



ELECTRICAL INSTALLATION MANUAL

Subject to Changes Without Notification

All installation wiring must conform to your National Electrical Code and meet Local Codes. While we can't guarantee it, we believe that using Envira-North Systems controls and following our instructions will result in an installation that meets those requirements. Code compliance is ultimately the installer's and/or the user's responsibility.

ENVIRA-NORTH
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www.enviranorth.com

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SAFETY PRECAUTIONS

All installations must be installed by a qualified person.
Do not work on live equipment. Use of lock-out procedures is a must.

IMPORTANT!
The installation of a wind sensor is mandatory in agricultural installations.

EssentialAIR

FAN CONTROL



VFD

- Wall Mounted Variable Frequency Drive (VFD) Configuration
- Minimal Distance Between VFD & HVLS Fan
- One Per Fan Required

Essential AIR FAN CONTROL INSTALLATION

REFERENCE ACRONYM KEY

VFD - Variable Frequency Drive

WIRE REQUIREMENTS

- The size of the input and output wires depends on the length and current draw of the VFD and Motor
- Use a continuous run of wires between the Motor and VFD (no splices or connections)
- See 'Power Requirements' for current draw of VFD and Motor

POWER REQUIREMENTS

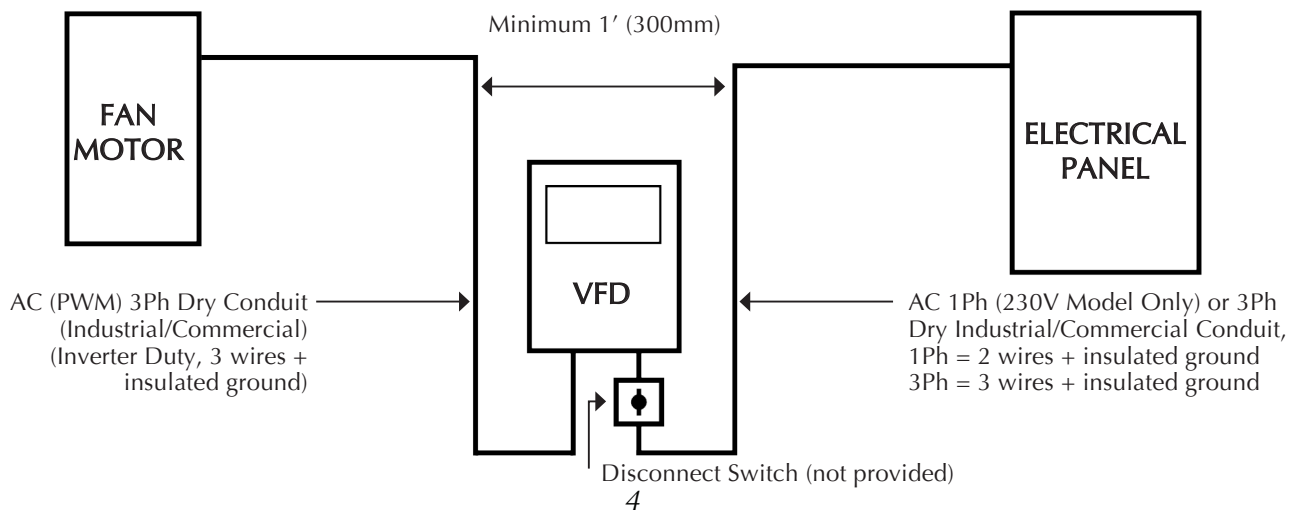
VFD	INPUT 240V		OUTPUT 240V	INPUT 400V	OUTPUT 400V	INPUT 480V	OUTPUT 480V	INPUT 600V	OUTPUT 600V
	1 Ph	3 Ph	3 Ph	3 Ph	3 Ph	3 Ph	3 Ph	3 Ph	3 Ph
1.0HP (.75 kW)	8.8 A	5.0 A	4.2 A	2.9 A	2.4 A	2.5 A	2.1 A	2 A	1.7 A
1.5HP (1.1 kW)	12.0 A	6.9 A	6.0 A	4.2 A	3.5 A	3.6 A	3.0 A	N/A	N/A
2.0HP (1.5 kW)	13.3 A	8.1 A	7.0 A	4.7 A	4.0 A	4.1 A	3.5 A	3.2 A	2.7 A
	170-264 VAC 48-62 Hz	170-264 VAC 48-62 Hz		340-440 VAC 48-62 Hz		340-528 VAC 48-62 Hz		425-660 VAC 48-62 Hz	

The above values are full-load current values.

A separate insulated ground must be provided to each VFD from the electrical panel. This will reduce the noise from being radiated in other equipment.

Motor is rated with an Insulation Class F; Ensure proper wiring is used as per current electrical codes.

WIRING SCHEMATIC



WIRE LOCATION

- DO NOT RUN input and output power cables in the same conduit
- DO NOT RUN control cables with any power cables in the same conduit
- DO NOT RUN different fan's output power cables in the same conduit

You may run different fans input (only) power cables in the same conduit.

CABLE LENGTH

The cable distance between the Lenze AC Tech VFD and the Motor has changed. In all cases it has been reduced due to variable cable quality, variations in workmanship and changes in technology in the VFD.

LOAD REACTOR AND dV/dT FILTER

The following table; the cable length includes vertical distances. There will be 3 different classes of distance having distance measurement, addition of load reactor or dV/dT filter and change in the horsepower rating of the VFD. In cases of adding either a load reactor or filter, the device has to be installed close to the VFD (within 6-10 feet) on the Load Side of the VFD.

CABLE LENGTH BETWEEN THE LENZE AC TECH VFD AND MOTOR			
Normal Length	No Additional Device Required or Change in VFD HP		
	230 VAC	Max. 250'	No HP Change
	460 VAC	Max. 160'	No HP Change
	600 VAC	Max. 125'	No HP Change
Above Normal Length	Load Reactor Required (1 ½ or 3 % Impedance)		
	230 VAC	250' - 400'	No HP Change
	460 VAC	160' - 250'	No HP Change
	600 VAC	125' - 160'	No HP Change
Greater Than Above Normal Length	dV/dT Filter Required Plus Upsize VFD HP		
	230 VAC	Greater than 400' & less than 1000'	+1 HP
	460 VAC	Greater than 250' & less than 1000'	+1 HP
	(*1) 600 VAC	Greater than 160' & less than 1000'	+1 HP

The filter and load reactor can operate at either 50Hz or 60Hz.

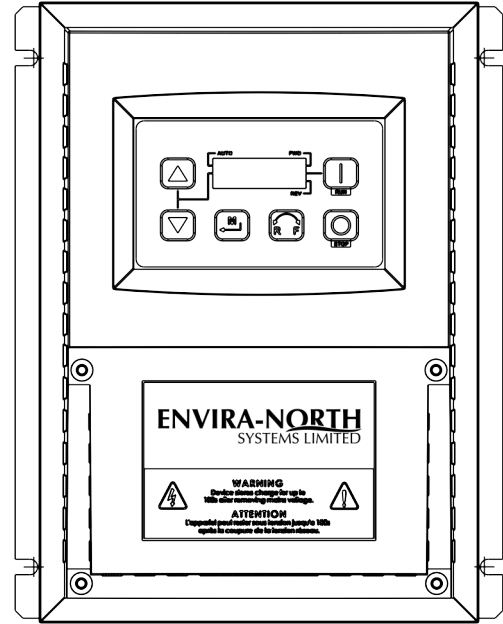
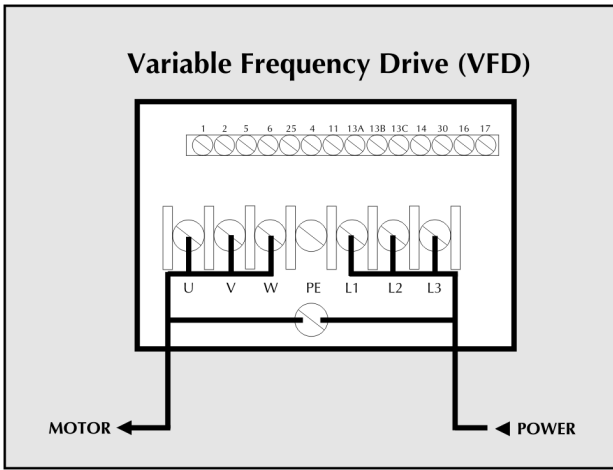
(*1) When using 600VAC Lenze AC Tech VFD, special care will have to be taken as VFD manufacturers have noted that excessive reflective voltages are generated due to the distance. The voltages may shorten the life expectancy of the motors and VFDs and may cause bearing failures if not dealt with according to the instructions above.

Essential AIR FAN CONTROL INSTALLATION

WIRE CONNECTIONS (VFD)

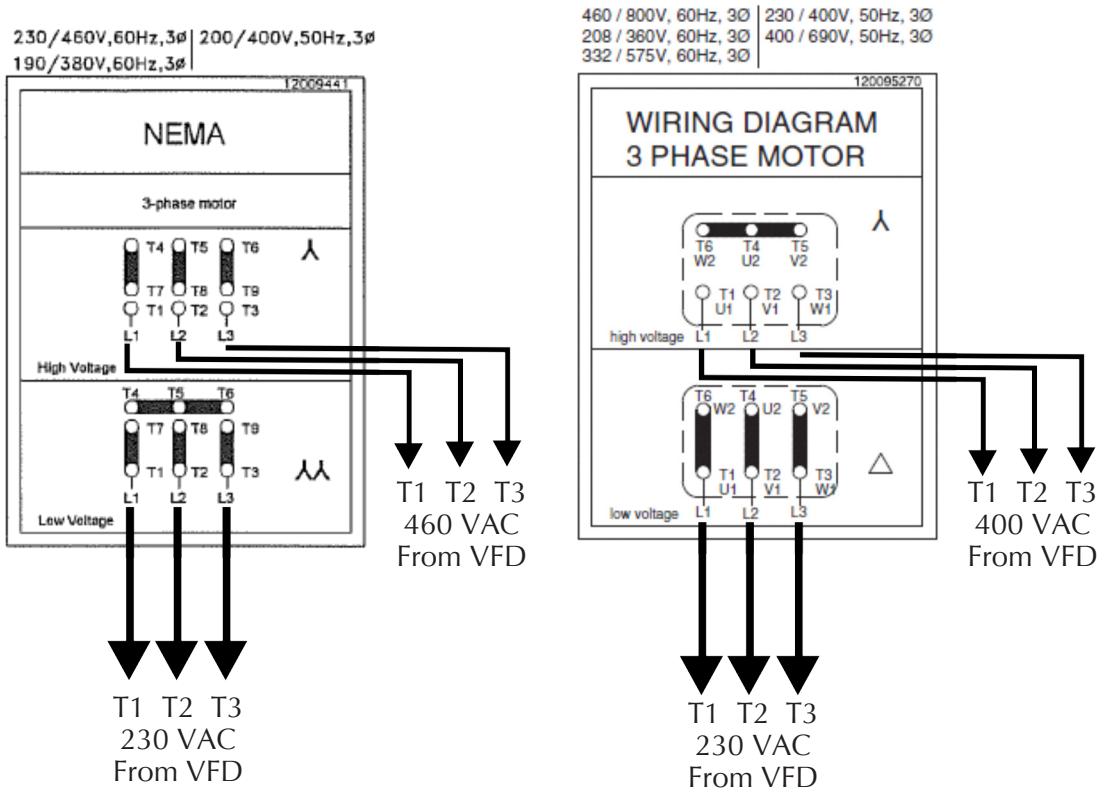
Input Power

- Single phase (1Ph) use L1 - L2 + PE (Ground)
- Three phase (3Ph) use L1 - L2 - L3 + PE (Ground)



WIRE CONNECTIONS (MOTOR)


The thermal protection wires in the junction box of the Nord motor are not to be used unless otherwise directed. The Variable Frequency Drive provides the over temperature and overload protection.







EssentialAIR FAN CONTROL OPERATION

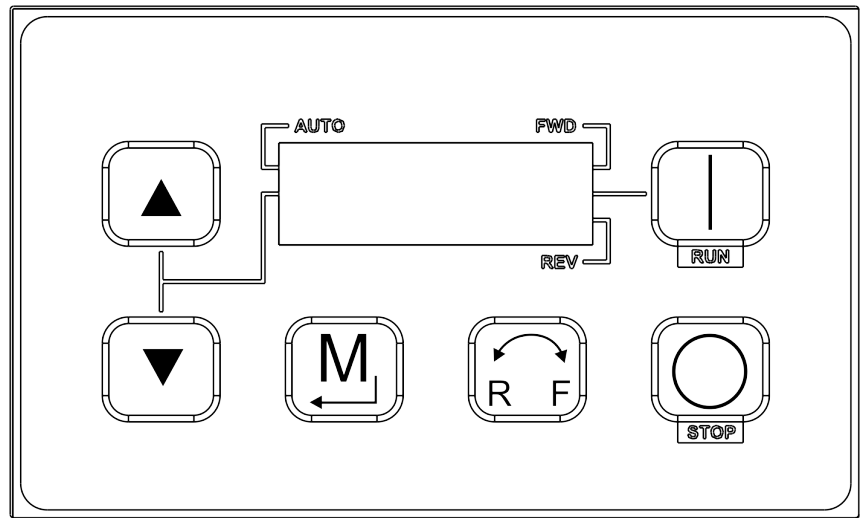
OPERATING INSTRUCTIONS

TO START (Press): 

TO STOP (Press): 

TO CHANGE SPEED (Press): 


TO CHANGE ROTATION (Press): 
(Then Press): 



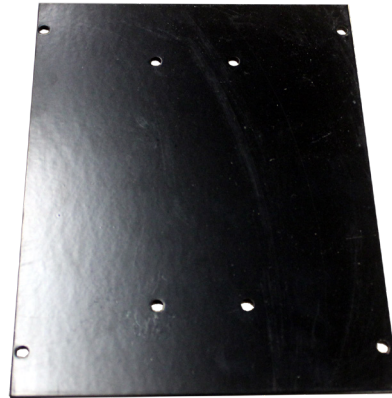
EssentialAIR Keypad

ZoneAIR

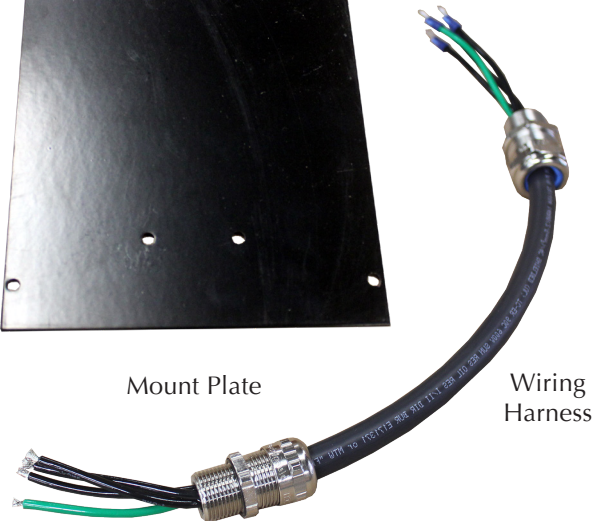
FAN CONTROL



VFD



Mount Plate



Wiring Harness

- Fan Mounted VFD
- One ZoneAir Control Per Fan Required
- Package Includes Mounting Plate + Wiring Harness
- Designed to Provide a Single Control for Multiple Fans
- Requires Additional Controls

ZoneAIR FAN CONTROL INSTALLATION

REFERENCE ACRONYM KEY

VFD - Variable Frequency Drive LVC - Low Voltage Control TFD - Temperature Control

WIRE REQUIREMENTS

- The size of the input and output wires depends on the length and current draw of the VFD and Motor
- Use a continuous run of wires between the Motor and VFD (no splices or connections)
- See 'Power Requirements' for current draw of VFD and Motor

POWER REQUIREMENTS

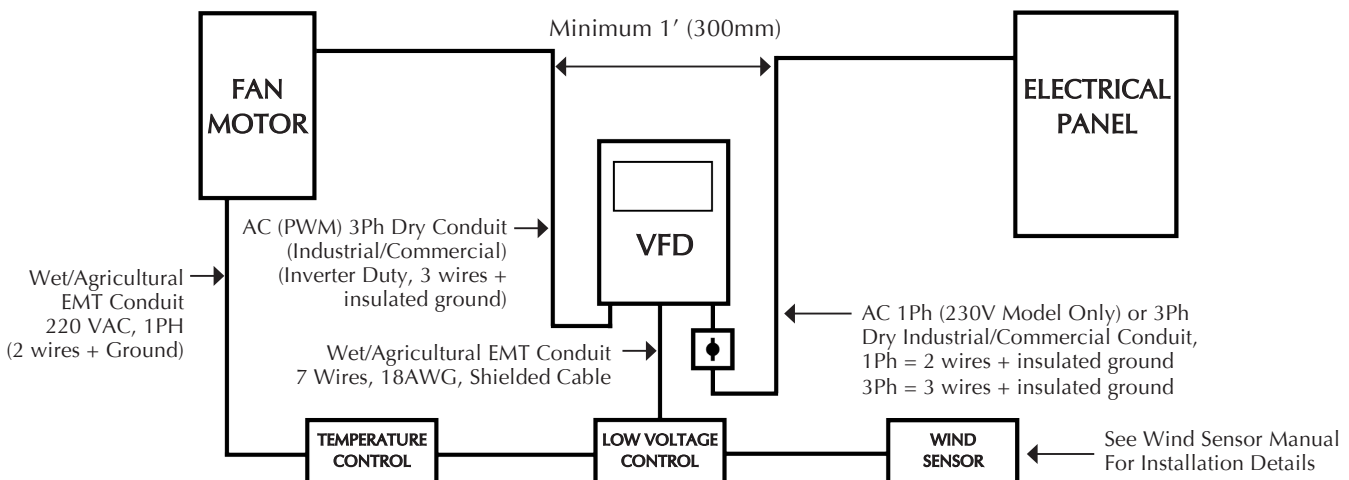
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	1 Ph	3 Ph	3 Ph	3 Ph	3 Ph	3 Ph	3 Ph	3 Ph	3 Ph
VFD	1 Ph	3 Ph	3 Ph	3 Ph	3 Ph	3 Ph	3 Ph	3 Ph	3 Ph
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	170-264 VAC 48-62 Hz	170-264 VAC 48-62 Hz		340-440 VAC 48-62 Hz		340-528 VAC 48-62 Hz		425-660 VAC 48-62 Hz	

The above values are full-load current values.

**A separate insulated ground must be provided to each VFD from the electrical panel.
This will reduce the noise from being radiated in other equipment.**

**Motor is rated with an Insulation Class F;
Ensure proper wiring is used as per current electrical codes.**

WIRING SCHEMATIC



ZoneAIR FAN CONTROL INSTALLATION

WIRE LOCATION

- DO NOT RUN input and output power cables in the same conduit
- DO NOT RUN control cables with any power cables in the same conduit
- DO NOT RUN different fan's output power cables in the same conduit

You may run different fan's input (only) power cables in the same conduit.

CABLE LENGTH

The cable distance between the Lenze AC Tech VFD and the Motor has changed. In all cases it has been reduced due to variable cable quality, variations in workmanship and changes in technology in the VFD.

LOAD REACTOR AND dV/dT FILTER

The following table; the cable length includes vertical distances. There will be 3 different classes of distance having distance measurement, addition of load reactor or dV/dT filter and change in the horsepower rating of the VFD. In cases of adding either a load reactor or filter, the device has to be installed close to the VFD (within 6-10 feet) on the Load Side of the VFD.

CABLE LENGTH BETWEEN THE LENZE AC TECH VFD AND MOTOR			
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The filter and load reactor can operate at either 50Hz or 60Hz.

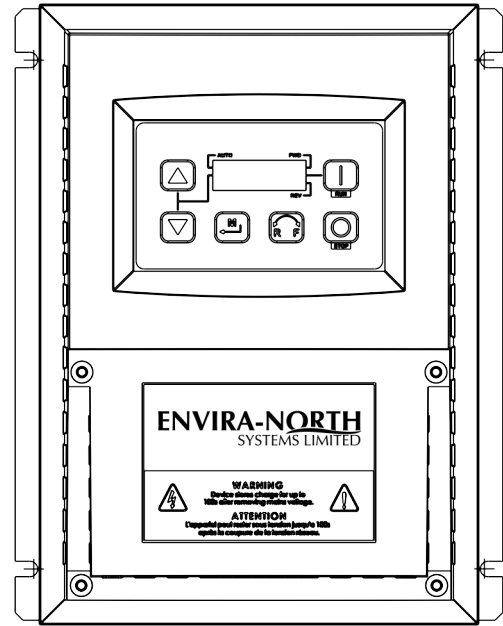
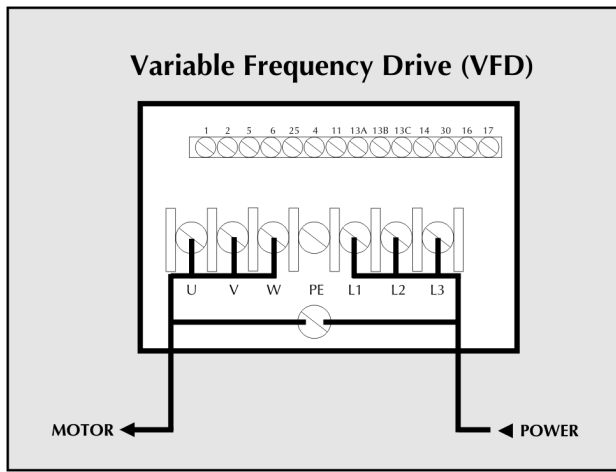
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ZoneAIR FAN CONTROL INSTALLATION

WIRE CONNECTIONS (VFD)

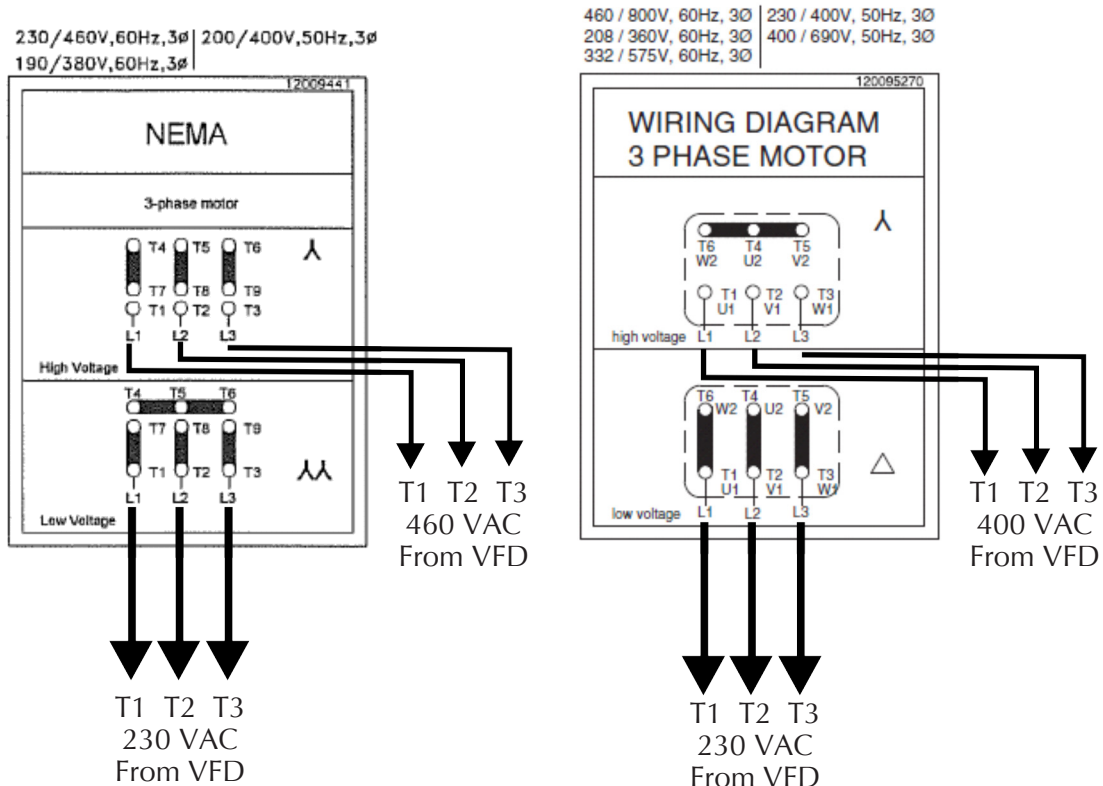
Input Power

- Single phase (1Ph) use L1 - L2 + PE (Ground)
- Three phase (3Ph) use L1 - L2 - L3 + PE (Ground)



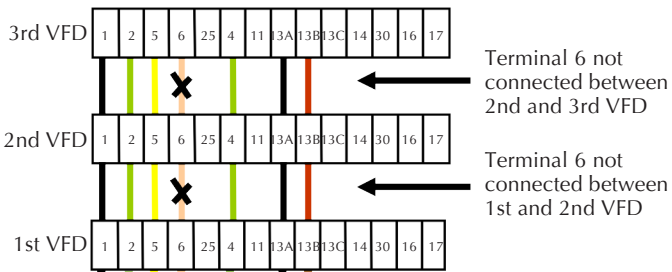
WIRE CONNECTIONS (MOTOR)

The thermal protection wires in the junction box of the Nord motor are not to be used unless otherwise directed. The Variable Frequency Drive provides the over temperature and overload protection.



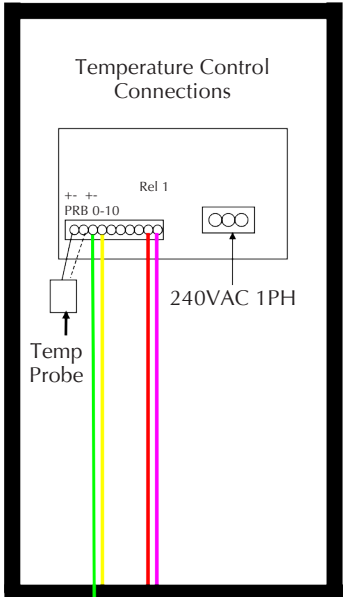
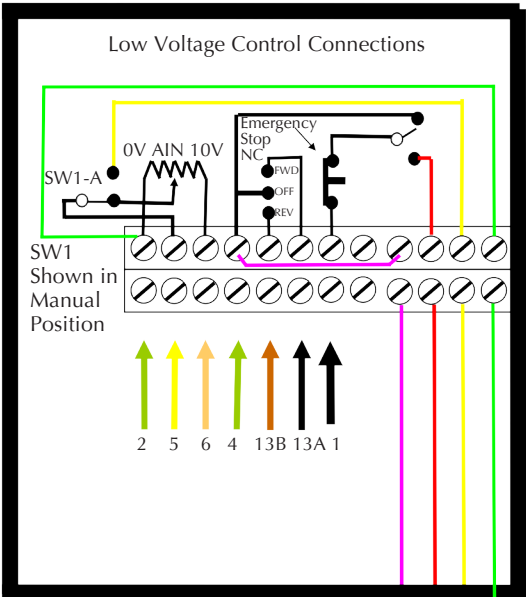
ZoneAIR FAN CONTROL INSTALLATION

WIRE CONNECTIONS (LVC)



IMPORTANT
All VFDs must have their individual power turned on for the fans to operate.

Maximum distance between the LVC and the LAST or 7th VFD is 700 feet (214meters)



7 Wires to VFD (18AWG Shielded)

4 Wires to TFD-1 (18AWG Shielded)

OPERATING INSTRUCTIONS (LVC)

1. DO NOT TURN OFF THE FAN WHILE IN MOTION USING A DISCONNECT SWITCH.
2. Make sure the toggle switch labelled "TFD-1 / Manual" switch is in the 'MANUAL' position.
3. Use the speed potentiometer to adjust the fan's speed
4. Always use the Red Stop button (on the right of the Low Voltage Controller) to turn off or stop the fan.
5. To reverse the direction of the fan while in motion, use the toggle switch labelled "Forward / Reverse."



ZoneAIR FAN CONTROL INSTALLATION

SETUP OF TFD TEMPERATURE CONTROLLER

To adjust the TFD:

- Rotate the Selector dial to position (1) Set Point
- Rotate the Adjustor dial to desired set point temperature (Example 20°C)
- Rotate the Selector dial to position (2) Modulation Band
- Rotate the Adjustor dial to desired modulation band (Example 10°C)
- Rotate the Selector dial to position (3) Minimum Ventilation Off
- Rotate the Adjustor dial to desired minimum (Example 5°C)

In the examples above, from start-up, the fan will start to turn only if the interior temperature reaches 20°C. The speed that will be indicated on the fan controller should be approximately 27%. As the temperature rises in the building, the fan will increase speed until the temperature reaches the end of the modulation band. At 30C (set point + modulation band) the fan will be at its maximum (100%) speed.

As the temperature decreases the speed will decrease until you reach the set point (20°C). At that point the speed will be at its minimum. As the temperature decreases below the set point, the fan will continue to operate at its minimum rate until you reach 15°C (set point minus the minimum ventilation off). Below this point of 15°C the fan will stop and will stay in the off condition until the temperature rises to the set point – minimum off (15°C) and then the cycle repeats itself.

The minimum speed has been programmed to 15 Hz or 27%. DO NOT lower it pass this limit otherwise your warranty will be void. Lowering the speed below 15 Hz or 27% will cause the motor to overheat because the motor will not draw enough air to cool down at these low speeds.

OPERATING INSTRUCTIONS (LVC + TFD)

1. DO NOT TURN OFF THE FAN WHILE IN MOTION USING A DISCONNECT SWITCH.
2. Make sure the toggle switch labelled “TFD-1 / Manual” switch is in the ‘TFD-1’ position.
3. Always use the Red Stop button (on the right of the Low Voltage Controller) to turn off or stop the fan.
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CommandAIR

FAN CONTROL



VFD



Mount Plate



Wiring Harness



Remote Keypad



100' (30.48m)
CAT 5 Cable

- Fan Mounted VFD
- One CommandAIR Control Per Fan Required
- Package Includes Mounting Plate + Wiring Harness + Control Wire and Remote Keypad
- Provides Remote Troubleshooting for Fan Mounted VFD
- User Friendly, Simplified Installation and Operation

CommandAIR FAN CONTROL INSTALLATION

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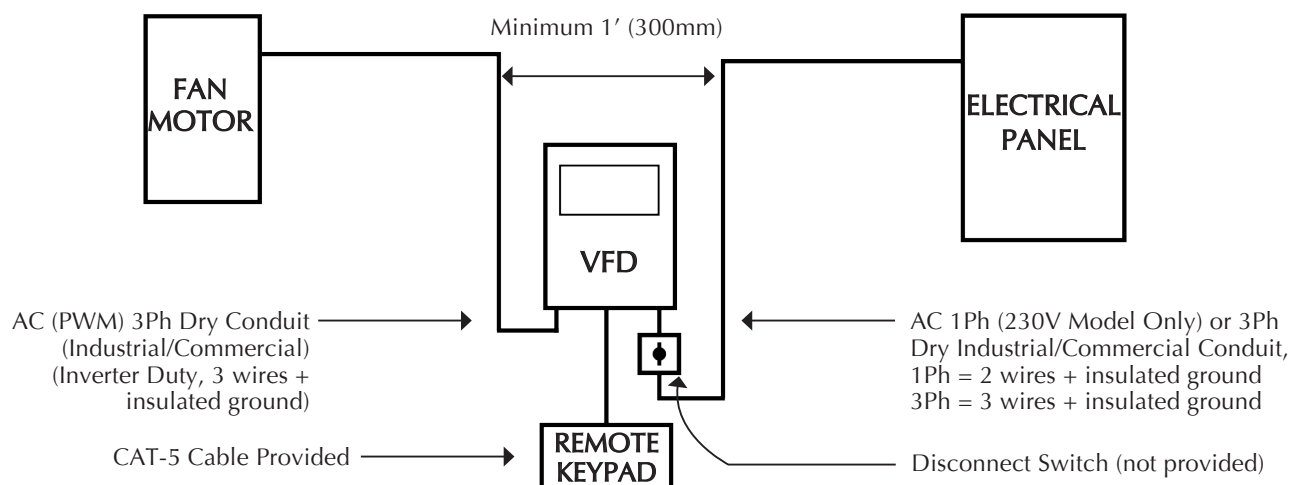
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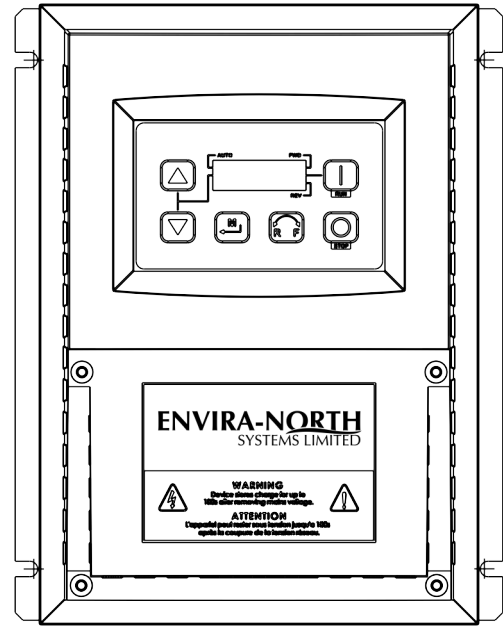
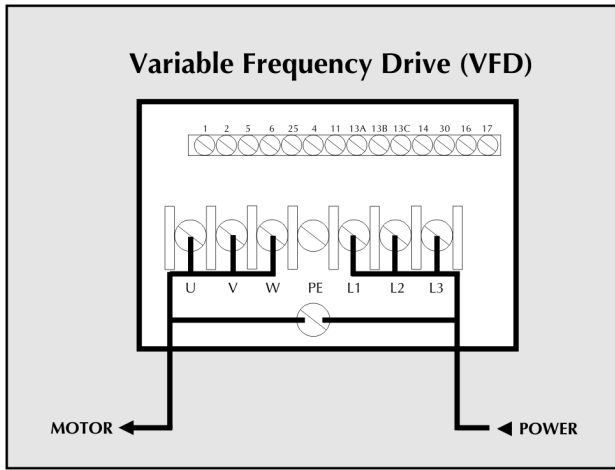
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CommandAIR FAN CONTROL INSTALLATION

WIRE CONNECTIONS (VFD)

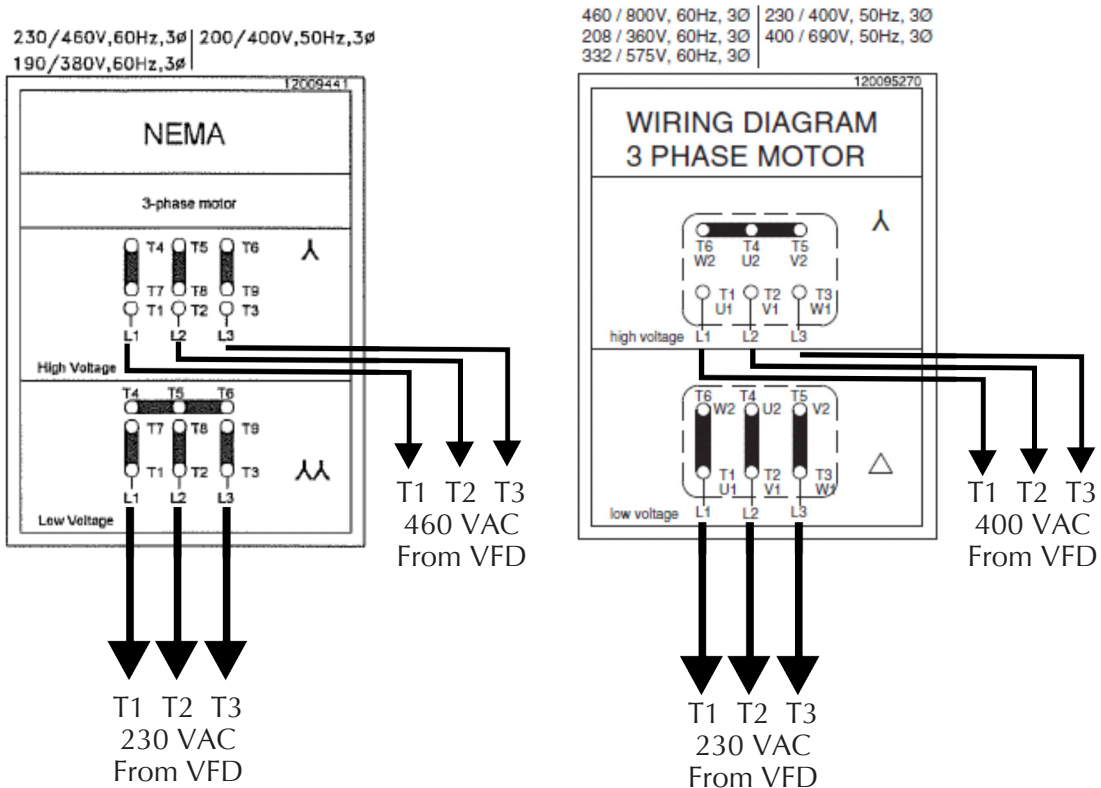
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

CommandAIR FAN CONTROL OPERATION

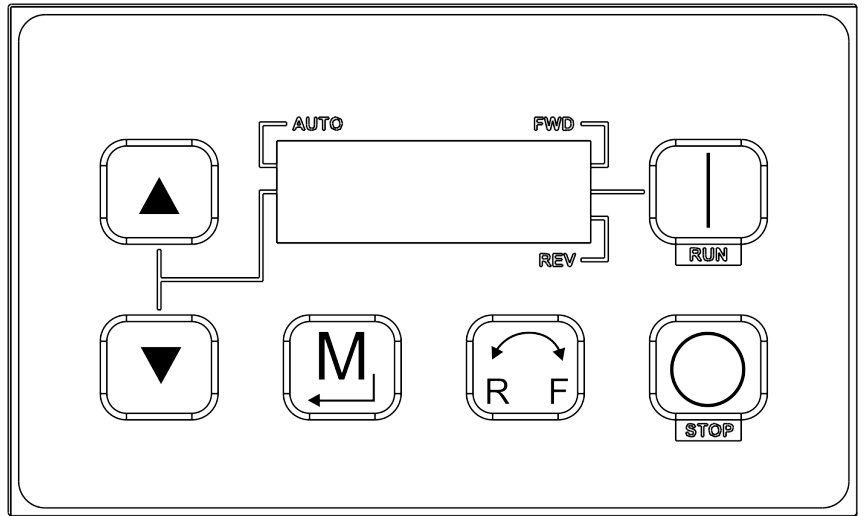
OPERATING INSTRUCTIONS

TO START (Press): 

TO STOP (Press): 

TO CHANGE SPEED (Press): 


TO CHANGE ROTATION (Press): 
(Then Press): 



Keypad



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