




# POWERFOIL X3.0 ELECTRICAL SPECS & DIAGRAMS

-  **WARNING:** Disconnect power to the installation locations before installing the fan and controller!
-  **WARNING:** Wait three minutes after disconnecting the VFD before servicing!
-  **WARNING:** Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction. Incorrect assembly can cause electric shock or damage the motor and the controller.

## Supply power guidelines

Before beginning fan installation, route power wiring to the VFD installation site. Refer to the minimum supply circuit requirements for your fan size below.

### Powerfoil X3.0







Fan	Diameter	Minimum Circuit Size <sup>1</sup>
PFX3-12	12 ft (3.6 m)	30 A @ 200–240 V, 1 $\Phi$ 20 A @ 200–240 V, 3 $\Phi$ 10 A @ 400–480 V, 3 $\Phi$ 10 A @ 575–600 V, 3 $\Phi$
PFX3-14	14 ft (4.3 m)	
PFX3-16	16 ft (4.9 m)	
PFX3-18	18 ft (5.5 m)	
PFX3-20	20 ft (6.1 m)	
PFX3-24	24 ft (7.3 m)	

### Powerfoil X3.0 Plus

Fan	Diameter <sup>2</sup>	Minimum Circuit Size <sup>1</sup>
PPX3-12	14 ft (4.3 m)	30 A @ 200–240 V, 1 $\Phi$ 20 A @ 200–240 V, 3 $\Phi$ 10 A @ 400–480 V, 3 $\Phi$ 10 A @ 575–600 V, 3 $\Phi$
PPX3-14	16 ft (4.9 m)	
PPX3-16	18 ft (5.5 m)	
PPX3-18	20 ft (6.1 m)	
PPX3-20	22 ft (6.7 m)	
PPX3-24	24 ft (7.3 m)	

1. All VFDs produce three-phase output power regardless of input phase.
2. With Powerfoil Plus winglets

## Power wiring guidelines

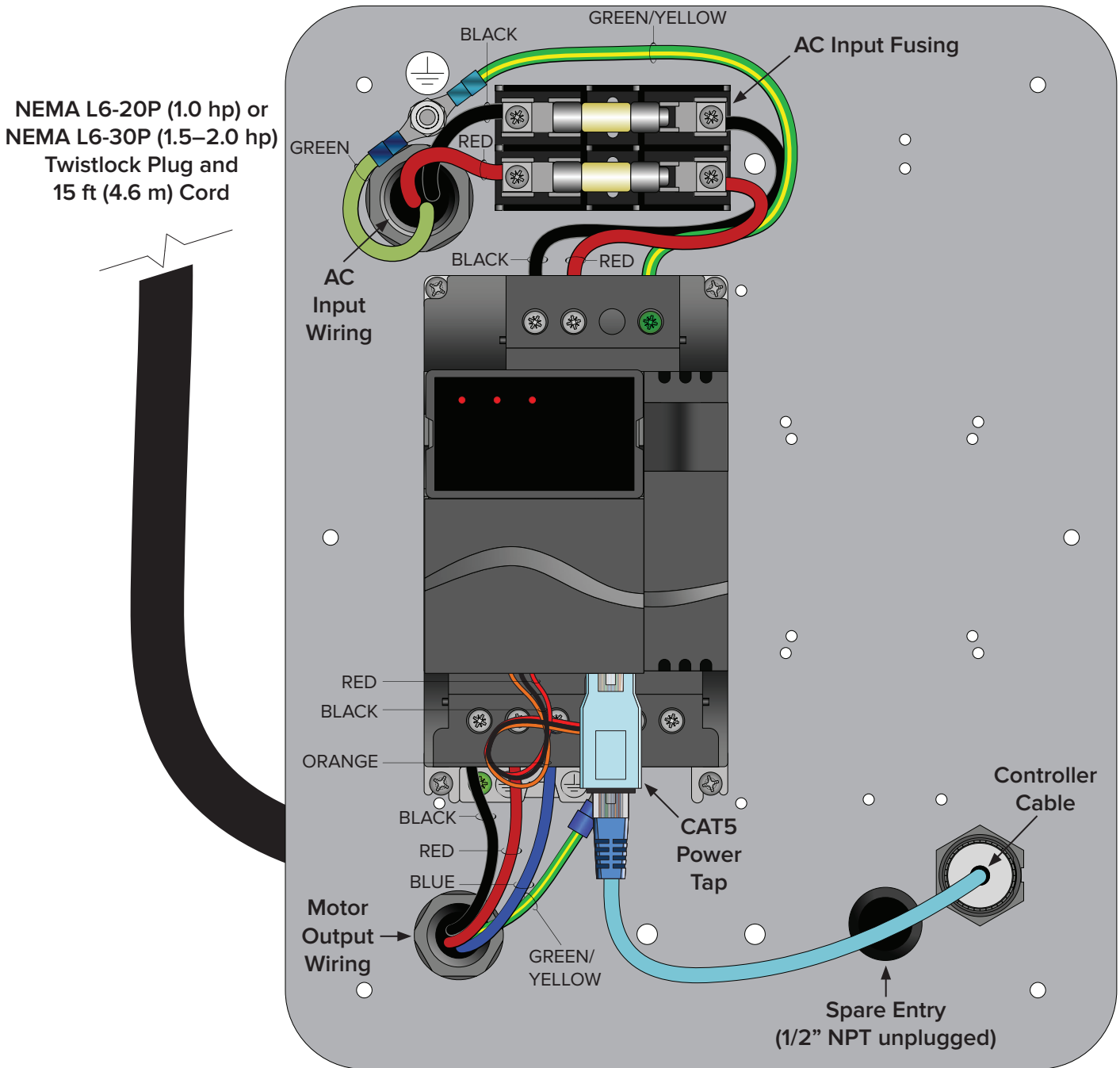
-  Make sure the supply power circuit is the appropriate size and voltage and that power wiring is routed to the fan's Variable Frequency Drive (VFD) installation site. Refer to the supply circuit requirements above.
-  Each fan requires dedicated overcurrent protection.
-  The VFD output circuit cannot share conduit with any other fan controller's input or output circuits, or with the input circuit to the same VFD.
-  We do not provide additional means of disconnect. If required, a local disconnect should be installed per all national and local codes.
-  To satisfy some local code requirements, it may be necessary to install a manual disconnect at the fan motor location when the fan is not within 50 ft (15.2 m)/line-of-sight of the VFD.
-  VFD output circuit to motor: Use 600 V rated THHN stranded wire in conduit or 600 V rated SO, SOOW portable cord where permitted. Do not use Metal Clad (MC) cable or solid core wire between the VFD and the motor.

# Wiring: 200–240 V, 1 $\Phi$

**⚠ WARNING:** Power tap used with BAFCon only. Not compatible with any other controller.

**📝 Note:** Fire relay not shown. See Fire Relay Wiring for fire relay wiring instructions.

The diagram below shows a standard VFD (200–240 V, 1  $\Phi$ ) using single-phase input from AC power supply. Actual component layout may differ from illustration.



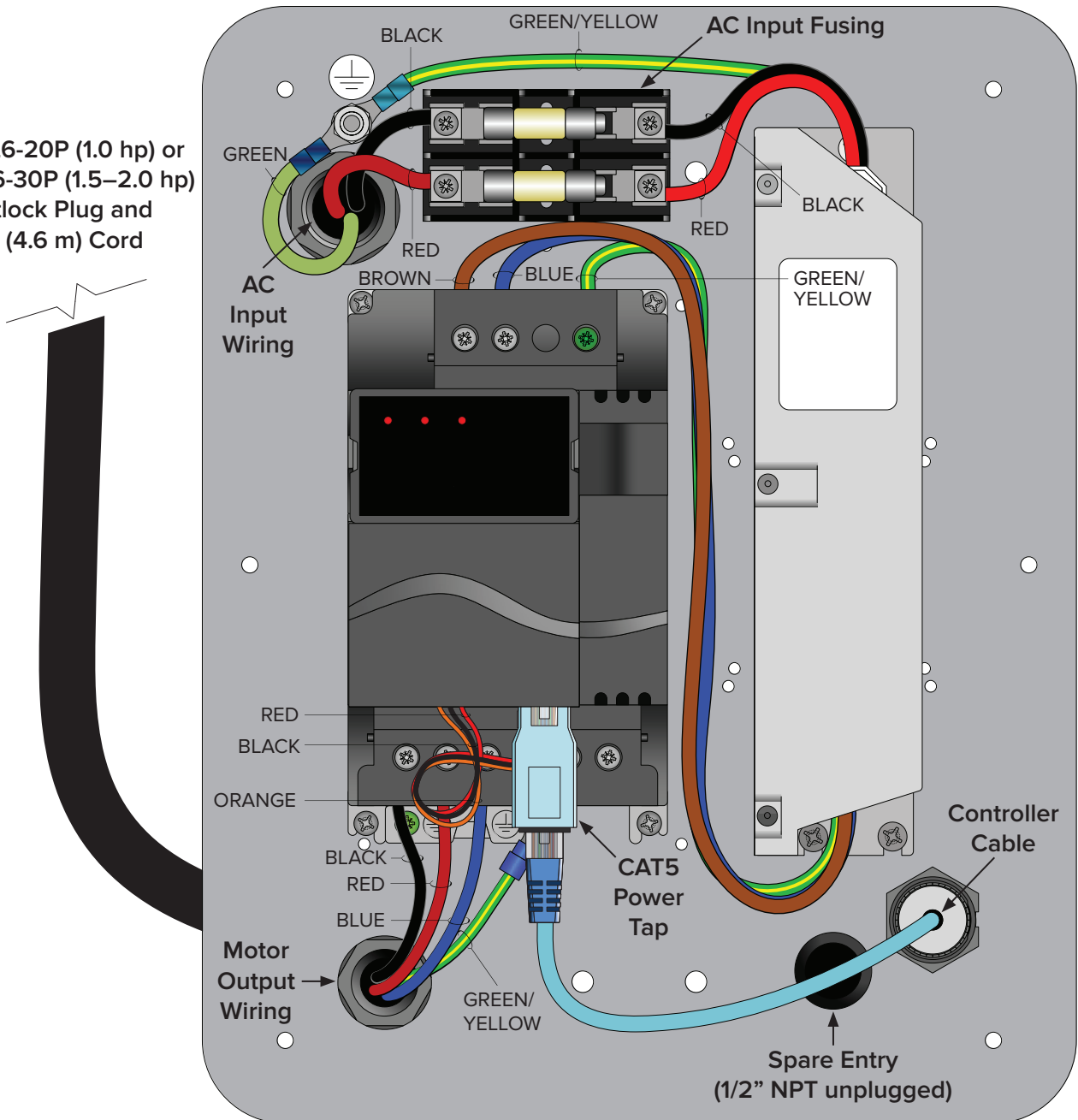
# Wiring: 200–240 V, 1 $\Phi$ with EMI filter

**⚠ WARNING:** Power tap used with BAFCon only. Not compatible with any other controller.

**📝 Note:** Fire relay not shown. See Fire Relay Wiring for fire relay wiring instructions.

The diagram below shows a typical EMI filter installation on a standard VFD (200–240 V, 1  $\Phi$ ) using single-phase input from AC power supply. *Actual component layout may differ from illustration.*

NEMA L6-20P (1.0 hp) or  
NEMA L6-30P (1.5–2.0 hp)  
Twistlock Plug and  
15 ft (4.6 m) Cord

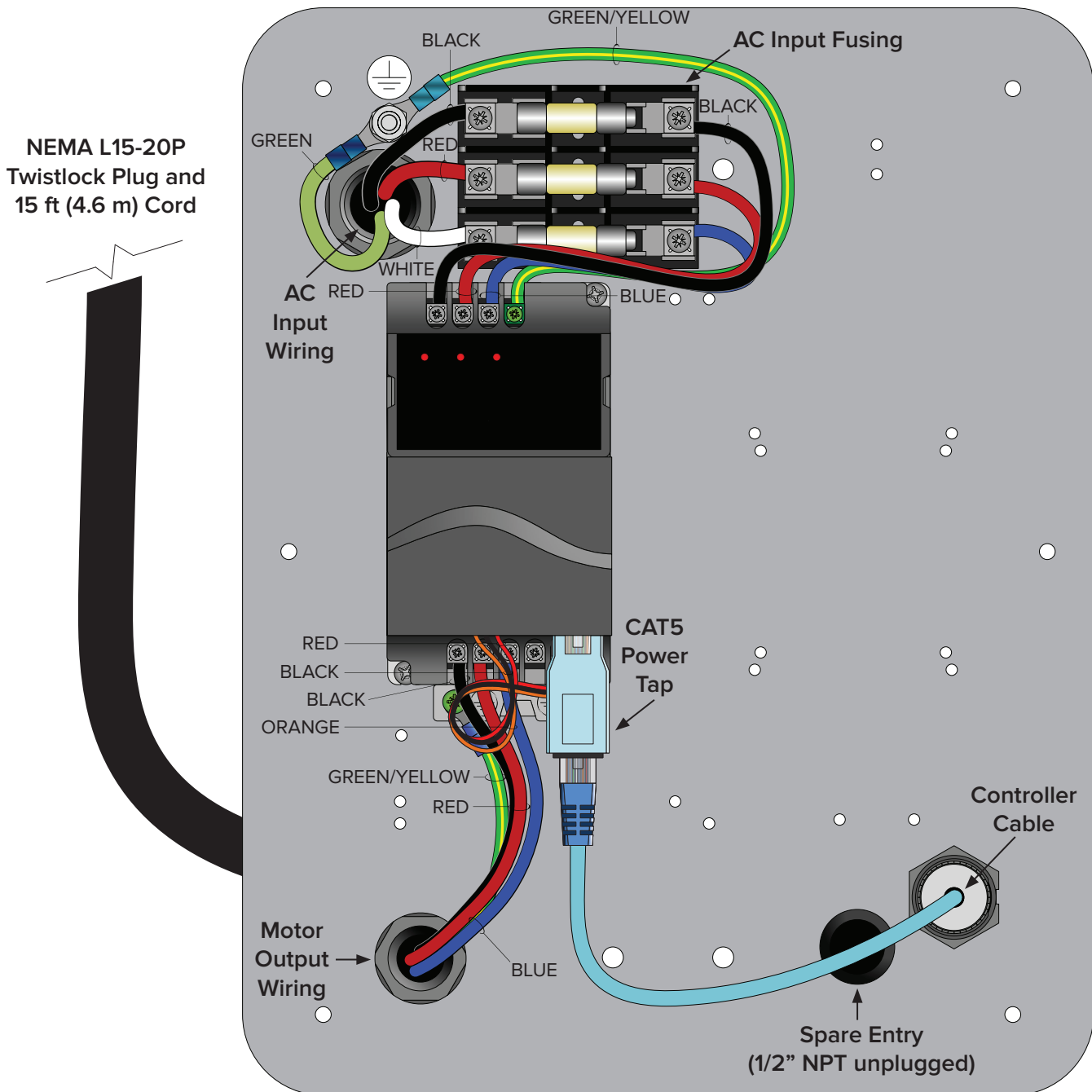


# Wiring: 200–240 V, 3 $\Phi$

**⚠ WARNING:** Power tap used with BAFCon only. Not compatible with any other controller.

**📝 Note:** Fire relay not shown. See Fire Relay Wiring for fire relay wiring instructions.

The diagram below shows a standard VFD (200–240 V, 3  $\Phi$ ) using three-phase input from AC power supply. Actual component layout may differ from illustration.

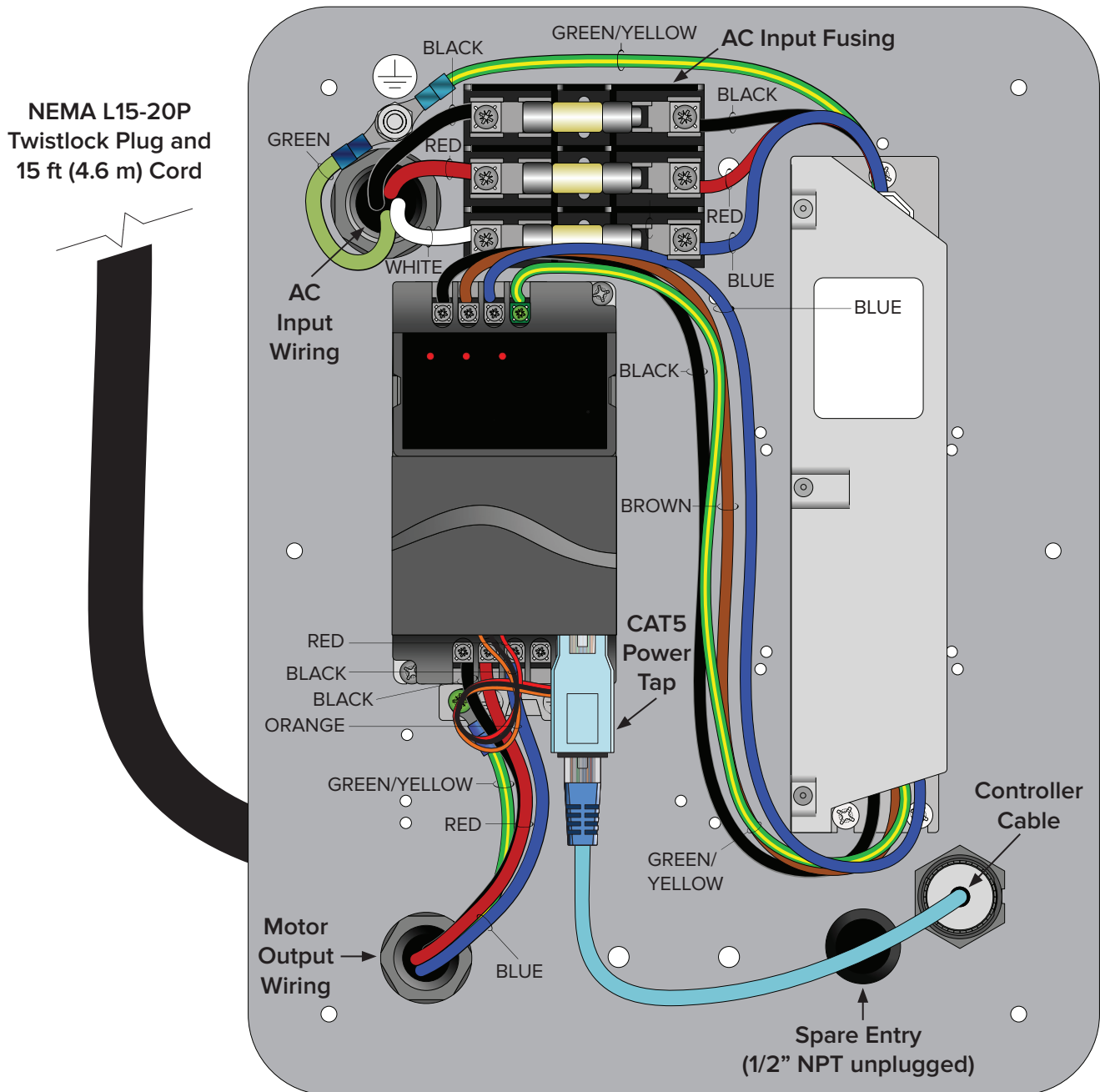


# Wiring: 200–240 V, 3 $\Phi$ with EMI filter

**⚠ WARNING:** Power tap used with BAFCon only. Not compatible with any other controller.

**📝 Note:** Fire relay not shown. See Fire Relay Wiring for fire relay wiring instructions.

The diagram below shows a typical EMI filter installation on a standard VFD (200–240 V, 3  $\Phi$ ) using three-phase input from AC power supply. *Actual component layout may differ from illustration.*

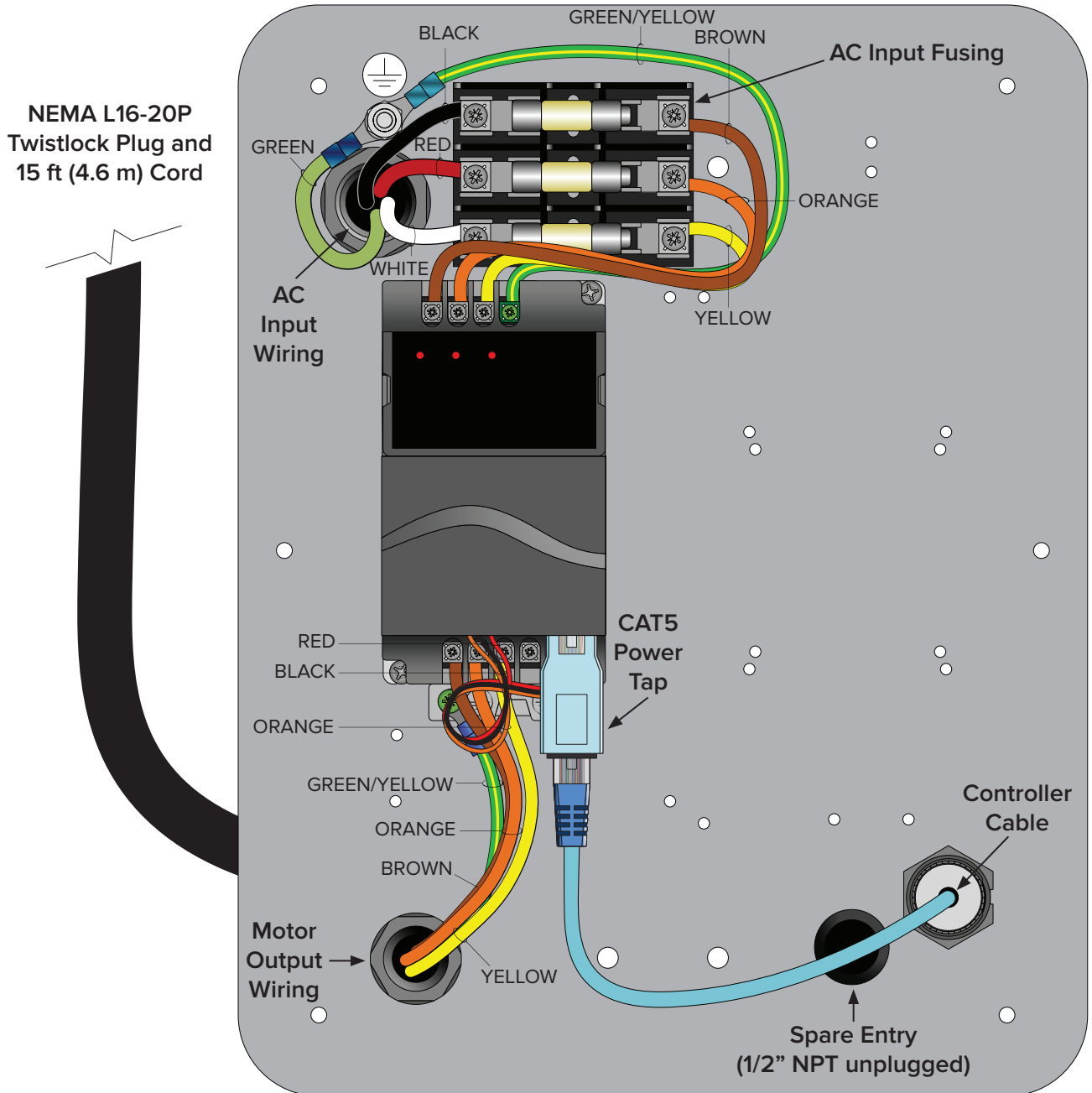


# Wiring: 400–480 V, 3 $\Phi$

**⚠ WARNING:** Power tap used with BAFCon only. Not compatible with any other controller.

**📝 Note:** Fire relay not shown. See Fire Relay Wiring for fire relay wiring instructions.

The diagram below shows a standard VFD (400–480 V, 3  $\Phi$ ) using three-phase input from AC power supply. Actual component layout may differ from illustration.

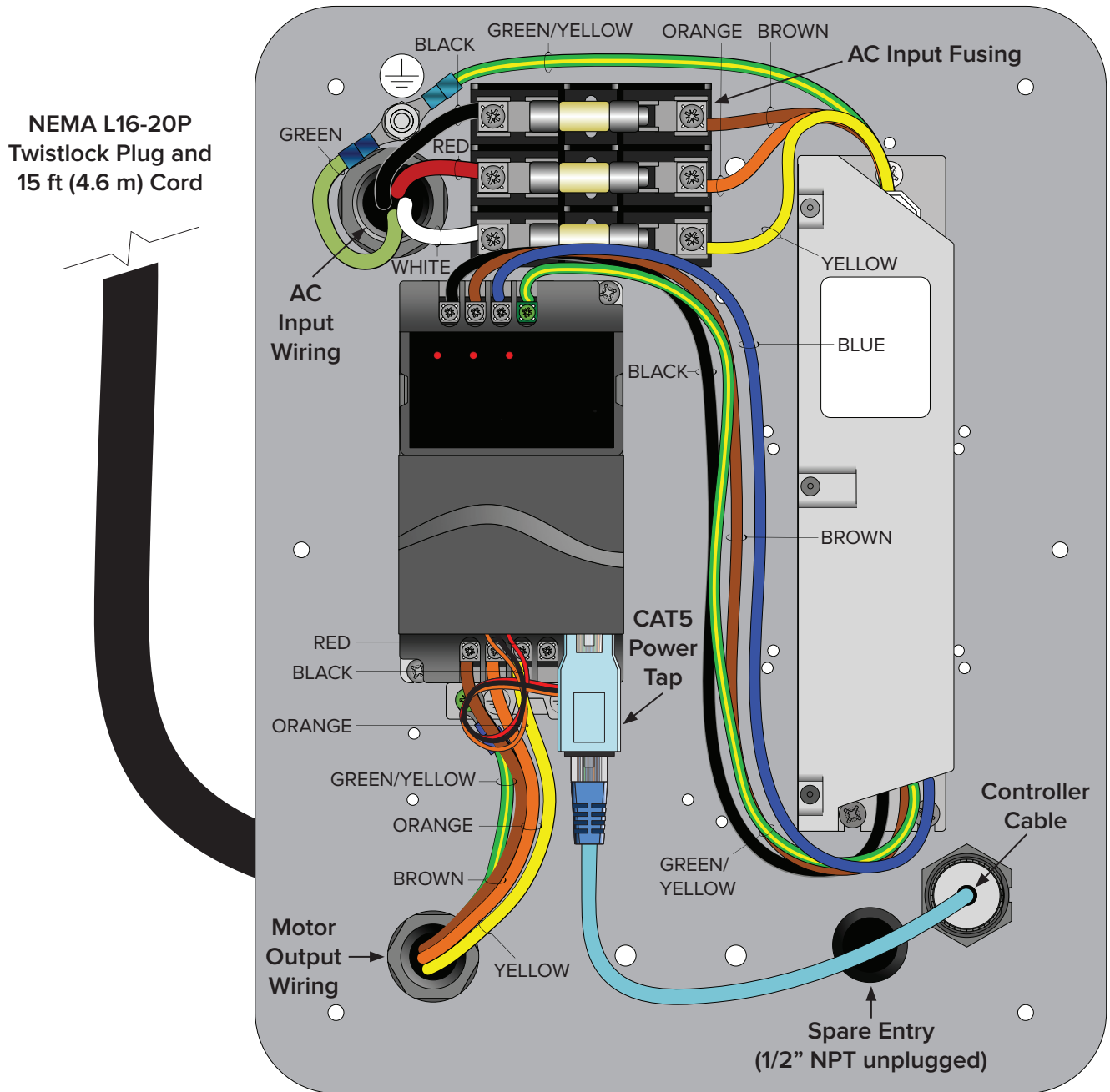


# Wiring: 400–480 V, 3 $\Phi$ with EMI filter

**⚠ WARNING:** Power tap used with BAFCon only. Not compatible with any other controller.

**📝 Note:** Fire relay not shown. See Fire Relay Wiring for fire relay wiring instructions.

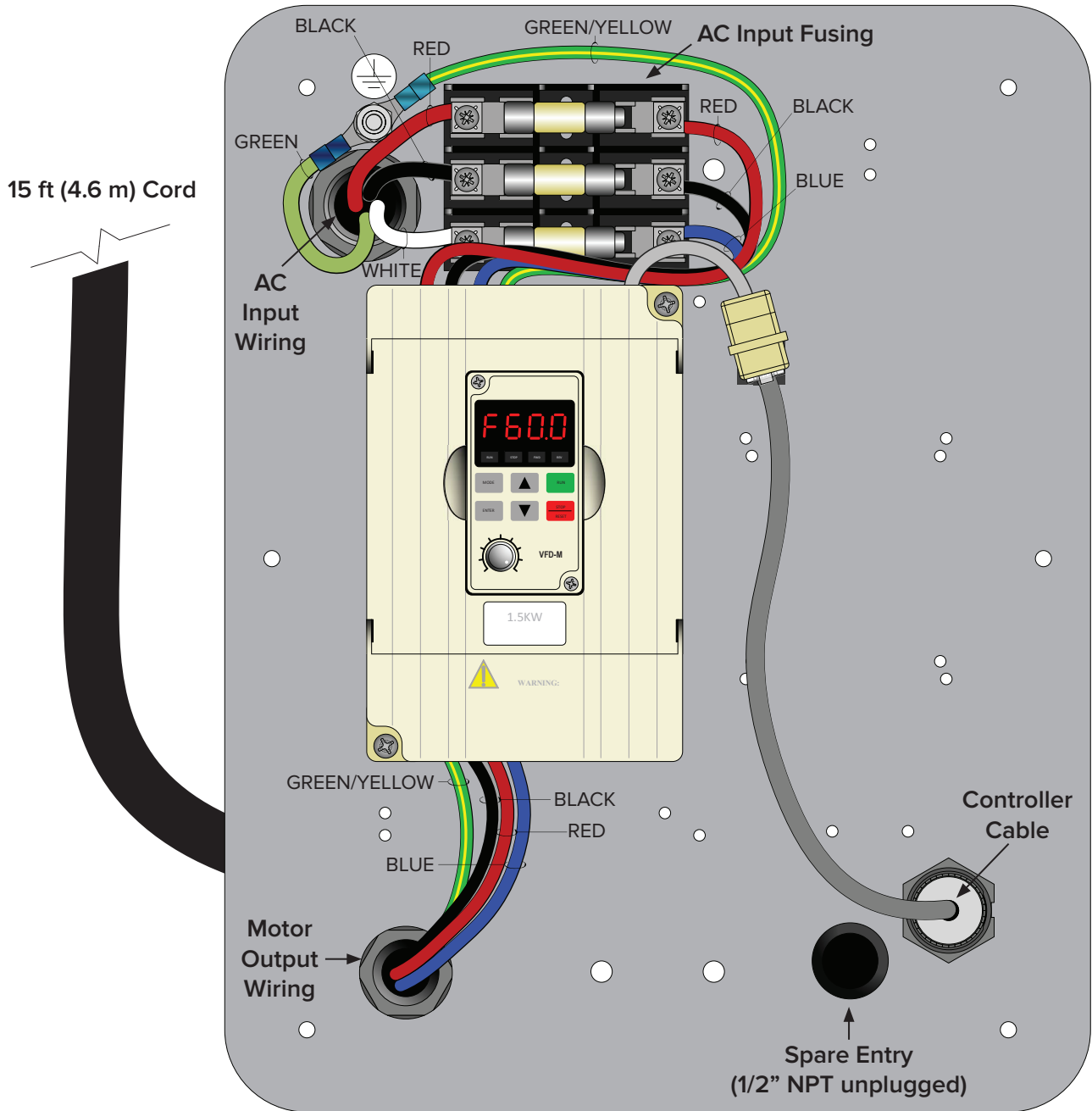
The diagram below shows a typical EMI filter installation on a standard VFD (400–480 V, 3  $\Phi$ ) using three-phase input from AC power supply. Actual component layout may differ from illustration.



# Wiring: 575–600 V, 3 $\Phi$

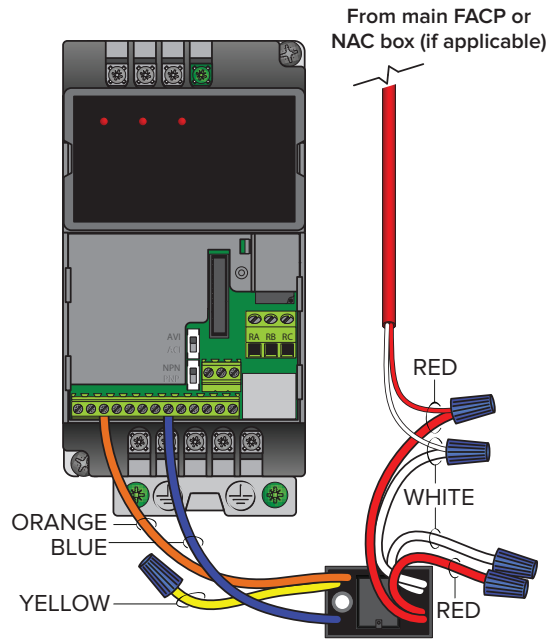
 **Note:** Fire relay not shown. See Fire Relay Wiring for fire relay wiring instructions.

The diagram below shows a standard VFD (575–600 V, 3  $\Phi$ ) using three-phase input from AC power supply. Actual component layout may differ from illustration.





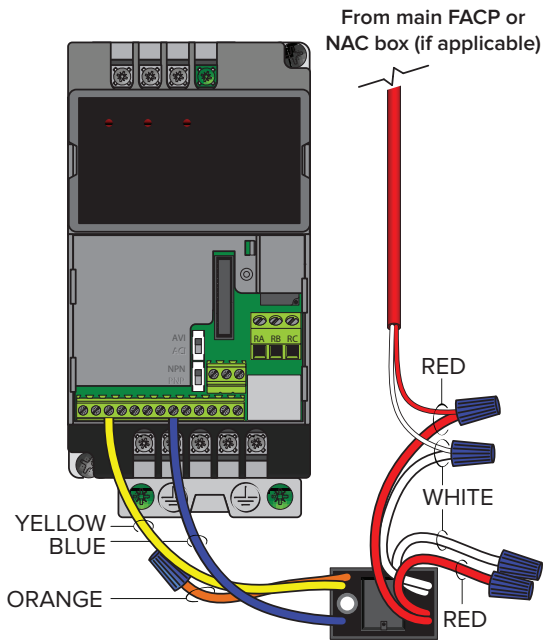
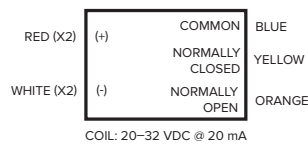
# Fire relay wiring (E Series)



A contact closure across digital input terminals MI3 and DCM will result in fan shutdown. The relay uses a Normally Open (N.O.) contact. The relay coil must be energized by the FACP for fan shutdown.

Two additional relay coil leads are provided to facilitate supervision pass-through where required.

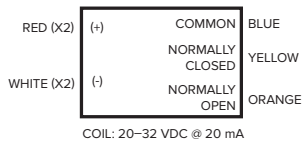
An alarm condition will stop the fan and issue a fault at the controller.



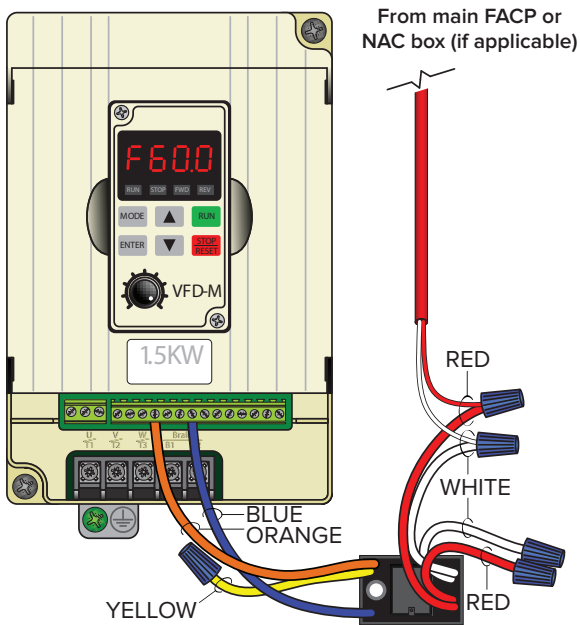
Optionally, the relay can be used with a Normally Closed (N.C.) contact. The relay coil must remain energized by the FACP for fan operation. This would be considered a fail safe or fail open wiring arrangement.

Two additional relay coil leads are provided to facilitate supervision pass-through where required.

An alarm condition will stop the fan and issue a fault at the controller.



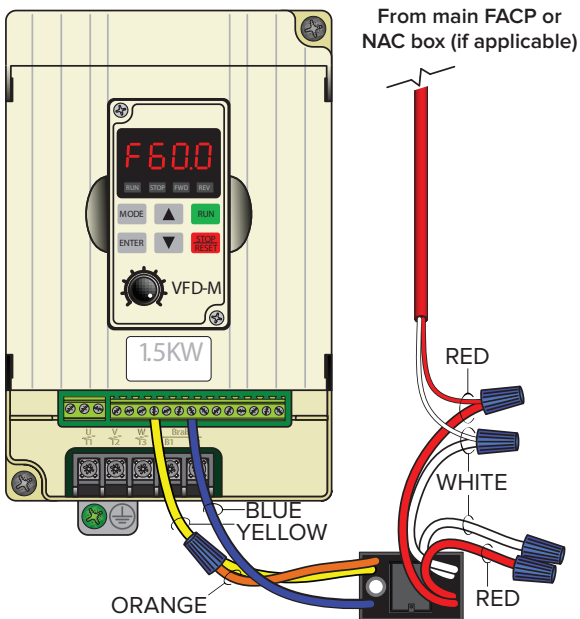
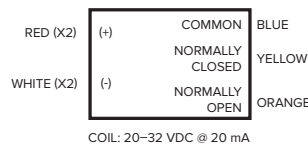
# Fire relay wiring (M Series)



A contact closure across digital input terminals M3 and GND will result in fan shutdown. The relay uses a Normally Open (N.O.) contact. The relay coil must be energized by the FACP for fan shutdown.

Two additional relay coil leads are provided to facilitate supervision pass-through where required.

An alarm condition will stop the fan and issue a fault at the controller.



Optionally, the relay can be used with a Normally Closed (N.C.) contact. The relay coil must remain energized by the FACP for fan operation. This would be considered a fail safe or fail open wiring arrangement.

Two additional relay coil leads are provided to facilitate supervision pass-through where required.

An alarm condition will stop the fan and issue a fault at the controller.

