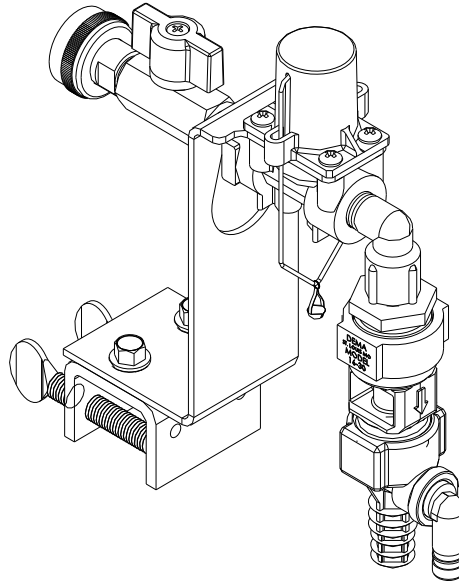


**WATCH GUARD**  
**440 SERIES FLOAT VALVES**  
**INSTALLATION INSTRUCTIONS**  
**MODELS: 440-22T, 440-22TX, 440-23T, 440-23BT, 440-24**



Overview

**Figure 1**

The Watch Guard 440 Series of float valves fills and maintains fluids in reservoirs. The units are equipped with proportioners and integral backflow preventers to inject chemicals into the reservoir at selected dilution rates.

The Watch Guard 440 Series includes brackets for secure attachment and shut-off ball valves.

## Warnings



**ALL ELECTRICAL POWER MUST BE TURNED OFF TO THE DISPENSER AND TO THE APPLIED MACHINE.**



All installations must conform to local plumbing codes and use approved backflow prevention devices. A pressure indicating tee is to be installed with existing faucets according to local plumbing codes in the state of Wisconsin and any other state that requires the use of a pressure indicating tee.



**ALWAYS WEAR PROTECTIVE CLOTHING AND EYEWEAR WHEN WORKING WITH CHEMICAL PRODUCTS.**

# Specifications

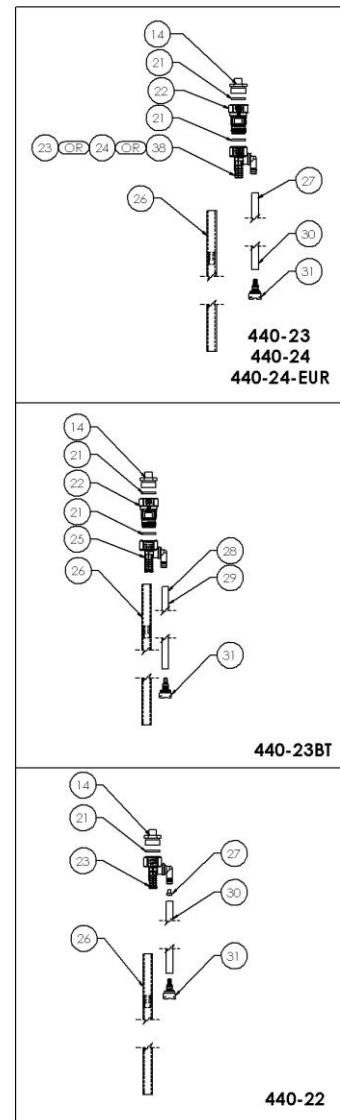
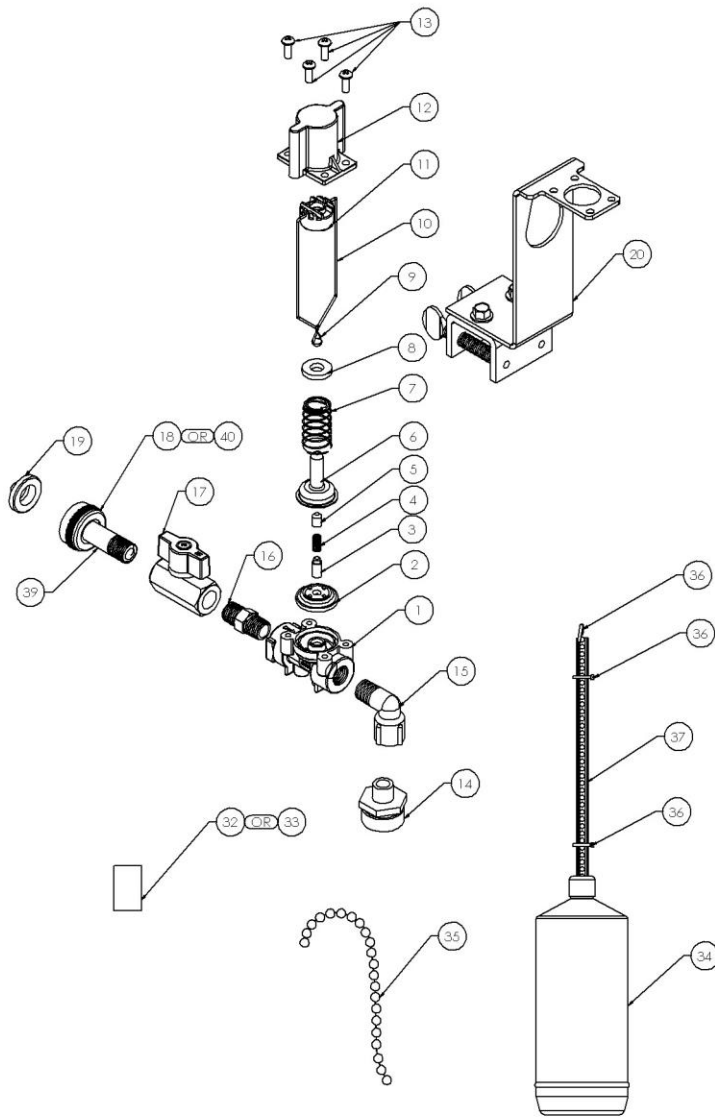
## Packing List

- A. Valve Assembly and Brackets
- B. Proportioner with Backflow Preventer (Excluding 440-22 Models)
- C. 8' Long Vinyl Supply Tubing & Foot Valve Assembly
- D. Float, Chain, Tube Stiffener & Cable Ties
- E. Ceramic Weight
- F. ½" ID X 2' Long Vinyl Discharge Tubing w/Priming Insert
- G. Metering Tip Kit 61-9K-FV or 100-15K-FV

## Operational Requirements

- Pressure: 15-150 psi (1.0-10.3 bar)
- Temperature: 33-120°F (0.6-49.0°C)

## Parts List



ITEM NO.	PART NO.	DESCRIPTON	
1	35-36	VALVE BODY	VALVE REPAIR KIT 63-87
2	41-15-10	DIAPHRAGM	
3	63-38	PLUNGER	
4	41-1-8	SPRING	
5	63-37	SPACER	
6	41-7-25	ENCLOSING TUBE	
7	35-33	SPRING	
8	63-35	MAGNET	
9	35-12	FLOAT HANGER CLIP	
10	35-42	FLOAT HANGER WIRE	
11	35-43	MAGNET HOLDER	
12	35-44	MAGNET HOUSING	
13	44-116-1	SCREW	
14	61-122-2	ADAPTER (MGHT 1/4" MNPT)	
15	50-63	STREET ELBOW (POLYPROPYLENE)	
16	-	1/4" HEX NIPPLE	
17	16-11	BALL VALVE	
18	98-55-2	COUPLING	
19	100-38	INLET WASHER SCREEN	
20	-	MOUNTING BRACKET ASSEMBLY	
21	150-6	RUBBER WASHER	
22	16-30	ACTION GAP BACKFLOW PREVENER	
23	61-22-2	4 GPM (3/8" BARB) WHITE PROPORIONER	
24	61-97A	2.5 GMPM (3/8" BARB) BLUE PROPORIONER	
25	61-22-3	4 GPM (1/4" BARB) WHITE PROPORIONER2' DISCHARGE TUBE & PROVER	
26	16-3-24-1	2' DISCHARGE TUBE & PRIMER	
27	61-9	METERING TIP SPECIFY COLOR	
28	100-15	METERING TIP SPECIFY COLOR	
29	100-12	8' PLASTIC TUBIENG (7/32" ID)	
30	100-12L	8' PLASTIC TUBIENG (3/8" ID)	
31	100-16V	FOOT BALVE	
32	61-107-5	CERAMIC WEIGHT (FOR 3/8" TUBING)	
33	61-107-4	CERAMIC WEIGHT (FOR 1/4" TUBING)	
34	35-18	FLOAT ASSEMBLY & CHAIN	
35	34-17	(9OPTIONAL) 16" CHAIN W/CONNECTOR	
36	81-16-2	CABLE TIE 4" LONG	
37	81-312-1	TUBE STIFFENER	
38	61-99-1	1 GPM DBL BARB PROPORIONER (3/8" BARB)	
39	65-17-3	G.H. SWIVEL ADAPTER, 1/4" NPT, PLATED	
40	65-10-2	HOSE FITTING COUPLING - PLATED	

# Installation

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## A. Valve Bracket and Proportioner Assembly:

Attach bracket to tank as shown in Figure 3 or 4. Connect a garden hose to the valve assembly or mount the valve assembly directly to a ¼ NPT pipe line by removing the inlet garden hose adapter. If using a ¼ NPT connection, apply pipe dope or 2-3 wraps of Teflon tape, hand tighten. Then turn with a wrench until snug. **DO NOT OVER TIGHTEN.**

Plastic discharge tubing is supplied and must be used. Discharge tubing should be shortened to avoid kinks. 12" tube length is required for proper operation. The discharge tubing outlet should be below the bottom of the float.

## B. Float and Chain:

Run chain through the clip on the pull wire until the top of the float is about 1 or 2 inches above the desired maximum water level (with pull wire in "up" position). Snap the bead into the clip to hold the chain in place. Excess chain may be cut off if so desired. (See Figure #3).

Measure the tube stiffener length to cover the chain and hanger clip. Cut the tube stiffener to proper length. Attach the tube stiffener around chain and hanger clip. Install the cable tie to top and bottom of the tube stiffener. Install a cable tie around hanger clip and wire. Excess cable tie ends may be cut off if so desired.

## C. Chemical Supply:

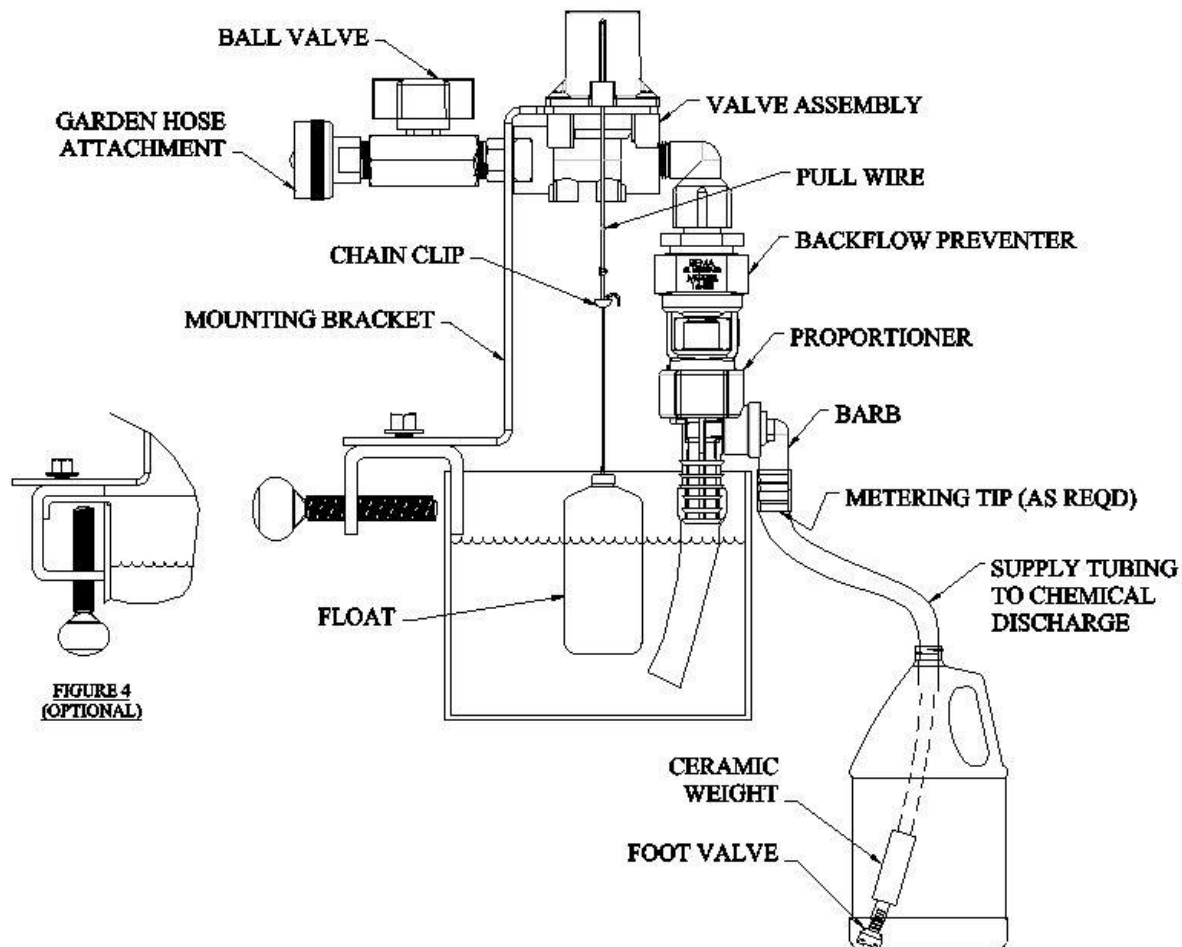
Place the chemical container in a convenient location not more than 6 feet below the valve, (greater lifts will reduce injection capacities). Slip the ceramic weight over the chemical intake tubing. Insert the end with the foot valve of the 8 foot vinyl tubing into the chemical container. Cut the tubing to any convenient length that will allow it to extend from the bottom of the chemical container to the proportioner inlet barb (See Figure 3). Thread desired metering tip into the barb end, then slide tubing over the metering tip and barb.

### **CHEMICAL INJECTION ADJUSTMENTS:**

#### **WARNING: USE CARE WHEN HANDLING HAZARDOUS CHEMICALS.**

Metering tips are used to control chemical dilution rates. Tables 1, 2, & 3 show the dilution ratios for various chemical viscosities. For highly viscous products, the induction rate can be increased by substituting 1/2" ID inlet tubing. (Leave a short piece of 3/8" ID tubing on proportioner and foot valve barbs as bushings.)

## LIQUID PROPORTIONING LEVEL CONTROL



## Operation

At least 15 PSI pressure must be available to induct chemical. Turn on water to the unit. Open the ball valve. As the tank fills, chemical concentrate will be drawn up through the plastic tubing and will mix with the incoming water. The valve will close when water reaches approximately 1-2 inches below the top of the float. The float valve will operate again when the water level drops approximately 4 inches.

## Troubleshooting

### **CAUTION: TURN OFF WATER SUPPLY BEFORE SERVICING.**

#### **A. Proportioner fails to draw chemical:**

1. Proportioner outlet tubing cut too short or not attached. Pinch outlet tube to create back pressure, which will cause unit to prime. The foot valve will keep the inlet tube primed after initial use.
2. Insufficient water supply pressure. 15 psi is the minimum required water pressure.
3. Chemical inlet may be drawing air.

#### **B. Proportioner stops drawing chemical:**

1. Inspect foot valve for dried chemical or dirt. Soak in hot water to clean.
2. Proportioner metering tip clogged with dried chemical. Remove tip and soak in hot water. If there is no suction, remove proportioner and soak in hot water to clear interior passages.

3. If there is a buildup of calcium carbonate (lime) inside the proportioner, soak component in a vinegar or D-Limonene solution.
  4. Chemical inlet may be drawing air.
- C. Proportioner continues drawing chemical after water valve closes:**
1. Chemical supply is higher than bottom of discharge tube creating a natural siphon. Lower the supply container.
- D. Valve malfunction:**
1. Check that the wire moves freely up & down and that a “click” can be heard when the wire is pulled and released, indicating that the magnet is activating the plunger properly. To inspect internal parts, remove magnet housing and carefully pull off the enclosing tube so as not to drop the plunger, kick-off spring and spacer. Check for dirt or damage impeding plunger and kick-off spring movement. Inspect the diaphragm, making sure two small pin holes (bleed holes) in the diaphragm are clear to allow the valve to close. Check the float valve assembly to verify the internal weight is free moving and not water logged.
  2. Valve will not operate if pressure exceeds 150 psi.
- CAUTION:** When servicing unit, be sure that replacement parts have been installed according to drawing.
- Note: All induction rates are based on a water pressure of 40 psi.

<b>1 cps (Centipoise) is equal to the viscosity of water</b>
<b>75 cps is approximately equal to the viscosity of 10 weight motor oil</b>
<b>200 cps is approximately equal to the viscosity of most dishwashing detergents</b>

**Table 1: 440-23BT, 440-23BT-KR (White proportioner with 1/4” hose barb)**

Metering Tip Color	Injection Rates For Viscosities Shown					
	1 cps		75 cps		200 cps	
	Oz/Gal	Ratio	Oz/Gal	Ratio	Oz/Gal	Ratio
<b>Tan</b>	0.33	387-1	0.26	500-1	0.12	1090-1
<b>Orange</b>	0.42	307-1	0.32	430-1	0.17	735-1
<b>Turquoise</b>	0.51	256-1	0.34	382-1	0.19	676-1
<b>Pink</b>	0.78	165-1	0.56	230-1	0.3	422-1
<b>Clear</b>	0.87	147-1	0.67	192-1	0.33	391-1
<b>Brown</b>	0.99	128-1	0.74	174-1	0.37	345-1
<b>Red</b>	1.37	93-1	0.91	141-1	0.44	289-1
<b>White</b>	1.52	84-1	1.04	128-1	0.48	264-1
<b>Green</b>	1.72	74-1	1.22	105-1	0.52	244-1
<b>Blue</b>	2.13	60-1	1.27	101-1	0.54	239-1
<b>Yellow</b>	3.05	42-1	1.71	75-1	0.56	229-1
<b>Black</b>	4.50	28-1	1.96	64-1	0.57	224-1
<b>Purple</b>	7.75	17-1	2.4	53-1	0.59	217-1
<b>Gray</b>	9.86	13-1	2.54	50-1	0.63	204-1
<b>No Tip</b>	19.63	7-1	3.16	40-1	0.67	190-1

Small Tips 1/4” barb (5111 and 440.23BT)		
HydroMinder Tip	DEMA Tip	Dilution Ratio
Red	Gray	13:1
White	Purple	17:1
Blue	Black	28:1
Tan	Yellow	42:1
Orange	Blue	60:1
Brown	Green	74:1
Yellow	Red	93:1

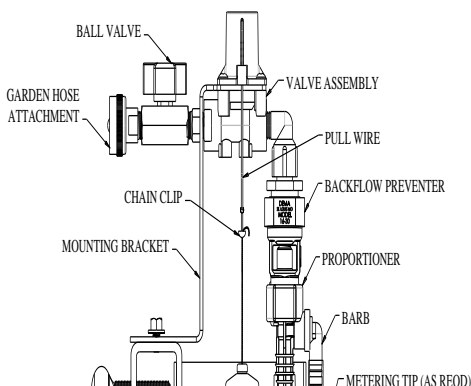
Aqua	Brown	128:1
Purple	Pink	165:1
Pink	Tan	387:1

**Table 2: 440-22T, 440-22T-KR, 440-23T, 440-23T-KR (White proportioner with 3/8" hose barb)**

Metering Tip Color	Injection Rates For Viscosities Shown					
	1 cps		75 cps		200 cps	
	Oz/Gal	Ratio	Oz/Gal	Ratio	Oz/Gal	Ratio
Clear	0.30	430-1	0.22	592-1	0.13	864-1
Purple	0.48	265-1	0.32	406-1	0.24	524-1
Yellow	1.28	100-1	0.82	157-1	0.6	212-1
Green	1.67	77-1	1.29	99-1	1	128-1
Pink	2.36	54-1	1.65	77-1	1.25	103-1
Turquoise	3.76	34-1	2.55	50-1	1.85	69-1
Black	4.47	29-1	3.03	42-1	2.12	60-1
Gray	5.53	23-1	3.67	35-1	2.58	50-1
Red	7.00	18-1	4.79	27-1	2.79	46-1
Blue	8.78	15-1	5.39	24-1	3.06	42-1
Brown	10.95	12-1	6.49	20-1	3.35	38-1
White	14.19	9-1	7.08	18-1	3.46	37-1
Orange	17.58	7-1	7.91	16-1	3.71	35-1
Light Blue*	21.75	6-1	8.66	15-1	3.9	33-1
Tan*	27.98	5-1	9.15	14-1	4.11	32-1
No Tip	33.15	4-1	10.54	12-1	4.52	28-1

Large Tips 3/8" barb (506, 507, 511, 512 and 440.22T, 440.23T)		
HydroMinder Tip	DEMA Tip	Dilution Ratio
Gray	Tan	5:1
Black	Light Blue	6:1
Beige	Orange	7:1
Red	Red	18:1
White	Gray	23:1
Blue	Black	29:1
Tan	Turquoise	34:1
Orange	Pink	54:1
Brown	Green	77:1
Yellow	Yellow	100:1
Pink	Purple	265:1

**LIQUID PROPORTIONING LEVEL CONTROL**



**Table 3**  
**440-24, 440-24-KR (Blue proportioner with 3/8" hose barb)**

Metering Tip Color	Injection Rates For Viscosities Shown					
	1 cps		75 cps		200 cps	
	Oz/Gal	Ratio	Oz/Gal	Ratio	Oz/Gal	Ratio
Clear	0.66	195-1	.027	470-1	.14	903-1
Purple	1.01	128-1	.041	315-1	.33	393-1
Yellow	1.53	83-1	1.03	128-1	.86	148-1
Green	2.52	51-1	1.64	78-1	1.44	89-1
Pink	3.53	36-1	2.04	64-1	2.09	64-1
Turquoise	5.73	22-1	3.24	40-1	2.92	44-1
Black	6.72	19-1	3.88	32-1	3.34	38-1
Gray	8.95	14-1	4.98	26-1	4.04	32-1
Red	12.34	10-1	6.22	21-1	4.67	27-1
Blue	14.00	9-1	7.28	18-1	4.99	26-1
Brown	18.68	7-1	9.02	14-1	5.35	24-1
White	24.45	5-1	10.35	12-1	5.53	23-1
Orange	30.97	4-1	11.86	11-1	5.88	22-1
Light Blue*	38.26	3-1	13.31	10-1	6.22	21-1
Tan*	53.96	2.5-1	15.21	8-1	6.49	20-1
No Tip	66.07	2-1	18.61	7-1	7.07	18-1

\* These tips are not included in the standard tip pack.

## Warranty

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NO MERCHANDISE MAY BE RETURNED FOR CREDIT WITHOUT DEMA'S WRITTEN PERMISSION. RETURN MERCHANDISE AUTHORIZATION NUMBER REQUIRED IN ADVANCE OF RETURN.

**WARRANTY:** DEMA products are warranted against defective material and workmanship under normal use and service for one year from the date of manufacture. This limited warranty does not apply to any products, which have a normal life shorter than one year or failure and damage caused by chemicals, corrosion, improper voltage supply, physical abuse, or misapplication. Rubber and synthetic rubber parts such as "O"- rings, diaphragms, squeeze tubing and gaskets are considered expendable and are not covered under warranty. This warranty is extended only to the original buyer of DEMA products. If products are altered or repaired without prior approval of DEMA, this warranty will be void.

Defective units or parts should be returned to the factory with transportation prepaid. If inspection shows them to be defective, they will be repaired or replaced without charge, F.O.B. factory. DEMA assumes no liability for damages. Return merchandise authorization number, to return units for repair or replacement, must be granted in advance of return.