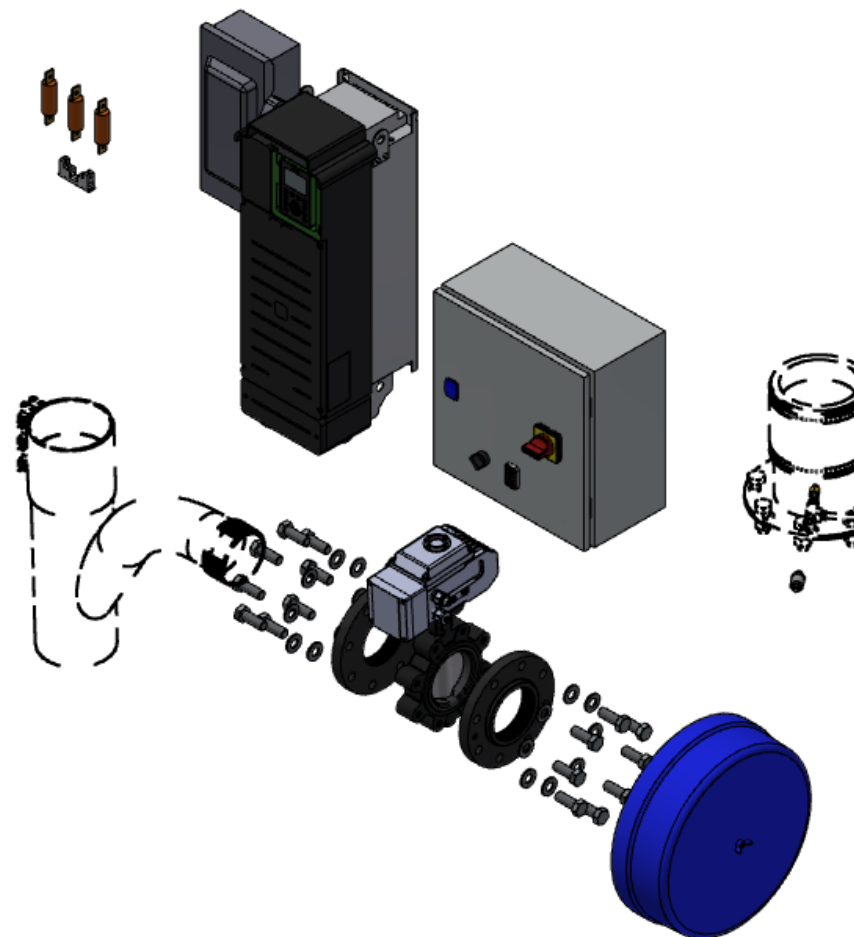




## VARIABLE FREQUENCY DRIVE(VFD) WITH MODULATING SURGE CONTROL

Page 2	Product Information
Page 3	Safety Instructions
Page 4	Pre-Installation Checks
Page 5-9	Installation
Page 10-12	Control Panel Overview
Page 13-14	VFD Overview
Page 15-17	Initial Startup
Page 18	Troubleshooting
Page 19-20	Bill of Materials



# **PRODUCT INFORMATION**

Please take a moment to fill out the information below in order to aid us with any future sales or service inquiries. Model number and serial number information can be found on the serial tag located inside the control box and/or on the lower exterior of the can. Key number can be found on the tag that comes attached to the keys. There may be more than one key number depending on unit.

Please keep this information with your records.

MODEL#: \_\_\_\_\_

ORDER#: \_\_\_\_\_

VFD SERIAL#: \_\_\_\_\_

VALVE SERIAL#: \_\_\_\_\_

DATE PURCHASED: \_\_\_\_\_

J.E. Adams Industries  
1025 63rd Ave. S.W.  
Cedar Rapids, IA 52404  
1-800-553-8861  
[www.jeadams.com](http://www.jeadams.com)

# IMPORTANT SAFETY INSTRUCTIONS

When using an electrical appliance, basic precautions should always be followed, including the following:

**Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it.**

## **WARNING – To reduce the risk of fire, electric shock, or injury:**



- Use only as described in manual. Use only manufactures recommended attachments.
- Do not allow to be used as a toy. Close attention is necessary when used by or near children.
- Do not put any object into openings. Do not use with any opening blocked; keep free of dust, lint, hair and anything that may reduce air flow.
- Keep hair, loose clothing, fingers, and all parts of body away from openings and moving parts.

## **SAVE THESE INSTRUCTIONS**

### **Installation Safety Instructions:**

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by J.E. Adams for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

- Determine location to mount unit (**“DANGER” “THIS EQUIPMENT INCORPORATES PARTS SUCH AS SWITCHES, OR THE LIKE THAT TEND TO PRODUCE ARCS OR SPARKS THAT CAN CAUSE AN EXPLOSION. WHEN LOCATED IN GASOLINE-DISPENSING AND SERVICE STATIONS INSTALL AND USE AT LEAST 20 FEET (6 M) HORIZONTALLY FROM THE EXTERIOR ENCLOSURE OF ANY DISPENSING PUMP AND AT LEAST 18 INCHES (450 MM) ABOVE A DRIVEWAY OR GROUND LEVEL.”**)
- Run electrical service to that location
- **Grounding Instructions:** This appliance must be connected to a grounded metal, permanent wiring system; or an equipment-grounding conductor must be run with the circuit conductors and connected to the equipment-grounding terminal or lead on the appliance.
- All local and national electric codes must be followed for installation and use.



**DANGER!**

**LETHAL VOLTAGES ARE PRESENT:** before applying power to the Variable Frequency Drive, ensure that all wire connections are secure and all protective covers are on. After power has been turned OFF, wait at least 15 minutes or until the power indicator light extinguishes before touching any wires, circuit boards, or components.

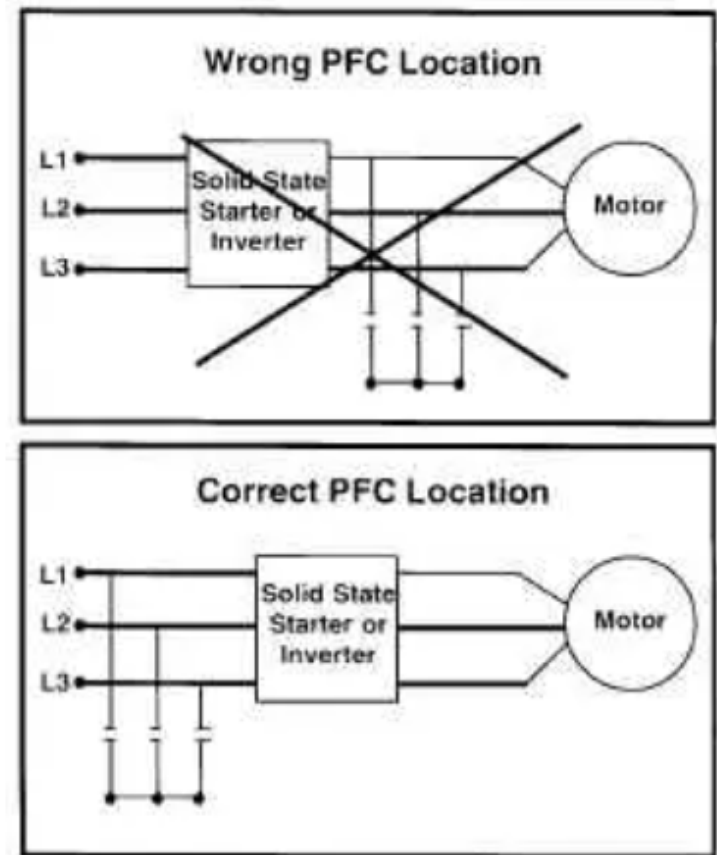
# Pre-Installation Checks

Prior to installation, check the following:

- Power Rating of VFD is equal or greater than the motor power rating.
- Supply voltage, VFD rated voltage, and motor voltage match.
- Motor and Producer rotate freely.

During installation ensure that the follow occurs.

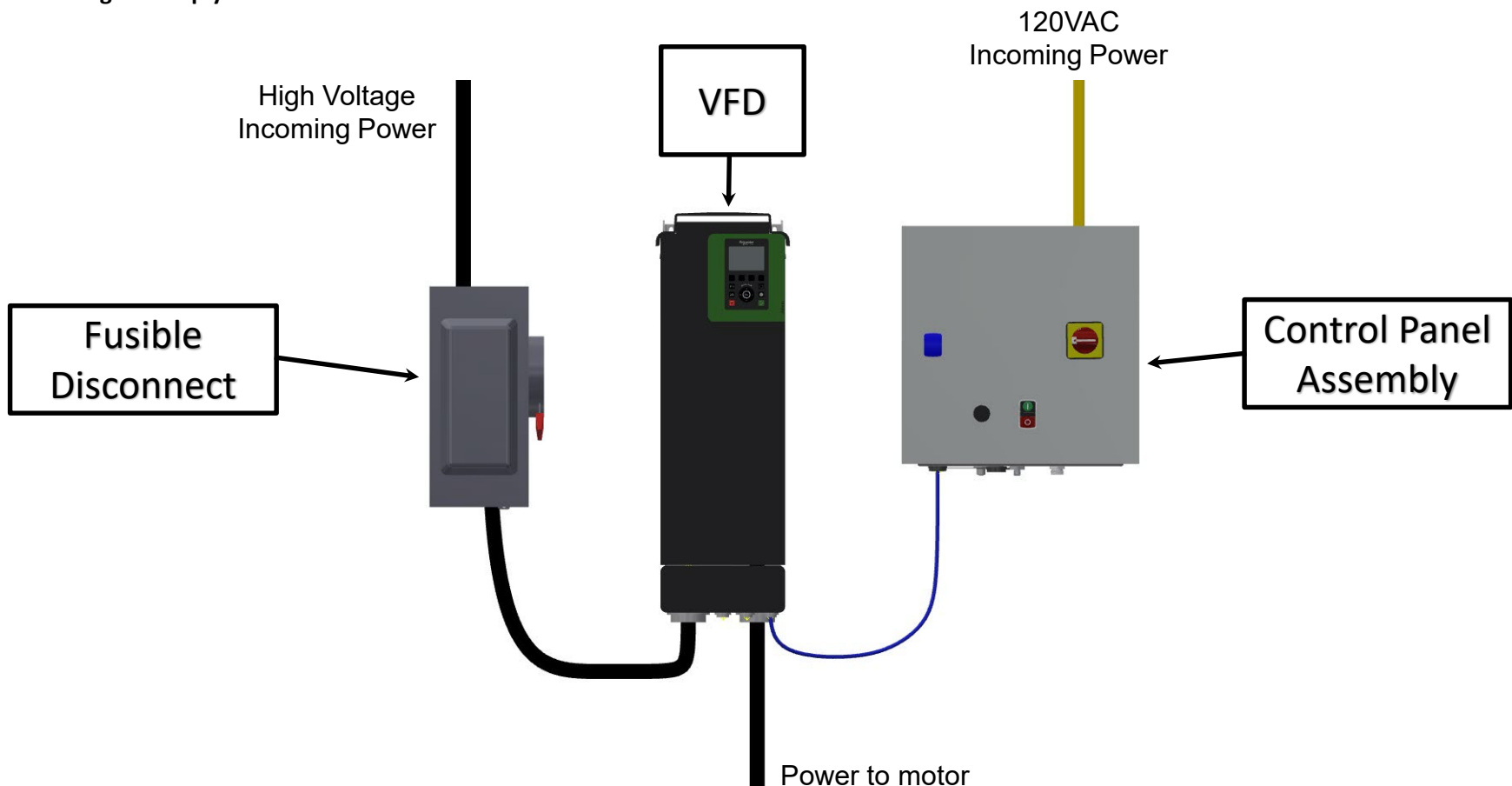
- Power factor correction capacitors are NOT installed between VFD and motor.
- Power factor correction capacitors are NOT installed on input to VFD without a line reactor.



# Installation

## Typical Electrical Panel Layout

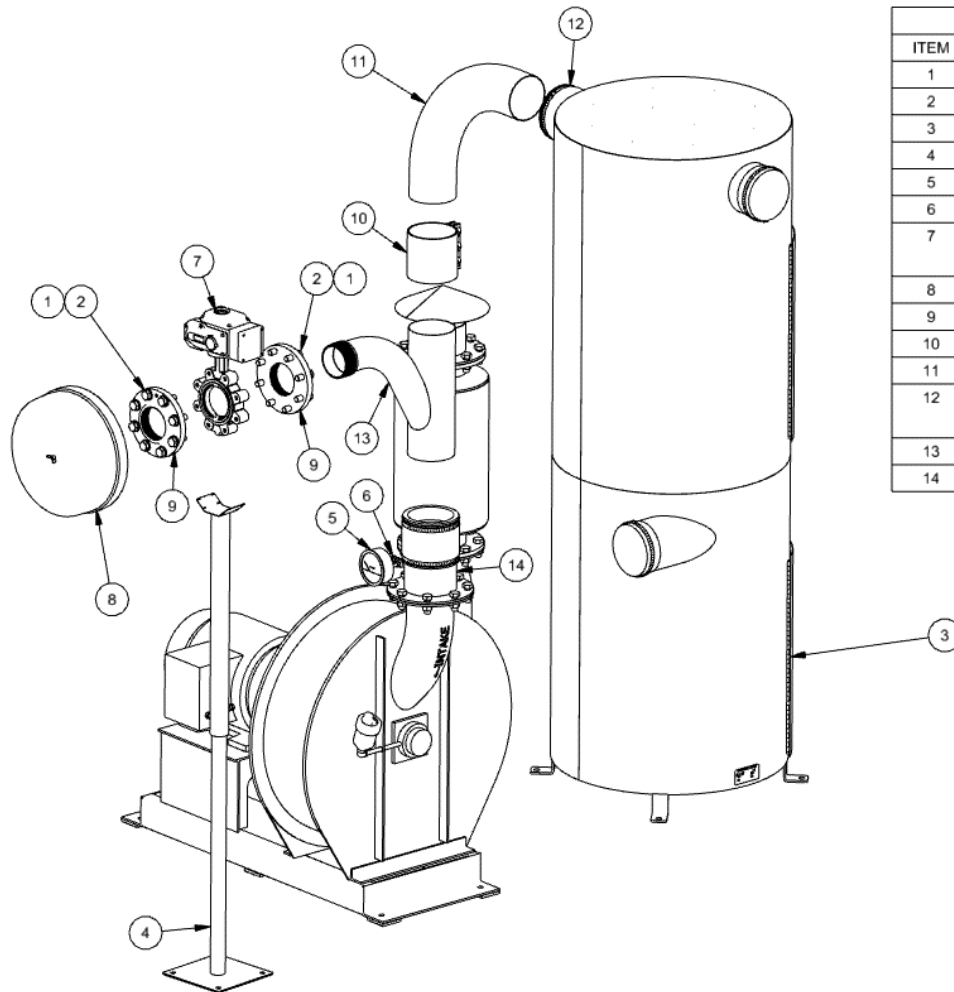
- The Modulating Surge Control system includes a Fusible Disconnect, Variable Frequency Drive (VFD), and a control panel assembly. The recommended layout for these components is illustrated below.
  - Size and exact locations will vary based on system.
  - High voltage wiring is not provided
- **All wiring to comply with local and national electric codes**



# Installation

## Valve Assembly Installation

- Seal threaded connections with thread sealant.
- Plumbing may be changed based on site configuration, the valve assembly must always be installed between the main collector and the producer.
- Valve assembly must be supported to ensure the vibration isolation coupler works. (Support Stand sold separately.)



BILL OF MATERIALS			
ITEM	PART NUMBER	DESCRIPTION	QTY
1	5606D21	WASHER, FLAT, 3/4 SAE, ID 13/16	16
2	5735D5	BOLT, 3/4-10 X 2.00", HH, HD, FT	16
3	35000-3A	CENTRAL VAC COLLECTOR/SEPARATOR 6"	1
4	35000-31A-2	CV PIPE SUPT ASY, 60-86IN	1
5	35000-143	PRESSURE GAUGE, DWYER 0-150 IN/H2O	1
6	35000-144-1	TRANSDUCER, 1 TO -1 BAR, 4-20MA	1
7	CV-MSC-4	VALVE ASSY, MODULATING, 4 IN, SURGE CONTROL	1
8	CV-MSC-4-3	INTAKE SILENCER, 4 MIP, F64-4	1
9	CVP-4FLG-4FIP	ADAPTER, 4 IN 150 FLANGE, 4 FIP	2
10	CVP-60003B10Z	COMP COUPLER, GALV, 6.0, 6.0 L	1
11	CVP-EL-602AS	ALUMINUM EL 6x6 STR ENDS	1
12	CVP-FCO-1002-56	FLEXIBLE CONNECTOR/COUPLER 6" PVC TO 6" TUBE	2
13	CVP-TY-609-A-SP	ALUMINUM TY 6x4, 4 MNPT	1
14	M30B	PRODUCER ASSEMBLY	1

# Installation

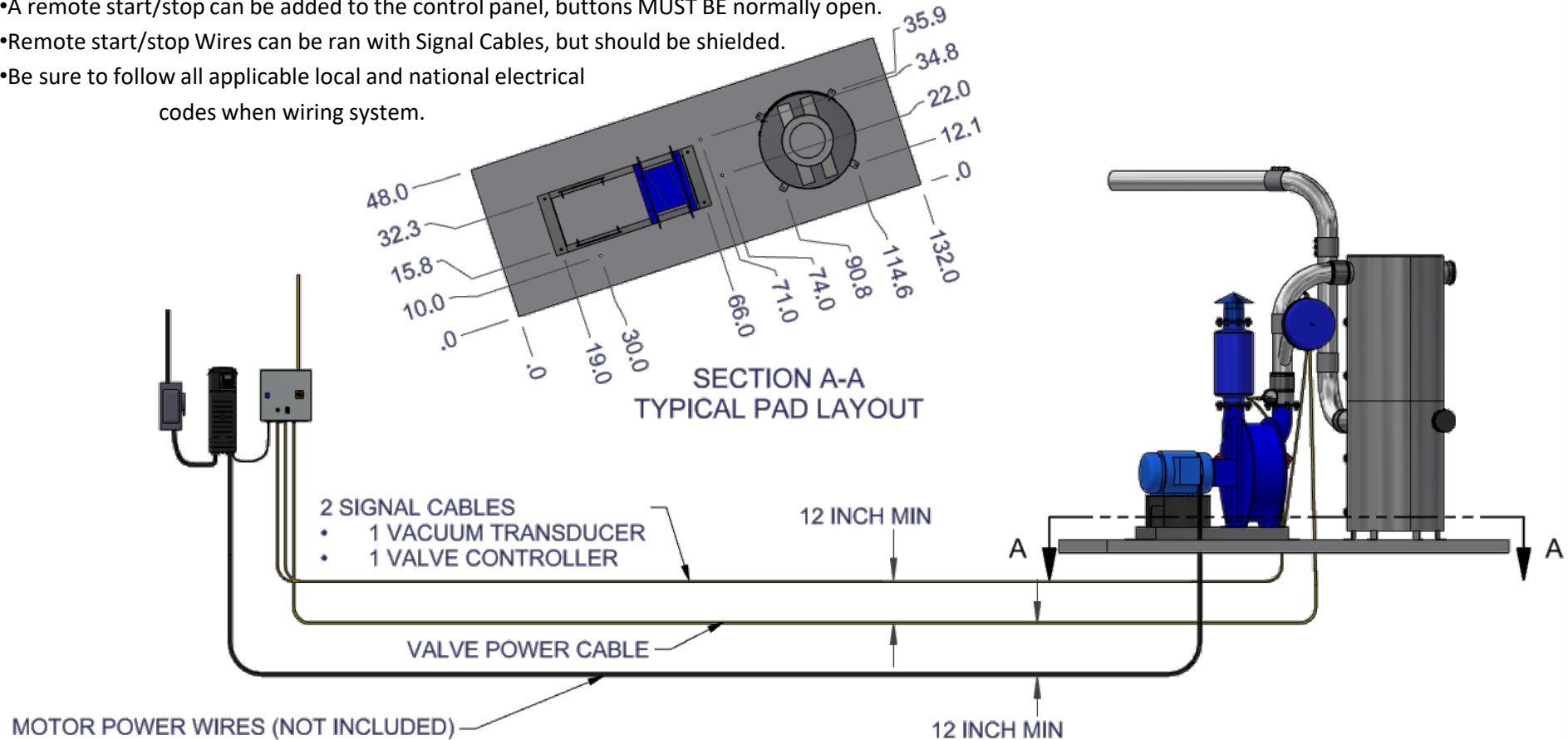


## NOTICE

JE Adams cannot be held responsible for transducer feedback errors due to signal wires being run in the same trench as high voltage wires.

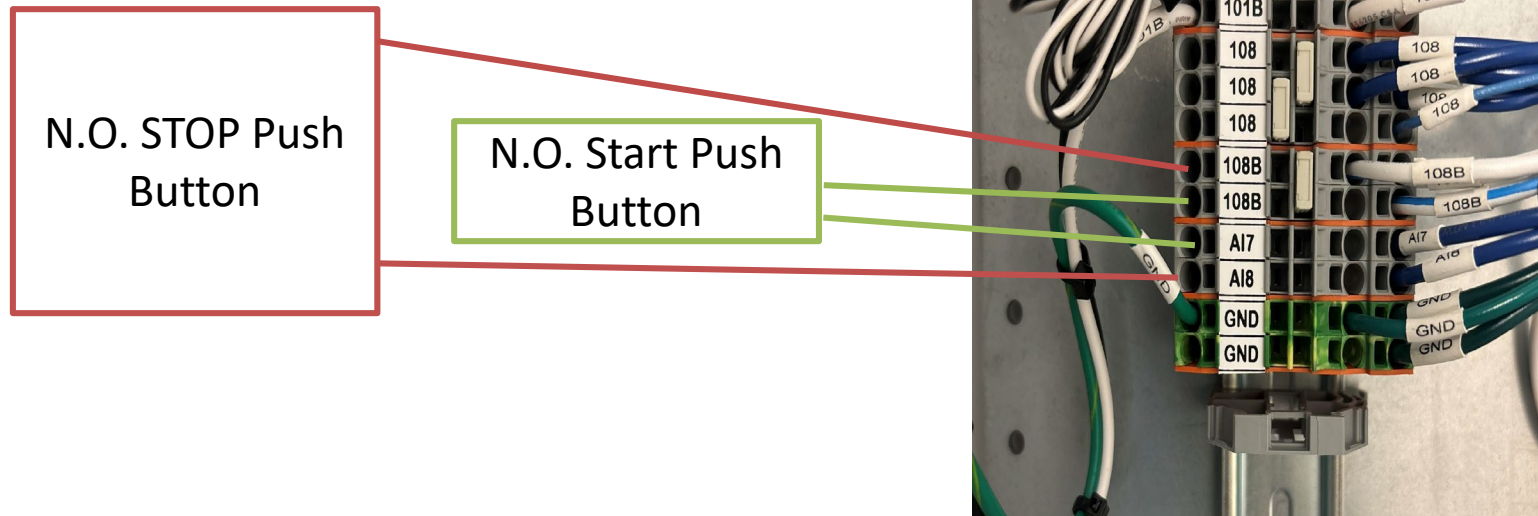
### Control Panel Wiring Connections

- All connections to be made with power OFF.
- Connections are keyed to ensure proper installation.
- Signal Cables to be ran at least 12 inches away from power wires and in separate conduit.
- Valve Power Cable to be ran in separate conduit.
- Motor Power to be ran in dedicated conduit and trench.
- A remote start/stop can be added to the control panel, buttons MUST BE normally open.
- Remote start/stop Wires can be ran with Signal Cables, but should be shielded.
- Be sure to follow all applicable local and national electrical codes when wiring system.



# Installation

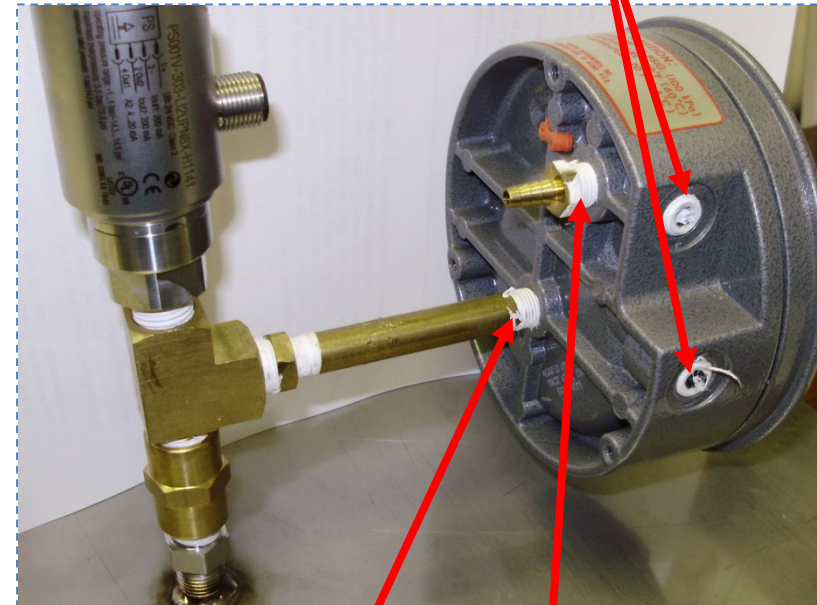
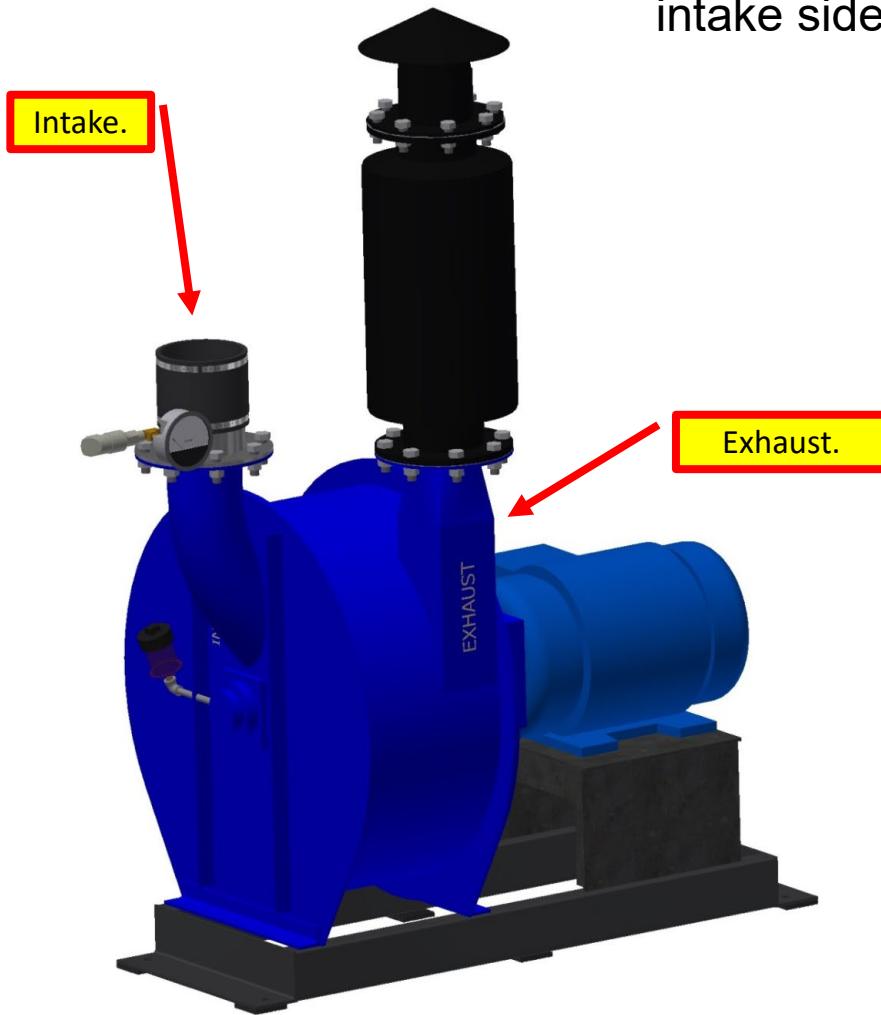
- Remote START button(s) to be wired to AI7 and to 24VDC Common. Button must be Normally Open
- Remote STOP button(s) to be wired to AI8 and to 24VDC Common. Button must be Normally Open
- NOTE: In photo below, 24VDC common is 108B. For your specific build refer to the control panel schematic provided.





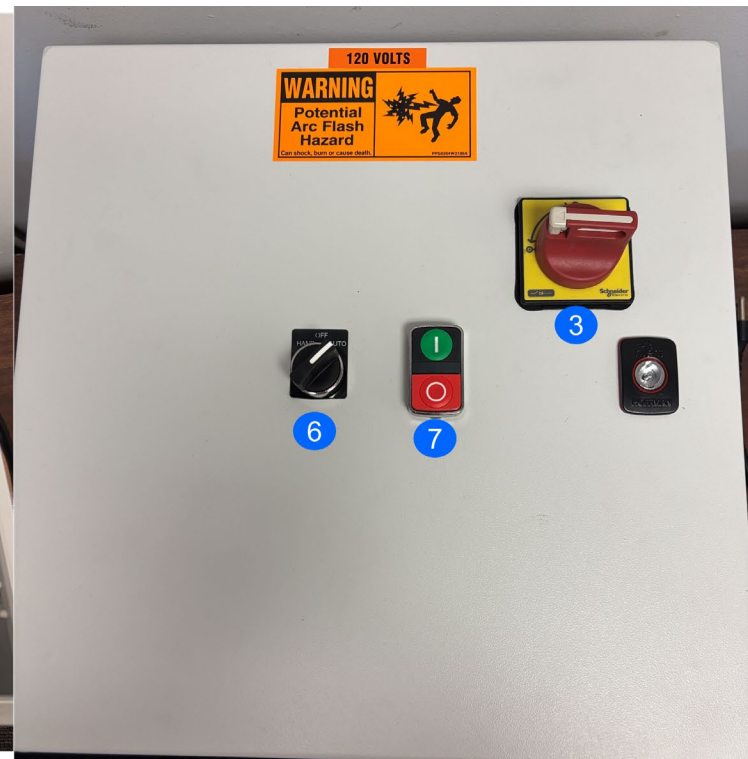
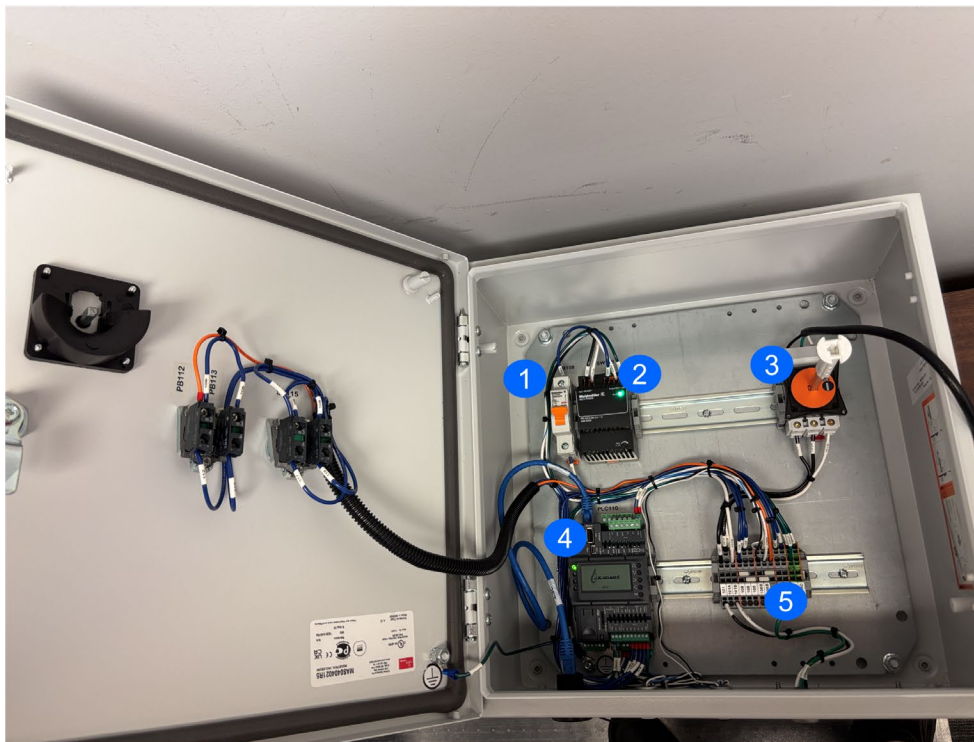
# Installation

Transducer and magnehelic gauge go on intake side of vacuum producer.



# Control Panel Overview

1. 24 VDC Breaker
2. 24 VDC Transformer
3. 120 VAC Disconnect
4. PLC Controller
5. Remote Pushbutton Landing
6. Hand/Off/Auto Switch
7. Local On/Off Buttons



# Control Panel PLC Navigation

- **Navigation**

To enter the system menu screen, press and hold the OK button (1)



Use the UP (1) or DOWN(2) arrows to highlight the menu option desired



Press ENTER (1) to select the desired menu screen or a user input to edit value.

Use RIGHT (3) or LEFT (4) arrow to move between menu pages.

When editing a number use UP (1) or DOWN (2) allows a specific number to be increased or decreased.

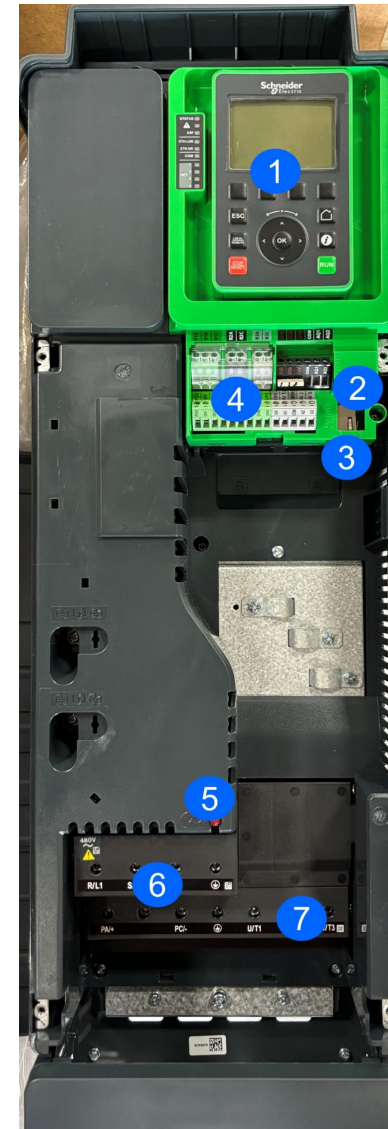
When editing a number use RIGHT (3) or LEFT (4) allows you to move between digits.

# Control Panel Menu Structure

- **Setup**
  - **Target Vacuum Level** – 40-60 inH2O  
This setting determines what vacuum level the system will target. System vacuum level is adjusted by increasing or decreasing the producer motor frequency.
  - **Surge HP**  
Surge HP is the HP level that at 60Hz the system will start to experience the effects of surge. This value is used by Modulating Surge Control to open and close the air inlet valve. The value is provided by JE Adams.
  - **Idle System** – Disable/Enable  
This input controls if the system should go into Idle when not used for a specified amount of time.
  - **Delay Idle Start** – 1-60 minutes  
This setting determines how long the system needs to be at steady state before dropping the frequency to the idle frequency (Default 40 Hz).
  - **Idle Settling Time** – 2-10 Seconds  
This setting determines how long the system is allowed to sit in idle before monitoring for changes in the system pressure which singles the system is back in use.
- **Mtr Info**  
This menu shares performance information about the VFD. No user settings are available on this screen.
- **Mnl Stgs**
  - **Motor Frequency** – 40-60 Hz  
This input is the setpoint for motor speed while in Manual mode. System can be run manually between 40 and 60 Hz. System pressure is not considered. Idle mode is not enabled while in Manual Mode.
  - **Valve Open Percent**
    - **Auto/Manual** determines if Surge Control is automatically or manually controlled.
    - **Percentage** is the valve open percentage. **Use caution when using system with surge control disabled.**
- **Run Times**
  - **Running Hrs** – Total time in Hours with producer running
  - **AutoLuber Hrs** – Time in Hours since automatic lubrication time last reset.
  - **Idle Hrs** – Time in Hours system has run in IDLE mode
  - **Surge Mins** – Total time in Minutes that system has ran in surge.
- **Service**
  - **Reset AutoLuber Timer** – Setting value to reset will reset AutoLuber Hrs. This should be done when new AutoLubers are installed.
  - **Reset Mtr Com** – Set value to reset will reset the communication between the VFD and Control Panel.

# VFD Overview

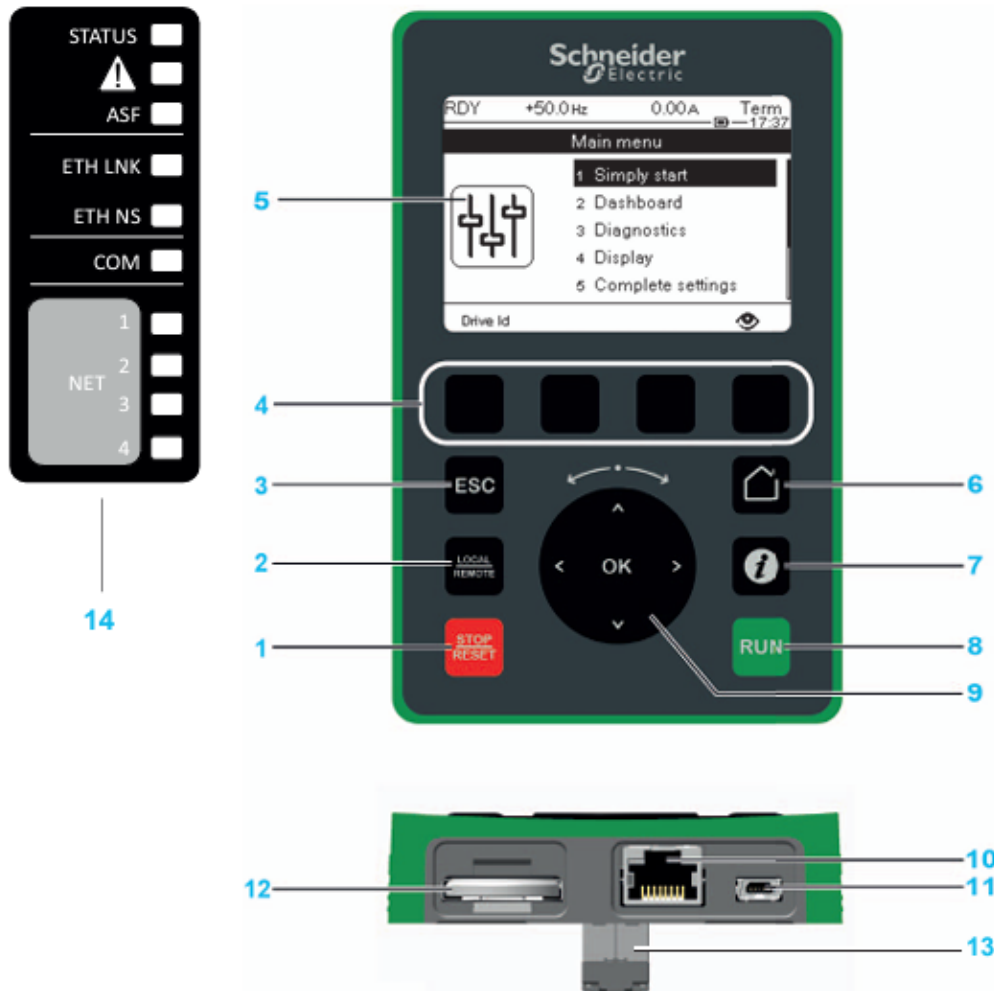
1. Graphic Display Terminal (GDT)
2. Ethernet, connects to Control Panel
3. MODBUS, unused RJ45 terminal
4. VFD inputs
5. Capacitor Power Warning Light
6. Incoming Power
7. Outgoing power



NOTE: VFD shown with front cover removed.

# VFD Controls Overview

## 8 LEDs and Graphic Display Terminal



1. STOP / RESET: Stop command / apply a Fault Reset.
2. LOCAL / REMOTE: used to switch between local and remote control of the drive.
3. ESC: used to quit a menu/parameter or remove the currently displayed value in order to revert to the previous value retained in the memory.
4. F1 to F4: function keys used to access drive id, QR code, quick view, and submenus.
5. Graphic display.
6. Home: used to access directly at the home page.
7. Information: to get more information about parameters.
8. RUN: executes the function assuming it has been configured.
9. Touch wheel / OK: used to save the current value or access the selected menu/parameter. The touch wheel is used to scroll fast into the menus. Up/down arrows are used for precise selections, right/left arrows are used to select digits when setting a numerical value of a parameter.
10. RJ45 Modbus serial port: used to connect the Graphic Display Terminal to the drive. This connection requires specific cables to be ordered separately.
11. Mini USB port: used to connect the Graphic Display Terminal to a computer.
12. Battery (10 years service life. Type: CR2032).
13. RJ45 male connector to plug on the drive or on the door mounting kit.
14. LED System Lights

NOTE: For more detailed instructions, refer to the ATV630 users manual



# Initial Startup

**The VFD and Control Panel come factory pre-programmed; the following instructions are to verify configuration matches factory programming. IF configuration is wrong, only an AUTHORIZED TECHNICIAN should perform adjustments.**

With the power ON, verify the following on the VFD Simple Start Menu:

- Motor Standard = 60 Hz IEC
- Nominal Motor Power = Motor Horse Power
- Nom Motor Voltage = Motor Voltage
- Nom Motor Current = Rated Amperage
- Nominal Motor Freq = 60 Hz
- Nominal Motor Speed = Motor RPM
- Motor Th Current = Rated Amperage at voltage
- Acceleration and Deceleration Ramp rates set to 60 s

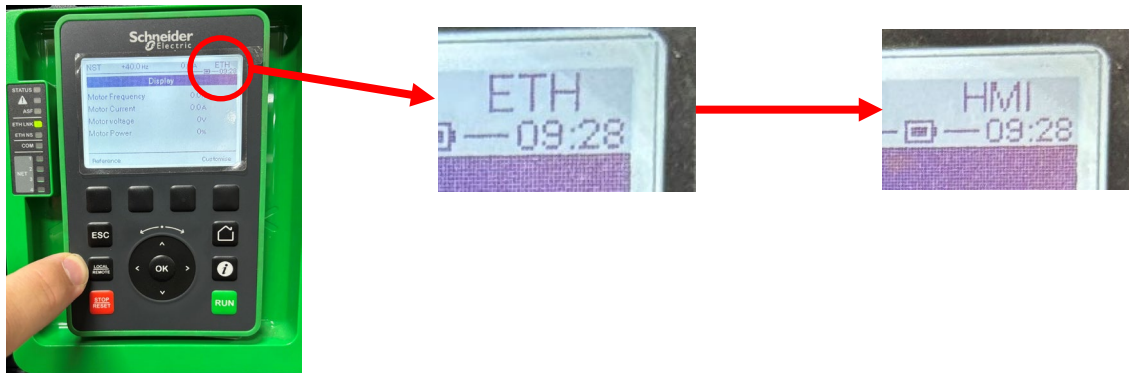
With the Control Panel power ON, verify the “Setp” parameters as follows:

- Target Scaling set between 45-55 inch of water.
- “Surge HP” is not set to Zero, call JE Adams if set to zero.

# Initial Startup

Bump test motor to ensure correct motor rotation

- On VFD enable Local control by hitting the Local/Remote button until the display shows HMI in the upper right hand corner



- Hit RUN, then listen for and watch motor for movement. Once the motor starts moving hit STOP and ensure motor/producer are turning the direction the arrows on the producer indicate.



- If its not, on the VFD go to 5. Complete Settings/5.2. Motor Parameters/Motor Control and then change the “Output Ph Rotation” parameter.
- Switch VFD back to ETH control by hitting the Local/Remote button again.



# Initial Startup

Complete the “Setting Butterfly Intake Valve” per the *M24B & M30B Vacuum Producer* manual by enabling hand mode then on the control panel interface open the “manual settings” menu then:

- Set motor speed to 60 Hz
- Set valve control to “Manual”
- Set valve open percentage to zero.

With Butterfly Valve set, change system to “Auto” mode, start the system, and then slowly hang all the hoses up.

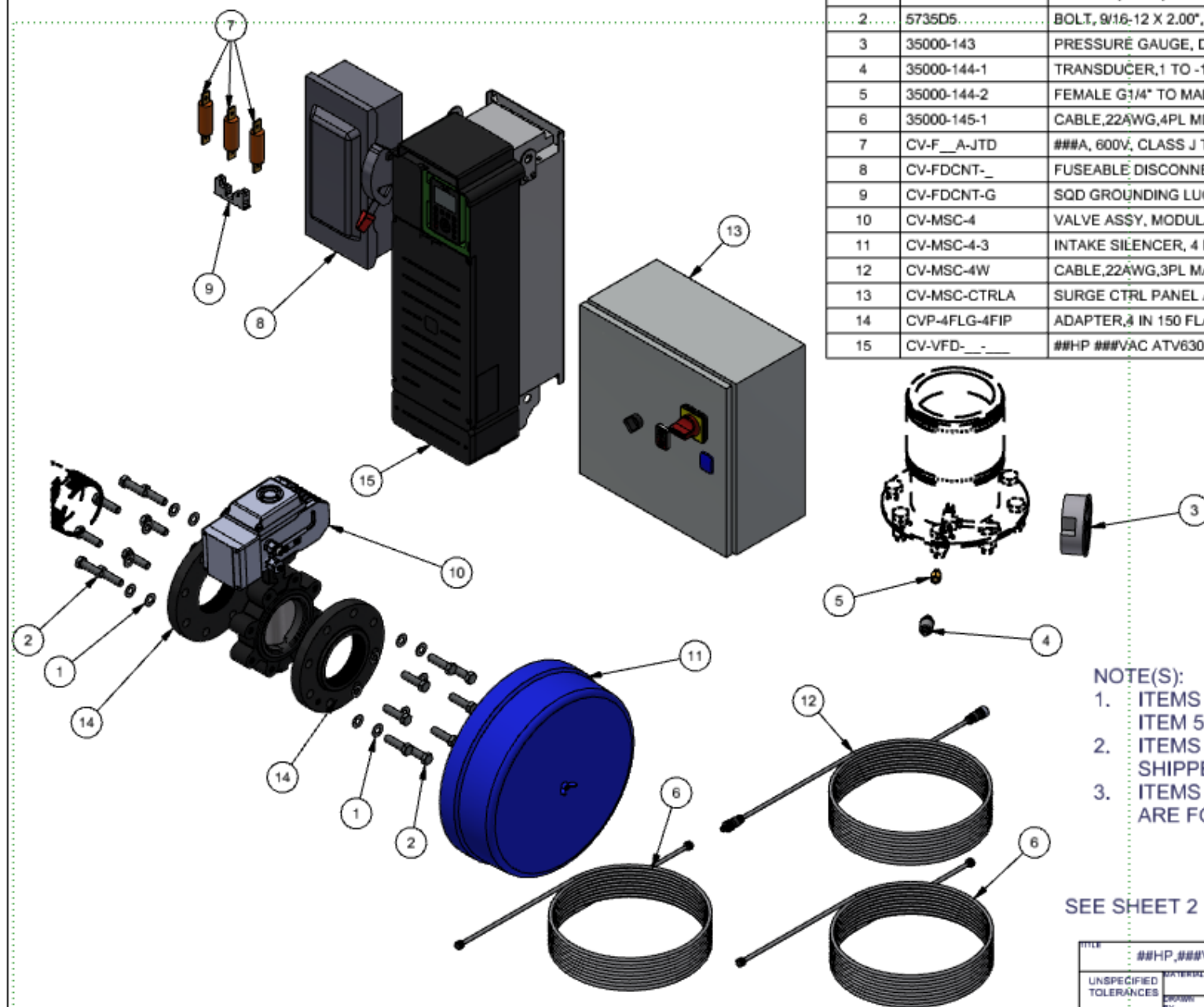
Listen for signs of surging while hanging hoses up. If surging occurs, increase the “Surge HP” setting by 0.5. Repeat this step up to 4 times.

If Surge persists, contact JE Adams.

REFER to *M24B & M30B Vacuum Producer manual* for more information on surge.

# Troubleshooting

ALWAYS DISCONNECT POWER BEFORE TROUBLESHOOTING!!		
Problem	Possible cause	Solution
PLC not powering up	Breaker inside fuse panel is not in the on position.	Turn breaker on.
	No 120 VAC power to machine.	Check incoming power line voltage.
	120VAC disconnect is turn off.	Turn disconnect to ON position.
	Loose connection.	Check incoming power connection.
	24 VDC Breaker is Off.	Turn 24VDC breaker on.
Unit does not start when start button is pushed	Communication between Control Panel and VFD is not working.	Check connection of LAN cable between VFD and Control Panel.
		Power off Control Panel and VFD, Turn VFD on and let HMI fully power up, THEN turn power on to Control Panel.
System has a low vacuum level, valve is open, and VFD is not running at 60 Hz.	System Calibration is off.	Turn off system, hang all hoses up, turn system back on, and then remove hoses from hangers 1 at a time.
	Vacuum Transducer signal is getting lost.	Check connection of cable at transducer and control panel.
System surges while operating in AUTO mode.	Surge HP set to low.	Increase Surge HP in the Setp menu in the Control Panel.
	Air filter on surge valve plugged.	Clean or replace air filter.



BILL OF MATERIALS			
ITEM	PART NUMBER	DESCRIPTION	QTY
1	5606D34	WASHER, FLAT, 9/16 SAE, ID .578	16
2	5735D5	BOLT, 9/16-12 X 2.00", HH, HD	16
3	35000-143	PRESSURE GAUGE, DWYER 0-150 IN/H2O	1
4	35000-144-1	TRANSDUCER, 1 TO -1 BAR, 4-20MA	1
5	35000-144-2	FEMALE G 1/4" TO MALE 1/4" NPT ADAPTOR, BRASS	1
6	35000-145-1	CABLE, 22AWG, 4PL MDC M-F, 96FT/30M	2
7	CV-F__A-JTD	###A, 600V, CLASS J TIME DELAY FUSE	3
8	CV-FDCNT-__	FUSEABLE DISCONNECT, 600V ###A	1
9	CV-FDCNT-G	SQD GROUNDING LUG, FOR CV-FDCNT	1
10	CV-MS-4	VALVE ASSY, MODULATING, 4 IN, SURGE CONTROL	1
11	CV-MS-4-3	INTAKE SILENCER, 4 MIP, F64-4	1
12	CV-MS-4W	CABLE, 22AWG, 3PL MAC M-F, 96FT/30M	1
13	CV-MS-CTRLA	SURGE CTRL PANEL ASSEMBLY, MSC	1
14	CVP-4FLG-4FIP	ADAPTER, 4 IN 150 FLANGE, 4 FIP	2
15	CV-VFD-_-_-	###HP ###VAC ATV630 VFD	1

NOTE(S):

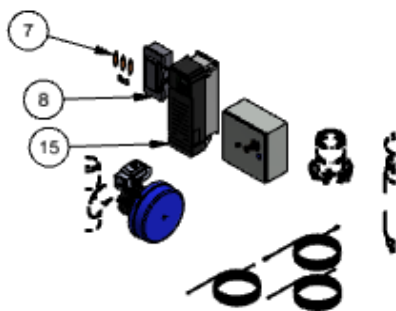
- ITEMS 4 AND 6 TO BE PACKAGED IN ITEM 5.
- ITEMS 12, 10, 8, AND 7 TO BE SHIPPED IN ORIGINAL PACKAGING.
- ITEMS SHOWN AS DASHED LINES ARE FOR REFERENCE ONLY.

SEE SHEET 2 FOR CONFIGURATION CHART

REV	9222	RELEASED	8/22/24	BJL	DATE	BY
NO.		DESCRIPTION				
THIS DOCUMENT SHALL NOT BE REPRODUCED NOR SHALL THE INFORMATION THEREIN BE USED BY OR DISCLOSED TO OTHERS EXCEPT AS AUTHORIZED BY J.E. ADAMS INDUSTRIES						

TITLE: ###HP, ###V, VFD, MODULATING SURGE CONTROL			
UNSPECIFIED TOLERANCES	BY: BJJ	DATE: 8/15/2024	SCALE: 0.09
1 PL ± .030			
2 PL ± .020			
3 PL ± .003			
ANGLE ± 1°			
SHEET 1 / 2		PART NO. CV-MVFD-_-_-	

CONFIGURATION CHART						
VOLTS	HP	Part Number	DESCRIPTION	ITEM 7	ITEM 8	ITEM 15
208	10	CV-MVFD-10-208	10HP,208V,VFD,MODULATING SURGE CONTROL	CV-F50A-JTD	CV-FDCNT-60	CV-VFD-10-208
208	15	CV-MVFD-15-208	15HP,208V,VFD,MODULATING SURGE CONTROL	CV-F60A-JTD	CV-FDCNT-60	CV-VFD-15-208
208	20	CV-MVFD-20-208	20HP,208V,VFD,MODULATING SURGE CONTROL	CV-F90A-JTD	CV-FDCNT-100	CV-VFD-20-208
208	25	CV-MVFD-25-208	25HP,208V,VFD,MODULATING SURGE CONTROL	CV-F100A-JTD	CV-FDCNT-100	CV-VFD-25-208
208	30	CV-MVFD-30-208	30HP,208V,VFD,MODULATING SURGE CONTROL	CV-F125A-JTD	CV-FDCNT-200	CV-VFD-30-208
208	40	CV-MVFD-40-208	40HP,208V,VFD,MODULATING SURGE CONTROL	CV-F175A-JTD	CV-FDCNT-200	CV-VFD-40-208
208	50	CV-MVFD-50-208	50HP,208V,VFD,MODULATING SURGE CONTROL	CV-F200A-JTD	CV-FDCNT-200	CV-VFD-50-208
208	60	CV-MVFD-60-208	60HP,208V,VFD,MODULATING SURGE CONTROL	CV-F250A-JTD	CV-FDCNT-400	CV-VFD-60-208
240	10	CV-MVFD-10-240	10HP,240V,VFD,MODULATING SURGE CONTROL	CV-F40A-JTD	CV-FDCNT-60	CV-VFD-10-240
240	15	CV-MVFD-15-240	15HP,240V,VFD,MODULATING SURGE CONTROL	CV-F60A-JTD	CV-FDCNT-60	CV-VFD-15-240
240	20	CV-MVFD-20-240	20HP,240V,VFD,MODULATING SURGE CONTROL	CV-F90A-JTD	CV-FDCNT-100	CV-VFD-20-240
240	25	CV-MVFD-25-240	25HP,240V,VFD,MODULATING SURGE CONTROL	CV-F100A-JTD	CV-FDCNT-100	CV-VFD-25-240
240	30	CV-MVFD-30-240	30HP,240V,VFD,MODULATING SURGE CONTROL	CV-F100A-JTD	CV-FDCNT-100	CV-VFD-30-240
240	40	CV-MVFD-40-240	40HP,240V,VFD,MODULATING SURGE CONTROL	CV-F150A-JTD	CV-FDCNT-200	CV-VFD-40-240
240	50	CV-MVFD-50-240	50HP,240V,VFD,MODULATING SURGE CONTROL	CV-F200A-JTD	CV-FDCNT-200	CV-VFD-50-240
240	60	CV-MVFD-60-240	60HP,240V,VFD,MODULATING SURGE CONTROL	CV-F200A-JTD	CV-FDCNT-200	CV-VFD-60-240
480	10	CV-MVFD-10-480	10HP,480V,VFD,MODULATING SURGE CONTROL	CV-F20A-JTD	CV-FDCNT-30	CV-VFD-10-480
480	15	CV-MVFD-15-480	15HP,480V,VFD,MODULATING SURGE CONTROL	CV-F30A-JTD	CV-FDCNT-30	CV-VFD-15-480
480	20	CV-MVFD-20-480	20HP,480V,VFD,MODULATING SURGE CONTROL	CV-F40A-JTD	CV-FDCNT-60	CV-VFD-20-480
480	25	CV-MVFD-25-480	25HP,480V,VFD,MODULATING SURGE CONTROL	CV-F50A-JTD	CV-FDCNT-60	CV-VFD-25-480
480	30	CV-MVFD-30-480	30HP,480V,VFD,MODULATING SURGE CONTROL	CV-F60A-JTD	CV-FDCNT-60	CV-VFD-30-480
480	40	CV-MVFD-40-480	40HP,480V,VFD,MODULATING SURGE CONTROL	CV-F80A-JTD	CV-FDCNT-100	CV-VFD-40-480
480	50	CV-MVFD-50-480	50HP,480V,VFD,MODULATING SURGE CONTROL	CV-F100A-JTD	CV-FDCNT-100	CV-VFD-50-480
480	60	CV-MVFD-60-480	60HP,480V,VFD,MODULATING SURGE CONTROL	CV-F100A-JTD	CV-FDCNT-100	CV-VFD-60-480



REV	NO.	DESCRIPTION	DATE	BY
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TITLE 10HP,208V,VFD,MODULATING SURGE CONTROL		DATE 8/15/2024		SHEET 2 / 2		REV. -	
UNSPECIFIED TOLERANCES 1 PL ± .030 2 PL ± .020 3 PL ± .003 ANGLE ± 1°		BY BJL		SCALE 0.09		PART NO. CV-MVFD-_-_-	
		J.E. ADAMS INDUSTRIES, LTD.		CEDAR RAPIDS, IOWA			

THIS DOCUMENT SHALL NOT BE REPRODUCED NOR SHALL THE INFORMATION THEREIN BE USED BY OR DISCLOSED TO OTHERS EXCEPT AS AUTHORIZED BY J.E. ADAMS INDUSTRIES