
**Safety and control devices for gas
burners and gas-burning appliances —
Particular requirements —**

**Part 5:
Manual gas valves**

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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 document 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).

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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 gaseous and liquid fuels*.

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This second edition cancels and replaces the first edition (ISO 23551-5:2014), which has been technically revised.

The main changes are as follows:

- the document has been updated to align technically and with the revised format of ISO 23550:2018;
- references to the current annex structure have been corrected.

A list of all parts in the ISO 23551 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 is designed to be used in combination with ISO 23550. This document, together with ISO 23550, establishes the full requirements as they apply to the product covered by this document.

Where needed, this document adapts ISO 23550 by stating in the corresponding clause:

- “with the following modification”;
- “with the following addition”;
- “is replaced by the following”; or
- “is not applicable”.

In order to identify specific requirements that are particular to this document, that are not already covered by ISO 23550, this document contains certain clauses or subclauses that are additional to the structure of ISO 23550. These subclauses are indicated by the introductory sentence: “Subclause (or Annex) specific to this document”.

To ensure the global relevance of this document, the differing requirements resulting from practical experience and installation practices in various regions of the world have been taken into account. The variations in basic infrastructure associated with gas and/or oil controls and appliances have also been recognized, some of which are addressed in [Annexes F, G](#) and [H](#). This document intends to provide a basic framework of requirements that recognize these differences.

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Safety and control devices for gas burners and gas-burning appliances — Particular requirements —

Part 5: Manual gas valves

1 Scope

This document specifies safety, constructional and performance requirements for manual gas valves intended for use with gas burners and gas-burning appliances, hereafter referred to as "valves", unless otherwise specified.

This document applies to the following types of manual gas valves:

- manual gas shut-off valves;
- gas burner valves;
- appliance connector valves;
- delta C valves.

This document applies to valves for gas burners and gas-burning appliances of nominal connection size up to and including DN 100 that can be used and tested independently of these appliances using fuel gases, as natural gas, manufactured gas or liquefied petroleum gas (LPG) at inlet pressures up to and including 500 kPa.

This document is not applicable to corrosive and waste gases.

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This document covers type testing only.

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.

ISO 23550:2018, *Safety and control devices for gas and/or oil burners and appliances — General requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 23550 and the following apply.

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

manual gas shut-off valve

manually-operated valve for the control of the gas flow from an “off” to an “on” position and vice versa

Note 1 to entry: Parts commonly used in manual gas shut-off valves are shown as examples in [Figure I.1](#) to [Figure I.5](#).

3.2

delta C valve

manual gas valve suitable for use on food service equipment (commercial cooking equipment)

Note 1 to entry: These valves are identified by a Δ marking.

3.3

gas burner valve

manual gas valve that requires user initiation of each usage cycle

Note 1 to entry: This type of manual gas valve is intended to be used between the gas supply piping and the gas burner.

Note 2 to entry: The valve is turned on when the burner operating cycle is initiated and turned off when the burner operating cycle is completed.

3.4

appliance connector valve

manual gas valve having a *non-displaceable valve member* (3.7), a minimum specified *capacity* (3.9) and an internal taper pipe thread inlet and an outlet for flared tubing connection

Note 1 to entry: This type of manual gas valve is intended to be used between the gas supply piping and the appliance connector attached to the appliance.

Note 2 to entry: For minimum capacity, see [Table 2](#), and for inlet and outlet connection, see [6.7](#).

3.5

bearing seal

shortest distance between gas-carrying parts and the atmosphere measured along the length of the sealing surfaces

3.6

plug

tapered valve member of a manual gas valve containing one or more gas flow openings

3.7

non-displaceable valve member

valve member that cannot be moved from its seat by a force applied to the handle, or force applied by a plane surface to any exterior portion of the valve

3.8

safety lock

means in a manual valve that requires a separate action of the user before the valve can be opened

EXAMPLE Pushing on the valve handle to “unlatch” the valve before the valve handle can be rotated to turn on the gas.

3.9

capacity

amount of a specified gas that flows through a control at a specified pressure drop in a fixed period of time

4 Classification

4.1 Classes of controls

Shall be according to ISO 23550:2018, 4.1, with the following addition.

Manual gas valves are classified according to the number of operations:

- 1 000 operations (e.g. appliance connector valves);
- 5 000 operations (e.g. central heating);
- 10 000 operations (e.g. space heaters);
- 12 000 operations; and
- 40 000 operations (e.g. domestic cooking).

4.2 Groups of controls

Shall be according to ISO 23550:2018, 4.2.

4.3 Types of DC supplied controls

ISO 23550:2018, 4.3, is not applicable.

4.4 Classes of controls functions

ISO 23550:2018, 4.4, is not applicable.

5 Test conditions and tolerances

Shall be according to ISO 23550:2018, Clause 5.

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6 Construction

6.1 General

Shall be according to ISO 23550:2018, 6.1.

6.2 Construction requirements

6.2.1 Appearance

Shall be according to ISO 23550: 2018, 6.2.1.

6.2.2 Holes

Shall be according to ISO 23550: 2018, 6.2.2.

6.2.3 Breather holes

ISO 23550:2018, 6.2.3, is not applicable.

6.2.4 Vent limiter

ISO 23550:2018, 6.2.4, is not applicable.

6.2.5 Screwed fastenings

Shall be according to ISO 23550:2018, 6.2.5.

6.2.6 Moving parts

Shall be according to ISO 23550:2018, 6.2.6.

6.2.7 Sealing caps

Shall be according to ISO 23550:2018, 6.2.7.

6.2.8 Dismantling and reassembling for servicing and/or adjustment

Shall be according to ISO 23550:2018, 6.2.8.

6.2.9 Auxiliary channels and orifices

Shall be according to ISO 23550:2018, 6.2.9.

6.2.10 Pre-setting device

Shall be according to ISO 23550:2018, 6.2.10.

6.2.11 Operating parts of manual gas valves

Subclause specific to this document.

Manual gas valves operated by rotation shall be opened by turning the operating device anticlockwise and closed by turning it clockwise, except for valves, which provide more than one burner with gas. Alternate construction is acceptable provided the rotation direction is clearly marked. Manual gas valves with 90° rotation do not have to meet these requirements when the construction is such that the lever or tee handle is 90° to the line of flow in the off position and parallel to the line of flow in the on position.

A separable handle, removable without further disassembly of the valve, shall be attached by tamper-resistant means unless removal of the handle does not affect the leak tightness of the valve or the retention of the valve member.

Manual gas shut-off valves shall be operated without the use of tools.

It shall not be possible to exert direct axial pressure (other than spring pressure) on the closure member when the operating spindle is depressed to clear any safety lock.

6.2.12 Seating force

Subclause specific to this document.

Manual gas valves shall be provided with a means, other than gravity, to maintain a continuous seating force to compensate for manufacturing tolerances, operational variations, or displacement of lubricant(s).

It shall not be possible in normal use to apply such forces to the closure member that it is lifted out of its seat or is brought into a position which causes the leakage rates to exceed the values given in [7.2](#).

6.2.13 Tapered plug cavity

Subclause specific to this document.

For taper plug manual gas valves, the closure member included angle shall be at least $9^\circ 25'$. The taper plug at the large diameter shall be recessed into the body, and the plug shall protrude beyond the taper of the body at the small end. There shall be adequate clearance provided for this protrusion.

NOTE Regional specific requirements are given in [Annex G](#).

6.3 Materials

6.3.1 General material requirements

Shall be according to ISO 23550:2018, 6.3.1.

6.3.2 Housing

6.3.2.1 General

Shall be according to ISO 23550:2018, 6.3.2.1.

6.3.2.2 Requirements

Shall be according to ISO 23550:2018, 6.3.2.2, with the following modification.

Item b) is not applicable. O-rings, gaskets and other seals are exempt.

6.3.2.3 Test

Shall be according to ISO 23550:2018, 6.3.2.3.

6.3.2.4 Manual gas valves with shaft seal

Subclause specific to this document.

For manual gas valves with shaft seals, the shaft seal is excluded from the requirement in [6.3.2.1](#), if the following requirements are met:

The structure surrounding a shaft seal shall be such as to confine the seal properly and, with the seal removed and the valve in any position, to allow, when tested at room temperature with air, not more than $45,6 \text{ dm}^3/\text{h}$ at a pressure of $1,74 \text{ kPa}$ to leak past the shaft.

6.3.3 Springs providing closing force and sealing force

Shall be according to ISO 23550:2018, 6.3.3.

6.3.4 Resistance to corrosion and surface protection

Shall be according to ISO 23550:2018, 6.3.4.

6.3.5 Impregnation

Shall be according to ISO 23550:2018, 6.3.5.

6.3.6 Seals for glands for moving parts

Shall be according to ISO 23550:2018, 6.3.6.

6.3.7 Jointing

Shall be according to ISO 23550:2018. 6.3.7.

6.3.8 Closure members

Subclause specific to this document.

Gas-closing parts shall either have a metallic support to withstand the sealing force or shall be made of metal. This requirement also applies to parts transmitting the closing force.

For guide elements (see [Figure I.1](#) to [Figure I.5](#)), non-metallic materials are admissible.

6.4 Connections

Shall be according to ISO 23550:2018, 6.4.

6.5 Gas controls employing electrical components in the gas way

ISO 23550:2018, 6.5 is not applicable.

6.6 Component parts

Subclause specific to this document.

6.6.1 General

The off-position shall have a non-adjustable stop.

6.6.2 Turning angles

6.6.2.1 General

The reduced flow position, if any, shall be placed either after the fully open position or between the open and the closed position.

The turning angle of the manual gas needle valve between the closed and the fully open position shall be between 180° and 360° when used as a shut-off valve unless otherwise specified in the installation and operating instructions.

6.6.2.2 Opening at maximum flow

If the reduced flow rate position is placed after the fully open position the following requirements shall be met:

- in order to change from the closed position to the fully open position the turning angle shall be $(90 \pm 5)^\circ$ unless otherwise specified in the installation and operating instructions;
- the turning angle between the fully open position and the reduced flow rate position shall be greater than 70° unless otherwise specified in the manufacturer's installation and operating instructions; this requirement is not applicable to multi-outlet valves;
- the movement of the manual gas valve closure member shall be limited by a fixed stop at the reduced flow rate position.

6.6.2.3 Opening at minimum flow

If the reduced flow rate position is placed between the closed and fully open position the following requirements shall be met:

- in order to change from the closed position to the fully open position the turning angle shall be greater than 90° unless otherwise specified in the installation and operating instructions;