AS 3102—1983
(Incorporating Amendment Nos. 1, 2 and 3)
(Amendment No. 4 Attached)

Australian Standard®

APPROVAL AND TEST SPECIFICATION FOR ELECTRIC DUCT HEATERS

This Australian standard was prepared by Committee EL/2, Electrical Approvals Standards. It was approved on behalf of the Council of the Standards Association of Australia on 1 February 1983 and published on 6 June 1983.

The following interests are represented on Committee EL/2:

Australian Consumer Association

Australian Electrical and Electronic Manufacturers Association

Confederation of Australian Industry

Electrical Apparatus Approvals Authorities

Electrical Testing Laboratories

Electricity Supply Association of Australia

Electronic Importers Association

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PREFACE

This standard was prepared by the Association's Committee EL/2, Electrical Approvals Standards.

It is one of a series of approval and test specifications issued by the Association. These specifications are accompanied by a general specification, AS 3100, containing definitions and general requirements for electrical materials and equipment. The purpose of these specifications is to outline conditions which must be met to secure approval for sale and use of electrical equipment in Australia. Only safety matters and related conditions are covered.

Preparation of this standard was undertaken following requests from approval authorities for a standard containing safety requirements for duct heaters.

During the preparation of this standard consideration was given to the requirements of AS 1668, SAA Mechanical Ventilation and Airconditioning Code, Part 1— Fire Precautions in Buildings with Air-handling Systems, and many of the safety requirements of that standard are included in this standard.

The Association desires to call attention to the fact that this standard does not purport to include all the necessary provisions of a contract.

This standard requires reference to the following Australian standard approval and test specifications:

AS 3100 Definitions and General Requirements for Electrical Materials and Equipment

AS 3158 Heat-resisting Fibrous-insulated Cables and Flexible Cables

AS 3161 Thermostats and Energy Regulators

AS 3179 Small Self-contained Refrigerated Air Conditioners

AS 3191 Electric Flexible Cords

and the following Australian standards:

AS 1939 Classification of Degrees of Protection Provided by Enclosures for Electrical Equipment

AS 2420 Fire Test Methods for Solid Insulating Materials and Non-metallic Enclosures Used in Electrical Equipment.

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
APPROVAL AND TEST SPECIFICATION FOR ELECTRIC DUCT HEATERS

This specification shall be read in conjunction with AS 3100. (See also Clause 3 below.)

1 SCOPE. This specification applies to electric duct heaters, as defined in Clause 2.1 below, designed for operation at low or medium voltage with a rating up to 50 kW. It does not apply to duct heaters which are integral with air-conditioning units complying with AS 3179.

2 DEFINITIONS. For the purpose of this specification the following definitions apply:

2.1 Electric duct heater — an encased assembly of electrical heating units designed primarily for mounting as an integral part of a ducted system for the purpose of heating enclosed spaces by means of circulating heated air. The means of circulating air may be incorporated as part of the heater or elsewhere in the duct system.

For the purpose of this specification an electric duct heater is referred to as a 'duct heater' and the means of circulating air is referred to as a 'blower'.

2.2 Heating element — the actual electrical conducting medium which is heated by an electric current.

2.3 Heating unit — a heating element together with its insulation and supports and immediate enclosure, if any.

3 COMPLIANCE WITH SPECIFICATIONS.

3.1 General Requirements of AS 3100. This specification shall be read in conjunction with AS 3100, and the appropriate provisions of AS 3100 shall apply to the construction of the duct heater and the insulation and safeguarding of parts that normally carry current.

3.2 Specific Requirements of This Specification. A duct heater shall be deemed to comply with this specification only if it complies with all the requirements of this specification and passes the relevant tests specified herein.

3.3 Requirements of Other Specifications. Components incorporated in a duct heater which are depended upon for safety shall comply with the appropriate requirements of any relevant approval and test specification unless such requirements are varied herein.

4 DESIGN AND CONSTRUCTION.

4.1 Material. The casing of the duct heater shall be of adequate strength and stability and shall consist of metallic material having a fusion temperature not less than 1000°C. The casing shall extend along the duct for a distance not less than 250 mm upstream and downstream of any heating unit.

4.2 Thermal insulation. The casing of the duct heater shall be internally insulated, for a distance of not less than 250 mm upstream and downstream of any heating unit with non-combustible material of suitable thermal conductance. The insulation shall be securely fixed to the casing so that it remains in position under all operating conditions and shall be clear of any heating units and of live parts on switches and other accessories.

NOTES:

1. A suitable insulating material would be one with a thermal conductance not greater than 30 W/m^2K at 100°C.
2. A test for non-combustible material is under consideration.

4.3 Heating Units Surface Temperature. The surface temperature of the heating unit shall not exceed 400°C when tested in accordance with the relevant requirements of Clause 16.3.

5 MEANS OF CONNECTION.

5.1 Permanent Connection. The duct heater shall be provided with terminals for connection to fixed wiring in accordance with Clause 4.9 of AS 3100.

5.2 Marking of Terminals. The marking requirements for earth and live terminals shall be as specified in Clauses 7.4 and 7.6 of AS 3100.

5.3 Temperature at Terminals. Where the arrangement of terminals is such that when the duct heater is tested in accordance with Clause 16.3 the temperature of any supply cables connected thereto will exceed 75°C at any point where the insulation is relied upon to prevent short-circuit or contact with material through which leakage may occur, the terminals shall be clearly and permanently marked to indicate the temperature rating for which the supply cables must be suitable. Where in order to comply with these requirements a terminal box is attached to the duct heater by flexible conduit, such terminal box shall be clearly marked with the applicable position of mounting.

6 PROTECTION AGAINST HEAT AND FIRE.

6.1 Fixing of Heating Units. An electric heating unit incorporated in a duct heater shall be assembled and firmly supported so that it will not introduce a risk of fire through displacement resulting from loosening of fixings or other defects likely to be brought about by vibration or other conditions of service.

6.2 Interlocking of Supply to Heater Unit and Blower Motor. The electrical supply to the heating unit(s) shall be interlocked with the supply to the associated blower motor such that interruption of supply to the blower motor will automatically interrupt supply to the heating units.