



SLOVENSKI STANDARD

SIST EN 14382:2005

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BUXca Yý U.

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Varnostne naprave za plinske regulacijske postaje in napeljave - Plinske varnostne zaporne naprave za vstopne tlake do 100 bar

Safety devices for gas pressure regulating stations and installations - Gas safety shut-off devices for inlet pressures up to 100 bar

Sicherheitseinrichtungen für Gas-Druckregelanlagen und -einrichtungen - Gas-Sicherheitsabsperreinrichtungen für Betriebsdrücke bis 100 bar

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Dispositifs de sécurité pour postes et installations de détente-régulation de pression de gaz - Clapets de sécurité pour pressions amont jusqu'à 100 bar

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English version

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installations - Gas safety shut-off devices for inlet pressures up
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einrichtungen - Gas-Sicherheitsabsperreinrichtungen für
Betriebsdrücke bis 100 bar

This European Standard was approved by CEN on 30 December 2004.

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 Central Secretariat 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 Central Secretariat 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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Foreword

This document (EN 14382:2005) has been prepared by Technical Committee CEN/TC 235 "Gas pressure regulators and associated safety devices for use in gas transmission and distribution", the secretariat of which is held by UNI.

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of an identical text or by endorsement, at the latest by September 2005, and conflicting national standards shall be withdrawn at the latest by September 2005.

This document supersedes EN 14382:2002.

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 97/23/EC.

For relationship with EU Directive 97/23/EC, see informative Annex ZA, which is an integral part of this document.

Safety shut-off devices dealt with in this document are standard safety shut-off devices and, when used in pressure regulating stations complying with EN 12186 or EN 12279, they are considered as standard pressure equipment in accordance with Clause 3.1 of Art. 1 of Pressure Equipment Directive (PED).

For standard safety shut-off devices used in pressure regulating stations complying with EN 12186 or EN 12279, Table ZA.1 given in Annex ZA includes all applicable Essential Requirements given in Annex I of PED except the external resistance to environmental conditions where corrosion occurs.

The normative Annex J of this document lists some suitable materials for pressure containing parts, inner metallic partition walls, fasteners and connectors. Other materials may be used when complying with the restrictions given in Table 5.

A safety shut-off-device does not need protection against exceeding its allowable limit of pressure if the maximum downstream incidental pressure (MIP_D) of the upstream gas pressure regulating station is less than or equal to 1,1 times the maximum allowable pressure (PS) of the safety shut-off device itself.

The continuing integrity of safety shut-off devices is assured by periodic functional checks. For periodic functional checks it is common to refer to national regulations/standards where existing or users/manufacturers practices.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

1 Scope

This document specifies constructional, functional, sizing, and testing requirements, also documentation and marking of gas safety shut-off devices used in the pressure regulating stations in accordance with EN 12186 or EN 12279:

- for inlet pressures up to 100 bar and nominal diameters up to DN 400;
- for an operating temperature range from $-20\text{ }^{\circ}\text{C}$ to $+60\text{ }^{\circ}\text{C}$,

which operate with fuel gases of the 1st and 2nd family in accordance with EN 437 in transmission and distribution networks and also in commercial and industrial installations.

"Gas safety shut-off devices" will hereafter be called "SSDs" except in titles.

The harmonized part of this document deals with standard safety shut-off devices used in pressure regulating stations complying with EN 12186 or EN 12279. For standard safety shut-off devices integral strength type when used in pressure regulating stations complying with EN 12186 or EN 12279, Annex ZA lists all applicable Essential Requirements except the external resistance to environmental conditions where corrosion occurs.

This document considers the following classes of SSDs:

temperature classes:

- class 1: operating temperature range from $-10\text{ }^{\circ}\text{C}$ to $60\text{ }^{\circ}\text{C}$;
- class 2: operating temperature range from $-20\text{ }^{\circ}\text{C}$ to $60\text{ }^{\circ}\text{C}$;

functional classes:

- class A: SSDs that close when damage to the pressure sensing element occurs (applicable to overpressure SSDs only) or when external power fails;
- class B: SSDs that do not close when damage to the pressure sensing element occurs or are able to be opened automatically by the pressure control system (applicable to overpressure SSDs only).

SSDs complying with the requirements of this document may be declared as "in conformity with EN 14382" and bear the mark "EN 14382".

The material and functional requirements specified in this document may be applied to SSDs which use thermal energy or the effects of electrical energy to trip the operation of the closing member. For these SSDs the operational parameters are not specified in this document.

This document does not apply to:

- SSDs upstream from/on/in domestic gas-consuming appliances which are installed downstream of domestic gas meters;
- SSDs in accordance with prEN xxxxxx (WI 00235003 under preparation by CEN/TC 235).

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including amendments) applies.

- EN 287 (all parts), *Qualification test of welders – Fusion welding*.
- EN 288 (all parts), *Specification and approval of welding procedures for metallic materials*.
- EN 334:2005, *Gas pressure regulators for inlet pressures up to 100 bar*.
- EN 473, *Non destructive testing – Qualification and certification of NDT personnel – General principles*.
- EN 571-1, *Non destructive testing – Penetrant testing – Part 1: General principles*.
- EN 970, *Non-destructive examination of fusion welds – Visual examination*.
- EN 1289, *Non-destructive examination of welds – Penetrant testing of welds – Acceptance levels*.
- EN 1290, *Non-destructive examination of welds – Magnetic particle examination of welds*.
- EN 1291, *Non-destructive examination of welds – Magnetic particle testing of welds – Acceptance levels*.
- EN 1349, *Industrial process control valves*.
- EN 1418, *Welding personnel – Approval testing of welding operators for fusion welding and resistance weld setters for fully mechanized and automatic welding of metallic materials*.
- EN 1435, *Non-destructive examination of welds – Radiographic examination of welded joints*.
- EN 1712, *Non-destructive examination of welds – Ultrasonic examination of welded joints – Acceptance levels*.
- EN 1713, *Non-destructive examination of welds – Ultrasonic examination – Characterization of indications in welds*.
- EN 1714, *Non-destructive examination of welds – Ultrasonic examination of welded joints*.
- EN 10045-1, *Metallic materials – Charpy impact test – Part 1: Test method*.
- EN 10204, *Metallic products – Types of inspection documents*.
- EN 12186, *Gas supply systems – Gas pressure regulating stations for transmission and distribution – Functional requirements*.
- EN 12279, *Gas supply systems – Gas pressure regulating installations on service lines – Functional requirements*.
- EN 12517, *Non-destructive examination of welds – Radiographic examination of welded joints – Acceptance levels*.
- EN 12627, *Industrial valves – Butt welding ends for steel valves*.
- EN 13445-4, *Unfired pressure vessels – Part 4: Fabrication*.
- EN 13906-1, *Cylindrical helical springs made from round wire and bar – Calculation and design – Part 1: Compression springs*.

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EN 13906-2, *Cylindrical helical springs made from round wire and bar – Calculation and design – Part 2: Extension springs.*

EN 60534-1:1993, *Industrial-process control valves – Part 1: Control valve terminology and general considerations (IEC 60534-1:1987).*

EN ISO 175:2000, *Plastics – Methods of test for the determination of the effects of immersion in liquid chemicals (ISO 175:1999).*

EN ISO/IEC 17025:2000, *General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025:1999).*

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

ISO 1817, *Rubber, vulcanized – Determination of the effect of liquids.*

ISO 7005 (all parts), *Metallic flanges.*

ANSI/ASME B1.20.1:1983, *Pipe threads, general purpose (inch).*

ASME B16.34:1996, *Valves – Flanged, threaded and welding end.*

MSS SP 55:1985, *Quality standard for steel castings for valves, flanges and fittings and other piping components (Visual method).*

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3 Terms, definitions and symbols

3.1 Terms and definitions

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For the purposes of this document, the terms and definitions given in EN 60534-1:1993 and the following apply.

3.1.1

safety shut-off device

device whose function is to stay in the open position under normal operating conditions and to shut-off the gas flow automatically and completely when the monitored pressure exceeds the pre-set values (over-pressure and/or under-pressure)

3.1.2

main components

parts including normally: a controller, a trip mechanism, an actuator, a closing member and a relatching device permitting the manual opening of the SSD. All these parts are functionally connected (see Figures 1, 2 and 3)

3.1.3

closing member

part which shuts off the gas flow completely

3.1.4

trip mechanism

mechanism which releases the closing member when activated by the controller

3.1.5

actuator

device activated by the trip mechanism which shuts the closing member

3.1.6**relatching device**

device which enables the complete opening of the SSD

3.1.7**body**

main pressure containing envelope which provides the fluid flow passageway and the pipe end connections

3.1.8**valve seat**

corresponding sealing surfaces within an SSD which make full contact only when the closing member is in the closed position

3.1.9**seat ring**

part assembled in a component of the SSD to provide a removable seat

3.1.10**controller**

device which may include:

- setting element to adjust the set value of the trip pressure;
- sensing element the function of which is to detect the feedback of the monitored pressure (e.g. a diaphragm);
- unit which compares the set value of the trip pressure with the monitored pressure;
- system which gives the energy to operate the trip mechanism

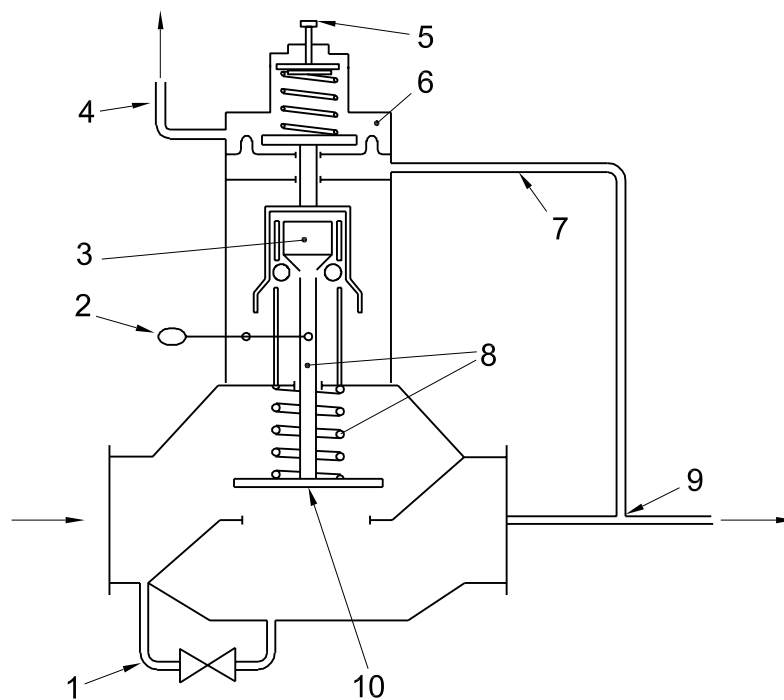
3.1.11**fixtures**

devices functionally connected to the main components of the SSD

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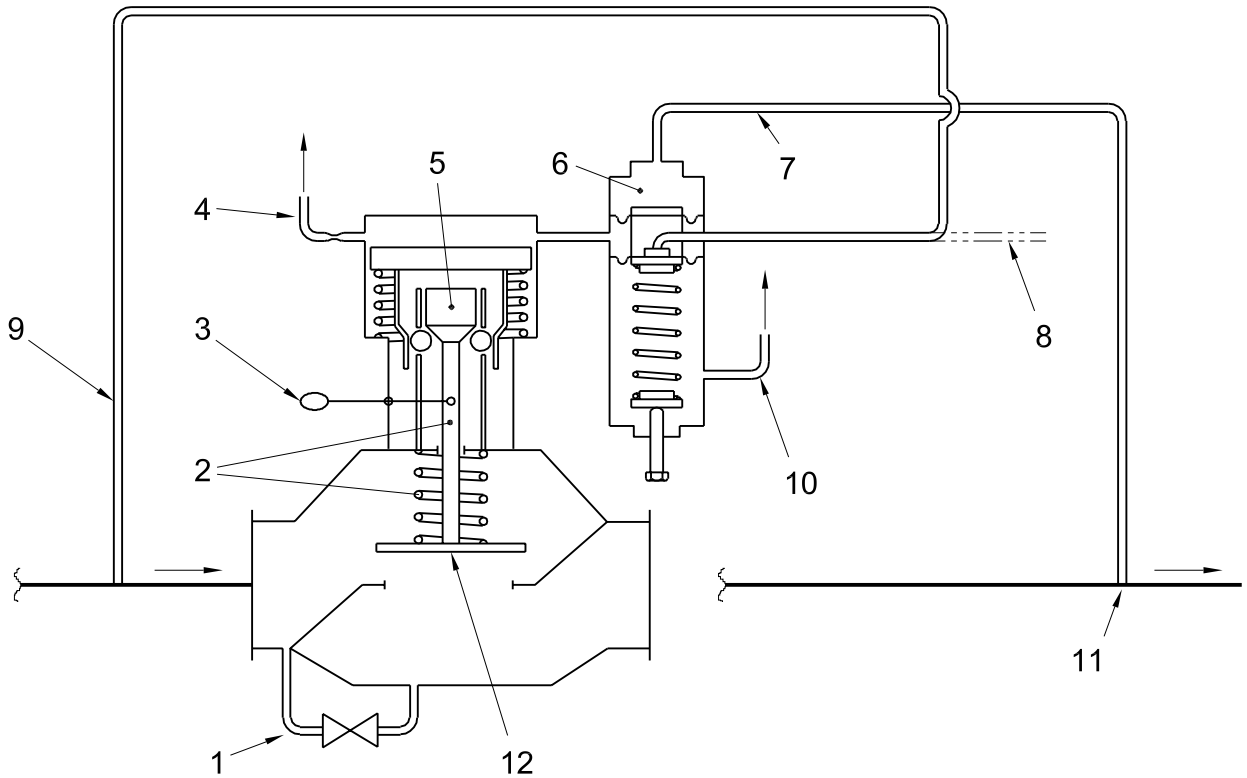
Key

- 1 Bypass
- 2 Relatching device
- 3 Trip mechanism
- 4 Breather line
- 5 Setting element

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- 6 Controller
- 7 Sensing line
- 8 Actuator
- 9 Sensing point
- 10 Closing member

Figure 1 — Example of a direct acting safety shut-off device

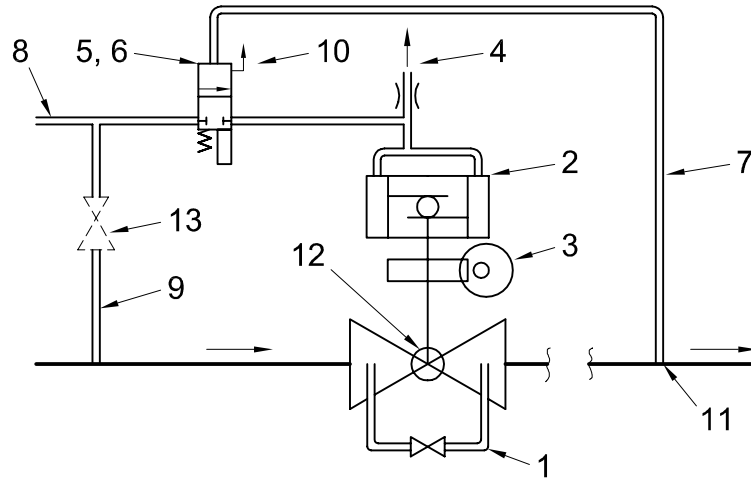


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Key

- | | |
|---------------------|----------------------------------|
| 1 Bypass | 7 Sensing line |
| 2 Actuator | 8 External loading pressure line |
| 3 Relatching device | 9 Internal loading pressure line |
| 4 Exhaust line | 10 Breather/exhaust line |
| 5 Trip mechanism | 11 Sensing point |
| 6 Controller | 12 Closing member |

Figure 2 — Example of an indirect acting shut-off device



Key

- | | |
|---------------------|-------------------------------------|
| 1 Bypass | 7 Sensing line |
| 2 Actuator | 8 External loading pressure line |
| 3 Relatching device | 9 Internal loading pressure line |
| 4 Exhaust line | 10 Breather/exhaust line |
| 5 Trip mechanism | 11 Sensing point |
| 6 Controller | 12 Closing member |
| | 13 Pressure reducer (is applicable) |

Figure 3 — Example of an indirect acting shut-off device
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3.1.12

direct acting shut-off device

SSD in which the sensing element is directly connected to the trip mechanism (see Figure 1)

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3.1.13

indirect acting shut-off device

SSD in which the energy required to move the closing member or to operate the controller is supplied by an internal or external power supply (see Figures 2 and 3)

3.1.14

cut-off device

SSD designed to shut-off the gas flow, which responds slower dynamically than a slam shut device when the monitored pressure exceeds the pre-set values

EXAMPLE SSD using actuator driven by pipeline gas or external power

3.1.15

slam shut device

SSD designed to quickly shut-off the gas flow when the monitored pressure exceeds the pre-set values

EXAMPLE Spring or weight loaded SSD

3.1.16 Accessories of shut-off devices

3.1.16.1

loading pressure line

line connecting the controller and/or actuator to the internal or external power source

3.1.16.2**sensing line**

line connecting the sensing point and the controller

3.1.16.3**exhaust line**

line connecting the controller and/or actuator of the SSD to atmosphere

3.1.16.4**breather line**

line connecting the atmospheric side of the sensing element to atmosphere

3.1.16.5**bypass**

device permitting manual equalization of pressure across a closed SSD

3.2 Functional variables**3.2.1 Reference values****3.2.1.1****pressure**

all pressures specified in this standard are static gauge pressures

NOTE Pressure is expressed in bar¹⁾.

3.2.1.2**differential pressure**

Δp

difference between two values of pressure at two different points

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3.2.2 Variables in the monitoring process**3.2.2.1****monitored pressure**

pressure monitored and safeguarded by the SSD, normally the outlet pressure of the pressure regulating station/installation

3.2.2.2**disturbance variables**

variables affecting the functioning of the SSD

EXAMPLES

- flow rate fluctuations;
- temperature changes;
- mechanical impacts;
- influence of moisture;
- influence of gas conditioning agents;

¹⁾ 1 bar = 10⁵ Pascal = 1 000 mbar = 10⁻¹ MPa = 10⁵ N/m².