

JIS

JAPANESE INDUSTRIAL STANDARD

Electric radiant heaters

Ⓒ JIS C 9202—1990

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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Electric Radiant Heaters

C 9202-1990

1. Scope

This Japanese Industrial Standard specifies electric radiant heaters of rated power consumption not exceeding 2 kW (hereafter referred to as "heaters"). This Standard, however, does not apply to heaters of convection type, heat storage type, built-in type, wall type and heaters with hot air blower.

Remarks 1. Heaters of convection type and heat storage type referred in this Standard mean the following:

- (1) Convection Type A heating appliance of such a system that it has no glowing heating element and the heat is emitted as radiant heat and natural convection heat from the heat radiation panel.
- (2) Heat Storage Type A heating appliance of such a system that the heat is not directly emitted from the heating element as its radiant heat but the heat is stored in the heat storage material around the heating element and then emitted as the radiant heat from the said material.

2. Applicable Standards are listed below:

JIS C 2520-Wires and Rolled Wires for Electrical Heating

JIS C 3301-Rubber Insulated Flexible Cords

JIS C 3327-600 V Rubber Insulated Flexible Cables

JIS C 8303-Plugs and Receptacles for Domestic and Similar General Use

JIS C 8304-Small Switches for Indoor Use

JIS C 8358-Appliance Couplers for Domestic and Similar Use

JIS K 2240-Liquefied Petroleum Gases

JIS K 5400-Testing Methods for Paints

JIS K 7202-Method of Rockwell Hardness Test for Plastics

JIS S 6006-Pencils and Coloured Pencils

JIS S 7002-Sporting Rubber Balls

3. The units and numerical values given in { } in this Standard are based on the traditional unit system and are appended for informative reference.

2. Definitions

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

- (1) electric radiant heater A heating appliance which is composed of the heating element that glows under normal service state and the reflector for making the heat radiation in a certain direction, and which is located on a floor during service.
- (2) blower A device which is composed of a fan and a fan driving motor and which blows the air warmed by the glowing heating element inside the appliance body out of the body.
- (3) hot air blower A heating appliance which is composed of a heating element exclusively for heating of air, a fan and a fan driving motor and which carries out heating only by the hot air produced by the said components.
- (4) steam generator Generic name of a device which is composed of a water tank and an exclusive heating element and which generates steam by the heat produced by the heating element.
- (5) Overturn-safety switch A switch which cuts off the circuit of the heating element which the appliance body overturns.
- (6) automatic oscillating mechanism A mechanism which changes the direction of heat radiation by moving the appliance body equipped with a reflector and a heating element right and left through a predetermined angle by means of a motor.
- (7) appliance body All of the heater.
- (8) glowing heating element The heating element glowing of which can be visually verified under the light of fluorescent lamp.
- (9) burning The heat generating action of a substance due to oxidation which accompanies flame, glow or discharge of large amount of smoke.

3. Rating

3.1 Rated Voltage The rated voltage of heaters shall be a single-phase a.c. voltage not exceeding 300 V.

3.2 Rated Frequency The rated frequency shall be 50 Hz, 60 Hz or 50 Hz/60 Hz.

4. Performances

4.1 Voltage Fluctuation The heater shall be capable of being used without any trouble when subjected to the test of 7.2.

4.2 Power Consumption When the test of 7.3 is carried out, the power consumption shall be as specified in Table 1 in correlation with the rated power consumption.

Table 1. Tolerance on Power Consumption

Rated power consumption W	Tolerances %
Over 100 up to and including 1000	±10
Over 1000	± 5

4.3 Insulation

4.3.1 Insulation Resistance When the test of 7.4.1 is carried out, the insulation resistance shall be 1 MΩ or more.

4.3.2 Dielectric Withstand Voltage The heater shall withstand the test voltage when subjected to the test of 7.4.2.

4.3.3 Insulation Resistance at Water Overflow When a heater equipped with a steam generator is tested as specified in 7.4.3 (1), the insulation resistance shall be 0.3 MΩ or more and when the heater is tested as specified in 7.4.3 (2), the insulation resistance shall be 1 MΩ or more.

4.4 Temperature

4.4.1 Normal Temperature When the test of 7.5.1 is carried out, the temperature of each part of the heater shall not exceed the relevant value given in Table 2.

Table 2. Temperature

Unit: °C

Measurement position		Temperature
Handle for transfer (excluding ones operated by a man during use)	Made of metals, ceramics and glass	60
	Made of others	75
Knob of switch and push button	Made of metals, ceramics and glass	60
	Made of others	75
Surface of wooden board on which heater is placed		80
Outside surface of enclosure (excluding protective frame of heating element and reflector)		125
Rectifier (ones used in a.c. side circuit only)	Made of silicone	135
Winding	of class A insulation	100
	of class E insulation	115
	of class B insulation	125
	of class F insulation	150
	of class H insulation	170
Surface of each layer of wire inside cord reel mechanism	Natural rubber compound, polyurethane rubber compound	60
	Chloroplene rubber compound, styrene-butadiene rubber compound	75
	Butyl rubber compound, ethylene-propylene rubber compound	80
	Chlorosulfonic polyethylene rubber compound, silicone rubber compound	90

Remarks: The reference ambient temperature is 20°C.

4.4.2 Abnormal Temperature The heater shall comply with the requirements prescribed below when tested in accordance with 7.5.2.

- (1) The temperature of each part shall not exceed the relevant value given in Table 3. However, if the specimen or the wooden base does not burn when the temperature limiter operates, such a case is an exception.

Table 3. Temperature Limits

Measurement position	Temperature °C
Wooden board and leg parts in contact with board	150
Enclosure	150

Remarks: The reference ambient temperature is 20°C.

- (2) The insulation resistance between the surface of appliance body and the live parts measured by a d.c. 500 V insulation resistance tester shall be not less than 0.1 MΩ.

4.4.3 Abnormal Temperature Checked by Flannelette When the heater is tested as specified in 7.5.3, the test flannelette shall not burn.

4.5 Temperature Due to Radiation When the test is carried out in accordance with 7.6, the temperature due to radiation of the heater shall be such that the temperature rise of the measurement point shall be not less than the relevant value given in Table 4.

Table 4. Temperature Rise Due to Radiation

Rated power consumption W	Temperature rise °C
Up to and including 500	5
Over 500 Up to and including 1000	8
Over 1000	10

4.6 Endurance of Electric Heating Wire (Ribbon) The electric heating wire (ribbon) shall not break when tested in accordance with 7.7.

4.7 Endurance of Cord

4.7.1 Flexure of Joint between Body and Cord When a heater having no cord reel mechanism is tested in accordance with 7.8.1, the cord shall not cause short circuit or other hazards, and the relative breakage of component wires shall not exceed 20%.

4.7.2 Flexure of Joint between Non-Renewable Connector and Cord When a heater having a non-renewable connector with cord is tested in accordance with 7.8.2, the cord shall not cause short circuit or other hazards, and the relative breakage of component wires shall not exceed 20%.

4.7.3 Endurance of Cord Reel Mechanism When a heater equipped with a cord reel mechanism is tested in accordance with 7.8.3, the cord shall not cause short circuit or other hazards and the relative breakage of component wires shall not exceed 20%.

4.8 Performances of Thermostat and Self-resetting Temperature Limiter
The heater equipped with a thermostat which is so constructed that it is operated by the heat generated from the electric heater and it controls the temperature by mechanically switching the contacts and a self-resetting temperature limiter shall comply with the following requirements:

- (1) Make-break Property When the make-break test is carried out as specified in 7.9.1, no abnormality shall appear at any part.
- (2) Operating temperature The operating temperature shall comply with Table 5, when the test of 7.9.2 is carried out.

Table 5. Tolerance on Operating Temperature

Classification		Permissible range
Before make-break test	Thermostat	The average value of the average temperature at which the circuit opens and the average temperature at which the circuit closes shall fall within $\pm 5^{\circ}\text{C}$ from the set temperature for heaters with a temperature setting of less than 100°C , within $\pm 5\%$ for the ones with a setting of 100°C to 200°C incl., and within $\pm 10^{\circ}\text{C}$ for the ones with a setting of over 200°C .
	Self-resetting temperature limiter	The average value of temperatures at which the circuit opens shall fall within $\pm 15^{\circ}\text{C}$ from the set temperature.
After make-break test	Thermostat	The average value of the average temperature at which the circuit opens and the average temperature at which the circuit closes shall fall within $\pm 5^{\circ}\text{C}$ from the value measured before the make-break test for heaters with a temperature setting of less than 100°C and within $\pm 5\%$ from the value before test, for the ones with a setting of 100°C or more.
	Self-resetting temperature limiter	The average value of temperatures at which the circuit opens shall fall within $\pm 5^{\circ}\text{C}$ from the value measured before the make-break test for heaters with a temperature setting of less than 100°C , and within $\pm 5\%$ from the value before test for the ones with a setting of 100°C or more.

4.9 Performance of Non-self-resetting Temperature Limiter The heater equipped with a non-self-resetting temperature limiter which operates due to the temperature shall comply with the following requirements:

- (1) Make-break Property When the make-break test is carried out as specified in 7.10.1, no abnormality shall appear at any part.
- (2) Operating Temperature The operating temperature shall comply with Table 6, when the test of 7.10.2 is carried out.

Table 6. Tolerance on Operating Temperature

Classification	Permissible range
Before make-break test	The average value of temperature at which the circuit opens shall fall within $\pm 15^{\circ}\text{C}$ from the set temperature.
After make-break test	The average value of temperatures at which the circuit opens shall fall within $\pm 5^{\circ}\text{C}$ from the value measured before the make-break test for heaters with a temperature setting of less than 100°C , and within $\pm 5\%$ from the value before test for the ones with a setting of 100°C or more.

4.10 Resistance to Overturn by Bump When a heater is tested as specified in 7.11., the appliance body shall not overturn.

4.11 Operation of Overturn-Safety Switch When a heater is tested as specified in 7.12, the overturn-safety switch shall operate surely and the newspaper shall not burn.

4.12 Automatic Oscillation When a heater equipped with an automatic oscillating mechanism is tested as specified in 7.13, no abnormality shall appear on the automatic oscillating mechanism.

4.13 Starting When a heater equipped with a motor is tested as specified in 7.14, the motor shall start irrespective of the position of the rotor.

5. Construction

5.1 Construction in General The construction of heaters shall comply with the following requirements:

- (1) Heaters shall be assembled to have correct shape and the appearance shall be good.
- (2) The parts of metallic cover or box of a switch to which the arc due to opening or closing of the switch may reach, shall be lined with an arc resistant electrical insulating material.