

# LAFFERTY EQUIPMENT MANUFACTURING, INC.

## Installation & Operation Instructions

### Level Master Series

Model # 989004 - Level Master

Model # 989020 - 20 Gallon Level Master

Model # 989040 - 40 Gallon Level Master

Model # 989050 - Gemini Level Master

Model # 989060 - 20 Gallon Gemini Level Master

Model # 989070 - 40 Gallon Gemini Level Master

#### REQUIREMENTS

##### Water:

Pressure range .....25 to 100 PSI

Temp. range ....Ambient to 160° F

##### Hose:

I.D. .... 1/2"

#### OPTIONS

##### Jug Racks

1 Gallon

Round ..... # 224200

Square ..... # 224205

2 ½ Gallon ..... # 224210

8 ½" x 10 ½"

5 Gallon ..... # 224215

12" x 12"



989004.....Level Master



989070.....40 Gallon Gemini  
Level Master



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

501-851-2820



### Safety & Operational Precautions

#### SAFETY PRECAUTIONS:

- **Backflow prevention:** Follow all local codes for preventing backflow into the water supply before installing/operating equipment.
- **Mounting:** Mount unit above chemical supply.
- **Personal Safety:**
  - Wear protective clothing, gloves and eyewear when working with chemicals.
  - Follow the chemical manufacturer's safe handling instructions.

- **Regular equipment maintenance** should include checking all tubes and connections. (See also, *Preventive Maintenance, page 4.*)

#### OPERATIONAL PRECAUTIONS:

- Do not substitute hose size (see "Requirements".) Unit **will not** work properly with hose of any other size.

**MANUFACTURER ASSUMES NO LIABILITY FOR THE USE OR MISUSE OF THIS UNIT.**

## TO INSTALL *(Refer to Diagram, Next Page.)*

**Read all Safety and Operational Precautions on page 1.**

**Backflow prevention:** Follow all local codes for preventing backflow into the water supply before installing / operating equipment.

- Mount the unit** to any container above chemical supply. For models which include the 20 or 40 gallon tank, the unit is premounted to the lid of the tank.
- Adjust the ball chain** to the appropriate length to maintain the desired level of chemical solution in the tank. Make sure the float is hanging straight down.
- Connect the water supply, discharge tube, and siphon breaker** as shown in the diagram.
- To set the dilution ratio** you must select and install a metering tip.

### ***How to Select the Correct Metering Tip***

- The dilution ratios provided in the *Metering Tip Selection Chart*, at right, are based on water-thin chemical with a water pressure of 40 psi. Use the *Metering Tip Selection Formula* if you have water pressure other than 40 psi.
  - Due to varying chemical viscosities, you may need to increase the metering tip size.
  - For the strongest possible chemical dilution ratio, do not install a metering tip.
- Install metering tip into chemical check valve (#20).** Push the chemical tube over the chemical check valve and into your chemical concentrate. For the Gemini Level Master models, repeat this step for the second chemical.

## PRINCIPALS OF OPERATION

The built-in venturi injects chemical concentrate into the water flow until the reservoir fills to the level set by the adjustable float, which closes the float valve. When solution usage causes the reservoir level to drop by 1½ inches, the float valve will open and replenish the reservoir. This cycle repeats automatically.

## TO OPERATE

- Completely open the water ball valve.

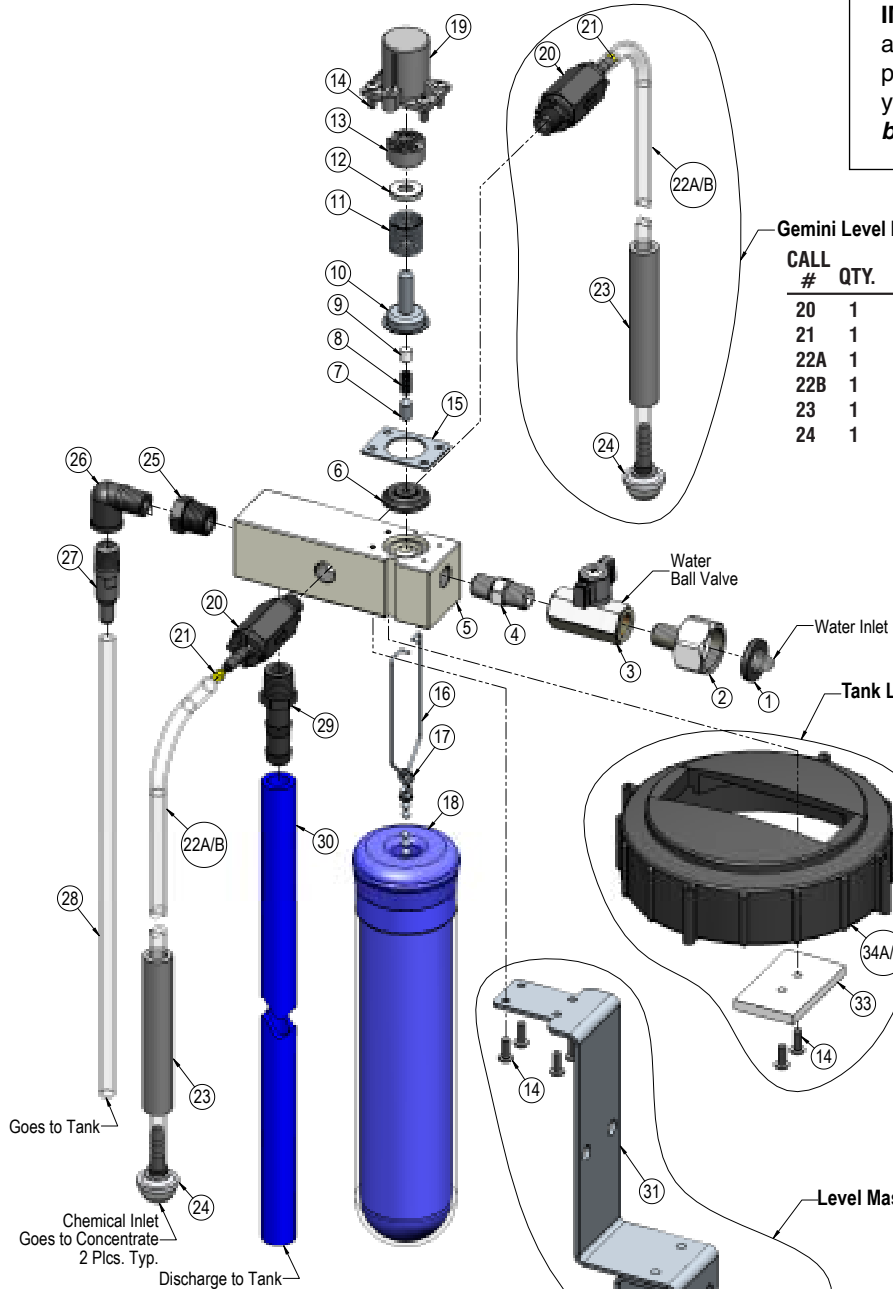
<b>Metering Tip Selection</b>		
<b>Metering Tip Color</b>	<b>Oz. per Min.</b>	<b>Dilution Ratio @ 40 PSI</b>
Brown	.84	373:1
Clear	1.16	270:1
Bright Purple	1.4	224:1
White	2.0	157:1
Pink	2.7	116:1
Corn Yellow	3.4	92:1
Dark Green	4.0	78:1
Orange	5.3	59:1
Gray	6.1	51:1
Light Green	7.0	45:1
Med. Green	8.5	37:1
Clear Pink	9.2	34:1
Yellow Green	11.2	28:1
Burgundy	12.5	25:1
Pale Pink	12.9	24:1
Light Blue	14.2	22:1
Dark Purple	17.6	18:1
Navy Blue	21.4	15:1
Clear Aqua	30.2	10:1
Black	40.4	8:1

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

<b>Metering Tip Selection Formula</b>	
<b>(GPM x 128)</b>	← See chart below for GPM and convert to oz. per min.
÷	
<b>Dilution Ratio</b>	← 50:1, 100:1, etc.
=	
<b>Oz. per Min.</b>	← Match to nearest number in the chart above.

<b>Water Flow Rate Chart</b>	
<b>Water Pressure</b>	<b>Water Flow Rate</b>
<i>PSI</i>	<i>GPM</i>
30	2.32
40	2.45
50	2.72
60	2.90
70	3.10
80	3.30
90	3.48
100	3.70

**IMPORTANT:** Unit supplied without a backflow preventer. Check local plumbing codes for requirements in your area and *install appropriate backflow preventer before operating.*



**Gemini Level Masters**

CALL #	QTY.	PART #	DESCRIPTION
20	1	491402	Check Valve, Chemical, PP, 1/4" HB x 1/4" MPT
21	1	443798	Metering Tips-Color Coded (20)
22A	1	473006	Tube, PVC, 1/4" x 6'
22B	1	473010	Tube, PVC, 1/4" x 10'
23	1	475100	Weight, PVC, Chemical Tube, 1/4"
24	1	150115	Strainer, Chemical, Hastelloy, 1/4"

**Tank Level Masters**

CALL #	QTY.	PART #	DESCRIPTION
14	2	396452	Screw, SS, PNHD, #8 x 1/2", SMS
33	1	227117	Saddle Plate, PP, 1/4"
34A	1	709120	Tank, 20 Gallon, HDPE w/Modified Lid
34B	1	709140	Tank, 40 Gallon, HDPE w/Modified Lid

**Level Masters**

	UNLESS OTHERWISE SPECIFIED:	Lafferty Equipment Mfg., Inc.	
	TOLERANCES ARE IN INCHES: FRACTIONS: 1/16" 1/8" 1/4" 3/8" 1/2" DECIMALS: .0005" .001" .002" .005" .010" .015" .030" .050" .100" ANGLES: 30° 45° 60° 90° 120° 150° 180°	TITLE:	Level Master
PROPRIETARY AND CONFIDENTIAL	DWG. NO.	REV	00
THE INFORMATION CONTAINED IN THIS DRAWING IS THE PROPERTY OF LAFFERTY EQUIPMENT MFG., INC. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF LAFFERTY EQUIPMENT MFG., INC. IS EXPRESSLY PROHIBITED.	See BOM	Level_Master_Series	00
			SHEET 1 OF 1

CALL #	QTY.	PART #	DESCRIPTION	CALL #	QTY.	PART #	DESCRIPTION
1	1	102050	GH Washer, Vinyl, W/ Screen	18	1	710460	Float, Blue, W/ 18" Chain
2	1	102020	GH Adapter, NPB, FGH x 1/4" MPT	19	1	710430	Float Valve, Housing
3	1	413602	Ball Valve, NPB, 1/4" FFB	20	1	491402	Check Valve, Chemical, PP, 1/4" HB x 1/4" MPT
4	1	429004	Nipple, NPB, Hex, 1/4"	21	1	443798	Metering Tips-Color Coded (20)
5	1	366004	Injector Body, Level Master	22A	1	473006	Tube, PVC, 1/4" x 6'
6	1	710410	Float Valve, Diaphragm	22B	1	473010	Tube, PVC, 1/4" x 10'
7	1	710412	Float Valve, Armature	23	1	475100	Weight, PVC, Chemical Tube, 1/4"
8	1	710414	Float Valve, Kick-Off Spring	24	1	150115	Strainer, Chemical, Hastelloy, 1/4"
9	1	710416	Float Valve, Kick-Off Spacer	25	1	305216PP	Bushing, PP, 3/8" x 1/4"
10	1	710418	Float Valve, Armature Cap	26	1	257379	Elbow, St., PP, 1/4"
11	1	710420	Float Valve, Spring, 1lb	27	1	491311	Check Valve, Chemical, PP/Viton, 1/4"
12	1	710422	Float Valve, Magnet	28	1	473000FT	Tube, PVC, 1/4" X 1'
13	1	710424	Float Valve, Magnet Holder	29	1	119266PP	Hose Barb, PP, 1/2" x 3/8" MPT
14	8	396452	Screw, SS, PNHD, #8 x 1/2", SMS	30	5	803400FT	Hose, Blue, 1/2" x 1' (By Foot)
15	1	710426	Float Valve, Flange, SS	31	1	227060	Bracket, SS, Level Master
16	1	710428	Float Valve, Wire Hanger	32	2	393318	Bolt, SS, HXHD, 3/8" -16 x 1 3/4"
17	1	710402	Float Valve, #10 Ball Chain Clip				

# Troubleshooting Guide

## Level Master Series

Problem	Startup Issues	Maintenance Issues
A) Unit will not draw chemical.	1, 2, 5	8, 9, 10, 11, 15
B) Dilution too strong.	6	
C) Dilution too weak.	1, 4, 7	15
D) Float will not turn off.	3	12, 13, 14

### Possible Cause / Solution

- |   |  |
|---|--|
| <ol style="list-style-type: none"> <li>1. <b>Water pressure too low or water temperature too high</b> <ul style="list-style-type: none"> <li>• 25 psi water pressure minimum.</li> </ul> </li> <li>2. <b>Water ball valve not completely open</b></li> <li>3. <b>Water pressure too high</b> <ul style="list-style-type: none"> <li>• Install a water pressure regulator if pressure exceeds 100 psi.</li> </ul> </li> <li>4. <b>Chemical too thick</b> <ul style="list-style-type: none"> <li>• Install a larger metering tip.</li> </ul> </li> <li>5. <b>Chemical tube not immersed in chemical or chemical depleted.</b></li> <li>6. <b>Metering tip too large or no tip installed</b> <ul style="list-style-type: none"> <li>• Install smaller metering tip.</li> </ul> </li> <li>7. <b>Metering tip too small</b> <ul style="list-style-type: none"> <li>• Install larger metering tip.</li> </ul> </li> </ol> | <ol style="list-style-type: none"> <li>8. <b>Chemical strainer or metering tip blocked</b> <ul style="list-style-type: none"> <li>• Clean or replace chemical strainer and/or metering tip.</li> </ul> </li> <li>9. <b>Chemical tube stretched out where tube slides over metering tip holder or pin hole/cut in chemical tube (sucking air in)</b> <ul style="list-style-type: none"> <li>• Cut off end of tube or replace tube.</li> </ul> </li> <li>10. <b>Vacuum leak in chemical pick-up connections</b> <ul style="list-style-type: none"> <li>• Tighten the connection.</li> </ul> </li> <li>11. <b>Water strainer screen clogged</b> <ul style="list-style-type: none"> <li>• Clean the water strainer screen.</li> </ul> </li> <li>12. <b>Valve orifice blocked</b> <ul style="list-style-type: none"> <li>• Clean the orifice.</li> </ul> </li> <li>13. <b>Float valve parts are dirty or defective</b> <ul style="list-style-type: none"> <li>• Clean or replace the affected parts.</li> </ul> </li> <li>14. <b>Float valve diaphragm stretched out</b> <ul style="list-style-type: none"> <li>• Replace the float valve diaphragm.</li> </ul> </li> <li>15. <b>Chemical build-up or scale may have formed in the injector body causing poor or no chemical pick-up</b> <ul style="list-style-type: none"> <li>• Remove fittings and soak <i>entire</i> injector body in descaling acid. Replace fittings being careful not to cross thread or overtighten.</li> </ul> </li> </ol> |
|---|--|

**PREVENTIVE MAINTENANCE:** When the unit will be out of service for extended periods, remove chemical tube from chemical concentrate and place in water. Completely open the water ball valve and pull down on float for a few seconds to flush chemical and help prevent chemical build-up. Check and/or clean chemical strainer; replace if missing.