Installation and Operation Manual

VFD Protection

Spartan

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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 Overview

The Spartan VFD Protection Control Panel is used in conjunction with a single freestanding Variable Frequent Drive. It has multiple devices that offer protection to the VFD. The main components include a secondary Surge Arrestor designed to protect against lightning and high current surges up to 36,00 amps. It also has a 3% Impedance Input Line Reactor that protects the AC drive from transient overvoltage conditions, typically caused by utility capacitor switching. The input Line Reactor also reduces harmonics associated with the AC drive. Input Line Reactors are recommended for all installations.

Sequence of Operation

The System shall be configured for (1) normally open contact input to enable the VFD.

(Non-Pressurized suction, Storage Tank)
The system shall be configured for a normally open tilt type float switch. Should the level in the storage tank fall below the float switch; the following will occur:

A. Disable VFD, open the "run" command

The VFD will remain Disabled until the level in the storage tank is restored, while the 3-position " Enable-Disable-Auto" switch is in "Auto".

(Pressurized Suction)
The system shall be configured for a normally open pressure switch. Should the pressure on the suction side of the pump fall below the pressure switch setpoint; the following will occur:

A. Disable VFD, open the "run" command

The VFD will remain Disabled until the pressure on the suction side of the pump is restored, while the 3-position "Enable-Disable-auto" switch is in "Auto".

The Pump can be Manually stopped by placing the VFD Enable 3-position switch in the "OFF", center, position.

The Pump can be Manually enabled by placing the VFD Enable 3-position switch in the " Enable", left, position. Be aware, manually placing the switch in the "Enable" position, there will be **NO** Dry Run or Low Suction pressure protection.

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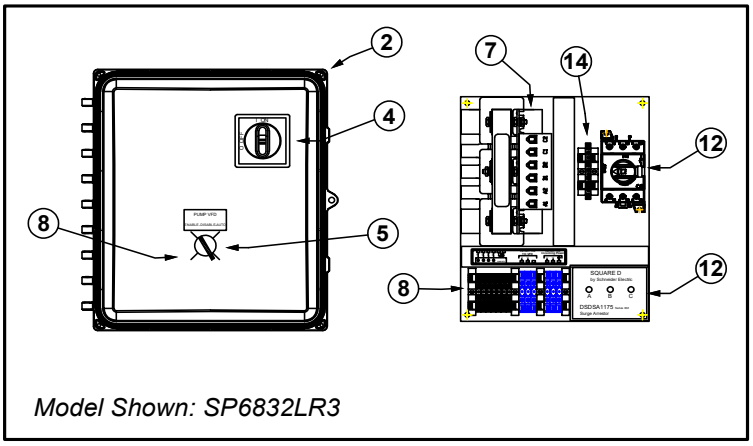
FEATURES

- Type 4X construction withstands outdoor installations and prevents corrosion
- Lockable hinged front enclosure door
- Drive input line reactor, 3% impedance
- Thru-the Door Lockable Main Disconnect
- Three position switch VFD “Enable – Disable – Auto”
- VFD Enable Relay
- Type 1 Surge Protection device, surge current 36KA
- Pump disable circuit
- Numbered screw type field termination block
- Field wiring diagram and installation instructions included
- Self-Protected Manual Motor Starter, UL508 Type E device with class 10 trip

PANEL COMPONENTS

1. **TYPE 4X Enclosure**
2. **Main Disconnect Thru-Door**
3. **VFD Run Indicator**
4. **VFD Enable Selector switch**
5. **VFD Enable Relay**
6. **Surge Protection**
7. **Terminal Strip**
8. **Line Reactor**



Model Shown: SP6832LR3

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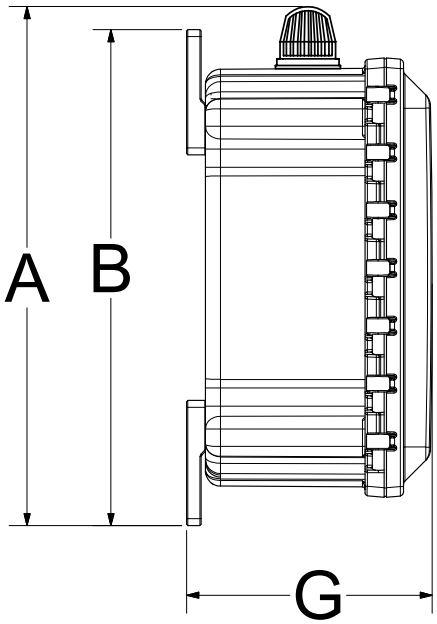
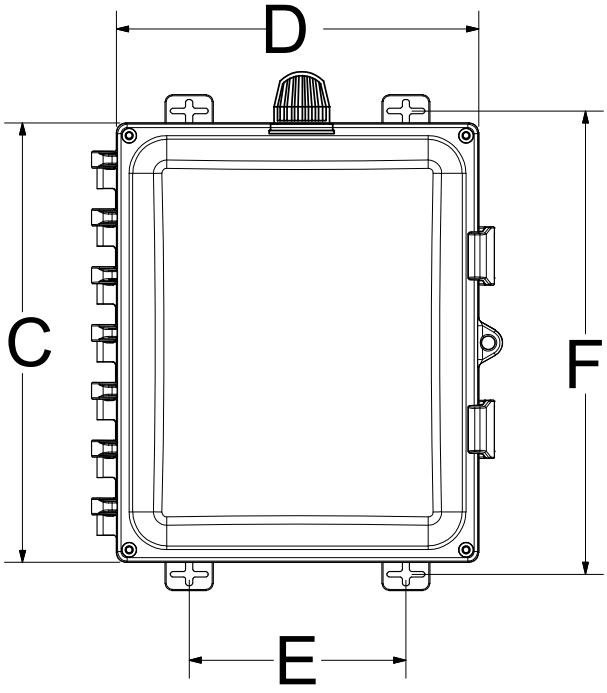
ENCLOSURE DIMENSIONS

STANDARD - 16x14x08

A	B	C	D	E	F	G
19.47	18.88	17.41	15.41	11.63	18.03	9.89





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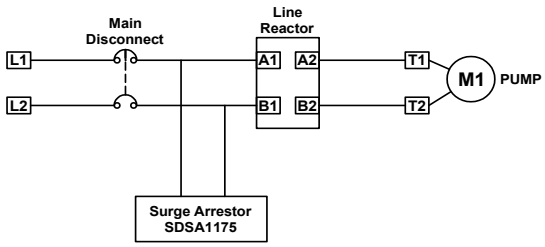
WIRING DIAGRAM

Standard Wiring Controls & Incoming Power Service of 208/240vac - 1 phase. Simplex setup (Figure 1). Horsepower options available.



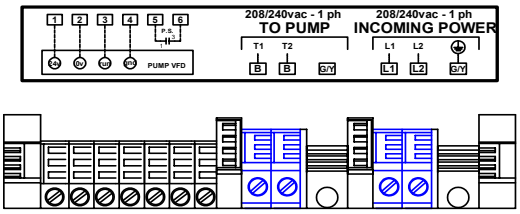
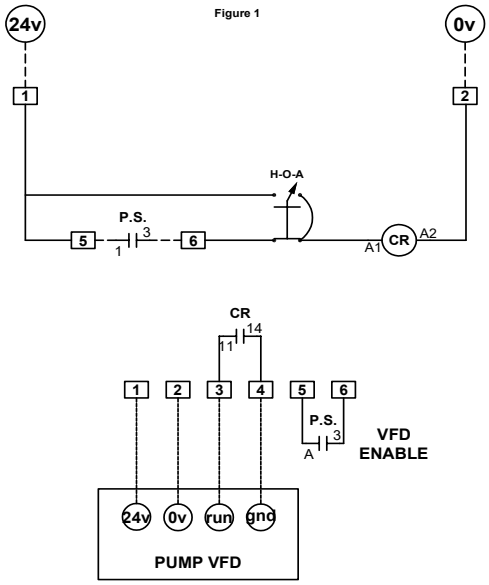
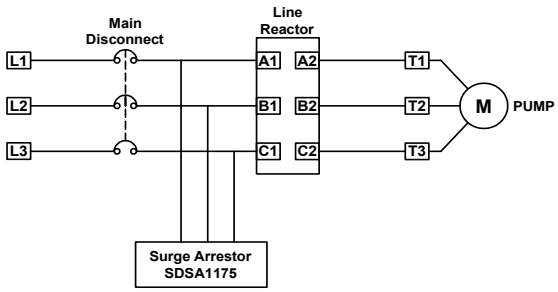
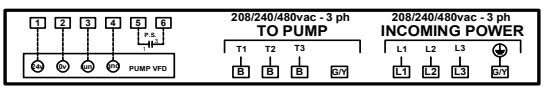


Figure 1



Standard Wiring Controls & Incoming Power Service of 208/240/480vac - 3 phase. Simplex setup (Figure 2). Horsepower options available.





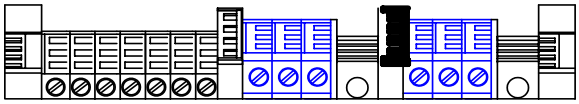
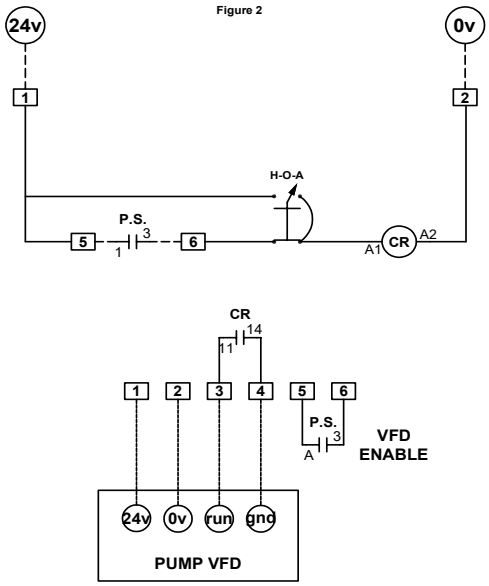


Figure 2



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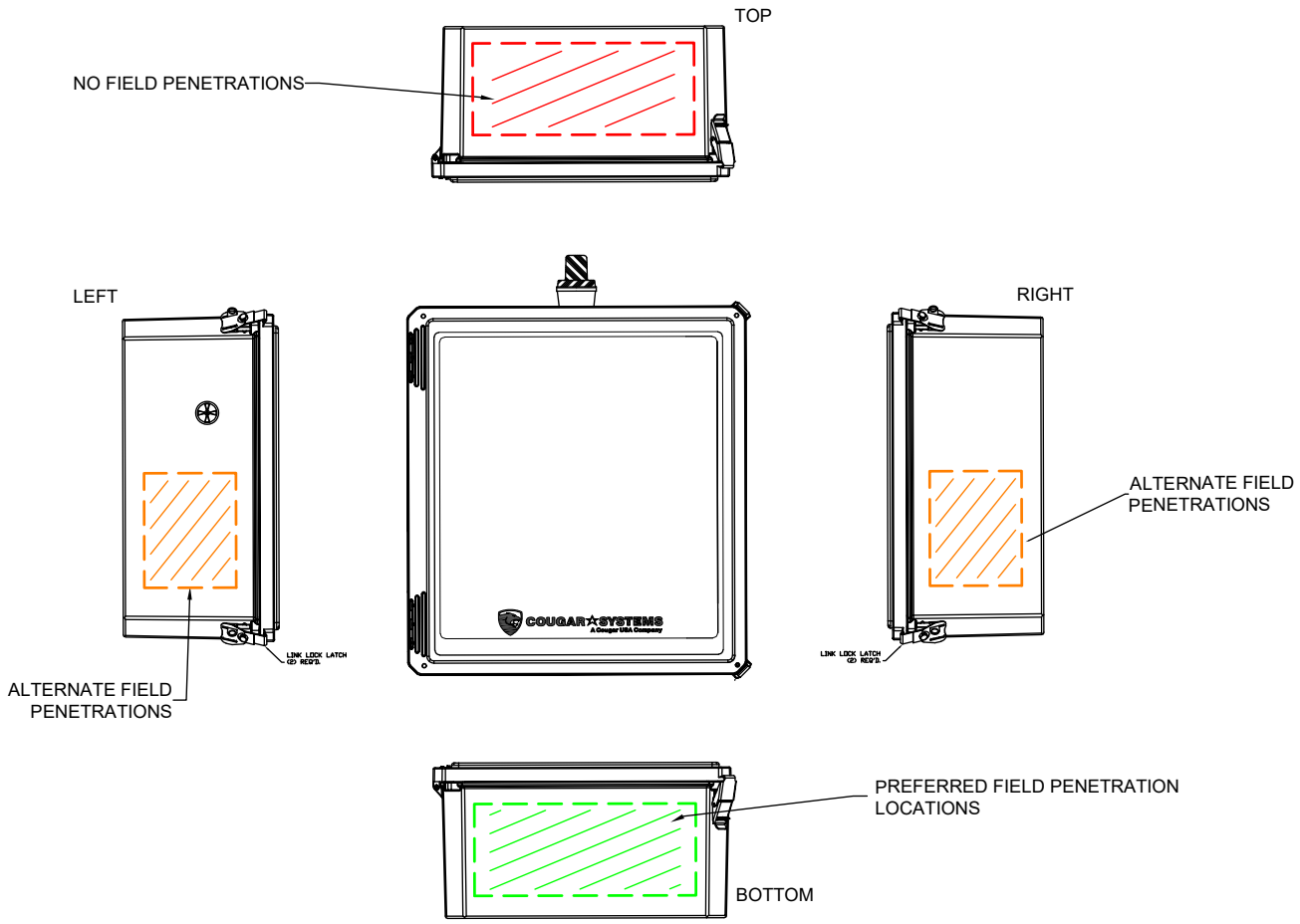
Field Penetration

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



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