

Mechanical thermostats for gas-burning appliances

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National foreword

This British Standard has been prepared under the direction of the Gas Standards Policy Committee and is the English language version of EN 257 'Mechanical thermostats for gas-burning appliances' (including Amendment A1), published by the European Committee for Standardization (CEN). It supersedes BS 4201 : 1979 which is withdrawn. EN 257 was produced as a result of international discussion in which the UK took an active part.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 28, an inside back cover and a back cover.

Sidelining in this document indicates the most recent changes by amendment.

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English version

Mechanical thermostats for gas-burning appliances

(includes amendment A1 : 1996)

Thermostats mécaniques équipant les appareils
d'utilisation des combustibles gazeux
(inclut l'amendement A1 : 1996)

Mechanische Temperaturregler für Gasgeräte
(enthält Änderung A1 : 1996)

This European Standard was approved by CEN on 1992-02-06, amendment A1 was approved by CEN on 1995-11-30. 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.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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Foreword

This European Standard was prepared by the 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 European Standard has been prepared under a mandate given to CEN by the Commission of the European Communities and the European Free Trade Association and supports Essential Requirements of the EC Directives.

This standard covers type testing only.

In accordance with the Common CEN/CENELEC Rules, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

Foreword to amendment A1

This Amendment EN 257 : 1992/A1 : 1996 to EN 257 : 1992 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 Amendment to the European Standard EN 257 : 1992 is issued to align the standard with the essential requirements of the Gas Appliance Directive (90/336/EEC) and to correct errors in the first edition of the standard.

This Amendment to the European Standard EN 257 : 1992 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 1996, and conflicting national standards shall be withdrawn at the latest by December 1996.

This Amendment to the European Standard EN 257 : 1992 has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this Amendment: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This European Standard specifies the construction and performance requirements for mechanical thermostats for gas applications. It also establishes the definitions, test conditions and marking.

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

The requirements of this standard apply to thermostats for all gas appliances, either heating or cooling, which are suitable for gases of one or more fuel gases of the 1st, 2nd or 3rd families and for gas pressures as defined for these gas families.

This standard only applies to thermostats used with gas appliances which are not installed in the open air. Mechanical thermostats dealt with in this standard are intended for control functions.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publications referred to applies.

ISO 7-1 : 1982	Pipe threads where pressure-tight joints are made on the threads — Part 1 : Designation, dimensions and tolerances	ISO 262 : 1973	ISO general purpose metric screw threads — Selected sizes for screws, bolts and nuts
ISO 65 : 1981	Carbon steel tubes suitable for screwing in accordance with ISO 7-1	ISO 274 : 1975	Copper tubes of circular section — Dimensions
ISO 228-1 : 1982	Pipe threads where pressure-tight joints are not made on the threads — Part 1: Designation, dimensions and tolerances	ISO 301 : 1981	Zinc alloy ingots intended for casting
		ISO 1817 : 1985	Rubber, vulcanized — Determination of the effect of liquids
		ISO 7005 : 1988	Metallic flanges
		IEC 335-1 : 1983	Safety of household and similar electrical appliances — Part 1 : General requirements
		IEC 335-1 : 1983 + A4 : 1984 Amendment 4	
		IEC 335-1 : 1983 + A5 : 1986 Amendment 5	
		IEC 529 : 1989	Classification of degrees of protection provided by enclosures
		IEC 685-2-1 : 1980	Connecting devices (junction and/or tapping) for household and similar fixed electrical installations — Part 2: Particular requirements — Screwless terminals for connecting copper conductors without special preparation
		IEC 998-2-1 : 1990	Connecting devices for low voltage circuits for household and similar purposes — Part 2-1 : Particular requirements for connecting devices as separate entities with screw-type clamping units
		IEC 730-1 : 1986	Automatic electrical controls for household and similar use — Part 1 : General requirements
		CEE Rec. 6 : 1974	Snap-on connectors

3 Definitions

For the purposes of this standard, the following definitions apply.

3.1 mechanical thermostat (referred to as 'thermostat' in this standard)

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.

3.2 Types of mechanical thermostat

3.2.1 adjustable thermostat

Thermostat in which the temperature set-point can be adjusted by the user between minimum and maximum values.

3.2.2 fixed setting thermostat

Thermostat that has a preset fixed operating temperature which cannot be adjusted by the user.

3.2.3 snap-acting thermostat

Thermostat with only two positions for the flow rate, i.e. 'full on-off', 'full on-reduced rate' or 'reduced rate-off'.

3.2.4 modulating thermostat

Thermostat which controls the flow rate in accordance with a predetermined and continuous function of the temperature of the temperature sensor.

3.2.5 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.

3.3 closure member

Moving part of the thermostat which opens and closes the gas circuit and/or varies the gas rate.

3.4 breather hole

Orifice that allows atmospheric pressure to be maintained in a compartment of variable volume.

3.5 presetting device

Device 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.

3.6 fixed bypass

Non-adjustable presetting device for fixing the minimum gas flow through a thermostat.

3.7 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.

3.8 temperature sensor

Device which senses the temperature of the medium to be controlled or to be supervised.

3.9 Leak-tightness

3.9.1 external leak-tightness (soundness)

Leak-tightness of a gas-carrying compartment with respect to atmosphere.

3.9.2 internal leak-tightness (thermostat with complete shut-off)

Leak-tightness of the closure member when in a closed position sealing a gas carrying compartment with respect to another compartment or to the outlet of the thermostat.

The internal leak-tightness is the total leakage of those closure members in the closed position.

3.10 Pressures

3.10.1 general

All pressures are relative to the atmospheric pressure and are measured at right angles to the direction of gas flow.

3.10.2 inlet pressure

Pressure at the inlet of the thermostat.

3.10.3 maximum working pressure

Highest inlet pressure declared by the manufacturer at which the thermostat may be used.

3.10.4 minimum working pressure

Lowest inlet pressure declared by the manufacturer at which the thermostat may be used.

3.10.5 outlet pressure

Pressure at the outlet of the thermostat.

3.10.6 test pressure

Pressure to be applied during the test.

3.10.7 pressure difference

Difference between the inlet and outlet pressures with the closure member fully open.

3.11 flow rate

Volume of the air flowing through the thermostat in unit time.

3.12 rated flow rate

Air flow rate under standard reference conditions of temperature and pressure declared by the manufacturer at a pressure difference of 2,5 mbar with the closure member fully open.

3.13 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.

3.14 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.

3.15 maximum cycling frequency

Number of working cycles in unit time as declared by the manufacturer which shall not be exceeded during operation.

3.16 mounting position(s)

Position(s) declared by the manufacturer for mounting the thermostat.

3.17 adjusting knob (or spindle)

That part of the thermostat which is used to select the temperature set-point.

3.18 Temperature

3.18.1 maximum ambient temperature

Highest temperature of the surrounding air declared by the manufacturer at which the thermostat may be operated.

3.18.2 minimum ambient temperature

Lowest temperature of the surrounding air declared by the manufacturer at which the thermostat may be operated.

3.18.3 temperature set-point

Any value selected within the temperature range at which the controlled temperature should be maintained.

3.18.4 temperature set-point range

Range between the minimum and maximum adjustable temperature set-points (by means of the adjusting knob).

3.18.5 calibration flow rate

Flow rate declared by the manufacturer for calibration.

3.18.6 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.

3.18.7 temperature differential for snap-acting thermostats

Difference in temperature necessary to obtain a change in the flow rate, at a given set-point.

3.19 deviation

Maximum deviation from the temperature set-point which is declared by the manufacturer.

3.20 drift

Permanent change in the operating curve of the thermostat.

4 Group of thermostat

A thermostat is grouped according to the bending moment that it is required to withstand.

— Group 1 thermostats

A group 1 thermostat is a thermostat intended for use in a situation where it will not be subjected to bending stresses imposed by installation pipework, e.g. by the use of rigid adjacent supports.

— Group 2 thermostats

A Group 2 thermostat is a thermostat for use in any situation, either internal or external to the appliance and without support.

NOTE. A thermostat which complies with the requirements for group 2 thermostats shall be deemed to comply also with the requirements for group 1 thermostats.

5 Construction requirements

5.1 General construction requirements

5.1.1 Mechanical thermostats shall be designed, manufactured and assembled so that they function correctly when installed and used according to the manufacturer's instructions.

5.1.2 Thermostats shall be free from sharp edges and corners which might cause damage, injury or incorrect operation.

All parts shall be clean internally and externally.

5.1.3 Holes for screws, pins, etc., which are used for the assembly of parts of the thermostat or for mounting, shall not penetrate gasways.

The wall thickness between these parts and gasways shall be at least 1 mm.

5.1.4 Holes necessary in manufacture which connect gasways to the atmosphere but which do not affect the function of the thermostat shall be permanently sealed by metallic means.

NOTE. Suitable jointing compounds may additionally be used.