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ELECTRIC WATER HEATERS—THERMOSTATS AND THERMAL CUTOUTS

This Australian Standard was prepared by Committee EL/20, Electric Water Heating Appliances. It was approved on behalf of the Council of the Standards Association of Australia on 13 April 1987 and published on 1 June 1987.

The following interests are represented on Committee EL/20:

Australian Consumers Association

Australian Electrical and Electronic Manufacturers' Association

Australian Gas Association

Confederation of Australian Industry

Electricity Supply Association of Australia

Engineering and Water Supply Department, South Australia

Representatives of manufacturers and suppliers of thermostats and thermal cutouts also participated in the drafting of this Standard.

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PREFACE

This Standard was prepared by the Association's Committee on Electric Water Heating Appliances to supersede AS 1308—1973, Thermostats and Over-temperature Energy Cutouts for Electric Water Heaters.

Terminology has been updated, e.g. an over-temperature energy cutout is now known as a thermal cutout (TCO), and definitions have been clarified. Current ratings have been modified and made non-mandatory. Dimensions of thermostats, TCOs, and combined units have been revised. Clip-mounted units are required to accept a specified clip template. For immersion thermostats, the 12.7 mm stemmed type has been deleted, as have detailed dimensional requirements for thermostat heads. Instead a maximum diameter and length of stem are specified. For immersion thermostat pockets, dezincification requirements refer to AS 2345, An Accelerated Laboratory Test Method for Assessment of the Susceptibility of Brass to Dezincification.

For the information of water heater manufacturers, notes are provided on temperature settings (see Clause 2.5.1); also the concept of 'scale offset' is introduced (see Clauses 1.5.11 and 2.6.1) to allow for differences between the specified standard test tank and the water heater to be controlled. To assist both the purchaser and the manufacturer, Appendix A lists information to be supplied with enquiry and order.

Test methods have been clarified and relocated in the appendices.

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SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This Standard specifies the performance and corresponding test requirements for thermostats, for non-self-resetting thermal cutouts, and for combinations thereof, intended for use in storage water heaters (see AS 1056), including the heat exchange type (see AS 1361), those with solar input (see AS 2712), and those for use in dairies (see AS 2123).

For immersion thermostats, the Standard specifies a pocket to suit an 8 mm diameter stem.

While this Standard is written around electromechanical devices, other devices, e.g. solid state, are not excluded.

NOTES:

1. Throughout this Standard, the term 'non-self-resetting thermal cutout' is abbreviated to TCO. (The plural is TCOs).
2. For special purposes, additional requirements would need to be specified, e.g. a high temperature setting for dairy water heaters; a low temperature differential for close control of temperature.
3. In order to facilitate the specification and purchase of thermostats and TCOs, information which should be supplied with enquiry and order is given in Appendix A.

1.2 APPLICATION. This Standard shall be read in conjunction with AS 3100 and AS 3161.

1.3 REFERENCED DOCUMENTS. A list with titles of the Standards referred to in this Standard is given in the Annex.

1.4 SAFETY. Thermostats and TCOs shall comply with the relevant requirements of AS 3100 and AS 3161.

NOTE: TCOs are not included in AS 3161.

1.5 DEFINITIONS. For the purposes of this Standard, the definitions given in AS 3161 and the following apply.

1.5.1 Thermostat—a temperature-sensing device, the cut-out (operating) temperature of which may be either fixed or adjustable and which, during normal operation, keeps the temperature of an appliance, or of parts of it, between certain limits by automatically switching a circuit or circuits.

1.5.2 User-adjustable thermostat—a thermostat where the adjustment is accessible to the user without the use of a tool.

1.5.3 Contact thermostat—a thermostat intended for mounting on the surface of the container of a water heater.

1.5.4 Immersion thermostat—a thermostat intended for mounting so that the thermally responsive component (stem) is either immersed directly in the water or inserted into a pocket that is immersed directly in the water.

1.5.5 Pocket—an enclosure intended for fitting into the container of a water heater to accommodate the stem of an immersion thermostat.

1.5.6 Fixed setting thermostat—a thermostat without temperature adjustment intended for operation at a stated nominal cut-out temperature.

1.5.7 Temperature adjustment—a function involving the movement of a pointer across an external scale or other means of indication in order to alter the cut-out temperature.

1.5.8 Temperature range—the difference between the highest and the lowest nominal cut-out temperatures to which the thermostat can be adjusted.

1.5.9 Cut-out temperature—the temperature of the water in the standard test tank (see Appendix B) at which the contacts of a thermostat or TCO open or at which the device reduces the current effectively to zero when tested in accordance with this Standard.

NOTE: Previously referred to as 'operating temperature'.

1.5.10 Cut-in temperature—the temperature of the water in the standard test tank (see Appendix B) at which the contacts of a thermostat close or at which the circuit current is restored when tested in accordance with this Standard.

1.5.11 Temperature differential—the difference between the cut-out temperature and the cut-in temperature of a thermostat.

1.5.12 Scale offset—the nominal cut-out temperature measured in accordance with Appendix B minus the indicated scale value.

NOTE: A water heater manufacturer may specify a scale offset of a few degrees Celsius to allow for the difference in characteristics between the test tank and the particular water heater (see also Clause 2.5). The scale offset may be positive or negative.

1.5.13 Single-throw thermostat—a thermostat intended to open one or more circuits at a predetermined temperature.

1.5.14 Double-throw thermostat—a thermostat intended to open one or more circuits and to close other circuit(s) at a predetermined temperature.

1.5.15 Non-self-resetting thermal cutout (TCO)—a device which, during abnormal operation, limits the temperature of an appliance, or of parts of it, by automatically opening the circuit or by reducing the current. The cutout is constructed so that its setting cannot be altered by the user. In order to restore the current, it requires resetting by hand, or replacement of a part.

1.5.16 Double-pole TCO—a TCO intended to open two conductors at a predetermined temperature.