

JIS

JAPANESE INDUSTRIAL STANDARD

**Convectors, Baseboard-Heaters
and Panel-Radiators**

JIS A 4004—1987

Translated and Published

by

Japanese Standards Association

Printed in Japan

In the event of any doubt arising,
the original Standard in Japanese is to be final authority.

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Convectors, Baseboard-Heaters
and Panel-Radiators

A 4004-1987

1. Scope

This Japanese Industrial Standard specifies convectors, baseboard-heaters and panel-radiators which use hot water at temperature 100°C and a pressure ⁽¹⁾ not exceeding 0.3 MPa, or steam at a pressure not exceeding 0.2 MPa, among the natural convection and radiation type heaters for room heating.

Note ⁽¹⁾ All pressures used in this Standard mean gauge pressures.

2. Definitions

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

- (1) heat source Such parts as burner, electric heater and chiller (heat pump) are called as heat sources.
- (2) rated heat emitting capacity The heating capacity, when a heater is operated under the conditions of Table 3 by the method of 6.1., is called as the rated heat emitting capacity.
- (3) rated volume flow rate of water In a hot water heater, the volume flow rate of hot water under the measuring conditions for rated heat emitting capacity shown in Table 3, is called as the rated volume flow rate of water, and its value shall be determined by the manufacturer.
- (4) rated waterflow resistance The waterflow resistance, when it is measured by the method of 6.2, while hot water is passed through a hot water heater at the rated volume flow rate of water, is called as the rated waterflow resistance.

3. Convectors

3.1 A convector means such natural convection type heater without heat source that the element (heat exchanger) consists of copper tubes and aluminium fins, is accommodated in a casing to promote convectional actions.

3.2 Classes and Type

- 3.2.1 Classes The classes of convector shall be as given in Table 1.

Applicable Standards and Reference Standards: See page 21.

Table 1. Class of Convector

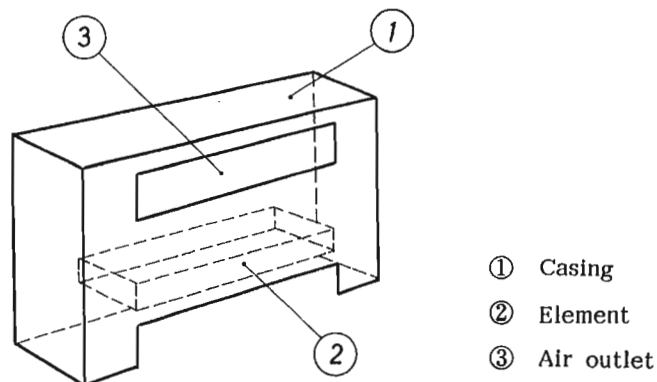
Class	Symbol
For hot water	W
For steam	S

3.2.2 Types The types of convectors shall be as follows:

- (1) Floor-installed Type A convector which is used, being installed on the floor in a room to be heated with its casing entirely exposed to the inside of the room.
- (2) Wall-hung Type A convector which is used, being installed on the wall adjacent to the floor in a room to be heated with its casing exposed to the inside of the room.

3.3 Names of Parts The names of principal parts of a convector shall be as given in Fig. 1.

Fig. 1. Example of Convector (Floor-installed Type)



3.4 Materials The materials for convectors shall be those conforming to the requirements of Table 2 or those at least equivalent in quality.

Table 2. Materials for Convector

Principal part	Name of material
Copper tubes of element	JIS H 3300
Fins of element	JIS H 4000 JIS H 4160
Header of element	JIS G 3131 JIS G 3141 JIS G 3452 JIS G 5501 JIS G 5502 JIS G 5702 JIS H 3100 JIS H 3300 JIS H 5111
Mounting fittings	JIS G 3101 JIS G 3141 JIS G 3313
Casing	JIS G 3141 JIS G 3302 JIS G 3313

3.5 Construction The construction of convectors shall be as follows:

- (1) Principal structural parts shall be manufactured from the materials specified in 3.4 Materials, and shall have high durability.
- (2) The parts which will be touched by a person under normal use conditions shall be free from sharp protrusions and corners.
- (3) The casing shall be free from deformation, crack and separation of weld.
- (4) The painting of the casing shall be smooth, and uniform in thickness of film, luster and tone of colour, and be free from such defects as uneven painting and run, and be sufficiently enduring to the temperatures under normal working conditions.
- (5) The convector using hot water shall have suitable equipment or construction to extract the air in the element.

3.6 Measuring Conditions for Rated Heat Emitting Capacity The conditions for measuring rated heat emitting capacity of convectors shall be as specified in Table 3.

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Table 3. Measuring Conditions for Rated Heat Emitting Capacity

For hot water	Inlet air condition	Dry bulb temperature	18.5°C
	Conditions of feed water	Mean hot water temperature	75.0°C
		Volume flow rate of hot water	Rated volume flow rate of water
For steam	Inlet air condition	Dry bulb temperature	18.5°C
	Condition of steam	Saturation temperature	102.0°C

3.7 Performances The performances of the convector shall conform to the requirements of Table 4.

Table 4. Performances

Item	Performance	Test method
Heat emitting capacity	100 ± 10 % of rated heat emitting capacity	6.1
Waterflow resistance (only for hot water)	100 ± 10 % of rated waterflow resistance	6.2
Airtightness and pressure resistance	Neither leakage nor abnormality shall occur.	6.3

4. Baseboard-Heater

4.1 A baseboard-heater means a heater without heat source consisting of the element (heat exchangers) made of steel tubes and steel fins, and the cover for its protection, to be installed along the wall bottom baseboard parts inside a room.

4.2 Classes and Types

4.2.1 Classes The classes of baseboard-heater shall be as given in Table 5.

Table 5. Class of Baseboard-Heater

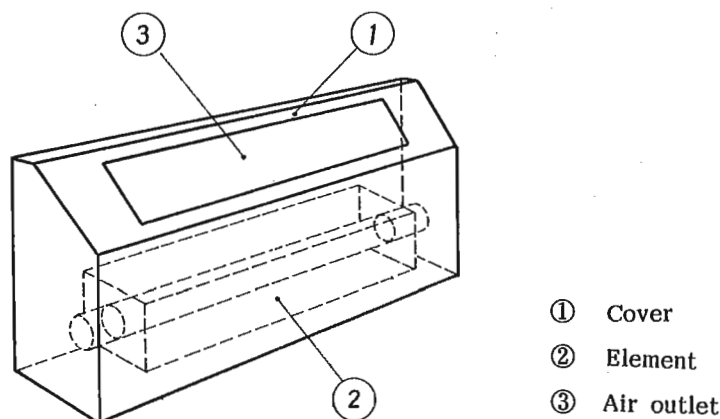
Class	Symbol
For hot water single stage system	W 1 H
For hot water double stage system	W 2 H
For steam single stage system	S 1 H
For steam double stage system	S 2 H

4.2.2 Types The types of baseboard-heater shall be as given in the following:

- (1) Wall-hung Type A baseboard-heater which is used, being installed on the wall adjacent to the floor inside the room to be heated, and the cover of which is exposed to the inside of the room.
- (2) Floor-installed Type A baseboard-heater which is used, being installed on the floor inside the room to be heated, and entire cover of which is exposed to the inside of the room.

4.3 Names of Parts The names of principal parts of a baseboard-heater shall be as given in Fig. 2.

Fig. 2. Example of Baseboard-Heater (Wall-hung Type · Single Stage)



4.4 Materials The materials for baseboard-heaters shall be those conforming to the requirements of Table 6 or those at least equivalent in quality.

Table 6. Materials for Baseboard-Heater

Principal part	Name of material
Steel tubes of element	JIS G 3452
Fins of element	JIS G 3141 JIS G 3302 JIS G 3312 JIS G 3313
Couplings of element	Nominal pressure 5 K of JIS B 2220 JIS B 2301
Mounting fittings	JIS G 3101 JIS G 3141 JIS G 3313
Cover	JIS G 3141 JIS G 3302 JIS G 3313

4.5 Construction The construction of baseboard-heaters shall be as follows:

- (1) The principal structural parts shall be made of the materials specified in 4.4 Materials, and shall have high durability.
- (2) The parts which will be touched by a person under normal use conditions shall be free from sharp protrusions and corners.
- (3) The cover shall be free from deformation, crack and separation of weld.
- (4) The painting of the cover shall be smooth, and uniform in thickness of film, luster and tone of colour, be free from such defects as uneven painting and run, and be sufficiently enduring to the temperatures under normal working conditions.
- (5) The baseboard-heater using hot water shall have suitable equipment or construction to extract the air in the element.

4.6 Measuring Conditions for Rated Heat Emitting Capacity The conditions for measuring rated heat emitting capacity of baseboard-heater shall be as specified in Table 3.

4.7 Performances The performances of baseboard-heaters shall conform to the requirements of Table 4.