



# SYMMONS® TempControl®

## Thermostatic Water Control Valve

### Installation, Operation & Service Instructions



All TempControl Installations must have a thermometer and shut off valve in the tempered water outlet (as shown in diagrams) for proper trouble shooting service.

**IMPORTANT** When these installation, operation and service instructions are not followed, TempControl service life will be greatly impaired.

#### Sizing and Technical Assistance

For assistance and technical support in sizing and selection of the proper TempControl valve or system, consult the Symmons Temp-Size™ computer sizing software, your local representative or Symmons Customer Service Department at 1-800-SYMMONS.

#### TempControl Location

An underlying premise of thermostatic water controller installations is an acknowledgement that thermostatic mixing valves will not operate properly when the hot and cold supplies serving such valves are subjected to pressure disturbances when flowing less than full capacity. In a correctly designed mechanical room, the supply pressures are stable and not subject to pressure disturbances. As a result, when a TempControl valve is indicated as being located in the mechanical room, a Hi-Low system will not be recommended.

When the valve's location is indicated as being outside of the mechanical room, it is assumed that there is a potential for pressure fluctuations in the hot and cold supply lines servicing a TempControl valve and a Hi-Low system will automatically be recommended.

Note: If the system is designed so that the TempControl valve is not subjected to hot and cold supply pressure disturbances, even though it is located outside the mechanical room, a single valve will operate properly.

#### Installation and Operation

All piping should be thoroughly flushed before TempControl is installed. The TempControl can be installed in any position as long as Hot Water is connected to "H" port and Cold Water is connected to "C" port. Close service stops on TempControl, remove cartridge, (see procedure on bottom of page).

Turn on water supply, open stops wide to thoroughly flush piping before putting valve in service. TempControl is set at factory to deliver approximately 120 F. With approximately 80% of the design intent flowing water, turn knob to obtain desired setting and lock setscrew.

To change high limit, turn knob to maximum hot, remove dial and turn slotted screw counter-clockwise for higher setting, clockwise for lower setting. Valve must be flowing when setting temperature. These setting instructions are on valve label. Thermostatic water controllers should be sized according to the flow capacity required from the valve, NOT the pipe size supplied to the valve.

For assistance and technical support in sizing and selection of the proper TEMPCONTROL Thermostatic Water Controller, consult the Symmons TEMPSIZE™ computer sizing software, your local representative or Symmons Customer Service Department at 1-800-SYMMONS.

#### Maintenance

The cartridge unit contains the entire valve control mechanism. For non-interrupted service, keep a spare cartridge on hand.

TempControl valve control mechanism must be kept clean and free

from deposits and any foreign matter build-up that will be present in many water systems. Inspect within 30 days of initial installation or operation. If inspection determines that your water system causes deposits and foreign matter build-up monthly, then valve should be cleaned monthly as follows: Remove cartridge and soak in any acceptable de-liming agent (or regular household vinegar). Wash off deposits, be sure piston is moving freely in its sleeve, and replace cartridge. Clean more frequently if your system so demands (Do not completely remove piston from cartridge).

The Check Valves in the TempControl are highly important factors in its proper operation. If chips, dirt or other foreign materials lodge on the Seats and prevent the checks from fully seating, there may be a by-pass of water into the opposing line, and the TempControl will not operate to its set delivery temperature. A by-pass may be detected by feeling the supply line while the TempControl is not operating. If, for example, the cold line feels hot, the cold water check is not seating properly. It should be removed and the check and its seat cleaned.

Constant by-passing of hot water will ruin the temperature control mechanism by keeping it constantly expanded.

The valve will operate most efficiently at controlling a set temperature, when flowing at its maximum capacity for any given supply pressure. For example, if supply pressure is 45 psi, the maximum flow rate will be 10 GPM. If it is desired to have a lower flow rate with this 45 psi supply pressure, reduce volume flow as follows:

Shut off screwdriver supply stops and open volume control shut-off valve wide...determine maximum desired flow rate and open screwdriver stops (an equal amount of hot and cold) to obtain the desired flow rate. Now use volume control shut-off for future operation.

When valve is used at low temperatures (normally below 90 F), always be sure cold water supply is 10 F lower than set temperature for efficient operation. In some cases it may be necessary to supply chilled water to valve.

#### Seasonal Use

When a TempControl is used seasonally (schools, campgrounds, golf clubs, etc.), the cartridge must be removed and thoroughly drained of all water. The check stops should also be removed to drain all water from the supply lines and valve body (See "cartridge removal and replacement"). This will prohibit damage caused by freezing water.

#### Cartridge Removal and Replacement

Before removing a used cartridge for cleaning, have new casing gasket and sleeve o-rings on hand.

Shut off supplies at stop checks by turning clockwise.

Remove 4 bolts on cartridge bolt flange.

With 2 large bladed screwdrivers, pry evenly on two opposite sides of bolt flange until cartridge is free to be removed by hand. Pull out cartridge with a twisting action, always keeping cartridge on center line.

Leave compensating spring in position at bottom center of valve body.

Clean cartridge as described in maintenance instructions above.

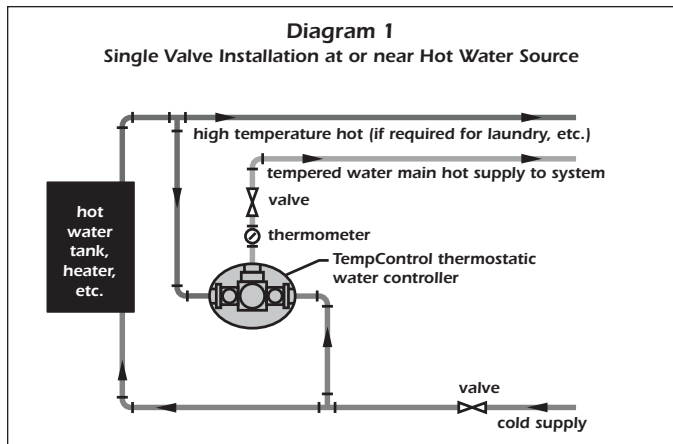
Replace sleeve O-rings and grease same.

With a twisting and pushing action, replace cartridge in valve body until bolt flange is firmly against housing gasket.

While holding cartridge in place, replace bolts and tighten.

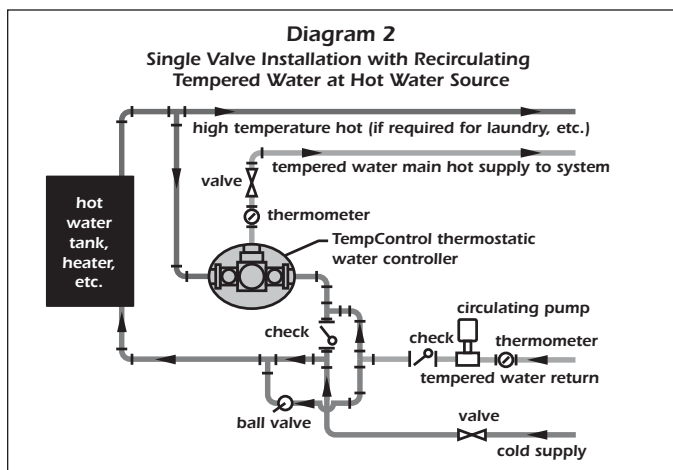
Caution: Do not attempt to pull cartridge into position with bolts—it will damage the valve control mechanism.

Open stops and adjust temperature.



#### Installation at or near the hot water source (Diagram 1)

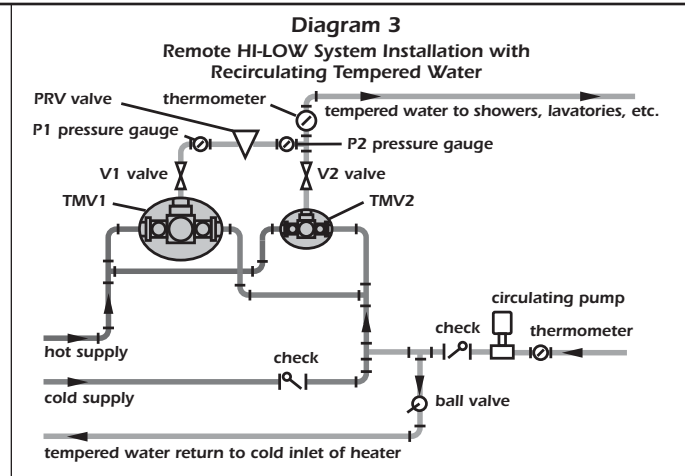
TempControl must be positioned below the hot water tank or heater, well below the high temperature water line. This procedure creates a heat trap and protects against hot water by-passing through the controller, if the checks become fouled with foreign matter and are prevented from fully seating.



#### Installation with recirculating tempered water at hot water source (Diagram 2)

TempControl must have the return line connected exactly as shown. This procedure allows the controller to maintain the set temperature during periods of no draw by (a) allowing the major volume of return water to supply the cold inlet of the TempControl and (b) the minor volume of return water to be reheated and supply the hot inlet of the TempControl. When there is no water draw on the plumbing system, no water can be added to the system; therefore, the "cold" and "hot" supplies to the TempControl must come from within the system as described below using the ball valve for fine tuning the operation as outlined in (a) and (b) above.

1. With ball valve closed, set TempControl to desired temperature with water flowing from tempered water line.
2. After obtaining desired temperature, stop the water flow.
3. Crack the ball valve open so that a small amount of water is returned to the hot water source. This allows the TempControl to maintain the set temperature during periods of no draw on the system.
4. During no draw, observe the thermometer on the discharge of the TempControl. If the temperature increases above the setting in Step 1, close the ball valve slightly or if temperature decreases, open it slightly.

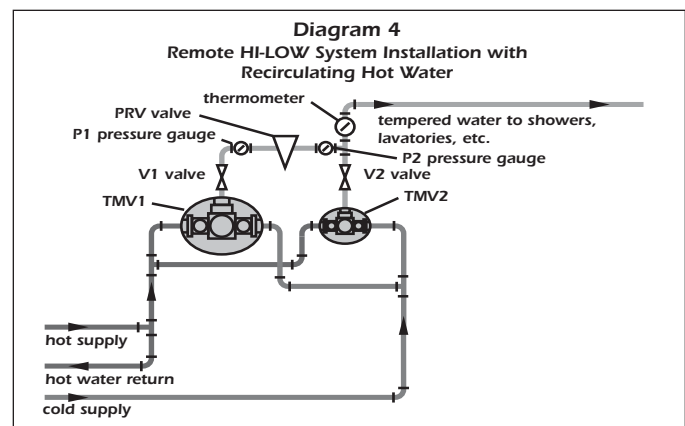


#### Remote Hi-Low installation with recirculating tempered water or hot water return (Diagram 3)

TempControl Hi-Low system must have the return line connected exactly as shown (See Diagram 2 notes).

#### Procedure for setting TempControl Hi-Low System

1. Turn off recirculating pump and close ball valve
2. Shut off (V1).
3. Open 5 showers or equivalent to the full hot position.
4. Set small TempControl valve (TMV2) to the full cold position and note the temperature on thermometer.
5. Shut off valve (V2) and open valve (V1). Set large TempControl valve (TMV1) to desired system temperature (make sure adjustment screw on PRV valve is in the full clockwise position).
6. Shut off 2 showers or equivalent (leaving 3 still on) and open valve (V2).
7. Turn PRV adjustment screw counter-clockwise until temperature (T) equals that obtained in step #4.
8. Adjust TempControl valve (TMV2) to desired system temperature and system will be in operational mode.
9. Stop the water flow, after obtaining desired temperature and turn on the recirculating pump.
10. Crack the ball valve open so that a small amount of water is returned to the hot water source. This allows the TempControl to maintain the set temperature during periods of no draw on the system.
11. During no draw, observe the thermometer on the discharge on the TempControl. If the temperature increases above the setting in step #8, Close the ball valve slightly or open it if the temperature decreases.



#### Remote Hi-Low installation with recirculating hot water supply only (Diagram 4)

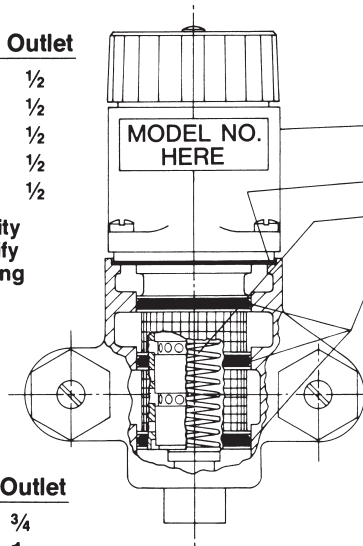
TempControl Hi-Low system must be piped as shown. Follow steps 2 through 9 from diagram 3. Ignore reference to recirculating pump in step 9 (not applicable to this installation).

# TEMPCONTROL Repair Parts

## Model No. Inlets Outlet

5-100	1/2	1/2
5-101	1/2	1/2
5-101P	1/2	1/2
5-102	1/2	1/2
5-102P	1/2	1/2

Suffix HC High Capacity  
Model specify  
when ordering  
cartridge



CARTRIDGE UNIT 5-( ) NW CARTRIDGE

TT-11-100 CASING GASKET

TT-16-100 SPRING with SPRING SADDLE

TT-15-100 SLEEVE O-RINGS (3 REQ'D.)

CSE-35 CHECK SPINDLE

CSE-29 O-RING

CSE-31 WASHER

CSE-26 CAP

CSE-34 SPRING

CSE-33 CHECK

CE-30 GASKET (2 PAIR REQ'D.)

CSE-32 CHECK WASHER

CSE-25 STOP BODY with INTEGRAL SEAT

## Model No. Inlets Outlet

5-200	3/4	3/4
5-400	3/4	1
5-500	1	1 1/4
5-700	1 1/4	1 1/2

5-200-1 } lower  
5-400-1 } capacity  
units

GLAND NUT DISTINGUISHES  
VALVE PRIOR TO 1988

\*TT-22-( ) STOP SPINDLE

\*TT-19-( ) GLAND NUT & PACKING

\*TT-20-( ) CAP

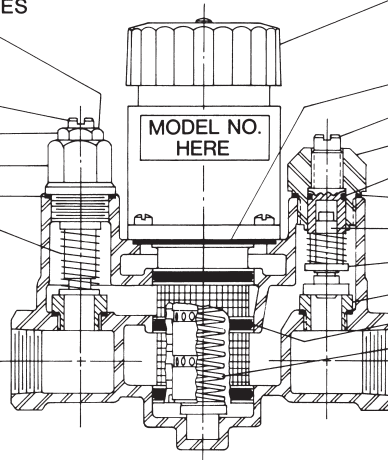
TT-21-( ) CAP GASKET

TT-24-( ) CHECK SPINDLE & SPRING

INSERT PROPER  
MODEL NUMBER  
IN PARENTHESIS

STOP PARTS BEFORE 1988

\*NO LONGER AVAILABLE, ORDER  
TT-50AN-( ) CONSISTING OF  
TT-22N-( ), TT-20N-( ),  
TT-47N-( ), TT-21-( ),  
TT-24N-( ) & TT-17N-( )



CARTRIDGE UNIT  
5-( ) NW CARTRIDGE

TT-11-( ) CASING GASKET

\*TT-22N-( ) STOP SPINDLE

\*TT-20N-( ) CAP

\*TT-47N-( ) STOP SPINDLE O-RING

TT-21-( ) CAP GASKET

\*TT-24N-( ) CHECK SPINDLE & SPRING

\*TT-17N-( ) CHECK SPRING RETAINER

TT-26-( ) CHECK SEAT

TT-15-( ) SLEEVE O-RINGS (3 REQ'D.)

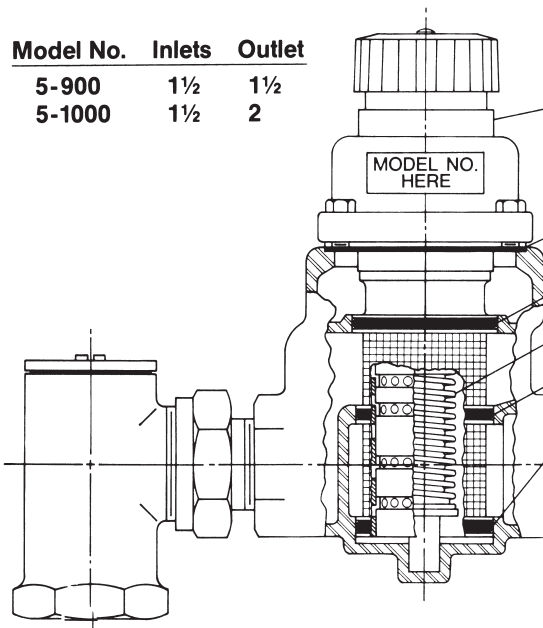
TT-16-( ) SPRING with SPRING SADDLE

INSERT PROPER  
MODEL NUMBER  
IN PARENTHESIS

\*STOP PARTS 1988 TO DATE

## Model No. Inlets Outlet

5-900	1 1/2	1 1/2
5-1000	1 1/2	2



CARTRIDGE UNIT  
5-( ) NW CARTRIDGE

TT-11-( ) CASING GASKET

TT-15L-( ) SLEEVE LARGE O-RING

TT-16-( ) DOUBLE SPRING with  
SPRING SADDLE

TT-15S-( ) SLEEVE SMALL O-RINGS (2 REQ'D.)

TT-22-( ) STOP SPINDLE

TT-19-( ) GLAND NUT & PACKING

TT-20-( ) CAP

TT-21-( ) CAP GASKET

TT-27-( ) CHECK STOP BODY with  
INTEGRAL SEAT

TT-24-( ) CHECK SPINDLE & SPRING

INSERT PROPER MODEL  
NUMBER IN PARENTHESIS

## TROUBLE SHOOTING CHART

### For Tempered Water Recirculated Systems:

Problem	Cause	Solution (Follow service instructions)
Thermometer in TempControl outlet rises to temperature of the heater at start of no draw. (i.e. sink or showers not running, etc.)	No circulation of tempered water because return line is piped to the hot water source only.	Repipe system to diagram 2 or 3 which allows the discharge of the pump (tempered water return) to go back to the hot water source and the cold inlet of the TempControl.
Hot water temperature at sink or shower is below set point of TempControl.	Same as above	Same as above
Same as above but after a period of draw, water temperature rises above set point of controller and then stabilizes to set point.	Same as above	Same as above
Temperature rises 10° to 15° above set temperature, but not to heater temperature.	Not piped exactly like diagram 2 or 3. Ball valve open too much.	Check valve must be installed on cold supply to controller or close ball valve (see diagram 2 or 3 on page 2).
Cannot elevate or decrease tempered water by turning control handle.	Piston stuck with foreign matter, cause, lack of preventive maintenance program	Remove cartridge and clean, free piston—cartridge could be damaged if stuck too long—replace cartridge.
Temperature drops when draw (sink, shower etc. running).	Valve was set in no draw mode.	Run showers and sinks and then set valve.

### For Tempered Water Non-Recirculated Systems:

Problem	Cause	Solution (Follow service instructions)
By-pass, cold to hot or hot to cold.	Checks not properly seating.	Clean fouled checks, or if damaged, replace damaged parts.
Initial draw on system running higher than set temperature, gradually reducing to set temperature.		Same as above

#### Limited Warranty

Symmons Industries, Inc. warrants to the original user of this product that for a period of five years from the date of installation of the product, any defective product will be exchanged or reconditioned (at our option) free of charge. Return the defective product (at your expense) to Symmons Industries, Inc., 31 Brooks Drive, Braintree, Massachusetts 02184. There are no other express warranties on this product and ALL WARRANTIES OF MERCHANTABILITY AND WARRANTIES AS TO FITNESS FOR A PARTICULAR PURPOSE AND ANY OTHER IMPLIED WARRANTIES ARE LIMITED TO A

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