

Technical Solution Sheet 6.03

6: Hot Water Plumbing

Heat Trace Cables in Warm Water and Hot Water Systems

AIM

The aim of this technical solution is to inform practitioners about heat trace cables used in warm water and hot water systems, and highlight the importance of safety and isolation of the electricity supply.

BACKGROUND

Some buildings have warm and hot water systems that use electric heat trace cables to maintain temperature in reticulation piping. Plumbers must ensure that the heat trace cable electricity supply is isolated prior to undertaking any work that requires cutting through the pipe insulation to expose the pipes.

The following is recommended when heat trace cables are installed:

Earthing

The pipe to which the heat tracing system is attached and the metal cladding used for mechanical protection must be effectively bonded to the circuit earthing conductor.

Particular attention should be paid to earth continuity at flanges and valves and individual sections of metal cladding must be effectively bonded to ensure earth continuity.

Electrical protection

The installation must be protected by a core balance earth leakage protection device (RCD) having an operating residual current of not greater than 30 mA.

Mechanical protection

Mechanical protection in the form of metal cladding must be provided over the heat trace cables.

Warning notices

Suitable clear and permanent notices must be affixed to the external surface of the mechanical protection adjacent to the supply terminal box, and at regular intervals along the pipe. The notices must indicate the presence of electrical heat tracing cables operating at a dangerous voltage.

ELECTRICAL REGULATIONS AND STANDARDS

The *Electrical Safety (Installations) Regulations 2009* mandates the use of [AS/NZS 3000:2007 Wiring Rules](#). [AS/NZS 3000](#) has specific requirements for the installation and alteration of electric heating cable systems.

These requirements, in part, are reproduced as follows (using the appropriate clause references of the Standard):

CI 4.10 Electric heating cables for floors and ceilings and trace heating applications

CI 4.10.1 General

Cables for electric heating systems in floors and ceilings and trace heating applications shall be of a type specifically designed for the purpose.

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The heating equipment shall be installed in accordance with the manufacturer's instructions.

CI 4.10.5 Additional protection

All heating cables shall be provided with additional protection by an RCD with a fixed rated residual current not exceeding 30 mA, and—

(a) in the case of heating units fitted with a conductive covering, this covering shall be earthed; and

(b) in the case of under-floor heating units without a conductive covering an earthed metallic grid with a spacing not exceeding 30 mm shall be provided above the under-floor heating cable; and

(c) heating units shall be provided with adequate mechanical protection to prevent damage.

CI 4.10.6 Signs

Where heating cables are installed, suitable signs drawing attention to their existence shall be provided in each location. Signs warning of the danger of covering embedded heating equipment with furnishings or building materials that might cause excessive temperatures shall be provided, where appropriate.

Note:

Electrical wiring systems must be installed by Licensed Electrical Installation Workers who on completion of the work, are required to lodge a Certificate of Electrical Safety with Energy Safe Victoria and provide a copy to the customer.

ARCHIVED
25 March 22