

#### OPERATION

Hot and cold water enter their respective ports and the flows are equalized through the action of the balancing poppet (1). The poppet caps (2) prevent a “slamming” of the poppet as it approaches the seat by a feedback of the controlled pressure. The entire balancing poppet assembly is contained in a Celcon chamber (3). This chamber is replaceable as a complete cartridge. After the hot and cold flows are equalized, they are mixed by the action of the mixing plate (4). As the temperature adjustment stem is rotated from shutoff to maximum hot water temperature, the mixing plate passes the required proportion of hot and cold water to produce the control point. With the adjustment stem in its full clockwise position, shutoff is obtained by shutting off both supplies.

The adjustable limit stop (5) allows the user to set the maximum discharge temperature. This mixer does not recognize supply water temperature changes so any variation in the water temperature will affect the control point and the adjustable limit stop setting.

**CAUTION:** Maintenance of units requires resetting of adjustable limit stop.

#### SPECIFICATIONS

##### Operating

Capacity @ 45 psi differential.....	(310 kPa)
All models 1–3.....	6 gpm (0.38 l/sec)
Model 4.....	3 port valve 6 gpm (0.38 l/sec)
	4 port (tub) 6 gpm (0.38 l/sec)
	(shower) 6 gpm (0.38 l/sec)
Maximum pressure (static).....	125 psi (862 kPa)
Maximum inlet temperature.....	180°F (82°C)
Inlet and outlet sizes.....	1/2" NPT
Built-in shutoff.....	All Models
Built-in Volume Control.....	Models 412 and 414 only
Roughing-in template.....	All Models
Adjustable Limit Stop.....	All Models
Compliance.....	CSA 125, ASSE 1016



#### APPLICATION

The Series 410 Hydroguard is particularly recommended for showers and shower bath installations in motels, hotels, dormitories, and high-rise apartment buildings.

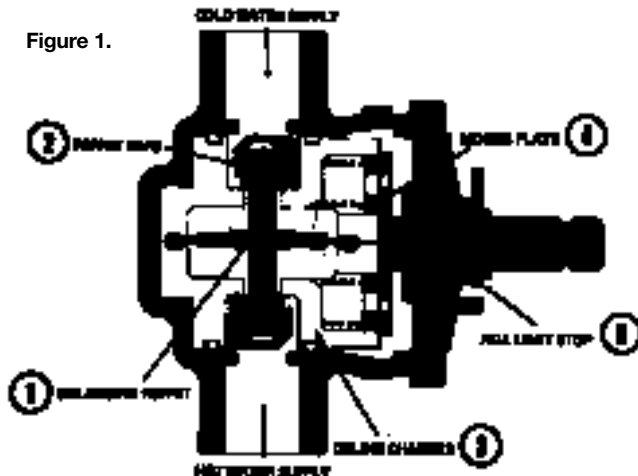
#### MAINTENANCE

##### Troubleshooting

What to look for if:

1. **The flow of water is less than desired.**
  - a. Valves upstream from supply not fully open.
  - b. Low supply pressures.
  - c. Accumulation of lime deposits in hot water pipes, restricting the flow of hot water.
  - d. Showerhead clogged.
  - e. Low hot water supply temperature.
2. **Flow of water is completely shut off.**
  - a. Valves upstream from supply completely closed.
  - b. Failure of hot or cold water supply pressure. The HydroGuard is constructed to restrict the flow of water on hot or cold water supply failure.
3. **Flow is untempered hot or cold water.**
  - a. The water supplies are connected to the wrong ports. See Fig. 5 for instructions on reversing the mixing plate.
  - b. DIAPHRAGM is ruptured, replace with new cartridge.
4. **Flow of water continues when HydroGuard is shut off.**
  - a. Worn SHUTOFF DISCS. Replace worn disc.
  - b. Foreign particles on mixing plate.
  - c. Scored mixing plate.
5. **Maximum temperature is too low.**
  - a. Accumulation of lime deposits in hot water pipes, which restricts the flow of hot water.
  - b. The Adjustable Limit Stop is not at its maximum adjustment.
  - c. Hot water temperature too low.

Figure 1.



**SERVICING**



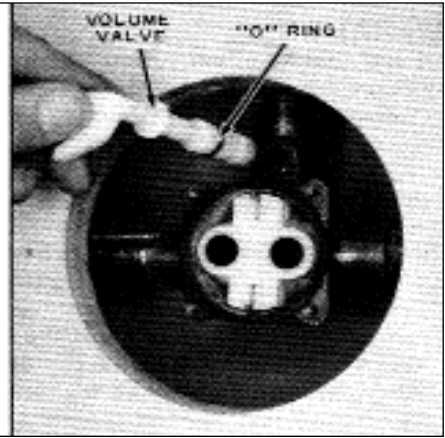
**Figure 2**

Remove and replace hot and cold water discs as shown above



**Figure 3**

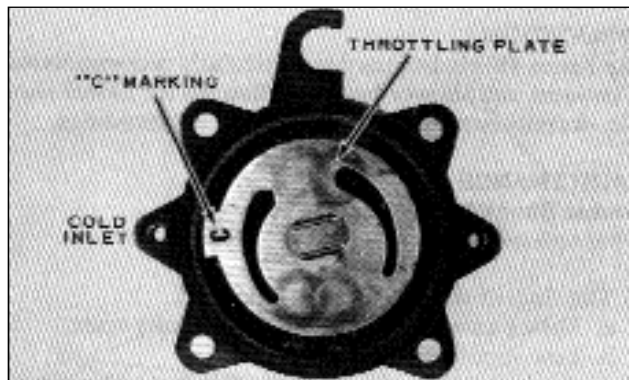
To remove balancing chamber, carefully pull out with pliers or use cartridge removal tool 410-202. Replace with parts in kit 410-183.



**Figure 4**

If volume valve is leaking at body, remove as shown and replace "O"-ring. Reassembles in reverse order. When reassembling cap assembly on Model 412 HydroGuards, make sure hook is engaged in volume valve.

**To Correct Reversed Inlets or To Change From Top to Bottom Outlet**



**Figure 5**

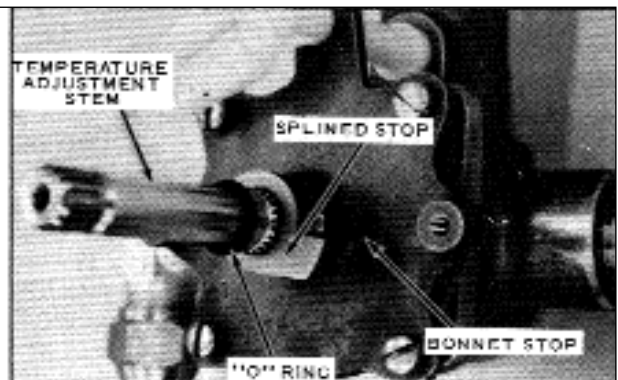
Both the Model 411 and Model 412 and 414 HydroGuards are shipped from the factory with top outlet.

THE MODEL 411 "STANDARD" HYDROGUARD CAN BE PIPED FOR BOTTOM OUTLET.

The Model 411 HydroGuard can be piped for bottom outlet. Rotate body assembly so that outlet is at bottom. It is then necessary to remove and rotate the throttling plate so that the letter "C" is next to the cold inlet.

THE MODEL 412 and 414 "DELUXE" HYDROGUARD IS PIPED FOR TOP OUTLET ONLY.

**Maximum Temperature Setting**



**Figure 6**

HydroGuards are factory set at full hot water. To change setting, remove splined stop by slipping "O"-ring up on stem. Do not remove from stem. Rotate Adjustable Limit Stop to required maximum temperature setting. Position splined stop on adjustment stem so that it contacts bonnet stop. See Figure 6. Slip "O"-ring back to the original position. Shutoff is made by rotating temperature adjustment stem clockwise.

CAUTION: MAINTENANCE OF UNIT REQUIRES RESETTING OF ADJUSTABLE LIMIT STOP.

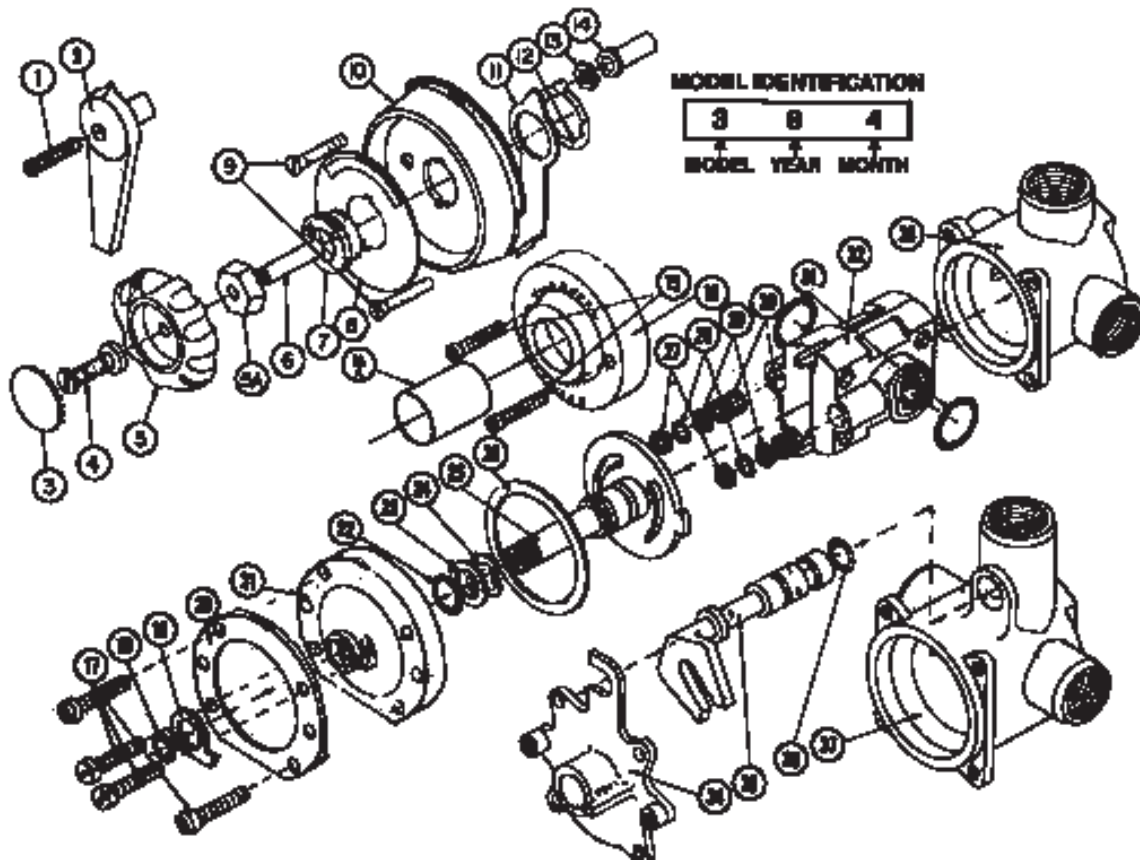
	<b>Troubleshooting</b>	<b>Recommended Repair Kit</b>
<b>Gasket and Disc Replacement</b>	1. Water leak at stem and/or bonnet 2. Flow of water continues after mixer is turned off.	410-182 (Mod. 1-3), 18, 22, 26, 27(2), 31(2), 36
<b>Balancing Cartridge Replacement</b>	1. Variable or untempered discharge temperature. 2. Leakage after mixer is turned off.	410-183 (Mod. 1-3) 401-175 (Mod. 4) Items 26-32
<b>Throttling Stem and Plate Replacement</b>	1. Flow continues after mixer is turned off. 2. Handle splines on stem damaged.	410-378 Items 13, 18, 22, 23, 24, 25, 26, 27

NOTE: To remove Balance Chamber, use Cartridge Puller #401-202.

For parts not covered above, refer to Technical Instruction Form MV-400-4, MV-410-4, or MV-410-5.

\*\* For Model 4 410, must also order new handle for new brass stem. Order either Lucite handle kit #410-383 or lever handle kit #410-384.

Since kits contain parts for all models, discard the extra parts.



**PARTS LIST**

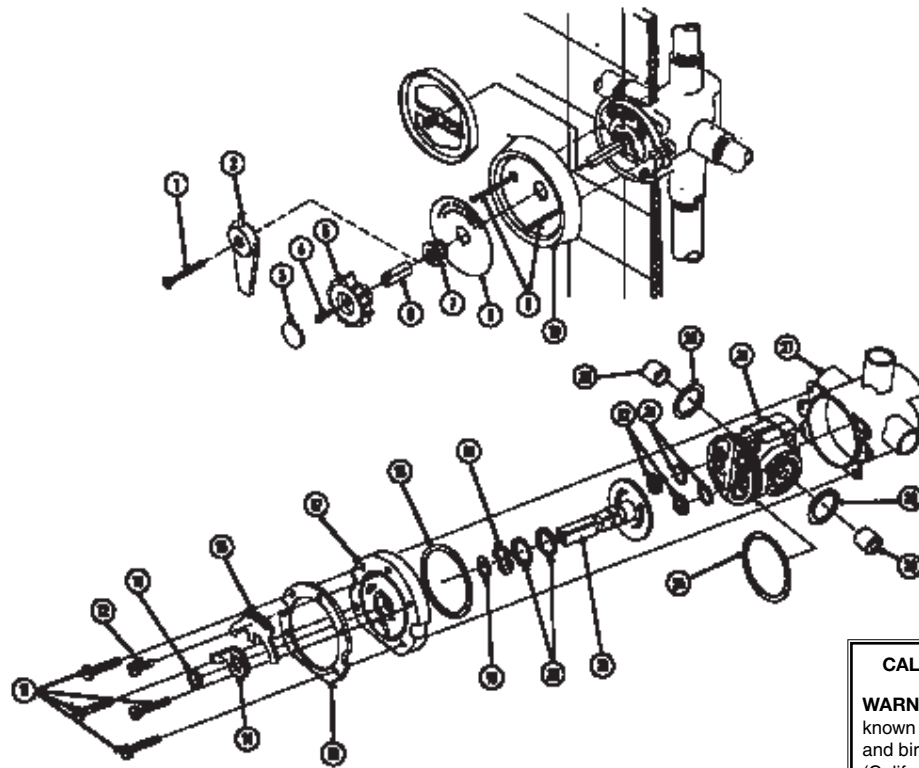
Item	Product No.	Description	Material	Item	Product No.	Description	Material
1	410-365 (10)	Screw (All but 415, 8-32 x 1¼")	C.P. Brass	18	410-366 (25)*	"O"-Ring (¼ x ½ x ⅛")	Buna-N
	420-218 (10)	Screw (On 415, 8-32x1½")	C.P. Brass	19	410-371 (6)	Adjustable Limit Stop	Brass
2	420-495	Lever Handle	C.P. Zinc	20	410-377	Support Ring (Standard)	Stainless Steel
	420-230	Lever Handle (419 only)	C.P. Zinc	21	410-346	Bonnet (Standard)	Noryl
3	420-314	Plug Button	C.P. Steel	22	410-366 (25)*	"O"-Ring (⅝ x ½ x ⅛")	Buna-N
4	420-215 (4)	Screw (8-32x1½")	C.P. Brass	23	410-368 (15)*	Washer	Synthane
5	420-300	Lucite Handle	Lucite	24	410-369 (10)*	Wavy Washer	Stainless Steel
5A	420-213 (3)	Handle Insert	—	*		Stem (On all except 415/419)	—
6	401-267	Sleeve	C.P. Copper	25	410-375	Stem (for 415)	—
7	410-339*	Retainer	Rubber	26	410-370 (10)*	Bonnet Gasket	Rubber
8	410-374	Dial Insert	Aluminum	27	400-023	Shut-Off Disc	Buna-N
9	420-216 (20)	Screws	C.P. Steel	28	410-366 (25)	"O"-Ring (⅝ x ½ x ⅛")	Buna-N
10	410-389	Dial Plate (Standard)	C.P. Zinc	29	410-427	Guide	Brass
	410-404	Dial Plate (Deluxe) Not shown	—	30	410-138	Spring	Monel
11	410-415	Volume Lever (Deluxe only)	Steel	31	047-031	"O"-Ring (¼ x ⅛ x ⅜")	Buna-N
12	410-166	Speed Nut	Steel	32	410-440	Cartridge	Celcon
13	041-080	Nut (Deluxe only)	Brass		410-211	415 Body	C.P. Bronze
14	410-167	Sleeve (Deluxe only)	C.P. Steel	33	410-243	411 and 413 Body	Bronze
15	030-066G	Exposed Dial Screw 8-32x1½")	Brass		410-520	416 and 417 Body	Bronze
16	440-041	Exposed Dial	C.P. Brass	34	410-396	Bonnet (Deluxe)	Noryl
	227-196	Exposed Dial Sleeve for Lucite Handle	C.P. Brass	35	410-157	Volume Valve Assembly (Deluxe)	Bronze
16A	420-232	Exposed Dial Sleeve for Lever Handle	C.P. Brass	36	410-366 (25)	"O"-Ring (⅝ x ½ x ⅛")	Buna-N
	030-889	Screw (Standard 10-24 x ⅞")	Stainless Steel	37	N/A	412 and 414 Body	Bronze
17	030-887	Screw (Deluxe 10-24 x ⅞")	Stainless Steel				

( ) Number of items per package.

\* Items available in kits on page 2.

\*\* Lucite Handle Kit #410-447 contains items 3, 4, 5, 5A, 6

HydroGuard 410—Model 4



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

**PARTS LIST**

Item	Product No.	Description	Material	Item	Product No.	Description	Material
1	034-222G	Screw (8-32 x 1-3/4")	C.P. Brass	16	410-377	Support Ring	Stainless Steel
2	—	See note below	—	17	401-162	Bonnet	Noryl
3	420-225 (4)	Plug Button	C.P. Steel	18	**	Bonnet Gasket	Rubber
4	030-070	Screw (8-32 x 1/8")	Brass	19	410-369 (10)	Wavy Washer	Stainless Steel
5	410-359	Handle	Lucite	20	410-368 (10)	Flat Washer	Synthane
6	410-360	Extension	C.P. Brass	21	401-176	Stem	—
7	401-339	Retainer	Rubber	22	**	Shut-Off Discs	Buna-N
8	410-374	Dial Insert	Aluminum	23	**	Quad Ring	Buna-N
9	420-216 (20)	Screws (8-32 x 2")	C.P. Steel	24	*	"O"-Ring (4-Port Only)	Buna-N
10	410-389	Dial Plate	C.P. Zinc	25	**	"O"-Ring (3/4 x 15/16 x 3/32")	Buna-N
11	030-885	Bonnet Screws (4) 10-32 x 1"	Stainless Steel	26	**	Balance Chamber	Celcon
12	030-884	Adjustable Stop Screw 10-32 x 5/16"	Stainless Steel	27	401-158	4-Port Body	Bronze
13	410-366 (25)	"O"-Rings (3/4 x 1/2 x 1/16")	Buna-N		401-160	3-Port Body	Bronze
14	401-165	Adjustable Limit Stop	Brass	28	401-210	Strainer Caps	Celcon
15	401-278	Adjustable Stop	C.P. Steel				

**\*\*NOTE:** To replace lever handle, convert from square to round stem, order:  
 410-448 Lever Handle  
 410-378 Stem Kit  
 410-371 Temp. Stop

( ) Number of items per package.

\* Used on 4-port mixers only. No discharge will occur when used in 3-port mixer.

\*\* Items available in kits on page 2.

**POWERS™**

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