

Contents

Hart Multiplexer

Page

Introduction	253
HART Multiplexer master	
KFD2-HMM-16	254
HART Multiplexer slave	
KFD2-HMS.16	255
HART Flexible interface w/HART pick-up resistor and 4-20 mA signal	
FI-D0-R-Y49092/Y41610	256
HART Flexible interface customized with special system connector	
FI- ** -PFH-Y- **	257

Hart Multiplexer

Introduction

Many field devices are distributed over a wide area in process systems. The characteristic values of these field devices must be monitored and adapted to changes in the processing environment. The Pepperl+Fuchs HART Multiplexer system enables on-line communication between a PC and intelligent field devices that support the HART protocol.

Smart transmitters and positioners allow information such as measurement range, manufacturer, tag and ID numbers to be entered directly into the field device. The data can be accessed with a hand-held terminal, enabling values to be changed in the field. Some data might be required in order to comply with the quality assurance standard ISO 9000. This translates into increased costs for the process control system because the respective data must be cyclically queried and stored in a database.

The HART Multiplex system from Pepperl+Fuchs provides the connection between a PC and the intelligent HART-compatible field devices. This connection allows easy transfer of data to a software package such as Asset Management Solutions (AMS). All actions on the field device are parallel to the transmission of the 4-20 mA measurement signal and have no influence on the measurement value processing through the process control system.

For hazardous location applications, the intelligent field device must be isolated from the safe area. Pepperl+Fuchs offers a smart analog input isolator (KFD2-STC3-Ex1) and an analog output isolator (KFD2-SCD-Ex1.LK). A connection of the HART Multiplexer system to other smart isolators is also possible. Systems can be easily expanded and the advantages of the HART communications can be exploited. The system consists of a maximum of 31 HART Multiplexer masters which are linked to the PC with an RS485 interface. Each HART Multiplexer master controls up to 15 HART Multiplexer slaves. Each multiplexer, regardless of whether it is a slave or a master, provides a connection to 16 field instruments. Up to 7,936 field units can communicate and exchange data with a PC. Working with a hand-held terminal is also possible since the HART protocol accepts two masters (PC and hand held terminal) in one system.

Advantages

- Fast activation of new systems through uniform data that is made available in the form of a data base by various software. The standard parameters must only be transmitted from a central PC to the field units.
- On-line monitoring of operations in accordance with ISO 9000
- Layered service field parallel to the measurement processing in the control system
- Saving money and time through remote access and control
- Constant overview of all process variables
- Simple fault diagnosis via monitor functions
- Easy manipulation of the software by means of a Windows- based control display
- Exploitation of available, intelligent field units

HART Multiplexer Software

Pepperl+Fuchs' HART multiplexer works with major software packages, such as AMS from Fisher-Rosemount, Cornerstone from Applied Systems Technology and P+F's own PACTware. PACTware is on a fast track to become the universal configuration tool for all P+F intelligent process automation products.

These Windows-based packages are easy to use with simple interfaces for configuring and monitoring control devices. They are all compatible with the open HART protocol.



HART Multiplexer Master



Model Number
KFD2-HMM-16

- 24 VDC supply voltage
- Up to 15 KFD0-HMS-16 slave units can be connected
- RS 485 interface for PC connection
- Up to 31 HART Multiplexers may be connected to an RS 485 interface
- Up to 7936 loops on one interface

The KFD2-HMM-16 is a HART Multiplexer that can operate up to 256 analog field instruments. The built-in slave unit operates the first 16 loops. If more than 16 loops are required, additional KFD0-HMS-16 slave units can be connected. The slave units are connected to the Master with a 14-pin flat band cable. The connector for the ribbon cable is found on the same housing side as the connectors for the interface and the power supply. The analog signals are separately linked to a P+F termination board via a 26 pin cable for each unit. 16 leads are designated for the HART signal of the analog measurement circuit. The remaining 10 leads are sent to ground. This unit is designed with removable terminals and can be connected to P+F Power Rail.

Technical Data

Power Supply

Nominal voltage	20-32 VDC
Power Consumption	≤3 W

HART Signal Channels

Leakage current	< 3µA at -20 to +85°C (-4°F to +185°F)
Output termination	External 230-500 Ω (up to 1000 Ω)
Output voltage	>400 mV _{pp}
Output impedance	100 Ω, capacitively linked
Input impedance	per HART conventions
Input voltage range	80 mV-4.0 V _{pp}
Input voltage	±5.2 V, typical

Interface

Type	RS 485, 2-wire multi-drop
Transmission speed	9600, 19200, 38400 baud
Address Selection	31 possible RS-485 addresses

Switch Settings

Test	SW1: ON = test				
	OFF = normal operation				
Baud rate	SW 2	SW 3			
	OFF	OFF	9600 baud		
	OFF	ON	19,200 baud		
	ON	OFF	38,400 baud		
	ON	ON	N/A		
RS-485 Address	SW 4	SW5	SW6	SW 7	SW8
Example: address = 22 (10110)	ON	OFF	ON	ON	OFF

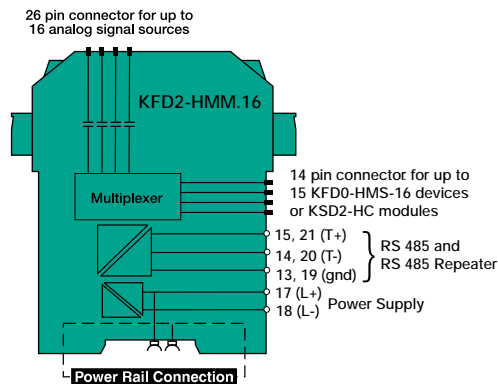
Mechanical

Design	Makrolon housings, flammability class per UL 94: V-0, Type A2 (see page 387)
Mounting	35 mm DIN rail or wall-mounted
Connection options	26-pin ribbon cable for analog
	14-pin ribbon cable for master-slave
	Removable terminals, max. 14 AWG for interface and power supply



Connection Diagram

Div 2, Zone 2 or Safe Area

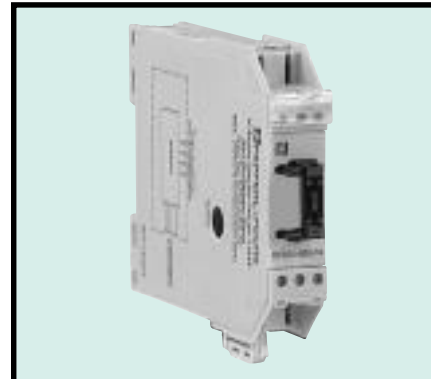


Technical Data

Power Supply	14-pin flat cable from master
HART Signal Channels	
Leakage current	< 3 μ A at -20 to +85°C (-4°F to +185°F)
Output termination	External 230-500 Ω (up to 1000 Ω)
Output voltage	> 400 mV _{pp}
Output load	< 100 Ω , capacitively linked
Input impedance	per HART conventions
Input voltage range	80 mV-4.0 V _{pp}
Input voltage	\pm 5.2 V, typical
Mechanical	
Design	Makrolon housings, flammability class per UL 94: V-0, type C2 (see page 387)
Mounting	35 mm DIN rail or wall-mounted
Connection options	26-pin ribbon cable for analog 14-pin ribbon cable for master-slave Removable terminals, max. 14 AWG for interface and power supply



HART Multiplexer Slave



Model Number
KFD0-HMS-16

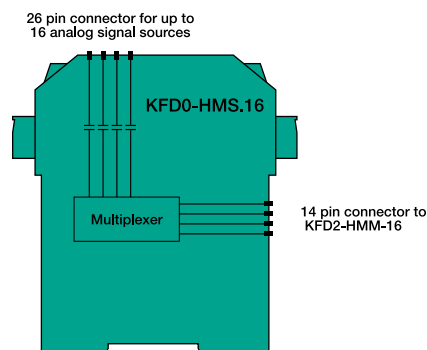
- No external power supply
- Up to 16 analog transmitters
- 14-pin flat cable for master connection

The KFD0-HMS-16 is a HART multiplexer slave, which operates up to 16 analog field instruments. The slave can only be operated with the KFD2-HMM-16 and is powered by the master across a 14-pin flat cable connection. Up to 15 slaves can be connected to the master. The slave address is set with a 16 position rotary switch (addresses 1-16). If only one slave is connected to the master, then the slave address should be 1. If multiple slaves are connected, slaves are to be assigned addresses in ascending order.

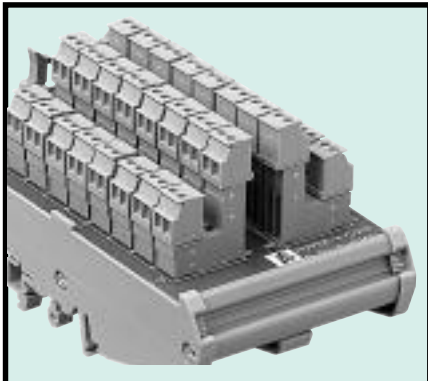
The analog signals are fed into the slave by means of a 26-pin ribbon cable. 16 leads are reserved for the HART signal of the analog measurement circuits. The remaining ten leads are assigned to ground.

Connection Diagram

Class I, Div 1, Group A-G, Zone 0, IIC



HART Flexible Interface



Model Number
FI-DO-Y49092/Y41610

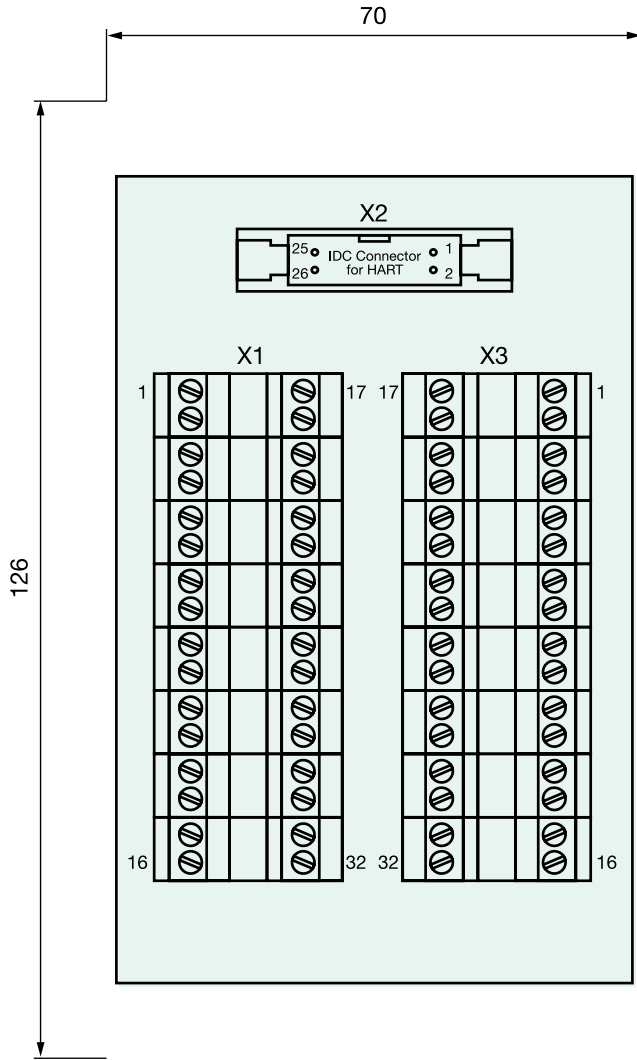
- Removable terminals
- Mounts on DIN rail
- Interfaces with SMART field instruments

The FI-DO-Y49092 is a flexible interface board with a HART pick-up connector. This FI board has 16 terminal blocks to connect up to 16 SMART field devices.

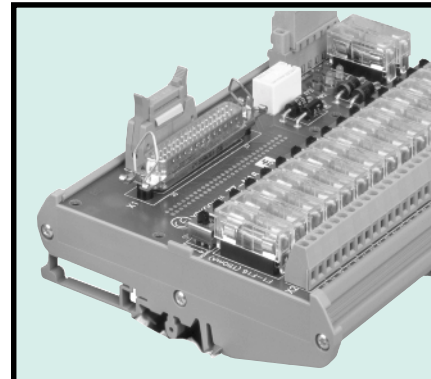
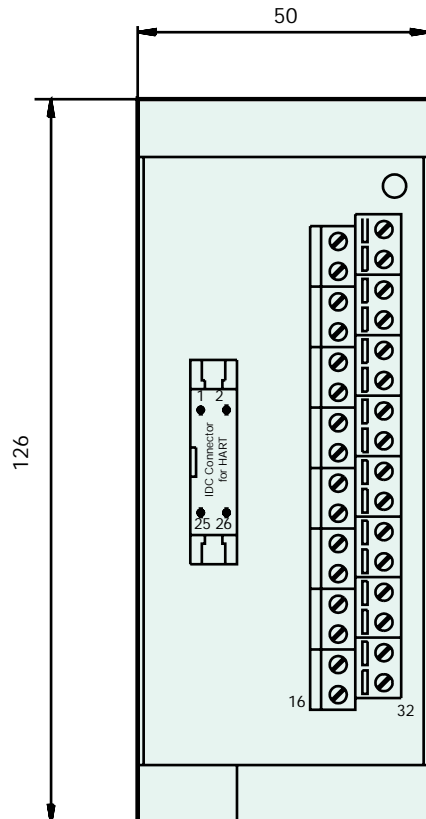
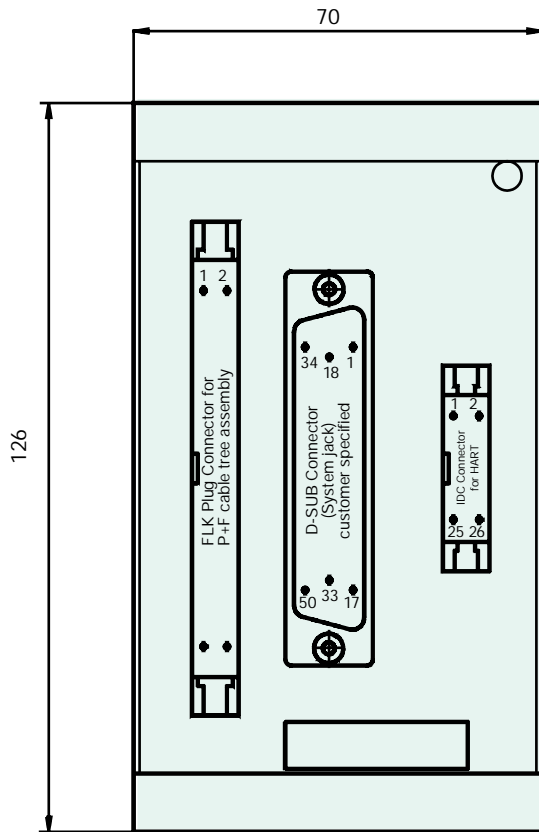
The FI-DO-Y49092 does not have a 250 Ω HART pick-up resistor built in, and can only be used in applications that have a 250 Ω resistor in the DCS/PLC or I/O card.

The FI-DO-Y41610 does, however, have a 250 Ω HART pick-up resistor built in.

Both interfaces can be used for general purpose applications or in conjunction with intrinsic safety barriers for hazardous area applications.



HART Flexible Interface



Model Number
FI- * * - PFH-Y- * * *

- Customer-specified design
- Fused outputs
- Interfaces with SMART field instruments

The individual I/O components of the P+F HART Multiplexer system have a 26-pin system connector for the interface of the individual intrinsic safety isolators or SMART field instruments (nonhazardous location applications). Pepperl+Fuchs provides specially developed connection units with HART connectors. Depending on the requirements, these units may be connected by means of a system cable or conventional screw terminals.

The figures shown are two examples of flexible interfaces for HART. One is custom made to fit cables from specific PLC/DCS vendors and the second is made with screw terminals. Please contact a P+F representative for more information on flexible interfaces for HART systems.

Hart Multiplexer

Contents

HiD2000

Page

Introduction	259-260
General Information	
Flexible Split Termination Boards	261
Custom Solutions & Features	262
Signal Marshalling Philosophy Using Cross-Wiring	263
The Pepperl+Fuchs Elcon System Concept	264
Model Selection	265
Data Sheets	
Modules Data Sheets HiD2000	266-282
Modules Data Sheets HiD2900	283-285
Modules Data Sheet Mux2700	286-287
Specifications	
General Specification & Approvals	288
Termination Boards	
Termination Board & Module Specification	289
Termination Board Dimensional Drawings	290
Termination Board Structure & Accessories	203

HD2000

Supply Connections

Redundant 24Vdc reverse polarity protected and fault bus connectors both with LED indication.

LED Status Indicators

Module status and power-on indicators for monitoring module operation and highlighting loop wiring faults.

Tagging

Provided on the front of every module, terminal strip and termination board.

Quick-Lok Modules

No wiring on modules, and no tools are required to plug the modules on the termination board, simply plug-in and lock by pushing down on the Quick-Lok tabs!

Fault Monitoring

Modules monitor field wiring faults and output a common alarm to assist in maintenance.



Terminal Options

Use multi level terminal blocks (HAT) or choose the optional knife edge loop disconnect terminals with integral test jacks (HAKE).



SYSTEM OVERVIEW

System Connection

Choose either terminals, standard sub-D connectors, or a specific custom solution connector to plug direct to your DCS, PLC or ESD system I/O cards.

Module Keying

Using simple blocking pins you can configure each module position, so no mistake can occur during maintenance or commissioning.



Safety Approvals

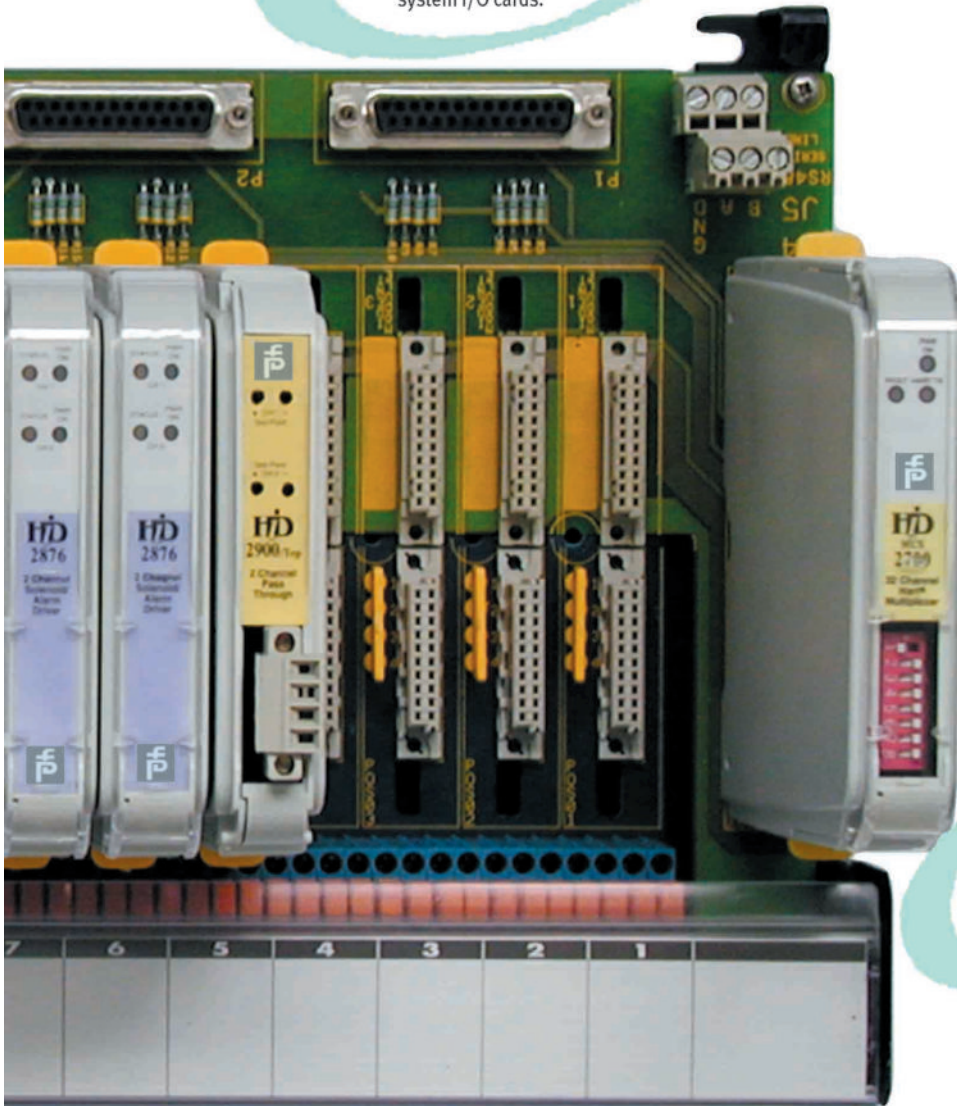
Modules are available with SIL2 approval for Safety System applications.

Fixed Terminals

No loose terminals, allow you to terminate your field wiring direct to the termination board, therefore no wiring on modules.

High Density Modules

Up to 4 channel modules (DI) and 2 channels are available for all other signal types.



HART® Multiplexer

Simply plug-in the Mux2700 to access all your HART® field devices (see page 31).



Non I.S. Signals?

Use the HiD2900TOP module to mix non I.S. signals and I.S. signals together on the same termination board . The module provides the required cable segregation.

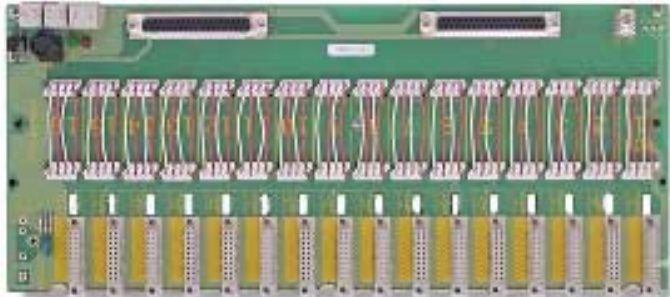
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FLEXIBLE SPLIT TERMINATION BOARDS

Just 2 Simple Steps!

1. Choose your connection method

Simply select the safe area PCB (green) to match your preferred system connection. Choose from standard multi-level terminals (SAT), Universal Sub D connector (SACON) or match your DCS, ESD or PLC I/O cards by using a custom connector solution.



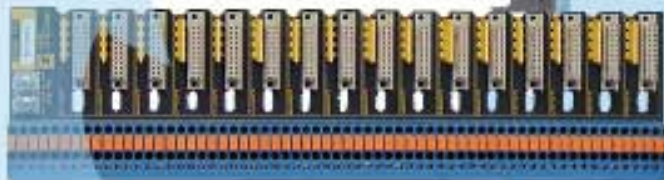
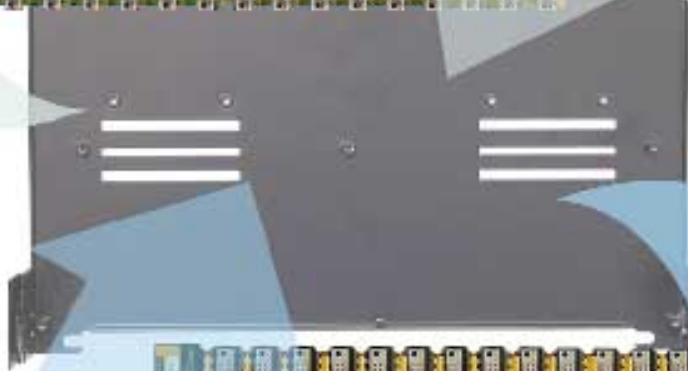
SACWCON



DCS SYSTEM



SAT



HAKE



HAT

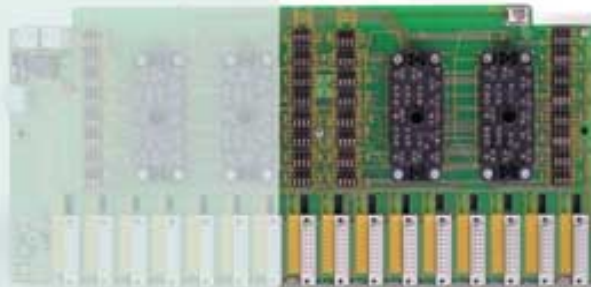
2. Choose field side terminals

Add a HAT (multilevel) or HAKE (Knife Edge disconnects) terminal PCB (blue) for hazardous area applications and FCT or FCKE PCB for standard non I.S. applications.

CUSTOM SOLUTIONS & FEATURES

Simply Choose a Solution

Direct Custom Interface Solutions are available for the most common DCS, PLC and ESD systems available on the market.



Can I replace my proprietary FTP?

Yes, it is now redundant, our HiD2000 emulates the standard FTP (Field Termination Panels) in every way. Just plug to our termination board using standard system cables.

Do you have a solution for my control system?

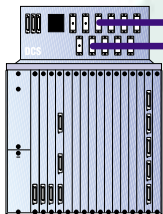
Yes!! Custom Solutions are available for all major DCS, ESD and PLC systems on the market today. If we do not have a solution for you, we will design one to your specifications.

Can I mix I.S. and non I.S. signals together?

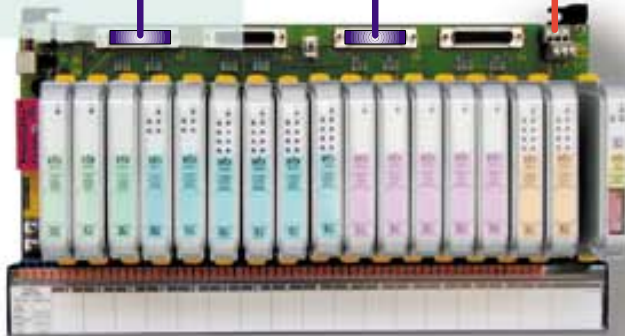
Yes! Using our 2900TOP entry modules, you can mix I.S. and non I.S. signals on the same termination board while maintaining the necessary cable segregation.

How can I connect my PAM software?

Simply plug on the Mux2700 HART® multiplexer to access all your HART® field devices.



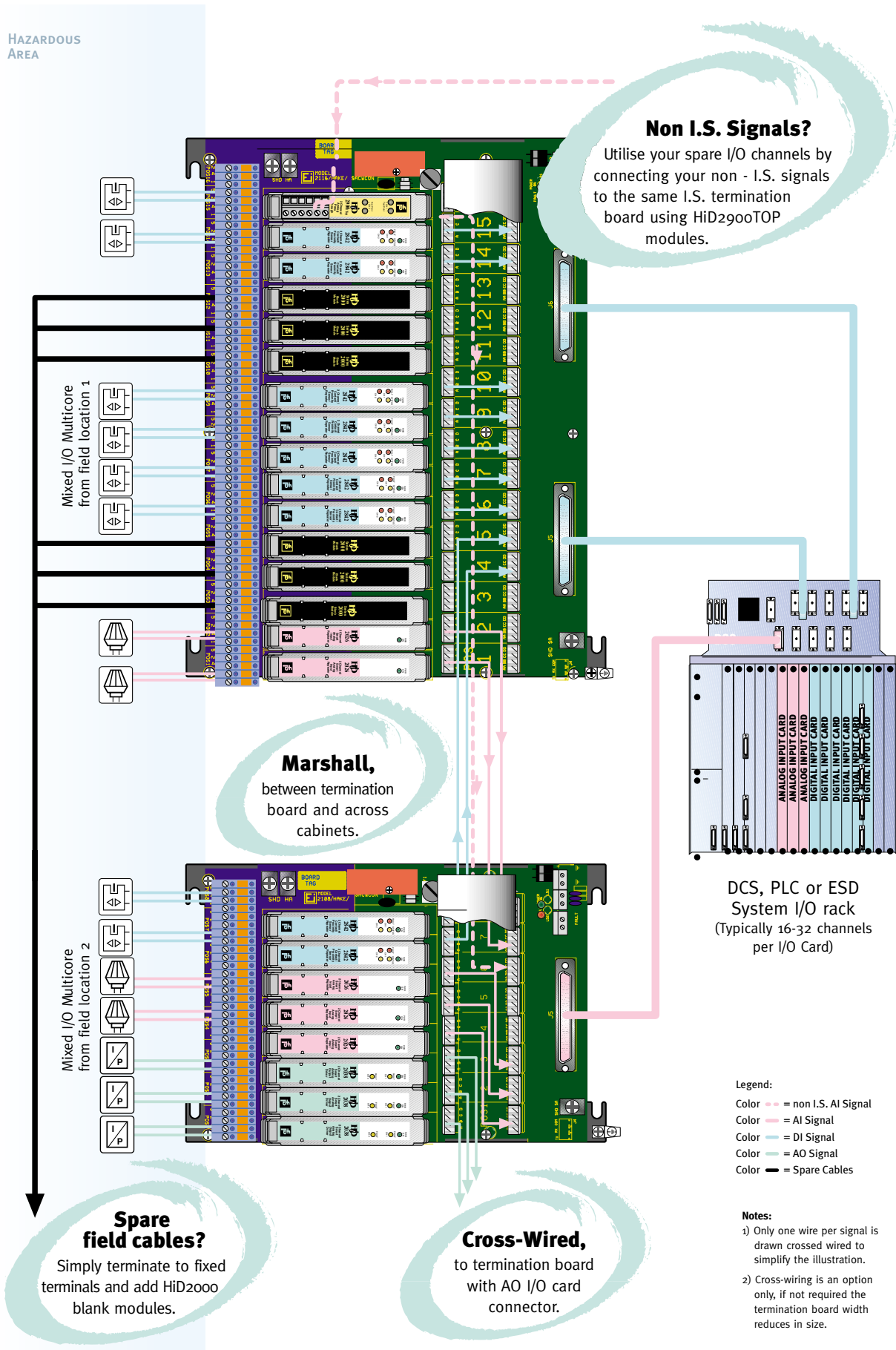
Control System I/O Card Racks



PAM Workstation



SIGNAL MARSHALLING PHILOSOPHY USING CROSS-WIRING



THE PEPPERL+FUCHS ELCON SYSTEM CONCEPT

www.pepperl-fuchs.com

Hi-Integrity Power Supply

PS1550 modular redundant 24 Vdc supply for mission critical applications.

Integral Marshalling

Use Cross Wiring, to eliminate external marshalling cabinets!

Hi-Density,

Up to 1400 I/O channels are possible in a single back to back cabinet.

Complete Solution

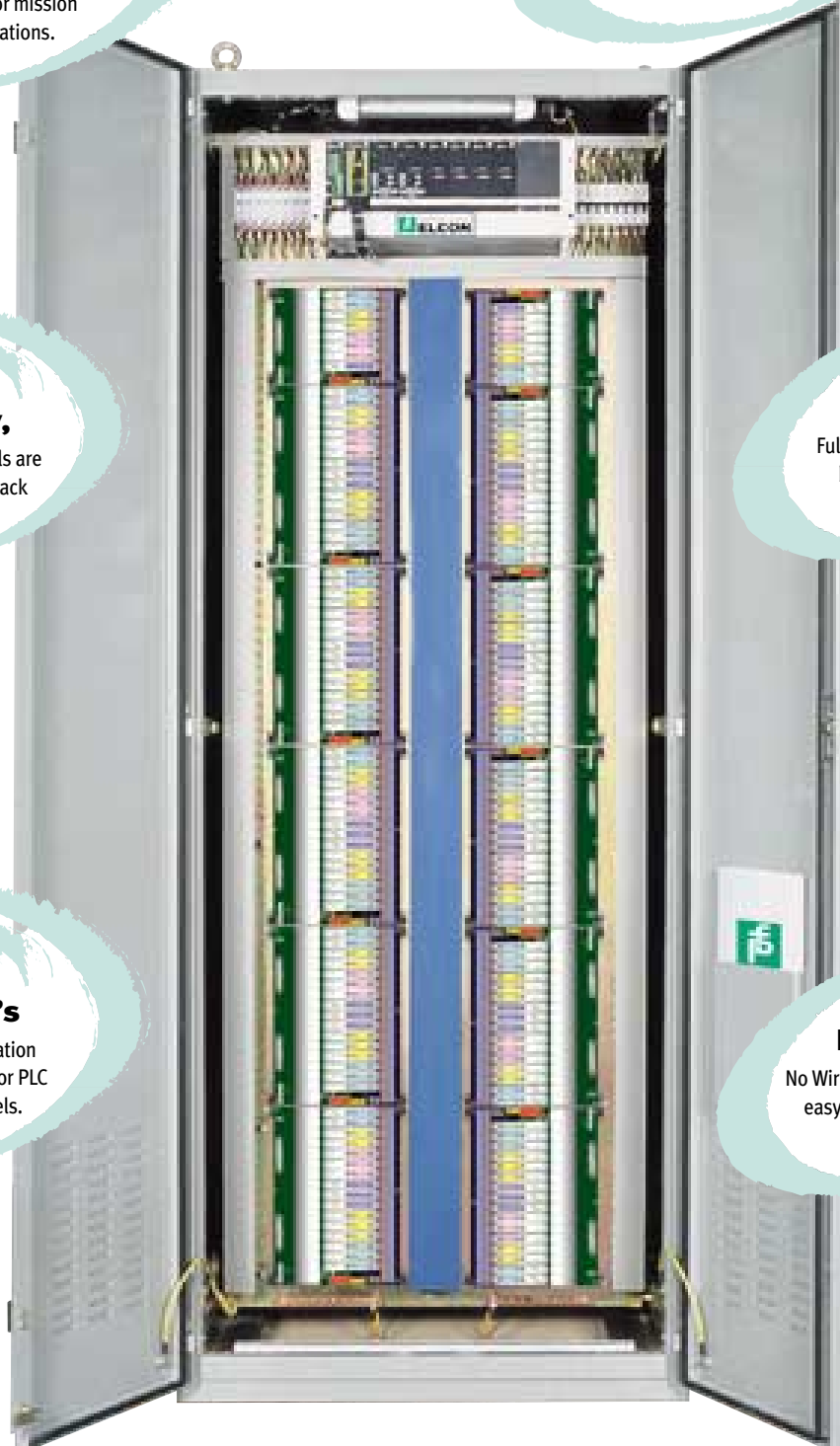
Fully engineered cabinets can be supplied to customer specifications.

Replace FTP's

HiD2000 custom termination boards replace DCS, ESD or PLC Field Termination Panels.

Clean Installation






















No Wiring on modules, for a clean easy to maintain installation.



Note:

Up to 1400 channels + PS1550 power supply in a 2000 x 800 x 800 cabinet.

MODEL SELECTION

Field Device	Model	No. of Ch.	Hazardous Area Signal	Safe Area Signal	Fault Bus Output	Page
Analog IN  	HiD2025	1	4-20 mA (15.5 V) floating supply to Smart or non-Smart two wire Transmitters.	4-20 mA (or 1-5 V) output isolated from input, Smart compatible.		266
	HiD2026	2				
	HiD2025SK	1	4-20 mA (15.5 V) floating supply to Smart or non-Smart two wire Transmitters.	4-20 mA load sink, isolated from input, Smart compatible.		267
	HiD2026SK	2				
	HiD2029	1	4-20 mA (15.5 V) floating supply to Smart or non-Smart two or three wire Transmitters.	4-20 mA (or 1-5 V) output isolated from input and power supply, Smart compatible, Line Fault Detection.		268
	HiD2030	2				
HiD2029SK	1	4-20 mA (15.5 V) floating supply to Smart or non-Smart two or three wire Transmitters.	4-20 mA load sink, isolated from input and power supply, Smart compatible, Line Fault Detection.		269	
HiD2030SK	2					
Analog OUT  	HiD2031	1	4-20 mA to I/P converters, valve actuators and displays.	Bus powered, 4-20 mA signal from DCS, PLC or other control devices.		270
	HiD2032	2				
	HiD2033	1	4-20 mA to I/P converters, valve actuators and displays.	Loop powered, 4-20 mA signal from DCS, PLC or other control devices.		271
	HiD2034	2				
	HiD2035	1	Fire, smoke detectors or I/P converters.	Loop powered 1,5 to 50 mA signal from control devices.		272
	HiD2036	2				
HiD2037	1	4-20 mA and Smart signal to I/P converters, electrovalve actuators and displays.	Bus powered, 4-20 mA signal from DCS, PLC or other control devices, Line Fault Detection, smart compatible.		273	
HiD2038	2					
HiD2038Y	2					Recommended for use with Yokogawa DCS systems.
Temperature IN 	HiD2061	1	Thermocouple or mV.	4-20 mA (or 1-5 V) output isolated from input.		274
	HiD2062	2				
	HiD2071	1	RTD or Potentiometer.	4-20 mA (or 1-5 V) output isolated from input.		275
HiD2072	2					
Digital IN 	HiD2821	1	Dry Contact or Proximity Switch.	DPST relay for output and separate relay for LFD output. DPST relay per channel, Line Fault Detection. SPST relay per channel, Line Fault Detection.		276
	HiD2822	2				
	HiD2824	4				
	HiD2842	2	Dry Contact or Proximity Switch.	2 open-collector outputs per channel, Line Fault Detection. 1 open-collector output per channel, Line Fault Detection.		277
HiD2844	4					
Digital OUT   	HiD2871	1	40 mA at 12 V to drive solenoid valve, audible or visual alarm (LED).	Bus powered, and/or loop powered, controlled by external contact from DCS or control device.		278
	HiD2872	2				
	HiD2873	1	40 mA at 12 V to drive solenoid valve, audible or visual alarm (LED).	Bus powered, controlled by external contact or logic level from DCS or control device, Line Fault Detection.		279
	HiD2874	2				
	HiD2875	1	40 mA at 11,2 V to drive solenoid valve, audible or visual alarm (LED).	Bus powered, and/or loop powered, controlled by external contact from DCS or control device.		280
	HiD2876	2				
	HiD2877	1	40 mA at 11,2 V to drive solenoid valve, audible or visual alarm (LED).	Bus powered, controlled by external contact or logic level, from DCS or control device, Line Fault Detection.		281
	HiD2878	2				
HiD2881	1	60 mA at 13 V to driver solenoid valve, IIB Gas Group.	Bus powered and/or loop powered, controlled by external contact or logic level from DCS or control device, Line Fault Detection.		282	
Field Device	Model	No. of Ch.	Field Signal	Safe Area Signal		Page
Signal IN/OUT  	HiD2900	2	o(4)-20 mA to Smart or non-Smart two wire Transmitters. 4-20 mA to I/P converters, electrovalve actuators and display. Dry contact. Driver to solenoid valve, audible or visual alarm (LED).	o(4)-20 mA (or o(1)-5V) output from input, Smart compatible. Loop powered, 4-20 mA signal from DCS, PLC or other control device. Loop power to switch, load, resistor. Loop power driver signal.		283
	HiD2900TOP	2				
Digital IN 	HiD2942	2	Dry Contact or Logic Level.	2 open-collector outputs per channel.		284
	HiD2942TOP	2				
Digital OUT 	HiD2962	2	Change over relay contact to drive solenoid valve, audible or visual alarm (LED), etc.	Bus powered, and/or loop powered, controlled by external contact from DCS or control device.		285
	HiD29462TOP	2				

HiD2000 I.S. ISOLATOR RANGE



2025/2026
**REPEATER POWER SUPPLY,
 SMART TRANSMITTER**

Application

Provides a fully floating supply to power a two wire transmitter in a Hazardous Area, repeating the current to drive a Safe Area load. Bi-directional communication is provided for smart transmitters which use current modulation to transmit data and voltage modulation to receive data. Outputs are isolated from the inputs and are referenced to the power supply common.

Specification

DC Supply

CURRENT CONSUMPTION: 50 mA at 24 V, 20 mA output (per channel).

POWER DISSIPATION: 0.8 W at 24 V (per channel).

Hazardous Area Signal (input)

SIGNAL RANGE: 4-20 mA (overload limited at 26 mA typ.)

VOLTAGE AVAILABLE FOR TRANSMITTER AND LINES: 15.5 V min at 20 mA (ripple content 10 mV rms).

Safe Area Signal (output)

USER SELECTABLE: 4-20 mA or 1-5 V (on 250 Ω internal shunt).

RIPPLE CONTENT: 10 mV rms on 250 Ω load required for communications.

LOAD: 0 to 650 Ω.

LOAD EFFECT: ≤0.1% of full scale from 0 to 650 Ω.

FREQUENCY RESPONSE OF COMMUNICATION CHANNEL: (Tx to output and output to Tx), 0.5 KHz to 40 KHz within 3 db, (-6 db at 100 KHz).

Suitable for use with Smart transmitters using HART® or similar protocol.

RESPONSE TIME: 40 msec, 10 to 90% step change.

Performance at Reference Conditions

CALIBRATION ACCURACY: < ±0.1% of full scale. (current output).

LINEARITY: < ±0.1% of full scale.

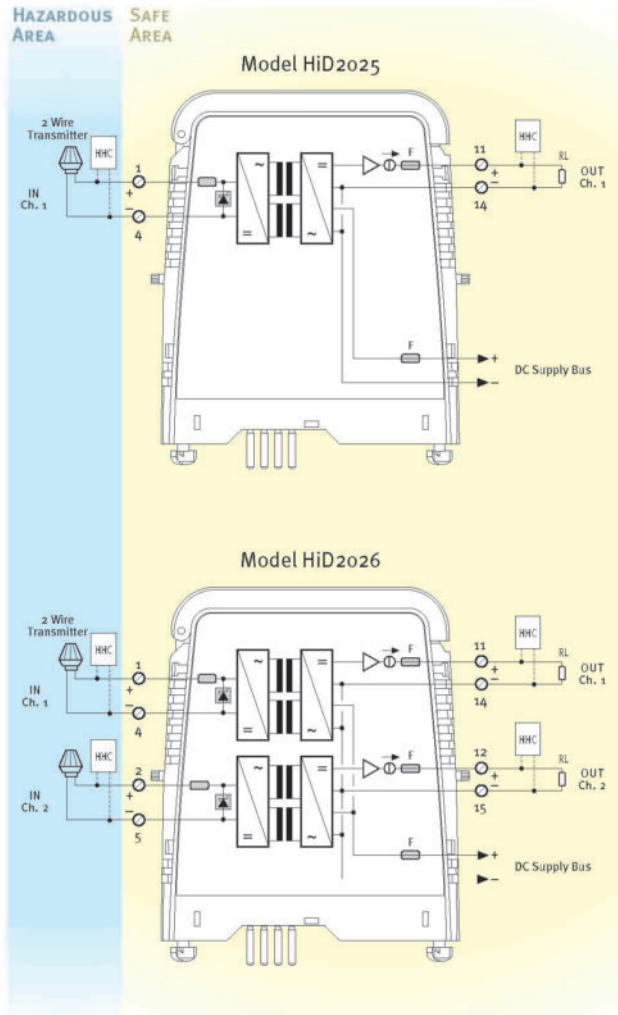
TEMPERATURE DRIFT: < ±0.01%/°C.

SELECTOR SWITCHES: Output 4-20 mA or 1-5 V. (250 Ω, 0.1% internal shunt).

FACTORY SET AS: 4-20 mA.

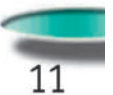
LED INDICATORS: Power on (green).

- Single (2025) and Dual (2026) channel.
- Smart Transmitter compatible.
- Low power dissipation.



Safety Description	Maximum External Parameters				
	GROUPS		Co (μF)	Lo (mH)	L/R (μH/Ω)
	CENELEC	USA			
Uo = 26.25 V	II C	A-B	0.097	4.1	58
Io = 93 mA	II B	C-E	0.74	16.5	230
Po = 610 mW	II A	D-F-G	2.51	33	470

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HID2000 I.S. ISOLATOR RANGE



2025SK/2026SK

REPEATER POWER SUPPLY,
SMART TRANSMITTER

Application

Provides a fully floating supply to power a two wire transmitter in a Hazardous Area, repeating the current in sink mode to simulate a two wire transmitter load in Safe Area.

Bi-directional communication is provided for smart transmitters which use current modulation to transmit data and voltage modulation to receive data. Outputs are isolated from the inputs and are referenced to the power supply common.

Suitable for use with Siemens Moore APACS, Quadlog and YISS systems.

Specification

DC Supply

CURRENT CONSUMPTION: 50 mA at 24 V, 20 mA output (per channel).

POWER DISSIPATION: 1.3 W at 24 V supply and 24 V external supply from DCS or PLC (per channel).

Hazardous Area Signal (input)

SIGNAL RANGE: 4-20 mA (overload limited at 26 mA typ.).

VOLTAGE AVAILABLE FOR TRANSMITTER AND LINES: 15.5 V min at 20 mA (ripple content 10 mV rms).

Safe Area Signal (output)

SINK MODE FROM EXTERNAL SUPPLY: 4-20 mA (overload limited at 26 mA typ.).

WORKING VOLTAGE RANGE: 7 V min. to 30 V max.

FREQUENCY RESPONSE OF COMMUNICATION CHANNEL: (Tx to output and output to Tx), 0.5 KHz to 40 KHz within 3 db, (-6 db at 100 KHz).

Suitable for use with Smart transmitters using HART® or similar protocol.

RESPONSE TIME: 40 msec, 10 to 90% step change.

Performance at Reference Conditions

CALIBRATION ACCURACY: $\pm 0.1\%$ of full scale.

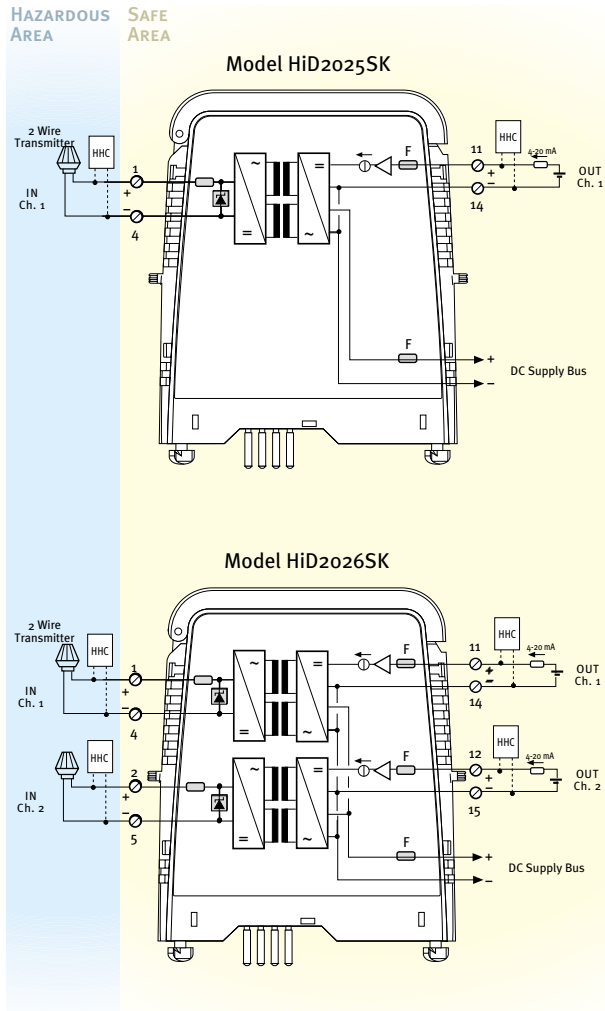
LINEARITY: $\pm 0.1\%$ of full scale.

TEMPERATURE DRIFT: $\pm 0.01\%/^{\circ}\text{C}$.

SELECTOR SWITCHES: none.

LED INDICATORS: Power on (green).

- Single (2025SK) and Dual (2026SK) channel.
- Smart Transmitter compatible.
- Current sink mode capability.



Safety Description	Maximum External Parameters				
	GROUPS		Co	Lo	L/R
	CENELEC	USA	(μF)	(mH)	($\mu\text{H}/\Omega$)
Uo = 26.25 V	II C	A-B	0.097	4.1	58
Io = 93 mA	II B	C-E	0.74	16.5	230
Po = 610 mW	II A	D-F-G	2.51	33	470



HiD2000 I.S. ISOLATOR RANGE



2029/2030

REPEATER POWER SUPPLY,
SMART TX, FULLY FLOATING

Application

Provides a fully floating supply to power a two or three wire transmitter in a Hazardous Area, repeating the current to drive a Safe Area load. Bi-directional communication is provided for smart transmitters which use current modulation to transmit data and voltage modulation to receive data. Outputs are fully isolated from the inputs, the power supply and each other. A separate fault output is signalled if the input signal is outside the range 0.2 - 24 mA.

Specification

DC Supply

CURRENT CONSUMPTION: 60 mA at 24 V, 20 mA output (per channel).

POWER DISSIPATION: 1.05 W at 24 V (per channel).

Hazardous Area Signal (input)

VOLTAGE AVAILABLE FOR TRANSMITTER AND LINES: 15.5 V min at 20 mA (ripple content 10 mVrms).

INPUT RANGE: 4-20 mA (overload limited at 26 mA typical).

INPUT RESISTANCE FOR CURRENT SOURCE: 40 Ω.

HART COMS: Pass through to safe area. (Note: current sink terminals 4, 7, 5 and 6 do not pass HART® signal to safe area).

Safe Area Signal (output)

USER SELECTABLE: 4-20 mA or 1-5 V (on 250 Ω internal shunt).

LOAD: 0 to 650 Ω.

LOAD EFFECT: ≤0.1% of full scale from 0 to 650 Ω.

FREQUENCY RESPONSE OF COMMUNICATION CHANNEL: (tx to output and output to tx), 0.5 KHz to 40 KHz within 3 db, (-6 db at 100 KHz).

Suitable for use with Smart transmitters using HART® or similar protocol.

RESPONSE TIME: 70 msec, 10 to 90% step change.

Performance at Reference Conditions

CALIBRATION ACCURACY: < ±0.1% of full scale (current output).

LINEARITY: < ±0.05% of full scale.

TEMPERATURE DRIFT: < ±0.01%/°C.

NO FAULT DETECTION: > 1 mA or < 23.5 mA input current.

FAULT DETECTION: < 0.2 mA or > 24 mA input current.

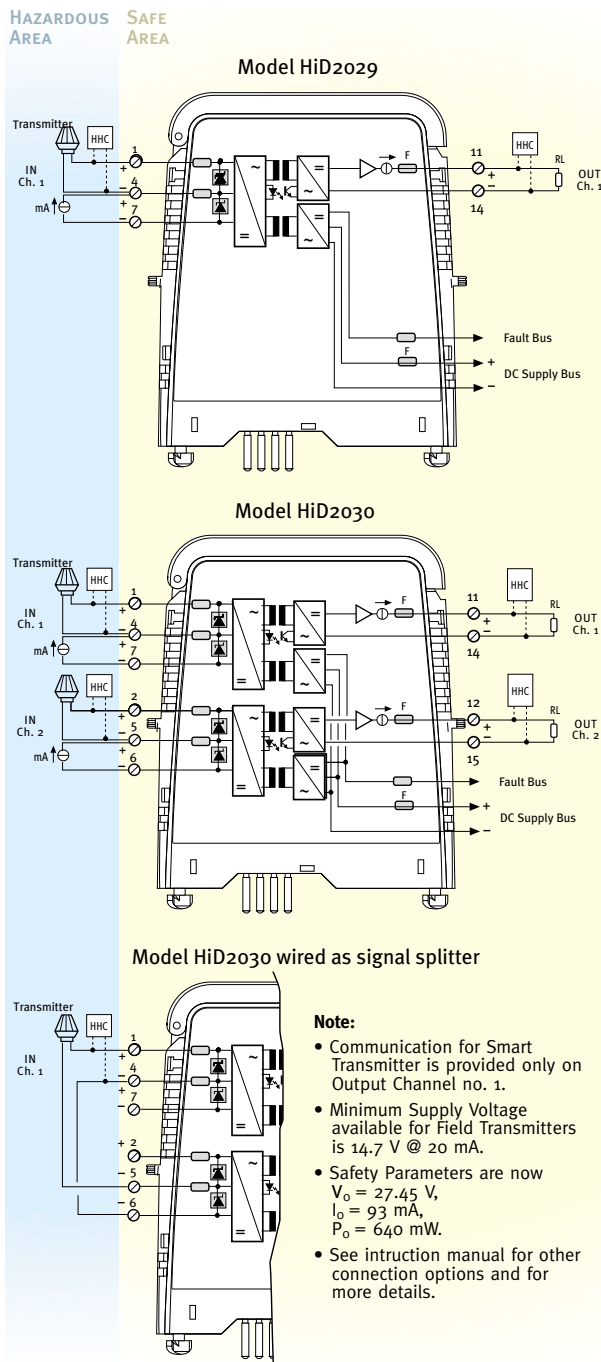
SELECTOR SWITCHES: Output 4-20 mA or 1-5 V. (250 Ω, 0.1% internal load).

FACTORY SET AS: 4-20 mA.

LED INDICATORS: Power on (green). Fault (red) each channel.

FAULT OUTPUT: Open collector transistor. (common to both channels).

- Single (2029) and Dual (2030) channel.
- 2 or 3 wire Smart Transmitters.
- Fully floating outputs.
- Fault bus output.
- Suitable for 1 input and 2 outputs (Signal Splitter).



Note:

- Communication for Smart Transmitter is provided only on Output Channel no. 1.
- Minimum Supply Voltage available for Field Transmitters is 14.7 V @ 20 mA.
- Safety Parameters are now $V_o = 27.45 V$, $I_o = 93 mA$, $P_o = 640 mW$.
- See instruction manual for other connection options and for more details.

Term.	Safety Description	Maximum External Parameters				
		Groups CENELEC	USA	Co (µF)	Lo (mH) L/R (µH/Ω)	
1-4	$V_o = 26.25 V$	II C	A-B	0.097	4.1	58
	$I_o = 93 mA$	II B	C-E	0.74	16.5	230
2-5	$P_o = 610 mW$	II A	D-F-G	2.51	33	470
4-7*	$V_o = 1.2 V$	* SUITABLE FOR NON ENERGY STORING APPARATUS CONNECTION.				
5-6*	$I_o < 50 mA$					
	$P_o < 15 mW$					



HID2000 I.S. ISOLATOR RANGE



2029SK/2030SK

REPEATER POWER SUPPLY,
SMART TX, FULLY FLOATING

Application

Provides a fully floating supply to power a two or three wire transmitter in a Hazardous Area, repeating the current in sink mode to simulate a two wire transmitter load in Safe Area. Bi-directional communication is provided for smart transmitters which use current modulation to transmit data and voltage modulation to receive data. Outputs are fully isolated from the inputs, the power supply and each other. A separate fault output is signalled if the input signal is outside the range 0.2 - 24 mA. Suitable for use with Siemens Moore APACS, Quadlog and YISS systems.

Specification

DC Supply

CURRENT CONSUMPTION: 40 mA at 24 V, 20 mA output (per channel).
POWER DISSIPATION: 1.05 W at 24 V supply, 24 V external supply from DCS or PLC (per channel).

Hazardous Area Signal (input)

VOLTAGE AVAILABLE FOR TRANSMITTER AND LINES: 15.5 V min at 20 mA (ripple content 10 mVrms).
INPUT RANGE: 4-20 mA (overload limited at 26 mA typical).
INPUT RESISTANCE FOR CURRENT SOURCE: 40 Ω.
HART COMs: Pass through to safe area. (Note: current sink terminals 4, 7, 5 and 6 do not pass HART® signal to safe area).

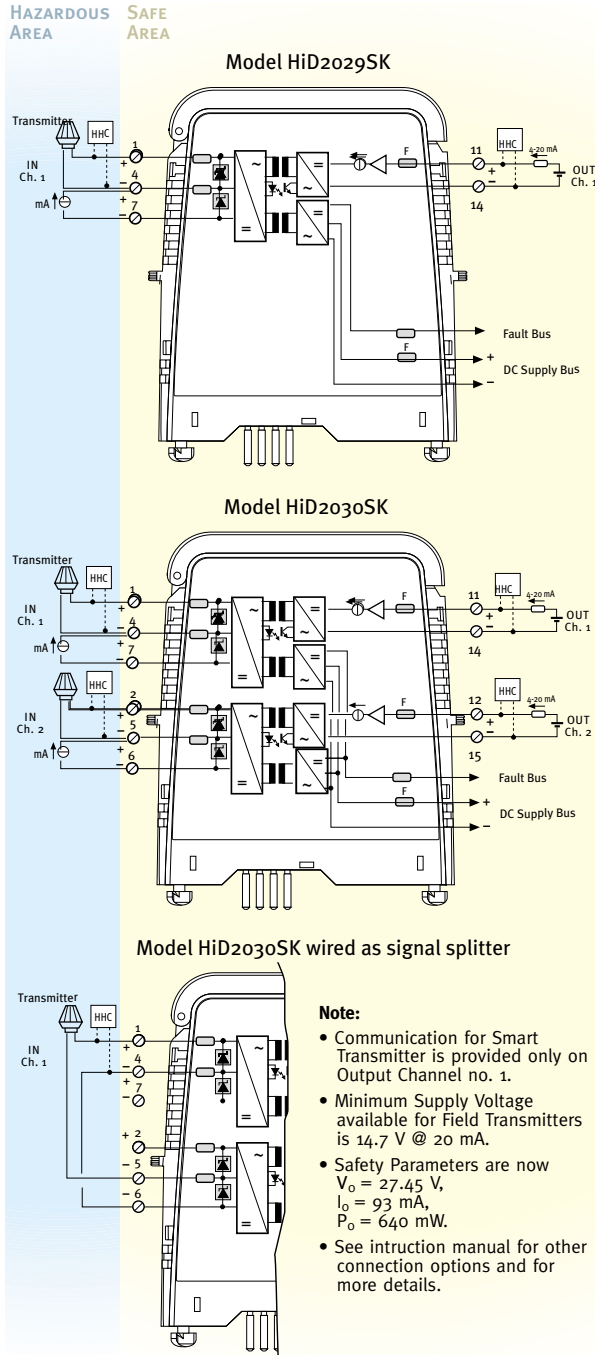
Safe Area Signal (output)

SINK MODE FROM EXTERNAL SUPPLY: 4-20 mA (overload limited at 24 mA typ.).
WORKING VOLTAGE RANGE: 7 V min. to 30 V max.
FREQUENCY RESPONSE OF COMMUNICATION CHANNEL: (tx to output and output to tx), 0.5 KHz to 40 KHz within 3 db. (-6 db at 100 KHz).
 Suitable for use with Smart transmitters using HART® or similar protocol.
RESPONSE TIME: 70 msec, 10 to 90% step change.

Performance at Reference Conditions

CALIBRATION ACCURACY: < ±0.1% of full scale.
LINEARITY: < ±0.05% of full scale.
TEMPERATURE DRIFT: < ±0.01%/°C.
NO FAULT DETECTION: > 1 mA or < 23.5 mA input current.
FAULT DETECTION: < 0.2 mA or > 24 mA input current.
SELECTOR SWITCHES: none.
LED INDICATORS: Power on (green). Fault (red) each channel.
FAULT OUTPUT: Open collector transistor (common to both channels).

- Single (2029SK) and Dual (2030SK) channel.
- 2 or 3 wire Smart Transmitters.
- Current sink output capability.
- Fully floating outputs.
- Fault bus output.
- Suitable for 1 input and 2 outputs (Signal Splitter).



- Note:**
- Communication for Smart Transmitter is provided only on Output Channel no. 1.
 - Minimum Supply Voltage available for Field Transmitters is 14.7 V @ 20 mA.
 - Safety Parameters are now
 $V_o = 27.45 V$,
 $I_o = 93 mA$,
 $P_o = 640 mW$.
 - See instruction manual for other connection options and for more details.

Term.	Safety Description	Maximum External Parameters				
		GROUPS CENELEC	USA	Co (µF)	Lo (mH)	L/R (µH/Ω)
1-4	$V_o = 26.25 V$	II C	A-B	0.097	4.1	58
	$I_o = 93 mA$	II B	C-E	0.74	16.5	230
2-5	$P_o = 610 mW$	II A	D-F-G	2.51	33	470
4-7*	$V_o = 1.2 V$	* SUITABLE FOR NON ENERGY STORING APPARATUS CONNECTION.				
5-6*	$I_o < 50 mA$ $P_o < 15 mW$					



HID2000 I.S. ISOLATOR RANGE



2031/2032

I/P DRIVER,
BUS POWERED

Application

Repeats a 4-20 mA input signal from a control system to drive I/P converters, valve actuators and displays located in a Hazardous Area. Each isolated channel has a low input impedance and allows complete freedom of connection in the input loop due to the high common mode compliance with respect to the supply. A field open circuit presents a high impedance to the control device input to allow alarm conditions to be monitored by control systems.

Specification

DC Supply

CURRENT CONSUMPTION: 35 mA at 24 V, 20 mA output (per channel).
POWER DISSIPATION: 0.75 W at 24 V (per channel).

Hazardous Area Signal (output)

OUTPUT: 4-20 mA on a load of 0 to 750 Ω max.
LOAD EFFECT: ≤0.1% of full scale from 0 to 750 Ω.
OUTPUT RIPPLE: 15 mV rms.
RESPONSE TIME: 50 msec, 10 to 90% step change.

Safe Area Signal (input)

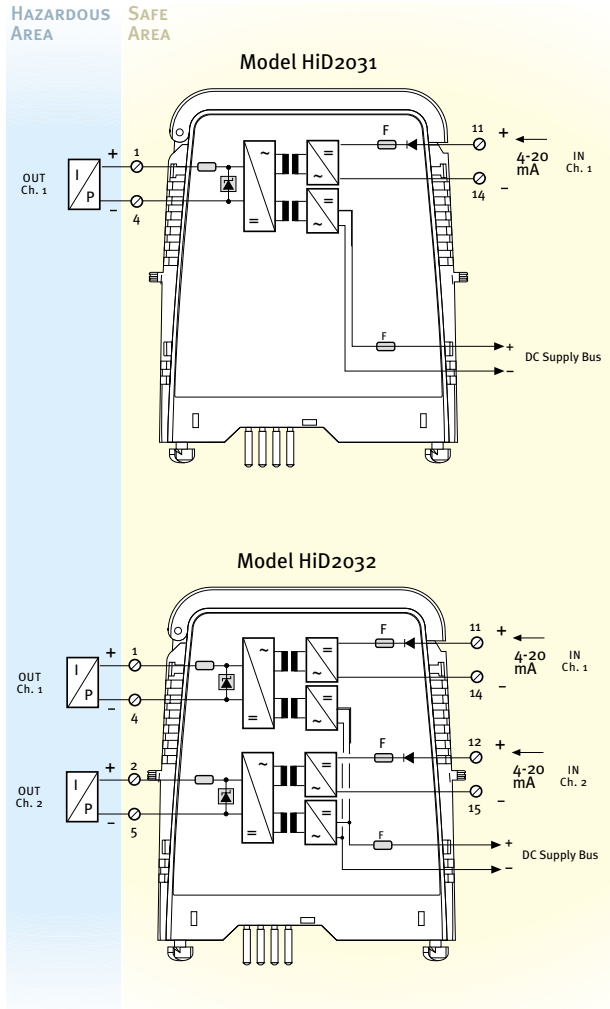
INPUT CURRENT: 4-20 mA (reverse polarity protected).
Input drop-out < 4 V with field wiring intact.
Input current < 1.2 mA with field wiring open.

Performance at Reference Conditions

CALIBRATION ACCURACY: < ±0.1% of full scale.
LINEARITY: < ±0.1% of full scale.
TEMPERATURE DRIFT: < ±0.01%/°C.
SELECTOR SWITCHES: none.
LED INDICATORS: power ON (green).

- Single (2031) and Dual (2032) channel.
- Bus powered 750 Ω load.
- Fully floating operation.
- Suitable for 1 input and 2 outputs.

(see Instruction Manual for details)



Safety Description	Maximum External Parameters				
	GROUPS		Co	Lo	L/R
	CENELEC	USA	(μF)	(mH)	(μH/Ω)
Vo = 26.25 V	II C	A-B	0.097	4.1	58
Io = 93 mA	II B	C-E	0.74	16.5	230
Po = 610 mW	II A	D-F-G	2.51	33	470



HID2000 I.S. ISOLATOR RANGE



2033/2034

I/P DRIVER,
LOOP POWERED

- Single (2033) and Dual (2034) channel.
- Loop powered.
- Low voltage drop.
- Fail safe operation.

Application

Repeats a 4-20 mA input signal from a control system to drive I/P converters, valve actuators and displays located in a Hazardous Area. Designed for high integrity applications, each channel is loop powered with a low voltage drop and permits detection of line faults, by the control system.

A field open circuit presents a high impedance to the control device input to allow alarm conditions to be monitored.

Specification

Hazardous Area Signal (output)

OUTPUT: 4-20 mA on a load of 0 to 500 Ω max.

LOAD EFFECT: ≤0.2% of full scale from 0 to 500 Ω.

OUTPUT RIPPLE: 40 μA peak to peak.

RESPONSE TIME: 50 msec, 10 to 90% step change.

Safe Area Signal (input)

INPUT VOLTAGE: powered by the loop, 7 to 30 V max. (reverse polarity protected).

INPUT CURRENT: powered by the loop, 4-20 mA (voltage drop-out 7 V at 20 mA and 500 Ω load). Open circuit consumption <0.8 mA at 24 V.

POWER DISSIPATION: 0.14 W at 20 mA, per channel.

Performance at reference conditions

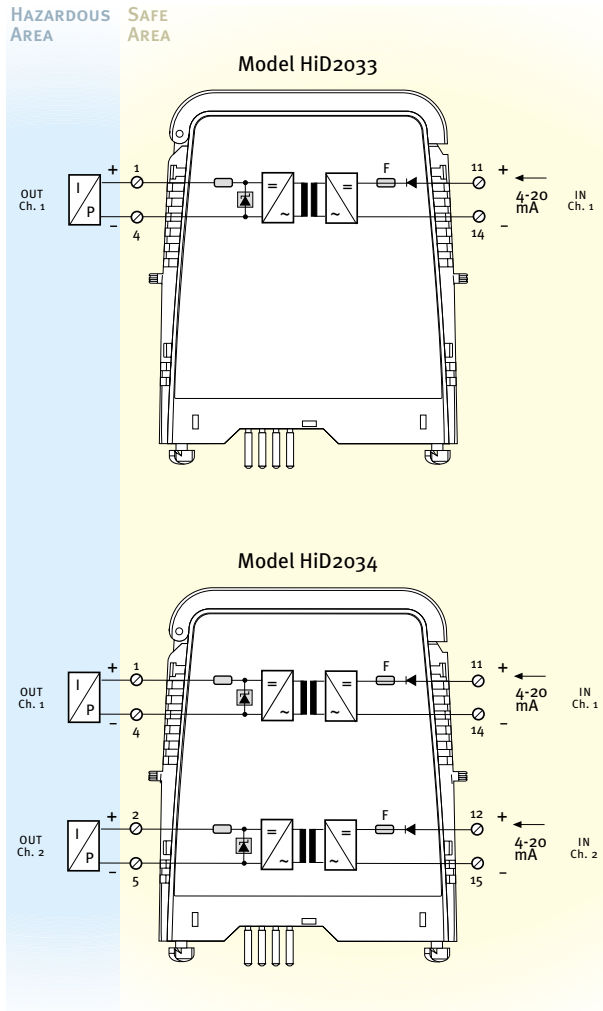
CALIBRATION ACCURACY: < ±0.1% of full scale.

LINEARITY: < ±0.1% of full scale.

TEMPERATURE DRIFT: < ±0.01%/°C.

SELECTOR SWITCHES: none.

LED INDICATORS: none.



Safety Description	Maximum External Parameters				
	GROUPS		Co (μF)	Lo (mH)	L/R (μH/Ω)
	CENELEC	USA			
Vo = 26.25 V	II C	A-B	0.097	4.1	58
Io = 93 mA	II B	C-E	0.74	16.5	230
Po = 610 mW	II A	D-F-G	2.51	33	470



HiD2000 I.S. ISOLATOR RANGE



2035/2036

LOOP POWERED ISOLATOR FOR FIRE AND SMOKE DETECTORS

Application

These loop-powered isolators are primarily intended to interface with fire and smoke detectors, or with similar switched resistor systems requiring a wide output current range (1.5 to 50 mA) to operate correctly. They can also be used to drive a current to pressure (I/P) converter or in similar application requiring an analog output signal.

Specification

Hazardous Area Signal (output)

Fire and Smoke Detectors

OUTPUT: 1.5 - 50 mA.

OUTPUT CHARACTERISTIC (TYPICAL):

$$V_{out} = (V_{in} - 1.6) - (0.4 \times I_{out}) \quad 6 \text{ V} < V_{in} < 25 \text{ V}$$

$$V_{out} = (25 - 1.6) - (0.4 \times I_{out}) \quad 25 \text{ V} < V_{in} < 30 \text{ V}$$

ANALOG OUTPUT I/P APPLICATIONS

OUTPUT: 4-20 mA (on a load of 0 to 750 Ω max.).

LOAD EFFECT: ≤ 0.3% (of full scale from 0 to 750 Ω).

OUTPUT RIPPLE: 150 μA peak to peak.

Safe Area Signal (input)

OPERATING VOLTAGE RANGE: 6-30 V (powered by the loop, reverse polarity protected).

INPUT CURRENT: 1.5 - 50 mA (powered by the loop).

VOLTAGE DROP-OUT: 9.6 V @ 20 mA and 500 Ω load (4 V @ 4 mA).

OPEN CIRCUIT CONSUMPTION: < 0.6 mA @ 24 V.

Performance at reference conditions

CURRENT TRANSFER ERROR: < ±300 μA,
6 V < V_{in} < 25 V / 1.5 mA < I_{out} < 50 mA.

CALIBRATION ACCURACY: < ±0.1% of full scale (4-20 mA range).

LINEARITY: < ±0.1% of full scale (4-20 mA range).

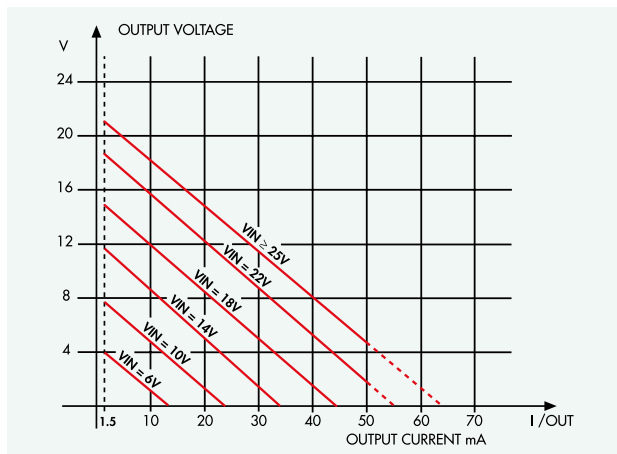
RESPONSE TIME: 50 msec. (10 to 90% step change).

POWER DISSIPATION: < 0.7 W @ 40 mA, 24 V (per channel).

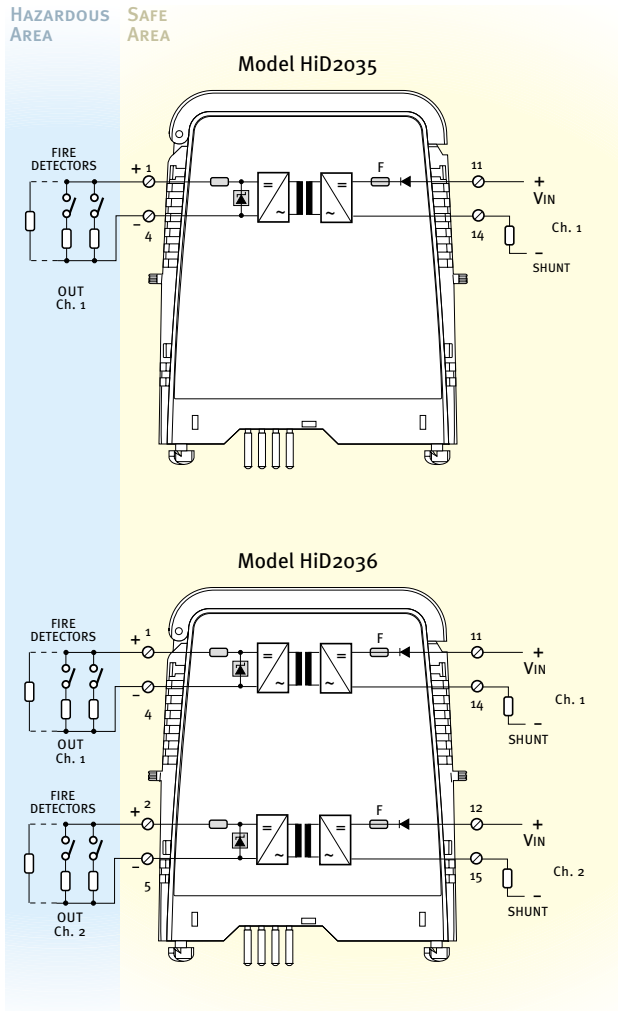
TEMPERATURE DRIFT: < ±0.01%/°C.

SELECTOR SWITCHES: none.

LED INDICATORS: none.



- Single (2035) and Dual (2036) channel.
- Wide operating current range (1.5 to 50 mA).
- Applicable also for loop powered analog output (I/P).
- High accuracy (±0.1%) in I/P applications.



Safety Description	Maximum External Parameters				
	GROUPS CENELEC	USA	Co (μF)	Lo (mH)	L/R (μH/Ω)
V _o = 26.25 V	II C	A-B	0.097	4.1	58
I _o = 93 mA	II B	C-E	0.74	16.5	230
P _o = 610 mW	II A	D-F-G	2.51	33	470



HID2000 I.S. ISOLATOR RANGE



2037/2038

I/P DRIVER,
BUS POWERED, SMART

- Single (2037) and Dual (2038) channel.
 - Dual (2038Y) channel for Yokogawa DCS system.
 - Bus powered operation, 750 Ω load.
 - Smart I/P and Valve positioners.
 - Fault bus output. (not available on 2038Y).
 - Suitable for 1 input and 2 outputs.
- (see Instruction Manual for details)

Application

Repeats a 4-20 mA input signal from a control system to drive I/P converters, electrovalve actuators and displays located in a Hazardous Area. Designed for use with smart I/P and valve positioners, each isolated channel has a low input impedance and allows complete freedom of connection in the input loop due to the high common mode compliance with respect to the supply.

On the 2037 and 2038 a separate fault output is signalled if the field wiring is broken or shorted. A field open circuit presents a high impedance to the control device input.

For the 2038Y a field open circuit presents an impedance of around 50 KΩ to the DCS control system. This allows the Yokogawa DCS to perform normal internal alarm monitoring functions.

Specification

DC Supply

CURRENT CONSUMPTION: 40 mA at 24 V, 20 mA output (per channel).

POWER DISSIPATION: 0.85 W at 24 V (per channel).

Hazardous Area Signal (output)

OUTPUT: 4-20 mA on a load of 0 to 750 Ω max.

LOAD EFFECT: ≤0.1% of full scale from a 0 to 750 Ω.

OUTPUT RIPPLE: 15 mV rms.

RESPONSE TIME: 50 msec, 10 to 90% step change.

Safe Area Signal (input)

INPUT CURRENT: 4-20 mA (reverse polarity protected). Input drop-out <4 V with field wiring intact. Input current <1.2 mA with field wiring open. Input current (2038Y) <0.6 mA (>47 KΩ) with field wiring open.

FREQUENCY RESPONSE OF COMMUNICATION CHANNEL: (field to input and input to field), 0.5 KHz to 40 KHz within 3 db, (-6 db at 100 KHz) for use with smart positioners using HART® protocol.

Performance at reference conditions

CALIBRATION ACCURACY: < ±0.1% of full scale.

LINEARITY: < ±0.1% of full scale.

TEMPERATURE DRIFT: < ±0.01%/°C.

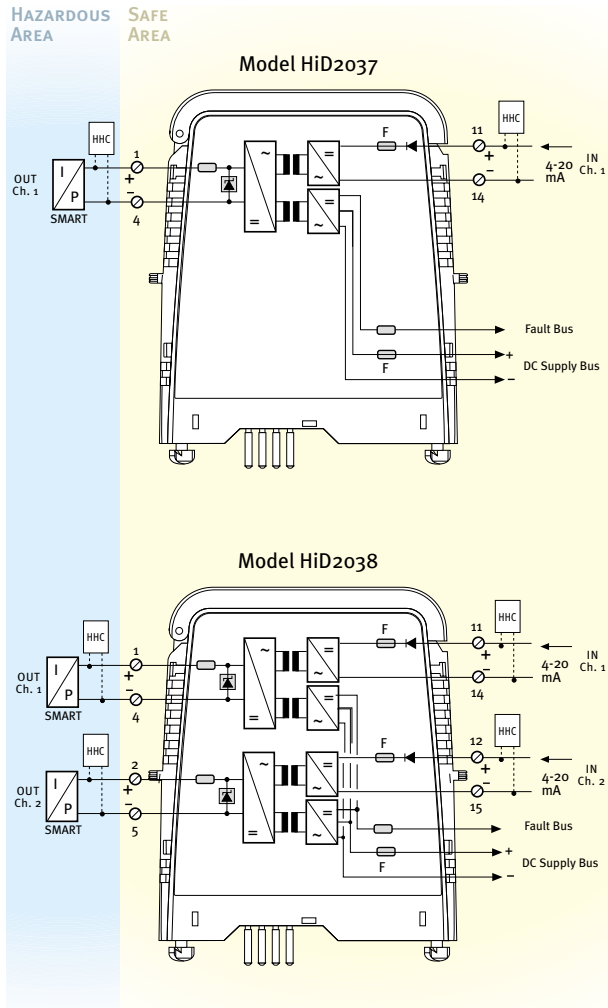
SHORT WIRE FAULT DETECT: < 70 Ω.

OPEN WIRE FAULT DETECT: > 100 KΩ.

SELECTOR SWITCHES: none.

LED INDICATORS: Power ON (green). Fault (red) each channel.

FAULT OUTPUT: Open collector transistor (common to both channels). (not applicable to 2038Y).



Safety Description	Maximum External Parameters				
	GROUPS		Co	Lo	L/R
	CENELEC	USA	(μF)	(mH)	(μH/Ω)
Vo = 26.25 V	II C	A-B	0.097	4.1	58
Io = 93 mA	II B	C-E	0.74	16.5	230
Po = 610 mW	II A	D-F-G	2.51	33	470



HID2000 I.S. ISOLATOR RANGE



2061/2062

TEMPERATURE CONVERTER,
mV/TC

Application

Accepts thermocouple or mV input signals from a Hazardous Area and converts them to an isolated analogue current signal in the Safe Area. Each channel is fully independent, Input type, range and error handling parameters are configurable by switches and trimmers. Each module is supplied with a CJC (Cold Junction Compensator), which is mounted on the screw terminals (HAT). Outputs are isolated from input and referenced to the power supply common.

Specification

DC Supply

CURRENT CONSUMPTION: 30 mA at 24 V, 20 mA output (per channel).

POWER DISSIPATION: 0.6 W at 24 V (per channel).

Hazardous Area Signal (input)

USER SELECTABLE INPUT: mV-TC type B, E, J, K, N, R, S, T to IEC584-1 and L to GOST.

RANGE: -10 mV to + 100 mV.

SPAN LIMITS: 2.6 mV min, 100 mV max.

ZERO SUPPRESSION: $\pm 500\%$ of span.

Safe Area Signal (output)

USER SELECTABLE: 4-20 mA or 1-5 V (on 250 Ω internal shunt).

RIPPLE CONTENT: 10 mVrms.

LOAD: 0 to 650 Ω .

LOAD EFFECT: $\leq 0.1\%$ of full scale from 0 to 650 Ω .

Burnout

USER PROGRAMMABLE: upscale, downscale (burnout current 25 nA).

Performance at reference conditions

CALIBRATION ACCURACY: $\pm 0.1\%$ of full scale (current output).

LINEARITY: $\pm 0.1\%$ of full scale (terminal based mV in to mA out for TC).

TEMPERATURE INFLUENCE: $\pm 0.01\%$ / $^{\circ}\text{C}$ on zero and span.

COMPENSATION ERROR: $\pm 0.5^{\circ}\text{C} \pm 0.05^{\circ}\text{C}/^{\circ}\text{C}$ ($^{\circ}\text{C}$ deviation from reference temperature for TC).

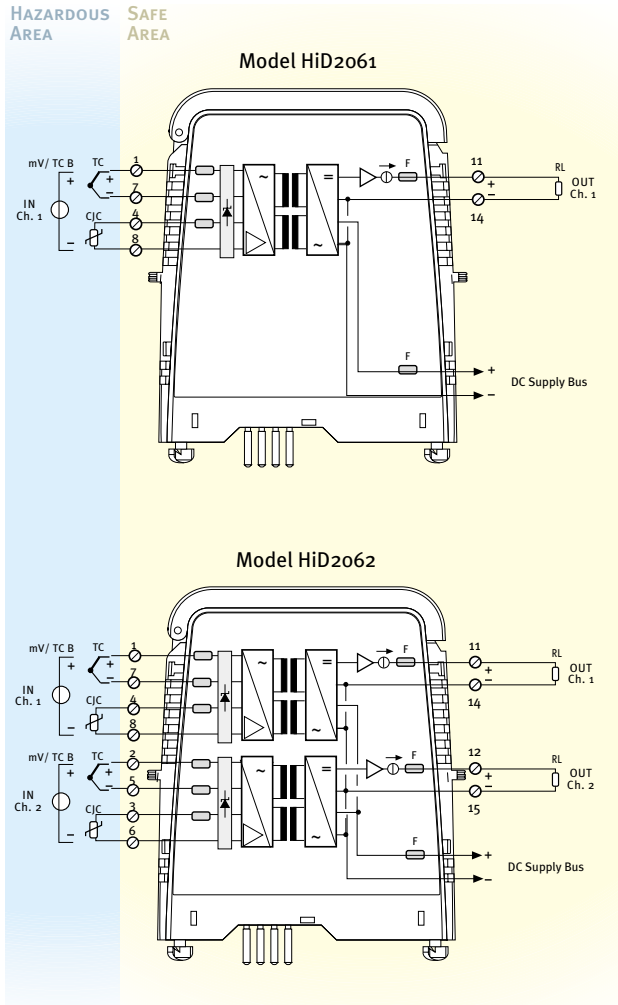
SELECTOR SWITCHES: Output 4-20 mA or 1-5 V, (250 Ω , 0.1% internal load). Thermocouple type. Burnout up/down. Input zero and span coarse settings.

FACTORY SET AS: 4-20 mA. TC type K. 0-500 $^{\circ}\text{C}$, up scale burn-out.

FRONT PANEL ADJUSTMENT: Zero and span trimmers for each channel.

LED INDICATORS: Power ON (green).

- Single (2061) and Dual (2062) channel.
- Configurable for thermocouples or mV inputs.
- Simple span and zero selection.
- Output proportional to mV input.



Safety Description	Maximum External Parameters				
	GROUPS		Co	Lo	L/R
	CENELEC	USA	(μF)	(mH)	($\mu\text{H}/\Omega$)
$V_o = 26.25 \text{ V}$	II C	A-B	0.097	4.1	58
$I_o = 93 \text{ mA}$	II B	C-E	0.74	16.5	230
$P_o = 610 \text{ mW}$	II A	D-F-G	2.51	33	470



HID2000 I.S. ISOLATOR RANGE



2071/2072

RTD/POTENTIOMETER CONVERTER

Application

Accepts input from Resistance Temperature Detectors (RTD) or Transmitting Potentiometers from a Hazardous Area and converts them to an isolated analog current signal in the Safe Area.

Each channel is fully independent, Input type, range and error handling parameters are configurable by switches and trimmers.

Outputs are isolated from inputs and referenced to the power supply common.

Specification

DC Supply

CURRENT CONSUMPTION: 30 mA at 24 V, 20 mA output (per channel).

POWER DISSIPATION: 0.6 W at 24 V (per channel).

Hazardous Area Signal (input)

USER SELECTABLE

RTD: 2, 3 or 4 wire Pt 100 to DIN 43760.

Measuring current: 0.4 mA max.

Range: -200 °C to 850 °C.

Span limits: 40 °C min, 850 °C max.

Zero suppression $\pm 500\%$ of span.

POT.: Range: 100 Ω to 100 K Ω .

NOTE: when use potentiometer with more than 300 Ω value, a shunt resistor must be mounted in parallel to the potentiometer on the terminal block. See the HiD2000 instruction manual IM-R&D-111GB-PN991169 at chapter 10.1.2 for details.

Safe Area Signal (output)

Output is linear with temperature for Pt 100 RTD.

USER SELECTABLE: 4-20 mA or 1-5 V (on 250 Ω internal shunt).

RIPPLE CONTENT: 10 mVrms.

LOAD: 0 to 650 Ω .

LOAD EFFECT: $\leq 0.1\%$ of full scale from 0 to 650 Ω load change.

Burnout (not available on Pot. and RTD 4 wire).

USER PROGRAMMABLE: upscale, downscale.

Performance at reference conditions

CALIBRATION ACCURACY: $\leq \pm 0.1\%$ of full scale (current output).

LINEARITY: $\leq \pm 0.1\%$ of full scale (terminal based °C or °F input to mA out for Pt 100).

TEMPERATURE INFLUENCE: $\leq \pm 0.01\%$ / °C on zero and span.

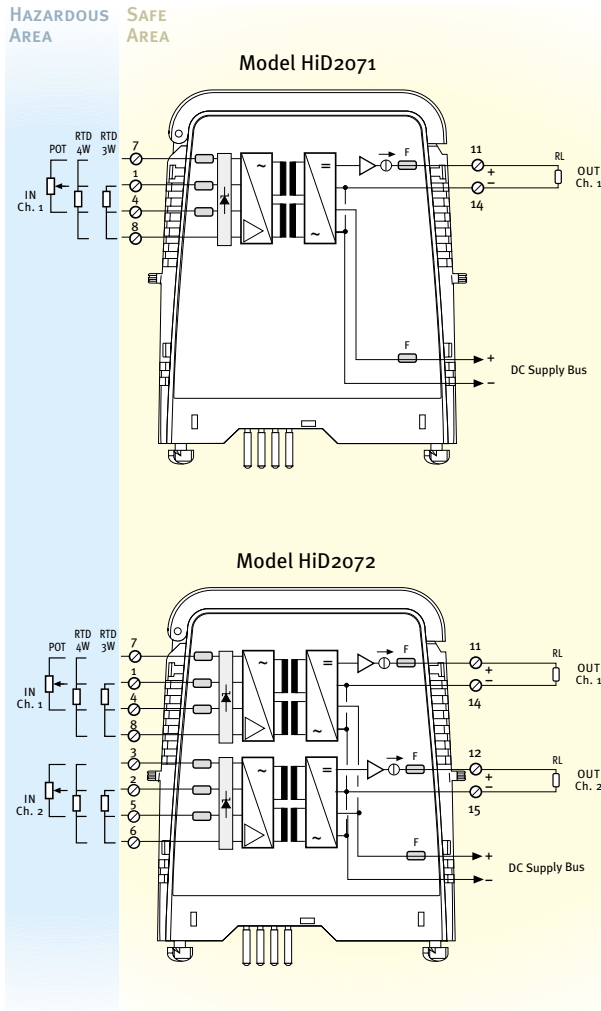
SELECTOR SWITCHES: Output 4-20 mA or 1-5 V. (250 Ω , 0.1% internal load). Input type. Burnout up/down. Input zero and span coarse settings.

FACTORY SET AS: 4-20 mA. 3 wire RTD. 0-200 °C, upscale burn-out.

FRONT PANEL ADJUSTMENT: Zero and span trimmers for each channel.

LED INDICATORS: Power on (green).

- Single (2071) and Dual (2072) channel.
- Configurable for 2, 3 or 4 wire RTD.
- Simple span and zero selection.
- Output proportional to temperature.
- Burnout up or down scale.



Safety Description	Maximum External Parameters				
	GROUPS		Co	Lo	L/R
	CENELEC	USA	(μ F)	(mH)	(μ H/ Ω)
Vo = 13.1 V	II C	A-B	1.97	70	520
Io = 22 mA	II B	C-E	13.8	250	1860
Po = 72 mW	II A	D-F-G	60	580	4300



HiD2000 I.S. ISOLATOR RANGE



2821/22/24

SWITCH/PROXIMITY DETECTOR
REPEATER, RELAY OUTPUT

Application

Repeats the status of a voltage free contact or IS proximity sensor in a Hazardous Area to a relay output(s) in a Safe Area.

The line fault detection feature (primarily used with proximity sensors) de-energises the output relay (output status and output fault relays on 2821), with a LED indication and is signalled by a separate fault bus output on the termination board.

Fault detection can be used on normal switches providing two resistors are installed at the switch (see installation guide).

Specification

DC Supply

CURRENT CONSUMPTION: 15 mA at 24 V, relay energised (per channel).
40 mA at 24 V, relay energised (2821).

POWER DISSIPATION: 0.35 W at 24 V (per channel). 1 W at 24 V (2821).

Hazardous Area Signal (input)

INPUT: voltage free contact or proximity sensor to DIN 19234 (NAMUR).

THRESHOLD VALUES:

- 0 to 0.2 mA = wire break (fault for proximitor mode operation).
- 6.5 mA to max mA = wire short (fault for proximitor mode operation).
- 0.2 to 1.2 mA = contact open / proximity sensor with target.
- 2.1 to 6.5 mA = contact closed / proximity sensor without target.

Safe Area Signal (output)

RELAY OUTPUT: DPST per channel (2822).
SPST per channel (2824).
DPST per STATUS (2821).

Normally Energised DPST per FAULT, one pole NO, the other NC (2821).

CONTACT RATING: 50 Vdc, 0.5 A non inductive.

RESPONSE TIME: 20 msec.

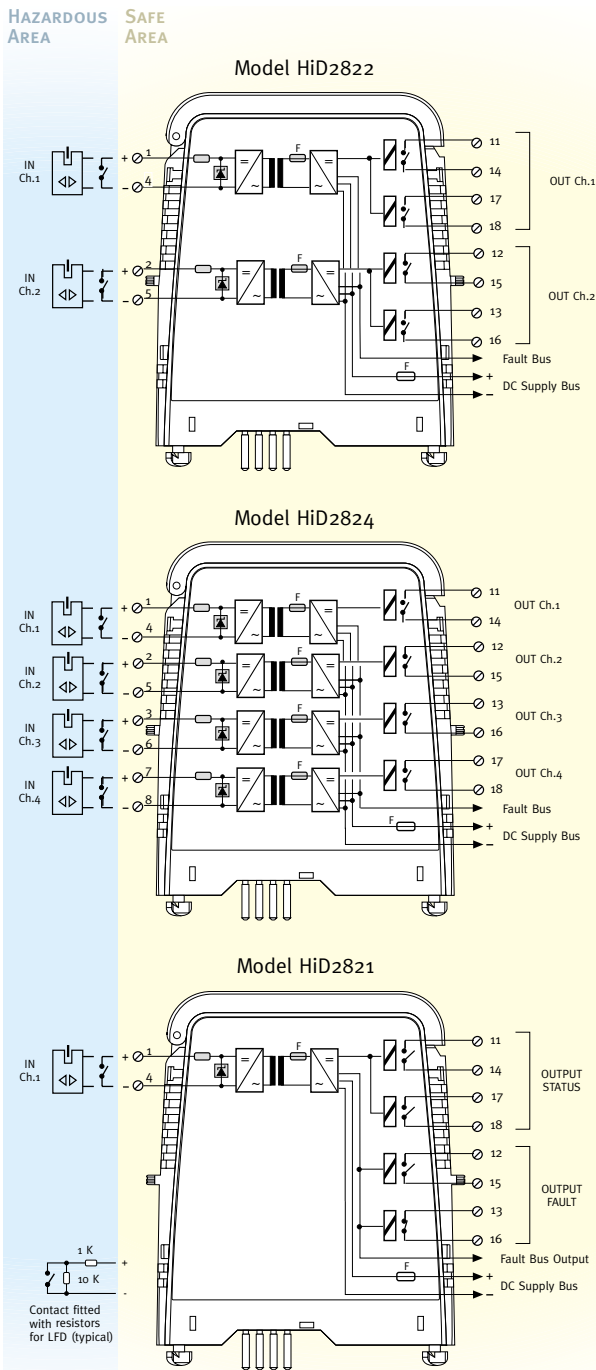
SELECTOR SWITCHES: Relay NE/ND (phase). Line fault detect enable/disable.

FACTORY SET AS: Input close relay energised. Relay NE. LFD enabled.

LED INDICATORS: Power on (green). Output status (yellow, per channel) on when relay energised. Fault (red, per channel).

FAULT OUTPUT: Open collector transistor (common to all channels).

- Single (2822) and Quad (2824) channel.
- Single (2821) channel for ESD applications.
- Switch or proximity detector input.
- Line fault detection.
- Relay output.
- Fault bus output.



Safety Description	Maximum External Parameters				
	GROUPS CENELEC	USA	Co (µF)	Lo (mH)	L/R (µH/Ω)
Vo = 13.1 V	II C	A-B	1.97	70	520
Io = 22 mA	II B	C-E	13.8	250	1860
Po = 72 mW	II A	D-F-G	60	580	4300



HID2000 I.S. ISOLATOR RANGE



2842/2844

SWITCH/PROXIMITY DETECTOR REPEATER, OPEN COLL. OUTPUT

Application

Repeats the status of a voltage free contact or IS proximity sensor in a Hazardous Area to a solid state output(s) in a Safe Area.
 The line fault detection feature (primarily used with proximity sensors) de-energises the output signal, gives an LED indication and is signalled by a separate fault output on the termination board.
 Fault detection can be used on normal switches providing two resistors are installed at the switch (see installation guide).

Specification

DC Supply

CURRENT CONSUMPTION: 15 mA at 24 V, transistor close (per channel).
POWER DISSIPATION: 0.35 W at 24 V (per channel).

Hazardous Area Signal (input)

INPUT: voltage free contact or proximity sensor to DIN 19234 (NAMUR).

THRESHOLD VALUES:

- 0 to 0.2 mA = wire break (fault for proximitor mode operation).
- 6.5 mA to max mA = wire short (fault for proximitor mode operation).
- 0.2 to 1.2 mA = contact open / proximity sensor with target.
- 2.1 to 6.5 mA = contact closed / proximity sensor without target.

Safe Area Signal (output)

OUTPUT: Two optocoupled transistor per channel (2842).
 One optocoupled transistor per channel (2844).

RATING: 30 Vdc, 50 mA (zener protected for inductive load).

LEAKAGE: 50 µA max (5 µA typical).

SATURATION VOLTAGE: max 1 V.

RESPONSE TIME: 150 µsec (2 KHz max frequency).

SELECTOR SWITCHES: Output NC/NO (phase).

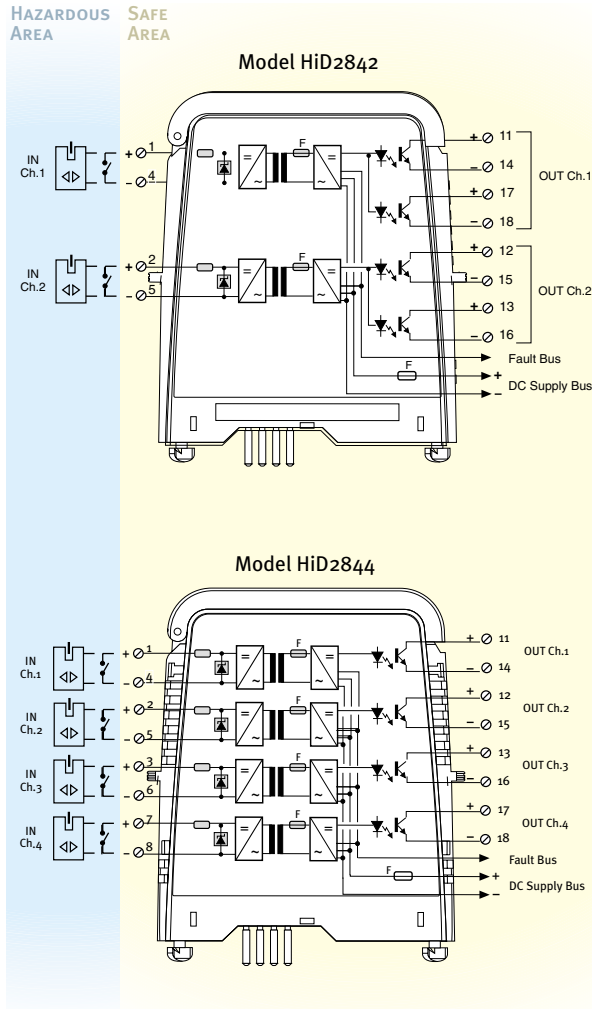
Line fault detect enable/disable.

FACTORY SET AS: Input close. Transistor NC. Lfd enabled.

LED INDICATORS: Power on (green). Output status (yellow, per channel).
 Fault (red, per channel).

FAULT OUTPUT: Open collector transistor (common to all channels).

- Dual (2842) and Quad (2844) channel.
- Switch or proximity detector input.
- Line fault detection.
- Transistor output.
- Fault bus output.



Safety Description	Maximum External Parameters				
	GROUPS	Co (µF)	Lo (mH)	L/R (µH/Ω)	
	CENELEC	USA			
Vo = 13.1 V	II C	A-B	1.97	70	520
Io = 22 mA	II B	C-E	13.8	250	1860
Po = 72 mW	II A	D-F-G	60	580	4300



HiD2000 I.S. ISOLATOR RANGE



2871/2872

SOLENOID/ALARM DRIVER,
LOOP OR BUS POWERED

Application

Energises intrinsically safe solenoid valves, alarm sounders, displays or LED indicators in a Hazardous Area from a loop powered Safe Area control signal, or controlled by a Safe Area switch contact or transistor. An alternative low current output is available for driving a single LED without installing an external current limiting resistor. Each channel can be loop-powered, ensuring high integrity operation and permitting current monitoring for detection of line fault. Status of each channel is signalled by an LED.

Specification

Hazardous Area Signal (output)

OUTPUT CHARACTERISTIC: see diagram below.

RESPONSE TIME (AT 300 Ω LOAD): Turn-on time 1 msec.
Turn-off time 8 msec.
Max. operating frequency 50 Hz.

Safe Area Signal (input)

INPUT CURRENT: 20 mA with open output. 70 mA with 300 Ω load.
75 mA with shorted output.

POWER DISSIPATION: 1.2 W at 24 V, 300 Ω load (per channel).

LOOP POWERED:

INPUT VOLTAGE: Powered by the loop, 21 - 30 Vdc, reverse polarity protected.

INRUSH CURRENT: 1A, 0.5 msec.

BUS POWERED:

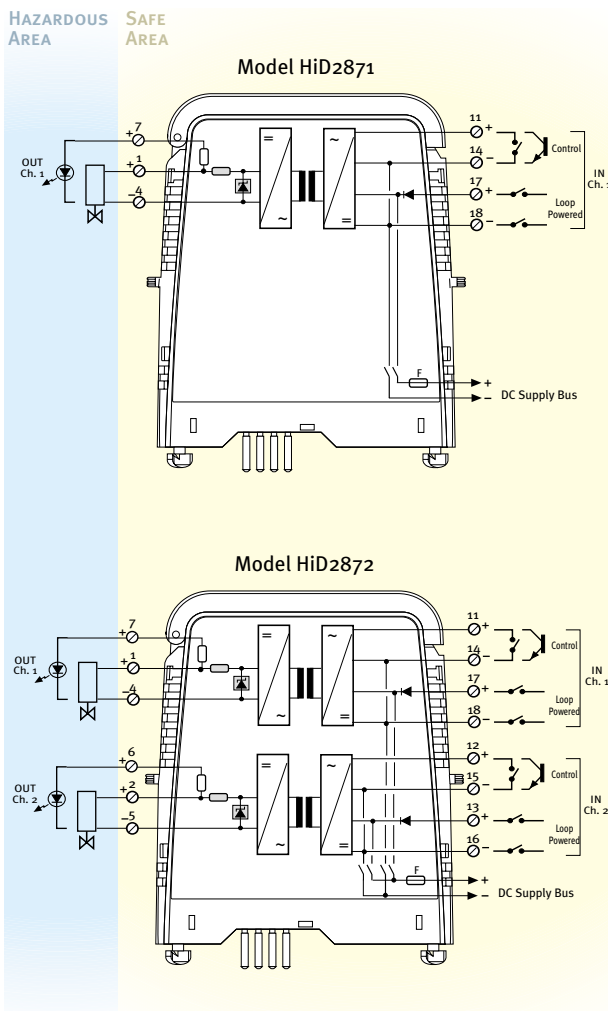
CONTROL SIGNAL: Voltage free contact or open collector. Output on with contact close or transistor on. Output off with contact open or transistor off.

SELECTOR SWITCHES: Loop powered. Bus powered with control. Loop power with control.

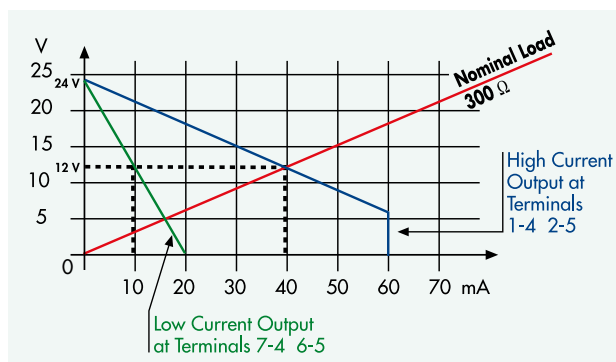
FACTORY SET AS: Bus Power with control.

LED INDICATORS: Bus or Loop Power on (green per channel) output status (yellow, per channel).

- Single (2871) and Dual (2872) channel.
- Loop or bus powered operation.
- Low current output for LEDs.
- Dual input drive for DCS and/or ESD control.



Output Characteristic



Safety Description	Maximum External Parameters				
	GROUPS CENELEC	USA	Co (μF)	Lo (mH)	L/R (μH/Ω)
Vo = 26.25 V	II C	A-B	0.097	3	50
Io = 110 mA	II B	C-E	0.74	11	200
Po = 720 mW	II A	D-F-G	2.51	22	400

NOTE: when both channels of HiD2872 are operated in normally energised condition, either the load must be reduced or increased spacing/ventilation be applied to reduce the temperature rise. Contact Pepperl + Fuchs Elcon for guidance, or consult the Instruction Manual for more details.



HID2000 I.S. ISOLATOR RANGE



2873/2874

SOLENOID/ALARM DRIVER,
BUS POWERED

Application

Energises intrinsically safe solenoid valves, alarm sounders or displays in a Hazardous Area controlled by a Safe Area contact, transistor or logic-level signal.

Line faults (open and shorted) can be detected and signalled by LED and fault output signal. Status of each channel is signalled by an LED.

Specification

DC Supply

CURRENT CONSUMPTION: 65 mA at 24 V, 300 Ω load (per channel).

POWER DISSIPATION: 1.1 W at 24 V, 300 Ω load (per channel).

Hazardous Area Signal (output)

OUTPUT CHARACTERISTIC: see diagram below.

RESPONSE TIME (AT 300 Ω LOAD): Turn-on time 1 msec. Turn-off time 2 msec. Max. operating frequency 250 Hz.

Safe Area Signal (input)

CONTROL INPUT: External switch (dry contact or open collector) non isolated or logic level input fully floating.

OPERATION MODE: Output on with contact close, transistor on or logic level > 4 V. Output off with contact open, transistor off or logic level < 1.5 V.

NOMINAL LOAD: >100 Ω to < 5 K Ω.

SHORT WIRE FAULT DETECT: <25 Ω typical.

OPEN WIRE FAULT DETECT: >100 KΩ typical.

FAULT DETECT CURRENT: 4 mA typical.

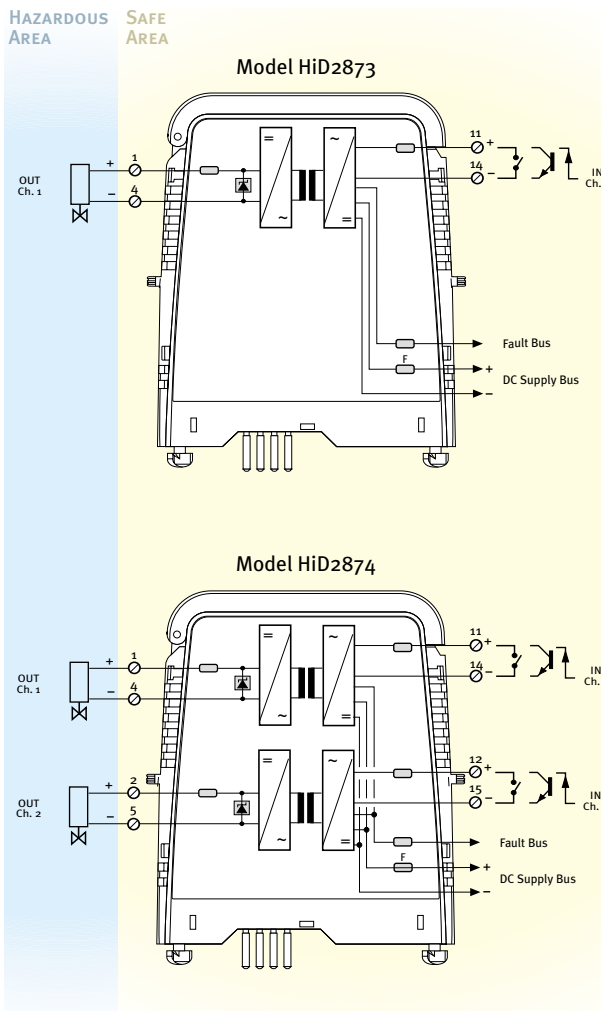
SELECTOR SWITCHES: Input logic level (fully floating). Input dry contact or open collector.

FACTORY SET AS: Input dry contact.

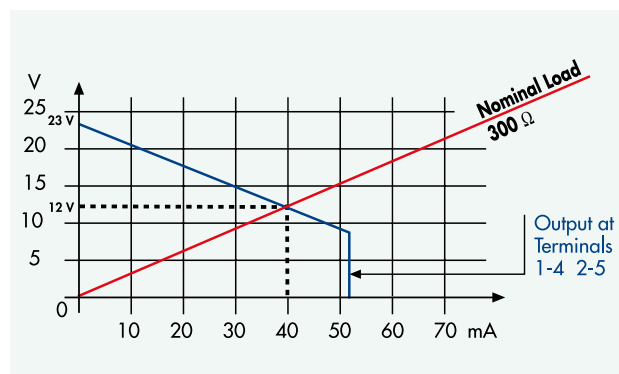
LED INDICATORS: Power ON (green). Output status (yellow, per channel). Line fault (red, per channel).

FAULT OUTPUT: Open collector transistor. (common to both channels).

- Single (2873) and Dual (2874) channel.
- Bus Powered.
- Fault bus output.



Output Characteristic



Safety Description	Maximum External Parameters				
	GROUPS		Co	Lo	L/R
	CENELEC	USA	(μF)	(mH)	(μH/Ω)
Vo = 26.25 V	II C	A-B	0.097	3	50
Io = 110 mA	II B	C-E	0.74	11	200
Po = 720 mW	II A	D-F-G	2.51	22	400

NOTE: when both channels of HiD2874 are operated in normally energised condition, either the load must be reduced or increased spacing/ventilation be applied to reduce the temperature rise. Contact Pepperl + Fuchs Elcon for guidance, or consult the Instruction Manual for more details.



HiD2000 I.S. ISOLATOR RANGE



2875/2876

SOLENOID/ALARM DRIVER,
LOOP OR BUS POWERED

Application

Energises intrinsically safe solenoid valves, alarm sounders, displays or LED indicators in a Hazardous Area from a loop powered Safe Area control signal, or controlled by a Safe Area switch contact or transistor. An alternative low current output is available for driving a single LED without installing an external current limiting resistor. Each channel can be loop-powered, ensuring high integrity operation and permitting current monitoring for detection of line fault. Status of each channel is signalled by an LED. Similar to HiD2871/2872 but with $I_o = 93$ mA.

Specification

Hazardous Area Signal (output)

OUTPUT CHARACTERISTIC: see diagram below.

RESPONSE TIME (AT 300 Ω LOAD): Turn-on time 1 msec. Turn-off time 8 msec. Max. operating frequency 50 Hz.

Safe Area Signal (input)

INPUT CURRENT: 30 mA with open output. 70 mA with 300 Ω load. 80 mA with shorted output.

POWER DISSIPATION: 1.2 W at 24 V, 300 Ω load (per channel).

LOOP POWERED:

INPUT VOLTAGE: Powered by the loop, 21 - 30 Vdc, reverse polarity protected.

INRUSH CURRENT: 1A, 0.5 msec.

BUS POWERED:

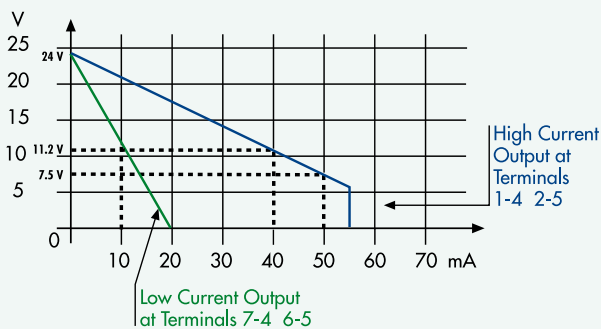
CONTROL SIGNAL: Voltage free contact or open collector. Output on with contact close or transistor on. Output off with contact open or transistor off.

SELECTOR SWITCHES: Loop powered. Bus powered with control. Loop power with control.

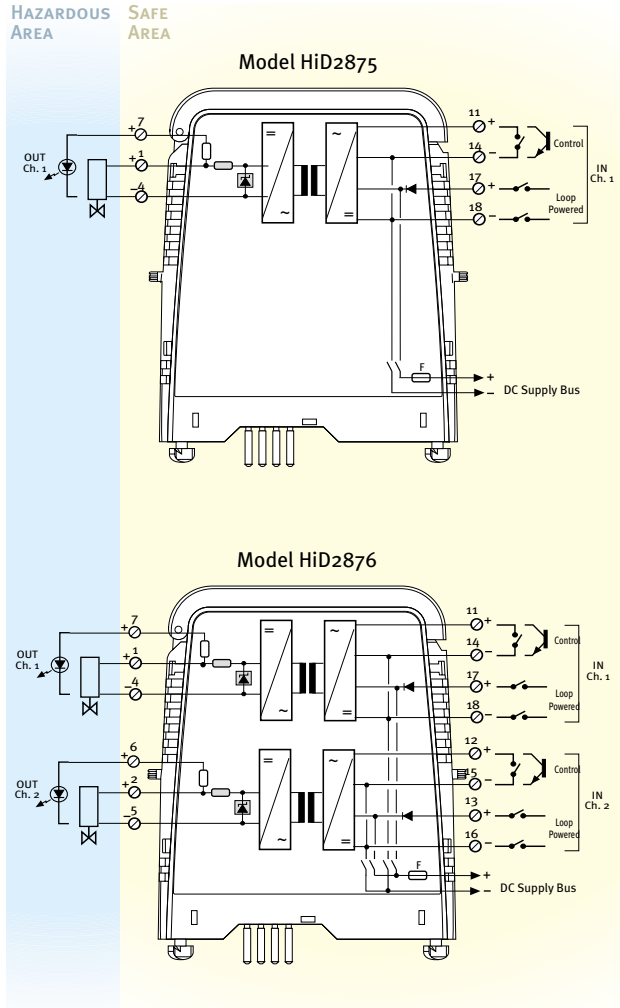
FACTORY SET AS: Bus Power with control.

LED INDICATORS: Bus or Loop Power on (green per channel) output status (yellow, per channel).

Output Characteristic



- Single (2875) and Dual (2876) channel.
- Loop or bus powered operation.
- Low current output for LEDs.
- $I_o = 93$ mA Safety Parameter.
- Dual input drive for DCS and/or ESD control.



Safety Description	Maximum External Parameters				
	GROUPS CENELEC	USA	Co (μF)	Lo (mH)	L/R (μH/Ω)
$V_o = 26.25$ V	II C	A-B	0.097	4.1	58
$I_o = 93$ mA	II B	C-E	0.74	16.5	230
$P_o = 610$ mW	II A	D-F-G	2.51	33	470

NOTE: when both channels of HiD2876 are operated in normally energised condition, either the load must be reduced or increased spacing/ventilation be applied to reduce the temperature rise. Contact Pepperl + Fuchs Elcon for guidance, or consult the Instruction Manual for more details.



HID2000 I.S. ISOLATOR RANGE



2877/2878

SOLENOID/ALARM DRIVER,
BUS POWERED

Application

Energises intrinsically safe solenoid valves, alarm sounders or displays in a Hazardous Area controlled by a Safe Area contact, transistor or logic-level signal.
Line faults (open and shorted) can be detected and signalled by LED and fault output signal. Status of each channel is signalled by an LED.
Similar to HiD2873/2874 but with $I_o = 93$ mA.

Specification

DC Supply

CURRENT CONSUMPTION: 60 mA at 24 V, 300 Ω load (per channel).

POWER DISSIPATION: 1 W at 24 V, 300 Ω load (per channel).

Hazardous Area Signal (output)

OUTPUT CHARACTERISTIC: see diagram below.

RESPONSE TIME (AT 300 Ω LOAD): Turn-on time 1 msec. Turn-off time 2 msec. Max. operating frequency 250 Hz.

Safe Area Signal (input)

CONTROL INPUT: External switch (dry contact or open collector) non isolated or logic level input fully floating.

OPERATION MODE: Output on with contact close, transistor on or logic level > 4 V. Output off with contact open, transistor off or logic level < 1.5 V.

NOMINAL LOAD: $> 100 \Omega$ to < 5 K Ω .

SHORT WIRE FAULT DETECT: $< 25 \Omega$ typical.

OPEN WIRE FAULT DETECT: > 100 K Ω typical.

FAULT DETECT CURRENT: 4 mA typical.

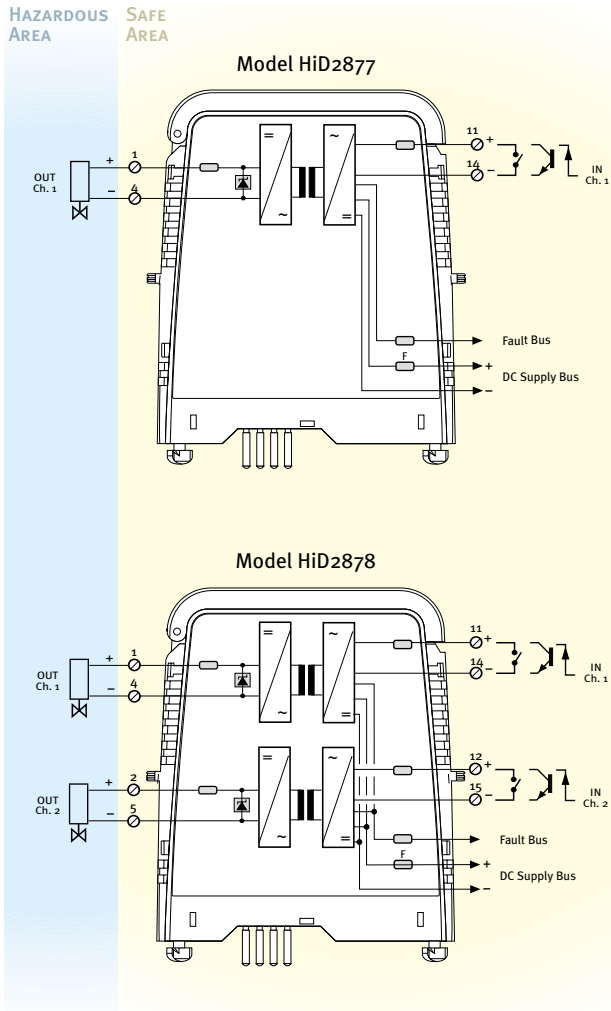
SELECTOR SWITCHES: Input logic level (fully floating). Input dry contact or open collector.

FACTORY SET AS: Input dry contact.

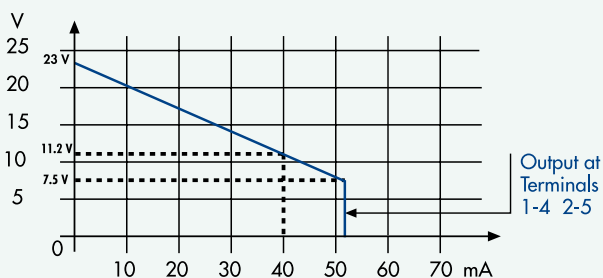
LED INDICATORS: Power ON (green). Output status (yellow, per channel). Line fault (red, per channel).

FAULT OUTPUT: Open collector transistor (common to both channels).

- Single (2877) and Dual (2878) channel.
- Bus powered.
- Fault bus output.
- $I_o = 93$ mA Safety Parameter.



Output Characteristic



Safety Description	Maximum External Parameters				
	GROUPS		Co	Lo	L/R
	CENELEC	USA	(μ F)	(mH)	(μ H/ Ω)
$V_o = 26.25$ V	II C	A-B	0.097	4.1	58
$I_o = 93$ mA	II B	C-E	0.74	16.5	230
$P_o = 610$ mW	II A	D-F-G	2.51	33	470

NOTE: when both channels of HiD2878 are operated in normally energised condition, either the load must be reduced or increased spacing/ventilation be applied to reduce the temperature rise. Contact Pepperl + Fuchs Elcon for guidance, or consult the Instruction Manual for more details.



HiD2000 I.S. ISOLATOR RANGE



2881

SOLENOID/ALARM DRIVER, LOOP OR BUS POWERED, IIB OUTPUT

- Single channel.
- Loop or bus powered operation.
- High output power for IIB gas group.
- Line fault detection.
- Separate fault output.
- Dual input drive for DCS and/or ESD control.

Application

Energises intrinsically safe solenoid valves in a Hazardous Area controlled by a Safe Area contact, transistor or logic level. A further programming mode allows the unit to be totally control loop powered ensuring high integrity operation. Line faults (open and short) can be detected and signalled by a LED, a fault bus output signal and an isolated transistor which is energised in case of fault. The high output power (60 mA at 13 V) is suitable for Gas Group IIB and IIA (Cenelec) or C-D (USA).

Specification

DC Supply (Bus Powered Mode)

CURRENT CONSUMPTION: 80 mA at 24 V, 300 Ω load.

POWER DISSIPATION: 1,3 W at 24 V, 300 Ω load.

HAZARDOUS AREA SIGNAL (output)

OUTPUT CHARACTERISTIC: see diagram.

RESPONSE TIME (AT 300 Ω LOAD): Turn-on time 2 msec. Turn-off time 8 msec. Max. operating frequency 50 Hz.

Safe Area Signal (input)

LOOP POWERED:

INPUT VOLTAGE: Powered by the loop, 21 - 30 Vdc, reverse polarity protected.

INRUSH CURRENT: 1A, 2 msec.

BUS POWERED:

CONTROL INPUT: external switch (dry contact or open collector) non isolated or logic level input fully floating.

OPERATION MODE: Output on with contact close, transistor on or logic level > 4 V. Output off with contact open, transistor off or logic level < 1.5 V.

NOMINAL LOAD: >100 Ω to < 5 K Ω.

SHORT WIRE FAULT DETECT: < 25 Ω typical.

OPEN WIRE FAULT DETECT: >100 KΩ typical.

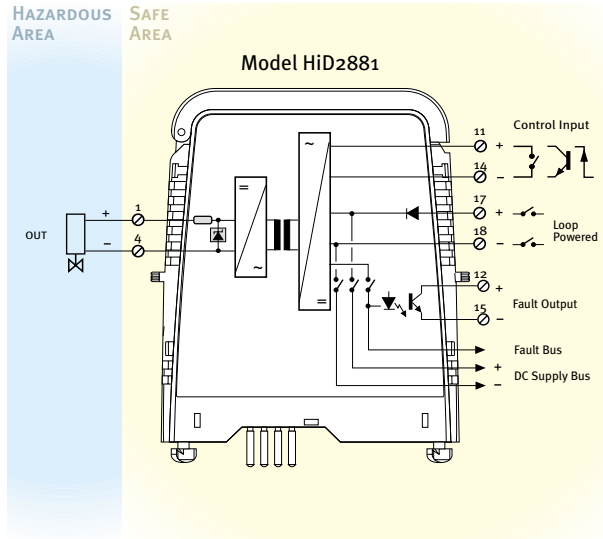
FAULT DETECT CURRENT: 4 mA typical.

SELECTOR SWITCHES: Loop powered or bus powered. Input logic level (fully floating). Input dry contact or open collector. Fault output enable/disable.

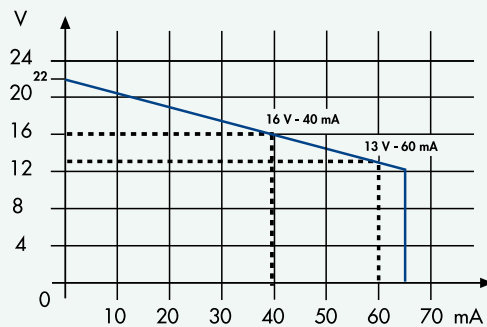
FAULT OUTPUT: Open collector transistor on common bus and optocoupled transistor (rating 30 V, 50 mA Max.).

LED INDICATORS: Power ON (green). Output status (yellow). Line fault (red).

FACTORY SET AS: Bus powered, Input dry contact, fault output enable.



Output Characteristic



Safety Description	Maximum External Parameters				
	GROUPS		Co	Lo	L/R
	CENELEC	USA	(μF)	(mH)	(μH/Ω)
Vo = 26.24 V	II B	C-E	0.5	4.5	127
Io = 184 mA	II A	D-F-G	1.9	8.5	241
Po = 1.2 mW					



HiD2900 SIGNAL REPEATERS



2900/2900^{TOP}

SIGNAL "PASS-THROUGH"
FOR ANALOG & DIGITAL I/O

Application

HiD2900 provides a "pass-through" function for non-IS signals into and out of a control system using the terminals (FCT or FCKE) on a non-IS termination board or using the HiD2900^{TOP} which features a connector on the top of the module to ensure cable segregation.

Each channel can be configured via DIP switch to simply pass through a input or output signal and also for the powering a field device using the power supply of the termination board.

A 250 Ohm load resistor can also be user selected to covert a 4-20 mA signal into 1-5 V.

Specification

DC Supply

MAXIMUM CURRENT: 75 mA (per channel).

MAXIMUM VOLTAGE: 30 V dc each channel.

Connections

HiD2900

FIELD: Termination board, non-IS.

CONTROL: Termination board, or IAC.

HiD2900^{TOP}

FIELD: Top Connector.

CONTROL: Termination board, or IAC.

CONNECTOR: 4 pole plug-socket, with retaining screws.

CONDUCTOR: Up to 1.5 mm² (16 AWG).

General

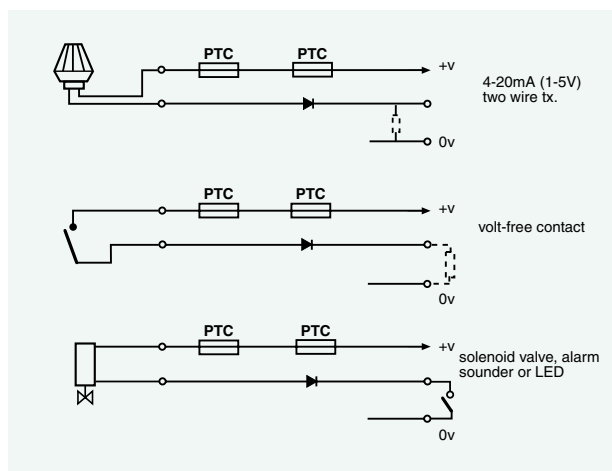
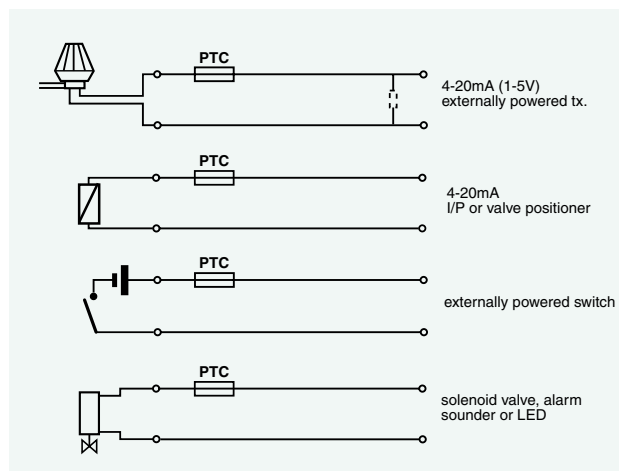
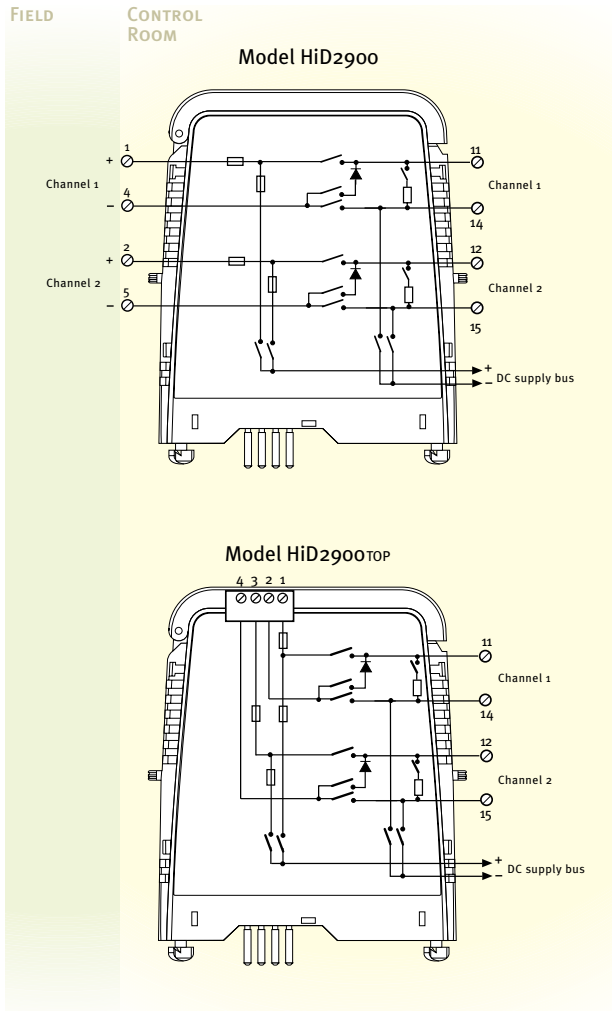
Over current protection by resettable fuse (PTC).

SELECTOR SWITCHES: Pass through, mA or V. Field supply. Load resistor 250 Ohm, 0.1%.

FACTORY SET AS: Pass through.

LED INDICATORS: None.

- Dual channel module.
- Analog or digital signals.
- Terminal board (2900) or,
- Top connections (2900^{TOP}) for cable segregation.
- Power feed to field terminals.



HiD2900 SIGNAL REPEATERS



2942/2942TOP

SWITCH SIGNAL REPEATER,
OPEN COLLECTOR OUTPUT

Application

This module enables the connection of voltage-free contacts or logic-level signals into a control or monitoring system, using the terminals on a non-IS termination board (HiD2942) or using a connector on the top of the module (HiD2942TOP).

Each channel monitors the state of the field contact or voltage input and drives two solid-state (open-collector) outputs for connection to the control or monitoring system.

An LED for each channel indicates the output status.

Specification

DC Supply

VOLTAGE: 20.4 V to 30 Vdc.

CURRENT CONSUMPTION: 10 mA at 24 V, transistor close (per channel).

POWER DISSIPATION: 0.3 W at 24 V (per channel).

Connections

HiD2942

FIELD: Termination board, non-IS.

CONTROL: Termination board, or IAC.

HiD2942TOP

FIELD: Top Connector.

CONTROL: Termination board, or IAC.

CONNECTOR: 4 pole plug-socket, with retaining screws.

CONDUCTOR: Up to 1.5 mm² (16 AWG).

Input Signal

INPUT: Volt-free contact or logic-level (24 Vdc).

OPERATING MODE: Output on with contact closed or logic level >15 V.
Output off with contact open or logic level <12 V.

Output Signal

OUTPUT: Two optocoupled transistors per channel.

RATING: 30 Vdc, 50 mA (zener protected for inductive load).

LEAKAGE: 500 µA max. (100 µA typical).

SATURATION VOLTAGE: Maximum 1 V.

RESPONSE TIME: 150 µsec, (2 KHz max. frequency).

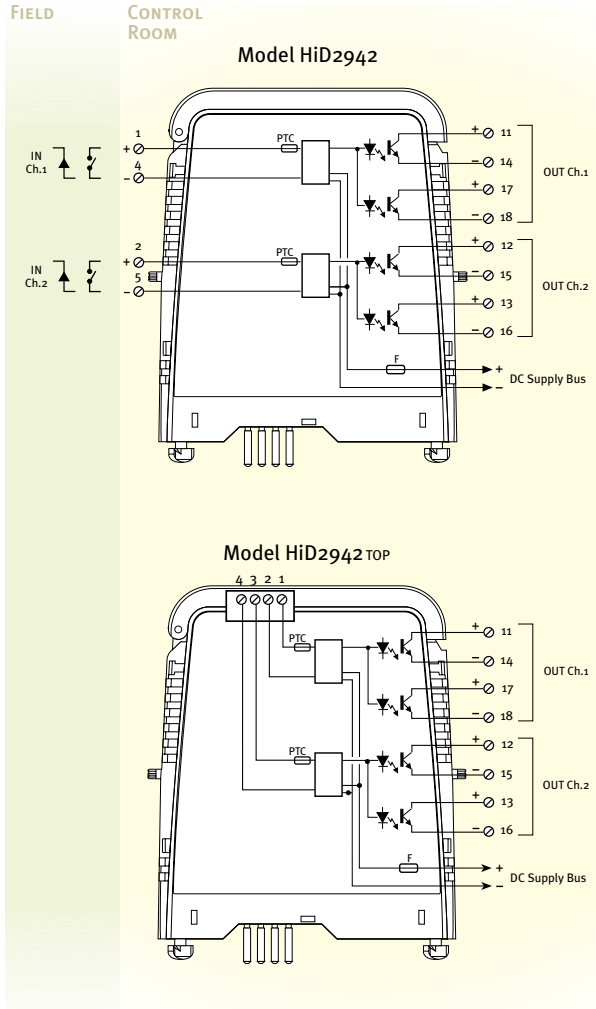
General

SELECTOR SWITCHES: Voltage-free contact or logic-level.

FACTORY SET AS: Voltage-free contact.

LED INDICATORS: Output status (yellow, per channel).

- Dual channel module.
- Volt-free contact or logic level input.
- Terminal board (2942) or,
- Top connections (2942TOP).
- Two outputs from each channel.



HiD2900 SIGNAL REPEATERS

2962/2962^{TOP}

CONTACT ACTUATOR

Application

This module provides a voltage free contact into the field operated by a control or monitoring system, using the terminals on a non-IS termination board (HiD2962) or using a connector on the top of the module (HiD2962TOP).

Bus power or loop power can be selected for each channel. The use of loop power to drive the channel ensures high integrity control operation. Further operating modes enable the "AND" combination of the control input with either bus or loop power.

An LED for each channel indicates the output status.

Specification

DC Supply

VOLTAGE: 20.4 V to 30 Vdc.

CURRENT CONSUMPTION: 15 mA at 24 V, (per channel).

POWER DISSIPATION: 0.8 W at 24 V (per channel).

Connections

HiD2962

FIELD: Termination board, non-IS.

CONTROL: Termination board, or IAC.

HiD2962TOP

FIELD: Top Connector.

CONTROL: Termination board, or IAC.

CONNECTOR: 4 pole plug-socket, with retaining screws.

CONDUCTOR: Up to 1.5 mm² (16 AWG).

Input / Control Signal

INPUT: Volt-free contact, open collector or logic-level output on with contact closed.

LOOP POWER: 21-30 Vdc, reverse polarity protected.

Output Signal

HiD2962:

One SPDT relay per channel contact rating 50 Vdc, 100 mA, PTC protected.

HiD2962TOP:

One SPST relay per channel contact rating 50 Vdc, 100 mA, PTC protected.

FUNCTION: volt-free relay contact or linked to bus power.

RESPONSE TIME: <100 msec.

General

SELECTOR SWITCHES: Loop powered. Bus powered with control. Loop powered with control. Field powered (+24 V, GND).

FACTORY SET AS: Bus powered with control, Voltage-free contact.

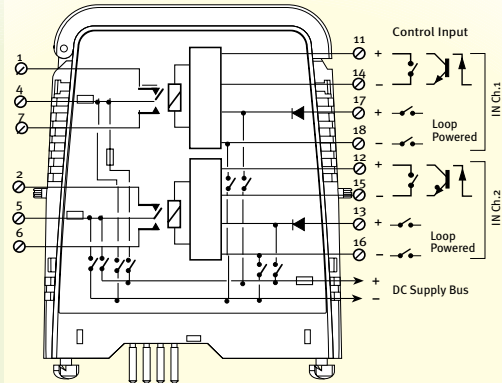
LED INDICATORS: Output status (yellow, per channel).

- Dual channel module.
- Loop or bus powered operation.
- Terminal board (2962) or,
- Top connections (2962^{TOP}).

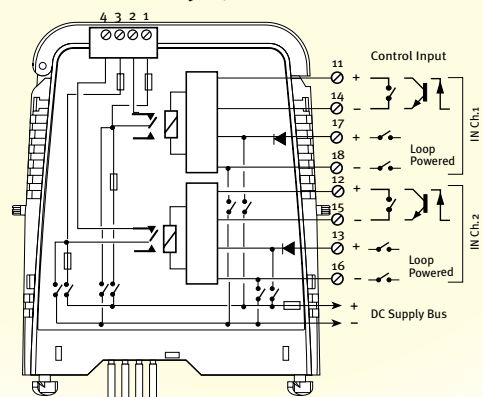
FIELD

CONTROL ROOM

Model HiD2962



Model HiD2962/TOP



HART® MULTIPLEXER

Mux2700

32 CHANNEL HART® MULTIPLEXER

Application

The Mux2700 HART® Multiplexer provides 32 signal channels for connection to "smart" transmitters or control devices supporting digital communication according to the HART® standard. Alternatively up to 16 HART® only (i.e. no 4-20mA signal) devices can be connected to each channel in multidrop configuration. Full three-port isolation is included and each input channel has dual capacitor isolation for freedom of loop connection. It acts as a gateway between a workstation - typically a PC with suitable PAM software - and the field instrumentation. Each Mux2700 is networked simply by connecting the high-speed RS485 output in multidrop configuration. The Mux2700 interrogates each field device, under the supervision of the workstation, retrieving information for storage in its internal database, which can then be accessed at ease.

Specification

DC Supply

CURRENT CONSUMPTION: 28 mA at 24 V typical, RS485 quiescent.

POWER DISSIPATION: 0.7 W at 24 V.

Signal Channels

NUMBER OF CHANNELS: 32.

DC ISOLATION: dual capacitor each channel.

COMMON MODE VOLTAGE: up to 30 V.

DIFFERENTIAL MODE CLAMPING: ± 5.2 V (for transient or ac signals).

COMMON MODE CLAMPING: ± 10 V (for transient or ac signals).

RECEIVE SIGNAL RANGE: 0.12 Vpp < signal < 1.5 Vpp.

RECEIVE IMPEDANCE: > 5000 ohms.

CARRIER DETECT LEVEL: signal > 0.12 Vpp, CD asserted.
signal < 0.08 Vpp, CD not asserted.

TRANSMIT AMPLITUDE: 200 Ω load - 0.43 Vpp < signal < 0.49 Vpp.
500 Ω load - 1.1 Vpp < signal < 1.2 Vpp.

DEVICE TYPE: secondary device.

IMPEDANCE LEVEL: high impedance device.

DATA LINK TYPE: HART® primary or secondary.

FIELD MULTI-DROP SUPPORT: option available upon request.

NOTE: the Mux 2700 generally complies with the HART® FSK Physical Layer Specification Rev. 8.0 available from the HART® Communication Foundation. HART® is a registered trademark of the HART® Communication Foundation.

Galvanic Isolation Specifications

24 V SUPPLY/FIELD CHANNELS: 1400 Vac, rms.

24 V SUPPLY /RS-485 SERIAL PORT: 1400 Vac, rms.

RS-485 SERIAL PORT/FIELD CHANNELS: 500 Vac, rms.

Serial Port

LINE TYPE: RS-485, differential pair plus ground.

LINE SPEED: 9600 or 19200 Baud, switch selectable.

LINE TOPOLOGY: multi-point, master-slave connection.

UNIT ADDRESS: 1 to 31, switch selectable.

Selector Port

SW1-SW5: Unit slave address.

SW6-SW7: Baud rate.

SW8: Test mode.

LED Indicators

POWER ON: green.

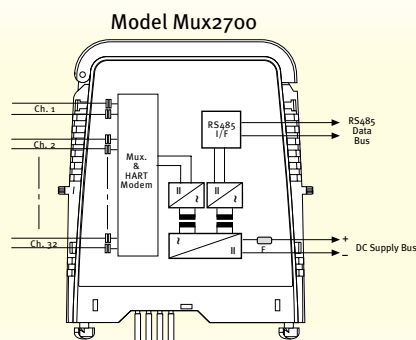
HART® TRANSMISSION: yellow.

FAULT: red.

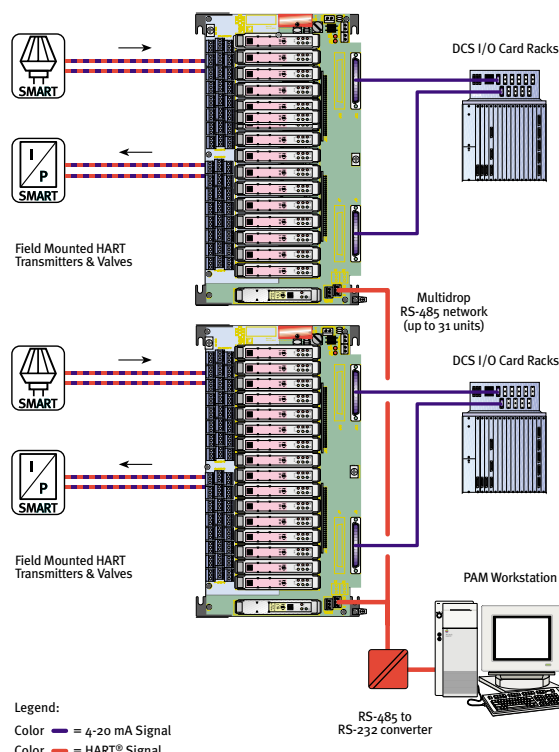
- 32 channel input.
- RS485 serial data connection.
- Communicate with HART® Transmitters and HART® I/P Valve positioners.
- No complicated master/slave configuration.
- Channel to channel isolation.



SAFE AREA OR HAZARDOUS AREA ZONE 2 (IEC60079-14)



HID2000 Intrinsic Safety Isolator with integral HART Mux



MUX2700 DESIGN FEATURES & MOUNTING OPTIONS

Special Design Features

High Specification Front end Design

Two Decoupling Capacitors are provided, one for each signal connection. Both +Ve (positive) & -Ve (negative) signal wires are therefore decoupled from DC signal. Only the high frequency digital HART® protocol signal passes through to the internal Multiplexer circuitry.

Failure of any one capacitor from either a short circuit or open circuit means that availability of 4-20 mA control signal will not be affected.

- No DC loading of 4-20 mA Control Signal.
- No single point of failure.
- High Noise Immunity.

The max 30 Vdc input voltage (specified between all terminals, both belonging to the same channel or not) makes it possible to connect any MUX terminal to whatever voltage level can be derived from a 24 Vdc supply, +20% tolerance included.

Three-Port Isolation

The three-port isolation structure of the MUX2700 is depicted in the previous page. As you can see, both the 24 V supply input and the RS-485 serial interface are isolated from the HART® section, i.e. from the HART® signals on the field devices.

This is full galvanic isolation, implemented either by transformer or by optocoupler.

Self Contained Architecture

Each Multiplexer module is a stand alone device containing all necessary hardware to communicate with up to 32 HART® protocol enabled Field Devices and a host PC via RS485.

- Fast Polling.
- One module design.
- RS485 direct from module.
- No communications bottleneck.
- Ideal for valve diagnostics.

Wide Software Compatibility

Fully compatible with F-R AMS (Ver 5.0 is also an OPC server), ValveLink, and Cornerstone.

Additional compatibility extends to HART® OPC server software available from HCF (HART® Communication Foundation). Allowing users to write dedicated applications for their specific needs.

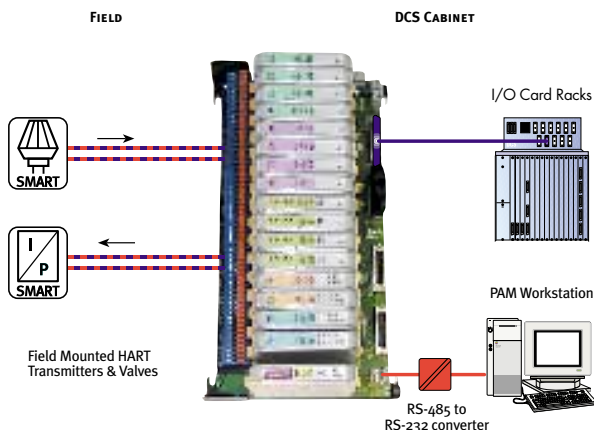
Fully tested, by all key PAM vendors.

Mux2700 Mounting Options

HiD2000 with Integrated HART® Mux2700

- Fully integrated Intrinsic Safety and HART® Mux.
- Replaces DCS, ESD or PLC field Termination panels.
- Total integrated solution with minimal interconnections.

Termination boards with 2116/..../....-HART in the model number identifies that this board includes a position to mount an integral Mux2700.

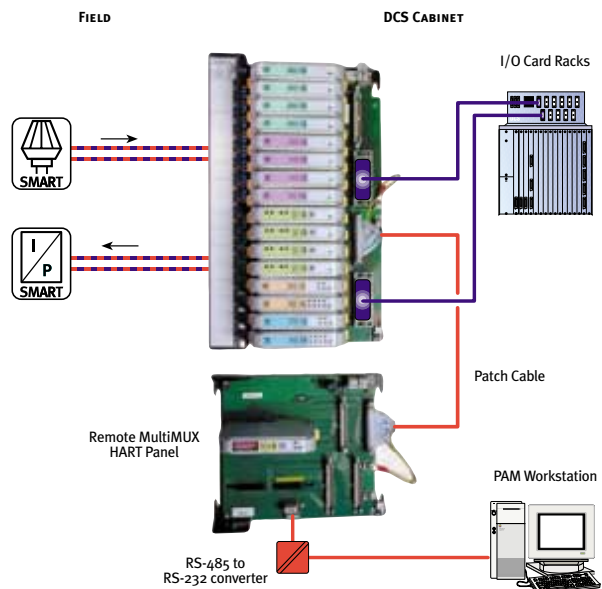


Legend:
 Color — = 4-20 mA Signal
 Color — = HART® Signal

HiD2000 with Remote HART® Mux2700

- Retro-fit existing installations by adding a remote HART® Panel.
- Use when the termination board height is critical, as the HART® panel can be mounted in another location.

Termination boards with 2116/..../....-H in the model number identifies that this board includes a HART patch cable connector to plug to a remote HART® panel.



GENERAL SPECIFICATION & APPROVALS

General Specification

A range of plug-in isolator modules with intrinsically safe connections for hazardous-area signals and standard connections for general purpose signals, mounting on termination boards with screw-clamp or multi-way safe-area connectors.

Reference conditions

TEMPERATURE: 23 °C (74 °F).

RELATIVE HUMIDITY: 50%.

NOMINAL SUPPLY VOLTAGE: 24 Vdc.

LOAD WHERE APPLICABLE: 250 Ω.

FULL SCALE VALUE: 20 mA.

Power supply (module)

24 V dc -15%, +25%, (20.4 V to 30 Vdc).

Modules individually fused.

Termination boards have redundant power connections with fuse suitable for customer replacement.

Environmental conditions limits

OPERATING TEMPERATURE: 0 to 60 °C, (32 to 140 °F).

STORAGE TEMPERATURE: -20 to 70 °C, (-4 to 158 °F).

RELATIVE HUMIDITY: 5 to 90% non condensing, up to 35 °C (95 °F).

Isolation

1500 VRMS - Field side to control side.

500 VRMS - Field side to field side channels.

250 VRMS - Control side input - output circuits to supply circuit (where applicable).

Location

Safe area mounting.

Electromagnetic Compatibility

Conform to EU standards EN 50081-2, EN 50082-2.



Mounting

Terminal boards are surface fixing with option for single DIN rail by the use of accessories. Modules plug-in, no tools required for replacement.

MODULES: See detailed specification. HiD2000 Common to all relevant modules is the provision of a separate fault output which is bussed on the termination boards to provide a collective alarm signal per interface assembly. HiD2900 available with field connections through termination boards or with TOP entry field connections.

TERMINAL BOARDS: See detailed specification. Standard range comprises 8, 12 and 16 position boards in both screw-clamp and multi-connector forms, with cross-wiring and loop-disconnect options.

PROTECTION CLASS: IP rating (IEC 529).

Module: IP 30. Board: IP 20 with module inserted.

WEIGHT: Module approximately 140 gms.

TB 2108 approximately 1000 gms.

TB 2108 CW approximately 1050 gms.

TB 2112 approximately 1300 gms.

TB 2116 approximately 1600 gms.

TB 2116 CW approximately 2000 gms.

CASE MATERIAL: Polycarbonate.

CASE FIRE PROTECTION CLASS: V2 according to UL 94 Std. (When not otherwise stated, modules specifications are typical at reference conditions).

Ordering Information

Series HiD2000 Isolator modules and termination boards are available with standard factory settings (as detailed in this brochure)

Model No. Example:

HiD2026: dual channel repeater power supply module.

2116/HAKE/SACON-HART: 16 position terminal board with terminals for hazardous and connector for safe area.

2116 = 21 series number - **16** I/O module positions.

HAKE = Hazardous **A**rea **K**nife **E**dge terminals with integral test jacks.

SACON = Safe **A**rea **C**ONnector, 37 pin female sub-D connector.

HART = Position for mounting optional Mux2700 **HART**® Multiplexer.

A custom configuration and calibration service can be provided for an additional charge - contact your local Pepperl+Fuchs representative.

Approvals

AUTHORITY	CERTIFICATE/ FILE NO.	STANDARD	MARKING
CESI	EX-97.D.054 EX-97.D.055 EX-97.D.056	EN 50.020 EN 50.014	[EEx ia] IIC/IIB
CSA	Approved	C 22.2 No. 157 C 22.2 No. 142	Cl. I, II, III; Div 1; Gr.A to G
FM Approved	Approved	FM Cl. No. 3610 Entity FM Cl. No. 3600	Cl. I, II, III; Div 1; Gr.A to G
SCS	EX 97Y4109X	BS 6941:1988	Ex N IIC T4
SAA SAA	Ex 2389X	AS 2380.1 AS 2380.7	[Ex ia] IIC
NEPSI	GY98140	GB3836.1-83 GB3836.4-83	Ex (ia) IIC
CCVE IGD	05.B00272	GOST 12.2.007.0-75 GOST P 51330.10-99	Ex ia IIB X Ex ia IIC X
FTZÜ	00 EX 0533 00 EX 0537	CSN EN 50014 CSN EN 50020	II (1) G [EEx ia] IIC/IIB

Pepperl+Fuchs Elcon continually improves product development. Therefore specifications may change without notice.

TERMINATION BOARD & MODULE SPECIFICATION

Mounting:

Surface mounting by front accessible screws (max 6 mm dia.), or clamp directly onto symmetrical 35 mm rail to DIN 46277, EN50022, through DINK kit.

Input (field) terminals:

Screw (../HAT/..) → for I.S. application (blue)

(../FCT/..) → for non I.S. application (grey)

compression type, directly accept solid or braided conductors.

9 terminals per position (8 signal + 1 screen), conductor size up to 2.5 mm² (12 AWG).

Suitable for use with all module types.

Loop-disconnect (../HAKE/..) → for I.S. application (blue)

(../FCKE/..) → for non I.S. application (grey)

compression type, directly accept solid or braided conductors, similar to the Weidmüller SAK Series.

4 terminals per position conductor size up to 2.5 mm² (12 AWG).

Nominal current 15 A. Each terminal connection can be “open-circuited” and test-points (for 2.3 mm banana plugs) are integrated into the terminal.

Suitable for use with all 1 and 2 channel modules, except:

- Temperature inputs Mod. HiD2061, HiD2062, HiD2071, HiD2072.
- AI Mod. HiD2029, HiD2029SK, HiD2030, HiD2030SK with sink mA input.
- DO Mod. HiD2871, HiD2872, HiD2875, HiD2876 with LED output.

Output (control room) terminals:

Screw (../SAT) - compression type, directly accept solid or braided conductors.

9 terminals per position (8 signal + 1 screen), conductor size up to 2.5 mm² (12 AWG).

Suitable for use with all module types.

Connector (../SACON) - 37 pin D-type connector DIN 41652, female terminals, one for each 4 positions on non-CW boards, one for each 8 positions on CW boards.

Suitable for use with all module types.

Cross-wiring:

(../SACW.+) - insulation displacement type for solid conductors from 0.4 to 0.65 mm (26 to 22 AWG), accept 2 wires max per terminal.

One 4 wire block per module position with 2 wires for each channel. Cross-wiring area cover carries marking strip and forms effective cable raceway.

Suitable for use with all 1 and 2 channel modules.

- (HiD2871, HiD2872, HiD2875, HiD2876, HiD2881, HiD2962 Bus-Powered only).
- (HiD2942 first output of each channel only).

Screen Connections:

In addition to screen terminals provided at each module position where appropriate, one 4 mm² (10 AWG) terminal is provided on both hazardous (field input) and safe (output) parts of the board. Two 4 mm² terminals are provided on loop-disconnect boards.

Power Supply:

24 vdc, -15% +25%, with plug-in connectors, dual input with diode separation. Connectors accept conductors up to 2.5 mm² (12 AWG).

Primary and secondary power supplies can be connected and green LED indicates power on the board.

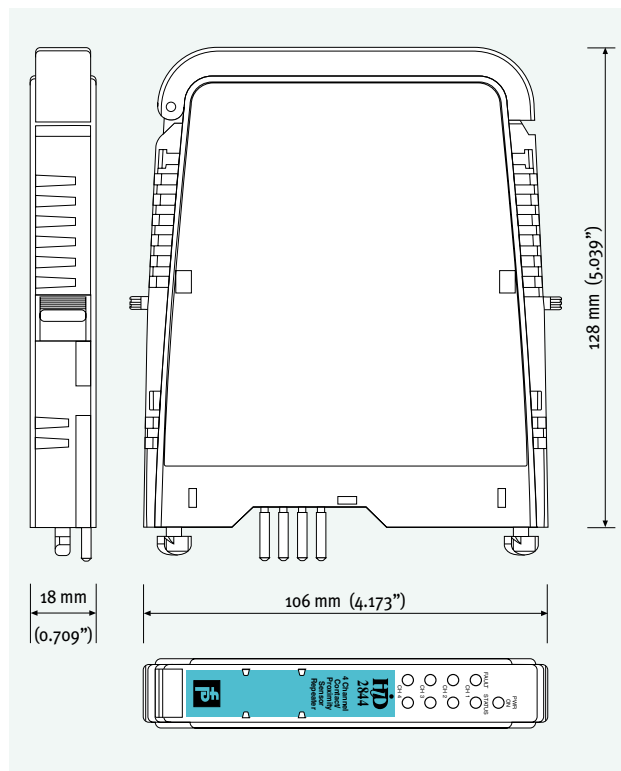
Fuse Rating:

TB type 2108, power supply fuse 2 Amp (T).

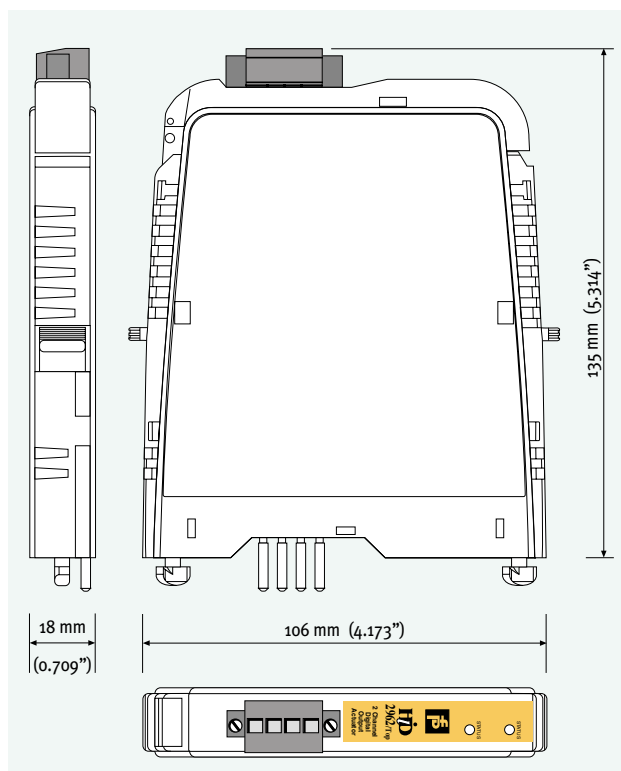
TB type 2116, power supply fuse 4 Amp (T).

TB type 2112, power supply fuse 3.15 Amp (T).

Module Dimensional Drawing

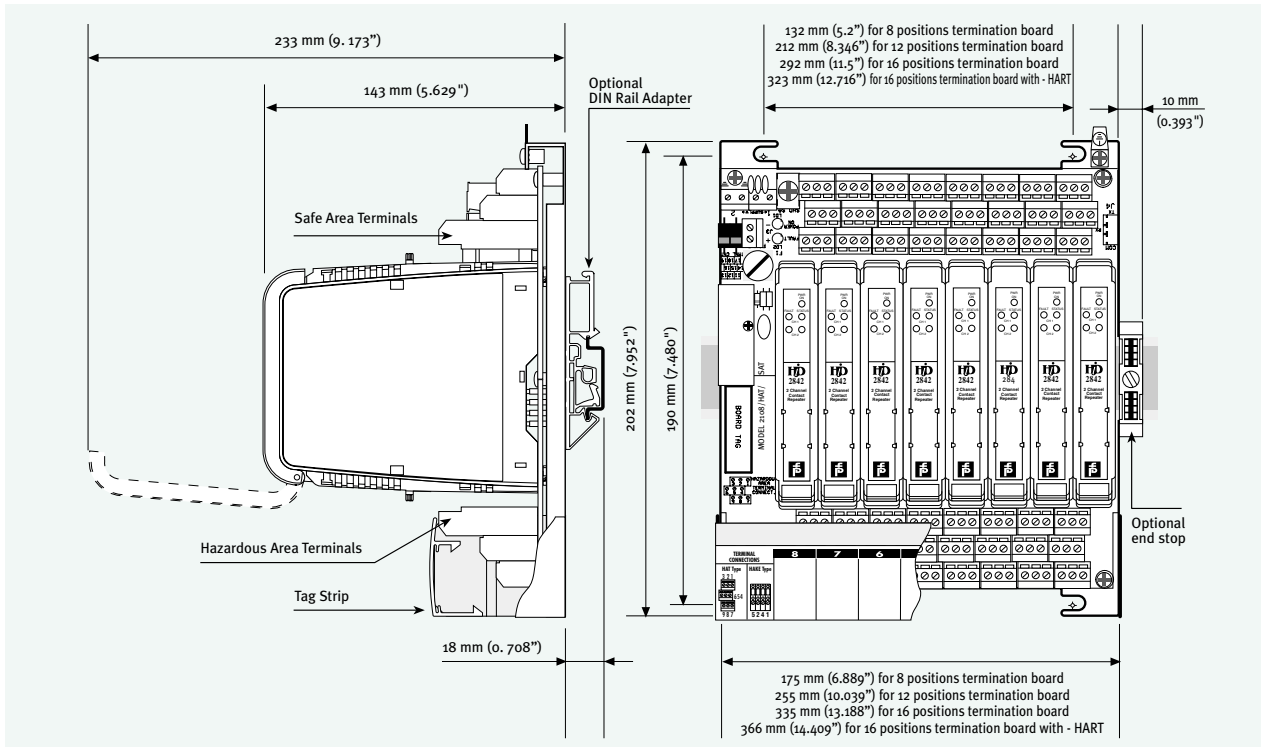


Module Dimensional Drawing "TOP"

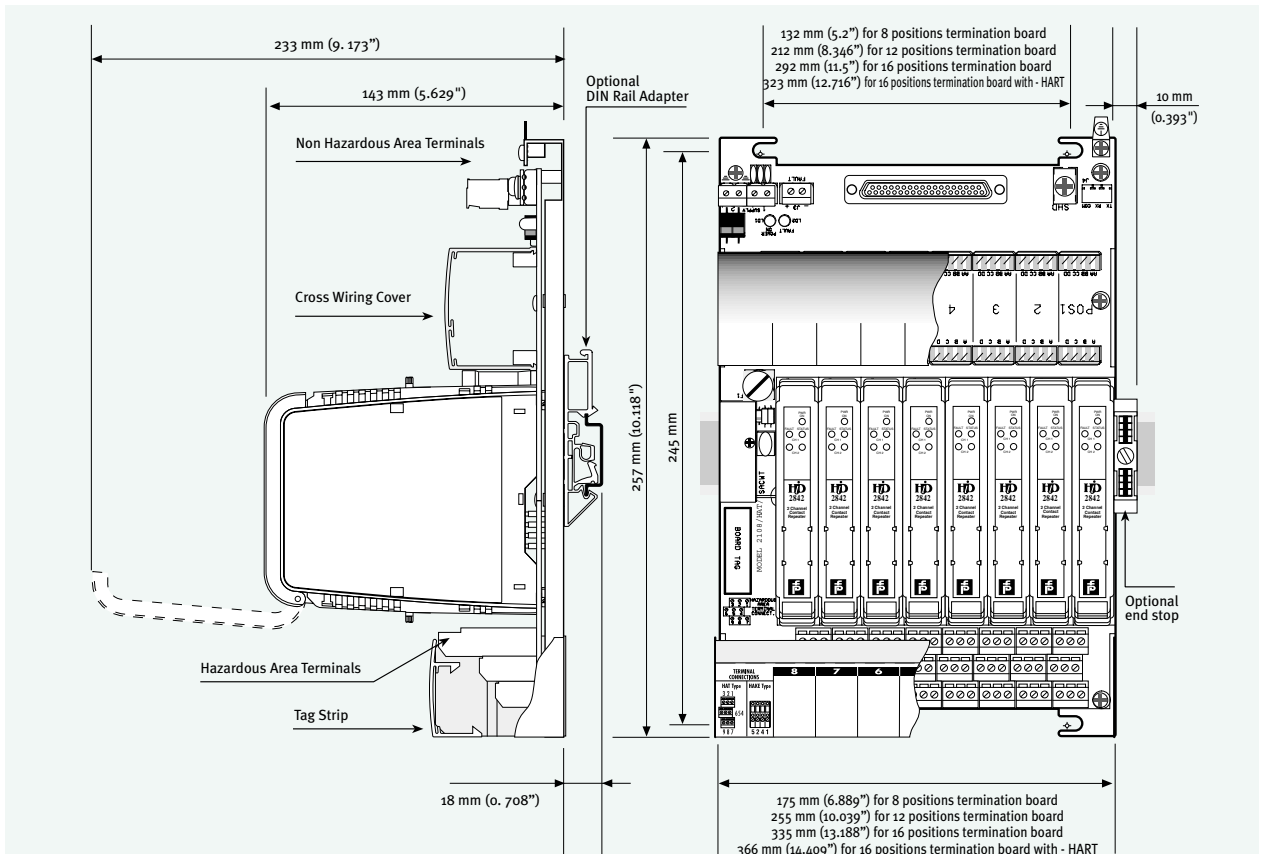


TERMINATION BOARD DIMENSIONAL DRAWINGS

Standard Non Cross-Wiring Type



Cross-Wiring Type



NOTE: when the DIN rail adapter is used to mount the board, add 18 mm to the overall depth. When using the rail end stop add 10 mm to the overall board dimension.

TERMINATION BOARD STRUCTURE & ACCESSORIES

Termination Boards

Base Model	Hazardous Area Options	Safe Area Options	Description	Suitable For Module Type
2108			8 position terminal board	ALL
2112			12 position terminal board	ALL
2116			16 position terminal board	ALL
	/HAT		Hazardous-area (blue) screw-clamp terminals	ALL
	/FCT		Non I.S. (grey) haz.-area screw-clamp terminals	ALL
	/HAKE		Hazardous-area (blue) loop-disconnect terminals	1-2 Ch. not Temperature IN
	/FCKE		Non I.S. (grey) haz.-area loop-disconnect terminals	1-2 Ch. not Temperature IN
		/SAT	Safe-area screw-clamp terminals	ALL
		/SACON	Safe-area multipole connector	ALL
		/SACWT	Safe-area cross-wiring, screw-clamp terminals	1-2 Ch. not 2871/2/5/6
		/SACWCON	Safe-area cross-wiring, multipole connector	1-2 Ch. not 2871/2/5/6
		/SAT-TWIN (16 positions only)	Safe-area screw-clamp terminals + dual output to DCS and ESD	1-2 Ch. not Temperature IN not 2871/2/5/6

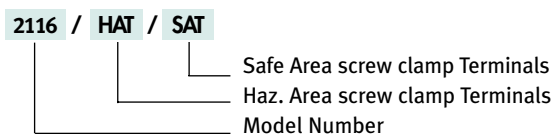
- Standard 8 position and 16 position Termination Boards, with or without the cross-wiring feature.
- Any HiD2000 interface module can be plugged into any position and module types can be mixed on a single termination board.
- Termination Board with -HART® includes a position to mount the Mux2700 HART® Multiplexer. -H includes a connector for remote mounting HART® Multiplexer.
- Optional Fault Monitor Module (MM2100) can be plugged into standard termination boards to provide composite logic output for fault signals from suitable interface modules.
- HiD2900TOP modules can be plugged onto standard HiD2000 termination boards provided that the wiring connections are separated and segregated more than 50 mm from the hazardous area wiring.

All termination boards are supplied standard with a rugged metal chassis (that can be grounded by a dedicated stud) which provide support and protection for the boards. This rigid structure allows fast and reliable mounting of the assembly within cabinets. Also included is a field wiring tagging strip and terminal cover.

Custom Termination Boards

Replace control system termination panels, by interfacing your DCS, shutdown, fire & gas and PLC system I/O cards direct to a customized HiD2000 termination board, using the standard cable sets from the control system supplier. Refer to the individual T.P.S. (Technical Products Specification) or our Website for specific details.

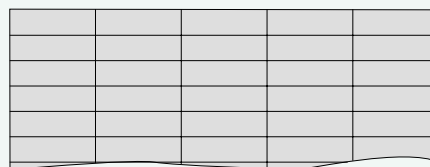
Typical Example



Part Code

Part	Description
MM2100	Fault monitor output module.
DINK1	DIN-rail mounting kit for the 2116 and 2112 termination boards.
DINK8	DIN-rail mounting kit for the 2108 termination boards.
HiD BLANK	Blank module, non-functional.
TAG2108	Tagging strip for 8 position termination board.
TAG2112	Tagging strip for 12 position termination board.
TAG2116	Tagging strip for 16 position termination board.
1301/PZ	Cross Wiring Tool.
1303/CA	Cross Wiring Wire.
PPP2000	Polarization plastic pins.
TSHT2000	Sheet of perforated tagging labels, for HiD2000 modules in DIN A4 format (92 tag each).

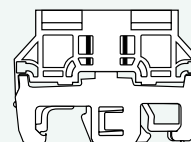
TSHT/2000



1301/PZ



DINK1 and DINK8



1 x Rail end Stop

4 x M3 Screws
(2 x M3 Screws for
the DINK8)

2 x Rail Adapter