MicroMetl

Since 1965

Economizer & Power Exhaust Combination Package
Install Guide
PECD-SRTCA-D0-L & T

Foremost HVAC Accessory Manufacturer

MicroMetl

Since 1965

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MicroMetl

Select 3 to 15 Tons
Accessory Ultra Low Leak Vertical Economizer Without Controller
Small Rooftop Units

Installation Instructions

For ECD-SRT12CA-D0**, ECD-SRT34CA-D0** & ECD-SRT05CA-D0** Economizers

IMPORTANT: Read these instructions completely before attempting to install the Vertical Economizer Accessory.

Table 1 - Package Contents

PACKAGE NO.	QTY	CONTENTS
ECD-SRT12CA-D0 ECD-SRT34CA-D0**	1 1 1 1 1	Hood Top and Sides Hood Divider Aluminum Filter Hardware Bag Economizer Assembly
ECD-SRT05CA-D0**	1 1 1 2 1 1	Hood Top and Sides Hood Divider Hood Filter Divider Aluminum Filters Hardware Bag Economizer Assembly

Table 2 - Package Usage

UNIT SIZE	PART NUMBER
Small Cabinet, Footprint size: 46 3/4" x 74 3/8"	ECD-SRT12CA-D0**
Large Cabinet, Footprint size: 58 1/2" x 88 1/8"	ECD-SRT34CA-D0**
Extra-Large Cabinet, Footprint size: 63 3/8" x 115 7/8"	ECD-SRT05CA-D0**

SAFETY CONSIDERATIONS

Installation and servicing of air-conditioning equipment can be hazardous due to system pressure and electrical components. Only trained and qualified service personnel should install, repair, or service air-conditioning equipment.

Untrained personnel can perform the basic maintenance functions of replacing filters. All other operations should be performed by trained service personnel. When working on air-conditioning equipment, observe precautions in the literature, tags, and labels attached to the unit, and other safety precautions that may apply. Follow all safety codes. Wear safety glasses and work gloves.

Recognize safety information. This is the safety-alert symbol ⚠. When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury.

Understand the signal words DANGER, WARNING, and CAUTION. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards which will result in severe personal injury or death. WARNING signifies a hazard which could result in personal injury or death. CAUTION is used to identify unsafe practices which may result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which will result in enhanced installation, reliability, or operation.

⚠ WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could cause personal injury and/or death.

Disconnect power supply and install lockout tag before attempting to install the accessory.

GENERAL

The economizer system utilizes the latest technology available for integrating the use of free cooling with mechanical cooling for rooftop units.

This system utilizes gear-drive technology with a direct mount spring return actuator that will close upon loss of power. The ECD-SRT**CA-D0D* system comes standard with an outdoor air temperature sensor. ECD-SRT**CA-D00* includes only actuator, no sensors or controller provided.

IMPORTANT NOTE

Economizers meet many state and national codes pertaining to damper leakage.
Economizer must be installed perfectly square to avoid damper leakage or binding. Squareness tolerance +/- 1/32".

Standard barometric relief dampers provide natural building pressurization control. An optional power exhaust system is available for applications requiring even greater exhaust capabilities.

Economizer accessories require an actuator signal control. These accessories do not include a controller. The economizer actuator is operated by a signal from an field-supplied DDC controller or building management system.

Table 3

	MicroMetl Economizer Part Number	Description
Small Cabinet	ECD-SRT12CA-D0DB-X	For use with Carrier ComfortLink. Includes Belimo MFT Actuator 500 OHM Resistor, 12 Pin plug, and dry bulb outside air sensor.
	ECD-SRT12CA-D0DS-4	For use with Carrier RTU Open, PremierLink, or System Vu. Includes Siemens Actuator 500 OHM Resistor, 12 Pin plug, and dry bulb outside air sensor.
	ECD-SRT12CA-D00B	Economizer with 2-10Vdc Belimo actuator. Use with field supplied controller and sensors.
	ECD-SRT12CA-D00S	Economizer with 2-10Vdc Seimens actuator. Use with field supplied controller and sensors.
Large Cabinet	ECD-SRT34CA-D0DB-X	For use with Carrier ComfortLink. Includes Belimo MFT Actuator 500 OHM Resistor, 12 Pin plug, and dry bulb outside air sensor.
	ECD-SRT34CA-D0DS-4	For use with Carrier RTU Open, PremierLink, or System Vu. Includes Siemens Actuator 500 OHM Resistor, 12 Pin plug, and dry bulb outside air sensor.
	ECD-SRT34CA-D00B	Economizer with 2-10Vdc Belimo actuator. Use with field supplied controller and sensors.
	ECD-SRT34CA-D00S	Economizer with 2-10Vdc Seimens actuator. Use with field supplied controller and sensors.
Extra Large Cabinet	ECD-SRT05CA-D0DB-X	For use with Carrier ComfortLink. Includes Belimo MFT Actuator 500 OHM Resistor, 12 Pin plug, and dry bulb outside air sensor.
	ECD-SRT05CA-D0DS-4	For use with Carrier RTU Open, PremierLink, or System Vu. Includes Siemens Actuator 500 OHM Resistor, 12 Pin plug, and dry bulb outside air sensor.
	ECD-SRT05CA-D00B	Economizer with 2-10Vdc Belimo actuator. Use with field supplied controller and sensors.
	ECD-SRT05CA-D00S	Economizer with 2-10Vdc Seimens actuator. Use with field supplied controller and sensors.

Notes:
1. All actuators are spring-return closed without power

Table 4 - Sensor Usage For ECD-SRT**CA-D0DB-X For ComfortLink

APPLICATION	OUTDOOR AIR TEMPERATURE SENSOR	RETURN AIR TEMPERATURE SENSOR	OUTDOOR AIR ENTHALPY SENSOR	RETURN AIR ENTHALPY SENSOR
Dry Bulb Temperature	Included	Included	—	—
Differential Dry Bulb Temperature	Included	Required — 33ZCT55SPT	—	—
Single Enthalpy	Included	—	Required — HH57AC077	—
Differential Enthalpy	Included	—	Required — HH57AC077	Required — HH57AC078

Note: Factory sensor part numbers shown.

Table 4A - Sensor Usage For ECD-SRT**CA-D0DS For System Vu

APPLICATION	OUTDOOR AIR TEMPERATURE SENSOR	RETURN AIR TEMPERATURE SENSOR	OUTDOOR AIR ENTHALPY SENSOR	RETURN AIR ENTHALPY SENSOR
Dry Bulb Temperature	Included	Included	—	—
Differential Dry Bulb Temperature	Included	Required — CRTEMPSN001A00	—	—
Single Enthalpy	Included	—	Required — CRHUMDSN001B00	—
Differential Enthalpy	Included	—	—	Required — CRHUMDSN001B00

Note: Factory sensor part numbers shown.

Table 4B - Sensor Usage For ECD-SRT**CA-D0DS For RTU Open or PremierLink

APPLICATION	OUTDOOR AIR TEMPERATURE SENSOR	RETURN AIR TEMPERATURE SENSOR	OUTDOOR AIR ENTHALPY SENSOR	RETURN AIR ENTHALPY SENSOR
Dry Bulb Temperature	Included	Included	Included	—
Differential Dry Bulb Temperature	Included	Required — CRTEMPSN001A00	—	—
Single Enthalpy	Included	—	Required — 33CSENTHSW	—
Differential Enthalpy	Included	—	—	Required — 33CSENTHSW

Note: Factory sensor part numbers shown.

ACCESSORIES LIST

The Economizer has several field-installed accessories available to optimize performance. Refer to Table 5 for authorized parts and power exhaust descriptions

Table 5 - Economizer Field-Installed Accessories

DESCRIPTION	PART NUMBER
Small Cabinet Power Exhaust 208-230 v 1 Ph	PPD-SRT12TA-D-1V
Small Cabinet Power Exhaust 460 v 3Ph	PPD-SRT12TA-D-4V
Large Cabinet Power Exhaust 208-230 v 1 Ph	PPD-SRT34TA-D-1V
Large Cabinet Power Exhaust 460 v 3 Ph	PPD-SRT34TA-D-4V
Extra Large Cabinet Power Exhaust 208-230 v 1 Ph	PPD-SRT05TA-D-1V
Extra Large Cabinet Power Exhaust 460 v 3 Ph	PPD-SRT05TA-D-4V

Note: Power exhausts listed above are propeller type. Centrifugal power exhausts are also available.

INSTALLATION

1. Turn off unit power supply(s) and install lockout tag.

⚠ WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury and/or death.

Disconnect power supply and install lockout tag before attempting to install accessory.

2. Remove the existing unit filter access panel. Raise the panel and swing the bottom outward. The panel is now disengaged from the track and can be removed. (See Fig. 2.)
3. Remove the indoor coil access panel and discard. (See Fig. 2.)
4. The box with the economizer hood components is shipped with the economizer. Remove hood from packaging. The hood top and sides are shipped factory assembled.

NOTE: If the power exhaust accessory is to be installed on the unit, the hood shipped with the economizer will not be used and may be discarded. Save the aluminum filter for use in the power exhaust hood assembly.

5. Insert the hood divider between the hood sides. (See Fig. 3) Secure hood divider with 2 screws (provided) on each hood side. Screws should go through the hood sides into the divider. The hood divider is also used as the bottom filter rack for the aluminum filter. On hood for extra large cabinet install filter divider. (See Fig. 4.)
6. Slide the Economizer assembly into the rooftop unit. (See Fig. 6). On small and large cabinets be sure to engage the rear economizer flange under the tabs in the return-air opening of the unit base. (See Fig. 7)

IMPORTANT NOTE

Economizers meet many state and national codes pertaining to damper leakage.

Economizer must be installed perfectly square to avoid damper leakage or binding. Squareness tolerance +/- 1/32”.

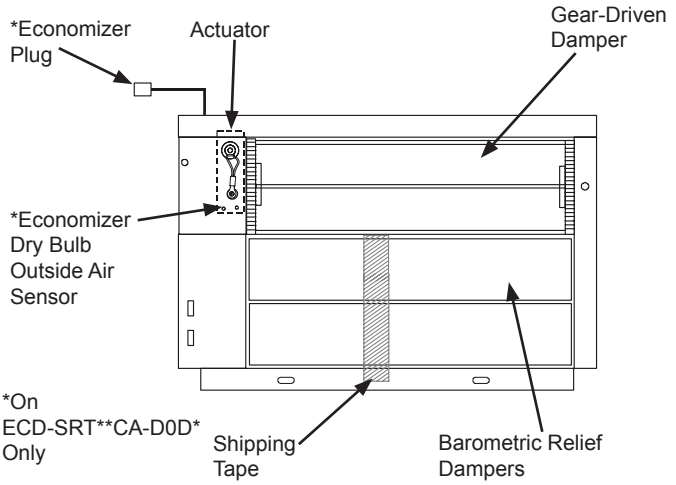

Fig. 1 - Economizer Component Locations — (Small Cabinet Economizer Shown)

7. Secure the economizer to unit along side and bottom flanges using the screws provided. (See Fig. 6)
8. Remove the tape securing the relief dampers in place.
9. For ECD-SRT**CA-D0D* remove and save the 12-pin jumper plug from the unit wiring harness (located in the upper left corner of the unit). Insert the economizer plug into the unit wiring harness. Refer to Fig. 9 for typical wiring diagram.

NOTE: The 12-pin jumper plug should be saved for future use, in the event that the economizer is removed from the unit. The jumper plug is not needed as long as the economizer is installed.

10. While everything is open install and wire any other accessories and/or sensors as applicable and convenient, per their installation instructions. Some accessories require that unit ducting already be installed.
11. Attach the provided economizer controls to a field supplied economizer control system.

NOTE: If also installing a power exhaust accessory, skip step 12 and follow the power exhaust instructions instead.

12. Some economizer hoods require that the hood divider be field installed into hood per Fig. 3. Install economizer hood over the economizer. Use screws provided see Fig. 3.
13. Check all wiring for safety then reapply power to the unit. Verify correct operation and setting of the accessory(s) per the Configuration and Operations sections of the instruction.
14. Replace the filter access panel. Slide top of panel into track and lift. Push bottom of panel into place.
15. Install the economizer hood filter(s) by opening the filter clips which are located underneath the hood top. Insert the aluminum filter(s) into the bottom filter rack (hood divider). Push the filter into position past the open filter clips. Close the filter clips to lock the filter into place. (See Fig. 5.)
16. To adjust economizer minimum position and other settings, refer to instructions provided with specific field supplied economizer controller.

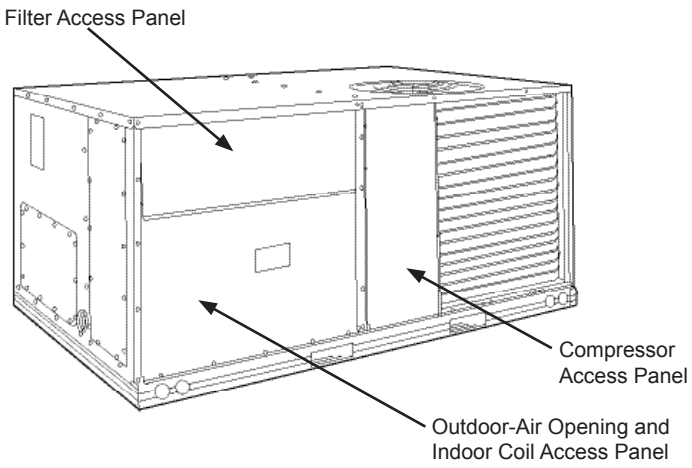

Fig. 2 - Typical Access Panel Locations

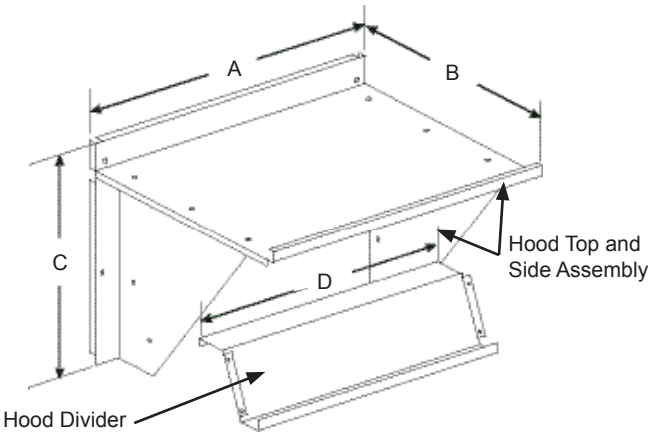

Fig. 3 - Hood Assembly

ECONOMIZER P/N	A	B	C	D	SHIP WT.
ECD-SRT12CA-D0**	33 3/8”	17 1/2”	19 1/16”	29 1/2”	49 lb
ECD-SRT34CA-D0**	40 3/8”	22 3/8”	24 1/2”	36 1/4”	70 lb
ECD-SRT05CA-D0**	52 15/16”	27 1/16”	33 7/16”	50”	126 lb

NOTE: The ECD-SRT05CA hood has 2 aluminum filters and a hood filter divider that installs between the filters.

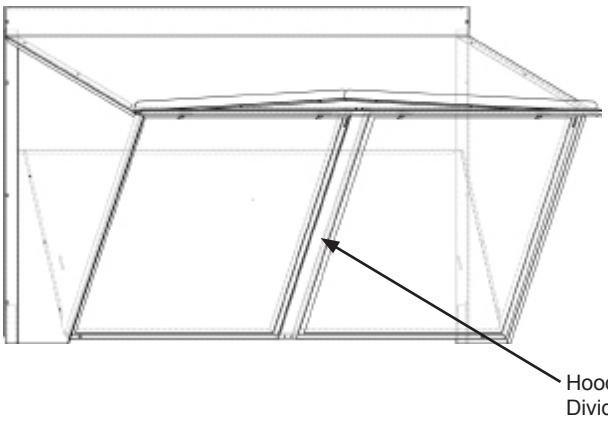

Fig. 4 - Hood for Extra Large Cabinet

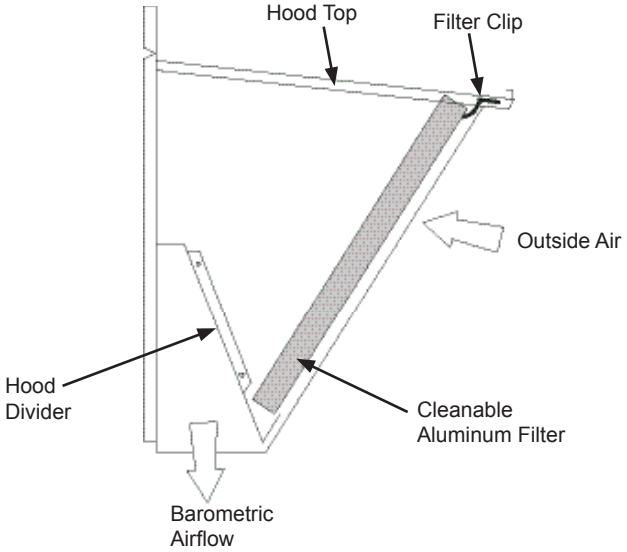

Fig. 5 - Filter Installation

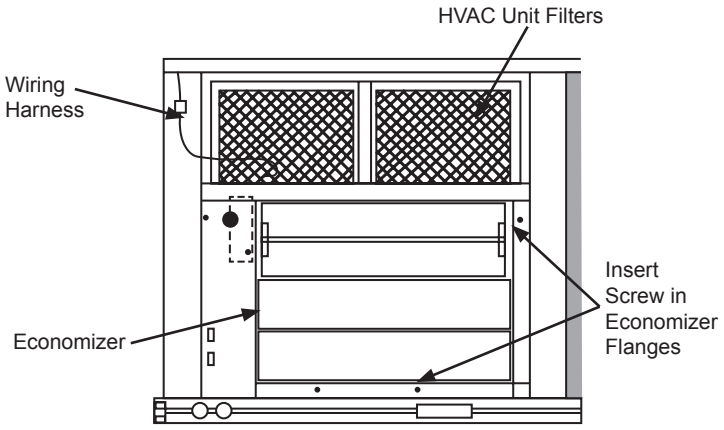

Fig. 6 - Economizer Installed in HVAC Unit (Small Cabinet Economizer Shown)

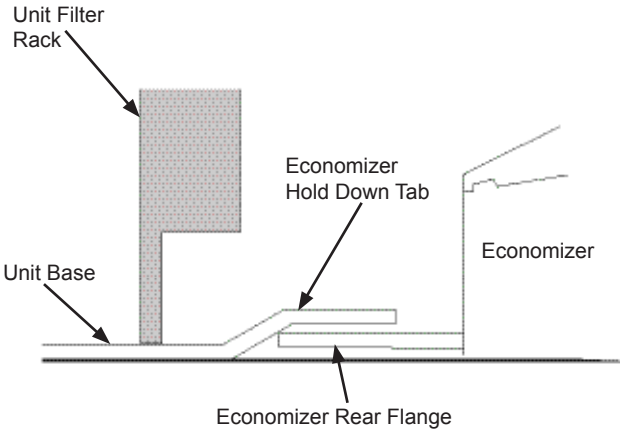

Fig. 7 - Rear Economizer Flange Installation (Small and Large Cabinet)

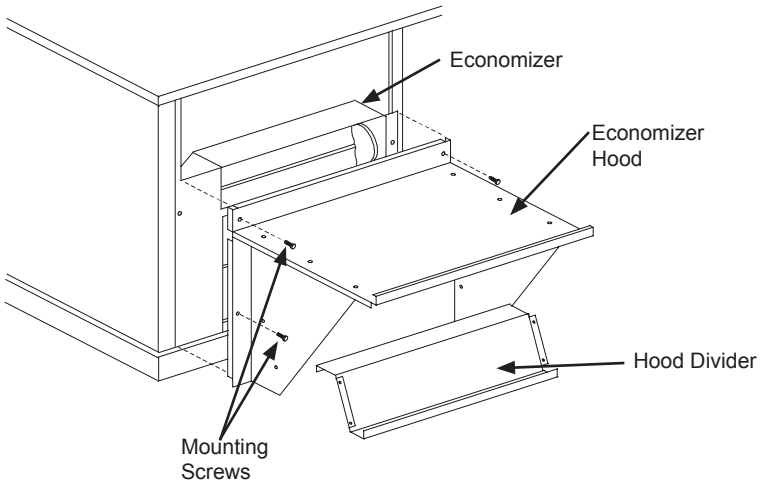

Fig. 8 - Economizer Hood Installation

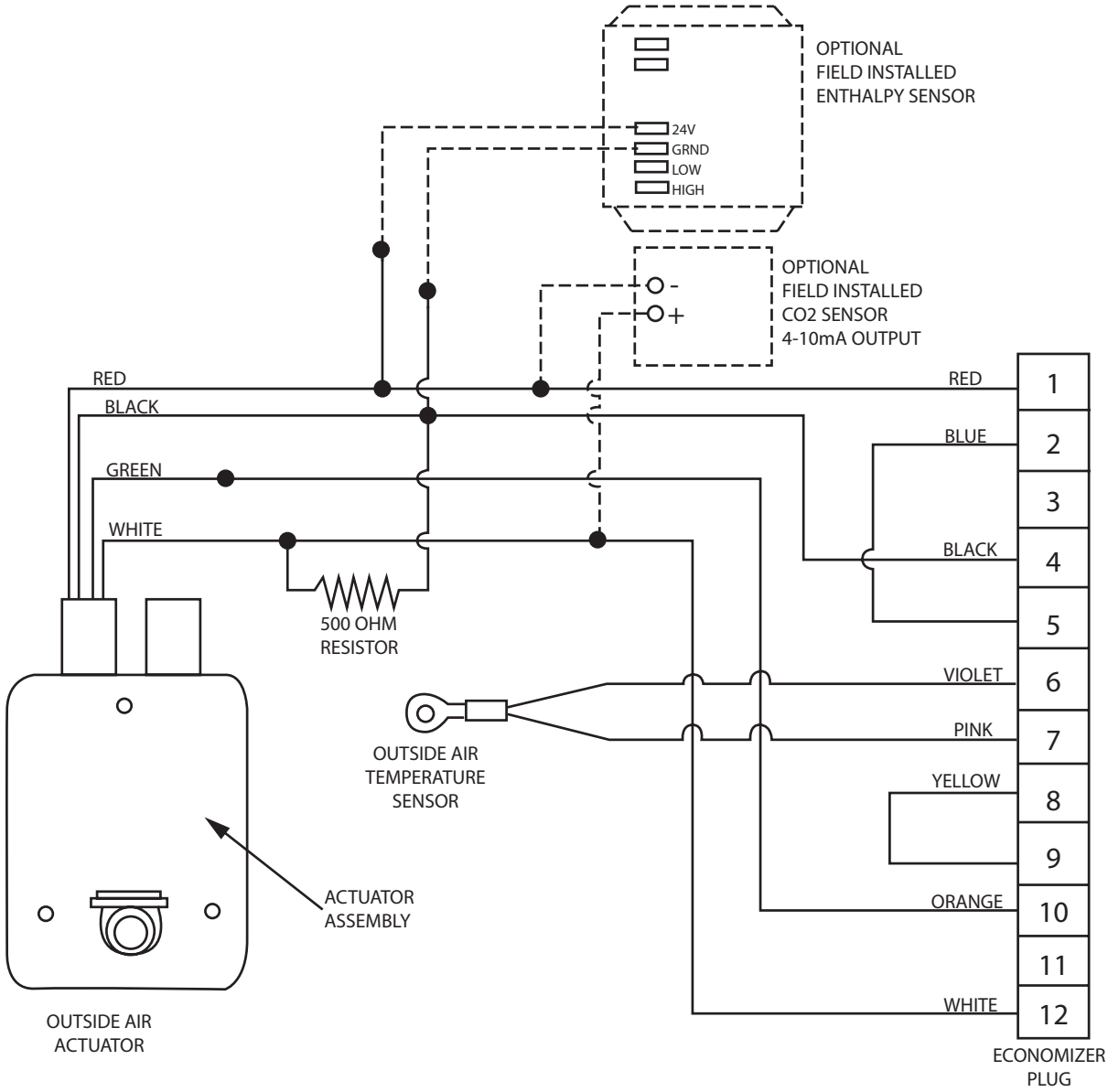

Fig. 9 - Typical Wiring (ECD-SRTCA-D0DB-X Shown)**

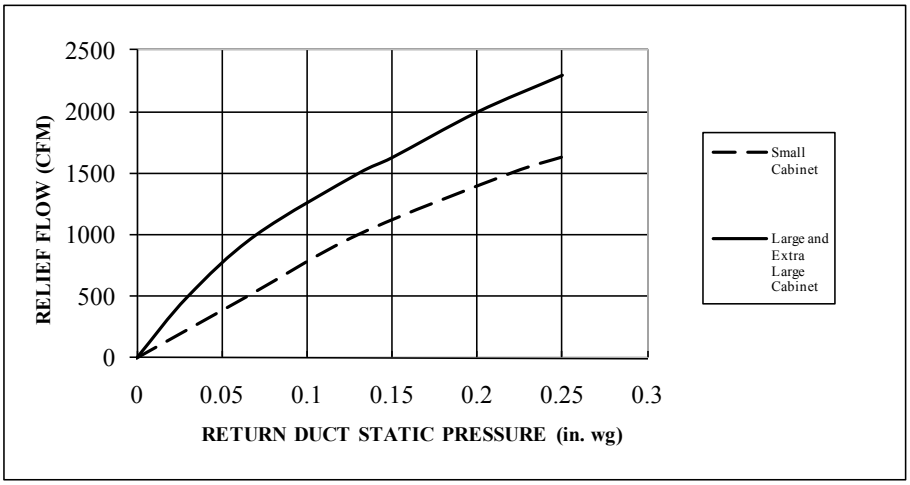

Fig. 10 - Barometric Relief Flow Capacity

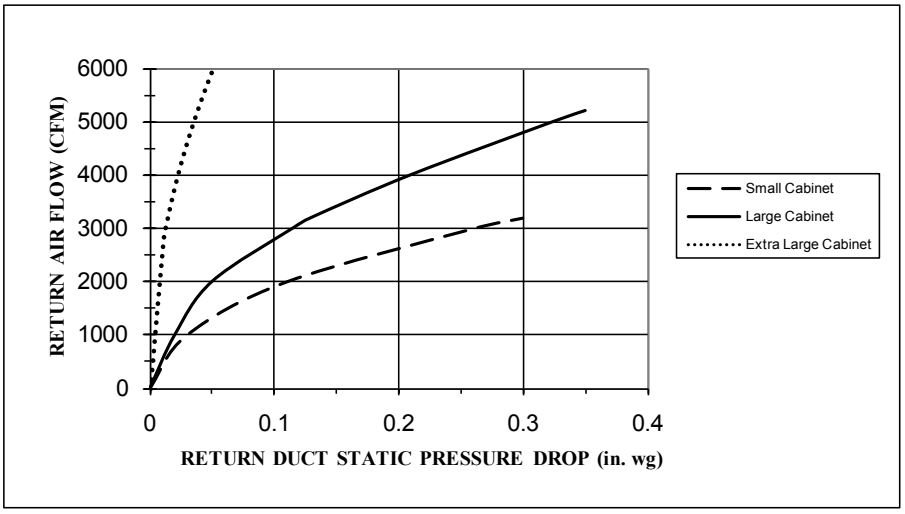

Fig. 11 - Return Air Pressure Drop

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INSTALLATION INSTRUCTIONS
Power Exhaust Option
Centrifugal Blower

GENERAL

IMPORTANT: *Read these instructions completely before attempting to install this economizer accessory.*

These instructions are intended as a general guide and do not supersede Building and/or Electrical codes in any way.

All phases of the installation must comply with all NATIONAL, STATE and LOCAL CODES.

IMPORTANT: *This document is the property of the end user and is to remain with the equipment.*

Installation and servicing of air conditioning equipment can be hazardous due to high pressures of hazardous gases, moving parts, and electrical components. Only trained and qualified service personnel should install, service, or repair air conditioning equipment

Untrained personnel can perform basic maintenance functions of cleaning coils, and cleaning and replacing filters, but all other operations should be performed by trained service personnel.

When working on air conditioning equipment, observe precautions in literature, tags, and labels attached to the unit, and other safety precautions that may apply.

The optional Power Exhaust systems, available for Economizer applications, include Constant Volume Propeller Fan, Constant Volume Centrifugal Blower, and Variable (Modulating) Centrifugal Blower for building pressure control. In some cases, this assembly will replace the OA Hood and Relief Hood of the Economizer. In others only the Relief Hood is replaced.

The following instructions are for the installation of the RTU mounted exhaust for Downflow (Vertical) applications, and Duct Mounted (Horizontal) applications. Any wiring information provided in these instructions is provided for wire routing and generic connections, only. See Supplemental Instructions and/or provided wiring diagram for all electrical connections and/or Set Up procedures.

Optional motorized relief is also available for positive closure. See Motorized Relief Supplemental Instructions for more details.

Note: *A dedicated power source and disconnect may be required when installing a power exhaust.*

Note: *External Static will be specific to each job and will include everything external of the Power Exhaust cabinet, including the RTU and Return Air opening.*

SAFETY CONSIDERATIONS

⚠ WARNING

Turn off main power to the roof top unit (RTU) or air handling unit (AHU). Lockout and tag disconnect switch before starting installation, performing service, or maintenance operations.

Electrical shock and/or moving parts could cause personal injury, or death.

CAUTION

HEAVY OBJECT

To prevent personal injury use lifting aides and proper lifting techniques when installing, removing or replacing.

CAUTION

When working on air conditioning equipment, observe precautions in literature, tags and labels attached to the unit and other safety precautions that may apply.

Installation and servicing of air conditioning equipment can be hazardous due to high pressures of hazardous gases, moving parts, electrical components, and sharp sheet metal parts. Wear safety glasses and gloves.

Only trained and qualified service personnel should install, service, or repair air conditioning equipment. Untrained personnel can perform basic maintenance functions of cleaning coils, and cleaning and replacing filters, but all other operations should be performed by trained service personnel.

PRE-INSTALLATION

1. **Inspect Shipment for Damage** - File claim with shipping company if accessory is damaged or incomplete. Contact your supplier for any missing parts.

Important: *To eliminate any delays in shipping and to insure part(s) replacement accuracy, provide the Economizer/Power Exhaust Model Number and Production Number.*

2. **Check Unit Clearance** - In addition to the clearances required for the RTU, provide sufficient space for airflow clearance, wiring, and servicing this accessory after it is mounted on unit - See Submittal Data for unit dimensions and weight.

Exhaust/Outside Air Hood	24”
Access Door(s)	36”
Top	36”

INSTALLATION

Please read these instructions thoroughly before beginning the installation.

Constant Volume and Modulating Downflow Installations:

1. Follow the instructions provided with the economizer to complete the economizer installation.

2. Set Power Exhaust Assembly in front of HVAC unit and check to be sure all clearances are met - See Pre-Installation Step 2.

3. If provided attach Molex 4-pin plug (Orange / Yellow wires) to Receptacle in Economizer Panel for Start/Stop Control. If not, route the Start/Stop (Orange/Yellow) control wires to the Economizer Control Exhaust Fan terminals, Actuator Auxiliary Switch wires, or Building Management System for unit Start/Stop function. See Supplemental Instructions and/or provided wiring diagram for wiring details.

4. **Skip this step if not installing Modulating Power Exhaust.** If tubing was pre-installed prior to RTU installation, route MicroMetl factory supplied pressure tubing to the location the pre-installed tubing was terminated (cut to length if necessary). Connect factory tubing to the field installed tubing (may require a field supplied coupler)

Note: *If tubing not pre-installed, approximately 25 ft. of tubing is supplied with Power Exhaust that can be fed down the return air duct, or with stat wire, to building envelope.*

Important! *Do Not terminate tubing in ductwork! The negative pressure of the return air is not representative of building pressure - See Figure 1.*

5. Install room pressure sensing port (factory supplied) in ceiling or wall. Avoid close proximity to supply registers. A Coaxial cover plate (field supplied) may be used for a clean finish - See Fig. 1

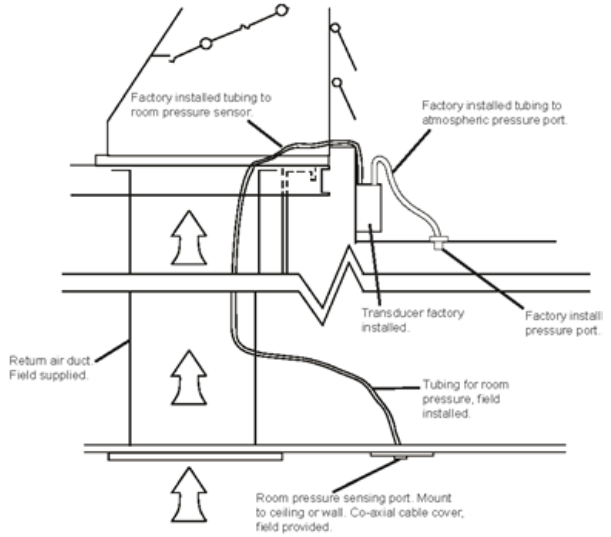

Fig. 1 - Typical Pressure Tubing Installation

6. Tip power exhaust back and elevate onto RTU base rail.

7. Being careful not to pinch control wires and/or tubing at bottom of unit, tilt power exhaust up to mate with RTU. Properly installed the top and both sides will be flush with RTU. Attach with provided screws. Use provided Blank-off panel where applicable.

8. Some models require a field installed Hood over the Relief Dampers. If a pre-installed Hood was removed for access to screws, re- install at this time.

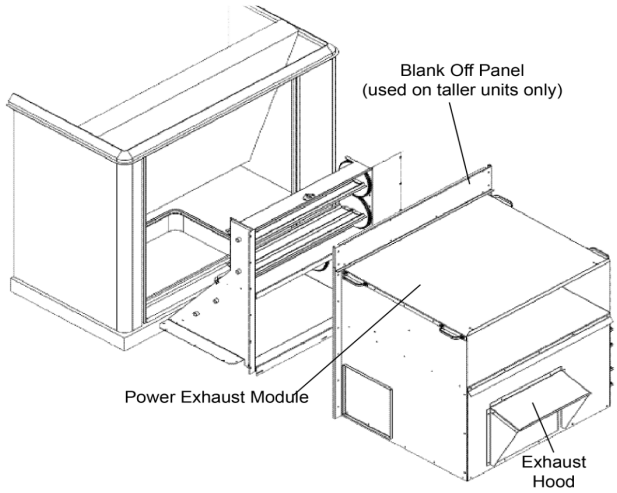

Fig. 2 - Typical Small to Midsize Downflow Power Exhaust with Built-in OA Hood (Not unit specific)

9. Install all Filler Panel(s) where necessary.

10. Caulk all seams to ensure weather tight seal

11. Connect Power Exhaust to an electrical source in accordance with voltage specified on the MicroMetl Name Plate affixed to the Power Exhaust Assembly. Please adhere to all applicable National, State, and Local Codes.

Note: *A knockout and junction box is provided for external routing of High Voltage Power. High Voltage (SEOOW) Cable for internal routing of High Voltage Power is not provided. All High Voltage wiring and connections to be provided by others.*

12. Open the Blower Door for inspection of the following:

- Wires free from moving parts
- Tubing free from kinks and moving parts
- Belt(s) for tension and alignment
- Sheaves and Pulley’s properly tightened (Set Screws Tight).

13. Open the Control Door and inspect all electrical connections.

14. See Wiring Diagram for wiring information.

15. For Modulating units (VFD controlled) units, see Supplement Control Document for setup and wiring options

Constant Volume and Modulating Horizontal Installations:

1. Follow the instructions provided with the economizer to complete the economizer installation.

2. Set Power Exhaust assembly in front of intended mounting location of the Horizontal Duct and check to be sure all clearances are met - See Table 1 on pg. 2.

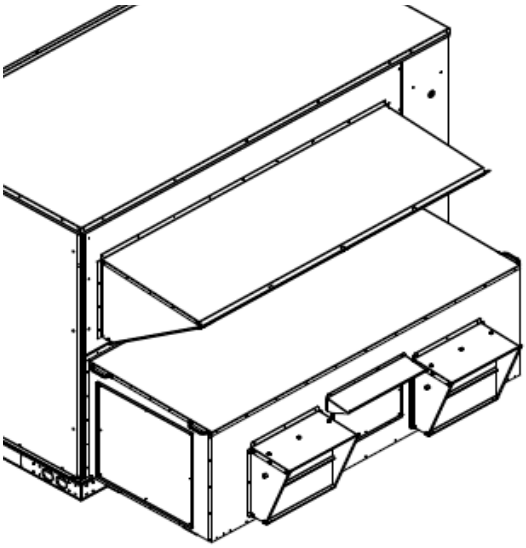

Fig. 3 - Typical Large Downflow Installation

3. Measure and cut opening in Horizontal Duct to match Power Exhaust opening.

4. Mount the Power Exhaust assembly to the duct with the provided screws and caulk all seams to ensure weather tight seal. Field fabricated support legs, or other support mechanism may be required. See Fig. 4.

Note: *Some units come with Duct Plenums - See Fig. 5 - as part of the assembly. In this case, attach the Plenum to the RTU then connect the ductwork. Set the Power Exhaust in front of the opening and route any tubing and wiring through the RA opening. Then lift and attach the Power Exhaust.*

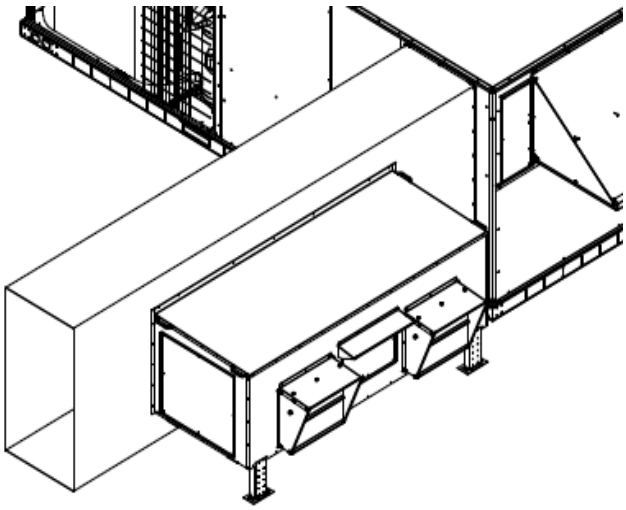

Fig. 4 - Typical Large Horizontal Power Exhaust Installation

5. Open the Blower Door to access the Start/Stop control wiring and pressure tubing (Modulating version only). Route the Start/Stop (Orange/Yellow) control wires to the Economizer Control Exhaust Fan terminals, Actuator Auxiliary Switch wires, or Building Management System for unit Start/Stop function. See Supplemental Instructions and/or provided wiring diagram for wiring details.

6. **Skip this step if not installing Modulating Power Exhaust.** If tubing was pre-installed prior to RTU installation, route MicroMetl factory supplied pressure tubing to the location the pre-installed tubing was terminated (cut to length if necessary). Connect factory tubing to the field installed tubing (may require a field supplied coupler)

Note: *If tubing not pre-installed, approximately 25 ft. of tubing is supplied with the Power Exhaust that can be routed to the building envelope.*

Important! *Do Not terminate tubing in ductwork! The negative pressure of the return air is not representative of building pressure - See Figure 1.*

7. Install room pressure sensing port (factory supplied) in ceiling or wall. Avoid close proximity to supply registers. A Coaxial cover plate (field supplied) may be used for a clean finish - See Fig. 1

8. Connect the Power Exhaust to an electrical source in accordance with voltage specified on the MicroMetl Name Plate affixed to the power exhaust assembly. Please adhere to all applicable National, State, and Local Codes.

Note: *A knockout and junction box is provided for external routing of High Voltage Power. High Voltage (SEOOW) Cable for internal routing of High Voltage Power is not provided. All High Voltage wiring and connections to be provided by others.*

9. Open blower door for inspection of the following:

- Wires free from moving parts
- Tubing free from kinks and moving parts
- Belt(s) for tension and alignment
- Sheaves and Pulley's properly tightened (Set Screws Tight).

10. Open control door and inspect all electrical connections.

11. See Wiring Diagram for wiring information.

12. For Modulating units (VFD controlled) see Supplement Control Document for setup and wiring options.

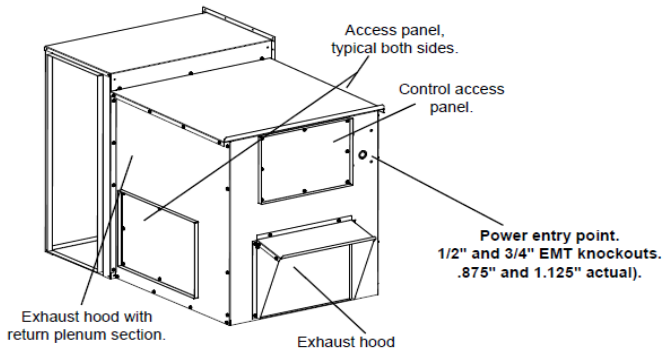

Fig. 5 - Horizontal Duct Mount with Plenum

MicroMetl Indianapolis
3035 N. Shadeland Ave., Suite 300
Indianapolis, IN 46226
1.800.MMC.HVAC (EST)
indycustomerservice@micrometl.com

MicroMetl Longview
201 Kodak Blvd.
Longview, TX 75602
1.903.248.4800 (CST)
longviewcustomerservice@micrometl.com

MicroMetl Sparks
905 Southern Way
Sparks, NV 89431
1.800.884.4662 (PST)
sparkscustomerservice@micrometl.com

GENERAL

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IMPORTANT: *This document is the property of the end user and is to remain with the equipment.*

Installation and servicing of air conditioning equipment can be hazardous due to high pressures of hazardous gases, moving parts, and electrical components. Only trained and qualified service personnel should install, service, or repair air conditioning equipment.

Untrained personnel can perform basic maintenance functions of cleaning coils, and cleaning and replacing filters, but all other operations should be performed by trained service personnel.

When working on air conditioning equipment, observe precautions in literature, tags, and labels attached to the unit, and other safety precautions that may apply.

The MicroMetl optional Power Exhaust systems available for Economizer applications include Constant Volume Propeller Fan, Constant Volume Centrifugal Blower, and Variable (Modulating) Centrifugal Blower for building pressure control. The following pages will address the Modulating version.

When ordered with modulaing controls, the MicroMetl Power Exhaust comes standard with VFD for motor modulation, a Pressure Transducer to monitor building pressure, and fuses. About 25' of vinyl tubing is provided to be routed into the building along with a pressure terminal. The VFD is programmed for stand alone function and does not require any setup. However, occasionally the building pressure setpoint (PI) may need to be addressed.

The system may also be ordered without the Transducer for Third Party Control. If ordered for Third Party Control, a standard program will be uploaded; however, the program can be field modified as needed to be used with or without BACnet.

Optional Motorized Relief is available for positive closure. See supplemental instructions for the Motorized Relief for more details.

SAFETY CONSIDERATIONS

⚠ WARNING

Turn off main power to the roof top unit (RTU) or air handling unit (AHU). Lockout and tag disconnect switch before starting installation, performing service, or maintenance operations.

Electrical shock and/or moving parts could cause personal injury, or death.

CAUTION

When working on air conditioning equipment, observe precautions in literature, tags and labels attached to the unit and other safety precautions that may apply.

Installation and servicing of air conditioning equipment can be hazardous due to high pressures of hazardous gases, moving parts, electrical components, and sharp sheet metal parts. Wear safety glasses and gloves.

Only trained and qualified service personnel should install, service, or repair air conditioning equipment. Untrained personnel can perform basic maintenance functions of cleaning coils, and cleaning and replacing filters, but all other operations should be performed by trained service personnel.

KEYPAD OPERATING AND STATUS DISPLAY

Upon Power Up the Inverter is in Operating Mode, after a short initialization phase.

In the Operating Mode, the Keypad displays information on the Status of the Inverter.

Lenze i510 QR Code

Keypad Display	Display Meaning
If the inverter is inhibited, the keypad shows “STOP”: 1 2 3 VEL:FLEX:AIN1 STOP LOC REM MAN AUTO SET↵ 5 If the Inverter is enabled, the Keypad shows the Output Frequency of the Inverter: 1 4 VEL:RUN:FWD Hz 20.0 LOC REM MAN AUTO SET↵ 5 In the Process Control Mode, instead of the Output Frequency, the Process Control Setpoint is displayed. PID:FLEX:AIN2 50.00 LOC REM MAN AUTO SET↵	1 - Active Control Mode: VEL Speed Mode PID Process Control Mode TRQ Torque Mode JOG Manual Mode 2 - Active Control Source: FLX Flexible I/O Configuration KPD Keypad KPDF Keypad (complete control via Keypad including set-point selection NET Network 3 - Active Setpoint Source: AINx Analog input x KPD Keypad NET Network FREQ Digital frequency PRx Preset setpoint x SEGx Segment x MOP Motor potentiometer 4 - Current direction of rotation: FWD Motor is rotating forwards REV Motor is rotating backwards 5 - Lower status line: LOC Local keypad control active. REM Remote control via terminals, network, etc. active. MAN Manual setpoint selection via keypad active. AUTO Automatic setpoint selection via terminals, network, etc. active. SET Blinking if one parameter setting has been changed but has not been saved in the memory module with mains failure protection. Save settings: Press keypad enter key longer than 3s.
If an error is pending, the keypad shows the following information: 1 Warn. DC Bus UV 01 W 3221 LOC REM MAN AUTO SET↵ 2 3 Faults (F) and trouble (T) are displayed continuously. Warnings (W) are only displayed every 2 seconds for a short time.	1 - Error Text 2 - Error Type: F Fault T Trouble W Warning 3 - Error Code (hexadecimal)
Restart Pending AI1 fault 01 W 3221 LOC REM MAN AUTO SET↵	After a disturbance, a restart is possible if the error condition is not active anymore. The keypad shows this by the “Restart Pending” note. The note is displayed in a 1-second interval alternating with the error text

MicroMetl VFD Programming does not require all keys on the Keypad to be functional. The functional keys are the Navigation (UP/DOWN) Arrows, the Enter (Go to Menu/Parameter) Key, and the Exit (Quit) Key.

***IMPORTANT!** - For Safety reasons the **Stop Motor Key** is also valid, but the Start Motor Key will not restart the blower if the Stop Motor Key is pressed.*

To restart the blower after the Stop Motor Key is pressed the following steps must be performed:

1. Press the Start Motor Key to change the Display from **KSTOP** to **STOP**.

2. Cycling the device is also required by:

   a. Remove the Start/Stop Signal between the 24V and DI1 terminals for approx. 3 seconds; OR:
   b. Unplug the 6-Pin Plug for approx. 3 seconds; OR:
   c. Cycle Power to the Power Exhaust. The Display must go blank before re-applying power.

Neither the CTRL (Keypad Control), nor the R/F(Change Direction) Key are valid. If pressed Error will be displayed.

	Navigation in the menu Parameter alteration
	Go to Menu/Parameters Confirm parameter
	Quit Menu/Parameters
	Keypad control
	Start motor
	Change direction of rotation
	Stop motor

PARAMETERS

The Parameter List in this Drive is extensive and many are unrelated to this application; therefore, only a limited number of Parameters will be accessible for manipulation. All other Parameters will be Read Only. The Limited Parameters are found in Group 0 (Favorites) and can be accessed as follows:

1. Use the ↵ (Enter) key in the operating mode to navigate to the parameterization mode one level below. Password in the upper left corner with 0 in the lower right will appear.

***Note:** By using the ↩ (Back) key you can navigate one level upwards again at anytime. By using the ↩ key you can also exit (abort) the editing mode without accepting the new setting.*

2. Use the Enter key a second time and GROUP 0 will appear. You are now in the parameter level of the group selected. Press Enter again and P100.00 or similar will appear.

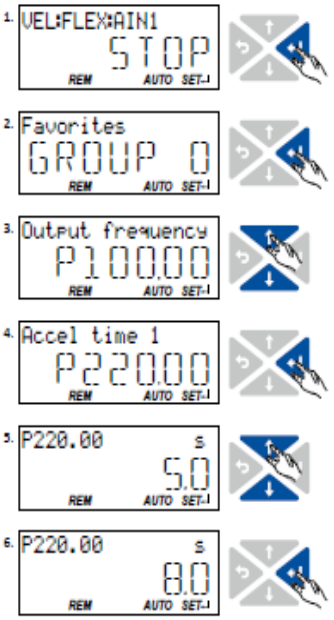
3. Use the ↑ (UP) and ↓ (DOWN) navigation keys to move to the desired parameter.

4. Use the ↵ key to enter the desired Parameter. You are now in the Editing Mode.

5. Set the desired value using the ↑ and ↓ navigation keys.

6. Use the ↵ key to accept the changed setting. The Editing Mode is exited.

***Note:** If one or more parameter setting has been changed with the keypad but has not been saved in the memory module with mains failure protection, the SET display is blinking.*
In order to save parameter settings in the user memory of the memory module, press the keypad Enter key longer than 3 seconds. Cycle power to the Inverter for new parameter to take effect.



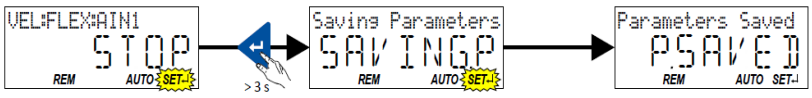


Table 2 - MicroMetl Group 0 Favorites List

The Favorites Parameters List is as follows:

1. P100.00 - Output Frequency (Read Only)
2. P104.00 - Motor Current - Running Value (Read Only)
3. P106.00 - Motor Voltage - Actual Input (Read Only)
4. P150.00 - DC-bus on-UV (Read Only)
5. P201.01 - Frequency Setpoint Source
6. P210.00 - Minimum Frequency
7. P211.00 - Maximum Frquency
8. P220.00 - Acceleration Time (Freq. Mode)
9. P221.00 - Deceleration Time (Freq. Mode)
10. P302.00 - V/f Characteristics
11. P305.00 - Switching Frequency
12. P308.01 - Max Load Amps (%)
13. P310.01 - Motor Phase Failure Response
14. P310.02 - Current Threshold
15. P310.03 - Voltage Threshold
16. P317.01 - Skip Frequencies - Skip Freq. 1
17. P317.02 - Skip Frequencies - Skip Bandwidth 1
18. P317.03 - Skip Frequencies - Skip Freq. 2
19. P317.04 - Skip Frequencies - Skip Bandwidth 2
20. P323.00 - Motor Current (Amps)
21. P324.00 - Max Current (%)
22. P400.37 - Network Control
23. P420.01 - Relay Function
24. P420.02 - DO1 Function
25. P430.01 - AI1 Input Range
26. P508.00 - BACnet Activate Network
27. P510.01 - BACnet MS/TP MAC Address
28. P510.02 - BACnet Baudrate
29. P510.03 - BACnet Data Format (Fixed)
30. P510.04 - BACnet Device ID #
31. P510.05 - BACnet Device Name
32. P510.06 - BACnet Min. Response Delay
33. P510.07 - BACnet Max Master Property
34. P510.08 - BACnet Max Info Frames
35. P510.09 - BACnet 'I-AM' Service
36. P510.10 - BACnet Re-initialization Service
37. P514.01 - BACnet COM Loss Time-out
38. P515.01 - BACnet COM Loss Reaction
39. P600.02 - PID AI1 Process Variable
40. P606.01 - PID Acceleration Time
41. P606.02 - PID Deceleration Time
42. P610.01 - PID Sleep Mode Activation
43. P610.02 - PID Sleep Mode Stop Method
44. P610.03 - PID Sleep Mode Freq. Threshold
45. P610.04 - PID Sleep Mode Feedback Threshold
46. P610.05 - PID Sleep Mode Delay Time
47. P610.06 - PID Sleep Mode Recovery
48. P700.01 - Load VFD Default Settings
49. P700.05 - Load OEM Default Settings

Table 3 - MicroMetl Group 0 Settings Values

P201 - Frequency Setpoint Source:

1. Keypad
2. **Analog Input 1** ***(dependent on program)***
3. **Analog Input 2** ***(dependent on program)***
5. Network

P210/211 - Min/Max Frequency:

15Hz Min/60Hz Max

P220/221 - Accel/Decel Time:

5 or 10 Seconds Accel / 5 or 10 Seconds Decel
(dependent on program)

P302 - V/f Characteristics:

0 - Linear
1 - Quadriatic
2 - Multipoint
3 - Eco

P305 - Switching Frequency:

1. 4 kHz variable / drive-optimised
2. 8 kHz variable / drive-optimised
3. 16 kHz variable / drive-optimised 5. 2 kHz fixed / drive-optimized
6. 4 kHz fixed / drive-optimised
7. 8 kHz fixed / drive-optimised
8. 16 kHz fixed / drive-optimised
11. 4 kHz variable / min. Pv
12. 8 kHz variable / min. Pv
13. 16 kHz variable / min. Pv
15. 2 kHz constant/min. Pv
16. 4 kHz constant/min. Pv
17. 8 kHz constant/min. Pv
18. 16 kHz constant/min. Pv
21. 8 kHz variable / drive-optimised / 4 kHz min.
22. 16 kHz variable / drive-optimised / 4 kHz min.
23. 16 kHz variable / drive-optimised / 8 kHz min.
31. 8 kHz variable /min. Pv / 4 kHz min.
32. 16 kHz variable /min. Pv / 4 kHz min.
33. 16 kHz variable /min. Pv / 8 kHz min.

P308.01 - Max Load Amps (%)

150%

P310.01 - Motor Phase Protection Failure
0 - No Response
1 - Warning
2 - Trouble
3 - Fault

P310.02 - Motor Phase Protection Current Threshold
5 %

P310.03 - Motor Phase Protection Voltage Threshold
25 Volts @ 230V
40 Volts @ 460V

P317 - Skip Frequencies/Bandwidth
Hz

P323 - Motor Current
Dependent on Size

P324 - Max Current
200%

P400 - Network Connection
0 - Not Connected
1 - Constant TRUE
11 - Digital Input 1
12 - Digital Input 2
13 - Digital Input 3
14 - Digital Input 4
15 - Digital Input 5

P420 - Relay and DO1 Function
0 - Not Connected
1 - Constant TRUE
11 - Digital Input 1 ***(DO1 Function Default)***
12 - Digital Input 2
13 - Digital Input 3
14 - Digital Input 4
15 - Digital Input 5
51 - Ready for Operation ***(Relay Function Default)***
52 - Operation Enabled
53 - Stop Active
56 - Error Active
57 - Error (non-resettable) Active
60 - Heatsink Temperature Warning Active
66 - Flying Restart Active
67 - DC Brake Active
69 - Rotational Direction Reversed
70 - Frequency Threshold Exceeded
72 - Setpoint Speed Reached
73 - PID Feedback = Setpoint
74 - PID Idle State Active
75 - PID Min Alarm Active
76 - PID Max Alarm Active
77 - Min/Max Alarm Active
78 - Current Limit Reached
81 - Error of Analog Input 1 Active
82 - Error of Analog Input 2 Active
104 - Local Control Active
105 - Remote Control Active
106 - Manual Setpoint Selection Active
107 - Automatic Setpoint Selection Active
115 - Release Holding Brake
117 - Motor Phase Failure

P430 - AI1 Input Range
0 - 0-10Vdc
1 - 0-5Vdc
2 - 2-10Vdc
4 - 4-20mA
5 - 0-20mA

P508 - BACnet Active Network
0 - No Action
1 - Restart with Current Values
2 - Restart with Factory Default
5 - Stop Fieldbus Operation
10 - Busy
11 - Cancelled
12 - Faulted

P510.01 - BACnet MS/TP MAC Address
1-254
Default 1

P510.02 - BACnet Baudrate
0: Automatic
3: 9600 bps
4: 19200 bps
5: 38400 bps (Default)
6: 57600 bps
7: 76800 bps
8: 115200 bps

P510.03 - BACnet Data Format (Fixed)
0: Automatic – not available on BACnet
1: 8, E, 1 – not available on BACnet®
2: 8, O, 1 – not available on BACnet®
3: 8, N, 2 – not available on BACnet®
4: 8, N, 1 – Fixed for BACnet®

P510.04 - BACnet Device ID #
Default 0

P510.05 - BACnet Device Name
20 character string
Default i500 ***(not configuarable with Keypad)***

P510.06 - BACnet Min. Response Delay
0-1000ms
Default 0

P510.07 - BACnet Max Master Property
0-127
Default 127

P510.08 - BACnet Max Info Frames
1-255
Default 1

P510.09 - BACnet 'I-AM' Service
0 – Send at Power up ONLY
1 – Send Continuously (approx. every 60 sec)

P510.10 - BACnet Re-initialization Service
16 character string
Default: "password"

P600.02 - PID AI1 Process Variable
1 - Analog Input 1
2 - Analog Input 2
3 - DC-bus Voltage
4 - Motor Current
5 - Network P606:01/02
0-3600 Seconds

P610.01 - PID Sleep Mode Activation
0 - Disabled
1 - Output Frequency <Threshold
2 - Output Frequency <Threshold OR Process variable >Feedback Threshold
3 - Output Frequency <Threshold OR Process variable <Feedback Threshold

P610.02 - PID Sleep Mode Stop Method
0 - Coasting
1 - Deceleration to Standstill
2 - Stop Method used as set in P203:03

P610.03 - PID Sleep Mode Freq. Threshold
15.0 Hz.

P610.04 - PID Sleep Mode Feedback Threshold
PID Units
15.0 Default or 12.0 depending on program

P610.05 - PID Sleep Mode Delay Time
Seconds - **Default 300 or 150 depending on program**

P610.06 - PID Sleep Mode Recovery
0 - Setpoint > Threshold OR System Deviation > Bandwidth
1 - Process variable < recovery threshold
2 - Process variable > recovery threshold

P700.01/05 - Load VFD/OEM Default Settings
0 - Off / Ready
1 - On / Strat
2 - In Progress
3 - Action Cancelled (Status Feedback only)
4 - No Access (Status Feedback only)
5 - No Access - Inverter Disabled (Status Feedback only)

SETUP

Setting the PI Setpoint

The controller is programmed to maintain building pressure of .05" wg. This is displayed in whole numbers - i.e. 50.00 will be .05" wg. This number represents a 0-100% of the 0.0" - 0.10" wg. scale of the Transducer. If necessary the PI Control Setpoint can be field changed. The following steps explain the procedure:

To ensure blower does not run during the Setup process, disconnect the Start/Stop Control – either the Yellow or Orange wires connected to the 6-Pin Plug. See Wire Diagrams for details.

During Power Up the controller will flash Green and Blue lights. Once booted up the Control will show STOP on the LCD Screen. This indicates the controller is ready for operation.

1. Expose the Setpoint by pressing the UP or DOWN Arrow key once.

2. Lower the settings by pressing the DOWN Arrow key

3. Raise the setting by pressing the UP Arrow key

4. Press the Enter ↵ Key when finished. The screen will revert back to STOP. The change made will remain in memory.

Note: *Most jobs can be satisfied with a .03" (30.00 PI Units) to .05" (50.00 PI Units) setting – See Table 1*

Parameter Setpoints

MicroMetl pre-programs all VFDs to the values listed in Table 2. These values (Favorites) will always be present and can be re-established at any time; as can the Lenze i510 Default values. This can be accomplished by exercising the reset option in Parameter P700.01 and P700.05.

Any Parameter(s) changed in the field will not be retained in Long-Term Memory. If the VFD is Reset to either the VFD (Factory) or MicroMetl (OEM) Default Values all Parameters set in the field will be lost.

Table 1 – Pressure Chart – Screen displays in PI Units

Transducer Output		*Space Pressure*	*PI Units*
Vdc or mA (output)		*in wg.*	*(Sreen Display)*
0	*0.00*	*0.00*	*00.0*
1	*2.00*	*0.01*	*10.0*
2	*4.00*	*0.02*	*20.0*
3	*6.00*	*0.03*	*30.0*
4	*8.00*	*0.04*	*40.0*
5	*10.00*	*0.05*	*50.0*
6	*12.00*	*0.06*	*60.0*
7	*14.00*	*0.07*	*70.0*
8	*16.00*	*0.08*	*80.0*
9	*18.00*	*0.09*	*90.0*
10	*20.00*	*0.10*	*100.0*

To access Group 0 (Favorites) Parameters take the following steps:

1. Press the Enter ↵ Key twice. Level 1 then Group 0 will appear, then press Enter again, P100.00 or similar will appear.

2. Press the UP ↑ Arrow or DOWN ↓ Arrow to scroll through the Parameters

3. Press the Enter Key to enter the Parameter you want to change.

   a. Use the UP/DOWN arrows to change the value.
   b. After a value is changed press the Enter Key once to save the setting.
   c. Once all changes have been made press the Return ↩ Key twice. STOP will appear on the screen. Unit is ready for operation.

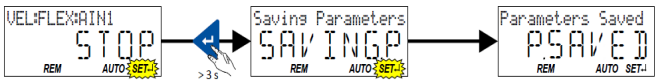
4. Contact MicroMetl if access to other Parameters are required.

Saving Parameter Settings in the Memory Module

Save Parameter Settings with Keypaad

If one or more parameter setting(s) has been changed with the keypad but has not been saved in the Memory Module with Mains Failure Protection, the SET display will be blinking.

In order to save parameter settings in the User Memory of the Memory Module, press the keypad enter key longer than 3 s.



Cycle the unit off and back on for the settings to be accepted.

Important: *The Display must go blank (Capacitors fully discharged) before power is restored*.

Pressure Transducer

The MAMAC transducer is set at the factory to sense building pressure between 0.0" to 0.1" w.c, to operate in concert with the AC Tech with a 0-10Vdc output for Uni-directional control. See Fig. 1 for Dip Switch settings. See Table 1 for scaling values.

For more information see MAMAC Technical Information.

MAMAC QR CODE

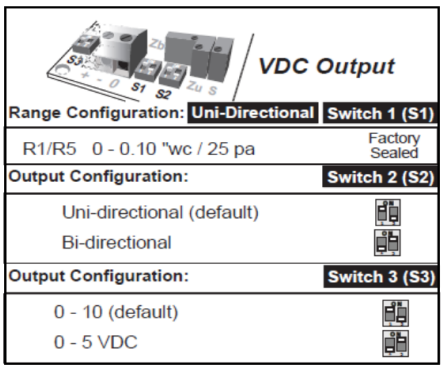


Fig. 1 - Dip Switch Settings

For 4-20mA control, an Ashcrift transducer is used. The pressure range of operation is also 0.0" to 0.1" w.c., but of course, the output is 4-20mA. Unlike the MAMAC transducer, however, these are fixed values and cannot be changed. For more information see Ashcroft Installation & Operation Manual 011-10130 AMR 1M.
While field calabration is acceptable on both the MAMAC and Ashcroft transducers, it is not recommended unless the instruments used for testing have been labratory calabrated within the last 12 months.

If field calabration is required the following steps should be followed:

MAMAC:

1. Connect terminals [+] and [-] to the appropriate power source. The [-] terminal is also the negative output terminal.

2. Connect a Digital Volt Meter on DC volts across [O] and [-] terminal.

3.Disconnect both the High and Low pressure ports. If configured for uni-direction, adjust Zu trimmer to achieve the desired low output value. If configured for bi-direction, adjust Zb trimmer to achieve desired low output.

4. Apply high pressure (0.10 w.c.) to the unit and adjust span trimmer [S] to obtain the desired voltage output.

5. Repeat steps 3 and 4 until desired calibration is achieved.

Ashcroft:

1. To find true zero differential pressure, pneumatically connect the high and low pressure connections together using a short piece of vinyl tubing.

2. Adjust the Zero potentiometer to the desired low output value.

3. Remove the jumper tubing and connect the high and low pressure tubes.

4. Apply high pressure (0.10" w.c.) to the unit and adjust the Span potentiometer to the desired voltage output.

Ashcroft QR CODE

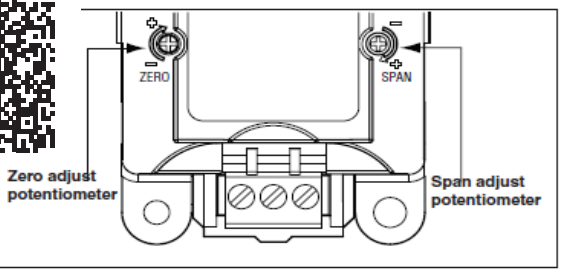


Fig. 2 - Ashcroft Pressure Transducer

Setting up BACnet Control

With the Start/Stop signal open power up the VFD. Once the VFD is booted up STOP will appear on the LCD Screen.

1. Press the Enter ↵ Key twice. LEVEL 1 then GROUP 0 will appear.

2. Press Enter ↵ and P100.00 or similar will appear.

3. Using the UP/Down ↑/↓ Arrows go to P201.01 and press Enter.

4. Using the UP Arrow change the value to 5 and press Enter. P201.01 will re-appear.

5. Using the UP Arrow go to P400.37 and press Enter.

6. Using the UP/DOWN Arrows change value to TRUE (1).

7. Using the UP Arrow go to P510.01 and press Enter.

8. Using the UP/DOWN Arrows set the MAC Address then press Enter. P510.01 will re-appear.

9. Using the UP Arrow go to P510.02 and press Enter.

10. Using the UP/Down Arrows set the desired Baud Rate. Thenpress Enter. P510.02 will re-appear.

11. Using the UP Arrow go to P510.04 and press Enter. Parameter P510.03 is the BACnet Data Format and is fixed at 8, N, 1 and is not configurable.

12. Using the UP/DOWN Arrows set the BACnet Device ID # then press Enter. P510.04 will re-appear.

13. Using the UP Arrow go to P510.06 and press Enter. *Parameter P510.05 is not configurable with Keypad.*

14. Using the UP/DOWN Arrows set the BACnet Min. Response Delay if necessary then press Enter. P510.06 will re-appear.

15. Using the procedures discribed above set the following parameters as necessary:

P510.07 - Max. Master Property
P510.08 - Max. Info Frames
P510.09 - "I-AM" Service

16. After all Parameters have been addressed press the Return ↩ Key; GROUP 0 will appear and SET ↵ will be flashing in lower right corner. Press Enter and hold for 3 seconds. SavingP then P.Saved will appear. Once P.Saved appears release Enter. All changed Parameters will be save in Memory.

Note: *To review additional Parameters related to BACnet go to Group 5. These Parameters can be viewed but no values can be changed. If additional Parameters need to be accessed and changed contact MicroMetl for assistance.*

SEQUENCE OF OPERATION

The MicroMetl version of the Lenze i510 Variable Frequency Drive (VFD) is enabled when circuit 24V and DI1 is closed. This can be done by installing a jumper between the two, or via a remote contact. This contact can be the Exhaust Option on the Economizer Logic marked EF and EF1 on the electromechanical W7212, the EXF 2-pin connector on the ReliaTel RTEM – see Economizer Instructions for Sequence of Operation, the Auxiliary Switch option on the Actuator Motor, or a relay. See wire Diagram Options for details.

A Pressure Transducer is utilized to monitor the building pressure. The Transducer provides a 0-10VDC signal to terminals AI2 and GND, or a 4-20mA signal at terminals AI1 and GND on the VFD to control the motor speed. On a scale of 0" to .10" wg. and 0-10Vdc, for example, the transducer will output ~ 3.0 VDC (8.5mA) @ .03" wg. and ~ 5.0 VDC (11.5mA) @ .05" wg.

If a jumper between 24V and DI1 is used to enable the VFD the motor is commanded on and will run at minimum speed (15Hz) for a minimum of 2.5 minutes or 5 minutes, depending on the program, if the building pressure stays below the PI Setpoint (typically .03" to .05" w.c.). When the building pressure rises above Setpoint the frequency output to the motor will be increased for increased motor speed. If the pressure stays above Setpoint, the motor will continue to increase in speed until it achieves maximum speed of 60Hz, or the building pressure decreases to below Setpoint. If the building pressure stays below, or drops below the predetermined Setpoint for longer than 2.5 or 5 minutes mentioned earlier, the motor is commanded OFF and the display will show SLP. This feature is called the Sleep Mode. Needless to say, if the pressure rises above the Setpoint the motor will be commanded back on and the Sleep Timer will be reset.

Assuming a Setpoint of .03" the transducer will output a VDC or mA signal in relation to the building pressure. Once the signal rises above the Setpoint the motor will begin to increase in speed. The PI Protocol of the VFD controls the response time, however. So if the increase is only a spike the VFD may not respond right away, or possibly, not at all. Additionally, if the increase is minor and the pressure fails to decrease with the increase in motor speed, the VFD will continue to increase the frequency output to increase the motor speed. This is because the goal of the VFD is to try to maintain Setpoint. Because of this, the frequency output of the VFD does not always correspond with the Transducer VDC output.

WIRING

Wiring for Single Phase and Three Phase Input

In applications where Single Phase is required, MicroMetl will provide a drive that is rated for Single and Three Phase inputs. Whether Single Phase or Three Phase input the output to the motor will always be Three Phase. Therefore, in the case of Single Phase units the input wiring will be to terminals L1 and L2 only, where the wiring for Three Phase applications will be to terminals L1, L2, and L3.

For typical wiring of 3 Phase High Voltage and Control Connections see Fig. 1. For High Voltage Single Phase variations with 3 Phase Output see Fig. 2.

Control Wiring

For full wiring options, see provided Wiring Document. Choose one of the following options for controlling the ON/OFF function of the VFD:

1. Continuous Enable Operation:

Place a jumper between 24V and DI1. The Drive will sleep (turn off) during periods of low building pressure.

Note: *If jumper is utilized the VFD will operate independent of the Economizer. This could result in undesirable operation and high energy consumption.*

2. Enable/Disable Operation:

a. Connect control wires to actuator Auxiliary Switch (if available).

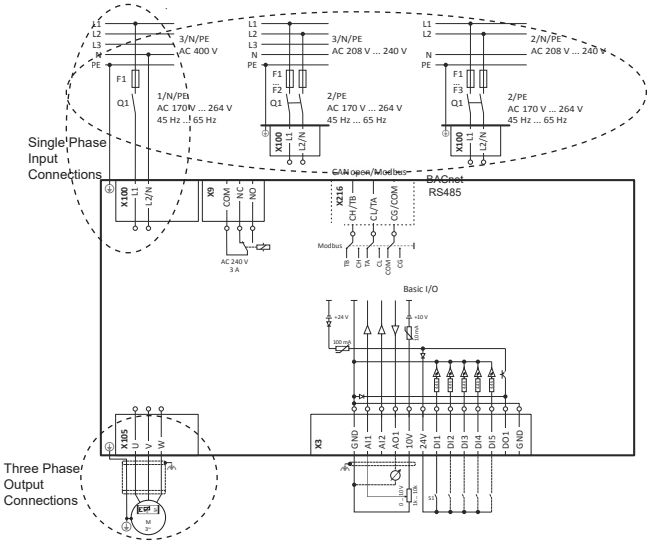


Fig. 2 - Single Phase Input with Three Phase Output

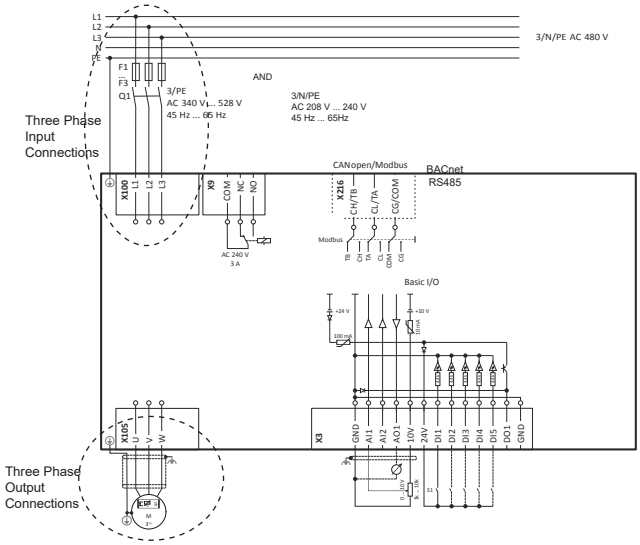


Fig. 1 - Three Phase Input with Three Phase Output

i. Connect provided Yellow and Orange control wires to Yellow and Orange wires going to Terminals 24V and DI1.
ii. Route and connect loose ends of Yellow and Orange control wires to the Actuator Auxiliary Switch identified as S1 and S3.

b. Install Relay (if not already provided) in Power Exhaust Control Panel or other conventient location.

i. Connect Yellow and Orange wires to N.O. contacts of the relay end and 24V and DI1 on the other. Applications where the relay is not installed in the Control Panel will require these wires to be extended.
ii. Connect the 24Vac Exhaust Fan output from the Economizer Control to Terminals A and B of the relay.
iii. Route these wires to a 24Vac control output. See unit specific Wire Diagram for details.

c. Install Tilt Switch to Damper or Gear for ON/OFF operation.

i. Connect control wires to Tilt Switch
ii. Connect other ends of control wires to 24V and DI1

3. Building Management (Automated) System (aka BMS or BAS) for Enable/Disable operation:

a. Connect BMS/BAS Start/Stop (Dry Contact) Control to 24V and DI1
b. Provide 0-10Vdc signal to AI2 and GND; OR
c. Provide 4-20mA signal to AI1 and GND

4. Building Management Full Control:

a. Analog Control:

i. If ordered for 3rd Party Control the Lenze Drive will be programmed and wired for full BMS/BAS Control - see provided Wire Diagram for details.
ii. If ordered for Standard PID Control follow the below steps to convert to BMS/BAS Control:

1. locate and disconnect the Orange and Pink wires located between the 6-Pin Plug and VFD see provided Wire Diagram.
2. Reconnect the two Orange wires along with field provided wire jumper to the Pink wire going to the DI3 terminal on the VFD - see provided Wire Diagram for details.
3. Unplug and remove Pressure Transducer.
4. Connect Black and White wires previously attached to the Pressure Transducer to the BMS/BAS 0-10Vdc Control source.
5a. If Relay is provided make connection per the provided Wire Diagram; OR:
5b. Remove the Relay and connect Dry Contact Start/Stop control directly to the Orange and Yellow wires - i.e. Actuator Aux. Switch, Tilt Switch (provided by others), or BMS/BAS Controls; OR:
5c. Remove Relay and install jumper between the Orange and Yellow wires for 24/7 Enable Function.

b. BACnet Control:

i. If ordered for 3rd Party Control the Lenze Drive will be programmed and wired for full BMS/BAS Analog Control - see provided Wire Diagram for details. Go to step iii below.
ii. If ordered for Standard PID Control follow the below steps to convert to BMS/BAS Control:

1. locate and disconnect the Orange and Pink wires located between the 6-Pin Plug and VFD see provided Wire Diagram.
2. Reconnect the two Orange wires along with field provided wire jumper to the Pink wire going to the DI3 terminal on the VFD - see provided Wire Diagram fordetails.
3. Unplug and remove Pressure Transducer.
4a. If Relay is provided make connection per the provided Wire Diagram; OR:
4b. Connect Dry Contact Start/Stop control directly to the Orange and Yellow wires - i.e. Actuator Aux. Switch, Tilt Switch (provided by others), or BMS/BAS Controls; OR:
4c. Install jumper between the Orange and Yellow wires for 24/7 Enable Function.

RESET PARAMETERS

If you find it necessary to have to reset the VFD to Lenze Factory Settings, or MicroMetl OEM Values the following steps should be followed:

1. Using the method layed out under Parameters to enter Group 0.

2. Using the UP/DOWN Arrows go to P700.01 for Reset Factory Default Settings, or P701.05 to Load (reset) OEM Data.

3. Changing either of these from 0 to 1 will reset any user setting(s) to Lenze Factory or MicroMetl OEM Values respectively.

Important: *By executing this device command, all parameter settings made by the user are lost!*

4. If needed change any Parameters in Group 0 as described under Parameters on previous pages. Contact MicroMetl if access to other Parameters are required.

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Form No. CD-PE-B

MicroMetl

Since 1965

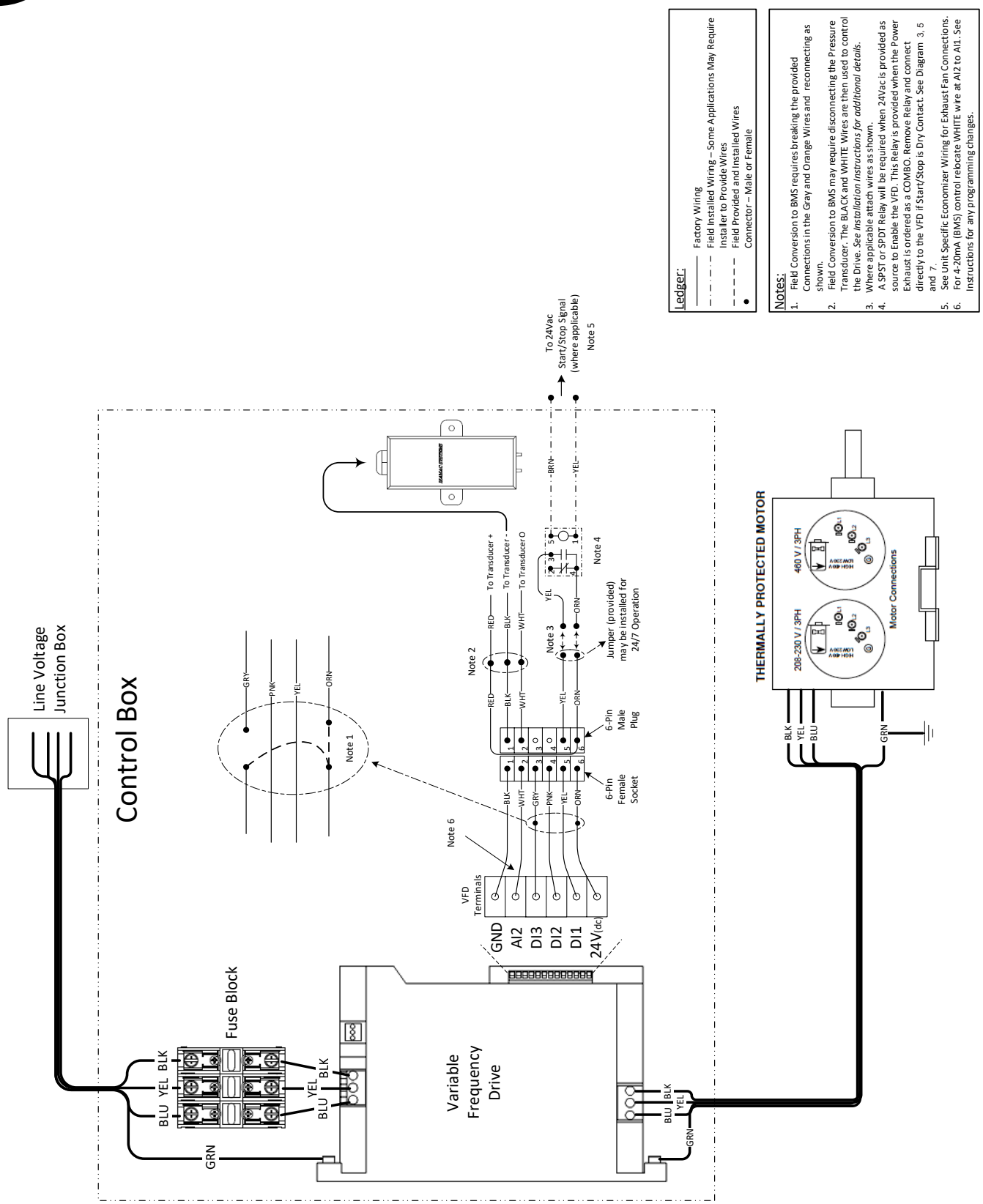
WIRE DIAGRAM

Modulating Power Exhaust

General Purpose *(not Brand/Unit Specific)*

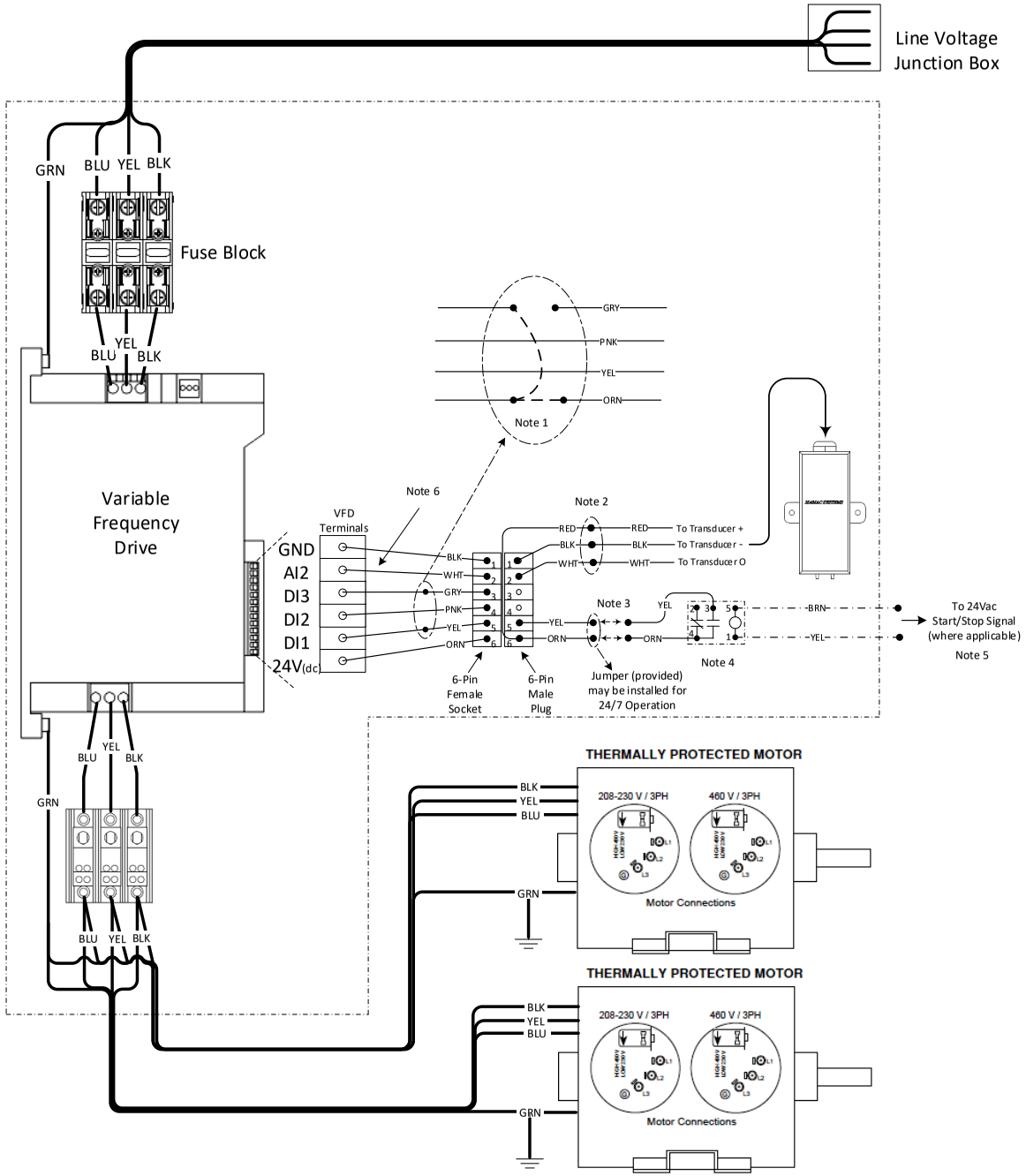
Building Pressure Controlled w/24Vac Start/Stop Signal & Single Motor

Follow Notes for any Required Field Wiring and/or Modifications.



Building Pressure Controlled w/24Vac Start/Stop Signal & Multiple Motors

Follow Notes for any Required Field Wiring and/or Modifications.



Ledger:

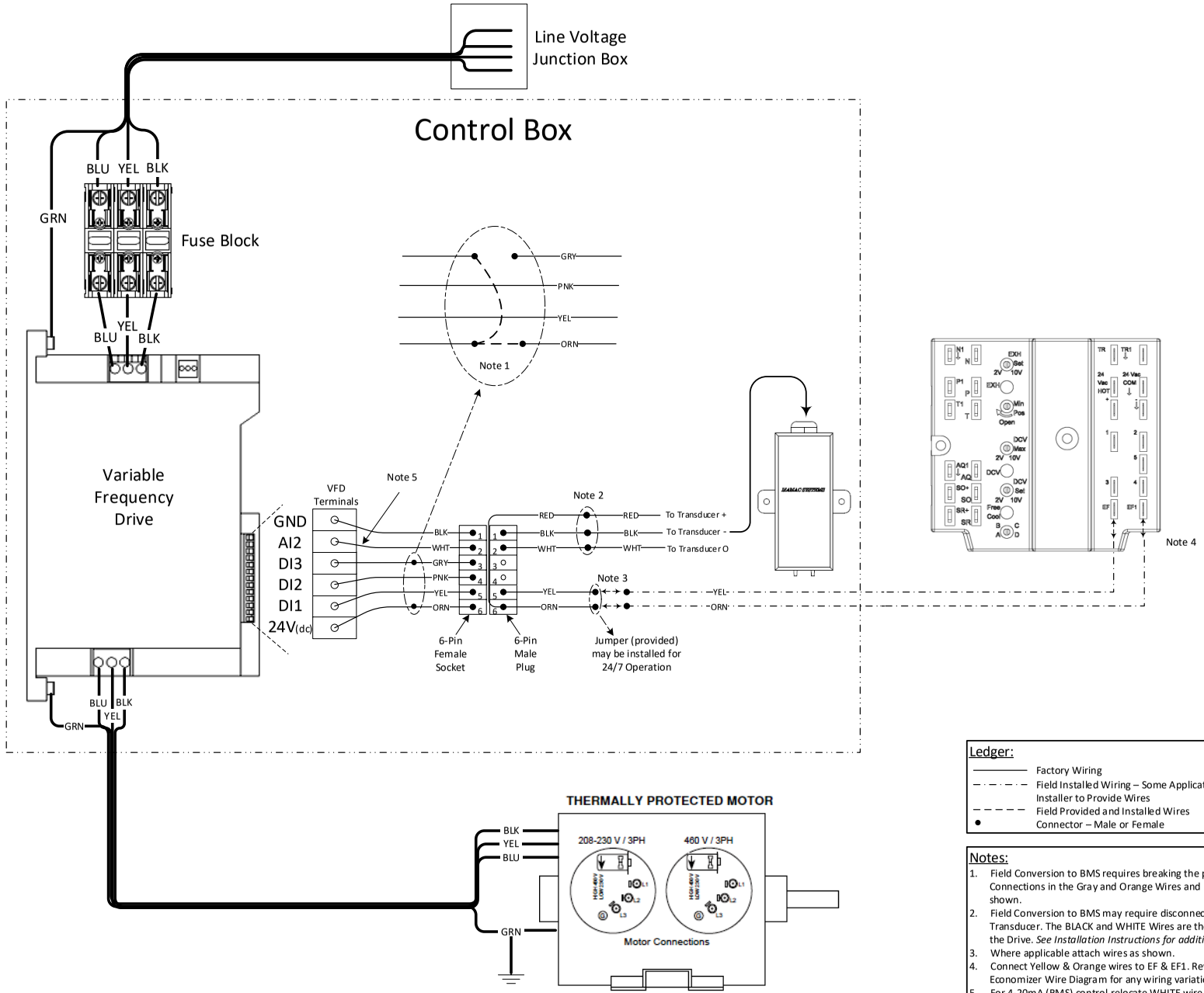
- Factory Wiring
- Field Installed Wiring – Some Applications May Require Installer to Provide Wires
- Field Provided and Installed Wires
- Connector – Male or Female

Notes:

1. Field Conversion to BMS requires breaking the provided Connections in the Gray and Orange Wires and reconnecting as shown.
2. Field Conversion to BMS may require disconnecting the Pressure Transducer. The BLACK and WHITE Wires are then used to control the Drive. *See Installation Instructions for additional details.*
3. Where applicable attach wires as shown.
4. A SPST or SPDT Relay will be required when 24Vac is provided as source to Enable the VFD. This Relay is provided when the Power Exhaust is ordered as a COMBO. Remove Relay and connect directly to the VFD if Start/Stop is Dry Contact. See Diagram 4, 6 and 8.
5. See Unit Specific Economizer Wiring for Exhaust Fan Connections.
6. For 4-20mA (BMS) control relocate WHITE wire at AI2 to AI1. See Instructions for any programming changes.

Building Pressure Controlled w/W7212A Start/Stop Signal & Single Motor

Follow Notes for any Required Field Wiring and/or Modifications.



Ledger:

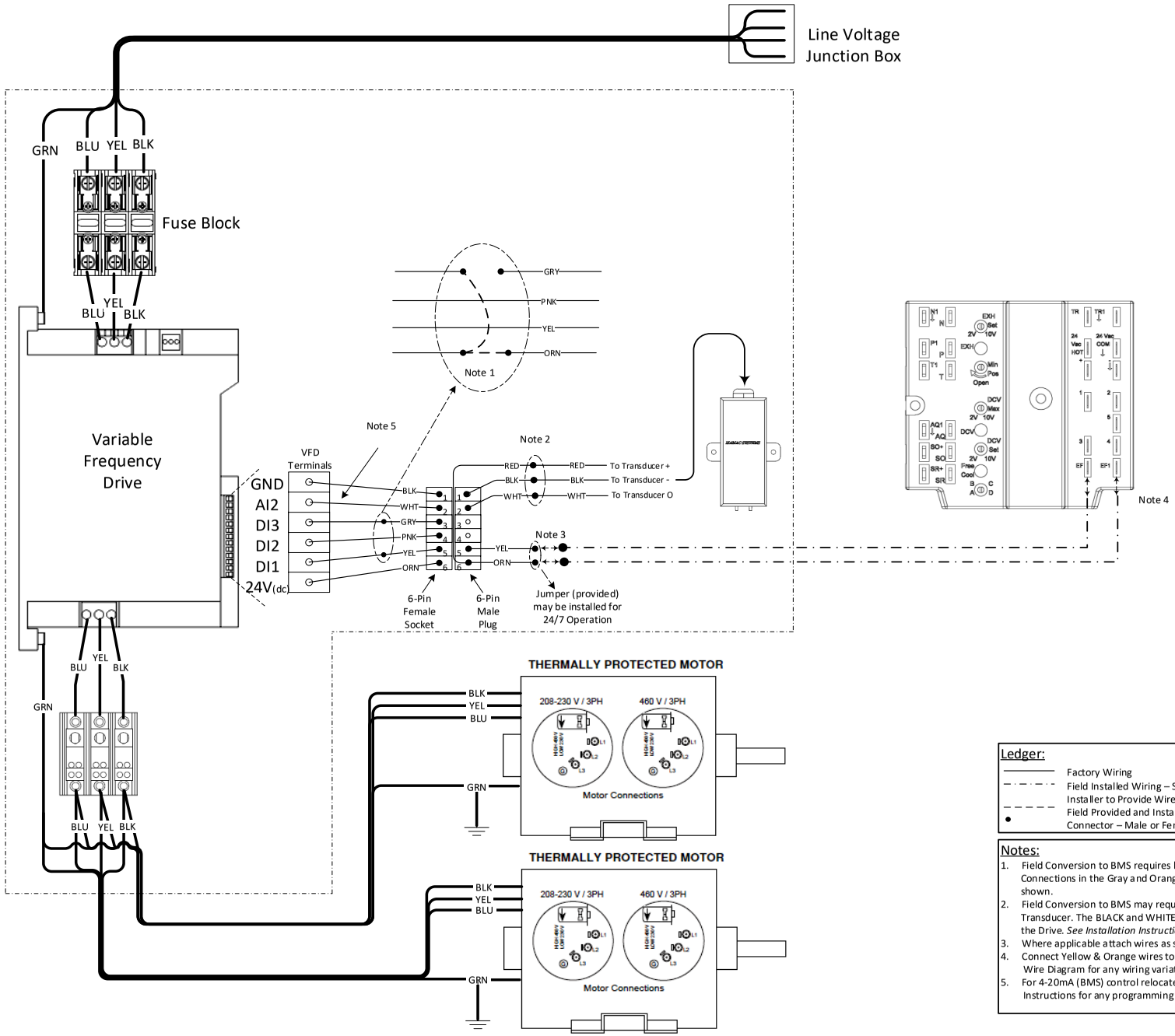
- Factory Wiring
- Field Installed Wiring – Some Applications May Require Installer to Provide Wires
- Field Provided and Installed Wires
- Connector – Male or Female

Notes:

1. Field Conversion to BMS requires breaking the provided Connections in the Gray and Orange Wires and reconnecting as shown.
2. Field Conversion to BMS may require disconnecting the Pressure Transducer. The BLACK and WHITE Wires are then used to control the Drive. *See Installation Instructions for additional details.*
3. Where applicable attach wires as shown.
4. Connect Yellow & Orange wires to EF & EF1. Review Unit Specific Economizer Wire Diagram for any wiring variations.
5. For 4-20mA (BMS) control relocate WHITE wire at AI2 to AI1. See Instructions for any programming changes.

Building Pressure Controlled w/W7212A Start/Stop Signal & Multiple Motors

Follow Notes for any Required Field Wiring and/or Modifications.



Ledger:

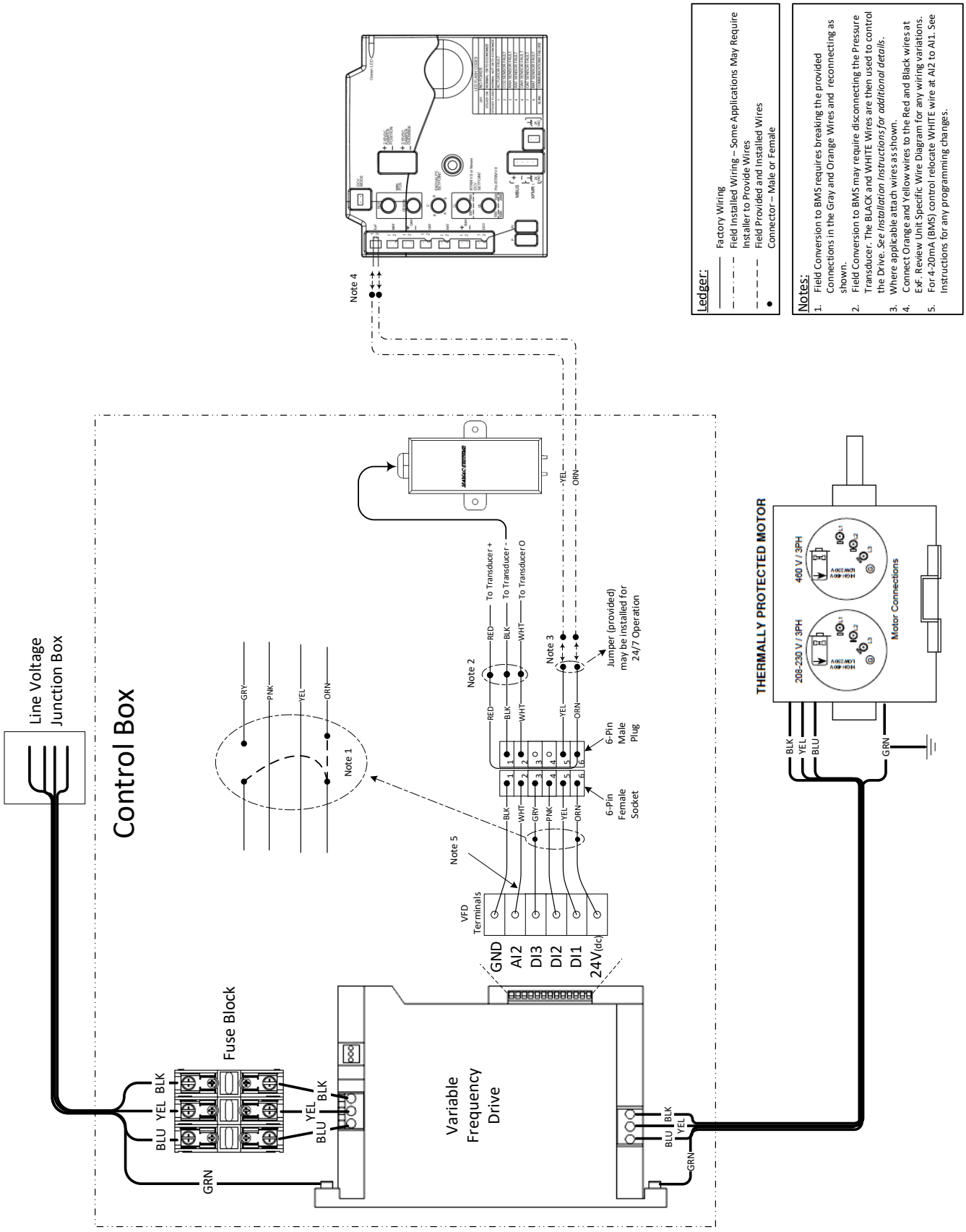
- Factory Wiring
- Field Installed Wiring – Some Applications May Require Installer to Provide Wires
- Field Provided and Installed Wires
- Connector – Male or Female

Notes:

1. Field Conversion to BMS requires breaking the provided Connections in the Gray and Orange Wires and reconnecting as shown.
2. Field Conversion to BMS may require disconnecting the Pressure Transducer. The BLACK and WHITE Wires are then used to control the Drive. *See Installation Instructions for additional details.*
3. Where applicable attach wires as shown.
4. Connect Yellow & Orange wires to EF & EF1. Review Unit Specific Wire Diagram for any wiring variations.
5. For 4-20mA (BMS) control relocate WHITE wire at AI2 to AI1. See Instructions for any programming changes.

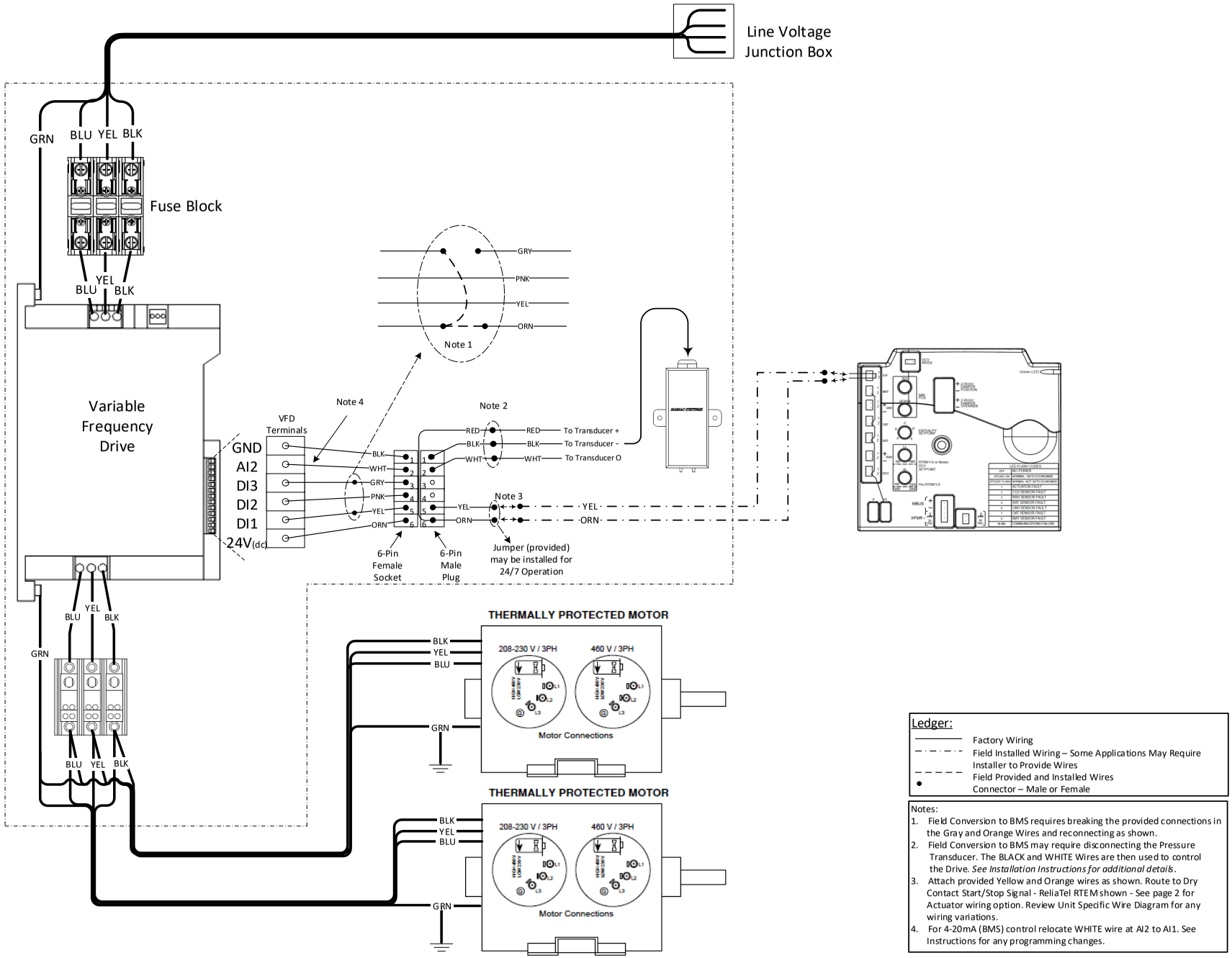
Building Pressure Controlled w/RTEM Start/Stop Signal & Single Motor

Follow Notes for any Required Field Wiring and/or Modifications.



Building Pressure Controlled w/RTEM Start/Stop Signal & Multiple Motors

Follow Notes for any Required Field Wiring and/or Modifications.



Ledger:

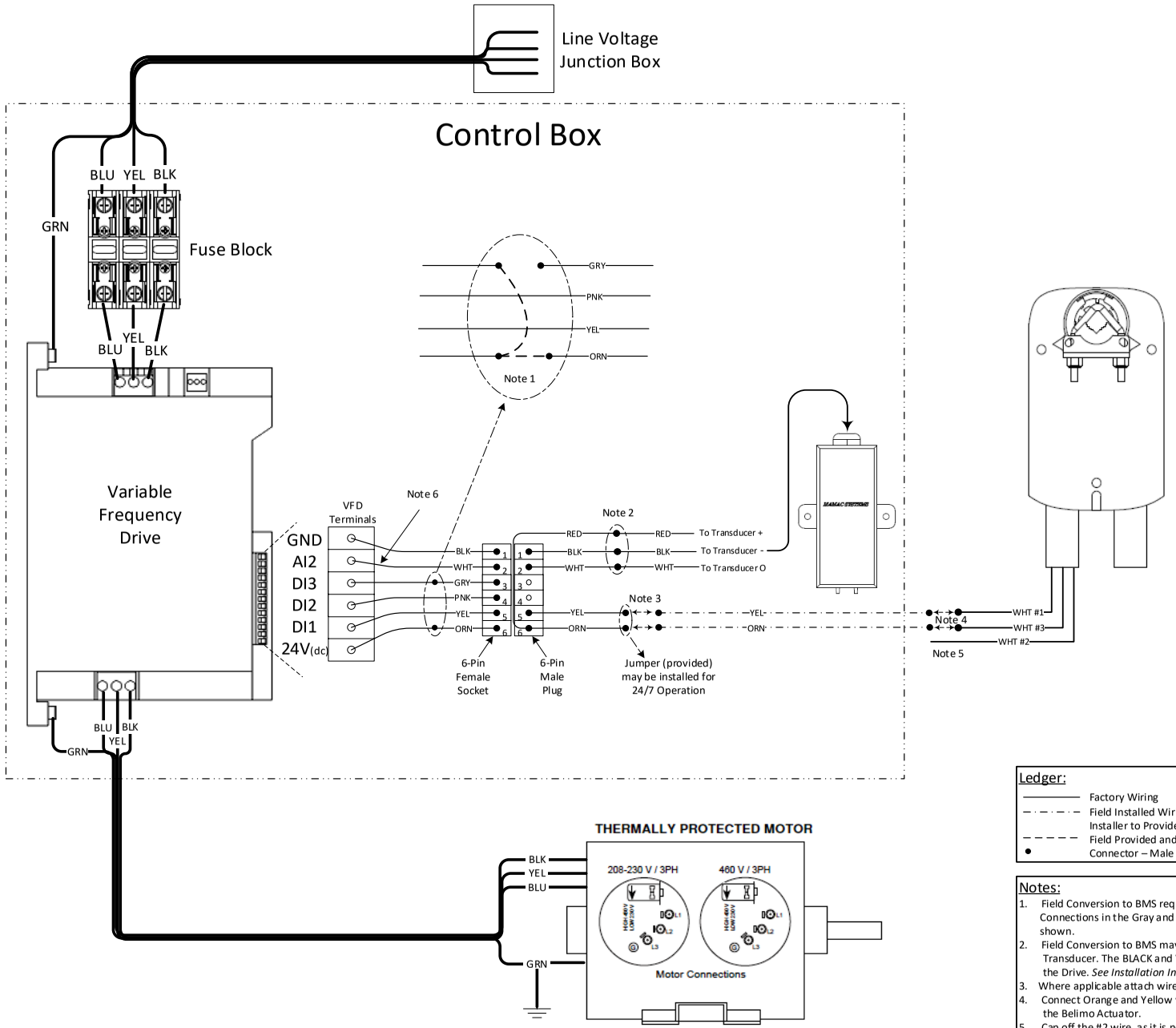
- Factory Wiring
- Field Installed Wiring – Some Applications May Require Installer to Provide Wires
- Field Provided and Installed Wires
- Connector – Male or Female

Notes:

1. Field Conversion to BMS requires breaking the provided connections in the Gray and Orange Wires and reconnecting as shown.
2. Field Conversion to BMS may require disconnecting the Pressure Transducer. The BLACK and WHITE Wires are then used to control the Drive. *See Installation Instructions for additional details*.
3. Attach provided Yellow and Orange wires as shown. Route to Dry Contact Start/Stop Signal - ReliaTel RTEM shown - See page 2 for Actuator wiring option. Review Unit Specific Wire Diagram for any wiring variations.
4. For 4-20mA (BMS) control relocate WHITE wire at AI2 to AI1. See Instructions for any programming changes.

Building Pressure Controlled w/Actuator Start/Stop Signal & Single Motor

Follow Notes for any Required Field Wiring and/or Modifications.



Ledger:

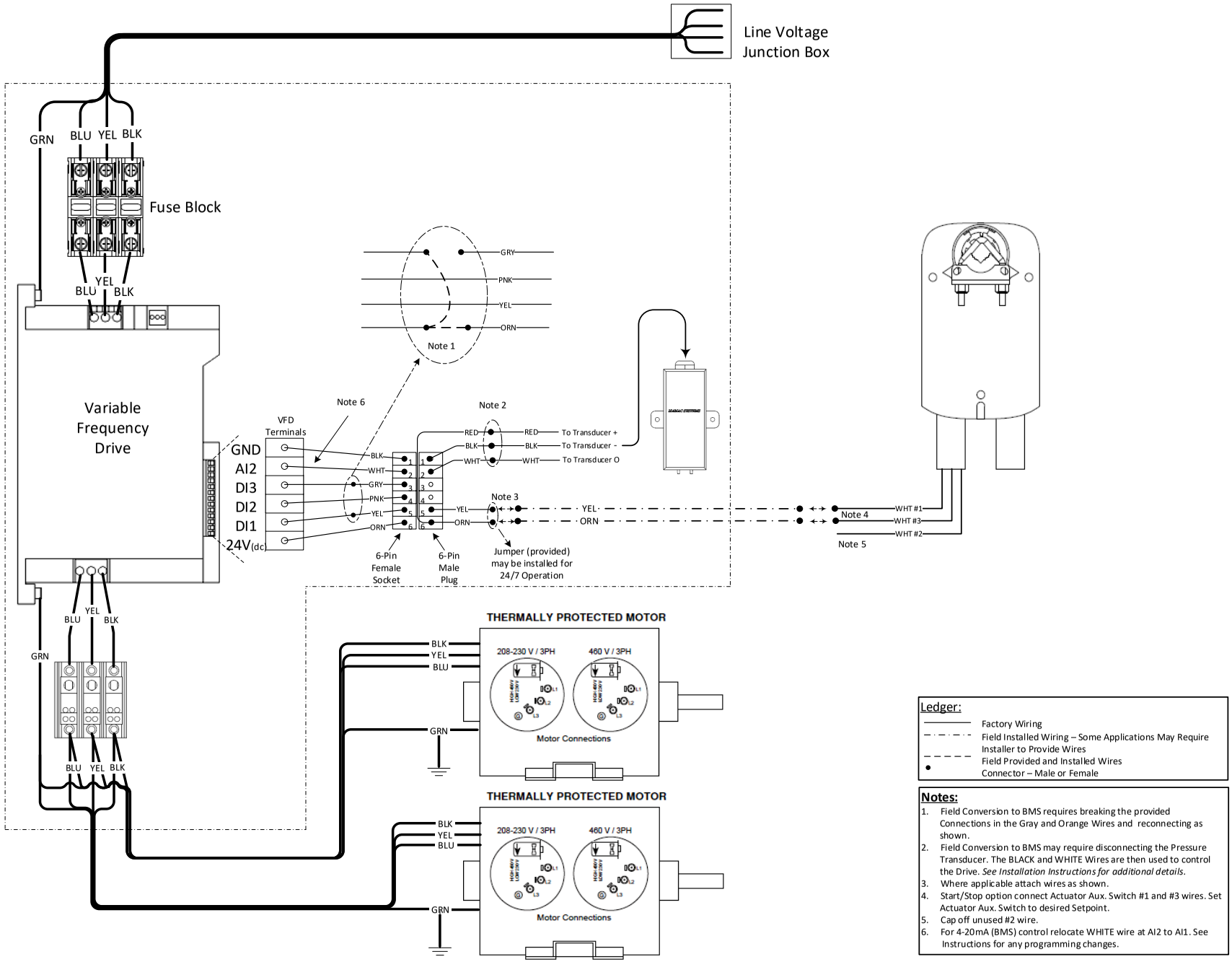
- Factory Wiring
- Field Installed Wiring – Some Applications May Require Installer to Provide Wires
- Field Provided and Installed Wires
- Connector – Male or Female

Notes:

1. Field Conversion to BMS requires breaking the provided Connections in the Gray and Orange Wires and reconnecting as shown.
2. Field Conversion to BMS may require disconnecting the Pressure Transducer. The BLACK and WHITE Wires are then used to control the Drive. *See Installation Instructions for additional details.*
3. Where applicable attach wires as shown.
4. Connect Orange and Yellow wires to the White #1 and #3 wires of the Belimo Actuator.
5. Cap off the #2 wire, as it is not used.
6. For 4-20mA (BMS) control relocate WHITE wire at AI2 to AI1. See Instructions for any programming changes.

Building Pressure Controlled w/Actuator Start/Stop Signal & Multiple Motors

Follow Notes for any Required Field Wiring and/or Modifications.



Ledger:

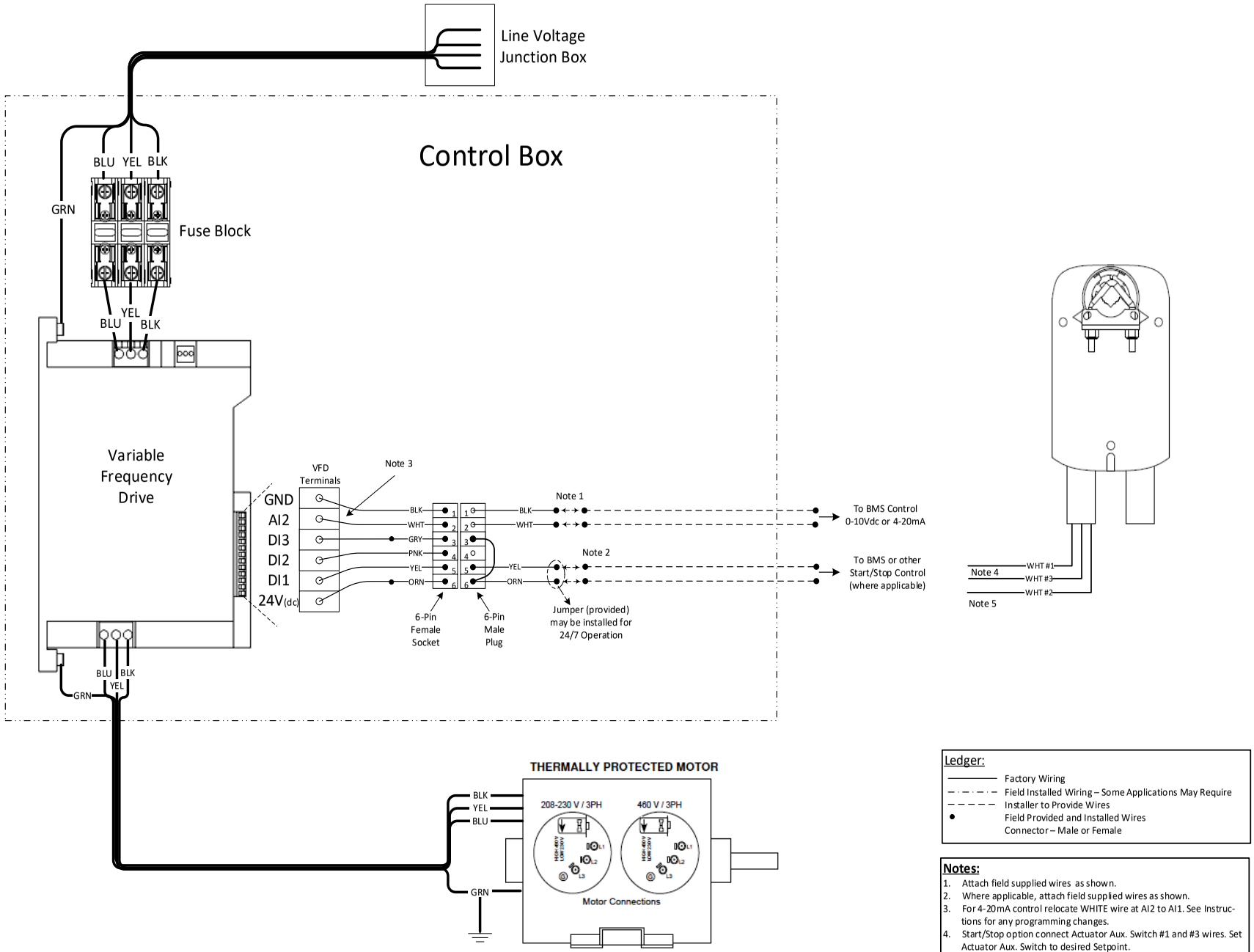
- Factory Wiring
- Field Installed Wiring – Some Applications May Require Installer to Provide Wires
- Field Provided and Installed Wires
- Connector – Male or Female

Notes:

1. Field Conversion to BMS requires breaking the provided Connections in the Gray and Orange Wires and reconnecting as shown.
2. Field Conversion to BMS may require disconnecting the Pressure Transducer. The BLACK and WHITE Wires are then used to control the Drive. *See Installation Instructions for additional details.*
3. Where applicable attach wires as shown.
4. Start/Stop option connect Actuator Aux. Switch #1 and #3 wires. Set Actuator Aux. Switch to desired Setpoint.
5. Cap off unused #2 wire.
6. For 4-20mA (BMS) control relocate WHITE wire at AI2 to AI1. See Instructions for any programming changes.

Third Party (BMS) Controlled w/Actuator Start/Stop Signal & Single Motor

Follow Notes for any Required Field Wiring and/or Modifications.



Ledger:

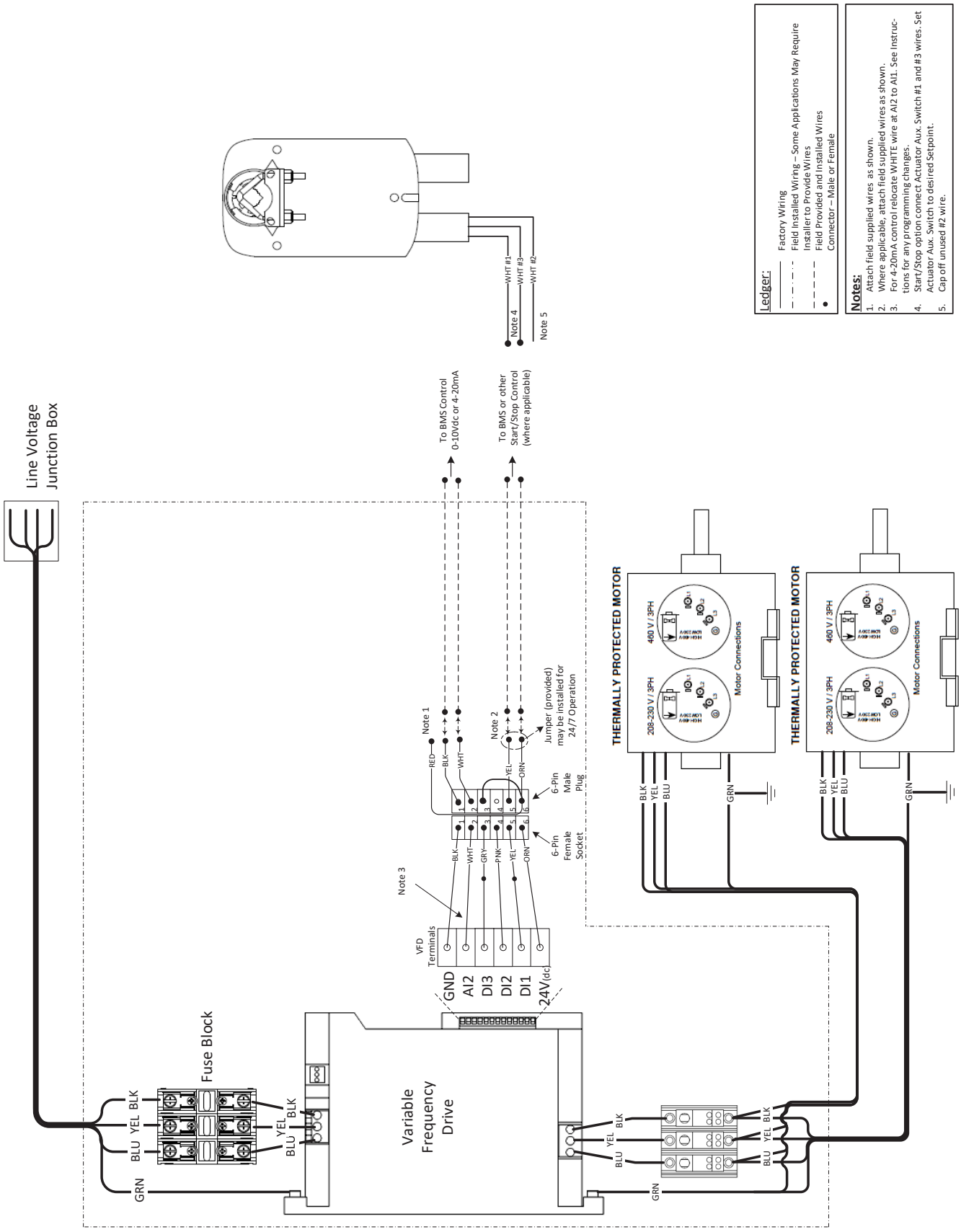
- Factory Wiring
- Field Installed Wiring – Some Applications May Require Installer to Provide Wires
- Field Provided and Installed Wires
- Connector – Male or Female

Notes:

1. Attach field supplied wires as shown.
2. Where applicable, attach field supplied wires as shown.
3. For 4-20mA control relocate WHITE wire at AI2 to AI1. See Instructions for any programming changes.
4. Start/Stop option connect Actuator Aux. Switch #1 and #3 wires. Set Actuator Aux. Switch to desired Setpoint.
5. Cap off unused #2 wire.

Third Party (BMS) Controlled w/Actuator Start/Stop Signal & Multiple Motors

Follow Notes for any Required Field Wiring and/or Modifications.



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