CALMAC

Glycol Management System

115V

INSTALLATION & OPERATION MANUAL

MODELS 301000 and 303000

This Technical Guide is written to provide a complete, comprehensive procedure for the installation of CALMAC®'s Glycol Management System (GMS). It is not the intent of this Guide to exclude proven methods of installation by contractors who have, through experience, developed an efficient method of installation expertise. All work must be performed in accordance with LOCAL, STATE and NATIONAL codes.

I. GENERAL

The CALMAC Glycol Management System is designed to maintain the proper volume of coolant in a building circulating loop, by monitoring the system pressure, and adding fluid from a reservoir to the system when the pressure drops below a set point. Features include the following:

- TEFC pump motor and hot dipped galvanized frame so that unit can be located outdoors
- 65 gallon covered, vented reservoir, with 10 gallon graduations, which can be used for mixing glycol/water solution.
- Visible warning lights and electrical contacts (rated 4A at 230 Volts for remote monitoring) for the following conditions:
- **Add Solution Warning-** Solution needs to be added to the reservoir, but pump will continue to run until level reaches the Low Liquid Level alarm.
- **Low Liquid Level**- GMS pump is automatically turned off
- **High Liquid Level**
- **Low System Pressure-** Possible leak in building system.
- **Loss of Power**– Low Liquid Level alarm contacts close on loss of power
- Pressure Relief Valve which protects the building system against over-pressurization by the Glycol Management System; Not to be used in place of a system pressure relief valve
- Check Valve between building system and GMS.
- Service valve between the reservoir and the pump.

II. INSTALLATION INSTRUCTIONS

A. Unpacking. Prior to unpacking the unit, completely inspect the shipping container for signs of damage or mishandling. Carefully remove crating material but leave the unit on the pallet until it is close to the point of installation.

B. Placement. The unit should be installed with a minimum of 24 inches (61 cm) of clearance on both sides and on top. An unobstructed view of the front of the unit must be maintained to allow observation of warning lights. Remove the system from the pallet and set it in place. Legs, located on the four corners of the units base, have 3/8 inch (9.5 mm) holes for affixing the system to the floor. Shims should be used to level the unit if necessary.

C. Plumbing. Install a line connecting the GMS's Check Valve (see Figure 1) and the building piping somewhere upstream (suction side) of the circulation pump. For proper installation, the line must NOT have a pressure drop greater than ½ psi (3.5 kPa) for a flow of 4 GPM (15 l/s). For short connection lengths, this line's size should be at least 3/4 inch (18mm) pipe. For runs longer than 20 feet, one-inch (25mm) pipe should be used.

D. Electrical. The GMS requires a 115 volt, 15 amp service. The Glycol Management System must be wired to a service disconnect box or have a wire and plug connected in the field. Power is connected to the terminal strip in the control box as follows: Line to FB1, common to T14 and ground to grounding block. (See Figure 2).

III. START-UP INSTRUCTIONS

A. Connection Verification. Before starting the unit, verify that the piping and electrical connections have been properly installed. Verify that the Pump Switch, located on the front of the control box, is in the off position. Turn on power to the unit at the service disconnect. The green "Power" light, two red lights, "Low Liquid Level" and "Low System Pressure" and the amber "Add Solution" light should be illuminated.

B. Filling Reservoir. Turn off power to the unit at the disconnect. Remove the manway cover from the top of the tank. The graduations on the tank can be used as a guide to mix solution, but the actual concentration should be determined by testing the refractive index of the solution. The reservoir should be filled with glycol/water solution to a level above the 60-gallon graduation mark on the tank. Power to the unit should always be disconnected when adding fluid in the tank. Reapply power to the unit. The lights indicating "Low Liquid Level" and "Add Solution" should be off and the red "High Liquid Level" and "Low Pressure" lights should be illuminated. More solution may need to be added to the reservoir if the "High Liquid Level"

light has not become illuminated. Confirm that the Service Valve, between the reservoir and the pump, is open.

C. Setting Pressure Switches. Correct setting of the pressure switches is imperative for proper operation. Factory settings for the pressure switch closures are SW1 = 15 psig (103 kPa) and SW2 = 10 psig (69 kPa). The switches close on pressure fall.

C1. Remove the cover from the pressure switch. Note the two pressure set point adjustment screws labeled SW1 and SW2. SW1 is the pressure switch used to maintain building system pressure by turning the pump on and off. SW2 will be set to trigger the "Low System Pressure" alarm.

C2. Although it is possible to fill the building's piping by running the GMS in the "Manual" mode, it is impractical due to the flow rate associated with the GMS's pump which is 4 GPM (15 l/s) max. SW1 is set after the building's piping is already filled with glycol solution and while the building. Confirm that the Service Valve is open circulating pump is running. Open the Building System Isolation Valve and turn the pump switch to the "AUTO" position. The pump should not turn on unless the building pressure on the suction side of the pump is less than 15 psig (103 kPa). The switch SW1 should be adjusted by turning the SW1 screw counter-clockwise to increase, and clockwise to decrease the set point at which the GMS pump turns on. Check pump control operation by observing the building system pressure after bleeding some solution from a convenient point in the system. Note the pressure at which the pump comes on. Turn the screw to adjust the system to the desired operating pressure. The pressure switch set point is adjustable over the range 0.5 to 80 psig (3.5 to 552 kPa). Depending on this set point, the pump will turn on when the pressure drops 6 - 13 psi (42 - 90 kPa). The higher the system pressure, the greater the drop in pressure required to turn on the pump.

C3. The "Low System Pressure" alarm is adjusted by turning the SW2 screw counter clockwise to increase and clockwise to decrease the set point. The indicating light should come on when the pressure falls 3 - 6 psi (21 - 42 kPa) lower than the pressure at which the pump turns on. To set this switch (SW2), turn the pump switch to the OFF position and bleed fluid while observing the pressure at which the "Low System Pressure" light comes on. The pump can be manually "jogged" to increase the pressure to repeat the process. Replace the cover on the pressure switch and check the solution level in the tank.

C4. If the solution level is still high enough to result in the "High Liquid Level" light being illuminated, excess solution can be pumped from the drain valve (½" ball valve) at the pump exit.

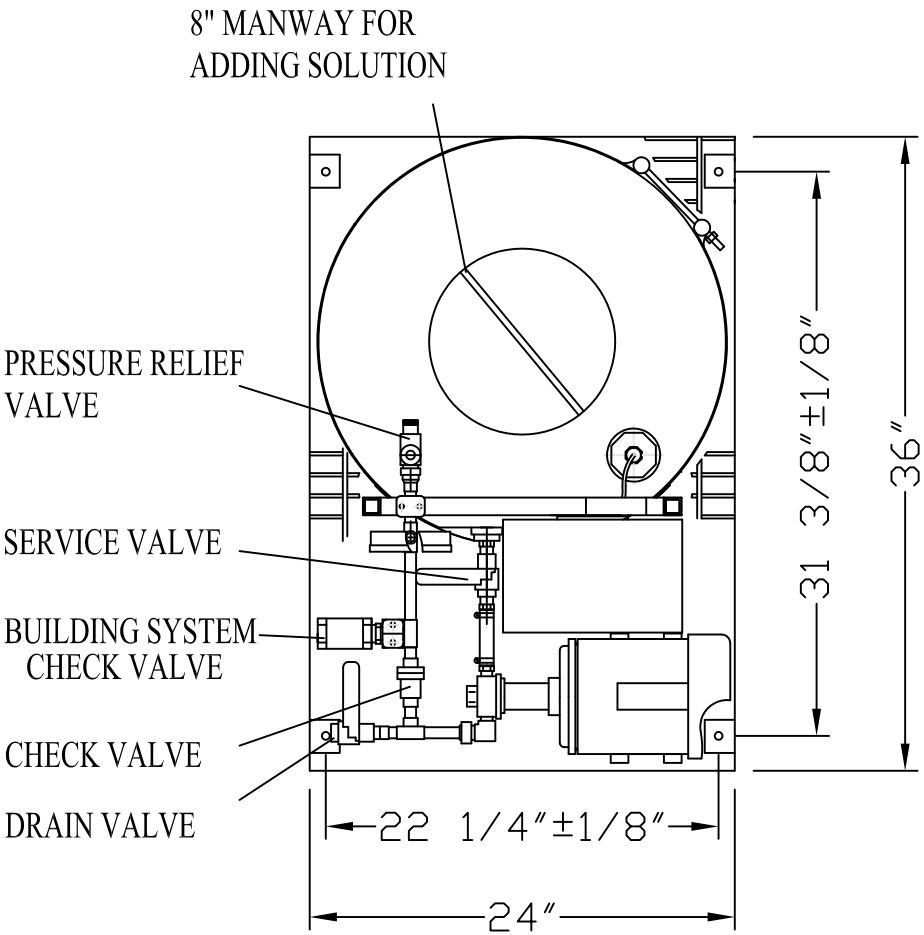
D. Setting Pressure Relief Valve. The Pressure Relief Valve (PRV) on the GMS is not intended to be the building system's high pressure safety. The building's piping system must include a separate PRV which is designed for the entire system.

The Glycol Management System's PRV is factory set at 75 psig (520 kPa) and needs to be adjusted after the system is operating. The set point should be adjusted to be approximately 20 psi (140 kPa) above the static pressure observed at the GMS when the pumps are turned off. Turn the graduated cylinder on the PRV counter-clockwise to lower the set point.

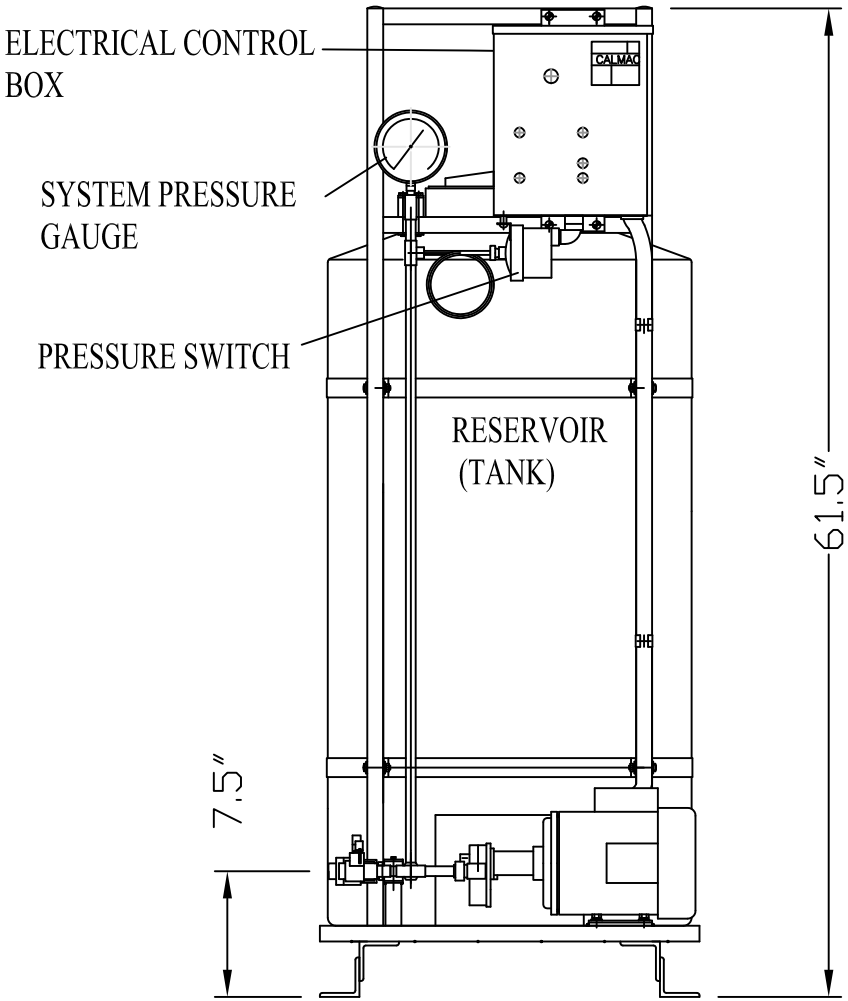
Note: The maximum working pressure for a CALMAC IceBank® tank is 90 psig (620 kPa).

E. Remote Monitoring. Terminals T1 through T8 (see Figure 2) provide connections to allow remote monitoring of the alarms or warning conditions indicated visually by illumination of the lights on the front of the control box. These dry contacts are rated at 230V 4A.

F. Trouble Shooting. Page 7 has a flow chart for assistance in finding the source of a problem and how to fix it. If further assistance is required, call CALMAC Corp.'s Application Engineering Department at 1-201-797-1511.



TOP VIEW



FRONT VIEW

FIGURE 1

GMS 115 Volt MODELS: 301000 (60 Hz) / 303000 (50 Hz)

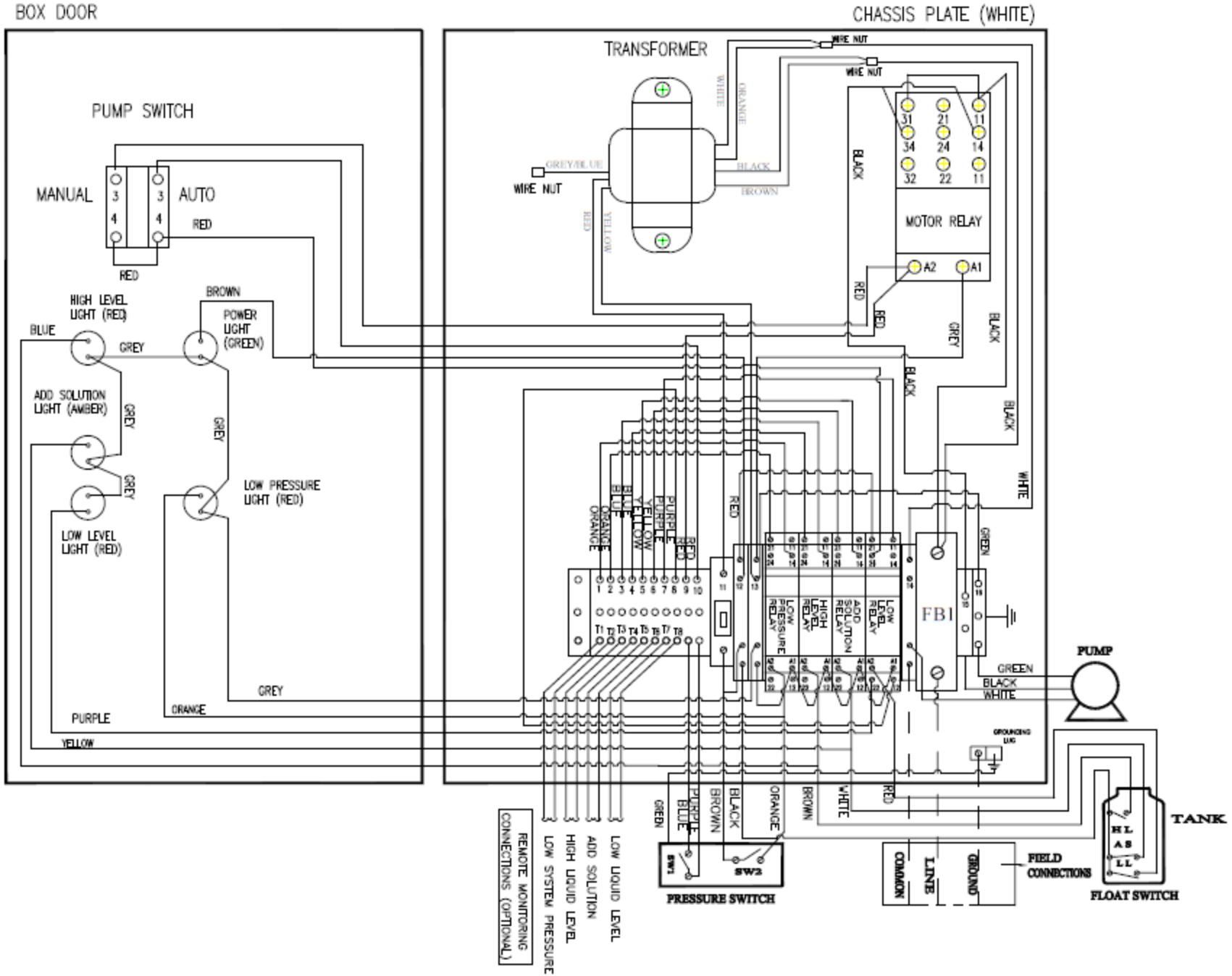
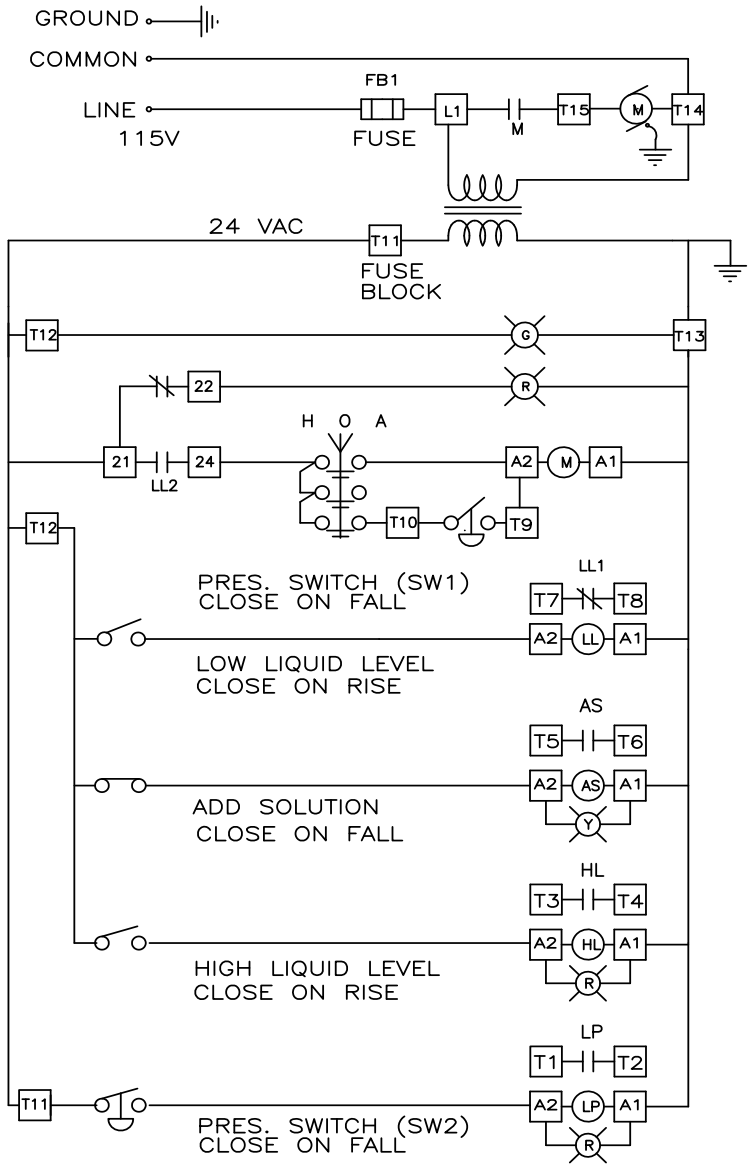
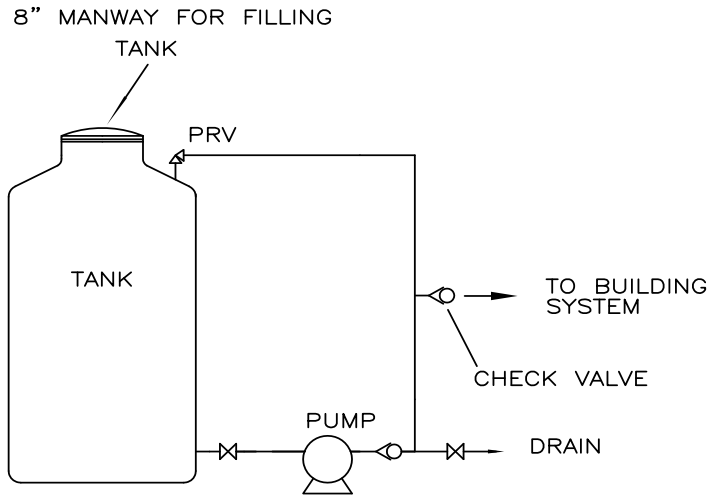


FIGURE 2



WIRING SCHEMATIC



PIPING SCHEMATIC

REMOTE MONITORING CONNECTIONS

T7–T8	LOW LIQUID LEVEL ALARM
T5–T6	ADD SOLUTION WARNING
T3–T4	HIGH LIQUID LEVEL ALARM
T1–T2	LOW SYSTEM PRESSURE ALARM

FIGURE 3

FIGURE 3

GMS TROUBLESHOOTING

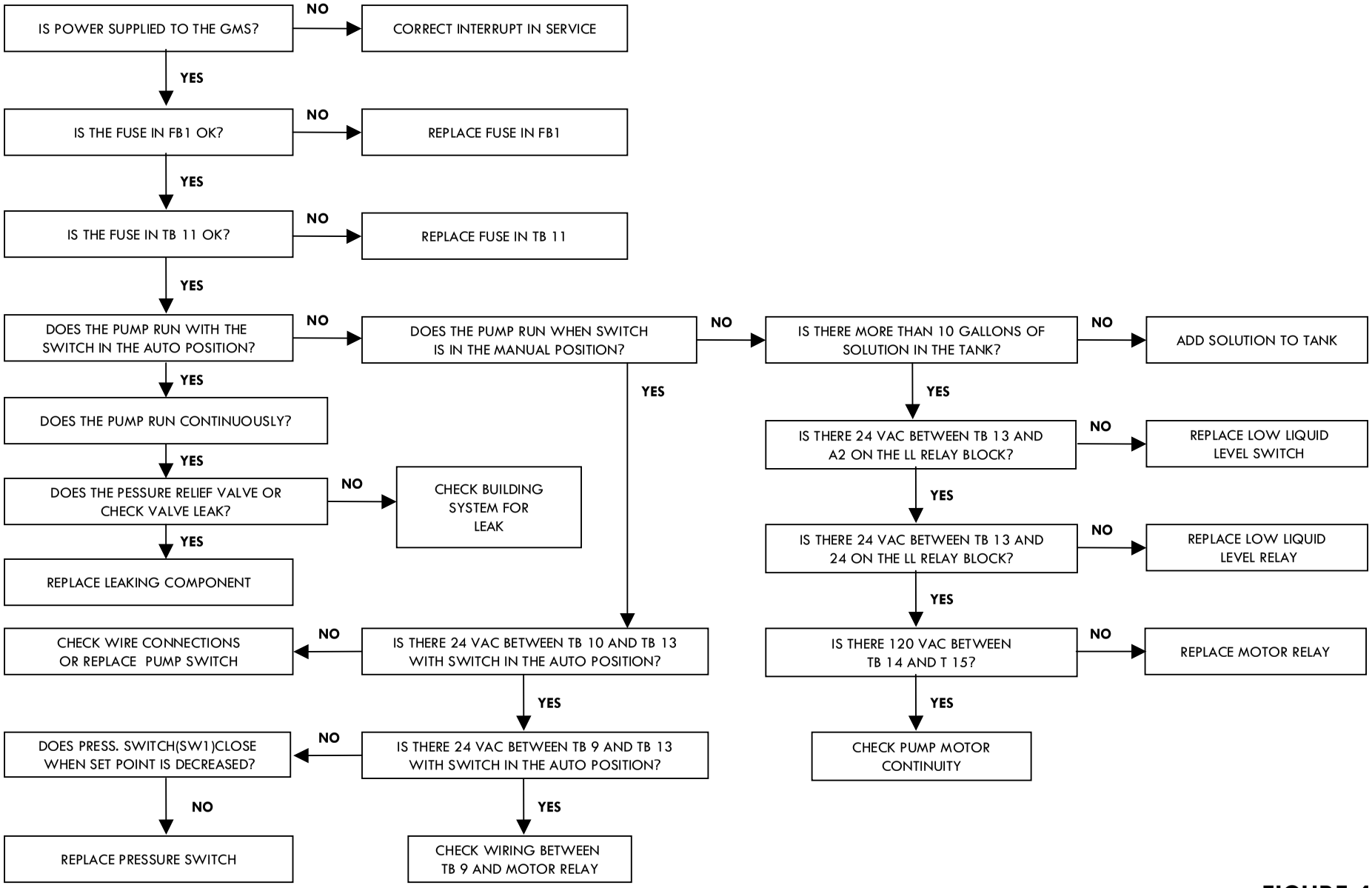
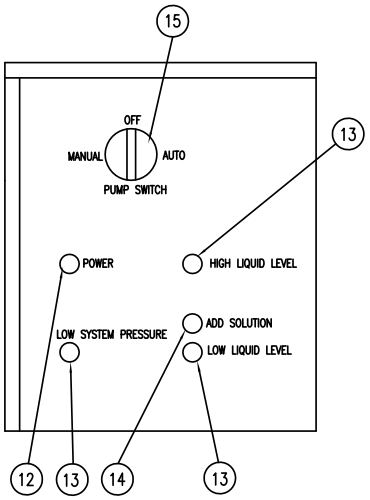
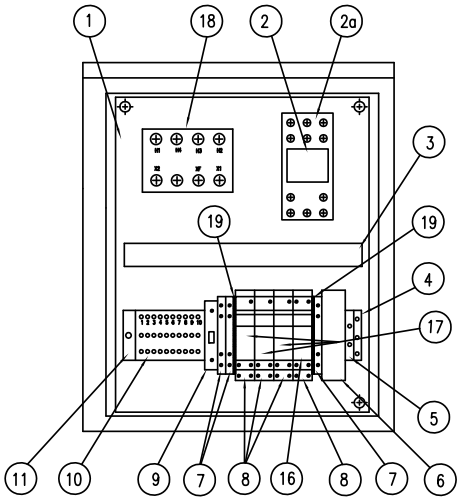
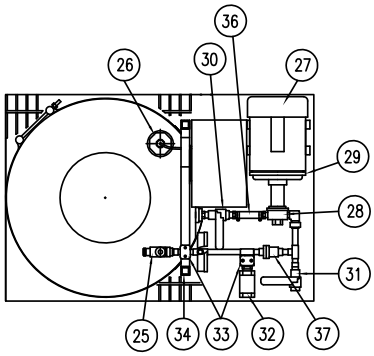
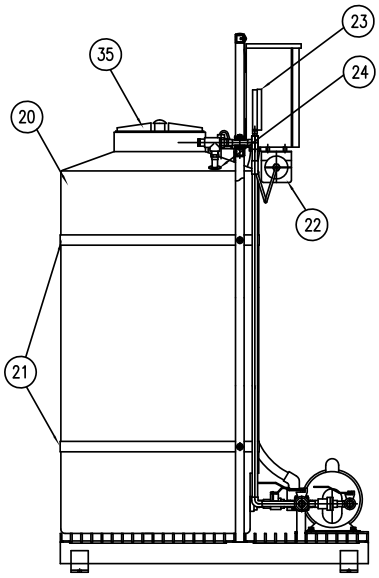


FIGURE 4









POS #	DESCRIPTION	PART #
1	Chassis Plate Assembly	300015
2	Motor Relay	300193
2a	Socket	300194
3	Wire Duct (L=8")	300062
4	Grounding Block	300032
5	Single Terminal Block	300031
6	Fuse Holder Assembly (Line Voltage)	300118
6a	12 Amp fuse (120v)	300027
6b	6 Amp fuse (220v)	300165
7	Double Twin Terminal Block	300030
8	Relay Socket	300202
9	Fuse Block, Control Voltage	300036
9a	1.6 Amp fuse	300028
10	10 Terminal Block	300029
11	End Retainer	300035
12	Green Light Assembly	300022
12a	Green Bulb	300162G
13	Red Light Assembly	300021
13a	Red Bulb	300162R
14	Amber Light Assembly	300023
14a	Amber Bulb	300162A
15	Switch H/O/A	300024
16	DPDT Relay	300114
17	SPST Relay	300201
18	Control Transformer Dual Voltage Primary	300192
19	End Plate	300034
20	Tank Assembly	300001
21	Band Clamp W/ Tee Bolt	300112
22	Pressure Switch	300004U
23	Pressure Gage	300177
24	Gromet	300113
25	Pressure Relief Valve	300161
26	Level Switch	300005
27a	Pump Motor (120v)	300173
27b	Pump Motor (220v)	300174
28	Pump	300169
29	Pump Motor Adapter plate	300176
30	Ball Valve, 1/2" FNPT x 1/2"MNPT	300203
31	Ball Valve, 1/2" FNPT	300063
32	Check Valve, 3/4" FNPT x FNPT	300220
33	Vibration Dampening Clamp	300060
34	End Cap	300149
35	Vented Tank Cover	300159
36	1/2" Hose (L=4")	300097
37	Check Valve, 1/2" sweat	300120

FIGURE 5

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