SLOVENSKI STANDARD
SIST EN 12583:2022

01-september-2022

Nadomešča:
SIST EN 12583:2014

Infrastruktura za plin - Kompresorske postaje - Funkcionalne zahteve

Gas Infrastructure - Compressor stations - Functional requirements

Gasinfrastruktur - Verdichterstationen - Funktionale Anforderungen

Infrastructures gazières - Stations de compression - Prescriptions fonctionnelles

Ta slovenski standard je istoveten z: **EN 12583:2022**

ICS:

23.140	Kompresorji in pnevmatični stroji	Compressors and pneumatic machines
75.200	Oprema za skladiščenje nafte, naftnih proizvodov in zemeljskega plina	Petroleum products and natural gas handling equipment

SIST EN 12583:2022 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 12583

May 2022

ICS 23.140; 75.200

Supersedes EN 12583:2014

English Version

Gas Infrastructure - Compressor stations - Functional requirements

Infrastructures gazières - Stations de compression - Prescriptions fonctionnelles

Gasinfrastruktur - Verdichterstationen - Funktionale Anforderungen

This European Standard was approved by CEN on 20 March 2022.

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

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Ref. No. EN 12583:2022 E

Contents

Page

European foreword

This document (EN 12583:2022) has been prepared by Technical Committee CEN/TC 234 “Gas Infrastructure”, 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of an identical text or by endorsement, at the latest by November 2022, and conflicting national standards shall be withdrawn at the latest by November 2022.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 12583:2014.

In comparison with the previous edition, the following technical modifications have been made:

— addition of requirements for hydrogen readiness;

— addition of Methane Emissions Management;

— addition of NOx and CO determination;

— addition of references to new European Standards, for example EN 17649[1];

— updated normative references;

— updated with practical experience from the application of the previous edition;

— clarification of technical wording.

A detailed overview of all changes is given in Annex G.

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association.

There is a complete suite of functional standards prepared by CEN/TC 234 “Gas infrastructure” to cover all parts of the gas infrastructure from the input of gas into the onshore transmission network up to the inlet connection of gas appliances, including transmission, distribution, storage, compression, pressure regulation and metering, installation, injection of non-conventional gases, gas quality issues and others. In preparing this document a basic understanding of gas infrastructure by the user has been assumed.

The gas infrastructure is complex and the importance on safety of its 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 recognized standards of gas engineering and the specific requirements imposed by the legal structures of the member countries.

Directive 2009/73/EC concerning common rules for the internal market in natural gas and the related Regulation (EC) No 715/2009 on conditions for access to the natural gas transmission networks also aim at technical safety (security) including technical reliability of the European gas system. These

[1] Under preparation. Stage at the time of publication: FprEN 17649.

aspects are also in the scope of CEN/TC 234 standardization. In this respect CEN/TC 234 evaluated the indicated EU legislation and amended this document accordingly, where required and appropriate.

In this edition of EN 12583 environmental aspects relevant to the design, construction and testing, operation and maintenance, decommissioning and disposal of compressor stations in the scope of this document are covered in accordance with CEN Guide 4 and CEN/TR 16388.

Directive 2009/28/EC on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC, in Articles 3 and 5 are with regard to the calculation of the share of energy from renewable sources and the contribution of hydrogen originating from renewable sources in the total fuel mix. In this respect CEN/TC 234 evaluated the indicated EU legislation and amended this document.

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

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

1 Scope

This document describes the specific functional requirements for the design, construction, operation, maintenance and disposal activities for safe and secure gas compressor stations.

This document applies to new gas compressor stations with a Maximum Operating Pressure (MOP) over 16 bar and with a total shaft power over 1 MW. For existing compressor stations, this document applies to new compressor units. Where changes/modifications to existing installations or gas composition take place, due account can be taken of the requirements of this document.

This document does not apply to gas compressor stations or compressor units operating prior to the publication of this document. For existing sites this document can be used as guidance.

The purpose of this document is to:

— ensure the health and safety of the public and all site personnel;

— cover environmental issues;

— avoid incidental damage to nearby property; and

— open the gas infrastructure to accommodate renewable gases, including a possible design for hydrogen.

This document specifies common basic principles for the gas infrastructure. Users of this document are expected to be aware that more detailed national standards and/or codes of practice can exist in the CEN member countries.

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

In the event of conflicts in terms of more restrictive requirements in national legislation/regulation with the requirements of this document, the national legislation/regulation takes precedence as illustrated in CEN/TR 13737 (all parts). CEN/TR 13737 (all parts) gives:

— clarification of all legislations/regulations applicable in a member state;

— if appropriate, more restrictive national requirements;

— a national contact point for the latest information.

This document does not apply to:

— off-shore gas compressor stations;

— gas compressor stations for compressed gas filling-stations;

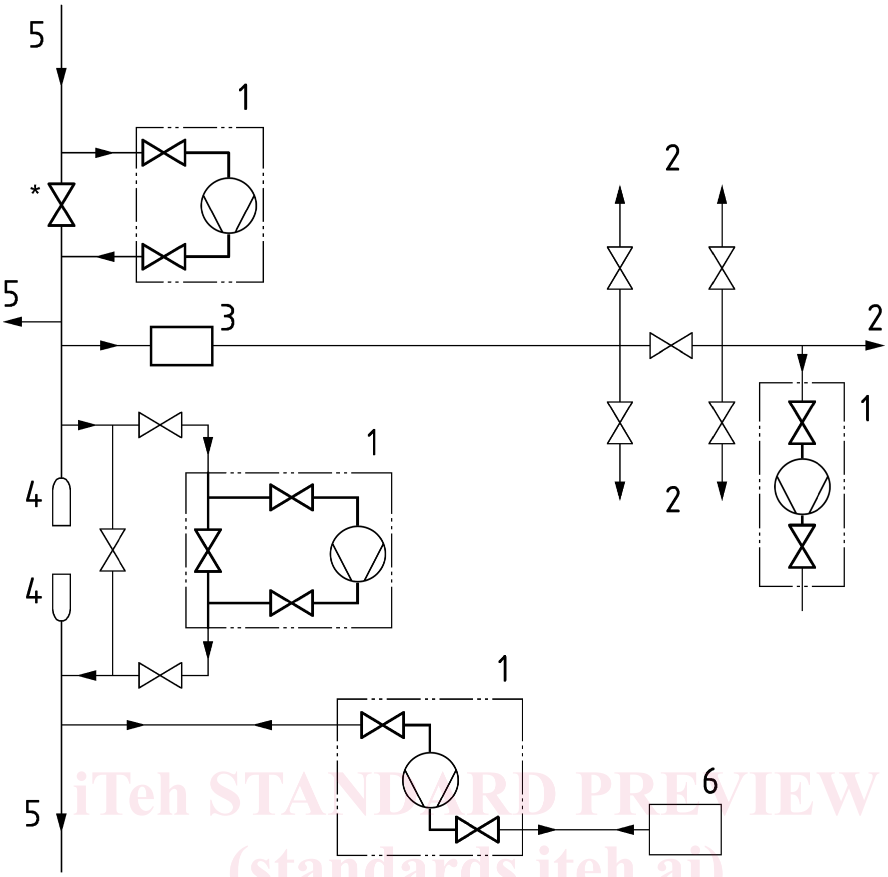
— customer installations downstream of the point of custody transfer;

— design and construction of driver packages (see Annex C);

— mobile compressor equipment.

For supplies to utility services such as small central heating boilers reference is made to EN 1775.

Figure 1 shows a schematic representation of compressor stations in a gas infrastructure. For further information refer to Annexes A, B, C, D, E and F.



Key

1 compressor station
2 distribution system
3 metering and/or pressure limiting or regulation station
4 pig traps
5 transmission line
6 storage facility
* part of pipeline but operated by safety control systems

NOTE Parts indicated in frames by thick lines are within the scope of this document.

Figure 1 — Schematic representation of compressor stations in the gas infrastructure

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1012-3, *Compressors and vacuum pumps - Safety requirements - Part 3: Process compressors*

EN 14181, *Stationary source emissions - Quality assurance of automated measuring systems*

EN 1594, *Gas infrastructure - Pipelines for maximum operating pressure over 16 bar - Functional requirements*

EN 12186, *Gas infrastructure - Gas pressure regulating stations for transmission and distribution - Functional requirements*

EN 12266-1, *Industrial valves - Testing of metallic valves - Part 1: Pressure tests, test procedures and acceptance criteria - Mandatory requirements*

EN 12266-2, *Industrial valves - Testing of metallic valves - Part 2: Tests, test procedures and acceptance criteria - Supplementary requirements*

EN 12732, *Gas infrastructure — Welding steel pipework — Functional requirements*

EN 14505, *Cathodic protection of complex structures*

EN 60079-20-1, *Explosive atmospheres — Part 20-1: Material characteristics for gas and vapour classification — Test methods and data*

EN IEC 61000-6-2, *Electromagnetic compatibility (EMC) - Part 6-2: Generic standards – Immunity standard for industrial environments*

EN 61000-6-4, *Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments*

EN 61508 (all parts), *Functional safety of electrical/electronic/programmable electronic safety-related systems*

EN 61511 (all parts), *Functional safety - Safety instrumented systems for the process industry sector*

EN ISO 10437, *Petroleum, petrochemical and natural gas industries - Steam turbines - Special-purpose applications (ISO 10437)*

EN ISO 10439 (all parts), *Petroleum, chemical and gas service industries - Axial and centrifugal compressors and expander-compressors - Part 4: Expander-compressors (ISO 10439)*

EN ISO 13849-1, *Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design (ISO 13849-1)*

ISO 3977-1, *Gas turbines — Procurement — Part 1: General introduction and definitions*

ISO 3977-2, *Gas turbines — Procurement — Part 2: Standard reference conditions and ratings*

ISO 13707, *Petroleum and natural gas industries — Reciprocating compressors*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at https://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1
alarm
signal provided to an operator which indicates the approach or the presence of an unwanted event

3.2
availability
ability to be in a state to perform as and when required under given conditions, assuming that the required external resources are provided

Note 1 to entry: This ability depends on the combined aspects of the reliability, the maintainability and recoverability of the item and the maintenance supportability.

Note 2 to entry: Required external resources, other than maintenance resources, do not affect the availability of the item although the item may not be available from the user's viewpoint.

[SOURCE: EN 13306:2017, 4.7]

3.3
commissioning
activities required to fill pipework, equipment and assemblies with gas for the first time and to perform test runs to check the system's integrity

3.4
compressor surge
flow and/or pressure instability including reverse flow inside a compressor

3.5
compressor unit
set of driver package, gas compressor, control system and their auxiliary equipment which includes unit valves and associated pipework to compress gas

Note 1 to entry: See Annex D for boundary definitions.

3.6
compressor unit building
structure where one or more drivers with compressors and auxiliary equipment are installed

Note 1 to entry: Operation and maintenance are normally carried out inside the building.

Note 2 to entry: Temporary partitions could be installed to isolate a compressor unit during maintenance (see Figure 2).

3.7
compressor unit housing
structure to contain the compressor unit which can consist of compressor unit building, enclosure or a combination of both

3.8
control room
room housing the control system from which the station personnel can, when necessary, take action on the process

3.9
decommissioning
activities required to take out of service any pipework, stations, equipment or assemblies filled with gas and to disconnect them from the system

3.10
design pressure
DP
pressure on which design calculations are based

3.11
design temperature
DT
temperature on which design calculations are based

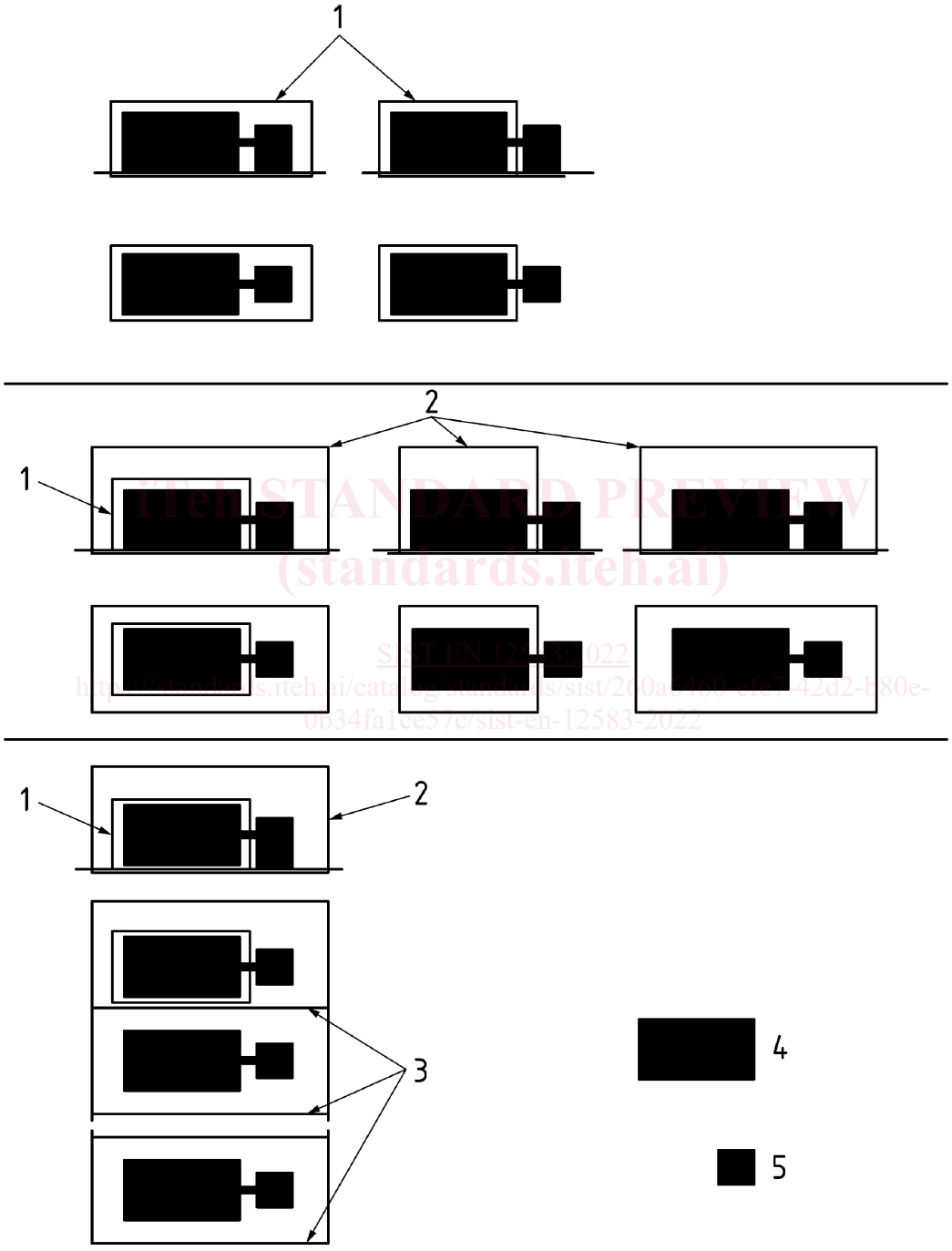
3.12
disposal
activities to be performed after components of a decommissioned gas compressor station have been dismantled

3.13
emergency
situation which could affect the safe operation of the gas infrastructure and/or the safety of the surrounding area, requiring urgent action

3.14
emergency shutdown
ESD
actions, in the event of an emergency, to bring the station and/or the compressor unit(s) into a safe condition which requires local manual resetting

3.15
enclosure
structure (a close framework) to surround a driver and/or a compressor and some of their auxiliary equipment in order to protect them from outside influence and avoid possible hazards to personnel

Note 1 to entry: Enclosures could be installed inside the compressor unit building to confine part of a compressor unit (see Figure 2).



Key

1	enclosure	4	driver
2	building	5	compressor
3	walls or temporary partitions		

Figure 2 — Compressor unit housing

3.16
fail-safe system
system where loss of power or actuating fluid to any control element, for example an individual relay, valve, actuator, etc. or any failure of these to operate when energised, leads to a safe condition

Note 1 to entry: In particular, all fault shutdown systems operate by de-energizing and not energizing components.

3.17
fuel gas system
system which conditions the fuel gas prior to it entering a gas turbine or gas engine driver package

Note 1 to entry: It can consist of gas filtration, scrubbing, heating, pressure regulating, metering and compression.

3.18
gas
gaseous fuel which is in gaseous state at a temperature of 15 °C under atmospheric pressure (1,013 25 bar absolute)

3.19
gas compressor station
installation used for:

— transporting gas in pipelines;

— compressing gas from a pipeline to a gas storage facility or vice versa

Note 1 to entry: More than one of the above functions could be performed simultaneously or alternately.

3.20
gas infrastructure
pipeline system including pipework and associated stations or plants for the transmission and distribution of gas

3.21
hazardous area
area in which an explosive gas atmosphere is or may be expected to be present, in quantities such as to require special precautions for the construction, installation and use of equipment

[SOURCE: EN 60079-10-1:2015]

3.22
incident
unexpected occurrence which could lead to an emergency situation

3.23
isolation valve
valve which permits isolation of a part or the complete gas compressor station

3.24
maximum incidental pressure
MIP
maximum pressure which a gas system can experience during a short time, limited by the safety devices