Lafferty Equipment Manufacturing, LLC
Installation & Operation Instructions

Model # 989304 · Level Master™ (No Tank)

REQUIREMENTS

Chemical Concentrate

Water

Temperature	up to 160°F
Pressure	25 to 80 PSI
Flow	2.4 GPM @ 40 PSI
Supply Line	1/2"

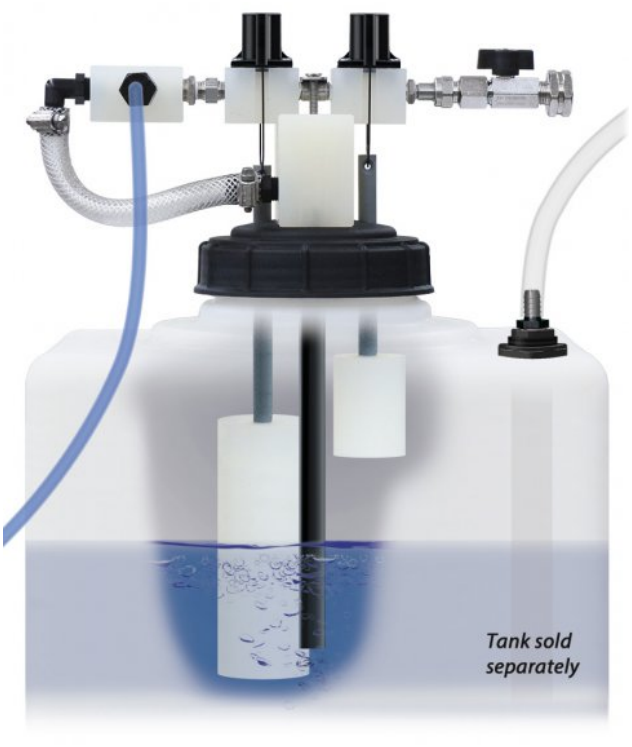
OPTIONS

Alternate Chemical Check Valve - Viton Standard

Check Valve, Chemical, PP(W), 1/4" (EPDM)	# 491401

Level Master Tank Sizes (Specify When Ordering)

7 Gallon	# 709170
16 Gallon	# 709171
20 Gallon	# 709172



Lafferty EQUIPMENT MANUFACTURING LLC

CFS TECHNOLOGIES

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WARNING! READ ALL INSTRUCTIONS BEFORE USING EQUIPMENT!

OVERVIEW

The Level Master™ is a water driven chemical proportioner that automatically maintains a constant supply of ready-to-use solution in a paired tank (sold separately). When the solution in the tank drops below a pre-set level, this venturi injection system uses city water pressure (25 - 80 PSI) to draw and blend chemical concentrate into the water stream to create an accurately diluted solution using precision metering tips. The solution replenishes at 2.4 GPM @ 40 PSI and cycles continuously. A secondary fail-safe float prevents overfilling.

SAFETY & OPERATIONAL PRECAUTIONS

- **When connecting to a potable water supply follow all local codes for backflow prevention.**
- For proper performance do NOT modify, substitute nozzle, hose diameter or length.
- Manufacturer assumes no liability for the use or misuse of this unit.
- Wear protective clothing, gloves and eye wear when working with chemicals.
- Always direct the discharge away from people and electrical devices.
- Follow the chemical manufacturer's safe handling instructions.
- NEVER mix chemicals without first consulting chemical manufacturer.

TO INSTALL (REFER TO DIAGRAM ON NEXT PAGE)

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

1. Position Level Master Tank on a **level surface**.
2. Carefully unpack the lid / float assembly and thread on to tank opening. Ensure that the float(s) are hanging freely.
3. Connect the water supply. DO NOT TURN ON.

Set the chemical dilution ratio by threading one of the color coded metering tips into each chemical check valve. See chemical labels for dilution ratio recommendation or consult your chemical supplier.

- For the strongest dilution ratio do NOT install a colored metering tip.
- The dilution ratios in the metering tip chart are based on water thin chemicals with a viscosity of 1CPS.
- Thicker chemicals will require a larger tip than the ratios shown in the chart.
- Application results will ultimately determine final tip color.
- Select the tip color that is closest to your desired chemical strength and thread it into the tip holder. **DO NOT OVER-TIGHTEN.**
- Push the chemical tube over the check valve barb and place the suction tube in the chemical concentrate.
- If necessary, cut suction tube(s) to length before attaching suction strainer.

TO OPERATE

1. With the Level Master assembly securely attached to an empty tank, push down on the secondary safety float valve wire hanger (see diagram) to so that it sticks in the "down" position. Gravity will cause the primary float valve to automatically sit in the "down" position. Both float valves are now open.
2. Completely open the water inlet ball valve to begin filling the tank with diluted solution.
3. When the solution in the tank reaches the fill level, the primary float will rise and shut off the water flow.

NOTE: The fill level and fail-safe shutoff level are pre-determined by the length of the "push rods" attached to the floats, which are intended to be used as provided. If necessary, floats can be lowered 1/2" by partially unscrewing them from the push rods.

4. Unit is now ready for use and will maintain the solution level until the inlet ball valve is manually closed.
5. Make final metering tip adjustments based on application results.

Secondary Fail-Safe Valve Reset Procedure

- If the solution level in the tank rises above the normal fill level the secondary fail-safe float will rise and cause the secondary fail-safe float valve to close.
- This will shut-off the water supply to the unit to prevent overflow.
- The unit will not operate until the secondary float valve is manually reset by pushing down on the float valve wire hanger (per operating instructions step 1, above).
- If the secondary fail-safe valve is triggered, refer to the Troubleshooting Guide to determine the cause before continuing operation.

METERING TIP SELECTION

METERING TIP COLOR	OZ/MIN	DILUTION RATIO @ 40 PSI
Brown	0.56	549:1
Clear	0.88	349:1
Bright Purple	1.38	223:1
White	2.15	143:1
Pink	2.93	105:1
Corn Yellow	3.84	80:1
Dark Green	4.88	63:1
Orange	5.77	53:1
Gray	6.01	51:1
Light Green	7.01	44:1
Med. Green	8.06	38:1
Clear Pink	9.43	33:1
Yellow Green	11.50	27:1
Burgundy	11.93	26:1
Pale Pink	13.87	22:1
Light Blue	15.14	20:1
Dark Purple	17.88	17:1
Navy Blue	25.36	12:1
Clear Aqua	28.60	11:1
Black	50.00	6:1
No Tip Ratio Up To:		2.4:1

The dilution ratios above are approximate values. Due to chemical viscosity, actual dilution ratios may vary.

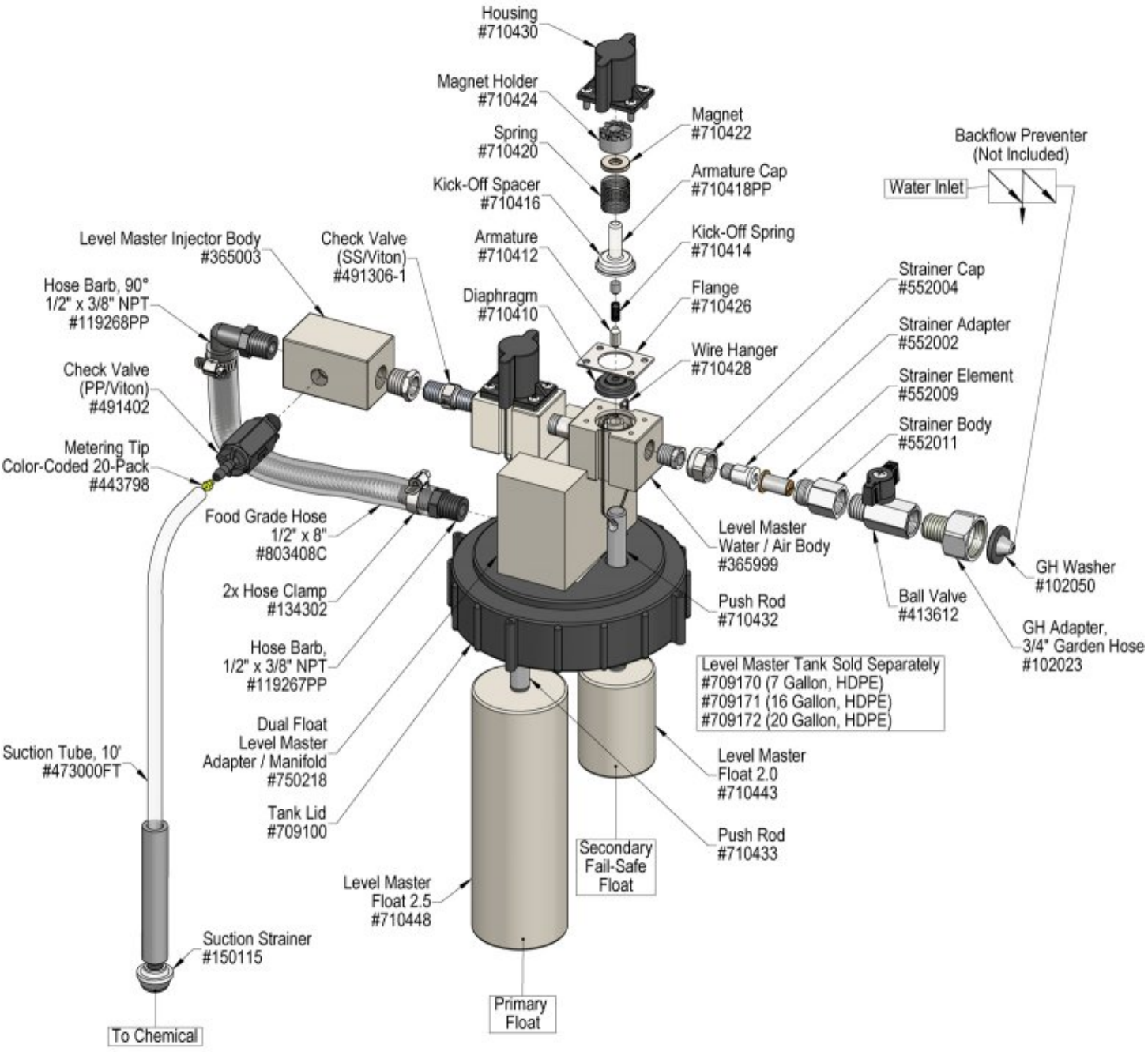
FORMULA

GPM × 128 ÷ Desired Dilution Ratio = oz/min

- *See Unit Flow Rates chart for GPM*
- *Use 20 for 20:1 dilution ratio, 30 for 30:1, etc.*
- *Match calculated ounces per minute (oz/min) to nearest oz/min in Metering Tip Selection chart.*

UNIT FLOW RATES

PSI	GPM
25	1.90
30	2.08
40	2.40
50	2.68
60	2.94
70	3.17
80	3.39


Housing
#710430
Magnet Holder
#710424
Spring
#710420
Kick-Off Spacer
#710416
Armature
#710412
Diaphragm
#710410
Magnet
#710422
Armature Cap
#710418PP
Kick-Off Spring
#710414
Flange
#710426
Wire Hanger
#710428
Backflow Preventer
(Not Included)
Water Inlet
Level Master Injector Body
#365003
Check Valve
(SS/Viton)
#491306-1
Hose Barb, 90°
1/2" x 3/8" NPT
#119268PP
Check Valve
(PP/Viton)
#491402
Metering Tip
Color-Coded 20-Pack
#443798
Food Grade Hose
1/2" x 8"
#803408C
2x Hose Clamp
#134302
Hose Barb,
1/2" x 3/8" NPT
#119267PP
Dual Float
Level Master
Adapter / Manifold
#750218
Tank Lid
#709100
Suction Tube, 10'
#473000FT
Suction Strainer
#150115
To Chemical
Level Master
Float 2.5
#710448
Primary
Float
Secondary
Fail-Safe
Float
Level Master
Float 2.0
#710443
Push Rod
#710433
Push Rod
#710432
Level Master
Water / Air Body
#365999
Strainer Cap
#552004
Strainer Adapter
#552002
Strainer Element
#552009
Strainer Body
#552011
Ball Valve
#413612
GH Washer
#102050
GH Adapter,
3/4" Garden Hose
#102023
Level Master Tank Sold Separately
#709170 (7 Gallon, HDPE)
#709171 (16 Gallon, HDPE)
#709172 (20 Gallon, HDPE)

Troubleshooting Guide

Problem	Possible Cause / Solution	
	Startup	Maintenance
A) Unit will not draw chemical.	1, 4, 5	9, 10, 11, 12, 16
B) Dilution too strong.	2	
C) Dilution too weak.	3, 4, 5	9, 10, 11, 12, 16
D) Primary float will not activate (does not fill)	7, 9	13, 14, 15, 17
E) Primary float valve will not turn off (overfills or triggers secondary fail-safe float valve on double-float models)	6, 7, 8	13, 14, 15, 17

Possible Cause / Solution

Startup

1. **Water ball valve not completely open**
   - Completely open water ball valve.
2. **Metering tip too large or no tip installed**
   - Install smaller metering tip.
3. **Not enough chemical**
   - Install a larger metering tip.
4. **Chemical tube not immersed in chemical or chemical depleted.**
   - Immerse tube or replenish.
5. **Water pressure too low or water temperature too high**
   - Requires 25 PSI water pressure, see requirements.
6. **Water pressure too high**
   - Install a water pressure regulator if pressure exceeds 100 PSI.
7. **Level Master body is not level**
   - Install the Level Master on an even surface where the body (injector) is level to the horizon. Ensure that the Level Master will not become unbalanced as it fills.
   - If the body is not level, the float assembly may snag and prevent proper activation and/or deactivation.
8. **Secondary fail-safe float has been triggered *(double float models only)***
   - Manually reset the secondary fail-safe float valve (refer to operation instructions)
   - Inspect the primary float assembly before resetting the secondary float valve. If necessary, troubleshoot the primary float assembly.

Float hanger seated correctly

Maintenance

9. **Chemical strainer or metering tip blocked**
   - Clean or replace chemical strainer and/or metering tip.
10. **Chemical tube stretched where tube slides over metering tip holder or pin hole/cut in tube (sucking air)**
    - Cut off end of tube or replace tube.
11. **Vacuum leak in chemical pick-up connections**
    - Tighten the connection.
12. **Water strainer screen clogged**
    - Clean the water strainer screen.
13. **Physical blockage or interference is preventing the float from rising or falling**
    - Ensure that the tank is on a level surface.
    - Ensure that the float, push rods, and metal clips are hanging freely without any interference.
14. **Float valve parts are dirty or defective**
    - Clean or replace the affected parts (may require careful disassembly, refer to parts diagram).
    - Ensure that all parts are free of rust, grease, and loose metal chips.
    - Depending on the type of chemical used and other operational variables, regular cleaning and/or replacement may be required.
15. **Float valve diaphragm stretched out or damaged**
    - Replace the float valve diaphragm.
16. **Chemical build-up or scale may have formed in the injector body causing poor or no chemical pick-up**
    - 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.
17. **Upward force has unclipped hanger from magnet holder**
    - *Carefully* remove float housing and align wire hanger to grooves in magnet holder.
    - Pull down on wire hanger until you hear a sharp 'click' after the normal activation sound.
    - Wire hanger must be *fully* seated in magnet holder grooves, as shown on LEFT.

PREVENTIVE MAINTENANCE: When the unit will be out of service for extended periods, place chemical tube(s) in water and flush the chemical out of the unit to help prevent chemical from drying out and causing build-up. Periodically check and clean chemical strainer and replace if missing.