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Mechanical thermostats for gas-burning appliances

Mechanische Temperaturregler für Gasgeräte

Robinets automatiques de sectionnement pour brûleurs à gaz et appareils à gaz

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Mechanical thermostats for gas-burning appliances

Robinets automatiques de sectionnement pour brûleurs à gaz et appareils à gaz

Mechanische Temperaturregler für Gasgeräte

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 58.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (prEN 257:2008) has been prepared by Technical Committee CEN/TC 58 “Safety and control devices for gas-burners and gas-burning appliances”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 257:1992.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EC Directive(s).

For relationship with EC Directive(s), see informative Annex ZA, which is an integral part of this document.

This document is intended to be used in conjunction with EN 13611:2007. This document refers to clauses of EN 13611:2007 or adapting it by stating “Addition”, “Modification” or “Replacement” in the corresponding clause.

Note that the following provides details of significant technical changes between this European Standard and the previous edition:

a) scope is enlarged to maximum inlet pressures up to and including 500 mbar (50 kPa);

b) alignment with EN 13611:2007;

c) updating of clause 2, normative references;

d) units of measurement and test conditions are updated according to EN 13611:2007;

e) although thermostats, which do not require external electrical energy for their operation, are not covered by this standard, clauses 6.5 (Electronic parts of the control) and 6.6 (Protection against internal faults for the purpose of functional safety) are added according to EN 13611:2007 to cover requirements and tests for thermostats using internal electrical energy, if applicable;

f) requirements and tests concerning durability of elastomers in contact with gas (clause 7.8 of this standard) are completely aligned to EN 13611:2007, which refers to EN 549;

g) marking, installation and operating instructions (clause 9 of this standard) are extended to some more information;

h) annexes E to I are added according to EN 13611:2007.

1 Scope

This European Standard specifies the safety, construction and performance requirements for mechanical thermostats intended for use with gas appliances and similar use, hereafter referred to as 'thermostats'.

This European Standard covers type testing only.

It applies to thermostats controlling the gas flow directly or indirectly through an integral gas valve, and which do not require external electrical energy for their operation.

It applies to thermostats of nominal connection sizes up to and including DN 50 with declared maximum inlet pressures up to and including 500 mbar (50 kPa) for use with one or more fuel gases in accordance with EN 437.

It only applies to thermostats used with gas appliances which are not installed in the open air.

Thermostats dealt with in this standard are intended for control functions.

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.

EN 13611:2007, *Safety and control devices for gas burners and gas-burning appliances — General requirements*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
control
[EN 13611:2007, 3.1]

3.2
control function
[EN 13611:2007, 3.2]

3.3
closure member
[EN 13611:2007, 3.3]

3.4
external leak-tightness
[EN 13611:2007, 3.4]

3.5
internal leak-tightness
[EN 13611:2007, 3.5]

3.6
inlet pressure
[EN 13611:2007, 3.6]

3.7
outlet pressure
[EN 13611:2007, 3.7]

3.8
pressure difference
[EN 13611:2007, 3.8]

3.9
maximum inlet pressure
[EN 13611:2007, 3.9]

3.10
minimum inlet pressure
[EN 13611:2007, 3.10]

3.11
flow rate
[EN 13611:2007, 3.11]

3.12
rated flow rate
[EN 13611:2007, 3.12]

3.13
maximum ambient temperature
[EN 13611:2007, 3.13]

3.14
minimum ambient temperature
[EN 13611:2007, 3.14]

3.15
mounting position
[EN 13611:2007, 3.15]

3.16
nominal size DN
[EN 13611:2007, 3.16]

3.17
apparatus
[EN 13611:2007, 3.17]

3.18
system
[EN 13611:2007, 3.18]

3.19
installation
[EN 13611:2007, 3.19]

3.20
fault tolerating time
[EN 13611:2007, 3.20]

3.21
fault reaction time
[EN 13611:2007, 3.21]

3.22
normal operation
[EN 13611:2007, 3.22]

3.23
defined state
[EN 13611:2007, 3.23]

3.24
complex electronics
[EN 13611:2007, 3.24]

3.25
reset
[EN 13611:2007, 3.25]

3.26
failure
[EN 13611:2007, 3.26]

3.27
degradation
[EN 13611:2007, 3.27]

3.28
fault
[EN 13611:2007, 3.28]

3.29
harm
[EN 13611:2007, 3.29]

3.30
hazard
[EN 13611:2007, 3.30]

3.31
risk
[EN 13611:2007, 3.31]

3.32
functional safety
[EN 13611:2007, 3.32]

3.33
program
[EN 13611:2007, 3.33]

3.34
breather hole
[EN 13611:2007, 3.34]

3.35
Types of thermostats

3.35.1
mechanical thermostat
thermostat which controls the temperature by adjusting the flow rate accordingly to the temperature of the sensor without any external energy, such that the temperature remains within defined limits, and which is distinguished to the following types

3.35.2
adjustable thermostat
thermostat in which the temperature set-point can be adjusted by the user between minimum and maximum values

3.35.3
fixed setting thermostat
thermostat that has a preset fixed operating temperature which cannot be adjusted by the user

3.35.4
snap-acting thermostat
thermostat with only two positions for the flow rate, i.e. 'full on-off', 'fall on-reduced rate' or 'reduced rate-off'

3.35.5
modulating thermostat
thermostat which controls the flow rate in accordance with a predetermined and continuous function of the temperature of the temperature sensor

3.35.6
modulating thermostat with additional on-off action
thermostat which acts as a snap-acting thermostat between the closed and reduced positions and as a modulating thermostat between the reduced and full-on positions

3.36
thermostat closure member
movable part of the thermostat which opens and closes the gasway and/or varies the flow rate

3.37
presetting thermostat
thermostat for adjusting an operating condition only by an authorized person. It may be fixed or variable, e.g. when it is the gas flow that is adjustable, either an orifice or an adjusting screw may be used

3.38
fixed bypass
non-adjustable presetting device for fixing the minimum gas flow through a thermostat

3.39
bypass adjusting device
screw adjustment or an exchangeable orifice, that fixes the minimum gas flow rate through the thermostat, and which is accessible only by the use of tools

3.40
temperature sensor
device which senses the temperature of the medium to be controlled or to be supervised

3.41
operating curve
graphical representation of the flow rate as a function of the sensor temperature at a given temperature set-point and at a constant inlet pressure

3.42
backlash
difference of position of the adjusting knob when it is moved in both directions to obtain the same flow rate at a constant sensor temperature

3.43
adjusting knob (or spindle)
part of the thermostat which is used to select the temperature set-point

3.44
temperature set-point
any value selected within the temperature range at which the controlled temperature should be maintained

3.45
temperature set-point range
range between the minimum and maximum adjustable temperature set-points (by means of the adjusting knob)

3.46
calibration flow rate
flow rate declared by the manufacturer for calibration

3.47
calibration temperature set-point
temperature at which the calibration flow rate should be obtained with the adjustment set to the position and in the direction declared by the manufacturer

3.48
temperature differential for snap-acting thermostats
difference in temperature necessary to obtain a change in the flow rate, at a given set-point

3.49
deviation
maximum deviation from the temperature set-point which is declared by the manufacturer

3.50
drift
permanent change in the operating curve of the thermostat

4 Classification

4.1 Classes of control

According to EN 13611:2007, 4.1.

Addition:

Thermostats are not classified.

4.2 Groups of control

According to EN 13611:2007, 4.2.

4.3 Classes of control functions

According to EN 13611:2007, 4.3.

5 Units of measurement and test conditions

According to EN 13611:2007, Clause 5.

6 Construction requirements

6.1 General

According to EN 13611:2007, 6.1.

Addition:

Thermostats shall shut off automatically the gas way to the burner with at least the sealing force specified in 7.14 in case of failure in the thermoelectric current.

Thermostats shall be designed so that during ignition either the gas way to the main burner is open, if there is no pilot burner, or the gas way to the main burner is closed, and that to the pilot burner is open.

6.2 Mechanical parts of the control

6.2.1 Appearance

According to EN 13611:2007, 6.2.1.

6.2.2 Holes

According to EN 13611:2007, 6.2.2.

6.2.3 Breather holes

EN 13611:2007, 6.2.3 is not applicable.

6.2.4 Test for leakage of breather holes

EN 13611:2007, 6.2.4 is not applicable.

6.2.5 Screwed fastenings

According to EN 13611:2007, 6.2.5.

6.2.6 Jointing

According to EN 13611:2007, 6.2.6.

6.2.7 Moving parts

According to EN 13611:2007, 6.2.7.

6.2.8 Sealing caps

According to EN 13611:2007, 6.2.8.

6.2.9 Dismantling and reassembly

According to EN 13611:2007, 6.2.9.

Addition:

If the thermostat, according to the manufacturer's instructions, can be dismantled in order to service it, the operation to do this shall not cause any change to the temperature calibration exceeding the maximum deviation at the calibration temperature set-point declared by the manufacturer (see 7.11.1).

6.2.10 Presetting thermostats

A presetting thermostat shall only be adjustable by a tool. It shall be easily accessible and shall not change of its own accord, but it shall be protected against unauthorized interference, e.g. using a lacquer.

A presetting thermostat which connects a gas-carrying part to atmosphere shall be made sound by a means which shall not seal on the thread, e.g. O-ring seal.

The presetting thermostat shall not be able to fall into the gasways of the thermostat. If an O-ring or equivalent provides a seal against the atmosphere, then when the presetting thermostat is completely unscrewed it shall not be able to be pushed out by gas pressure and shall remain tight at the higher pressure specified in 7.3.

If a presetting thermostat is used for different gas families it shall have a fixed minimum orifice.

Any cover of any presetting thermostat shall require a tool for removal and replacement and it shall not interfere with the adjustment of the temperature range.

6.3 Materials

6.3.1 General material requirements

According to EN 13611:2007, 6.3.1.

6.3.2 Housing

According to EN 13611:2007, 6.3.2.

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

According to EN 13611:2007, 6.3.3.

6.3.4 Zinc alloys

According to EN 13611:2007, 6.3.4.

6.3.5 Springs providing closing and/or sealing force

According to EN 13611:2007, 6.3.5.

6.3.6 Resistance to corrosion and surface protection

According to EN 13611:2007, 6.3.6.

6.3.7 Impregnation

According to EN 13611:2007, 6.3.7.