

# LAFFERTY EQUIPMENT MANUFACTURING, INC. Installation & Operation Instructions

## Ball Valve Mixing Stations

### REQUIREMENTS

Water	U.S.	S.I.
Supply line	1/2 in (min.)	12.7 mm (min.)
Temperature	up to 160°F	up to 70°C
Pressure	35 - 100 psi	2.4 - 6.9 bar
Flow	See Water Flow Chart (page 2)	

### OPTIONS

Jug Racks		
# 224200	1 gallon, round (6 ¾ in ID)	3.8 liter, round (171 mm ID)
# 224205	1 gallon, square (6 ¾ in x 6 ¾ in)	3.8 liter, square (162 mm x 171 mm)
# 224210	2 ½ gallon (8 ½ in x 10 ½ in)	9.5 liter, square (216 mm x 267 mm)
# 224215	5 gallon (12 in x 12 in)	19 liter (305 mm x 305 mm)

**READ ALL  
INSTRUCTIONS BEFORE  
USING EQUIPMENT!**

#985100, 1-Way



#985200, 2-Way



#985300, 3-Way



#985400, 4-Way



[www.LaffertyEquipment.com](http://www.LaffertyEquipment.com)

501-851-2820



## Principles of Operation

This is a venturi proportioner that will siphon chemical concentrates from any sized container up to 21 different dilution ratios using the supplied metering tips to provide a ready to use (RTU) chemical solution.



## Safety & Operational Precautions

- Manufacturer assumes no liability for the use or misuse of this unit.
- Backflow Prevention: If you are connecting to a potable water supply, be sure to follow all local codes for backflow prevention.
- Wear protective clothing, gloves and eyewear when working with chemicals.
- Always direct the discharge away from people and electrical devices.
- Follow the chemical manufacturer's safe handling instructions.

### TO INSTALL (Refer to diagram, next page. Do not turn on during installation.)

1. Mount the unit to a suitable surface above chemical supply to prevent siphoning.
2. Connect the discharge tube(s) as shown in the diagram.
3. Select chemical dilution ratio by selecting and installing a metering tip into each chemical check valve. (For the strongest possible chemical dilution ratio, do not install a metering tip.)

**How to Select the Correct Metering Tip** - See chemical label for dilution ratio recommendation or consult your chemical supplier.

- The dilution ratios provided in the Metering Tip Selection Chart, at right, are based on water-thin chemical.
  - Due to varying chemical viscosities, you may need to increase/decrease the metering tip size.
  - If you have water pressure other than the example, use the Metering Tip Selection Formula.
4. Connect water supply.

### TO OPERATE

1. While holding the discharge tube inside the container to be filled, completely open the corresponding water ball valve. **Open only one water ball valve at a time.**
2. When container is full, completely close the water ball valve. Allow the discharge tube to drain completely before removing it from the container.

### Metering Tip Selection

Metering Tip Color	Oz. per Min.	Example: Dilution Ratio @ 40 PSI		
		Bottle Fill	Low Flow	High Flow
Brown	.62	161:1	372:1	826:1
Clear	.91	110:1	253:1	563:1
Bright Purple	1.7	61:1	140:1	310:1
White	2.3	44:1	102:1	228:1
Pink	3.3	30:1	70:1	155:1
Corn Yellow	4.0	25:1	58:1	128:1
Dark Green	5.0	20:1	46:1	102:1
Orange	6.0	17:1	38:1	85:1
Gray	6.8	15:1	34:1	75:1
Light Green	8.1	12:1	29:1	64:1
Med. Green	9.1	11:1	25:1	56:1
Clear Pink	11.9	8:1	19:1	43:1
Yellow Green	13.4	7:1	17:1	38:1
Burgundy	15.3	7:1	15:1	33:1
Pale Pink	16.9	6:1	14:1	30:1
Light Blue	18.0	6:1	13:1	28:1
Dark Purple	22.5	—	10:1	23:1
Navy Blue	33.1	—	7:1	15:1
Clear Aqua	39.3	—	6:1	13:1
Black	59.0	—	—	—
No Tip		<b>4.34:1</b>	<b>5.7:1</b>	<b>8.6:1</b>

The dilution ratios provided above are approximate values. Your actual dilution ratio may be higher or lower due to variation in chemical viscosity.

### Metering Tip Selection Formula

(GPM x 128)	See chart below for GPM and convert to oz. per min.
÷	
Dilution Ratio	20:1, 30:1, etc.
=	
Oz. per Min.	Match to nearest number in chart above.

### Water Flow Rate Chart

Water Pressure	Bottle Fill	Low Flow	High Flow
PSI	Gallons Per Minute (GPM)		
30	.64	1.64	3.57
<b>40</b>	<b>.78</b>	<b>1.80</b>	<b>4.00</b>
50	.84	1.95	4.42
60	.88	2.10	4.90
70	.93	2.25	5.32
80	1.00	2.40	5.70
90	1.05	2.55	6.10
100	1.10	2.70	6.52

**⚠ Turn off ball valves when unit is not in use.**

**2-WAY SHOWN**

*Drawing not "to scale".*

**Water Inlet**  
**35 – 100 PSI**  
*(1/2" I.D. minimum)*

Washer, w/Screen  
 #102050

Water Ball Valve  
 #413602

Backflow Preventer  
 #273413

Adapter  
 #102020

Mixing Station Injector Body  
 #366470-High Flow (HF)  
 #366473-Low Flow (LF)  
 #366476-Bottle Fill (BF)

St. Elbow  
 #257379

Chemical Check Valve  
 #491311

Metering Tips,  
 Color Coded (20 pk)  
 #443798

Chemical Tube, 6'  
 #473006

Tube Weight  
 #475100

Chemical Strainer  
 #150115

Discharge Tube, 4.5'  
 #473400FT

# Troubleshooting Guide

## Ball Valve Mixing Stations

PROBLEMS	Possible Cause / Solution	
	Startup	Maintenance
A) Unit will not draw chemical.	1, 2, 3, 4, 6	7, 8, 9, 10, 13
B) Dilution too weak.	1, 4	12
C) Using too much chemical.	5	
D) Backflow preventer constantly dripping/leaking.		11
E) Water backing up into chemical container.		12

Possible Cause / Solution	
Startup	Maintenance
<p><b>1. Water pressure too low or water temperature too high</b> • 25 PSI water pressure minimum.</p> <p><b>2. Water ball valve not completely open</b> • Completely open the water ball valve.</p> <p><b>3. More than one water ball valve is open</b> • Open only one water ball valve at a time.</p> <p><b>4. Not enough chemical - Metering tip too small</b> • Install larger metering tip.</p> <p><b>5. No metering tip installed or metering tip too large</b> • Install smaller metering tip.</p> <p><b>6. Chemical tube not immersed in chemical or chemical depleted</b> • Immerse tube or replenish.</p>	<p><b>7. Water strainer screen clogged</b> • Clean the water strainer screen.</p> <p><b>8. Chemical strainer or metering tip partially blocked</b> • Clean or replace chemical strainer and/or metering tip.</p> <p><b>9. Chemical tube stretched out where tube slides over metering tip holder or pin hole/cut in chemical tube (sucking air in)</b> • Cut off end of tube or replace tube.</p> <p><b>10. Vacuum leak in chemical pick-up connections</b> • Tighten the connection.</p> <p><b>11. Backflow preventer failed or defective</b> • Replace backflow preventer.</p> <p><b>12. Chemical check valve stuck or failed</b> • Clean or replace.</p> <p><b>13. Chemical build-up may have formed in the body causing poor or no chemical pick-up</b> • Follow Preventive Maintenance instructions below, using hot water and/or descaling acid. When there is no draw at all carefully remove fittings and soak entire body in descaling acid.</p>

**PREVENTIVE MAINTENANCE:** When the unit will be out of service for extended periods, remove chemical tube from chemical concentrate and place it in water. Completely open each water ball valve (separately) for several seconds to flush chemical and help prevent chemical build-up. Check and/or clean chemical strainer; replace if missing.