ASME B40.200-2008

(Revision of ASME B40.200-2001)

Thermometers, Direct Reading and Remote Reading

REAFFIRMED 2013

FOR CURRENT COMMITTEE PERSONNEL
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AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

ASME
SETTING THE STANDARD

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Date of Issuance: August 4, 2008

This Standard will be revised when the Society approves the issuance of a new edition. There will be no addenda or written interpretations of the requirements of this Standard issued to this edition.

The American Society of Mechanical Engineers
Three Park Avenue, New York, NY 10016-5990

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FOREWORD

ASME B40 Standard Committee is composed of a balanced cross section of manufacturers of pressure and temperature instruments, users, and interested individuals representing government agencies, testing laboratories, and other standards-producing bodies.

This Standard has been prepared not only to provide performance, configuration, and interchangeability guidelines but also to inform and update the specifier and user regarding product types, application, and use. This Standard is a vehicle by which the Committee can transmit to users the benefits of their combined knowledge and experience regarding the proper and safe use of temperature instruments and accessories.

Use of this advisory standard is a voluntary matter and shall in no way preclude the manufacture or use of products that do not conform. Neither ASME nor the B40 Committee assumes responsibility for the effect of observance or nonobservance of recommendations made herein.

This Standard is a consolidation and revision of the following standards:

(a) B40.3, Bimetallic Actuated Thermometers

(b) B40.4, Filled System Thermometers

(c) B40.8, Liquid-in-Glass Thermometers

(d) B40.9, Thermowells for Thermometers and Elastic Temperature Sensors

This Standard provides terminology and definitions, dimensions, safety construction and installation issues, test procedures, and general recommendations.

This Standard supersedes SAMA Standard RC-6-10-1963, PC-4-1-1962, and is intended to supersede Military Specifications MIL-I-17244, MIL-T-19646, and MIL-T-24272.

Suggestions for the improvement of this Standard are welcome. They should be addressed to The American Society of Mechanical Engineers, Secretary, B40 Standards Committee, Three Park Avenue, New York, NY 10016-5990.

ASME B40.200 was approved by the American National Standards Institute on May 8, 2008.

ASME B40 COMMITTEE
Standards for Pressure and Temperature Instruments and Accessories

(The following is the roster of the Committee at the time of approval of this Standard.)

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CORRESPONDENCE WITH THE B40 COMMITTEE

General. ASME standards are developed and maintained with the intent to represent the consensus of concerned interests. As such, users of this Standard may interact with the Committee by proposing revisions, and attending Committee meetings. Correspondence should be addressed to:

Secretary, B40 Standards Committee
The American Society of Mechanical Engineers
Three Park Avenue
New York, NY 10016-5990

Proposing Revisions. Revisions are made periodically to the Standard to incorporate changes that appear necessary or desirable, as demonstrated by the experience gained from the application of the Standard. Approved revisions will be published periodically.

The Committee welcomes proposals for revisions to this Standard. Such proposals should be as specific as possible, citing the paragraph number(s), the proposed wording, and a detailed description of the reasons for the proposal, including any pertinent documentation.

Proposing a Case. Cases may be issued for the purpose of providing alternative rules when justified, to permit early implementation of an approved revision when the need is urgent, or to provide rules not covered by existing provisions. Cases are effective immediately upon ASME approval and shall be posted on the ASME Committee Web page.

Requests for Cases shall provide a Statement of Need and Background Information. The request should identify the Code, the paragraph, figure or table number(s), and be written as a Question and Reply in the same format as existing Cases. Requests for Cases should also indicate the applicable edition(s) of the Code to which the proposed Case applies.

Attending Committee Meetings. The B40 Standards Committee regularly holds meetings, which are open to the public. Persons wishing to attend any meeting should contact the Secretary of the B40 Standards Committee.

ASME B40.3

BIMETALLIC ACTUATED THERMOMETERS

1 SCOPE

This Standard is confined to analog, dial-type bimetallic actuated thermometers utilizing helical bimetallic elements that mechanically sense temperature and indicate it by means of a pointer moving over a scale.

2 TERMINOLOGY AND DEFINITIONS

accuracy: the conformity of indication to an accepted standard or true value. Accuracy is the difference (error) between the true value and indicated value expressed as a percentage of span. It includes the combined effects of method, observer, apparatus, and environment. Accuracy error includes hysteresis and repeatability errors but not friction error.

accuracy, reference: the accuracy of a thermometer under reference conditions [normal position at 20°C ± 1°C (approximately 68°F ± 2°F) and 29.92 in. Hg (101.32 kPa) barometric pressure].

adjustment, pointer indication: a means of causing a change in indication. The change is approximately equal over the entire scale. Some examples of this type of adjustment are adjustable pointers, rotatable dials, or other similar items. This adjustment, if provided, is generally accessible to the user.

bezel: see *ring*.

bimetallic element: see *element, bimetallic*.

bulb: a term sometimes used to describe the temperature-sensitive portion of the stem (see also *length, sensitive portion*).

bushing: a fitting usually provided with external threads for attachment to a vessel. A bushing does not have a pressure-tight sheath below the external threads.

calibration: the process of causing the thermometer to indicate within specified accuracy limits.

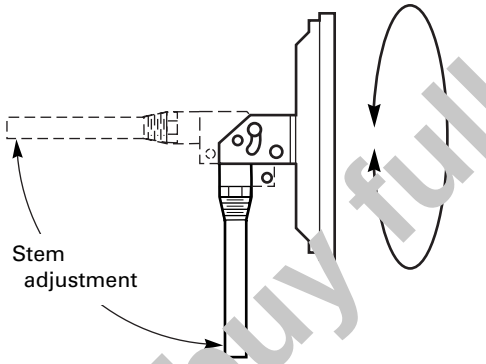
calibration verification: the checking of a thermometer by comparison with a given standard to determine the error at specified points on the scale.

clamping: see *ring, cam*.

case: the housing or container that supports, protects, and surrounds the internals.

case, hermetically sealed: for purposes of this Standard, a term used to describe a sealed bimetallic thermometer meeting the requirements of the prescribed test (see para. 6.7). Removal of the ring may void the hermetic seal.

Fig. 1 Connection, Adjustable Angle



GENERAL NOTE: This illustration is not intended to show design details.

case, liquid-filled: see *thermometer, liquid-filled*.

case, sealed: a case that is sealed but need not comply with the hermetic seal test as prescribed in this Standard.

case size: see *size, case*.

Celsius: SI unit of temperature measurement (formerly Centigrade), abbreviation °C.

Centigrade: see *Celsius*.

conditions, environmental: the conditions, other than process, that are external to the thermometer including weather, temperature, humidity, salt spray, vibration, corrosive atmosphere, etc., and could affect the thermometer's performance or life.

connection, adjustable angle: one that allows case rotation of 360 deg and stem adjustment of at least 90 deg (see Fig. 1).

connection, back: (90-deg back angle, rear connection) one in which the stem projects from the rear of the case at a 90-deg rear angle to the dial.

connection, bottom: (straight form, lower connection) one in which the stem projects downward from the case, parallel to the dial.

connection, left-side: one in which the stem projects from the left side of the case, parallel to the dial, as viewed from the front.