

## Chapter E 470

RESISTORS AND REACTORS  
(For Rheostats see section E 430.082)

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**E 470.01 Location.** Resistors and reactors shall not be placed where exposed to physical damage. Where in the immediate vicinity of easily ignitable material they shall be of the oil-immersed type or shall be enclosed in metal boxes or cabinets. See chapter E 500 for Hazardous Locations.

**History:** Cr. Register, November, 1961, No. 71, eff. 12-1-61.

**E 470.02 Space separation.** Unless attached to a switchboard or other non-combustible material, or unless mounted as provided in section E 470.03, resistors and reactors shall be separated from combustible material by a distance of not less than 1 foot.

**History:** Cr. Register, November, 1961, No. 71, eff. 12-1-61.

**E 470.03 On or in a proximity to combustible material.** Where placed within a distance of 1 foot from combustible material, resistors and reactors shall be installed as follows:

(1) **SLAB OR PANEL.** They shall be attached to a slab or panel of noncombustible, nonabsorptive material such as slate, soapstone, or marble.

(2) **SIZE OF SLAB.** The slab shall extend beyond the edges of the device and shall have a thickness proportioned to the size and weight of the device but shall not be less than ½ inch thick.

(3) **SUPPORTS.** The slab shall be secured in position by supports independent of those fastening the device to the slab. Bolts which support the device shall be countersunk at least ¼ inch below the rear surface of the slab and shall be covered with insulating material.

**History:** Cr. Register, November, 1961, No. 71, eff. 12-1-61.

**E 470.04 Contacts.** Fixed and movable contacts shall be so designed that arcing will be kept at a minimum.

**History:** Cr. Register, November, 1961, No. 71, eff. 12-1-61.

**E 470.05 Reactor materials.** Reactors shall be composed of noncombustible materials, and shall be mounted on noncombustible bases.

**History:** Cr. Register, November, 1961, No. 71, eff. 12-1-61.

**E 470.06 Mounting.** Enclosures when mounted on plain surfaces shall make contact with such surfaces only at the point of support, an air space of at least ¼ inch being maintained between the enclosures and surfaces.

**History:** Cr. Register, November, 1961, No. 71, eff. 12-1-61.

**E 470.07 Conductor insulation.** Insulated conductors used for connection between resistance elements and controllers shall be suitable for an operating temperature of not less than 90° C. (194° F.). Exception: For motor starting service other conductor insulations may be used.

**History:** Cr. Register, November, 1961, No. 71, eff. 12-1-61.

**E 470.08 Incandescent lamps as resistors.** Incandescent lamps may be used as protective resistors for automatic controllers, or may by special permission be used as resistors in series with other devices and shall conform to the following:

(1) **MOUNTING.** They shall be mounted in porcelain receptacles on noncombustible supports.

(2) **VOLTAGE.** They shall be so arranged that they cannot have impressed upon them a voltage greater than that for which they are rated.

(3) **NAMEPLATE.** They shall be provided with a nameplate, permanently attached, giving the wattage and voltage of the lamp to be used in each receptacle.

(4) **NOT CARRY MAIN CURRENT.** They shall not carry or control the main current nor constitute the regulating resistance of the device.

**History:** Cr. Register, November, 1961, No. 71, eff. 12-1-61.