AERCO
A WATTS Brand

Electrical Power Design Guide

Benchmark® E Electric Boilers

Models 216 through 684

Other documents for this product include:

OMM-0169 BMK E - Installation, Startup, Operation and Maintenance
TAG-0019 Benchmark Boiler Application Guide

ASME H

Heating and Hot Water Solutions
AERCO International, Inc. • 100 Oritani Drive • Blauvelt, NY 10913
USA: T: (845) 580-8000 • Toll Free: (800) 526-0288 • AERCO.com
Technical Support • (800) 526-0288 • Mon-Fri, 8 am - 5 pm EST

1. GENERAL

Benchmark E (BMK E) Electric Boilers are fully factory wired packaged units which require 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 Benchmark 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. 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

Benchmark E boilers are available with the following power options:

BMK E Model	Voltage	Phase	Amperage	MCA	MOCP
BMK E 216	480V	3Æ / 60 Hz	260	325	350
	600V	3Æ / 60 Hz	208	260	300
BMK E 360	480V	3Æ / 60 Hz	433	542	600
	600V	3Æ / 60 Hz	347	434	450
BMK E 432	480V	3Æ / 60 Hz	520	650	700
	600V	3Æ / 60 Hz	416	520	600
BMK E 576	480V	3Æ / 60 Hz	693	867	1000
	600V	3Æ / 60 Hz	555	694	700
BMK E 684	480V	3Æ / 60 Hz	823	1029	1200
	600V	3Æ / 60 Hz	659	824	1000

Table 1: Benchmark E Electrical Specifications

Voltages lower than those specified in the table above will result in increased wear and premature failure of the unit. Use proper wire size and branch circuit protection as required by the latest addition of the National Electrical Code, NPFA-70, or Canadian Electrical Code, C22.1, and any additional local codes. Wire size must be copper and wire size must be No. 4/0 AWG or larger. Field connections accept wire sizes up to 500 MCM. Wire must be suitable for at least 194°F (90°C).

NOTE: Copper wire is recommended. If using aluminum wire, conductive grease is required to prevent corrosion. Damage resulting from the use of aluminum wiring is excluded from coverage under the warranty for this unit.

The short circuit current rating (SCCR) of Benchmark E boilers is 100kA RMS Symmetrical, 600V maximum.

For all **Benchmark E** models, the connection point for field power wiring is located in the upper left behind the control panel door.

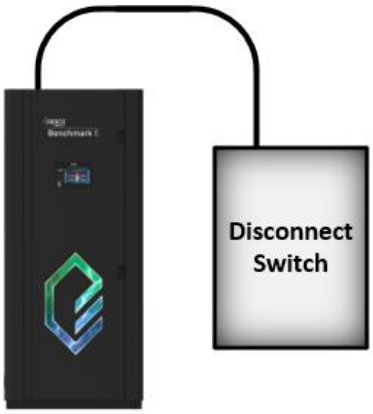

Figure 1: Service Disconnect Switch Typical Location

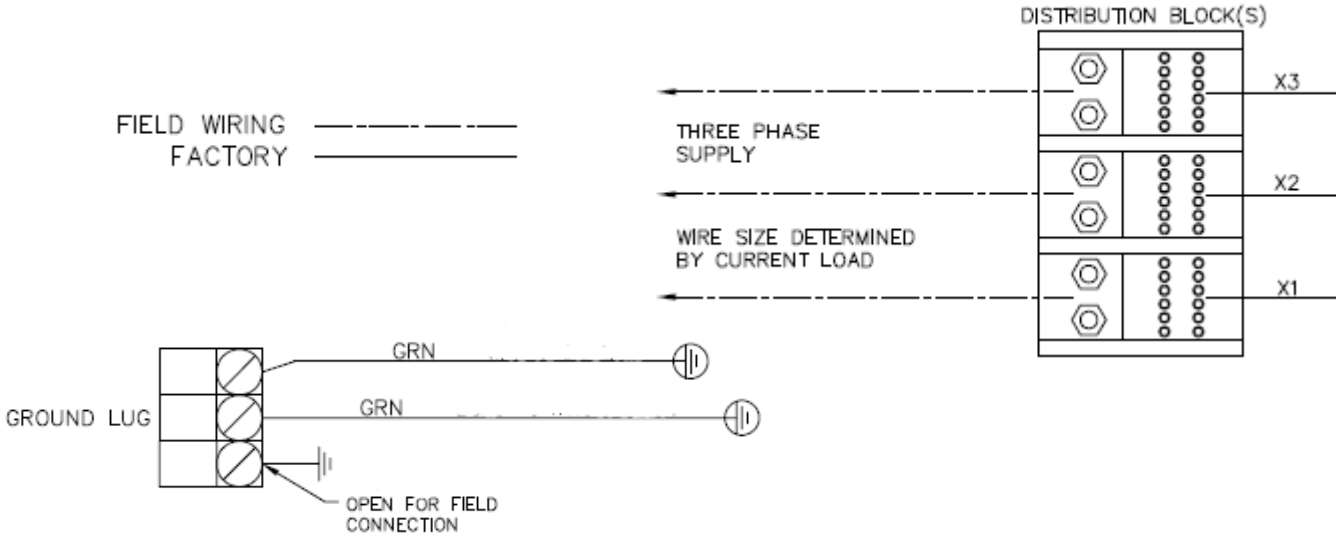

Figure 2a: Power and Ground Connections, BMK216 – 432

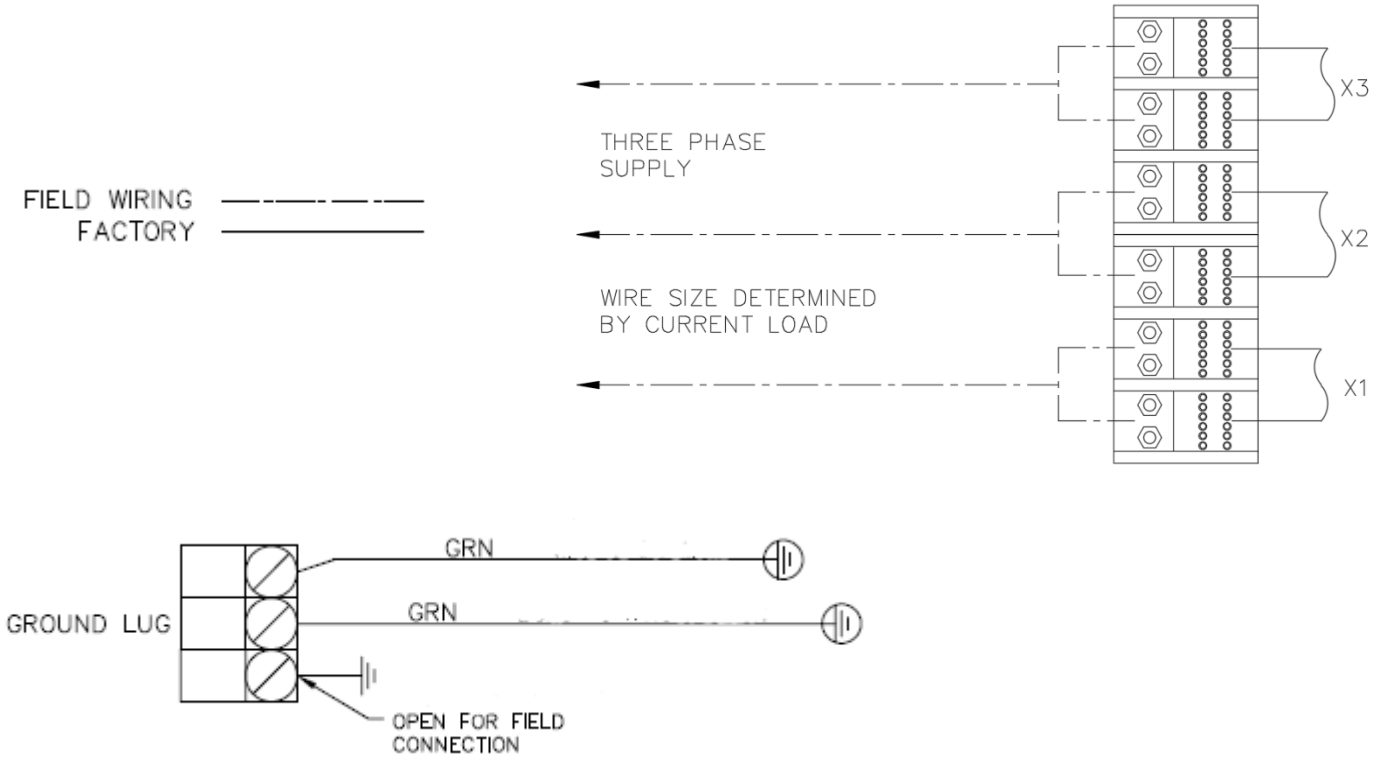

Figure 2b: Power and Ground Connections, BMK 576 & 684

3. PROVISIONS FOR SERVICE

Designers must provide emergency shutoffs and other devices to satisfy electrical codes. An electrical shutoff disconnect switch of suitable load carrying characteristics must also be provided that is external to the unit, in an easily accessible location to quickly and safely disconnect electrical service. Do not attach the switch to sheet metal enclosures of the unit. 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. 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. Electrical conduit and hardware must not interfere with the removal of any covers or prevent access between the unit and walls or another unit.

The boiler must be grounded in accordance with the requirements of the authority having jurisdiction. In the absence of such requirements, the installation shall conform to National Electrical Code (NEC), ANSI/NFPA 70 and/or the Canadian Electrical Code (CEC) Part I, CSA C22.1 Electrical Code.

4. BOILER WIRING

A dedicated protected circuit, sized for the amperage values in Table 1, must be provided to the boiler. No other electrical devices should be permanently wired on the same circuit.