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Republic of China

JB/T 11968-20XX
Replace JB/T 11968-2014

Unitary Air Conditioners for
Communication Base Station

通信基站用单元式空气调节机

(English Translation)

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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 document 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 document replaces JB/T 11968-2014 *Unitary Air Conditioners for Communication Base Station* in whole. In addition to structural adjustments and editorial changes, the following technical deviations have been made with respect to JB/T 11968-2014:

- a) The definition of unitary air conditioners for communication base station has been modified (see 3.1 herein and 3.1 of the 2014 Edition);
- b) The terms and definitions of free cooling, compressor refrigeration type base station air conditioners, composite cooling type base station air conditioners, and annual energy efficiency ratio have been added (see 3.2, 3.3, 3.4, and 3.11 herein);
- c) Content related to heat pumps and heating has been deleted (see 3.4, 3.5, 3.6, 3.8, 4.1.1, 4.2.1 b), 5.4.6, 5.4.7, 5.4.12, 6.3.6, 6.3.7, and 6.3.12 of the 2014 Edition);
- d) The type classification of base station air conditioners has been modified (see 4.1 herein and 4.1 of the 2014 Edition);
- e) The provision on the model of base station air conditioners has been modified (see 4.2 herein and 4.1.4 of the 2014 Edition);
- f) The indoor and outdoor environmental conditions for the normal operation of base station air conditioners have been modified (see 4.3 herein and 4.2 of the 2014 Edition);
- g) The general performance test conditions for compressor refrigeration type base station air conditioners have been modified (see Table 1 herein and Table 3 of the 2014 Edition);
- h) The general performance test conditions for composite cooling type base station air conditioners (composite cooling type with heat tube) have been added (see Table 2 herein);
- i) The test conditions for annual energy efficiency ratio (see Table 3 herein) and the limits for annual energy efficiency ratio (see Table 5 herein) have been added;
- j) The limits for the energy efficiency ratio have been modified (see Table 4 herein and Table 1 of the 2014 Edition);
- k) The general requirements of the technical requirements section have been modified (see 5.1 herein and 5.1 of the 2014 Edition);
- l) The safety requirements have been modified (see 5.2 herein and 5.2 of the 2014 Edition) and safety testing methods have been added (see 6.3.1 herein);

m) The technical requirements on electromagnetic compatibility (see 5.3 herein and 5.3.7 of the 2014 Edition) and the testing methods for the same (see 6.3.2 herein) have been modified;

n) The requirements and testing methods for annual energy efficiency ratio (see 5.6.4 and 6.3.8 herein), the requirements and testing methods for humidification capacity (see 5.6.7 and 6.3.15 herein), and the working mode switching and testing methods for composite cooling type base station air conditioners (see 5.7 and 6.3.17 herein) have been added;

o) The power supply adaptability requirements (see 5.8.1 herein and 5.3.5 of the 2014 Edition), group control requirements (see 5.8.2 herein and 5.3.2 of the 2014 Edition), diagnostic requirements (see 5.8.3 herein and 5.3.4 of the 2014 Edition), and requirements for the alarm and protection functions (see 5.8.4 herein and 5.3.8 of the 2014 Edition) have been modified;

p) The control requirement tests (see 6.3.18 herein) and other tests (see 6.3.19 herein) have been added;

q) Some of the inspection items have been modified (see Table 7 herein and Table 4 of the 2014 Edition);

r) The main technical parameters on the nameplate have been modified (see 8.1.1 b) herein and 8.1.1 of the 2014 Edition).

Please note that some of the elements of this document may be the subject of patent rights. The issuing body of this document shall not be held responsible for identifying any or all of such patent rights.

This document was proposed by the China Machinery Industry Federation.

This document is subject to the centralized administration of the National Technical Committee 238 on Refrigeration & Air-Conditioning Equipment of Standardization Administration of China (SAC/TC238).

The previous editions replaced by this document are as follows:

— The first edition was issued in 2014 as JB/T 11968-2014. This is the first revised edition.

Unitary Air Conditioners for Communication Base Station

1 Scope

This document specifies the types, basic parameters and technical requirements of unitary air conditioners for communication base stations, describes the testing methods, and prescribes the inspection rules, marking, packaging, transportation and storage of the same.

This document is applicable to unitary air conditioners used in communication base stations or similar occasions.

2 Normative References

The following normative documents contain provisions which, through reference in this text, constitute indispensable provisions of this document. For dated references, only the dated edition applies to this document. For undated references, the latest edition (including all amendments) applies to this document.

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

GB 8624-2012 *Classification for burning behavior of building materials and products*

GB 17625.1 *Electromagnetic compatibility – Limits – Part 1: Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)*

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

GB 25130 *Safety requirements for unitary air-Conditioners*

GB/T 191 *Packaging – Pictorial marking for handling of goods*

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/T 4208-2017 *Degrees of protection provided by enclosure (IP code)*

GB/T 4798.1 *Classification of environmental conditions – Classification of groups of environmental parameters and their severities – Part 1: Storage*

GB/T 5296.2 *Instructions for use of products of consumer interest – Part 2: Household and similar electrical appliances*

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

GB/T 17758-2023 *Unitary air conditioners*

GB/T 19413-2024 *Air conditioning unit for data center and communication room*

JB/T 7249 *Refrigeration and air conditioning apparatus – Terminology*

YD/T 1363.3 *Specification of supervision system for power, air condition and environment – Part 3: Intelligent equipment communication protocol*

3 Terms and Definitions

For the purpose of this document, the following terms and definitions and those given in JB/T 7249, GB/T 17758 and GB/T 19413 apply.

3.1

unitary air conditioners for communication base station

unitary air conditioners supplying processed air to an enclosed room or space accommodating small communication devices

3.2

free cooling

a process in which the system consisting of a heat exchanger, fan and/or power transmission and distribution equipment allows direct or indirect heat exchange between the outdoor air or other cooling sources and the air inside the base station to reduce or completely replace compressor refrigeration

3.3

compressor refrigeration type base station air conditioner

base station air conditioner that only relies on the vapor compression refrigeration cycle to acquire cooling capacity

3.4

composite cooling type base station air conditioner

base station air conditioner that has at least two operation modes (i.e. compressor refrigeration and free cooling circulation) integrated in the same unit

Note: Some units feature a mode in which both the two cooling circulations operate.

3.5

cooling capacity

total heat removed from an enclosed base station by a base station air conditioner per unit time under the specified cooling capacity test conditions

Note: The unit is W.

3.6

cooling power consumption

total power consumed by a running base station air conditioner under the specified cooling capacity test conditions

Note: The unit is W.

3.7

energy efficiency ratio

EER

ratio of a base station air conditioner's cooling capacity to its cooling power consumption under the specified cooling capacity test conditions

Note: The unit is W/W.

3.8

indoor discharge air-flow

air flow sent by a base station air conditioner per unit time to an enclosed room, space or area under the specified cooling capacity test conditions

Note: The unit is m^3/h .

3.9

sensible cooling capacity

sensible heat removed by a base station air conditioner per unit time under the specified cooling capacity test conditions

Note: The unit is W.

3.10

sensible heat ratio

ratio of sensible cooling capacity to total cooling capacity

3.11

annual energy efficiency ratio

AEER

ratio of total heat removed from a room to total power consumption when a base station air conditioner operates in the cooling mode throughout the year

Note 1: The unit is Wh/Wh and the calculated value is rounded to two decimal places.

Note 2: When the sensible heat ratio is used for calculation, the value obtained is the sensible annual energy efficiency ratio, which is expressed in *AEER_s*.

4 Types, Models and Basic Parameters

4.1 Types

4.1.1 Unitary air conditioners for communication base station (hereinafter referred to as "base station air conditioners") are classified into the following types according to their function:

- Cooling-only type;
- Constant temperature and humidity type.

4.1.2 Base station air conditioners are classified into the following types according to their structure:

- Integral type;
- Split type.

4.1.3 Base station air conditioners are classified into the following types according to their air supply mode:

- Top air supply type;
- Bottom air supply type;
- Horizontal air supply type.

4.1.4 Base station air conditioners are classified into the following types according to their application place:

- In-room type;
- In-row type;
- Cabinet type.

4.1.5 Base station air conditioners are classified into the following types according to their energy adjustment features:

- Constant capacity type;
- Non-constant capacity type.

4.1.6 Base station air conditioners are classified into the following types according to their return air temperature:

- Standard return air temperature type;
- High return air temperature type.

4.1.7 Base station air conditioners are classified into the following types according to their product category:

- Compressor refrigeration type;
- Composite cooling type.

4.2 Models

The compilation of the model of a base station air conditioner may be determined by the manufacturer, but the unit cooling capacity under nominal operating conditions shall be reflected in the model.

Note: The cooling capacity under nominal operating conditions may be an approximation of the nominal cooling capacity.

4.3 Basic Parameters

4.3.1 The power supply of base station air conditioners shall be rated voltage 220V single-phase or 380V three-phase alternating current, with a rated frequency of 50Hz.

4.3.2 Base station air conditioners shall work normally under the following conditions:

- a) Indoor environment: dry bulb temperature of 5° C to 45° C, relative humidity of 8% to 80%;
- b) Outdoor environment: dry bulb temperature of -15° C to 48° C (for compressor refrigeration type), or dry bulb temperature of -35° C to 48° C (for composite cooling type);
- c) Altitude: not more than 1000m.

If the design of a base station air conditioner does not meet the above service conditions, the manufacturer shall expressly state this and negotiate with the user to add relevant provisions or requirements for de-rated use.

4.3.3 The general performance test conditions for base station air conditioners are as specified in Table 1 and Table 2, and the annual energy efficiency test conditions are as specified in Table 3. The standard unit external static pressure is specified below:

- a) In-room and in-row types: 0Pa;
- b) Cabinet type: 10Pa.

Table 1 General Performance Test Conditions for Compressor Refrigeration Type Base Station Air Conditioners

Item	Return Air Temperature Type	Indoor Return Air State		Outdoor Air Inlet State	
		Dry Bulb Temperature ° C	Wet Bulb Temperature ° C	Dry Bulb Temperature ° C	Wet Bulb Temperature ° C
Nominal cooling	Standard return air temperature type	27	19	35	24
	High return air temperature type	35	21		
Maximum load cooling	Standard return air temperature type	32	23	48	32
	High return air temperature type	40	22	48 ^a	32 ^a

Item	Return Air Temperature Type	Indoor Return Air State		Outdoor Air Inlet State	
		Dry Bulb Temperature ° C	Wet Bulb Temperature ° C	Dry Bulb Temperature ° C	Wet Bulb Temperature ° C
Low temperature cooling	Standard return air temperature type	21	15	-15 ^a	—
	High return air temperature type	23	15		
Condensation/Condensed water drainage	Standard return air temperature type	27	24	27	24
	High return air temperature type	35	26	23	16.5
Humidifying	Standard return air temperature type	27	15	—	—
	High return air temperature type	35	22	—	—
Reheating capacity	—	20	16	—	—
^a If the temperature recommended by the manufacturer is more stringent than the temperature specified in the table, the former shall be used for testing.					

Table 2 General Performance Test Conditions for Composite Cooling Type Base Station Air Conditioners (Composite Cooling Type with Heat Tube)

Item	Unit Mode	Return Air Temperature Type	Indoor Return Air State		Outdoor Air Inlet State	
			Dry Bulb Temperature ° C	Wet Bulb Temperature ° C	Dry Bulb Temperature ° C	Wet Bulb Temperature ° C
Nominal cooling	Compressor refrigeration	Standard return air temperature type	27	19	35	24
		High return air temperature type	35	21		
	Free cooling I	Standard return air temperature type	27	19	5	—
		High return air temperature type	35	21	10	

Item	Unit Mode	Return Air Temperature Type	Indoor Return Air State		Outdoor Air Inlet State	
			Dry Bulb Temperature ° C	Wet Bulb Temperature ° C	Dry Bulb Temperature ° C	Wet Bulb Temperature ° C
	Free cooling II	Standard return air temperature type	27	19	-5	—
		High return air temperature type	35	21	5	—
Maximum load cooling	Compressor refrigeration	Standard return air temperature type	32	23	48	32
		High return air temperature type	40	22	48 ^a	32 ^a
Low temperature cooling	Compressor refrigeration	Standard return air temperature type	21	15	-5 ^a	—
		High return air temperature type	23	15	5 ^a	
Condensation/Condensed water drainage	Compressor refrigeration	Standard return air temperature type	27	24	27	24
		High return air temperature type	35	26	23	16.5
	Free cooling	Standard return air temperature type	27	24	-7	—
		High return air temperature type	35	26		
Humidifying	—	Standard return air temperature type	27	15	—	—
		High return air temperature type	35	22	—	—
Reheating capacity	—	—	20	16	—	—
^a If the temperature recommended by the manufacturer is more stringent than the temperature specified in the table, the former shall be used for testing.						

Table 3 Annual Energy Efficiency Ratio Test Conditions for Base Station Air Conditioners

Item		Return Air Temperature Type	Operating Conditions				
			A	B	C	D	E
Indoor side	Dry bulb temperature ° C	Standard return air temperature type	27	27	27	27	27
		High return air temperature type	35	35	35	35	35
	Wet bulb temperature ° C	Standard return air temperature type	19	19	19	19	19
		High return air temperature type	21	21	21	21	21
Outdoor side	Dry bulb temperature ° C	Air-cooled type	35	25	15	5	−5

5 Technical Requirements

5.1 General Requirements

5.1.1 All base station air conditioners shall be manufactured based on the drawings and technical documents approved in accordance with required procedures.

5.1.2 The surfaces of ferrous metal parts for base station air conditioners shall undergo anti-corrosion treatment.

5.1.3 The surfaces of electroplated parts for base station air conditioners shall be smooth, uniform in color, and free of defects such as peeling, exposed bottom, pinholes, obvious spots, and scratches. All electroplated parts for base station air conditioners shall be corrosion-resistant and undergo a salt spray test using the method specified in 6.23.1 of GB/T 19413-2024. After testing, the area of each rust spot or rust stain on the metal plating shall not exceed 1mm², and there shall be no more than two rust spots or rust stains on every 100cm² of test piece plating. If the area of the test piece plating is less than 100cm², no rust spots or rust stains shall be observed.

5.1.4 The surfaces of painted parts for base station air conditioners shall be flat, with even coating and uniform color, and free of obvious air bubbles, flow marks, wrinkles and other defects or damages, as well as coating omissions and exposed primer. The coating of painted parts for base station air conditioners shall have good adhesion. The tested adhesion shall not be greater than 0.30 after the coating undergoes an adhesion test using the method specified in 6.23.2 of GB/T 19413-2024.

5.1.5 The surfaces of decorative plastic parts for base station air conditioners shall be flat and smooth, uniform in color, and free of defects such as cracks, bubbles, and obvious shrinkage cavities. All plastic parts shall be aging-resistant.

5.1.6 All components and parts of base station air conditioners shall be installed firmly and reliably, without friction and collision between pipes and such components and parts. Refrigeration compressors shall be equipped with anti-vibration provisions.

5.1.7 The contents of hazardous substances in the control system hardware of base station air conditioners shall be as specified in GB/T 26572.

5.1.8 According to the agreement entered into by and between the manufacturer and the user, each base station air conditioner shall be equipped with a shockproof support, and the pipe connection between indoor and outdoor units shall have shockproof provisions.

5.1.9 The outdoor unit shall have good weather resistance, and the outdoor fan should achieve stepless speed regulation based on the system pressure when the compressor operates in the cooling mode.

5.1.10 Each base station air conditioner shall be equipped with a display device.

5.1.11 For a composite cooling type base station air conditioner with backup cooling sources, each cooling source shall meet the requirements of this document.

5.2 Safety Requirements

5.2.1 General

The safety design of base station air conditioners with compressor refrigeration mode shall be as specified in GB 25130 and GB/T 9237.

5.2.2 Fire Resistance Requirements

Air filters, thermal insulation and sound absorbing materials shall comply with the requirements for class B₁ flame retardant materials specified in GB 8624-2012.

5.2.3 Protection Requirements

5.2.3.1 The structure and enclosure of base station air conditioners shall provide adequate protection against accidental contact with live parts. Detachable parts, panels, covers or protective doors, etc. shall also prevent accidental contact between human beings and live parts when used normally or removed with bare hands without using any special tool. When such an air conditioner is tested according to 6.4.1 of GB/T 19413-2024, the test probe shall not come into contact with live parts.

5.2.3.2 The arrangement or covering of moving parts for base station air conditioners shall provide sufficient protection against personal injury during normal use, and their protective enclosures, protective covers and other similar parts shall be non-detachable and have sufficient mechanical strength. When such an air conditioner is tested according to 6.4.2 of GB/T 19413-2024, the test probe shall not come into contact with dangerous moving parts, and the protective parts shall not negatively affect other properties.

5.2.3.3 The waterproof rating of the outdoor units for base station air conditioners shall not be inferior to the nominal value and shall meet the requirements for IPX4 specified in GB/T 4208-2017.

5.2.4 Other Requirements

The insulation resistance, leakage current, electrical strength, and earthing device of base station air conditioners shall be as specified in GB/T 19413-2024.

5.3 Electromagnetic Compatibility

5.3.1 The terminal disturbance voltage, disturbance power and intermittent interference of base station air conditioners shall meet the following requirements:

- a) The terminal disturbance voltage, disturbance power and intermittent interference of base station air conditioners with a nominal cooling capacity $\leq 24.36\text{kW}$ shall not exceed the limits specified in GB 4343.1.
- b) The terminal disturbance voltage, disturbance power and intermittent interference of base station air conditioners with a nominal cooling capacity $> 24.36\text{kW}$ shall comply with the relevant standards or the agreement entered into by and between the supplier and the purchaser.

5.3.2 The harmonic current of base station air conditioners shall meet the following requirements:

- a) For base station air conditioners with an input current $\leq 16\text{A}$ per phase, the harmonic current shall not exceed the limit specified in GB 17625.1.
- b) For base station air conditioners with an input current $> 16\text{A}$ per phase, the harmonic current and total harmonic current shall comply with the relevant standards or the agreement entered into by and between the supplier and the purchaser.

5.3.3 The electrical control system of base station air conditioners shall meet the immunity requirements for Class II electrical appliances specified in GB/T 4343.2.

5.4 Sealing Performance

No refrigerant shall leak from any part of the refrigeration system of base station air conditioners.

5.5 Running

Base station air conditioners shall start normally in trial operation and have no abnormalities during operation.

5.6 Performance Requirements

5.6.1 Cooling Capacity

The measured cooling capacity of a base station air conditioner shall not be lower than 95% of its nominal cooling capacity.

5.6.2 Cooling Power Consumption

The measured cooling power consumption of a base station air conditioner shall not exceed 110% of its nominal cooling power consumption.

5.6.3 Energy Efficiency Ratio

The energy efficiency ratio of base station air conditioners shall be no less than the required values specified in Table 4.

5.6.4 Annual Energy Efficiency Ratio

The annual energy efficiency ratio of base station air conditioners shall be no less than the limits given in Table 5, and not lower than 95% of the nominal value.

5.6.5 Sensible Heat Ratio

The measured sensible heat ratio of base station air conditioners shall be no less than the stated value, not lower than 0.80 for standard return air temperature type and not lower than 0.90 for high return air temperature type.

5.6.6 Reheating Capacity

The measured reheating power of base station air conditioners shall be no less than 95% of the stated value and no more than 115% of the stated value.

5.6.7 Humidification Capacity

The measured humidification capacity of base station air conditioners shall be no less than 95% of the stated value, and no water shall be sprayed during humidification. The humidification capacity shall be greater than the dehumidification capacity caused by refrigeration operation under humidification operating conditions.

Table 4 Limits for Energy Efficiency Ratio

Type	Standard Return Air Temperature Type	High Return Air Temperature Type
Compressor refrigeration type	3.20	3.40

Table 5 Limits for Annual Energy Efficiency Ratio

Type	Standard Return Air Temperature Type	High Return Air Temperature Type
Compressor refrigeration type (constant capacity type)	4.00	4.60
Compressor refrigeration type (non-constant capacity type)	4.30	4.90
Composite cooling type with heat tube	4.90	6.40

5.6.8 Operating Under Maximum Cooling Conditions

When a base station air conditioner is operating under the maximum cooling conditions:

- a) No parts shall be damaged and the base station air conditioner shall run normally.

- b) The motor overload protector shall not trip during the first hour of continuous operation.
- c) After the base station air conditioner shuts down for 3 minutes, start it to run continuously for 1 hour. The motor overload protector can trip in the first 5 minutes of operation but is prohibited from acting afterwards. If the motor overload protector does not reset within the first 5 minutes of operation but can reset within 30 minutes after shutdown, the base station air conditioner shall run continuously for 1 hour.
- d) If the manually reset motor overload protector trips within the first 5 minutes of operation, it shall be forcibly reset 10 minutes after tripping, and the base station air conditioner shall run continuously for another 1 hour.

5.6.9 Operating under Low Temperature Cooling Conditions

When a base station air conditioner is operating under low temperature cooling conditions, the safety device shall not trip within 4 hours after the 10-minute startup, and the area of frost on the windward surface of the evaporator shall not exceed 50% of the area of the evaporator.

Note 1: The automatic resettable protector that automatically controls the starting and stopping of the compressor to prevent freezing is not regarded as a safety device.

Note 2: If the area of frost on the windward surface of the evaporator is invisible, it can be judged based on the air flow (the drop in air flow shall not exceed 25% of the initial air flow).

5.6.10 Condensation

Condensation on the external surface of the base station air conditioner cabinet shall not drip and the indoor air supply unit shall be free of water droplets.

5.6.11 Condensed Water Drainage Capacity

The base station air conditioner shall be capable of draining condensed water, and no water shall overflow or be blown out of the base station air conditioner.

5.6.12 Noise

The noise generated by a base station air conditioner shall meet the following requirements:

- a) The base station air conditioner in operation shall not produce abnormal noise or cause excessive vibration.
- b) When the noise test is conducted in a semi-anechoic room, the maximum measured noise level of the base station air conditioner shall not exceed the value specified in Table 6, and the measured value shall not be more than 3dB(A) above the stated value.

Table 6 Maximum Allowable Noise Level (Sound Pressure Level)

Nominal Cooling Capacity (CC), in W	Indoor Side, in dB(A)		Outdoor Side, in dB(A)	
	Integral Type	Split Type	Integral Type	Split Type
CC≤5500	≤58	≤53	≤57	≤52

5500<CC≤7500	≤62	≤60	≤60	≤57
7500<CC	≤67	≤67	≤65	≤62

5.7 Working Mode Switching

Each composite cooling type base station air conditioner shall automatically switch among its working modes, and it shall operate normally after mode switching.

5.8 Control Requirements

5.8.1 The power supply adaptability of a base station air conditioner shall meet the following requirements:

- a) The base station air conditioner shall operate normally within a voltage range of -15% to $+20\%$ of its rated voltage and at a frequency equal to the rated frequency $\pm 2\text{Hz}$. Outside this voltage range, it shall automatically activate protection, give an alarm, and automatically start and return to the state set before shutdown once the power supply is restored to normal.
- b) If three-phase AC power is supplied, the base station air conditioner shall perform the functions of phase loss protection, alarming, and phase sequence fault tolerance. When a phase error occurs, it shall automatically adjust to maintain normal operation.
- c) The base station air conditioner shall automatically resume operation upon power restoration. When the power supply is restored after a power failure, it shall start automatically according to the parameter settings and running status before the power failure.

5.8.2 The base station air conditioner shall have the functions of mutual backup, mutual switching, in-turn start, and conflict management.

5.8.3 The base station air conditioner shall automatically adjust according to the set temperature, display its operating status, automatically perform fault detection and diagnosis, and be subject to manual control.

5.8.4 When an alarm is triggered, the base station air conditioner shall send audible and visual signals and display the alarm message, and perform corresponding actions according to the alarm category. The main alarms of a base station air conditioner shall include:

- a) Power supply alarms, such as power supply voltage alarm, frequency alarm, phase loss alarm, and power failure alarm;
- b) Refrigeration system alarms, such as system high/low pressure alarm and compressor overload alarm;
- c) Temperature and humidity control alarms, such as alarms for too high or too low temperature and humidity;
- d) Component fault alarms, such as sensor fault alarm and driver fault alarm;
- e) Security alarms.

5.8.5 The remote control of a base station air conditioner shall meet the following requirements:

- a) The standard configuration of a base station air conditioner shall include an RS485 or RS232 monitoring interface, which can be used for local and remote control modes and have good electrical isolation performance (the signal terminals shall withstand a DC voltage of 500V to the ground for 1 minute without breakdown or flashover);
- b) The protocol format shall comply with the requirements specified in YD/T 1363.3 and the Modbus protocol;
- c) All three of the functions listed below shall be provided:
 - Telemetry: remotely test the temperature and humidity of the base station (if any);
 - Telecommand: remotely read operating status parameters and fault messages of the air conditioner;
 - Telecontrol: remotely control the ON/OFF operation and related parameter settings of the air conditioner.

6 Test Methods

6.1 Test Conditions

6.1.1 See Appendix A to GB/T 17758-2023 for details of the cooling capacity test devices for base station air conditioners.

6.1.2 See Table 1 to Table 2 for the test conditions.

6.1.3 The type and accuracy of instruments and meters shall be as specified in 6.1.4 of GB/T 17758-2023, and the instruments and meters used for testing shall be verified by a legal metrological inspection department and be within the validity period.

6.1.4 During the cooling test of base station air conditioners, the reading tolerances for test condition parameters shall be as specified in Table 9 and Table 10 of GB/T 17758-2023, and the data collection and processing shall comply with the provisions in 6.3 of GB/T 17758-2023.

6.2 General Test Requirements

The relevant requirements specified in 6.2 of GB/T 17758-2023 shall be met.

6.3 Test Methods

6.3.1 Safety Test

Carry out the test according to the method specified in 6.4 of GB/T 19413-2024.

6.3.2 Electromagnetic Compatibility Test

Carry out the test according to the method specified in 6.5 of GB/T 19413-2024.

6.3.3 Sealing Performance Test

Carry out the test according to the method specified in 6.4.1 of B/T 17758-2023.

6.3.4 Running Test

Carry out the test according to the method specified in 6.5 of GB/T 17758-2023.

6.3.5 Cooling Capacity Test

Carry out the test according to the method specified in Appendix A to GB/T 17758-2023 and under the nominal cooling conditions.

6.3.6 Cooling Power Consumption Test

Carry out the test according to 6.3.5 and measure the power input and operating current of the base station air conditioner.

6.3.7 Energy Efficiency Ratio Test

Carry out the test according to 6.3.5 and measure the ratio of the base station air conditioner's cooling capacity to its power input.

6.3.8 Annual Energy Efficiency Ratio Test

Carry out the test according to the method specified in Appendix C to GB/T 19413-2024 and under the test conditions specified in Table 3.

6.3.9 Sensible Heat Ratio Test

Carry out the test according to 6.3.5 and measure the ratio of the base station air conditioner's sensible cooling capacity to its total cooling capacity.

6.3.10 Maximum Load Cooling Test

At the rated frequency and voltage, run the base station air conditioner continuously for 1 hour after keeping it in stable operation under the specified maximum cooling conditions, then shut it down for 3 minutes (with a voltage rise not exceeding 3% during the shutdown), and restart it for another 1 hour of operation.

6.3.11 Low Temperature Cooling Test

Fully close the base station air conditioner's ventilation and exhaust dampers (if any) for indoor and outdoor air exchange. Adjust the set temperature, fan speed, and guide grille to the conditions that are most likely to cause icing. Start the base station air conditioner and run it under the specified low temperature cooling test conditions until it operates stably, then continue running it for 4 hours.

6.3.12 Condensation Test

Without violating the manufacturer's instructions, adjust the temperature controller, fan speed, damper and guide grille of the indoor unit of the base station air conditioner to the conditions that are most likely to cause condensation. Run the base station air conditioner in the cooling mode until the specified condensation test conditions are reached, and then run it continuously for 4 hours.

6.3.13 Condensed Water Drainage Capacity Test

Adjust the temperature controller, fan speed, damper and guide grille of the base station air conditioner to the conditions that are most likely to cause condensation. After the drain pan is full of water, namely the water reaches the water outlet, run the base

station air conditioner under the specified condensation test conditions. Wait until water level stabilizes inside the drain pan, and then run it continuously for another 4 hours.

6.3.14 Reheating Capacity Test

The test shall meet the following requirements:

- a) The test shall be carried out under the specified test conditions.
- b) The reheating capacity test shall be carried out without cooling and humidification. The reheating capacity includes the power consumption of the electric heater, indoor fan motor, electrical control device, etc.
- c) The fan speed for the reheating capacity test shall be consistent with that for the nominal cooling capacity test.

6.3.15 Humidification Capacity Test

The test shall meet the following requirements:

- a) The test shall be carried out according to the method specified in Appendix D to GB/T 19413-2024 and under the specified test conditions.
- b) During the test, the cooling mode of the base station air conditioner shall be turned off to eliminate the impact of refrigeration on the humidification capacity test.
- c) Humidification power consumption refers to the power consumed by the humidifier itself, excluding that consumed by the fan and control devices.

6.3.16 Noise Test

Carry out the test according to the method specified in 6.16 of GB/T 17758-2023.

6.3.17 Working Mode Switching Test

Carry out the test according to the method specified in 6.20 of GB/T 19413-2024.

6.3.18 Control Requirement Tests

6.3.18.1 Power Supply Adaptability

Carry out the power supply adaptability test on the base station air conditioner using the following method:

- a) Adjust the base station air conditioner's input voltage to 120% of the rated voltage and the frequency to the rated frequency +2Hz. Then, adjust the input voltage to 85% of the rated voltage and the frequency to the rated frequency -2Hz. Check whether the base station air conditioner can start and operate normally at such voltages and frequencies.
- b) Disconnect any of phases A, B and C of the base station air conditioner's power supply, and check whether an alarm message is generated.

- c) Switch any two of phases A, B and C of the power supply, and check whether the base station air conditioner can start and operate normally.

6.3.18.2 Alarm and Protection Function Test

Simulate and test all alarm functions of the base station air conditioner in turn, and check whether it sends audible and visual alarm signals and displays alarm messages.

6.3.18.3 Remote Control Test

Carry out the test according to the method specified in 6.21.4 of B/T 19413-2024.

6.3.19 Other Tests

Carry out the salt spray test, coating adhesion test and hazardous substance content test according to the methods specified in 6.23 of GB/T 19413-2024.

7 Inspection Rules

7.1 Factory Inspection

Each base station air conditioner shall undergo factory inspection. The inspection items and test methods are as specified in Table 7.

7.2 Sampling Inspection

7.2.1 Samples shall be taken from the base station air conditioner products that have passed the factory inspection.

7.2.2 The sampling method is as specified in GB/T 2828.1. The sampling items, lot size, sampling plan, inspection level, and acceptable quality level for lot-by-lot inspection are determined by the manufacturer.

7.3 Type Inspection

7.3.1 For new products or approved products with significant improvements, the first unit shall undergo type inspection, with the inspection items complying with the provisions in Table 7.

7.3.2 The type test duration shall not be less than the time specified in the testing method. If a fault occurs during operation, the inspection shall be conducted again after the fault is rectified.

Table 7 Inspection Items

S/N	Item	Factory Inspection	Sampling Inspection	Type Inspection	Technical Requirements	Test Method
1	General requirements	△	△	△	5.1	Visual inspection
2	Marking				8.1	
3	Packaging				8.2	

S/N	Item	Factory Inspection	Sampling Inspection	Type Inspection	Technical Requirements	Test Method
4	Protection requirements				5.2.3	GB/T 19413-2024 6.4.1-6.4.3
5	Insulation resistance				5.2.4	GB/T 19413-2024 6.4.4
6	Leakage current					GB/T 19413-2024 6.4.5
7	Electrical strength					GB/T 19413-2024 6.4.6
8	Earthing device					GB/T 19413-2024 6.4.7
9	Sealing performance					5.4
10	Running				5.5	6.3.4
11	Phase sequence fault tolerance				5.8.1 b)	6.3.18.1 c)
12	Electromagnetic compatibility	—			5.3	GB/T 19413-2024 6.5
13	Cooling capacity				5.6.1	6.3.5
14	Cooling power consumption				5.6.2	6.3.6
15	Energy efficiency ratio				5.6.3	6.3.7
16	Annual energy efficiency ratio				5.6.4	6.3.8
17	Sensible heat ratio				5.6.5	6.3.9
18	Reheating capacity				5.6.6	6.3.14
19	Humidification capacity				5.6.7	6.3.15
20	Maximum load cooling		—		5.6.8	6.3.10
21	Low temperature cooling				5.6.9	6.3.11
22	Condensation				5.6.10	6.3.12
23	Condensed water drainage				5.6.11	6.3.13
24	Noise				5.6.12	6.3.16
25	Power supply adaptability				5.8.1	6.3.18.1
26	Alarm and protection functions				5.8.4	6.3.18.2

S/N	Item	Factory Inspection	Sampling Inspection	Type Inspection	Technical Requirements	Test Method
27	Remote control function				5.8.5	6.3.18.3
28	Working mode switching				5.7	6.3.17
Note: "△" for items to be inspected and "—" for items not to be inspected.						

8 Marking, Packaging, Transportation and Storage

8.1 Marking

8.1.1 Each base station air conditioner shall have a durable nameplate fixed in a visible location, and the nameplate shall clearly contain the following items and comply with the relevant provisions specified in GB 4706.32:

- a) Name and model of the product;
- b) Name of the manufacturer;
- c) Main technical parameters (including cooling capacity, reheating capacity, energy consumption efficiency, noise, name or code and injection amount of refrigerant, rated voltage, rated frequency, rated current, power input, and mass), which shall be marked separately on the indoor and outdoor units of a split base station air conditioner (specifically, parameters of the entire air conditioner are marked on the indoor unit, while the outdoor unit parameters are marked on the outdoor unit, at least including the name or code and injection amount of refrigerant, rated voltage, rated frequency, input current, and power input);
- d) Manufacturing serial number;
- e) Manufacturing date.

Note 1: As for the power input, both the nominal cooling power consumption and the reheating power consumption of the electric heater shall be marked.

Note 2: The manufacturing serial number and manufacturing date of the product may be durably marked in a visible location on the base station air conditioner.

8.1.2 Each base station air conditioner shall have signs indicating its operating status, such as rotation direction signs for control switches and knobs, and the electrical schematic diagram shall be attached in an appropriate position.

8.1.3 Each base station air conditioner shall have a registered trademark.

8.1.4 Packing marks shall be clearly written on the packing cases using non-fading pigments.

8.1.5 Product name, specification/model and trademark;

- a) Mass (gross mass and net mass);

- b) Outline dimensions: width × height × depth (in mm)
- c) Name of the manufacturer;
- d) The marks for storage and transportation precautions such as "Fragile", "This Side Up", "Keep Dry" and "Maximum Stack Layers" shall comply with the relevant provisions specified in GB/T 191.

8.1.6 The product adopted standard shall be indicated on the packaging.

8.2 Packaging

8.2.1 Each base station air conditioner shall be cleaned and dried before being packed.

8.2.2 The packing case of a base station air conditioner shall contain a certificate of conformity, a user manual, a packing list, and the listed accessories.

The certificate of conformity shall indicate the following:

- a) Name and model of the product;
- b) Manufacturing serial number;
- c) Inspection conclusion;
- d) Inspection seal;
- e) Inspection date.

The user manual shall be prepared as specified in GB 5296.2 and at least include the following:

- a) Name and model (specification) of the product;
- b) Product overview (application, characteristics, service environment, main performance indicators, rated parameters, etc.);
- c) Earthing instructions;
- d) Installation and use requirements, and precautions for maintenance and servicing;
- e) Name, quantity and specification of product accessories;
- f) List of common faults and solutions, after-sales service matters, and production responsibilities;
- g) Name and address of the manufacturer.

Note: The above information may also be compiled into separate documents.

8.2.3 Accompanying documents shall be sealed against moisture and placed in an appropriate location inside the packing case.

8.3 Transportation and Storage

8.3.1 Base station air conditioners shall be protected from collision, tilting, and exposure to rain or snow during transportation and storage.

8.3.2 Base station air conditioners shall be stored in a dry and well-ventilated place without corrosive and harmful gases. The storage environment shall comply with the provisions specified in GB/T 4798.1.

8.3.3 Unpacked products shall be repacked if they need to be stored.
