Lafferty Equipment Manufacturing, LLC
Installation & Operation Instructions

Model # 982185 · Gemini™ High Flow Satellite Mixing Station

REQUIREMENTS

Chemical Concentrate

Water

Temperature	up to 160°F
Pressure	35 to 125 PSI
Flow	7 GPM @ 40 PSI
Supply Line	3/4"

OPTIONS

Air Level Master Options (Specify When Ordering)

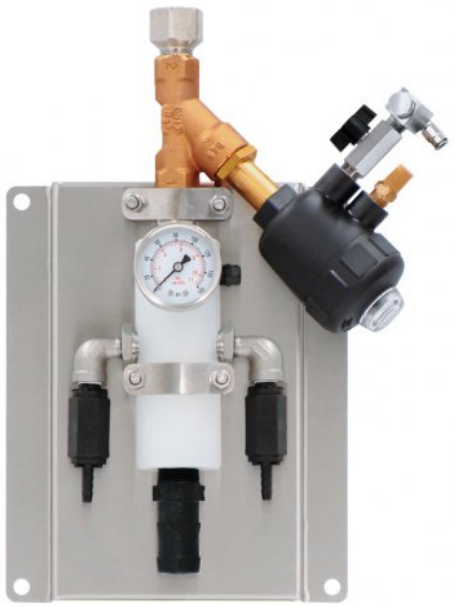
For Paired Air Level Master Tanks	# 989402
For User-Supplied Tanks	# 989405, 989408

Air Level Master Tank Sizes (Specify When Ordering)

Tank, 20 Gallon (Single Satellite)	# 709180
Tank, 40 Gallon (Single Satellite)	# 709181
Tank, 40 Gallon (Double Satellite)	# 709184
Tank, 60 Gallon (Single Satellite)	# 709182
Tank, 60 Gallon (Double Satellite)	# 709185

Alternate Chemical Check Valve - Viton Standard

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



Lafferty EQUIPMENT MANUFACTURING LLC

CFS TECHNOLOGIES

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WARNING! READ ALL INSTRUCTIONS BEFORE USING EQUIPMENT!

OVERVIEW

The Gemini™ High Flow Satellite Mixing Station is a 7 GPM @ 40 PSI chemical proportioner that will simultaneously dilute and blend two chemical concentrates into one accurately diluted solution. When the air-activated water solenoid is opened by an Air Level Master (sold separately) this venturi injection system uses standard city water pressure (35 - 125 PSI) to draw and blend 2 chemical concentrates into the water stream independently so that the chemicals never mix until they are diluted. The ready-to-use solution is quickly dispensed into a paired Air Level Master Tank (sold separately) or a user-supplied tank. Use multiple Satellite Mixing Stations to refill the tank faster.

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 empty RTU holding tank on a **level surface.**
2. Carefully unpack the Air Level Master assembly and secure to the tank (see Air Level Master instructions). Ensure that the float(s) are hanging freely.
3. Mount the High Flow Satellite Mixing Station unit(s) to a suitable surface above the chemical supply to prevent siphoning.
4. Connect the discharge hose(s) as shown in the diagram.
5. Flush any new plumbing of debris before connecting water. If water piping is older, or has known contaminants, install a water filter.
6. Connect the water supply to the Mixing Station unit(s).
7. Push lock the supplied 5/32 poly-flow tubing to the tube lock fitting on the Level Master and to the wall mount Mixing Station solenoid(s)
8. Connect a clean, dry compressed air supply to the Level Master unit

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

- For the strongest dilution ratio do NOT install a colored metering tip in one or both check valves.
- 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 each check valve. DO NOT OVER TIGHTEN.
- Push the chemical tubes over the check valve barbs and place the strainers in each chemical concentrate.
- **BOTH chemical suction tubes must be placed in chemical.** If one suction tube will not be used, plug the unused tube to prevent it from drawing in air.
- 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) 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 air inlet ball valve to activate the Satellite Mixing Station(s) and 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 air flow to the Satellite Mixing Station. This will cause the solenoid on the water inlet to close and deactivate the Satellite Mixing Station.

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. System 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 to the Satellite Mixing Station(s) 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 air supply to the Satellite Mixing Station water solenoid and deactivate the system to prevent overflow.
- The system 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	1600:1
Clear	0.88	1018:1
Bright Purple	1.38	649:1
White	2.15	417:1
Pink	2.93	306:1
Corn Yellow	3.84	233:1
Dark Green	4.88	184:1
Orange	5.77	155:1
Gray	6.01	149:1
Light Green	7.01	128:1
Med. Green	8.06	111:1
Clear Pink	9.43	95:1
Yellow Green	11.50	78:1
Burgundy	11.93	75:1
Pale Pink	13.87	65:1
Light Blue	15.14	59:1
Dark Purple	17.88	50:1
Navy Blue	25.36	35:1
Clear Aqua	28.60	31:1
Black	50.00	18:1
No Tip Ratio Up To:		8.5:1

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

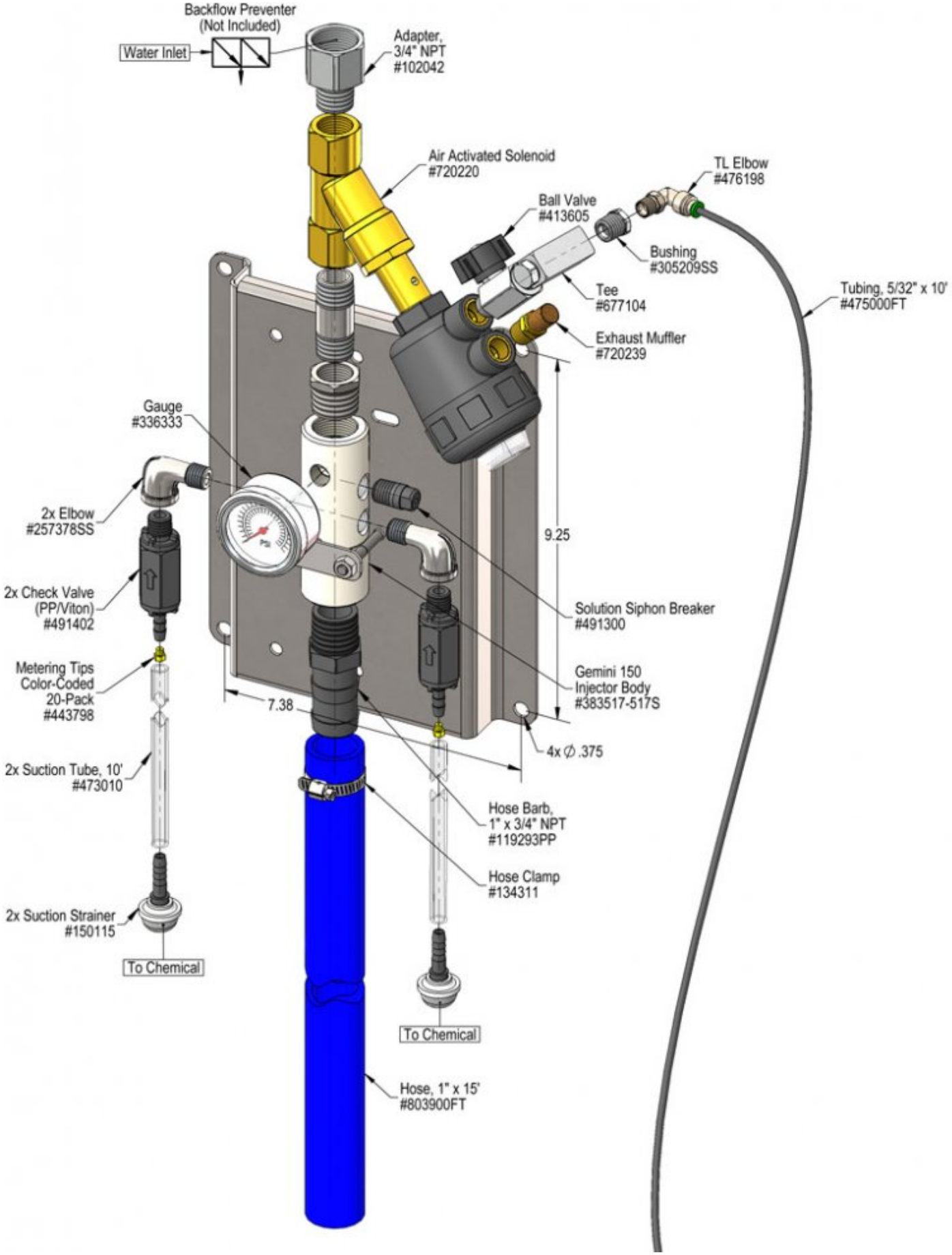
FORMULA

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
35	6.55
40	7.00
50	7.83
60	8.57
70	9.26
80	9.90
90	10.50
100	11.07
110	11.61
120	12.12
125	12.37


Backflow Preventer
(Not Included)
Water Inlet
Adapter,
3/4" NPT
#102042
Air Activated Solenoid
#720220
TL Elbow
#476198
Ball Valve
#413605
Bushing
#305209SS
Tee
#677104
Tubing, 5/32" x 10'
#475000FT
Exhaust Muffler
#720239
Gauge
#336333
2x Elbow
#257378SS
9.25
2x Check Valve
(PP/Viton)
#491402
Solution Siphon Breaker
#491300
Metering Tips
Color-Coded
20-Pack
#443798
Gemini 150
Injector Body
#383517-517S
7.38
4x ∅ .375
2x Suction Tube, 10'
#473010
Hose Barb,
1" x 3/4" NPT
#119293PP
Hose Clamp
#134311
2x Suction Strainer
#150115
To Chemical
To Chemical
Hose, 1" x 15'
#803900FT

Troubleshooting Guide

Problem	Possible Cause / Solution	
	Startup	Maintenance
A) Mixing station will not draw chemical.	1, 4, 5	9, 10, 11, 12, 16, 17
B) Dilution too strong.	2	
C) Dilution too weak.	3, 4, 5	9, 10, 11, 12, 16, 17
D) Primary float will not activate (does not fill)	7, 9	13, 14, 15, 18
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, 18
NOTE: This guide is for Air Level Masters used with High Flow Satellite Mixing Stations		

Possible Cause / Solution

Startup

1. **Air inlet ball valve not completely open**
   - Completely open air inlet 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**
   - Mixing station requires 25 PSI water pressure, see requirements.
6. **Air pressure to Level Master too high**
   - Install an air pressure regulator in-line before the Level Master if air pressure exceeds 80 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.
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.
    - Do not modify the float assemblies.
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, etc.
    - Depending on the chemical and on-site 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. **Water solenoid failed or air is turned off**
    - Replace solenoid
    - Ensure air inlet ball valve is completely open
18. **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.