

Australian Standard™

Thermoelectric flame safeguards



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Australian Liquefied Petroleum Gas Association
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Gas Appliance Manufacturers Association of Australia
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OF

AS 4620—2004

Thermoelectric flame safeguards

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NOTES

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PREFACE

This Standard was reviewed by the Standards Australia Committee, AG-011, Gas Components and Industrial Equipment, to supersede AG 204—1998, *Approval requirements for thermoelectric flame safeguards*. The Standard is republished without technical alterations.

The objective of this Standard is to provide manufacturers, designers, regulatory authorities, testing laboratories and similar organizations with uniform minimum requirements for the safety, performance and use of thermoelectric flame safeguards.

This Standard should not be regarded as a design specification or as an instruction manual.

In its preparation, consideration has been given to—

- (a) continuity of satisfactory operation;
- (b) the prevention of fire hazards, and explosions;
- (c) the prevention of injury to persons or property;
- (d) gas rules and regulations now in force; and
- (e) relevant International Standards.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of a Standard, whereas an ‘informative’ appendix is only for information and guidance.

Statements expressed in mandatory terms in notes to tables and figures are deemed to be requirements of this Standard.

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STANDARDS AUSTRALIA

Australian Standard

Thermoelectric flame safeguards

SECTION 1 SCOPE, CLASSIFICATION AND
DEFINITIONS

1.1 SCOPE

These requirements apply to flame safeguards operating on the thermoelectric principle.

Compliance with these requirements does not imply that a flame safeguard is acceptable for use without supplemental tests in its intended application.

Thermoelectric flame safeguards incorporating electrical components shall comply with the requirements of the appropriate electrical authority.

Requirements for combination controls are published in AG 209 (to be AS 4624) and for electronic flame safeguards are published in AG 210 (to be AS 4625).

1.2 CLASSIFICATION

Flame safeguards shall be classified according to type and class.

1.2.1 Type

The flame safeguards referred to herein may be one of two types:

- (a) Valve type flame safeguards—These incorporate a valve or valves that upon flame failure cut off the gas supply directly.
- (b) Switch type flame safeguards—These incorporate an electrical switch that upon flame failure breaks an electrical circuit. Switch type flame safeguards may include a pilot valve.

1.2.2 Class

The valve in the thermoelectric flame safeguard shall be classified as follows:

Class 1—A shut off valve having the tightest shut off requirements with respect to closure against reverse flow conditions.

Class 2—As Class 1 but with a lower shut off requirement with respect to closure against reverse flow conditions.

Class 3—As Class 1 but with no closure requirements against reverse flow conditions.

1.3 DEFINITIONS

For the purpose of this Standard, the following definitions apply:

1.3.1 Authority

Means the authority having jurisdiction or such authority as delegated. (Technical Regulator).

1.3.2 Certified

Assessed by a Certifying Body, and having a certificate number to demonstrate compliance with a Standard.

1.3.3 Certifying body

A body acceptable to the Technical Regulator that provides assurance of compliance of appliances and components with nominated standards or other accepted safety criteria.

1.3.4 Flame safeguard

A safety device that automatically cuts off the gas supply if the actuating flame is extinguished.

1.3.5 Flame safeguard, thermoelectric

A device which, when connected to a heated thermocouple, holds a valve open and/or holds electrical contacts closed by means of an electromagnet. The valve closes and/or the electrical contacts open when the thermocouple cools.

1.3.6 Gas

A combustible fuel gas which may be one of the following:

1.3.6.1 *Natural gas (NG)*

A hydrocarbon gas, consisting mainly of methane.

1.3.6.2 *Simulated natural gas (SNG)*

A gas comprising a mixture of LPG and air, in the approximate proportions of 55% gas and 45% air for commercial propane.

1.3.6.3 *Town gas (TG)*

A gas manufactured from coal or petroleum feedstocks.

1.3.6.4 *Tempered liquefied petroleum gas (TLP)*

A gas comprising a mixture of LPG and air, in the approximate proportions of 27% gas and 73% air for commercial propane.

1.3.6.5 *Liquefied petroleum gas (LPG)*

A gas composed predominantly of any of the following hydrocarbons, or any combination of them in the vapour phase; propane, propene (propylene), butane, butene (butylene).

1.3.7 Pilot

A permanently located burner independent of the main burner, small in relation to it, and arranged to provide ignition for the main burner.

1.3.8 Rated working pressure

The maximum allowable inlet pressure specified by the manufacturer.

SECTION 2 DESIGN AND CONSTRUCTION

2.1 MATERIALS

2.1.1 Continuity of satisfactory operation

Materials used in the construction shall be such that continuity of satisfactory operation can be expected during normal usage within the manufacturer's specification.

2.1.2 Suitability for the conditions of use

Materials and finishes, including dressings and lubricants, used in the construction, shall be suitable for the conditions of use (e.g. corrosion, temperature, handling, etc.).

2.1.3 Materials in contact with the gas

Materials in contact with the gas, including lubricants, dressings and jointing compounds, shall be suitable for use with all gases.

2.1.4 Melting point of materials

Valve bodies shall be made of materials having a melting point not less than 430°C.

2.1.5 Copper containing alloys

Brass parts shall be resistant to season cracking when tested in accordance with AS 2136.

2.1.6 Component parts shall be selected from appropriate Standards

Alloys used for component parts shall be selected from appropriate Australian Standards or their equivalent.

2.2 DESIGN AND CONSTRUCTION

2.2.1 Continued safe operation

Construction shall ensure the continued safe operation of the unit during usage within the manufacturer's specification.

2.2.2 Castings and hot pressings

All castings and hot pressings shall be clean and sound, free from laps, blow holes and pitting and all surfaces not machine finished shall be clean, smooth and free from sand.

2.2.3 Porous castings or cracks

Porous castings or cracks in gas-carrying parts shall not be sealed other than by an accepted method for the impregnation of castings e.g. vacuum impregnation.

2.2.4 Assembled valves to be clean

The assembled unit shall not contain dirt, casting sand, swarf or other foreign matter. There shall be no excess diaphragm dressing or jointing compound in the unit.

2.2.5 Accidental displacement of parts

Every part shall be secure against accidental displacement and shall be constructed to maintain a fixed relationship between essential parts under normal and reasonable conditions of handling and usage to ensure continued compliance with this Standard.

2.2.6 Factory calibration means sealed

Means provided for factory calibration shall be factory sealed to prevent accidental shifting after calibration.

2.2.7 Attachment of knobs, handles, movable dials and pointers

Knobs, handles, movable dials and pointers, where supplied, shall be securely attached to their spindles.

2.2.8 Springs

Springs shall be resistant to corrosion. The ends of a helical spring shall be flat and in a plane perpendicular to the axis of the spring. The coils of a cylindrical helical spring shall not be able to overlap.

2.2.9 Securing of parts together

Adhesives shall not be used for securing parts together without additional mechanical fixing means, except for labels.

2.2.10 Sharp edges

Constituent parts shall be free from sharp edges that may cause damage or injury.

2.2.11 Means of limiting the travel of manual valves

The means of limiting the travel of a manual valve shall be so arranged that it cannot be displaced or damaged.

2.2.12 Holes for assembly or mounting

Holes for screws, pins, etc., intended for the assembly of parts or for mounting shall not open into gasways and shall provide a minimum wall thickness of 1 mm from gasways.

2.2.13 Permanent sealing of non-functional holes

Non-functional holes used for manufacture and which form a passage between gasways and the atmosphere shall be permanently sealed by mechanical means.

2.2.14 Self-tapping screws

Self-tapping screws, other than those that form a fully swaged machine type thread, shall not be used to secure together the external joint of a gas-carrying component that may be removed in servicing. The application of thread-forming screws shall be limited to malleable materials and shall not result in deformation or cracking of the component.

2.2.15 The construction of parts not covered by this Standard

The construction of parts not covered by this Standard shall be in accordance with reasonable concepts of safety, substantiality and durability. The general assembly shall be of a neat and workmanlike character with all parts well fitted.

2.2.16 The tightening of a gland or any other adjustments

The tightening of a gland or any other adjustment will not destroy the ability of the control to meet this Standard.

2.3 DESIGN

2.3.1 Flame safeguard—Fail safe

A flame safeguard shall be of the fail safe type.

2.3.2 Safety device cannot be overridden

No means shall be incorporated to bypass, hold open or partly open any safety function when it should be closed.

2.3.3 Accessibility of integral parts

Integral parts that may require adjustment shall be accessible for adjustment.

2.3.4 Adjusting devices

Adjusting devices shall be arranged to prevent movement other than manual adjustment.

2.3.5 Locking device

The tightening of a locking device shall not alter the setting.

2.3.6 Components requiring servicing

Components requiring servicing during normal use shall be accessible and shall be manufactured so that parts cannot be incorrectly assembled.

2.3.7 Special tools not required for servicing or replacement

Special tools beyond those normally carried by service personnel shall not be required for field servicing or replacement.

2.3.8 Manual reset

A flame safeguard shall be designed so that when connected to the thermocouple specified by the manufacturer, it must be manually reset in order to open the valve or close the switch.

2.3.9 Protection of mechanism

The mechanism of a switch type flame safeguard shall be protected by an enclosure to avoid damage to or interference with operating parts.

2.3.10 Knobs and movable dials

Knobs and movable dials shall be so designed as to avoid accidental change of setting in service.

2.3.11 Connections

Except when the unit is supplied with special purpose fittings for a specific appliance, the connections shall be in accordance with an approved standard and, if threaded, shall be provided with spanner flats.

2.3.12 Proving of pilot flame

Where a pilot valve is incorporated, it shall not be possible to open the main valve or close the switch until the pilot flame has been proved.

2.3.13 Location or enclosure of electrical parts

Electrical parts shall be located or enclosed so that accidental contact or shorting of live parts will be prevented.

2.3.14 Separation of operating parts from stowed wiring

Operating parts shall be separated from stowed wiring by barriers or by their physical location.

2.4 MARKINGS

2.4.1 General

Markings shall be provided and shall include:

- (a) Manufacturer's name or trademark.
- (b) Model designation.
- (c) Month and year of manufacture or serial number.
- (d) Rated working pressure in kPa.