INTERNATIONAL STANDARD

ISO 23555-1

First edition
2022-01

Gas pressure safety and control devices for use in gas transmission, distribution and installations for inlet pressures up to and including 10 MPa —

Part 1:
General requirements

Reference number
ISO 23555-1:2022(E)

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Published in Switzerland

Contents

Page

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 161, *Controls and protective devices for gas and/or oil*.

A list of all parts in the ISO 23555 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document provides general requirements for controls and protective devices and is intended to be used in conjunction with ISO 23555-2 and ISO 23555-3 for specific types of controls and protective devices or for controls for specific applications.

This document can also be applied, so far as reasonable, to controls not mentioned in a specific standard and to controls designed on new principles, in which case additional requirements can be necessary.

When no specific International Standard for a control exists, the control can be tested according to this document and further tests which take into account the intended use.

Controls and safety devices used with gases need to withstand the type of gas which is specified. Other ISO Technical Committees, such as ISO/TC 28, *Petroleum products and lubricants,* and ISO/TC 193, *Natural gas*, deal with the testing and properties of fuel gases.

Note that due to the differing properties of gas depending on its source/region of origin, certain differences in regulations exist at present in different regions, some of which are presented in Annex E.

This document intends to provide a basic framework of requirements until these differences can be harmonized.

Gas pressure safety and control devices for use in gas transmission, distribution and installations for inlet pressures up to and including 10 MPa —

Part 1: General requirements

1 Scope

This document specifies generic safety, constructional, performance, testing and documentation requirements for high pressure controls for use in gas transmission, distribution and installations (hereafter referred to as controls).

This document is applicable to controls with operating pressures greater than 500 kPa (5 bar) and up to and including 10 MPa (100 bar) and nominal size up to DN 400 for use with fuel gases as natural gas, manufactured gas, biomethane or liquefied petroleum gas (LPG) in commercial, industrial installations, including fuel gas infrastructures.

The test methods given in this document are intended for product type test, routine tests and batch surveillance tests.

This document is not applicable to:

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

— controls designed with declared maximum capacity ≤200 m^3/h (normal conditions) and declared maximum inlet pressure ≤500 kPa (5 bar), to be incorporated into pressure control systems used in service lines (pipework from the main pipework in a gas infrastructure to the point of delivery of the gas);

— industrial process control valves, such as IEC 60534;

— controls used in aggressive/sour gas environments (gas environments containing water and H_2S are considered sour) or severely corrosive conditions;

— controls in service conditions with renewables (e.g. H_2NG with hydrogen more than 10 %) and/or waste gases (e.g. biogas, etc.), if additional information is not provided (e.g. contaminant, liquid, etc.).

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 amendments) applies.

ISO 148-1, *Metallic materials — Charpy pendulum impact test — Part 1: Test method*

ISO 175, *Plastics — Methods of test for the determination of the effects of immersion in liquid chemicals*

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

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

ISO 7005 (all parts),*Pipe flanges*

ISO 9606-1, *Qualification testing of welders — Fusion welding — Part 1: Steels*

ISO 9606-2, *Qualification test of welders — Fusion welding — Part 2: Aluminium and aluminium alloys*

ISO 9606-3, *Approval testing of welders — Fusion welding — Part 3: Copper and copper alloys*

ISO 9606-4, *Approval testing of welders — Fusion welding — Part 4: Nickel and nickel alloys*

ISO 9712, *Non-destructive testing — Qualification and certification of NDT personnel*

ISO 10474:2013, *Steel and steel products — Inspection documents*

ISO 14732, *Welding personnel — Qualification testing of welding operators and weld setters for mechanized and automatic welding of metallic materials*

ISO 15607, *Specification and qualification of welding procedures for metallic materials — General rules*

ISO 15609-1, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 1: Arc welding*

ISO 15610, *Specification and qualification of welding procedures for metallic materials — Qualification based on tested welding consumables*

ISO 15611, *Specification and qualification of welding procedures for metallic materials — Qualification based on previous welding experience*

ISO 15612, *Specification and qualification of welding procedures for metallic materials — Qualification by adoption of a standard welding procedure specification*

ISO 15613, *Specification and qualification of welding procedures for metallic materials — Qualification based on pre-production welding test*

ISO 15614-1, *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 15614-2, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 2: Arc welding of aluminium and its alloys*

ISO 17637, *Non-destructive testing of welds — Visual testing of fusion-welded joints*

ISO/IEC 17025:2017, *General requirements for the competence of testing and calibration laboratories*

IEC 60534-2-3, *Industrial-process control valves — Part 2-3: Flow capacity — Test procedures*

IEC 60534-4:2006, *Industrial-process control valves — Part 4: Inspection and routine testing*

EN 437, *Test gases — Test pressures — Appliance categories*

EN 549:2019, *Rubber materials for seals and diaphragms for gas appliances and gas equipment*

EN 12516-1:2014, *Industrial valves — Shell design strength — Part 1: Tabulation method for steel valves shells*

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

EN 16129:2013, *Pressure regulators, automatic change-over devices, having a maximum regulated pressure of 4 bar, with a maximum capacity of 150 kg/h, associated safety devices and adaptors for butane, propane, and their mixtures*

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