# SLOVENSKI STANDARD
# SIST EN 562:2003

**01-december-2003**

**Nadomeġļa:**
**SIST EN 562:1995**

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**Oprema za plamensko varjenje - Manometri za varjenje, rezanje in sorodne postopke**

Gas welding equipment - Pressure gauges used in welding, cutting and allied processes

Gasschweißgeräte - Manometer für Schweißen, Schneiden und verwandte Prozesse

Matériel de soudage aux gaz - Manomètres utilisés pour le soudage, le coupage et les techniques connexes



**Ta slovenski standard je istoveten z: EN 562:2003**

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**ICS:**

| | | |
|---|---|---|
| 17.100 | Merjenje sile, teže in tlaka | Measurement of force, weight and pressure |
| 25.160.30 | Varilna oprema | Welding equipment |

**SIST EN 562:2003** **en**

EUROPEAN STANDARD

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**EN 562**

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ICS 17.100; 25.160.30

Supersedes EN 562:1994

English version

# Gas welding equipment - Pressure gauges used in welding, cutting and allied processes

Matériel de soudage aux gaz - Manomètres utilisés pour le soudage, le coupage et les techniques connexes

Gasschweißgeräte - Manometer für Schweißen, Schneiden und verwandte Prozesse

This European Standard was approved by CEN on 17 March 2003.

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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.



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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Ref. No. EN 562:2003 E

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# Foreword

This document (EN 562:2003) has been prepared by Technical Committee CEN/TC 121 "Welding", the secretariat of which is held by DS.

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of an identical text or by endorsement, at the latest by November 2003, and conflicting national standards shall be withdrawn at the latest by November 2003.

This document supersedes EN 562: 1994.

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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

## 1 Scope

This European Standard specifies requirements for Bourdon-tube pressure gauges normally used with compressed gases at pressures up to 300 bar in welding, cutting and allied processes. It also covers use for dissolved acetylene and for liquefied gases under pressure.

It does not cover gauges for acetylene in acetylene manufacturing plants.



## 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 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).

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

EN 29539, *Materials for equipment used in gas welding, cutting and allied processes (ISO 9539:1988).*

EN ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads - Part 1: Dimensions, tolerances and designation (ISO 228-1:2000).*

EN ISO 4589-2:1999, *Plastics - Determination of burning behaviour by oxygen index - Part 2: Ambient-temperature test (ISO 4589-2:1996).*

ISO 7-1, *Pipe threads where pressure-tight joints are made on the threads - Part 1: Dimensions, tolerances and designation.*

ISO 497, *Guide to the choice of series of preferred numbers and of series containing more rounded values of preferred numbers.*

ISO 7000:1989, *Graphical symbols for use on equipment—Index and synopsis.*

ISO 10102, *Assembly tools for screws and nuts—Double headed open-ended engineers' wrenches—Length of wrenches and thickness of the heads.*

ANSI/ASME B1.20.1, *Pipe threads, general purpose (inch)*[1)].

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[1)] Standard published and available at: ANSI – American National Standards Institute, 11 West 42nd Street, New York, NY 10036.

## 3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 472:1994 and the following apply.

**3.1**
**bourdon-tube pressure gauges**
device incorporating flexible tubes with direct indication by pointer and graduated scale of the pressure being measured

**3.2**
**dial**
plate or area on which the scale is marked

**3.3**
**pointer stop**
projection that stops the travel of the pointer

## 4 Pressure

### 4.1 Unit of pressure

All pressures given are gauge (effective) pressures in bar.



### 4.2 Maximum scale reading

Where practical the maximum scale reading for a particular gas and pressure level shall be selected from the values given in Table 1. Where it is not practicable the maximum scale reading shall be selected from the R10 series of preferred numbers or more rounded values given in ISO 497.



**Table 1 — Maximum scale reading**

Values in bar

| Pressure level | Acetylene | Oxygen and other gases |
|---|---|---|
| low-pressure (LP) | 1<br>1,6<br>2,5 | 2,5<br>4<br>6<br>10<br>16<br>25<br>40 |
| high-pressure (HP)<br>(see NOTES 1, 2 and 3) | 40 | 250<br>315<br>400 |

NOTE 1 250 bar pressure gauge for use with $CO_2$ and compressed gas cylinders filled to a maximum settled filling pressure of 185 bar at 15 °C.

NOTE 2 315 bar pressure gauge for use with compressed gas cylinders filled to a maximum settled filling pressure of 230 bar at 15 °C.

NOTE 3 400 bar pressure gauge for use with compressed gas cylinders filled to a maximum settled filling pressure of 300 bar at 15 °C.

### 4.3 Maximum pressure mark

The maximum operating pressure[2)] shall be indicated on the dial by a symbol or coloured mark and shall not exceed ¾ of the maximum scale reading.

## 5 Manufacturing requirements

### 5.1 Materials

#### 5.1.1 General

The materials of the pressure gauge components liable to come into contact with the gas shall have adequate resistance to the chemical action of the gas under operating conditions.

Bourdon tubes and other parts in contact with acetylene gas shall conform to EN 29539.

#### 5.1.2 Oxygen pressure gauges

Bourdon tubes and other parts in contact with the gas shall be resistant to the chemical action of the oxygen and shall not be flammable under operating conditions.

Thread sealants or sealing rings shall also be resistant to the chemical action of the oxygen and shall not be flammable under operating conditions.



Components in contact with oxygen gas shall conform to EN 29539.



Only lubricants suitable for use in oxygen at the service pressure and temperature shall be used.



### 5.2 Design and dimensions

#### 5.2.1 Operational requirements

##### 5.2.1.1 Accuracy

The pressure gauge accuracy shall be at least that of class 2,5, i.e. with a maximum deviation within the tolerance ± 2,5 % (of full scale reading) over the entire scale.

##### 5.2.1.2 Strength

Those parts of the pressure gauge that are in contact with the gas shall not burst or leak when tested to a pressure corresponding to 2,5 times the maximum scale reading (see 8.7).

##### 5.2.1.3 Torsion

After the application of the torque of 10 Nm according to 8.4.1 for a period of not less than 30 s, the pressure gauge shall satisfy the conditions of accuracy specified in 5.2.1.1.

After the application of the torque of 25 Nm according to 8.4.2 for a period of not less than 30 s, the pressure gauge shall be leak-tight at a pressure corresponding to the maximum scale reading.

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2) For pressure gauges used with regulators to EN ISO 2503 the maximum pressure mark is normally $p_2$ for low-pressure gauges and $p_1$ for high-pressure gauges, as defined in EN ISO 2503:1998, Table 4.

#### 5.2.1.4 Bending

After the application of the load of 1 kN according to 8.5, the pressure gauge shall be leak-tight to atmosphere at a pressure corresponding to the maximum scale reading.

### 5.2.2 Dimensions

The nominal size is based on the diameter of the casing (dimension A in Figure 1 and Figure 2). The values 40, 50 and 63 are standardized.

The dimensions shall be in accordance with Figure 1 and Table 2, or Figure 2 and Table 3 as appropriate. The connecting dimensions are shown in Figure 3 and Table 4.

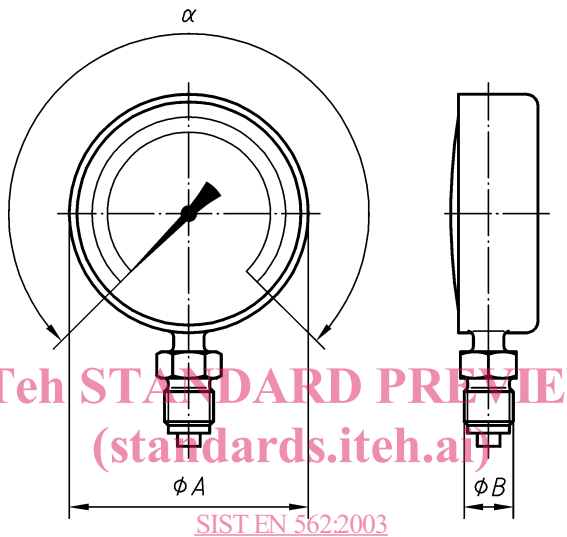




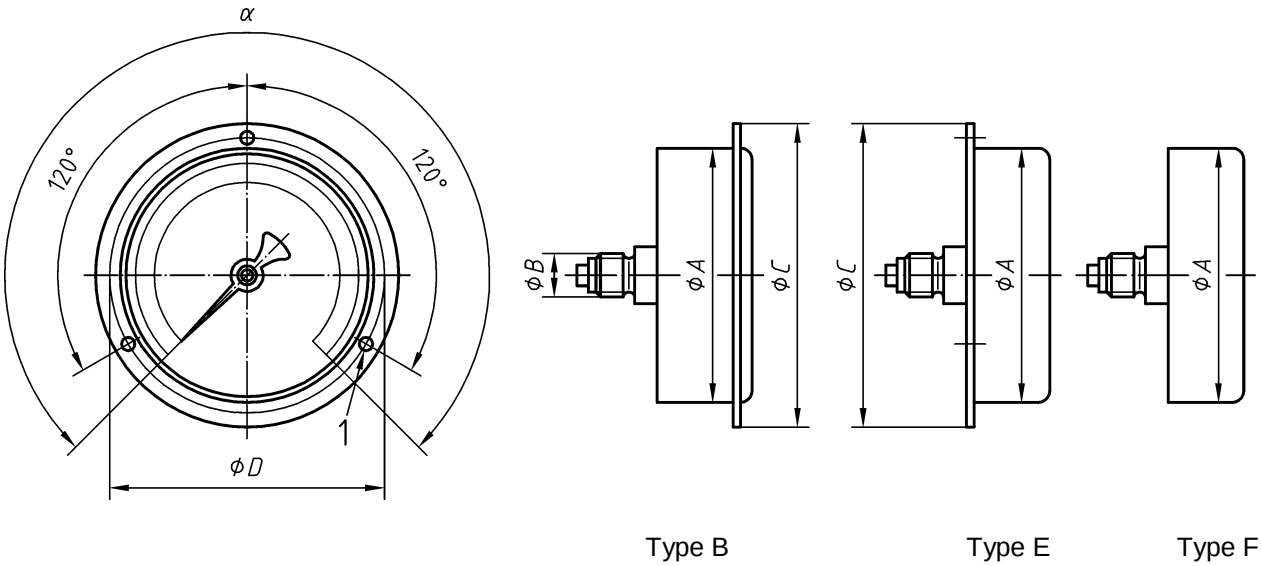

**Figure 1 — Pressure gauge with bottom entry**

**Table 2 — Dimensions of threads pressure gauge with bottom radial entry**

| Nominal size | *α* [degree] | *A* [mm] | *B* | |
|---|---|---|---|---|
| | | | Parallel thread | Tapered thread |
| 40 | 270 | $40^{+5}_{-2}$ | G1/8 B or G1/4 B | R1/8 or 1/8-27 NPT EXT or R1/4 or 1/4-18 NPT EXT |
| 50 | 270 | $50^{+7}_{-2}$ | G1/8 B or G1/4 B | R1/8 or 1/8-27 NPT EXT or R1/4 or 1/4-18 NPT EXT |
| 63 | 270 | $63^{+7}_{-2}$ | G1/4 B | R1/4 or 1/4-18 NPT EXT |

The thread connection (see Figure 3) according to the type shall conform to the following standards:

Parallel thread – EN ISO 228-1; Tapered thread (Symbol R) – ISO 7-1; Tapered thread (Symbol NPT) – ANSI/ASME B1.20.1.




Type B Type E Type F

**Key**

1 Fixing holes F

**Figure 2 — Pressure gauge with rear entry**



**Table 3 — Dimensions of threads pressure gauge with rear entry**

| Nominal size | $\alpha$ | $A_{max}$ | $B$ | | $C_{max}$ | $D$ | $F_{min}$ |
|---|---|---|---|---|---|---|---|
| | [degree] | [mm] | Parallel thread | Tapered thread | [mm] | [mm] | [mm] |
| 40 | 270 | 42 | G1/8 B or G1/4 B | R1/8 or 1/8-27 NPT EXT or R1/4 or 1/4-18 NPT EXT | 61 | 51 | 3,6 |
| 50 | 270 | 52 | G1/8 B or G1/4 B | R1/8 or 1/8-27 NPT EXT or R1/4 or 1/4-18 NPT EXT | 68 | 60 | 3,6 |
| 63 | 270 | 67 | G1/4 B | R1/4 or 1/4-18 NPT EXT | 81 | 75 | 3,6 |



The thread connection (see Figure 3) according to the type shall conform to the following standards:

Parallel thread – EN ISO 228-1; Tapered thread (Symbol R) – ISO 7-1; Tapered thread (Symbol NPT) – ANSI/ASME B1.20.1.