

# POWERS

A WATTS INDUSTRIES CO.

## TECHNICAL INSTRUCTIONS

### HYDROPANEL™ II SHOWER SYSTEM with Hydroguard 420 Thermostatic Valve

#### DESCRIPTION

The Powers Hydropanel II Series 450-4200 Shower System combines thermostatic water control with the convenience of modular shrouding. Hydropanel II stainless steel shrouding provides a concealed shower system where in-wall piping does not exist or may not be practical. The Hydroguard 420 valve uses a self-actuated thermostatic motor to quickly sense any change in hot or cold supply water temperature or pressure and respond to maintain the user-selected temperature. In the event of cold water failure, the thermostatic motor virtually shuts off the flow of hot water. The unit also features a concealed handle rotation stop to guard against over adjustment of the handle.

The Series 450-4200 Hydropanel II comes complete with the stainless steel Hydropanel II Shrouding, Series 420 Hydroguard, in-line checkstops, piping, showerhead, end cap and mounting hardware. Some models feature a stainless steel soapdish. Some models feature an ADA compliant lever handle. An optional handshower comes preassembled with a full spray pushbutton handshower, 60" hose, 18" mounted glide-bar and connectors. The Hydroguard 420 valve is CSA approved, and the Series 450-4200 Hydropanel II carries a one-year limited warranty.

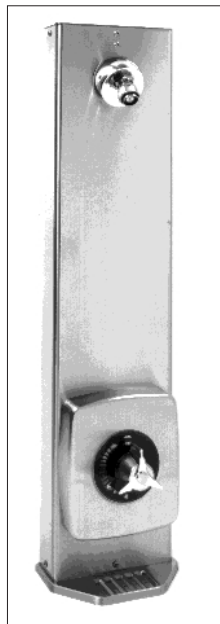
The following instructions serve as guide for installation, general maintenance and parts replacement for the Hydropanel II Series 450-4200. For detailed repair and maintenance instructions for the Hydroguard 420 valve, please refer to Form #T1420-1. For repair and maintenance of checkstops, see Form #129-028. For specification or installation of the Hydropanel II Optional Modular Shrouding for shower rooms, please refer to Forms #PS450SH or #T1450SH.

#### OPERATION

Hot and cold water enter respective ports in the valve and mix in a chamber containing a thermostatic motor. This liquid filled motor connects to the valve assembly, which includes a hot water seat and a shut off disc. With the adjustment handle in full clockwise (OFF) position, the shut-off disk closes the mixing chamber from the outlet, and the hot water disc seats to prevent crossflow.

Rotating the adjustment handle repositions the valve assembly to mix hot and cold supply water in proportions required to produce the user-selected temperature. The mixed water passes over the shut-off disc, to the showerhead. If the mixed water temperature differs from the handle setting (i.e., the hot or cold supply water temperature or pressure changes) the liquid filled bellows inside the thermostatic motor will contract or expand. This movement repositions the valve assembly to maintain the desired delivery temperature.

A handle rotation stop limits the movement of the control handle toward the full hot position. The Hydroguard 420 valve is factory set to deliver tempered water up to 115°F [46.1°C] with equal supply pressures, hot water temperature 140°F [60°C], cold water temperature 60°F [15.6°C].



*Hydropanel II Model 450-4202 with Swivel Showerhead and Soapdish (available with ADA compliant lever handle, Model 450-4212).*



*Hydropanel II Model 450-4204 with Handshower Assembly and Soapdish (available with ADA compliant lever handle Model 420-4214).*

#### SPECIFICATIONS

**Hydropanel:** Brushed 18 Gauge 304 SS. Dimensions 31 1/8"H x 7 1/2"W x 6 1/2"D [791mm H x 191mm W x 165mm D].

**Piping:** 1/2" copper tubing.

**Showerhead:** Fixed: Chrome plated brass, maximum flow 2.5 gpm @ 80 psi [.16 l/s @ 552 kPa]. Adjustable Swivel: Chrome plated brass, 30° angle of rotation, maximum flow 2.5 gpm @ 80 psi [.16 l/s @ 552 kPa].

**Valve Assembly and Trim:** Hydroguard 420 Thermostatic Mixing Valve. Three port, heavy cast bronze body with brass stem. Standard in line checkstops. Concealed handle rotation stop. Chrome plated zinc tri-handle, or ADA compliant lever handle.

**Connections:** 1/2" NPT inlets and outlet.

**Valve Operation:** 6 gpm @ 45 psi differential [.38 l/s @ 310 kPa]. Maximum pressure 125 psig [862 kPa]. Maximum inlet temperature 190°F [88°C].

**Handshower:** Full spray with pushbutton water control. Minimum flow 2.0 gpm @ 20 psi [.13 l/s @ 138 kPa]. Maximum flow 2.5 gpm @ 80 psi [.16 l/s @ 138 kPa]. 60" [1499mm] reinforced vinyl hose with 1/2" chrome finished supply connections. 18" [457mm] chrome finished brass glide bar, self-tensioned for easy height adjustment.

## INSTALLATION

Before installation of any Hydropanel II unit, rotate the stem (or handle if attached) of the valve to its full clockwise position (OFF).

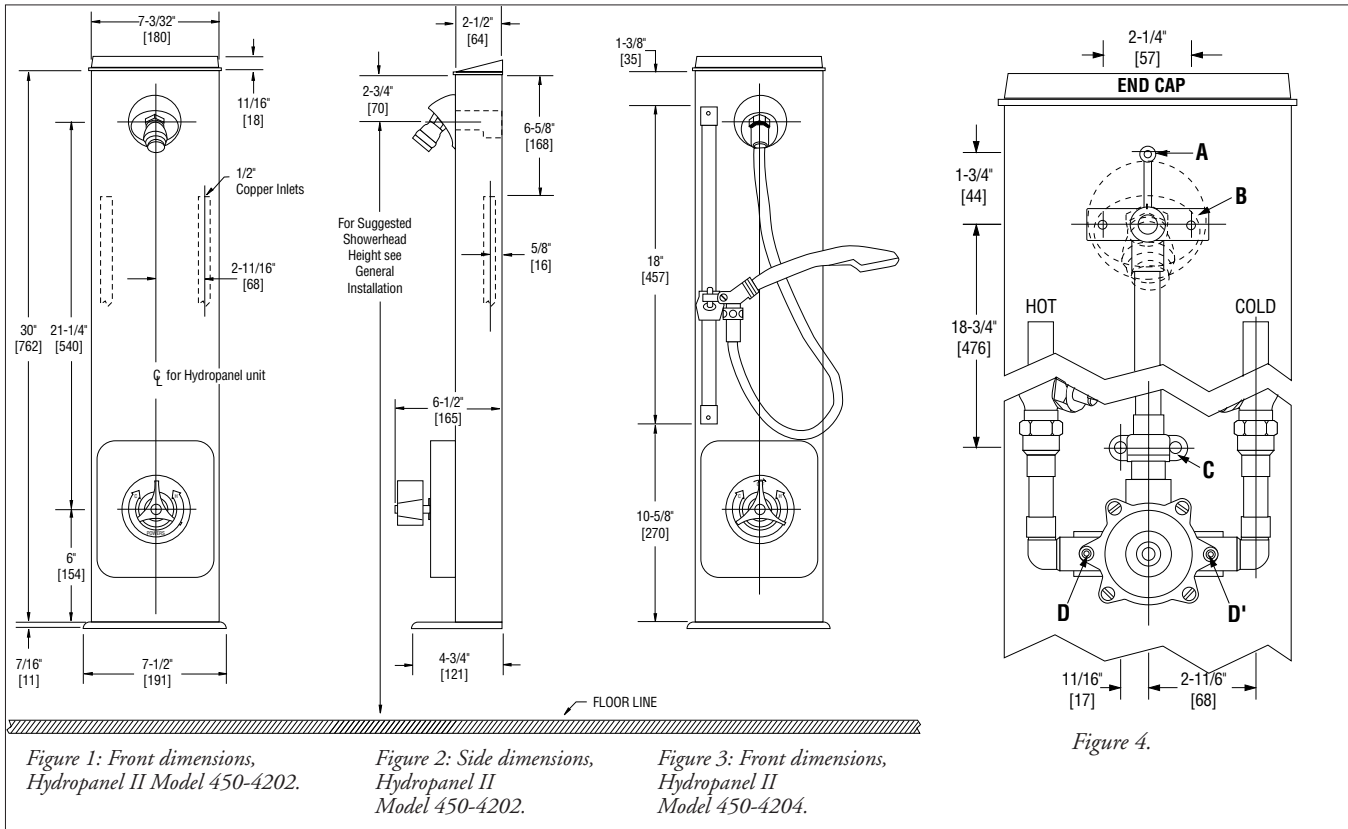
### POSITION THE HYDRO PANEL II UNIT

(See Figures 1 and 2) Determine the horizontal position of the unit according to shower room layout, and mark the centerline. For multiple shower applications, the recommended minimum distance between the centerline of two units is 36 inches [1914mm].

- Determine the floor-to-showerhead height for the unit. Recommended heights are listed below:

Men - 77" [1956mm]	Youth - 66" [1676mm]
Women - 70" [1778mm]	Youth - 60" [1524mm]

- The preassembled copper tubing for supply water inlets are 6-5/8" [168mm] from the top of the shroud and 2-11/16" [68mm] left and right of the centerline. Adjust supply piping accordingly.



### Install the Piping Assembly

The piping and Hydropanel II shrouding must be separated before mounting to wall. The valve trim and cover plate are in a separate plastic bag in the Hydropanel II shipping carton. For #450-4204 and #450-4205 Hydropanel II units, the hand-shower, hose and showerhead base come preassembled to the shrouding. Refer to Figure 4.

- Detach the piping from the shrouding, by removing screw A above the showerhead. Slide piping out of the shrouding; the shower head remains attached to the shroud.
- For mounting the piping assembly upper bracket (B), use the bracket as a template and drill two small holes in the wall at showerhead height.
- For mounting the piping assembly lower bracket (C), drill two small holes in the wall that are 18-3/4" [476mm] below the upper bracket, and 11/16" [17mm] to the left and right of centerline.
- Install any mounting anchors as detailed by the individual room specifications.
- Secure upper piping bracket B with mounting screws (not included).
- Secure lower piping bracket C with mounting screws (not included).
- Connect the supply lines to the piping assembly.

### Attach the Shrouding

Do Not remove the entire chrome plated end cap from the shrouding; it functions as an end cap and gasket for shroud extension. Part of the end cap can be broken out to provide vertical and horizontal piping clearance.

- To remove scored section, hit it sharply with a hammer.
- To connect the showerhead on the shroud to the water outlet pipe, slide the showerhead nipple on the inside of the shroud into the piping assembly. The End Cap will slide over the supply piping. Secure the shrouding with the screw at A.

### Test the System

Before final assembly, test the Hydropanel II system.

- Fit the handle onto the valve stem and turn clockwise to the shut off position.
- Turn on water supply, and then rotate the valve handle counterclockwise. Water should come through the showerhead.
- Now turn handle fully counterclockwise and measure the temperature of the outlet water. Wait until the temperature stabilizes for an accurate reading.
- Turn off valve (fully clockwise) and check all connections (showerhead, pipe connections, valve bonnet) for leaks.

## INSTALLATION, CONTINUED

### Set the Handle Rotation Stop

The 420 Hydroguard valve was factory set to deliver 115°F [46°C] tempered water with hot water supply at 140°F [60°C] and cold water supply at 60°F [16°C].

The handle rotation setting must be adjusted to limit the distance the user can rotate the handle towards the full hot water position.

**CAUTION:** Any repair or modification of the valve may affect the high temperature setting.

When the user rotates the handle fully counterclockwise, the limit stop will rest against the bonnet stop. Refer to Figure 5.

16. Remove the valve handle.
17. If the measured temperature exceeds the desired maximum outlet temperature, move the limit stop ONE SPLINE COUNTERCLOCKWISE. This will DECREASE the handle rotation and the maximum adjustable temperature.
18. If the measured temperature is below the desired maximum outlet temperature, move the limit stop ONE SPLINE CLOCKWISE. This will INCREASE the handle rotation and the maximum adjustable temperature.
19. Replace handle. Repeat steps 12 through 18 until desired maximum outlet temperature is reached. Remove handle before final assembly of shrouding.

### Assemble the Valve Cover and Handle

The Hydropanel II piping assembly and shrouding must be securely mounted to the wall before the valve cover plate and handle assembly are attached. Only properly mounted piping and

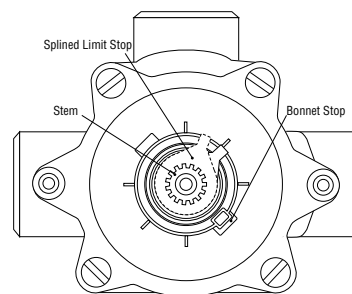


Figure 5.

shrouding provide the stable platform needed for the cover plate to snap snugly into place.

The valve parts and cover plate are in a separate plastic bag in the Hydropanel II shipping carton.

20. The cover plate fits over the tabs around the shroud valve hole. Snap the cover plate into place.
21. (Figure 4) Secure the cover plate to the shroud and piping assembly at D and D', with the 1-1/2" stainless steel screws.
22. (Figure 6) Place the graphic insert into the cover plate, snap the retaining ring into place in the valve hole and slide the brass collar over the stem.
23. Place the tri-handle over the stem, and secure with retaining washer and screw using the 3/32" wrench (included). Snap the button plug into place.
24. (Figure 4) Finish assembly by tightening the shrouding screw at A above the showerhead.

## SERVICING THE HYDRO PANEL UNIT

Before servicing checkstops or piping, turn off the supply water upstream. To access the checkstops, remove the valve handle assembly, cover plate and shrouding (refer to Install the Piping Assembly).

At least every twelve months, open up the checkstops and check for free movement of the poppet.

Before servicing the valve, either turn off the water supply upstream (the shroud does not have to be removed), OR access

and close the checkstops. To close the checkstops, turn the adjustment screw on each fully clockwise.

Every six months, check and adjust the handle rotation setting. Every twelve months, remove the valve bonnet and check the internal components for freedom of movement.

To service or clean the showerhead, unscrew from shroud at hex nut. Service as necessary, and reattach.

## TROUBLESHOOTING

**\*NOTE\*:** For complete instructions on servicing the Hydroguard 420 valve, please refer to Form #T1420-1 for Models 4-9 and T1420 v3 for Model 10. For complete instructions on servicing checkstops, please refer to Form #129-028.

1. **If you have an older model (4-6) of the 420 Hydroguard valve...**
  - a. Convert to Model 10 with Kit #420-451.
2. **If the flow of water is less than desired...**
  - a. The upstream supply valves may not be fully open.
  - b. The inlet supply pressure(s) may be low.
  - c. Lime deposits may have accumulated in the hot water pipes, restricting water flow.
  - d. The showerhead may be clogged. Remove and clean.
  - e. The checkstops may be clogged.\*
3. **If the flow of water is completely shut off...**
  - a. The upstream supply valves may be completely closed.
  - b. The hot or cold water supply pressure may have failed. The Hydroguard 420 valve is designed to shut off upon cold water failure.
  - c. The checkstops may be closed. Access the checkstops and open by turning the adjustment screw fully counterclockwise.

### 4. **If the water flowing from the showerhead varies in temperature, or is untempered hot or cold...**

- a. Lime deposits may have accumulated in the hot water pipes, restricting water flow.
- b. The thermostatic motor may have failed. Replace with Repair Kit #227-339 for Models 4-9 and Repair Kit #420-453 for Model 10\*.
- c. The inlet water supplies may be connected to the wrong ports. Remove the Hydropanel II unit and reinstall.
- d. There may be extreme pressure variations in the water supply lines. Check with plumber or plumbing engineer.

### 5. **If water is still untempered after motor replacement...**

- a. The hot water seat may be worn. Replace with Repair Kit #227-340\*.

### 6. **If the water flows from the valve or showerhead after shut-off...**

- a. The shut-off disc may be worn. Replace with Repair Kit #227-338\*.
- b. The combination seat O-ring may be worn. Replace with Repair Kit #227-341\*.

**TROUBLESHOOTING, CONTINUED**

**7. If the valve leaks only at the stem and/or bonnet...**

a. The bonnet gasket, Huva cup or motor quad ring may be worn. Replace with Repair Kit #227-338\*.

**8. If the maximum temperature cannot be obtained...**

- a. Lime deposits may have accumulated in the hot water pipes, restricting the hot water supply.
- b. The hot water supply temperature may be too low.

c. The handle rotation setting may be too low. Remove valve handle, and readjust the handle rotation stop (see Setting the Handle Rotation Stop).

**9. If the valve opens with hot water flow rather than cold water flow...**

a. The inlet water supplies are connected to the wrong ports, Remove the Hydropanel II unit and reinstall.

**ORDERING**

#	Part #	Description	Qty	Material
2	N/A	Shroud	1	St Steel
4	450 268	Soap Dish	1	St Steel
5	4504011	End Cap Kit	1	Chrm Plt ABS
6	450 273	Screw 10-32 x 3/8 (shroud)	7	St Steel
NS	141 837	Handshower with 18" Glidebar	1	-
7	450 276	Set Screw 10-32 x 7/8	1	St Steel
8	141 815	Fixed Showerhead	1	Chrm Plt Brass
9	141 816	Adjustable Swivel Showerhead	1	Chrm Plt Brass
10	450 277	Gasket, Showerhead Base	1	Garlock 3000
11	450267G	Showerhead Base	1	Chrm Plt Brass
12	047 013	Quad Ring 3/8 x 1/2 x 1/16	1	Buna N
13	450 274	Screw 10-32 x 1/4 (showerhead)	3	Brass
14	410 195	Button Plug	1	Ni Plt Brass
15	450 271	Screw 8-32 x 1/2 (tri-handle)	1	St Steel
NS	034224G	Screw (lever handle)	1	St Steel
18	046008K	Shakeproof Washer	1	Cad Plt Brass
19	410 191	Tri Handle	1	Chrm Plt Znc
NS	420 312	Lever Handle Assembly	1	Chrm Plt Znc
22	450 192	Sleeve Bonnet (repair only)	1	Chrm Plt Brass
23	227 166	Retaining Ring	1	Chrm Plt Brass
29	420 330	Nameplate and Baseplate Ass'y	1	Al w/ Mylar
30	080 009	Screw 8-32 x 1" (dial insert)	2	St Steel
31	450 356	Cover Plate	1	St Steel
34	N/A	Hydroguard/Piping Assembly	1	-
NS	089 003	3/32" Service Wrench	1	Steel
NS	089 004	1/8" Service Wrench	1	Steel

NS = Not shown in diagram    NA = Not available as commercial part

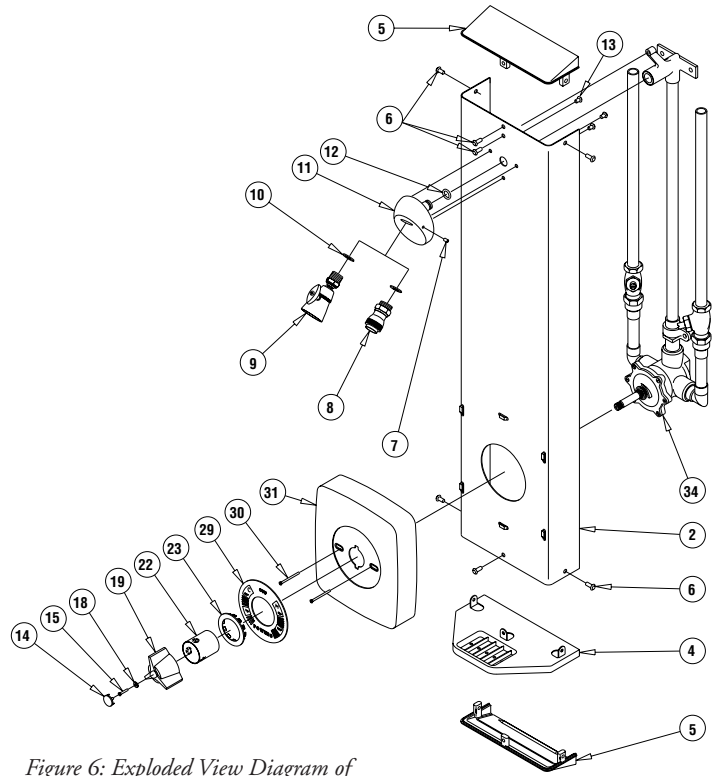


Figure 6: Exploded View Diagram of Hydropanel II Series 450-4200 Shower Unit.

**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](http://www.wattsind.com/prop65)



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