

BRITISH STANDARD

The design and construction of gas boosters used in association with combustion equipment – Specification

ICS 91.140.40



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Foreword

Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution.

This British Standard came into effect on 29 June 2007 and was prepared by Technical Committee GW/33, *Gas supply*. A list of organizations represented on the committee can be obtained on request to its secretary.

Supersession

BS 8487:2007+A1:2013 supersedes BS 8487:2007, which is withdrawn.

Information about this document

Text introduced or altered by Amendment No. 1 is indicated in the text by tags **A1** **A1**. Minor editorial changes are not tagged.

Use of this document

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is “shall”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

In particular, attention is drawn to the following statutory regulations:

Supply of Machinery Regulations 1992, as amended [1]

Provision and Use of Equipment at Work Regulations 1992 [2]

Dangerous Substances and Explosive Atmospheres Regulations [DSEAR] 2002 [3]

Electricity at Work Regulations 1989 [4]

Gas Safety (Installation and Use) Regulations 1998 [5]

Gas Safety (Installation and Use) Regulations (Northern Ireland) 2004 [6]

Gas Act 1986, as amended [7]

Introduction

This British Standard has been produced to address the growing use of centrifugal boosters on gas-fired plant. The boosters normally supply gas at pressures up to about 150 mbar, but almost identical units may also be used for combustion air duties.

The standard has been produced to enhance the advice provided by manufacturers with respect to the need for maintenance on gas boosters by competent persons. The sections on maintenance and commissioning within this standard will be of relevance to existing units.

1 Scope

This British Standard specifies the construction and maintenance requirements of indirectly and directly driven single-stage centrifugal booster assemblies (hereafter referred to as machines), working on first, second or third family gas, having an outlet pressure of not greater than 150 mbar.

This standard is not applicable to positive displacement gas and slide vane type compressors.

This standard is also applicable to machines with outlet pressures not greater than 150 mbar used on landfill gases or biogases or gas/air mixtures, provided that any additional design and safety issues have been incorporated.

Though applicable to single-stage machines only, this standard can be used as a basis for multi-stage machines where, in general, pressures higher than 150 mbar are achieved.

NOTE All pressures are gauge pressures. All pressure tests are performed with air under ambient conditions.

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.

BS EN 953, *Safety of machinery – Guards – General requirements for the design and construction of fixed and movable guards*

BS EN 1092 (all parts), *Flanges and their joints – Circular flanges for pipes, valves, fittings and accessories, PN designated*

BS EN 1515-1, *Flanges and their joints – Bolting – Part 1: Selection of bolting*

BS EN 10226-1, *Pipe threads where pressure tight joints are made on the threads – Taper external threads and parallel internal threads – Part 1: Dimensions, tolerances and designation*

BS EN 10255, *Non-alloy steel tubes suitable for welding or threading – Technical delivery conditions*

BS EN 60529, *Specification for degrees of protection provided by enclosures (IP code)*

BS EN 60730-1, *Automatic electrical controls for household and similar use – Part 1: General requirements*

BS EN ISO 228 (both parts), *Pipe threads where pressure-tight joints are not made on the threads*

BS EN ISO 10380:2003, *Pipework – Corrugated metal hoses and hose assemblies*

BS ISO 1940-1, *Mechanical vibration – Balance quality requirements for rotors in a constant (rigid) state – Part 1: Specification and verification of balance tolerances*

3 Materials and components

3.1 General

All materials used in the construction of the machine shall be suitable for their intended application and purpose, and shall not be liable to deterioration likely to cause a hazard within the intended design life of the machine.

All components shall be subject to defined quality control procedures; all castings shall be of good quality with no inclusions or porosity exceeding recognized good standards of engineering.

3.2 Design life

The machine shall be designed to have a life of at least 20 000 hours running and at least 3 years elapsed time.

NOTE Maintenance in accordance with the manufacturer's instructions is permitted during this period.

3.3 Mechanical strength

The mechanical strength of the machine shall be:

- a) capable of containing 150% of the machine's maximum declared outlet pressure;
- b) suitable for the intended application;
- c) such that, when tested in accordance with Annex A, the vibrations in use do not lead to fatigue failure of the booster base plate or any integral castings during their declared design life;
- d) such that the casing remains gas-tight in the event of failure of the rotating elements.

NOTE 1 This may be demonstrated by deliberately generating failure of the impeller blades.

NOTE 2 A casing is that part of the machine forming a gasway and which normally contains the impeller and its drive shaft, seals and bearings. In a high-speed indirect drive machine it is typically of aluminium or cast iron.

NOTE 3 Pressure tests are performed at 150% maximum working pressure for 5 minutes on air, ensuring a maximum leakage rate of 100 cm³/h.

The inlet and outlet connections shall conform to **12.2.**