

Termometrar med visare

Dial thermometers

Europastandarden EN 13190:2001 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN 13190:2001.

The European Standard EN 13190:2001 has the status of a Swedish Standard. This document contains the official English version of EN 13190:2001.

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English version

Dial thermometers

Thermomètres à cadran

Zeigerthermometer

This European Standard was approved by CEN on 28 September 2001.

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 Management Centre 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 Management Centre 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.



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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 141 "Pressure gauges - Thermometers - Means of measuring and/or recording temperature in the cold chain", 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of an identical text or by endorsement, at the latest by May 2002, and conflicting national standards shall be withdrawn at the latest by May 2002.

This document includes a Bibliography.

Annex A is informative.

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.

1 Scope

This European Standard specifies requirements and testing for dial indicating thermometers using sensing methods of gas expansion (symbol **GE**), liquid expansion (symbol **LE**) and bimetallic strip (symbol **BM**). Nominal sizes are from 40 to 160, and temperature measurement from -100 °C to +700 °C.

Thermometers specified have circular scales, and are for industrial use only.

Thermometers of square form are also covered by this standard except for case, scale and pointer dimensions.

Annex A includes recommendations for selection and installation.

This standard does not apply to thermometers for medical use nor to thermometers with electrical limit contact devices.

2 Normative references

This European Standard incorporates by dated or undated references, 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 (including amendments).

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

EN 22768-1, *General tolerances – Part 1: Tolerances for linear and angular dimensions without individual tolerance indications (ISO 2768-1 : 1989)*.

ISO 68-1, *ISO general purpose screw threads – Basic profile – Part 1: Metric screw threads*.

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

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

International vocabulary of basic and general terms in metrology (VIM). BIPM, IEC, IFCC, ISO, IUPAC, IUPAP, OIML, 2nd. Edition 1993.

3 Terms and definitions

For the purpose of this European Standard the terms and definitions given in the International vocabulary of basic and general terms in metrology (VIM) and the following terms and definitions apply.

3.1

dial indicating thermometer

instrument consisting of head and temperature detecting element or stem connected together by a rigid stem or, except for a bimetallic thermometer, by a flexible capillary

3.2

bimetallic thermometer (BM)

dial indicating thermometer operated by differential expansion strip, helix or coil

3.3

gas expansion thermometer (GE)

dial indicating thermometer operating on the principle of change in pressure of a fixed volume of gas in response to temperature change

3.4

liquid expansion thermometer (LE)

dial indicating thermometer operating on the principle of liquid volume expansion in response to temperature change

3.5

temperature detecting element

that part of a thermometer which supports and includes the sensitive portion

3.6

sensitive portion of temperature detecting element

that part of the temperature detecting element which contains the major portion of the temperature sensitive fluid or bimetal strip

**3.7
thermometer insertion length**

distance that temperature detecting element is inserted into process medium

**3.8
thermometer movement**

assembly by means of which the expansion of the fluid used or bimetallic strip are transformed and enlarged into an angular variation

**3.9
thermometer connection**

part by which the dial indicating thermometer can be coupled to the temperature tapping of the plant, pipework or equipment

**3.10
thermometer compensation**

apparatus fitted inside head and/or capillary to minimise errors due to ambient temperature variations

**3.11
adjustable pointer**

pointer with an adjustable device

**3.12
nominal size (thermometer)**

conventional alpha-numerical designation relating to the size of the thermometer

4 Nominal sizes

Nominal sizes of the thermometers are as follows: 40, 50, 63, 80, 100, 130, 150 and 160.

See Table 1 for dimensions.

5 Nominal ranges

The degree Celsius abbreviated to °C is the preferred unit of temperature measurement. The following nominal ranges are specified:

from 0 °C to 60 °C	from -20 °C to +40 °C
from 0 °C to 80 °C	from -20 °C to +60 °C
from 0 °C to 100 °C	from -20 °C to +120 °C
from 0 °C to 120 °C	from -30 °C to +30 °C
from 0 °C to 160 °C	from -30 °C to +50 °C
from 0 °C to 200 °C	from -30 °C to +70 °C
from 0 °C to 250 °C	from -40 °C to +40 °C
from 0 °C to 300 °C	from -40 °C to +60 °C
from 0 °C to 400 °C	from -100 °C to +60 °C
from 0 °C to 500 °C	
from 0 °C to 600 °C	
from 0 °C to 700 °C	
from 50 °C to 650 °C	
from 100 °C to 700 °C	

NOTE Not all types of thermometer are suitable for all ranges (see also Table A.1).

6 Accuracy classes

The following accuracy classes are defined: class 1 and class 2.

Class 1 may be used with nominal sizes 63 to 160, class 2 may be used with nominal sizes 40 to 160.

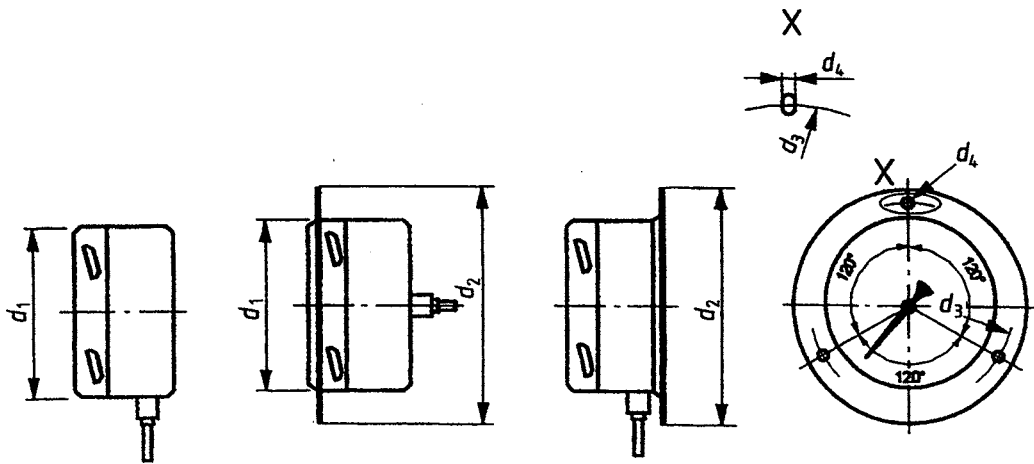
7 Dimensions

7.1 General tolerances

General tolerances: Tolerance class m according to 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.



Key

- 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 - Dimensions of thermometer cases and flanges

Table 1 - Dimensions

Nominal size	d_1 min. mm	d_2 max. mm	d_3 mm	d_4 mm
40	38	61	51	3,6
50	48	71	60	3,6
63	61	86	75	3,6
80	77	110	95	5
100	97	134	118	6
130	125	–	–	–
150	147	186	168	6
160	157	196	178	6

NOTE Elongated holes can be accepted to ensure interchangeability with previous standards.

7.3 Thermometer connection

The type of connections in Figure 2 are used for both rigid stem thermometers and thermometers with capillary. The connections in Figure 3 are for rigid stem thermometers only. The length of " l_5 " of thermometer connection form 4 depends of the length of the threaded part of its thermowell and shall be longer than the latter.

The minimum height of the hexagon, square or flats shall be compatible with use of standard spanners according to ISO 10102.

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.

ISO general purpose metric screw threads (symbol M) having basic profile according to ISO 68-1.

Other threads specific to certain industries are acceptable.

7.3.2 Temperature detecting element

The diameter of the temperature detecting element " d_5 " and its length " l_1 " (see Figures 2 and 3) will be at manufacturer's discretion or should be by agreement between purchaser and supplier.

7.3.3 Sensitive portion of the temperature detecting element

The length of the sensitive portion of the temperature detecting element " l_2 " (see Figures 2 and 3) shall be stated by the manufacturer.