Installation and Operation Manual

Tank Level

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Safety Instructions

Read this manual carefully to learn how to safely install and operate your pump. Throughout this manual there are a number of SAFETY HAZARDS that must be read and adhered to in order to prevent possible personal injury and/or damage to the equipment.

Three keywords, “DANGER” ,“WARNING”, and “CAUTION”, are used to indicate the potential severity of the hazard, and are preceded by a SAFETY ALERT SYMBOL. Failure to follow the safety-related instructions may result in a safety hazard.

DANGER Indicates an imminently hazardous situation which, if not avoided, WILL result in serious injury or death.

WARNING Indicates a potentially hazardous situation which, if not avoided,

Could result in serious injury or death.

CAUTION Indicates a potentially hazardous situation which, if not avoided,

May result in minor or moderate injury.

THOROUGHLY REVIEW ALL INSTRUCTIONS AND WARNINGS PRIOR TO PERFORMING ANY WORK ON THIS PUMP.

Introduction:

Because panel installations are seldom identical, this manual cannot possibly provide detailed instructions and precautions for each specific application. Therefore, it is the responsibility and the duty of all personnel involved in the installation, operation and maintenance of the equipment to ensure that applications not addressed in this manual are performed only after establishing that neither operator safety nor panel integrity are compromised by the installation.

Pre-Installation Check:

Open all cartons and inspect for shipping damage. Report any damage to your supplier or shipping carrier immediately. Always verify that the panel nameplate Voltage, Phase, and HP ratings as well as Amps rating on panel match your pumps and power supply. Warranty does not cover damage caused by connecting panels to an incorrect power source (i.e., voltage and phase).

Installation:

Electrical connections are to be made by a qualified electrician in accordance with the National Electrical Code (NEC) or the Canadian Electrical Code, as well all national, state and local codes. Code questions should be directed to your local electrical inspector. Failure to follow electrical codes and OSHA safety standards may result in personal injury or equipment damage. Failure to follow manufacturer’s installation instructions may result in electrical shock, fire hazard, personal injury or death, damaged equipment, provide unsatisfactory performance, and may void the manufacturer’s warranty.

Motor must have a properly sized starter with a properly sized heater to provide overload and under voltage protection unless motor meets following two conditions: single phase and motor horsepower is 1HP or less. Motors that satisfy these two conditions have built-in thermal overload protection.

Operating personnel should be trained in the operation of the pump and any associated system.

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SYSTEM INSTALLATION

Power Wiring

Mount the control panel vertically on a wall or other solid structure. Connect 120 VAC supply to "L1" and "N".

Electrode Wiring - Panel

Wiring from the control panel to the electrode fitting should be either MTW or THHN, #14 or #16 AWG and should be installed in a separate dry metallic conduit. Do not run electrode wires together in a conduit with power supply wires! Connect the electrode wires to the control panel as follows:

- Terminal 1 - Domestic Tank High Level Alarm
- Terminal 2 - Domestic Tank High Level Ground Reference Electrode
- Terminal 3 - Domestic Fill Valve Off
- Terminal 4 - Domestic Fill Valve On
- Terminal 5 - Domestic Tank Low Level Alarm & Pump Cut-Off Electrode
- Terminal 6 - Domestic Tank Low Level Ground Reference Electrode

Note: The ground reference electrodes are system references, not earth grounds, and are **not** to be wired to the ground lug in the control panel.

Domestic Tank Valve Wiring

Wire the power circuit of the Valve as follows:

- Terminals 7 & 8 – Fill Valve

Block Valve Wiring

Wire the Valve as follows:

- Terminal 9 & 10 – Block Valve Power
- Terminal 10 – MOV Open
- Terminal 11 – MOV Closed

Auxiliary Alarm Wiring

Connect the auxiliary alarm wires as follows:

- Terminals 13 & 44 - Domestic Tank High Level Remote Alarm
- Terminals 15 & 16 - Domestic Tank Low Level Remote Alarm
  Please note that these are normally open dry contacts that **close** in the event of an alarm condition.

Domestic Tank Low Level Pump Cut-Off Wiring

Wire the control circuit of the pump to be cut-off on low level as follows:

- Terminals 17 & 18 - If the pump cut-off logic requires a contact “closure” on low level
- Terminals 18 & 19 - If the pump cut-off logic requires a contact “opening” on low level

Electrode Wiring - Tank

Wiring used in the tank to suspend the electrodes should be Warrick 3Z1A electrode suspension wire. Using the hardware supplied, attached the 3W2 electrodes to the 3Z1A suspension wire. The stainless electrode piece must be fully engaged into to the plastic housing to ensure the o-ring seals. The electrodes are suspended in the tank using the flanged electrode fitting. Route the wires through the bushings in the flange of the fitting, allowing enough spare wire for electrode adjustment. Typically, the High Level Alarm Electrode is set 3” to 6” below the tank overflow, and the Low Level Alarm Electrode is set 12” to 18” above the pump suction connection. Once the proper electrode levels are attained, secure the wires in the fitting by tightening the bushings with a wrench or a pair of pliers. Take care not to over tighten the bushings. Trim the excess electrode wire and connect each wire to the proper wire from the control panel using wire nuts. Seal the connection with electrician’s tape.

All wiring shall be in accordance with the national electrical code.

(continued on next page)

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System Operation

High Level Alarm - Domestic Tank

Should the level in Domestic Tank compartment rise to the HIGH LEVEL ALARM ELECTRODE, the following functions will occur:

- Alarm buzzer will sound
- General alarm beacon will be illuminated
- Domestic High Level Alarm Light will be illuminated
- Block Valve power to close
- Remote high level alarm contact will close

The alarm buzzer can be silenced by momentarily depressing the silencing pushbutton, however, the general alarm beacon and high level alarm light will remain illuminated, the block valve will remain closed and the remote alarm contact will remain closed until the level in the domestic tank has receded below the HIGH LEVEL ALARM ELECTRODE.

Fill Valve Operation - Domestic Tank

Should the level in the tank recede below the Lead Valve On probe, the following panel functions will occur:

- The Fill Valve Pilot Solenoid circuit will be Energized
- The Fill Valve Green On Light Will Be Illuminated. The lead fill valve will remain open until the level in the tank rises to the Valve Off probe.

Should the level in the tank recede below the Lag Valve On probe, the following panel functions will occur:

- The Fill Valve Pilot Solenoid circuit will be Energized
- The Fill Valve Green On Light Will Be Illuminated. The lead and lag fill valve will remain open until the level in the tank rises to the Valve(s) Off probe.

Low Level Alarm – Domestic Tank

Should the level in the Domestic Tank compartment recede below the LOW LEVEL ALARM ELECTRODE, the following functions will occur:

- Alarm buzzer will sound
- General alarm beacon
- Domestic low level alarm light will be illuminated
- Normally Open Pump cut-off contact will close
- Normally Closed Pump cut-off contact will open
- Low level remote alarm contact will close

The alarm buzzer can be silenced by momentarily depressing the silencing pushbutton, however, the general alarm beacon and low level alarm light will remain illuminated, pump cut-off contacts will remain closed/opened and the low level remote alarm contact will remain closed until the level in the domestic tank has risen to the LOW LEVEL ALARM ELECTRODE.

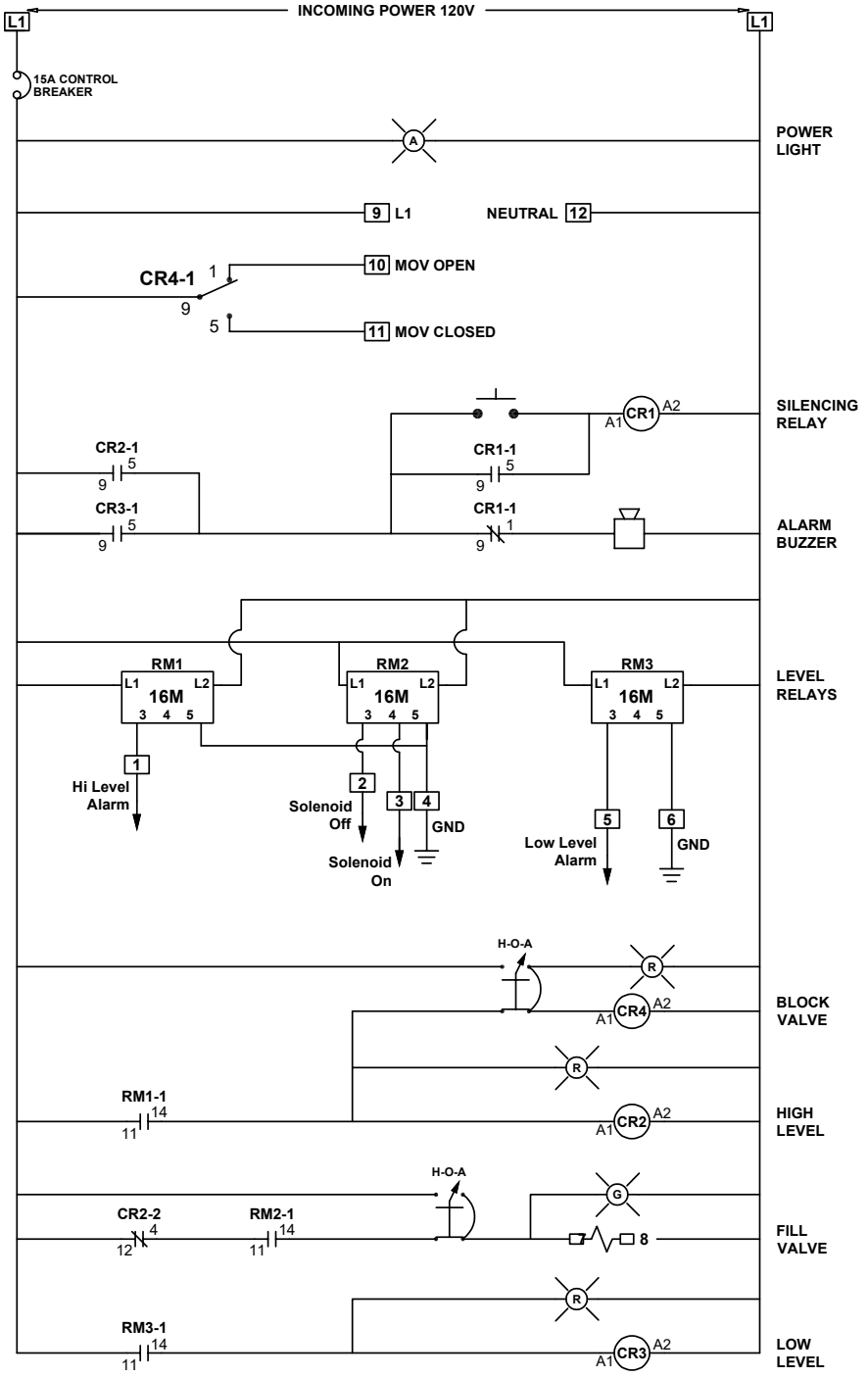
The Lone Star in Water Control

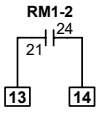
CONTROLS DIAGRAM

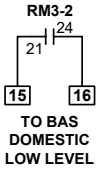
Domestic

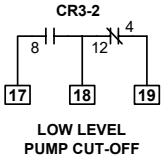
- **Example Wiring diagram below is: SP11F1B1T1 (1 Fill Valve, 1 Block Valve, Single Tank compartment.)**

- **Standard Spartan Domestic Tank Level control panel. Fill Valve options are available. Block Valve options are available. 120vac, 1 phase Incoming Power supply. Stainless Steel conductivity electrodes input.**









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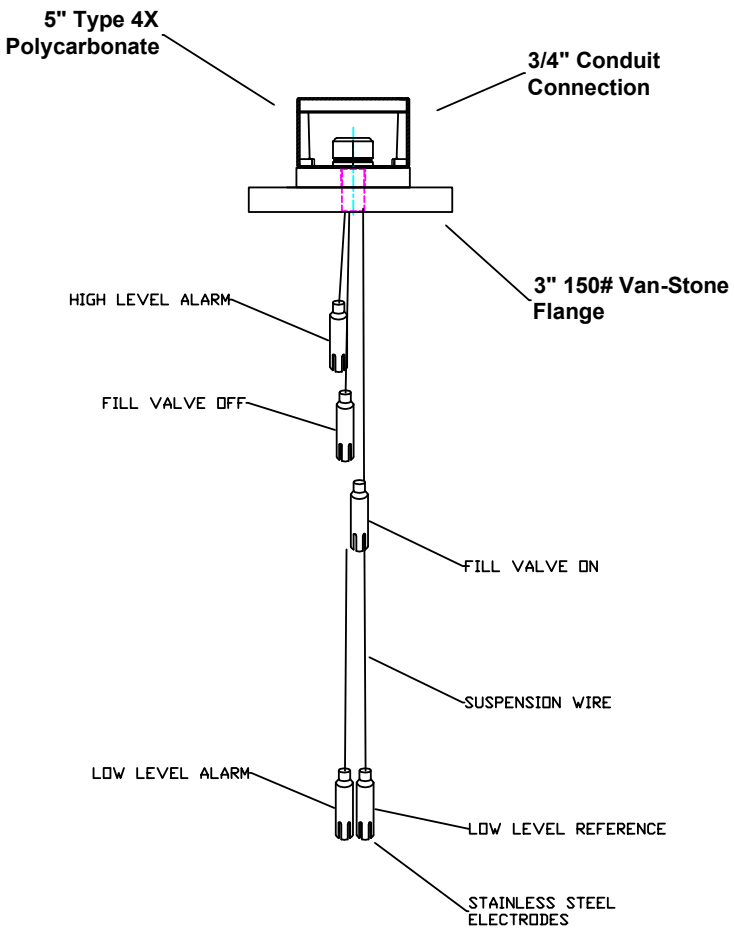
SENSOR DETAIL

- **Standard Level Sensor Assembly consists of a Type 4X Polycarbonate Junction Box, standard 3" Sch. 80 150# PVC flange, stainless steel wire suspended electrodes. Figure 2.1 shows assembly design in detail.**



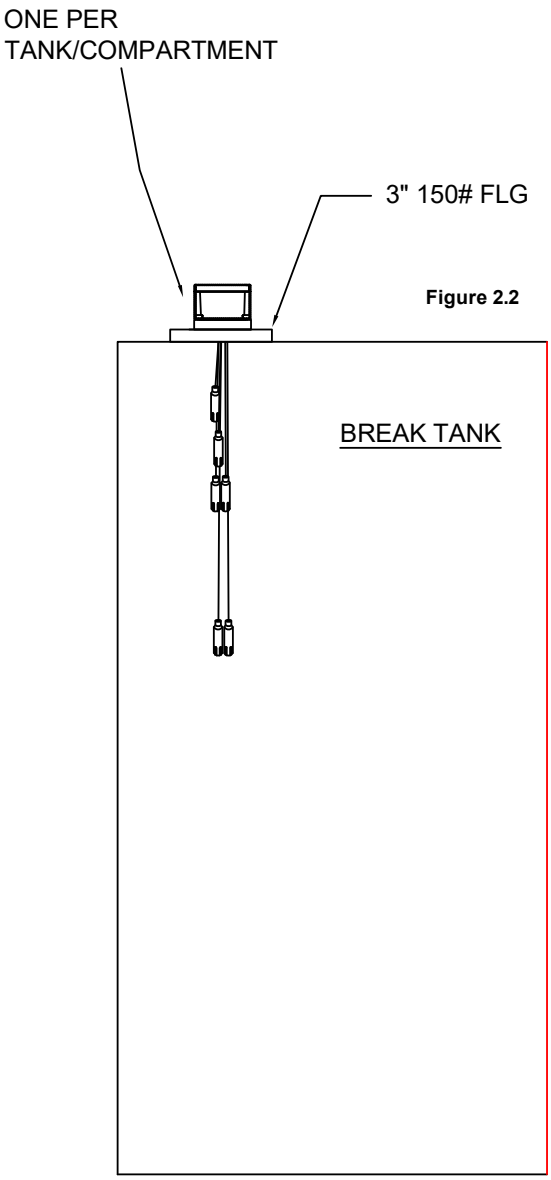


Figure 2.2

Field Penetration

*** URGENT ***
ANY FIELD PENETRATIONS IN LOCATIONS OTHER THEN FACTORY AUTHORIZED AREAS WILL ***VOID MANUFACTURERS WARRANTY*** OF ALL INTERNAL COMPONENTS.