



SLOVENSKI STANDARD
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01-junij-2009

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SIST EN 334:2005

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Gas pressure regulators for inlet pressures up to 100 bar

Gas-Druckregelgeräte für Eingangsdrücke bis 100 bar

Appareils de régulation de pression de gaz (régulateurs) pour des pressions amont jusqu'à 100 bar

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Ta slovenski standard je istoveten z: EN 334:2005+A1:2009

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ICS:

23.060.40 V|æ } ã^*~ |æf |lä Pressure regulators

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EUROPEAN STANDARD

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Gas pressure regulators for inlet pressures up to 100 barAppareils de régulation de pression de gaz (régulateurs)
pour des pressions amont jusqu'à 100 bar

Gas-Druckregelgeräte für Eingangsdrücke bis 100 bar

This European Standard was approved by CEN on 23 December 2004 and includes Amendment 1 approved by CEN on 8 December 2008.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG**Management Centre: rue de Stassart, 36 B-1050 Brussels**

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Foreword

This document (EN 334:2005+A1:2009) 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of an identical text or by endorsement, at the latest by July 2009, and conflicting national standards shall be withdrawn at the latest by July 2009.

This document includes Amendment 1, approved by CEN on 2008-12-08.

This document supersedes A1 EN 334:2005 A1.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1.

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.

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Gas pressure regulators dealt with in this document are standard gas pressure regulators 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 97/23/EC (PED).

For standard gas pressure regulators 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, A1 except the external corrosion resistance in case of environmental conditions where corrosion is likely to occur A1.

The normative Annex H 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.

A1 *deleted text* A1

A1 Continued A1 integrity of gas pressure regulators 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, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

EN 334:2005+A1:2009 (E)**1 Scope**

A1 This document specifies constructional, functional, testing and marking requirements, sizing and documentation of gas pressure regulators used in the pressure regulating stations in accordance with EN 12186 or EN 12279: **A1**

- for inlet pressures up to 100 bar and nominal diameters up to DN 400;
- for an operating temperature range from -20 °C to +60 °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 pressure regulators" hereafter will be called "regulators" except in the titles.

A1 For standard regulators when used in pressure regulating stations complying with EN 12186 or EN 12279, Annex ZA lists all applicable Essential Requirements except the external corrosion resistance in case of environmental conditions where corrosion is likely to occur. **A1**

A1 This document considers the following classes/types of regulators: **A1**

- class 1: operating temperature range from -10 °C to 60 °C;
- class 2: operating temperature range from -20 °C to 60 °C;

A1

- type IS: (integral strength type);

- type DS: (differential strength type). **A1**

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This document applies to regulators which use the pipeline gas as a source of control energy unassisted by any external power source.

The regulator may incorporate a creep (venting) relief device, complying with the requirements in Annex F.

The regulators complying with the requirements of this document may be declared as "in compliance with EN 334" and bear the marking "EN 334".

This document does not apply to:

- regulators upstream from/on/in domestic gas-consuming appliances which are installed downstream of domestic gas meters;

A1

- regulators incorporated into pressure-regulating devices used in service lines¹ with volumetric flow rate ≤ 200 m³/h at normal conditions and inlet pressure ≤ 5 bar; **A1**
- regulators for which a specific document exists (e.g. EN 88, etc.);
- industrial process control valves in accordance with EN 1349.



¹⁾ **A1** The services lines are those defined in EN 12279. **A1**

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.

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
 EN 287-1, *Qualification test of welders – Fusion welding – Part 1: Steel*

 EN 473:2000 , *Non destructive testing – Qualification and certification of NDT personnel – General principles*

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 EN 970:1997 , *Non-destructive examination of fusion welds – Visual examination*

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

 EN 1092-1:2007, *Flanges and their joints – Circular flanges for pipes, valves, fittings and accessories, PN designated – Part 1: Steel flanges*

EN 1092-2:1997, *Flanges and their joints – Circular flanges for pipes, valves, fittings and accessories, PN designated – Part 2: Cast iron flanges*


EN 1092-3:2003, *Flanges and their joints – Circular flanges for pipes, valves, fittings and accessories, PN designated – Part 3: Copper alloy flanges*

EN 1092-4:2002, *Flanges and their joints – Circular flanges for pipes, valves, fittings and accessories, PN designated – Part 4: Aluminium alloy flanges* 


EN 1349, *Industrial process control valves*

 EN 1418:1997 , *Welding personnel – Approval testing of welding operators for fusion welding and resistance weld setters for fully mechanised and automatic welding of metallic materials*

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
 EN 1759-1, *Flanges and their joint – Circular flanges for pipes, valves, fittings and accessories, Class designated – Part 1: Steel flanges, NPS ½ to 24*


EN 1759-3, *Flanges and their joints – Circular flanges for pipes, valves, fittings and accessories, Class designated – Part 3: Copper alloy flanges*

EN 1759-4, *Flanges and their joint – Circular flanges for pipes, valves, fittings and accessories, class designated – Part 4: Aluminium alloy flanges* 

EN 10045-1, *Metallic materials – Charpy impact test – Part 1: Test method*

 EN 10204:2004 , *Metallic products – Types of inspection documents*

 EN 10226-1, *Pipe threads where pressure tight joints are made on the threads – Part 1: Taper external threads and parallel internal threads – Dimensions, tolerances and designation*

EN 10226-2, *Pipe threads where pressure tight joints are made on the threads – Part 2: Taper external threads and taper internal threads – Dimensions, tolerances and designation* 

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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*

Ⓐ₁ *deleted text* Ⓐ₁

Ⓐ₁ EN 12516-1:2005, *Industrial valves – Shell design strength – Part 1: Tabulation method for steel valves shells*

EN 12516-2:2004, *Industrial valves – Shell design strength – Part 2: Calculation method for steel valve shells*

EN 12516-4:2008, *Industrial valves – Shell design strength – Part 4: Calculation method for valve shells in metallic materials other than steel* Ⓐ₁

EN 12627, *Industrial valves – Butt welding ends for steel valves*

EN 13445-4, *Unfired pressure vessels – Part 4: Fabrication*

Ⓐ₁ EN 14382:2005 Ⓐ₁, *Safety devices for gas pressure regulating stations and installations – Gas safety shut-off devices for inlet pressures up to 100 bar*

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

EN 60534-2-1, *Industrial-process control valves – Part 2-1: Flow capacity – Sizing equations for fluid flow under installed conditions (IEC 60534-2-1:1998)*

EN 60534-2-3, *Industrial-process control valves – Part 2-3: Flow capacity – Test procedures (IEC 60534-2-3:1997)*

Ⓐ₁ EN 60534-8-3, *Industrial-process control valves – Part 8-3: Noise considerations – Control valve aerodynamic noise prediction method (IEC 60534-8-3:2000)* Ⓐ₁

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

Ⓐ₁ *deleted text* Ⓐ₁

Ⓐ₁ EN ISO 9606-2, *Qualification test of welders – Fusion welding – Part 2: Aluminium and aluminium alloys (ISO 9606-2:2004)*

EN ISO 9606-3, *Qualification test of welders – Fusion welding – Part 3: Copper and copper alloys (ISO 9606-3:1999)*

EN ISO 9606-4, *Qualification test of welders – Fusion welding – Part 4: Nickel and nickel alloys (ISO 9606-4:1999)*

EN ISO 15607:2003, *Specification and qualification of welding procedures for metallic materials – General rules (ISO 15607:2003)*

EN ISO 15609-1:2005, *Specification and qualification of welding procedures for metallic materials – Welding procedure specification – Part 1: Arc welding (ISO 15609-1:2004)*

EN ISO 15610:2003, *Specification and qualification of welding procedures for metallic materials – Qualification based on tested welding consumables (ISO 15610:2003)*

EN ISO 15611:2003, *Specification and qualification of welding procedures for metallic materials – Qualification based on previous welding experience (ISO 15611:2003)*

EN ISO 15612:2004, *Specification and qualification of welding procedures for metallic materials – Qualification by adoption of a standard welding procedure (ISO 15612:2004)*

EN ISO 15613:2004, *Specification and qualification of welding procedures for metallic materials – Qualification based on pre-production welding test (ISO 15613:2004)*

EN ISO 15614-1:2004, *Specification and qualification of welding procedures for metallic materials – Welding procedure test – Part 1: Arc and gas welding of steels and arc welding of nickel and nickel alloys (ISO 15614-1:2004)*

EN ISO 15614-2:2005, *Specification and qualification of welding procedures for metallic materials – Welding procedure test – Part 2: Arc welding of aluminium and its alloys (ISO 15614-2:2005)* ^{A1}

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

^{A1} deleted text ^{A1}

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

ISO 3419, *Non-alloy and alloy steel butt-welding fittings*

ISO 5752, *Metal valves for use in flanged pipe systems – Face-to-face and centre-to-face dimensions*

ISO 7005(all parts), *Metallic flanges* (standards.iteh.ai)

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MSS SP 55:1985, *Quality standard for steel castings for valves, flanges and fittings and other piping components (Visual method)* ^{A1}
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3 Terms, definitions and symbols

^{A1} For the purposes of this document, the following terms, definitions and symbols apply.

NOTE Annex I list all terms in alphabetic order for English language, the relevant translation in French and German language and the relevant sub-clause of this clause. ^{A1}

3.1 ^{A1} General terms and definitions of types of gas pressure regulators ^{A1}

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3.1.1

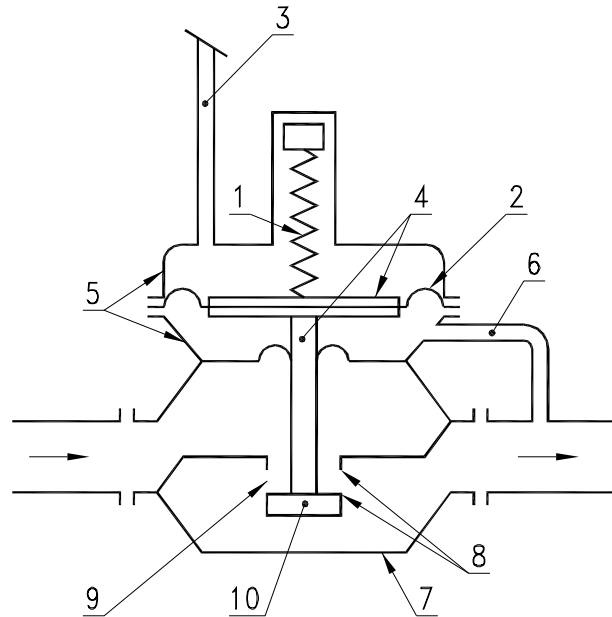
gas pressure regulator

device whose function is to maintain the value of the controlled variable ^{A1} (see 3.3.4.1) ^{A1} within its tolerance field irrespective of disturbance variables

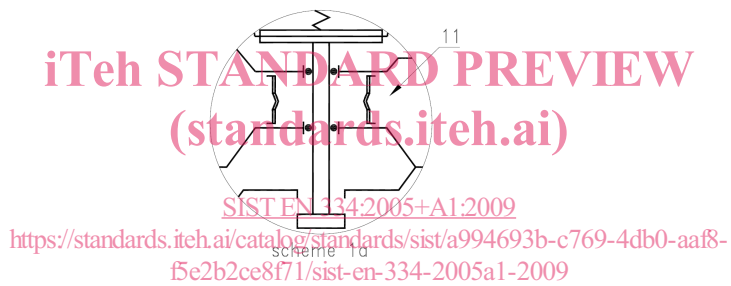
3.1.2

direct acting gas pressure regulator

regulator in which the net force required to move the control member is supplied directly by the controlled variable (see example in Figure 1)



A1



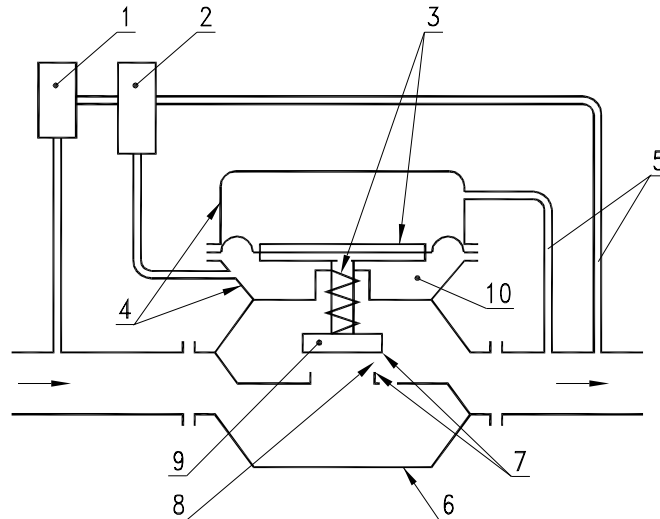
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Key

- | | |
|-----------------------------------|--------------------|
| 1 Setting element | 6 Sensing line |
| A1 2 pressure detector element A1 | 7 Regulator body |
| 3 Breather/exhaust line | 8 Valve seats |
| 4 Actuator | 9 Seat ring |
| 5 Casing of actuator | 10 Control member |
| 1 + 2 = Controller | A1 11 scheme 1a A1 |

Figure 1 — Example of a direct acting regulator**3.1.3****pilot controlled gas pressure regulator (indirect acting)**

regulator in which the net force required to move the control member is supplied by a pilot (see example in Figure 2)

**Key**

1 Fixture	6 Regulator body
2 Pilot	7 Valve seats
3 Actuator	8 Seat ring
4 Casing of actuator	9 Control member
5 Sensing/process line	10 Motorization chamber

Figure 2 — Example of a pilot controlled regulator
(standards.iteh.ai)

3.1.4 monitor

A1 second regulator installed in series with an active regulator, normally upstream, which has the task of maintaining the **A1** controlled variable within allowable limits in the event of its value exceeds a pre-established value (e.g. in the event of opening of the active regulator due to a failure, etc.)

A1 deleted text **A1**

3.1.5 fail open regulator

regulator whose control member automatically tends to open when the main diaphragm fails or when the energy required to move the control member fails

NOTE The definition in this clause is based on typical control failure modes.

3.1.6 fail close regulator

regulator whose control member automatically tends to close when the main diaphragm fails or when the energy required to move the control member fails

NOTE The definition in this clause is based on typical control failure modes.

A1 deleted text **A1**

3.1.7 regulator size

A1 deleted text **A1**

nominal size DN of the inlet connection in accordance with EN ISO 6708

EN 334:2005+A1:2009 (E)**A1 3.1.8****series of regulators**

regulators with the same design concept but differing only in size A1

A1 *deleted text* A1

3.2 A1 Terms and definitions of components of gas pressure regulators A1**3.2.1****main components**

parts including normally: control member, regulator body, actuator, casing of actuator, controller, pilot (only in pilot controlled regulators)

NOTE The regulator might include additional devices such as a shut-off device, a monitor, a relief valve and other fixtures. The Figures 1 and 2 serve as examples.

3.2.1.1**control member**

movable part of the regulator which is positioned in the flow path to restrict the flow through the regulator

NOTE A control member may be a plug, ball, disk, vane, gate, diaphragm, etc.

3.2.1.2**body**

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

3.2.1.3**valve seats**

corresponding sealing surfaces within a regulator which make full contact only when the control member is in the closed position

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3.2.1.4**seat ring**

part assembled in a component of the regulator to provide a replaceable seat

3.2.1.5**actuator**

device or mechanism which changes the signal from the controller into a corresponding movement controlling the position of the control member

3.2.1.6**casing of actuator**

housing of the actuator (which may consist of two chambers under pressure)

NOTE When the pressure in each chamber is different from atmospheric pressure, the chamber at the higher pressure is termed the "motorization chamber".

3.2.1.7**controller**

device which normally includes:

- a setting element, normally a spring, to obtain the set value of the controlled variable;
- A1 a pressure detector element, normally a diaphragm, for the controlled variable A1

3.2.1.8**pilot**

device which includes:

— a setting element to obtain the set value of the controlled variable;

Ⓐ

— a pressure detector element, normally a diaphragm, for the controlled variable Ⓐ;

— a unit which compares the set value of the controlled variable with its feedback value;

— a system which provides the motorization energy for the actuator

3.2.1.9

main diaphragm

diaphragm, the function of which is to detect the feedback of the controlled variable and/or the diaphragm which provides the thrust to move the control member

3.2.2

pressure containing parts

Ⓐ parts whose failure to function would result in a release of the retained fuel gas to the atmosphere

NOTE These include bodies, control member, bonnets, the casing of the actuator, blind flanges and pipes for process and sensing lines but exclude compression fittings, diaphragms, bolts and other fasteners. Ⓐ

3.2.3

inner metallic partition wall

metallic wall that separates a chamber into two individual pressure-containing chambers at different pressures under normal operating conditions

Ⓐ *deleted text* Ⓐ

3.2.4

process and sensing lines

lines which connect impulse points to the regulator

NOTE Sensing and process lines may be integrated into the regulator or external to the regulator. Those lines with no internal flow are termed "sensing lines"; those with internal flow are termed "process lines".

3.2.5

breather line

Ⓐ line connecting the atmosphere side of the pressure detector element to atmosphere

NOTE In the event of a fault in the pressure detector element this line may become an exhaust line. Ⓐ

3.2.6

exhaust line

Ⓐ line connecting the regulator or its fixtures to atmosphere for the safe exhausting of gas in the event of failure of any part Ⓐ

3.2.7

fixtures

functional devices connected to the main components of the regulator Ⓐ (see 3.2.1) Ⓐ