HydroGuard®

430 Series Two-Valve Hi/Lo

Water Tempering Stations to 150 GPM

POWERS™

Water Tempering Innovation Since 1891

Description ■

Powers' HydroGuard® Series 430 Hi/Lo's are fully assembled factory tested systems, designed to provide safe water throughout commercial and institutional facilities. Hydroguard Series 430 Hi/Lo systems consist of series e420 and series 430 thermostatic valves which utilize paraffin-based actuation technology to sense and adjust outlet temperature. Each system also includes a PRV, ball valves, pressure/temperature gauges and Powers' triple-duty check stops. Optional equipment include cabinets and /or Powers' AquaSentry2 high temperature alarm system.

Operation ■

Two-valve supply fixtures feature a low capacity valve that works in parallel with a high capacity valve. During low demand, the low capacity valve handles the load requirements. As the load demand is increased, the pressure reducing valve, which is set at a certain pressure differential, will open and allow flow through the high capacity valve to assist the low capacity valve in meeting the increased load requirements.

Specifications ■

Maximum Pressure Differential	100 psi (689 kpa)
Maximum Static Pressure	125 psi (862 kpa)
Maximum Hot Water Temperature	200°F (93°C)
Minimum flow*	0.5 gpm (2.0 lpm)
Minimum flow at which valve will control to ASSE 1017 requirements.	
431HL	1.0 gpm (3.8 lpm)
432HL	1.0 gpm (3.8 lpm)
433HL	2.5 gpm (9.5 lpm)
434HL	2.5 gpm (9.5 lpm)
435HL	4.0 gpm (15 lpm)
Approach Temperature	15°F (8°C)
Temperature Adjustment Range	40° - 160°F (4° - 71°C)

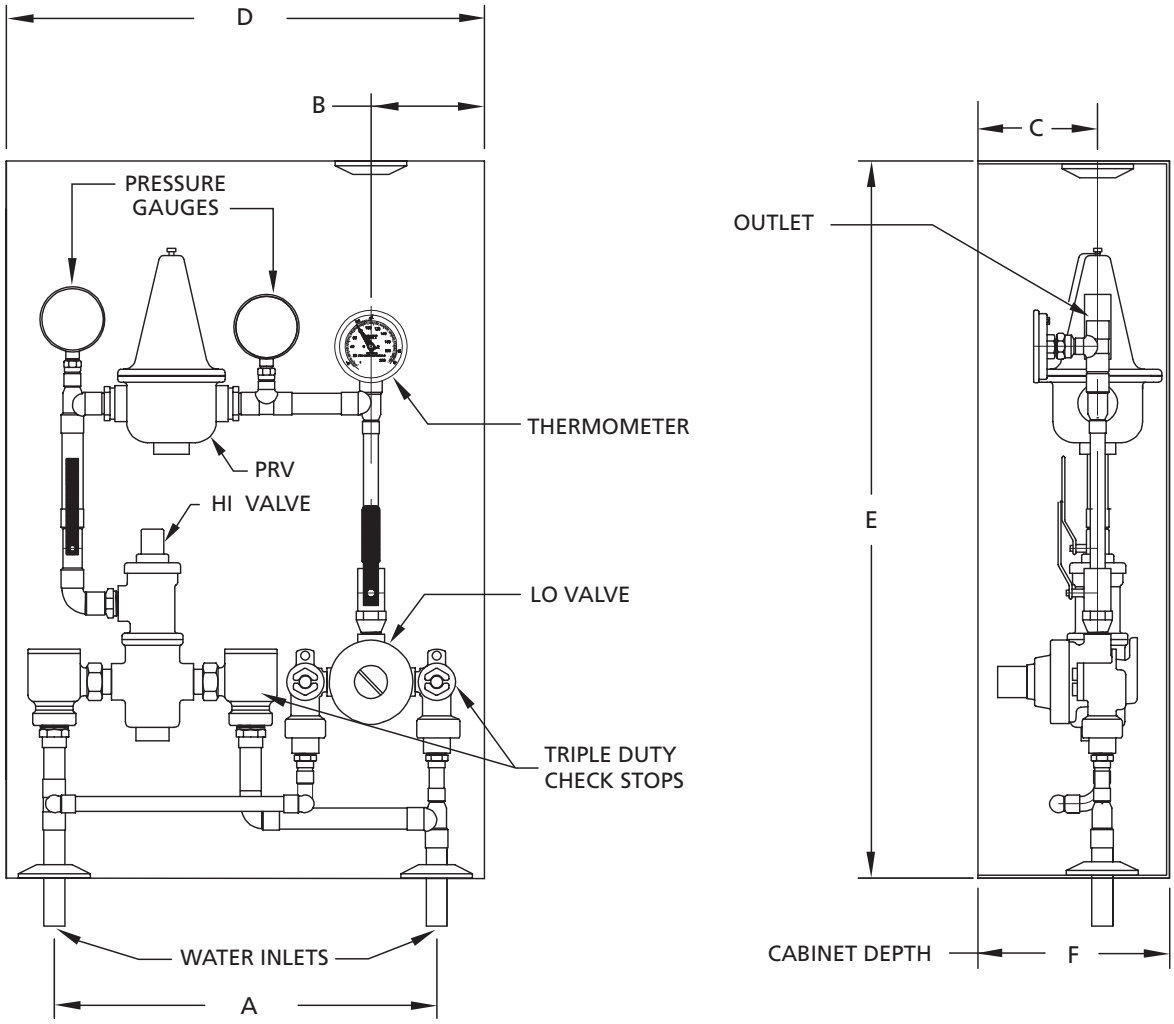
**Minimum flow when Two-Valve Hi/Lo are installed at or near hot water source with re-circulated tempered water with a properly sized continuously operating re-circulating pump.*

Table 1 — Flow Capacity When Tested To ASSE 1017 Standard ■

Model	Min. Flow to ASSE 1017-2003	Pressure Drop Across Valve					
		5 psi (34 kpa)	10 psi (69 kpa)	20 psi (138 kpa)	30 psi (207 kpa)	45 psi (310 kpa)	60 psi (414 kpa)
431HL	1.0 gpm (4 lpm)	10.0 gpm (38 lpm)	14.1 gpm (53 lpm)	20.0 gpm (76 lpm)	24.5 gpm (93 lpm)	30.0 gpm (114 lpm)	34.6 gpm (132 lpm)
432HL	1.0 gpm (4 lpm)	16.7 gpm (63 lpm)	23.6 gpm (89 lpm)	33.3 gpm (126 lpm)	40.8 gpm (154 lpm)	50.0 gpm (189 lpm)	57.7 gpm (218 lpm)
433HL	2.5 gpm (10 lpm)	31.3 gpm (118 lpm)	44.3 gpm (167 lpm)	62.6 gpm (237 lpm)	76.8 gpm (290 lpm)	94.0 gpm (356 lpm)	108.6 gpm (410 lpm)
434HL	2.5 gpm (10 lpm)	46.3 gpm (175 lpm)	65.5 gpm (248 lpm)	92.7 gpm (350 lpm)	113.5 gpm (429 lpm)	139.0 gpm (525 lpm)	160.5 gpm (607 lpm)
435HL	4.0 gpm (15 lpm)	50.5 gpm (189 lpm)	70.7 gpm (267 lpm)	100.0 gpm (378 lpm)	122.5 gpm (463 lpm)	150.0 gpm (568 lpm)	175.0 gpm (662 lpm)

Dimensions & Legends ■

Hi/Lo System (HL)



Valve	A	B	C	Inlets	Outlets
431HL	16" (406 mm)	4-3/4" (121 mm)	5" (127 mm)	3/4" (19 mm)	3/4" (19 mm)
432HL	16" (406 mm)	4-3/4" (121 mm)	5" (127 mm)	3/4" (19 mm)	1" (25 mm)
433HL	20" (508 mm)	6-3/4" (171 mm)	7" (178 mm)	1-1/4" (32 mm)	1-1/4" (32 mm)
434HL	20" (508 mm)	6-3/4" (171 mm)	7" (178 mm)	1-1/4" (32 mm)	1-1/2" (38 mm)
435HL	20" (508 mm)	6-3/4" (171 mm)	7" (178 mm)	1-1/4" (32 mm)	1-1/2" (38 mm)

Cabinet	Code	431HL & 432HL			433HL, 434HL & 435HL		
		D	E	F	D	E	F
Stainless Steel, Recessed	N	20" (508 mm)	30" (762 mm)	8" (203 mm)	28" (711 mm)	40" (1016 mm)	10" (254 mm)
Stainless Steel, Wall Mount	Q	20" (508 mm)	30" (762 mm)	8" (203 mm)	28" (711 mm)	40" (1016 mm)	10" (254 mm)
Painted Steel, Recessed	R	20" (508 mm)	30" (762 mm)	8" (203 mm)	28" (711 mm)	40" (1016 mm)	10" (254 mm)
Painted Steel, Wall Mount	U	20" (508 mm)	30" (762 mm)	8" (203 mm)	28" (711 mm)	40" (1016 mm)	10" (254 mm)

Diagram 1. Low temperature hot water recirculation diagram.

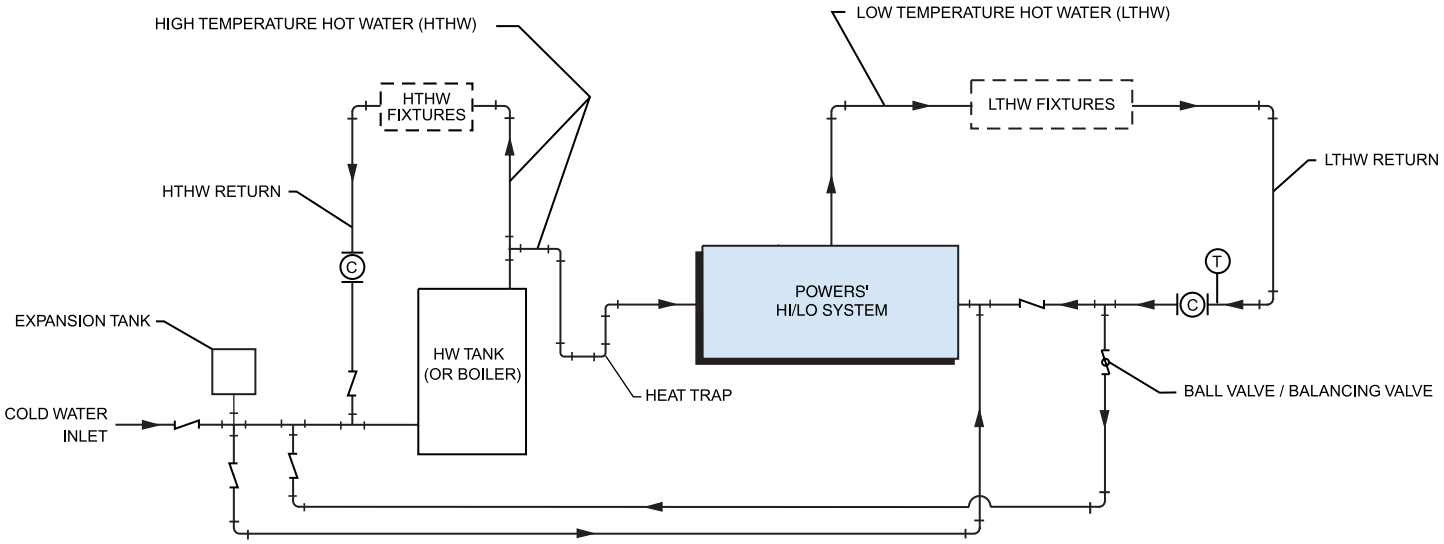
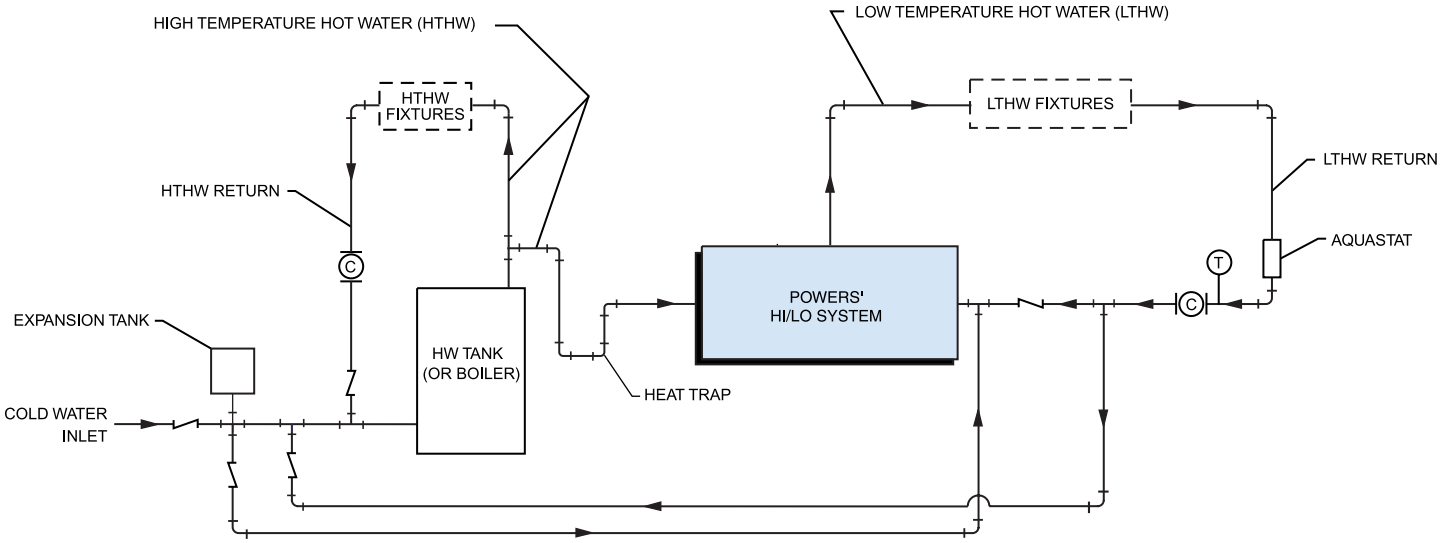


Diagram 2. Low temperature hot water recirculation diagram with separate high temperature hot water recirculation.



Installation and Troubleshooting ■

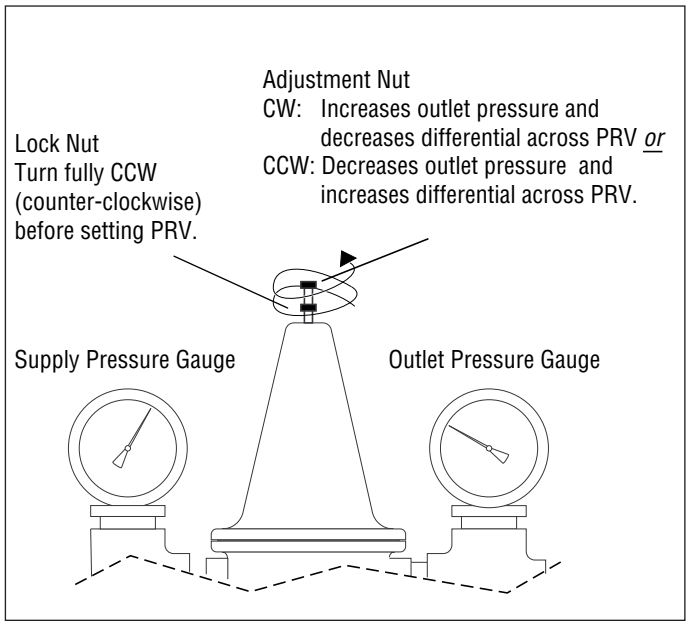
Prior to Installation

1. Flush all piping thoroughly before installing.
2. Make sure all ball valve handles are in "OFF" position.
3. In order to make any temperature adjustment to the valves, you must open end-of-line fixtures to ensure you have adequate flow across the valve.
4. Use a thermometer at the showerhead or install an in-line thermometer at the point-of-use.
5. Typical piping diagrams are shown on page 3, for other alternatives or special circumstances, contact Powers' Technical Support Department at 1.800.669.5430 or info@powerscontrols.com.

Set Up Procedure ■

You must follow these procedures in order to properly adjust your HiLo System. You need flow greater than the minimum shown in table 1 across the valve in order to set a maximum temperature.

1. Close the low flow valve by turning the ball valve handle fully clockwise.
2. Open the ball valve at the discharge of the high flow valve.
3. Open enough fixtures to meet the minimum flow requirement as per table 1.
4. Set valve temperature.
5. Set the PRV as follow for a 15 psi differential.
   a) Loosen the locknut at the top of the PRV. This must be all the way out or you will be limiting the range of the adjustment.
   b) Adjust the PRV so the outlet pressure gauge (top) reads 15 psi less than the supply pressure gauge (bottom). Turning the adjustment nut counter-clockwise will increase the differential across the PRV (allowing the PRV to open later).
6. Close the ball valve at the discharge of the high flow valve and open the low flow side ball valve by rotating the handle fully counter-clockwise.
7. Open enough fixtures to meet the minimum flow requirement as per table 1.
8. Set the temperature for the low flow valve.
9. Open the ball valve at the discharge of high flow valve.
10. Open additional fixtures so that enough water flow through the high flow valve (refer to table 1 @ 20 psi drop).
11. When water is at desired outlet temperature, verify temperature remains at set point.
12. Gradually start to close fixtures to verify that the temperature remains constant through the full range of flow.
13. For any problem, refer to troubleshooting section of the document or contact Powers' Technical Support Department at 1.800.669.5430 or info@powerscontrols.com.



Adjusting to Individual High Flow and Low Flow Valves ■

See enclosed TI e420, TI e427 and/or TI 430.

Troubleshooting ■

Outlet temperature is too hot with low flow:

1) The maximum temperature of the low flow valve was not properly set. Refer to set up procedure and reset the maximum temperature of the low flow valve.
2) The thermal actuator of the low flow valve is not working properly. Test and replace accordingly to the appropriate technical instructions (TI e420, TI 427 and/or TI 430 enclosed).

Troubleshooting Cont'd ■

Outlet temperature is too hot with a high flow:

1) The maximum temperature of a high flow valve was not properly set. Refer to set up procedure and reset the maximum temperature of the high flow valve.
2) The thermal actuator of the high flow valve is not working properly. Test and replace accordingly, TI 430 enclosed.

Outlet temperature too low on low and high flow:

1) The hot water temperature is too low. You must have a supply temperature of at least 15º F (8º C) higher than the set temperature. Re-adjust the hot water supply.
2) The check stops on the hot side of the valve are not fully open, or may be stuck due to liming. Open and clean check stops.
3) The temperature has not been set properly on the small and/or large valve. Refer to set up procedure and reset the valves.

Outlet flow drops off:

1) The differential across the PRV is set too high, so the high flow valve begins controlling the system too late, and starves the system. Refer the set up procedure and decrease the differential across PRV.
2) The check stops on the high flow valves are not fully open or are stuck due to liming. Open and clean check stops.
3) The system pressure varies by more than 50% of the inlet supply pressure.

Outlet temperature cycles between hot and cold:

1) The differential across the PRV is set too low, so the high flow valve begins controlling the system too early, and therefore cycles (hunt for the set point). Refer the set up procedure and increase the differential across PRV. Refer the set up procedure and decrease the differential across PRV.
2) The system pressure varies by more than 50% of the inlet supply pressure.

Preventive Maintenance ■

Thermostatic water mixing valves are control devices which must be cleaned and maintained on a regular basis.

1) Before servicing check stops or piping, turn off the water upstream. At least every twelve (12) months open up the check stops and check for the free movement of the poppet.
2) Before servicing the valve, turn off the water supply upstream or close the check stops. To close the check stops, turn the adjusting screw clockwise.
3) When opening check stops after servicing, do not over adjust; make sure the center of the stop is still pushed in.
4) Every three (3) months, check the maximum temperature adjustments.

Caution:

Any changes in supply condition could effect the outlet water temperature. Check and adjust the valves accordingly to prevent injury to the users.

5) Every twelve (12) months, remove the valve bonnets and check the internal components for freedom of movement.

Parts Kits ■

See enclosed TI e420, TI e427 and/or TI 430.

Ordering Information ■

Valve#	Inlet (inches)	Outlet (inches)	Order Code
e420/431	3/4	3/4	**431HL**
e420/432	3/4	1-1/4	**432HL**
e428/433	1-1/4	1-1/4	**433HL**
e428/434	1-1/4	1-1/2	**434HL**
431/434	1-1/4	1-1/2	**435HL**

Piping/Finish

Rough Bronze	**A**
Polished Chrome (Nickel Plated Piping/ Polished Chrome Valve)	**B**

CabinetsΔ

Exposed, No Cabinet	**M**
Stainless Steel, Recessed	**N**
Stainless Steel, Wall Mount	**Q**
Painted Steel, Recessed	**R**
Painted Steel, Wall Mount	**U**

Δ ***Window on the cabinet door. Please consult Powers Technical Support Department for the part number.***

Alarm (not factory installed)*

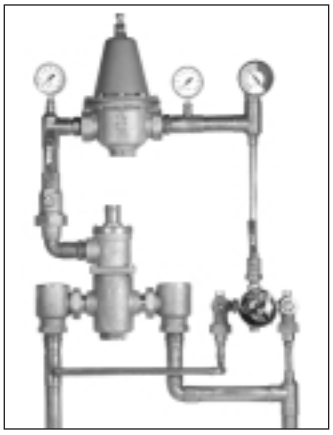
None	**0**
AquaSentry2** for 431HL	**1**
AquaSentry2** for 432HL	**2**
AquaSentry2** for 433HL	**3**
AquaSentry2** for 434HL	**4**
AquaSentry2** for 435HL	**5**

* Mounting requirements varies based on individual installation.
** Includes control module, sensor, electrical box, transformer, solenoid, shock absorber, and 25 feet of station cable.

Typical Specification ■

Hi/Lo water temperature control system shall be factory assembled and tested and shall include two thermostatic mixing valves capable of maintaining water temperature to within 15° F (8° C) above set point within the range of 40° F (4° C) - 160° F (71° C). Valves must compensate for temperature fluctuation due to changes in inlet temperature and pressure. Valves shall be of bronze body with strainer checkstops and must have advanced, paraffin-based thermal actuation technology in order to insure precise control when tested in accordance with ASSE 1017 and CSA B125. Thermostatic valves must be ASSE listed and CSA certified.

Hi/Lo system must include PRV, ball valves, pressure/temperature gauges and thermometers. Hi/Lo system shall be a Powers' model 430HL series. Any alternate must have a written approval prior to bidding.



CALIFORNIA PROPOSITION 65 WARNING

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For more information: www.wattsind.com/prop65

Engineering Approval

Project _____

Contractor _____

Architect/Engineer _____

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