



ANSI Z21.23-2010
(reaffirmed 2020)

American National Standard For Gas Appliance Thermostats



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10036***

Preface

This publication represents a basic standard for safe operation, substantial and durable construction, and acceptable performance of gas appliance thermostats. It is the result of years of experience in the manufacture, testing, installation, maintenance, inspection and research on gas appliance thermostats designed for the utilization of gas. There are risks of injury to persons inherent in some appliances that, if completely eliminated, would defeat the utility of the appliance. The provisions in this Standard are intended to reduce such risks while retaining the normal function of the appliance.

Nothing in this standard is to be considered in any way as indicating a measure of quality beyond compliance with the provisions it contains. It is designed to allow compliance of gas appliance thermostats, the safety construction and performance of which may exceed the various provisions specified herein. In its preparation, recognition has been given to possibilities of improvement through ingenuity of design. As technical advances take place, revisions may become necessary. When they are believed desirable, recommendations or suggestions should be forwarded to the Chairman of Standards Committee Z21/83, 8501 East Pleasant Valley Road, Cleveland, Ohio 44131. A proposal form is provided in the back of this document.

Safe and satisfactory operation of gas appliance thermostats depends to a great extent upon its proper installation, use and maintenance. It should be installed, as applicable, in accordance with the National Fuel Gas Code, ANSI Z223.1/NFPA 54; the (U.S.) Manufactured Home Construction and Safety Standard, Title 24 CFR, Part 3280, or when such standard is not applicable, Manufactured Home Installations, ANSI/NCSBCS A225.1 or the Standard for Manufactured Home Installations, Sites, and Communities, ANSI/NFPA 501A, manufacturers' installation instructions, and local municipal building codes.

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EFFECTIVE DATE: An organization using this standard for product evaluation as a part of its certification program will normally establish the date by which all products certified by that organization should comply with this standard.

History Of The Development Of Standard For Gas Appliance Thermostats

(This History is informative and is not part of the standard.)

There appears to be no evidence of the existence of construction and performance standards for gas appliance thermostats prior to the preparation of this standard, except for certain performance provisions in previous American Gas Association standards for domestic gas appliances, such as gas ranges and gas water heaters. These standards were primarily concerned with appliance performance, and thermostats were considered only to the extent of their effect on appliance operation.

In September 1930, a representative of the National Gas Appliance Manufacturer's Association appeared before American Standards Association Sectional Committee Z21 requesting recognition of various accessories used on, or in conjunction with, gas appliances. A special committee was appointed to study this problem which resulted in the formation of the Subcommittee on Listing Requirements for Gas, Pressure and Temperature Control Accessories in May 1931 for the development of standards for various control accessories.

At the first meeting of this group in March 1932, the general scope of its assignment was considered and, since there were a number of distinct types of accessories to be considered, representative subgroups were appointed to draft standards for specific classes of accessories.

One of these subgroups was the Subcommittee on Listing Requirements for Thermostats and Thermostatic Pilots. A draft standard for thermostats was developed by this group and distributed to the industry for review and comment during August 1933. The draft standard was reconsidered in April 1934 in conjunction with the comments received and was adopted with minor revisions. The resultant draft standard was adopted by the Z21 Committee at its June 1934 meeting. The first edition of this standard was subsequently approved as American Standard by the American Standards Association in February 1935.

An expansion of the standard to cover thermostats used on various gas appliances, including substituting the words "gas appliance thermostats" for the term "water heater, gas range and space heater thermostats" was distributed for review and comment in April 1939. The revisions were adopted by the Z21 Committee, and the second edition of this standard was subsequently approved as American Standard in February 1940.

The development of new types of gas appliance thermostats, such as range top burner thermostats and low temperature oven thermostats, and general progress in the development of gas appliance thermostats prompted the subcommittee to prepare extensive revisions to the standard. Following the procedures outlined above, these revisions were adopted by the Z21 Committee at its March 1961 meeting. This third edition was subsequently approved as American Standard by the American Standards Association, Inc., in October 1961.

The increasing use of electric switch type thermostats prompted further revisions to the standard to cover this type of thermostats, in addition to integral gas valve type thermostats, and revisions covering thermostats of both types for use in gas refrigerators. These revisions were subsequently adopted by the Z21 Committee at its March, 1963 meeting. The fourth edition was approved as American Standard by the American Standards Association, Inc., in December 1963.

In August, 1966, the American Standards Association, Inc., was reconstituted as the United States of America Standards Institute which, in October, 1969, was in turn renamed the American National Standards Institute, Inc. As a result, the fifth through seventh editions of the gas appliance thermostat standard were approved as American National Standards by the American National Standards Institute, Inc., between 1971 and 1980.

Following the procedure outlined above, further revisions to this standard were developed in line with industry developments. This, the tenth edition of the gas appliance thermostat standard was approved as an American National Standard by the American National Standards Institute, Inc., on August 27, 2010.

Previous editions of the gas appliance thermostat standard, and addenda thereto, approved by ANSI or its predecessor organizations are as follows:

Z21.23-1935			Z21.23-1975	Z21.23a-1977	Z21.23b-1978
Z21.23-1940	(R1947, 1950, 1953)		Z21.23-1980	Z21.23a-1985	Z21.23b-1988
Z21.23-1961			Z21.23-1989	Z21.23a-1991	Z21.23b-1993
Z21.23-1963	(R1968)		Z21.23-1993	Z21.23a-1994	Z21.23b-1997
Z21.23-1971	Z21.23a-1971	Z21.23b-1974	Z21.23-2000	Z21.23a-2003	Z21.23b-2005

NOTE: This edition incorporates changes to the 2000 edition of Z21.23, and addenda thereto. Changes other than editorial, are denoted by a vertical line in the margin.

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American National Standard For Gas Appliance Thermostats

Part I: Construction

1.1 Scope

1.1.1

This standard applies to newly produced gas appliance thermostats of the integral gas valve type having a maximum operating gas pressure of $1/2$ psi (3.5 kPa) or electric type (see Part IV, Definitions), constructed entirely of new, unused parts and materials.

This standard does not apply to an electric type comfort heating thermostat (wallmounted) for installation remote from an appliance.

When the operating performance characteristics of the thermostat can be affected by the separate components, such as power supply, transformer and valve(s), the thermostat shall be tested as part of a complete system.

Compliance of a device with this standard does not imply that such device is acceptable for use on gas appliances without supplemental tests with the device applied to the particular appliance design.

1.1.2

An accessory incorporated as an integral part of a thermostat shall comply with all provisions of the applicable standard for such a device.

1.1.3

If a value for measurement as given in this standard is followed by an equivalent value in other units, the first stated value is to be regarded as the specification.

1.1.4

All references to psi throughout this standard are to be considered gauge pressures unless otherwise specified.

1.2 General

1.2.1

Representative complete thermostats, together with necessary adapters or connectors, shall be provided for examination under this standard as specified by the testing agency. If the thermostat assembly includes accessories which are covered by other standards, but which have not been certified under those standards, additional quantities of each accessory shall be provided as specified by the testing agency.

1.2.2

A description of the operating principle and necessary installation and service instructions of the thermostat shall be provided.

1.2.3

The manufacturer shall specify the maximum recommended ambient temperature(s) for the thermostat and its components. The specified maximum ambient temperature shall not be less than 125°F (51.5°C), and the specified minimum ambient temperature shall not be greater than 32°F (0°C).