SLOVENSKI STANDARD
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Pressure gauges - Part 2: Selection and installation recommendations for pressure gauges

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Druckmeßgeräte - Teil 2: Auswahl- und Einbauempfehlungen für Druckmeßgeräte

Manometres - Partie 2: Recommandations sur le choix et l'installation des manometres

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Pressure gauges - Part 2: Selection and installation recommendations for pressure gauges

Manomètres - Partie 2: Recommandations sur le choix et l'installation des manomètres

Druckmeßgeräte - Teil 2: Auswahl- und Einbauempfehlungen für Druckmeßgeräte

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CEN

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

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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 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of an identical text or by endorsement, at the latest by September 1997, and conflicting national standards shall be withdrawn at the latest by September 1997.

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.

This European standard consists of the following parts, under the general title "Pressure gauges":

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

Part 2 : Selection and installation recommendations for pressure gauges

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

0 Introduction

Pressure gauges are instruments used for pressure measurement which implies :

- the selection of a gauge suited to the conditions of use ;

- the respect of a certain number of rules and precautions concerning :

  . storage ;
  . installation ;
  . safety in view of the service conditions ;
  . maintenance.

1 Scope

This European standard only applies to those pressure gauges whose pressure responsive element measuring system is a metal part which deforms under the effect of the pressure measured, as defined in EN 837-1 and EN 837-3.

This standard has been prepared to assist in the selection, installation and use of pressure gauges to ensure that they give satisfactory service for the intended application with the maximum level of safety.

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 part of this European standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 472	1994	Pressure gauges - Vocabulary
EN 837-1	1996	Pressure gauges - Part 1 : Bourdon tube pressure gauges - Dimensions, metrology, requirements and testing
EN 837-3	1996	Pressure gauges - Part 3 : Diaphragm and capsule pressure gauges - Dimensions, metrology, requirements and testing

3 Definitions

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

4 Selection

Following criteria should be considered :

4.1 Selection of pressure sensitive element

The type of pressure responsive element may be selected according to the following table 1 :

Table 1

Reference of the standard	Type of pressure gauge	Pressure range	Process fluid			
			Gas or steam	Liquid		
				Low viscosity	High viscosity	Polluted
EN 837-1	Bourdon tube	0,6 bar to 1 600 bar	x	x	1)	1)
EN 837-3	Diaphragm	2,5 mbar to 25 bar	x	x	x	x
EN 837-3	Capsule	1 mbar to 600 mbar	x	x[2)]		

1) Separators should be used.
2) The capsule and the pipe shall be fully filled with the liquid.

4.2 Safety

4.2.1 Pressure range

The range should be such that the maximum working pressure does not exceed 75 % of the maximum scale value for steady pressure or 65 % of the maximum scale value for cyclic pressures.

4.2.2 Safety design

The safety design shall be selected in consideration of safety requirements of the specific applications.

Criteria for the selection of pressure gauges with Bourdon tube are given in table 2.

For diaphragm and capsule gauges normally there are no specific requirements but the manufacturer should be consulted where special conditions may apply: for instance possibility of high pressure overload.

NOTE : Capsule and diaphragm gauges are not recommended for oxygen and acetylene use. However where absolutely necessary, consultation between user and manufacturer is required.

4.3 Materials

Pressure gauges are manufactured with pressure responsive elements that can be made from various materials. It is therefore necessary to choose from these materials the one best suited to the type of process fluid and its pressure . The purchaser shall indicate to the manufacturer all information concerning the materials which are compatible with the fluid in relation to the specific conditions of measurement.

If none of the standard materials are suitable, it shall be necessary to interpose a separator between the process fluid and the pressure gauge.

The filling of a chemical seal pressure gauge assembly shall always be done by the manufacturer and these two instruments shall never be uncoupled.

4.4 Accuracy

The accuracy class required shall be selected from EN 837-1 or EN 837-3.

4.5 Pressure connection

The pressure connection shall be selected from EN 837-1 or EN 837-3.

Other connections specific to certain industries and applications shall be specified.

4.6 Nominal size

The size of gauge required shall be selected from EN 837-1 or EN 837-3.

4.7 Mounting

Type of mounting required shall be selected from EN 837-1 or EN 837-3.

4.8 Other criteria

If the application involves pressure pulsations, vibrations, extremes of temperature, shock loading, solids in suspension, viscous or chemically aggressive pressure fluid, hostile environment, or requires correction for a static head, the manufacturer shall be consulted.

5 Transport

Certain modes of transport may be incompatible with certain types of pressure gauges (for instance : high precision gauges or gauges with sensitivity to variations of atmospheric pressure). In these cases, the customer shall leave the manufacturer with free choice of the means of transport, even the free choice of the carrier.

6 Storage prior to installation

Gauges should be stored in dry, clean conditions within the temperature range of - 40 °C to + 70 °C and protected against any impact damage.

Table 2: Criteria for selection of pressure gauges with Bourdon tube (safety aspect)

Pressure fluid	Liquid								Gas or steam (see note 1)							
Case filling	Dry				Liquid				Dry				Liquid			
Nominal size	< 100		≥ 100		< 100		≥ 100		< 100		≥ 100		< 100		≥ 100	
Pressure range (in bar)	≤ 25	> 25	≤ 25	> 25	≤ 25	> 25	≤ 25	> 25	≤ 25	> 25	≤ 25	> 25	≤ 25	> 25	≤ 25	> 25
Minimum safety design code	0	0	0	0	S1	S1	S1	S1	0	S2	S1	S3	S1	S2	S1	S3

Safety design codes :

0	Gauge without blow-out device
S1	Blow-out device gauge
S2	Safety pattern gauge without baffle wall
S3	Safety pattern gauge with baffle wall (providing a higher level of safety)

NOTE 1 : All oxygen and acetylene gauges shall be safety pattern gauges.

NOTE 2 : Glycerine filled gauges shall not be used with oxygen or other strong oxydising process fluid. For such applications, highly fluorinated and chlorinated liquids can be used.

NOTE 3 : This table indicates the normal safety design code. Users must have cognisance of their special requirements and may use safety pattern gauges at pressures lower than 25 bar.