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Naprave za nadzor plamena pri plinskih aparatih - Termoelektriļ na varovala

Flame supervision devices for gas burning appliances - Thermo-electric flame supervision devices

Flammenüberwachungseinrichtungen für Gasgeräte - Thermoelektrische Zündsicherungen

Dispositifs de surveillance de flamme pour appareils utilisant les combustibles gazeux - Dispositifs thermoélectriques de sécurité a l'allumage et a l'extinction

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English version

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CEN

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

Central Secretariat: rue de Stassart 36, B-1050 Brussels

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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.

NOTE : (referring to 2.2.2 in this Standard resulting fromthe discussions during the elaboration of the Standard within CEN/TC 58):

It should be noted that in some member countries there may be legislation limiting the application of zinc and zinc alloys.

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 and United Kingdom.

1 General

1.1 Object and field of application

This standard specifies the safety, constructional and performance requirements for thermo-electric flame supervision devices, energized by a thermocouple, hereafter referred to as devices, intended for use with gas appliances. It also gives the test procedures for evaluating these requirements and information necessary for the purchaser and user.

This standard applies to devices of nominal connection size up to and including DN 50 for use with one or more fuel gases of the 1st, 2nd or 3rd families.

This standard does not cover the thermocouple.

1.2 References

ISO 7-1:1982	Pipe threads where pressure tight joints are made on the threads - Part I: Designation, dimensions and tolerances
ISO 65:1981	Carbon steel tubes suitable for screwing in accordance with ISO 7-1
ISO 228-1:1982	Pipe threads where pressure-tight joints are not made on the threads - Part I: Designation, dimensions and tolerances
ISO 262:1973	ISO general purpose metric screw threads - Selected sizes for screws, bolts and nuts
ISO 274:1975	Copper tubes of circular section - Dimensions
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 730-1(1986)	Automatic electrical controls for household and similar use Part 1: General requirements

1.3 Definitions

1.3.1 component parts

1.3.1.1 **thermocouple**. Thermo-electric flame sensing element that responds to the temperature of the supervised flame, and in which the flame effect produces an electromotive force (e.m.f.).

1.3.1.2 **flame supervision device**. Device which, in response to the e.m.f. produced by the thermocouple maintains the gas supply to the main burner or the main burner and the pilot burner open and which shuts off the gas supply to the main burner at least, after extinction of the supervised flame (see figures 6 and 7).

1.3.1.3 **ignition interlock**. Part which prevents the operation of the igniter as long as the main gasway is open.

1.3.1.4 **re-start interlock**. Mechanism which prevents the re-opening of the gasway to the main burner or to the main burner and the pilot burner until the armature plate has separated from the magnetic element.

1.3.1.5 **closure member**. Movable part of the device which shuts off the gas flow.

1.3.2 operational terms

1.3.2.1 leak-tightness

1.3.2.1.1 **external leak-tightness**. Leak-tightness of a gas-carrying compartment with respect to the atmosphere.

1.3.2.1.2 **internal leak-tightness**. Leak-tightness of the closure member (in the closed position) sealing a gas-carrying compartment with respect to another compartment or to the outlet of the device.

1.3.2.2 pressures

1.3.2.2.1 **inlet pressure**. Pressure at the inlet of the device.

1.3.2.2.2 **outlet pressure**. Pressure at the outlet of the device.

1.3.2.2.3 **maximum working pressure**. Highest inlet pressure declared by the manufacturer at which the device may be operated.

1.3.2.2.4 **minimum working pressure**. Lowest inlet pressure declared by the manufacturer at which the device may be operated.

1.3.2.3 **pressure difference**. Difference between the inlet and outlet pressures.

1.3.2.4 **flow rate**. Volume of the medium flowing through the device in unit time.

1.3.2.5 **rated flow rate**. Highest air flow rate at a pressure difference of 1 mbar with the device in the fully open position declared by the manufacturer corrected to standard conditions.

1.3.2.6 **temperature**

1.3.2.6.1 **maximum ambient temperature**. Highest temperature of the surrounding air declared by the manufacturer at which the device may be operated.

1.3.2.6.2 **minimum ambient temperature**. Lowest temperature of the surrounding air declared by the manufacturer at which the device may be operated.

1.3.2.7 **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.

1.3.2.8 **mounting position**. Position declared by the manufacturer for mounting the device.

1.3.2.9 **de-energized position**. Position of the valve or valves in the absence of the thermo-electrical energy or auxiliary energy (if applicable).

1.3.2.10 **auxiliary energy**. External energy for the valve or valves (e.g. electric, pneumatic or hydraulic auxiliary energy) other than that provided by the thermocouple.

1.4 Classification

1.4.1 *Classes of device*

Devices are classified by application into classes A, B or C (see 4.9.3.2). These classes are characterised for the number of operations that may be expected of the device during the life of the appliance.

1.4.2 *Groups of device*

A device is classified as group 1 or group 2 according to the bending stresses that it is required to withstand (see table 4).

- Group 1 devices

Devices for use in an appliance and/or installation where they are not subjected to bending stresses imposed by installation pipework, e.g. by the use of rigid adjacent supports.

- Group 2 devices

Devices for use in any situation, either internal or external to the appliance typically without support.

NOTE - A device which complies with the requirements for group 2 devices complies also with the requirements for group 1 devices.

1.5 Measuring units

1.5.1 All dimensions are given in millimetres

1.5.2 All pressures are static pressures above the atmospheric pressure and are expressed in millibars.

1.5.3 Bending moments and torques are given in newton metres.

2 Construction requirements

2.1 General construction requirements

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

They shall be designed such that in the event of failure in the thermo-electric current or auxiliary energy system, the device automatically shuts off the gas supply to the burner with at least the sealing force specified in 3.10.

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

All parts shall be clean internally and externally.

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

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

2.1.4 Holes necessary in manufacture which connect gasways to the atmosphere but which do not affect the function of the device shall be permanently sealed by metallic means. Suitable jointing compounds may additionally be used.

2.1.5 Closure parts, including those of measuring and test points, which may be dismantled for servicing, adjustment or conversion, shall be constructed such that leak-tightness in accordance with 3.2 will be achieved by mechanical means (e.g. metal to metal joints, O-rings). This excludes all jointing compounds such as liquids, pastes and tapes.

Jointing compounds, however, may be used for permanent assemblies and shall remain effective under normal operating conditions.

Closure parts not intended to be dismantled during servicing, adjustment or conversion shall be sealed by means which will show evidence of interference (e.g. lacquer).

2.1.6 Parts that require dismantling, e.g. for servicing, shall be capable of being dismantled and reassembled with common commercial tools and shall be so constructed or marked that, following the instructions of the manufacturer, incorrect assembly is impossible.

Screwed fastenings that may be removed during servicing shall have metric threads according to ISO 262:1973 unless a different thread is essential for the correct functioning and adjustment of the device.

Self-tapping screws that cut a thread and produce swarf shall not be used for connecting gas-carrying parts or parts that may be removed in servicing.

Only self-tapping screws that form a thread and do not produce swarf shall be used. They shall permit replacement by metric machine screws conforming to the above mentioned ISO standard.

2.1.7 The function of moving parts, e.g. diaphragms, bellows, shall not be impaired by other parts.

2.1.8 Soldering or other processes where the jointing material has a melting point below 450 °C after application shall not be used for joining gas-carrying parts except for additional sealing.

2.2 Materials

2.2.1 *General material requirements*

The quality of materials and the dimensions used and the method of assembling the various parts shall be such that construction and performance characteristics are safe. Moreover, the performance characteristics shall not alter significantly during a reasonable life when the device is installed and used according to the manufacturer's instructions. Under these circumstances, all components shall withstand any mechanical, chemical, and thermal conditions to which they may be subjected during service.

2.2.2 *Zinc alloys*

Zinc alloys shall only be used up to a maximum working pressure of 200 mbar if of quality ZnAl4 to ISO 301:1981 and if the parts will not be exposed to a temperature higher than 80 °C. For the main inlet and outlet threaded connections of devices, only external threads conforming to ISO 228-1: 1982 are permitted if these connections are made of zinc alloy.

2.2.3 *Housing*

Parts of the housing separating a gas-carrying compartment from the atmosphere shall be manufactured only of metallic materials.

This also applies to parts of the housing which are separated by a diaphragm from the gas-carrying compartment.

Nevertheless, a gas-carrying compartment may be made of non-metallic material provided that upon removal or fracture of this non-metallic part under all circumstances not more than 30 dm^3/h of air can escape at the maximum working pressure.

This clause is not intended to cover diaphragms, O-rings, gaskets and seals.

2.2.4 *Closure springs*

Springs providing the sealing force for the valve of the device as specified in 3.10 shall be made of corrosion-resistant materials and shall be designed to be fatigue resistant.

2.2.5 *Resistance to corrosion*

Any part in contact with the gas or the surrounding atmosphere, and springs other than those covered by 2.2.4, shall be manufactured from corrosion-resistant materials or shall be suitably protected. The corrosion protection for springs and other moving parts shall not be impaired by any movement.