GridBee GS-12-Air

120V Owner's Manual

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GridBee GS-12-Air

120V Owner's Manual

Safety

IMPORTANT

YOU MUST COMPLETELY READ AND FULLY UNDERSTAND THESE INSTRUCTIONS BEFORE INSTALLING, OPERATING, OR SERVICING THIS UNIT.

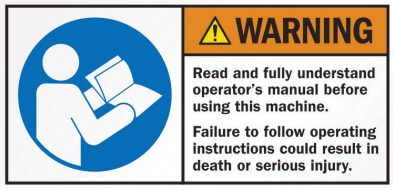
Be sure you have read all installation, operation, maintenance and safety instructions before you install, service or begin to operate this unit.

Accidents occur every year because of careless use of industrial equipment. You can avoid hazards by following these safety instructions, and applying some ordinary common sense when operating or servicing this unit.

Keep in mind that ***full operator attention and alertness*** are required when operating or servicing this unit.

USE COMMON SENSE!! Most accidents can be avoided by using ***common sense and concentration*** on the job being done.

Carefully read safety information when you see any safety symbols.



Safety

IMPORTANT

YOU MUST COMPLETELY READ AND FULLY UNDERSTAND THESE INSTRUCTIONS BEFORE INSTALLING, OPERATING, OR SERVICING THIS UNIT.

Identify all possible hazards. Determine what safeguards are needed and implement them. **Only you, the user,** understand your product and system characteristics fully. ***The ultimate responsibility for safety is with you. Your safety ultimately rests in your hands.*** Do your part and you will enjoy safe, trouble free operation for years to come. This instruction manual is not intended to include a comprehensive listing of all details for all procedures required for placement, operation and maintenance. If you have a question about a procedure or are uncertain about any detail, **Do Not Proceed.** Please contact Ixom Watercare Customer Service at **866-437-8076** to speak to a representative.

IMPORTANT!!!

Follow all federal and state laws in regards to safety regulations of working at heights, confined spaces, rescue, etc. as required by the U.S. Department of Labor, Occupational Safety and Health Administration. Use necessary PPE when placing and servicing this unit.

ELECTRICAL HAZARD

WARNING: THIS EQUIPMENT CONTAINS HIGH VOLTAGE! ELECTRICAL SHOCK CAN CAUSE SERIOUS OR FATAL INJURY. ONLY QUALIFIED PERSONNEL SHOULD ATTEMPT PLACEMENT, OPERATION AND MAINTENANCE OF ELECTRICAL EQUIPMENT. REMOVE ALL SOURCES OF ELECTRICAL POWER BEFORE PERFORMING ANY SERVICE WORK TO THE MACHINE. USE PROPER LOCKOUT TAGOUT (LOTO) PROCEDURES TO ENSURE A SAFE WORK ENVIRONMENT.

Crush Hazard

WARNING: DO NOT REMOVE ANY FLOAT ASSEMBLY BOLTS OR PINS WHILE EQUIPMENT IS FLOATING IN WATER. EQUIPMENT MUST BE SECURELY SUPPORTED BEFORE PERFORMING SERVICE.

Rotating Hazard

CAUTION: KEEP BODY APPENANDAGES OR LOOSE CLOTHING AWAY FROM EQUIPMENT WHILE OPERATING. ENSURE EQUIPMENT IS OFF BEFORE ATTEMPTING SERVICE.

Entanglement Hazard

WARNING: ENSURE THAT PERSONNEL ARE CLEAR OF THE ELECTRIC CORD AND CHAIN TO AVOID ENTANGLEMENT.

Thin Ice Hazard

WARNING: ICE SURROUNDING MACHINE MAY NOT SUPPORT WEIGHT, KEEP CLEAR OF THIN ICE.

Laceration Hazard

CAUTION: EDGES MAY BE SHARP AND CAUSE LACERATION IF PROPER CARE IS NOT USED.

Safety

Protect Yourself

It is important that you comply with all relative OSHA and local regulations while installing and performing any maintenance to the mixer circulation equipment.

Key OSHA Compliance Standards that must be followed (and not limited to) are:

- **1910.146 Permit-required confined spaces**
- **1910.147 Lockout/Tagout**
- **1926.500 Fall Protection**

Fall Protection Tips

- Identify all potential tripping and fall hazards before work starts.
- Look for fall hazards such as unprotected floor openings/edges, shafts, open hatches, stairwells, and roof openings/edges.
- Inspect fall protection and rescue equipment for defects before use.
- Select, wear, and use fall protection and rescue equipment appropriate for the task.
- Secure and stabilize all ladders before climbing.
- Never stand on the top rung/step of a ladder.
- Use handrails when you go up or down stairs.
- Practice good housekeeping. Keep cords, welding leads and air hoses out of walkways or adjacent work areas.

Refer to 29 CFR 1926.500 for complete regulations set by OSHA. Refer to your state's regulations if your state established and operates their own safety and health programs approved by OSHA.

Lockout Tagout

When the On/Off switch is in the "ON" position, the mixer may start up at any time if not already operating. The mixer's On/Off switch can be locked out by placing a pad lock thru the door latch of the controller after the switch has been turned to the "OFF" position. The On/Off switch is to be used as the emergency stop.

Permit-Required Confined Spaces

A confined space has limited openings for entry or exit, is large enough for entering and working, and is not designed for continuous worker occupancy. Confined spaces include underground reservoirs, ground storage tanks, elevated tanks, silos, manholes, and pipelines.

Confined Space Tips

- Do not enter permit-required confined spaces without being trained and without having a permit to enter.
- Review, understand and follow employer's procedures before entering permit-required confined spaces and know how and when to exit.
- Before entry, identify any physical hazards.
- Before and during entry, test and monitor for oxygen content, flammability, toxicity or explosive hazards as necessary.
- Use fall protection, rescue, air monitoring, ventilation, lighting and communication equipment according to entry procedures.
- Maintain contact at all times with a trained attendant either visually, via phone, or by two-way radio. This monitoring system enables the attendant and entry supervisor to order you to evacuate and to alert appropriately trained rescue personnel to rescue entrants when needed.

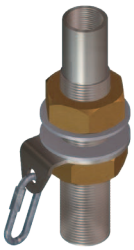
Refer to 29 CFR 1910.146 for complete regulations set by OSHA. Refer to your state's regulations if your state established and operates their own safety and health programs approved by OSHA.

Package Contents

GS-12 Air

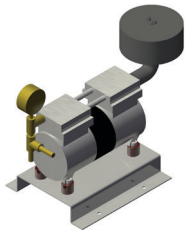
Package Contents

GS-12-Air Mixer



Through-tank fitting for air line; supports junction box and retrieval chain attach point

Kellem Grip
Cord Strain Relief



AC655 1HP
Compressor Unit

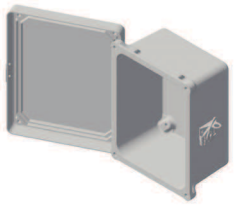
Chain Grab Tools

Lexel
Sealant Tube

GS-12-Air SCADA Panel
(Optional Accessory Item)

1 5/16” Hole Saw

100’
Stainless Steel
Chain



Tank-roof junction box (Optional Accessory Item included with Heated hose, mounts onto through-tank fitting,)

Interior Hose
(Optional Accessory Item)

Exterior Hose
(Optional Accessory Item)

Requirements - 120V

GS-12-Air

Hatch Requirement

A 12 inch (305 mm) diameter hatch opening is required to fit the GS Mixer through.

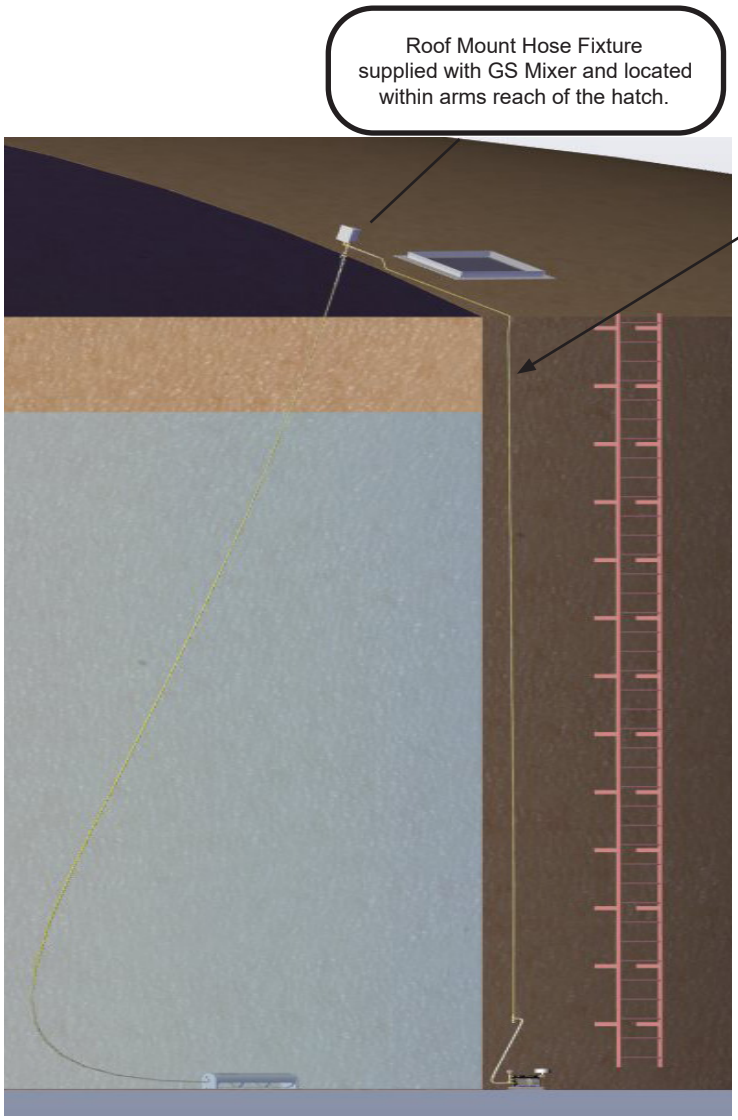
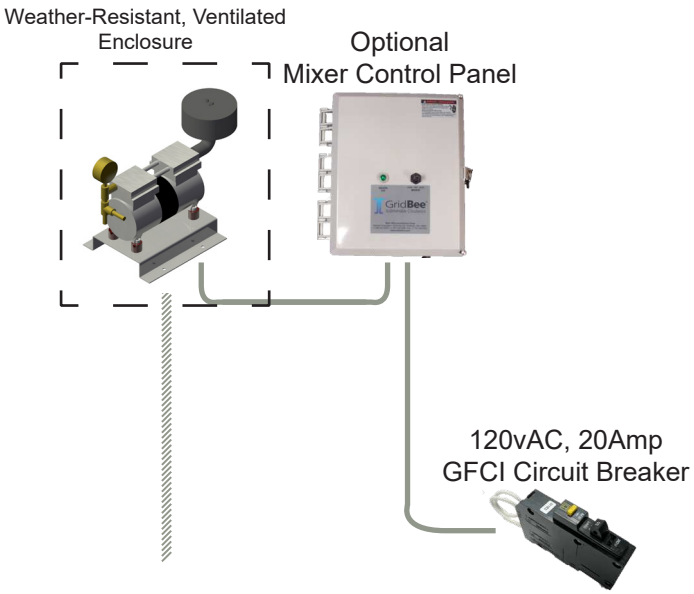


Figure 1: *Typical GS Placement*

Power Requirement

120 VAC, 20 amp GFCI protected service and means of quick power disconnect recommended

Condensate Drain Located at the lowest point of the hose.



Locate power source flex conduit termination at customer preferred location of Mixer Control Panel

RATING					FULL LOAD		LOCKED ROTOR AMPS
HP	KW	VOLTS	HZ	S.F.	AMPS	WATTS	
1	0.655	115	60	1.6	6.0	655	18

GS-12-Air

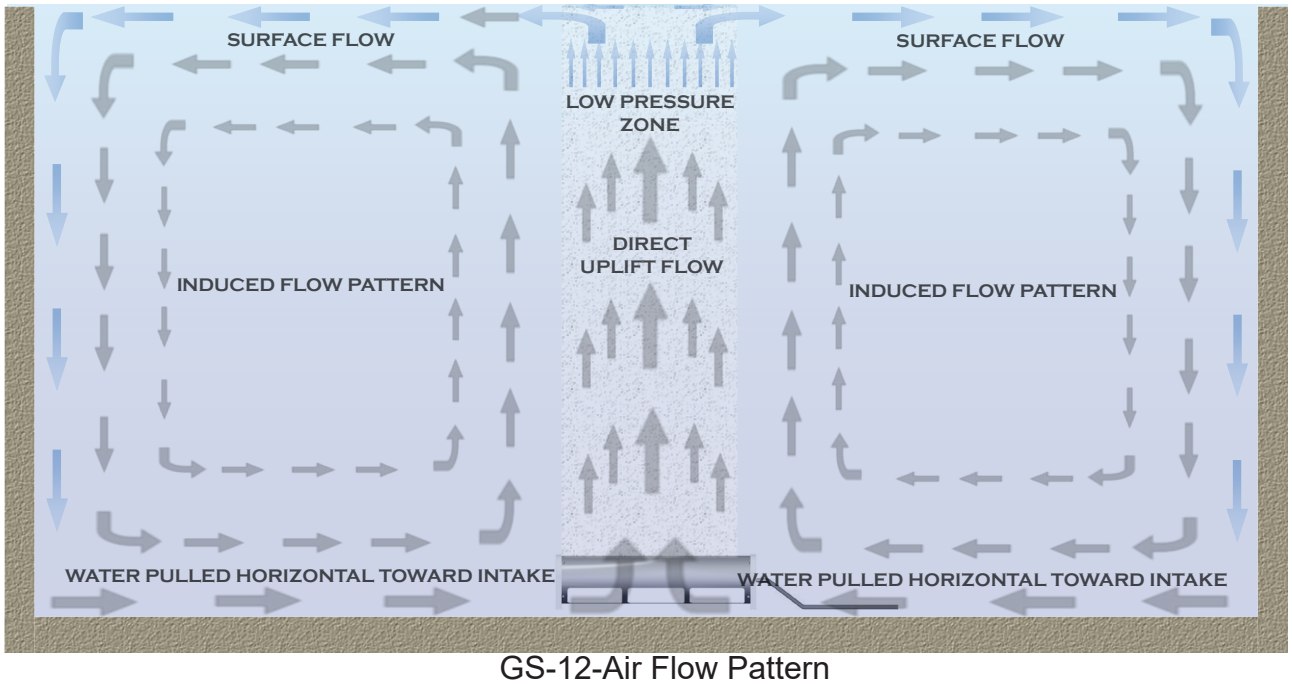
The GS-12-Air is designed to circulate water by bringing water from along the tank floor and sending it upward and out across the water surface in layers causing direct and induced mixing effects. The air diffuser creates thousands of tiny bubbles which produces a "Low Pressure Zone" that creates an uplift suction flow through the intake draft tube, and a slight mound at the water surface, producing gentle flow radially outward from the AP Unit.

The near laminar layers flow outward radially, in diverging stream lines directly above the GS-12-Air. As flow leaves the Unit, vertical flow is induced in between the water being drawn below and the water above. At the level of the flow intake, water is drawn from all inner walls and along the floor of the tank. As this lower layer of fluid makes its way inward with converging streamlines to the GS-12-Air, the water is forced upward, toward the surface, providing gentle mixing, de-stratification, and surface renewal.

The GS-12-Air Unit requires a minimal amount of supplied air. The air is supplied to the GS-12-Air Unit with the provided air feed hose that connects to air manifold.

It is acceptable to use the Unit on an as needed or required basis. This will allow for reduced power consumption and will benefit in energy savings. This will require the Unit to run on a timer or local SCADA system.

Refer to air supply manufacturer for recommended duty cycle and other operational recommendations and constraints.



GS-12-Air Flow Pattern

GS-12-Air

INSTALL THROUGH TANK FITTING:

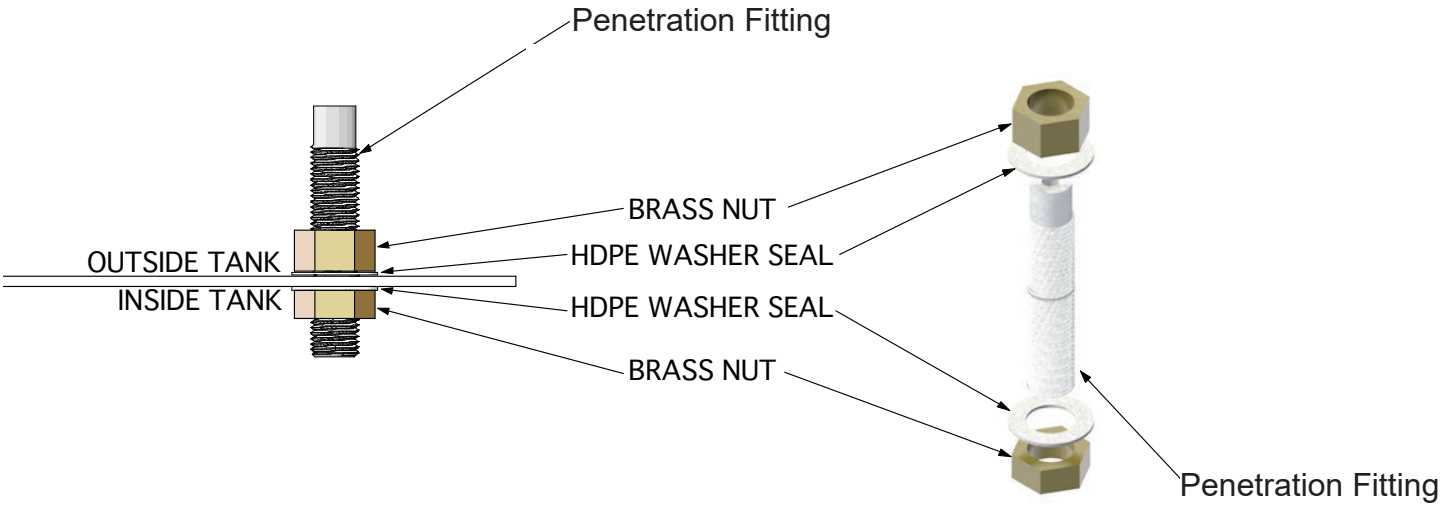
STEP 1: Locate the hatch where the GS-12-Air mixer will be installed through and mark a penetration point on the roof for the penetration fitting. When selecting a penetration location be sure to confirm the following:
A. The penetration is not going to hit an internal structure.
B. The penetration is centered within a clear footprint of approximately 8-inch X 8-inch (20cmX20cm)
C. The penetration is within arms reach of the hatch.

STEP 2: Use a cordless drill with the 1-5/16 inch (33mm) hole saw and begin drilling a hole through the tank roof. A small amount of food grade vegetable oil or water works well for lubrication of the hole saw. Prior to completing the penetration, position a catch bucket below the penetration point to catch filings and the hole cut out. If a catch bucket is not readily available, use the cardboard box the hole saw and fittings came in to catch the filings and disc cut out from falling into the tank.

STEP 3: Thoroughly clean all surfaces around the penetration of any filings before removing the catch bucket. The penetration is now ready for a sealant application and installation of the penetration fitting.

STEP 4: Apply a healthy amount of sealant on all the surrounding surfaces of the penetration (interior, exterior, and inner wall). This will prevent future corrosion of the roof around the fixture.

STEP 5: Install the penetration fitting as shown below so that there is an interior and exterior nut and gasket in place prior to tightening the fixture to the roof. Adjust the height of the fixture so the top is approximately 3-1/2 inches (9cm) above tank roof. Tighten jam nut to firmly secure the fixture to the roof using a large channel lock and pipe wrench.



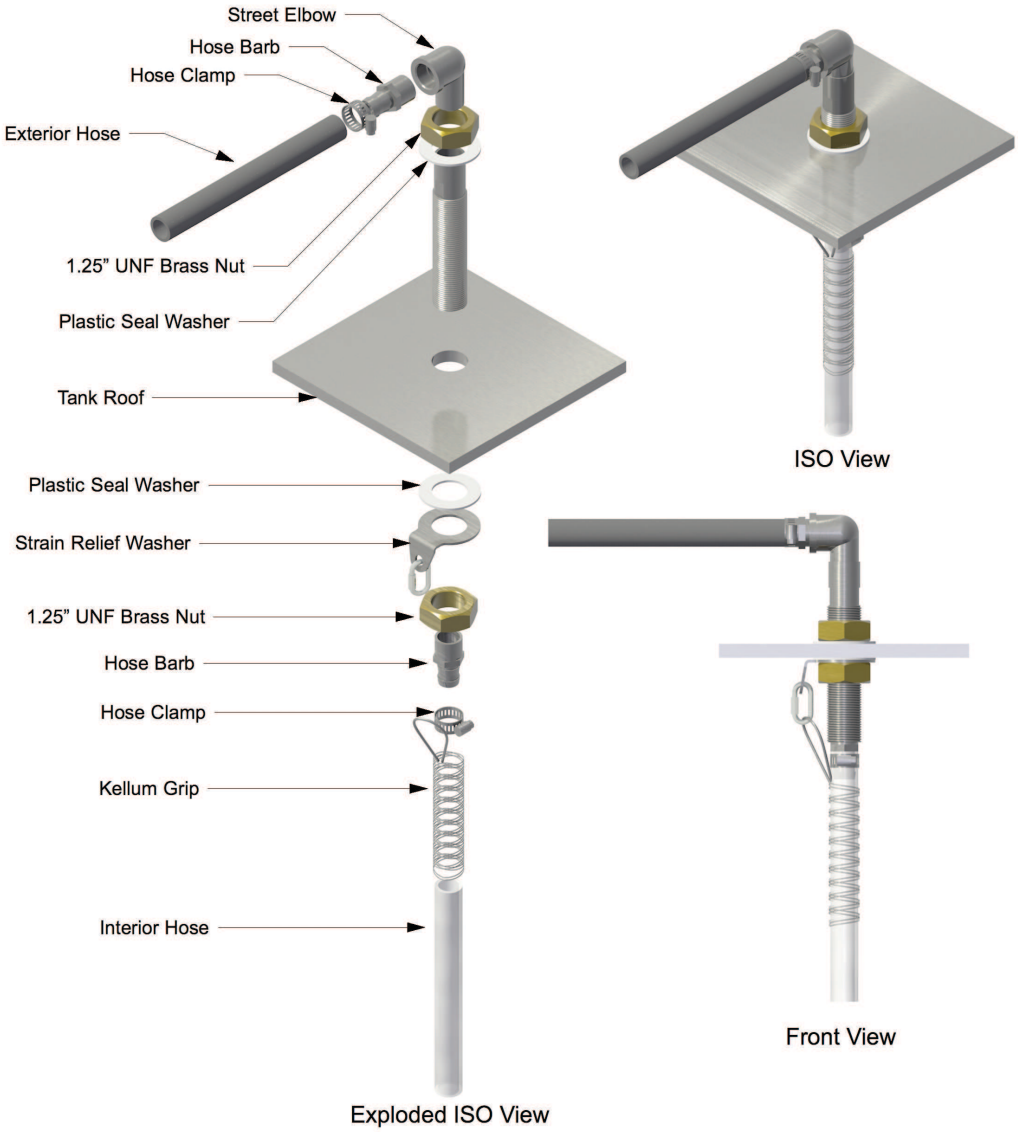
GS-12-Air

INSTALL AIR HOSE

STEP 1: Secure interior hose barb to bottom of penetration fitting. Secure interior hose (cut to length) to the interior hose barb with the provided hose clamp as shown below.

STEP 2: Secure exterior hose barb and elbow to the penetration fitting. Secure exterior hose to the exterior hose barb using provided hose clamp as shown below.

STEP 3: Run external air hose to air compressor. Place water drain assembly at the lowest part of the hose length to allow water condensation to collect. Secure hose using stainless steel zip ties, magnet pads, or adhesive pads attaching hose to structure at a recommended spacing of every 4’. Best attaching method depends on specific tanks.



Exploded ISO View

GS-12-Air

INSTALL GS-12-Air MIXER:

STEP 1: Plan out a safe procedure and hoist the GS-12-Air mixer to the top of the tank near the hatch opening. Use the chain attached to the GS-12-Air mixer for lifting and supporting the weight. Keep clear of chain and air hose to avoid entanglement.

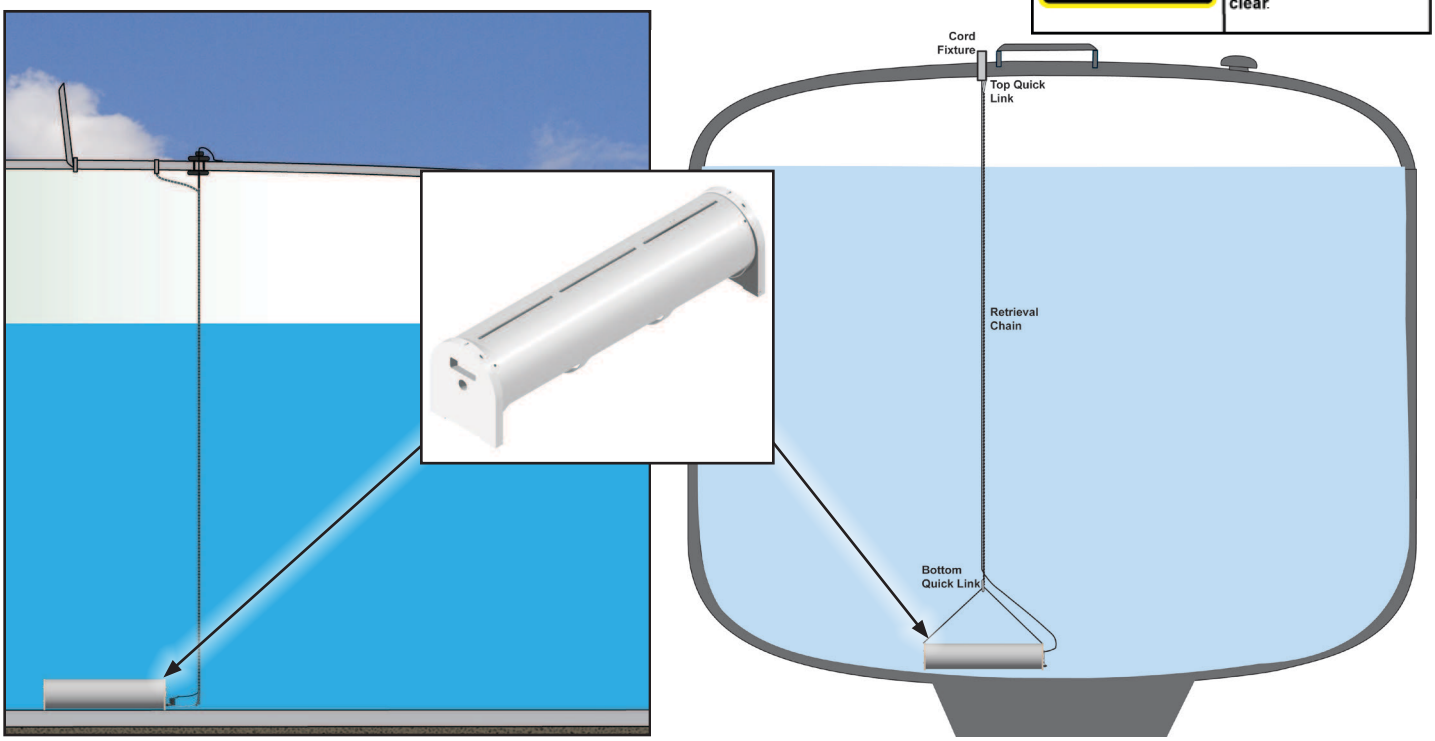
STEP 2: Slide the required kellem grip over the air hose that will attach to the machine. Make sure kellem grip is 6-8ft from the end and eye loop is towards the machine end of the hose. Attach the kellem grip using a quick link to the center of the suspension chain attached to the machine. Attach air hose to hose barb on the machine with supplied hose clamp and tighten.

STEP 3: Attach one end of the retrieval chain to the bottom of the penetration fitting with a quick link. Attach opposite end of the retrieval chain to the quick link located on the mixer chain. Tighten both quick links with a pliers.

STEP 4: Slowly and carefully lower the GS-12-Air mixer down to the tank floor until it is resting on the bottom. The proper position is when the flat edge of the GS-12-Air mixer ends are resting on the floor.
For suspended configuration pick the unit up so it is just above the tank floor, but is as low as possible, and with the mixer hanging horizontally. The discharge slots should point directly upward.

Entanglement Hazard

WARNING: WHEN LOWERING OR RAISING THE GS-12-Air MIXER, BE SURE THAT YOU AND OTHERS ARE CLEAR OF THE ELECTRIC CORD AND CHAIN TO AVOID ENTANGLEMENT!

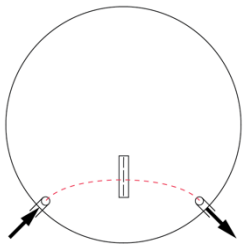


Mixer Placement Guidelines

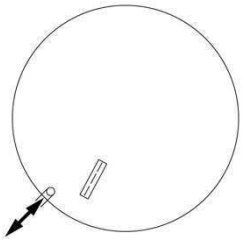
GS Series Mixers

In many cases, mixer deployment just below the main access hatch is sufficient. However, consider the below recommendations, where practical, for guidelines of mixer placement.

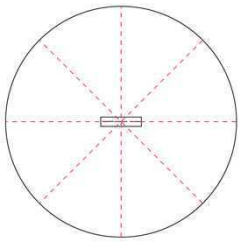
Short circuit path:
Ideally, the mixer should be placed in the short circuit path between the inlet and outlet of the tank. This provides the mixer the best opportunity to blend all incoming water with the tank volume prior to water exiting the outlet.



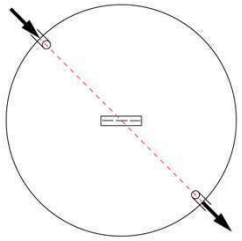
Common Inlet / Outlet:
The mixer should be favored toward a common inlet / outlet pipe to prevent short circuiting. This provides the mixer the best opportunity to blend all incoming water with the tank volume prior to water exiting the tank. However, the mixer should stay clear at least 10-15ft away from a common inlet/outlet pipe.



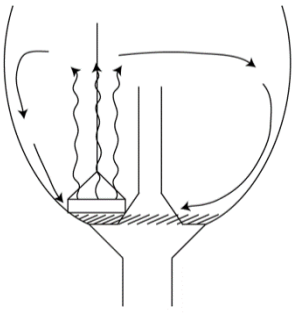
Radial Orientation:
It is best to orientate the mixer so the discharge slots are radial with the tank. This is most critical if the mixer is placed near a sidewall of the tank.

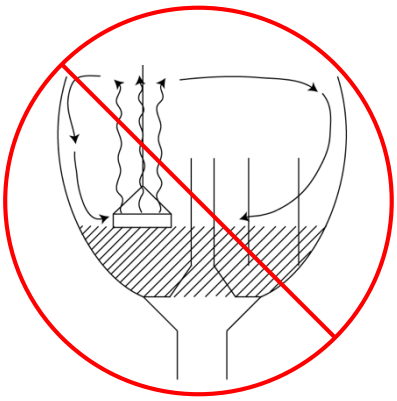


Center Tank Placement:
A mixer is often positioned at the tank center when a separate inlet and outlet are positioned at or approximately 180° apart. It is most critical for the mixer to be along a short circuit path.



Mixer Elevation:
The mixer should be located in the lowest elevation of the tank, and resting or supported in a horizontal position with discharge slots pointed vertical. Water below the mixer will not be circulated.





GS Series Final Checklist

120V Single Phase

Installation Checks

Before starting the GS Series mixer a few checklist items are recommended to confirm the installation is correct.

Installation Checks	Check
Is the mixer placed correctly with slots facing up? (Placement)	
Is the mixer retrieval chain connected securely? (Placement)	
Is the kellum grip supporting the weight of the cord/hose? (Placement)	
Is the cord/hose ran through the cord seal in the top of tank junction box? (Placement)	
Is the Tank Penetration fitting sealed with Lexel? (Top of Tank Junction Box)	
Are the top of tank junction box splices correct and each splice individually sealed to protect from corrosion? (Top of tank Junction Box) **(Not applicable for GS-12-Air)**	
Is the field wiring correct? (Requirements)	
Is the mixer submerged with at least 2' (0.75m) of water above the discharge slots?	

Pre Operation Checks	Reading	
Continuity Check	Line to Neutral:	
	Line to Ground:	
	Neutral to Ground:	
Source Voltage Reading		

Operation Checks

The following checklist items are recommended to confirm proper operation.

Operation Check (While Mixer is Running)	Reading / Observation
Source Voltage Reading	
Amperage Reading Normal Operating Range: (7.5 amps to 10.0 amps)	
Flow Check Auditory	
Flow Check Visual	

Troubleshooting

GS-12-Air

Voltage (Ṽ)

To measure the voltage follow these steps.

1. Set the voltmeter on Volts AC.
2. Place the positive probe on the black wire and the negative probe on the white wire on the top of the contactor (source side).
3. Record the reading.

Amperage (Ã)

To Measure the Amperage follow these steps.

1. Use a clamp type ammeter, set to Amps AC.
2. Clamp around the black wire on the bottom of the contactor (load side). Marked Load 1 (L1).
3. Record the reading with mixer turned on.

Ohms (Ω)

To Measure the Ohms follow these steps.

1. Turn off the circuit breaker feeding the control panel and follow lock out tag out procedures.
2. Measure the Voltage to confirm that the power is removed.
3. Disconnect the black and white wires from the bottom of the contactor (load side). Marked Load 1 (L1) and Neutral (N).
4. Set the Voltmeter to Ohms.
5. Place the positive probe on the black wire and the negative probe on the white wire that were disconnected.
6. Record the reading.

Depending on the length and gauge of wires to the mixer the ohms should be approximately:
1-4 Ohms, 120V.

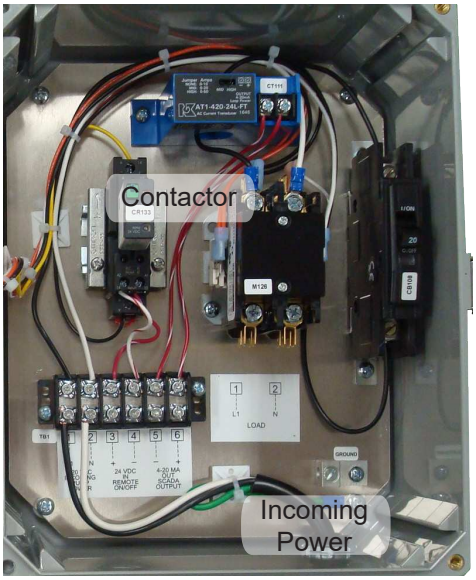


Figure 1: *SCADA Control Panel*

Figure 2: *Disconnect Control Panel*

⚠WARNING

ELECTRIC SHOCK HAZARD.

This equipment is to be serviced by trained personnel only.

Troubleshooting Information	
Serial Number	
Location Name	
Tank Name	
Distributor Name (if applicable)	
Voltage Reading	
Amperage Reading	
Ohm Reading	

Problem	Possible Cause
Compressor Intermittently Tripping Circuit Breaker	Multiple GFCI on Circuit Source Power Fluctuation
Compressor Quickly Tripping Circuit Breaker	Short to Ground Locked Rotor on Motor
Compressor Not Operating but Circuit Breaker not tripped	Loose or Loss of Connection
Compressor Making Loud Noise	Motor Bearing Failure Compressor Gasket Failure

Technical Data Sheet

GS-12-Air

Technology Description- GridBee® electric submersible water circulation equipment, designed for continuous operation. Constructed with T316 stainless steel shell and safe materials for contact with potable drinking water. Designed to be placed into service through roof hatch without tank entry.

Materials of Construction - T316 stainless steel shell and hardware construction. UHMW-PE end plates for worry-free safe contact with all tank surfaces. See certifications section below.

100 ft (30 m) of T316 stainless steel retrieval chain included for machine installation and retrieval without requiring tank entry.

Minimum Access Opening - Machine can be placed through 12 inch (30 cm) diameter opening.

Minimum Water Depth - Machine requires 20 in (0.5 m) of water to effectively circulate. No damage to machine when run dry in shallow water or drained condition.

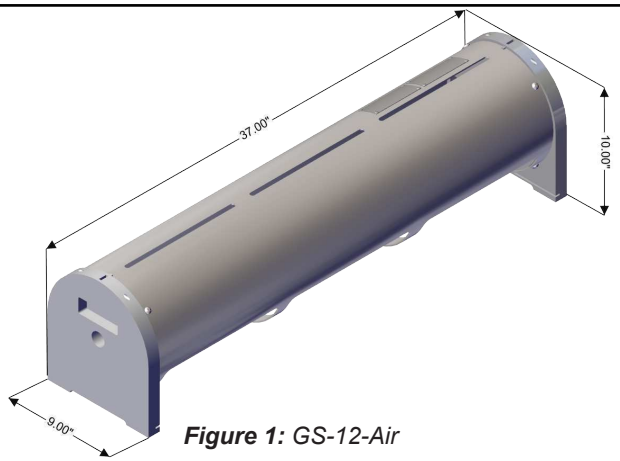


Figure 1: *GS-12-Air*

Maximum Operating Depth - Maximum air discharge depth is limited by the air supply pressure available.

Electrical Requirements - 120VAC motor requires 120VAC/1PH power source outlet ***(minimum 20 Amp service)***.

Recommended Air Supply - Machine is provided with a 3/4 inch air hose connection point.

1 HP Compressor Unit - AC585 - 1 HP (585 Watt) rated compressor capable of producing 3.0 standard cubic feet per minute (0.085 standard cubic meters per minute) @ 15 psi (105 kiloPascal). Mounted to stainless steel skid, includes brass fittings, air inlet filter, 120psi pressure gauge, and pressure relief. Factory set at 90 psi (621 kiloPascal) Maximum Pressure of 125 psi (862 kiloPascal). Continuous duty-cycle. Sound Level: 55dB. Connection: 3/8" FNPT with 3/4" hose barb. Size: 18" L x 10.5" W x 15.5" H. Recommended for applications from 50 to 120ft (3.7 to 36.6 meters).

1 HP Compressor Unit - AC655 - 1 HP (655 Watt) rated compressor capable of producing 4.3 standard cubic feet per minute (0.13 standard cubic meters per minute) @ 15 psi (105 kiloPascal). Mounted to stainless steel skid, includes brass fittings, air inlet filter, 0-100psi pressure gauge, and pressure relief. Factory set to maximum Pressure of 60 psi (414 kiloPascal). Continuous duty-cycle. Sound Level: 55dB. Connection: 3/8" FNPT with 3/4" hose barb. Size: 18" L x 10.5" W x 15.5" H. Recommended for applications from 12ft (3.6 meters) to 50ft (15.2 meters).
For applications requiring greater than 60 psi (414 kiloPascal) operating pressure, please refer to the AC1080 model. High Pressure unit for specific application requirements is available upon request. For self-supplied air source, please contact Ixom.

Optional Accessories - Additional standard hose available in 100' length.

Machine Size / Weight

- 37 in (93.98 cm) long x 10 in (25.4 cm) height x 9 in (22.9 cm) width / 50 lbs (23 kg)

Enclosed Area Warning - Air powered mixers should not be used in enclosed areas where methane or other explosive gases could build up. Some gases can explode when combined with air. Please verify that you have proper ventilation to prevent a buildup of methane gas or other gases in the headspace above the explosion limit.

Certifications - Ixom's potable water products are certified to NSF/ANSI/CAN 61-G & 372 for lead-free content. Learn more at: www.ixomwatercare.com/std61

Maintenance / Warranty - Limited maintenance. Limited 5-year parts and labor warranty. See Warranty Statement for details.

Patent Pending

Subject to change without notice.

GridBee GS Submersible Mixer

Limited Replacement Warranty

GridBee GS Mixers. The GridBee Series GS mixers are warranted to be free of defective parts, materials, and workmanship for a period of five years from the date of purchase. This warranty is valid only for use of the equipment in accordance with the owner's manual and any initial and ongoing factory recommendations. This warranty is limited to the repair or replacement of defective components only and does not apply to normal wear and tear. If the factory's service crews performed the original on-site placement and startup, then this warranty also includes labor. Where labor is included, in lieu of sending a factory service crew to the site for minor repairs, Ixom may choose to send the replacement parts to the owner postage-paid and may pay the owner a reasonable labor allowance, as determined solely by Ixom, to install the parts. There is no liability for consequential damages of any type. The warranty that is submitted and provided with the purchased equipment is the valid warranty.

GridBee control panels, cold weather hose kits, air compressors and any optional accessories. These items are considered "buyout" items for Ixom, and as such include a warranty against defects in material and workmanship for one year from the date of purchase. This warranty covers parts only, not labor. Parts that are determined by Ixom to be defective in material or workmanship under normal use during the one year warranty period will be repaired or replaced. Shipping charges are the responsibility of the customer.

Terms applicable to all equipment. This Limited Replacement Warranty is subject to the terms of Ixom's General Terms and Conditions of Sale. In the event of any inconsistency between the terms of this Limited Replacement Warranty and Ixom's General Terms and Conditions of Sale, the terms of this Limited Replacement Warranty shall prevail to the extent of that inconsistency.

Brochure

Protect Your Investment With The Ixom Service Program

Comprehensive Damage Repair

Damage which occurs to your Ixom manufactured equipment in the normal course of operation will be repaired or replaced including supply and installation of structural repairs and replacement parts in accordance with Ixom's standard terms & conditions.

Trained & Experienced Service Technicians

The Ixom Service Program allows our customers to take advantage of our highly trained service technicians. We have the equipment, experience and training to ensure the machines are well maintained while following OSHA regulations. Our dedication to safety and high level of training has earned us the prestigious SHARP recognition award time and time again. We have the means to safely service the equipment whether in municipal water tanks, lakes, reservoirs, or wastewater ponds & basins.

Guaranteed Annual Onsite Maintenance

Ixom service personnel will perform a minimum of one (1) onsite equipment inspection & maintenance per yearly term of the service contract including mechanical, structural, and electronic components of Ixom manufactured equipment.

On-Site Crew Response for Critical Application and Operational Service Issues

If service issues arise, the customer may be asked to perform a basic machine inspection and discuss results with Ixom's Customer Service Department. In some cases, the customer may be asked to perform minor tasks (i.e., cleaning, basic troubleshooting, and replacing minor parts). If replacement parts are needed, the factory will ship them out at no cost. For more serious application and service issues, Ixom will dispatch service personnel to resolve the issues onsite.

Removal, Storage, and Redeployment of Equipment

For situations when Ixom equipment needs to be removed, stored, and redeployed, services can be offered at a discounted rate.

Access to On-Staff Water Quality Experts

Ixom employs many experts in the water quality field including specialized areas such as limnology, hydrology, wastewater, biology, and engineering. Our water quality personnel are available for data analysis and troubleshooting when you need it.

Contact us for a quote!

Call +1 866-437-8076 or email us at watercare@ixom.com

IXOM
WATERCARE

Nationwide Installation & Service

EVERYONE DESERVES GREAT CUSTOMER SUPPORT

Ixom Watercare earns customer trust with unparalleled service start to finish. Every department in Ixom is dedicated to the support of our Customers and the improvement of water quality. Complete life cycle support is much, much more than a returned phone call or an email. It centers around direct access and communication to those who can help when help is needed from the beginning of a project throughout the life of the equipment.

ABOUT IXOM

Ixom combines innovative water quality solutions with top notch manufacturing and nationwide in-field service capabilities to create trusted, full circle support our Customers depend on.

We design and manufacture many trusted brands including GridBee®, SolarBee®, MIEX®, and ResidualHQ© for use across the water quality spectrum. This includes solutions for Water Treatment, Distribution Treatment, Wastewater Treatment and Lakes & Source Water Reservoirs.

Ixom has thousands of installations and is an industry-leader solving water quality problems across the United States, Canada and the world.

Contact us today to discuss your water quality and service needs.

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