ASME B40.100-2005

(Revision of ASME B40.100-1998)

Pressure Gauges and Gauge Attachments

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

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The next edition of this Standard is scheduled for publication in 2010. There will be no addenda or written interpretations of the requirements of this Standard issued to this edition.

The American Society of Mechanical Engineers
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FOREWORD

ASME Standards Committee B40 is comprised of a balanced cross section of pressure gauge users, manufacturers, and interested members representing governmental agencies, testing laboratories, and other standards-producing bodies. All are convinced that national standards such as this one serve not only to provide product performance and configuration guidelines, but also to inform and update the specifier and user 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.

This Standard is advisory only. Its use is entirely 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 effects of observance or nonobservance of recommendations made herein.

An addenda was issued on December 31, 2001, adding Nonmandatory Appendix C to B40.1, B40.2, B40.5, and B40.6.

This Standard was approved by the B40 Standards Committee and approved as an American National Standard by the American National Standards Institute on September 19, 2005.

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.)

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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
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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.

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.

PREFACE

ORGANIZATION OF THIS DOCUMENT

This Standard compiles the following standards.

Standard	*Title*
ASME B40.1	Gauges: Pressure Indicating Dial Type — Elastic Element
ASME B40.2	Diaphragm Seals
ASME B40.5	Snubbers
ASME B40.6	Pressure Limiter Valves
ASME B40.7	Gauges: Pressure Digital Indicating

ASME B40.1

GAUGES: PRESSURE INDICATING DIAL TYPE — ELASTIC ELEMENT

1 SCOPE

This Standard (B40.1) is confined to analog, dial-type gauges, which, utilizing elastic elements, mechanically sense pressure and indicate it by means of a pointer moving over a graduated scale.

This Standard does not include gauges of special configuration designed for specific applications, edge reading, deadweight or piston gages, or any other gauges not using an elastic element to sense pressure.

2 PRESSURE GAUGES, GENERAL

2.1 Pressure Terms

See Fig. 1.

2.2 Pressure Gauge Components

See Fig. 2.

2.3 Pressure Gauge Terminology

absolute pressure: see *pressure, absolute*.

absolute pressure gauge: see *gauge, absolute pressure*.

accuracy: the conformity of a gauge indication to an accepted standard or true value. Accuracy is the difference (error) between the true value and the gauge indication expressed as a percent of the gauge span. It is the combined effects of method, observer, apparatus, and environment. Accuracy error includes hysteresis and repeatability errors, but not friction error. It is determined under specific conditions. See Table 1.

accuracy, reference: the accuracy of a gauge 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, rotatable movements, and other similar items. This adjustment, if provided, is generally accessible to the gauge user (see para. 3.3.4).

adjustment, span: a means of causing a change in the angle of pointer rotation for a given change in pressure. This adjustment is not generally accessible to the gauge user.

ambient pressure: see *pressure, ambient*.

bar: a metric pressure unit equal to approximately 14.50 psi (see paras. 3.3.2.1 and 7.2).

bellows: a thin walled, convoluted elastic pressure-sensing element (see Fig. 3).

bezel: see *ring*.

Bourdon tube: a tubular elastic pressure-sensing element. May have "C," helical, spiral, or other form (see Fig. 3).

brazing: a metal joining process wherein coalescence is produced by use of nonferrous filler metal having a melting point above 425°C (800°F), but lower than that of the base metals joined.

calibration: the process of graduating the pressure scale or adjusting the mechanism to cause the gauge to indicate within specified accuracy limits.

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

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

case, liquid filled: a case that is filled with a liquid such as glycerin or silicone fluid to at least 75% of its total internal volume. Liquid-filled cases may be either open front or solid front types. The purpose of this construction is to exclude ambient corrosives or protect the internals from damage caused by severe vibration or pulsation.

case, open front with case pressure relief: a case with a pressure relief device or openings and no partition between the pressure element and the window [see Fig. 4, illustration (a)]. An alternate construction is a plastic window especially designed to relieve internal case pressure.

case, open front without case pressure relief: a case having no partition between the pressure element and the window, and no pressure relief devices or openings [see Fig. 4, illustration (a)].

case, pressure tight: a case capable of maintaining a pressure differential between the inside and the outside of the case.

case ring: see *ring*.

case, sealed: a case that is sealed to exclude ambient corrosives.

case, size: see *size, gauge*.