

SVENSK STANDARD

SS-EN 12279

Fastställt/Approved: 2000-05-26

Rättad och omtryckt/Corrected and reprinted: september 2008

Utgåva/Edition: 1

Språk/Language: engelska/English

ICS: 23.060.40 ; 75.200; 91.140.40

Gassystem – Tryckregleringsstationer på serviceledning – Funktionskrav

Gas supply systems – Gas pressure regulating installations on service lines – Functional requirements

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EUROPEAN STANDARD

EN 12279

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2000

ICS 23.060.40; 91.140.40

English version

Gas supply systems - Gas pressure regulating installations on service lines - Functional requirements

Systèmes d'alimentation en gaz - Installations de détente-régulation de pression de gaz faisant partie des branchements - Prescriptions fonctionnelles

Gasversorgungssysteme - Gas-Druckregleinrichtungen in Anschlußleitungen - Funktionale Anforderungen

This European Standard was approved by CEN on 16 August 2000.

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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 234 "Gas supply", the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by October 2000, and conflicting national standards shall be withdrawn at the latest by October 2000.

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

There is a complete suite of functional standards prepared by CEN/TC 234 "Gas Supply" to cover all parts of the gas supply system from the input of gas to the transmission system up to the inlet connection of the gas appliances, whether for domestic, commercial or industrial purposes.

In preparing this standard a basic understanding of gas supply by the user has been assumed.

Gas supply systems are complex and the importance on safety of their construction and use has led to the development of very detailed codes of practice and operating manuals in the member countries. These detailed statements embrace recognised standards of gas engineering and the specific requirements imposed by the legal structures of the member countries.

1 Scope

This European Standard contains the relevant functional requirements for gas pressure regulating installations forming a part of the service lines in gas supply systems. It is applicable to the design, materials, construction, testing, operation and maintenance of gas pressure regulating installations which form a part of the service line for the supply of residential, high rise, public access, commercial and mixed use buildings (see EN 1775) and for which the maximum upstream operating pressure is equal to or less than 16 bar and the design flow rate is equal to or less than 200 m³/h (normal m³/h).

This European Standard does not apply to gas pressure regulating installations commissioned prior to the publication of this standard.

Basic system requirements for gas pressure regulating installations are contained in this European Standard. Requirements for individual components (valves, regulators, safety devices, pipes, etc.) or installation of the components, are contained in the appropriate European Standards.

For gas pressure regulating installations forming a part of service lines with design flow rates of more than 200 m³/h (normal m³/h) or for a maximum upstream operating pressure of more than 16 bar prEN 12186 applies.

The requirements of this European Standard are based on good gas engineering practice under conditions normally encountered in the gas industry. Requirements for unusual conditions cannot be specifically provided for, nor are all engineering and construction details prescribed.

The requirements of this European Standard are based on the physical and chemical data of gaseous fuels in accordance with table 1 of EN 437:1993 for first and second family gases. For gaseous fuels heavier than air additional considerations may be necessary.

The objective of this European Standard is to ensure the safe operation of such systems. This does not, however, relieve all concerned of the responsibility for taking the necessary care and applying effective quality management during the design, construction and operation.

This European Standard specifies common basic principles for gas supply systems. Users of this European Standard should be aware that more detailed national standards and/or codes of practice can exist in the CEN member countries.

This European Standard is intended to be applied in association with these national standards and/or codes of practice setting out the above mentioned principles.

In the event of conflicts in terms of more restrictive requirements in national legislation/regulation with the requirements of this standard, the national legislation/regulation shall take precedence.

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

EN 124	Gully tops and manhole tops for vehicular and pedestrian areas - Design requirements, type testing, marking, quality control
EN 334	Gas pressure regulators for inlet pressures up to 100 bar
EN 437:1993	Test gases - Test pressures - Appliance categories
EN 1775	Gas supply systems - Gas pipework for buildings - Maximum operating pressure \leq 5 bar - Functional recommendations
EN 12007-1	Gas supply systems - Pipelines for maximum operating pressure up to and including 16 bar - Part 1: General functional recommendations
EN 12186	Gas supply systems - Gas pressure regulating stations for transmission and distribution - Functional requirements
EN 12327	Gas supply systems - Pressure testing, commissioning and decommissioning procedures - Functional requirements
EN 60079-10	Electrical apparatus for explosive gas atmospheres - Part 10: Classification of hazardous areas (IEC 60079-10:1995)
prEN 50154	Erection of electrical installations in hazardous areas; electrical installations in hazardous gas atmospheres (other than mines)

3 Definitions, symbols and abbreviations

For the purposes of this standard, the following definitions, symbols and abbreviations apply:

3.1 General

3.1.1 authorized person: A competent person who is appointed to fulfill a given task on gas supply systems or installation pipework.

NOTE: The appointment procedure is defined in each member country.

3.1.2 competent person: A person who is trained, experienced and approved to perform activities relating to gas supply systems or installation pipework.

NOTE: The means of approval, if any, will be determined within each member country.

3.2 Installation

3.2.1 residential building: A building which contains one or more dwelling places but excludes areas intended principally for professional activities and for public use.

3.2.2 high rise building: A building of which the height from the floor of the highest occupied level to ground level is:

- for a residential building greater than 50 m;
- any other building, excluding an industrial production plant, greater than 30 m.

NOTE: It is recognised that the safety of the gas installation is related to the use of the building and the vertical height of the sections of pipework.

3.2.3 public access building: A building containing principally areas where the public is authorized to have access.

NOTE 1: Such a building can be a school, a hospital, a movie theatre, a railway station, a shop, etc.

NOTE 2: The public does not need to have access to all parts of the building (e.g. operation theatres of a hospital,...)

3.2.4 commercial building: A building containing only areas reserved for professional activities, with the exception of industrial production plants.

NOTE: Such a building could be an office block, a repair shop, etc.

3.2.5 mixed use building: A building containing more than one of the following locations:

- residential locations;
- commercial locations;
- public access locations.

3.2.6 gas: The gaseous fuel, which is in a gaseous state at a temperature of 15 °C and under atmospheric pressure (1,013 25 bar absolute).

3.2.7 m³ under normal conditions: A quantity of gas which in a dry state occupies a volume of 1 m³ at a pressure of 1,013 25 bar absolute and at a temperature of 0 °C.

3.2.8 hazardous area: An area in which an explosive or flammable gas atmosphere is present, or may be expected to be present, in quantities such as to require special precautions for the construction, installation and use of electrical apparatus.

3.2.9 hazardous area zones: Hazardous areas are classified in zones based upon the frequency of the occurrence and the duration of a flammable atmosphere (see EN 60079-10).

3.2.10 component: Any item from which a gas supply system or installation is constructed. A distinction is drawn between the following groups of components:

- ancillaries;

EXAMPLE 1: Pressure-regulators, valves, safety devices, expansion joints, insulating joints.

- pipes including bends made from pipe;
- instrumentation pipeworks;
- fittings.

EXAMPLE 2: Reducers, tees, factory-made elbows, flanges, convex heads, welding stubs, mechanical joints.

3.2.11 instrumentation: Any system or combination of equipment for measurement and control.

3.2.12 instrumentation pipework: The pipework required for the proper functioning of the ancillaries installed within the pressure regulating installation.

EXAMPLE: Sensing, measuring, auxiliary and sampling lines.

3.2.13 monitor: A second regulator used as a safety device, in series with the active regulator which assumes control of the pressure at a higher set value in the event of the active regulator failing open.

3.2.14 inlet pipework: The connecting pipework through which gas enters the installation.

3.2.15 outlet pipework: The connecting pipework through which gas leaves the installation.

3.2.16 service line: The pipework from the main to the point of delivery of the gas.

3.2.17 main: A pipework in a gas supply system to which service lines are connected.

3.3 Pressure, design and testing

3.3.1 design factor (f_d): A factor applied when calculating the wall thickness or design pressure.

3.3.2 design flowrate: Flowrate on which the design calculations are based.

3.3.3 design pressure (DP): The pressure on which design calculations are based.

3.3.4 pressure: The gauge pressure of the fluid inside the system, measured in static conditions.

3.3.5 operating pressure (OP): The pressure which occurs within a system under normal operating conditions.

3.3.6 maximum operating pressure (MOP): The maximum pressure at which a system can be operated continuously under normal operating conditions.

NOTE: Normal operating conditions are: no fault in any device or stream.

3.3.7 temporary operating pressure (TOP): The pressure at which a system can be operated temporarily under control of regulating devices.

3.3.8 maximum incidental pressure (MIP): The maximum pressure which a system can experience during a short time, limited by the safety devices.

3.3.9 strength test: A specific procedure to verify that the pipework and/or installation meets the requirements for mechanical strength.

3.3.10 tightness test: A specific procedure to verify that the pipework and/or installation meets the requirements for tightness.

3.3.11 combined test: A specific procedure to verify that the pipework and/or installation meets the requirements for mechanical strength and tightness.

3.4 Pressure regulating and safety system

3.4.1 pressure regulating system: The system which ensures that a pressure is maintained at the outlet system within required limits.

3.4.2 pressure safety system: The system which ensures that the outlet pressure of the regulating system does not exceed the safety limits.

4 Quality assurance

4.1 General

During design and construction, quality assurance shall provide the basic integrity of the gas pressure regulating installation. During operation and maintenance, that integrity shall be preserved until the installation is abandoned.

4.2 Quality assurance during design, construction, operation and maintenance

Design, construction, operation and maintenance of gas pressure regulating installations shall be done by competent persons.

Reference may be made to the EN ISO 9000 series of standards or to equivalent quality system standards.

5 Layout of the gas pressure regulating installation

5.1 General

Gas pressure regulating installations shall be designed, constructed, located, maintained and operated taking into consideration the safety and environmental requirements of the applicable regulations.

Careful consideration shall be given to the location, need for ventilation, noise control, accessibility and the possible housing of the installation.

5.2 Location of the gas pressure regulating installation

The area of the site shall be adequate to accommodate the equipment and provide access for operation and maintenance.

Where necessary, components shall be protected from damage.

The combustion air intake of any gas appliance shall be located so as to minimise any hazard arising from sources of gas leakage or emission (see 6.2.3 and 7.4).

EXAMPLE : Relief devices, vents

5.3 Security of the gas pressure regulating installation

Where applicable, gas pressure regulating installations should be secured against entry by unauthorized persons.

Where necessary, prominent signs prohibiting smoking and other ignition sources and signs showing an emergency telephone number should be displayed.

6 Requirements for housings

6.1 General

Gas pressure regulating installations shall be located as shown in annex A. Other options may be used if equivalent safety and maintenance are ensured.

The maximum upstream operating pressure of gas pressure regulating installations inside a building, which is owned by a third party, shall not exceed 5 bar, as shown in figure A.1. The pressure may be higher where the installation is housed as shown in figures A.2 to A.5, and operations are carried out by competent persons.

Materials chosen for the construction of the housing should be durable and weather resistant and should require minimum maintenance.

6.2 Specific requirements for maximum upstream operating pressures greater than 5 bar

6.2.1 Where applications are in accordance with the examples shown in figures A.2 and A.3, partition walls and ducts for pipe, cable and wiring shall be designed in such a way that gas leakage does not lead to a hazard.

6.2.2 Where applications are in accordance with the examples shown in figures A.2 and A.3 any wall, floor or ceiling separating the installation from the rest of the building shall be of fire-resistant construction.

The access doors of spaces housing gas pressure regulating installations shall be protected against unauthorized entry. The doors shall be on the outside wall of the building and open outwards. It shall be possible to fix them in an open position. In the case of accessible spaces, it shall be possible to open the doors from the inside without a key. Passages into the open air shall be kept clear at all times.

Doors and ventilation apertures shall be at a safe distance from windows, which can be opened, or doors and apertures of other buildings.

There shall be no apertures to other closed spaces.