HydroGuard®

Series 1434 Triple & Quad-Valve Hi/Lo

Water Tempering Stations to 475 GPM

POWERS™

Water Tempering Innovation Since 1891

DESCRIPTION ■

Powers' Series 1434 Triple and Quad-Valve Hi/Lo Systems are fully assembled, factory tested systems which are designed to provide safe hot water throughout commercial and institutional facilities. Each consists of 434 and 1434 HydroGuard thermostatic tempering valves (ASSE 1017 listed) which utilize paraffin-based actuation technology to sense and adjust outlet temperature. Each system also includes a PRV, ball valves, thermometers, temperature/pressure gauges and Powers' triple-duty check stops. Each of these systems are supported by heavy-duty welded struts. Optional equipment includes cabinets and AquaSentry2 alarm system.

OPERATIONS ■

The Triple and Quad-Valve Hi/Lo systems feature one low capacity valve that works in parallel with two or three high capacity valves which are modulated on/off via the PRV. During low demand, the low capacity valve handles the load requirements. As the load demand increases, the pressure reducing valve, which is set at a certain pressure differential, will open and allow flow through the high capacity valves to assist the low capacity valve in meeting the increased load requirements.

SPECIFICATION ■

Maximum Pressure Differential	100 psi (689 kpa)
Maximum Static Pressure	125 psi (861 kpa)
Maximum Hot Water Temperature	200°F (93°C)
Minimum flow*	0.5 gpm (1.9 lpm)
Minimum flow at which valve systems will control to ASSE 1017 requirements.	5.0 gpm (19 lpm)
Approach Temperature	15°F (8°C)
Temperature Adjustment Range	40°F - 160°F (4°C - 71°C)

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

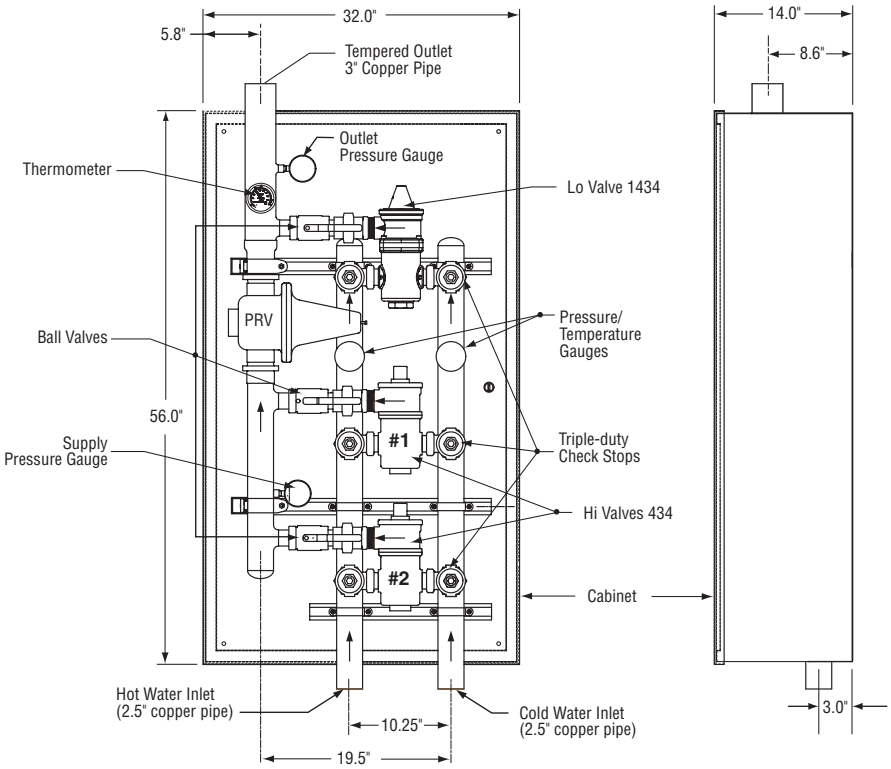
Table 1 — Flow Capacity When Tested To ASSE 1017 Standard † ■

Model	Min. Flow to ASSE 1017	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)
1434TV	5.0 gpm (19 lpm)	112.0 gpm (424 lpm)	155.0 gpm (587 lpm)	230.0 gpm (871 lpm)	282.0 gpm (1067 lpm)	350.0 gpm (1325 lpm)	409.0 gpm (1548 lpm)
1434QV	5.0 gpm (19 lpm)	152.0 gpm (574 lpm)	210.0 gpm (794 lpm)	312.0 gpm (1180 lpm)	383.0 gpm (1449 lpm)	475.0 gpm (1797 lpm)	555.0 gpm (2099 lpm)
434	15.0 gpm (57 lpm)	40.0 gpm (151 lpm)	55.0 gpm (208 lpm)	82.0 gpm (310 lpm)	101.0 gpm (382 lpm)	125.0 gpm (473 lpm)	146.0 gpm (552 lpm)
1434	5.0 gpm (19 lpm)	32.0 gpm (121 lpm)	45.0 gpm (170 lpm)	66.0 gpm (250 lpm)	80.0 gpm (303 lpm)	100.0 gpm (378 lpm)	117.0 gpm (443 lpm)

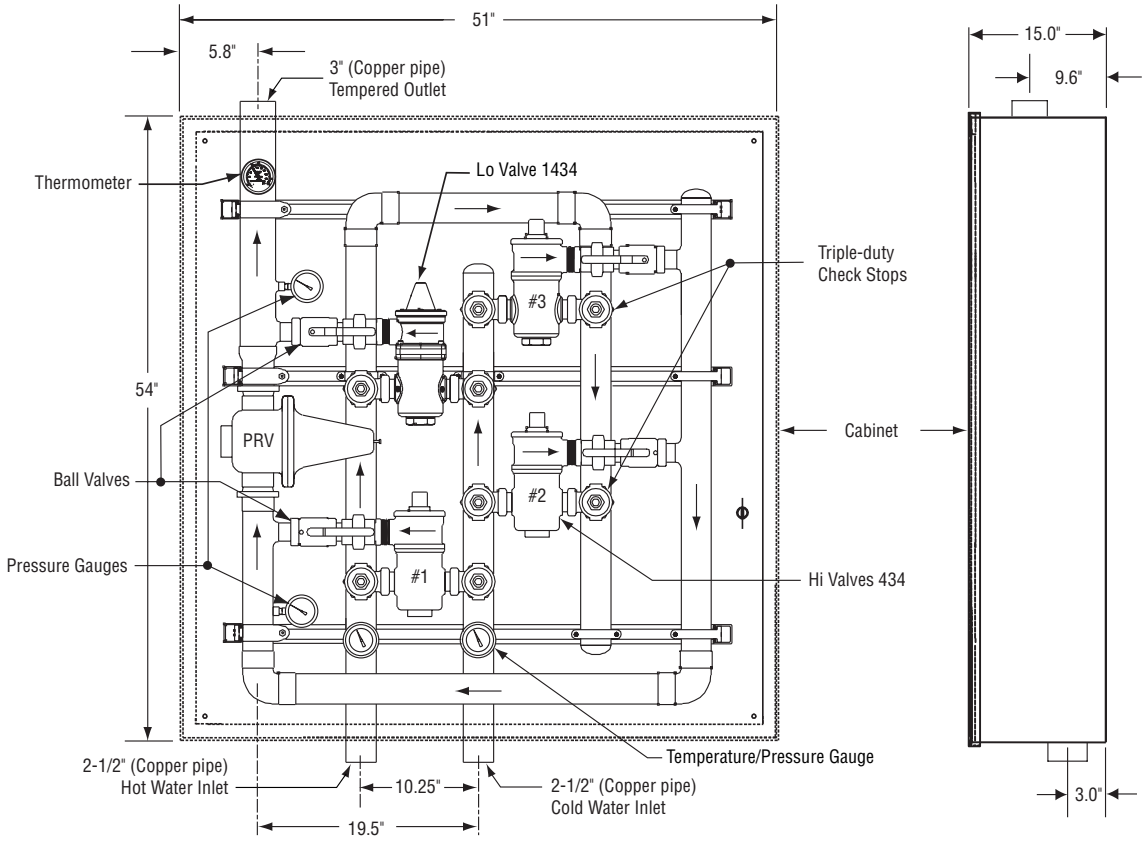
† ASSE 1017 Section 3-2

DIMENSIONS & LEGEND ■

TRIPLE-VALVE SYSTEM



QUAD-VALVE SYSTEM



Note: Dimension may vary by ± 0.25”

PIPING DIAGRAMS ■

Diagram 1. Piping diagram without Aquastat.

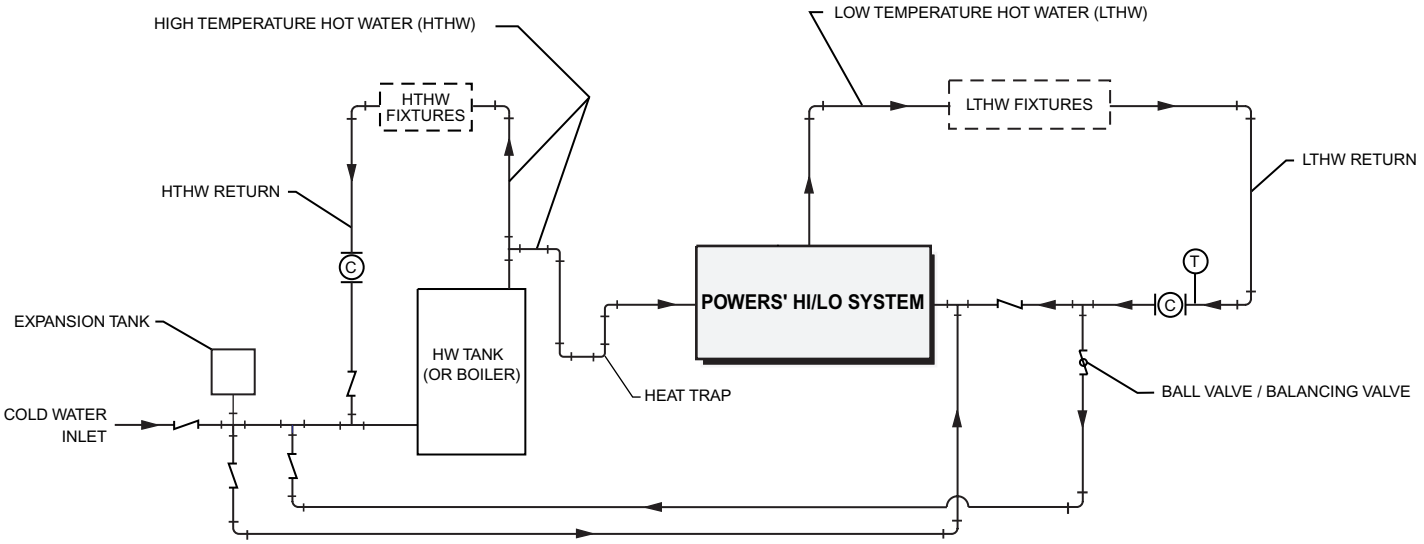
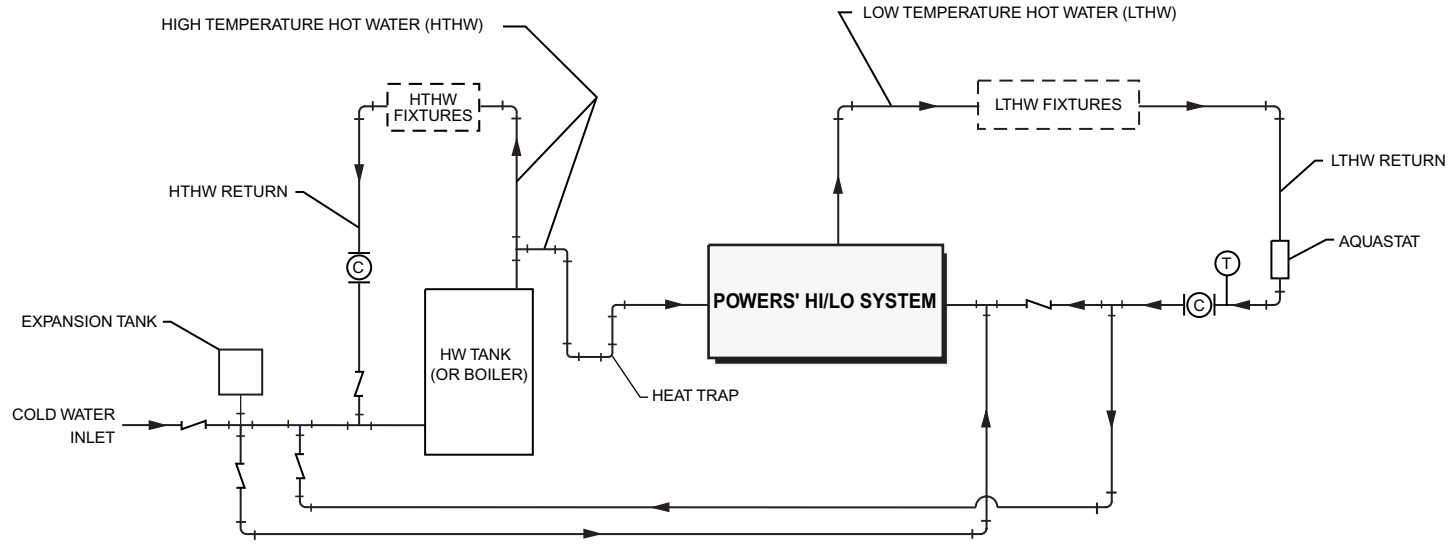


Diagram 2. Piping diagram with Aquastat.



INSTALLATION ■

Prior to Installation

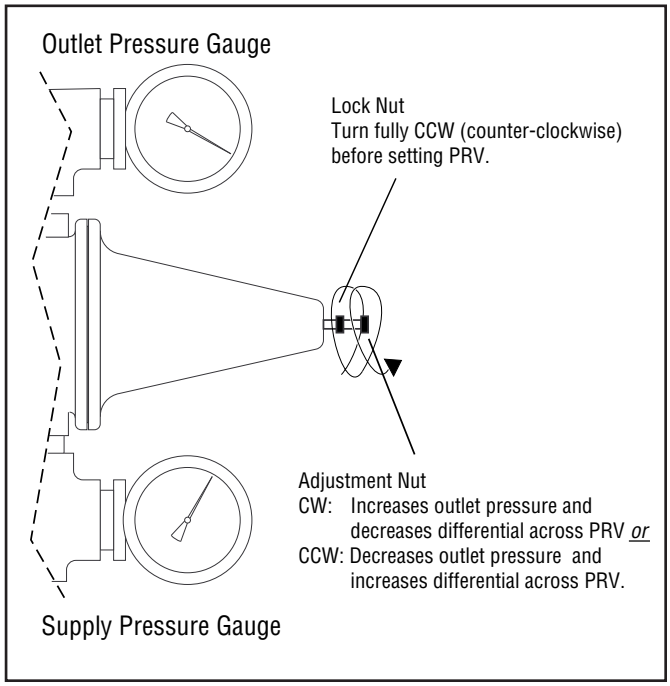
1. Flush all piping thoroughly before installing.
2. In order to make any temperature adjustment to the valves, you must have the capability to obtain adequate flow across the valve (refer to table 1).
3. Typical piping diagrams are shown on page 4, for other alternatives or other circumstances, contact 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 Hi/Lo system. You need flow greater than the minimum shown in table 1 across the valve in order to set a desired temperature.

1434TV

1. Close the ball valve at the outlet of the 1434 valve and 434 valve #2.
2. Open the ball valve at the outlet of the 434 valve #1.
3. Open enough fixtures to meet the minimum flow requirement of the 434 valve #1 as per table 1.
4. Set 434 valve #1 temperature (refer to TI 430 if required).
5. Close ball valve at the outlet of the 434 valve #1 and open the ball valve at the outlet of the 434 valve #2. Repeat steps 3 and 4.
6. 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.
7. Adjust the PRV so the outlet pressure gauge reads 15 psi less than the supply pressure gauge. Turning the adjustment nut clockwise will decrease the differential across the PRV (allowing the PRV to open sooner). Turning the adjustment nut counter-clockwise will increase the differential across the PRV (allowing the PRV to open later).
8. Close the ball valve at the discharge of the 434 valves.
9. Open the ball valve on the outlet of the 1434 valve.
10. Open enough fixtures to meet the minimum flow requirement of the 1434 valve as per table 1.
11. Set the temperature for the 1434 valve (refer to TI 1430 if required).
12. Open all the ball valves at the outlets.
13. Verify outlet temperature remains at the set point.
14. For any problem, refer to troubleshooting section of the document or contact Powers' Technical Support Department at 1.800.669.5430



1434QV

1. Close the ball valve at the outlet of the 1434 valve and 434 valves #2 and #3.
2. Open the ball valve at the outlet of the 434 valve #1.
3. Open enough fixtures to meet the minimum flow requirement of the 434 valve #1 as per table 1.
4. Set 434 valve #1 temperature (refer to TI 430 if required).
5. Close ball valve at the outlet of the 434 valve #1 and open the ball valve at the outlet of the 434 valve #2. Repeat steps 3 and 4.
6. Close ball valve at the outlet of the 434 valve #2 and open the ball valve at the outlet of the 434 valve #3. Repeat steps 3 and 4.
7. 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.
8. Adjust the PRV so the outlet pressure gauge reads 15 psi less than the supply pressure gauge. Turning the adjustment nut clockwise will decrease the differential across the PRV (allowing the PRV to open sooner). Turning the adjustment nut counter-clockwise will increase the differential across the PRV (allowing the PRV to open later).

9. Close the ball valve at the discharge of the 434 valve #3.
10. Open the ball valve on the outlet of the 1434 valve.
11. Open enough fixtures to meet the minimum flow requirement of the 1434 valve as per table 1.
12. Set the temperature for the 1434 valve (refer to TI 1430 if required).
13. Open all the ball valves at the outlets.
14. Verify outlet temperature remains at the set point.
15. 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.

TROUBLE SHOOTING ■

Outlet temperature is too hot on 1434 valve:

1) The temperature of the 1434 valve was not properly set. Refer to set up procedure and reset the temperature.
2) The thermal actuator of the 1434 valve is not working properly. Test and replace accordingly to the technical instructions TI 1430 enclosed.
3) Recirculation lines are not properly plumbed. Refer to piping diagram on page 4.

Outlet temperature is too hot on the 434 valves:

1) The temperature of 434 valves were not properly set. Refer to set up procedure and reset the temperature.
2) The thermal actuator of the 434 valves are not working properly. Test and replace accordingly to the technical instructions TI 430 enclosed.
3) Recirculation lines are not properly plumbed. Refer to piping diagram on page 4.

Outlet temperature stable, but creep high overnight:

1) Recirculation lines are not properly plumbed. Refer to piping diagram on page 4.
2) The PRV opening too soon. Refer to set up procedure and reset the differential across the PRV.
3) The return pump runs constantly. Install a balancing valve or an Aquastat on the return pump. Refer to piping diagram on page 4.
4) No heat trap was installed. Install a heat trap.
5) Balancing valve open too much. Adjust balancing valve.

Outlet temperature too low on either 1434 or 434 valves.

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. Increase 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 1434 or 434 valves. Refer to set up procedure and reset the valves temperature.

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 too much. Regulate the inlet pressure to the mixing valves.

Outlet temperature cycles between hot and cold:

1) The differential across the PRV is set too low, so the 434 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.
2) The system pressure varies too much. Regulate the inlet pressure to the mixing valves.

PREVENTIVE MAINTENANCE ■

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

1) Before servicing check stops, turn off the water upstream. At least every twelve (12) months open up the check stops bonnet 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 to verify discharge temperature remains at the setpoint.

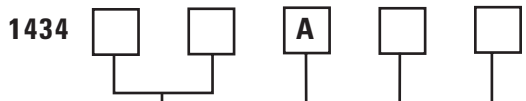
Caution:
Any changes in supply condition will affect the outlet water temperature. Check and adjust the valves accordingly to prevent injury to the users.

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

PARTS KITS ■

See Enclosed TI 430 and TI 1430.

ORDERING INFORMATION ■



Valve	Inlets (inches)	Outlets (inches)	Order Code
Triple-Valve	2.5	3.0	TV
Quad-Valve	2.5	3.0	QV
Piping/Finish			
Copper Piping/Rough Bronze Valve			A
Cabinets			
Exposed, No Cabinet			M
Stainless Steel, Wall Mount			Q
Painted Steel, Wall Mount			U
Alarm (not factory installed)*			
None			0
AquaSentry2**			1

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

TYPICAL SPECIFICATION ■

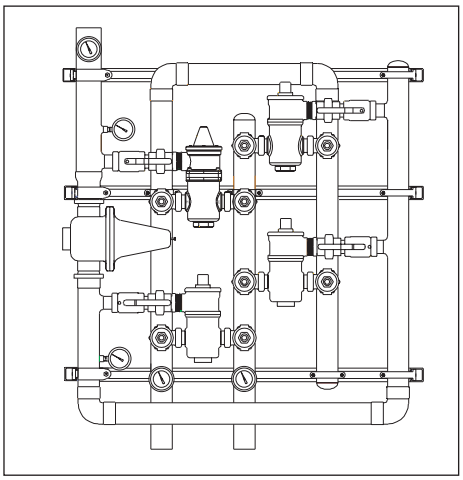
Triple-Valve Hi/Lo

Triple-Valve Hi/Lo water temperature control system should include three thermostatic 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 fluctuations due to inlet water temperature changes. Valves shall be of bronze body with triple-duty check stops and must have advanced, paraffin-based thermal actuation technology in order to guarantee a precise control when tested in accordance with ASSE 1017 and CSA B125. Thermostatic valves must be ASSE listed and CSA approved.

Triple-Valve Hi/Lo system must include PRV, ball valves, pressure/temperature gauges, thermometers and mounted on heavy-duty metal struts.

The Hi/Lo system shall be a Powers' 1434TV. Any alternate must have a written approval prior to bidding.

Quad-Valve Hi/Lo



Quad-Valve Hi/Lo water temperature control system should include four thermostatic 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 fluctuations due to inlet water temperature changes. Valves shall be of bronze body with triple-duty check stops and must have advanced, paraffin-based thermal actuation technology in order to guarantee a precise control when tested in accordance with ASSE 1017 and CSA B125. Thermostatic valves must be ASSE listed and CSA approved.

Quad-Valve Hi/Lo system must include PRV, ball valves, pressure/temperature gauges, thermometers and mounted on heavy-duty metal struts.

The Hi/Lo system shall be a Powers' 1434QV. Any alternate must have a written approval prior to bidding.

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. (California law requires this warning to be given to customers in the State of California.)
For more information: www.wattsind.com/prop65

ENGINEERING APPROVAL

Project: _____

Contractor: _____

Architect/Engineer: _____

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USA Phone: 800-669-5430 • Fax: 847-824-0627 • Canada Phone: 1.888.208.8927 • Fax: 1.888.882.1979
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