ASME B40.100-2022

(Revision of ASME B40.100-2013)

Pressure Gauges and Gauge Attachments

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

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Two Park Avenue • New York, NY • 10016 USA

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FOREWORD

ASME Standards Committee B40 is comprised of a group of volunteers representing pressure gauge users, manufacturers, governmental agencies, testing laboratories, and other standard-producing bodies. All are convinced that national standards such as this serve not only to provide product performance and configuration guidelines but also to inform and assist both those who specify and the users regarding the science of pressure gauge production, application, and use. The standards are vehicles by which the Committee as a body can transmit to users the benefits of their combined knowledge and experience as regards the proper and safe use of pressure gauges.

The use of this Standard is entirely voluntary and shall in no way preclude the manufacturer or use of products that do not conform. Neither ASME nor the B40 Committee assumes responsibility for the effects of observance or nonobservance of recommendations made herein.

The 2005 edition, which was approved on September 19, 2005, was issued to include Nonmandatory Appendix C on Supplemental Requirements to B40.100.

The 2013 revision, which was approved on June 18, 2013, was issued to clarify wording in the B40.1 body document as well as in Nonmandatory Appendix C, now designated as Mandatory Appendix III. Nonmandatory Appendix A was also rewritten to include new gauge performance criteria, and it was designated as Mandatory Appendix I. Nonmandatory Appendix B was designated as Mandatory Appendix II.

The 2022 revision was issued to consolidate the previously combined ASME B40 standards: ASME B40.1, ASME B40.2, ASME B40.5, and ASME B40.6, now designated as Sections 1 through 4, respectively. ASME B40.7 has been removed from this Standard and will be revised and incorporated into ASME B40.300. All appendices are now grouped at the end of this Standard. Definitions and references have been consolidated and moved to the beginning of the standard along with a comprehensive scope of the overall standard. Following approval by the ASME B40 Standards Committee, ASME B40.100-2022 was approved by the American National Standards Institute on June 6, 2022.

ASME B40 COMMITTEE
Specifications for Pressure and Vacuum Gauges

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

STANDARDS COMMITTEE OFFICERS

P. Reed, *Chair*
K. Gross, *Vice Chair*
A. Guzman, *Secretary*

STANDARDS COMMITTEE PERSONNEL

J. Conti, Consultant
K. Gross, WIKA Instrument LP
R. E. Honer, Jr., Perma-Cal® Industries
M. F. Lancaster, NOSHOK, Inc.
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J. W. Weiss, Weiss Instruments, Inc.
R. A. Weissner, Consultant
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M. Nylin, *Alternate,* WIKA Instrument LP
J. M. Payne, *Alternate,* Ashcroft

CORRESPONDENCE WITH THE B40 COMMITTEE

General. ASME codes and standards are developed and maintained by committees with the intent to represent the consensus of concerned interests. Users of ASME codes and standards may correspond with the committees to propose revisions or cases, report errata, or request interpretations. Correspondence for this Standard should be sent to the staff secretary noted on the committee's web page, accessible at https://go.asme.org/B40committee.

Revisions and Errata. The committee processes revisions to this Standard on a periodic basis 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 in the next edition of the Standard.

In addition, the committee may post errata on the committee web page. Errata become effective on the date posted. Users can register on the committee web page to receive e-mail notifications of posted errata.

This Standard is always open for comment, and the committee welcomes proposals for revisions. 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 background information and supporting documentation.

Cases

(a) The most common applications for cases are

(1) to permit early implementation of a revision based on an urgent need

(2) to provide alternative requirements

(3) to allow users to gain experience with alternative or potential additional requirements prior to incorporation directly into the Standard

(4) to permit the use of a new material or process

(b) Users are cautioned that not all jurisdictions or owners automatically accept cases. Cases are not to be considered as approving, recommending, certifying, or endorsing any proprietary or specific design, or as limiting in any way the freedom of manufacturers, constructors, or owners to choose any method of design or any form of construction that conforms to the Standard.

(c) A proposed case shall be written as a question and reply in the same format as existing cases. The proposal shall also include the following information:

(1) a statement of need and background information

(2) the urgency of the case (e.g., the case concerns a project that is underway or imminent)

(3) the Standard and the paragraph, figure, or table number(s)

(4) the edition(s) of the Standard to which the proposed case applies

(d) A case is effective for use when the public review process has been completed and it is approved by the cognizant supervisory board. Approved cases are posted on the committee web page.

Interpretations. The committee does not issue interpretations for this Standard.

Committee Meetings. The B40 Standards Committee regularly holds meetings that are open to the public. Persons wishing to attend any meeting should contact the secretary of the committee. Information on future committee meetings can be found on the committee web page at https://go.asme.org/B40committee.

Section 1
Scope, References, Definitions

1-1 SCOPE

This Standard covers analog, dial-type gauges, which, using elastic elements, mechanically sense pressure and indicate it by means of a pointer moving over a graduated scale.

It also includes the following attachments installed between the pressure source and gauge(s): diaphragm seals, snubbers, and pressure limiting valves.

This Standard does not include gauges of special configuration designed for specific applications, edge reading, deadweight or piston gauges, other gauges not using an elastic element to sense pressure, diaphragm actuated pressure instruments that employ mechanical linkages to transmit the applied pressure, other attachments such as siphons, electric contacts, and gauge isolation valves or other separation devices designed to protect the pressure element assembly.

1-2 REFERENCES

Other standards and specifications relating to pressure gauges and their performance requirements follow. The edition bearing the latest date of issuance shall be used.

3-A 63-04, Sanitary Fittings
Publisher: 3-A Sanitary Standards, Inc., 1800 Elm Street, Suite 2D, McLean, VA 22101 (www.3-a.org)

ANSI Z26.1, Safety Glazing Materials for Glazing Motor Vehicles and Motor Vehicle Equipment Operating on Land Highways — Safety Standard
Publisher: SAE International, 400 Commonwealth Drive, Warrendale, PA 15096 (www.sae.org)

ASME B1.13M, Metric Screw Threads: M Profile
ASME B1.20.1, Pipe Threads, General Purpose (Inch)
ASME B1.20.3, Dryseal Pipe Threads (Inch)
ASME B16.5, Pipe Flanges and Flanged Fittings: NPS ½ Through NPS 24, Metric/Inch Standard
ASME B16.9, Factory-Made Wrought Buttwelding Fittings
ASME B16.11, Forged Fittings, Socket-Welding and Threaded
ASME B31.3, Process Piping
ASME BPE, Bioprocessing Equipment
ASME BPVC VIII-1, Rules for Construction of Pressure Vessels Division 1
ASME PTC 19.2, Pressure Measurement: Instruments and Apparatus Supplement
Publisher: The American Society of Mechanical Engineers (ASME), Two Park Avenue, New York, NY 10016-5990 (www.asme.org)

ASTM C1048, Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass
ASTM C1422, Standard Specification for Chemically Strengthened Flat Glass
ASTM G93, Standard Guide for Cleanliness Levels and Cleaning Methods for Materials and Equipment Used in Oxygen-Enriched Environments
Publisher: American Society for Testing and Materials (ASTM International), 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959

CGA E-4, Standard for Gas Pressure Regulators
CGA G-4.1, Cleaning of Equipment for Oxygen Service
Publisher: Compressed Gas Association (CGA), 14501 George Carter Way, Suite 103, Chantilly, VA 20151 (www.cganet.com)

EN 837-1, Pressure Gauges Part 1: Bourdon Tube Pressure Gauge — Dimensions, Metrology, Requirements, and Testing
Publisher: European Committee for Standardization (CEN), Avenue Marnix 17, B-1000, Brussels, Belgium (www.cen.eu)

IEC 60529, Degrees of Protection Provided by Enclosure (IP Code)
Publisher: International Electrotechnical Commission (IEC), 3, rue de Varembé, Case Postale 131, CH-1211, Genèva 20, Switzerland/Suisse (www.iec.ch)

ISA RP2.1, Manometer Tables
Publisher: International Society of Automation (ISA), 67 T.W. Alexander Drive, P.O. Box 12277, Research Triangle Park, NC 27709 (www.isa.org)

ISO 15001, Anaesthetic and respiratory equipment — Compatibility with oxygen
Publisher: International Organization for Standardization (ISO), Central Secretariat, Chemin de Blandonnet 8, Case Postale 401, 1214 Vernier, Geneva, Switzerland (www.iso.org)