C22.2 No. 236-15

Heating and cooling equipment

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Heating and Cooling Equipment

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The Department of Defense (DoD) has adopted UL 1995 on March 9, 1992. The publication of revised pages or a new edition of this Standard will not invalidate the DoD adoption.

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Preface

This is the harmonized CSA Group and UL standard for Heating and Cooling Equipment. It is the fifth edition of CSA C22.2 No. 236 and the fifth edition of UL 1995. This edition of CSA C22.2 No. 236 and UL 1995 supersedes the previous editions published in 1995, 1990, 2005 and 2011.

This harmonized standard was prepared by the CSA Group and Underwriters Laboratories Inc. (UL). The efforts and support of the heating and cooling equipment industry, the Air Conditioning and Refrigeration Institute (ARI), and the Heating, Refrigerating, and Air Conditioning Institute of Canada (HRAI) are gratefully acknowledged.

This Standard is considered suitable for use for conformity assessment within the stated scope of the Standard.

This Standard was reviewed by the CSA Subcommittee on Appliances for Air-Conditioning for Household and Similar Purposes, under the jurisdiction of the CSA Technical Committee on Consumer and Commercial Products and the CSA Strategic Steering Committee on the Requirements for Electrical Safety, and has been formally approved by the CSA Technical Committees. It was also reviewed by the UL Standards Technical Panel 1995 and processed according to the method of development, revision, and implementation of UL standards for safety.

This Standard has been approved as a National Standard of the U.S.A. by the American National Standards Institute (ANSI).

Application of Standard

Where reference is made to a specific number of specimens to be tested, the specified number is to be considered a minimum quantity.

> **Note:** *Although the intended primary application of this standard is stated in its scope, it is important to note that it remains the responsibility of the users of the standard to judge its suitability for their particular purpose.*

Level of harmonization

This standard uses the IEC format but is not based on, nor is it considered equivalent to, an IEC standard. This standard is published as an equivalent standard for CSA Group and UL.

An equivalent standard is a standard that is substantially the same in technical content, except as follows: Technical national differences are allowed for codes and governmental regulations as well as those recognized as being in accordance with NAFTA Article 905, for example, because of fundamental climatic, geographical, technological, or infrastructural factors, scientific justification, or the level of protection that the country considers appropriate. Presentation is word for word except for editorial changes.

Reasons for differences from IEC

The TMSC investigated and found no existing IEC standards or work programs covering the scope of the products in this standard.

Interpretations

The interpretation by the standards development organization of an identical or equivalent standard is based on the literal text to determine compliance with the standard in accordance with the procedural rules of the standards development organization. If more than one interpretation of the literal text has been identified, a revision is to be proposed as soon as possible to each of the standards development organizations to more accurately reflect the intent.

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UL Effective Date

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Heating and cooling equipment

1 Scope

1.1 These requirements apply to the following stationary equipment for use in nonhazardous locations rated greater than 600 volts up to 7200 V, and remote control assemblies for such equipment:

a) Heat pumps, for heating and cooling with or without factory, or field-installed electric resistance heaters, or hot water or steam heating coils;

b) Air conditioners for cooling with or without factory, or field-installed electric resistance heaters, or hot water or steam heating coils;

c) Liquid chillers and compressor-evaporator or liquid chiller assemblies intended for use with remote condensers;

d) Add-on heat pumps for comfort heating or heating and cooling; and

e) Heat pump water heaters and refrigerant desuperheaters, and packaged heat pump water heaters consisting of a heat pump water heater and an associated storage tank;

Note: The above equipment rated 600 V or less are covered by the scope of ANCE/CSA/UL 60335-2-40.

1.2 These requirements apply to the following stationary equipment for use in nonhazardous locations rated 7200 V or less, single or 3-phase, and remote control assemblies for such equipment:

a) Cooling portion and associated components of combination heating and cooling equipment employing gas-, oil-, or gas-oil-fired heating means. However, the requirements for the construction and performance of the gas-, oil-, or gas-oil-fired heating means, and their associated components, shall conform to the particular standards covering such heating equipment and components;

b) Condensing units intended for connection to a remote nonspecified evaporator and compressor units intended for connection to a remote nonspecified evaporator and condenser; and

c) Room fan heater units, central heating furnaces, and similar fixed electric space heating for comfort heating.

Note: The equipment mentioned in Clauses 1.3, 1.4, 1.5, 1.6, 1.7 and 1.13 are rated 7200 V or less, single or 3-phase. These products are not covered by the scope of ANCE/CSA/UL 60335-2-40.

1.3 A fan unit includes a motor-operated fan or blower and is intended to be connected to a duct system that supplies conditioned air for environmental heating and/or cooling. Such a unit may have air-controlled dampers, but does not include a factory-installed heat exchanger or any other integral heating or cooling means.

1.4 A fan coil unit includes a motor-operated fan or blower together with a cooling coil, a heating coil, or both. The fan or blower is intended to recirculate air, and can introduce air from outside of the heated or cooled space. The coil can be used for refrigerant cooling, for chilled water cooling, for hot water heating, for steam heating, or for combinations of these functions.

1.5 A fan coil unit is intended to be piped to a remote source of the heating and/or cooling mediums. A unit that includes an electric resistance heater is considered to be a fan coil unit if a water or refrigerant coil for comfort cooling and/or a water or steam coil for comfort heating is provided in the unit.

1.6 A room fan heater unit is intended for heating only, includes a motor-operated fan or blower, employs electric resistance heat as the only heat source, and is intended to serve only one room or space.

1.7 A fan coil unit or electric space heating equipment, as covered by these requirements, can be designed for free discharge of air to the room or can be provided with means for duct connection.

1.8 A central warm air furnace is a heating appliance that consists of an electric heating element or elements with an air-circulating fan or blower, is provided with appropriate integral operating and temperature-limiting controls, and is housed in an enclosure designed to be connected to ductwork for the distribution of the heated air remote from the unit.

1.9 The units referenced in Clause 1.1 and 1.2 can consist of one or more factory-made assemblies. If provided in more than one assembly, the separate assemblies are to be used together, and the requirements are based on the use of matched assemblies. These requirements apply to assemblies designed for free discharge of air into the conditioned space as well as those which may be provided with means for duct connection.

1.10 These requirements do not apply to add-on heat pump systems designed to utilize the indoor fan motor assembly of an installed furnace where:

a) The heat pump and furnace are intended to operate simultaneously during heating operation except as noted in the Exception to Clause 26.17; or

b) The refrigerant coil is intended to be mounted upstream (return air side) of the furnace.

1.11 These requirements apply to equipment designed to be used in nonhazardous locations in accordance with the rules of CSA C22.1, ANSI/NFPA No. 70, CSA B52, ANSI/ASHRAE 15, NFPA 90A, and NFPA 90B.

Note 1: **Requirements for the installation of units designed to be connected to air duct systems are also included in codes such as the BOCA Basic National Mechanical Code, the ICC's Standard Mechanical Code, and the ICC's Uniform Mechanical Code.**

Note 2: **Coolant distribution equipment are intended for use in an information technology room (ITE) that comples with NFPA 75.**

1.12 The values given in SI (metric) units are normative. Any other values given are for informational purposes only.

1.13 Units intended for connection to telecommunication equipment are to have the appropriate assembly containing such circuitry meet CAN/CSA C22.2 No. 225 and UL 1459.

1.14 The general requirements of CSA C22.2 No. 0 apply, except as follows:

a) "General Requirements", Clause 3, and "Construction Details", Clause 4 (refer to Clauses 2 through 36 of this standard);

b) "Marking", Clause 5 (refer to Clauses 43, 44, and 45 of this standard);

c) "Tests", Clause 6 (refer to Clauses 46 through 79 of this standard).

1.15 These requirements do not cover panel or cable type radiant heating equipment, electric boilers, baseboard heaters, air heaters, duct heaters, and unit coolers for refrigeration purposes, nor any other electric heating equipment or appliances which are covered in or as a part of separate, individual standards.

2 Definitions

2.1 The following definitions apply in this Standard:

Absolute Irradiance – E, (W/cm^2), Radiant Flux incident on a surface. The quotient of radiant flux at that element of a surface to the area of that element.

Add-on heat pump – a pump that normally consists of an outdoor section, one or more indoor sections (without circulating fan), and related control devices.

Adjustable Speed Drive – A combination of the power converter, inverter, motor(s), motor-compressor(s) and motor-mounted auxiliary devices such as encoders, tachometers, thermal switches and detectors, air blowers, heaters, and vibration sensors.

Adjustable Speed Drive System – An interconnected combination of equipment that provides a means of adjusting the speed of a mechanical load coupled to motor(s) and/or motor-compressor(s). A drive system typically consists of an adjustable speed drive and auxiliary electrical apparatus.

Air-circulating blower – the complete blower or fan assembly, including the blower wheel or fan, the blower housing, and the motor used to provide the means for the circulation of air in a system.

Appliance Coupler – A single-outlet, female contact device for attachment to a flexible cord as part of a detachable power-supply cord to be connected to an appliance inlet (motor attachment plug). Note: Female contact device is defined as an electrical connector surrounded by an electrically isolated material such that the electrical contact cannot be accessed with the probe illustrated in Figure 7.1.

Appliance Inlet (Motor Attachment Plug) – A male contact device mounted on an end product appliance to provide an integral blade configuration for the connection of an appliance coupler or cord connector. Note: Male contact device is an electrical connector that is inserted into a corresponding female contact device to complete the electrical connection for the appliance.

Ballast – A current limiting device required to start and operate fluorescent lamps.

Barrier – A partition for the isolation (insulation) of hazardous voltage electrical circuits or isolation of electrical arcs, moving parts, or ultraviolet (UV) radiation from lamps.