.5V

Start up time*:

Less than 6 seconds

Minimum current failure mode*:

Typically 3mA

Insulation:

Tested to 500V DC

Reverse voltage: -100V DC

Over current:

100mA continuous. 500mA for 1 second; fitted internal fuse 160mA

Rangeability:

More than ±20% on zero and span

Connections:

Two part quick release terminal block with capacity up to 2.5mm cable

Failure mode:

On failure of input signal the output pressure will fall below 0.2 psig (15 mbar)

Pneumatic

Output signal*: 3-15 psig (0.2-1 bar)

Response time*: See graph

Minimum outlet pressure*: Less than 0.2 psig (15 mbar)

Consumption*: Typically 0.01 scfm (200 cc/min)

Flow capacity: Up to 5 scfm (150 NI/min)

Output ripple: Less than ±0.5% span at 10 Hz into zero load volume

Media: Oil free, dry air filter to 5 microns

Supply pressure range: 20-50 psig (1.5-3.5 bar)

Preferred range: 25-35 psig (1.7-2.5 bar)

Connections: 1/8" NPT female

Environmental & Physical Data

Vibration:

The unit possesses a high degree of immunity

Life:

Designed MTTF greater than 8 years

Electromagnetic compatibility:

RFI protection is incorporated in the instrument

Operating temperature: 15° to 140°F (-10° to 60°C)

Compensated range: 32° to 122°F (0° to 50°C)

IP rating: IP40

Material of construction

Anodized natural aluminum

Mounting:

Any orientation. A rail clip for TS32 (EN50035)/TS35

(EN50022) rail is provided with each instrument,

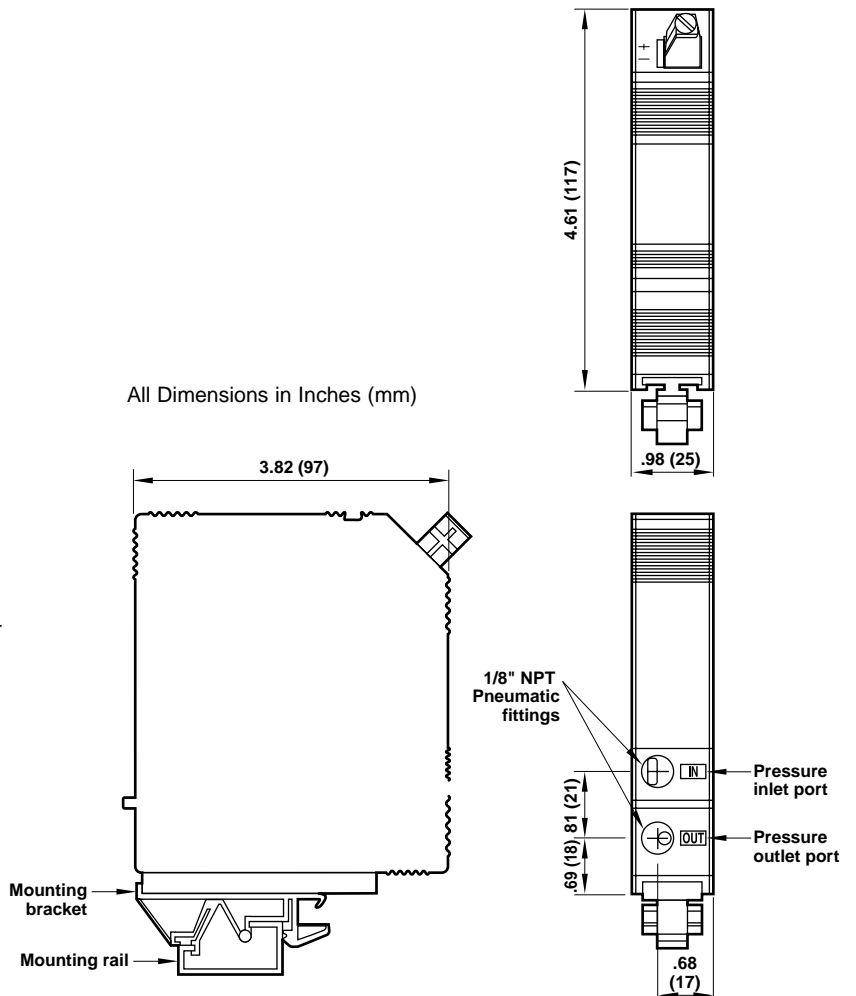
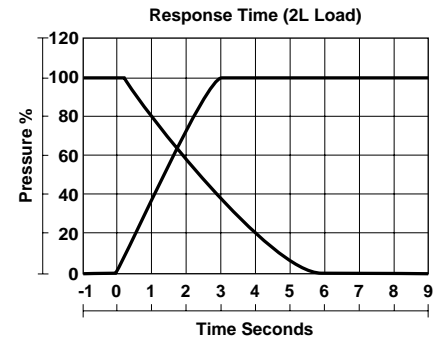
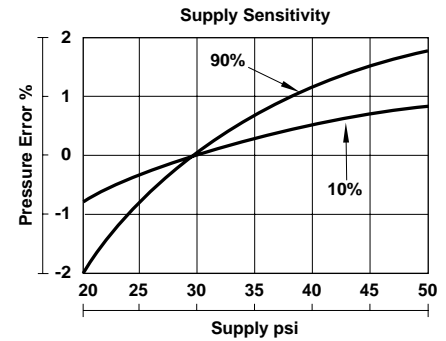
options include surface mounting bracket and a

manifold kit for up to 20 converters

Weight: 600gm

* Parameters marked with * are tested on every unit by computer controlled test equipment. Other parameters are typical.

Typical Performance Characteristics



- A major advance in I/P converter design, offering failfreeze in addition to conventional I/P features
- Advanced electronic control and a precision pressure transducer to achieve outstanding performance
- Intended for field application in which rugged construction, vibration immunity, weatherproofing and reliability are essential, together with the enhanced system safety gained from its failfreeze characteristic
- Two wire operation from a 4-210mA control signal with output pressures up to 120 psig (8 bar) as standard



Ordering Information

Standard models:

4-20mA input, forward action, DIN connector

Outputs	Model Number
0.2-1 bar	53AC2100
3-15 psig	53AC0100
0.2-8 bar	53AC2400
3-120 psig	53AC0400

Options to special order:

- Other pressure ranges
- Conduit entry with flying leads
- Type N Certification
- 50mm pipe mounting bracket
- 1/8" NPT pneumatic connections
- I.S. Certification

Certification

All instruments are tested on the Watson Smith ATE system. An individual test certificate is provided at no extra charge.

Hazardous area approvals:

The 422 is available with Type NIIT6 approval to BS6941 1988 or Type EEx ia IICT4 approval for intrinsically safe applications

Accuracy

Control characteristics*:

Linear, pressure proportional to signal

Maximum error*:

(Combined effect of non-linearity, hysteresis, deadzone & repeatability)

±0.5% span of a terminally based straight line (low pressure), 1% (high pressure)

Supply pressure effect*: Negligible

Temperature effect: (span & zero)

Typically less than 1% span over compensated range

Long term stability:

Typically <0.5% span per annum

* Parameters marked with * are tested on every unit by computer controlled test equipment. Other parameters are typical.



Electrical

Input signal*: 4-20mA two wire
 Load*:
 Presents a constant voltage drop to the current source of 5.5-6 Volts
 Start up time*:
 Less than 6 seconds
 Insulation:
 Tested to 500V dc
 Reverse voltage: -100Vdc
 Over current: 30mA
 Rangeability:
 More than ±20% on zero and span
 Connections:
 30mm square connector DIN 43650 provided, orientable in four directions
 Failure mode:
 When input signal falls below 2mA ±0.5mA, the output is held at its previous pressure
 Failfreeze drift rate:
 ±2% setpoint/hour at a constant temperature

Pneumatic

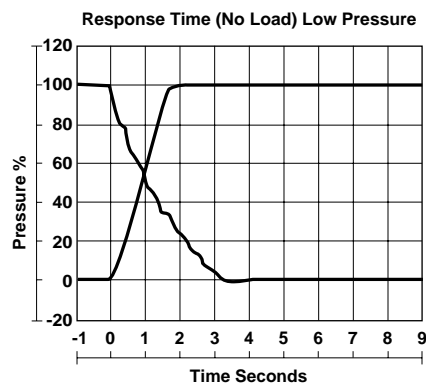
Output signal*:
 Low pressure 3-15 psig (0.2-1 bar)
 High pressure 3-120 psig (0.2-8 bar)
 Response time*: See graph
 Minimum outlet pressure*: Less than 2 psig (140 mbar)
 Air consumption*:
 Low pressure 200cc/min typical
 High pressure 400cc/min typical
 Flow capacity: Up to 10 scfm (300 NI/min)
 Media: Oil free, dry air filtered to 5 microns
 Supply pressure range:
 Low pressure 20-100 psig (1.5-7 bar)
 High pressure 125-150 psig (8.7-10 bar)
 Preferred range (low pressure): 25-35 psig (1.7-2.5 bar)
 Connections:
 1/4" NPT female (plus two integral 1/4" NPT gauge ports)

Environmental & Physical Data

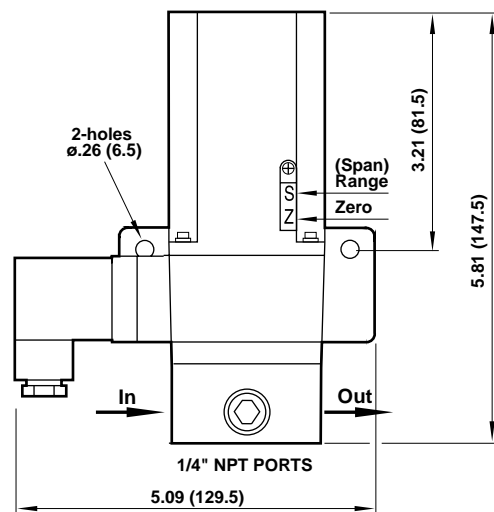
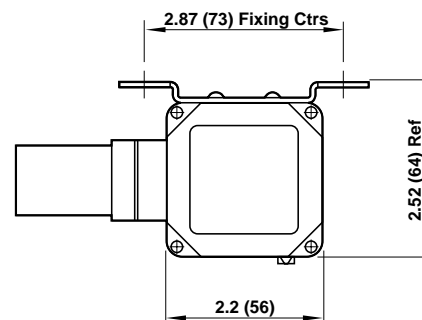
Vibration:
 The unit possesses a high degree of immunity
 Life:
 Better than 1,000,000f.s. cycles
 Electromagnetic compatibility:
 Emissions more than 20dB below accepted limits (BS800). Instrument immune to conducted transient interference up to 4kV
 Operating temperature: -4° to 158°F (-20° to 70°C)
 Compensated range: 15° to 140°F (-10° to 60°C)
 IP rating: IP65
 Material of construction
 Zinc diecasting passivated and epoxy painted, Verton glass/nylon cover, Nitrile diaphragms
 Mounting:
 Integral surface mounting bracket provided for vertical mounting. Operation in any attitude is possible without recalibration
 Weight: 800gm

* Parameters marked with * are tested on every unit by computer controlled test equipment. Other parameters are typical.

Typical Performance Characteristics



All Dimensions in Inches (mm)



- A completely new design of electronic current/ pneumatic converter for field mount process control applications
- State-of-art electronics, precision internal pressure measurement, digital pressure control and excellent environmental and vibration characteristics
- Rugged high sensitivity Reedex Valve for pressure control
- Extreme reliability, freedom from vibration effect and long life, together with very low air consumption and hysteresis.
- The pneumatic design off the 423 allows an output capacity of up to 10 scfm, so that no volume booster is necessary for high flow applications such as large valves



Ordering Information

Standard models:

4-20mA input, forward action, DIN connector

Outputs	Model Number
0.2-1 bar	53AD2100
3-15 psig	53AD0100

Options to special order:

Other pressure ranges
 Conduit entry with flying leads
 Type N Certification
 Intrinsically Safe certification
 50mm pipe mounting bracket
 1/8" NPT pneumatic connections

Certification

All instruments are tested on the Watson Smith ATE system. An individual test certificate is provided at no extra charge.

Hazardous area approvals:

The 423 is available with Type N (Ex N II T6) approval to BS6941 1988 or Intrinsically Safe certified (Ex ia IIC T5) for hazardous area applications

Accuracy

Control characteristics*:

Linear, pressure proportional to signal

Maximum error*:

(Combined effect of non-linearity, hysteresis, deadzone & repeatability)

Within $\pm 0.5\%$ span of a terminally based straight line

Hysteresis + Resolution*:

Less than 0.1% span

Supply pressure effect*: See graph

Temperature effect: (span & zero)

Typically less than 1% FS over compensated range

Long term stability:

Typically <0.5% span per annum

* Parameters marked with * are tested on every unit by computer controlled test equipment. Other parameters are typical.



Electrical

Input signal*: 4-20mA two wire
 Load*: Presents a constant voltage drop to the current source of 10V ±0.5V
 Start up time*: Less than 6 seconds
 Minimum current failure mode*: Typically 2mA
 Insulation: Tested to 500V DC
 Reverse voltage: -100V
 Over current: 100mA Continuous, 500mA for 1 second
 Rangeability: More than ±20% on zero and span
 Connections: 30 mm square connector DIN 43650 provided, orientable in four directions
 Failure mode: On failure of input signal the output pressure will fall to below 0.2 psig (15 mbar)

Pneumatic

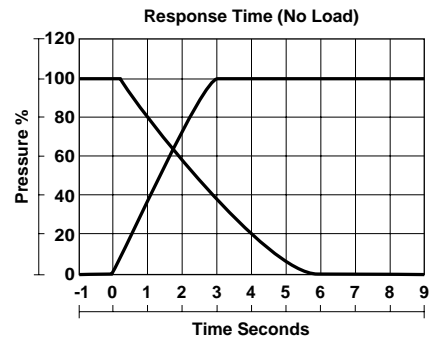
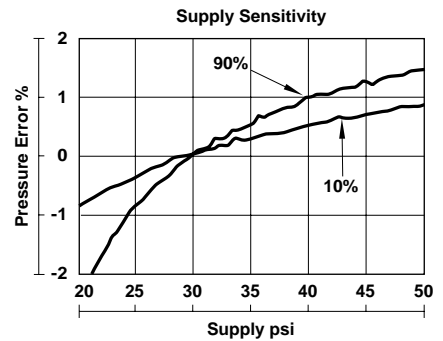
Output signal*: 3-15 psig (0.2-1 bar)
 Response time*: See graph
 Minimum outlet pressure*: Less than 0.2 psig (15 mbar)
 Consumption*: Typically 0.02 scfm (500 cc/min)
 Flow capacity: Up to 10 scfm (300 NI/min)
 Output ripple: Less than ±0.5% span at 10Hz into zero load volume
 Media: Oil free, dry air filtered to 5 microns
 Supply pressure range: 20-50 psig (1.5-3.5 bar)
 Preferred range: 25-35 psig (1.7-2.5 bar)
 Connections: 1/4" NPT female (plus two integral 1/4" NPT gauge ports)

Environmental & Physical Data

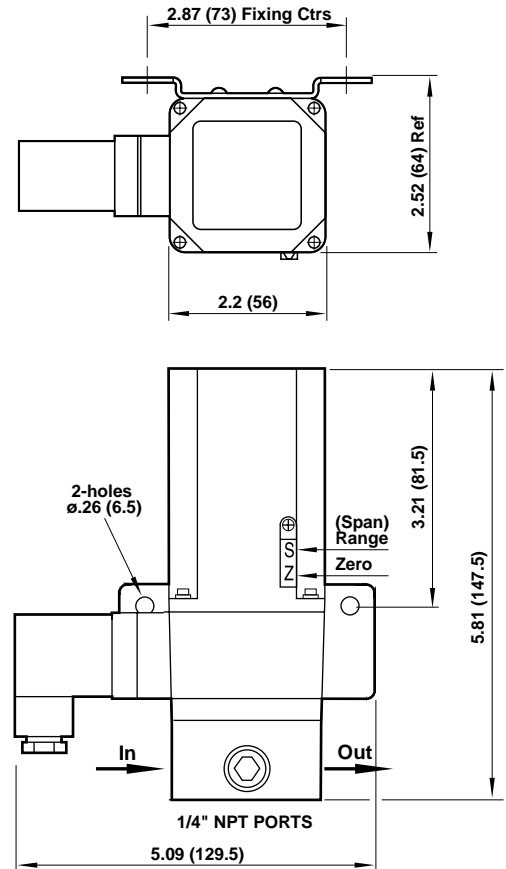
Vibration: The unit possesses a high degree of immunity
 Life: Better than 1,000,000f.s. cycles
 Electromagnetic compatibility: Emissions more than 20dB below accepted limits (BS800). Instrument immune to conducted transient interference up to 4kV
 Operating temperature: -4° to 158°F (-20° to 70°C)
 Compensated range: 15° to 140°F (-10° to 60°C)
 IP rating: IP65
 Material of construction: Zinc diecasting passivated and epoxy painted, Verton glass/nylon cover, Nitrile diaphragms
 Mounting: Integral surface mounting bracket provided for vertical mounting. Operation in any attitude is possible without recalibration
 Weight: 800gm

* Parameters marked with * are tested on every unit by computer controlled test equipment. Other parameters are typical.

Typical Performance Characteristics



All Dimensions in Inches (mm)



- **Designed for service in the most demanding industrial and process control applications, and are normally used to accurately convert a loop control current of 4-20mA to 3-15 psig (0.2-1 bar) pneumatic signal to operate a control valve actuator**
- **The pressure control principle employed uses the well proven Reedex® microminiature solenoid valve avoiding the use of sensitive flapper nozzle electromechanical components.**
- **Internal pressure sensor provides solid state closed loop control ensuring long term accuracy**
- **Advanced electronics and sophisticated control techniques with a rugged weather proof packaging to produce a field mountable I/P converter suitable for use in adverse environmental conditions giving optimum performance and low cost of ownership**


Product Safety

This product must be installed and operated in conformance with the specific safety instructions contained within the instrument handbook provided with each unit.

Ordering Information.

Conduit Entry	Certification				Range
	FM Explosion Proof	FM Intrinsically Safe	CENELEC IS	Standard	
1/2" NPT	53-AF01-11	53-AF01-21	53-AF01-31	53-AF01-01	4-20mA, 3-15 psi
	53-AF21-21	53-AF21-21	53-AF21-31	53-AF21-01	4-20mA, 0.2-1 bar
M20	X	53-AF01-22	53-AF01-32	53-AF01-02	4-20mA, 3-15 psi
	X	53-AF21-22	53-AF21-32	53-AF21-02	4-20mA, 0.2-1 bar

Certification

CENELEC (SIRA)

Intrinsically Safe E Ex ia IIC T4

Certificate number: SCS Ex 94C 2047

Factory Mutual (Pending)

Explosion Proof Class I Division I Groups BCD T6

Intrinsically Safe Class I Division I Groups BCD T4

Copies of certification documents are available on request

Testing:

All units are tested on the Watson Smith ATE System assessed by LQRA to ISO 9001

Accuracy

Control characteristics*:

Linear, pressure proportional to input signal

Maximum error*:

(Combined effect of non-linearity, hysteresis, deadzone & repeatability)

Within $\pm 0.5\%$ span of a terminally based straight line

Hysteresis + Resolution*:

Less than 0.1% span

Temperature effect: (span & zero)

Typically less than $\pm 1\%$ over compensated range

Supply pressure sensitivity* (span and zero)

Less than 1% span for 10% supply pressure change

* Parameters marked with * are tested on every unit by computer controlled test equipment. Other parameters are typical.



Electrical

Input signal*: 4-20mA two wire

Load*:

Presents a constant voltage drop to the current source of 6.0V ±0.5V
 – See note

Start up time*: Less than 6 seconds

Minimum operating current*: Less than 3.5mA

Insulation:

Tested to 500V DC

Current reversal:

No effect within normal 4-20mA range, instrument will not function

Rangeability:

More than ±20% on zero and span

Connections:

Internal terminal block with capacity up to 2.5 mm2 cable

Conduit entry: 1/2" NPT or M20 female

Alternative plug/socket: DIN 43650, 30mm, rating IP65

Failsafe operation*:

On interruption of input signal the output pressure will fall to below 0.2 psig (15mbar)

Note: Electronic I/P converters present an approximately constant voltage drop to the control loop, and therefore the loop load cannot be presented as a constant resistance. Electromechanical I/P converters normally behave as a simple resistance load, from which the loop voltage drop can be calculated. For example, a resistive I/P converter with internal resistance 300 ohms would give a loop voltage drop of 6.0V at 20 mA, the same value as the 425 converter.

Pneumatic

Output signal*: 3-15 psig (0.2-1 bar)

Response time*:

Into load volume up to 5 liters

Upscale 10-90% span, less than 1 sec.

Downscale 90-10% span, less than 6 sec.

Minimum outlet pressure*: Less than 0.2 psig (15 mbar)

Consumption*: Typically 0.01 scfm (350 cc/min)

Flow capacity: Up to 10 scfm (300 NI/min)

Output ripple:

Less than ±0.5% span at 10Hz into load volume 0.51

Media: Oil free, dry air filtered to 5 microns

Supply pressure range: 18-60 psig (1.3-4 bar)

Preferred range: 25-35 psig (1.7-2.5 bar)

Connections:

1/4" NPT female (plus two integral 1/4" NPT gauge ports)

Environmental & Physical Data

Vibration:

Less than 1% output pressure change for vibration amplitude 5mm 10-30Hz, 10g 30-500Hz

Electromagnetic compatibility:

RFI protection is incorporated within the instrument, giving full protection up to RF field of 10V/m over the band 30-1000MHz

Operating temperature range: -4° to 158°F (-20° to 70°C)

Compensated temperature range: 15° to 140°F (-10° to 60°C)

Materials of construction

Aluminum and zinc diecastings. Nitrile diaphragms

Paint:

Standard paint finish is black epoxy powder coating. Optional finish for severe or off-shore environments

Weatherproofing:

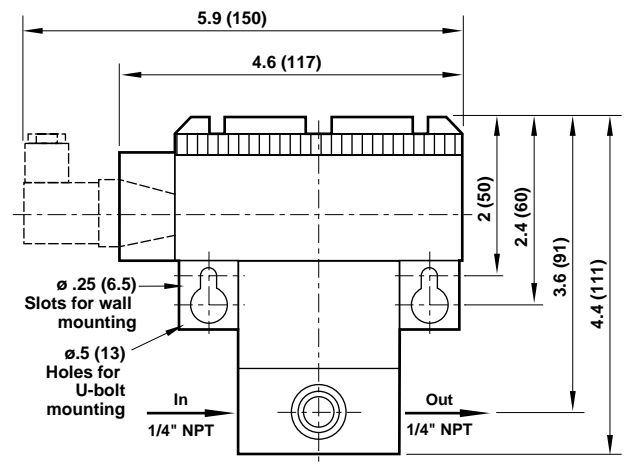
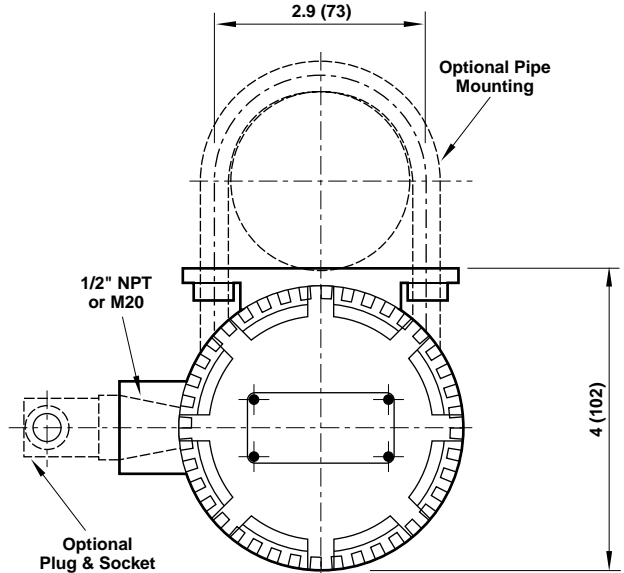
NEMA 4X, IP66. The unit will operate in any orientation, but must be mounted upright to achieve these environmental ratings

Mounting:

Integral bracket allow for surface or 50mm pipe mounting

Weight: 2.0 lb (0.93kg)

All Dimensions in Inches (mm)



* Parameters marked with * are tested on every unit by computer controlled test equipment. Other parameters are typical.

Compressed Air Dryers

Compressor room refrigerated, heated and heatless regenerative dryers and accessories.

Features and Benefits of Dry Compressed Air ALE-27-2
 D11 Series Refrigerated Compressed Air Dryers ALE-27-4
 D10 Series Air Cooled Refrigerated Compressed Air Dryers ALE-27-6
 D10 Series Water Cooled Refrigerated Compressed Air Dryers ALE-27-8
 D50 Series Compact Heatless Regenerative Compressed Air Dryers ALE-27-10
 D51 Series Heatless Regenerative Compressed Air Dryers ALE-27-12
 D60 Series Externally Heated Regenerative Compressed Air Dryers ALE-27-16
 D70 Series Blower Purge Regenerative Compressed Air Dryers ALE-27-18
 W74D Excelon® Desiccant Compressed Air Dryers ALE-27-20
 Product Numbering System ALE-27-22
 Technical Data (Selecting and Sizing) ALE-27-28



D11 Series Refrigerated Compressed Air Dryers



D10 Series Air or Water Cooled Refrigerated Compressed Air Dryers



D50 Series Compact Heatless Regenerative Compressed Air Dryers



D51 Series Heatless Regenerative Compressed Air Dryers



D60 Series Externally Heated Regenerative Compressed Air Dryers



D70 Series Blower Purge Regenerative Compressed Air Dryers



W74D Excelon® 74 Desiccant Compressed Air Dryers



Features and Benefits

Why dry your compressed air?

Because wet air costs you money. Moisture-laden air is not compatible with a clean, efficient, smooth-running system. Understanding how water enters a compressed air system will help illustrate the extent of the problem.

When air is compressed the moisture and impurities contained in the ambient atmosphere are also compressed. This results in a high concentration of moisture and impurities in the receiver. For example, at 75°F ambient temperature and 75% relative humidity, a 100 scfm compressor will take in the equivalent of 18 gallons of water, as vapor in a day.

The elevated temperature of the compressed air contributes to the problem. The higher the air temperature, the greater its capacity for holding water vapor. Conversely, as the air temperature is lowered, its capacity for holding water vapor is decreased. An after-cooler positioned immediately after the compressor will allow some of the moisture to be released as condensate, but does not cool the air sufficiently to remove enough of the water vapor to protect the entire system.

Air line filters installed downstream will satisfactorily remove solid impurities and water in liquid form, but are not able to remove water vapor. As the air cools downstream the water is released, introducing a number of moisture related problems to the system.

What happens when moisture invades your compressed air system?

Water in a compressed air system attacks lubricants injected into the system to protect air tools and cylinders. This reduces operational efficiency, shortens scheduled maintenance intervals and ultimately results in premature tool failure. Air blow-offs become a quick rinse and painting processes are spoiled because of condensate mixing with the paint spray.

Equally as serious are the long-term effects of water in pneumatic systems. Oxidation of metal piping soon occurs. This threatens the integrity of the system by weakening the walls of the pipe. Rust flakes form, break-off from the walls, and are scattered throughout the piping, introducing an entirely new contaminant to the system.

Water settling in low spots in the line or clinging to pipe walls acts like a magnet collecting solid contaminants and oil droplets. This mixture can solidify on the pipe walls restricting flow, causing additional pressure drop. Oil and water emulsion can form. This is a gummy substance that fouls air motors and causes other moving parts to stick.

The ultimate result in a system where moisture problems are not addressed is pipe clogged with rust and scale. The cost of a compressed air dryer is an investment in the longevity of the system.



Did You Know?

A 100 scfm compressor operating in 75°F temperature and 75% relative humidity ambient conditions will take in the equivalent of 18 gallons of water, as vapor, in a day.

The higher the air temperature, the greater its capacity for holding water.

Equally as serious are the long-term effects of water in compressed air systems.



D11 Refrigerated Dryer Operation

Refrigerated Compressed Air Dryer Operation

Norgren refrigerated compressed air dryers remove moisture from compressed air systems by lowering the temperature of the compressed air to condense the water vapor. A cool drink on a hot day illustrates this process. Warm, moist air comes in contact with the cold glass causing water droplets to condense from the ambient air and form on the outside of the glass. Refrigerated dryers use a heat exchanger and refrigerant circuit to lower the temperature of the compressed air to initiate condensation. The condensate generated in the heat exchanger is then directed to a moisture separator and drained away.

D11 Heat Exchangers Operation 5 through 40 scfm

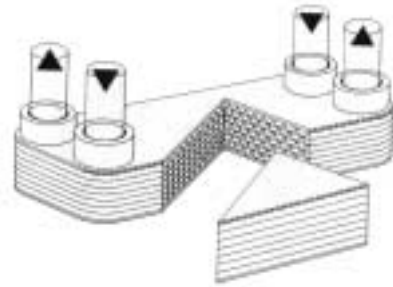
D11 dryers within this size range are equipped with a spiral tube-in-tube heat exchanger. This design provides maximum heat exchange efficiency with minimum pressure drop. The spiral design generates a helical pattern of air flow against the cooled tube surface to provide maximum heat transfer.



As the water vapor condenses on the spiral tube surface it is directed to the moisture separator at high velocity. The spiral air flow pattern eliminates the sharp angled surfaces that collect contaminants. This provides a continuous cleaning action to retard oil and varnish buildup that can clog exchangers, resulting in pressure loss and reduced efficiency. Note: 30 and 40 scfm dryer operation similar to that shown below with the incorporation of an air-to-air heat exchanger.

50 through 200 scfm

D11 dryers within this size range are equipped with a brazed plate heat exchanger. These light-weight, compact, plate-type heat exchangers are noted for their excellent thermal efficiency. Air-to-air and air-to-refrigerant heat exchanges occur within the same unit, eliminating the need for multiple heat exchangers.



Corrugated stainless steel plates brazed with copper alloy into a honeycomb system create counter flow paths in both the air-to-air and air-to-refrigerant sides. Compressed air and refrigerant are securely contained in their separate channels to avoid leakage. The smooth flow path design provides a continuous cleaning action to retard oil and varnish buildup. These heat exchangers can be back-flushed for thorough cleaning when necessary.

Dryer Comparison

Dryer Type	Pressure Dew Point	Atmospheric Dew Point	Drying Media Replacement	Power Consumption	Initial Cost	Pre Filters	After Filters	Maintenance Cost
Refrigerated	35°F (2°C)	74°F (23°C)	Nil	For refrigeration motor	Medium	General purpose and coalescing	None	Regular maintenance of refrigeration
Regenerative Desiccant	-40°F (-40°C)	-70°F (-57°C)	Infrequent	For drying desiccant	High	General purpose and coalescing	Coalescing	Small
Deliquescent	50°F (10°C)	5°F (-15°C)	Regularly, minimum 6 months	Nil	Low	General purpose and coalescing	Coalescing	Recharging container

- Continuous compressor operation adds years to compressor life, and maintains a 35° to 42° (2° to 6°C) pressure dew point per ANSI/B93.45M.
- Norgren's D11 Series Dryers offer a wide range of accessories such as gauges, ambient filters, automatic timer drain, and many others to meet changing conditions.
- All Norgren dryers are warranted to be free from defects in materials and workmanship for a period of two years from date of manufacture.
- Norgren's quality dryer construction is unsurpassed in the industry.



Specifications

Refrigerant: R-134a
 Maximum Working Pressure: 250 psig
 Maximum Inlet Air Temperature: 120°F
 Ambient Temperature Range: 50° to 110°F

Standard Equipment

Moisture separator/automatic drain
 16" power cord (5 through 75 scfm units)
 Electrical terminal block (100 through 200 scfm units)

Optional Equipment

On/Off switch
 Power on light
 High temperature warning light
 Refrigerant suction pressure gauge
 Refrigerant discharge pressure gauge (100 through 200 scfm units)
 6' power cord (5 through 75 scfm units)
 Drain tube kit
 Inlet air temperature gauge (30 through 200 scfm units)
 Outlet air temperature gauge (100 through 200 scfm units)
 Inlet air pressure gauge (100 through 200 scfm units)
 Outlet air pressure gauge (30 through 200 scfm units)

Accessories

Automatic timer drain valve
 Bypass valving (5 and 10 scfm units)
 Pre-filters
 Afterfilters

Electrical Data for Air Cooled Dryers

Model Number	Voltage (volt-ac/hz/phase)
D11-1__-0005 thru D11-1__-0150	115-60-1/100-50-1
D11-2__-0005 &0010 D11-2__-0040 thru 0200	220-60-1/200-50-1
D11-3__-0200	230/208-60-3
D11-4__-0200	460-60-3
D11-6__-0005 thru D11-6__-0200	240/220-50-1

Dryer Flow, Power Ratings, and Weights

Nominal Dryer Flow	Model Number	ΔP (psid)	Compressor Hp.	Total Weight lbs. (kg)
5	D11-__-0005	1.0	1/6	50 (23)
10	D11-__-0010	3.8	1/6	50 (23)
15	D11-__-0015	0.7	1/5	53 (24)
20	D11-__-0020	1.0	1/5	53 (24)
30	D11-__-0030	1.4	1/5	90 (41)
40	D11-__-0040	2.4	1/4	90 (41)
50	D11-__-0050	3.5	1/4	90 (41)
75	D11-__-0075	3.5	1/2	121 (55)
100	D11-__-0100	2.7	1/2	185 (84)
130	D11-__-0130	2.8	3/4	210 (95)
150	D11-__-0150	3.0	3/4	210 (95)
200	D11-__-0200	4.3	1	221 (100)

D11 Series Refrigerated Compressed Air Dryers



Flow Capacity Selection Chart

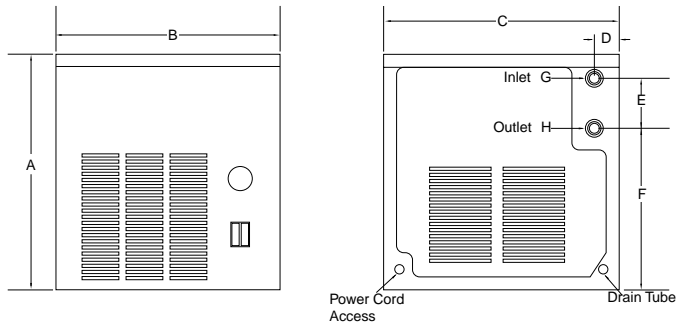
[scfm (dm³/s) @ 38°F (3°C) Pressure Dew Point, and 100°F (38°C) Ambient Temperature]

Model Number*	90°F (32°C) Inlet Air Temp				100°F (38°C) Inlet Air Temp.				110°F (43°C) Inlet Air Temp.			
	50 psig	100 psig	150 psig	200 psig	50 psig	100 psig	150 psig	200 psig	50 psig	100 psig	150 psig	200 psig
D11-___-0005	4.40 (2)	5.50 (3)	5.94 (3)	6.16 (3)	4.00 (2)	5.00 (2)	5.40 (3)	5.60 (3)	3.56 (2)	4.45 (2)	4.80 (2)	4.98 (2)
D11-___-0010	8.80 (4)	11.00 (5)	11.88 (6)	12.32 (6)	8.00 (4)	10.00 (5)	10.80 (5)	11.20 (5)	7.12 (3)	8.90 (4)	9.61 (5)	9.96 (5)
D11-___-0015	13.20 (6)	16.50 (8)	17.82 (8)	18.48 (9)	12.00 (6)	15.00 (7)	16.20 (8)	16.80 (8)	10.68 (5)	13.35 (6)	14.41 (7)	14.95 (7)
D11-___-0020	17.60 (8)	22.00 (10)	23.76 (11)	24.64 (12)	16.00 (8)	20.00 (9)	21.60 (10)	22.40 (11)	14.24 (7)	17.80 (8)	19.22 (9)	19.93 (9)
D11-___-0030	26.40 (12)	33.00 (16)	35.64 (17)	36.96 (17)	24.00 (11)	30.00 (14)	32.40 (15)	33.60 (16)	21.36 (10)	26.70 (13)	28.83 (14)	29.90 (14)
D11-___-0040	35.20 (17)	44.00 (21)	47.52 (22)	49.28 (23)	32.00 (15)	40.00 (19)	43.20 (20)	44.80 (21)	28.40 (13)	35.60 (17)	38.44 (18)	39.87 (19)
D11-___-0050	44.00 (21)	55.00 (26)	59.40 (28)	61.60 (29)	40.00 (19)	50.00 (24)	54.00 (25)	56.00 (26)	35.60 (17)	44.50 (21)	48.06 (23)	49.84 (23)
D11-___-0075	66.00 (31)	82.50 (39)	89.10 (42)	92.40 (43)	60.00 (28)	75.00 (35)	81.00 (38)	84.00 (39)	53.40 (25)	66.75 (31)	72.09 (34)	74.76 (35)
D11-___-0100	88.00 (41)	110.00 (52)	118.80 (56)	123.20 (58)	80.00 (38)	100.00 (47)	108.00 (51)	112.00 (53)	71.20 (33)	89.00 (42)	96.12 (45)	99.68 (47)
D11-___-0130	114.40 (54)	143.00 (67)	154.44 (73)	160.16 (75)	104.00 (49)	130.00 (61)	140.40 (66)	145.60 (68)	92.56 (44)	115.70 (54)	124.95 (59)	129.58 (61)
D11-___-0150	132.00 (62)	165.00 (78)	178.20 (84)	184.80 (87)	120.00 (56)	150.00 (71)	162.00 (76)	168.00 (79)	106.80 (50)	133.50 (63)	144.18 (68)	149.52 (70)
D11-___-0200	176.00 (83)	220.00 (103)	237.60 (112)	246.40 (116)	160.00 (75)	200.00 (94)	216.00 (102)	224.00 (105)	142.40 (67)	178.00 (84)	192.24 (90)	199.36 (94)

* For complete D11 product numbering system see ALE-27-22.

Ambient Temperature Multipliers

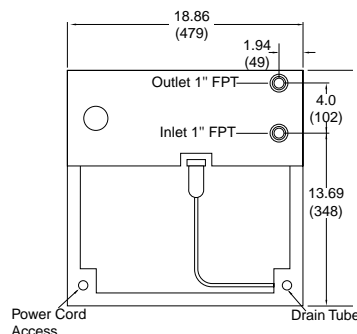
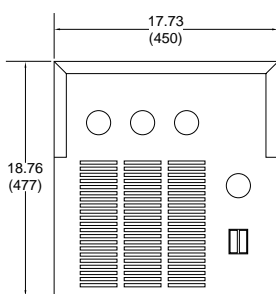
°F (°C)	Multiply by
60 (16)	1.34
70 (21)	1.27
80 (27)	1.19
90 (32)	1.10
100 (38)	1.00
110 (43)	0.89



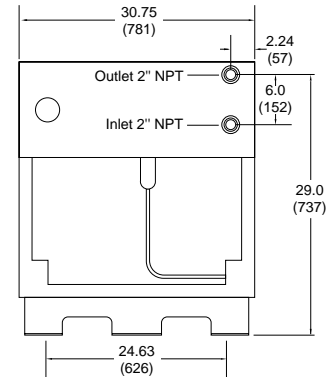
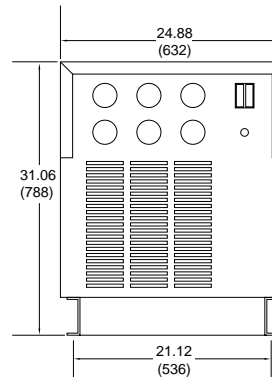
Dimensions for D11-***-0005 thru D11-***-0020 Refrigerated Air Dryers Inches (mm)

Dryer Number	A	B	C	D	E	F	G Inlet	H Outlet
D11-___-0005 thru D11-___-0010	14.00 (356)	15.13 (384)	12.11 (308)	1.98 (51)	2.0 (51)	10.38 (264)	3/8" NPT	3/8" NPT
D11-___-0015 thru D11-___-0020	14.00 (356)	16.00 (406)	14.88 (378)	1.98 (50)	2.00 (51)	10.38 (264)	1/2" NPT	1/2" NPT

Dimensions for D11-***-0030 thru D11-***-0100 Refrigerated Air Dryers Inches (mm)



Dimensions for D11-***-0150 & D11-***-0200 Refrigerated Air Dryers Inches (mm)



D10 Series Dryers

Air-Cooled Refrigerated Compressed Air Dryers

- Refrigerant compressor runs continuously when power is applied to the dryer, providing a nearly constant dew point at all times
- High efficiency heat exchangers.
- Heat exchangers are modular in design and may be replaced in the field.
- Hot gas by-pass valve directs hot refrigerant into the compressor suction line at the exit of the air to refrigerant heat exchanger, permitting constant dew point control down to zero air flow.
- Does not need a separate centrifugal type moisture separator.



Specifications

Refrigerant: R-22
 Maximum Working Pressure: 150 psig (10 bar)
 Maximum Inlet Air Temperature: 120°F (49°C)
 Ambient Temperature Range:
 50° to 110°F (10° to 43°C)

Standard Equipment

Dryer running light
 High suction temperature light
 ON/OFF switch (control circuit)
 Air inlet temperature gauge
 Air outlet temperature gauge (600 through 2,000 scfm units)
 Air inlet pressure gauge (600 through 2,000 scfm units)
 Air outlet pressure gauge
 Refrigerant discharge pressure gauge (600 through 2,000 scfm units)
 Refrigerant analyzer gauge (suction pressure and temperature)
 Automatic timer drain valve
 Compressor motor overload protection
 Crankcase heater
 High/Low refrigerant pressure control
 Low ambient fan control

Optional Equipment

Six gauge package (250 through 500 scfm units)
 Air outlet temperature gauge
 Air inlet pressure gauge
 Refrigerant discharge pressure gauge
 Low or high refrigerant pressure alarm
 NEMA 4 and NEMA 12 wiring (excludes compressor and fan motors)
 Alarm bell
 Hour meter
 Ambient air filter
 Flow meter
 Prefilters
 Afterfilters

Air Inlet and Air Outlet Ports Sizes

Model	Porting
D10-__0-0250 - 0500	2" FPT
D10-__0-0600 - 1000	3" FPT
D10-__0-1250 - 2000	4" FPT
Drains – 1/2" NPT	

Electrical Data for Air Cooled Dryers

Model Number	Main Power (volt-ac/hz/phase)	Control Power (VAC)
D10-200-0250 thru D10-200-0325	230/208-60-1	230
D10-300-0250 thru D10-300-2000	230/208-60-3	230
D10-400-0250 thru D10-400-2000	460-60-3	115
D10-500-0400 thru D10-500-2000	600/550-60-3	115
D10-600-0250 thru D10-600-0325	240/220-50-1	240
D10-700-0250 thru D10-700-2000	240/220-50-3	240
D10-800-0250 thru D10-800-2000	420/380-50-3	115

Dryer Flow, Power Ratings, and Weights

Nominal Dryer Flow	Model Number	ΔP (psid)	Compressor Hp.	Total Weight	
				lbs.	(kg)
250	D10-__00-0250	0.8	1.5	650	(295)
325	D10-__00-0325	1.1	2.0	675	(306)
400	D10-__00-0400	1.5	3.0	700	(318)
500	D10-__00-0500	2.5	3.0	725	(329)
600	D10-__00-0600	1.0	3.0	1,250	(567)
800	D10-__00-0800	2.0	4.0	1,300	(590)
1000	D10-__00-1000	3.0	5.0	1,400	(635)
1250	D10-__00-1250	1.6	7.5	1,925	(882)
1500	D10-__00-1500	2.0	9.0	1,950	(885)
1750	D10-__00-1750	2.8	10.0	2,075	(941)
2000	D10-__00-2000	3.5	12.0	2,125	(964)

D10 Series Air-Cooled Refrigerated Compressed Air Dryers



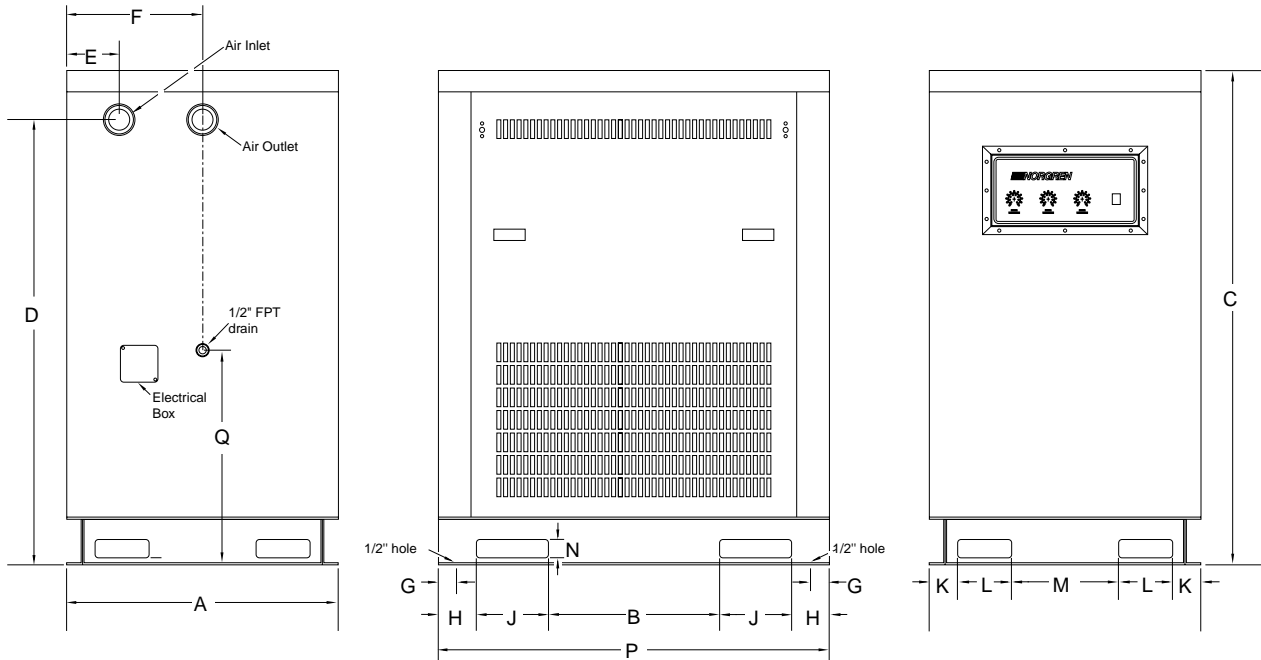
Ambient Temperature Correction Factor for Air Cooled Dryers

°F (°C)	Multiply by
60 (16)	1.34
70 (21)	1.27
80 (27)	1.19
90 (32)	1.10
100 (38)	1.00
110 (43)	0.89

Flow Capacity Selection Chart [scfm (dm³/s) @ 38°F (3°C) Pressure Dew Point, and 100°F (38°C) Ambient Temperature]

Model Number*	90°F (32°C) Inlet Air Temp			100°F (38°C) Inlet Air Temp			110°F (43°C) Inlet Air Temp		
	50 psig	100 psig	150 psig	50 psig	100 psig	150 psig	50 psig	100 psig	150 psig
D10_00-0250	265 (125)	300 (141)	330 (155)	210 (99)	250 (118)	275 (129)	163 (77)	200 (94)	220 (103)
D10_00-0325	344 (162)	390 (183)	429 (202)	273 (128)	325 (153)	358 (168)	211 (99)	260 (122)	286 (134)
D10_00-0400	424 (199)	480 (226)	528 (248)	336 (158)	400 (188)	440 (207)	260 (122)	320 (150)	352 (165)
D10_00-0500	530 (249)	600 (282)	660 (310)	420 (197)	500 (235)	550 (259)	325 (153)	400 (188)	440 (207)
D10_00-0600	636 (299)	720 (338)	792 (372)	504 (237)	600 (282)	660 (310)	390 (183)	480 (226)	528 (248)
D10_00-0800	848 (399)	960 (451)	1,056 (496)	672 (316)	800 (376)	880 (414)	520 (244)	640 (301)	704 (331)
D10_00-1000	1,060 (498)	1,200 (564)	1,320 (620)	840 (395)	1,000 (470)	1,100 (517)	650 (306)	800 (376)	880 (414)
D10_00-1250	1,325 (623)	1,500 (705)	1,650 (776)	1,050 (494)	1,250 (588)	1,375 (646)	810 (381)	1000 (470)	1,100 (517)
D10_00-1500	1,590 (748)	1,800 (846)	1,980 (931)	1,260 (592)	1,500 (705)	1,650 (776)	975 (458)	1,200 (564)	1,320 (621)
D10_00-1750	1,855 (872)	2,100 (988)	2,310 (1086)	1,470 (691)	1,750 (823)	1,925 (905)	1,140 (536)	1,400 (658)	1,540 (724)
D10_00-2000	2,120 (996)	2,400 (1128)	2,640 (1241)	1,680 (790)	2,000 (940)	2,200 (1034)	1,300 (611)	1,600 (752)	1,760 (827)

* For complete D10 product numbering system see ALE-27-23.



Dimensions for Air-Cooled Dryers
Inches (mm)

Dryer Number	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
D10_00-0250 thru D10_00-0500	30.00 (762)	19.00 (483)	54.50 (1384)	49.13 (1248)	5.75 (146)	15.00 (381)	2.00 (51)	4.00 (102)	8.00 (203)	3.00 (76)	6.00 (152)	12.00 (305)	2.00 (51)	43.00 (1092)	23.63 (600)
D10_00-0600 thru D10_00-1000	33.00 (838)	24.00 (610)	69.88 (1775)	61.63 (1565)	6.38 (162)	16.50 (419)	3.38 (86)	6.75 (171)	8.00 (203)	3.00 (76)	6.00 (152)	15.00 (381)	2.00 (51)	53.50 (1359)	31.00 (787)
D10_00-1250 thru D10_00-2000	39.00 (991)	24.00 (610)	75.88 (1927)	66.88 (1699)	7.50 (191)	19.50 (495)	6.25 (159)	12.50 (318)	8.00 (203)	3.00 (76)	6.00 (152)	21.00 (533)	2.00 (51)	65.00 (1651)	33.00 (838)

- Refrigerant compressor runs continuously when power is applied to the dryer, providing a nearly constant dew point at all times
- High efficiency heat exchangers.
- Heat exchangers are modular in design and may be replaced in the field.
- Hot gas by-pass valve directs hot refrigerant into the compressor suction line at the exit of the air to refrigerant heat exchanger, permitting constant dew point control down to zero air flow.
- Does not need a separate centrifugal type moisture separator.



Specifications

Refrigerant: R-22

Maximum Working Pressure: 150 psig (10 bar)

Maximum Inlet Air Temperature: 120°F (49°C)

Ambient Temperature Range:
50° to 110°F (10° to 43°C)

Standard Equipment

Dryer running light

High suction temperature light

ON/OFF switch (control circuit)

Air inlet temperature gauge

Air outlet temperature gauge (600 through 2,000 scfm units)

Air inlet pressure gauge (600 through 2,000 scfm units)

Air outlet pressure gauge

Refrigerant discharge pressure gauge (600 through 2,000 scfm units)

Refrigerant analyzer gauge (suction pressure and temperature)

Automatic timer drain valve

Compressor motor overload protection

Crankcase heater

High/Low refrigerant pressure control

Water pressure switch

Water regulating valve

Optional Equipment

Six gauge package (400 and 500 scfm units)

Air outlet temperature gauge

Air inlet pressure gauge

Refrigerant discharge pressure gauge

Low or high refrigerant pressure alarm

NEMA 4 and NEMA 12 wiring (excludes compressor and fan motors)

Alarm bell

Hour meter

Prefilters

Afterfilters

Electrical Data for Water-Cooled Dryers

Model Number	Main Power (VAC)	Control Power (VAC)
D10-301-0400 thru D10-301-2000	230/208-60-3	230
D10-401-0400 thru D10-401-2000	460-60-3	115
D10-501-0400 thru D10-501-2000	600/550-60-3	115
D10-701-0400 thru D10-701-2000	240/220-50-3	240
D10-801-0400 thru D10-801-2000	420/380-50-3	100

Dryer Flow, Power Ratings, and Weights

Model Number	ΔP (psid)	Compressor Hp.	Total Weight lbs. (kg)
D10-01-0400	1.8	2.0	700 (318)
D10-01-0500	3.0	3.0	725 (329)
D10-01-0600	1.1	3.0	1,250 (567)
D10-01-0800	2.3	4.0	1,300 (590)
D10-01-1000	3.3	5.0	1,400 (635)
D10-01-1250	1.6	7.5	1,925 (873)
D10-01-1750	3.1	9.0	2,075 (941)
D10-01-2000	3.9	10.0	2,125 (964)

Air Inlet and Air Outlet Ports Sizes

Model	Porting
D10-__1-0400 - 0500	2" FPT
D10-__1-0600 - 1000	3" FPT
D10-__1-1200 - 2000	4" FPT
Drains – 1/2" NPT	
Water Inlet and Water Outlet	
D10-__1-0400 - 0500	1/2" FPT
D10-__1-0600 - 1000	1" FPT

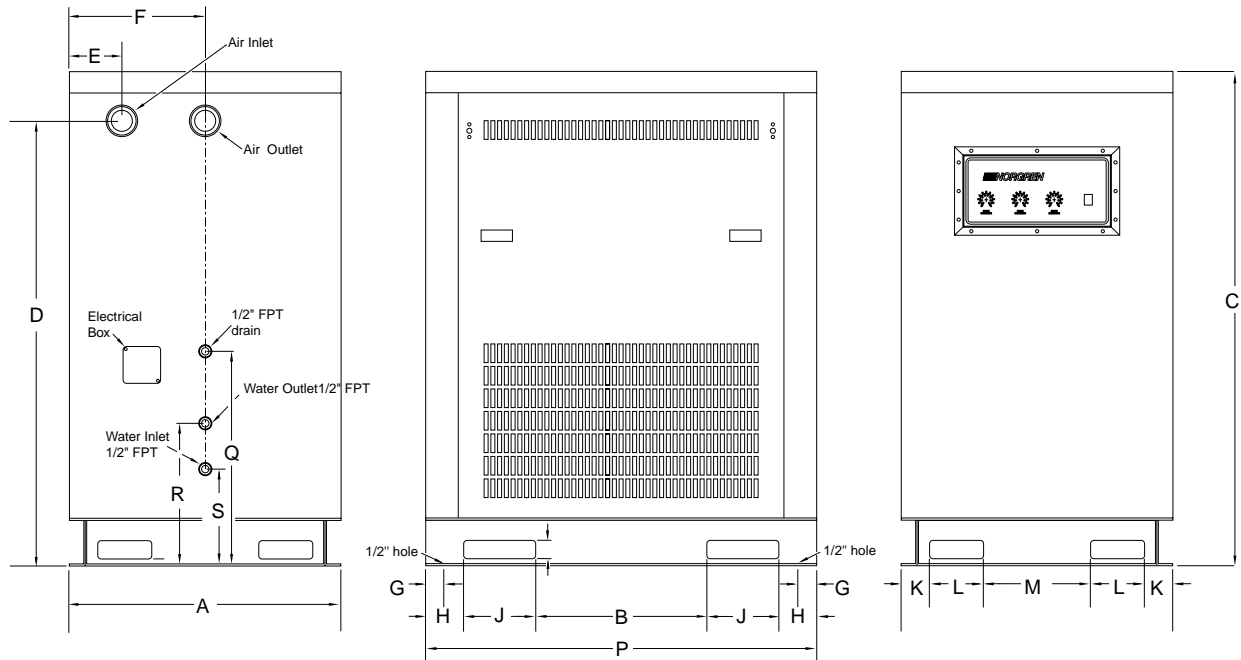


Flow Capacity Selection Chart

[scfm (dm³/s) @ 38°F (3°C) Pressure Dew Point, 100°F (38°C) Ambient Temperature, and 85°F Inlet Water Temperature]

Model Number*	90°F (32°C) Inlet Air Temp			100°F (38°C) Inlet Air Temp			110°F (43°C) Inlet Air Temp		
	50 psig	100 psig	150 psig	50 psig	100 psig	150 psig	50 psig	100 psig	150 psig
D10_01-0400	461 (217)	522 (245)	574 (270)	365 (172)	435 (204)	479 (225)	283 (133)	348 (164)	383 (180)
D10_01-0500	583 (274)	660 (310)	726 (341)	462 (217)	550 (259)	605 (284)	358 (168)	440 (207)	484 (227)
D10_01-0600	662 (311)	756 (355)	832 (391)	529 (249)	630 (296)	693 (326)	410 (193)	504 (237)	554 (260)
D10_01-0800	901 (423)	1,020 (479)	1,122 (527)	714 (336)	850 (400)	935 (439)	553 (260)	680 (320)	748 (352)
D10_01-1000	1,113 (523)	1,260 (592)	1,386 (651)	882 (415)	1,050 (494)	1,155 (543)	683 (321)	840 (395)	924 (434)
D10_01-1250	1,325 (623)	1,500 (705)	1,650 (776)	1,050 (494)	1,250 (588)	1,375 (646)	810 (381)	1,000 (470)	1,110 (522)
D10_01-1750	1,950 (916)	2,208 (1038)	2,430 (1142)	1,545 (726)	1,840 (865)	2,024 (951)	1,196 (562)	1,472 (692)	1,619 (761)
D10_01-2000	2,226 (1046)	2,520 (1184)	2,772 (1303)	1,764 (829)	2,100 (987)	2,310 (1086)	1,365 (642)	1,680 (790)	1,848 (869)

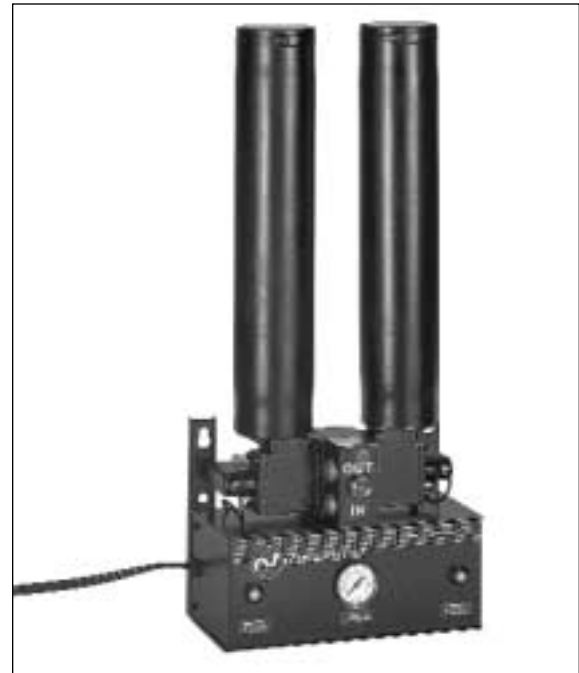
* For complete D10 product numbering system see ALE-27-23.



Dimensions for Water-Cooled Dryers Inches (mm)

Dryer Number	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S
D10_01-0400 thru D10_01-0500	30.00 (762)	19.00 (483)	54.50 (1384)	49.13 (1248)	5.75 (146)	15.00 (381)	2.00 (51)	4.00 (102)	8.00 (203)	3.00 (76)	6.00 (152)	12.00 (305)	2.00 (51)	43.00 (1092)	23.63 (600)	15.63 (397)	10.63 (270)
D10_01-0600 thru D10_01-1000	33.00 (838)	24.00 (610)	69.88 (1775)	61.63 (1565)	6.38 (162)	16.50 (419)	3.38 (86)	6.75 (171)	8.00 (203)	3.00 (76)	6.00 (152)	15.00 (381)	2.00 (51)	53.50 (1359)	31.00 (787)	14.00 (356)	10.00 (254)
D10_01-1250 thru D10_01-2000	39.00 (991)	24.00 (610)	75.88 (1927)	66.88 (1699)	7.50 (191)	19.50 (495)	6.25 (159)	12.50 (318)	8.00 (203)	3.00 (76)	6.00 (152)	21.00 (533)	2.00 (51)	65.00 (1651)	33.00 (838)	14.00 (356)	10.00 (254)

- The twin desiccant-packed towers alternate operation continuously to provide ultra-dry air for critical applications.
- Timer controlled shuttle valves direct the compressed air into the active tower for drying.
- Calibrated needle valve adjusts purge flow to actual outlet flow and pressure conditions.
- Overlapping cycle times provide constant downstream pressure and dew point.



Specifications

Inlet Air Pressure: 60 to 150 psig (4 to 10 bar)
 Ambient Temperature Range: 35° to 110°F (2° to 43°C)
 Outlet Pressure Dew point: -40°F (-40°C)
 Optional: -66°F (54°C)
 Inlet and Outlet ports: 1/2-14 NPTF
 Electrical Requirements: 115 v-60 hz -1 ph, 230 v-60 hz-1ph,
 240/220 V-50 hz-1 ph, 12 or 24 VDC
 Purge Air Consumption for Regeneration: 20%
 Power Consumption: 10 Watts
 Sound Level:
 Running: 56 dBa
 Switching: 74 dBa

Materials of Construction

Tower and Body: Aluminum
 Elastomers: Nitrile and Polyurethane
 Desiccant: Activated Alumina

Standard Equipment

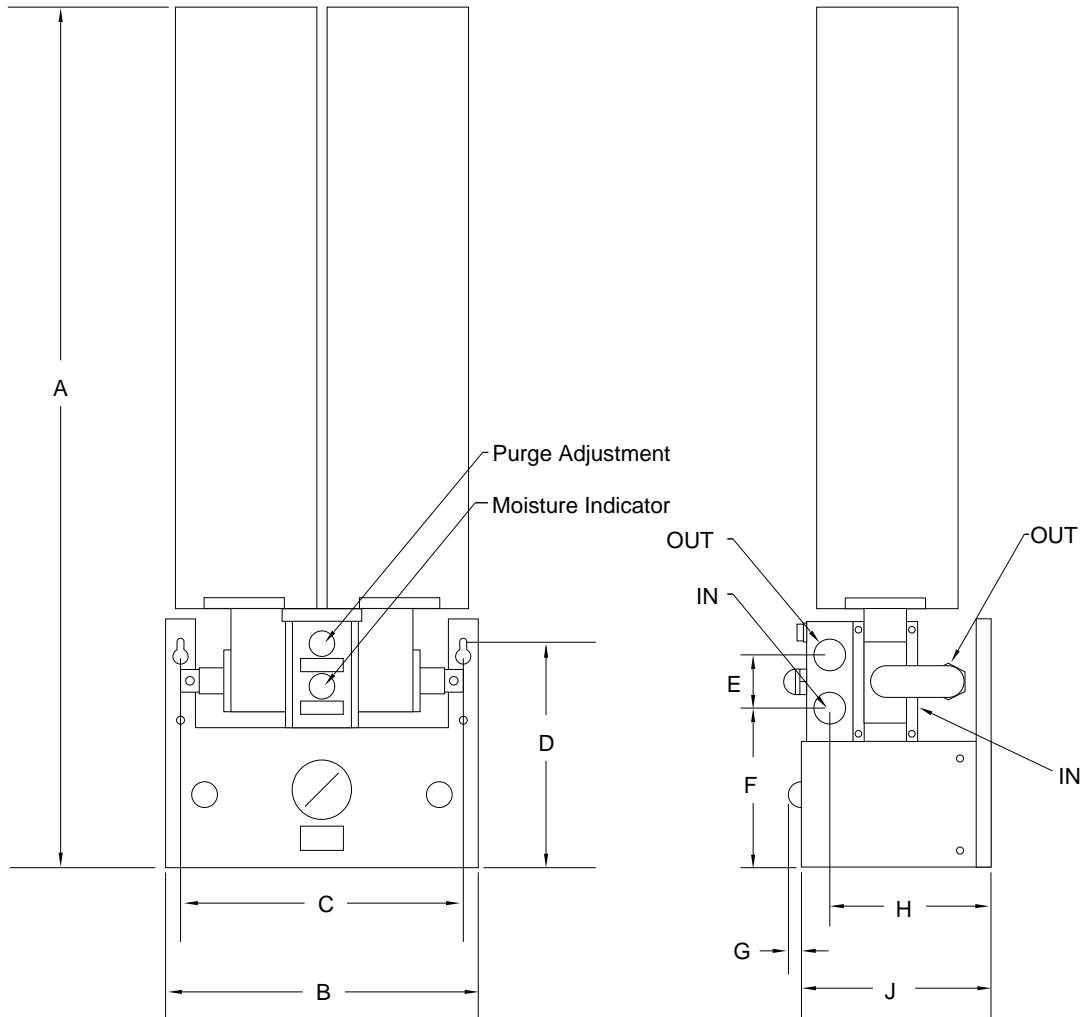
Switching valves
 Purge valves
 Purge control valve
 Purge mufflers
 Desiccant packed towers
 Electric timer
 Six-foot power cord
 Moisture indicator (standard unit only)
 Inlet pressure gauge (standard unit only)
 Tower pressure indicators (standard unit only)
 Tower pressure indicator color code:
 Green: Tower is at line pressure in drying cycle
 Black: Tower is slightly above atmospheric pressure
 and in regenerative cycle

Optional Equipment

-66°F (-54°C) outlet pressure dew point
 NEMA 7 rating (hazardous location)
 Prefilters (recommended)
 Afterfilters (recommended)

Inlet and Outlet Flow Capacities, and Weights

Model Number	Inlet Flow Range (scfm @ 100 psig)	Outlet Flow Range (scfm @ 100 psig)	Total Weight lbs. (kg)
D50-___-0010	2 to 10	1.5 to 7.7	17 (8)
D50-___-0025	8 to 25	6.1 to 19.3	24 (11)
D50-___-0050	20 to 50	15.2 to 38.5	44 (20)



Dimensions for D50 Heatless Regenerative Compressed Air Dryers
Inches (mm)

Dryer Number*	A	B	C	D	E	F	G	H	J
D50-___0010	18.50 (469.90)	10.00 (254.00)	9.00 (228.60)	7.06 (179.32)	1.25 (31.75)	4.90 (124.46)	0.44 (11.18)	4.62 (117.35)	5.25 (133.35)
D50-___0025	22.25 (565.15)	10.00 (254.00)	9.00 (228.60)	7.06 (179.32)	1.25 (31.75)	4.90 (124.46)	0.44 (11.18)	4.62 (117.35)	5.25 (133.35)
D50-___0050	27.70 (703.58)	10.00 (254.00)	9.00 (228.60)	7.06 (179.32)	1.25 (31.75)	4.90 (124.46)	0.44 (11.18)	4.62 (117.35)	5.25 (133.35)

* For complete D50 product numbering system see ALE-27-24.

D51 Series Dryers

Heatless Regenerative Compressed Air Dryers

- -40°F pressure dew point ultra-dry air.
- Automatic operation
- Provides continuous supply of dry air.
- Precision timing control.



Specifications

Maximum Working Pressure: 150 psig (10 bar)

Maximum Inlet Air Temperature: 110°F (43°C)

Electrical Requirements: 115 V/60hz/1ph

Dryer Vessel:

ASME Code VIII and latest addenda (200 to 6,250 scfm units)

Purge Air Consumption for Regeneration: 15%

Standard Equipment

ON/OFF switch

Tower indicating lights

Purge adjustment valve

Purge control pressure gauge

Purge control valve

Purge exhaust muffler

Tower pressure gauges

Tower pressure relief valves

Check valves

4-way automatic switching valves (25 to 350 scfm units)

Pneumatically actuated switching valves (500 to 6,250 scfm units)

Pilot control valve (500 to 6,250 scfm units)

Pilot control air filter (500 to 6,250 scfm units)

Pilot air switching valve (500 to 6,250 scfm units)

Repressurization valves (200 to 6,250 scfm units)

ASME Coded vessels (200 to 6,250 scfm units)

Activated alumina desiccant (shipped separately)

Desiccant fill and drain ports

Stainless steel air diffuser screens

NEMA 4 enclosure

Solid state timer

Structural steel frame

Optional Equipment

Purge saving system

High humidity warning light

Fail-to-switch warning light

Audible alarm (s)

Moisture indicator

Prefilter (recommended)

Afterfilter (recommended)

Dryer by-pass system

Pneumatic controls

High pressure units

Dryer Port Size, and Weight

Model Number	Inlet/Outlet Ports	Total Weight lbs. (kg)
D51-100-0025	1/2	70 (32)
D51-100-0035	1/2	85 (39)
D51-100-0050	3/4	120 (54)
D51-100-0070	3/4	160 (73)
D51-100-0100	1	240 (109)
D51-100-0150	1	265 (120)
D51-100-0200	1-1/2	625 (284)
D51-100-0250	1-1/2	750 (350)
D51-100-0350	1-1/2	875 (397)
D51-100-0500	2	1,350 (612)
D51-100-0650	2	1,600 (726)
D51-100-0800	2-1/2	2,000 (907)
D51-100-1000	3	2,650 (1202)
D51-100-1250	3	3,000 (1361)
D51-100-1500	3	3,500 (1588)
D51-100-2000	3	4,600 (2087)
D51-100-2500	4	5,100 (2313)
D51-100-3000	4	6,500 (2948)
D51-100-3500	4	8,000 (3629)
D51-100-4500	6	10,000 (4536)
D51-100-5500	6	13,000 (5897)
D51-100-6250	6	15,500 (7031)



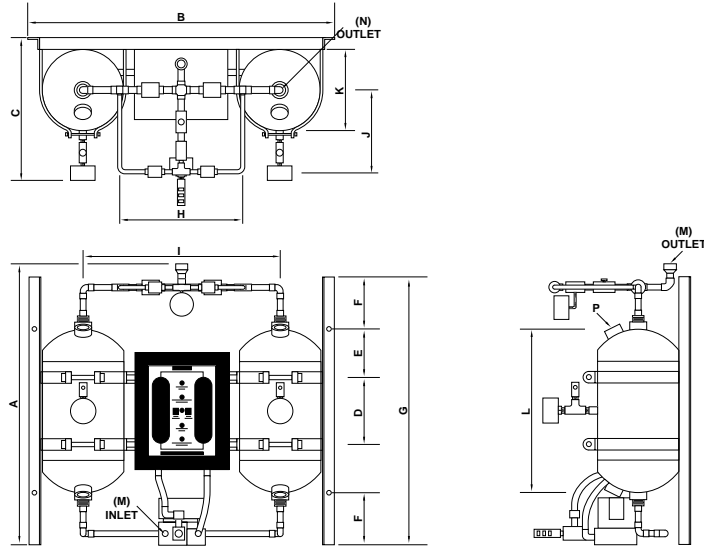
Flow Capacity Selection Chart
 [scfm (dm³/s) @ -40°F (-40°C) Pressure Dew Point and
 100°F (38°C) Ambient Temperature]

Model Number*	75 psig	100 psig	125 psig	150 psig
D51-100-0025	20 (9)	25 (12)	30 (14)	36 (17)
D51-100-0035	27 (13)	35 (16)	43 (20)	50 (24)
D51-100-0050	39 (18)	50 (24)	61 (29)	72 (34)
D51-100-0070	55 (26)	70 (33)	85 (40)	100 (5)
D51-100-0100	78 (37)	100 (47)	122 (57)	144 (68)
D51-100-0150	117 (55)	150 (71)	183 (86)	215 (101)
D51-100-0200	156 (73)	200 (94)	244 (115)	287 (135)
D51-100-0250	196 (92)	250 (118)	304 (143)	359 (169)
D51-100-0350	274 (129)	350 (165)	426 (200)	503 (236)
D51-100-0500	391 (184)	500 (235)	609 (286)	718 (337)
D51-100-0650	508 (239)	650 (306)	792 (372)	933 (439)
D51-100-0800	626 (294)	800 (376)	974 (458)	1,149 (540)
D51-10-1000	782 (368)	1,000 (470)	1,218 (572)	1,436 (675)
D51-100-1250	978 (460)	1,250 (588)	1,522 (715)	1,795 (844)
D51-100-1500	1,173 (551)	1,500 (705)	1,827 (859)	2,154 (1012)
D51-100-2000	1,564 (735)	2,000 (940)	2,436 (1145)	2,872 (1350)
D51-100-2500	1,955 (919)	2,500 (1175)	3,045 (1431)	3,590 (1687)
D51-100-3000	2,346 (1103)	3,000 (1410)	3,654 (1717)	4,308 (2025)
D51-100-3500	2,740 (1288)	3,500 (1645)	4,265 (2005)	5,025 (2362)
D51-100-4500	3,520 (1654)	4,500 (2115)	5,480 (2576)	6,460 (3036)
D51-100-5500	4,300 (2021)	5,500 (2585)	6,700 (3149)	7,900 (3713)
D51-100-6250	4,885 (2296)	6,250 (2938)	7,610 (3577)	8,980 (4221)

* For complete D51 product numbering system see ALE-27-25.

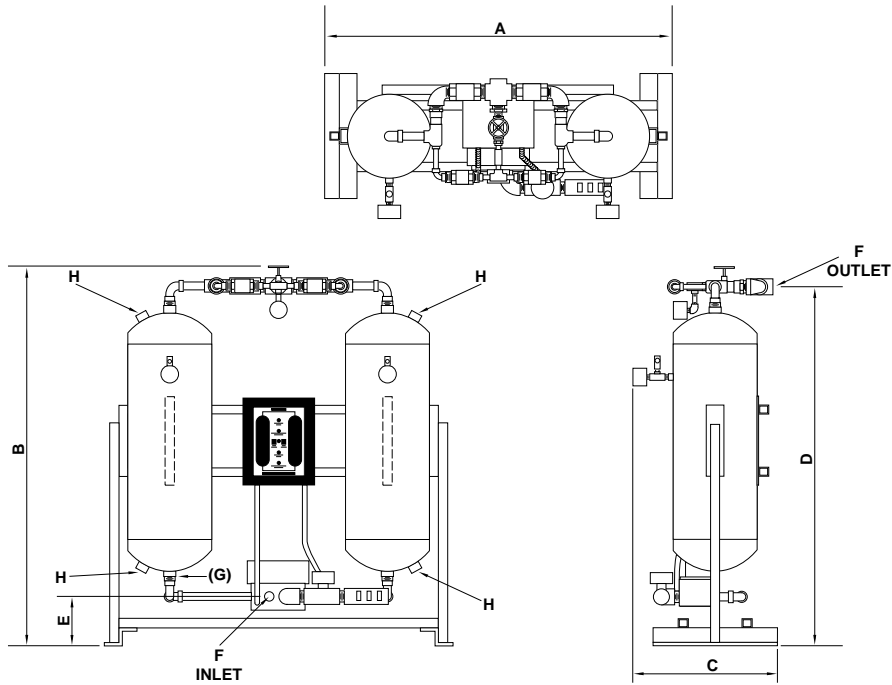


D51 Series Compact Heatless Regenerative Compressed Air Dryers



Dimensions for D51-100-0025 thru D51-100-0070 Compressed Air Dryers
Inches (mm)

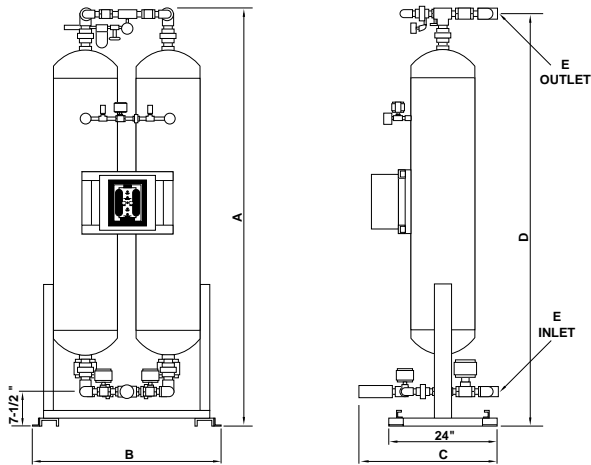
Dryer Number	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P
D51-100-0025	24.50 (622)	26.50 (673)	12.75 (324)	5.38 (137)	4.69 (119)	1.00 (25)	23.00 (584)	11.75 (292)	17.00 (432)	7.50 (191)	7.00 (178)	14.00 (356)	.50 (13)	.75 (19)	.75 (19)
D51-100-0035	29.0 (737)	26.50 (673)	12.75 (324)	7.38 (187)	5.81 (148)	1.00 (25)	23.00 (584)	11.75 (292)	17.00 (432)	7.50 (191)	7.0 (178)	19.00 (482)	.50 (13)	.75 (19)	.75 (19)
D51-100-0050	35.50 (902)	30.50 (775)	17.00 (432)	7.88 (200)	5.56 (141)	2.00 (51)	25.00 (635)	20.50 (521)	20.50 (521)	10.00 (254)	8.00 (203)	21.00 (533)	.75 (19)	.75 (19)	.75 (19)
D51-100-0070	41.00 (1041)	30.50 (775)	17.00 (432)	11.13 (283)	6.69 (170)	2.00 (51)	30.50 (775)	20.50 (521)	20.50 (521)	10.00 (254)	8.00 (203)	26.50 (673)	.75 (19)	.75 (19)	.75 (19)



Dimensions for D51-100-100 thru D51-100-150 Compressed Air Dryers
Inches (mm)

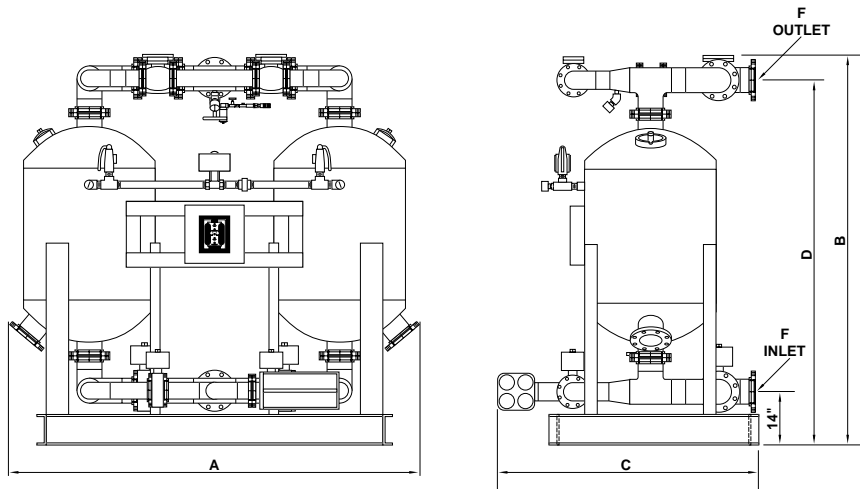
Dryer Number	A	B	C	D	E	F	G	H
D51-100-100	34.00 (866)	46.00 (1168)	17.00 (432)	45.00 (1143)	6.00 (152)	1.00 (25)	1.00 (25)	1.00 (25)
D51-100-150	41.50 (1054)	39.00 (991)	17.00 (432)	36.00 (914)	6.00 (152)	1.00 (25)	1.00 (25)	1.00 (25)

D51 Series Compact Heatless Regenerative Compressed Air Dryers



**Dimensions for D51-100-200 thru D51-100-650
Compressed Air Dryers
Inches (mm)**

Dryer Number	A	B	C	D	E
D51-100-200	65.00 (1651)	34.00 (1156)	35.00 (889)	61.00 (1549)	1.50 (38)
D51-100-250	79.00 (2007)	34.00 (1156)	35.00 (889)	75.00 (1905)	1.50 (38)
D51-100-350	65.00 (1651)	38.00 (965)	35.00 (889)	62.00 (1575)	1.50 (38)
D51-100-500	95.00 (2413)	38.00 (965)	27.00 (686)	91.00 (2311)	2.00 (51)
D51-100-650	94.00 (2388)	42.00 (1067)	29.00 (7366)	90.00 (2286)	2.00 (51)



**Dimensions for D51-100-0800 thru D51-100-6250
Compressed Air Dryers
Inches (mm)**

Dryer Number	A	B	C	D	E	F
D51-100-0800	51.00 (1295)	100.00 (2540)	40.00 (1016)	96.00 (2438)	2.50 (64)	2.5 (64)
D51-100-1000	54.50 (1384)	102.00 (2591)	40.00 (1016)	98.00 (2489)	3.00 (76)	3.00 (76)
D51-100-1250	68.00 (1727)	109.00 (2769)	40.00 (1016)	105.00 (2667)	3.00 (76)	3.00 (76)
D51-100-1500	72.00 (1829)	94.00 (2388)	42.00 (1067)	89.00 (2261)	3.00 (76)	3.00 (76)
D51-100-2000	66.00 (1676)	111.00 (2819)	42.00 (1067)	107.00 (2718)	3.00 (76)	3.00 (76)
D51-100-2500	78.00 (1981)	116.00 (2946)	55.00 (1397)	111.00 (2819)	4.00 (102)	4.00 (102)
D51-100-3000	99.00 (2515)	113.00 (2870)	57.50 (1461)	108.00 (2743)	4.00 (102)	4.00 (102)
D51-100-3500	99.00 (2515)	117.00 (2972)	58.00 (1473)	112.00 (2845)	4.00 (102)	4.00 (102)
D51-100-4500	105.00 (2667)	136.00 (3454)	58.00 (1473)	130.00 (3302)	6.00 (152)	6.00 (152)
D51-100-5500	105.00 (2667)	125.00 (3175)	58.00 (1473)	119.00 (3023)	6.00 (152)	6.00 (152)
D51-100-6250	116.00 (2946)	138.00 (3505)	58.00 (1473)	132.00 (3353)	6.00 (152)	6.00 (152)

D60 Series Externally Heated Regenerative Compressed Air Dryers

- Delivers -40° pressure dew point
- Provides continuous supply of dry air
- Operates automatically with flexible controls
- Reduces purge air requirements



Specifications

Maximum Working Pressure: 150 psig
 Maximum Inlet Air Temperature: 110°F
 Electrical Requirements: 460v/60 hz 3ph (control circuit 115v/60 hz/1ph)
 Dry Vessel: ASME Code, Section VIII and latest addenda
 Exterior Finish: Industrial enamel
 Purge Air Consumption for Regeneration: 7%

Standard Equipment

On/Off switch
 Dryer running light
 Purge adjustment valve
 Purge cooling valve
 Purge control pressure gauge
 Purge control valve
 Purge exhaust mufflers
 Tower pressure gauges
 Tower pressure relief valves
 Electric heater
 Heater high temperature control
 Check valves
 Pneumatically actuated switching valves
 Pilot control valve
 Pilot control air filter
 Pilot air switching valves
 Regeneration valve
 ASME Coded vessels
 Jacketed insulation
 Activated alumina desiccant (shipped separately)
 Desiccant fill and drain ports
 Stainless steel air diffuser screens
 NEMA 1 enclosure
 Programmable logic controller
 460-3-60 main power circuit
 115-1-60 control circuit
 Structural steel frame

Optional Equipment

Automatic logic functions
 Purge saving system
 High humidity warning light
 Fail-to-switch warning light
 Purge exhaust temperature control
 Audible alarm(s)
 Tower indicating lights
 NEMA 4 or 12 rating
 Visual moisture indicator
 Prefilter (recommended)
 Afterfilter (recommended)
 Dryer bypass system
 Steam to air heat exchanger
 Molecular sieve and silica gel desiccants

Weights and Heater Specifications

Model Number	Weight		Heater KW
	lbs	(kg)	
D60-400-0100	700	(318)	1
D60-400-0175	825	(374)	1-1/2
D60-400-0250	900	(408)	2
D60-400-0350	1,500	(680)	2-1/2
D60-400-0500	2,400	(1,089)	4
D60-400-0700	2,900	(1,315)	5
D60-400-0850	3,350	(1,520)	6
D60-400-1000	3,800	(1,724)	8
D60-400-1350	5,000	(2,268)	10
D60-400-1700	5,500	(2,495)	12
D60-400-2100	7,200	(3,266)	15
D60-400-2400	8,750	(3,969)	17
D60-400-3100	11,000	(4,990)	25
D60-400-3800	14,200	(6,441)	33
D60-400-4300	16,300	(7,393)	33
D60-400-5000	17,600	(7,983)	42
D60-400-6250	20,200	(9,163)	50

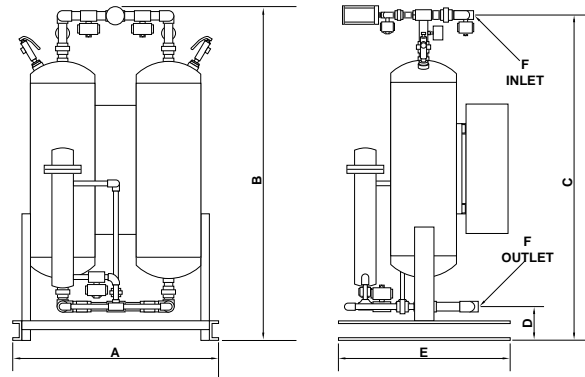
D60 Series Externally Heated Regenerative Compressed Air Dryers



Flow Capacity Selection Chart
 [scfm (dm³/s) @ 100°F (38°C) inlet temperature and
 -40°F (-40°C) pressure dew point]

Model Number*	75 psig	100 psig	125 psig	150 psig
D60-400-0100	78 (37)	100 (47)	122 (57)	144 (68)
D60-400-0175	137 (64)	175 (82)	213 (100)	252 (85)
D60-400-0250	196 (92)	250 (118)	304 (143)	359 (169)
D60-400-0350	274 (129)	350 (165)	426 (200)	503 (236)
D60-400-0500	391 (184)	500 (235)	609 (286)	718 (337)
D60-400-0700	547 (257)	700 (329)	853 (401)	1,005 (472)
D60-400-0850	665 (313)	850 (400)	1,035 (486)	1,220 (573)
D60-400-1000	782 (368)	1,000 (470)	1,218 (572)	1,436 (675)
D60-400-1350	1,056 (496)	1,350 (635)	1,644 (773)	1,938 (911)
D60-400-1700	1,329 (625)	1,700 (799)	2,071 (973)	2,441 (1147)
D60-400-2100	1,642 (772)	2,100 (987)	2,558 (1202)	3,016 (1418)
D60-400-2400	1,877 (882)	2,400 (1128)	2,923 (1374)	3,446 (1620)
D60-400-3100	2,424 (1139)	3,100 (1457)	3,776 (1775)	4,451 (2092)
D60-400-3800	2,972 (1397)	3,800 (1786)	4,628 (2175)	5,456 (2564)
D60-400-4300	3,363 (1581)	4,300 (2021)	5,237 (2461)	6,175 (2902)
D60-400-5000	3,910 (1838)	5,000 (2350)	6,090 (2862)	7,180 (3375)
D60-400-6250	4,888 (2297)	6,250 (2938)	7,612 (3578)	8,975 (4218)

* For complete D60 product numbering system see ALE-27-26.

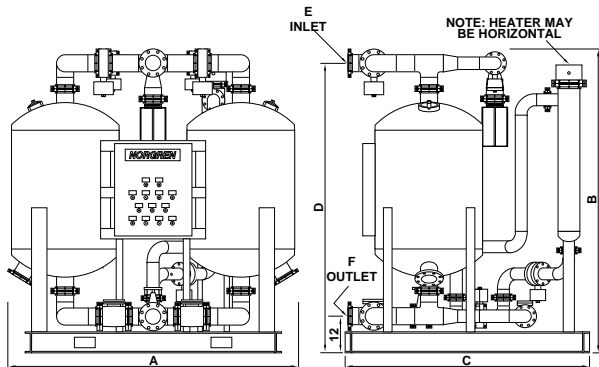


Dimensions for D60-400-0100 thru D60-400-0500 Externally Heated Regenerative Compressed Air Dryers
 inches (mm)

Dryer Number	A	B	C	D	E	F
D60-400-0100	36.00 (914)	77.50 (1969)	68.00 (1727)	6.00 (152)	34.00 (864)	1.00 (25)
D60-400-0175	40.00 (1016)	82.00 (2083)	72.00 (1829)	7.00 (178)	38.00 (965)	1.50 (38)
D60-400-0250	42.00 (1067)	71.00 (1803)	61.00 (1549)	7.00 (178)	43.00 (1092)	1.50 (38)
D60-400-0350	42.00 (1067)	86.00 (2184)	85.00 (2159)	7.00 (178)	43.00 (1092)	1.50 (38)
D60-400-0500	50.00 (1270)	97.00 (2464)	95.00 (2413)	10.00 (254)	44.00 (1118)	2.00 (51)

Dimensions for D60-400-0700 thru D60-400-6250 Externally Heated Regenerative Compressed Air Dryers
 inches (mm)

Dryer Number	A	B	C	D	E	F
D60-400-700	44.00 (1118)	109.00 (2769)	48.00 (1219)	105.00 (2667)	2.00 (51)	2.00 (51)
D60-400-850	50.00 (1270)	111.00 (2819)	50.00 (1270)	106.00 (2692)	2.50 (64)	2.50 (64)
D60-400-1000	71.00 (1803)	93.00 (2362)	61.00 (1549)	89.00 (2261)	3.00 (76)	3.00 (76)
D60-400-1350	71.00 (1803)	110.00 (2794)	61.00 (1549)	106.00 (2692)	3.00 (76)	3.00 (76)
D60-400-1700	78.00 (1981)	100.00 (2540)	61.00 (1549)	96.00 (2438)	3.00 (76)	3.00 (76)
D60-400-2100	95.00 (2413)	97.50 (2477)	70.00 (1778)	93.50 (2375)	3.00 (76)	3.00 (76)
D60-400-2400	99.00 (2515)	114.00 (2896)	67.00 (1702)	109.00 (2769)	4.00 (102)	4.00 (102)
D60-400-3100	105.00 (2667)	112.00 (2845)	67.00 (1702)	107.00 (2718)	4.00 (102)	4.00 (102)
D60-400-3800	105.00 (2667)	120.00 (3048)	67.00 (1702)	115.00 (2921)	4.00 (102)	4.00 (102)
D60-400-4300	116.00 (2946)	120.00 (3048)	85.00 (2159)	114.00 (2896)	6.00 (152)	6.00 (152)
D60-400-5000	116.00 (2946)	127.00 (3226)	85.00 (2159)	121.00 (3073)	6.00 (152)	6.00 (152)
D60-400-5500	122.00 (3099)	113.00 (2870)	85.00 (2159)	107.00 (2718)	6.00 (152)	6.00 (152)
D60-400-6250	122.00 (3099)	121.00 (3073)	85.00 (2159)	115.00 (2921)	6.00 (152)	6.00 (152)



D70 Series Dryers

D70 Series Blower Purge Regenerative Compressed Air Dryers

- Delivers -40° pressure dew point
- Provides continuous supply of dry air
- Operates automatically with flexible controls
- Reduces purge air requirements



Specifications

Maximum Working Pressure: 150 psig
 Maximum Inlet Air Temperature: 110°F
 Electrical Requirements: 460v/60 hz 3ph (control circuit 115v/60 hz/1ph)
 Dry Vessel: ASME Code, Section VIII and latest addenda
 Exterior Finish: Industrial enamel
 Purge Air Consumption for Regeneration: Less than 5%

Standard Equipment

On/Off switch
 Dryer running light
 Purge adjustment valve
 Purge cooling valve
 Purge control pressure gauge
 Purge control valve
 Purge exhaust mufflers
 Tower pressure gauges
 Tower pressure relief valves
 Blower
 Blower intake filter
 Electric heater
 Heater high temperature control
 Check valves
 Pneumatically actuated switching valves
 Pilot control valve
 Pilot control air filter
 Pilot air switching valves
 Regeneration valve
 ASME Coded vessels
 Jacketed insulation
 Activated alumina desiccant (shipped separately)
 Desiccant fill and drain ports
 Stainless steel air diffuser screens
 NEMA 1 enclosure
 Programmable logic controller
 460-3-60 main power circuit
 115-1-60 control circuit
 Structural steel frame

Optional Equipment

Automatic logic functions
 Purge saving system
 High humidity warning light
 Fail-to-switch warning light
 Purge exhaust temperature control
 Audible alarm(s)
 Tower indicating lights
 NEMA 4 or 12 rating
 Visual moisture indicator
 Prefilter (recommended)
 Afterfilter (recommended)
 Dryer bypass system
 Steam to air heat exchanger
 Molecular sieve and silica gel desiccants

Weights and Heater Specifications

Model Number	Weight lbs.	Weight (kg)	Blower HP	Heater KW
D70-400-0250	1,200	(544)	3	4
D70-400-0350	1,500	(680)	3	5
D70-400-0500	2,400	(1,089)	5	8
D70-400-0700	2,900	(1,315)	5	10
D70-400-1000	3,800	(1,724)	10	12
D70-400-1350	5,000	(2,268)	10	17
D70-400-1700	5,500	(5,495)	15	25
D70-400-2400	8,750	(3,969)	15	33
D70-400-3100	11,000	(4,990)	15	42
D70-400-3800	14,200	(6,441)	20	50
D70-400-4300	16,300	(7,394)	20	58
D70-400-5000	17,700	(8,029)	25	67
D70-400-6250	20,200	(9,163)	30	87

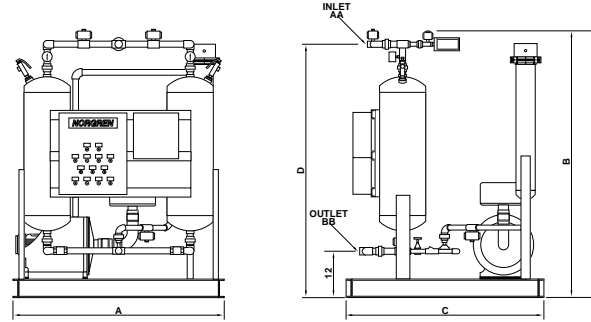
D70 Series Blower Purged Regenerative Compressed Air Dryers



Flow Capacity Selection Chart

[scfm (dm³/s) @ 100°F (38°C) inlet temperature, and
-40°F (-40°C) pressure dew point]

Model Number*	75 psig	100 psig	125 psig	150 psig
D70-400-0250	196 (92)	250 (118)	304 (143)	359 (169)
D70-400-0350	274 (129)	350 (165)	426 (200)	503 (236)
D70-400-0500	391 (184)	500 (235)	609 (286)	718 (337)
D70-400-0700	547 (257)	700 (329)	853 (401)	1,005 (472)
D70-400-0850	665 (313)	850 (400)	1035 (487)	1220 (574)
D70-400-1000	782 (368)	1,000 (470)	1,218 (572)	1,436 (675)
D70-400-1350	1,056 (496)	1,350 (635)	1,644 (773)	1,938 (911)
D70-400-1700	1,329 (625)	1,700 (799)	2,071 (973)	2,441 (1147)
D70-400-2100	1642 (773)	2100 (988)	2558 (1204)	3016 (1419)
D70-400-2400	1,877 (882)	2,400 (1128)	2,923 (1374)	3,446 (1620)
D70-400-3100	2,424 (1139)	3,100 (1457)	3,776 (1775)	4,451 (2092)
D70-400-3800	2,972 (1397)	3,800 (1786)	4,628 (2175)	5,456 (2564)
D70-400-4300	3,363 (1581)	4,300 (2021)	5,237 (2461)	6,175 (2902)
D70-400-5000	3,910 (1838)	5,000 (2350)	6,090 (2862)	7,180 (3375)
D70-400-6250	4,888 (2297)	6,250 (2938)	7,612 (3578)	8,975 (4218)

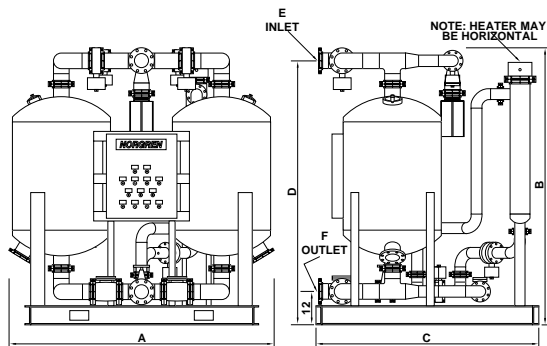


**Dimensions for D70-400-0100 thru D70-400-0500 Blower Purge
Regenerative Compressed Air Dryers**
inches (mm)

Dryer Number	A	B	C	D	E	F
D70-400-0100	64 (1626)	78 (1981)	45 (1143)	68 (1727)	1 (25)	1 (25)
D70-400-0175	68 (1727)	82 (2083)	50 (1270)	72 (1829)	1.5 (38)	1.5 (38)
D70-400-0250	72 (1829)	71 (1803)	55 (1397)	61 (1549)	1.5 (38)	1.5 (38)
D70-400-0350	72 (1829)	89 (2261)	55 (1397)	79 (2007)	1.5 (38)	1.5 (38)
D70-400-0500	78 (1981)	101 (2565)	60 (1524)	90 (2286)	2 (51)	2 (51)

* For complete D70 product numbering system see ALE-27-27.

**Dimensions for D70-400-0700 thru D70-400-6250 Blower Purge
Regenerative Compressed Air Dryers**
inches (mm)



Dryer Number	A	B	C	D	E	F	G
D70-400-0700	49 (1245)	101 (2565)	62 (1575)	99 (2515)	49 (1245)	2 (51)	2 (51)
D70-400-0850	50 (1270)	111 (2819)	67 (1702)	106 (2692)	50 (1270)	2.5 (64)	2.5 (64)
D70-400-1000	72 (1829)	99 (2515)	70 (1778)	95 (2413)	72 (1829)	3 (76)	3 (76)
D70-400-1350	72 (1829)	116 (2946)	70 (1778)	112 (2845)	72 (1829)	3 (76)	3 (76)
D70-400-1700	74 (1880)	100 (2540)	75 (1905)	96 (2438)	78 (1981)	3 (76)	3 (76)
D70-400-2100	79 (2007)	98 (2489)	95 (2413)	94 (2388)	91 (2311)	3 (76)	3 (76)
D70-400-2400	88 (2235)	114 (2896)	95 (2413)	109 (2769)	99 (2515)	4 (102)	4 (102)
D70-400-3100	93 (2362)	112 (2845)	95 (2413)	107 (2718)	105 (2667)	4 (102)	4 (102)
D70-400-3800	93 (2362)	120 (3048)	95 (2413)	115 (2921)	105 (2667)	4 (102)	4 (102)
D70-400-4300	100 (2540)	120 (3048)	100 (2540)	114 (2896)	116 (2946)	6 (152)	6 (152)
D70-400-5000	100 (2540)	127 (3226)	100 (2540)	121 (3073)	116 (2946)	6 (152)	6 (152)
D70-400-5500	105 (2667)	113 (2870)	107 (2718)	107 (2718)	122 (3099)	6 (152)	6 (152)
D70-400-6250	105 (2667)	121 (3073)	107 (2718)	115 (2921)	122 (3099)	6 (152)	6 (152)

Excelon 74 Desiccant Compressed Air Dryer
1/4", 3/8", and 1/2" Port Sizes

- Excelon Quikclamp™ design provides in-line or modular installation with 72, 73 and 74 Series products.
- Helps eliminate condensate at point-of-use.
- Replaceable element filters outlet air to help prevent desiccant dust migration down stream.
- Desiccant color changes from blue to pink when desiccant replacement is needed.
- Transparent or metal bowl available. On models with metal bowl, moisture indicator on top of body indicates condition of desiccant.
- Desiccant can be dried and reused or replaced with new packet.
- Typical dew point suppression of 15°F (-10°C) below inlet ambient pressure dew point.



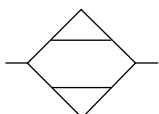
Ordering Information. Models listed include PTF threads and a closed bottom bowl.

Port Size	Bowl	Model	Weight lb (kg)
3/8"	Transparent, 7 fluid ounce (0.2 liter)	W74D-3AN-NPN	2.00 (0.91)
1/2"	Transparent, 7 fluid ounce (0.2 liter)	W74D-4AN-NPN	2.00 (0.91)
1/2"	Metal, 1 quart (1 liter)	W74D-4AN-NMN	4.25 (1.93)

Alternative Models

Port Size		Substitute		Flow		Substitute	
1/4"		2		Not applicable		N	
3/8"		3					
1/2"		4					
Threads		Substitute		Bowl		Substitute	
PTF		A		1 quart (1 liter) metal		M	
ISO Rc taper		B		7 fluid ounce (0.2 liter) transparent with guard		P	
ISO G parallel		G					
Moisture Indicator *		Substitute		Drain		Substitute	
No indicator		N		Closed bottom (no drain)		N	
With indicator		D					

* Moisture indicator used only with dryers equipped with metal bowl.

ISO Symbols


Excelon 74 Desiccant Compressed Air Dryer

All Dimensions in Inches (mm)



Technical Data

Fluid: Compressed air

Maximum pressure

Transparent bowl: 150 psig (10 bar)

Metal bowl: 250 psig (17 bar)

Operating temperature*

Transparent bowl: 0° to 125°F (-20° to 50°C)

Metal bowl: 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Nominal bowl capacity

Transparent: 0.25 pounds (0.11 kg) desiccant

Metal: 1.25 pounds (0.57 kg) desiccant

Nominal air drying capacity at 100 psig (6.9 bar) inlet pressure and 77°F (25°C)

Transparent bowl: 750 cubic feet (21 cubic meters)

Metal bowl: 6000 cubic feet (170 cubic meters)

Required prefilters: General purpose filter with 5-micron element and an oil removal filter with equivalent pipe size and flow capacity equal to or greater than the desiccant dryer.

Desiccant regeneration: Desiccant can be dried and reused by removing from dryer and heating to 275°F (135°C). Regeneration is complete when desiccant returns to original blue color.

Moisture indicator leakage on models with metal bowl: Air continuously passes through the moisture indicator and escapes to atmosphere. This is normal and does not indicate a faulty indicator.

Materials

Body: Aluminum

Bowl

Transparent: Polycarbonate with steel bowl guard

Metal: Aluminum

Supply tube assembly: Aluminum/stainless steel screen

Desiccant drying agent: Silica gel

Filter element: Sintered polypropylene

Elastomers: Neoprene and Nitrile

Moisture indicator materials - used only with 1 quart (1 liter) metal bowl

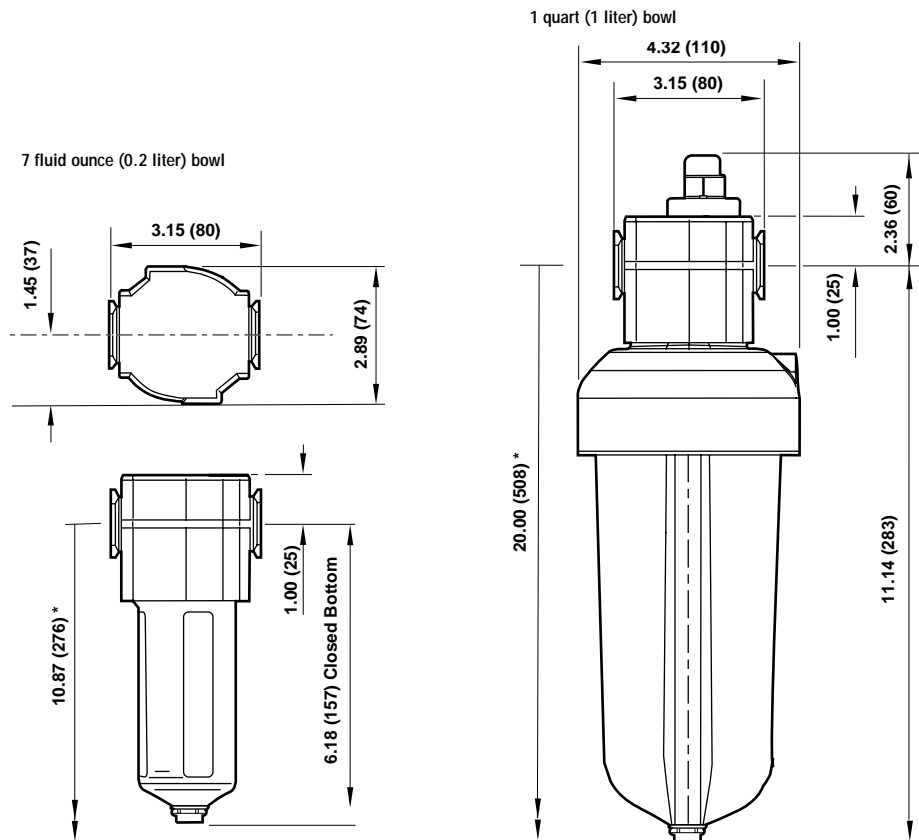
Body: Transparent nylon

Test paper: Cobalt chloride

Elastomers: Nitrile

Service Kits

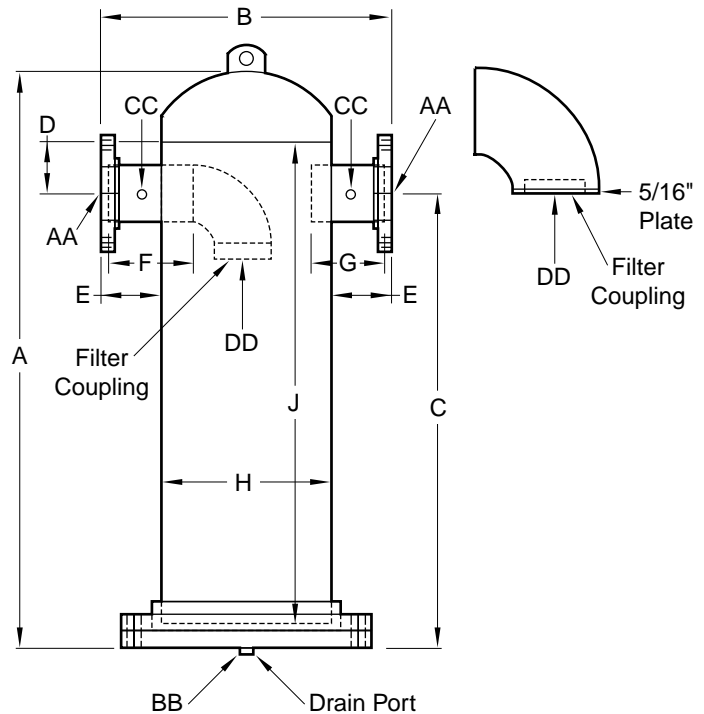
Item	Type	Part Number
Service kit	Seal and filter element	4385-710
Desiccant	5 bags desiccant, 0.25 lb (0.11 kg) in each bag	4385-700



- High flow mainline system filters
- The F21 provides 1 micron particle removal filtration
- The F61 provides 0.01 oil coalescing
- The F61 features carbon type vapor removal filtration
- Optional automatic or timer drains available


Technical Data

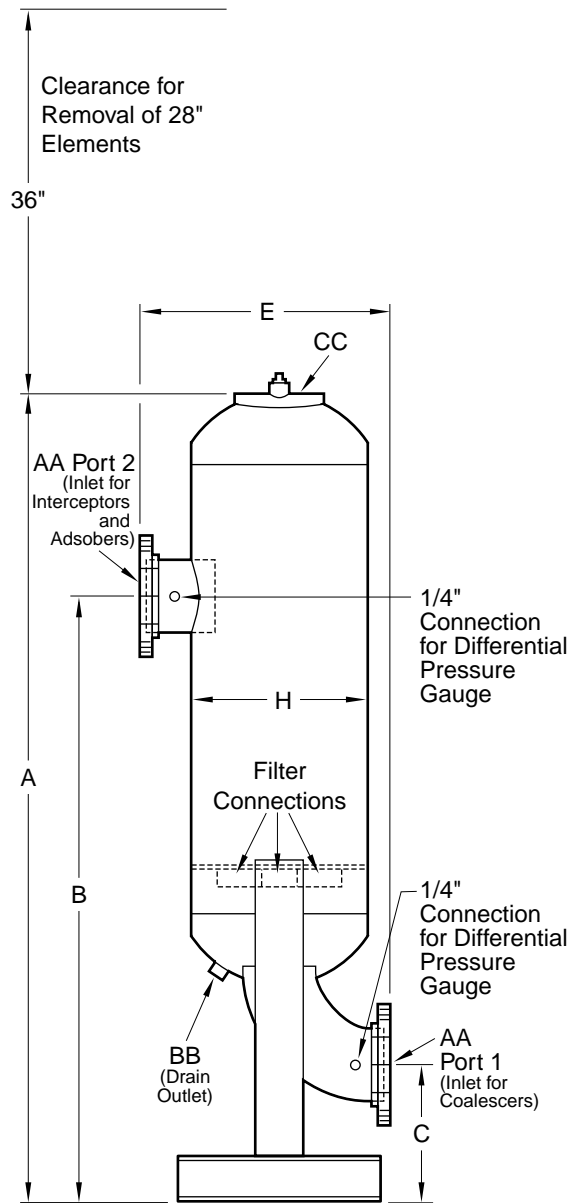
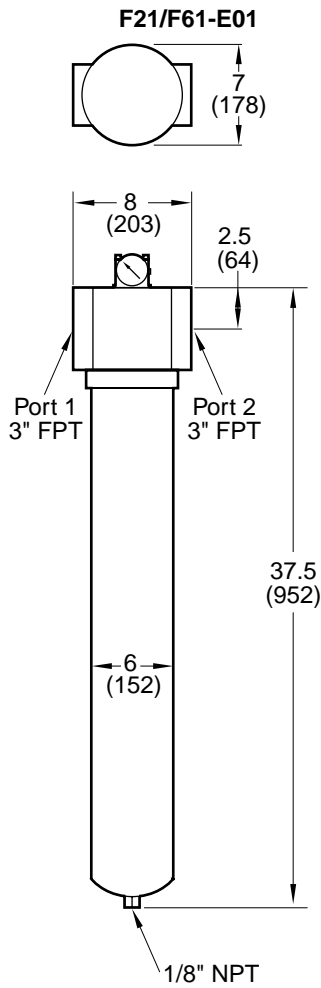
Maximum Working Pressure: 150 psig (10 bar)
 Maximum Inlet Temperature: 150°F (65°C)
 Dryer Vessel: ASME Code, Section VIII, and latest addenda (4" and larger units)
 Exterior Finish: Industrial enamel
 Standard: Manual drain valve, and pressure differential gauge.


F21/F61-01
 Inches (mm)

Model	A	B	C	D	E	F	G	H	J	AA	BB	CC	DD	Wt.
F21/F61-F01	45.13 (1146)	17.63 (448)	36.50 (927)	3.50 (89)	4.50 (114)	6.00 (152)	5.50 (140)	8.63 (219)	41.00 (1041)	3.00 (76)	0.50 (13)	0.25 (6)	3.00 (76)	175
F21/F61-G01	44.38 (1127)	21.75 (552)	34.88 (886)	4.00 (102)	4.50 (114)	6.38 (162)	5.50 (140)	12.75 (324)	37.00 (940)	4.00 (102)	0.50 (13)	0.25 (6)	4.00 (102)	300
F21/F61-J01	56.25 (1429)	23.75 (603)	45.75 (1162)	5.00 (127)	5.50 (140)	6.50 (165)	7.00 (178)	12.75 (324)	51.00 (1295)	6.00 (152)	0.50 (13)	0.25 (6)	4.00 (102)	350

F21 and F61 Mainline Filters

All Dimensions in Inches (mm)



F21/F61-51
Inches (mm)

Model	A	B	C	D	E	AA	BB	CC	Wt.
F21/F61-J51	75.00 (1905)	55.56 (1411)	12.63 (321)	16.00 (406)	22.00 (559)	6.00 (152)	0.50 (13)	6 x 8	415
F21/F61-L51	81.00 (2057)	60.31 (1532)	12.06 (306)	20.00 (508)	27.13 (689)	8.00 (203)	0.50 (13)	11x15	670

* For complete F21 and F61 product numbering system see ALE-27-30



D11 Series Product Numbering System

Sample Model Number **D 1 1 - 1 0 0 - 0 0 1 0**

Position **1 2 3 - 4 5 6 - 7 8 9 10**

1 Unit

D = Compressed Air Dryer

2 3 Series

11 Series = Refrigerated, R134a

4 Voltage

1 = 115-60 Hz-1/110-50 Hz-1 (5 thru 150 scfm units)
2 = 230/220-60 Hz-1/200-50 Hz-1 (5 & 10, 40 thru 200 scfm units)
3 = 230/208-60 Hz-3 (200 scfm only)
4 = 460-60 Hz-3 (200 scfm only)
6 = 240/220-50 Hz-1 (5 thru 200 scfm units)

5 Accessory Package

0 = (5 thru 100 scfm units)
16" power cord
(130 thru 200 scfm units)
On/Off switch, power on and high temperature indicator lights, drain tube, panel mounted refrigerant suction pressure gauge, and electrical terminal block

1 = (5 thru 20 scfm units)
Panel mounted refrigerant suction pressure gauge, drain tube kit and 16" power cord

2 = (5 thru 100 scfm units)
Panel mounted refrigerant suction pressure gauge, 6' power cord, on/off switch, power on and high temperature indicator lights and drain tube kit

3 = (30 thru 100 scfm units)
Panel mounted refrigerant suction pressure gauge, 6' power cord, on/off switch, power on and high temperature indicator lights, outlet air pressure gauge, inlet air temperature gauge, and drain tube kit
(130 thru 200 scfm units)
Panel mounted refrigerant suction pressure gauge, electrical terminal block, on/off switch, power on and high temperature indicator lights, outlet air pressure gauge, inlet air temperature gauge and drain tube kit

4 = (130 thru 200 scfm units)
Panel mounted refrigerant suction pressure gauge, refrigerant discharge pressure gauge, electrical terminal block, on/off switch, power on and high temperature indicator lights, outlet air pressure gauge, inlet air temperature gauge, outlet air temperature gauge, inlet air pressure gauge and drain tube kit

6 Cabinet Options

0 = No side panels
1 = Side panels
2 = Ambient filter with no side panels
3 = Ambient filter with side panels

7 8 9 10 Size

0005 = 5 scfm
0010 = 10 scfm
0015 = 15 scfm
0020 = 20 scfm
0030 = 30 scfm
0040 = 40 scfm
0050 = 50 scfm
0075 = 75 scfm
0100 = 100 scfm
0130 = 130 scfm
0150 = 150 scfm
0200 = 200 scfm

D10 Series Product Numbering System



Sample Model Number **D 1 0 - 2 0 0 - 0 2 5 0**

Position **1 2 3 - 4 5 6 - 7 8 9 10**

1 Unit

D = Compressed Air Dryer

2 3 Series

10 Series = Refrigerated, R22

4 Voltage

2 = 230/208-60 Hz-1
 3 = 230/208-60 Hz-3
 4 = 460-60 Hz-3
 5 = 600/550-60 Hz-3
 6 = 240/220-50 Hz-1
 7 = 240/220-50 Hz-3
 8 = 420/380-50 Hz-3

5 Accessory Package

0 = (250 thru 500 scfm units)
 On/off switch (control circuit), power on light, refrigerant suction pressure gauge, air inlet temperature gauge and air outlet pressure gauge
 (600 scfm and larger units)
 On/off switch (control circuit), power on light, refrigerant suction pressure gauge, refrigerant discharge pressure gauge, air inlet and outlet temperature gauges, and air inlet and outlet pressure gauges

1 = (250 thru 500 scfm units)
 On/off switch (control circuit), power on light, refrigerant suction pressure gauge, refrigerant discharge pressure gauge, air inlet and outlet pressure gauges, and air inlet and outlet temperature gauges

2 = On/off switch (control circuit), power on light, refrigerant suction pressure gauge, refrigerant discharge pressure gauge, air inlet and outlet pressure gauges, air inlet and outlet temperature gauges, and alarm bell

3 = On/off switch (control circuit), power on light, refrigerant suction pressure gauge, refrigerant discharge pressure gauge, air inlet and outlet pressure gauges, and air inlet and outlet temperature gauges, and flow meter

4 = On/off switch (control circuit), power on light, refrigerant suction pressure gauge, refrigerant discharge pressure gauge, air inlet and outlet pressure gauges, air inlet and outlet temperature gauges, alarm bell and flow meter

6 Options

0 = Air-cooled
 1 = Water-cooled
 2 = Air-cooled with ambient filters

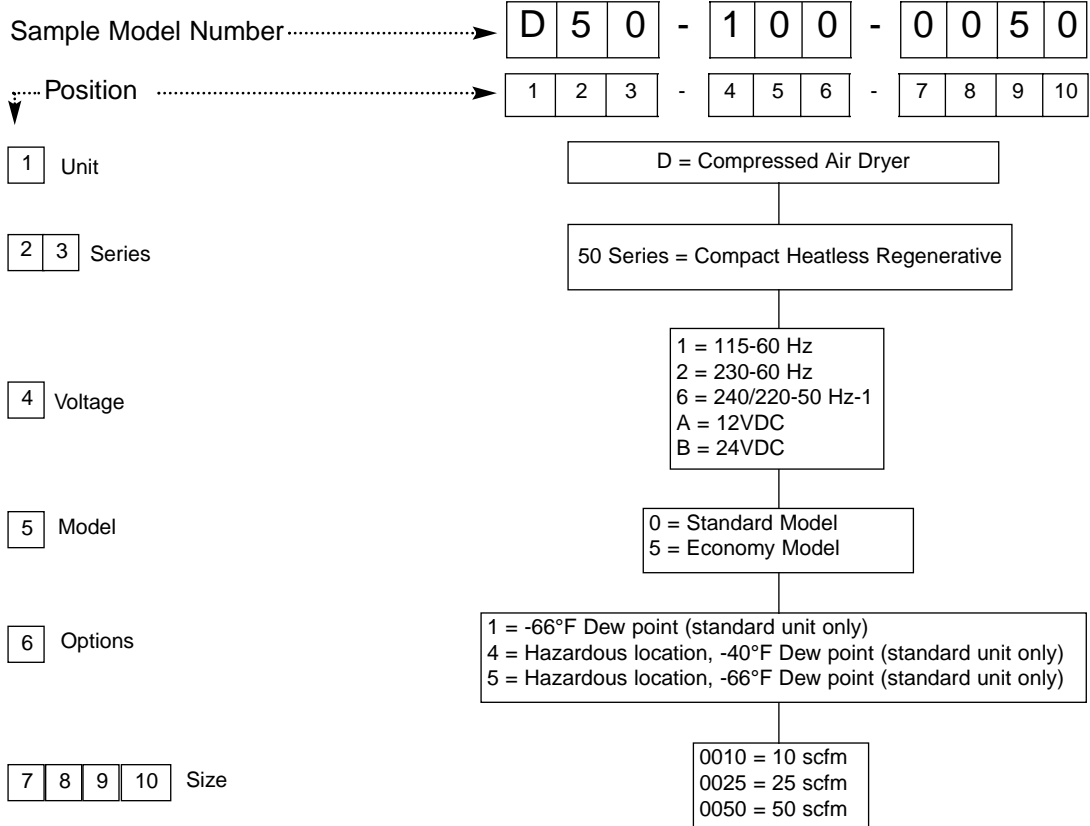
7 8 9 10 Size

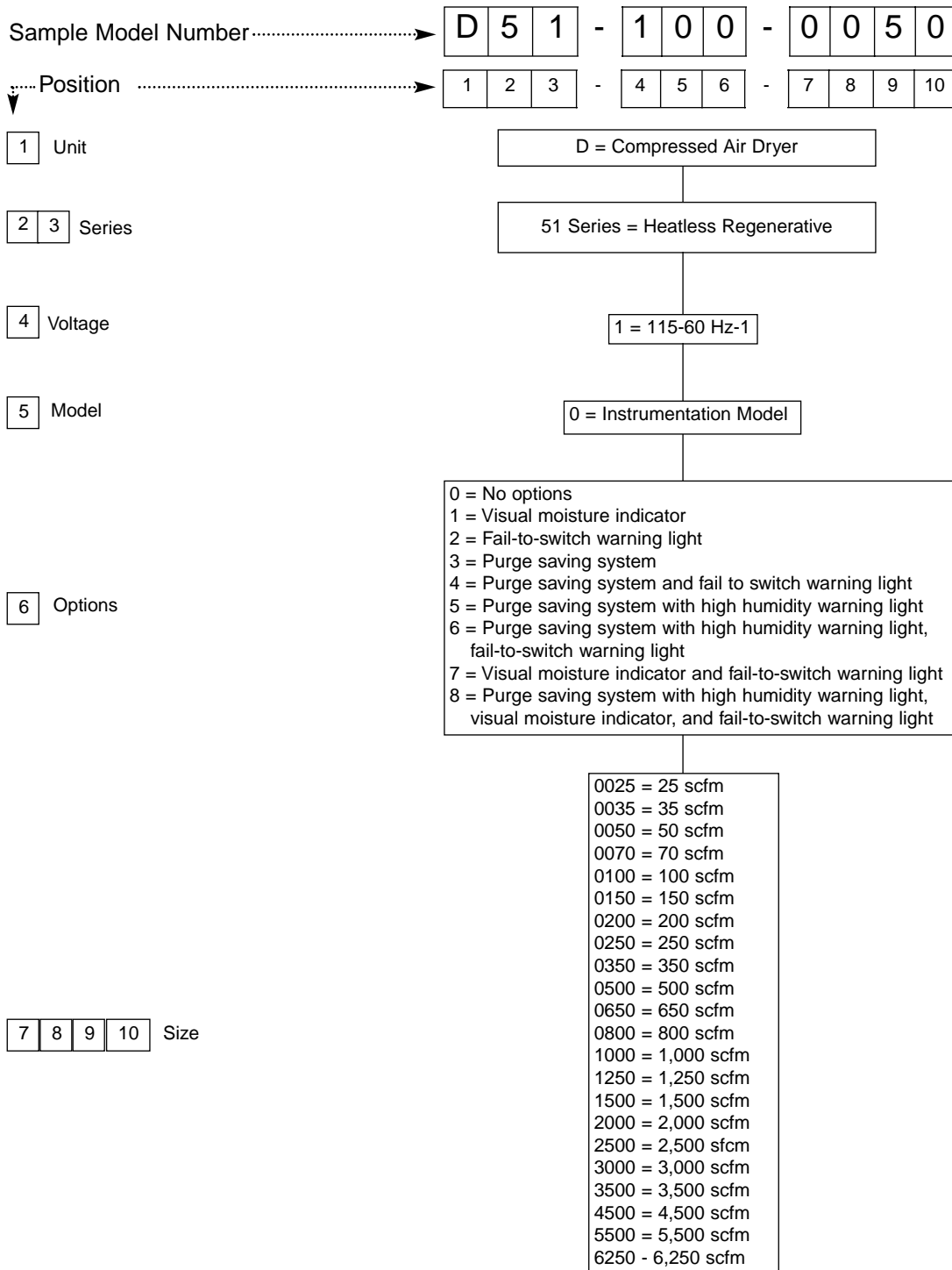
0250 = 250 scfm
 0325 = 325 scfm
 0400 = 400 scfm
 0500 = 500 scfm
 0600 = 600 scfm
 0800 = 800 scfm
 1000 = 1000 scfm
 1250 = 1250 scfm
 1500 = 1500 scfm*
 1750 = 1750 scfm
 2000 = 2000 scfm
 2500 = 2500 scfm
 3200 = 3200 scfm
 4000 = 4000 scfm
 5000 = 5000 scfm
 6250 = 6250 scfm
 7500 = 7500 scfm

* Not available as a water-cooled unit



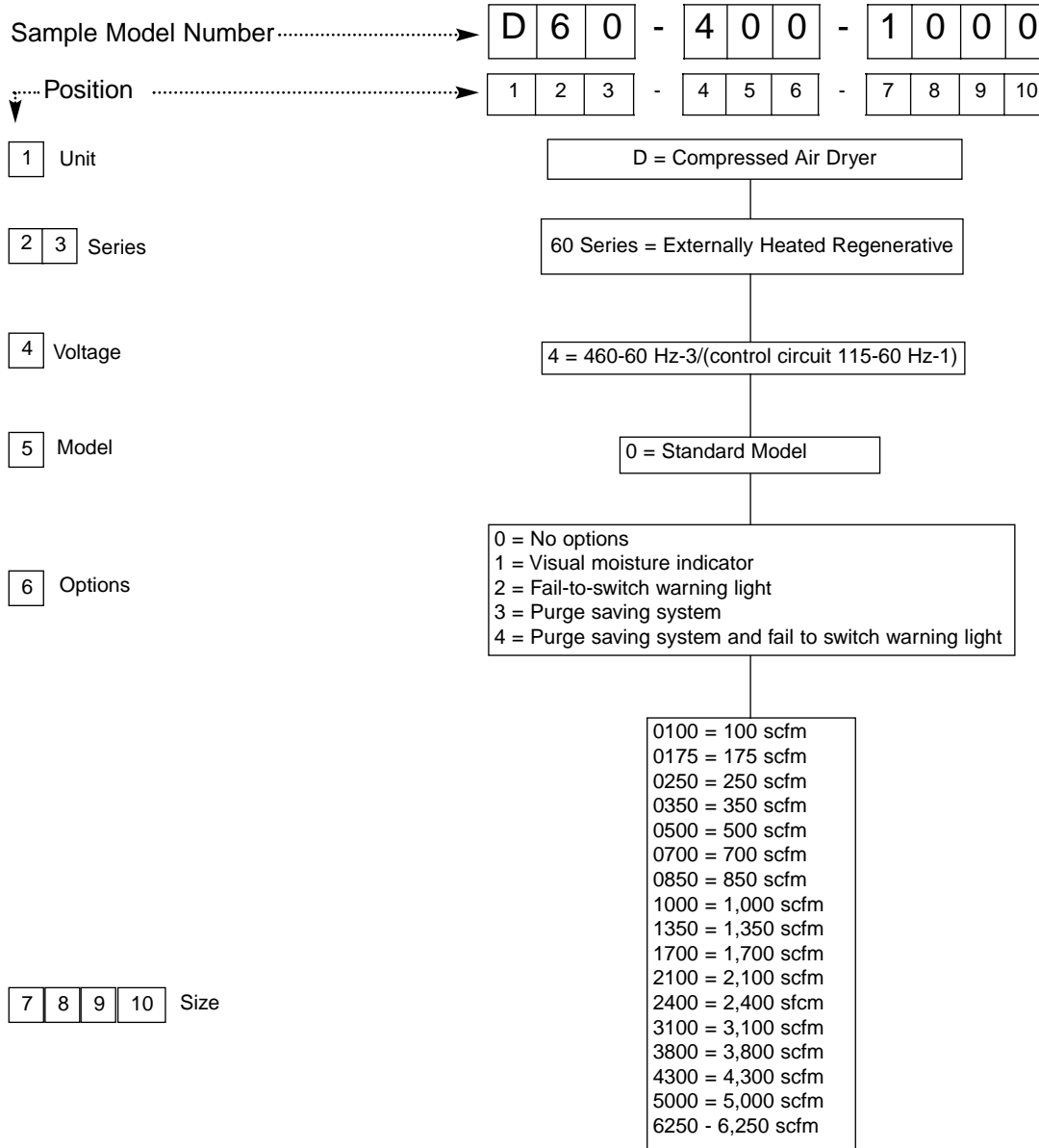
D50 Series Product Numbering System

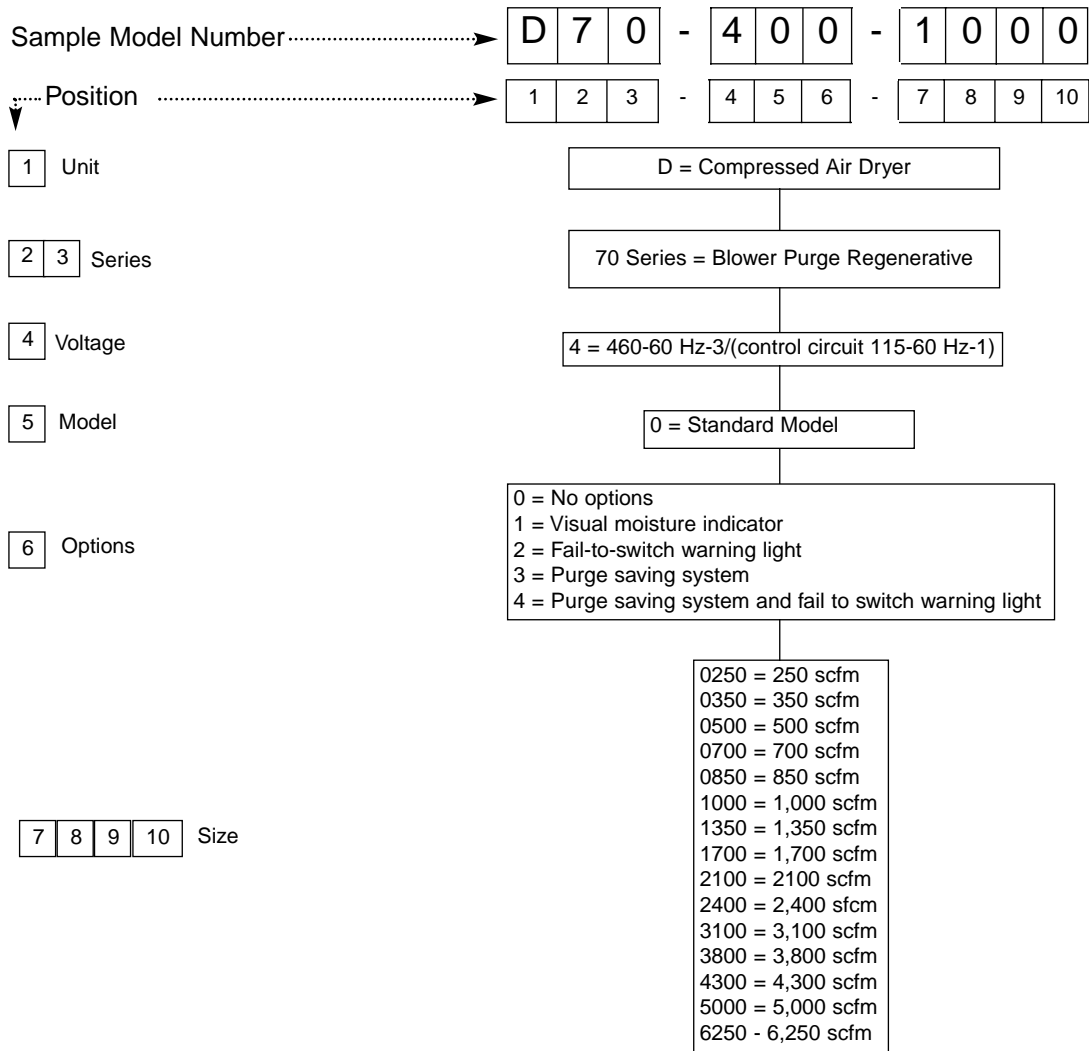






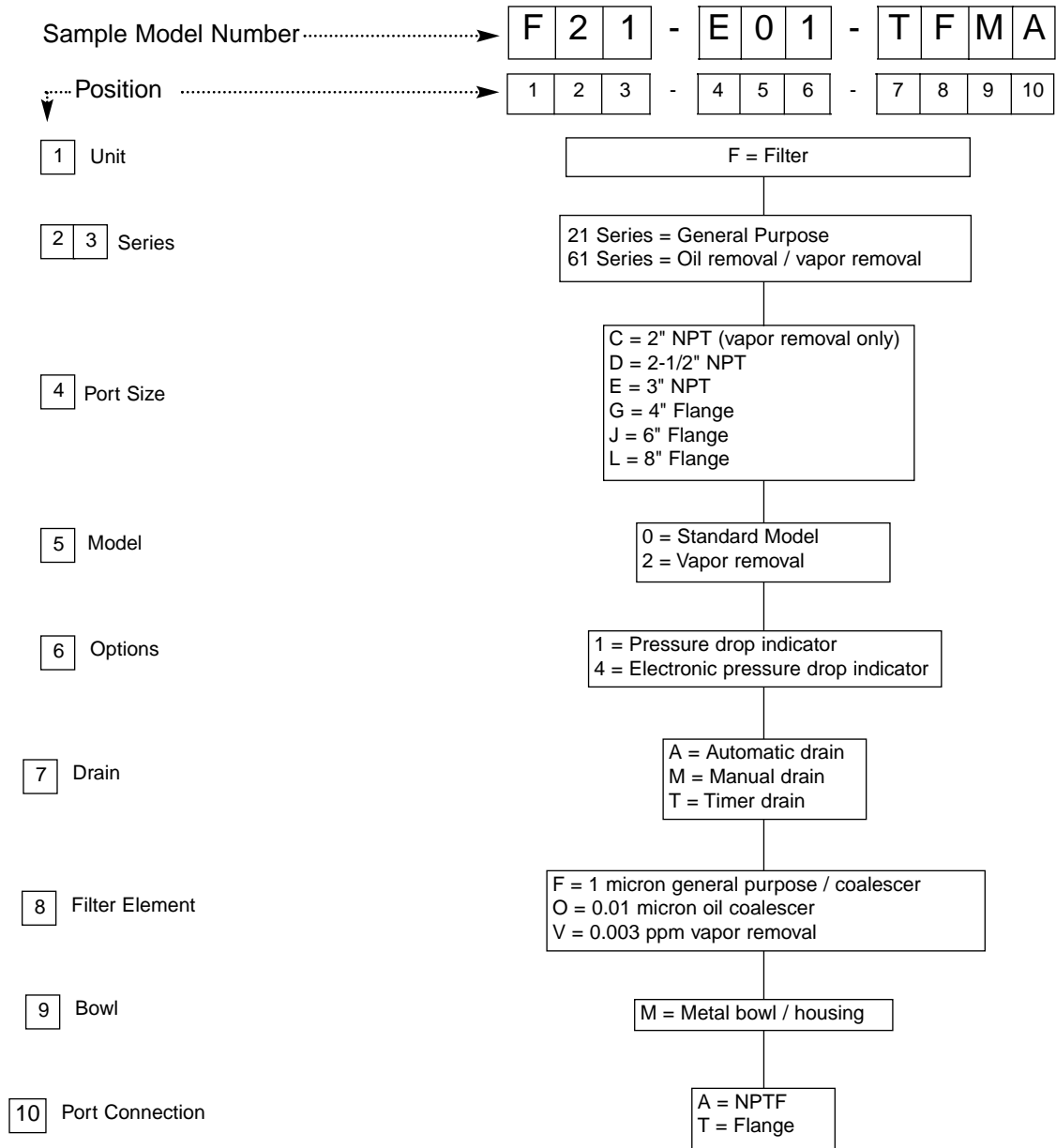
D60 Series Product Numbering System







Technical Data





Selecting an Air Dryer

Identify the following operational conditions:

1. Air flow requirement of your system in scfm: _____
 - For dryers servicing a complete air system, multiply the compressor horsepower by four to obtain an approximation of the compressor flow capacity in scfm.
 - For dryers servicing a branch line, determine the maximum flow for that branch.
2. Dryer inlet air pressure in psig: _____ 100 psig*
 - Best results are obtained with a high inlet air pressure. Do not exceed the maximum inlet air pressure listed under **Specifications**.
3. Dryer inlet air temperature in °F: _____ 100 psig*
 - Bests results are obtained with a low inlet air temperature. Do not exceed maximum temperature listed under **Specifications**.
4. Ambient air temperature at dryer in °F: _____ 100 psig*
 - Ambient temperature must be within the range listed under **Specifications**.
5. Minimum temperature to which downstream piping will be exposed in °F: _____
Pressure dewpoint required in °F: _____
 - The lowest downstream temperature determines dewpoint requirement. A 35°F pressure dewpoint is the lowest practical dewpoint for refrigerant dryers. In some cases a 50°F pressure dewpoint may be acceptable, resulting in greater flow capacity and cost savings. The dewpoint chosen should be approximately 10°F (6°C) below the lowest downstream temperature.
6. Power requirements: Volts _____ Cycle _____ Phase _____
7. Air or water-cooled model: _____
 - Use water-cooled model (available in 400 scfm size and larger) when ambient temperature is above 110°F (43°C).

If your dryer operational conditions for Items 2, 3, and 4 are the same as the number in the shaded box* on the same line you need only determine which nominal capacity will meet your pressure dewpoint requirement, Item 5. See **Flow Specifications** on facing page.

Operational conditions other than Standard Operating Conditions*, require use of the Dryer Sizing Formula to determine the appropriate dryer size for the application.

*Standard Operating Conditions, per ANSI/B93.45M, are used to obtain the nominal flow rating for Norgren dryers. These conditions are fully detailed under **Flow Specifications** on the facing page.

Converting cfm at stated Pressure to scfm

- Q = Air flow in CFM at stated P pressure
- P - Pressure in psig
- P_A = P pressure converted to pressure in psia
- Q_A = Flow in scfm

$$Q_A = Q \left[\frac{P_A}{14.7 \text{ psia}} \right]$$

Example:

Flow = 23 cfm at 125 psig (at 500' above sea level)

$$P_A = 125 \text{ psig} / 14.4^{**} = 139.4$$

**See correction table at right for atmospheric pressure for your elevation

$$Q_A = 23 \text{ cfm} \left[\frac{139.4 \text{ psia}}{14.7 \text{ psia}} \right] Q_A = 218.10 \text{ scfm or } 218 \text{ scfm}$$

Finding Pressure Drops for Non-standard Flows

Use the following formula to find the approximate pressure drop for flows not listed in the flow specifications table

$$\Delta P \approx \left[\frac{Q_R}{Q_S} \right]^2 \times \frac{114.7 \text{ psia}}{P} \times \Delta P_S$$

Where:

- ΔP = Calculated pressure drop
- Q_R = Actual flow
- Q_S = Air flow at 35°F pressure dew point rating
- P = Actual supply pressure in psia
- ΔP_S = Pressure drop at rated conditions and flow

Dryer Sizing

If conditions are other than standard operating conditions*, use the following formula to determine dryer air flow rating (Q_R) required for your system. (Q_R = _____ scfm)

$$Q_R = Q_A(K1)(K2)$$

Where:

Q_R = Air flow rating required for dryer

Q_A = Actual flow requirement – Item 1

K1 = Correction factor for inlet temperature and operating pressure (Chart 1)

K2 = Correction factor for ambient temperature (Chart 2)

Example

Given the following conditions, determine the dryer air flow rating required.

1. Air flow requirement of system: 120 scfm
2. Dryer inlet air pressure: 150 psig
3. Dryer inlet air temperature: 80°F
4. Ambient air temperature at dryer: 110°F
5. Minimum downstream temperature: 50°F
6. Power requirements: 115V, 60 cycle, 1 phase
7. Air or water cooled: Air

Solution

$$Q_R = Q_A (K1)(K2)$$

$$Q_R = 120 \text{ scfm} \times .62 \text{ (Chart 1)} \times 1.11 \text{ (Chart 2)}$$

$$Q_R = 82.6 \text{ scfm}$$

A 100 scfm D11 dryer will fit this application.

Chart 1. Inlet Temperature F° vs. Inlet Pressure Correction Factor

Pressure psig	60°	80°	100°	120°	130°
	Correction Factors K1				
50	0.43	0.77	1.20	1.80	2.23
75	0.39	0.70	1.07	1.56	1.89
100	0.37	0.66	1.00	1.43	1.71
125	0.36	0.63	0.95	1.34	1.60
150	0.35	0.62	0.92	1.28	1.51
175	0.35	0.60	0.90	1.24	1.46
200	0.34	0.60	0.88	1.21	1.41

Chart 2 Ambient Correction Factor For 35°F (2°C) Pressure Dewpoint

Ambient Temperature	Correction Factor K2
60°F	0.66
70°F	0.73
80°F	0.81
90°F	0.90
100°F	1.00
110°F	1.11

Atmospheric Pressure at Selected Altitudes

Alt. above sea level ft	Atmospheric Pressure (psi)
0	14.7
500	14.4
1500	14.2
2000	13.9
2500	13.4
3000	13.1
3500	12.9
4000	12.7
4500	12.5
5000	12.2

Fittings and Accessories

Contents

Fittings and Accessories	ALE-28-2
Diaphragm Amplifiers	ALE-28-9
Rotowink Indicators	ALE-28-10
Differential Pressure Indicators	ALE-28-12
Pressure Switch	ALE-28-13
Boostermities	ALE-28-14
Miniature Inline Restrictors	ALE-28-16
Miniature Inline Filters	ALE-28-17



Fittings



Diaphragm Amplifier



Rotowink Indicators



Differential Pressure Indicators



Pressure Switch



Boostermities



Miniature Inline Restrictors



Miniature Inline Filters

- Reduced assembly and maintenance time.
- Expanded pressure rating.
- Pre-applied thread sealant.
- Silicone free o-rings.
- Nickel plated brass bodies and collets.
- Maximum flows in a reduced size.

Specifications

Fluid: Compressed air, nitrogen, inert and non-combustible gases compatible with materials of construction.

Working Pressure: 29.5" Hg vacuum to 260 psig (750 mm Hg to 18 bar)

Note: Flow Control working pressures: 5 to 150 psig (.3 to 10 bar)

Working Temperature: 0° to 175°F (-20° to 80°C)

Materials

Body, swivel fitting and collet: Nickel plated brass

O-ring: Silicone free Nitrile

Sealing washer (parallel male threads): Thermoplastic

Tubing: Nylon 11 or 12, Polyurethane (95 durometer or above) and LDPE (Low Density Polyethylene).

Thread Sealant: Precote 5 thread sealant is factory applied to the circumference of tapered male threads.

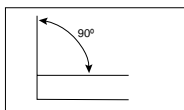


Tube O.D.'s and Tube Tolerances

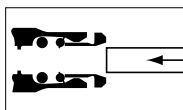
Tube O.D.	O.D. Tube Tolerances	
	Nylon	Polyurethane
1/8" to 1/2" (3 mm to 14 mm)	+0.002" (+0.05 mm) -0.004" (-0.10 mm)	±0.004" (±0.10 mm)

LDPE –Tolerances specified in DIN 73378 or BS54-09/1:1976

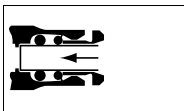
Method of Assembly



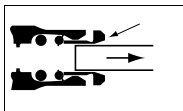
1. Ensure that the tube end is cut square and is free of burrs.



2. Push the tube through the collet into the fitting.

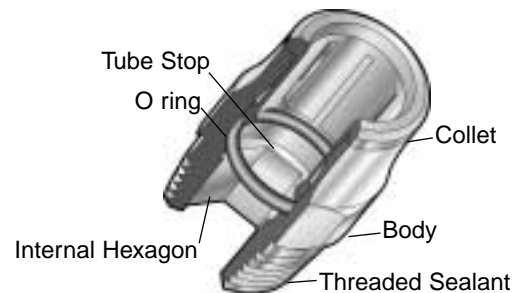


3. Continue pushing the tube (firmly) through the O-ring until it bottoms on the tube stop, then pull back



4. To disconnect, push the tube into the fitting until it bottoms on the tube stop. Then while holding down the collet, withdraw the tube.

Fitting Cutaway





Male Connector



Tube O.D.	NPTF or UNF Thread	
	Thread	Part Number
1/8"	10-32	12 425 0110
	1/16	12 425 0116
	1/8	12 425 0118
	1/4	12 425 0128
5/32"	10-32	12 425 0210
	1/8	12 425 0218
	1/4	12 425 0228
3/16"	1/8	12 425 0318
	1/4	12 425 0328
1/4"	10-32	12 425 0410
	1/8	12 425 0418
	1/4	12 425 0428
	3/8	12 425 0438
5/16"	1/8	12 425 0518
	1/4	12 425 0528
	3/8	12 425 0538
3/8"	1/8	12 425 0618
	1/4	12 425 0628
	3/8	12 425 0638
	1/2	12 425 0648
1/2"	1/4	12 425 0728
	3/8	12 425 0738
	1/2	12 425 0748

Swivel Male Elbow



Tube O.D.	NPTF or UNF Thread	
	Thread	Part Number
1/8"	10-32	12 447 0110
	1/8	12 447 0118
	1/4	12 447 0128
5/32"	10-32	12 447 0210
	1/8	12 447 0218
	1/4	12 447 0228
3/16"	1/8	12 447 0318
	1/4	12 447 0328
1/4"	10-32	12 447 0410
	1/8	12 447 0418
	1/4	12 447 0428
	3/8	12 447 0438
5/16"	1/8	12 447 0518
	1/4	12 447 0528
3/8"	1/8	12 447 0618
	1/4	12 447 0628
	3/8	12 447 0638
	1/2	12 447 0648
1/2"	1/4	12 447 0728
	3/8	12 447 0738
	1/2	12 447 0748

For additional sizes, configurations, metric products, and technical specifications request catalog Fittings APC-101.



Fittings and Accessories

Male Elbow



Tube O.D.	NPTF Thread	Part Number
1/8"	1/8	12 445 0118
5/32"	1/8	12 445 0218
	1/4	12 445 0228
3/16"	1/8	12 445 0318
	1/4	12 445 0328
1/4"	1/8	12 445 0418
	1/4	12 445 0428
	3/8	12 445 0438
5/16"	1/8	12 445 0518
	1/4	12 445 0528
3/8"	1/8	12 445 0618
	1/4	12 445 0628
	3/8	12 445 0638
1/2"	1/2	12 445 0648
	1/4	12 445 0728
	3/8	12 445 0738
	1/2	12 445 0748

Female Connector



Tube O.D.	NPTF Thread	Part Number
5/32"	1/8	12 426 0218
	1/4	12 426 0228
1/4"	1/8	12 426 0418
	1/4	12 426 0428
3/8"	1/4	12 426 0628
	3/8	12 426 0638

Union



Tube O.D.	Part Number
1/8"	12 020 0100
5/32"	12 020 0200
1/4"	12 020 0400
5/16"	12 020 0500
3/8"	12 020 0600
1/2"	12 020 0700

Swivel Male Branch Tee



Tube O.D.	NPTF or UNF Thread	Part Number
1/8"	10-32 UNF	12 467 0110
	1/8	12 467 0118
	1/4	12 467 0128
5/32"	10-32 UNF	12 467 0210
	1/8	12 467 0218
	1/4	12 467 0228
1/4"	1/8	12 467 0418
	1/4	12 467 0428
	3/8	12 467 0438
5/16"	1/8	12 467 0518
	1/4	12 467 0528
3/8"	1/8	12 467 0618
	1/4	12 467 0628
	3/8	12 467 0638
	1/2	12 467 0648
1/2"	1/4	12 467 0728
	3/8	12 467 0738
	1/2	12 467 0748



Union Tee

Tube O.D.	Part Number
1/8"	12 060 0100
5/32"	12 060 0200
1/4"	12 060 0400
5/16"	12 060 0500
3/8"	12 060 0600
1/2"	12 060 0700

Union Elbow



Tube O.D.	Part Number
5/32"	12 040 0200
1/4"	12 040 0400
5/16"	12 040 0500
5/16"	12 040 0500
3/8"	12 040 0600
1/2"	12 040 0700

Swivel Male Run Tee



Tube O.D.	NPTF or UNF Thread	Part Number
5/32"	10-32 UNF	12 468 0210
	1/8	12 468 0218
	1/4	12 468 0228
1/4"	1/8	12 468 0418
	1/4	12 468 0428
	3/8	12 468 0438
3/8"	1/8	12 468 0618
	1/4	12 468 0628
	3/8	12 468 0638
1/2"	1/2	12 468 0648
	1/4	12 468 0728
	3/8	12 468 0738
	1/2	12 468 0748



Plug*

Stem O.D.	Part Number
5/32"	11 004 0400
1/4"	94 050 904
5/16"	11 004 0800
3/8"	94 050 906
1/2"	94 050 907

*Material: Thermoplastic

Bulkhead Union



Tube O.D.	Part Number
1/8"	12 029 0100
5/32"	12 029 0200
3/16"	12 029 0300
1/4"	12 029 0400
5/16"	12 029 0500
3/8"	12 029 0600
1/2"	12 029 0700

For additional sizes, configurations, metric products, and technical specifications request catalog Fittings APC-101.



Parallel Union “Y” Connector*



Tube O.D. (2x)	Tube O.D. (1x)	Part Number
5/32"	5/32"	12 082 0200
5/32"	1/4"	12 082 0402
1/4"	1/4"	12 082 0400

*Body Material: Thermoplastic



Tube End Reducer

Tube O.D.	Stem O.D.	Part Number
5/32"	1/4"	12 023 0402
	3/8"	12 023 0602
1/4"	3/8"	12 023 0604
	1/2"	12 023 0704
3/8"	1/2"	12 023 0706

Right Angle (Banjo) Flow Controls

Operation:

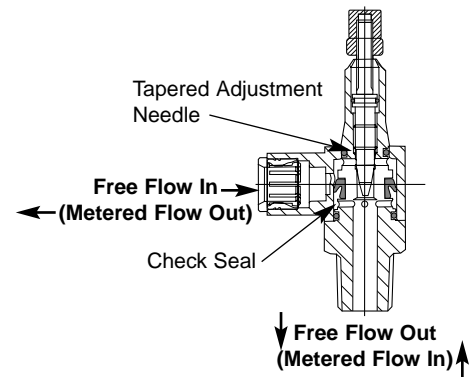
Flow Controls are meter out type. Compressed air passes freely into the push-in fitting portion of the flow control, flowing past the check seal and entering the connected component. In reverse flow conditions, air passes back into the flow control and energizes the check seal. Air must now flow through the metered passage controlled by the tapered adjustment needle of the flow control, and finally exits through the push-in fitting end.

Specifications

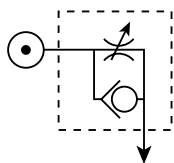
- Fluid: Compressed air.
- Working Pressure: 5 to 150 psig (.3 to 10 bar)
- Temperature Range: 0° to 175°F (-20° to 80°C)

Materials of Construction:

- Banjo bolt, body, collet: Nickel plated brass
- Tapered adjusting needle: Brass
- O-rings and check-seal: Silicone free Nitrile
- Sealing washer: Thermoplastic (10-32 UNF)
- Tubing: Nylon 11 or 12, 95 durometer polyurethane.
- Thread Sealant: Applied to the full circumference of tapered male threads.



Pneumatic Symbol



VB0 Series

Tube O.D.	NPT or UNF Thread	Part Number
5/32"	10-32 UNF	12 VB0 0210
	1/8	12 VB0 0218
1/4"	1/8	12 VB0 0418
	1/4	12 VB0 0428
3/8"	1/4	12 VB0 0628
	3/8	12 VB0 0638
1/2"	3/8	12 VB0 0738
	1/2	12 VB0 0748

NPT Female	NPT Male	Part Number
1/8	1/8	12 VB0 1818
1/4	1/4	12 VB0 2828
3/8	3/8	12 VB0 3838
1/2	1/2	12 VB0 4848

For additional sizes, configurations, metric products, and technical specifications request catalog Fittings APC-101.



Fittings and Accessories

Check Valves - T50 In-line Push-in 5/32" - 1/2" O.D. tube

Technical Data

Fluid: Compressed air, nitrogen, inert and non-combustible gases compatible with materials of construction.

Operating Pressure:

26.8" Hg vacuum to 230 psi (-0.9 to 16 bar)

Operating Temperature:

0°* to 175°F (-20°* to 80°C)

* Consult our Technical Service for use below 35°F (2°C)



Model	O.D. Tube
T50Y0002	5/32"
T50Y0004	1/4"
T50Y0005	5/16"
T50Y0006	3/8"
T50Y0007	1/2"

ISO Symbol



Pressure Reducing Fitting - 124GB

In-line Push-in 5/32" - 1/2" O.D. tube 1/8 - 1/2 NPTF pipe

Technical Data

Fluid: Compressed air, nitrogen, inert and non-combustible gases compatible with materials of construction.

Operating Pressure:

Primary (inlet) pressure 0 to 150 psi (0 - 10 bar)

Maximum secondary (regulated) pressure 115 psi (8 bar)

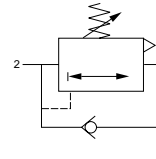
Operating Temperature:

0° to 175°F (-20° to +80°C)



Part Number	O/D Tube	NPTF Thread
12 4GB 0218	5/32	1/8
12 4GB 0418	1/4	1/8
12 4GB 0428	1/4	1/4
12 4GB 0528	5/16	1/4
12 4GB 0538	5/16	3/8
12 4GB 0638	3/8	3/8
12 4GB 0748	1/2	1/2

ISO Symbol



Pressure Reducing Fitting: It is often necessary to provide a secondary reduced pressure to an actuator to control its operating force. A pressure reducing fitting provides this function, and can be manually adjusted to the required pressure level.

Pilot Operated Check Valve - 124GA

In-line Push-in 1/4" - 1/2" O.D. tube 1/8 - 1/2 NPTF pipe

Technical Data

Fluid: Compressed air, nitrogen, inert and non-combustible gases compatible with materials of construction.

Operating Pressure:

15-150 psi (1 - 10 bar)

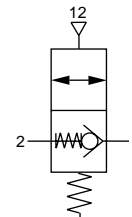
Operating Temperature:

0° to 175°F (-20° to +80°C)



Product Number	O.D. Tube	NPTF Thread
12 4GA 0418	1/4"	1/8
12 4GA 0428	1/4"	1/4
12 4GA 0638	3/8"	3/8
12 4GA 0748	1/2"	1/2

ISO Symbol



Pilot Operated Check Valve: A blocking fitting which allows air flow in both directions if a pilot pressure is applied to port 12. When pressure to the pilot port is removed flow occurs in one direction only due to an integral control valve. When used in pairs, blocking fittings can control an actuator to give controlled operation in the event of an electrical problem, air failure, or tube breakage.

For additional sizes, configurations, metric products, and technical specifications request catalog Fittings APC-101.



Pressure Reducing Fitting -124GD

**In-line Push-in
5/32" O.D. tube
1/8 - 1/4 NPTF pipe**

Technical Data

Fluid: Compressed air, nitrogen, inert and non-combustible gases compatible with materials of construction.

Operating Pressure:

- Cylinder pressure (Pc) 145 psi (10 bar) max
- Sensor supply pressure 43 to 145 psi (3 - 10 bar)
- Sensor switch pressure 14.5 psi (1.0 bar) typical

Operating Temperature:

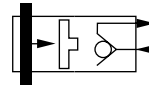
0° to 175°F (-20° to +80°C)

Pneumatic Sensor Fittings: Provides an air signal when a cylinder has reached the end of travel. Sensor fittings operate by detecting the drop in exhaust pressure at the end of a stroke. They effectively offer an all-pneumatic option to the electrical reed switch.



Product Number	Tube O/D	NPTF Thread
12 4GD 0218	5/32"	1/8
12 4GD 0228	5/32"	1/8

ISO Symbol



Tubing and Accessories

High Pressure Inch Tubing (Nylon 12)

Tubing				Maximum Working Pressure @ -40°F to 70°F (-40°C to 20°C)		Minimum Bend Radius		Part Number and Color				
OD (inch)	ID (inch)	OD (mm)	ID (mm)	psig	bar	inch	mm	Natural	Black	Blue	Green	Red
1/8	0.060			400	27.6	0.38	10	40 016 101	40 016 401	40 016 701	40 017 301	40 017 601
5/32	0.090	4	2.3	350	24.1	0.56	14	40 016 102	40 016 402	40 016 702	40 017 302	40 017 602
3/16	0.122			315	21.7	0.63	16	40 016 103	40 016 403	40 016 703	40 017 303	40 017 603
1/4	0.165			290	21.0	0.88	22	40 016 104	40 016 404	40 016 704	40 017 304	40 017 604
5/16	0.213	8	5.5	275	19.0	1.13	29	40 016 105	40 016 405	40 016 705	40 017 305	40 017 605
3/8	2.450			265	18.3	1.25	32	40 016 106	40 016 406			
1/2	0.370			210	14.5	1.50	38	40 016 107	40 016 407			

For other colors, lengths or packaging, please consult factory.

High Flow Inch Tubing (Nylon 11)

Tubing				Maximum Working Pressure @ -40°F to 70°F (-40°C to 20°C)		Minimum Bend Radius		Part Number and Color					
OD (inch)	ID (inch)	OD (mm)	ID (mm)	psig	bar	inch	mm	Natural	Black	Blue	Green	Red	Yellow
1/8	0.093			225	15.5	0.38	10	PB 0051 100	PB 0751 100	PB 0551 100	PB 0251 100	PB 0151 100	PB 0351 100
5/32	0.106	4	2.3	275	19.0	0.50	13	PB 0052 100	PB 0752 100	PB 0552 100	PB 0252 100	PB 0152 100	PB 0352 100
3/16	0.138			225	15.5	0.63	16	PB 0053 100	PB 0753 100	PB 0553 100	PB 0253 100	PB 0153 100	PB 0353 100
1/4	0.180			250	17.2	0.88	22	PB 0054 100	PB 0754 100	PB 0554 100	PB 0254 100	PB 0154 100	PB 0354 100
5/16	0.232	8	5.5	220	15.2	1.25	32	PB 0055 100	PB 0755 100	PB 0555 100	PB 0255 100	PB 0155 100	PB 0355 100
3/8	0.275			220	15.2	1.50	38	PB 0056 100	PB 0756 100	PB 0556 100	PB 0256 100	PB 0156 100	PB 0356 100
1/2	0.375			200	13.8	2.00	51	PB 0057 100	PB 0757 100	PB 0557 100	PB 0257 100	PB 0157 100	PB 0357 100

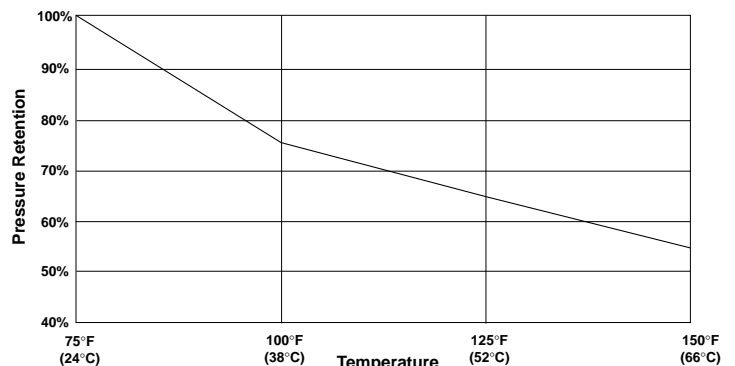
Notes

The working pressure for Nylon 11 tubing is calculated using a 4 to 1 safety factor.

* To determine working pressures at other temperatures, see chart. Tubing is supplied in 100 ft. (30.5m) coils, packaged in poly bags. For other colors, lengths or packaging, please consult factory.

For availability of "ghosted" part numbers consult factory.

Working Pressure at Elevated Temperature



Tube Cutter

Item	Product Number
Tube Cutter (5 pack)	M/3314
Replacement blade (5 pack)	M/32009



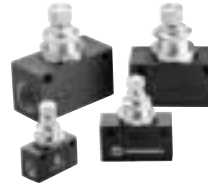
Fittings and Accessories

Check Valves



Port Size NPT	Model
1/8	C/520
1/4	C/521
3/8	C/532
1/2	C/522
3/4	C/523
1	C/524

In-line Flow Controls



Port Size NPT	Model
1/8	T1000A1800
1/4	T1000A2800
3/8	T1000A3800
1/2	T1000A4800

Quick Exhaust Valves



Port Size NPT	Model
1/8	T70A 1800
1/4	T70A 2800
3/8	T70A 3800
1/2	T70A 4800

Shuttle Valves



Port Size NPT	Model
1/8	T65A1800
1/4	T65A2800

Quietaire™ Pneumatic Silencers

Heavy-duty shell type



Port Size NPT	Part Number (male)	Part Number (female)
1/8	MB001A	MA001A
1/4	MB002A	MA002A
3/8	MB003A	MA003A
1/2	MB004A	MA004A
3/4	MB006A	MA006A
1	MB008A	MA008A

Standard-duty, sintered bronze



Port Size NPT	Part Number
10-32	MS000A
1/8	MS001A
1/4	MS002A
3/8	MS003A
1/2	MS004A
3/4	MS006A
1	MS008A

Standard-duty porous plastic



Port Size NPT	Part Number
10-32 UNF	M/S0
1/8	C/S1
1/4	C/S2
3/8	C/S3
1/2	C/S4
3/4	C/S6
1	C/S8

Breather vent sintered bronze



Port Size NPT	Part Number
1/8	MV001A
1/4	MV002A
3/8	MV003A
1/2	MV004A
3/4	MV006A
1	MV008A

Heavy duty speed control sintered bronze



Port Size NPT	Part Number
1/8	MM001A
1/4	MM002A
3/8	MM003A
1/2	MM004A

Standard-duty speed control porous plastic



Port Size NPT	Part Number
10-32 UNF	T20M0500
1/8	T20A1800
1/4	T20A2800
3/8	T20A3800
1/2	T20A4800

For additional sizes, configurations, metric products, and technical specifications request catalog Fittings APC-101.V

Diaphragm Amplifiers



- Miniature pneumatic interface amplifiers
- Sense very low pneumatic signals
- Provide on/off control of a high pressure air supply
- Low and ultra-low pressure models
- Used with non-contact sensors to amplify outputs to a usable level
- Serves as an output device in miniature pneumatic circuits

Ordering Information

To order, quote appropriate product number from the tables on the following pages, e.g. 5DA-010-D0A for control of systems where actuation is required above a 4" H₂O signal with the output resetting to off when the control signal falls below 1" H₂O.

Operation:

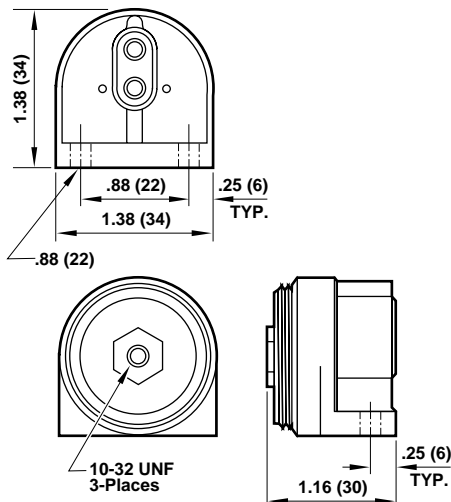
Supply pressure travels through an orifice and is vented to atmosphere. When a control signal is applied, it energizes a diaphragm, compressing a spring and cutting off the vent passage. Pressure is now directed from the supply to outlet port, providing an amplified signal. When the control signal is removed, the spring returns the diaphragm to its non-energized position, and the supply signal is once again vented to atmosphere.

Specifications

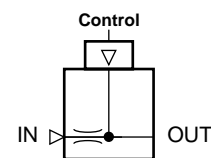
Fluid: Compressed air, nitrogen, or inert gases
 Max. Control Pressure: 5 psig (.3 bar)
 Inlet Pressure
 Minimum: 0 psig (0 bar)
 Maximum: 125 psig (8.6 bar)
 Temperature Range: 35° to 150°F (2° to 66°C)
 Equivalent Orifice Size: 0.014" (.36 mm)
 Cycle Rate: 25 Hz
 Ports: 10-32 UNF

Materials of Construction

Body: Noryl
 End Cap: Polycarbonate
 Spring: Stainless steel
 Diaphragm: Buna-N



Pneumatic Symbol



Part Number	Port Thread	Positive On/Off Actuation Points	
		ON - when control signal is more than:	OFF - when control signal is less than:
5DA-010-D0A	10-32 UNF	4" H ₂ O (10 mbar)	1" H ₂ O (2.5 mbar)
5DA-011-D0A	10-32 UNF	10" H ₂ O (25 mbar)	5" H ₂ O (12.5 mbar)

Furnished with three adapters for use with 1/16" ID flexible tubing.

Rotowink Indicators

- Visual indication of system status
- Indicate presence or absence of pressure
- Large (13/16") or small (7/16") lens
- Choice of connections
- Contrasting, fluorescent indicator colors

Operation

Pressure applied to an internal piston/diaphragm assembly compresses a spring, moving a linkage which rotates the colored indicator ball. When full actuation pressure is reached, the indicator ball rotates fully, changing the indicator color.

When the pressure signal is removed, the internal spring returns the indicator ball to its non-actuated color/position.



Specifications

Fluid: Compressed air, nitrogen, or inert gases
Air Consumption: None
Working Pressure: See order chart FIT-9-9.
Temperature Range: 35° to 150°F (2° to 66°C)

Materials of Construction

Body:
5VS-1XX-XXX - Acetal
5VS-4XX-XXX - Polyphenylene
5VS-2XX-XXX - Acetal

End Plug:
5VS-1XX-XXX - Acetal
5VS-4XX-XXX - Aluminum

Piston: Acetal
Elastomer: Buna-N
Lens: Acrylic

Options

Special versions of the Rotowink are available, please consult factory with specific requirements and quantities.

Ordering Information

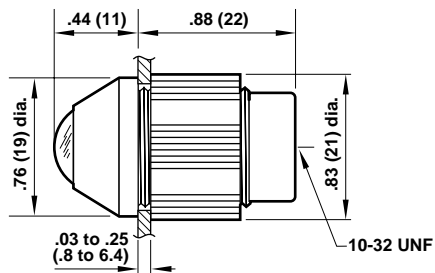
To order, quote appropriate product number from the tables on the following pages, e.g. 5VS-401-00 for 1/8 NPT female connection, black/red indication, and 10 psig actuation pressure.



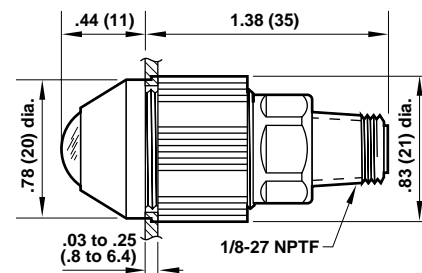
Colors (Standard combinations listed. Other combinations available.)		Operating Pressure Ranges		
		1 to 15 psig (.07 to 1 bar)	10 to 125 psig (.7 to 8.6 bar)	15 to 150 psig (1 to 10.3 bar)
		NPT or UNF Thread Port		
Normal	Actuated	10-32 UNF* (Female)	1/8 NPTF (Female)	1/8 NPTF (Male)
Part Numbers				
Black	Red	5VS-101-000	5VS-401-000	5VS-201-000
Black	Green	5VS-102-000	5VS-402-000	5VS-202-000
Black	Yellow	5VS-103-000	5VS-403-000	—
Red	Green	5VS-112-000	5VS-412-000	5VS-212-000
Green	Red	5VS-121-000	5VS-421-000	5VS-221-000
Specifications				
Maximum Pressure - psig (bar)		15 (1)	125 (8.6)	150 (10.3)
Actuation Pressure - psig (bar)		1 (.07)	10 (.7)	15 (1)
Deactuation Pressure - psig (bar)		15" H2O (38 mbar)	2 (.14)	2 (.14)
Mounting Hole Ø - in. (mm)		.72 (18.3)	1.22 (31.0)	.72 (18.3)

*Furnished with an adapter for use with 1/16" ID flexible tubing.

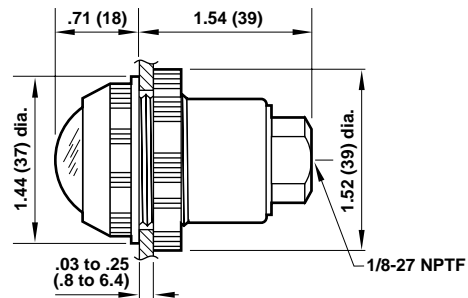
5VS-1XX Series



5VS-2XX Series



5VS-4XX Series



Differential Pressure Indicators

- Visual indication of differential pressure levels
- Full 360° visibility of RED/GREEN pressure indicator
- Light weight construction
- 1/8 NPT (female) connections
- In-line or bottom porting

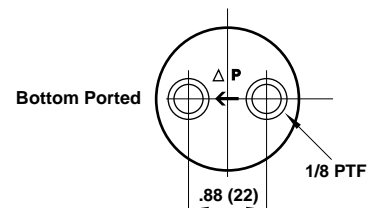
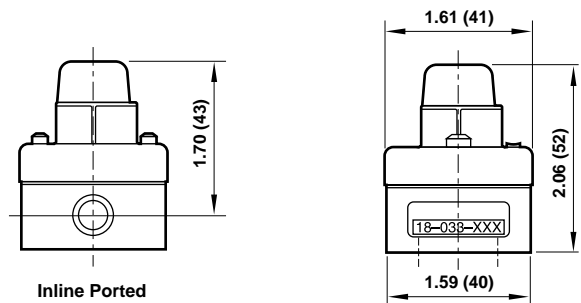
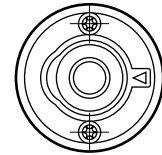


Specifications

Fluid: Compressed air, nitrogen or inert gases
 Max. Inlet Pressure: 250 psig (17.2 bar)
 Temperature Range: 0° to 175°F (-18° to 79°C)
 Max. Differential Pressure: 15 psid (1 bar d)
 Ports: 1/8 NPT (female)

Materials of Construction

Indicator Body: Transparent nylon
 Adapter Body: Aluminum
 Internal Parts: Acetal
 Spring: Stainless steel
 Elastomers: Nitrile



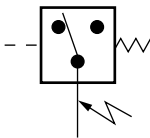
Part Number	Port Location	Differential Range	Indicator Color Code - (ΔP range)		
			GREEN	GREEN/RED	RED
18-033-104	In-line	0 to 5 psid	less than 0.5 psid	between 0.5 and 4.5 psi	greater than 4.5 psid
18-033-105	Bottom	(0 to 0.35 bar d)	(0.04 bar d)	(0.04 and 0.31 bar d)	(0.31 bar d)
18-033-101	In-line	0 to 10 psid	less than 4 psid	between 4 and 10 psid	greater than 10 psid
18-033-102	Bottom	(0 to 0.7 bar d)	(0.3 bar d)	(0.3 and 0.7 bar d)	(0.7 bar d)

Pressure Switch



- Integrates pneumatic and electrical systems
- Low actuation pressure
- Panel mountable
- Single-pole Double-throw operation
- May be wired Normally-open or Normally-closed

Pneumatic Symbol



Operation:

Signal pressure extends a diaphragm which contacts and actuates an electrical micro-switch.

Specifications

Fluid: Compressed air, nitrogen, or inert gases

Max. Working Pressure: 15 psig (1 bar)

Actuation Pressure: 1 psig (.07 bar)

Temperature Range: 35° to 150°F (2° to 66°C)

Electrical Rating: 5 Amps 125/250 Vac

Air Consumption: 0

Panel Mounting Hole: Ø1-7/32" (31 mm)

Panel Thickness: 0.03 to 0.25" (.8 to 6.4 mm)

Connections

Pneumatic: 10-32 UNF

Electrical: 0.093 female spade (3x)

Materials of Construction

Body and Locknut: Aluminum

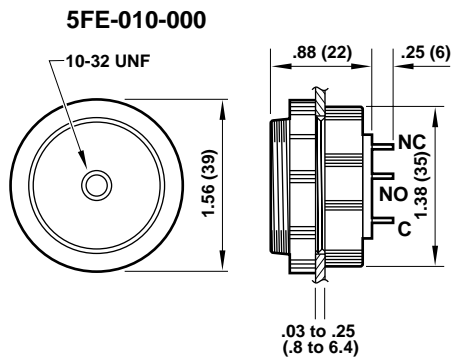
Switch Carrier: Noryl

Diaphragm: Polyurethane

Diaphragm Plate: Nylon

Order Number - 5FE-010-000

Crimp type, insulated, male spade electrical terminals for 18-22 gauge wire are furnished with each switch.



Boostermites

- **Compact pneumatic power amplifiers**
- **Sense very low pneumatic signals**
- **Provide on/off control of a high pressure air supply**
- **Low and ultra-low pressure models**
- **Inputs (control) from pneumatic sensors, logic devices, instrumentation systems**
- **Provide direct operation of small actuators (cylinders), large air piloted valves, and other small pneumatic devices**
- **Average service life exceeding 100 million cycles**



Operation

Boostermites are bleed actuated, 2-position, 3-way, 3-port, normally closed poppet valves. Supply pressure travels through an orifice and is vented to atmosphere. When a control signal is applied, it energizes a diaphragm, compressing a spring and cutting off the vent passage. Pressure is now directed from the supply to the poppet piston, which shifts the valve, connecting the inlet to the outlet ports. When the control signal is removed, the spring returns the diaphragm to its non-energized position, and the supply signal is once again vented to atmosphere, and the poppet piston shifts the valve to the non-actuated position.

Specifications

Fluid: Filtered (25 μ), lubricated or non-lubricated compressed air

Max. Control Pressure: 5 psig (.3 bar)

Inlet Pressure

Minimum: 20 psig (1.4 bar)

Maximum: 125 psig (8.6 bar)

Temperature Range: 35° to 150°F (2° to 66°C)

Equivalent Orifice Size: 0.094" (2.4 mm)

Cycle Rate: 900 cpm

Ports

Control: 10-32 UNF

Main: 1/8 PTF

Materials of Construction

Body: Aluminum

Piston Assembly: Aluminum, Acetal

End Caps: Polycarbonate, Nylon

Springs: Stainless steel

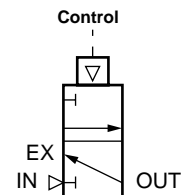
Elastomers: Buna-N

Service Kit (includes seals) Part Number: P0150A-01

Ordering Information

To order, quote appropriate product number from the tables on the following pages, e.g. 5BV-011-D0A for operation of pneumatic devices where actuation is required above a 3" H₂O signal with the output resetting to off when the control signal falls below 1/2" H₂O.

Pneumatic Symbol

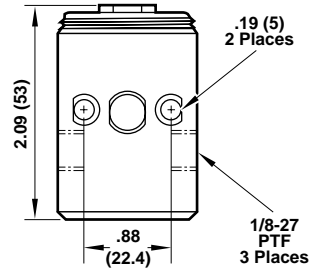
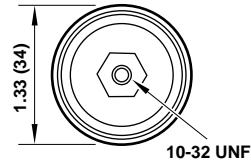




Part Number	Port Thread		Positive On/Off Actuation Points	
	Control	Main	ON - when control signal is more than*	OFF - when control signal is less than:
5BV-011-10A	10-32 UNF	1/8 PTF	3" H2O (7.5 mbar)	1/2" H2O (1.3 mbar)
5BV-010-10A	10-32 UNF	1/8 PTF	10" H2O (25 mbar)	5" H2O (12.5 mbar)

*Variation with attitude change: 1/2" H2O (1.3 mbar)

Furnished with two 1/2" long mounting spacers and a control port adapter for use with 1/16" ID flexible tubing.



Miniature Inline Restrictors

- Provide “resistor” function in pneumatic circuits
- High precision sapphire orifices
- Color coded aluminum body with internal 200 x 200 mesh stainless steel prefilter
- 10-32 UNF or barbed tube connections
- Direct in-line mounting
- Signal attenuation and time delay functions in miniature pneumatic circuits



Specifications

Fluid: Compressed air, nitrogen or inert gases
 Maximum Pressure: 125 psig (8.6 bar)
 Temperature Range: 35° to 150°F (2° to 66°C)

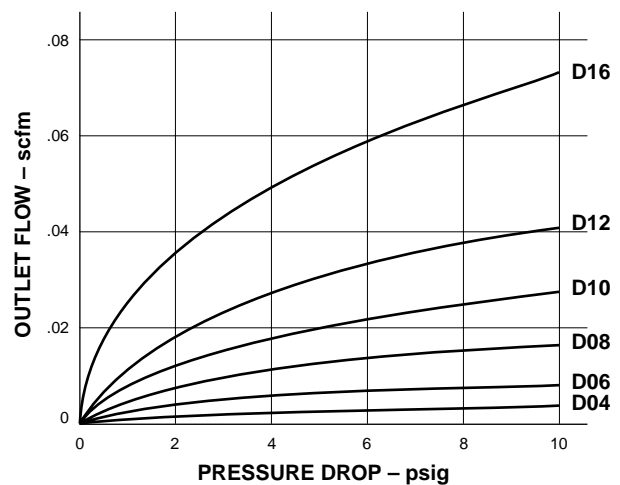
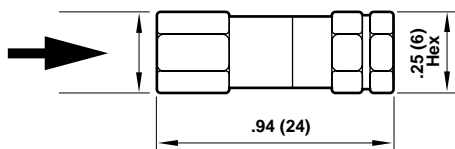
Materials of Construction

Body: Aluminum
 Orifice: Sapphire
 Screen: Stainless steel

Pneumatic Symbol



Part Number	Orifice Inch (mm)	Color Code
4LR-010-D04	0.004 (.10)	Yellow
4LR-010-D06	0.006 (.15)	Brown
4LR-010-D08	0.008 (.20)	Red
4LR-010-D10	0.010 (.25)	Black
4LR-010-D12	0.012 (.30)	Blue
4LR-010-D16	0.016 (.40)	Green

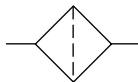


Miniature Inline Filters



- 25-micron element rating
- Connections for 1/8" or 5/32" ID flexible tubing
- Direct in-line mounting
- Protection against particulate contamination for miniature pneumatic systems

Pneumatic Symbol

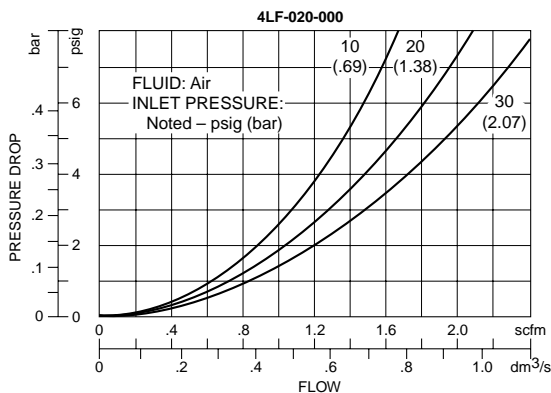
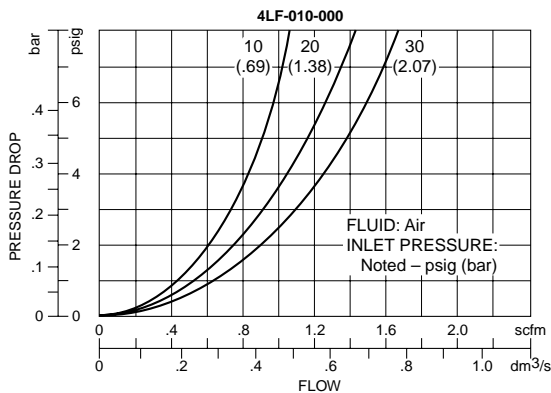


Specifications

Fluid: Compressed air, nitrogen or inert gases
 Element Rating: 25 μ
 Maximum Pressure: 60 psig (4.1 bar)
 Maximum Temperature: 125°F (52°C)

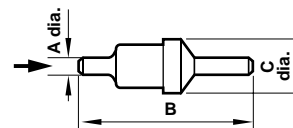
Materials of Construction

Body: Polypropylene
 Element: Sintered Bronze
 Elastomers: Buna-N



Part Number	Flexible Tube Connection
4LF-010-000	1/8" ID
4LF-020-000	5/32" ID

Part Number	ØA	ØC	B
4LF-010-000	0.15 (3.8)	0.64 (6.3)	1.58 (40.1)
4LF-020-000	0.18 (4.6)	0.64 (16.3)	1.70 (43.2)



Appendix

Contents	
Lubricants For Use With Norgren Airline Products	ALE-29-2
Glossary of Pneumatic Terms	ALE-29-3
Improving the Bottom Line with Pneumatics	ALE-29-6
Helpful Engineering Information	ALE-29-10
Conversion Tables	ALE-29-12
Thread Forms	ALE-29-13
Norgren Web Site	ALE-29-16
Warning and Warranty	ALE-29-17
Part Index	ALE-29-18



Recommended Lubricants

Recommended Oils for use with Norgren Lubricators

Oils listed in the following tables may be used in Norgren Lubricators. All oils, however, may not be compatible with the equipment to be lubricated. Contact your lubricant supplier and the builder of the equipment to be lubricated to obtain specific lubricant recommendations.

Light Duty Tool Lubricants (ISO 3448 Viscosity Grades 10 to 22) for Small Air Tools

Manufacturer	Product	ISO 3448 Viscosity Number
BRITISH PETROLEUM	Energal HLP10	10
CASTROL	Hyspin AWS10	10
MOBIL	Velocite Oil No. 6	10
SHELL	Tellus R10	10
TOTAL	Azolla ZS10	10
CENTURY	P198	15
DUCKHAMS	Zeroflo 15	15
ELF	Elfolna 15	15
ESSO	Nuto H15	15
MOBIL	Velocite Oil No. 8	15
ROCOL	MO-4	15
MOBIL	Velocite Oil No. 10	22
SHELL	Tellus 22	22

Heavy Duty Tool Lubricants (ISO 3448 Viscosity Grades 32 to 68) for Standard Air Tools and Cylinders

Manufacturer	Product	ISO 3448 Viscosity Number
BRITISH PETROLEUM	Energal HLP32	32
CASTROL	Hyspin AWS32	32
CENTURY	PWLA	32
ELF	Elfolna 32	32
ESSO	Nuto H32	32
GULF	Harmony 32	32
MOBIL	SHC 524	32
MOBIL	DTE 24	32
MOBIL	DTE Oil Light	32
MOBIL	Gargoyle Arctic Oil Light	32
SHELL	Tellus 32	32
TEXACO	Rondo 32	32
SHELL	Tellus 37	37
GULF	Hydrasil 46	46
BRITISH PETROLEUM	Energal HLP46	46
SHELL	Tellus 46	46
TEXACO	Regal Oil R & 046	46
ROCOL	MO-10	46
BRITISH PETROLEUM	Energal HLP68	68 *

Low Temperature Applications - For use when temperature remains below 32°F (0°C)

Manufacturer	Product	ISO 3448 Viscosity Number
MOBIL	SHC 624	32
DUCKHAMS	Zeroflo 32	32
MOBIL	S4C 524	32

Antifreeze Lubrication

Manufacturer	Product
CASTROL	Antifreeze Mist Lubricant

* For certain applications requiring heavy oil.

Assembly Greases

The following greases may be used in the reassembly of Norgren Airline Equipment.

Industrial Compressed Air Applications

Manufacturer	Product
BRITISH PETROLEUM	Energrease LS2 (non-silicone)
DOW CORNING	Molykote BR-2 Plus (non-silicone)
CARLETON-STUART	Magnalube G (non-silicone)
DOW CORNING	DC44 (silicone)
DOW CORNING	DC55 (silicone)

Low Temperature Industrial Compressed Air Applications below -20°F (-29°C)

Manufacturer	Product
KLUBER	Unisilicon L50/2 (silicone)

Food and Potable Water Applications

Manufacturer	Product
DOW CORNING	Molykote 111 (silicone)

**Activated Carbon**

A filter material (media) used to remove odors and oil vapors from compressed air.

Aerosol

A suspension of fine liquid particles in gas, i.e., smoke, fog, and mist

After Cooler

A heat exchanger mounted on a compressor outlet to extract the heat of compression.

Air-Piloted Pressure Regulator

See Pilot Operated Regulator

Ambient

The normal condition of air usually defined by temperature or humidity in the vicinity of the equipment being evaluated.

Automatic Drain

A mechanical float used to open and drain excess fluids from a filter bowl (these drains are normally open and use pressure to close)

Average Flow

Typical rate of instantaneous flow over a given timeframe (used to determine compressor capacity requirement). See Instantaneous Flow.

Back Pressure Regulator

See relief valve

Balanced Valve, Regulator

A term used to denote the use of equal pressure on both sides of regulator valve to balance and minimize effect of changing primary pressure.

Bearing Lubricator

Micro-Fog lubricator (See Micro-Fog Lubricator) normally used to lubricate machine bearings.

Beverage Regulator

Regulator normally used for tank systems, often high-pressure, of inert gases (i.e., CO₂) and used in conjunction with beverage dispensing equipment.

Check Valve

A device which allow flow in one direction only.

Coalescing:

The action causing small oil aerosols to combines through adsorption to form larger, heavier, droplets for removal from the compressed air stream.

Coalescing Filter

Filter using coalescing element to remove oil aerosol particles.

CFM

Cubic Feet per Minute, a volumetric flow measurement at a specified pressure.

Cv

A dimensionless number expressing the flow capability or conductance of a fixed orifice of a pneumatic device

Constant Bleed

A method used to reduce or eliminate droop in a regulator to provide higher performance, more precise flow and faster regulation characteristics.

Creep

Used to describe increase in secondary pressure (P₂) due to a leak from primary pressure (P₁).

Critical Back Pressure Ratio (CBPR)

CBPR is equal to 53% with compressed air; CBPR is when downstream pressure is less than 53% of the upstream pressure reducing downstream pressure further will not increase flow.

Dead End Service

Implies a secondary volume is pressurized, however, under normal circumstances the volume does not flow air but acts as a holding vessel.

Deliquescent Dryer

An air dryer utilizing chemicals for purposes of dewpoint suppression by absorbing water from a compressed air stream.

Delta-P Indicator

See Service Life Indicator, Pressure Drop indicator

Desiccant

A material creating adherence, or adsorption, of water to its surface. Often used in regenerative or desiccant dryers to lower the dewpoint for removal of water from compressed air.

Dew Point

The temperature at which moisture begins to condense to liquid at a constant pressure. The temperature at which air is saturated is the dew point and at this point relative humidity is equal to 100%.

Drip Leg Drain

A device placed at the low point of a main air distribution system used to removed condensed liquid water from the compressed air stream where water is likely to accumulate.

Droop

A term used to describe the initial pressure drop seen in a regulator flow curve (caused by seal impingement).

Dump Valves

See Exhaust Valves

Electronic Regulator

Electronically controlled regulator used to reduce inlet pressures to a regulated process range output.

Emulsion

A mixture of oil and water.

Excelon

A Norgren trade name used to describe a modular FRL product using a patented one-piece clamping mechanism called a Quikclamp.

Exhaust Valves

Valve used to evacuate downstream air of the valve itself (warning- air can be trapped by other pneumatic devices downstream of the valve).

Feedback Regulator

A special pilot regulator designed to sense and control pressure more accurately at a remote point downstream of the pilot operated regulator to provide more consistent pressure control.

Free Air

Air at ambient conditions usually measured at a compressor intake (compressors are rated in CFM of Free Air @ Intake).

Flow

The rate of air allowed to pass through a device or orifice at a given pressure, usually in SCFM or dm³/sec. Two expressions are commonly associated with flow: instantaneous flow and average flow.

Flow Curve

A performance chart showing various flow rates for a specific component at specific pressure settings and pressure drop.

General Purpose Filter

Filter used for common liquid extraction and particle removal, normally filtered to 40 or 5 micron particle size.



General Purpose Regulator

A common regulator used to provide normal industrial pressure regulation.

Instantaneous Flow

Flow rate demanded within a single cycle of a compressed air system (used to size pneumatic components of valves, air preparation, fittings, and conductors)

Instrument Regulator

A higher precision regulator used to provide exceptionally close tolerance pressure regulation.

Integral Filter/Regulator

A unit combining the function of a filter and regulator into one space-saving unit.

Integral Pilot Operated Regulator

A unit combining the integral pilot operated regulator with the main control regulator

I/P Pressure Converter

Essentially a precision electronic regulator (see also Electronic Regulator). Also known as E/P, P/I, and P/E converters (I = current, E = voltage, P = pressure).

Machine Lubricator

See Micro-Fog or Bearing Lubricator.

Manual Drain

A valve that requires manually open and closure to drain liquids from a filter bowl (sometimes used with lubricator bowls).

Manifolding Regulator

A regulator with two common P1 ports and two common P2 ports which can be assembled in a single or multiple output fashion for various pressure settings using a solitary inlet air line.

Manifold Block

Block used to connect multiple air line products.

Master Regulator

A term sometimes used to refer to the controlling regulator of a Pilot Operated Regulator.

Membrane Dryer

A variable dewpoint suppression device using hollow fibers which has an affinity for water, whereby moisture-laden air enters into the fibers and the water vapor permeates through the walls to be removed from the air stream.

Micro-Fog Lubricators

A Norgren trade name for lubricators designed to atomize oil to an aerosol within the airflow, usually less than 2 microns in size, to provide longer travel distance at a higher consistency of suspended oil in pipes. Typically used with distances up to 50 feet or when more than one tool requires lubrication from a single lubricator.

Micron

A measurement of size equal to one-millionth of a meter (.000039 inch).

NACE

National Association of Corrosion Engineers specifying standards used to determine corrosion resistance requirements of products.

Non-Return Valve

See Check Valve

Oil-Fog Lubricator

A Norgren trade name for a lubricator designed to heterogeneously disperse oil mist, having particles size usually larger than 2 microns to small droplets. Typically used for short distances or when only one tool requires lubrication.

Odor Removal filter

See Oil Vapor Removal filter.

Oil Vapor Removal Filter

Filter utilizing an activated carbon to remove oil vapor. Also used to remove odors from air stream.

Olympian

A Norgren trade name to describe European manufactured FRL products utilizing a modular yoke design.

P1

See Primary Pressure

P2

See Secondary Pressure.

Pilot Operated or Slave Regulator

A regulator, which has its outlet pressure, controlled by air pilot pressure instead of a spring. Requires another pressure regulator to control the pilot pressure.

Porting Block

Modular device providing a pipe port(s) from a main airflow stream or pneumatic control mechanism.

Precision Pressure Regulator

A regulator used to provide the most precise pressure regulation without electrical feedback (usually a constant bleed regulator).

Pressure Switch

Devices to monitor pressure and/or provide an output signal in a system.

Pounds Per Square Inch Absolute (PISA)

Pressure including atmospheric pressure. Atmospheric pressure is caused by the weight of the atmosphere pushing down on the earth's surface. (Atmospheric pressure is equal to 14.7 at sea level.)

Pounds Per Square Inch Gauge (PSIG)

Pressure related and visual on a gauge, not taking into account atmospheric pressure

Pounds per Square Inch Drop (PSID)

The amount of pressure loss, in PSI, incurred by the flow of air through a device (losses usually due to friction and other factors).

Pressure Reducing Device

See Regulator, Pressure

Primary Pressure

Supply or inlet pressure, P1.

Prismatic Lens

A Norgren trade name used to describe a special bowl liquid level indicator, a bowl sight lens.

Quikclamp

Norgren trade name used to describe the patented one-piece clamping mechanism for Norgren EXCELON(r) products

QuikDrain

A Norgren trade name for the patented manual 1/4 turn drain for Norgren Bowls.

Refrigeration Dryer

An air dryer utilizing refrigeration to cool air for purposes of dewpoint suppression in order to condense and remove water from a compressed air stream.

**Regenerative Dryer**

An air dryer utilizing desiccant for purposes of dewpoint suppression by method of adsorption in order to accumulate and remove water from a compressed air stream.

Regulation Curve

A performance chart of a regulator used to determine the expected fluctuation of secondary pressure under constant flow with varying primary pressure.

Regulator, Pressure

A device used to reduce (regulate) air pressure in a pneumatic system to a desired working level.

Relief Valve

A device used to reduce likelihood of over pressurization of a system by relieving air at a given pressure set point.

Relative Humidity

The ratio of actual water present in a volume of air, as measured as a percentage of air completely saturated at the same temperature.

Remote Fill Device

A device used to fill lubricator bowls from a remote location.

Reverse Flow Regulator

A regulator designed to exhaust downstream air with loss of upstream pressure.

SCFM

Standard Cubic Feet per Minute, SCFM converts CFM to standard conditions: 14.7 PSIZ, 68oF ambient temperature, and 35% relative humidity (See also CFM).

Secondary Pressure

Regulated pressure downstream of a specific device, P2.

Semi-automatic Drain

A drain that requires manual operation to drain when pressurized, but opens automatically in the absence of pressure. Sometimes referred to as an overnight drain.

Service Life Indicator

Device used to visually or electronically indicate pressure drop (Delta-P), variance in P1 to P2, across a filter used to warn of filter clogging.

Sight Feed Dome

The control device adjustment on a lubricator used to increase or decrease oil feed rate.

Slave regulator

See Pilot Operated Regulator

Smooth Start Valve

A valve allowing slow pressure build-up of a system to an intermediate pressure before permitting a step-up to full line pressure. Used to prevent sudden movement, damage, and potential failure of equipment during start-up.

Soft Start Valve

See Smooth Start Valve

SSU or Viscosity

Sabolt Universal Seconds, the time in seconds for 60 milliliters of oil to flow through a standard orifice at a given temperature.

Standard Conditions

The basis of comparison of ambient conditions, the specification used to convert CFM as ambient conditions for direct comparison @ SCFM. (For compressed air: temperature of 68o- 72oF, relative humidity of 35%, and atmospheric pressure of 14.7 psia.)

Terminal Velocity

In compressed air applications, terminal (critical) velocity is reached when the downstream pressure (P2) is less than 53% of the upstream pressure (P1). See also Critical Back Pressure Ratio.

Tool Lubricator

See Oil-Fog Lubricator.

Unbalanced Valve

A term used to denote where primary pressure is allowed to act as a closing force across the valve seat area. Changes in primary pressure (P1) can impact the secondary pressure setting (P2).

Yoke

A term used to describe the connection or mounting method used in the Olympian Series Product.



IMPROVING THE "BOTTOM LINE" WITH PNEUMATICS.

Clayton W. Fryer, IMI NORGREN, Littleton, Colorado

Abstract:

The cost of compressed air continues to be a very elusive subject in industrial applications. The notion that compressed air is free is a common misconception. Countless attempts at making end users aware of the costs to produce compressed air have largely been ignored. It seems that Operations Managers are concerned with the power consumption of a couple of sixty-watt light bulbs, but couldn't care less about the power required to run a 400 horsepower compressor! Let's put this into perspective, one horsepower equals 745.7 Watts. You can light 4,971 sixty-watt light bulbs with the same power it takes to run a 400 horsepower compressor! Indeed, the single largest electrical appliance in a manufacturing plant may be the compressor motor.

This paper will provide some common sense approaches to determine the cost of compressed air required in a typical pneumatic circuit. It is the discovery of the approach and the requisite considerations that we hope to explore. By clearing up several popular pneumatic myths, we will be able to make better decisions to reduce the cost of compressed air.

Compressed air costs are typically hidden in the operating overheads of most companies. **Any overhead cost reduction immediately falls to the bottom line in the form of profit.**

The real test of this improved bottom line is determining the additional sales a company must generate to produce a similar profit.

Real Costs

Experts in the compressed air field suggest the cost to produce compressed air varies from \$.15 to \$.40 per 1000 Standard Cubic Feet (SCF) (1), (2), depending on geographical location. In spite of these estimates, a large sector of the user public fails to complete the simple calculations to determine what a machine will require in terms of Standard Cubic Feet per Minute (SCFM) of compressed air, let alone for an entire year or the life of the equipment. In order to improve the bottom line with pneumatics, we must also expose three popular pneumatic myths!

Myth #1: Compressed Air is Free

Myth #2: Pipe Size = Right Size

Myth #3: If a little bit's good, a whole lot's better

Myth #1: Compressed Air is Free!

In the past most people wouldn't take the time to determine the cost of the compressed air required by an actuator for a year. It is ironic that hydraulic system designers have to do the calculations in order to determine the size of the power unit required to operate hydraulic cylinders. For far too long, little effort has been made to recognize the similarities between hydraulic and pneumatic systems. Typically, fluid power people have defended the differences between hydraulic and pneumatic systems. By recognizing the similarities, we can design and service the two mediums from similar perspectives, including the need for safety, conservation, component sizing, and cost justification.

There is a developing interest in determining the cost of compressed air in a pneumatic system. We are beginning to see users specify 60 PSIG as the maximum pressure range for a pneumatic system. Pneumatic component manufacturers are somewhat paranoid about discussing the cost of compressed air in fear they might encourage customers to apply a substitute for compressed air. Since compressed air is readily available, affordable, clean, and has less force hazards than hydraulic power, it seems reasonable that compressed air will continue to be applied in the industrial sector.

Real Common Sense

To properly apply pneumatic components in a system, the first component to be considered is the actuator. We have seen a large number of cylinders grossly oversized resulting in poor actuator performance, wasted compressed air, and high initial component costs. **Oversizing an actuator by one bore size can result in a fifty percent increase in the cost of compressed air required for the application.** If the cylinder is sized to move more than twice the load at the design pressure, the cylinder speed will be adversely affected, and the cost of compressed air will also increase. Using this simple observation can result in significant savings

If care is taken at this step of the design process, every component upstream of the actuator (valves, conductors, fittings, filters, regulators, and lubricators) will have a better chance of being correctly sized and applied. A good and correct start in the process is essential to having an efficient operating system.

Real Calculations

A Cylinder Flow Calculation is required for a number of reasons. It takes into consideration the force required to move the load at the specified pressure, the extend and retract stroke volumes of the cylinder, the cycles per minute, the operating air pressure, and a conversion to Standard Cubic Feet per Minute (SCFM). SCFM is the value used by most pneumatic fluid power manufacturers to apply the correct components in a system. SCFM is also linked to valve sizing using Coefficient of Flow (Cv)

Once the cylinder flow calculation is completed, the designer can determine the correct tubing, fittings, valves, and the Filter, Regulator, and Lubricator (FRL) for the application. In spite of the obvious benefits this information provides, we find few designers attempting these critical calculations.

In a typical circuit (Figure 1.) comprised of a double-acting pneumatic cylinder, a five-port, four-way valve, and two flow



controls, the typical approach to sizing exposes another popular pneumatic myth.

Myth #2: "Pipesize = Right Size".

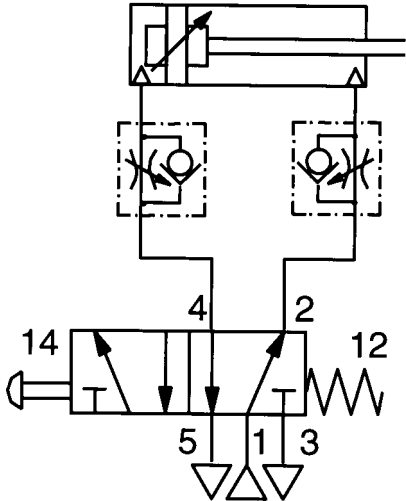


Figure 1. Typical valve/cylinder/flow control circuit
If the cylinder selected had a 1/2" pipe port, most installers would apply 1/2" flow controls, 1/2" pipe and fittings, a 1/2" valve, and quite possibly, a 1/2" FRL! This approach leads to oversized, high priced components and higher long term operating compressed air costs over the life of the equipment. As a result, oversizing components occurs frequently and quickly leads to another popular pneumatic myth.

**Myth #3: If a little bit's good, a whole lot's better!
Real Life Example?**

Let's consider the following example. We have a cylinder load that requires 500 pounds of force to move in the extend direction only. The retract stroke has no effective load. We want to move the load twelve inches and be able to do this at 30 cycles per minute, eight hours per day, five days per week, 50 weeks per year. The cylinder will be operated on a horizontal plane. Compressed air pressure is 80 PSIG. Of course, we want this cylinder to move as fast as possible (AFAP)!

- Specifications:**
- Load: 500 pounds**
- Operating Pressure: 80 PSIG**
- Stroke Length: 12 inches**
- Cycle Rate: 30 cycles per minute (CPM)**
- Time to Extend: 1 second**
- Time to retract: 1 second**
- Cylinder Velocity: AFAP**

Real Solution?

There are five steps required to accurately calculate a cylinder flow rate (in SCFM). The calculations are necessary to achieve accurate results. After the calculations are completed the system designer has the information needed to make sound, cost effective decisions that include downsizing components and conserving compressed air. (Calculations rounded to two decimal places.)

Step #1: Size the Cylinder for Max Performance

This is the stage in sizing a cylinder where we find many designers throwing in a little extra safety factor to cover breakaway forces of a cylinder! (If a little bit's good, a whole lot's better!)

Based on common practice and the orientation of the cylinder, we have found the range of the force multiplier to be between 1.25 to 2.00 times the load (3) being moved, at the specified pressure. This range of values will provide adequate force compensation in the calculations and need not be exceeded.

To size the cylinder for maximum performance (quickest stroke time) we will apply the X2 rule. Multiply the load by two and apply the correct cylinder at the specified pressure. In this case, 500 pounds X 2 = 1,000 pounds. Using the Formula, Force is equal to Pressure times Area (F=PA) we solve for the cross-sectional area we need for the cylinder bore. Written another way to solve for the Area, the formula looks like $A=F/P$. $1000(80)=12.50 \text{ in.}^2$. 12.50 in.² is the cross-sectional area of the bore needed to move our 500 pound load as fast as possible! This is very close to a standard NFPA bore of 4"(12.57 in.²). It is IMPORTANT to note here that any larger bore size will move slower at 80 PSIG, and any smaller bore size will also move slower. Use a 4" bore cylinder.

Step #2: Calculate total volume per cycle

Total volume per cycle requires some examination of the cylinder we will be applying. We need to recognize that the extend stroke volume will be more than the retract stroke volume on a typical double acting, single-rod, cylinder, due to the volume displacement of the rod.

Since we've selected an NFPA 4" bore cylinder we will apply the standard 1" rod after we've checked to avoid cylinder rod buckling! **Extend Volume** is equal to the bore cross-sectional area times the stroke length. $12.57 \text{ in.}^2 \times 12 \text{ in.} = 150.84 \text{ in.}^3$ **Retract Volume** (compensating for the rod) calculation is $(12.57 \text{ in.}^2 - .79 \text{ in.}^2) \times 12 \text{ in.} = 141.36 \text{ in.}^3$ **Total volume per cycle is:**
 $150.84 \text{ in.}^3 + 141.36 \text{ in.}^3 = 292.20 \text{ in.}^3$

For a 5" bore the total volume per cycle is:
 $235.68 \text{ in.}^3 + 226.20 \text{ in.}^3 = 461.88 \text{ in.}^3$ or a 58% increase in the volume of the 4" bore cylinder!

Step #3: Calculate total volume per minute

Multiply the total volume per cycle by the number of cycles per minute. $292.20 \text{ in.}^3/\text{cycle} \times 30 \text{ CPM} = 8,766 \text{ in.}^3 \text{ per minute (CIM)}$

Step #4: Convert CIM to Cubic Feet/Minute (CFM). (NOTE: this calculation step is often overlooked) $8,766 \text{ in.}^3 \div 1728 \text{ in.}^3 = 5.07 \text{ CFM}$

Step #5: Convert CFM to SCFM

This conversion reduces the cylinder flow calculation to the necessary and required terms. To make this conversion we must recognize the compression ratio of the compressed air being used in the application. Compression ratio is the working pressure expressed in absolute terms and converts compressed air to standard



Improving the Bottom Line

conditions. (14.7 PSIA, 36% Relative Humidity, and 68° Fahrenheit temperature). In most industrial applications, the ambient temperature and relative humidity can be ignored since these variables have little impact on the calculations.

Our **Compression Ratio (CR)** calculation:
 $(80 + 14.7) \div 14.7 = 6.44$

Multiplying the CFM by the CR = SCFM,
5.07 CFM X 6.44 CR = 32.65 SCFM!

32.65 SCFM for this application seems fairly harmless until you complete the compressed air cost evaluation.

The cylinder flow calculation provides the necessary information (SCFM) to more accurately determine the correct valve (Cv) and the proper FRL for the system. Without the cylinder flow calculation, sizing the rest of the components in the system will be accomplished empirically, (trial and error approach), or by using Myth #2.

With the cylinder flow calculation complete, we can move on to the real cost of compressed air for the application and sizing the rest of the components in the system.

Real Horsepower (HP) Requirements

Most compressor representatives will use a few rules of thumb to determine the compressor capacity required for an application. Depending on the type of compressor used, compressors are typically rated to deliver four to five SCFM per horsepower (rule of thumb). Most compressor representatives will strongly recommend a duty cycle of 50% to 75% (rule of thumb), again depending on the type of compressor. Duty Cycle is the percentage of time the compressor motor is generally running under loaded conditions. **In our application, at 50% duty cycle, and at 4 SCFM/ HP, a 32.65 SCFM application will require an additional compressor capacity of 16.32 HP!** $(32.65 \text{ SCFM} \div 4 \text{ SCFM/HP}) \div 50\% \text{ Duty Cycle} = 16.32 \text{ HP}$

Real Compressed Air Costs!

If we carry our SCFM calculations out to the number of SCF per year, per shift, pretty soon we are talking about some serious compressed air usage! Consider how many minutes there are in an eight-hour day, five days a week, fifty weeks in a year? $(60 \text{ minutes/hour} \times 8 \text{ hours/day} \times 5 \text{ days/week} \times 50 \text{ weeks/year}) =$

120,000 minutes/year per eight hour shift! (That's 360,000 minutes/year for three shifts!)

32.65 SCFM X 120,000 Minutes = 3,918,000 SCF/Year!

The 5" bore cylinder would require 51.6 SCFM, or 6,196,890 SCF/Year!

If your average cost per 1,000 SCF is only \$.25, the cost of compressed air to operate this one 4" bore cylinder for one shift, for the year is an incredible, **\$979.50!** $[(3,918,000 \div 1,000) \times .25]$

Obviously, if your cost of compressed air is \$.50/1,000 SCF, your annual cost would be **\$1,959.00!**

For the 5" bore, air consumption costs jump to \$1,549.22 (at \$.25/1,000 SCF) and \$3,098.45 (at \$.50/1,000 SCF). Over a 50% increase for one bore size increase!

Real Concern

The cost of compressed air actually used is a major concern for most manufacturing companies. If we could reduce the compressed air consumption in our system by 30%, most Chief Executive Officers, Chief Financial Officers, and plant engineers would leap at the opportunity! Let's consider another approach to our application.

Since our 500 pound load is only being moved in the extend direction, we could consider lowering the air pressure to return the cylinder. For example, say we were able to lower the return pressure from 80 PSIG to 20 PSIG. How would that impact on the total system air consumption?

If you recall from Step #2 above, the retract stroke volume was **141.36 in.³** per cycle, or about 48.4% of the total cycle volume. Without taking you through the additional math, **the compressed air cost for the extend stroke at \$.25/1000SCF is (51.6% of \$979.50) \$505.42/year.**

By changing the pressure on the return stroke to 20 PSIG the compressed air consumption is reduced from 15.8 SCFM to 5.8 SCFM. The impact on the compressed air bill for the retract stroke is a reduction from \$474.08/year to \$174.03, a **reduction of \$300.00 or 30%.**

Even if the price of a 1/2" regulator was \$50 you would be able to expect a payback on the cost of the regulator in about two months. That is, IF we use Myth #2: Pipe Size = Right Size, or Myth #3: If a little bit's good, a whole lot's better!

Please keep in mind this example is for only one 4" cylinder. How many cylinders are you applying? What is your cost of compressed air?

When we examine the application even closer, we are able to save even more in initial costs by properly sizing the valve, the fittings, and tubing by the use of Coefficient of Flow (Cv). It is sufficient to say the use of Cv's to size a system is reasonably accurate and provides an element of cushion in most system calculations.

There are other approaches to conserving compressed air in typical applications. If cylinder speed is not important, using a force multiplier between 1.25 and 2.0 times the load will result in smaller cylinders and less air consumption. Applying single-acting cylinders could significantly reduce the long-term cost of compressed air

Real System Cv?

Using Cv's we can evaluate the typical circuit (Figure 1.) for potential bottlenecks! Each component in the circuit has a Cv. With some effort it is possible to determine the Cv of the cylinder port, Cv of the flow control (in both the free flow direction as well as the WIDE OPEN controlled flow direction), Cv of the piping/tubing and fittings, and the Cv of the directional control valve. **The System Cv is ALWAYS going to be less than the component with the smallest Cv in the system!** A strong recommendation here is to make the most restrictive component ("the weakest link"!) **(4)** in the system, the most expensive component (usually the directional control valve). This will minimize the initial cost of the components in the system. It is fair to say that a 1/2" directional valve will cost



more than a 1/4" valve. The difference in pipe or tubing cost is marginally different.

Real Serious Savings?

With dual pressure savings, you can see the fast payback on applying additional regulators. More impressive savings can be realized by finding the leaks in the compressed air system, and eliminating them! We have seen reports suggesting compressed air losses due to system leaks and artificial demand range from 20% to 45%! (5) (Perhaps the high loss due to leaks is why compressor representatives suggest the 50-75% duty cycle for compressors?) Compressed air leaks, left unattended, will continue to grow in size and flow due to the abrasive effect of the air-line contamination and particulate matter continuing to attack the leak orifice. (6) The sooner leaks are discovered and repaired, the less waste there is in power required to produce the compressed air. Less wasted air reduces operating costs, and can justify the expense of a maintenance patrol to quickly repair air leaks.

As you can see in Figure 2., even small diameter leaks can be very expensive.

Orifice Size	Leak Rate (SCFM) @100 PSIG	Annual Cost @\$.25/1000 SCF
1/16" (.0625)	5.02	\$633
1/8" (.125)	20.1	\$2,533
1/4" (.25)	80.4	\$10,130
3/8" (.375)	180.8	\$22,781
1/2" (.50)	321.4	\$40,496

Figure 2. Flow & Cost of Leaks per Orifice Size

The values in Figure 2, are based on twenty-four hours per day, seven days per week, fifty weeks (8400 hours).

Real Maintenance

After all of this discussion to reduce the operating costs associated with wasting compressed air we must mention another, less obvious, source of waste. Users should regularly check for excess pressure drop across air filters. By applying pressure drop indicators, (also called service life indicators, or delta P indicators) and changing filter elements with greater frequency, you will avoid the escalating cost of the pressure drop across the filter element. Electronic and mechanical pressure drop indicators are commercially available to provide reminders to service the filter elements on a regular basis. Using pressure switches to monitor regulated pressure in the system will avoid surpassing the X2 multiplier, ensure efficient use of compressed air, and provide optimum performance of the system.

In hydraulic systems, a pressure drop across a filter has serious consequences effecting the entire hydraulic power unit adversely. Poor maintenance on hydraulic filters results in catastrophic failures. In hydraulic systems, leaks are quickly repaired due to the obvious hazards and cost associated with hydraulic oil.

Rarely does poor maintenance on a pneumatic filter result in catastrophic failure. However, excessive pressure drop across a pneumatic filter is an ongoing operating cost that is hidden

from view. In pneumatic systems, leaks are often ignored until they become so annoying (uncomfortably loud), or they have caused such a significant system pressure drop, that they **MUST** be repaired!

Summary

If you don't care about the cost of compressed air in your plant, don't do the calculations, and you will perpetuate the three pneumatic myths! Consider the similarities between pneumatic and hydraulic systems, rather than the differences.

If increased profits are of interest to you, than you'll find a hidden profit center in the cost-effective use of compressed air. If you reduce your compressed air overhead costs, avoid over-sizing components, and design your systems to operate at an optimum pressure, you can improve system performance, and you will improve the bottom line. The first step to recognizing the potential savings available to you is completing these simple calculations.

With a **little** time and effort you can make a **big** improvement on your bottom line with pneumatics.

References

- 1) "Compressed Air Handbook ", Electric Power Research Institute, Palo Alto, CA. 1994, pp12.
- 2) Wagner, H.H., "Your Total Compressor Cost May Be Too High" Plant Engineering, May 1, 1999.
- 3) Fleischer, H., "Stop Oversizing Pneumatic Components" Machine Design, June 3, 1999, pp 101-106.
- 4) Fleischer, H., "Manual of Pneumatic Systems Optimization" Chapter 2. Conductance (Cv), 1st ed., McGraw-Hill, New York, 1995, pp 25-66
- 5) Foss, R.S. "Improving Air System Efficiency" Part 1, Hydraulics & Pneumatics, April 1998, pp 41-68
- 6) Foss, R.S. "Improving Air System Efficiency" Part 7, Hydraulics & Pneumatics, July 1999, pp 33-79

Acknowledgements

A special thanks to my Norgren colleagues, Jim Dietvorst, Brad Dittmer, Doug Kelly, Jerry Martin, and Joseph Quinn, for their patience, support and technical expertise. Cf.



Determining Proper Air Valve Size

Most manufacturers catalogs give flow rating C_v for the valve, which was established using proposed National Fluid Power Association (NFPA) standard T3.21.3. The following tables and formulas will enable you to quickly size a valve properly. The traditional, often used, approach of using the valve size equivalent to the port in the cylinder can be very costly. Cylinder speed, not port size, should be the determining factor.

The following C_v calculations are based upon simplified formulas which yield results with acceptable accuracy under the following standard condition:

Air at a temperature of 68°F (20°C)

Absolute downstream or secondary pressure must be 53% of absolute inlet or primary pressure or greater. Below 53%, the air velocity may become sonic and the C_v formula does not apply. To calculate air flow to atmosphere, enter outlet pressure p_2 as 53% of absolute p_2 . Pressure drop ΔP would be 47% of absolute inlet pressure. These valves have been calculated for a $C_v = 1$ in Table 3.

Nomenclature

- B Pressure drop factor
 - C Compression factor
 - C_v Flow factor
 - D Cylinder Diameter (IN)
 - F Cylinder Area (SQ IN)
 - L Cylinder Stroke (IN)
 - p_1 Inlet or Primary Pressure (PSIG)
 - p_2 Outlet or Secondary Pressure (PSIG)
 - ΔP Pressure differential ($p_1 - p_2$) (PSID)
 - q Air flow at actual condition (CFM)
 - Q Air flow of free air (SCFM)
 - t Time to complete one cylinder stroke (SEC)
 - T Absolute temperature at operating pressure (R°)
- Deg R = Deg F + 460

Valve Sizing for Cylinder Actuation – (Method A)

$$C_v = \frac{\text{cylinder area (Sq In) (see Table 1) } F \times \text{cylinder stroke (IN) } L \times \text{Compression factor (see Table 2) } C}{\text{Pressure drop factor (See Table 2) } B \times \text{time to complete cylinder stroke (SEC) } t \times 29}$$

Example:

Cylinder size 4" Dia. x 10" stroke. Time to extend: 2 seconds. Inlet pressure 90 psig. Allowable pressure drop 5 psid. Determine C_v .

Solution: Table 1 F = 12.57 sq in
 Table 2 C = 7.1
 B = 21.6

$$C_v = \frac{12.57 \times 10 \times 7.1}{21.6 \times 2 \times 29} = .7$$

Select a valve that has a C_v factor of .7 or higher. In most cases a 1/4" valve would be sufficient.

It is considered good engineering practice to limit the pressure drop ΔP to approximately 10% of primary pressure p_1 . The smaller the allowable pressure drop, the larger the required valve will become.

After the minimum required C_v has been calculated, the proper size valve can be selected from the catalog.

Bore Size D (in)	Push Bore F (sq in)	Bore Size D (in)	Push Bore F (sq in)
3/4"	.44	4"	12.57
1"	.79	4-1/2"	15.90
1-1/8"	.99	5"	19.64
1-1/4"	1.23	6"	28.27
1-1/2"	1.77	7"	38.48
1-3/4"	2.41	8"	50.27
2"	3.14	10"	78.54
2-1/2"	4.91	12"	113.10
3-1/4"	8.30	14"	153.94

Table 1: Cylinder push bore area F for standard size cylinders

Inlet Pressure (psig)	Compression Factor C	Pressure Drop Factor B for various Pressure Drops ΔP				
		2 psig	5 psid	10 psid	15 psid	20 psid
10	1.7	6.5				
20	2.4	7.8	11.8			
30	3.0	8.9	13.6	18.0		
40	3.7	9.9	15.3	20.5	23.6	
50	4.4	10.8	16.7	22.6	26.4	29.0
60	5.1	11.7	18.1	24.6	29.0	32.0
70	5.8	12.5	19.3	26.5	31.3	34.8
80	6.4	13.2	20.5	28.2	33.5	37.4
90	7.1	13.9	21.6	29.8	35.5	39.9
100	7.8	14.5	22.7	31.3	37.4	42.1
110	8.5	15.2	23.7	32.8	39.3	44.3
120	9.2	15.8	24.7	34.2	41.0	46.4
130	9.8	16.4	25.6	35.5	42.7	48.4
140	10.5	16.9	26.5	36.8	44.3	50.3
150	11.2	17.5	27.4	38.1	45.9	52.1
160	11.9	18.0	28.2	39.3	47.4	53.9
170	12.6	18.5	29.0	40.5	48.9	55.6
180	13.2	19.0	29.8	41.6	50.3	57.2
190	13.9	19.5	30.6	42.7	51.7	58.9
200	14.6	20.0	31.4	43.8	53.0	60.4
210	15.3	20.4	32.1	44.9	54.3	62.0
220	16.0	20.9	32.8	45.9	55.6	63.5
230	16.7	21.3	33.5	46.9	56.8	64.9
240	17.3	21.8	34.2	47.9	58.1	66.3
250	18.0	22.2	34.9	48.9	59.3	67.7

Table 2: Compression Factor C and pressure drop Factor B.



Valve Sizing with $C_v = 1$ Table (Method B)

(For nomenclature see previous page)

This method can be used if the required air flow is known or has been calculated with the formulas as shown below:

$$1. \quad Q = .0273 \frac{D^2 L}{t} \times \frac{p_2 + 14.7}{14.7} \quad (\text{SCFM})$$

Conversion of CFM to SCFM

$$2. \quad Q = q_x \frac{p_2 + 14.7}{14.7} \times \frac{528}{T} \quad (\text{SCFM})$$

Flow factor C_v (standard conditions)

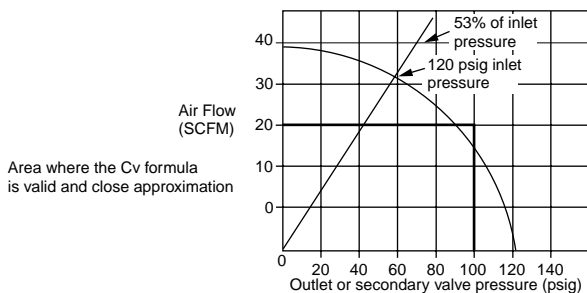
$$3. \quad C_v = \frac{1.024 \times Q}{\sqrt{\Delta P} \times (p_2 + 14.7)} \quad \text{Proposed NFPA Standard T3.21.3}$$

Maximum pressure drop Δp across the valve should be less than 10% of inlet pressure p_1 .

Inlet Pressure (psig)	Air Flow Q (scfm) for various Pressure drops ΔP at $C_v = 1$					Air Flow Q (scfm) to atmosphere
	2 psid	5 psid	10 psid	15 psid	20 psid	
10	6.7					12.0
20	7.9	11.9				16.9
30	9.0	13.8	18.2			21.8
40	9.9	15.4	20.6	23.8		26.6
50	10.8	16.9	22.8	26.7	29.2	31.5
60	11.6	18.2	24.8	29.2	32.3	36.4
70	12.3	19.5	26.7	31.6	35.1	41.2
80	13.0	20.7	28.4	33.8	37.7	46.1
90	13.7	21.8	30.0	35.8	40.2	51.0
100	14.4	22.9	31.6	37.8	42.5	55.9
110	15.0	23.9	33.1	39.6	44.7	60.7
120	15.6	24.9	34.5	41.4	46.8	65.6
130	16.1	25.8	35.8	43.1	48.8	70.5
140	16.7	26.7	37.1	44.7	50.7	75.3
150	17.2	27.6	38.4	46.3	52.5	80.2
160	17.7	28.4	39.6	47.8	54.3	85.1
170	18.2	29.3	40.8	49.3	56.0	90.0
180	18.7	30.1	42.0	50.7	57.7	94.8
190	19.2	30.9	43.1	52.1	59.4	99.7
200	19.6	31.6	44.2	53.4	60.9	104.6
210	20.1	32.4	45.2	54.8	62.5	109.4
220	20.5	33.1	46.3	56.1	64.0	114.3
230	21.0	33.8	47.3	57.3	65.5	119.2
240	21.4	34.5	48.3	58.6	66.9	124.0
250	21.8	35.2	49.3	59.8	68.3	128.9

Table 3: Air Flow Q (scfm) for $C_v = 1$

Flow Curves: How to read them



Example 1: Find air flow Q (scfm) if C_v is known.

C_v (from valve catalog) = 1.8

Primary pressure $p_1 = 90$ psig

Pressure drop across valve $\Delta P = 5$ psid

Flow through valve from Table 3 for $C_v = 1$: 21.8 scfm

$$Q = C_v \text{ of valve} \times \text{air flow at } C_v = 1 \text{ (scfm)}$$

$$Q = 1.8 \times 21.8 = 39.2 \text{ scfm}$$

Example 2: Find C_v if air flow Q (scfm) is given.

Primary pressure $p_1 = 90$ psig

Pressure drop $\Delta P = 10$ psid

Air flow - $Q = 60$ scfm

Flow through valve from Table 3 for $C_v = 1$: 30 scfm

$$C_v = \frac{\text{Air flow } Q \text{ (scfm)}}{\text{Air flow at } C_v = 1 \text{ (scfm)}}$$

$$C_v = \frac{60 \text{ scfm}}{30} = 2.0$$

A valve with a C_v of minimum 2 should be selected.

Example 3: Find C_v if air flow Q (scfm) to atmosphere is given (from catalog).

Primary pressure $p_1 = 90$ psig

Air flow to atmosphere $Q = 100$ scfm

Flow to atmosphere through valve from Table 3 for $C_v = 1$: 51 scfm

$$C_v = \frac{\text{Air flow to atmosphere } Q \text{ (scfm)}}{\text{Air flow to atmosphere at } C_v = 1 \text{ (scfm)}}$$

$$C_v = \frac{100}{51} = 2.0$$

Flow given in catalog is equivalent to a valve with $C_v = 2$. This conversion is often necessary to size a valve properly since some manufacturers do not show the standard C_v to allow a comparison.

Example 4: Find C_v if cylinder size and stroke speed is known, using the formulas 1 and 3.

Primary pressure = 90 psig

Pressure drop across valve 5 psid

Cylinder size 4" dia. x 10" stroke

Time to complete stroke 2 sec.

$$Q = .0273 \frac{4^2 \times 10}{2} \times \frac{85 + 14.7}{14.7} = 14.81 \text{ scfm}$$

$$C_v = \frac{1.024 \times 14.81}{\sqrt{5} \times (85 + 14.7)} = .7$$



Conversion Tables

VOLUME

from/to	cm ³	liter	in ³	ft ³	fl oz	pt.	qt.	gal
cm ³	1	.001	0.06102	3.53 x 10 ⁻⁵	.03381	.00211	0.106	2.64 x -10
liter	1000	1	61.02	0.03532	33.81	2.113	10.057	.2642
in ³	16.39	0.01639	1	5379 x 10 ⁻⁴	.5541	.03463	0.01732	.00433
ft ³	2.83 x 10 ⁴	28.32	1728	1	957.5	59.84	29.92	7.481
fl oz	29.57	0.02957	1.805	0.00104	1	.06250	.03125	.00781
pt	473.2	0.4732	28.88	0.01671	16	1	0.500	0.1250
qt	946.4	0.9463	57.75	0.03342	32	2	1	0.2500
gal (US)	3785	3.785	231	0.1337	128	8	4	1

PRESSURE

from/to	mm Hg	in Hg	in H ₂ O	ft H ₂ O	atm	lb/in ²	kg/cm ²
mm Hg	1	0.03937	0.5353	0.04460	.00132	0.01934	.00136
in Hg	25.40	1	13.60	1.133	.03342	0.4912	0.03453
in H ₂ O	1.868	0.07355	1	0.08333	0.00246	0.03613	0.00254
ft H ₂ O	22.42	0.8826	12	1	0.02950	0.4335	0.03048
atm	760	29392	406.8	33.9	1	14.70	1.033
lb/in ²	51.71	2.036	27.67	2.307	0.06805	1	0.07031
kg/cm ²	735.6	28.96	393.7	32.81	0.9678	14.22	1
bar	750.0	29.53	401.32	33.46	0.98592	14.504	1.01978

Length

from/to	cm	m	km	in	ft.	mile
cm	1	0.01	1 x 10 ⁻⁵	0.3937	0.03281	6.21 x 10 ⁻⁶
m	100	1	0.001	39.37	3.281	6.21 x 10 ⁻⁴
km	1 x 10 ⁵	1000	1	3.94 x 10 ⁴	3281	0.6214
in	2.540	0.02540	2.54 x 10 ⁻⁵	1	0.08333	1.58 x 10 ⁻⁵
ft	30.48	0.3048	3.05 x 10 ⁻⁴	12	1	1.89 x 10 ⁻⁴
mile	1.61 x 10 ⁵	1609	1.609	6.34 x 10 ⁴	5280	1

ENERGY

from/to	BTU	Cal	Joule	Hp. hr.	Kw hr.
BTU	1	252.0	1055	3.93 x 10 ⁻⁴	2.93 x 10 ⁻⁴
Cal	0.397	1	4.186	1.56 x 10 ⁻⁵	1.16 x 10 ⁻⁵
joule	9.48 x 10 ⁻⁴	0.2389	1	3.73 x 10 ⁻⁷	2.78 x 10 ⁻⁷
Hp hr	2545	6.41 x 10 ⁵	2.68 x 10 ⁶	1	0.7457
Kw hr	3413	8.60 x 10 ⁵	3.60 x 10 ⁶	1.341	1

AREA

from/to	cm ⁴	m ²	km ²	in ²	ft ²
cm ²	1	0.0001	1 x 10 ⁻¹⁰	0.1550	0.00108
m ²	1 x 10 ⁴	1	1 x 10 ⁻⁵	1550	10.76
km ²	1 x 10 ¹⁰	1x 10 ⁵	1	1.55 x 10 ⁹	1.08 x 10 ⁷
in ²	6.452	6.45 x 10 ⁻⁴	6.45 x 10 ⁻¹⁰	1	0.00694
ft ²	929.00	0.09290	9.29 x 10 ⁻⁸	144	1

TEMPERATURE CONVERSION

°C = 5/9 (°F - 32)
°F = 9/5 (°C + 32)
°K = °C + 273.2
°R = °F + 459.7

WEIGHT

from/to	gm	kg	oz	lb
gm	1	0.001	0.03527	0.00220
kg	1000	1	35.27	2.205
oz	28.35	0.02835	1	0.06250
lb	453.6	0.4536	16	1

TEMPERATURE COMPARISON

-100°C to +300°C			
°C	°F	°C	°F
-100	-148	29	84.2
-90	-130	30	86.0
-80	-112	31	87.8
-70	-94	32	89.6
-60	-76	33	91.4
-50	-58	34	93.2
-40	-40	35	95.0
-35	-31	36	96.8
-30	-22	37	98.6
-25	-13	38	100.4
-20	-4	39	102.2
-15	5	40	104.0
-10	14	45	113
-5	23	50	122
0	32	55	131
1	33.8	60	140
2	35.6	65	149
3	37.4	70	158
4	39.2	75	167
5	41	80	176
6	42.8	85	185
7	44.6	90	194
8	46.4	95	203
9	48.2	100	212
10	50	110	230
11	51.8	120	248
12	53.6	130	266
13	55.4	140	284
14	57.2	150	302
15	59	160	320
16	60.8	170	338
17	62.6	180	356
18	64.4	190	374
19	66.2	200	392
20	68	210	410
21	69.8	220	428
22	71.6	230	446
23	73.4	240	464
24	75.2	250	482
25	77	260	500
26	78.8	270	518
27	80.6	280	531
28	82.4	290	554
		300	572



M5 A metric machine screw thread (M5 x 0.8) 5 mm in diameter with 0.8 mm between threads. Used on miniature pneumatic products it is nearly identical in size to a 10-32 UNF thread. Port sealing is effected by a thermoplastic washer which creates a static face seal.

ISO G Designed to mate with threads conforming to ISO Standard 228/1, a parallel pipe thread available in both male and female forms. ISO G ports feature a flat surface perpendicular to the axis of the port on which a washer incorporated into the male fitting establishes a static face seal, (reference ISO 1179).

ISO G series threads are usually designated in the following manner, with a 1/4 size pipe thread being indicated in this example: G1/4. This format is always used with female threads, however, in some, but not all instances, male threads may include an "A" or "B" suffix following the port size indicating the thread class, (typically "A"). Example: G 1/4A.

In addition to itself, the ISO G thread form will also mate with British Standard Pipe Parallel (BSPP) and Japanese Industrial Standard Parallel per JIS B 0202. As both the BSPP and JIS B 0202 standards do not define an area for the ISO G static seal to engage, some form of thread sealant must be applied to the thread to prevent spiral leakage.

Note:

Norgren male ISO G threads have always included a thermoplastic washer to create the static face seal. During 1998/9 this design will be changed to provide an o-ring in an under-cut groove. This improved design will still mate with port forms shown opposite but will provide an improved seal.

ISO R Designed to mate with threads conforming to ISO Standard 7/1, a tapered pipe thread available in male form. ISO R ports are similar to NPTF threads, they form a pressure tight joint via an interference fit as they are tightened, (thread sealant is recommended). To insure a pressure tight seal, Pneufit ISO R male pipe threads are supplied with Precote 5 thread sealant.

ISO R male series threads are usually designated in the following manner, with a 1/4 size pipe thread being indicated in this example: R 1/4.

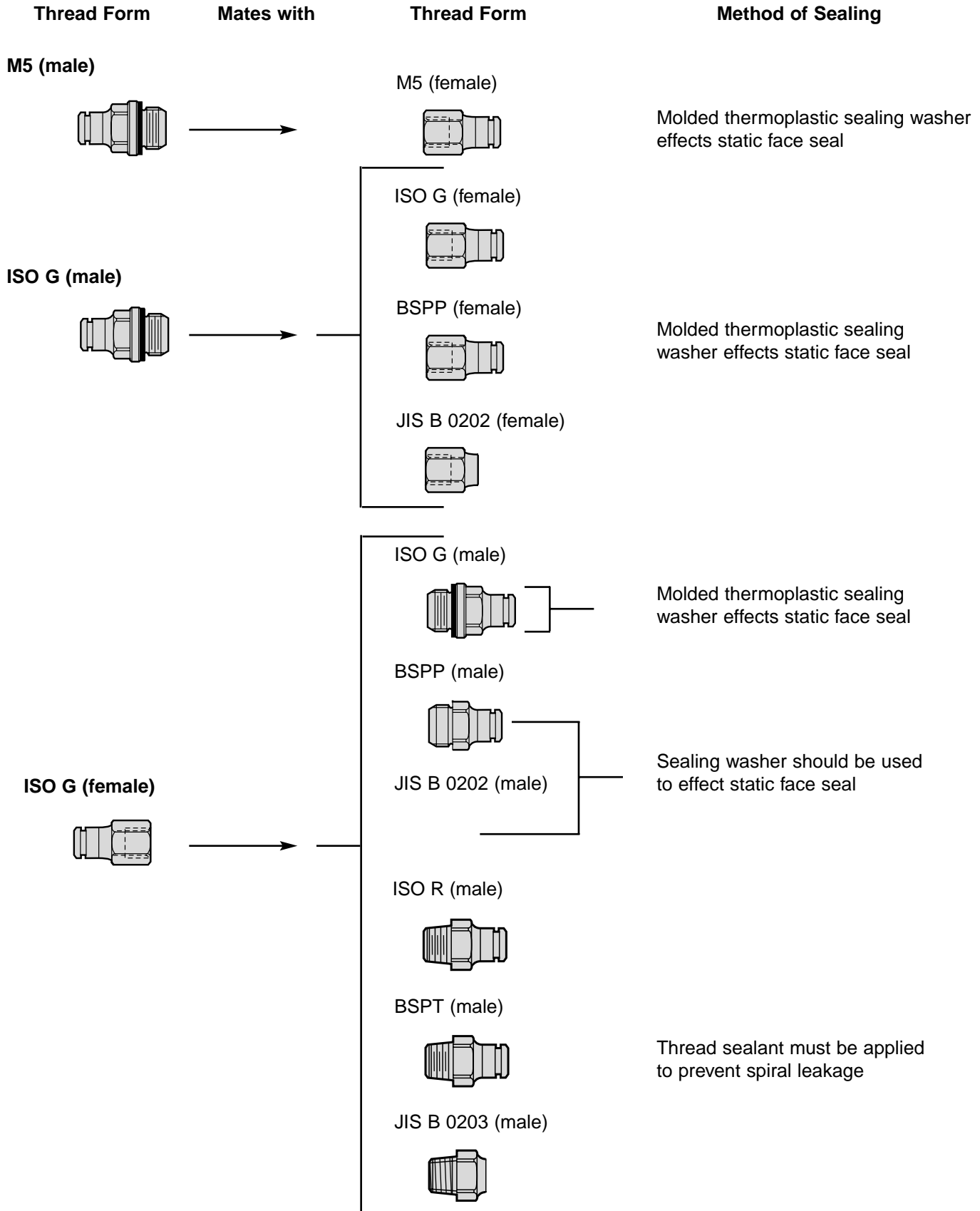
ISO R female series threads are usually designated in the same manner, but with a "c" subscript. Example: R_c1/4.

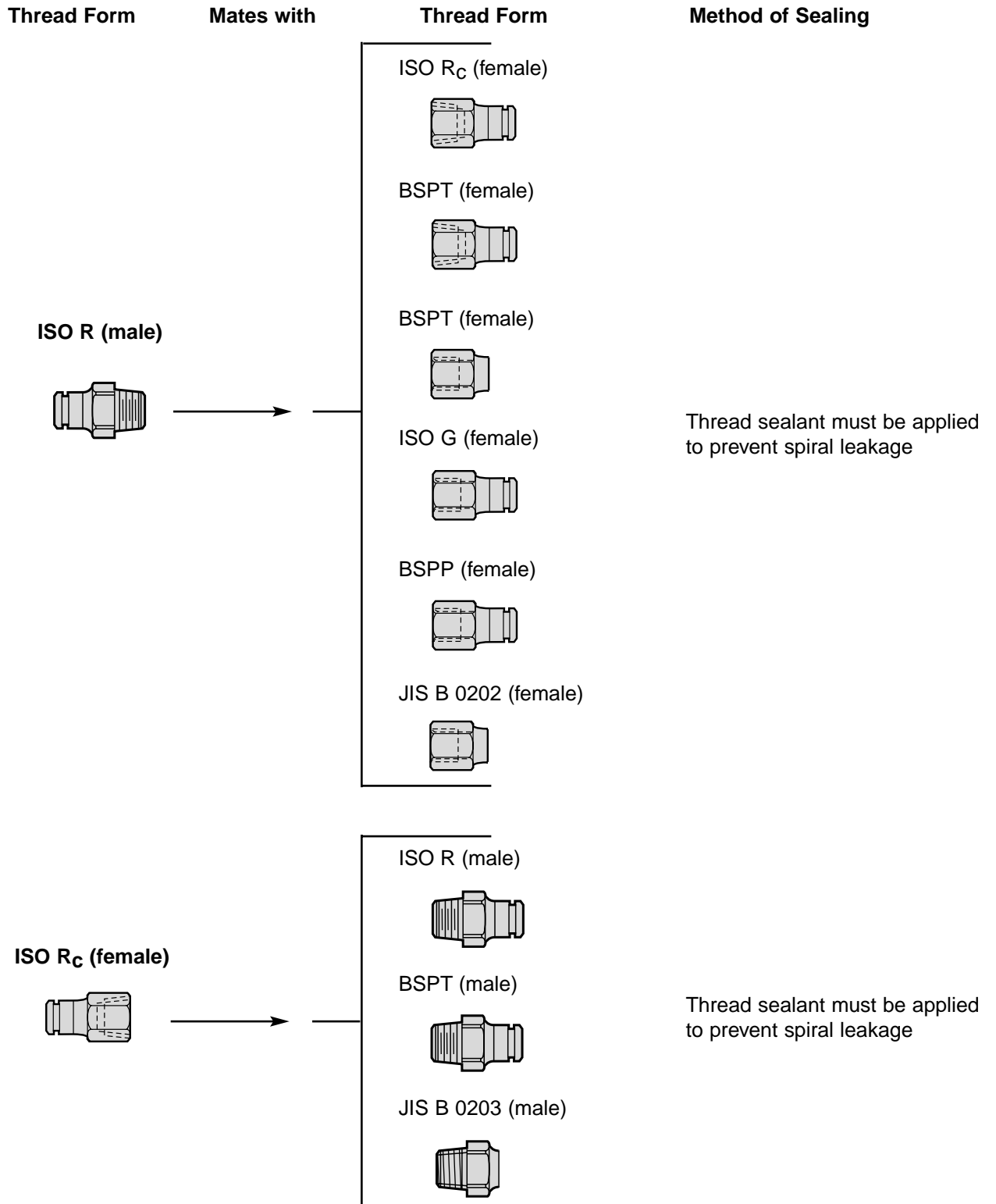
In addition to itself, the ISO R thread form will also mate with British Standard Pipe Tapered (BSPT) and Japanese Industrial Standard Tapered Pipe (PT) per JIS B 0203. Some form of thread sealant must be applied to the thread to prevent spiral leakage.

ISO R male threads will also effect a seal with ISO G, BSPP and JIS B 0202. In all cases, some form of thread sealant must be applied to the thread to prevent spiral leakage.



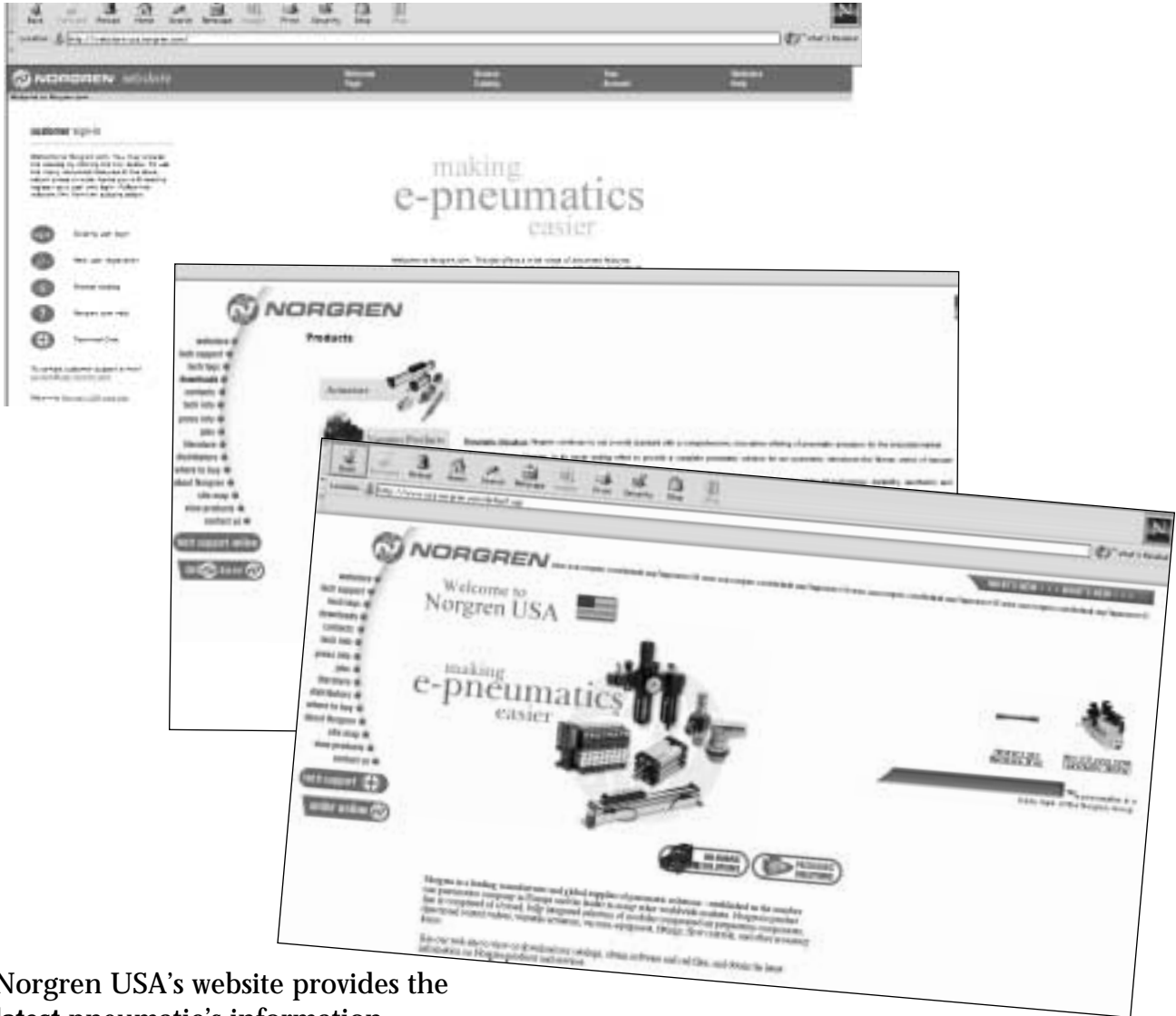
Thread Forms







www.norgren.com is your complete source for the latest Norgren product information, technical tips, and other valuable pneumatic information.



Norgren USA's website provides the **latest** pneumatic's information available from Norgren USA. It is **the source** for additional pneumatic product catalogs, CAD files, circuit design software, distributor locations, customer service and application engineering contacts.

To access our website, set your web browser to:
www.norgren.com



5400 South Delaware Street
Littleton, Colorado 80120-1663
Phone: 303-794-2611 Fax: 303-795-9487
www.norgren.com
e-mail: inquiry@usa.norgren.com



Warning

These products are intended for use in industrial compressed air systems only. Do not use these products where pressures and temperatures can exceed those listed under **Specifications**.

Before using these products with fluids other than those specified, for nonindustrial applications, life-support systems, or other applications not within published specifications, consult Norgren.

Through misuse, age, or malfunction, components used in fluid power systems can fail in various modes. The system designer is warned to consider the failure modes of all component parts used in fluid power systems and to provide adequate safeguards to prevent personal injury or damage to equipment in the event of such failure modes. **System designers must provide a warning to end users in the system instructional manual if protection against a failure mode cannot be adequately provided.**

System designers and end users are cautioned to review specific warnings found in instruction sheets packed and shipped with these products. System designers should also provide for all OSHA requirements including Title 29 CFR 1910.147 Lockout/Tagout.

It should be recognized that warnings are valid for any product, regardless of manufacturer, and are not restricted to products manufactured by Norgren. Norgren's reputation for product quality and performance is well established. We feel we have the additional obligation to provide information or warnings to customers to assist them in applying our products in a reasonable and safe manner.

Warranty

Items sold by Norgren are warranted to be free from defects in materials and workmanship for a period of two years from the date of manufacture, provided said items are used according to Norgren's recommended usages. Norgren's liability is limited to the repair of, refund of purchase price paid for, or replacement in kind of, at Norgren's sole option, any items proved defective, provided the allegedly defective items are returned to Norgren prepaid. The warranties expressed above are in lieu of and exclusive of all other warranties.

There are no other warranties, expressed or implied, except as stated herein. There are no implied warranties of merchantability or fitness for a particular purpose, which are specifically disclaimed. Norgren's liability for breach of warranty as herein stated is the exclusive remedy, and in no event shall Norgren be liable or responsible for incidental or consequential damages, even if the possibility of such incidental or consequential damages has been made known to Norgren.

Norgren reserves the right to discontinue manufacture of any product or change product materials, design, or specifications.



Norgren Valve Products

For complete Valve information order:

APC-102 - Norgren Actuator Products and Accessories



Nugget 30

Port Size: Port fittings in 5/32", 1/4", 4 mm, or 6 mm

Flow: Cv of .27

Valve Type: 5-port/2-position and 5-port/3-position

Electrical Connections: 25-pin D connector and plug-in wireway, or pinch plugs with leads

Subbase Mounting: lightweight plastic manifolding subbase with plug-on common wireway and 25-pin D connector provides up to 24 stations, or Aluminum fixed length 10-32 UNF ported subbase (1 to 12 stations).

Operator Types: Solenoid pilot

Fieldbus Compatible



Super X Valves

Port Size: 1/8" and 1/4" NPT

Flow: 1/8" (Cv of .34), 1/4" (Cv of .98)

Valve Type: 3-port/2-position, 5-port/2-position, and 5-port/3-position

Mounting Options: Two through holes for wall or control cabinet mounting.

Many operators are available for panel mounting.

Operator Types: Manual or mechanical



Nugget 40

Port Size: Inline ports - 10-32 UNF

Subbase ports - 1/8" NPT

Endplate ports - 1/4" NPT (inlet), 1/8" NPT (exhaust)

Flow: Inline - Cv of .26, subbase Cv of .41

Valve Type: 3-port/2-position, 5-port/2-position, and 5-port/3-position

Mounting Options: Inline, inline on a fixed length manifold, inline modular, single subbase valve, and subbase-modular manifolds

Electrical Connections: 25-pin D connector, or 1" conduit electrical connection

Operator Types: Solenoid pilot or air pilot

Fieldbus Compatible



Nugget 70

Port Size: 1/8" NPT, or ISO G

Flow: 3/2 and 5/2 Cv of 0.76, 5/3 Cv of 0.67

Valve Type: 3-port/2-position, 5-port/2-position, and 5-port/3-position

Mounting Options: Two through holes for wall or control cabinet mounting

Operator Types: Solenoid pilot or air pilot

Electrical Connections: DIN 43650 Table "C"



Nugget 120

Port Size: Inline ports - 1/4" NPT

Subbase ports - 1/4" NPT

Subbase endplates - 3/8" NPT (inlet), 1/4" (exhaust)

Flow: 3/2 and 5/2 Cv of 1.17, 5/3 Cv of 0.79

Valve Type: 3-port/2-position, 5-port/2-position, and 5-port/3-position

Mounting Options: Inline - through holes in valve bodies

Subbase valve - through holes to subbase and manifold

Manifold mounted - through holes in end plate or to a 35 mm DIN rail

Operator Types: Solenoid pilot or air pilot

Electrical Connections: 25-pin D connector, or 1" conduit electrical connection

Fieldbus Compatible



Nugget 200

Port Size: 1/4", 3/8", or 1/2" NPT or ISO G

Flow: Cv of 1.6

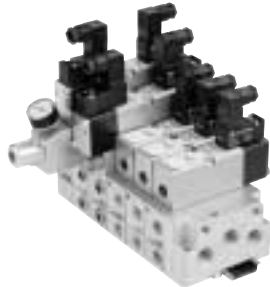
Valve Type: 3-port/2-position*, 5-port/2-position, and 5-port/3-position

Mounting Options: Inline valves, stacking valve assembly, stacking valve assembly with junction box, or inline fixed length manifold.

Operator Types: Solenoid pilot, air pilot, manual, or mechanical

Electrical Connections: DIN 43650 Table "B", 1/2" NPT conduit connector, or 1" conduit (junction box)

*Not available in 1/2" ports



Mini ISO Star Valves

Port Size: ISO 15407-1/VDMA 24 563, 26 mm

Flow: Cv of 0.92, 1.22, 1.17

Valve Type: 5-port/2-position and 5-port/3-position

Mounting Options: Subbase

Operator Types: Solenoid pilot, or air pilot

Electrical Connections: Cable grip standard. Optional: electrical connectors are cable grip with indicator light, a 1/2" NPT conduit connector, 10-foot molded cable, and 10-foot molded cable with surge suppression, reverse polarity protection, and indicator light.



ISO Star Valves

Port Size: 1/4" (size 1), 3/8" (size 2), 1/2" (size 3), NPT or ISO G

Flow: Cv of 1.2, 2.4, 4.0

Valve Type: 5-port/2-position and 5-port/3-position

Mounting Options: single subbase, or manifolding subbase

Operator Types: Solenoid pilot, or air pilot

Electrical Connections: Cable grip standard. Optional: electrical connectors are cable grip with indicator light, a 1/2" NPT conduit connector, 10-foot, three-conductor molded cable, and 10-foot, three-conductor molded cable with surge suppression, reverse polarity protection, and indicator light.



Nugget 500

Port Size: 3/8", or 1/2" NPT or ISO G, and 3/4" ports NPT (inline valves only)

Flow: Cv of 5.0

Valve Type: 5-port/2-position and 5-port/3-position

Mounting Options: Inline have two sets of mounting holes through the body. Fixed length manifolds, single subbase, and subbase valves attached to a manifolding subbase.

Operator Types: Solenoid pilot or air pilot

Electrical Connector Options: cable grip with indicator light, a 1/2" NPT conduit connector and a 5-foot, three-conductor, molded cable connector with or without indicator light and surge suppression.



Poppet Valves

Port Size: 1/4" through 2"

Flow: Cv of 2.1 to 49.5

Valve Type: 2-port/2-position, 3-port/2-position, 4-port/2-position, and 3-port/2-position multi-directional

Mounting Options: Inline or single subbase

Operator Types: Solenoid pilot, air pilot, manual, or mechanical

Electrical Connector Options: cable grip with indicator light, a 1/2" NPT conduit connector and a 5-foot, three-conductor, molded cable connector with or without indicator light and surge suppression.



Norgren Actuator Products

**For complete Actuator information order:
APC-103 - Norgren Actuator Products and Accessories**



Section 1 – Series 90000 Compact Actuators

Fluids: Compressed air, filtered, lubricated or non-lubricated
Operating Pressure: 14.5 to 145 PSI (1 to 10 bar)
Operating Temperature: 23°* to 176°F (-5°* to 80 °C)
* Consult Technical Service for use below 35°F (2° C)
Bore Sizes: 0.50"(12mm), 0.625" (16mm), 0.75" (20mm), 1.0" (25mm),
1.25" (32mm), 1.50" (40mm), 2.0" (50mm) 2.50" (63mm),
3.125" (80mm), 4.0" (100mm)



Section 2 – Roundline Stainless Steel Body Actuators

Fluids: Filtered, lubricated or non-lubricated, compressed air
Maximum Operating Pressure: 250 psig (17.2 bar)
Temperature Range:
Standard Nitrile Seals: -20° to 200°F (-29° to 93°C)
Viton Seals: -20° to 400°F (-29° to 205°C)
Bore Sizes: .438" (11mm), .563" (14mm), .75" (19mm), 1.063" (27mm),
1.25" (32mm), 1.50" (40mm), 2.0" (50mm), 2.50" (63)



Section 3 – Series SS Stainless Steel Actuators

Fluids: Filtered compressed air to 250 PSI
Petroleum based hydraulic fluid to 400 PSI
Lubrication: None required
Operating Pressure:
250 psig air (17.2 bar)
400 psig hydraulic (27.6 bar)
Operating Temperatures:
Series SS: -40° to 200°F (-40° to 93°C)
Series D: -20° to 250°F (-29° to 204°C)
with Viton Seals: -20° to 400°F (-29° to 204°C)
Bore Sizes: 1.125" (29mm), 1.50" (38mm), 2.0" (51mm), 2.50" (64mm), 3.25"
(83mm), 4.0" (102mm), 5.0" (127mm), 6.0" (152mm), 8.0" (203mm)



Section 4 – Series N Non-Rotating Actuators

Fluids: Filtered compressed air to 250 psi
(For hydraulic service consult factory.)
Operating Pressure: 250 psig (17.2 bar)
Operating Temperatures: -20° to 200°F (-29° to 93°C)
Bore Sizes: 1.125" (29mm), 1.50" (38mm), 2.0" (51mm), 2.50" (64mm),
3.25" (83mm), 4.0" (102mm)



Section 5 – 8000 & 8000/M ISO VDMA Actuators

Fluids: Compressed air, filtered, lubricated and non-lubricated
Operating Pressure: 1 to 16 bar (14.5 to 232 psig)
Operating Temperature: -20° to 80°C max (-4° to 176°F max)
(Consult Technical Services for use below 2°C (35°F))
Bore Sizes: 32, 40, 50, 63, 80, 100, 125, 160, 200, 250, 320 mm
Note: Corrosion Resistant available.



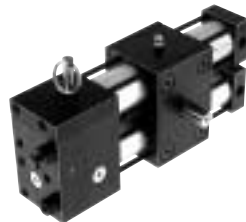
Section 6 – Lintra Series 46000 Rodless Actuators

Fluids: Compressed air filtered to 50µ and lubricated
 Operating Pressure
 16 mm: 22 to 150 psig (1.5 to 10 bar)
 20 mm to 80 mm: 15 to 150 psig (1 to 10 bar)
 Operating Temperatures
 -22° to 180°F* (-30°C to 80°C)
 *With dewpoint of supply air less than ambient air temperature.
 Bore Sizes: 0.63" (16mm), 0.79 (20mm), 0.98 (25mm), 1.26" (32mm),
 1.57" (40mm), 1.97" (50mm), 2.48" (63mm), 3.15" (80mm)



Section 7 – Lintra-Lite Series A440000 Rodless Actuators

Fluids: Compressed air, filtered to 50µ and lubricated
 Operating Pressure: 15 to 118 psig (1 to 8 bar)
 Operating Temperatures: -22° to 180°F* (-30° to 80°C)
 *With dewpoint of supply air less than ambient air temperature at cylinder,
 consult our Technical Service for use below 36°F (2°C)
 Bore Sizes: 1.0" (25mm), 1.25" (32mm), 1.50" (40mm)



Section 8 – Rack and Pinion Rotary Actuators

Fluids: Filtered compressed air to 150 psi (10 bar)
 Operating Pressure: 150 psi (10 bar)
 Operating Temperature:
 -20° to 200°F (-29° to 93°C) with Standard Nitrile Seals
 -20° to 400°F (-29° to 204°C) with Viton® Seals
 -20° to 250°F (-29° to 121°C) with Low Friction Seals
 Bore Sizes: 0.50" (12mm), 0.75" (20mm), 1.125" (29mm), 1.50" (38mm), 2.00"
 (50mm), 2.50" (64mm)



Section 9 – Rotary Vane Actuators

Fluids: Lubricated or non-lubricated, filtered, compressed air
 Operating Pressure:
 M/60280, M/60281: 44 to 102 psig (3 to 7 bar)
 M/60282, C/60283: 29 to 102 psig (2 to 7 bar)
 C/60284, C/60084/TI: 29 to 145 psig (2 to 10 bar)
 Operating Temperature: 40° to 140°F (5° to 60°C)



Section 10 – Tiny Tim Actuators

Fluids: Filtered compressed air to 150 psi (10 bar)
 Operating Pressure: 150 psi (10 bar)
 Operating Temperature:
 -20° to 225°F (-30° to 110°C) with Standard Seals
 -40° to 200°F (-40° to 90°C) with Buna N Seals
 -40° to 350°F (-40° to 175°C) with Viton Seals
 Bore Sizes: 3/4", 1", 1-1/8"



Part Index

Part	Page	Part	Page	Part	Page	Part	Page
5369	ALE-26-10	18-001-092	ALE-25-10	2117-01	ALE-25-7	4246-51	ALE-24-2
10-005-005	ALE-25-18	18-001-092	ALE-25-11	2117-01	ALE-25-8	4246-52	ALE-24-2
10-015	ALE-14-24	18-001-092	ALE-25-12	2117-01	ALE-25-8	4248-01	ALE-25-7
10-015-004	ALE-25-18	18-001-092	ALE-25-12	2117-01	ALE-25-13	4248-01	ALE-25-14
10-028	ALE-14-20	18-001-092	ALE-25-19	2117-01	ALE-25-13	4248-01	ALE-25-20
10-042	ALE-10-2	18-001-092	ALE-25-19	2117-01	ALE-25-14	4248-89	ALE-25-7
10-065-006	ALE-25-18	18-001-959	ALE-25-5	2117-01	ALE-25-14	4248-89	ALE-25-14
10-065-006	ALE-25-18	18-001-962	ALE-25-5	2117-01	ALE-25-14	4248-89	ALE-25-20
10-065-007	ALE-25-18	18-001-962	ALE-25-15	2117-01	ALE-25-16	4255-51	ALE-25-7
10-065-007	ALE-25-18	18-001-973	ALE-25-6	2117-01	ALE-25-16	4255-51	ALE-25-14
10-076	ALE-14-22	18-001-973	ALE-25-12	2117-01	ALE-25-20	4255-51	ALE-25-20
1095-02	ALE-25-11	18-001-974	ALE-25-6	2117-01	ALE-25-20	4313-50	ALE-24-3
11 004	ALE-27-4	18-001-974	ALE-25-12	2339-04	ALE-25-5	4313-50	ALE-24-4
11-002	ALE-6-14	18-001-978	ALE-25-2	2340-50	ALE-25-9	4314-51	ALE-24-3
11-002-0800	ALE-25-5	18-001-978	ALE-25-7	28991-97	ALE-25-9	4314-51	ALE-24-4
11-002-1000	ALE-25-5	18-001-978	ALE-25-13	2962-04	ALE-25-4	4314-52	ALE-24-3
11-004-0800	ALE-25-5	18-001-978	ALE-25-16	2962-04	ALE-25-5	4314-52	ALE-24-4
11-004-1000	ALE-25-5	18-001-978	ALE-25-19	2962-04	ALE-25-5	4315-01	ALE-24-3
11-008	ALE-10-4	18-003-002	ALE-25-10	2962-04	ALE-25-6	4315-01	ALE-24-4
11-009	ALE-6-12	18-003-004	ALE-25-10	2962-04	ALE-25-10	4315-02	ALE-24-3
11-018	ALE-8-2	18-003-006	ALE-25-10	2962-04	ALE-25-11	4315-02	ALE-24-4
11-044	ALE-6-4	18-004-987	ALE-25-6	2962-04	ALE-25-12	4315-03	ALE-24-3
11-104	ALE-9-6	18-004-987	ALE-25-12	2962-04	ALE-25-12	4315-03	ALE-24-4
11-400	ALE-9-4	18-006-016	ALE-25-9	2962-04	ALE-25-15	4315-04	ALE-24-3
12 020	ALE-27-4	18-006-016	ALE-25-18	2962-04	ALE-25-19	4315-04	ALE-24-4
12 023	ALE-27-5	18-006-027	ALE-25-9	2962-04	ALE-25-19	4315-05	ALE-24-3
12 029	ALE-27-4	18-006-067	ALE-25-9	2962-89	ALE-25-4	4315-05	ALE-24-4
12 040	ALE-27-4	18-006-068	ALE-25-9	2962-89	ALE-25-5	4315-06	ALE-24-3
12 060	ALE-27-4	18-007-974	ALE-25-16	2962-89	ALE-25-6	4315-06	ALE-24-4
12 082	ALE-27-5	18-007-975	ALE-25-16	2962-89	ALE-25-10	4315-07	ALE-24-3
12 425	ALE-28-3	18-008-002	ALE-25-9	2962-89	ALE-25-11	4315-07	ALE-24-4
12 426	ALE-27-4	18-008-004	ALE-25-9	2962-89	ALE-25-12	4315-08	ALE-24-3
12 445	ALE-27-4	18-008-015	ALE-25-9	2962-89	ALE-25-12	4315-08	ALE-24-4
12 447	ALE-28-3	18-01-039	ALE-25-18	2962-89	ALE-25-12	4315-09	ALE-24-3
12 467	ALE-27-4	18-011-006	ALE-25-18	2962-89	ALE-25-15	4315-09	ALE-24-4
12 468	ALE-27-4	18-011-008	ALE-25-18	2962-89	ALE-25-19	4315-10	ALE-24-3
12 4GA	ALE-28-6	18-011-021	ALE-25-15	2962-89	ALE-25-19	4315-10	ALE-24-4
12 4GB	ALE-28-6	18-011-021	ALE-25-16	2963-89	ALE-25-5	4315-11	ALE-24-3
12 VB0	ALE-27-5	18-011-024	ALE-25-16	3228-54	ALE-25-9	4315-11	ALE-24-4
1390-02	ALE-25-9	18-011-024	ALE-25-17	3228-55	ALE-25-9	4315-12	ALE-24-3
15-023-2818	ALE-25-5	18-011-024	ALE-25-17	3228-60	ALE-25-9	4315-12	ALE-24-4
15-023-4818	ALE-25-5	18-012-002	ALE-25-18	3228-61	ALE-25-9	4316-50	ALE-24-3
15-033-2818	ALE-25-5	18-013	ALE-19-8	3302-50	ALE-25-9	4316-50	ALE-24-4
1581-90	ALE-25-19	18-023-018	ALE-25-18	40-016	ALE-28-7	4316-51	ALE-24-3
16-004	ALE-15-12	18-023-020	ALE-25-18	40-017	ALE-28-7	4316-51	ALE-24-4
16-006-107	ALE-25-9	18-023-022	ALE-25-18	4020-51R	ALE-25-3	4316-52	ALE-24-3
16-009-001	ALE-25-9	18-023-024	ALE-25-18	4020-51R	ALE-25-3	4316-52	ALE-24-4
16-009-002	ALE-25-9	18-023-610	ALE-25-16	4213-89	ALE-24-2	4324-50	ALE-25-3
16-009-003	ALE-25-9	18-023-610	ALE-25-17	4214-51	ALE-24-2	4324-50	ALE-25-8
17-001	ALE-19-11	18-023-612	ALE-25-15	4214-52	ALE-24-2	4324-50	ALE-25-14
17-016	ALE-19-6	18-023-614	ALE-25-15	4215-02	ALE-24-2	4324-50	ALE-25-17
17-104	ALE-19-12	18-023-616	ALE-25-15	4215-03	ALE-24-2	4324-50	ALE-25-20
18-001	ALE-25-3	18-023-658	ALE-25-15	4215-04	ALE-24-2	4324-51	ALE-25-17
18-001-003	ALE-25-10	18-025-003	ALE-25-4	4215-05	ALE-24-2	4328-51	ALE-24-3
18-001-003	ALE-25-10	18-025-003	ALE-25-6	4215-06	ALE-24-2	4328-51	ALE-24-4
18-001-003	ALE-25-11	18-025-003	ALE-25-6	4215-07	ALE-24-2	4328-52	ALE-24-3
18-001-009	ALE-25-18	18-025-003	ALE-25-10	4215-08	ALE-24-2	4328-52	ALE-24-4
18-001-021	ALE-25-4	18-025-003	ALE-25-11	4215-09	ALE-24-2	4328-53	ALE-24-3
18-001-021	ALE-25-6	18-025-003	ALE-25-12	4216-50	ALE-24-2	4328-53	ALE-24-4
18-001-021	ALE-25-19	18-025-003	ALE-25-12	4216-51	ALE-24-2	4346-01	ALE-24-3
18-001-027	ALE-25-10	18-025-003	ALE-25-15	4216-52	ALE-24-2	4346-01	ALE-24-4
18-001-029	ALE-25-11	18-025-003	ALE-25-19	4224-50	ALE-25-3	4346-01R	ALE-24-3
18-001-039	ALE-25-15	18-025-003	ALE-25-19	4224-50	ALE-25-7	4346-50	ALE-24-3
18-001-039	ALE-25-18	18-026	ALE-24-5	4224-50	ALE-25-14	4346-50	ALE-24-4
18-001-039	ALE-25-18	18-033	ALE-28-12	4224-50	ALE-25-17	4346-51	ALE-24-3
18-001-056	ALE-25-15	18-999-412	ALE-25-5	4224-50	ALE-25-20	4346-51	ALE-24-4
18-001-056	ALE-25-18	1804-03	ALE-25-18	4224-50	ALE-25-21	4346-52	ALE-24-3
18-001-056	ALE-25-18	2117-01	ALE-25-4	4228-01	ALE-24-2	4346-52	ALE-24-4
18-001-056	ALE-25-18	2117-01	ALE-25-6	4228-02	ALE-24-2	4346-99	ALE-24-5
18-001-092	ALE-25-4	2117-01	ALE-25-6	4228-03	ALE-24-2	4348-89	ALE-25-7
18-001-092	ALE-25-5	2117-01	ALE-25-7	4246-01	ALE-24-2	4348-89	ALE-25-8
18-001-092	ALE-25-6	2117-01	ALE-25-7	4246-50	ALE-24-2	4348-89	ALE-25-14



Part	Page	Part	Page	Part	Page	Part	Page
4348-89	ALE-25-20	5939-06	ALE-25-2	D70	ALE-27-18	R07	ALE-5-2
4355-51	ALE-25-7	5950-01	ALE-25-5	F07	ALE-1-8	R14/R16	ALE-6-8
4355-51	ALE-25-7	5988-01	ALE-25-6	F17	ALE-1-20	R17G	ALE-5-16
4355-51	ALE-25-8	5988-01	ALE-25-12	F18	ALE-1-22	R18G	ALE-5-18
4355-51	ALE-25-13	5988-02	ALE-25-5	F22	ALE-17-2	R18G	ALE-10-6
4355-51	ALE-25-13	5988-02	ALE-25-6	F39	ALE-2-2	R22	ALE-17-6
4355-51	ALE-25-14	5988-02	ALE-25-12	F46	ALE-2-14	R24	ALE-6-16
4355-51	ALE-25-20	5BV	ALE-28-14	F46	ALE-3-10	R24	ALE-10-8
4368-51	ALE-25-8	5DA-0	ALE-28-9	F47	ALE-2-16	R26	ALE-26-6
4368-51	ALE-25-14	5FE	ALE-28-13	F64B/L	ALE-3-6	R30M	ALE-7-2
4368-51	ALE-25-20	5PG	ALE-19-9	F64C/H	ALE-2-10	R38	ALE-8-4
4384-570	ALE-24-2	5VS	ALE-28-10	F64G	ALE-1-16	R38	ALE-17-8
4384-770	ALE-24-3	616-01	ALE-25-4	F68C/H	ALE-2-12	R40/R41	ALE-9-2
4384-770	ALE-24-4	616-01	ALE-25-6	F68G	ALE-1-18	R43	ALE-6-10
4417-01	ALE-24-2	616-01	ALE-25-19	F68V/Y	ALE-3-8	R44	ALE-11-2
4417-01	ALE-24-3	6212-50	ALE-25-2	F72C	ALE-2-4	R46	ALE-5-4
4417-01	ALE-24-4	6212-50	ALE-25-2	F72G	ALE-1-10	R64G/R	ALE-5-12
4424-50	ALE-25-3	6212-50	ALE-25-15	F72V	ALE-3-2	R68G	ALE-5-14
4424-50	ALE-25-8	6212-51	ALE-25-2	F73C	ALE-2-6	R72G/R	ALE-5-6
4424-50	ALE-25-14	6212-51	ALE-25-2	F73G	ALE-1-12	R72M	ALE-7-4
4424-50	ALE-25-17	6212-51	ALE-25-15	F74C/H	ALE-2-8	R73G/R	ALE-5-8
4455-51	ALE-25-8	639-02	ALE-25-11	F74G	ALE-1-14	R74G/R	ALE-5-10
4455-51	ALE-25-14	655-97	ALE-25-6	F74V	ALE-3-4	R81	ALE-12-6
4461-50	ALE-25-8	655-97	ALE-25-12	H72A	ALE-20-2	R82	ALE-12-12
4461-50	ALE-25-14	74316-50	ALE-25-7	H73A	ALE-20-4	R83	ALE-11-4
4LF	ALE-28-17	74316-50	ALE-25-14	H74A	ALE-20-6	R84	ALE-12-2
4LR	ALE-28-16	74316-50	ALE-25-20	L07	ALE-14-6	R91	ALE-6-6
5095-51	ALE-25-9	7450-50	ALE-25-2	L17	ALE-14-18	T1000	ALE-28-8
5191-88	ALE-25-6	74504-50	ALE-25-7	L22	ALE-17-14	T20	ALE-28-8
5191-88	ALE-25-6	74504-50	ALE-25-13	L64	ALE-14-14	T40B1800	ALE-25-21
5191-88	ALE-25-8	74504-50	ALE-25-16	L68	ALE-14-16	T40M0500	ALE-25-21
5191-88	ALE-25-14	74504-50	ALE-25-19	L72	ALE-14-8	T50	ALE-28-6
5191-89	ALE-25-8	74504-50	ALE-25-22	L73	ALE-14-10	T64	ALE-16-8
5191-89	ALE-25-14	74504-52	ALE-25-16	L74	ALE-14-12	T65A	ALE-28-8
5198-89	ALE-25-6	74505-50	ALE-24-5	M/32009	ALE-28-7	T68	ALE-16-10
5198-89	ALE-25-6	74505-53	ALE-24-5	M/3314	ALE-28-7	T70A	ALE-28-8
5203-06	ALE-25-6	74507-50	ALE-24-5	MB00	ALE-28-8	T72	ALE-16-2
5226-97	ALE-25-4	74679-02	ALE-25-5	MB002A	ALE-25-22	T73	ALE-16-4
5229-89	ALE-25-4	74679-03	ALE-25-5	MB002B	ALE-25-22	T74	ALE-16-6
53-1	ALE-26-8	94 050	ALE-27-4	MB004A	ALE-25-19	V06	ALE-15-14
5301-52	ALE-25-15	B05	ALE-17-10	MB004A	ALE-25-22	V07	ALE-15-2
5335-50	ALE-25-16	B07	ALE-13-2	MB004B	ALE-25-19	V64	ALE-15-8
5335-50	ALE-25-17	B38	ALE-13-16	MB004B	ALE-25-22	V68H	ALE-15-10
5335-52	ALE-25-16	B38	ALE-17-12	MB006A	ALE-25-4	V72	ALE-15-4
53AB	ALE-26-12	B39	ALE-13-14	MB006A	ALE-25-11	V74	ALE-15-6
53AC	ALE-26-14	B64G	ALE-13-10	MB006B	ALE-25-4	VP10	ALE-26-2
53AD	ALE-26-16	B68G	ALE-13-12	MB006B	ALE-25-11	VP50	ALE-26-4
53AF	ALE-26-18	B72G	ALE-13-4	MB008A	ALE-25-19	W07	ALE-4-2
54463-01	ALE-25-21	B73G	ALE-13-6	MB008A	ALE-25-22	W72	ALE-4-4
54463-01	ALE-25-21	B74G	ALE-13-8	MB008B	ALE-25-19	W74	ALE-4-6
54547-01	ALE-25-7	C/5	ALE-28-8	MB008B	ALE-25-22	W74D	ALE-27-20
54547-01	ALE-25-7	C/S	ALE-28-8	MM00	ALE-28-8	Y64A-	ALE-24-5
54547-01	ALE-25-7	C00	ALE-16-12	MS00	ALE-28-8		
54547-01	ALE-25-8	C64A	ALE-22-18	MS000A	ALE-25-21		
54547-01	ALE-25-8	C64C	ALE-23-18	MS001A	ALE-25-21		
54547-01	ALE-25-13	C64H	ALE-21-16	MV00	ALE-28-8		
54547-01	ALE-25-13	C72A	ALE-22-4	P1A	ALE-22-2		
54547-01	ALE-25-14	C72C	ALE-23-4	P1C	ALE-23-2		
54547-01	ALE-25-14	C72H	ALE-21-4	P1H	ALE-21-2		
54547-01	ALE-25-14	C73A	ALE-22-8	P64F	ALE-18-10		
54547-01	ALE-25-20	C73C	ALE-23-8	P68F	ALE-18-12		
54547-01	ALE-25-20	C73H	ALE-21-8	P72C	ALE-18-14		
54547-01	ALE-25-21	C74A	ALE-22-12	P72E	ALE-18-2		
54547-01	ALE-25-21	C74C	ALE-23-12	P72F	ALE-18-6		
54547-01	ALE-25-22	C74H	ALE-21-12	P74	ALE-18-16/20		
5570-04	ALE-25-4	CS13	ALE-19-2	P74E	ALE-18-4		
5605-50	ALE-25-18	CS15	ALE-19-4	P74F	ALE-18-8		
5605-50	ALE-25-18	D10	ALE-27-6	P8A	ALE-22-16		
5605-60	ALE-25-15	D11	ALE-27-4	P8C	ALE-23-16		
5797-50	ALE-25-3	D50	ALE-27-10	PB 0	ALE-28-7		
5797-50	ALE-25-3	D51	ALE-27-12	R05	ALE-17-4		
5939-06	ALE-25-2	D60	ALE-27-16	R06	ALE-6-2		