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Dehumidifiers

除湿机 (征求意见稿)

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Foreword

SAC/TC 238 is in charge of this English translation. In case of any doubt about the contents of English translation, the Chinese original shall be considered authoritative.

This standard is drafted in accordance with the rules given in GB/T 1.1-2020 *Directives for Standardization - Part 1: Rules for the Structure and Drafting of Standardizing Documents.*

This standard replaces GB/T 19411-2003 *Dehumidifiers*. Compared with GB/T 19411-2003, except for structural adjustment and editorial changes, the main technical changes are as follows:

a) Added the terms and definitions for dehumidifiers, and changed the terms and definitions for dehumidifier typing (see 3.1-3.3, as well as 3.1, 3.2, 3.6 and 3.7 of the 2003 edition);

b) Changed the terms and definitions related to dehumidification performance (see 3.4-3.6, as well as 3.3-3.5 of the 2003 edition);

c) Added the terms and definitions for standby mode, clean air delivery rate and eliminating rate (see 3.7-3.9);

d) Changed the type classification of dehumidifiers (see 4.1, as well as 4.1.1 and 4.1.2 of the 2003 edition);

e) Changed the requirements for model compilation (see 4.2, as well as 4.1.4 of the 2003 edition);

f) Changed the content of the basic parameters for dehumidifiers, including the environmental parameters for the normal operation of the dehumidifier and the parameters of the test operation condition. (see 4.3, as well as 4.1.3 and 6.2.1 of the 2003 edition);

g) Changed the general requirements (see 5.1, as well as 5.1 of the 2003 edition);

h) Deleted the requirements for the power supply and components in the original standard (see
5.2 and 5.4 of the 2003 edition);

i) Changed the appearance requirements (see 5.2, as well as 5.10 of the 2003 edition);

j) Changed the requirements for dehumidification performance, and added the requirements and corresponding test methods for dehumidification performance at high temperature, overflow insulation performance and heat exchange limitation (see 5.5, 5.6, 5.10, 5.11, 6.6, 6.7, 6.11 and 6.12, as well as 4.2, 5.5 and 6.2 of the 2003 edition);

k) Added the requirements and corresponding test methods for power failure protection (see5.12 and 6.13);

1) Changed the requirements for safety and electromagnetic compatibility, and adjusted the corresponding test methods (see 5.13, 5.14, 6.14 and 6.15, as well as 5.7 of the 2003 edition);

m) Changed the requirements for noise limits, and added the noise test methods (see 5.15 and Appendix B, as well as 5.6 of the 2003 edition);

n) Added the technical requirements and corresponding test methods for standby power, overall mechanical performance of caster, weather resistance performance, clean air delivery rate and eliminating rate (see 5.16-5.20 and 6.17-6.21);

o) Deleted the requirements for charging refrigerant (see 5.9 of the 2003 edition);

p) Changed the general test conditions and requirements (see 6.1-6.3, as well as 6.1 of the 2003 edition);

q) Changed the inspection rules and requirements (see 7.1-7.3, as well as 7.1-7.2 of the 2003 edition);

r) Changed the requirements for marking, packaging, transportation and storage (see 8.1-8.3, as well as 8.1-8.3 of the 2003 edition);

s) Changed the performance test methods for dehumidifiers (see Appendix A, as well as Appendix A of the 2003 edition);

t) Added the correction methods for dehumidification consumption power of dehumidifiers with static pressure (see Appendix C).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. The authority issuing this document shall not be held responsible for identifying patent rights.

This standard is submitted by China Machinery Industry Federation.

This standard is centralized by National Technical Committee on Standardization of Refrigeration and Air-conditioning Equipment (SAC/TC238).

The previous edition of this standard and the standard it substitutes is as follows:

- First issued as GB/T 19411-2003 in 2003;

- This is the first revision.

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Dehumidifiers

1 Scope

This standard specifies the type and basic parameters, technical requirements, test methods, inspection rules, as well as marking, packaging, transportation and storage for dehumidifiers.

This standard is applicable to dehumidifiers that use a vapor compression refrigeration cycle driven by an electric motor for dehumidification.

This standard does not apply to fresh air dehumidifiers.

2 Normative references

The following referenced documents are indispensable for the application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 191 Packaging - Pictorial marking for handling of goods

GB/T 2423.17 Environmental testing for electric and electronic products - Part 2: Test method - Test Ka: Salt mist

GB/T 2423.55 Environmental testing - Part 2: Test methods - Test Eh: Hammer tests

GB/T 2828.1 Sampling procedures for inspection by attributes - Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection

GB 2894-2008 Safety signs and guideline for the use

GB/T 3241 Electroacoustics-Octave-band and fractional-octave-band filters

GB/T 3767-2016 Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Engineering methods for an essentially free field over a reflecting plane

GB/T 3785.1-2010 Electroacoustics - Sound level meters - Part 1: Specifications

GB/T 4208 Degrees of protection provided by enclosure (IP code)

GB 4343.1-2018 Electromagnetic compatibility requirements for household appliances, electric tools and similar apparatus - Part 1: Emission

GB/T 4343.2 Electromagnetic compatibility requirements for household appliances, electric tools and similar apparatus - Part 2: Immunity

GB 4706.1-2005 Household and similar electrical appliances-Safety Party 1: General requirements

GB 4706.32-2012 Household and similar electrical appliances - Safety-Particular requirements for heat pumps, air-conditioners and dehumidifiers

GB/T 5226.1-2019 Electrical safety of machinery - Electrical equipment of machines - Part 1: General requirements

GB/T 6388 Transport package shipping mark

GB 6882 Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Precision methods for anechoic rooms and hemi-anechoic rooms

GB/T 9237 Refrigerating systems and heat pumps - Safety and environmental requirements

GB/T 9286-2021 Paints and varnishes - Cross-cut test

GB/T 13306 Plates

GB/T 15173-2010 Electroacoustics - Sound calibrators

GB/T 16842-2016 Protection of persons and equipment by enclosures - Probe for verification GB 17625.1-2022 Electromagnetic compatibility - Limits - Part 1: Limits for harmonic current emissions (equipment input current \leq 16A per phase)

GB/T 17625.8 Electromagnetic compatibility - Limits - Limits for harmonic currents produced by equipment connected to public low-Voltage systems with input current >16 A and \leq 75 A per phase

GB/T 17758 Unitary air conditioners

GB/T 18801-2022 Air cleaner

GB 21551.3-2010 Antibacterial and cleaning function for household and similar electrical appliances - Particular requirements of air cleaner

GB/T 26572 Requirements of concentration limits for certain restricted substances in electrical and electronic products

JB/T 7249 Refrigerating and air-conditioning equipment - Terminology

JB/T 10359-2013 Environmental technical requirements of the plastics for the outdoor units of air-conditioners

3 Terms and definitions

For the purpose of this document, the terms and definitions given in JB/T 7249 and the following apply.

3.1

dehumidifier

A device for removing moisture from the air or reducing the moisture content of the air.

3. 2

comfort dehumidifier

A type of dehumidifier used to meet the requirements for a comfort human activity space.

3.3

process dehumidifier

A type of dehumidifier for process and production process, as well as in occasions with special dehumidification requirements.

3.4

dehumidification capacity

DC

The amount of water removed per unit time by a dehumidifier under specified standard condition or specific service condition.

Note 1: The unit is kilogram per hour (kg/h) or liter per day (L/d).

Note 2: The nominal dehumidification capacity of a dehumidifier is expressed by DC_{R} .

3.5

dehumidification consumption power

DP

The total input power of a dehumidifier during dehumidification under specified standard condition or specific service condition.

Note: The unit is kilowatt (kW).

3.6

dehumidification capacity per consumption power

EF

The ratio of dehumidification capacity to dehumidification consumption power of a dehumidifier under specified standard condition or specific service condition.

Note 1: The unit is kilogram per kilowatt-hour [kg/(kW•h)].

Note 2: The dehumidification capacity per consumption power is also called "energy efficiency ratio".

3.7

standby mode

A mode in which the dehumidifier is powered on but in a non-operating state, and it can monitor the control signal at any time from a remote control device, internal sensor or similar device that brings it into operation.

Note: Protection devices such as the crankcase heating device do not work in this mode.

3.8

clean air delivery rate

Q

A parameter of the purifying capacity of a dehumidifier with air purification function against target contaminant (particulate matter and gaseous contaminant) under specified test conditions, indicating the rate at which it delivers clean air.

Note: The unit is cubic meter per hour (m^3/h) .

3.9

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eliminating rate
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Κ
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A value expressed as a percentage of the number of microorganisms decreased by a dehumidifier with bacterial elimination function in the specified bacterial eliminating test.

4 Types and basic parameters

4.1 Types

4.1.1 Classified by the applicable range of return air temperature into:

- a) Type A $(18^{\circ}C-35^{\circ}C)$;
- b) Type B $(5^{\circ}C-35^{\circ}C)$;
- c) Type C (customized).

Note: Return air includes the return air mixed with fresh air.

- 4.1.2 Classified by the purpose into:
 - a) Comfort type (Type S);
 - b) Process type (Type G).

Note: Type S and Type G dehumidifiers with types of different return air temperature are represented by Type AS, Type BG, etc.

- 4.1.3 Classified by the condensation mode into:
 - a) Air-cooled type;
 - b) Water-cooled type;
 - c) Combined type.
- 4.1.4 Classified by the function type into:
 - a) Heating type;
 - b) Cooling type;
 - c) Temperature adjusting type.
- 4.1.5 Classified by the structure type into:
 - a) Integral type;
 - b) Split type.
- 4.1.6 Classified by the air supply mode into:
 - a) Direct blowing type;
 - b) Ducted type.
- 4.1.7 Classified by the capacity adjustment mode into:
 - a) Constant-volume type;
 - b) Non-constant-volume type.

Note: Refer to GB/T 17758-2023 for the concept of constant-volume type and non-constant-volume type.

4.2. Model

The model preparation method of the dehumidifier is determined by the manufacturer. The dehumidification capacity of a dehumidifier under nominal condition should be reflected in its model number.

4.3 Basic parameters

4.3.1 The dehumidifier shall be able to work normally under the ambient temperature condition shown in Table 1.

Туре	Return air temperature / °C		
Туре А	18~35		
Туре В	5~35		
Туре С	Other temperatures agreed by the manufacturer and the user		

Table 1 Normal operating ambient temperature conditions

4.3.2 The test conditions are specified in Table 2. For the process dehumidifier products not covered by Table 2, the test conditions shall be subject to the agreement between the manufacturer and the user.

No			ni Indoorside		Outdoor side			
		Uni +			Air-cooled		Water-cooled	
	Condition type	typ e	Dry-bulb temperature °C	Wet-bulb temperature °C	Dry-bulb temperature °C	Wet-bulb temperature °C	Water inlet temperature °C	Water outlet temperature °C
1	Nominal condition	A、 B	27	21.2	35	24ª	30	35
2	High temperature condition	A、 B	30	27. 1	35	24ª	30	b
3	Maximum load operation	AS 、 BS	35	31.8	43	24ª	24	b
		AG 、 BG	32	23	43	20	34	
	Low-	Α	18. 3	13. 7				
4	temperature dehumidificati on operation	В	5	2. 1	21	_	18	b
5	Condensation and condensate removal	A、 B	27	25	27	25°	27	b
6	Overflow insulation performance	A、 B	27	25	27	25°	27	b

Table 2 Test conditions

All tests shall be carried out under the nominal external static pressure of the dehumidifier. Note 1: The integral dehumidifier is tested under indoor conditions. Note 2: No reflection of the classification by purpose (Type S or Type G) indicates that it is applicable to both types Note 3: The test conditions of the Type C dehumidifier are subject to the agreement between the manufacturer and the user.

 $^{\rm a}$ It is applicable to devices where the wet-bulb temperature affects the outdoor heat transfer.

^b The water flow is consistent with the one in the dehumidification capacity test under nominal condition.

5 Technical requirements

5.1 General requirements

5.1.1 The dehumidifier shall comply with the provisions of this document, and be manufactured according to the drawings and technical documents approved by the prescribed procedures (or as agreed by the user and the manufacturer).

5.1.2 The refrigeration system of the dehumidifier shall comply with the provisions of GB/T 9237.

5.1.3 The parts of the dehumidifier shall be installed firmly and reliably, and the pipes and parts shall not rub or collide with each other.

5.1.4 The dehumidifier should be designed with recyclable materials, parts and structures.

5.1.5 The thermal insulation materials used for the dehumidifier shall be non-toxic, odorless, and with good thermal insulation performance. There shall be no condensation on the thermal insulating layer of the unit during normal operation.

5.1.6 The thermal insulation materials and the non-metallic electric control boxes used for the dehumidifier shall be flame-retardant or non-combustible.

5.1.7 The anti-overflow device (where available) of the dehumidifier shall operate reliably.

5.1.8 The harmful substance content of the dehumidifier shall comply with the provisions of GB/T 26572.

Note: Except for the items with exemptions granted by government departments.

5.2 Appearance

The appearance of the dehumidifier meets the following requirements:

a) The ferrous metal parts shall be treated to prevent corrosion;

b) The plating surface shall be smooth and uniform in color, and without peeling, exposed substrate, pinholes, obvious spots, scratches or other defects;

c) The coating surface shall be smooth and uniform in spreading and color, and without obvious bubbles, flow marks, wrinkles or other defects or damage, and there shall be no missing coating, exposed primer or other circumstances;

d) The decorative plastic surface shall be smooth and uniform in color, and without cracks, bubbles, obvious shrinkage cavities or other defects.

5.3 Trial operation

5.3.1 There should be no abnormality during the trial operation of the dehumidifier, and the safety protection devices shall not operate.

5.3.2 The temperature and humidity control system of the dehumidifier shall display and operate properly, and all safety protection devices shall operate sensitively and reliably.

5.4 Sealing performance of the refrigeration system

The refrigeration system of the dehumidifier shall be well sealed, and all parts of the refrigeration system shall not leak when tested according to 6.5.

5.5 Dehumidification performance under the nominal condition

The test shall be performed with the method specified in Appendix A under the nominal condition as specified in Table 2. The dehumidification performance under the nominal condition meets the following requirements:

- a) The measured nominal dehumidification capacity of the dehumidifier shall be no less than 95% of the indicated value;
- b) The measured nominal dehumidification power consumption of the dehumidifier shall be no less than 110% of the indicated value;
- c) The measured dehumidification capacity per unit of power consumption of the dehumidifier shall be no less than 95% of the indicated value, and no less than the limits specified in Table 3.

Neminal	Air-coo	Water-cooled type	
dehumidification capacity DC _R kg/h	Heating type kg/(kW • h)	Cooling type/temperature adjusting type kg/(kW • h)	Cooling type/temperature adjusting type kg/(kW • h)
<i>DC</i> _R ≪0. 25	1.40		
0. 25< <i>DC</i> _R ≤0. 50	1. 45	_	_
0.50< <i>DC</i> _R ≤1.00	1. 60	—	—
1.00< <i>DC</i> _R ≤2.00	1. 70	—	—
2. 00< <i>D</i> C _R ≤2. 50	1.90		

Table 3 Limit value of dehumidification capacity per unit of power consumption

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Newing	Air-coo	Water-cooled type	
Nominal dehumidification capacity DC _R kg/h	Heating type kg/(kW • h)	Cooling type/temperature adjusting type kg/(kW • h)	Cooling type/temperature adjusting type kg/(kW • h)
2.50< <i>DC</i> _R ≪5.0	2. 10	2.00	2. 20
5. 0< <i>DC</i> _R ≤10. 0	2. 15	2. 05	2. 25
10. 0< <i>DC</i> _R ≤20. 0	2. 20	2. 10	2. 30
20. 0< <i>DC</i> _R ≤30. 0	2. 25	2. 15	2. 35
30. 0< <i>DC</i> _R ≤40. 0	2. 30	2. 20	2. 40
40. 0< <i>DC</i> _R ≤60. 0	2. 35	2. 25	2. 45
60. 0< <i>DC</i> _R ≤80. 0	2. 40	2. 30	2. 50
<i>DC</i> _R >80. 0	2. 45	2. 35	2. 60

5.6 Dehumidification performance under the high temperature condition

5.6.1 The measured dehumidification capacity of the dehumidifier under the high temperature condition shall be no less than 95% of the indicated value.

5.6.2 The measured dehumidification power consumption of the dehumidifier under the high temperature shall be no less than 110% of the indicated value.

5.7 Maximum load operation

During the maximum load operation test, the dehumidifier meets the following requirements: a) In the first 1 h: The overload protector of the dehumidifier shall not be tripped;

- b) In the next 1 h: the overload protector is allowed to be tripped within 5 min after starting, but the dehumidifier shall be able to run continuously for 1 h after reset (the overload protector with automatic reset shall be able to reset within 30 min; the overload protector with manual reset shall be forcibly reset after 10 min);
- c) The dehumidifier runs properly and no parts are damaged.

5.8 Low-temperature dehumidification operation

During the low-temperature dehumidification operation test, the dehumidifier meets the following requirements:

- a) There shall be no water droplets blowing out of the outlet, and there shall be no water seepage or leakage in each part;
- b) There shall be no water or frost on the temperature and humidity sensor;
- c) At the end of operation, there shall be no frost on the windward side of the evaporator;
- d) The total defrosting time of the dehumidifier with automatic defrosting function shall not exceed 30% of the entire test time.

5.9 Condensation and condensed water removal

During the condensation and condensed water removal test, the dehumidifier meets the following requirements:

- a) It shall be able to remove condensed water, and there shall be no water overflow or blown out of any part other than the drainage outlet;
- b) Condensation on the outside surface of the dehumidifier shall not drip, and the supplied indoor air shall not contain water droplets;
- c) Live parts shall not accumulate condensed water.

5.10 Overflow insulation performance

After the overflow insulation performance test performed as specified in 6.11, the insulation resistance of the dehumidifier shall be no less than 2 M Ω .

5.11 Heat exchange limitation

The dehumidifier shall have no danger during the heat exchange limitation test, and the dehumidifier shall be able to return to normal operation by itself or manually after the safety protection device is activated.

5.12 Power failure protection

The dehumidifier shall have no abnormality during the power failure protection test, and the dehumidifier shall be able to return to normal operation by itself or manually after the safety protection device is activated.

5.13 Safety requirements

5.13.1 Protection requirements

5.13.1.1 The structure and enclosure of the dehumidifier shall be able to adequately protect against accidental contact with live parts. The accidental contact between human and live parts can still be prevented under normal use or after removing the removable parts. During the test performed as 6.14.1, the test probe shall not touch live parts.

5.13.1.2 The moving parts of the dehumidifier shall be placed or enclosed properly to provide adequate protection against personal injury in normal use. Protective enclosures, guards and similar parts shall be non-detachable parts and shall have adequate mechanical strength. During the test performed as 6.14.2, the test probe shall not touch dangerous moving parts, and the protective parts shall not have adverse effects that would affect other properties.

5.13.1.3 The degree of protection against harmful ingress of water of the dehumidifier shall be no lower than the nominal value, and it shall at least meet the requirements of IPX4 for the outdoor part.

5.13.2 Leakage current

The leakage current of the dehumidifier shall not exceed 2 mA/kW, and meet the following requirements:

- a) If it is an appliance not accessible to the public, the maximum leakage current shall not exceed 30 mA;
- b) If it is an appliance accessible to the public, the maximum leakage current shall not exceed 10 mA;
- c) If it is a portable appliance, the maximum leakage current shall not exceed 0.75 mA.

Note 1: The limits of leakage current are calculated on the basis of the indicated value of the dehumidification consumption power.

Note 2: See GB/T 4706.1 and GB/T 4706.32 for definitions of appliances accessible to the public, appliances not accessible to the public, and portable appliances.

5.13.3 Electric strength

During the electric strength test of a dehumidifier, there shall be no breakdown or flashover.

5.13.4 Earthing device

5.13.4.1 The dehumidifier shall be equipped with a permanent and reliable protective earthing device, and the accessible metal parts shall be securely connected to it. The earthing terminal and its clamping devices of the dehumidifier shall not be used for other purposes than earthing protection; The earthing device of the dehumidifier shall be firmly connected, and the parts of the protective earthing circuit shall be metal with sufficient corrosion resistance; the protective earthing circuit shall be identified in accordance with 8.2 of GB/T 5226.1-2019.

5.13.4.2 The protective earthing circuit of the dehumidifier shall have continuity. The maximum voltage drop measured according to the method in (b) of 6.14.6 shall not exceed the values specified in Table 4. The earthing resistance test shall be performed as specified by 27.5 in GB 4706.1-2005 for the dehumidifier with a nominal dehumidification capacity no more than 10 kg/h, or in condition that the earthing resistance test equipment can meet 1.5 times the rated current under nominal dehumidification condition. The earthing resistance shall not exceed 0.1 Ω .

Table 4 Maximum voltage drop of protective earthing circuit

Minimum effective cross-sectional area of branch of protective wire under test	Maximum voltage drop (corresponding test current is 10 A)		
mm ²	V		
1.0	3. 3		
1.5	2. 6		
2.5	1.9		
4. 0	1.4		

Minimum effective cross-sectional area of branch of protective wire under test	Maximum voltage drop (corresponding test current is 10 A)		
mm ²	V		
>6	1.0		

5.14 Electromagnetic compatibility

5.14.1 The terminal disturbance voltage, disturbance power (radiation disturbance) and discontinuous disturbance of the dehumidifier shall meet the following requirements:

- a) The terminal disturbance voltage, disturbance power (radiation disturbance) and discontinuous disturbance of the dehumidifier with a nominal dehumidification capacity less than or equal to 10 kg/h shall not exceed the value specified in GB 4343.1;
- b) The terminal disturbance voltage, disturbance power (radiation disturbance) and discontinuous disturbance of the dehumidifier with a nominal dehumidification capacity greater than 10 kg/h shall meet the corresponding standards or the agreement reached between the supply and requisitioning parties.
- 5.14.2 The harmonic current of the dehumidifier shall meet the following requirements:
- a) The harmonic current of the dehumidifier with a rated input current up to 16 A and including 16 A per phace shall be tested according to the method specified in GB 17625.1;
- b) The harmonic current of the dehumidifier with an input current greater than 16 A per phase shall be tested according to the method specified in GB/T 17625.8 or in the agreement reached between the supply and requisitioning parties;

5.14.3 The electrical control system of the dehumidifier shall meet the immunity requirements of Class II appliances described in GB/T 4343.2.

5.15 Noise

With the noise test of Appendix B, the measured sound pressure level noise of the dehumidifier shall not be exceed the values specified in Table 5, and shall not exceed + 3 dB(A) indicated value.

Nominal	Indoor u	nit/dB(A)	
dehumidification capacity DC _R kg/h	Direct blow type	Air duct type	Outdoor unit/dB(A)
<i>DC</i> _R ≪0. 25	40		_
0. 25< <i>DC</i> _R ≤0. 50	44	_	_

Table 5 Noise limits (sound pressure level)

Nominal	Indoor u	nit/dB(A)		
dehumidification capacity DC _R kg/h	Direct blow type	Air duct type	Outdoor unit/dB(A)	
0.50< <i>DC</i> _R ≤1.00	52		_	
1.00< <i>DC</i> _R ≪2.00	56		—	
2.00< <i>DC</i> _R ≪2.50	58	—	—	
2. 50< <i>DC</i> _R ≪5. 00	60	62	62	
5. 0< <i>DC</i> _R ≤10. 0	62	65	65	
10. 0< <i>DC</i> _R ≪20. 0	65	68	68	
20. 0< <i>DC</i> _R ≪30. 0	68	70	70	
30. 0< <i>DC</i> _R ≪40. 0	70	73	73	
40. 0< <i>DC</i> _R ≤60. 0	72	76	76	
60. 0< <i>DC</i> _R ≪80. 0	76	79	79	
<i>DC</i> _R >80. 0	According to the supply contract			
Note: The integral dehumidifier shall be regarded as indoor unit.				

5.16 Standby power

5.16.1 As for a dehumidifier with a nominal dehumidification capacity no more than 2.5 kg/h, in the case of no communication protocols such as sensor, Wi-Fi, and Bluetooth (or these functions can be disabled during the test, and the product is tested after these functions are disabled), its standby power shall be no more than 3 W and indicated value; in the case of communication protocols such as sensor, Wi-Fi, and Bluetooth, its standby power shall be no more than the indicated value.

5.16.2 As for a dehumidifier with a nominal dehumidification capacity more than 2.5 kg/h, its standby power shall be no more than the indicated value.

5.17 Overall mechanical performance of caster

5.17.1 Impact resistance and braking performance

A dehumidifier with casters meets the following requirements:

- a) After the impact resistance test, the casters shall not be damaged or make an abnormal sound, the parts of the casters shall not be loose, and the functions of the dehumidifier shall not be damaged;
- b) If the casters can be locked, the dehumidifier shall also undergo a braking performance test, during which the casters shall not roll.

5.17.2 Dynamic load test

After the dehumidifier with casters undergoes the dynamic load test, its casters shall not be damaged or stuck or make an abnormal sound, and its parts shall not be loose, and the functions shall not be damaged.

5.18 Weather resistance

5.18.1 The electroplated and coated parts of the dehumidifier shall have sufficient corrosion resistance. After the salt fog test, the area of each rust spot or stain on the metal coating shall not exceed 1 mm²; there shall be no more than 2 rust spots or stains per 100 cm² specimen, and there shall not be rust spots or stains when it is less than 100 cm².

5.18.2 The coating of coating parts of the dehumidifier shall be firm. After the coating adhesion test, the coating adhesion shall be at least at Grade 2 specified in GB/T 9286-2021.

5.18.3 For a dehumidifier with an outdoor unit, exposed plastic parts of the outdoor unit shall meet the requirements of subclause 3.5 of JB/T 10359-2013 after the aging test.

5.19 Clean air delivery rate

For a dehumidifier with a purification function, the measured value of clean air delivery rate shall not be less than 90% of the indicated value.

5.20 Bacterial eliminating rate

For a dehumidifier with a bacterial elimination function, the eliminating rate shall not be less than 90% of the indicated value.

6 Test method

6.1 Test conditions

6.1.1 Unless otherwise specified, test items of a dehumidifier shall be at the rated voltage and frequency specified by the manufacturer.

6.1.2 Purification, sterilization and other auxiliary functions shall be disabled during the test specified in this document, unless the manufacturer declares that the relevant functions remain enabled during the test,

6.1.3 Unless otherwise specified, the test shall be performed at the maximum air speed, and the air outlet grille shall be adjusted to a position with maximum air output. The temperature and relative humidity are set as specified by the manufacturer. In the case of no manufacturer's specification during the performance test, the test is carried out at the minimum temperature and humidity that can be set of the model machine.

6.1.4 During the test, the allowable deviation of the supply voltage shall not exceed $\pm 2\%$ of the rated voltage, and the allowable deviation of the frequency shall not exceed $\pm 1\%$ of the rated frequency.

6.1.5 Test instruments and meters shall be verified or calibrated by the metrological inspection department and shall be within applicable validity period, and their accuracy shall comply with the specification of Table 6.

Category	Ту	ре	Accuracy	
Temperature	Mercury glass thermometer, resistance thermometer, thermocouple		Air temperature ± 0.1°C Water temperature ± 0.1°C Refrigerant temperature ± 1.0°C	
Flow	Recording type, indicating type, integrating type		Measured flow \pm 1.0%	
Refrigerant pressure	Pressure gage	, transmitter	Measured pressure \pm 2.0%	
Relative humidity	Resistance type, capacitive type, etc.		Measured relative humidity \pm 5%	
	Barometer, air	Test air pressure	Static pressure difference \pm 2.45 Pa	
Air pressure	pressure transmitter	Barometric pressure	Measured barometric pressure ± 0.1%	
Electric questitu ^a	Indicat	ing type	Class 0.5 accuracy	
Electric quantity	Integrat	ing type	Class 1.0 accuracy	
Mass			Measured mass \pm 1.0%	
Speed	Mechanical type, electronic type		Measured speed \pm 1.0%	
Time	Stopwatch		Measured time \pm 0.2%	
^a The measuring instrument for standby power shall be accurate to at least 0.1 W.				

Table 6 Type and accuracy of instruments and meters

6.2 Installation requirements

6.2.1 The dehumidifier under test shall be installed in the test room in accordance with the manufacturer's installation instructions and accessories provided. During the test, all auxiliary components and parts (including intake shutters, ducts, pipes and accessories) shall be connected according to the manufacturer's installation requirements.

6.2.2 The connecting pipes between the indoor unit and outdoor unit of the split dehumidifier shall meet the following requirements.

a) Its length shall be 5.0 m for the dehumidifier with a nominal dehumidification capacity less than or equal to 10 kg/h.

- b) Its length shall be 7.5 m for the dehumidifier with a nominal dehumidification capacity greater than 10 kg/h.
- c) If the total pipe length provided by the manufacturer is greater than the above, the test shall be performed according to the pipe length provided by the manufacturer. The outdoor pipe length shall be no less than 3 m, and indoor thermal insulation and installation requirements shall be in accordance with the instruction manual.

6.2.3 During the dehumidification capacity test, the ventilator door, exhaust door (if any), fan speed, grid guide, etc. for indoor and outdoor air interchange of the dehumidifier shall be set within the normal adjustment range as specified by the manufacturer. If it is not specified, the ventilator door and exhaust door shall be fully closed, and the fan speed, grid guide, etc. shall be lowered to a position with maximum dehumidification capacity without violating manufacturer's regulations.

6.3 Data processing

6.3.1 When calculating the dehumidification capacity per power consumption of the dehumidifier with an outlet static pressure that is not equal to 0 Pa, its fan power counted in the dehumidification power consumption shall be corrected in accordance with Appendix C.

6.3.2 During the test, air volume, external static pressure and internal static pressure difference of the dehumidifier shall be measured and processed as specified in GB/T 17758.

6.3.2 The allowable deviation of the dehumidifier under each test condition shall comply with the specification of Table 7.

Note 1: Mean variation - deviation between the measured arithmetical mean value and the specified values under test conditions.

Note 2: Maximum variation - deviation between the measured maximum and minimum values and the specified values under test conditions.

l the sure	Non-defrost	ing process [®]	Defrosting process [®]		
Item	Maximum variation	Mean variation	Maximum variation	Mean variation	
Dry-bulb temperature	±0.5 °C	±0.3 °C	±5.0 °C	±3.0 °C	
Wet-bulb temperature	±0.5 °C	±0.2°C	±3.0 °C	±1.5 °C	
Water temperature	±0.5 °C	±0.3 °C	_	_	
Water flow	±5.0%	±5.0%	±5.0%	±5.0%	
^a The defrosting process includes the entire defrosting stage and the first 10 min after it ends.					

Table 7 Allowable deviation under test conditions

6.4 Trial operation test

The dehumidifier shall be powered on under the dehumidification mode for trial operation.

6.5 Sealing performance test of refrigeration system

The refrigeration system of the dehumidifier shall be checked for air tightness at the nominal refrigerant charge according to the following regulations:

- a) The dehumidifier with a nominal dehumidification capacity less than or equal to 10 kg/h shall be checked by using a refrigerant leak detector with a sensitivity of 1×10^{-6} Pa·m³/s;
- b) The dehumidifier with a nominal dehumidification capacity greater than 10 kg/h shall be checked by using refrigerant leak detector with a sensitivity of 1×10^{-5} Pa·m³/s.

6.6 Dehumidification performance test under nominal condition

The test shall be performed in accordance with Appendix A under nominal condition as specified in Table 2.

6.7 Dehumidification performance test at high temperature condition

The test shall be performed in accordance with Appendix A at high temperature condition as specified in Table 2.

6.8 Maximum load operation test

Subject to the manufacturer's regulations, the test shall be performed by adjusting the set humidity, fan speed, ventilator door and exhaust door and guide grille of the dehumidifier to the maximum dehumidification capacity state. The test voltage is of 90% and 110% of the rated voltage respectively. When it can run steadily under the maximum load condition as specified in Table 2, letting it run continuously for another 1 h, then powering it off for 3 min, and then starting it for 1 h.

Note: The dehumidifier without power-off memory and power-on delay protection can only be powered on again 3 min after powering off.

6.9 Low-temperature dehumidification operation test

Subject to the manufacturer's regulations, the test shall be performed by adjusting the set humidity, fan speed, ventilator door and exhaust door and guide grille of the dehumidifier to the state that the evaporator is most likely to frost or freeze. When it can run steadily under the low-temperature dehumidification condition as specified in Table 2, letting it run for another 3 h or 2 defrosting cycles (whichever is longer). For the dehumidifier with automatic defrosting function, if it starts defrosting at the end of the test and does not stop, it shall run continuously until the defrosting cycle ends.

6.10 Condensation and condensed water removal test

Subject to the manufacturer's regulations, the test shall be performed by adjusting the set humidity, fan speed, ventilator door and exhaust door and guide grille of the dehumidifier to the state that the evaporator is most likely to produce condensed water. Filling the

defrosting tray with water until water flows out of the drainage outlet (the dehumidifier with a draining pump shall be filled until the draining pump operates). When it can run with a stable water level of the defrosting tray under the condition of condensation and condensed water removal as specified in Table 2, letting it run continuously for another 3 h.

6.11 Overflow insulation performance test

For the dehumidifier equipped with a water receiving device, the test shall be performed by first plugging the drain hole, and then short circuiting the water overflow protection device (for the dehumidifier with a draining pump, the drainage pump shall be powered off). When reaching the overflow state during the operation under the overflow insulation condition as specified in Table 2, letting it run continuously for another 1 hour, and applying a DC voltage of 500 V between the live parts and the accessible metal parts within 2 min after the dehumidifier stops, and then measuring its insulation resistance.

6.12 Heat exchange limitation test

When the dehumidifier can run steadily under the maximum load condition as specified in Table 2, the test shall be performed as follows:

- Adjust the air deflector to a position with maximum air output under the dehumidification mode, and close the fresh air door if there has;
- b) Set the dehumidifier to top gear and block the condenser. In addition, stopping the fan if it is used by both the evaporator and condenser;
- c) Test continues until the protective device operates;
- d) Restart the dehumidifier and let it run continuously for 1 h.

6.13 Power failure protection test

The test shall be performed as follows:

- a) Let it run steadily for 1 h under the nominal condition as specified in Table 2, and then power off the dehumidifier;
- b) Power on the dehumidifier after 5s of powering off. The dehumidifier that cannot be automatically restarted shall be started manually;
- c) Let it run continuously for 1 h after restarting.

6.14 Safety tests

6.14.1 Electric-shock protection test

Applying an insignificant force to a Type B test probe in accordance with GB/T 16842-2016, in order to extending it through the opening to any depth permitted, and turning or bending it before, during, and after insertion into any position to reach the live parts. If the probe cannot be inserted into the opening, applying a force of 20 N to it in the vertical direction, and if the probe can be inserted into the opening, the test shall be repeated with it at a certain angle.

6.14.2 Protection test for moving parts

The test shall be performed as follows:

- a) Use a spring hammer to strike every possible weak spot of the protective enclosure or guard 3 times with 0.5 J of impact energy in accordance with GB/T 2423.55;
- b) Apply a force not exceeding 5 N by using a test probe similar to type B test probe in accordance with GB/T 16842-2016, attempting to touch the dangerous moving parts.

Note: The test probe shall be equipped with a circular stop plate with a diameter of 50 mm to replace the original non-circular one.

6.14.3 Test of degrees of protection against harmful ingress of water

The test of degrees of protection against harmful ingress of water shall be performed for the dehumidifier at corresponding degrees in accordance with GB/T 4208, and the leakage current and electric strength tests shall be performed immediately after it ends according to 6.14.4 and 6.14.5.

6.14.4 Leakage current test

The dehumidifier shall be tested at room temperature and without connecting to a power source. The test shall be conducted by applying the following AC voltage between the live parts and the accessible metal parts of the dehumidifier and measuring the leakage current within 5 seconds after applying the test voltage:

- a) 1.06 times the rated voltage for single-phase units;
- b) 1.06 times the rated voltage divided by $\sqrt{3}$ for three-phase units.

6.14.5 Electric strength test

The dehumidifier shall be tested at room temperature and without connecting to a power source. The test shall be conducted by applying a basic sine-wave voltage with a frequency of 50 Hz or 60 Hz between the live parts and the accessible metal parts of the unit, with a test voltage of 1,000 V + 2 times the rated voltage. The test time shall be 1 min. The test time can also be 1s, while the test voltage shall be 1.2 times (1,000 V + 2 times the rated voltage).

Note: Within the voltage range of a control circuit, the electronic devices applied in the control circuit with earth voltage values below AC (effective value) or DC 30 V can be exempted from electric strength test.

6.14.6 Earthing device test

The earthing device of the dehumidifier shall be tested as follows:

- a) Based on the provisions for the protective earthing device of the unit, the test shall be performed by judging whether it is qualified by visual inspection and manual test;
- b) For the continuity test of the protective earthing circuit, the current shall be obtained from a power source with a no-load voltage not exceeding 12 V (AC or DC), which passes alternately between the earthing terminal and each of the accessible metal parts.

6.15 Electromagnetic compatibility test

6.15.1 The terminal disturbance voltage, disturbance power (radiation emission) and intermittent interference shall be tested as follows:

- a) The terminal disturbance voltage, disturbance power (radiation emission) and intermittent interference of the dehumidifier with a nominal dehumidification capacity less than or equal to 10 kg/h shall be tested in accordance with GB 4343.1;
- b) The terminal disturbance voltage, disturbance power (radiation emission) and intermittent interference of the dehumidifier with a nominal dehumidification capacity greater than 10 kg/h shall be tested in accordance with the corresponding standards or the methods specified in the agreement between the supplying and demanding parties.
- 6.15.2 The harmonic current shall be tested as follows:
- a) The harmonic current of the dehumidifier with an input current less than or equal to 16 A per phase shall be tested according to the method specified in GB 17625.1;
- b) The harmonic current of the dehumidifier with an input current more than 16 A per phase shall be tested according to the method specified in GB/T 17625.8 or the agreement between the supplying and demanding parties;
- 6.15.3 The immunity shall be tested in accordance with GB/T 4343.2.

6.16 Noise test

The noise of the dehumidifier shall be measured in accordance with Appendix B.

6.17 Standby power test

During the test, the ambient temperature shall be maintained at (23 ± 5) °C. The dehumidifier shall be powered on and run for 10 min. Then it shall be powered off and in the standby mode. The power shall be measured under standby mode for 1 hour at least 30 min after powering off, with a data collection cycle not exceeding 10s. The average power during the measurement period is the standby power, in watts (W), with 1 decimal place reserved. The standby power can also be obtained by measuring the power consumption and dividing it by the measurement time.

6.18 Overall mechanical performance test of caster

6.18.1 Impact resistance test

The impact resistance of the dehumidifier shall be tested as follows.

- a) When the net weight of the dehumidifier is less than or equal to 30 kg, the dehumidifier shall be raised by 30 cm and kept the chassis level and drop free to the smooth and hard cement floor twice.
- b) When the net weight of the dehumidifier is greater than 30 kg and less than or equal to 60 kg, the dehumidifier shall be raised by 20 cm and kept the chassis level and drop free to the smooth and hard cement floor twice.

c) The test shall be not applicable for the dehumidifier with net weight greater than 60 kg.

6.18.2 Braking performance test

The test shall be performed by placing the dehumidifier on a hard and smooth cement surface (for the dehumidifier with a water tank, the tank shall be filled with water), locking all its casters, and gradually and steadily applying a 50 N of thrust at the center line of lower 1/3 of the front height of the dehumidifier.

6.18.3 Dynamic load performance test

The test shall be performed by placing the dehumidifier (for the dehumidifier with a water tank, the tank shall be filled with water) on a hard and smooth surface with 4 obstacles as shown (in Figures 1 and 2), where the dimension A shall ensure that the casters of the dehumidifier remain in the test area when it is pushed during the test.

The test shall be performed by pushing the dehumidifier along the center line from left to right of Figure 2, which the cycle period shall be 1,000 times (one back and forth motion is one cycle) at (0 ± 2) times/min. At the end of each motion, all casters shall leave the test area defined by the left and right dotted lines.

The above shall not apply to the process dehumidifier.

Unit: mm



Figure 1 Obstacle

Unit: mm



Description:

A - Twice the length of an obstacle.

Figure 2 Arrangement of Obstacles

6.19 Weather resistance test

6.19.1 Corrosion resistance test

The salt spray test shall be performed in accordance with GB/T 2423.17 at a test cycle of 24 h. Before the test, the plating surface shall be cleaned and unoiled; after the test, the salt remaining on the surface shall be washed away with clean water first, and then the corrosion of the electroplated parts could be checked.

6.19.2 Paint film adhesion test

The cross-cut test shall be performed in accordance with GB/T 9286.

6.19.3 Aging test of plastic parts

The artificial weathering aging test shall be performed according to 4.4 of JB/T 10359-2013.

6.20 Clean air volume test

The clean air volume test for particulate matters and gaseous pollutants shall be tested according to the method specified in Appendix E of GB/T 18801-2022. The test shall be performed in the purification effect mode indicated by the manufacturer.

6.21 Sterilization rate test

The test shall be performed according to Appendix A of GB 21551.3-2010. The model machine shall be placed in the center of the test chamber. The test time of sterilization function shall be 1 h. During the natural attenuation test, the model machine shall be static in the test chamber with no function being enabled.

7 Inspection rules

7.1 Delivery inspection

Delivery inspection shall be conducted for every dehumidifier, with the inspection items as specified in Table 8.

7.2 Sampling inspection

7.2.1 Sampling inspection shall be conducted from the products that have passed the delivery inspection, with the inspection items as specified in Table 8.

7.2.2 The sampling method shall be in accordance with GB/T 2828.1. The sampling inspection items, lot size, sampling scheme, inspection level and acceptable quality level of lot-by-lot inspection shall be determined by the manufacturer.

7.3 Type inspection

Type inspection shall be conducted every 2 years, with the inspection items as specified in Table 8.

Type inspection shall be conducted for the first product in the event of following:

- A new product is developed, or major improvement is made to a stereotyped product;

- A brand new production line is used;
- The production line is relocated, or major improvement is made to it.

No.	Test item		Delivery inspection	Sampling inspection	Type inspection	Technical requirements	Test method
1	General requirements		\checkmark	\checkmark	\checkmark	5. 1	Visual inspection
2	2 Appearance		\checkmark	\checkmark	\checkmark	5. 2	Visual inspection
3	Si	gn	\checkmark	\checkmark	\checkmark	8. 1	Visual inspection
4	Pack	<age< td=""><td>\checkmark</td><td>\checkmark</td><td>\checkmark</td><td>8. 2</td><td>Visual inspection</td></age<>	\checkmark	\checkmark	\checkmark	8. 2	Visual inspection
5		Protection requirements	_	\checkmark	\checkmark	5. 13. 1	6. 14. 1~6. 14. 3
6	Safety requirements	Leakage current	\checkmark	\checkmark	\checkmark	5. 13. 2	6. 14. 4
7		Electric strength	\checkmark	\checkmark	\checkmark	5. 13. 3	6. 14. 5

Table 8 Inspection items

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No.	Test	item	Delivery inspection	Sampling inspection	Type inspection	Technical requirements	Test method
8		Earthing device	\checkmark	\checkmark	\checkmark	5. 13. 4	6. 14. 6
9	Trial op	peration	\checkmark	\checkmark	\checkmark	5.3	6. 4
10	Sealing per refrigerat	formance of ion system	\checkmark	\checkmark	\checkmark	5.4	6. 5
11	Dehumidificat under nomina	tion capacity al condition	_	\checkmark	\checkmark	5.5	6. 6
12	Dehumidificat under high cond	tion capacity temperature ition	I	\checkmark	\checkmark	5. 6	6. 7
13	Nominal dehu power cor	midification nsumption		\checkmark	\checkmark	5.5	6. 6
14	High-tem dehumidific consur	nperature ation power nption		\checkmark	\checkmark	5. 6	6. 7
15	Dehumidificat per power d	tion capacity consumption		\checkmark	\checkmark	5.5	6. 6
16	Noise			\checkmark	\checkmark	5. 15	6. 16
17	7 Standby power		_	\checkmark	\checkmark	5. 16	6. 17
18	3 Maximum load operation				\checkmark	5.7	6. 8
19	Low-temp dehumidi opera	perature fication ation			\checkmark	5.8	6. 9
20	Condensa condensed wa	tion and ater removal	_	_	\checkmark	5.9	6. 10
21	Overflow perfo	insulation rmance	_		\checkmark	5. 10	6. 11
22	Heat exchang	e limitation	_		\checkmark	5. 11	6. 12
23	Power failur	e protection			\checkmark	5. 12	6. 13
24	Electror compat	magnetic ibility			\checkmark	5. 14	6. 15
25	Overall m performance	echanical e of caster			\checkmark	5. 17	6. 18

No.	Test item	Delivery inspection	Sampling inspection	Type inspection	Technical requirements	Test method
26	Weather resistance	_	—	\checkmark	5. 18	6. 19
27	Clean air volume	—	—	\checkmark	5. 19	6. 20
28	Sterilization rate	—	—	\checkmark	5. 20	6. 21
	Note: " \checkmark " indicates that an inspection is required, and "-" indicates that no inspection is required.					

8 Marking, packaging, transportation and storage

8.1 Marking

8.1.1 General

Each dehumidifier shall be provided with a permanent nameplate in an obvious place, which shall be in accordance with GB/T 13306 and shall contain the information in Table 9. In addition to the parameters under nominal condition specified in this document, the corresponding performance parameters of the dehumidifier under other operating conditions can be marked as well, yet the corresponding condition shall be indicated.

No.	ltem	Unit
1	Product name, model	_
2	Manufacturer's name	
3	Rated voltage, number of phases, frequency	V、—、Hz
4	Product type [®]	_
5	Nominal dehumidification capacity	kg/h
6	Nominal dehumidification power consumption	W
7	Dehumidification capacity per power consumption	kg∕(k₩•h)
8	Noise (sound pressure level)	dB (A)
9	Refrigerant number, charge volume	—, kg
10	Net mass	kg
11	Factory number	_
12	Date of manufacture	

Table 9 Nameplate information

GB/T 19411-202×

No.	ltem	Unit			
The dehumidi	The dehumidifier with purification function shall be marked with the clean air volume, and				
the dehumidifier with sterilization function shall be marked with the sterilization rate. [°] See the typing in 4.1.1 and 4.1.2.					

8.1.2 If the dehumidifier adopts flammable refrigerants, it shall be permanently marked in a prominent position according to the color and style of warning signs in No. 2-2 of Table 2 of GB 2894-2008. The vertical height of the marked symbol shall be no less than 30 mm.

8.1.3 The dehumidifier shall be provided with signs indicating its running status, such as fan steering, water direction, and signs indicating the instruments and control buttons, etc.

8.1.4 The number of this document shall be indicated in an appropriate place (such as the nameplate) of the dehumidifier.

8.2 Packaging

8.2.1 The dehumidifier shall be cleaned before packaging. All parts shall be clean and dry. Antirust agents shall be applied to rust-prone parts.

8.2.2 The dehumidifier shall be firmly fixed in the box to avoid moisture or mechanical damage during transportation.

8.2.3 The following shall be marked on the packaging box of the dehumidifier:

- Manufacturer's name;
- Product model and name;
- Gross mass;
- Overall dimensions;
- "Handle with Care", "Upward", "Keep Dry", stacking layers, etc.

The marks on packaging, storage and transportation shall comply with the provisions of GB/T 6388 and GB/T 191.

8.2.4 The following technical documents shall be attached to each dehumidifier.

a) Product certificate, containing:

- 1) Product model and name;
- 2) Factory number;
- 3) Signature or seal of inspector;
- 4) Date of inspection.
- b) Product instruction, containing:

1) Product model and name, applicable ambient temperature conditions, and main technical parameters;

2) Electrical schematic diagram, refrigeration system diagram and wiring diagram of the product;

3) Specifications or requirements for overall dimensions and installation (the installation requirements of the dehumidifier that adopts flammable refrigerant shall meet GB/T 9237);

4) Instructions for use, repair and maintenance precautions (the repair and maintenance of the dehumidifier that adopts flammable refrigerant shall be in accordance with GB/T 9237, as well as Appendix D of GB 4706.32-2012).

c) Packing list.

8.3 Transportation and storage

8.3.1 The dehumidifier shall not be bumped, tilted or exposed to rain or snow during transportation and storage.

8.3.2 Before delivery, the dehumidifier shall be filled with or kept with the refrigerant of a prescribed volume, or filled with 0.02 MPa - 0.03 MPa (gauge pressure) of dry nitrogen.

8.3.3 The dehumidifier shall be stored in a dry and well-ventilated place.

Appendix A

(normative)

Test methods for dehumidification performance

A.1 General requirements

A.1.1 The dehumidifier under test shall be installed according to the instruction (installation) manual provided by the manufacturer.

A.1.2 The laboratory size shall ensure that the minimum distance between the dehumidifier and the surrounding walls is no less than 1 m, and the minimum distance between the air outlet and the walls is no less than 1.8 m. The test device shall be able to simulate the actual operating state of the dehumidifier.

A.1.3 The indoor air circulation shall ensure that the air speed does not exceed 0.5 m/s at the distance of 1 m away from the dehumidifier.

A.1.4 The indoor air temperature and humidity shall be sampled 15 cm away from the air inlet of the dehumidifier, and it shall not be affected by the exhaust air or other heat sources of the dehumidifier under test.

A.1.5 The temperature and humidity at the measuring point shall be able to represent the temperature and humidity around the dehumidifier, and similar to the conditions in actual use. Air samplers shall be in accordance with GB/T 17758.

A.1.6 The air velocity through the wet-bulb thermometer shall be 5 m/s. The air velocity shall be the same when measuring the temperature at the air inlet and outlet, and the measured wet-bulb temperature shall be corrected if the air velocity is higher or lower than 5 m/s.

A.1.7 For the dehumidifier with a temperature and humidity controller, the temperature and humidity controller shall be disabled during the test to ensure that the compressor and fan are in continuous operation.

A.1.8 The temperature-adjusting dehumidifier shall be regarded as a cooling dehumidifier for test.

A.2 Test steps

A.2.1 The model machine under test shall be connected to a power supply that complies with the manufacturer's specifications.

A.2.2 The model machine shall be in the start state: the air outlet shall be adjusted to the maximum air output state, the fan shall be at maximum speed, the operating state shall be continuous dehumidification, and other auxiliary functions shall be disabled.

Note: The other auxiliary functions include purification, sterilization, etc.

A.2.3 Record the following data every 10 minutes during the test:

a) Inlet dry-bulb temperature, in degree Celsius (°C);

- b) Inlet wet-bulb temperature, in degree Celsius (°C);
- c) Power, in kilowatt (kW);
- d) Current, in ampere (A);
- e) Voltage, in volt (V);
- f) Power frequency, in hertz (Hz).

A.2.4 The amount of condensed water collected and the atmospheric pressure shall be recorded during the test at the end of the test.

A.3 Calculation of test results

A. 3.1 Calculation formula

A.3.1.1 The measured dehumidification capacity shall be calculated by the formula (A.1). Besides, the unit of measured high-temperature dehumidification capacity shall be converted to the unit of liter per day (L/d) on the basis of the result calculated by the formula (A.1).

Where:

G - Measured dehumidification capacity with the dry-bulb temperature under the corresponding test condition, in kilogram per hour (kg/h);

 G_1 - Amount of condensed water collected during the test, in kilogram (kg);

T - Duration of the test record, in hour (h);

 t_o - Dry-bulb temperature under the corresponding dehumidification capacity test condition, in degree Celsius (°C), which shall be 27°C or 30°C as specified in Table 2;

 Φ_0 - Relative humidity under the corresponding dehumidification capacity test condition, expressed in percentage (%), which shall be 60% or 80% as specified in Table 2 (in percent);

t - Inlet average dry-bulb temperature of the dehumidifier, in degree Celsius (°C);

 ϕ - Relative humidity (corrected for atmospheric pressure), in percent.

A.3.1.2 Relative humidity is calculated by the formula (A.2).

$$\Phi = \Phi_1 \times [1 + 1.860 \ 3 \times 10^{-3} \times (101.325 - B_1)] \cdots \cdots \cdots \cdots \cdots \cdots \cdots \cdots (A.2)$$

Where:

 ϕ_1 - Measured relative humidity (based on measured average), in percent (%);

 B_1 - Atmospheric pressure during the test, in kilopascal (kPa).

A. 3. 2 Calculation rules

The dehumidifier shall run for at least 1 h, and the data shall be recorded only when the dehumidifier can run steadily under stable conditions. The data shall be recorded every 10 min until the allowable deviation of the recorded data for 7 consecutive times is within the range specified in Table 7. The arithmetic mean of the recorded data shall be taken as the calculated value, and the collected condensed water shall be weighed. The dehumidification capacity shall be calculated by the formulas (A. 1) and (A. 2).

A.3.3 Calculation of dehumidification capacity per power consumption

The dehumidification capacity per power consumption of the dehumidifier shall be calculated by the formula (A. 3).

Where:

EF - Dehumidification capacity per power consumption, in kilogram per kilowatt-hour [kg/(kW•h)];

DC - Dehumidification capacity of the dehumidifier, in kilogram per hour (kg/h);

DP - Dehumidification power consumption of the dehumidifier, in kilowatt (kW).

Note: The DP of the dehumidifier with static pressure shall be the input power with the static pressure corrected.

Appendix B

(normative)

Test methods for the noise of the dehumidifier

B.1 Test site

The test site for the noise of the dehumidifier shall be a free field (semi-anechoic chamber) or approximately free field on a reflecting plane.

a) The noise of the dehumidifier with a nominal dehumidification capacity less than or equal to 10 kg/h shall be measured in a free field (semi-anechoic chamber) on a reflecting plane, and it shall be ensured that the difference between the A-weighted sound pressure level noise of the dehumidifier under test and the background noise is greater than 10 dB(A). The acoustic requirements of the test environment shall also comply with the provisions of GB/T 6882.

b) The noise of the dehumidifier with a nominal dehumidification capacity greater than 10 kg/h shall be measured in an approximately free field on a reflecting plane, and it shall be ensured that the difference between the A-weighted sound pressure level noise of the dehumidifier under test and the background noise is greater than 6 dB(A). The acoustic requirements of the test environment shall also comply with the provisions in 4.3 of GB/T 3767-2016.

B.2 Measuring instruments

B.2.1 Acoustic measuring instrument

B.2.1.1 The measuring instrument system shall meet the requirements for sound level 1 meter in accordance with GB/T 3785.1-2010. The measuring instrument system for the octave frequency band shall meet the requirements of GB/T 3241.

B.2.1.2 Before and after each measurement, the entire measuring system shall be checked at 1 or more frequencies within the measuring range by sound level 1 calibrators which shall be in accordance with GB/T 15173-2010. Without any adjustment to the measuring system, the difference of readings obtained from calibration between before and after each measurement shall be less than or equal to 0.5 dB(A). If this value is exceeded, the results of such measurements shall be invalid.

B.2.2 Measuring instruments under operating conditions

The measuring instruments under operating conditions shall comply with the provisions of 6.1.6.

B.3 Installation and operating conditions

B.3.1 The dehumidifier shall be installed in a noise test site with all its auxiliary components (including intake shutters and factory-made pipes and accessories) connected according to the manufacturer's installation requirements.

B.3.2 During the noise test, the operating conditions of the dehumidifier shall be maintained at nominal condition of 4.3.2.

B.3.3 The unit status of the dehumidifier when measuring its noise shall be consistent with the status during the nominal dehumidification capacity test, and the measurement shall start 30 min after the dehumidifier runs at the rated voltage and rated frequency.

Note: The unit status of the dehumidifier shall include its air deflector grille, fan speed, set temperature and humidity, compressor speed, etc.

B.4 Designated noise measuring points

B.4.1 Indoor unit / integral unit

B.4.1.1 Ceiling mounting

When measuring the noise of the dehumidifier with an external static pressure less than or equal to 12 Pa, a damping air duct (not applicable to the dehumidifier of 0 Pa) of more than 0.5 m long shall be connected to the return air inlet to adjust the external static pressure of the dehumidifier. The location of the measuring point is shown as Figure B.1.

When measuring the noise of the dehumidifier with an external static pressure greater than 12 Pa, a damping air duct (requirements shall be in accordance with Figure B. 1) of more than 0.5 m long shall be connected to the return air inlet to adjust the external static pressure of the dehumidifier, and a damping air duct of more than 2 m long shall be connected to the air outlet, with its outlet connected to the outside of the test room. The locations of the measuring points are shown as Figures B. 2-B. 3.



Figure B.1 Measuring point of the ceiling-mounted dehumidifier of less than or equal to 12 Pa



Figure B.2 Measuring point of the ceiling-mounted dehumidifier of greater than 12 Pa (side return air)



Figure B.3 Measuring point of the ceiling-mounted dehumidifier of greater than 12 Pa (bottom return air)

B.4.1.2 Floor mounting

When measuring the noise of the dehumidifier with 0 Pa, the location of the measuring point of the floor-mounted dehumidifier is shown as Figure B.4.



a) Side view

b) Top view

Description of symbol:

L - Width of the dehumidifier.

Figure B.4 Measuring point of the floor-mounted dehumidifier with O Pa

When measuring the noise of the dehumidifier with an external static pressure greater than 0 Pa, the locations of the measuring points for the top-outlet dehumidifier are shown as Figure B.5, and a damping air duct (with an outlet valve to adjust the external static pressure of the dehumidifier) of more than 2 m long shall be connected to the air outlet, with its outlet connected to the outside of the test room. The locations of the measuring points for the side-outlet dehumidifier are shown as Figure B.6. A damping air duct of more than 2 m long shall be connected to the air outlet, with its outlet connected to the outside of the test room. A damping air duct of more than 0.5 m long shall be connected to the return air inlet to adjust the external static pressure of the dehumidifier.



a) Front view



Figure B.5 Measuring points of the floor-mounted and top-outlet dehumidifier with external static pressure greater than 0 Pa





Figure B.6 Measuring points of the floor-mounted side-outlet dehumidifier with external static pressure greater than 0 Pa

B.4.1.3 Non-fixed installation

The measuring points of the non-fixed dehumidifier are 1 m away from the center of the four sides of the dehumidifier. When the height of the unit is less than or equal to 1 m, the height of the measuring points is 1 m; when the height of the unit is greater than 1 m, the height of the measuring points is 1.5 m. The locations of the measuring points are shown as Figure B.7.



Figure B.7 Measuring points of the non-fixed dehumidifier

B.4.1.4 Wall mounting

The location of the measuring point of the wall-mounted dehumidifier is shown as Figure B.8.



Figure B.8 Measuring point of the wall-mounted dehumidifier

B.4.1.5 Embedded installation with four outlets

The location of the measuring point of the embedded four-outlet dehumidifier is shown as Figure B.9.



Figure B.9 Measuring point of the embedded four-outlet dehumidifier

B.4.2 Outdoor side

B.4.2.1 Side outlet

The three measuring points are 1 m away from the outlet side and two sides of the dehumidifier, and the height is half of the total height of the dehumidifier height plus 1 m, which are shown as Figure B.10.





B.4.2.2 Top outlet

The four measuring points are 1 m away from all sides of the dehumidifier, and the height is half of the total height of the dehumidifier height plus 1 m, which are shown are Figure B.11.



Figure B.11 Measuring points of top-outlet dehumidifier

B.5 Measuring methods

B.5.1 Under the installation and operating conditions specified in B.3, the A-weighted sound pressure level noise at each designated measuring point of the dehumidifier shall be measured with a sound level meter at the "Slow" gear, where the average of the observed maximum value and minimum value shall be taken as the final value. If the difference between the maximum value and the minimum value is greater than 3 dB(A), a sound pressure level test system with acquisition function shall be used for measurement, where the average collected within 60 s shall be taken as the final value.

B.5.2 Air hoods shall be used for the test probe when the air speed at each designated measurement point of the dehumidifier is greater than 1 m/s.

B.5.3 The A-weighted average sound pressure level at designated measuring points of the dehumidifier shall be the noise value.

B.5.4 The A-weighted average sound pressure level of different noise test sites shall be calculated by the formula (B.1) or (B.2).

a) For a free field (semi-anechoic chamber) on a reflecting plane:

$$\overline{LP} = 10 \lg \frac{1}{n} \left[\sum_{i=1}^{n} 10^{0.1LP_i} \right] - K_1$$
 (B.1)

Where:

<u>IP</u> - Noise of the dehumidifier, in decibel (dB);

n - Total number of measuring points;

*LP*_i - Sound pressure level of noise at designated location i, in decibel (dB);

K₁ - Corrected background noise, in decibel (dB).

b) For an approximately free field on a reflecting plane:

Where:

- A weighted average sound pressure level, in decibel (dB); \overline{LP}

n - Total number of measuring points;

 LP_i - Sound pressure level of noise at designated location i, in decibel (dB);

K₁ - Corrected background noise, in decibel (dB);

 K_2 - Corrected environmental noise, in decibel (dB).

B.5.5 If $\Delta L_{\rho} > 15$ dB, then K_1 shall be 0, and it shall not be needed to correct the background noise; if 10 dB $<\Delta L_{\rho} \le 15$ dB, then the background noise shall be corrected by the Formula (B.3) and Formula (B.4).

$$K_1 = -10 \lg (1 - 10^{-0.1 \Delta L_p})$$
(B.3)

Where:

- K₁ Corrected background noise, in decibel (dB);
 - The difference between the average sound pressure level at the designated location
- ΔL_{ρ} of the dehumidifier under operation and the average sound pressure level of the background noise (dB);
- $\frac{1}{L_{p(SD)}^{\prime}}$ Measured average sound pressure level at the designated location of the dehumidifier under operation, in decibel (dB);
- $\frac{1}{L_{p(B)}}$ Average sound pressure level of the background noise at the designated location of the dehumidifier under operation, in decibel (dB).
- B.5.6 The environmental noise shall be corrected by the Formula (B.5).

$$K_2 = 10 \lg \left(1 + 4 \times \frac{S}{\alpha \times S_V} \right)$$
(B.5)

Where:

 K_2 - Corrected environmental noise, in decibel (dB);

S - Area of the measuring surface, in square meter (m²);

a - A-weighted average absorption coefficient given in Table A.1 of GB/T 3767-2016;

 S_v - Total area of bounding surfaces (walls, ceiling and floor) of the test room, in square meter (m²).

Appendix C

(normative)

Correction method for dehumidification power consumption of the dehumidifier with static pressure

C.1 General

During the performance test for a dehumidifier with outlet static pressure not equal to O Pa, part of the power consumed by the dehumidifier fan is used to overcome the internal resistance of the unit, and part of it is used to generate external static pressure to overcome the external resistance of the system. In this case, the part consumed to overcome the internal resistance shall be counted in the dehumidifier power consumption, and the other part shall be deducted from the dehumidifier power consumption.

C.2 The input power of the fan for a dehumidifier connected with an air duct

C.2.1 If the dehumidifier is equipped with a fan, then the fan power consumed to generate external static pressure shall be calculated by the formula (C.1).

Where:

 W_{TUBE} - Fan power consumed to generate external static pressure, in watt (W);

 η - Fan efficiency, as 0.3;

 Δp_{esc} - Measured external static pressure of the dehumidifier at nominal dehumidification capacity, in pascal (Pa);

 Q_{vsc} - Measured air volume of the dehumidifier at nominal dehumidification capacity, in cubic meter per second (m³/s).

C.2.2 If the dehumidifier is not equipped with a fan, then the fan power consumed to overcome internal resistance of the unit shall be calculated by the formula (C.2).

Where:

$$W'_{\text{TUBE}}$$
 - Fan power consumed to overcome internal resistance of the unit, in watt (W);

$$\eta$$
 - Fan efficiency, as 0.3;

- Measured internal static pressure of the dehumidifier at nominal dehumidification $\Delta p'_{esc}$ capacity, in pascal (Pa);

 Q_{vsc} - Measured air volume of the dehumidifier at nominal dehumidification capacity, in cubic meter per second (m³/s).

C.2.3 The dehumidification capacity per power consumption shall be calculated according to the following provisions:

- a) If the dehumidifier is equipped with a fan, then the fan power consumed to generate external static pressure shall be deducted from the dehumidification power consumption of the dehumidifier;
- b) If the dehumidifier is not equipped with a fan, then the fan power consumed to overcome the internal resistance of the unit shall be additionally included in the dehumidification power consumption of the dehumidifier.

Bibliography

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[1] GB/T 17758 - 2023 Unitary Air Conditioners