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Instruction Manual

IM355 2

# Glycol Make-up Unit

## GMU560P & GMU560S

Bell & Gossett
a xylem brand

# Table of Contents

# 1 Introduction and Safety

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## 1.1 Introduction

**Purpose of this manual**

The purpose of this manual is to provide necessary information for:

- Installation
- Operation
- Maintenance

**CAUTION:**

Read this manual carefully before installing and using the product. Improper use of the product can cause personal injury and damage to property, and may void the warranty.

**NOTICE:**

Save this manual for future reference, and keep it readily available at the location of the unit.

## 1.2 Safety

**WARNING:**

- The operator must be aware of safety precautions to prevent physical injury.
- Operating, installing, or maintaining the unit in any way that is not covered in this manual could cause death, serious personal injury, or damage to the equipment. This includes any modification to the equipment or use of parts not provided by Xylem. If there is a question regarding the intended use of the equipment, please contact a Xylem representative before proceeding.
- Do not change the service application without the approval of an authorized Xylem representative.

**CAUTION:**

You must observe the instructions contained in this manual. Failure to do so could result in physical injury, damage, or delays.

### 1.2.1 Safety terminology and symbols

**About safety messages**

It is extremely important that you read, understand, and follow the safety messages and regulations carefully before handling the product. They are published to help prevent these hazards:

- Personal accidents and health problems
- Damage to the product and its surroundings
- Product malfunction

**Hazard levels**

| Hazard level | Indication |
|---|---|
|  **DANGER:** | A hazardous situation which, if not avoided, will result in death or serious injury |

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| Hazard level | Indication |
|---|---|
|  WARNING: | A hazardous situation which, if not avoided, could result in death or serious injury |
|  CAUTION: | A hazardous situation which, if not avoided, could result in minor or moderate injury |
| NOTICE: | Notices are used when there is a risk of equipment damage or decreased performance, but not personal injury. |

### Special symbols

Some hazard categories have specific symbols, as shown in the following table.

| Electrical hazard | Magnetic fields hazard |
|---|---|
|  Electrical Hazard: |  CAUTION: |

## 1.2.2 User safety

### General safety rules

These safety rules apply:

- Always keep the work area clean.
- Pay attention to the risks presented by gas and vapors in the work area.
- Avoid all electrical dangers. Pay attention to the risks of electric shock or arc flash hazards.
- Always bear in mind the risk of drowning, electrical accidents, and burn injuries.

### Safety equipment

Use safety equipment according to the company regulations. Use this safety equipment within the work area:

- Hard hat
- Safety goggles, preferably with side shields
- Protective shoes
- Protective gloves
- Gas mask
- Hearing protection
- First-aid kit
- Safety devices

**NOTICE:**

Never operate a unit unless safety devices are installed. Also see specific information about safety devices in other chapters of this manual.

### Electrical connections

Electrical connections must be made by certified electricians in compliance with all international, national, state, and local regulations. For more information about requirements, see sections dealing specifically with electrical connections.

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### Precautions before work

Observe these safety precautions before you work with the product or are in connection with the product:

- Provide a suitable barrier around the work area, for example, a guard rail.
- Make sure that all safety guards are in place and secure.
- Make sure that you have a clear path of retreat.
- Make sure that the product cannot roll or fall over and injure people or damage property.
- Make sure that the lifting equipment is in good condition.
- Use a lifting harness, a safety line, and a breathing device as required.
- Allow all system and pump components to cool before you handle them.
- Make sure that the product has been thoroughly cleaned.
- Disconnect and lock out power before you service the pump.
- Check the explosion risk before you weld or use electric hand tools.

#### 1.2.2.1 Wash the skin and eyes

Follow these procedures for chemicals or hazardous fluids that have come into contact with your eyes or your skin:

| Condition | Action |
|---|---|
| Chemicals or hazardous fluids in eyes | 1. Hold your eyelids apart forcibly with your fingers.<br>2. Rinse the eyes with eyewash or running water for at least 15 minutes.<br>3. Seek medical attention. |
| Chemicals or hazardous fluids on skin | 1. Remove contaminated clothing.<br>2. Wash the skin with soap and water for at least 1 minute.<br>3. Seek medical attention, if necessary. |

## 1.2.3 Protecting the environment

### Emissions and waste disposal

Observe the local regulations and codes regarding:

- Reporting of emissions to the appropriate authorities
- Sorting, recycling and disposal of solid or liquid waste
- Clean-up of spills

### Exceptional sites

**CAUTION: Radiation Hazard**

Do NOT send the product to Xylem if it has been exposed to nuclear radiation, unless Xylem has been informed and appropriate actions have been agreed upon.

### Recycling guidelines

Always follow local laws and regulations regarding recycling.

### Note

The information contained in this manual is intended to assist operating personnel by giving information on the characteristics of the purchased equipment.

It does not release the user of the responsibility to adhere to local codes and ordinances and the use of accepted practices in the installation, operation, and maintenance of this equipment.

Further information pertaining to the installation, operation, and maintenance of your Glycol Make-up System can be found in the Installation Operation and Maintenance manuals for the related equipment given:

- FLOJET R8611344A – *https://www.xylem.com/siteassets/brand/flojet/resources/manual/versijet-series-high-capacity-pumps-installation-guide.pdf*
- Elbi of America XT-30 – *https://elbi.net/wp-content/uploads/2015/07/8109605-XT.pdf*

- SQUARE D Pressure Switch – *http://ecatalog.squared.com/pubs/Machine%20Control/Condition%20Sensors/Pressure%20Switches,%20Water%20and%20Air/9013F/65013-005-39F.pdf*

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# 2 Product Description

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## 2.1 General description

The Glycol Make-up unit is designed to automatically maintain minimum pressure in closed-loop systems.

The GMU560 uses a 5-GPM pump for systems requiring up to 60-psi. The unit uses a pressure switch starts and stops the pump(s).

## 2.2 Storage

For long periods of storage, the unit should be covered to prevent corrosion and contamination from dirt. It should be STORED in a clean, dry location between 0 and 170°F. The relative humidity should not exceed 85%. The unit should be checked periodically to ensure that no condensation has formed. After storage, again check that it is dry before applying power.

## 2.3 Handling

Care should be taken to prevent damage due to dropping or jolting when moving the Glycol Make-up Unit. Transportation damage should be brought to the carrier's attention immediately upon receipt.

## 2.4 Temperature and ventilation

All electrical equipment is susceptible to failure if operated in ambient temperatures outside of its rating. The OPERATING temperature range for this unit is 32 to 105°F. The relative humidity should not exceed 95% non-condensing. The unit should not be operated outside these extremes.

## 2.5 Electrical connections —A.C. power & signals input voltage

The input voltage tolerance is +10/-10% of nameplate voltage.

## 2.6 Ground connections

A grounding terminal is provided for a dedicated ground wire connection. All provisions of the National Electrical Code and local codes must be followed.

**WARNING: Electrical Hazard**

Risk of electrical shock or burn. You must connect an additional earth- (ground-) fault protection device to the grounded (earthed) connectors if persons are likely to come into contact with liquids that are also in contact with the energized unit.

## 2.7 Power wiring

Power wire types and sizes must be selected based upon conformance with the National Electrical Code and all local codes and restrictions. In addition, only copper (Cu) wire rated for at least 75°C may be used for the power connections. Refer to the input current as listed on the motor nameplate when sizing wire. Connect the 8ft Nema 5–15P power cord to a GFCI outlet. For hardwiring the unit, see wiring diagram.

## 2.8 Field connection diagrams

The following field connection diagrams should be reviewed prior to unit installation and operation.

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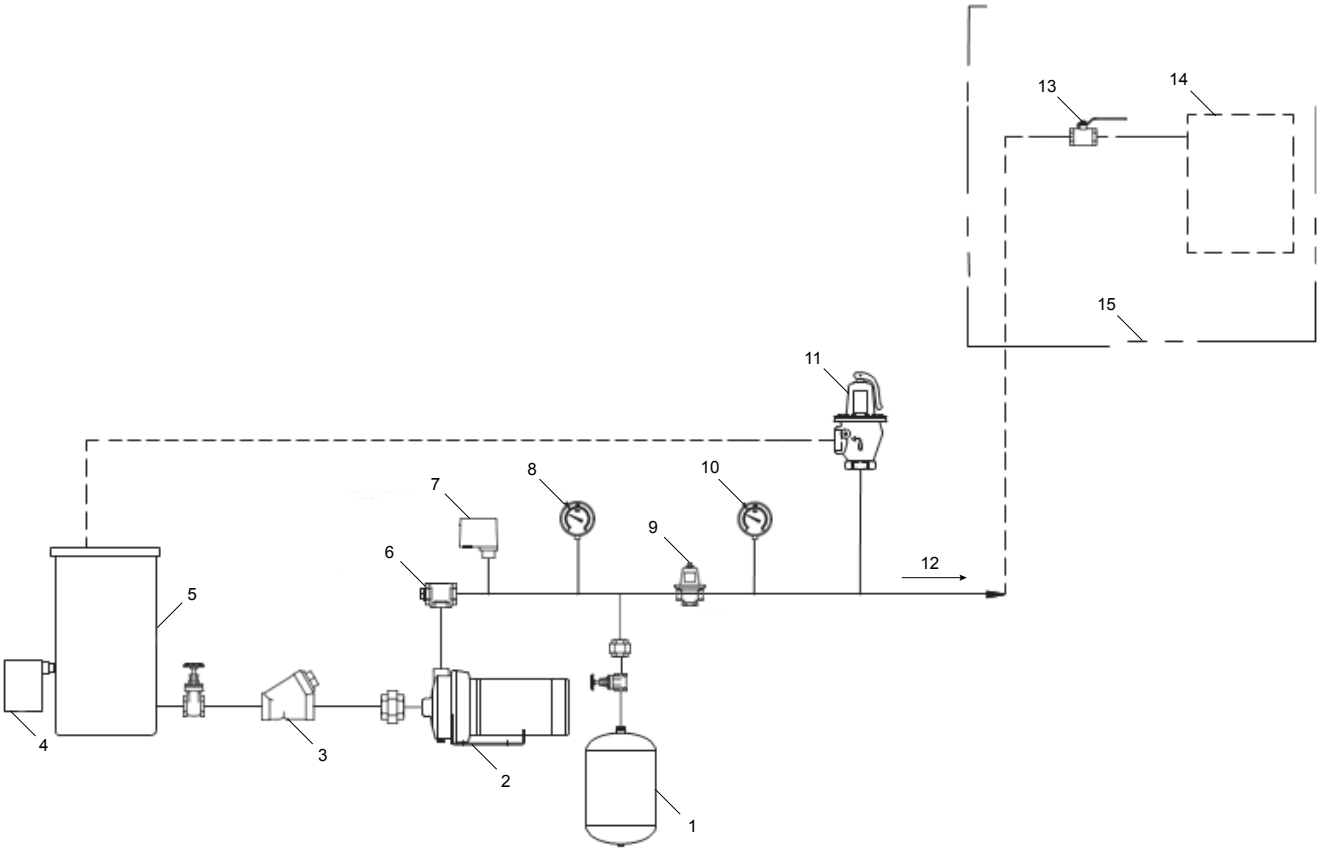


Figure 1: Typical field piping – IFC008

1. Diaphragm expansion tank
2. Pump
3. Y-Strainer
4. Low water cut off switch
5. Tank 55 gallons
6. Check valve
7. Pressure switch
8. Pressure gauge
9. Pressure reducing valve
10. Pressure gauge
11. Pressure relief valve
12. System outlet 3/4”NPT
13. Ball valve
14. System
15. By others

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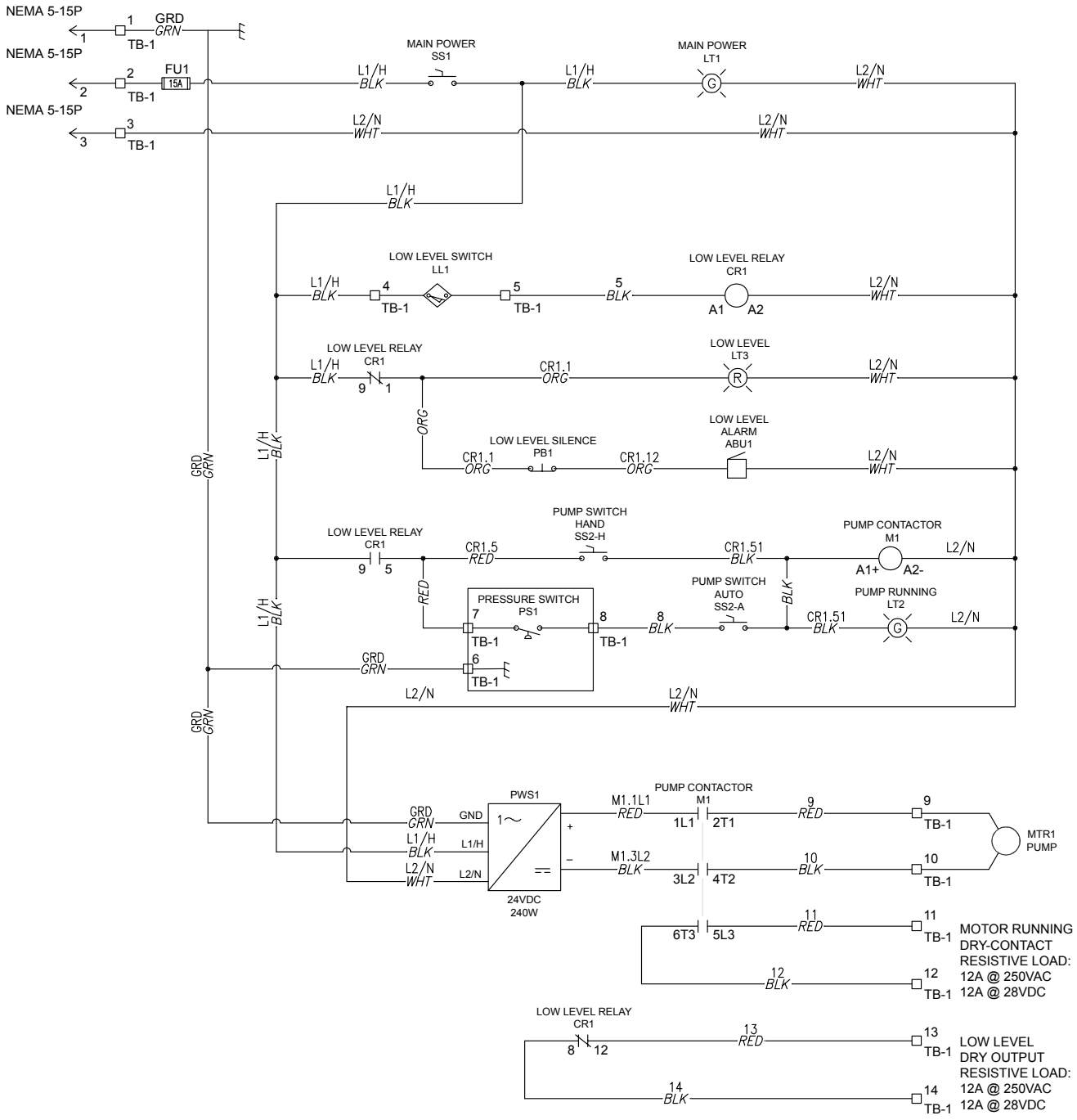


Figure 2: Wiring Diagram - 1GMU01

# 3 Installation

## 3.1 Installation instructions

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- Locate the Glycol Make-up unit for ease of inspection, maintenance, and service. For Glycol application secondary containment is required to catch any leaks or spills that could go down the drain or out a door and cause a risk to the environment. Refer to local codes for clarification.

  Failure to follow these instructions could result in serious personal injury, death and/or property damage.
- Place the unit preferably on a concrete floor or base. Level the steel base, on which the pump is mounted, in both directions by placing steel shims between the base and the anchor bolts.

**DANGER:**

Do not lift entire unit by any components lift eyebolts. Lift the unit with slings placed under the unit base rails.Top of unit is heavy when it is full of fluids and may tip if not lifted properly.Do not step on the top of the unit. It is not designed to support the weight of a person. Any fall can be serious, and may result in painful or incapacitating injury. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS PERSONAL INJURY, DEATH, AND/OR PROPERTY DAMAGE.

- A well-leveled and secured unit will result in quiet operation as well as longevity of service.
- See drawing 1FC008 for general piping requirements. When connecting the GMU discharge line to the make-up line of the Closed-loop system the 3/4" NPT fitting needs to be tightened. When doing this, be sure to use a back-up wrench on the fitting. Do not over tighten the fitting. Inspect all visible fittings for leaks. Tighten the fittings if any leaks are found. Be sure to use two wrenches one to tighten the fitting and the other to back-up the fitting. Using just one wrench may damage the fitting. Never tighten a fitting while there is hydraulic pressure in the fitting.
- Support the discharge line independently by use of pipe hangers or anchors. Do not attempt to spring the discharge line into position. It is recommended that there is a three (3) valve by-pass in the make-up line. See drawing 1FC008 for location of valves.

  **IMPORTANT**: Do not install and operate pumps in closed systems unless the system is constructed with properly sized safety devices and control devices. Such devices include the use of properly sized and located pressure relief valves, compression tanks, pressure controls, temperature controls and flow controls as appropriate.

**WARNING:**

The heating of water and other fluids causes volumetric expansion. The associated forces may cause failure of system components and release of high temperature fluids. This will be prevented by installing properly sized and located pressure relief valves and compression tanks. Failure to follow these instructions could result in serious personal injury, death, and/or property damage.

**IMPORTANT:** If vibration eliminators are used, note that unless the piping to which the vibration eliminators are connected to are properly anchored to the floor, the benefits may not be fully realized.

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**WARNING:**

Electrical shock hazard. Inspect all electrical connections prior to powering the unit. Wiring connections must be made by a qualified electrician in accordance with all applicable codes, ordinances, and good practice. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS PERSONAL INJURY, DEATH, AND/OR PROPERTY DAMAGE.

- The power supply required for the unit is indicated on the nameplate located inside the control panel. A dedicated ground wire must be connected to the unit.

**WARNING:**

Conduit grounds are not adequate. A separate ground wire must be attached to the ground lug provided in the enclosure to avoid potential safety hazards.

- Single phase motors have internal overload protection. The disconnecting means and short circuit protection are to be supplied and mounted by others. Single phase panel remains fully energized at all times, unless incoming power is disconnected. Do not use the "POWER ON" light as a method to determine when the control panel is de-energized.

**WARNING: Electrical shock hazard**

Electrical connections are to be made by a qualified electrician in accordance with all applicable codes, ordinances and good practices. Disconnect and lock out the power before making electrical connections. Failure to follow these instructions could result in serious personal injury and/or death.

**CAUTION:**

Seal damage may occur. Do not run pump dry. Fill and vent the pump volute prior to operation. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PROPERTY DAMAGE AND/OR MODERATE PERSONAL INJURY.

## 3.2 System piping and unit installation — final checklist

1. Is the unit base properly leveled and secured?
2. Are all lubrication points properly lubricated?
3. Is the shut-off valve to the pump suction open?
4. Is the shutoff valve to the Diaphragm Expansion Tank line open?
5. Are the shutoff valves for the make-up line open?
6. Is the piping properly supported to prevent strains on unit?
7. Is the system, including the pumps, purged of debris and air?

**CAUTION:**

Seal damage may occur. Do not run pump dry. Fill and vent the pump volute prior to operation. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PROPERTY DAMAGE AND/OR MODERATE PERSONAL INJURY.

## 3.3 Electrical wiring and control settings — final checklist

1. Does the feeder line voltage correspond to the unit voltage? Check the unit nameplate or motor terminal connection.

**WARNING: Electrical Hazard**

Risk of electrical shock or burn. A certified electrician must supervise all electrical work. Comply with all local codes and regulations.

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2. Are the feeder wires correctly sized for the load?

**WARNING: Electrical Hazard**

Risk of electrical shock or burn. You must connect an additional earth- (ground-) fault protection device to the grounded (earthed) connectors if persons are likely to come into contact with liquids that are also in contact with the energized unit.

3. Have all the power terminals in the control panel been checked for tightness? This is imperative since stranded wires tend to “flow” and become loose after initial installation.

**DANGER: Electrical Hazard**

Before starting work on the unit, make sure that the unit and the control panel are isolated from the power supply and cannot be energized. This applies to the control circuit as well.

4. Are the pressure controls correctly set? The pressure switch needs to be set for proper operation. Any subsequent change in system operating conditions may require resetting the controls. For best results, use compressed air and a continuity meter (across the switch) to reset the controls. The legend plate on the control indicates approximate readings only, therefore, should be used with caution.

# 4 Operation

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## 4.1 Putting the unit into service

**CAUTION:**

Prevent subsequent damage. A unit showing symptoms of possible problems (noise, leaks, vibration, and/or continual operation) must be corrected immediately. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PROPERTY DAMAGE AND/OR MODERATE PERSONAL INJURY.

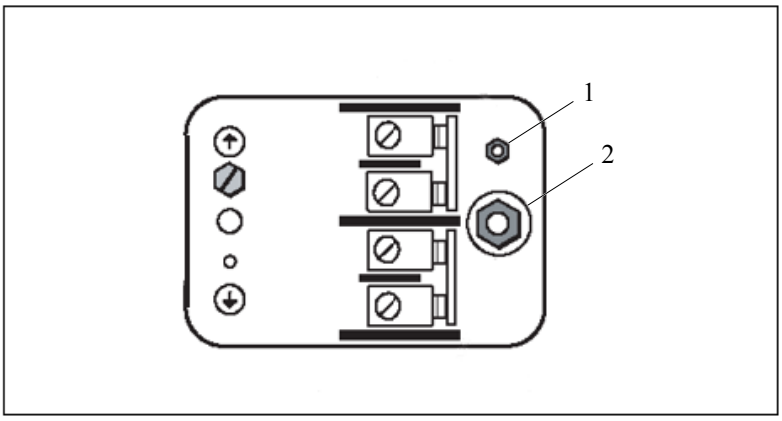
GMU60 is designed for systems requiring up to 60 psi, drawing water or water-glycol mixture up to 5 gpm from the 55-gallon tank and automatically servicing the closed loop system. The pressure switch factory default cut-in setting for GMU560 is 30 psi, and cut-out setting is 50 psi.

## 4.2 Adjustments and settings

### 4.2.1 Pressure switch

Electrical equipment should be serviced only by qualified electrical maintenance personnel.

The pressure switch is piped to the discharge line. There are two adjusting screws located on the top of the switch control. This adjustment must be made before operating the system.




1. Adjust for cut-out
2. Adjust for cut-in point

Adjust pressure switch as follows:

1. Cut-In (Turn nut clockwise for higher pressure or counterclockwise for lower pressure).
2. Cut-Out (Turn nut clockwise for higher pressure or counterclockwise for lower pressure).
3. Check switch operation after resetting.
4. See above picture for adjustment nut locations.

**DANGER: Electrical Hazard**

Before starting work on the unit, make sure that the unit and the control panel are isolated from the power supply and cannot be energized. This applies to the control circuit as well.

### 4.2.2 Pressure reducing valve

The Pressure Reducing valve is piped to the discharge of the pump for this unit. Prior to placing GMU into the operation, installer must adjust the Pressure Reducing valve, if the factory setting is not the desire setting. The Pressure Reducing valve is preset from the factory to 15 PSI.

### 4.2.3 Diaphragm expansion tank

Diaphragm expansion tank factory pre-charge is 30- psi. Adjust pre-charge to equal incoming pressure. Refer to the specific IOM that was shipped with the tank for installation and operating instructions.

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### 4.2.4 Low water cut off switch

When the water or water-glycol mixture in the 55-gallon reservoir falls below the low level point, the low water cut-off switch will turn the pump off. An alarm light will illuminate.

### 4.2.5 Sequence of operation

When pressure in the system decreases to the minimum allowable fill pressure, the pressure reducing valve opens.

The Glycol stored in the pressure tank flows to the system, when pressure supplied to the pressure reducing valve reaches the pump cut-in pressure, the GMU pump will start.

Pump runs until pressure switch reaches the cut-out pressure.

Should the Glycol solution in the 55-gallon reservoir fall below the low level point in the reservoir, the low level switch will turn pump off, an alarm light will be signaled.

# 5 Troubleshooting

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## 5.1 Pump will not operate:

**DANGER: Electrical Hazard**

Troubleshooting a live control panel exposes personnel to hazardous voltages. Electrical troubleshooting must be done by a qualified electrician.

1. Check incoming power and fuse.
2. With contactor pulled in, check voltage of the motor leads. Voltage should be the same as the incoming power. If no voltage is present, replace the contactor. If voltage is present, contact an electrician to check the leads & motor.
3. Check pressure switch cut-in and cut-out setting.
4. Check low water cut-off switch probe point in the reservoir.

## 5.2 Pump will not build pressure

1. Suction valve is closed. If closed, open.

**DANGER: Electrical Hazard**

Before starting work on the unit, make sure that the unit and the control panel are isolated from the power supply and cannot be energized. This applies to the control circuit as well.

2. Internal pump damage. Take pump to authorized pump repair facility.

## 5.3 Pump will not start automatically

**WARNING: Electrical Hazard**

Risk of electrical shock or burn. A certified electrician must supervise all electrical work. Comply with all local codes and regulations.

1. No power. Restore if there is no power.
2. Pressure switch not adjusted properly. Refer to *Pressure switch* on page 12

## 5.4 Low level light is on, but the tank is full

1. Low level switch may be defective. Place finger on the colored portion of the level switch. If the low level light turns off, the switch needs to be adjusted.
   a. Using a fine flat head screwdriver, turn the little screw on the back of the level switch clockwise until the light on the switch turns on
2. If the low level light does not turn off when the sensor is touched, the low level sensor will need to be replaced.

# 6 Product Warranty

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## Commercial warranty

**Warranty.** For goods sold to commercial buyers, Seller warrants the goods sold to Buyer hereunder (with the exception of membranes, seals, gaskets, elastomer materials, coatings and other "wear parts" or consumables all of which are not warranted except as otherwise provided in the quotation or sales form) will be (i) be built in accordance with the specifications referred to in the quotation or sales form, if such specifications are expressly made a part of this Agreement, and (ii) free from defects in material and workmanship for a period of one (1) year from the date of installation or eighteen (18) months from the date of shipment (which date of shipment shall not be greater than thirty (30) days after receipt of notice that the goods are ready to ship), whichever shall occur first, unless a longer period is specified in the product documentation (the “Warranty”).

Except as otherwise required by law, Seller shall, at its option and at no cost to Buyer, either repair or replace any product which fails to conform with the Warranty provided Buyer gives written notice to Seller of any defects in material or workmanship within ten (10) days of the date when any defects or non-conformance are first manifest. Under either repair or replacement option, Seller shall not be obligated to remove or pay for the removal of the defective product or install or pay for the installation of the replaced or repaired product and Buyer shall be responsible for all other costs, including, but not limited to, service costs, shipping fees and expenses. Seller shall have sole discretion as to the method or means of repair or replacement. Buyer’s failure to comply with Seller’s repair or replacement directions shall terminate Seller’s obligations under this Warranty and render the Warranty void. Any parts repaired or replaced under the Warranty are warranted only for the balance of the warranty period on the parts that were repaired or replaced. Seller shall have no warranty obligations to Buyer with respect to any product or parts of a product that have been: (a) repaired by third parties other than Seller or without Seller’s written approval; (b) subject to misuse, misapplication, neglect, alteration, accident, or physical damage; (c) used in a manner contrary to Seller’s instructions for installation, operation and maintenance; (d) damaged from ordinary wear and tear, corrosion, or chemical attack; (e) damaged due to abnormal conditions, vibration, failure to properly prime, or operation without flow; (f) damaged due to a defective power supply or improper electrical protection; or (g) damaged resulting from the use of accessory equipment not sold or approved by Seller. In any case of products not manufactured by Seller, there is no warranty from Seller; however, Seller will extend to Buyer any warranty received from Seller’s supplier of such products.

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# Xylem |’zīləm|

1) The tissue in plants that brings water upward from the roots;
2) a leading global water technology company.

We’re a global team unified in a common purpose: creating advanced technology solutions to the world’s water challenges. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. Our products and services move, treat, analyze, monitor and return water to the environment, in public utility, industrial, residential and commercial building services settings. Xylem also provides a leading portfolio of smart metering, network technologies and advanced analytics solutions for water, electric and gas utilities. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise with a strong focus on developing comprehensive, sustainable solutions.

**For more information on how Xylem can help you, go to www.xylem.com**

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