

## Chapter E 115

## TRANSFORMERS, INDUCTION REGULATORS, RHEOSTATS, GROUND DETECTORS, AND SIMILAR EQUIPMENT

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**E 115.01 Current transformer secondary circuits.** (1) **SHORT-CIRCUITING.** Secondary circuits of current transformers, including constant-current and instrument transformers, shall be provided with means (such as permanent connections for jumpers) for short-circuiting them which can be readily connected while the primary is energized and which are so arranged as to permit the removal of any instrument or other device from such circuits without opening the circuits.

(2) **PROTECTION WHEN OF MORE THAN 7,500 VOLTS.** Where primaries are of more than 7,500 volts, secondary circuits unless otherwise adequately protected from injury or contact of persons, shall be in conduit effectively grounded.

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

**E 115.02 Grounding secondary circuits of instrument transformers.** The secondary circuits of all instrument transformers shall be effectively grounded.

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

**E 115.03 Grounding transformer cases.** The metal case or exposed frame of each transformer, reactor, induction regulator, and similar equipment, which is located where dampness or flammable gas normally exists, or which is connected to a circuit operating at more than 150 volts, shall be effectively grounded.

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

**E 115.04 Location and arrangement of power transformers.** If located outdoors, transformers shall be installed in accordance with subsections (1), (2), or (3) below; if located indoors, or in sidewalk vaults communicating with the interior of the building, they shall be installed in accordance with subsections (4), (5), or (6) below.

(1) **ON POLES.** Transformers may be mounted on a pole or on a pole structure, in compliance with the rules of part 2.

(2) **ON WALLS.** If permitted by local authority, a transformer may be mounted on the exterior wall of a building, in compliance with the rules of part 2.

(3) ENCLOSED. A transformer may be mounted in an outdoor enclosure such that unauthorized persons cannot readily come in contact with any part of the casing or wiring.

(4) INDOORS, COMBUSTIBLE LIQUID. A transformer immersed in a liquid that will burn, and located in a station, should be provided with sills to confine any escaping liquid, or with suitable arrangements for draining. If located in a building used for other than station purposes, and the amount of such liquid is considerable, the transformer should be placed in a suitable transformer vault which is ventilated. Such a vault shall be accessible to authorized persons only.

(5) INDOORS, INCOMBUSTIBLE LIQUID. A transformer rated in excess of 25 Kv.-a. and immersed in a liquid that will not burn shall be furnished with a pressure-relief vent. If installed inside a building used for other than station purposes and not well ventilated, (a) the transformer shall be furnished with a means for absorbing any gases generated by arcing inside the case, or (b) the pressure-relief vent shall be connected to a chimney or flue which will carry such gases outside the building.

(6) INDOORS, OTHER TYPES. Other types of transformers, such as air-cooled transformers, or small transformers (25 kv.-a. or less) immersed in a liquid that will not burn, may be installed in stations or, if properly enclosed or guarded, in buildings used for other than station purposes.

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

**E 115.05 Resistance devices.** (1) Rheostats shall be not less than 1 foot from combustible material or separated therefrom by a slab or panel of noncombustible, nonabsorptive material of suitable thickness, not less than one-half inch, somewhat larger than the rheostat, and secured in place by bolts independently of the rheostat supports.

(2) Rheostats or resistance devices shall not be placed where spattering molten metal due to high temperature in the rheostat may fall upon flammable material or spaces frequently occupied by persons.

(3) Rheostats or resistance devices exposed to excessive dust or flyings should preferably be installed in suitable cabinets or equipped with dust-tight side and face plates. (For installation in hazardous locations see section E 112.08).

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

**E 115.06 Ground detectors.** One or more reliable means of ground detection shall be available for every station supplying circuits which are not effectively grounded in accordance with chapter E 103.

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