disconnection from all ungrounded conductors. Where readily accessible to the user of the equipment, the branch-circuit switch or circuit breaker shall be permitted to serve as the disconnecting means. The disconnecting means shall be of the indicating type and be capable of being locked in the open (off) position.

(B) Cord-and-Plug-Connected Equipment. The factory-installed attachment plug of cord-and-plug-connected equipment rated 20 amperes or less and 150 volts or less to ground shall be permitted to be the disconnecting means.

426.51 Controllers.

(A) Temperature Controller with "Off" Position. Temperature-controlled switching devices that indicate an "off" position and that interrupt line current shall open all ungrounded conductors when the control device is in the "off" position. These devices shall not be permitted to serve as the disconnecting means unless they are capable of being locked in the open position in compliance with 110.25.

(B) Temperature Controller Without "Off" Position. Temperature controlled switching devices that do not have an "off" position shall not be required to open all ungrounded conductors and shall not be permitted to serve as the disconnecting means.

(C) Remote Temperature Controller. Remote controlled temperature-actuated devices shall not be required to meet the requirements of 426.51(A). These devices shall not be permitted to serve as the disconnecting means.

(D) Combined Switching Devices. Switching devices consisting of combined temperature-actuated devices and manually controlled switches that serve both as the controller and the disconnecting means shall comply with all of the following conditions:

(1) Open all ungrounded conductors when manually placed in the "off" position
(2) Be so designed that the circuit cannot be energized automatically if the device has been manually placed in the "off" position
(3) Be capable of being locked in the open position in compliance with 110.25

426.54 Cord-and-Plug-Connected Deicing and Snow-Melting Equipment. Cord-and-plug-connected deicing and snow-melting equipment shall be listed.

According to the UL *Guide Information for Electrical Equipment*, which can be found at productspec.ul.com, category KOBQ deicing and snow-melting equipment is provided with means for permanent wiring connection, except for equipment rated 20 amperes or less and 150 volts or less to ground, which may be of cord-and-plug-connected construction.

See also

Article 100 for the definition of *listed*

ARTICLE 427

Fixed Electric Heating Equipment for Pipelines and Vessels

Part I. General

427.1 Scope. This article covers electrically energized heating systems and the installation of these systems used with pipelines and vessels.

Informational Note: See IEEE 515-2017, *Standard for the Testing, Design, Installation and Maintenance of Electrical Resistance Trace Heating for Industrial Applications*, for further information.

Also see applicable sections of the IEEE 844/CSA 293 series of standards for alternate technologies for fixed electric heating equipment for pipelines and vessels.

Article 427 includes requirements for impedance heating, induction heating, and skin-effect heating, in addition to resistance heating elements, where used in pipeline and vessel applications.

Δ • **427.3 Other Articles.** Cord-connected pipe heating assemblies shall additionally comply with Table 427.3.

N ***TABLE 427.3*** Other Articles

Equipment	Article
Appliances	422 (Parts I, II, III, IV, V)

427.4 Continuous Load. Fixed electric heating equipment for pipelines and vessels shall be considered continuous load.

Fixed electric heating equipment is considered a continuous load for the purpose of sizing branch circuits, feeders, service conductors, and overcurrent protective devices (OCPDs).

Part II. Installation

427.10 General. Equipment for pipeline and vessel electric heating shall be identified as being suitable for (1) the chemical, thermal, and physical environment and (2) installation in accordance with the manufacturer's drawings and instructions.

427.11 Use. Electric heating equipment shall be installed in such a manner as to be afforded protection from physical damage.

427.12 Thermal Protection. External surfaces of pipeline and vessel heating equipment that operate at temperatures exceeding 60°C (140°F) shall be physically guarded, isolated, or thermally insulated to protect against contact by personnel in the area.