

JIS

JAPANESE INDUSTRIAL STANDARD

Dehumidifiers

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In the event of any doubt arising,
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1. Scope

This Japanese Industrial Standard specifies such electrical defumidifiers⁽¹⁾ for the purpose of reducing of the humidity in a room, the compression refrigerating machine, blower, etc. are accommodated in a cabinet and the total sum of the powers consumed by motors necessary for exerting the defumidifying ability does not exceed 500 W (hereafter referred to as the "dehumidifier").

Note ⁽¹⁾ The electrical dehumidifier means a machine of such system that the air cooled and dehumidified by the heat exchanger is reheated, and the reheating by the electric heater or the like is also included besides that by the heat exchanger.

Remarks: The following Standards are cited in this Standard:

JIS C 0602-General Rules of Color Identification for Protective Conductor and Neutral Conductor and Terminal Marking for Apparatus

JIS C 1502-Sound Level Meters

JIS C 3306-Polyvinyl Chloride Insulated Flexible Cords

JIS K 2211-Refrigerating Machine Oils

JIS K 2240-Liquefied Petroleum Gases

JIS K 5400-Testing Methods for Paints

JIS K 7202-Method of Rockwell Hardness Test for Plastics

JIS K 8116-Ammonium Chloride

JIS S 6006-Pencils and Coloured Pencils

JIS Z 8731-Methods of Measurement and Description of A-Weighted Sound Pressure Level

2. Definitions

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

- (1) rated dehumidifying effect The amount of water condensed expressed in liters per day (24 h) when a dehumidifier is operated under the conditions specified in 8.4. It means the value marked on the nameplate.
- (2) rated power consumption The total sum of powers consumed by a dehumidifier when it is operated under the conditions specified in 8.5. It means the value marked on the nameplate.

- (3) type A The dehumidifier whose low temperature performance is guaranteed under the low temperature condition A of Table 7.
- (4) type B The dehumidifier whose low temperature performance is guaranteed under the low temperature condition B of Table 7, so that it can exert its dehumidifying ability in a place where the air temperature is low during winter season.

3. Classification

The dehumidifiers are classified as stated below according to the function and rated dehumidifying effect.

(1) Classification by function

(a) Type A

(b) Type B

(2) Classification by rated dehumidifying effect (l/d)

2.0	2.2	2.5	2.8	3.2	3.6	4.0	4.5
5.0	5.6	6.3	7.1	8.0	9.0	10	11
12	14	16	18	20	22	25	28

4. Rated voltage and rated frequency

The rated voltage of dehumidifier shall be single-phase a.c. 300 V or less and the rated frequency shall be 50 Hz, 60 Hz or 50/60 Hz in common.

5. Performances

5.1 Leakage of refrigerant When the test of 8.3 is carried out, there shall be no leakage of refrigerant at every part of the refrigerant circuit.

5.2 Dehumidifying effect When the test of 8.4 is carried out, the dehumidifying effect shall be not less than 95 % of the rated dehumidifying effect.

5.3 Power consumption When the test of 8.5 is carried out, the total sum of powers consumed shall not exceed 110 % of the rated power consumption.

5.4 Temperature When the test of 8.6 is carried out, the temperature at each part of dehumidifier shall not exceed the appropriate value shown in Table 1, and no abnormal heat is produced at other parts.

Table 1. Temperature

Unit: °C

Measurement position			Temperature
Winding	Hermetic compressor motor	Synthetic resin insulation	135
		Other insulation	125
	Others	Class A insulation	100
		Class E insulation	115
		Class B insulation	125 (120)
		Class F insulation	150 (140)
		Class H insulation	170 (165)
Motor enclosure			150
Rectifier (only that used in power supply circuit)	Made of selenium	75	
	Made of germanium	60	
	Made of silicon	135	
Contact of fuse clip and fuse			90
Carrying handle (excluding that operated by a man during service)	Made of metal, ceramics or glass	65	
	Made of others	80	
Handle operated by a man during service	Made of metal, ceramics or glass	55	
	Made of others	70	
Knob of switch and push button	Made of metal, ceramics or glass	60	
	Made of others	75	
Enclosure	Touched by a man in service	Made of metal, ceramics or glass	55
		Made of others	70
	Easily accessed by a man	Made of metal, ceramics or glass	85
		Made of others	100
	Not easily accessed by a man		
Surface of wooden base on which specimen is placed			95

Remarks: The numerical values in parentheses are applicable to motor windings.

5.5 Overload performances When the test of 8.7 is carried out, the overload performances shall comply with the following requirements:

- (1) During the first two hours, the overload protective device shall not operate and the dehumidifying running can be continued without any abnormality in the motor, electric components, wiring, refrigerant circuit and other parts.
- (2) The dehumidifying running can be continued when the specimen is put into running again after standing still of the specified time by the manufacturer (within 3 min). However, in a dehumidifier employing automatic resetting overload protective device, run and stop of compressor may be repeated due to on-off of the overload protective device during 5 min from the rerunning.

In such a dehumidifier that the overload protective device operates within 5 min from the rerunning and the overload protective device does not reset within the said 5 min, the overload protective device shall reset within 30 min from its operation, and the dehumidifying running can be continued.

In a dehumidifier employing a manual resetting overload protective device, if the protective device operates within 5 min from the rerunning, the protective device shall be forcedly reset after 10 min from its operation, and then the dehumidifying running can be continued.

5.6 Insulation resistance When the test of 8.8 is carried out, the insulation resistance shall be not less than 1 MΩ.

5.7 Dielectric withstand voltage When the test of 8.9 is carried out for dielectric withstand voltage, the specimen shall withstand the test voltage.

5.8 Low-temperature performance When the test of 8.10 is carried out, the low-temperature performance shall comply with either of the following requirements:

- (1) The dehumidifier without automatic defrosting device shall not produce frost or ice on the part of evaporator through which air flows.
- (2) In the dehumidifier with automatic defrosting device, the sum of the durations necessary for defrosting in the test shall not exceed 30 % of the duration of test.

Further, no ice shall drop or no water shall drip or blow out in the room during the test.

5.9 Disposition of water produced by dehumidification (Condensed water) When the test of 8.11 is carried out the specimen shall have capability of exhausting or disposing the water produced by dehumidification and shall show no dripping of water which wets the periphery of the dehumidifier.

5.10 Insulation at water overflow When the test of 8.12 is carried out for the insulation at water overflow, the value shall be not less than 1 MΩ.

5.11 Noise When the test of 8.13 is carried out, the noise shall not exceed 50 dB for the machine of rated dehumidifying effect not exceeding 6.3 l/d, and 60 dB for that not less than 7.1 l/d.

5.12 Abnormality When the abnormality test is carried out according to 8.14, the temperatures on surfaces of enclosures of the blower motor and compressor shall not exceed 150°C, and the temperature of winding shall not exceed the appropriate value of Table 2.

Table 2. Temperature of winding

Unit: °C

Kind of protective device for blower motor or compressor		Insulation class of winding				
		A	E	B	F	H
Protected by impedance		150	165	175	190	210
With protective device	First one hour (maximum value)	200	215	225	240	260
	After one hour or more (maximum value)	175	190	200	215	235
	After one hour or more (arithmetic average value)	150	165	175	190	210

6. Construction

6.1 Construction in general The construction of dehumidifier shall comply with the following requirements:

- (1) If a remote control is provided, closing of the circuit shall be impossible by other means than operation of the switch on the body or the remote controller.
- (2) An appliance having a mass of body not exceeding 40 kg shall not tumble when inclined through an angle of 10° (15° for appliance equipped with electric heater) under normal service state. If an appliance does not tumble when a force of 100 N is applied to every position of the body (excluding the bottom face), such a case is an exception.
- (3) The part of metallic cover or box to which arc may reach when the switch is opened or closed shall be lined with arc resistant electric insulating materials.
- (4) Adequate moisture proof treatment shall be applied to the part whose moisture absorption may result in such risks as burning of components and exposure of live parts.

- (5) Accessible moving parts under normal use, shall be equipped with suitable protective frame or protective net so as to prevent easy access. However, the parts having no possibility to cause danger such as electric shock, and injury, if accessed by a man, are exempted from the above requirements.
- (6) For switches operated by the user, the opening and closing operations, or open and closed states of the switch shall be marked on an easily visible place by means of letters, symbols or colors. If it is difficult to mark, such a case is an exception.
- (7) The enclosure shall not cause fissures, cracks, or other abnormalities which result in such danger as electrical shock and fire when a weight 250 g in mass, having a spherical surface of 10 mm radius finished with polyamide to have Rockwell hardness HRR 100 specified in JIS K 7202 is dropped vertically from the height of 20 cm once or when an impact force of $0.5 \pm 0.05 \text{ N}\cdot\text{m}$ is applied with the impact testing apparatus given in Attached Fig. 1, once. However, the indicator lamp, fuse holder or the like exposed on the outside of appliance body and their protective cover, each of which has a surface area not exceeding 4 cm^2 , and does not project by 10 mm or more from the surface of appliance body, are excluded.
- (8) The controller separated from the appliance body (excluding ones which are fixed to a wall or pillar in normal service state) shall not result in risks of electric shock, fire, etc. when dropped on the center of lauan plate of 30 mm thick with flat surface placed on a concrete floor from a height of 70 cm three times.
- (9) The appliance with an enclosure made of synthetic resin (except the portion which needs translucency or transparency or that which needs flexibility, mechanical strength, etc. due to its function) shall not burn when tested in such a manner, that a flat square part of 9 cm^2 or more on the external surface of enclosure (a square test piece with a side length of 3 cm and original thickness cut out of the same material if there is no flat square part of 9 cm^2 or more on the enclosure) is inclined about 45 degrees from the horizontal plane, a flame of about 20 mm long is produced by burning the gas of class 1 and no. 1 specified in JIS K 2240 or the equivalent gas using a burner having nozzle inside diameter 0.5 mm with the air inlet closed, the tip of the flame is applied, from the bottom, to the center of the said plane for 5 s and then removed.
- (10) When a circuit on secondary side of an insulating transformer or beyond a rectifier containing capacitors, semiconductor elements, resistors or the like, is subjected to the following tests, the component connected to that circuit shall not burn. If there is no possibility of burning of other parts even if a component connected to the circuit burns, such a case is an exception.
 - (a) For display lamps, etc., the heater or filament terminals shall be opened, and other terminals shall be short-circuited. [Excluding the case where the provision of 6.2 (2) is complied with. This applies to each item in (10)].

- (b) For capacitors, semiconductor elements, resistors, transformers, coils or the similar components, the terminals shall be short-circuited or opened.
- (c) The insulation resistance between the live parts and the surface of appliance body measured with a d.c. 500 V insulation resistance tester when the circuit is shorted or opened in the tests of (a) and (b) shall be not less than 0.1 M Ω . However, in such a case that the voltage to earth and the line voltage are not exceeding 30 V for a.c. or 45 V for d.c. or that the current flowing through 1 k Ω resistors connected between the live part and the earth and between the lines does not exceed 1 mA (excluding the case that there is no risk of electric shock at a frequency not less than power frequency) the insulation resistance between the live parts and the surface of appliance body is exempted from the above requirement.
- (11) The heat reserving material, heat insulating material, etc. to be filled in the vicinity of electric apparatus (less than 50 mm) shall be flame retardant ones. (If burning of the heat reserving material, heat insulating material, etc. does not result in risks of electric shock and fire, such a case is an exception.
- (12) The compressor motor shall be equipped with an overload protective device.
- (13) The appliance which may cause hazards due to temperature rise shall be equipped with a temperature limiter or overload protective device which surely operates before the occurrence of hazards. Such devices shall not operate under normal service state.
- (14) Such components to which the refrigerant pressure is applied as compressor, container, heat exchanger and valve shall withstand 1.5 times the designed pressure.

6.2 Live part The live part shall comply with the following requirements:

- (1) The live parts, except those prescribed below, shall not be touched by the test finger shown in Attached Fig. 2, with easily detachable parts removed.

In this procedure, the force to be applied to the test finger shall be 30 N. However, the force shall be 10 N, for the bottom face of table type and the back face and bottom face (for appliance whose body exceeds 40 kg in mass and whose bottom face height from the floor is 5 cm or less, to the extent within twice the height from the outer edges of the bottom) of floor type (stationary type only).

- (a) The live part on mounting face which is not easily accessible under mounted state.
- (b) The live part which is 40 cm or more apart from the opening of bottom face of an appliance body exceeding 40 kg in mass.