ISO 23551-1:2024-11 (E)

Safety and control devices for gas burners and gas-burning appliances - Particular requirements - Part 1: Automatic and semi-automatic shut-off valves

Contents

Page

Foreword vi

Introduction viii

1 Scope 1

2 Normative references 1

3 Termsanddefinitions 1
3.1 Terms related to valves 2
3.2 General terms 3

4 Classification 5
4.1 Classes of control 5
4.1.1 Classification based on sealing force 5
4.1.2 Classification based on pressure surge 5
4.1.3 Classification with neither sealing force nor pressure surge 5
4.1.4 Classification of flow control valves for general purpose 5
4.2 Groups of controls 6
4.3 Types of DC supplied controls 6
4.4 Classes of control functions 6

5 Test conditions and tolerances 6

6 Construction 6
6.1 General 6
6.2 Construction requirements 8
6.2.1 Appearance 8
6.2.2 Holes 8
6.2.3 Breather holes 8
6.2.4 Vent limiter 8
6.2.5 Screwed fastenings 8
6.2.6 Moving parts 8
6.2.7 Sealing caps 8
6.2.8 Disassembling and assembling for servicing and/or adjustment for controls 8
6.2.9 Auxiliary channels and orifices 10
6.2.10 Pre-setting device 10
6.2.11 Closed position indication 10
6.2.12 Specific construction 11
6.2.13 Flow rates of valves with modulating control 11
6.2.14 Bypass 12
6.2.15 Semi-automatic shut-off valve 12
6.2.16 Diaphragm type valve 12
6.2.17 Balanced valves with one or two ports 12
6.3 Materials 14
6.3.1 General material requirements 14
6.3.2 Housing 14
6.3.3 Springs providing closing force and sealing force 14
6.3.4 Resistance to corrosion and surface protection 14
6.3.5 Impregnation 14
6.3.6 Seals for glands for moving parts 15

6.3.7 Jointing 15
6.3.8 Closure members 15
6.4 Connections 15
6.4.1 General 15
6.4.2 Connection sizes 15
6.4.3 Connections types 15
6.4.4 Threads 15
6.4.5 Union joints 15
6.4.6 Flanges 15

6.4.7 Compression fittings 15
6.4.8 Flare connections 16
6.4.9 Nipples for pressure tests 16
6.4.10 Strainers 16
6.4.11 Gas connections by GQC 16
6.4.12 Hydraulic and pneumatic actuating mechanisms 16
6.5 Gas controls employing electrical components in the gas way 16

7 Performance 16
7.1 General 16
7.2 Leak-tightness 18
7.2.1 General 18
7.2.2 Requirements 18
7.2.3 Test 18
7.2.4 Pressure surge test 18
7.3 Torsion and bending 18
7.4 Rated flow rate 18
7.4.1 General 18
7.4.2 Requirements 18
7.4.3 Test 18
7.5 Durability 19
7.6 Functional requirements 19
7.6.1 Closing function 19
7.6.2 Opening and closing function of thermoelectric valves 20
7.6.3 Closing force 20
7.6.4 Delay time and opening time 20
7.6.5 Closing time 21
7.6.6 Sealing force 22
7.6.7 Gas cracking 23
7.7 Endurance 23
7.7.1 Requirements 23
7.7.2 Test 25
7.8 Hydrostatic withstand pressure test 27
7.8.1 General 27
7.8.2 Requirements 27
7.8.3 Test 27
7.9 Resistance to permanent damage at excessive supply pressure 28
7.9.1 General 28
7.9.2 Requirement 28
7.9.3 Test 28

8 Electrical equipment 28
8.1 General 28
8.2 Requirements 28
8.3 Test 28
8.4 Protection by enclosure 28
8.5 Electrical components 29
8.5.1 Switches 29
8.5.2 Plug connector 29
8.5.3 Power-saving circuit 29

9 Electromagnetic compatibility (EMC) 30

9.1 Protection against environmental influences 30
9.1.1 General 30
9.1.2 Requirements 30
9.2 Harmonics and interharmonics including mains signalling at a. c. power port, low frequency immunity 30
9.3 Voltage dips, voltage interruptions and voltage variations in the power supply network ... 30
9.4 Test of influence of voltage unbalance 30
9.5 Surge immunity test 30

9.6 Electrical fast transient/burst 30
9.7 Ring wave immunity 31
9.8 Electrostatic discharge 31
9.9 Radio-frequency electromagnetic field immunity 31
9.10 Influence of supply frequency variations 31
9.11 Power frequency magnetic field immunity 31
9.12 Evaluation of compliance 31

10 Marking, installation and operating instructions 31
10.1 Marking 31
10.2 Installation and operating instructions 32
10.3 Warning notice 32
10.4 Annexes 32

Annex A (normative) Specific regional requirements in Canada and the USA 33

Annex B (normative) Specific regional requirements in Japan 34

Bibliography 35