
**Vgrajeni gasilni sistemi – Sestavni deli sistemov za gašenje s plinom – 10. del:
Zahteve in preskusne metode za merilnike tlaka in tlačna stikala**

Fixed firefighting systems - Components for gas extinguishing systems - Part 10:
Requirements and test methods for pressure gauges and pressure switches

Ortsfeste Brandbekämpfungsanlagen - Bauteile für Löschanlagen mit gasförmigen
Löschmitteln - Teil 10: Anforderungen und Prüfverfahren für Druckmessgeräte und
Druckschalter

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Installations fixes de lutte contre l'incendie - Éléments constitutifs pour installations
d'extinction a gaz - Partie 10: Exigences et methodes d'essai pour manometres et
contacts a pression

Ta slovenski standard je istoveten z: EN 12094-10:2003

ICS:

| | | |
|-----------|------------------------------|--|
| 13.220.10 | Gašenje požara | Fire-fighting |
| 17.100 | Merjenje sile, teže in tlaka | Measurement of force, weight and pressure |

SIST EN 12094-10:2003**en**

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 12094-10

April 2003

ICS 13.220.20

English version

Fixed firefighting systems - Components for gas extinguishing systems - Part 10: Requirements and test methods for pressure gauges and pressure switches

Installations fixes de lutte contre l'incendie - Eléments constitutifs pour installations d'extinction à gaz - Partie 10: Exigences et méthodes d'essai pour manomètres et contacts à pression

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This European Standard was approved by CEN on 13 February 2003.

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



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Foreword

This document (EN 12094-10:2003) has been prepared by Technical Committee CEN /TC 191, "Fixed firefighting systems", the secretariat of which is held by BSI.

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 October 2003, and conflicting national standards shall be withdrawn at the latest by April 2006.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative annex ZA, which is an integral part of this document.

This part of EN 12094 is one of a number of European Standards prepared by CEN/TC 191 covering components for gas extinguishing systems.

They are included in a series of European Standards planned to cover:

- gas extinguishing systems (EN 12094)
- sprinkler systems (EN 12259 and EN 12845)
- powder systems (EN 12416)
- explosion protection systems (EN 26184)
- foam systems (EN 13565)
- hose systems (EN 671)
- smoke and heat control systems (EN 12101)
- water spray systems¹⁾

This European Standard has the general title "Fixed firefighting systems – Components for gas extinguishing systems" and will consist of the following parts:

- Part 1: Requirements and test methods for electrical automatic control and delay devices
- Part 2: Requirements and test methods for non-electrical automatic control and delay devices
- Part 3: Requirements and test methods for manual triggering and stop devices
- Part 4: Requirements and test methods for container valve assemblies and their actuators
- Part 5: Requirements and test methods for high and low pressure selector valves and their actuators for CO₂ systems
- Part 6: Requirements and test methods for non-electrical disable devices for CO₂ systems
- Part 7: Requirements and test methods for nozzles for CO₂ systems

1) under preparation

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- Part 8: Requirements and test methods for flexible connectors for CO₂ systems
- Part 9: Requirements and test methods for special fire detectors
- Part 10: Requirements and test methods for pressure gauges and pressure switches
- Part 11: Requirements and test methods for mechanical weighing devices
- Part 12: Requirements and test methods for pneumatic alarm devices
- Part 13: Requirements and test methods for check valves and non-return valves
- Part 16: Requirements and test methods for odorizing devices for CO₂ low pressure systems
- Part 17: Requirements and test methods for pipe hangers
- Part 20: Requirements and test methods for compatibility of components

This document includes a Bibliography.

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.

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Introduction

It has been assumed in the preparation of this European Standard that the execution of its provisions is entrusted to appropriately qualified and experienced people.

All pressure data in this European Standard are given as gauge pressures in bar, unless otherwise stated.

NOTE 1 bar = 10^5 N m⁻² = 100 kPa.

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EN 12094-10:2003 (E)**1 Scope**

This European Standard specifies requirements and describes test methods for pressure gauges and pressure switches.

This European Standard is applicable for pressure gauges for monitoring of pilot, control, alarm and storage containers of fire extinguishing systems filled with non-liquefied inert gases or pressurized halocarbon gases.

This European Standard is applicable for pressure switches for monitoring of pilot, control, alarm and storage containers of fire extinguishing systems filled with non-liquefied inert gases or pressurized halocarbon gases and remote indication of leakage.

This European Standard does not cover discharge indicating pressure switches.

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).

EN 837-1 : 1996, *Pressure gauges - Part 1: Bourdon tube pressure gauges - Dimensions, metrology, requirements and testing*.

EN 60529, *Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)*.

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3 Terms and definitions

For the purposes of this European Standard the following terms and definitions apply.

3.1**CO₂-high-pressure installation**

fire extinguishing installation in which the CO₂ is stored at ambient temperature. For example, the pressure of the CO₂ in storage is $p_{\text{abs}} = 58,6$ bar at 21 °C

3.2**CO₂-low-pressure installation**

fire extinguishing installation in which the CO₂ is stored at low temperature, normally –19 °C to –21 °C

3.3**halocarbon gas**

extinguishing agent that contains as primary components one or more organic compounds containing one or more of the elements fluorine, chlorine, bromine or iodine

3.4**halocarbon gas installation**

fire extinguishing installation in which the halocarbon gas is stored at ambient temperature

3.5**inert gas**

non liquefied gas or mixture of gases which extinguish the fire mainly by reducing the oxygen-concentration in the protected zone, e.g. Argon, Nitrogen or CO₂ or mixtures of these gases

3.6**inert gas installation**

fire extinguishing installation in which the inert gas is stored at ambient temperature

4 Requirements

4.1 Pressure gauges

NOTE The range of a pressure gauge should be greater than the pressure developed in the container at 50 °C or the maximum pressure given by the manufacturer, but not higher than the next highest standard range of EN 837-1.

4.1.1 General

The component shall comply with the technical requirements of EN 837-1.

4.1.2 Accuracy class and nominal size

The component shall have at least accuracy class 1,6 and at least nominal size 40 as given in EN 837-1.

4.1.3 Corrosion

The component shall meet the same accuracy requirements of EN 837-1 after being subjected to the corrosive atmosphere as described in 5.2.8 with the inlet sealed during conditioning.

4.2 Pressure switches

4.2.1 Design

The switching accuracy of the component at the designated setting point shall not exceed $\pm 2,5\%$ of the pressure developed in the container at 50 °C or shall not exceed $\pm 2,5\%$ of the maximum pressure expected at the place of use in the system.

The component shall be specified by the manufacturer for a working pressure of at least the pressure developed in the container at 50 °C.

The manufacturer shall specify the switching capacity.

The component shall incorporate self-resetting contacts.

The component shall be designed to have at least class IP 54 of EN 60529.

4.2.2 Function

When tested in accordance with 5.2.4 the component accuracy shall be in accordance with 4.2.1 and the electrical connection(s) shall function correctly.

4.2.3 Internal pressure

When tested in accordance with 5.2.5 the component shall not leak. The component shall operate satisfactorily when tested in accordance with 5.2.4 after being tested in accordance with 5.2.5.

4.2.4 Operational reliability

There shall be no deterioration of performance when the component is tested as described in 5.2.6.

EN 12094-10:2003 (E)**4.2.5 Temperature**

When tested in accordance with 5.2.7 at -20 °C and $+50\text{ °C}$ the component accuracy at the designated setting point shall not exceed $\pm 5\%$ of either the pressure developed in the container at 50 °C or the maximum pressure expected at the place of use in the system. The electrical connection(s) shall function correctly.

4.2.6 Corrosion

The component shall operate satisfactorily when tested in accordance with 5.2.4 after being subjected to the corrosive atmosphere as described in 5.2.8 with the inlet open.

4.3 Documentation

4.3.1 The manufacturer shall prepare and maintain documentation.

4.3.2 The manufacturer shall prepare installation and user documentation, which shall be submitted to the testing authority together with the sample(s). This documentation shall comprise at least the following:

- a) a general description of the component, including a list of its features and functions;
- b) a technical specification including:
 - 1) the information mentioned in 4.1 and 4.2, if applicable;
 - 2) sufficient information to permit an assessment of the compatibility with other components of the system (if applicable e.g. mechanical, electrical or software compatibility);
- c) installation instructions including mounting instructions;
- d) operating instructions; [SIST EN 12094-10:2003
https://standards.iteh.ai/catalog/standards/sist/61ad0862-755e-45ed-92b6-49b9f5d6fec2/sist-en-12094-10-2003](https://standards.iteh.ai/catalog/standards/sist/61ad0862-755e-45ed-92b6-49b9f5d6fec2/sist-en-12094-10-2003)
- e) maintenance instructions;
- f) routine testing instruction, if appropriate.

4.3.3 The manufacturer shall prepare design documentation, which shall be submitted to the testing authority together with the sample(s), except where the conditions of supply to the manufacturer make this impossible. This documentation shall include drawings, parts lists, block diagrams (if applicable), circuit diagrams (if applicable) and a functional description to such an extent that compliance with this standard may be checked and that a general assessment of the design is possible.

5 Test methods**5.1 Pressure gauges****5.1.1 Test conditions and tests**

NOTE See 5.1.3 and EN 837-1.

5.1.2 Compliance and conformity

A visual and measurement check shall be made with one sample to determine that the component corresponds to the description in the drawings, parts lists, description of functions, operating and installation instructions.

5.1.3 Corrosion

One sample shall be conditioned in accordance with 5.2.8 followed by an accuracy check in accordance with EN 837-1.

5.2 Pressure switches

5.2.1 Test conditions

The components shall be assembled for test as specified in the technical documentation. The tests shall be carried out at a temperature of (25 ± 10) °C, except when otherwise specified for a particular test.

The tolerance for all test parameters is 5 %, unless otherwise stated.

5.2.2 Test samples and order of tests

For the tests three samples are needed. The order of tests is shown in Table 1.

Table 1 — Order of tests

| Tests | Test order for | | |
|-------------------------------|----------------|----------|----------|
| | sample A | sample B | sample C |
| 5.2.3 Compliance | 1 | 1 | 1 |
| 5.2.4 Function | 3 | 2 | 2 and 4 |
| 5.2.5 Internal pressure | 2 | | |
| 5.2.6 Operational reliability | 4 | | |
| 5.2.7 Temperature | | 3 | |
| 5.2.8 Corrosion | | | 3 |

5.2.3 Compliance

A visual and measurement check shall be made to determine whether the test sample corresponds to the description in the drawings, parts list, description of functions, operating and installation.

5.2.4 Function under normal conditions

This test relates to the requirements of 4.2.2.

The following test cycle shall be carried out 10 times:

- A pressure of 1,1 times the pressure at the designated setting point shall be applied using air or Nitrogen;
- The pressure to the switch point shall be decreased by a rate calculated to reach the pressure at the designated setting point in $(1 \pm 0,5)$ min;
- The switch point pressure shall be recorded.

5.2.5 Internal pressure

This test relates to the requirements of 4.2.3.

The sample shall be connected to a suitable hydraulic pressure supply. Provision for venting shall be available.

Vent the system of air and increase the pressure to $(1,2 \pm 0,05)$ times the specified working pressure. Maintain this pressure for a period of (5 ± 1) min. After this period release the hydraulic pressure.