

DESCRIPTION

The Series ES Hydroguard thermostatically blends hot and cold water to deliver tepid water to emergency fixtures, quickly compensating for temperature variations due to changes in inlet temperature or pressure. Powers' exclusive Dual Internal By-Pass* ensures cold water flow in the event of a valve failure or loss of hot water.

* US Patent 6,575,377

WARNING: TO INSURE THE ACCURATE AND RELIABLE OPERATION OF THIS PRODUCT, IT IS ESSENTIAL TO:

- Properly size each valve based on the individual application
- Properly design the recirculation system to minimize pressure and temperature variations
- Conduct an weekly maintenance program to insure proper operation of all critical components

FAILURE TO COMPLY WITH PROPER INSTALLATION INSTRUCTIONS COULD CONTRIBUTE TO VALVE FAILURE, RESULTING IN INJURY OR DEATH.

SIZING

Table 1, Capacity Tables, present the Hydroguard discharge capacity in gpm and lpm for various pressure differentials (the difference between the lowest inlet pressure and the discharge pressure at the Hydroguard).

Table 1- Capacity Tables

Flow Capacity in US gpm at 50-50 Mixed Ratio

Model	Min. Flow Rate	Pressure Drop Across Valves in psi						
		5	10	20	30	45	60	75
ES200	3.0 gpm	15	20	30	36	45	52	58
ES400	3.0 gpm	27	38	54	66	80	93	104

Flow Capacity in lpm at 50-50 Mixed Ratio

Model	Min. Flow Rate	Pressure Drop Across Valves in kPa						
		34	69	138	207	310	414	517
ES200	11.0 lpm	57	76	113	136	170	197	220
ES400	11.0 lpm	102	144	203	249	305	352	393

By-Pass flows will vary depending on supply conditions and application.

SPECIFICATIONS

Operating

Maximum Pressure 125 psig (861.25 kPa)
 Maximum Hot Water Temperature 180°F (82°C)
 Approach Temperature 1.5°F (8°C)
 Temperature Adjustment Range 6.0°F (15°C) - 95°F (35°C)
 Factory Set Temperature 85°F (29°C)
 Compliance ANSI Z358.1 1998

Note: Set point cannot be less than the cold water temperature. For best operation, hot and cold water should be at least 15°F (9.4°C) from desired set point.



Model ES400

OPERATION

Typical Flow

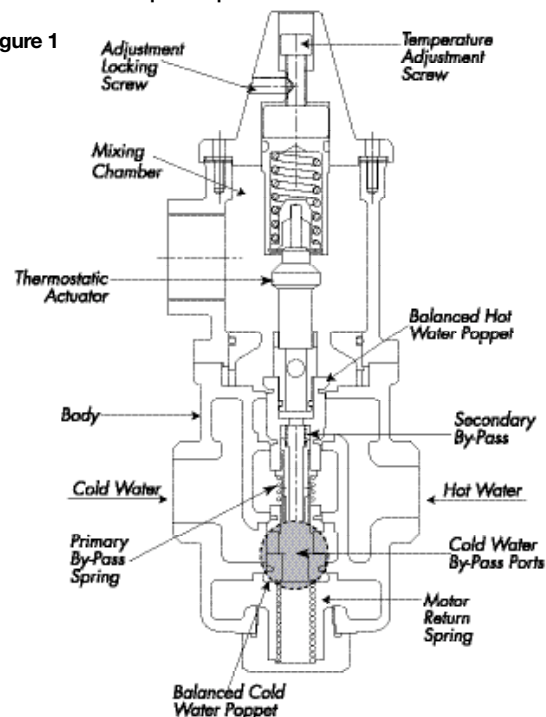
Hot and cold water supplies enter Hydroguard at indicated ports, (see Figure 1) then flow past their respective balanced poppet plug and seats. Next, hot and cold water flow is directed to the mixing chamber where the thermostatic actuator is located.

Temperature adjustment screw moves the actuator/poppets to determine the discharge temperature.

With a rise in discharge temperature due to pressure or temperature fluctuation on the inlet, the actuator expands, decreasing hot water and increasing cold water flow to maintain the valve set point. The reverse occurs with a drop in discharge temperature.

- Cold water supply failure – causes actuator to expand allowing the motor to seat hot water poppet.
- Hot water supply pressure failure – causes actuator to contract opening cold water bypass ports. Secondary bypass mechanism opens upon failure of actuator or hot water.

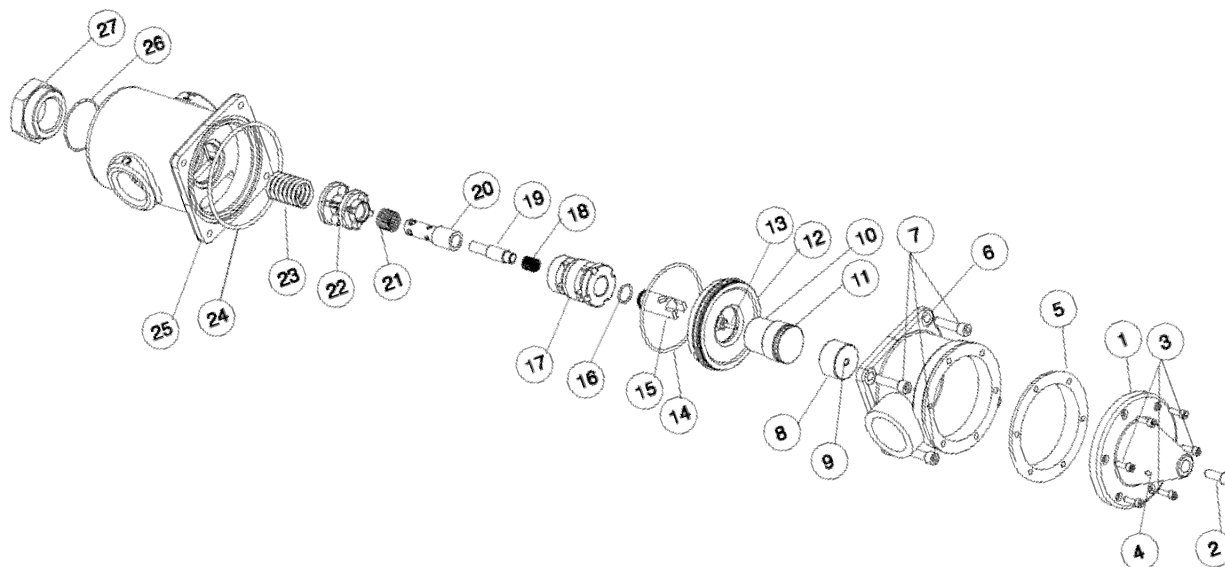
Figure 1



PARTS LIST

TAG	DESCRIPTION
1	Etched Bonnet
2	Adjustment Screw
3	Bonnet Screw
4	Set Screw
5	Bonnet Gasket
6	Motor Housing
7	Housing Bolt
8	Temp Limit Spacer
9	Spacer Set Screw
10	Overload Assy
11	Overload "O" Ring
12	Funnel
13	Thermal Actuator
14	Funnel "O" Ring

TAG	DESCRIPTION
15	Motor Adapter
16	Motor Adapter "O" Ring
17	Hot Water Poppet
18	Pressure Relief Spring
19	Pressure Relief Poppet
20	CW Bypass Plug
21	Bypass Spring
22	Cold Water Poppet
23	Return Spring
24	Body "O" Ring
25	Body
26	Body Cap "O" Ring
27	Body Cap



REPAIR KITS

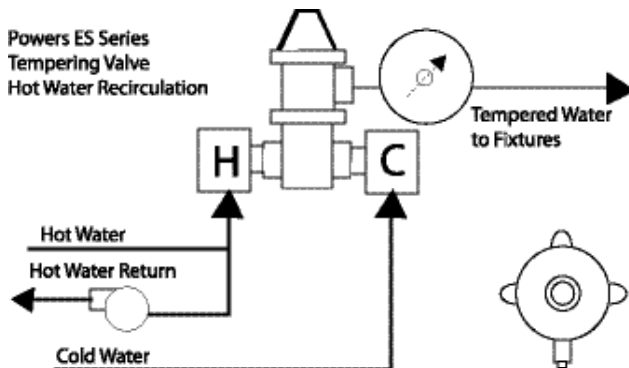
ES200 KIT NUMBER	ES400 KIT NUMBER	DESCRIPTION	CONTAINS ITEMS:
390-573	390-574	Actuator Replacement Kit	5, 13, 15, 16, 24
390-575	390-576	Poppet Replacement Kit	15-24, 26
390-577	390-578	Gasket and "O" Ring Kit	5, 11, 14, 16, 24, 26

RECIRCULATION

The mixing valve should be mounted as close as possible to the fixture(s) that it serves.

If the valve is some distance from the hot water source, recirculation may be required to keep the hot water supply within specified limits.

CAUTION: Use care in installing the cold water line such that it does not pass through areas with high ambient temperatures or become exposed to direct sunlight.



INSTALLATION INSTRUCTIONS

- IMPORTANT:** Flush all piping thoroughly before installing.
- Locate the Hydroguard as close as possible to the fixture being supplied.
Note: Remove body screws to turn outlet to any of four positions. The Hydroguard body can be rotated to any position due to the union inlets. Install thermometer in discharge using supplied fittings.
Make certain the body screws and unions are tightened securely to prevent leakage.
- CAUTION:** When the Hydroguard supplies tempered water to self-closing and/or solenoid valves, provide a shock absorber (Powers Part No. 460-353) on the discharge line. This protects the Hydroguard thermostatic motor from damage by water shock waves generated by the quick closing valves.
- Consult proper medical/safety authorities for the optimum temperature for your application. Before use, check for proper discharge temperature. Reset if necessary. Valve is preset for 85°F (29.4°C).

CALIFORNIA PROPOSITION 65 WARNING

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

(Installer: California law requires that this warning be given to the consumer.)

For more information: www.wattsind.com/prop65

MAINTENANCE AND TROUBLESHOOTING

What to look for if:

- The flow of water is less than desired.
 - Stop valves or supply to Hydroguard not fully open.
 - Clogged checkstop strainer screens.
 - Accumulation of lime deposits around valve seats.
 - Low supply pressures or unusual supply temperatures.
- The flow of water is completely shut off.
 - Stop valves or supply valves are completely closed.
 - Valves downstream from Hydroguard fully closed.
 - Loss of cold water supply pressure.

DISASSEMBLY AND REPAIR INSTRUCTIONS

Due to the safety nature of this product, we recommend removal of the valve and a full inspection of all components whenever the valve is disassembled for any reason.

- Disassembly:
 - Close supply valves and/or checkstops. Take apart unions between the valve and the checkstops.
 - Remove valve from its outlet piping. Work should be performed on a clean table or workbench. **Use caution when disassembling the valve as there are several small springs and parts inside.**
 - Remove bonnet screws with a 3/15" hex wrench.
 - Remove bonnet and actuator.

- Remove four (4) body screws and carefully remove lower body.
- Slide out hot water poppet and bypass assembly.
- Loosen plug on bottom of lower body. Remove plug, spring, and cold water poppet.
CAUTION: The plug is under spring pressure. Use care when removing.
- Remove the "O" rings from the body.

Inspection:

- Inspect the body for any damage, deposits, or pitting - clean or replace as necessary.
- Check the poppets, springs, and bypass assembly for any damage, deposits, or pitting. **If any component appears stuck, worn, or damaged, replace all the internal parts.**
- Check the actuator for proper operation. Measure and note the entire length of the actuator at room temperature or mark the stem with a piece of tape. Place the actuator in hot water (105-115°F) for one (1) minute. Measure the length of the actuator. Actuator should be at least 1/8" longer than when at room temperature.

ADJUSTMENT AND TESTING

- Replace adjustment screw and set to proper temperature. Open all fixtures and verify all outlet temperature is adequate.*

Consult proper medical/safety authorities for optimum temperature for your application. Before use, check for proper discharge temperature. Reset if necessary.

- Verify adequate flow rate from fixtures.
- Close the cold water checkstop. Verify that flow shuts down immediately.
- Open cold water checkstop, and close hot water checkstop. Verify adequate flow from fixture(s).
- Open hot water checkstop, verify temperature returns to set temperature.
- Record test data on maintenance tag which should be attached to the valve.

***Contact factory for high temperature readjustment procedure.**

Per ANSI Z358.1-1998, Emergency fixtures should be tested weekly. Any unit failing any of the above tests should be repaired or replaced immediately.

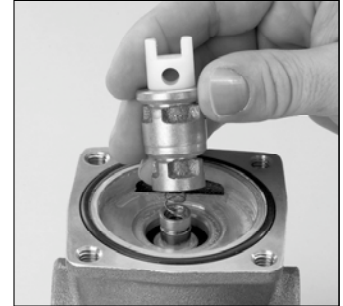
REASSEMBLY



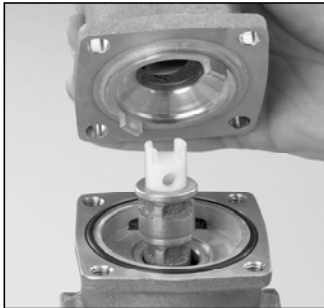
Insert the cold water poppet, spring, and plug into the bottom of the lower housing.



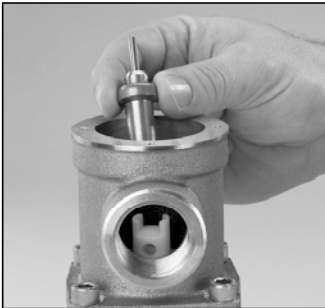
Carefully insert the bypass assembly into the body.



Install the hot water poppet using care not to disturb the springs or bypass assembly.



Lubricate the body "O" ring, and place in groove on body. Tighten housing bolts.



Place actuator into motor adaptor



Install bonnet onto valve with 4-3/16" screws.