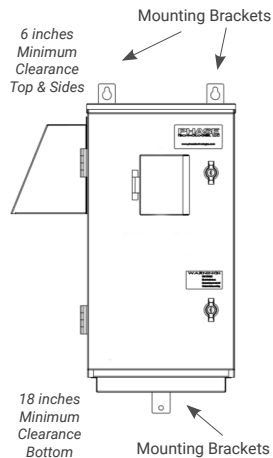


**SD SERIES & 2XD SERIES**

SD Series	SD Series	2XD Series
240V Models: SD002 SD003 SD005 SD007 SD010	480V Models: SD405 SD407 SD410	240V to 480V Models: (Voltage Doubling) 2XD205 2XD207 2XD210

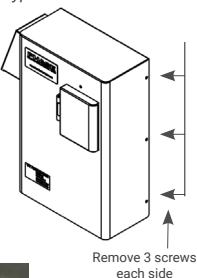
**Step 1 Installation & Mounting**

1. Drive must be mounted in an upright position
2. Minimum of 6" clearance on each side for proper ventilation and the surface around the enclosure should be of a non-flammable material and clear of obstacles.
3. Mounting surface must be sturdy and capable of bearing the weight of the unit.
4. Fasten the unit to the mounting surface using the installed mounting brackets.
5. Use screws or bolts of an appropriate size.  
**Recommended size:**  
5/16" x 2-1/2" lag screw



**CAUTION** Models SD202, SD203 & SD205  
See orange warning sticker on keypad

1. The front panel of this drive must be removed to install drive (does not have a hinged door). Remove six screws, three on each side.
2. IMPORTANT: Before lifting off the front panel, the keypad cable must be released. (Standard RJ45 connector).
3. Reconnect keypad cable before replacing the cover to ensure power to the keypad.

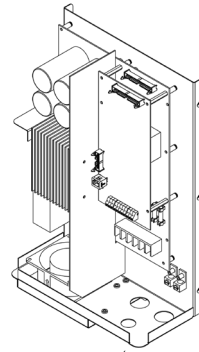


RJ45 cable connected to keypad on underside of front panel. Release cable before removing cover.

**Step 2 Routing Power & Control Cables**

**Conduit Openings**

1. Enclosures are supplied with conduit openings located in the bottom of the enclosure directly beneath the power terminals.
2. Power cables should only enter through the bottom of the enclosure in the area directly beneath the power terminals.
3. It is not recommended to drill holes in other areas of the enclosure for power and control cables.



**WARNING**

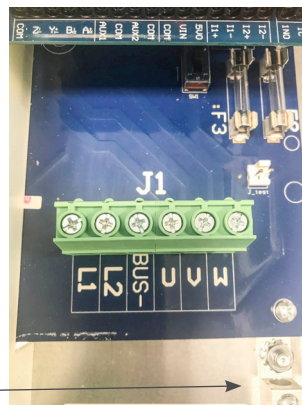
Metal filings can cause damage. If you do drill additional conduit openings, clean out filings thoroughly.

**Routing Cables**

1. IMPORTANT: Do not install line side power cables in the same conduit or cable tray with load side power cables.
2. Do not route control cables through the same conduit or cable tray as power cables. A separate conduit for control cables must be used. This reduces the exposure of control cables to EMI (electromagnetic interference, or noise) from the motor cables.
3. If the control cables must intersect the power cables, make sure they cross at right angles.

**Step 3 Connecting To Power Terminals**

1. Connect input power from single-phase power source:  
**L1 & L2**
2. Connect for three-phase output power:  
**U, V, W**
3. **DO NOT CONNECT:**  
**BUS-**
4. Connect to ground terminals:  
**GND**



**Wire Sizes: Input & Output Power Terminals**

Input Power Terminals			
Model			
SD007, SD010, 2XD205, 2XD207, 2XD210		SD002, SD003, SD005, SD405, SD407, SD410	
Wire Size	Torque	Wire Size	Torque
2 - 6 AWG	120 lb-in	20-6 AWG	15 lb-in
8 AWG	40 lb-in		
10 - 14 AWG	35 lb-in		

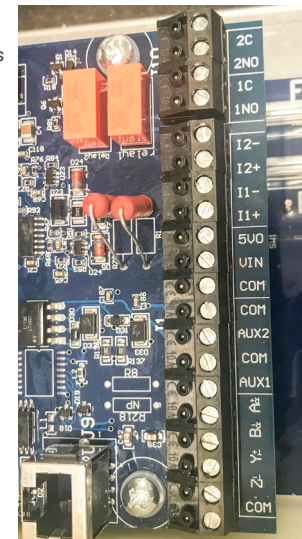
Output Power Terminals			
Model			
SD405-OF, SD407-OF, SD410-OF, 2XD205-OF, 2XD207-OF, 2XD210-OF		SD002, SD003, SD005, SD007, SD010, 2XD205, 2XD207, 2XD210	
Wire Size	Torque	Wire Size	Torque
4 - 18 AWG	16 in. lbs	20-6 AWG	15 lb-in

**Step 4 Connecting To Control Terminals**

SD & 2XD Series drives are equipped with Control Terminals that allow a number of control functions.

1. Remote ON/OFF control
2. Digital output signals
3. Remote notification
4. Operation of constant pressure water systems
5. MODBUS communication (In place of the display).

**Important Note:**  
The proper System Configuration must be selected (in the keypad) for proper operation of the various control systems.



**Connecting To Control Terminals** *Continued*

Terminal Designator	Description	Rating
1NO	Normally Open Relay	0-30 VDC or 120VAC <250mA
1C	Common	
2NO	Normally Open Relay	
2C	Common	
COM	Common	
I1+	4-20 mA positive	4-20 mA
I1 -	4-20 mA negative	
I2+	4-20 mA positive	4-20 mA
I2-	4-20 mA negative	
5 VO	0-5 VDC output	0-5 VDC
V In	0-5 VDC input	
COM	Common	
COM	COMMON	Rating
AUX1	Auxiliary 1	< 5 volts, galvanically isolated
AUX2	Auxiliary 2	

**WARNING**

Do not supply voltage to AUX1 or AUX2 terminals, it may cause damage and void any warranties in place.

Control Terminals are located on removable terminal blocks on the Master Control printed circuit board. Remove the block for easy connection of control wires. To remove the terminal blocks, simply pull the block from mounting pins soldered into the circuit board.

**CAUTION:**  
Use care not to damage other components on the printed circuit board when removing and replacing the Control Terminal blocks.

**CAUTION:**  
By default, AUX1 and AUX2 are programmed to be always ON (closed). See parameters AUX1 SELECT and AUX2 SELECT under the Interface Parameters menu.

**CAUTION:**  
If using external controls such as a float switch, timer, relay, etc., make note that by default AUX1 and AUX2 are programmed to be always ON (closed).

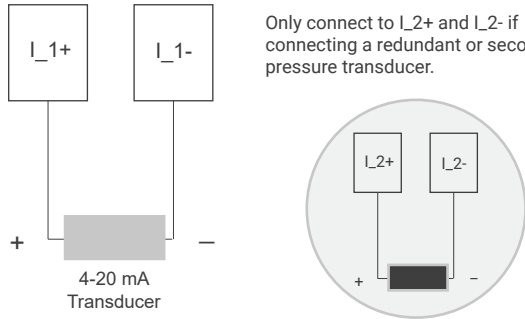
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**Step 4** Connecting To Control Terminals

Connecting A Transducer



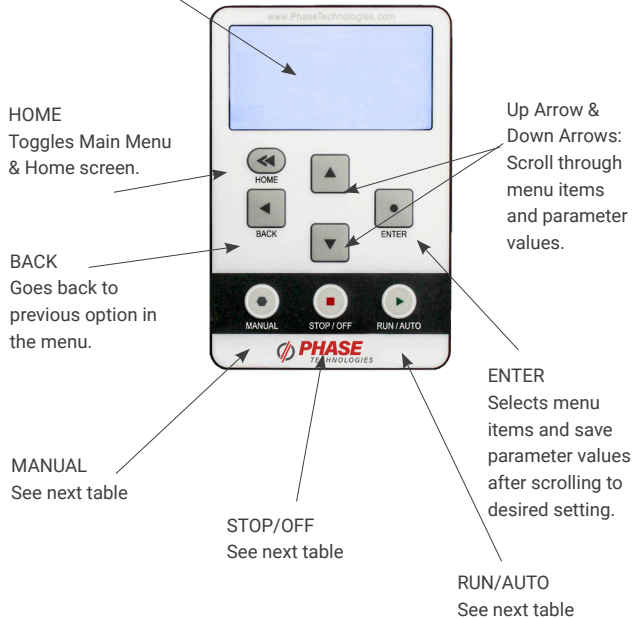
Only connect to L<sub>2+</sub> and L<sub>2-</sub> if connecting a redundant or second pressure transducer.



**Step 5** Keypad & Display

Keypad Overview

Back lit graphic screen  
Displays operating status, menu items for programming and fault codes.



Keypad Button Descriptions

Mode	Description
AUTO	The factory default operating mode is OFF. The parameter, ENABLE RESTARTS, must be set to YES to allow automatic re-starts. See Table 5-1 in the operating manual, "Operating Parameters" for details.  CAUTION: In AUTO mode, the motor load will automatically run if both AUX1 and AUX2 remote switches are closed. Open AUX1 or AUX2 to stop the motor or push STOP/OFF key.  CAUTION: By default, AUX1 and AUX2 are programmed to be always ON. See parameters AUX1 SELECT and AUX2 SELECT to change this setting.
MANUAL	Activate MANUAL mode by pushing the MANUAL key until MANUAL appears on top left of the display. In MANUAL mode the motor load is controlled by using the RUN and STOP keys, which will override the AUX1 and AUX2 remote switches.  Manual control of the drive through the keypad can be disabled through the parameter DISABLE MANUAL. See Table 5-3 in the operating manual, Interface Parameters, for details.  CAUTION: Operating the system in MANUAL mode on the keypad overrides signals from the pressures switches. Operating the system in this mode may lead to dangerous pressures in closed plumbing systems.  CAUTION: If the 4-20 mA or 0-5 VDC Control Terminals are short circuited, power will be lost to the keypad. If the drive is in MANUAL RUN mode the drive will not respond to a STOP command on the keypad. Disconnect input power to the drive to stop the motor and then fix the short circuit.
OFF	The factory default operating mode is OFF. The adjustable parameter, ENABLE RESTARTS, must be set to 1 to allow automatic re-starts. To exit AUTO mode, press the STOP/OFF key until OFF appears on top left of the display.  If the motor is running, it will stop. To restart the motor, revert to either AUTO mode or MANUAL mode. Certain faults can also be cleared by pressing the up and down arrow keys at the same time and holding for one second.

**Step 6** Constant Pressure Setup

The Perfect Pressure™ wizard guides you through a series of prompts to set up constant pressure control. The wizard will appear immediately when the drive is first initialized, powered up, or when all parameters are restored to factory default settings.

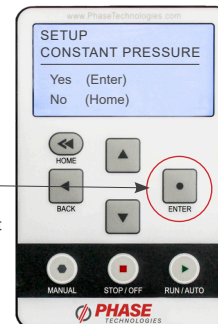
The settings in Perfect Pressure™ will provide adequate constant pressure control in most systems. However, if fine tuning and advanced control is required, an extensive menu of constant pressure control parameters are available. Refer to section 7 in the SD-2XD Series product manual.

**a. Set Up Constant Pressure**

SETUP CONSTANT PRESSURE?

Press the "ENTER" key for Yes

To select NO, press the "HOME" key. This will exit the startup menu and allow the user to program the drive manually.

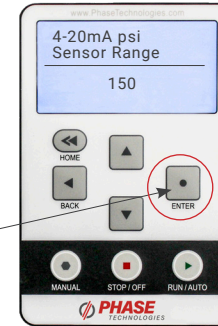


**b. 4-20mA psi RANGE**

This selects the full-range psi of the transducer. A 0-150 psi transducer is shipped with all drives. The default setting will be 150 psi.

If an alternate transducer is used, use the up and down arrow keys to change the full-range psi value.

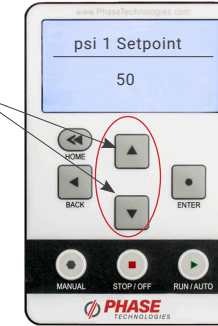
Press "ENTER" to proceed



**c. psi SETPOINT**

Sets the psi at which the system controls pressure. Use the up and down arrows to increase or decrease the value. Default is 50 psi.

Press "ENTER" to proceed

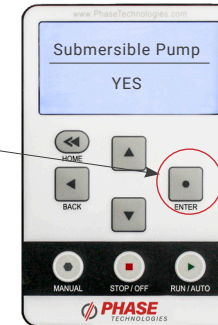


**d. Submersible Pump**

Controls the startup ramp profile to protect the thrust bearing in submersible pumps.

To select YES, press the "ENTER" key.

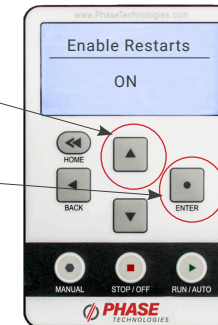
Select NO, by pressing the down arrow. Use this for a linear ramp time with non-submersible pumps. Press "ENTER" to proceed.



**e. Enable Restarts**

Allows the drive to initialize/restart in AUTO mode when the input power is cycled off/on. It is recommended to select "ON", by pressing the up arrow button, so that the drive remains in AUTO mode when operating constant pressure. Press "ENTER" to proceed.

If "OFF" is selected, and the input power is cycled off/on, the drive will initialize in "OFF" mode and will need to be restarted manually. Press "ENTER" to proceed



**f. Disable Manual Mode**

Disables MANUAL mode function on the keypad. Only OFF and AUTO mode operations are available if you disable manual mode. Disable manual mode if you are concerned about operators running the pump in manual mode, which can result in dangerous over pressure in closed plumbing systems.

When operating in manual mode, the drive will run at MAX FREQUENCY, ignoring all Control Terminal Signals, including the pressure sensor and AUX1 and AUX2 circuits.

Use the up and down arrows to select YES to disable manual mode, select NO to allow it. Press "ENTER" to save and proceed.

**g. Overcurrent Limit**

Protects the motor from damage due to high current. Refer to the nameplate of the motor connected to the drive to determine the setting for this parameter. The value should never be higher than maximum allowed amperage on the motor nameplate. Use the up and down arrows to change the value.

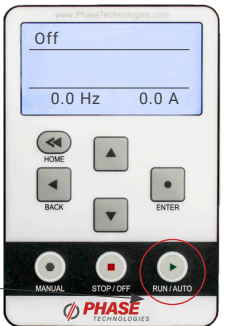
Press "ENTER" to proceed



By default - DRAWDOWN PSI is set to 5 psi (programmable). With a PSI SETPOINT of 60, the system will not resume control from sleep mode until pressure drops below 55 psi.

**h. Setup Complete**

When setup is complete and you are ready to pump with constant pressure control, press the RUN/AUTO key to start the drive and put it in AUTO mode.



**CAUTION** Manual Mode Operation

Operating the system in MANUAL mode on the keypad overrides signals from the pressures switches. Operating the system in this mode may lead to dangerous pressures in closed plumbing systems. The VFD will ramp up to MAX FREQUENCY (default 60hz) and run without input from the control terminals.