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

**Part 1:
Automatic valves**

iTeh STANDARD PREVIEW
*Dispositifs de commande et de sécurité pour brûleurs à gaz et appareils
à gaz — Exigences particulières —
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Partie 1: Robinets automatiques*

ISO 23551-1:2006

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 23551-1 was prepared by Technical Committee ISO/TC 161, *Control and protective devices for gas and oil burners and gas and oil burning appliances*.

ISO 23551 consists of the following parts, under the general title *Safety and control devices for gas burners and gas-burning appliances — Particular requirements*:

- *Part 1: Automatic valves*
- *Part 2: Pressure regulators*
- *Part 3: Gas/air ratio controls, pneumatic type*
- *Part 4: Valve-proving systems for automatic shut-off valves*

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Introduction

This part of ISO 23551 is designed to be used in conjunction with ISO 23550:2004.

This part of ISO 23551 either references existing requirements of ISO 23550:2004 or indicates that there has been an “addition”, “modification” or “replacement” in the cited requirement of ISO 23550:2004.

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

Part 1: Automatic valves

1 Scope

This part of ISO 23551 specifies safety, constructional and performance requirements and testing of automatic valves (hereafter referred to as valves) for gas burners, gas appliances and similar use.

This part of ISO 23551 covers type testing only.

This part of ISO 23551 applies to valves with declared maximum working pressures up to and including 500 kPa, for use on burners or in appliances using fuel gases as natural gas, manufactured gas or liquefied petroleum gas (LPG).

This part of ISO 23551 applies to valves directly or indirectly operated electrically or by mechanical means.

This part of ISO 23551 applies to valves actuated by fluids e.g. pneumatic, hydraulic.

This part of ISO 23551 applies to valves where the flow rate is controlled by external electrical signals, either in discrete steps or proportional to the applied signal.

This part of ISO 23551 applies to valves fitted with closed position indicator switches.

2 Normative references

The following referenced documents are indispensable for the application 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 4400, *Fluid power systems and components — Three-pin electrical plug connectors with earth contact — Characteristics and requirements*

ISO 6952, *Fluid power systems and components — Two-pin electrical plug connector with earth contact — Characteristics and requirements*

ISO 23550:2004, *Safety and control devices for gas burners and gas-burning appliances — General requirements*

IEC 60529, *Degrees of protection provided by enclosures*

IEC 60730-1, *Automatic electrical controls for household and similar use — Part 1: General requirements*

IEC 61058-1:2001, *Switches for appliances — Part 1: General requirements*

3 Terms and definitions

For the purpose of this document, the terms and definitions given in ISO 23550:2004 and the following apply.

- 3.1 automatic valve**
device consisting essentially of a valve body, closure member, and actuator that controls the flow of gas
- NOTE 1 The actuator can be actuated by electrical or mechanical means.
- NOTE 2 The actuation can be done by gas pressure or electrical, hydraulic or pneumatic energy.
- 3.2 automatic shut-off valve**
valve which opens when energized and closes automatically when de-energized
- 3.3 valve with step control**
valve which controls the flow rate in steps
- 3.4 valve with modulating control**
valve which controls the flow rate continuously between two limits in response to external signals
- 3.5 actuating mechanism**
part of the valve which moves the closure member
- 3.6 closed position indicator switch**
switch fitted to a valve which indicates when the closure member is in the closed position
- 3.7 actuating energy**
required energy for the actuating mechanism to move the closure member to the open position
- NOTE The actuating energy can have an external source (electrical, pneumatic or hydraulic) and can be transformed inside the valve.
- 3.8 closing force**
force available to close the valve, independent of any force provided by fuel gas pressure
- 3.9 sealing force**
force acting on the valve seat when the closure member is in the closed position, independent of any force provided by fuel gas pressure
- 3.10 frictional force**
largest force required to move the actuating mechanism and the closure member from the open position to the closed position with the closure spring removed, independent of any force provided by fuel gas pressure
- 3.11 actuating pressure**
hydraulic or pneumatic pressure supplied to the actuating mechanism of the valve

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3.12**pressure difference**

difference between the inlet and outlet pressures

3.13**opening time**

time interval between energizing the valve and the attainment of the maximum or other defined flow rate

3.14**closing time**

time interval between de-energizing the valve and the closure member attaining the closed position

3.15**delay time**

time interval between energizing the valve and the start of flow

3.16**control valve**

valve which controls the fluid (e.g. compressed air) supplied to the actuating mechanism

3.17**rated voltage**

voltage declared by the manufacturer at which the valve may be operated

3.18**rated current**

current declared by the manufacturer at which the valve may be operated

3.19**bypass**

passage, provided in the body of the device or in a gas line around the body, which permits a gas flow from the inlet to the outlet connections of the device entirely independent of the action of the valve

4 Classification**4.1 Classes of control**

If valves are classified, the following classes shall be used:

- Classes A, B and C: valves where the sealing force is not decreased by the gas inlet pressure. They are classified A, B or C according to the sealing force requirements of 7.6.10;
- Class D: valves that are not subject to any sealing force requirements;
- Class E: valves where the sealing force is decreased by the gas inlet pressure and that meet the requirements of 7.6.10;
- Class J: disc-on-seat valves, where the sealing force is not decreased by the gas inlet pressure and that meet the requirements of 7.6.10.

NOTE In USA, Canada and Japan, valves are not classified.

4.2 Groups of controls

A valve is classified as group 1 or group 2 according to the bending stresses that it is required to withstand (see ISO 23550:2004, Table 4):

- Group 1: valves for use in an appliance and/or installation where they are not subjected to bending stresses imposed by installation pipe work (e. g. by the use of rigid adjacent supports);
- Group 2: valves for use in any situation, either internal or external to the appliance, typically without support.

NOTE A valve that meets the requirements of group 2 valves also meets the requirements of group 1 valves.

5 Test conditions

ISO 23550:2004, Clause 5, shall apply.

6 Construction

6.1 General

ISO 23550:2004, 6.1, shall apply.

6.2 Construction requirements

6.2.1 Appearance

ISO 23550:2004, 6.2.1, shall apply.

6.2.2 Holes

ISO 23550:2004, 6.2.2, shall apply.

6.2.3 Breather holes

ISO 23550:2004, 6.2.3, shall apply.

6.2.4 Screwed fastenings

ISO 23550:2004, 6.2.4, shall apply.

6.2.5 Jointing

ISO 23550:2004, 6.2.5, shall apply.

6.2.6 Moving parts

ISO 23550:2004, 6.2.6, shall apply.

6.2.7 Sealing caps

ISO 23550:2004, 6.2.7, shall apply.

6.2.8 Dismantling and reassembling for servicing and/or adjustment

ISO 23550:2004, 6.2.8, shall apply.

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6.2.9 Auxiliary channels

ISO 23550:2004, 6.2.9, shall apply.

6.2.10 Closed position indicator switch

Closed position indicator switches, where fitted, shall not impair the correct operation of valves. Adjusters shall be sealed to indicate interference. Any drift of the switch and actuating mechanism from its setting shall not impair correct valve operation.

6.2.11 Flow rates

Flow rates of valves with modulating control shall be adjustable over the full range declared by the manufacturer. If the adjustment of one flow rate affects the setting of any other flow rate, this shall be clearly indicated in the manufacturer's instructions for setting up. The setting of any flow rate shall require the use of tools and shall be sealed to discourage unauthorized adjustment.

6.2.12 Protection of the valve mechanism

The mechanisms of automatic valves shall be protected by substantial enclosures so as to prevent interference with the safe operation of the devices.

6.2.13 By-pass

Valves classified as classes A, B, C, D, E and J shall not incorporate a by-pass.

6.3 Materials

6.3.1 General material requirements [ISO 23551-1:2006](https://standards.iteh.ai/catalog/standards/sist/a2fa40bf-26fd-4347-a501-2335e4019fde/iso-23551-1-2006)
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 ISO 23550:2004, 6.3.1, shall apply.

6.3.2 Housing

6.3.2.1 Housing design

ISO 23550:2004, 6.3.2.1, shall apply with the following addition.

When a diaphragm inside a housing separates the gas-carrying compartment from atmosphere, then the gas-carrying compartment is considered to be indirectly separated.

6.3.2.2 Test for leakage of housing after removal of non-metallic parts

Carry out the test as given in ISO 23550:2004; 6.3.2.2.

6.3.3 Springs

6.3.3.1 Closure springs

ISO 23550:2004, 6.3.3.1 shall apply.

6.3.3.2 Springs providing closing force and sealing force

ISO 23550:2004, 6.3.3.2, shall apply.

NOTE This is applicable when closing force and sealing force is provided by spring action.