

Pressure gauges

Part 3: Diaphragm and capsule pressure gauges — Dimensions, metrology, requirements and testing

The European Standard EN 837-3:1996 has the status of a British Standard

ICS 17.100

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

BSI
Documents



Document Sharing Hub

National foreword

This British Standard is the English language version of EN 837-3:1996 published by the European Committee for Standardization (CEN). It includes the corrections issued on 1997-02-20.

The UK participation in its preparation was entrusted by Technical Committee GEL/65, Measurement and control, to Subcommittee GEL/65/2, Elements of systems, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 22, an inside back cover and a back cover.

This British Standard, having been prepared under the direction of the Electrotechnical Sector Board, was published under the authority of the Standards Board and comes into effect on 15 July 1998

© BSI 1998

ISBN 0 580 28895 1

Amendments issued since publication

Amd. No.	Date	Text affected

ICS 17.100

Descriptors: Metrology, measuring instruments, pressure measurements, manometers, indicating instruments, dimensions, fidelity, measuring scales, specifications, metrological inspection, tests, packing, designation

English version

Pressure gauges — Part 3: Diaphragm and capsule pressure gauges — Dimensions, metrology, requirements and testing

Manomètres —

Partie 3: Manomètres à membrane et manomètres à capsule — Dimensions, métrologie, prescriptions et essais

Druckmeßgeräte —

Teil 3: Druckmeßgeräte mit Platten- und Kapselfedern — Maße, Meßtechnik, Anforderungen und Prüfung

This European Standard was approved by CEN on 1996-10-30. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

© 1996 All rights of exploitation in any form and by any means reserved worldwide for CEN national Members.

Ref. No. EN 837-3:1996 E



Documents
Document Sharing Hub

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 141, Pressure gauges — Thermometers — Means of measuring and/or recording temperature during the distribution of refrigerated frozen and quick-frozen products, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 1997, and conflicting national standards shall be withdrawn at the latest by June 1997.

This European Standard is a part of the series of the following standards:

- EN 837-1, *Pressure gauges — Part 1: Bourdon tube pressure gauges — Dimensions, metrology, requirements and testing*;
- EN 837-2, *Pressure gauges — Part 2: Selection and installation recommendations for pressure gauges*;
- EN 837-3, *Pressure gauges — Part 3: Diaphragm and capsule pressure gauges — Dimensions, metrology, requirements and testing*.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Contents

	Page
Foreword	2
1 Scope	3
2 Normative references	3
3 Definitions	3
4 Nominal sizes	3
5 Pressure ranges	3
6 Accuracy classes	4
7 Dimensions	4
8 Wetted parts	10
9 Requirements	10
10 Testing	13
11 Packaging for transportation	15
12 Designation	16
Annex A (informative) Examples of scale numbering for accuracy classes from 0,6 to 4	17
Annex B (informative) Examples of flanged and special connections	22

1 Scope

This European Standard specifies requirements for diaphragm and capsule (designated by D and C respectively, see clause 12) indicating pressure gauges, vacuum gauges and combined vacuum and pressure gauges (compound gauges), from 50 to 250 nominal size with ranges up to 25 bar for the measurement of gauge pressure.

A reading of zero bar is atmospheric pressure.

1 bar = 10^5 Pa.

Gauges specified have circular dials with concentric scales for industrial use.

The standard includes methods of test for performance to be applied at type approval and production piece tests.

The standard applies to gauges suitable for industrial use with common industrial fluids. It does not apply to pressure gauges for oxygen or acetylene use nor gauges with electrical contacts.

Pressure gauges for welding, cutting and associated processes are not included in this standard, but are specified in EN 562.

2 Normative references

This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

ANSI/ASME B1.20.1, *Pipe threads, general purpose (inch)*.

EN 472:1994, *Pressure gauges — Vocabulary*.

EN 526:1994, *Gas welding equipment — Pressure gauges used for welding, cutting and allied processes*.

EN 60529:1991, *Degrees of protection provided by enclosures*.

EN 60068-2-6: 1995, *Electrical engineering; basic environmental testing procedures — Part 2: Tests — Test Fc and guidance: Vibration (sinusoidal)*.

EN 60068-2-27:1993, *Electrical engineering; basic environmental testing procedures — Part 2: Tests — Test Ea and guidance: Shock*.

ISO 228-1:1994, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation*.

ISO 1302:1992, *Technical drawings — Methods of indicating surface texture on drawings*.

EN 22768-1:1993, *General tolerances — Part 1: Tolerances for linear and angular dimensions without individual tolerance indications*.

ISO 2859-1:1989, *Sampling procedures for inspection by attributes — Part 1: Sampling plans indexed by acceptable quality level (AQL) for lot-by-lot inspection*

ISO 7000:1989, *Motor vehicles; Graphic symbols — Principles, synopsis*.

ISO 10102:1990, *Assembly tools for screws and nuts — Double-headed open-ended engineers' wrenches*.

3 Definitions

For the purposes of this European Standard the definitions given in EN 472 apply.

4 Nominal sizes

Nominal sizes of gauges are as follows: 50, 63, 80, 100, 150, 160 and 250.

See Table 2 for dimensions.

5 Pressure ranges

The bar is the preferred unit of pressure, with millibar being used for ranges of 600 mbar or less.

a) Pressure ranges in bar

0 to 0,6	0 to 2,5	0 to 10
0 to 1	0 to 4	0 to 16
0 to 1,6	0 to 6	0 to 25

b) Vacuum ranges in bar

(Vacuum gauges have anti-clockwise pointer travel with increasing vacuum.)

–0,6 to 0 –1 to 0

c) Combined pressure and vacuum ranges in bar

–1 to +0,6	–1 to +3	–1 to +9	–1 to +24
–1 to +1,5	–1 to +5	–1 to +15	

Ranges in millibars are acceptable providing the span is in line with 5d).

d) Pressure ranges in millibar

0 to 1	0 to 6	0 to 40	0 to 250
0 to 1,6	0 to 10	0 to 60	0 to 400
0 to 2,5	0 to 16	0 to 100	0 to 600
0 to 4	0 to 25	0 to 160	

e) Vacuum ranges in millibar

Vacuum gauges have anti-clockwise pointer travel with increasing vacuum.

–1 to 0	–6 to 0	–40 to 0	–250 to 0
–1,6 to 0	–10 to 0	–60 to 0	–400 to 0
–2,5 to 0	–16 to 0	–100 to 0	–600 to 0
–4 to 0	–25 to 0	–160 to 0	

The SI-units Pascal (Pa) and Kilopascal (kPa) and Megapascal (MPa) should follow the millibar and bar series from 0 to 100 Pa up to 1000 Pa, then change to 0 to 1,6 kPa up to 1000 kPa then change to 0 to 1,6 MPa and 2,5 MPa.

6 Accuracy classes

The accuracy class stating the limits of permissible error is expressed as a percentage of the span.

The following accuracy classes are defined: 0,6; 1; 1,6; 2,5 and 4 (see Table 1).

For gauges with a pointer stop, the accuracy class will cover 10 to 100 % of the range. For gauges with a free zero, the accuracy class will cover 0 to 100 % of the range and zero shall be used as an accuracy check point.

Table 1 — Nominal size compared to the accuracy class

Nominal size	Accuracy class				
	0,6	1	1,6	2,5	4
50			×	×	×
63		×	×	×	×
80		×	×	×	×
100	×	×	×	×	×
150 and 160	×	×	×	×	×
250	×	×	×		

7 Dimensions

7.1 General tolerances

General tolerances: EN 22768-1.

7.2 Cases and flanges

The user will have to determine the dimensions for panel cut-out according to the manufacturer's data.

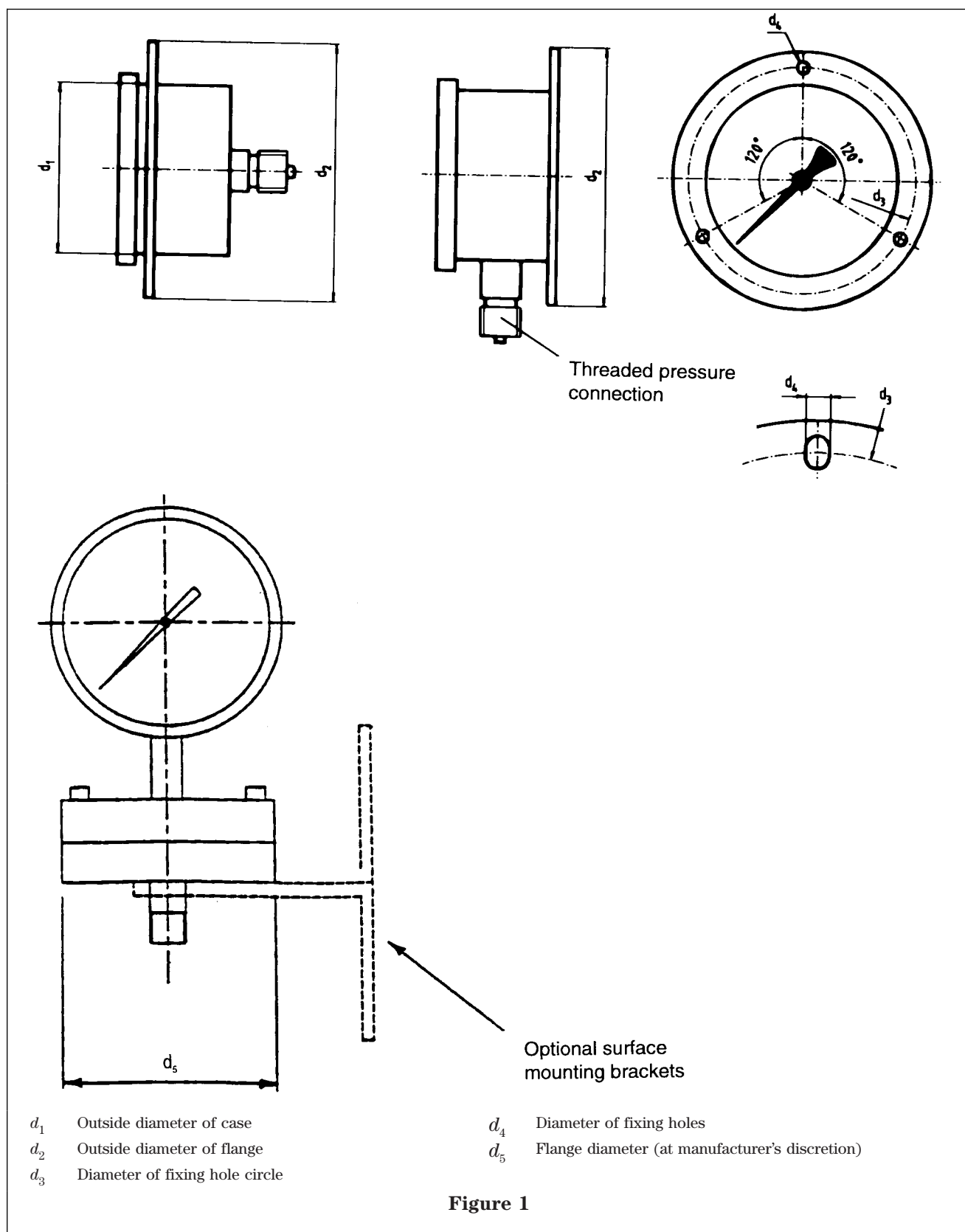


Table 2 — Dimensions

Nominal size	Dimensions in millimetres			
	d_1 min.	d_2 max.	d_3	d_4
50	48	71	60	3,6
63	61	86	75	3,6
80	78	110	95	5
100	97	134	118	6
150	147	186	168	6
160	157	196	178	6
250	245	290	276	7

NOTE d_4 elongated holes can be accepted to ensure interchangeability with standards.

7.3 Pressure connection

The positions of the connections can be selected from Table 8 “Types of mounting and connection position”. For thread forms and sizes, see Table 3.

Table 3 — Thread forms and sizes

Parallel pipe threads	Taper pipe threads
G 1/8 B	1/8-27 NPT EXT
G 1/4 B	1/4-18 NPT EXT
G 3/8 B	
G 1/2 B	1/2-14 NPT EXT

NOTE G 3/8 B is not preferred.

7.3.1 Screw threads

Parallel pipe threads (G) according to ISO 228-1.
 Taper pipe threads (NPT) according to ANSI/ASME B1.20.1.
 Other threads specific to certain industries are acceptable.

7.3.2 Shanks with parallel pipe threads

