
J[fU'Yb]'[Ug]'b]'g]ghYa]!'GYghUj b]'XY]'g]ghYa cj 'nU[UýYb'Y'g'd`]bca `!') "XY.
NU hrj Y]'b'dfYg_i gbYa YrcXYnUj]gc_chU bY]'b'b]n_chU bY'gcfh'fbY'j Ybh]'Y]'b
b' c j U'gdfcy]'UnUg]ghYa Y'g'7 C&

Fixed firefighting systems - Components for gas extinguishing systems - Part 5:
Requirements and test methods for high and low pressure selector valves and their
actuators for CO2 systems

STANDARD PREVIEW

Ortsfeste Brandbekämpfungsanlagen - Bauteile für Löschanlagen mit gasförmigen
Löschmitteln - Teil 5: Anforderungen und Prüfverfahren für Hoch- und Niederdruck-
Bereichsventile und zugehörige Auslöseeinrichtungen für CO2-Anlagen

[SIST EN 12094-5:2001](https://standards.iteh.ai/catalog/standards/sist/fba0ca8-2bc5-4f90-99f2-4146c9110/sist-en-12094-5:2001)

[https://standards.iteh.ai/catalog/standards/sist/fba0ca8-2bc5-4f90-99f2-](https://standards.iteh.ai/catalog/standards/sist/fba0ca8-2bc5-4f90-99f2-4146c9110/sist-en-12094-5:2001)

Installations fixes de lutte contre l'incendie - Elements constitutifs des installations
d'extinction a gaz - Partie 5: Exigences et méthodes d'essai pour vannes directionnelles
haute et basse pression et leurs déclencheurs pour systemes a CO2

Ta slovenski standard je istoveten z: EN 12094-5:2000

ICS:

13.220.10 Gašenje požara Fire-fighting

SIST EN 12094-5:2001 en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 12094-5:2001

<https://standards.iteh.ai/catalog/standards/sist/fbba0ca8-2bc5-4f90-99f2-41cae8c4101b/sist-en-12094-5-2001>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 12094-5

December 2000

ICS 13.220.10

English version

Fixed firefighting systems - Components for gas extinguishing systems - Part 5: Requirements and test methods for high and low pressure selector valves and their actuators for CO₂ systems

Installations fixes de lutte contre l'incendie - Eléments constitutifs des installations d'extinction à gaz - Partie 5: Exigences et méthodes d'essai pour vannes directionnelles haute et basse pression et leurs déclencheurs pour systèmes à CO₂

Ortsfeste Brandbekämpfungsanlagen - Bauteile für Löschanlagen mit gasförmigen Löschmitteln - Teil 5: Anforderungen und Prüfverfahren für Hoch- und Niederdruck-Bereichsventile und zugehörige Auslöseeinrichtungen für CO₂-Anlagen

This European Standard was approved by CEN on 18 November 2000.

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.

SIST EN 12094-5:2001

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents	Page
Foreword.....	3
Introduction.....	4
1 Scope.....	4
2 Normative references.....	4
3 Terms and definitions.....	4
4 Requirements.....	5
4.1 General design.....	5
4.2 Connection threads and flanges.....	6
4.3 Function and ambient temperatures.....	6
4.4 Resistance to internal pressure and leakage.....	6
4.5 Resistance to bursting.....	6
4.6 Operational reliability.....	6
4.7 Flow characteristics.....	6
4.8 Resistance to corrosion.....	6
4.9 Resistance to stress corrosion.....	6
4.10 Vibration resistance.....	7
4.11 Operating force.....	7
4.12 Documentation.....	7
5 Type test methods.....	7
5.1 Conditions.....	7
5.2 Samples and order of tests.....	7
5.3 Compliance.....	8
5.4 Test for function.....	8
5.5 Test for resistance to internal pressure and leakage.....	8
5.6 Test for resistance to bursting.....	9
5.7 Test for operational reliability.....	9
5.8 Test for operation under temperature conditions.....	9
5.9 Test for flow characteristic data.....	9
5.10 Test for resistance to corrosion.....	11
5.11 Test for resistance to stress corrosion.....	11
5.12 Vibration test.....	12
5.13 Test for operating force.....	12
6 Marking.....	12
7 Evaluation of conformity.....	13
7.1 General.....	13
7.2 Initial type testing.....	13
7.3 Factory production control (FPC).....	13
Annex ZA (informative) Clauses of this European Standard addressing essential provisions of EU Construction Products Directive.....	14
Bibliography.....	17

Foreword

This European Standard 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 June 2001, and conflicting national standards shall be withdrawn at the latest by September 2002.

This European Standard 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 89/106/EEC.

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

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)
- 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 systems

ITeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 12094-5:2001

The following parts of this European standard are planned:

- 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 high- pressure container valves assemblies and actuators
- Part 5: Requirements and test methods for selector valves and 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
- 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 weighing devices
- Part 12: Requirements and test methods for 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

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.

Introduction

It has been assumed in the preparation of this 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

1 Scope

This European Standard specifies requirements and describes test methods for selector valves and their actuators used in CO₂ firefighting systems.

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 1092

Flanges and their joints

EN 12094-8

Fixed firefighting system - Components for gas extinguishing systems - Part 8: Requirements and test methods for flexible connectors for CO₂ systems

ISO 7-1

Pipe threads where pressure-tight joints are made on the threads - Part 1: Dimensions, tolerances and designation

ISO 228-1

Pipe threads where pressure-tight joints are not made on the threads - Part 1: Dimensions, tolerances and designation

ISO 7005

Metallic flanges

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions of EN 12094-8 and the following terms and definitions apply:

3.1

actuator

a component which causes a valve to operate.

3.2

container valve

valve, which is intended to close the extinguishing media container and which releases the extinguishing media when the actuator is activated.

3.3

fill ratio

the mass of extinguishing medium related to the net capacity of a container expressed as kg/l.

3.4**functional reliability**

ability of function under different working conditions.

3.5**high pressure container**

cylinder filled with CO₂ under ambient temperature conditions.

NOTE The pressure at 20 °C is 56,3 bar.

3.6**low pressure container**

insulated tank filled with CO₂ equipped with a cooling machine.

NOTE The pressure at – 20 °C is 18,7 bar.

3.7**selector valve**

valve with two open positions, which is intended to release the extinguishing media to the pipework for a flooding zone when activated.

3.8**pressure relief valve**

a valve, which protects a closed part of a pipe work against dangerous over pressure.

3.9**resistance coefficient**

a value for the calculation of the pressure drop in a component under two-phase flow condition.

3.10**two-phase flow**

partial change of phase of a fluid from liquid to vapour under flowing conditions.

3.11**working pressure**

pressure at which the component is used in the system.

4 Requirements**4.1 General design**

4.1.1 Metal parts of the component shall be made of stainless steel, copper, copper alloy or corrosion-protected steel (e.g. galvanised steel, cadmium-plated steel etc.).

All materials shall be resistant to media with which they come into contact.

4.1.2 The open and closed position of the selector valve shall be clearly indicated at the valve and shall be defined by mechanical means at the valve of the actuator.

4.1.3 High pressure selector valves and actuators shall be designed for a maximum opening time of 3 s.

Low pressure selector valves and actuators shall be designed for a maximum opening time of 3 s and for a maximum closing time of 3 s.

4.1.4 Selector valves shall be designed so that the closed position may be left only by activation of the actuators or by manual means.

The closed position of low pressure valves shall not be maintained only by friction.

4.1.5 High pressure selector valves shall be designed and specified for a working pressure of 140 bar.

Low pressure selector valves shall be designed and specified for a working pressure of 25 bar.

NOTE Actuators may have a different working pressure than selector valves.

A manual emergency operating device, if applicable, at the selector valve may not override pre-warning and time delay.

4.1.6 The pressure of the housing of the selector valve shall not exceed the working pressure in any operating position.

4.1.7 The test sample shall comply to the technical description as specified in 4.12 (drawings, parts lists, description of functions, operating and installation instructions) when checked in accordance with 5.3.

4.2 Connection threads and flanges

Connections threads shall comply with ISO 7-1 or ISO 228-1 and for flanges with EN 1092 or ISO 7005.

Inlet and outlet of the valve shall be of the same size in diameter.

4.3 Function and ambient temperatures

The selector valve and actuator shall operate in an ambient temperature range encompassing - 20 °C to + 50 °C, when tested in accordance with 5.8.

High pressure selector valves and actuators shall be designed to provide opening times of maximum 3 s, when tested in accordance with 5.4.

Low pressure selector valves with their actuators shall be designed to provide times for opening and closing of 3 s maximum, when tested in accordance with 5.4.

NOTE Test temperature in accordance with 5.8 is - 30 °C taking into account temperature drop during discharge.

4.4 Resistance to internal pressure and leakage

The valve and its pneumatic actuators shall not leak at a test pressure of 1,5 times the working pressure and shall not suffer any permanent deformation, when tested in accordance with 5.5.

4.5 Resistance to bursting

The valve casing, closure mechanism and pressurised actuators shall not burst when subjected to a test pressure of three times the working pressure, when tested in accordance with 5.6.

4.6 Operational reliability

There shall be no deterioration of performance, when a selector valve and actuator is tested in accordance with 5.7. During operation no part of the valve or its components shall be ejected outside the confines of the valve or into the discharge pipework.

4.7 Flow characteristics

The free flow cross sectional area of the valve shall be not less than 90 % of the area given by the inlet pipe nominal diameter.

The flow characteristic of the valve can be given by the manufacturer either as an equivalent length or as a flow resistance coefficient. The figures given by the manufacturer shall be in an accuracy range of ± 10 %, when tested in accordance with 5.9.

4.8 Resistance to corrosion

The test sample shall operate satisfactorily when tested in accordance with 5.10.

4.9 Resistance to stress corrosion

Any copper alloy part used in the valve assembly shall not crack, when the valve is tested in accordance with 5.11.

4.10 Vibration resistance

The valve assembly including accessories and actuator shall not operate or be damaged when tested in accordance with 5.12.

4.11 Operating force

The effective force of the actuator shall under the most unfavourable conditions be at least twice the force required to operate the valve.

The figures of the maximum operating force when tested in accordance with 5.13 at the most severe conditions and the point at which the force is applied shall be given by the manufacturer.

4.12 Documentation

4.12.1 The manufacturer shall prepare and maintain documentation which specifies the installation, operation, routine testing and maintenance of the component and all other aspects relating to its incorporation within a fire extinguishing system.

4.12.2 The documentation shall be submitted to the testing authority and shall comprise at least the following:

- a) a general description of the equipment, including a list of the features and functions
- b) a technical specification including:
 - 1) the working pressure
 - 2) the suitability for use in various environments
 - 3) mounting instructions
- c) maintenance instructions.

4.12.3 The manufacturer shall also prepare, maintain and submit the following detailed documentation:

Description of the overall mechanical design including

- a) the main parts of the component and their tasks
- b) the way in which the parts interact
- c) component list
- d) layouts
- e) design drawings.

This documentation shall also comprise details of any components specific to the manufacturer.

4.12.4 All documentation normally supplied by and specified by the manufacturer for use by the end-user shall be supplied with the device and constitute part of supply.

5 Type test methods

5.1 Conditions

Assemble the component for test in accordance with the manufacturer's recommendation. Except when specified otherwise carry out the tests at $(20 \pm 5) ^\circ\text{C}$.

5.2 Samples and order of tests

For the tests the manufacturer shall submit three samples. If there is a design series three different diameters are chosen. The order of tests is shown in Table 1.

NOTE Bottom, top and middle of the range of sizes are proposed for use.