

Electrical Power Design Guide

CFR Boilers

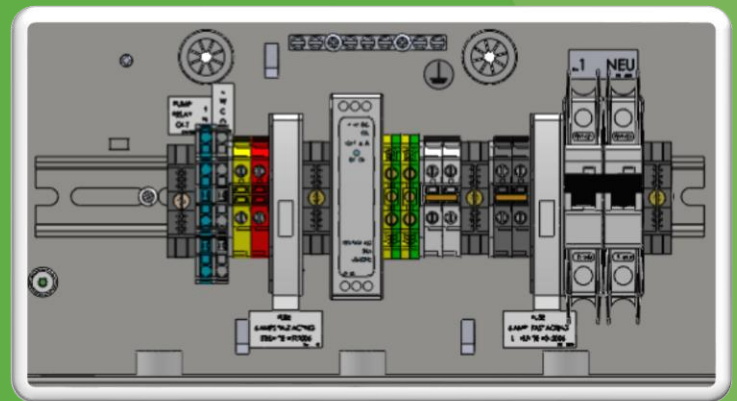
Models CFR1500 and CFR3000

Other documents for this product include:

TAG-0105 CFR Boiler Vent & Combustion Air Guide

TAG-0106 CFR Boiler Gas Guide

TAG-0107 CFR Boiler Application Guide



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1. GENERAL

CFR Boilers are fully factory wired packaged units which require simple external power wiring as part of the installation (Figure 1). This technical guide is intended to help designers provide electrical power wiring (line voltage) to CFR units. Control wiring details are provided in other publications, depending upon unit application. This document is intended only as a guide and therefore cannot include all possible alternatives or unit applications. In order to comply with all codes and authorities having jurisdiction, designers and installers must plan the electrical wiring carefully and execute the installation completely. Emergency shutoffs, fusible fire switches, break glass stations, and other electrical requirements should be considered and installed whenever necessary.

2. BOILER ELECTRICAL REQUIREMENTS

CFR boilers are available with the following power options:

Model	Voltage	Phase	Amperage
CFR1500	120 V	1Ø / 60 Hz	20
CFR2000	120 V	1Ø / 60 Hz	20
CFR3000	208 V	3Ø / 60 Hz	20
	480 V	3Ø / 60 Hz	15

Voltages lower than those specified in the table above will result in increased wear and premature failure of the blower motor. Wire size and type should be made per the National Electrical Code based on length and load.

For all CFR models, the power box for field wiring connections is located in the upper right corner behind the unit front panel. All copper wire must be connected to the power box.



Figure 2-1: Service Disconnect Switch Typical Location

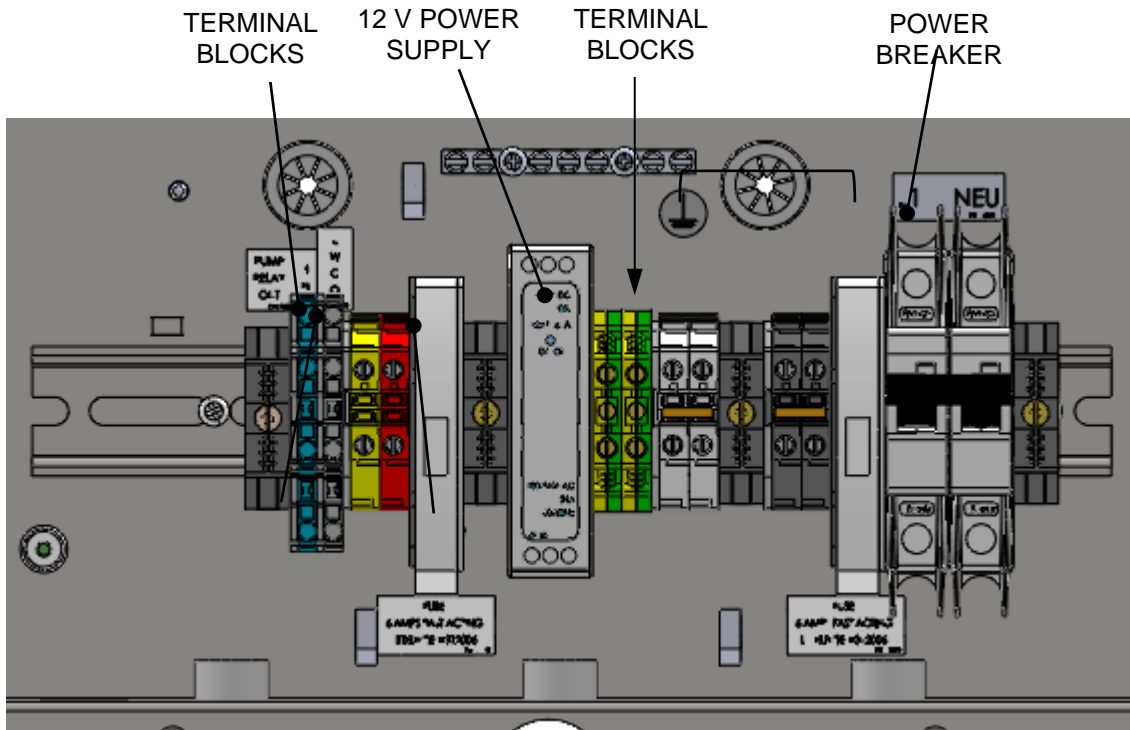


Figure 2-2: Power Box Components, CFR1500-2000

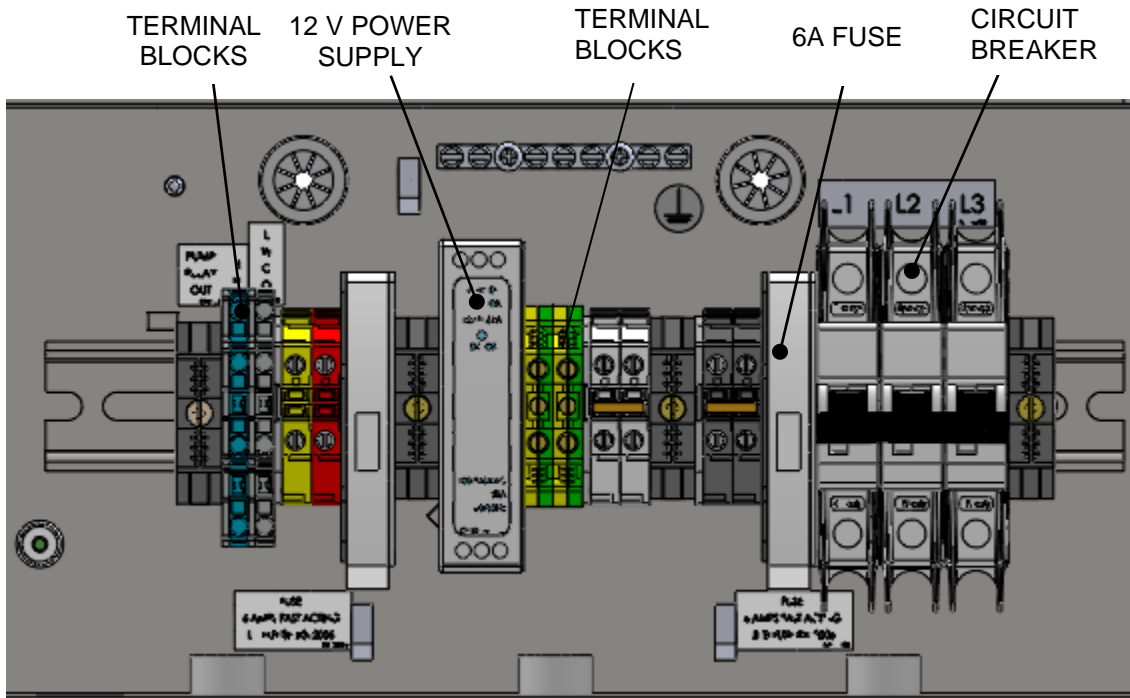


Figure 2-3: Power Box Components, CFR3000

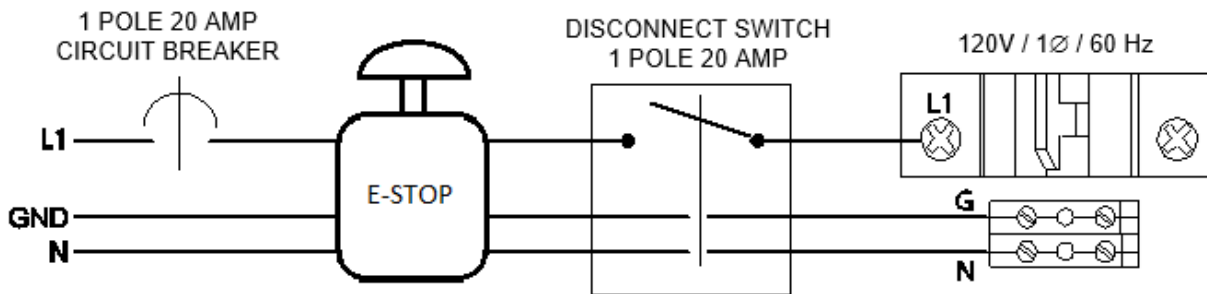
3. PROVISIONS FOR SERVICE

Designers must provide emergency shutoffs and other devices to satisfy electrical codes. It is also recommended to provide an electrical shutoff disconnect switch of suitable load carrying characteristics near each CFR boiler. No electrical boxes or field components should be mounted to the surface of the boiler or where they would interfere with the removal of the side or top panels for maintenance. The service disconnect switch should be mounted near the unit, as illustrated in Diagram 1. Wiring conduit, EMT, or other wiring paths should not be secured to the unit but supported externally. Electricians should be instructed as to where the wiring conduit should be located, such as away from the relief valve discharge, drains, etc. All electrical conduit and hardware should be installed so that it does not interfere with the removal of any covers, inhibit service or maintenance, or prevent access between the unit and walls or another unit.

4. BOILER WIRING

A dedicated protected circuit should be provided from the power source to the boiler. No other electrical devices should be permanently wired on the same circuit. The protected circuit and circuit breaker must be sized for the amperage values below.

An emergency switch (electrical shutoff) must be wired in series with power to the unit. Connecting an emergency shutoff switch (E-stop) to the main power terminals of the boiler is the recommended and safest way to totally disable and un-power the unit. Use of the remote interlock, located on the I/O board, is not recommended since it does **not** cutoff power within the unit, it only disables it. Under no circumstance should the remote interlock of the BST Manager unit be used as an emergency switch for the plant.



The following table lists the input power requirements for all CFR boilers, including the diagram number of each model’s corresponding schematic diagram:

CFR POWER REQUIREMENTS				
Model	Diag.	Voltage/Phase/Frequency	Amps	Wires
CFR1500	1a	120V / 1Ø / 60 Hz@	20 A	3
CFR2000	1a	120V / 1Ø / 60 Hz@	20 A	3
CFR3000	2	208V / 3Ø / 60 Hz	20 A	5
	3a	480V / 3Ø / 60 Hz	15 A	4

For applicable wiring connections, refer to the schematic diagrams below.

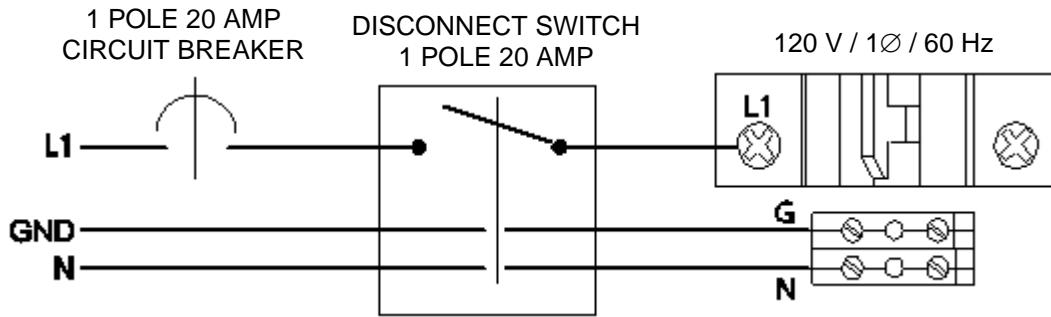


Diagram 1a - CFR1500-2000: 120 V / 1Ø / 60 Hz Wiring Schematic – 3 Wire

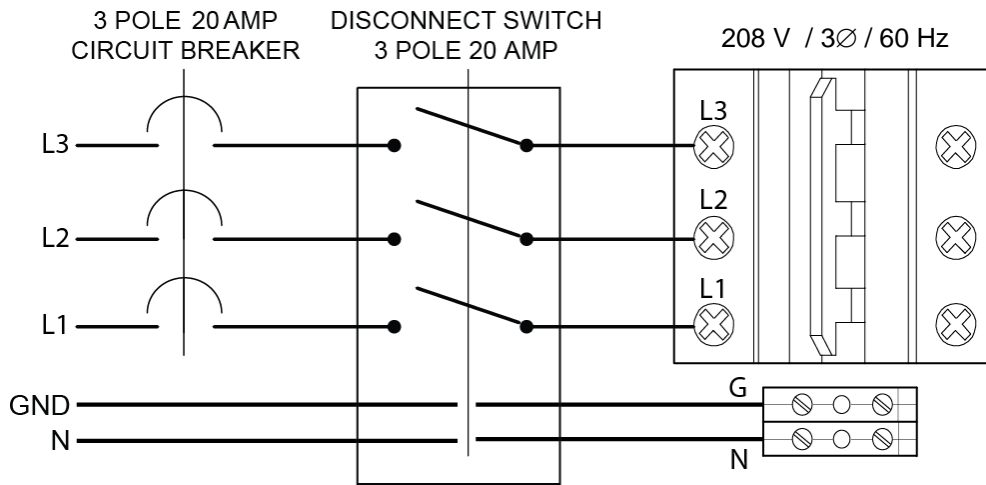


Diagram 2 - CFR3000: 208 V / 3Ø / 60 Hz Wiring Schematic- 5 Wire

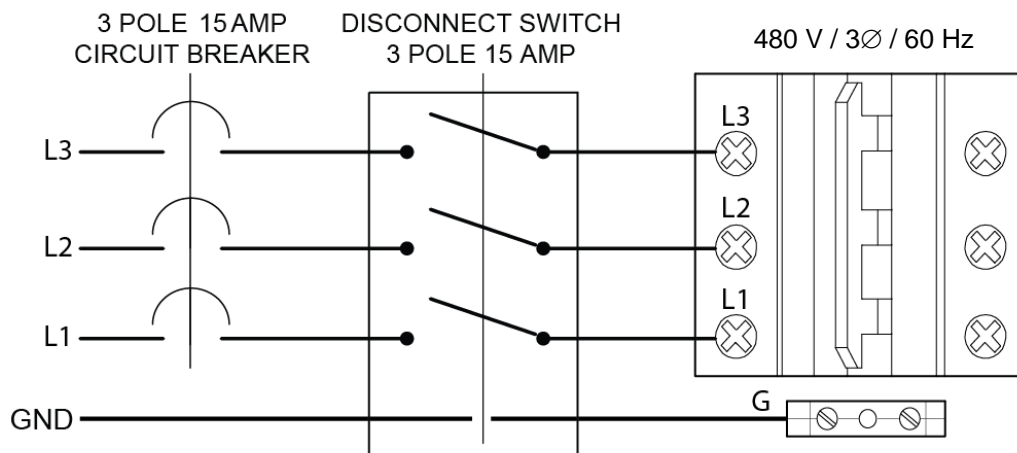


Diagram 3a - CFR3000: 480 V / 3Ø / 60 Hz Wiring Schematic- 4 Wire

5. MULTIPLE UNIT WIRING

Whenever multiple units are installed within the same mechanical spaces, electrical code requirements call for a single electrical shutoff for emergency use. It is the responsibility of the electrical designer to comply with local codes and regulations affecting an individual installation.



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