ASME B89.1.10M-2001

[Revision of ASME/ANSI B89.1.10M-1987 (R1995)]

REAFFIRMED 2011

FOR CURRENT COMMITTEE PERSONNEL
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DIAL INDICATORS (FOR LINEAR MEASUREMENTS)

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

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Mechanical Engineers

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Date of Issuance: July 1, 2002

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

ASME will issue written replies to inquiries concerning interpretation of technical aspects of this Standard.

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

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FOREWORD

ASME Standards Committee B89 on Dimensional Metrology, under procedures approved by the American National Standards Institute (ANSI), prepares standards that encompass the inspection and the means of measuring characteristics of such various geometric parameters as diameter, length, flatness parallelism, concentricity, and squareness. Because dial indicators are widely used for the measurement and comparison of some of these features, the chair of the B89.1 Main Committee on Length authorized formation of Working Group B89.1.10 to prepare this Standard.

Most dial indicators used in the U.S. are built to inch measure specifications but International Organization for Standardization (ISO) standards do not address all the needs of U.S. industry. The inch measure portion of this Standard is strongly influenced by Commercial Standard CS(E) 119-45, effective January 1, 1945, which was prepared by the American Gage Design Committee (from which the term *AGD Standard* is derived), and distributed by the Department of Commerce. It is also based in part on Commercial Item Description A-A-2348B, dated July 30, 1991, developed by the General Services Administration (GSA). It is also based on manufacturers' current practices and technologies. The metric measure portion of this Standard is based primarily on ISO efforts in support of international commerce.

Working Group B89.1.10 wishes to acknowledge the leadership of its chair, Bruce Robertson, whose untimely passing has prevented him from seeing the end result of his contributions to the work of this group.

This Standard was approved by ANSI on April 10, 2001.

ASME STANDARDS COMMITTEE B89
Dimensional Metrology

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

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CORRESPONDENCE WITH THE B89 COMMITTEE

General. ASME Codes and 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 requesting interpretations, proposing revisions, and attending Committee meetings. Correspondence should be addressed to:

Secretary, B89 Main Committee
The American Society of Mechanical Engineers
Three Park Avenue
New York, NY 10016

Proposed 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.

Interpretations. Upon request, the B89 Committee will render an interpretation of any requirement of the standard. Interpretations can only be rendered in response to a written request sent to the Secretary of the B89 Main Committee.

The request for interpretation should be clear and unambiguous. It is further recommended that the inquirer submit his/her request in the following format:

Subject:	Cite the applicable paragraph number(s) and provide a concise description.
Edition:	Cite the applicable edition of the standard for which the interpretation is being requested.
Question:	Phrase the question as a request for an interpretation of a specific requirement suitable for general understanding and use, not as a request for an approval of a proprietary design or situation.

Requests that are not in this format may be rewritten in the appropriate format by the Committee prior to being answered, which may inadvertently change the intent of the original request.

ASME procedures provide for reconsideration of any interpretation when or if additional information which might affect an interpretation is available. Further, persons aggrieved by an interpretation may appeal to the cognizant ASME committee or subcommittee. ASME does not ''approve,'' ''certify,'' ''rate,'' or ''endorse'' any item, construction, proprietary device or activity.

Attending Committee Meetings. The B89 Main Committee regularly holds meetings that are open to the public. Persons wishing to attend any meeting should contact the Secretary of the B89 Main Committee.

DIAL INDICATORS (FOR LINEAR MEASUREMENTS)

1 SCOPE

This Standard is intended to provide the essential requirements for dial indicators as a basis for mutual understanding between manufacturers and consumers. Described herein are various types and groups of dial indicators used to measure a linear dimension of a variation from a reference dimension.

2 REFERENCES

CS(E) 119-45 Dial Indicators (For Linear Measurements)

Publisher: Department of Commerce, 1401 Constitution Avenue NW, Washington, DC 20230

A-A-2348B Indicator, Dial, Accessories, and Test Set

Publisher: General Services Administration, 1800 F Street NW, Washington, DC 20405

MIL-I-8422D Indicators, Dial and Accessories

Publisher: National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield VA 22161

ISO R/463 Dial Gauges Reading in 0.01 mm, 0.001 in. and 0.0001 in.

Publisher: International Organization for Standardization (ISO), 1 rue de Varembé, Case Postale 56, CH-1211, Genève, Switzerland/Suisse

3 GLOSSARY

dial indicator: a measuring instrument in which small displacements of a spindle or a lever are magnified by suitable mechanical means to a pointer rotating in front of a circular dial having a graduated scale.

error of indication: the amount by which the displayed value of a measurement device differs from the true input.

4 CLASSIFICATION BY TYPE

(a) Type A. Dial indicators in which the spindle is parallel to the dial face (see Fig. 1).

(b) Type B. Dial indicators in which the spindle is perpendicular to the dial face (see Fig. 2).

(c) Type C. Dial indicators in which the measuring contact member is a lever. These are also known as dial test indicators (see Fig. 3).

5 CLASSIFICATION BY GROUP

Group members are assigned in accordance with nominal bezel diameter and apply only to Type A and B indicators (Table 1). For Type C indicators, which are available in a variety of sizes and designs, refer to the various manufacturers' standards. Group descriptions are as follows:

(a) Group 0. Dial indicators having nominal bezel diameters from 1 in. (25 mm) up to and including $1\frac{3}{8}$ in. (35 mm).

(b) Group 1. Dial indicators having nominal bezel diameters from above $1\frac{3}{8}$ in. (35 mm) up to and including 2 in. (50 mm).

(c) Group 2. Dial indicators having nominal bezel diameters from above 2 in. (50 mm) up to and including $2\frac{3}{8}$ in. (60 mm).

(d) Group 3. Dial indicators having nominal bezel diameters from above $2\frac{3}{8}$ in. (60 mm) up to and including 3 in. (76 mm).

(e) Group 4. Dial indicators having nominal bezel diameters from above 3 in. (76 mm) up to and including $3\frac{3}{4}$ in. (95 mm).

6 DIAL GRADUATION VALUES

All types of indicators shall have least graduations arranged either in four classes of inch values (i.e., 0.00005 in., 0.0001 in., 0.0005 in., and 0.001 in.) or in four classes of metric values (i.e., 0.001 mm, 0.002 mm, 0.01 mm, and 0.02 mm).

NOTE: Other values for graduations are sometimes used in industry. The supplier and the customer should agree on the determination of the maximum permissible error for dial indicators with graduations not mentioned in this Standard.

7 NOMENCLATURE

For the purposes of this Standard, the nomenclature in Figs. 1 through 6 shall apply.