



Specifications

Motor Winding Heater Series B

(Bulletin 1410)

1. General

- 1.1 This specification sheet describes requirements for the Bulletin 1410 Solid State Motor Winding Heater. The device shall conform to these specifications and be built in accordance with the following standards:
- NEMA ICS - 1970
 - NEC
 - UL
 - CSA

2. Function

- 2.1 The motor winding heater shall be for use with three-phase AC motors to guard against damage caused by condensation build-up on motor windings. The device shall utilize solid-state circuitry, including an SCR output.
- 2.2 The motor winding heater shall be designed for connection across two power contacts of a full voltage starter in such a way that the device shall be automatically energized after the contacts open and automatically deenergized when the contacts close.
- 2.3 With the motor winding heater energized, an SCR controlled voltage shall be applied to two terminals of the motor. The factory-set output voltage shall maintain the motor winding temperature at 5-10°C differential above ambient.
- 2.4 The SCR shall not begin to fire until the back EMF of the deenergized motor decays to a low value.
- 2.5 In certain instances, and with factory approval, the motor winding heater shall also be applicable to reduced voltage starters, multi-speed starters, and synchronous motors.

3. Design Features

- 3.1 The device shall consist of an SCR / heatsink assembly and printed circuit board framed by side plates which facilitate mounting, a terminal board which facilitates wiring, and fusing.
- 3.2 The device shall require only four wiring connections to the starter. Wiring terminals shall be the mechanical screw type.
- 3.3 The motor winding heater shall be available in three voltage ratings: 230V, 460V, and 575V.
- 3.4 The device shall be supplied with a fast-acting semiconductor fuse for SCR overcurrent protection. It shall also be supplied with a fuse for protection of wiring between starter and motor winding heater. This fuse shall have a 200,000 ampere interrupting rating with time delay.
- 3.5 Additional SCR protection shall be provided by a metal oxide varistor to protect against voltage transients, and an RC snubber circuit to limit the rate of change of circuit voltage.
- 3.6 The device shall include wiring terminals to permit the connection of a customer-supplied pilot light having a voltage rating equal to the applied line voltage. With the starter contacts open, the pilot light shall be ON, indicating that both fuses are intact. Terminals are customer accessible and identified.

4. Ratings

- 4.1 The motor winding heater shall have the following voltage and horsepower ratings:

Catalog Number	Motor Voltage + 10%, -15% 3 - Phase, 60 Hz	Motor Horsepower Range
1410-EOA47 1410-EOB50 1410-EOC50	230V 460V 575V	15 - 50 HP 24 - 100 HP 25 - 100-HP
1410 - FOA50 1410 - FOB 54 1410 - FOC54	230V 460V 575v	50 - 100 HP 100 - 200 HP 100 - 200 HP
1410 - GOA54 1410 - GOB59 141 0 - GOC59	230V 460V 575V	100 - 200 HP 200 - 400 HP 200 - 400 HP
1410 - HOA57 1410-HOB62 1410 - HOC62	230V 460V 575V	200 - 300 HP 400 - 600 HP 400 - 600 HP
50 Hz Applications: The 230V device can be used at 220V, 50 Hz; the 460V device can be used at 440V, 50 Hz; and the 575V device can be used at 550V, 50 Hz		

- 4.2 The output voltage regulation shall be such that the voltage applied to the motor winding shall vary $\pm 5\%$ maximum for line voltage variations of $+10\%$, -15% .
- 4.3 The operating temperature range shall be 0°C to $+50^{\circ}\text{C}$.
The storage temperature range shall be -25°C to $+85^{\circ}\text{C}$.
- 4.4 Power supplied to the motor shall range from 1 to 3 watts per horsepower.

5. Safety Precautions

- 5.1 In the interest of safety, the device shall be supplied with self-adhesive warning labels along with instructions the labels in a clearly visible location on the motor junction box and on the starter enclosure. The warning labels shall read as follows:

WARNING
This motor is equipped with a motor winding heater. Voltage is present at motor terminals even when motor starter is open. Before servicing motor or motor wiring, always disconnect main power ahead of motor starter.

6. Installation

- 6.1 The motor winding heater shall be available in the open type construction, for installation in the customer's starter enclosure or some other suitable enclosure. Four mounting holes shall be provided.
- 6.2 The device shall be position-insensitive, allowing it to be mounted in any position, except with the printed circuit board up.
- 6.3 The mounting area of the device shall be in accordance with the dimensions (approximate) listed on the following page.

7. Mounting Dimensions

MOUNTING DIMENSIONS		Dimensions In inches (mm)			
		Catalog Number			
		1410 -EOA47 -EOB50 -EOC50	1410 -FOA50 -FOB54 -FOC54	1410 -GOA54 -GOB59 -GOC59	1410 -HOA57 -HOB62 -HOC62
A	5 - 3/4 (146.1)	8 - 1/16 (204.8)	9 - 3/8 (238.1)	11 (279.4)	
B	3 - 1/2 (88.9)	4 - 1/4 (108)	5 - 3/4 (146.1)	9 - 5/8 (244.5)	
C	4 - 1/2 (114.3)	7 (177.8)	8 - 1/8 (206.4)	8 - 5/32 (207.2)	
D	2 - 1/4 (57.2)	3 - 5/8 (92.1)	5 (127)	8 - 7/8 (225.4)	
E	5 - 5/16 (134.9)	7 - 5/8 (193.7)	8 (203.2)	8 (203.2)	
F	1/2 (12.7)	5/16 (7.9)	3/8 (9.5)	3/8 (9.5)	
G	7/32 (5.6)	7/32 (5.6)	11/16 (17.5)	1-1/2 (38.1)	
Mounting Holes H	7/32 (5.6)	7/32 (5.6)	9/32 (7.1)	9/32 (7.1)	
Electrical Clearance J	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)	
Electrical Clearance K	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)	
Electrical Clearance L	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)	

