SLOVENSKI STANDARD
SIST EN 837-1:1997

01-april-1997

Merilniki tlaka - 1. del: Merilniki tlaka z Bourdonovo cevjo - Mere, meroslovje, zahteve in preskušanje

Pressure gauges - Part 1: Bourdon tube pressure gauges - Dimensions, metrology, requirements and testing

Druckmessgeräte - Teil 1: Druckmessgeräte mit Rohrfedern -Masse, Messtecknik, Anforderungen und Prüfung

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Manometres - Partie 1: Manomètres à tubes de Bourdon - Dimensions, métrologie, prescriptions et essais

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Ta slovenski standard je istoveten z: **EN 837-1:1996**

ICS:

17.100	Merjenje sile, teže in tlaka	Measurement of force, weight and pressure

SIST EN 837-1:1997 **en**

2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 837-1

December 1996

ICS 17.100

Descriptors: Metrology, measuring instruments, manometers, vacuum gauges, indicating instruments, designation, specifications, dimensions, fidelity, safety, metrology inspection, marking

English version

Pressure gauges - Part 1: Bourdon tube pressure gauges - Dimensions, metrology, requirements and testing

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Manomètres - Partie 1: Manomètres à tubes de Bourdon - Dimensions, métrologie, prescriptions et essais

Druckmeßgeräte - Teil 1: Druckmeßgeräte mit Rohrfedern - Maße, Meßtechnik, Anforderungen und Prüfung

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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.

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CEN

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

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

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Foreword

This European Standard has been prepared by the 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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This European Standard specifies requirements for Bourdon tube (designated by B, see clause 12) indicating pressure gauges, vacuum gauges and combined vacuum and pressure gauges (compound gauges), with circular, spiral or coiled forms, from 40 to 250 nominal size with ranges up to 1600 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 and test 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 applies also to liquid-filled gauges, gauges for high pressure gases and gauges for use with oxygen or acetylene. It does not apply to pressure 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

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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 of 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.

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ANSI/ASME B1.20.1		Pipe threads, general purpose (inch).
EN 472	1994	Pressure gauges - Vocabulary.
EN 562	1994	Gas welding equipment - Pressure gauges used for welding, cutting and allied processes.
EN 29539	1992	Materials used for equipment used in gas welding, cutting and allied processes (ISO 9539:1988).
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: Designation, dimensions and tolerances.

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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 purpose of this European Standard, the definitions given in EN 472 apply.

4 Nominal sizes

Nominal sizes of gauges are as follows : 40, 50, 63, 80, 100, 150, 160 and 250.

See table 2 for dimensions.

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5 Pressure ranges

The bar is the preferred unit of pressure.

Pressure ranges in bar :

0 to 0,6	0 to 6	0 to 60	0 to 600
0 to 1	0 to 10	0 to 100	0 to 1000
0 to 1,6	0 to 16	0 to 160	0 to 1600
0 to 2,5	0 to 25	0 to 250	
0 to 4	0 to 40	0 to 400	

Vacuum ranges in bar :

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

- 0,6 to 0 - 1 to 0

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	

The SI-units Kilopascal (kPa) and Megapascal (MPa) should follow the bar series from 0 to 60 kPa up to 1000 kPa, then change to 0 MPa to 1,6 MPa up to a maximum of 160 MPa.

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6 Accuracy classes

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

The following accuracy classes are defined : 0,1; 0,25; 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.

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Table 1 : Nominal size compared to the accuracy class

Nominal size	Accuracy class						
	0,1	0,25	0,6	1	1,6	2,5	4
40 and 50					X	X	X
63				X	X	X	X
80				X	X	X	X
100			X	X	X	X	
150 and 160		X	X	X	X		
250	X	X	X	X	X		

7 Dimensions

7.1 General tolerances

General tolerances : EN 22768-1

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7.2 Cases and flanges

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

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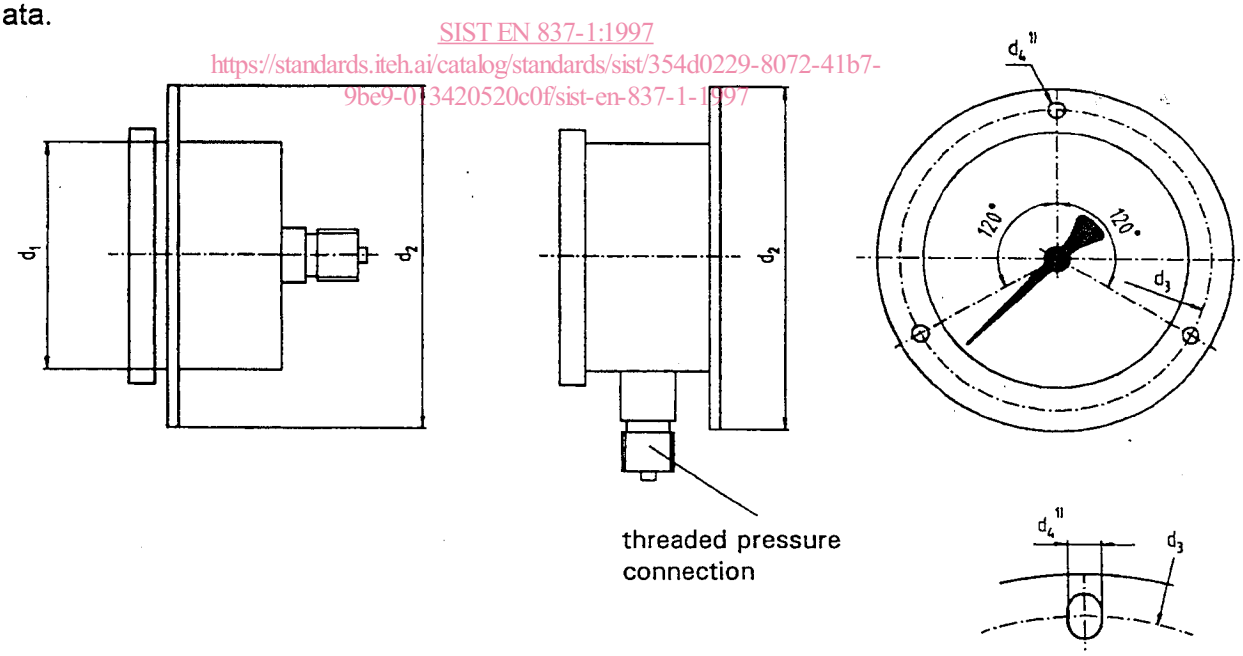

d_1 Outside diameter of case
d_2 Outside diameter of flange
d_3 Diameter of fixing hole circle
d_4 Diameter of fixing holes

Figure 1

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Table 2 : Dimensions

Nominal size	d_1 -min. (in mm)	d_2 max. (in mm)	d_3 (in mm)	d_4 (in mm)
40	38	61	51	3,6
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 previous standards.				

7.3 Pressure connection

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The positions of the connections can be selected from table 9 (Types of mounting and connection position). For thread forms and sizes, see table 3.

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Table 3 : Thread forms and sizes

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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 (symbol G) according to ISO 228-1

Taper pipe threads (symbol NPT) according to ANSI/ASME B1.20.1

Other threads specific to certain industries are acceptable.

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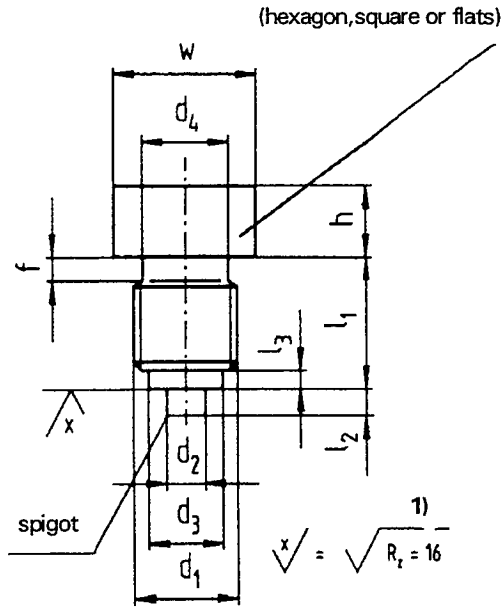
7.3.2 Shanks with parallel pipe threads



NOTE : Minimum height *h* of flats shall be compatible with use of standard spanners according to ISO 10102.

Figure 2

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Table 4 : Dimensions of parallel threaded shanks

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Dimensions in millimetres

Thread size d_1	d_2	d_3	d_4 min.	l_1 + 0,5 0	l_2	l_3 + 0,5 0	f	w min.
G 1/8 B	4	8	8	10	2	2	1,6	8
G 1/4 B	5	9,5	9,5	13	2	2	2	10
G 3/8 B	5,5	13	13	16	3	3	2	13
G 1/2 B	6	17,5	17,5	20	3	3	3	17

NOTE 1 : For stainless steel screwed connection, *f* dimensions can be raised up to 50 %.

NOTE 2 : G 1/8 B may be made without spigot.

NOTE 3 : G 1/8 B may be made without groove *f*. In this case, the length of threading shall be equal to l_1.

NOTE 4 : For inchangeability with previous standards, the spigot of G 1/4 B can be manufactured with diameter 4 mm.

[1] According to ISO 1302