INTERNATIONAL STANDARD

ISO 23551-3

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

Part 3: Gas/air ratio controls, pneumatic type

Dispositifs de commande et de sécurité pour brûleurs à gaz et appareils à gaz — Exigences particulières —

Partie 3: Dispositifs de régulation du rapport air/gaz, type pneumatique

Reference number
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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 23551-3 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 governors*

— *Part 3: Gas air/ratio controls, pneumatic type*

The following parts are under preparation:

— *Part 4: Valve-proving systems for automatic shut-off valves*

Introduction

This part of ISO 23551 is intended to be used in conjunction with ISO 23550:2004. It makes reference to clauses and subclauses of ISO 23550:2004 or adapts them by indicating “Addition” or “Modification” in its corresponding clauses or subclauses.

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

Part 3: Gas/air ratio controls, pneumatic type

1 Scope

This part of ISO 23551 specifies the safety, construction and performance requirements for gas/air ratio controls, pneumatic type (hereafter referred to as “ratio control”), for inlet pressures up to and including 50 kPa, of a nominal connection size up to and including DN 250, intended for use with gas appliances using fuel gases as natural gas, manufactured gas or liquefied petroleum gas (LPG). It also describes the test procedures for evaluating these requirements and specifies information necessary for installation and use.

This part of ISO 23551 is applicable to gas/air ratio controls for gas-burning appliances that can be tested independently of the appliance. It is applicable to gas/air ratio controls which function by controlling a gas pressure (or differential pressure) output in response to an air pressure (or differential pressure) and to a furnace back pressure signal input, but gas/air ratio controls which change the air pressure in response to the gas pressure are not excluded.

This part of ISO 23551 is not applicable to mechanically linked valves and electronic systems.

NOTE Sections of this part of ISO 23551 can be applied to the construction and performance of the ratio control function of multi-functional controls.

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 23550:2004, *Safety and control devices for gas burners and gas-burning 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.

3.1
gas/air ratio control, pneumatic type
control which supplies gas at specified pressures (absolute or relative) at its outlet in response to pneumatic signals

3.2
signal pressure
pressure input applied to the ratio control in order to provide the specified gas outlet pressure

3.3
gas/air ratio
slope of a straight line relationship between the outlet pressure and signal pressure applied to the ratio control

3.4
furnace back pressure
pressure of combustion gases from the combustion chamber applied to the gas/air ratio control

3.5
maximum flow rate
maximum rate, as a function of inlet and outlet pressures, declared by the manufacturer and expressed in cubic metres per hour of air at standard conditions

3.6
minimum flow rate
minimum rate, as a function of inlet and outlet pressures, declared by the manufacturer and expressed in cubic metres per hour of air at standard conditions

3.7
signal chamber
part of the ratio control to which the air, gas or furnace back pressure signal inputs are connected

3.8
signal tube
impulse line
pipe that is used to convey pressure from part of an installation to the signal chamber

3.9
response time
maximum time taken for the outlet pressure to reach stable conditions in the opening or closing direction in response to a step change in signal pressure

3.10
zero adjustment
offset shift
adjustment of the ratio control at zero point before setting into operation

4 Classification

4.1 General

Ratio controls shall be classified and grouped in accordance with 4.2 and 4.3.

4.2 Classes of control

See 7.6.1.

4.3 Groups of controls

ISO 23550:2004, 4.2 applies.

5 Test conditions

ISO 23550:2004, Clause 5 applies.

6 Construction

6.1 General

ISO 23550:2004, 6.1 applies.

6.2 Construction requirements

ISO 23550:2004, 6.2 applies.

6.3 Materials

6.3.1 General material requirements

ISO 23550:2004, 6.3.1 applies.

6.3.2 Housing

6.3.2.1 Housing design

ISO 23550:2004, 6.3.2.1 applies.

Addition:

When a diaphragm separates parts of the housing from the gas-carrying compartment or from atmosphere then this is considered to be indirectly separated. Those parts shall be made from metallic material.

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

Carry out the test according to ISO 23550:2004, 6.3.2.2.

Addition:

Rupture the diaphragm and remove all non-metallic parts of the housing which separate a gas-carrying compartment from the atmosphere, excluding O-rings, seals, gaskets and diaphragms. Pressurize the inlet and outlet(s) of the control to the maximum working pressure and measure the leakage rate.

6.3.3 Springs

6.3.3.1 Closure springs

ISO 23550:2004, 6.3.3.1 applies.

6.3.3.2 Springs providing closing force and sealing force

ISO 23550:2004, 6.3.3.2 applies.

6.3.4 Resistance to corrosion and surface protection

ISO 23550:2004, 6.3.4 applies.

6.3.5 Impregnation

ISO 23550:2004, 6.3.5 applies.