

JIS

JAPANESE INDUSTRIAL STANDARD

**Gas burning space heaters
for domestic use**

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

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1. Scope

This Japanese Industrial Standard specifies gas burning space heaters mainly for general domestic use⁽³⁾ (hereafter referred to as appliance), using liquefied petroleum gas or city gas⁽¹⁾ (hereafter referred to as gas) as the fuel of marked gas consumption⁽²⁾ of 18.6 kW: 67.0 MJ/h {appliance for liquefied petroleum gas 1.33 kg/h, that for city gas 16000 kcal/h} or less.

Notes ⁽¹⁾ The liquefied petroleum gas means the gas described in "Standard of liquefied petroleum gas" of enforcement regulation (1968, Ministerial Notification of Ministry of International Trade and Industry No. 14) based on the Law Concerning the Securing of Safety and the Optimization of Transaction of Liquefied Petroleum Gas (1967, Law No. 149).

The city gas means the gas of gas group described in the Ministerial Notification concerning the verification and the like of gas products (1971, Notification of Ministry of International Trade and Industry No. 27) based on the Gas Utility Industry Law (1954, Law No. 51).

⁽²⁾ The marked gas consumption means the gas quantity when using the appliance under the using condition at the maximum gas consumption, which is the marked value on the appliance.

⁽³⁾ The gas burning space heater means the appliance to make the room warm according to convection, radiation, etc. by using the heat generated by gas combustion.

Remarks 1. Applicable Standards to this Standard are shown in the following:

JIS B 0203-Taper Pipe Threads

JIS S 2092-General Constructions of Gas Burning Appliances for Domestic Use

JIS S 2093-Test Methods of Gas Burning Appliances for Domestic Use

2. In this Standard the units and numerical values shown in { } are in accordance with the traditional units and are Standard values.

Further, on and after Jan. 1, 1995, these are in accordance with the International System of Units (SI) and the traditional units and numerical values are Informative reference.

3. In this Standard the marked gas consumptions are described in four kinds of units and numerical values, but for each kind is substantially equivalent.
4. Pressures in this Standard, others than those indicated as atmospheric pressure are gauge pressures in all.

2. Classification

2.1 Classification in general

2.1.1 The classification of appliances according to installation system shall be as given in Table 2 of JIS S 2092, and the classification according to air supply and exhaust system, as given in Table 3 of JIS S 2092.

2.1.2 The classification according to installation mode of appliance shall be as given in Table 4 of JIS S 2092.

2.2 Classification according to heating system The classification according to heating system shall be as given in Table 1.

Table 1. Classification according to heating system

Heating system	Classification content	(Informative reference)
Radiating type	The system mainly to utilize radiation heat	Informative reference Fig. 1.
Natural convection type	The system to warm the room by natural convection.	Informative reference Fig. 2.
Forced convection type	The appliance body is built-in with a fan and warm the room by forced convection.	Informative reference Fig. 3.

3. Performance

The appliance, when tested according to JIS S 2093 and 5., shall satisfy the performance of Table 2.

Table 2. Performance and test method

Item	Performance	Test method	
		JIS S 2093	Test method specified in this Standard
Airtightness of gas passage	The leak quantity through appliance valve is 0.07 l/h max.	Table 6	
	The leak quantity through gas choking valve other than appliance valve is 0.55 l/h max.		
	From the gas connecting opening to burner port, the leak to outside is absent.		
	The accuracy to the marked gas consumption is $\pm 10\%$.		
Gas consumption		Table 5	For the forced convection type appliance capable of adjusting the wind quantity according to blower for convection, set up the condition at the maximum wind quantity.
Combustion condition and ordinary atmosphere condition of BP-D	Flame establishment is sound and is free from explosive ignition.	Table 7	The combustion gas sampling position of unvented system appliance and sampler are to be as given in Attached Fig. 1. In this case, the CO ₂ concentration in the sampled combustion gas, as a rule, is 1.5 % min. relating to appliance for liquefied petroleum gas, and 1.2 % min. relating to appliance for city gas.
	To be free from lifting.		
	To be free from flame failure.		
	The flame is uniform.		
	To be free from flash-back.		
	Continuous noise is 60 dB max.		
	At the time of extinction of flame, to be free from explosive noise.		

Table 2. (Continued)

Item	Performance	Test method	
		JIS S 2093	Test method specified in this Standard
	CO concentration (vol. %) in theoretical dry combustion gas (hereafter referred to as CO %) is 0.28 % (For unvented type 0.07 %) max.	Table 7	
	CO % until the oxygen concentration (dry) in supply air attains 18 % is 0.07 % max. (Applies to the unvented system having no incomplete combustion preventive apparatus).	Table 7	(1) <u>Test conditions</u> Set up the test gas conditions B-1 or 1-1. (2) <u>Appliance condition</u> In the appliance capable of adjusting the gas consumption the condition shall be in the range. (3) <u>Test method</u> Gradually reduce the oxygen concentration (The speed of not more than 1.5 % in 10 min. However, in the case it does not exert any influence on the test results, it may not be in accordance with this), and measure CO % in the combustion gas.
	When the primary air inlet of the main burner is changed from full open up to full close, CO % shall be not more than 0.07 % (This applies to the appliance of unvented system without incomplete combustion preventive apparatus).	Table 7	(1) <u>Test conditions</u> Set up the test gas conditions B-1 or 1-1. (2) <u>Appliance condition</u> In the appliance capable of adjusting the gas consumption the condition shall be in the range. (3) <u>Test method</u> Change the primary air inlet of main burner from full open up to full close, and measure CO % in combustion gas.
	To be free from generation of soot.	Table 7	
	The yellow flame does not contact always with the electrode part and heat exchange part.		

Table 2. (Continued)

Item	Performance	Test method	
		JIS S 2093	Test method specified in this Standard
	To be free from flowing out of combustion gas from the other parts than the exhaust-air opening.	Table 7	
	To be free from extinction of flame and flash-back of pilot burner.		
Exhaust air clogging condition	CO % in combustion gas flowing out from the parts other than exhaust air opening is 0.28 % max. (Applies to CF)	CF: Table 24	
Wind existing condition	To be free from flame failure, flash-back and overflow of flame harmful to use (Except the unvented system).	FE: Table 25	
	To be free from flame failure and flash-back of pilot burner (Except the unvented system).	BF-W: Table 26	
	To be free from flowing-out of combustion gas from parts other than exhaust air opening. (Applies to FE)	BF-C: Table 28	
	CO % is 0.28 % max. (Applies to BF and FF)	BF-D: Table 30	
	Flame establishment is sound and is free from explosive ignition. (Applies to BF, FF and RF)	FF: Table 33	

Table 2. (Continued)

Item	Performance	Test method	
		JIS S 2093	Test method specified in this Standard
Water sprinkling condition	To be free from extinction of flame. (Applies to BF-W, FF and RF).	RF: Table 35	
	Flame establishment is sound and is free from explosive ignition.	BF-D: Table 30	
	To be free from flame failure and flash-back of pilot burner.		
	To be free from flame failure.		
	To be free from generation of soot.		
Temperature rise	CO % is 0.28 % max.		
	The surface of part to be touched by hand at operating time (Surface of knob)	Table 10 Table 14	(1) Installation condition of appliance Install the appliance on the temperature measuring board indicated in Attached Fig. 2 so as the space between the appliance, exhaust pipe, etc. and the temperature measuring board to be as indicated in the following table according to the gist instructed by manufacturer (The gist indicated by the instructions and the like). Further, in case where relating to the space from the temperature measuring board, the countermeasures effective to fire prevention have been taken and the interval instructed by manufacturer is less than those specified in the following table, it is to be in accordance with the conditions specified.
	Those made of metal, pottery and glass are 60°C max. Others 70°C max.		
	Surface of part being apt to touch with hand at operating time		
	Surface of dry cell 55°C max. Surface of gas connecting opening (Except thread connection opening). 60°C max.		

Table 2. (Continued)

Item	Performance	JIS S 2093	Test method	
			Test method specified in this Standard	
	Outer surface of parts of gas passing of gas choking valve (including appliance valve) 85°C or not more than the temperature confirmed that according to the heat resistance test it complies with the item of airtightness of gas passage and its operation is free from abnormalities.		Space between the appliance and the temperature measuring board Unit: mm	
	Surface of ignition unit (including piezoelectric element) 85°C or not more than the temperature confirmed that according to the heat resistance test it is free from hindrance to use.			

Table 2. (Continued)

Item	Performance		Test method	
			JIS S 2093	Test method specified in this Standard
	Outer surface of part of gas passage of appliance governor	70°C or not more than the temperature confirmed that according to heat resistance test it complies with the item of airtightness of gas passage and the variation of regulating pressure is not more than (0.05 P_1 + 29.4) Pa $\{(0.05 P_1 + 3) \text{ mmH}_2\text{O}\}$ P_1 : regulated pressure before the heat resistance test.		

Table 2. (Continued)

Item	Performance	Test method	
		JIS S 2093	Test method specified in this Standard
Ordinary time temperature rise (Wooden wall and the like)	Surfaces of wooden walls of rear side and side of appliance and upper ceiling surface as well as the surface of wooden base underneath the appliance.	Table 10 Table 26 Table 28 Table 30 Table 33	(2) Using condition of appliance Set up the appliance under the condition of maximum gas consumption. For the forced convection type appliance capable of adjusting the wind quantity of blower for convection, set up the condition of the minimum wind quantity. Further, relating to the forced convection type appliance of which gas passage is not closed at the time of interruption of power supply, carry out the test also under the condition of interruption of power supply.
	Surface of wooden frame of wall through which vent and air-intake pipe passes.		(3) Temperature measuring time The temperature measuring time shall be 1 h after igniting the burner relating to each part of appliance, and successive 1 h relating to the wooden wall surrounding the appliance and the like.
	Surface of wooden wall adjacent to the exhaust pipe's top or vent and air-intake pipe's top (Except CF).		(4) The abnormal time temperature rise test of forced convection type appliance shall be carried out relating to the appliance of which main burner is closed at the time of interruption of power supply, and the condition of appliance and temperature measuring time shall be as follows.
	Exhaust air temperature (")(Except unvented system).	260°C max.	