Part I. General

424.1 Scope

This article contains the installation requirements for fixed electric equipment used for space heating, such as heating cable, unit heaters, boilers, or central systems.

AUTHOR'S COMMENT: Wiring for central heating equipment, such as gas, oil, or coal furnaces, shall be installed in accordance with Article 422 – Appliances, specifically 422.12. Room air-conditioning equipment shall be installed in accordance with Part VII of Article 440.

424.3 Branch Circuits

(B) Conductors and Overcurrent Protection. The branch-circuit conductor and overcurrent protection for fixed electric space heating equipment shall be no sized smaller than 125 percent of the total heating load.

Question: What size THHN conductor (75°C terminals) and protection device is required for a 9 kW 240V fixed electric space heater with a 3A motor? Figure 424-1

Answer: 6 AWG, 60A protection

Step 1. Determine the total load

I = 10,000 VA/240V = 41.67A + 3A = 44.67A × 1.25 = 56A

Step 2. Size conductor at 125% [110.14(C) and Table 310.16]

41.67A + 3A = 44.67A × 1.25 = 56A, 6 AWG, rated 65A at 75°C

Step 3. Size protection [240.4(B) and 240.6(A)]

41.67A + 3A = 44.67A × 1.25 = 56A, 60A overcurrent device

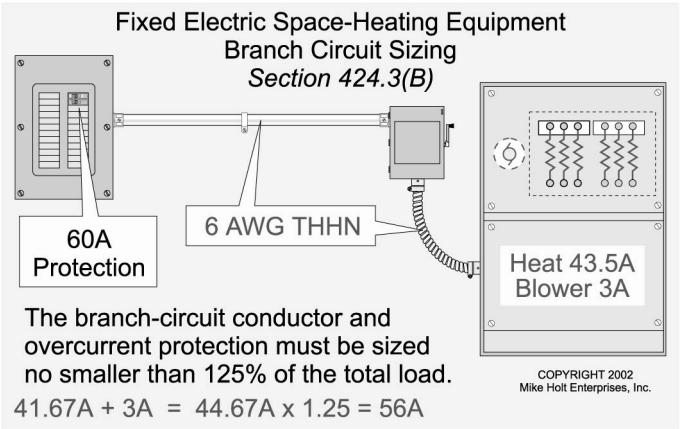

Figure 424-1

424.9 Permanently Installed Baseboard with Receptacles

Permanently installed electric baseboard heaters that have factory-installed receptacle outlets, or outlets provided as a separate listed assembly, can be used at the receptacle outlet(s) required by 210.50(B). Such receptacle outlets cannot be connected to the heater circuits.

FPN: Listed baseboard heaters include instructions that may not permit their installation below receptacle outlets.

Part III. Electric Space Heating Equipment

424.19 Disconnecting Means

Means shall be provided to disconnect the heater, motor controller(s), and supplementary overcurrent protective device(s) of all fixed electric space-heating equipment from all ungrounded conductors. The disconnecting means shall be within sight from the equipment, or it shall be capable of being locked in the open position. Figure 424-2

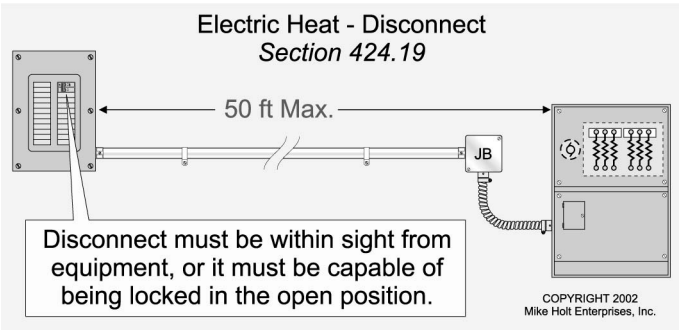

Figure 424-2