



# Domestic Hot Water Recirculation Systems

Application, Selection & Installation Guide



## Domestic Hot Water Recirculation

### **The Problem:** **Waiting for Hot Water**

It's a common problem: turn on the faucet or shower for hot water, then wait for it to arrive. In fact, the wait can be minutes in larger homes with multiple bathrooms and long runs of pipe between the plumbing fixtures and the water heater! With a Taco Domestic Hot Water Recirculation System in place, there's no more wait. Instant hot water!



### **Waiting Means Wasting**

Waiting for hot water sends millions of gallons of cooled water down the drain each year. In fact, an average family of four wastes up to 12,000 gallons of water each year waiting for hot water.\* Water conservation is so important that many US states and municipalities routinely impose watering bans and offer rebate incentives to help conserve this natural resource.

\*Source: Dept. of Energy study.

### **Energy Down The Drain**

Of course, all that "waiting water" contains some heat energy (BTU's), even if it's only room temperature. Wasting those BTU's and starting over with fresh, cold water to heat up requires even more heat energy. So in addition to wasting water, millions of BTU's and energy dollars are wasted, too.

### **The Solution:** **Install a Taco Domestic Hot Water Recirculation (DHWR) Product**

Provide your customers with the comfort and convenience of instant hot water without the waste. Taco DHWR products are designed to meet a variety of DHWR system types, and offer customers a variety of options to control hot water delivery to faucets and showers.

### **System Types & Products**

#### **Dedicated return line piping.**

This system is provided with a dedicated return line installed between the end of the hot water supply pipe and the water heater. A circulator is installed in the piping loop to move the hot water from the tank through the supply pipe and back through the return pipe.

*Taco provides three great options for this system:*

- Plumb N'Plug®
- SmartPlus™
- TacoGenie®

#### **Piping without a return line.**

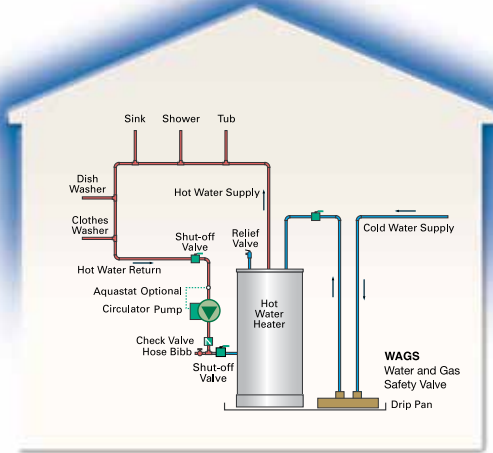
A domestic hot water system without a dedicated return line requires a "point of use" product that is typically installed at the fixture furthest from the hot water heater. The cold water supply pipe is used as the return line to the water heater.

*Taco provides three great options for this system:*

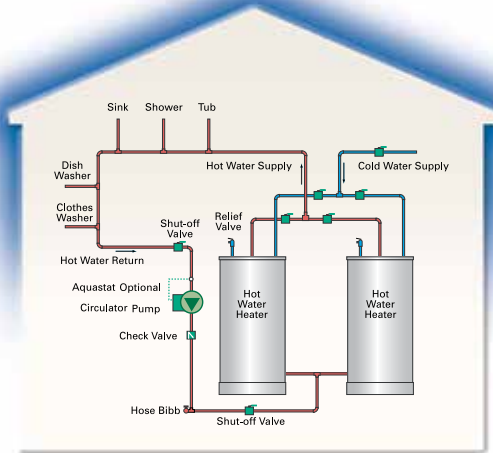
- Hot-Link® System
- Hot-LinkPlus™ System
- TacoGenie®

# Typical Installation & Piping

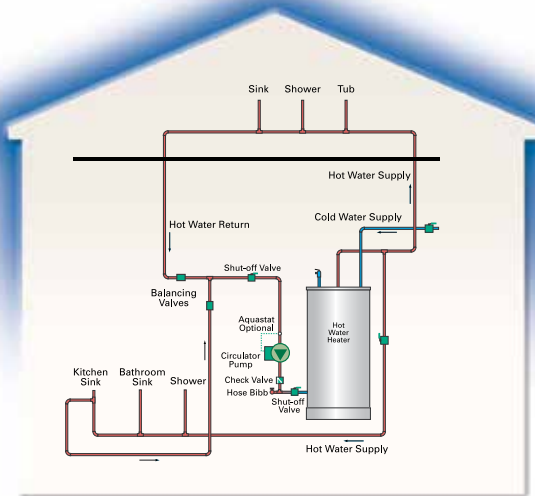
## One-Story with 1 Water Heater



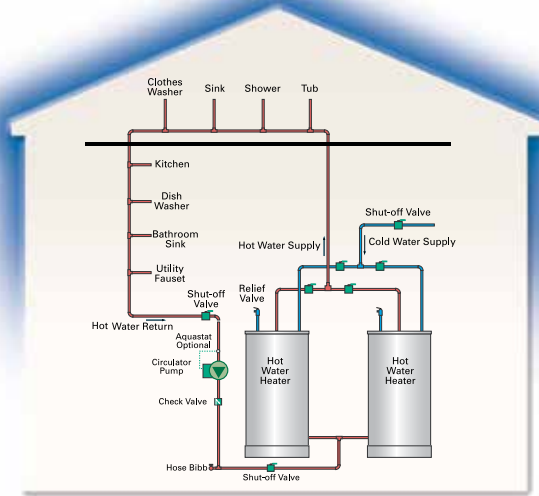
## One-Story with 2 Water Heaters



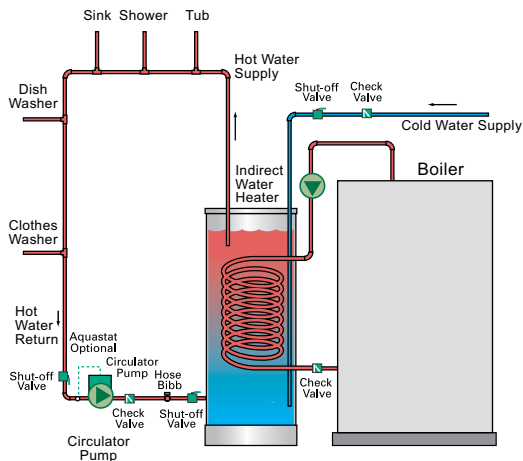
## Multi-Story with 1 Water Heater



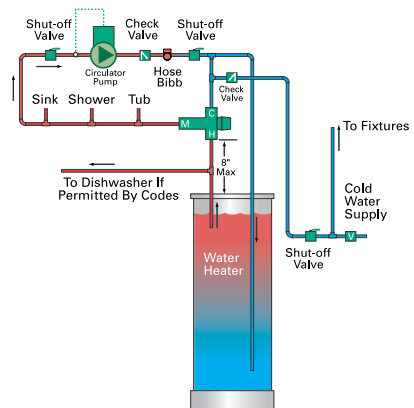
## Multi-Story with 2 Water Heaters



## Recirculation Piping with Indirect Water Heater

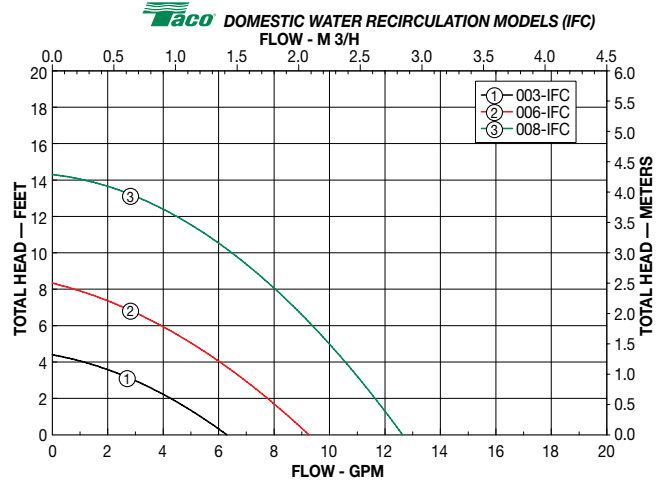
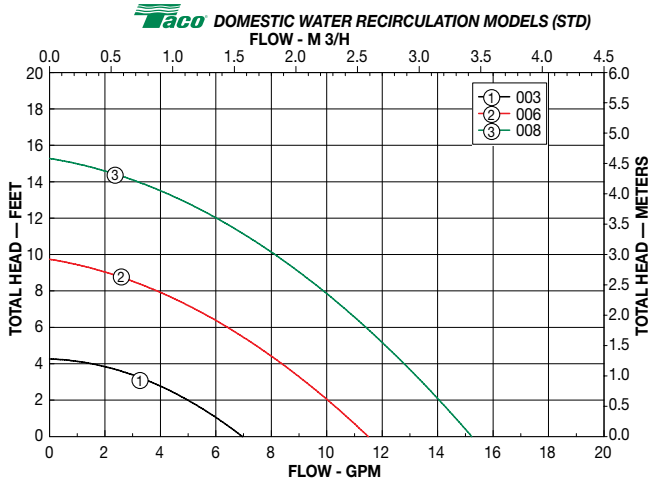


## Recirculation Piping with Storage Water Heater & Mixing Valve



# Choosing the Correct Circulator for the Job

## Performance Field Information - 60 Hz



## Pump Selection Charts

This information is provided as a guide only. Larger models are available. For larger systems, consult your local Taco representative. Find the table below that best describes the design you plan to use. Select the pump model based on the supply and return pipe length, size and pump options. Do not oversize the pump or high velocity noise and erosion corrosion of system piping may result.

### 1/2" Supply & 1/2" Return Lines

Model #	Supply Pipe Maximum Length (ft.)	Total Maximum Pipe Length (ft.)
003	50	100
006	150	300
008	275	550
003-IFC*	50	100
006-IFC*	125	250
008-IFC*	250	500

\* With Integral Flow Check

### 3/4" Supply & 3/4" Return Lines

Model #	Supply Pipe Maximum Length (ft.)	Total Maximum Pipe Length (ft.)
003	350	700
006	900	1,800
008	1,450	2,900
003-IFC*	350	700
006-IFC*	750	1,500
008-IFC*	1,350	2,700

\* With Integral Flow Check

### 3/4" Supply & 1/2" Return Lines

Model #	Supply Pipe Maximum Length (ft.)	Total Maximum Pipe Length (ft.)
003	100	200
006	275	550
008	450	900
003-IFC*	100	200
006-IFC*	275	550
008-IFC*	425	850

\* With Integral Flow Check

### 1" Supply & 1/2" Return Lines

Model #	Supply Pipe Maximum Length (ft.)	Total Maximum Pipe Length (ft.)
003	125	250
006	325	650
008	525	1,050
003-IFC*	130	260
006-IFC*	275	550
008-IFC*	500	1,000

\* With Integral Flow Check

### 1" Supply & 3/4" Return Lines

Model #	Supply Pipe Maximum Length (ft.)	Total Maximum Pipe Length (ft.)
003	600	1,200
006	1,500	3,000
003-IFC*	1,200	1,200
006-IFC*	2,500	2,500

\* With Integral Flow Check

## Assumptions:

Flow = 1 GPM

Max. Velocity = 3 ft./sec.

Allowances have been added for pressure drop of other typical system components

Type L Copper Tubing

Supply & Return Piping are equal in length

## SmartPlus™ HOT WATER RECIRCULATION



See Taco Catalog #100-97 and Submittal Datasheet 101-154 for full details.



### How SmartPlus™ works

The SmartPlus circulator has a mode select toggle switch that allows for 2 operation modes. "Pulse" or "Smart" mode can be selected using the toggle switch located on the capacitor base mounted electronic control board. A yellow LED indicates which mode is selected. All operation is automatic, no manual timer or temperature setting is required.

#### Pulse Mode

When set for Pulse mode, the SmartPlus circulator will run for 150 seconds every 10 minutes to maintain hot water at all fixtures.

#### Smart Mode

When set for Smart mode, the circulator will run in Pulse mode as above for the first 7 days. During the first 7 days, the SmartPlus will monitor and record the homes hot water usage pattern. For the next 7 days, the SmartPlus will use the preceding week's usage pattern to cycle the pump. This process will be repeated every 7 days.

### Features and Benefits

**Vacation Function** — After 36 hours of inactivity the pump will automatically TURN OFF and remain off until hot water usage is detected again.

**Exercise Function** — While in vacation mode the pump will cycle on once every 7 days and run for 10 seconds to prevent any corrosion or scale buildup.

**Factory installed 6' line cord**

**Remote Sensor Included**

**Optional IFC® (Integral Flow Check)**

**Quiet, Efficient Operation**

**Unique Replaceable Cartridge Design-Field Serviceable**

**Self-Lubricating**

**No Mechanical Seal**

**Unmatched Reliability—Maintenance Free**

**Comfort and Convenience**

Once the pump is set to the desired operating mode it never needs to be set again. Hot water is always available in seconds.

#### Efficiency

Smart operation maximizes hot water comfort and energy savings.

#### Reliability

The SmartPlus provides quiet operation and industry leading electronics with Taco's 00® circulator proven performance & dependability.

#### 3 Year Warranty

#### LED Indicator lights

- GREEN — Power
- YELLOW — Mode
- RED — Sensor Connection

### MATERIALS OF CONSTRUCTION

#### Circulator:

Stator Housing .....	Steel
Cartridge .....	Stainless Steel
Impeller .....	Noryl
Shaft .....	Ceramic
Bearings .....	Carbon
O-Ring .....	EPDM
Casing (Volute) .....	Bronze, Sweat Stainless Steel, Threaded Stainless Steel, Flanged

#### Integral Flow Check (IFC®):

Body & Plunger .....	Acetal
Spring .....	Stainless Steel
O-Ring .....	EPDM

## Plumb n' Plug® Circulators



See Taco Catalog #100-6.6 and Submittal Datasheet 101-066 for full details.



### Features with Analog Timer

- Factory Installed 6' Line Cord and 24 Hour/15 Minute Interval Analog Timer
- UL Listed
- Optional 95°F –115°F Aquastat Available
- Standard High Capacity Output
- Compact Design
- Quiet, Efficient Operation
- Direct Drive—Low Power Consumption
- Unique Replaceable Cartridge Design-Field Serviceable
- Self Lubricating
- No Mechanical Seal
- Unmatched Reliability—Maintenance Free
- Sweat Connections — Bronze
- Union & Threaded Connections — St. Steel
- Flanged — St. Steel

### Additional Features with Digital Timer

- Digital Timer, 7 day Programmable
- Large LCD Display
- Easy-to-Use Program Buttons
- On/Off Intervals as Short as 1 Minute
- 2,500 hour Capacitor Backup, Saves Settings

### MATERIALS OF CONSTRUCTION

#### Circulator:

Casing (Volute) .....	Bronze or Stainless Steel
Stator Housing .....	Steel
Cartridge .....	Stainless Steel
Impeller .....	Non-Metallic
Shaft .....	Ceramic
Bearings .....	Carbon
O-Ring .....	EPDM

#### Integral Flow Check (IFC®):

Body & Plunger .....	Acetal
Spring .....	Stainless Steel
O-Ring .....	EPDM

# Submittal Data Information



See Taco Catalog #100-15 and Submittal Datasheet 101-150 for full details.



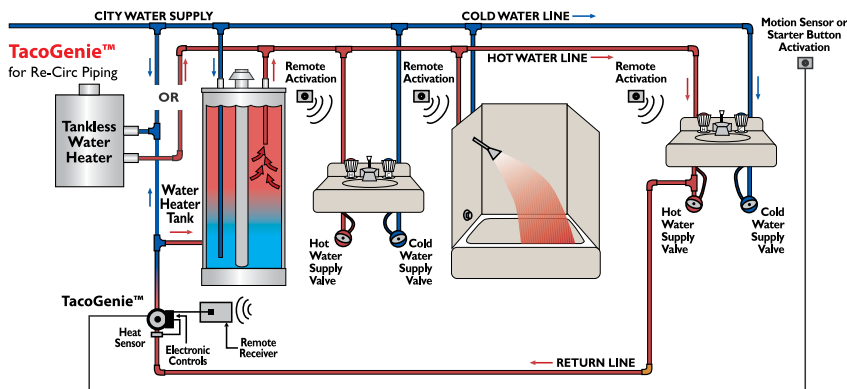
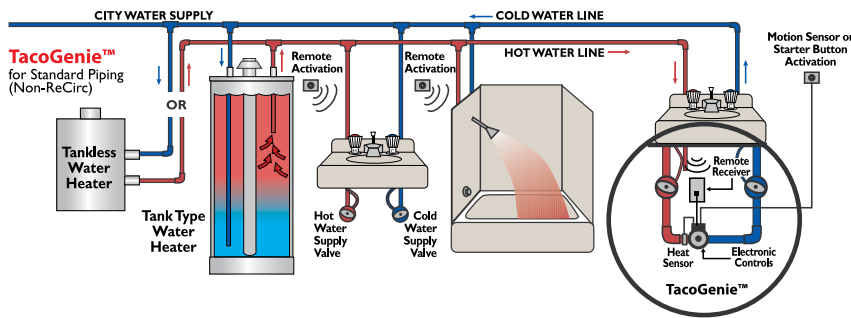
## For New or Retrofit Installations

Using the existing cold water line as the return line, TacoGenie® is ideal for both new and retrofit installations. Typically installed at the furthest fixture from the water heater, TacoGenie fits out of the way, under any bathroom vanity. Connections are made from the hot and cold lines to the suction and discharge side of the pump using adapter tees and stainless flex lines provided. When hot water is needed, the pump is activated by pressing a starter button, runs only long enough to supply hot water to the fixture and then automatically stops. This prevents hot water from entering the cold line. A spring-loaded Integral Flow-Check valve (IFC®) prevents cold water from entering the hot line. Optional wireless push button or motion sensor starters are also available.



## Features and Benefits of the TacoGenie®

- Instant Hot Water Comfort
- Maximum Water & Energy Savings
- 24 Hour operation
- Maintenance free circulator - unmatched reliability
- Removable stainless steel cartridge - contains all moving parts
- UL listed
- Integral Flow-Check (IFC®) to prevent thermo-siphoning or gravity flow
- Pre-wired power cord and integral temperature sensor
- Adapter tees & stainless steel flex lines included (USK models only)
- Wireless Push Button remote or motion sensor starter-optional
- Ideal for tankless water heaters



### TacoGenie® includes:

- TacoGenie Circulator
- Hard Wire Push Button
- (2) Copper T's (USK models only)
- (2) Flex Hoses (USK models only)
- RF Wireless Starter Kit (Optional)
- Motion Sensor (Optional)

### MATERIALS OF CONSTRUCTION

#### Circulator:

Casing (Volute).....	Stainless Steel
Stator Housing.....	Steel
Cartridge.....	Stainless Steel
Impeller.....	Noryl
Shaft.....	Ceramic
Bearings.....	Carbon
O-Ring.....	EPDM

#### Integral Flow Check (IFC®):

Body & Plunger.....	Acetal
O-Ring.....	EPDM

**HotLink®**  
Ingenious instant hot water



See Taco Catalog #100-93 and Submittal Datasheet 101-148 for full details.

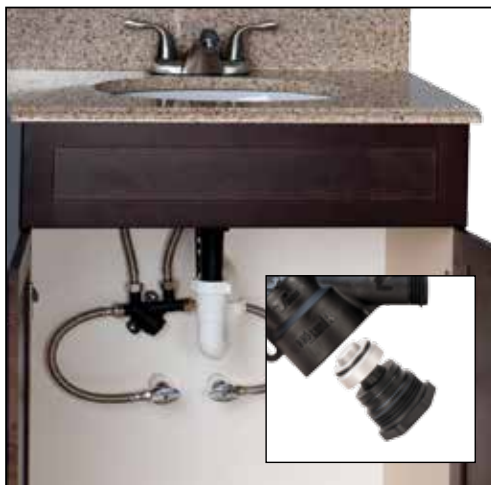
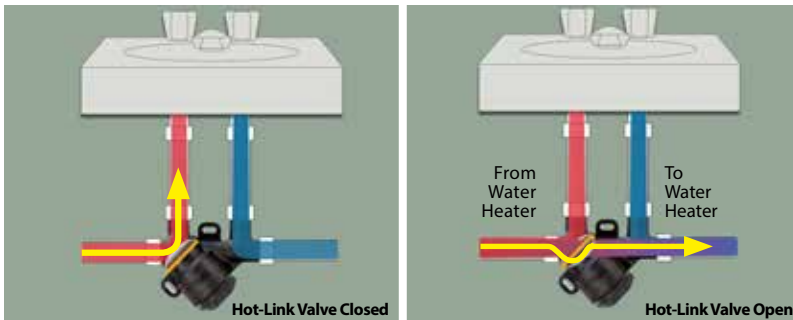


### Instant hot water. No additional plumbing or electrical needed!

Hot-Link® is a quick, easy retrofit using the existing plumbing. Mount the valve under the sink and the pump at the water heater. The valve's unique thermal disk technology sends cooled water back to the water heater so hot water lines remain hot.

### Cleaning made easy.

There's no need to remove the Hot-Link valve from the piping to keep it clean. Our exclusive clean-in-place design makes short work of keeping the system operating properly.



HotLink installation is a snap because it uses the existing plumbing.

### Features:

- Exclusive clean in place undersink valve design
  - Extends valve life
  - Reduces customer calls to replace "plugged" valves
- Creates a domestic hot water recirculation system without dedicated return loop piping
- Easy to retrofit to existing plumbing system
- Conserves water by greatly reducing the time it takes to get hot water
- Analog pump timer allows you to set the system to work during peak hours or to work continuously
- 3 Year Warranty

### The HotLink System Includes:

- Hot-Link Valve
- Hot-Link Circulator
- (2) Braided Flex Hoses

### MATERIALS OF CONSTRUCTION

#### Circulator:

Casting (Volute).....	Stainless Steel
Stator Housing.....	Steel
Cartridge.....	Stainless Steel
Impeller.....	Noryl
Shaft.....	Ceramic
Bearings.....	Carbon
O-Ring.....	EPDM

#### Hot-Link Valve:

Body.....	Nylon
Thermal Disk Actuator.....	Bi-Metal
O-Ring Seals.....	EPDM
Integral Flow Check (IFC®):	
Body, Plunger.....	Acetal
O-Rings.....	EPDM
Screen.....	304 SS
Stem.....	Nylon
Actuator Cartridge.....	Stainless Steel
Braided Flex Hoses.....	Stainless Steel

# Submittal Data Information

## Hot-LinkPlus™



See Taco Catalog #100-128 and Submittal Datasheet 101-172 for full details.



The Taco Hot-LinkPlus features a smart circulator that learns household hot water usage patterns and makes hot water available at the same times the following week. If water usage changes the Hot-LinkPlus circulator adapts for you. It never needs programming!

The Hot-LinkPlus bypass valves unique thermal disk technology sends cooled water back to the water heater so hot water lines remain hot.

### The Hot-LinkPlus Includes:

- Hot-Link Valve
- Hot-LinkPlus Circulator
- (2) Flex Hoses
- (2) Half Unions with Tail Pieces

### Features of Hot-LinkPlus™ Circulator:

- Up to 94% more energy efficient than standard recirculation circulators.
- Fully automatic. Never needs programming.
- LED Display.
- Vacation Function.
- 3-year warranty.

### Features of Hot-Link® Valve:

- Exclusive clean in-place design.
- Saves time, water and energy.
- Easy to install.
- Ideal for home retrofits. No recirculation line necessary.

### MATERIALS OF CONSTRUCTION

#### Circulator & Union:

Casting (Volute).....	Stainless Steel
Stator Housing.....	Steel
Cartridge.....	Stainless Steel
Impeller.....	Noryl
Shaft.....	Ceramic
Bearings.....	Carbon
O-Ring.....	EPDM
Half Unions.....	Stainless Steel
Tail Pieces.....	Stainless Steel

#### Hot-Link Valve:

Body.....	Nylon
Thermal Disk Actuator.....	Bi-Metal
O-Ring Seals.....	EPDM
Integral Flow Check (IFC®):	
Body, Plunger.....	Acetal
O-Rings.....	EPDM
Screen.....	304 SS
Stem.....	Nylon
Actuator Cartridge.....	Stainless Steel
Braided Flex Hoses.....	Stainless Steel

## Domestic Hot Water Accessories

Freedom FLANGE®	System Connection	Sweat	NPT
Shut-Off	1/2"	242-2	242-1
	3/4"	243-2	243-1
Bronze	1/2"	110-522BSF	---
	3/4"	110-523BSF	110-251BF
Stainless Steel	1/2"	---	---
	3/4"	----	110-251SF



Freedom FLANGE®



Half Unions



Analog Timer



Digital Timer



Aquastat



Unions	System Connection	Sweat	NPT
Half Unions	1/2"	110-558	110-556
	3/4"	110-559	110-557

Plumb n' Plug® Accesories	Model #
Analog Timer Kit	265-1
Digital Timer Kit	265-3
Aquastat	563-2



Taco Inc., 1160 Cranston Street, Cranston, RI 02920 / (401) 942-8000 / Fax (401) 942-2360  
 Taco (Canada) Ltd., 8450 Lawson Road, Unit #3, Milton, Ontario L9T 0J8 / (905) 564-9422 / Fax (905) 564-9436

[www.TacoComfort.com](http://www.TacoComfort.com)

