

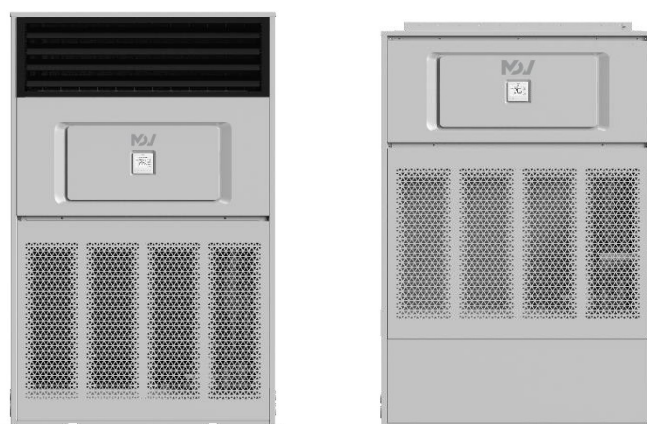


R410A

Commercial Air Conditioners

Service Manual

Floor Standing Units



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Floor Standing

MDV Indoor Units



Table continued on next page ...

Table 3.11: High Static Pressure Duct main PCB ports (continued)

Label in Figure 3.10	Code	Content	Port voltage	Note
11	CN-A	Sterilization module port	12V DC	Reserved
12	CN190	Drainage pump port	12V DC ^[5]	Standard
13	CN26	Communication with wire controller	18V DC ^[5]	Standard
14	CN18	Switch module	5V/12V DC ^[5]	Standard
15	CN14/CN11	Fan module connection	5V DC	Standard
16	CN25	Program burning port(indoor unit)	3.3V DC ^[5]	Standard
17	CN8	EEV drive port	12V DC ^[5]	Standard
18	CN30	Display panel connection	12V DC	Standard
19	CN55	Remote control ON/OFF port	Note 5	Standard
20, 21	CN6(X1X2,PQE)	X1 X2 communication port(with wire controller); P Q communication port(with ODU by RS-485)	X1 X2:18V DC ; P,E or Q,E: 2.5-2.7V DC	Standard
22	CN2(D1D2)	D1 D2 communication port(with Central controller or group controller)	D1,E or D2,E 2.5 - 2.7V DC	Standard
23	CN10(M1M2)	M1 M2 communication port(with ODU by HyperLink)	24V DC	Standard

Notes:

- Standard:** The model has this function, the customers can connect corresponding device through this port, such as water pump and hotel key card etc.
Customized: This function needs to be customized before leaving the factory.
Reserved: This port can not be used.
- When repairing, PQ connects after-sales tooling
- PQ and M1M2 communication ports both are used for indoor and outdoor communication, and only one of them can be used at a time. Meanwhile, be sure to connect the same communication ports (PQ to PQ; M1M2 to M1M2) in case of damage of the main control board.
- D1D2 communication ports are used for group control communication. When connecting the group controller, the D1D2 port of the indoor units that are to be group controlled must be connected in daisy chain, and the group controller must be connected to the X1X2 port of one of the indoor units in the group control, and set to group control mode. In addition, D1D2 communication ports can also be connected to the central controller.
- Refer to Table 3.2 for voltage test instructions of some ports.

2 Indoor unit settings

2.1 Parameter settings

Taking KJR-86S/BK as an example, the parameters can be set in the power-on or power-off state.

① Hold "⏏" and "≡" for 3 seconds to enter the parameter setting interface, and the main interface will display "CC"

②

a) Wired controller Parameter Settings (Cxx)

When display "CC", press "⏏" will enter the wired controller Parameter Settings "Cxx". Press "▲" and "▼" to switch the parameter code and press "⏏" to enter Parameter value setting interface. Then press "▲" and "▼" to change Parameter value and press "⏏" to save changes. (For example "CC" to "C03" to "01")

b) Indoor unit Parameter Settings (Nxx)

When display "CC", press "▼", then the indoor unit number will be displayed ("n00-n63" is displayed, and the last two digits are the indoor unit addresses). Press the "⏏" to enter the indoor unit parameter setting interface, and "n00" will be displayed. Use "▲" and "▼" to adjust to "Nxx" and press the "⏏" to confirm. Finally, press "▲" and "▼" to change Parameter value and press "⏏" to save changes. (For example "CC" to "n03" to "N25" to "01").

③ Press the "⌚" button to return to the previous page until exiting the parameter setting or exiting the parameter setting after 60s without any operation.

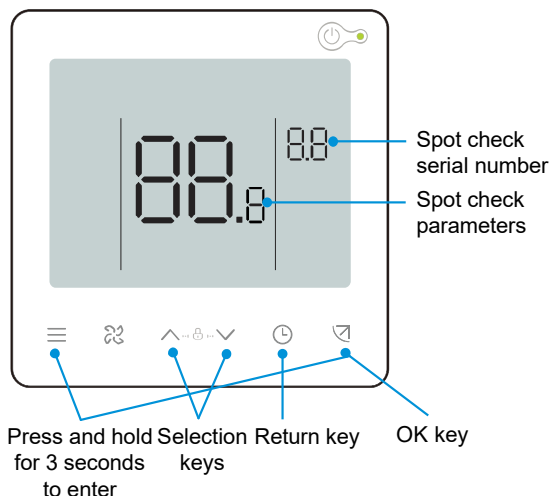


Table 4.1: Wired controller Parameter Settings

Parameter Code	Parameter Name	Parameter Range	Default Value	Remarks
C00	Main and secondary wired controller setting	0 indicates the main wired controller 1 indicates a secondary wired controller	0	If two wired controllers control one IDU, addresses for two wired controllers must be different. You are not allowed to set IDU parameters via the secondary wired controller (address 1), but can set the wired controller.
C01	Cooling only/cooling and heating setting	00: Cooling and Heating 01: Cooling Only	00	Heating mode is not available in cooling only setting
C02	Auto restart function setting for the wired controller	00: No 01: Yes	00	If the value is set to 00, the wired controller screen displays cooling, medium fan speed, and set temperature 24°C after each power-on. If the value is set to 01, the wired controller screen displays the mode, temperature, and fan speed that were previously set before a power failure upon each power-on.
C03	Time to remind users to clean the filter on the wired controller	00/01/02/03/04	01	00: No reminder to clean filter 01: 1200h, 02: 2500h 03: 5000h 04: 10000h
C04	Settings for infrared receiver of wired controller	00: Disable 01: Enable	01	When "Disable the infrared receiver of the wired controller" is on, the wired controller cannot receive remote control signal.

Table 4.1: Wired controller Parameter Settings(continues)

Parameter Code	Parameter Name	Parameter Range	Default Value	Remarks
C05	Whether indoor ambient temperature is displayed	00: No 01: Yes	00	Common IDU, V8 AHU-kit, and V8 FAPU : T1_modify is displayed. V6 FAPU and V6 AHU-kit: Subject to the unit type
C06	LED indicator of wired controller	00: Off 01: On	01	When it is on, LED indicator shows the on/off state of the indoor unit. When it is off, LED indicator is off.
C07	Wired controller Follow Me temperature calibration	Celsius: -5.0 to 5.0 Fahrenheit: -9.0 to 9.0	Celsius: -1.0 Fahrenheit: -2.0	Note: Accuracy is 0.5°C or 1°F
C08	Minimum cooling temperature	Common V8 IDU 16°C to 30°C	16°C	
		Common V6 IDU (including V6 AC FAPU) 17°C to 30°C	17°C	
		V8 FAPU (Supply air temperature control) 13°C to 30°C	13°C	
		V8 FAPU (Room temperature control) 16°C to 30°C	16°C	
		V6 DC FAPU 13°C to 30°C	13°C	
		V8 AHU kit (Supply air temperature control) 10°C to 30°C	10°C	
		V8 AHU kit (Return air temperature control) 16°C to 30°C	16°C	
		V6 AHU kit (Supply air temperature control) 10°C to 30°C	10°C	
		V6 AHU kit (Return air temperature control) 17°C to 30°C	17°C	

Table 4.1: Wired controller Parameter Settings(continues)

Parameter Code	Parameter Name	Parameter Range	Default Value	Remarks
C09	Maximum cooling temperature	Common V8 IDU 16°C to 30°C	30°C	The setting is valid only when the wired controller is connected to a V8 IDU.
		Common V6 IDU (including V6 AC FAPU) N/A	N/A	
		V8 FAPU (Supply air temperature control) 13°C to 30°C	30°C	
		V8 FAPU (Room temperature control) 16°C to 30°C	30°C	
		V6 DC FAPU N/A	N/A	
		V8 AHU kit (Supply air temperature control) 10°C to 30°C	30°C	
		V8 AHU kit (Return air temperature control) 16°C to 30°C	30°C	
		V6 AHU kit (Supply air temperature control) N/A	N/A	
		V6 AHU kit (Return air temperature control) N/A	N/A	
C10	Minimum heating temperature	Common V8 IDU 16°C to 30°C	16°C	The setting is valid only when the wired controller is connected to a V8 IDU.
		Common V6 IDU (including V6 AC FAPU) N/A	N/A	
		V8 FAPU (Supply air temperature control) 13°C to 30°C	13°C	
		V8 FAPU (Room Temperature control) 16°C to 30°C	16°C	
		V6 DC FAPU N/A	N/A	
		V8 AHU kit (Supply air temperature control) 10°C to 30°C	10°C	
		V8 AHU kit (Return air temperature control) 16°C to 30°C	16°C	
		V6 AHU kit (Supply air temperature control) N/A	N/A	
		V6 AHU kit (Return air temperature control) N/A	N/A	

Table 4.1: Wired controller Parameter Settings(continues)

Parameter Code	Parameter Name	Parameter Range	Default Value	Remarks
C11	Maximum heating temperature	Common V8 IDU 16°C to 30°C	30°C	
		Common V6 IDU (including V6 AC FAPU) N/A	N/A	
		V8 FAPU (Supply air temperature control) 13°C to 30°C	30°C	
		V8 FAPU (Room temperature control) 16°C to 30°C	30°C	
		V6 DC FAPU N/A	N/A	
		V8 AHU kit (Supply air temperature control) 10°C to 30°C	30°C	
		V8 AHU kit (Return air temperature control) 16°C to 30°C	30°C	
		V6 AHU kit (Supply air temperature control) N/A	N/A	
		V6 AHU kit (Return air temperature control) N/A	N/A	
		Common V8 IDU 16°C to 30°C	30°C	
C12	Set to display 0.5°C	00/01	01	00: Without 0.5°C display 01: With 0.5°C display
C13	Wired controller button light setting	00/01	01	00: Off 01: On
C14	One click to deliver IDU Parameter settings		01	The latest configuration parameters stored in the wired controller will be changed after power on for two hours or after configuration parameters of wired controller are changed. Note: 1: Applicable to one-to-one scenario 2: Only for 2nd generation IDU
C15	Buzzer of the wired controller rings	00/01	01	00: No 01: Yes
C16	Backlight on time	00/01/02	00	00: 15s 01: 30s 02: 60s

Table 4.1: Wired controller Parameter Settings(continues)

Parameter Code	Parameter Name	Parameter Range	Default Value	Remarks
C17	Whether energy efficiency attenuation is displayed when power off	00/01	00	00: Disable 01: Enable The setting is valid only when the wired controller is connected to a V8 IDU.
C18	Whether IDU filter blockage is displayed when power off	00/01	00	00: Disable 01: Enable The setting is valid only when the wired controller is connected to a V8 IDU.
C19	T1 temperature selection	F0/F1/F2/F3/...#IDU	F1	Only for the V8 FAPU, the value of C19 parameter cannot be set and T1 value is fixed to F1. For other models, the value of this parameter can be set. F0: IDU T1 temperature sensor F1: Follow Me T1 temperature sensor embedded in the wired controller (Note: The secondary wired controller does not respond to Follow Me) F2: Second temperature sensor (reserved) F3: Ground sensor (reserved)
C20	Swing motor direction setting	00/01	00	The setting is valid only when the wired controller is connected to a common V8 IDU.

Table 4.2: Indoor unit Parameter Settings

Parameter Code	Parameter Name	Parameter Range	Default Value	Remarks
N00	Static pressure of IDU	IDU static pressure level: 00/01/02/03/ 04/05/06/07/08/ 09/~ /19/FF	FF	The IDU sets the selected corresponding static pressure (FF-there may be different default values for different series of indoor units)
N01	Power failure memory function setting for the IDU	00/01	01	00: No 01: Yes
N02	IDU up/down swing setting	00/01/02/03/04	01	00: None 01: Available 02/03: Reserved 04: Q4/Qmin four air vents Note: The IDU can automatically identify up/down swing, so this function is invalid
N03	IDU left/right swing setting	00/01	01	00: None 01: Available Note: The IDU can automatically identify up/down swing, so this function is invalid
N04	Infrared receiver of IDU display box	00/01	00	00: Yes 01: No
N05	Buzzer of the IDU rings	00/01/02	02	00: No 01: Yes 02: Only the display box rings.
N06	Light (display panel) setting	00/01	01	00: Off 01: On
N07	Temperature unit	00/01	00	00: Celsius 01: Fahrenheit
N08	Mode changeover time interval in the auto mode (min)	00/01/02/03	00	00: 15min 01: 30min 02: 60min 03: 90min
N09	Heating and cooling temperature difference setting in auto mode	00/01/02/03/04/ 05/06/07/08	00	00: 0°C; 01: 1°C; 02: 2°C; 03: 3°C; 04: 4°C; 05: 5°C; 06: 6°C; 07: 7°C; 08: 8°C
N11	Set outdoor temperature for auxiliary heat source/alternative heat source to turn on	Celsius: -25°C to 20°C Fahrenheit: -13°F to 68°F	0°C	Note: Accuracy is 1°C or 1°F
N12	Indoor temperature when auxiliary heater is on	10°C to 30°C	24°C	(Accuracy is 1°C)

Table 4.2: Indoor unit Parameter Settings(continues)

Parameter Code	Parameter Name	Parameter Range	Default Value	Remarks
N13	T1 temperature difference for auxiliary heat source/alternative heat source to turn on	0-7	3	0-7 indicates 0 - 7°C (The value is accurate to 1°C or 1°F.)
N14	T1 temperature difference when auxiliary heat source/alternative heat source is off	0-10	5	0-10 indicates -4 - 6°C(The value is accurate to 1°C or 1°F.)
N15	Auxiliary heater used alone	00/01	00	00: No 01: Yes
N16	Auxiliary heater on/off	00/01/02	00	00: Auto 01: Forced on 02: Forced off
N17	IDU cold draft prevention temperature settings	00/01/02/03/04	00	Common IDU: 0: 15; 1: 20; 2: 24; 3: 26; 04: Anti-cold wind disabled Fan coil unit: 00: 32°C; 01: 34°C; 02: 36°C; 03: 38°C; 04: anti-cold wind invalid
N18	Fan speed setting in Cooling standby mode	00/01/02/03/04/ 05/06/07/14	01	00: Start/Stop delay 01: Speed 1 02: Speed 2 03: Speed 3 04: Speed 4 05: Speed 5 06: Speed 6 07: Speed 7 14: Fan speed before going to standby mode
N19	Standby fan speed range in dry mode	00/01/02/03	01	00: Fan off 01: L1 02: L2 03: Speed 1
N20	Fan speed setting in heating standby mode	0/1/14	0	0: Thermal 1: Speed 1 14: Fixed to Speed 1
N21	Time to stop the fan of IDU (Thermal)	01/02/03/04	01	00: Fan shutdown 01: 4min 02: 8min 03: 12min 04: 16min(stop the fan for Xmin; open the fan at speed 1 for 1min to detect the actual T1 temperature)

Table 4.2: Indoor unit Parameter Settings(continues)

Parameter Code	Parameter Name	Parameter Range	Default Value	Remarks
N22	EEV opening selection during heating standby	00/01/02/14	14	00: 56P 01: 72P 02: 0P 14: Auto regulation
N23	Cooling return difference temperature	00/01/02/03/04	00	00: 1°C 01: 2°C 02: 0.5°C 03: 1.5°C 04: 2.5°C
N24	Heating return difference temperature	00/01/02/03/04	00	00: 1°C 01: 2°C 02: 0.5°C 03: 1.5°C 04: 2.5°C
N25	IDU heating mode temperature compensation	00/01/02/03/04	00	00: 6°C 01: 2°C 02: 4°C 03: 8°C 04: 0°C
N26	IDU cooling mode temperature compensation	00/01/02/03/04	00	00: 0°C 01: 1°C 02: 2°C 03: 3°C 04: -1°C
N27	Maximum indoor temperature drop in dry mode	00/01/02/03/04	01	00: 03°C 01: 04°C 02: 05°C 03: 06°C 04: 07°C
N30	Constant air flow setting	00/01	01	00: Constant speed 01: Constant air flow
N31	High ceiling setting	00/01/02	00	00: $H \leq 3m$; 01: $3 < H \leq 4m$; 02: $4 < H \leq 4.5m$ (H: IDU Mounting height)
N32	Q4/Q4C air outlet 1 setting	00/01	00	00 - Free control 01 - Off
N33	Q4/Q4C air outlet 2 setting	00/01	00	00 - Free control 01 - Off
N34	Q4/Q4C air outlet 3 setting	00/01	00	00 - Free control 01 - Off

Table 4.2: Indoor unit Parameter Settings(continues)

Parameter Code	Parameter Name	Parameter Range	Default Value	Remarks
N35	Q4/Q4C air outlet 4 setting	00/01	00	00 - Free control 01 - Off
N37	One-to-more of wired controller enabled	00/01	00	00: No 01: Yes
N38	Remote On/Off port logic of the IDU	00/01	00	00: Remote off (closed); 01: Remote off (open) Note: When powered off remotely, the digital display of wired controller of V8 displays d6, while that of V6 does not display this code
N39	Remote OFF delay settings	00/01/.../06	00	00 - No delay 01 - 1min delay 02 - 2min 03- 3min 04- 4min 05- 5min 06- 10min
N40	Alarm port logic	00/01	00	00: Alarm when closed 01: Alarm when open
N41	Powerful operation	00/01	00	00: Off 01: On (Rapid cooling/Rapid heating)
N42	Sterilization function	00/01	00	00: No sterilization function (default) 01: Sterilization
N43	Sterilization setting	00/01/02	00	00: Auto on 01: Forced on 02: Forced off
N44	Silent mode setting	00/01	00	00: Off 01: On
N45	ECO	00/01	00	00: Off 01: On
N46	Drying time at self-cleaning	0/1/2/3	0	0: 10 min 1: 20 min 2: 30 min 3: 40 min
N47	Mildew-proof fan operation duration (power off in cooling/dry mode, except power off due to faults)	00/01/02/03	00	00 - 40s 01 - 120s 02 - 300s 03 - 600s
N48	Dirt proof for ceiling	00/01	00	00: Invalid 01: Valid

Table 4.2: Indoor unit Parameter Settings(continues)

Parameter Code	Parameter Name	Parameter Range	Default Value	Remarks
N49	Condensation proof	00/01	00	00: Invalid 01: Valid
N50	Human Detect Sensor	00/01/02	01	00: Invalid 01: Used to adjust the set temperature when unattended 02: Used to turn off the unit when unattended
N51	Setting temperature adjustment interval when unattended	00/01/02/03/04/05	00	00: 15 min 01: 30 min 02: 45 min 03: 60 min 04: 90 min 05: 120 min
N52	Setting maximum temperature adjustment when unattended	00/01/02/03	03	00: 1°C 01: 2°C 02: 3°C 03: 4°C
N53	Stop delay when unattended	00/01/02/03/04/05	01	00: 15 min 01: 30 min 02: 45 min 03: 60 min 04: 90 min 05: 120 min
N54	MDV ETA function setting	00/01	01	00: Off 01: On
N55	Energy rating of cooling MDV ETA	00/01/02	00	00: Level 1 01: Level 2 02: Level 3
N56	Energy rating of heating MDV ETA	00/01/02	00	00: Level 1 01: Level 2 02: Level 3
N57	On-site air flow adjustment factor	00/01/02/03/04/05/06	00	00: 1 01: 1.05 02: 1.1 03: 1.15 04: 0.95 05: 0.9 06: 0.85
N58	Initial static pressure detection	00/01	00	00: Not reset 01: Reset
N59	Filter ending - initial static pressure setting	00/01/.../19	00	00-10Pa/ 01-20Pa/ 02~19-30Pa ~200Pa

Table 4.2: Indoor unit Parameter Settings(continues)

Parameter Code	Parameter Name	Parameter Range	Default Value	Remarks
N60	Ambient temperature when preheating is turned on	00/01/02	00	00: 5°C 01: 0°C 02: (-5)°C
N61	Fresh air dry contact 1	00/01	00	00: Disconnected 01: Connected Note: Applicable to FAPU only
N62	Fresh air dry contact 2	00/01	00	00: Disconnected 01: Connected Note: Applicable to FAPU only
N63	Fresh air dry contact 3	00/01	00	00: Disconnected 01: Connected Note: Applicable to FAPU only
N64	Whether to open valve when the fan coil unit works in heating mode	00/01	00	00: Open the valve in heating mode; 01: Do not open the valve in heating mode Note: Applicable to fan coil unit only
N65	Fan coil unit's anti-hot wind temperature setting in cooling mode	01/02/03/04	00	00: 0°C 01: -2°C 02: -4°C 03: -6°C 04: Invalid anti-hot wind Note: Applicable to fan coil unit only
N66	Auto Dry Function	00/01	00	00: Invalid(default) 01: Valid Note: Only applicable to operations in Cool or Auto mode
N67	Auto Dry Target relative humidity	40%/41%/42%/... .../7 65% 0%	65%	
N68	Refrigerant leakage fault reset	00/01	00	00: Not reset; 01: reset
N69	Target humidity for third-party dehumidifiers	35%/36%/37%/... /75%	65%	
N70	Target humidity for third-party humidifiers	35%/36%/37%/... /75%	65%	
N71	IDU control type	01/02	01	Valid to V8 FAPU. 01: Supply air temperature control 02: Room temperature control
N72	Minimum temperature settings of cooling operating range	00/01/02/03/04/ 05/06/07	00	Valid to V8 FAPU.
N73	Maximum temperature settings of heating operating range	00/01/02/03/04/ 05/06/07	00	Valid to V8 FAPU.

Table 4.2: Indoor unit Parameter Settings(continues)

Parameter Code	Parameter Name	Parameter Range	Default Value	Remarks
N74	Anti-cold wind temperature setting of special IDUs	00/01/02/03/04	00	00/01/02/03: corresponds to different values; 04: Anti-cold wind disabled
N75	IDU operating mode setting if the IDU is shut down remotely	00/01	00	00: After the remote shutdown signal is canceled, the IDU runs in the preset mode or based on the command that is received during shutdown period. The preset mode is the mode set before the remote shutdown signal is triggered. 01: After the remote shutdown signal is canceled, the IDU is shut down.

Notes:

If use other controllers, parameter settings need refer to the corresponding manual.

2.2 Indoor unit parameter query

Taking KJR-86S/BK as an example

- ①Hold "≡" and "∧" for 2 seconds to enter the query interface, "u00-u03" indicates ODUs, "n00-n63" indicates IDUs (the last two digits are the ODU or IDU addresses), and "CC" indicates the wired controller. Press "∧" and "∨" to switch the IDU code (For example n02), then press "↩" to enter the parameter query page.
- ②In the parameter query page, use "∧" and "∨" to query parameters, and the parameters can be queried cyclically.
- ③The check list serial number is displayed in upper right corner of the wire controller, while the parameter value is displayed in the middle of the wire controller.
- ④Press "⌚" to exit the query page. The parameter query page automatically closes if no button is pressed within the next 60 seconds.

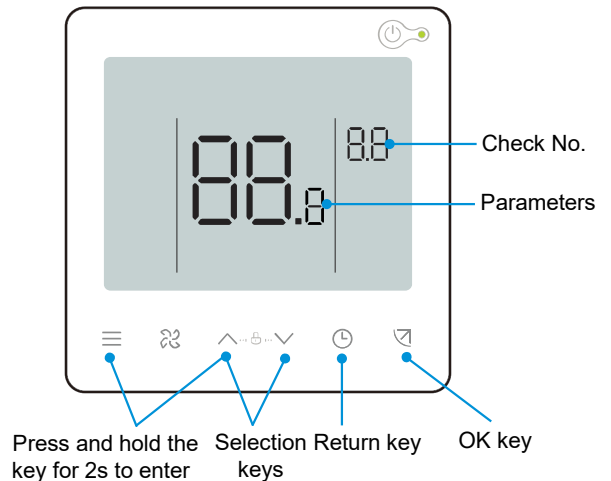


Table 4.3: Indoor unit parameters check list

Check No.	Parameters	Remarks
1	IDU and ODU communication address ¹	0 - 63
2	Capacity of indoor unit	Unit: HP
3	Actual set temperature Ts	Unit:℃
4	Set temperature of the unit that is operating currently, Ts (Remarks: The temperature displayed is the actual set temperature Ts)	Unit:℃
5	Actual T1 indoor temperature	Actual value = value displayed
6	Modified indoor temperature T1_ modify	Actual value = value displayed
7	T2 heat exchanger intermediate temperature	Actual value = value displayed
8	T2A heat exchanger liquid pipe temperature	Actual value = value displayed
9	T2B heat exchanger gas pipe temperature	Actual value = value displayed
10	Actual set humidity RHs	Actual value = value displayed

Check No.	Parameters	Remarks
11	Actual RH indoor humidity	Actual value = value displayed
12	[— — —] is displayed	
13	Air discharge pipe temperature	Actual value = value displayed
14	Compressor discharge temperature	Actual value = value displayed
15	Target superheat	Actual value = value displayed
16	EEV opening (actual opening/8)	Actual value/8 = value displayed
17	Software version No.	Actual value = value displayed
18	Historical error code (recent)	Actual value = value displayed
19	Historical error code (sub-recent)	Actual value = value displayed
20	Fan drive version No.	
21	[— — —] is displayed	

Notes:

1. For indoor units, the communication address and network address are the same and are routinely referred to simply as the unit's "address".
2. If use other controllers, please refer to the corresponding manual.

2.3 Function Descriptions

2.3.1 Power failure memory function

The power failure memory function can be used to ensure that, in the event of a power outage, the indoor units, which was in operation before, automatically restart once the power returns. When the power returns following a power outage, units with Power failure memory function enabled restart with the same operating mode, fan speed and remote control lock status settings as before the power outage. If, during this timed delay, the remote or wired controller is used to send a command to a unit, that unit starts-up immediately with those new settings. Indoor units with this function disabled go into standby once the power returns following a power outage.

2.3.2 Heating mode temperature compensation setting

Since indoor units are often installed at ceiling level, and since warm air rises, the ambient temperature sensed at the unit can be higher than the ambient temperature where users are standing or sitting. To compensate for this, in heating mode the indoor units target a temperature that is higher than the set temperature. The heating mode temperature compensation setting sets the difference between the set temperature and the target temperature. For example, if the set temperature is 20°C and the heating mode compensation setting is 4°C, the units target an ambient temperature (sensed at the unit) of 24°C

Depending on a variety of factors including the height of the room and the position of the units, different values may be appropriate for the heating mode temperature compensation setting. Values of heating mode temperature compensation can be selected by controller.

2.3.3 Cooling mode temperature compensation setting

With cooling mode temperature compensation, in cooling mode the indoor units target a temperature that is lower than the set temperature. The cooling mode temperature compensation setting sets the difference between the set temperature and the target temperature. For example, if the set temperature is 26°C and the cooling mode compensation setting is 2°C, the units target an ambient temperature (sensed at the unit) of 24°C. Values of cooling mode temperature compensation can be selected by controller.

4 Control

3.1 Temperature Compensation Control

Because of the installation position of Indoor Unit and different layout, indoor temperature detected by Indoor Unit may not consist with actual temperature. Indoor temperature could be compensated by controller (The parameter code is "N25" "N26")

3.2 EEV Control

When the IDU is powered on again or the ODU is stopped, the system automatically enters initialization mode. After initialization is completed, the system enters the normal start mode. The IDU EEV uses superheat degree control in cooling mode and uses supercool degree control in heating mode. If the IDU receives a protection control or special control command, this command is executed in priority.

● Superheat Degree Control in Cooling Mode

During cooling (dry), the IDU calculates the difference between the heat exchanger gas pipe temperature (T2B) and the heat exchanger liquid pipe temperature (T2A) detected by the temperature sensors and write this difference as the current superheat degree (SH). By comparing the current superheat degree (SH) with the set superheat degree (SHS), the opening adjustment trend of the EEV can be decided.

$$SH = T2B - T2A$$

- ◆ When $SH > SHS$, the EEV opening increases
- ◆ When $SH = SHS$, the EEV opening unchanged
- ◆ When $SH < SHS$, the EEV opening decreases

● Supercool Degree Control in Heating Mode

During heating, the IDU calculates the difference between the High pressure equivalent saturation temperature (Tc) and the heat exchanger liquid pipe temperature (T2A) detected by temperature sensors and write this difference as the current supercool degree (SC). By comparing the current supercool degree (SC) with the set supercool degree (SCS), the opening adjustment trend of the EEV can be determined.

$$SC = \max(T1 + 6, Tc_{\max} - 2) - T2A$$

- ◆ When $SC > SCS$, the EEV opening increases
- ◆ When $SC = SCS$, the EEV opening unchanged
- ◆ When $SC < SCS$, the EEV opening decreases

● EEV Operating in other Situations

The EEV decides its operating opening based on the IDU operating mode, IDU working mode, and ODU working mode. For details, see the following table:

IDU Status	Cooling Mode		Heating Mode	
	ODU Operating	ODU Stopped	ODU Operating	ODU Stopped
Operating	Superheat control	B PLS	Supercool control	D PLS
Standby	A PLS		C PLS	
Off				
Fault				

Note:

1. PLS indicates the unit of pulses regarding the EEV opening.
2. The values of A,B,C and D are depend on IDUs' series.

3.3 Start and Stop Control

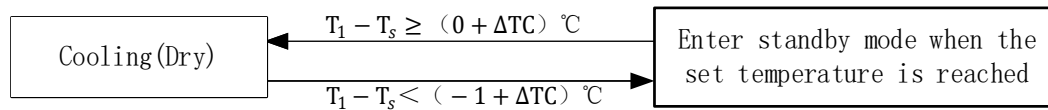
Indoor Unit judges the operation state according to the temperature compensation value (ΔTC) and the difference value between detected indoor temperature (T_1) and set temperature (T_s).

When the indoor temperature reaches the set one, Indoor Unit shut down; when the indoor temperature exceeds the set one, Indoor Unit start running.

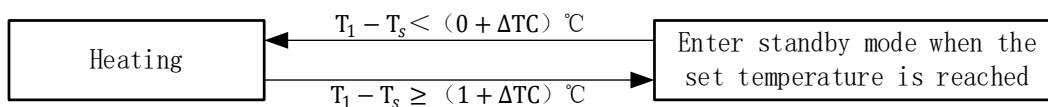
● Objective

1. Ensure comfort. When the indoor temperature of indoor return air reaches the temperature range set by the user, if the IDU fails to shut down, the room temperature will deviate from the expected value of the user and reduce the comfort of the room.
2. Energy saving. When the temperature of the return air reaches the temperature range set by the user, if the IDU fails to shut down, the air conditioning system will continue to operate inefficiently under the condition of low indoor load, with low energy efficiency and no energy saving.
3. The use of temperature compensation values is to solve the problem of differences in the distribution of the room temperature field. The room due to structural differences, room heat source distribution differences, solar radiation, hot air uplift, cold air sink and other factors will cause the temperature detected by the indoor unit's own return air temperature sensor(T_1) and the user's human activity area temperature deviation, temperature compensation value(ΔTC) is used to repair this deviation
4. Ensure compressor reliability. The control will prevent frequent start/stop and the temperature compensation in the temperature shutdown control will inhibit frequent opening and closing of the air conditioning system, extending the service life of the air conditioning system;

● Cooling (Dry)



● Heating



Note:

The temperature compensation value (ΔTC) of cooling and heating operation can be found in the specifications of each model. For details, please contact local technical support personnel

Indoor Units



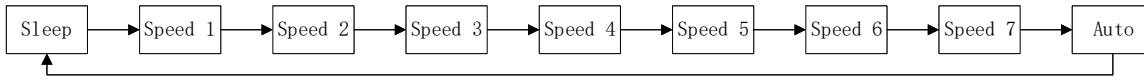
3.4 Fan Control

3.4.1 Fan speeds control

The IDU can work in seven-speeds or three-speeds.

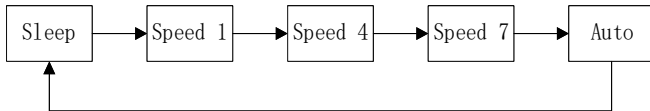
● Seven-speeds

When the Indoor Unit detects seven wind speeds the wind speed is set as follows.



● Three-speeds

When the Indoor Unit detects only three wind speeds the wind speed is set as follows.



For the specific IDU series, please consult the technical manual of each series. The following table describes the fan control in different situations

● Fan control in different situations

	IDU Status	Cooling Mode	Dry Mode	Heating Mode	Fan Mode	Speed Switch
Operating in Set Speed	Operating	Set speed	Speed 1	Set speed	Set speed	User set
	Standby	Set speed	Speed 1	Termal	/	
	Off	Stop fan	Stop fan	Stop fan	Stop fan	
	Fault	Stop fan	Stop fan	Stop fan	Stop fan	

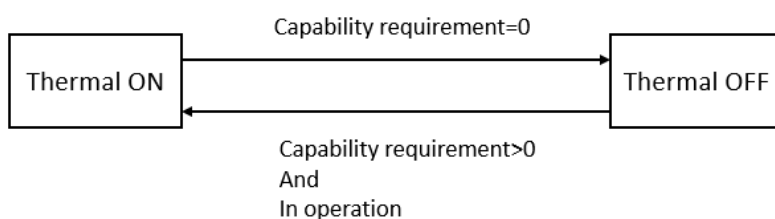
	IDU Status	Cooling Mode	Heating Mode	Auto Mode	Fan Mode	Speed Switch
Automatic Fan Speed	Operating	Automatic	Automatic	Automatic	Speed 1	Switch fan speed based on the difference of the set temperature and return air temperature
	Standby	Automatic	Termal	Automatic cooling, automatic fan speed, automatic heating, and Termal mode operating	/	
	Off	Stop fan	Stop fan	Stop fan	Stop fan	
	Fault	Stop fan	Stop fan	Stop fan	Stop fan	

Note:

Termal: In the heating mode, The IDU in the standby state heating mode will run fan periodically at speed 1 for one minute (the period can be set by controle)

3.4.2 Auto fan control mode

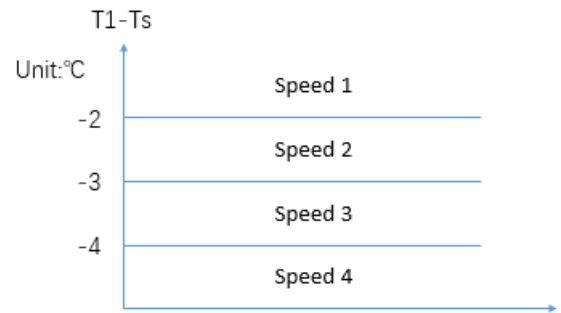
1. When set auto fan control in cooling or heating mode. After operation in the initial speed for a period of time, when Thermal ON, IDUs enter the auto mode and the fan speed will be changed every 2 minutes or when Ts change.
2. When Thermal OFF, IDUs enter the standby mode. When Thermal ON, IDUs enters the initial fan speed again.
3. The default speed is speed 1 when IDUs are set auto fan mode in Air supply only mode.



● Determine the initial fan speed of auto fan control

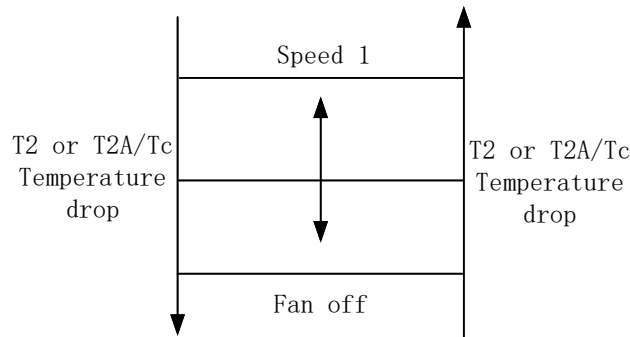
The initial fan speed is determined according to the difference between ambient indoor temperature (T_1) and set temperature (T_s), and it updates in the following situations:

- 1) The first time enter this mode
- 2) T_s is changed
- 3) When switching between normal operation and silent operation



3.4.3 Anti-cold Air Control

This function only be used in heating mode, fan speed is changed according to value changes of the heat exchanger intermediate temperature (T_2) of the heat exchanger liquid pipe temperature (T_{2A}) and High pressure equivalent saturation temperature (T_c). While in anti-cold air mode, set temperature (T_s) is displayed normally. Anti-cold air control is valid during the oil return or defrosting period. If the IDU is turned off, the fan is turned off as well.



Note: The switching temperature of the heat exchanger intermediate temperature (T_2), the heat exchanger liquid pipe temperature (T_{2A}) and the condensing temperature (T_c) is determined by T_{fanoff} .

T_{fanoff} is the switch temperature point between Breeze and Fan off can be adjusted by controller.

3.4.4 Standby fan speed Control

● Cooling standby

The default cooling standby fan speed is Speed 1. You can change the cooling standby fan speed from speed 1 to speed 7 through the controller.

The parameter setting code is "N18".

● Heating standby

The default heating standby is Thermal wind speed. The speed 1 runs for 1 minute and stops for X minutes (X is the set value by the controller) which can be set from 4 minutes (default), 8 minutes, 12 minutes and 16 minutes (The parameter setting code is "N21"). And You can change the heating standby fan speed through the controller (The parameter setting code is "N20").

Thermal: In the heating mode, The IDU in the standby state heating mode will run fan periodically at speed 1 for one minute (the period can be set by controller)

3.5 Swing control

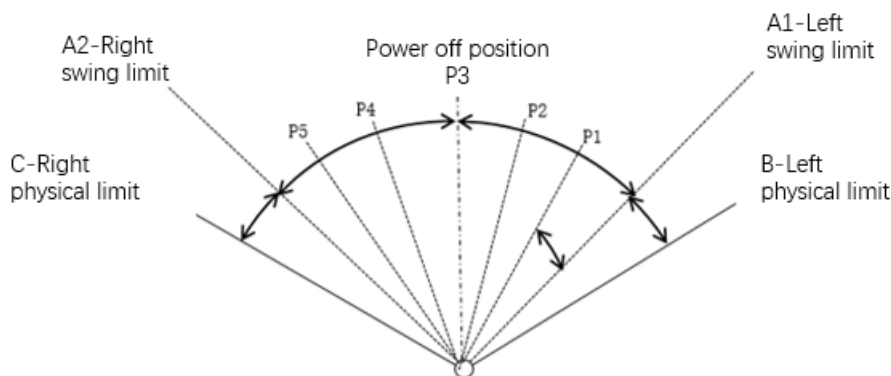
3.5.1 Horizontal swing control

● Angle range of horizontal swing

Table 6.1: Angle range of horizontal swing

	heating	cooling
adjustable range	A1+A2	A1+A2
shutdown angle	A1+B/A2+C	A1+B/A2+C

Figure 6.1 Horizontal swing angle



A1: Starting angle or power-on reset position (Swing from the left)

A2: Starting angle or power-on reset position (Swing from the right)

B: Angle limit of left end structure

C: Angle limit of right end structure

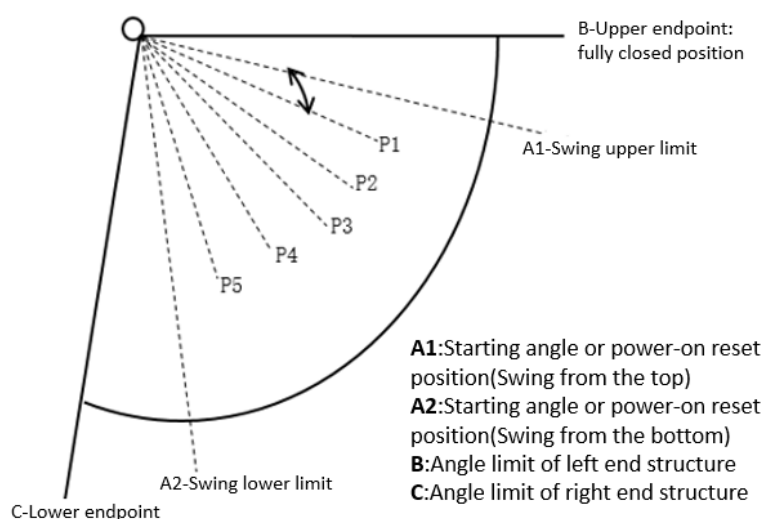
3.5.2 Vertical swing control

Different IDU series have different adjustable swing angle and default swing angle under different functions.

And each operation mode has its default adjustable range of swing angle. P1-P5 values vary because of the different operation modes and IDU series.

For details, please refer to Table 6.3, Table 6.4 and Figure 6.2.

Figure 6.2 Vertical swing control



A1: Starting angle or power-on reset position (Swing from the top)

A2: Starting angle or power-on reset position (Swing from the bottom)

B: Angle limit of left end structure

C: Angle limit of right end structure

3.6 Operation mode control

● Outdoor Unit is Heat Pump

①When the mode is set by ODU to VIP priority, Voting priority, Capability requirements priority, Cooling priority, heating priority, the Indoor Unit can be set to cooling, heating, dehumidification, ventilation modes. When the IDU set mode different from the mode of ODU, the indoor unit will enters the standby mode, and the "No permission" displays in the upper left corner of the controller.

②When the mode is set by ODU to **changeover**, VIP IDU can be set to cooling, heating, dehumidification, ventilation modes, while non-VIP IDUS can only follow the operation mode of VIP's.

● Outdoor Unit is Heat Recovery

①When the ODU is Heat recovery, VIP IDUs and others can have different modes such as automatic, cooling, heating, dehumidification and ventilation mode.

②**Auto mode** is only available to Heat Recovery ODU. In auto mode, user should set the Tsc(cooling setting temperature) and Tsh(heating setting temperature), which should meet the following conditions $Tsc \geq Tsh$. The setting steps are as follows.

<1>when enter the auto mode, the mode icon **Auto** and **Cool** (or **Auto** and **Heat**) will flash at the same time

<2> Press "^" and "v" to switch mode (Cool or Heat) and press "↵" to enter temperature setting interface (In Cool is Tsc, and Tsh in Heat). Then press "^" and "v" to change value and press "↵" to save changes.

<3>In auto mode, Icons **Auto** and **Cool** light up during cooling operation, when Icons **Auto** and **Heat** light up during heating operation.

<4>The heating mode and cooling mode are switched according to the following 3 conditions.

I The setting temperature **Tsc=Tsh**

When the return air temperature $T1 > Tsc + 2^{\circ}\text{C}$, the IDU will run the **cooling mode**.

When the return air temperature $T1 < Tsh - 2^{\circ}\text{C}$, the IDU will run the **heating mode**.

II The setting temperature **Tsc>Tsh, and Tsc-Tsh<3°C**

When the return air temperature $T1 > Tsc + 1.5^{\circ}\text{C}$, the IDU will run the **cooling mode**.

When the return air temperature $T1 < Tsh - 1.5^{\circ}\text{C}$, the IDU will run the **heating mode**.

III The setting temperature **Tsc>Tsh, and Tsc-Tsh≥3°C**

When the return air temperature $T1 > Tsc$, the IDU will run the **cooling mode**.

When the return air temperature $T1 < Tsh$, the IDU will run the **heating mode**.

● Set Temperature Display

1) When switching between cooling, heating or auto modes, if temperature Ts is not reset, the temperature after switching is the same as the temperature before switching.

2) In auto mode, switching between cooling and heating mode takes some time. The time can be set through the controller.

3.7 Controlling the Condensate Water Pump and Water Level Switch

- 1) When the IDU is powered on the first time, the water pump is forced to operate for 5 minutes.
- 2) When the IDU and ODU are in cooling, dehumidification and self-cleaning mode, the water pump starts immediately and operates continuously. After this mode is stopped (stop or mode switch), the water pump turns off five minutes later.
- 3) If the water level rises, causing the water level switch to be disconnected, the condensate water pump immediately starts and operates. Five minutes later, if the water level drops to lower than the alarm level, the system restores operation based on the originally set mode. Otherwise, the IDU and water pump stop operating, and a water level alarm is reported. When the water level switch is connected again, the protection is released, and the system restores operation based on the mode that was originally set.

Note:

This function is reserved for the unit models without drainage pumps and water level switches and it is disabled by default.

3.8 Anti-freeze Control

The IDU will close Electronic expansion valve, and the wind shift into speed 1.

Condition:

A) Entry conditions: Coil temperature $\leq$ A continuous T1 or coil temperature $\leq$ B continuous T2, and in any mode of forced cooling, cooling, dehumidification, self-cleaning(Except for the second stage);

B) Exit condition: coil temperature $\geq$ C continuous T3, and not in any mode of forced cooling, cooling, dehumidification, or at the second stage of self-cleaning mode;

3.9 Alarm control

Both IDU'S main control board and 1# Expansion board (Optional) have ALARM port, and can be used simultaneously.

● Setting positive or negative logic

① Port on IDU'S main control board

The positive and negative logic of the IDU main control board is set by the wired controller or central controller. (N40)

② Port on 1# Expansion board (Optional)

The positive and negative logic of the 1# expansion board is set by the S2-1/S2-2/S2-3 DIP switch on the 1# expansion board.

● Remote on/off port setting status and its corresponding function

Outdoor unit Set	Port status	Functional interpretation
Set to Positive logic (Default)	The port is connected	outputs alarm signals
Set to negative logic	The port is disconnected	outputs alarm signals

3.10 Remote on/off control

Both IDU'S main control board and 1# Expansion board (Optional) have remote on/off control port

● Remote on/off control port selection

① Port on IDU'S main control board

Port CN55 connects the passive switch signal

Note:

The port on the main board will be disabled when the port on the expansion board is enabled

② Port on 1# Expansion board (Optional)

Port CN7 connects the 220V switch signal. For detail refer to Expansion board manual

● Setting positive or negative logic

① Port on IDU'S main control board

The positive and negative logic of the IDU main control board is set by the wired controller or central controller. (N38)

② Port on 1# Expansion board (Optional)

The positive and negative logic of the 1# expansion board is set by the S4-1 DIP switch on the 1# expansion board.

● Remote on/off port setting status and its corresponding function

Outdoor unit	Port status	Corresponding function	Functional interpretation
Set to Positive logic (Default)	The port is connected, Input Low level	Remote delay OFF control	Shut down after the delay time, the controller can send commands normally, but the indoor unit remains off.
		Remote OFF control	Direct shutdown without delay, the controller can send commands normally, but the indoor unit remains off.
Set to negative logic	The port is disconnected, Input High level	Remote delay OFF control	Shut down after the delay time, the controller can send commands normally, but the indoor unit remains off.
		Remote OFF control	Direct shutdown without delay, the controller can send commands normally, but the indoor unit remains off.

The remote OFF delay time can be set through the wired controller (N39), the default value is 0

Indoor Units



3.11 Dry mode control

There is a difference between the control with humidity sensor and the control without humidity sensor, when the humidity sensor is damaged, the indoor unit automatically switches to the state without humidity sensor.

● Without humidity sensor

Related settings: ①The temperature of dry mode;②Maximum indoor temperature drop in dry mode (N27);③Standby fan speed in dry mode(N19)

Enter Standby: When $T_s - T_1 > \Delta T$, the IDU will Enter Dry standby mode.

Fan speed (operation): Automatic adjustment, cannot be set.

Fan speed (Standby): Can be set by controller (N19)

● With humidity sensor(customized)

Related settings: ①The temperature and humidity of dry mode;②Maximum indoor temperature drop in dry mode;③Standby fan speed in dry mode

Enter Standby: When $T_s - T_1 > \Delta T$ or actual humidity is lower than the set humidity 5%, the IDU will Enter Dry standby mode.

Fan speed (operation): Automatic adjustment, cannot be set

Fan speed (Standby): Can be set by controller (N19)

Note:

1. T_s : Dehumidification setting temperature
2. T_1 : IDU air return temperature
3. ΔT : Maximum indoor temperature drop, can be set(N27)

● Auto dry function

Prerequisites for function:①Only IDU with humidity sensor (customized) can use this function.

②Need to enter the IDU parameter setting menu to enable this function (N66).

Entry method: Cooling or Auto mode.

Operation Logic: Priority cooling, when the room temperature reaches the set temperature, automatically switch to dry mode, to approximate the purpose of dual control of temperature and humidity.

Note:

1. For Auto Dry Target relative humidity, the Default value is 65% and can be set (N67).

4 Errors and operation code

4.1 Error Code Table

Table 7.1: Error code

Error code	Content	Error code	Content
A01	Emergency stop	E81	TA (outlet air temperature sensor) short-circuits or cuts off
A51	Outdoor unit fault	F01	T2A (heat exchanger liquid pipe temperature sensor) short-circuits or cuts off
b36	Water level switch alarm	F11	T2 (heat exchanger middle temperature sensor) short-circuits or cuts off
C21	Abnormal communication between the IDU and ODU	F21	T2B (heat exchanger gas pipe temperature sensor) short-circuits or cuts off
C51	Abnormal communication between the IDU and wired controller	U12	Capacity(HP) code not set
E21	T0 (fresh inlet air temperature sensor) short-circuits or cuts off	U38	Address code not detected
E24	T1 (IDU return air temperature sensor) short-circuits or cuts off		

5 Troubleshooting

Warning

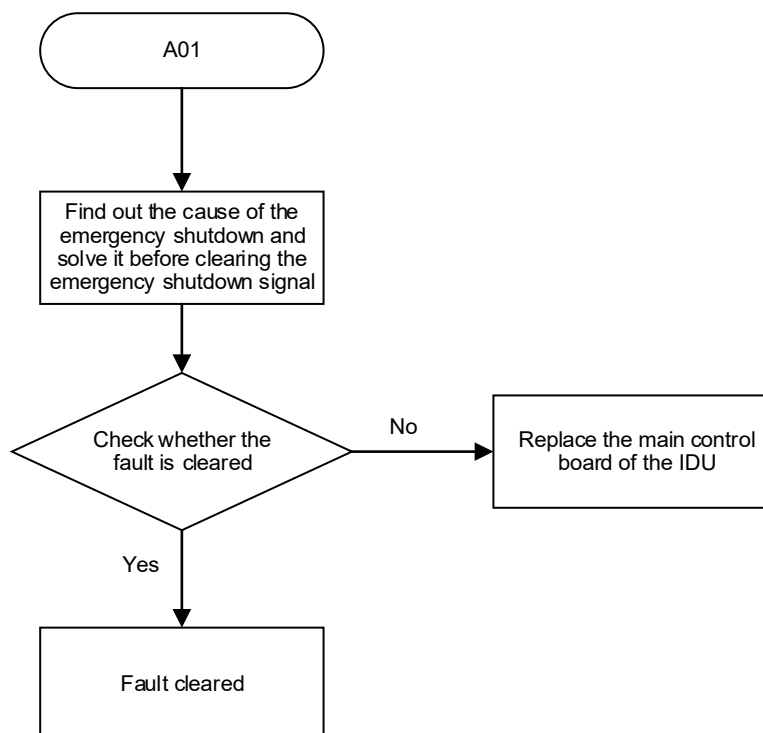


- All electrical work must be carried out by competent and suitably qualified, certified and accredited professionals and in accordance with all applicable legislation (all national, local and other laws, standards, codes, rules, regulations and other legislation that apply in a given situation).
- Power-off the unit before connecting or disconnecting any connections or wiring, otherwise electric shock (which can cause physical injury or death) may occur or damage to components may occur.

5.1.1 A01 – Emergency shutdown

Error display	Digital display	Display position
		Panel, display box, and wired controller
Error impact	The faulty IDU and other IDUs of the same system: stop running, displaying code "A01" (V6 platform indoor unit displays "A0" code)	
	ODU of the same system: stop running, displaying code "A01" (V6 platform outdoor unit displays "A0" code)	
Error trigger	When the IDU receives an emergency shutdown signal from the ODU	
Error recovery	After troubleshooting, power on again	
Possible cause	■ An emergency shutdown signal is received. ■ The IDU main control board is damaged.	

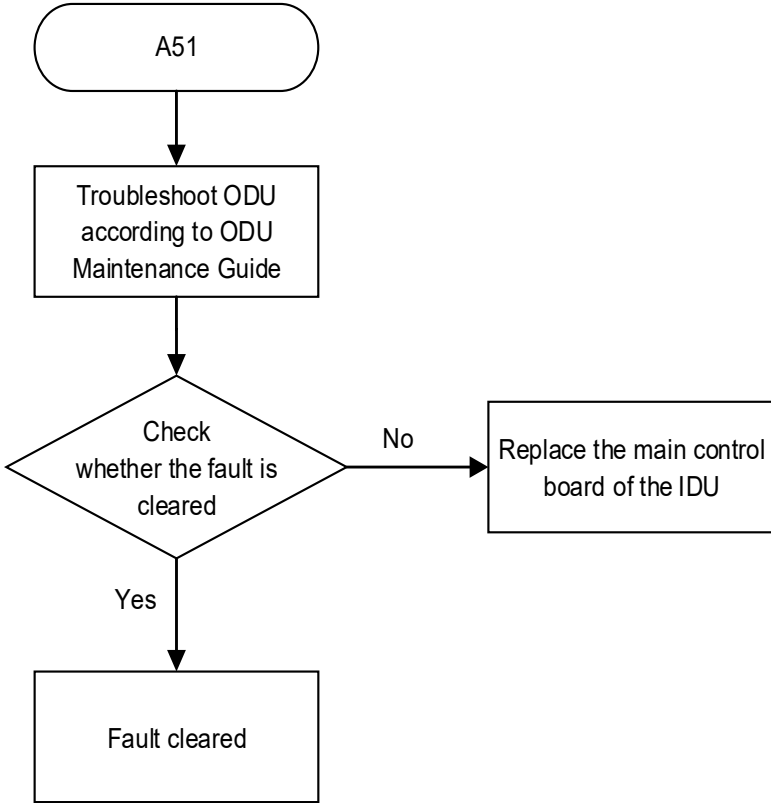
Troubleshooting



Note:

1. Emergency shutdown is usually caused by the outdoor unit receiving an emergency shutdown command sent by the central controller or external reasons. For detailed handling instructions, please refer to the corresponding outdoor unit troubleshooting manual.

5.1.2 A51 - ODU fault

Error display	Digital display	Display position
		Panel, display box, and wired controller
Error impact	The faulty IDU and other IDUs of the same system: The fan continues running, the EEV is closed, and code "A51" is displayed (V6 platform IDU displays the code "Ed")	
	ODU of the same system: ■ stops. ■ The displayed code depends on the error type of the ODU. For the meaning of the code, please refer to the error table specific to the model of the ODU.	
Error trigger	Duration of ODU error ≥ 10 minutes	
Error recovery	Automatic recovery	
Possible cause	■ The ODU error is transmitted to the IDU. ■ The IDU main control board is damaged.	
Troubleshooting	 <pre> graph TD A51([A51]) --> B[Troubleshoot ODU according to ODU Maintenance Guide] B --> C{Check whether the fault is cleared} C -- No --> D[Replace the main control board of the IDU] C -- Yes --> E[Fault cleared] </pre>	

5.1.3 b36 - Water level switch alarm error

Error display	Digital display	Display position
		Panel, display box, and wired controller
Error impact	The faulty IDU stops. Other IDUs of the same system: operate normally.	
	ODU of the same system: operate normally.	
Error trigger	The water level switch alarm is triggered when the floater of the water level switch rises to the warning water level and lasts for 5 min.	
Error recovery	Automatic recovery	
Possible cause	■ The drain pump/water level switch is damaged. ■ Water level switch float is stuck by a foreign object ■ The water level switch plug or short-circuit plug to the WATER port of the IDU main control board is loose. ■ Non-standard installation results in abnormal drainage: The drain pipe is blocked; the improperly sloped drain pipe causes the condensate water to flow backwards; and the lift of the drain pipe exceeds the allowable value. ■ The IDU main control board is damaged.	
Troubleshooting	<pre> graph LR b36[b36] --> C1[Cause 1: The water pump suction or discharge is blocked by dirt] b36 --> C2[Cause 2: The water level switch plug or short-circuit plug to the WATER port of the IDU main control board is loose (1)] b36 --> C3[Cause 3: The water level switch is damaged (2)] b36 --> C4[Cause 4: The water level switch floater is clogged] b36 --> C5[Cause 5: The pump outlet does not discharge water or discharge flow is very small (3)] b36 --> C6[Cause 6: Non-standard installation results in abnormal drainage (4)] b36 --> C7[Cause 7: Connect the short-circuit plug to the WATER port of the main control board. If the error persists, it can be determined that the main control board is damaged] C1 --> S1[Remove dirt and clean the drainage pan and drain pipe] C2 --> S2[Reconnect the loose plug] C3 --> S3[Replace the water level switch] C4 --> S4[Move the floater to remove impurities and reset the floater switch] C5 --> S5[Take measures according to Note (3)] C6 --> S6[Take measures according to Note (4)] C7 --> S7[Replace the main control board of the IDU] </pre>	

Note:

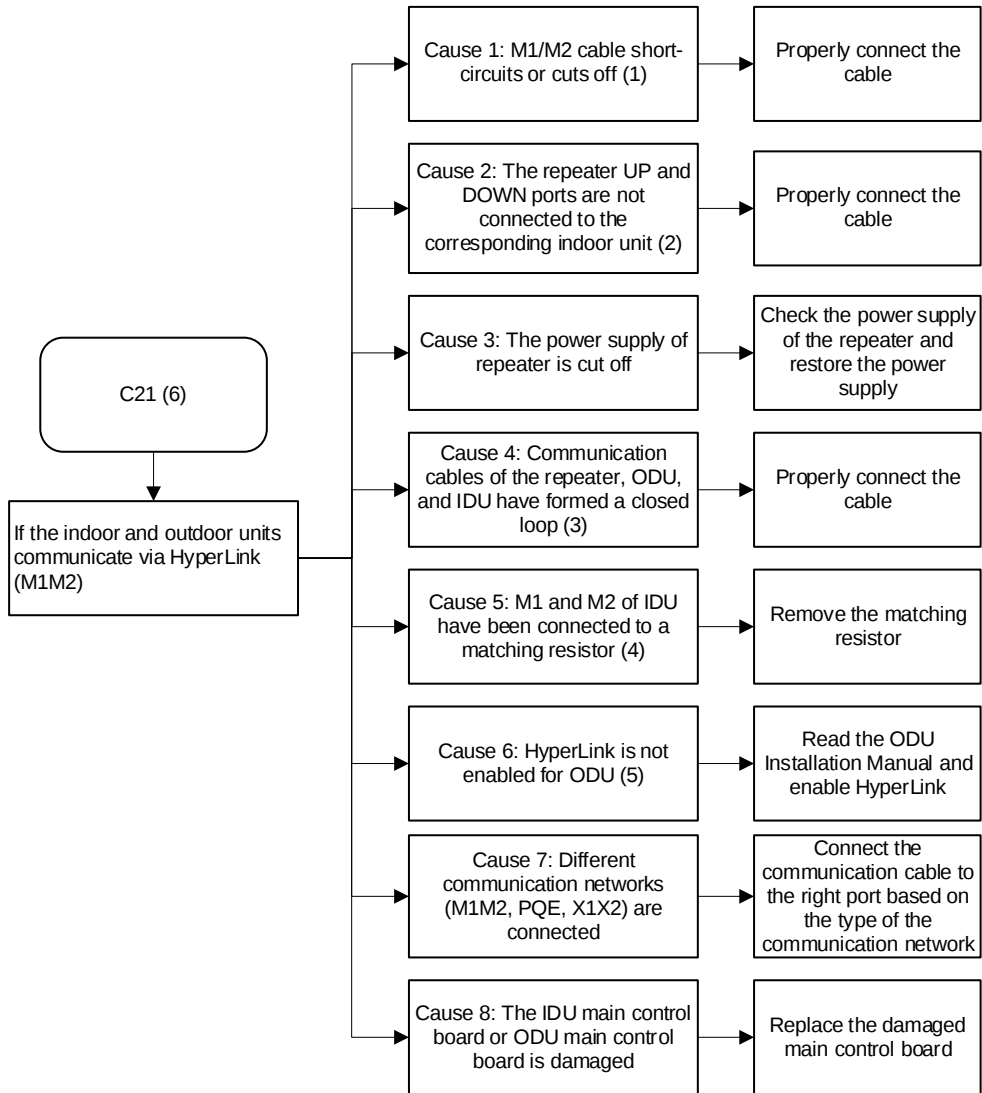
1. The plug attached to the WATER port of the main control board corresponds to the following two cases:
 - a. The factory default of IDUs without a water level switch uses a short-circuit plug to seal the WATER port.
 - b. IDUs with a water level switch use a water level switch plug to seal the WATER port.
2. Use a multimeter to measure the resistance between the pins corresponding to the two wires of the water level switch plug.
 - 1) After the floater of the water level switch is moved upwards to the highest position, the water level switch is in a short-circuited state, and the resistance value is infinite.
 - 2) After the floater of the water level switch is moved downwards to the lowest position, the water level switch is closed, and the resistance value is less than 1 Ω . If the detected resistance value does not meet the above values, the water level switch is damaged.
3. Possible causes and solutions for the situation where the pump outlet does not discharge water or the discharge flow is very small:
 - 1) The water pump plug to the PUMP port in the IDU main control board is loose. Reconnect it firmly.
 - 2) The drain pump suction impeller is clogged. Remove the debris causing the clog to make the pump continue running.
 - 3) If the error cannot be cleared after implementing solutions for causes 1) and 2), the drain pump body is damaged. Replace the drain pump.
4. Possible causes and solutions for abnormal drainage due to non-standard installation:
 - 1) If the drain pipe is blocked, remove the debris and clean the drainage pan and the drain pipe of the IDU.
 - 2) If the drain pipe is improperly installed, which causes the condensate water to flow backward, tilt the IDU to the drainage side by a certain gradient (inclination $\geq 1\%$). The centralized drain pipe must be lower than the drainage outlet of the unit. Air outlets must be placed at the highest horizontal pipeline (see Installation and Operation Manual of IDUs).
 - 3) If the lift of the drain pipe exceeds the allowable value, reduce the vertical height of the drain pipe or replace the drain pump with the one which has a higher lift.

5.1.4 C21 - Abnormal communication between IDU and ODU

Error display	Digital display	Display position
		Panel, display box, and wired controller
Error impact	Faulty IDU: The fan continues running, and the EEV is closed. Other IDUs of the same system: The fan continues running, the EEV is closed, and error code "A51" is displayed (V6 platform IDU displays the code "Ed"). Meaning of the code: ODU fault	
	ODU of the same system: ■ stops. ■ Error code "C26" is displayed (V6 platform ODU displays the code "H7"). Meaning of the code: IDU qty decrease fault	
Error trigger	If the IDU has not received any communication signal from ODU for 2 min	
Error recovery	Automatic recovery	
Possible cause	See the Troubleshooting section.	
Troubleshooting	■ If the indoor and outdoor units communicate via RS-485(PQE/PQ): <pre> graph TD C21[C21 (6)] --> Start[If the indoor and outdoor units communicate via RS-485 (PQE/PQ)] Start --> C1[Cause 1: P/Q/E communication cable short-circuits or cuts off (1)] Start --> C2[Cause 2: Communication cables are not connected in a series] Start --> C3[Cause 3: Cable P or Q is connected to port E] Start --> C4[Cause 4: The communication cable does not have a shield layer] Start --> C5[Cause 5: Interfered by strong-current power cables (over 220 V)] Start --> C6[Cause 6: Interfered by electromagnetic radiation source (transformer/high-power fluorescent lamp, etc.)] Start --> C7[Cause 7: Different communication networks (M1M2, PQE, X1X2) are connected] Start --> C8[Cause 8: The IDU main control board or ODU main control board is damaged] C1 --> S1[Properly connect the cable] C2 --> S2[Connect the cables in a series] C3 --> S3[Connect P/Q/E to the right port] C4 --> S4[Use shielded cables] C5 --> S5[Separate the communication cable from the strong-current power cable] C6 --> S6[Eliminate sources of interference or add one more shield to the cable] C7 --> S7[Connect the communication cable to the right port based on the type of the communication network] C8 --> S8[Replace the damaged main control board] </pre>	
	Note 1: If you measure the resistance between ports P, Q, and E of the IDU main control board, normally the resistance between P and Q is 120 Ω, the resistance between P and E is infinite, and the resistance between Q and E is infinite.	

Troubleshooting

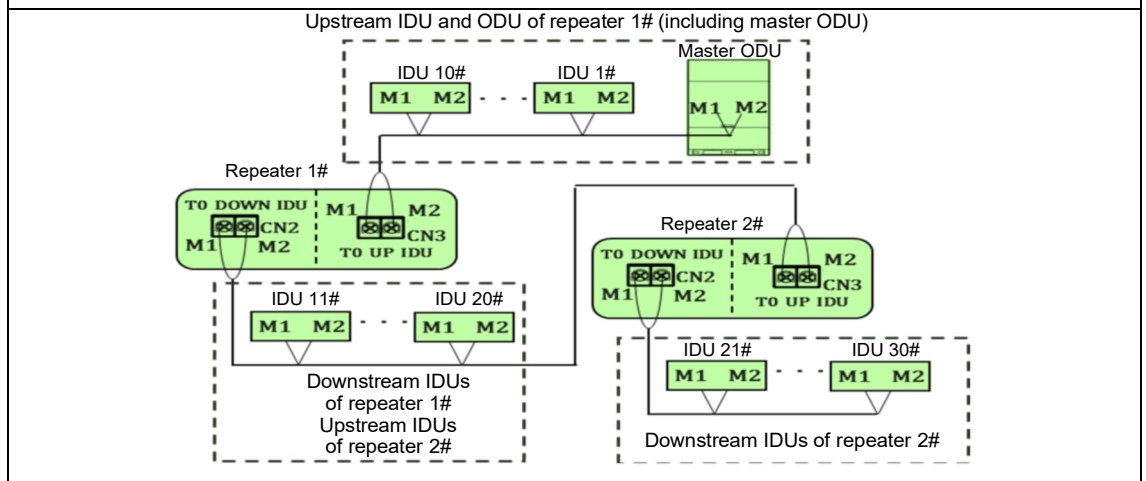
■ If the indoor and outdoor units communicate via HyperLink (M1M2):



Note:

1. If you measure the resistance between terminal blocks M1 and M2 of the IDU main control board, normally this resistance is greater than 1 MΩ.
2. Figure 1 shows the schematic diagram of HyperLink communication line connection. The connection of repeater wires must comply with the following requirements. Otherwise, an IDU communication fault may occur.

Figure 1 Schematic diagram of HyperLink communication cable connection



- 1) The UP communication port of 1# repeater is connected to the communication port of 10# IDU, and the DOWN communication port of 1# repeater is connected to the communication port of 11# IDU.
- 2) The UP communication port of 2# repeater is connected to the communication port of 20# IDU, and the DOWN communication port of 2# repeater is connected to the communication port of 21# IDU.
- 3) For each repeater added, 10 IDUs and 200 m communication distance can be added. A refrigerant system allows the addition of a maximum of 2 repeaters and can connect to up to 30 IDUs. If more than 30 IDUs are connected, please allocate separate refrigerant systems.

3. If communication cables connecting the communication ports of the repeater, IDU and ODU form a closed loop, it will cause a communication fault.

4. RS-485 communication cables must be connected hand in hand. If communication is unstable, a matching resistor needs to be added to the last IDU on the PQ (in the accessory bag of the ODU). However, a matching resistor should not be added between M1 and M2. Otherwise, a communication fault may occur.

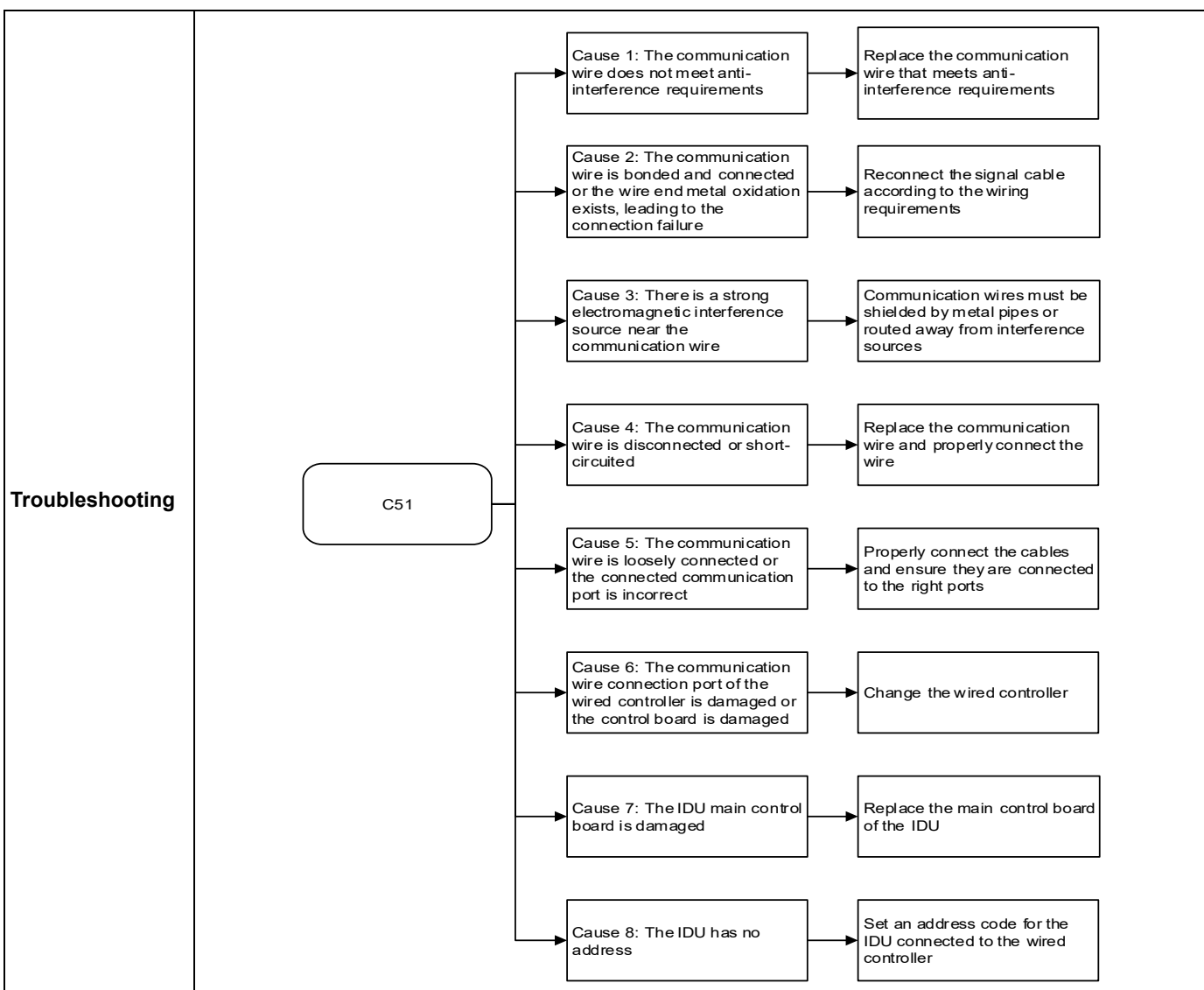
5. To select the communication mode HyperLink (M1M2), users must go to the ODU menu item to change the mode (For the setting method, refer to the ODU Installation Manual). Otherwise, communication faults may occur.

6. The V8 platform ODU typically uses the V8 communication protocol. If there are any IDUs that use a non-V8 platform, users must go to the ODU menu item to change the communication protocol (Please refer to the ODU Installation Manual for setup instructions). Otherwise, these IDUs will display communication fault codes (For the code number, please refer to the IDU wiring nameplate).

5.1.5 C51: communication exception between the IDU and wired controller

Note: The error code C51 can be triggered either at the IDU side or the wired controller side.

Fault Display	LED display	Display position
		If a powered-on IDU does not receive any message from the wired controller: 1) Wired controller: "C51" is displayed; 2) Panel or display box: The LED display and the error code bit on the inspection interface are displayed normally. If a powered-on IDU receives any message from the wired controller: 1) Wired controller: "C51" is displayed; 2) Panel or display box: The LED display is normal, and "C51" is displayed in the error code bit on the inspection interface.
Fault Impact	- Triggered at the IDU side: The faulty IDU and other IDUs of the same system operate normally. - Triggered at the wired controller side: The wired controller is unavailable.	
	ODU of the same system operates normally.	
Fault Trigger	- Triggered at the IDU side: The IDU main control board experiences a two-minute communication interruption with the wired controller. - Triggered at the wired controller side: The wired controller has not received any reply from the IDU main control board for one continuous minute.	
	Automatic recovery	
Possible Cause	- The wired controller is damaged. - The IDU main control board is damaged. - Communication wires are loose or the communication port is faulty. - Communication wires have short-circuited or been cut off. - The communication wire does not meet anti-interference requirements or is affected by strong-current interference. - IDU has no address.	



5.1.6 E21, E24, E81 - T0 (fresh inlet air temperature sensor) short-circuits or cuts off, T1 (IDU return air temperature sensor) short-circuits or cuts off, and TA (outlet air temperature sensor) short-circuits or cuts off

Error display	Digital display			Display position
				Panel, display box, and wired controller
Error impact	The faulty IDU stops. Other IDUs of the same system: operate normally.			
	ODU of the same system: operate normally.			
Error trigger	When detecting that the temperature sensor short-circuits or cuts off			
Error recovery	Automatic recovery			
Possible cause	■ The temperature sensor is damaged. ■ The sensor plug to the T0/T1/TA port in the IDU main control board is loose. ■ The IDU main control board is damaged.			
Troubleshooting	<pre> graph TD Start([E21/E24/E81 (1)]) --> D1{Is the temperature sensor plug connecting to the IDU main control board loose?} D1 -- Yes --> A1[Reconnect the plug tightly] D1 -- No --> D2{Is the temperature sensor resistance abnormal (2)?} D2 -- Yes --> A2[Replace the temperature sensor] D2 -- No --> A3[Replace the main control board of the IDU] </pre> Note: 1) The E21/E24/E81 code respectively corresponds to the T0/T1/TA temperature sensor. Check the wiring nameplate to find the sensor port on the main control board. 2) Measure the resistance between two pins of the sensor plug with a multimeter. A resistance value close to 0 indicates a short circuit has occurred in the temperature sensor, and a resistance value close to infinity indicates an open circuit in the temperature sensor. 3) When the AHU kit is set to return air temperature control, it is able to determine if the T1 sensor is short-circuited or open-circuited, but it is not able to determine if the T0 or TA sensors are short-circuited or open-circuited.			

	When the AHU kit is set to supply air temperature control, it is able to determine if the T0 or TA sensors are short-circuited or open-circuited, but it is not able to determine if the T1 sensor is short-circuited or open-circuited. 4) Only the master unit needs to be connected to the T1/T0/TA sensors when the AHU kit is installed in parallel.
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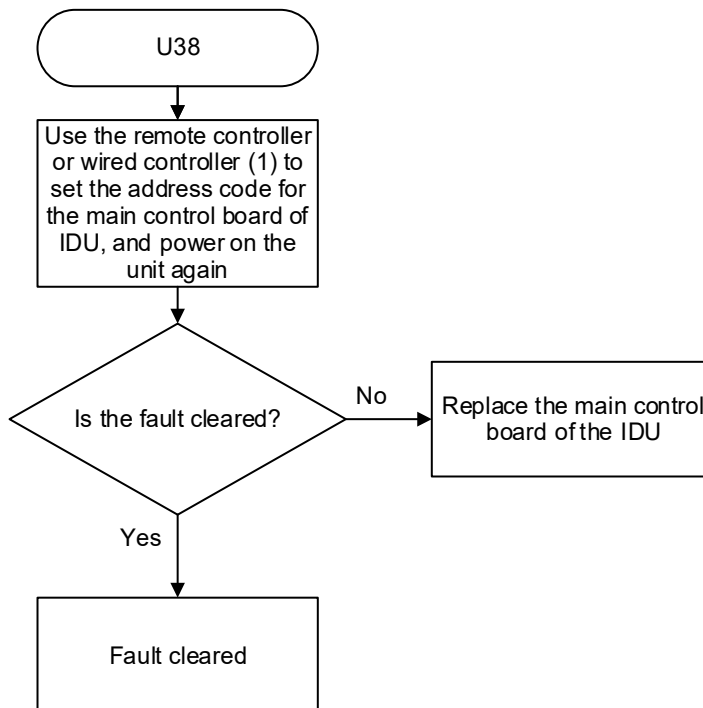
5.1.7 F01, F11, F21 - T2A (heat exchanger liquid pipe temperature sensor) short-circuits or cuts off, T2 (heat exchanger middle temperature sensor) short-circuits or cuts off, and T2B (heat exchanger gas pipe temperature sensor) short-circuits or cuts off

Error display	Digital display			Display position
				Panel, display box, and wired controller
Error impact	The faulty IDU stops. Other IDUs of the same system: operate normally.			
	ODU of the same system: operate normally.			
Error trigger	When detecting that the temperature sensor short-circuits or cuts off			
Error recovery	Automatic recovery			
Possible cause	■ The temperature sensor is damaged. ■ The sensor plug connecting to the T2A/T2/T2B port in the IDU main control board is loose. ■ The IDU main control board is damaged.			
Troubleshooting	<pre> graph TD Start([F01/F11/F21 (1)]) --> D1{Is the temperature sensor plug connecting to the IDU main control board getting loose?} D1 -- Yes --> A1[Reconnect the plug tightly] D1 -- No --> D2{Is the temperature sensor resistance abnormal (2)?} D2 -- Yes --> A2[Replace the temperature sensor] D2 -- No --> A3[Replace the main control board of the IDU] </pre> Note: 1) The F01/F11/F21 codes respectively correspond to T2A/T2/T2B temperature sensors. Check the wiring nameplate to find the sensor port on the main control board. 2) Measure the resistance between two pins of the sensor plug with a multimeter. A resistance value close to 0 indicates a short circuit has occurred in the temperature sensor, and a resistance value close to infinity indicates an open circuit in the temperature sensor. 3) If only the master unit is connected to the T2A/T2/T2B temperature sensors in the parallel control of the AHU kit, then only the master unit can detect the F01/F11/F21 faults, and the slave units cannot detect them.			

5.1.8 U12 - Capacity(HP) code not set

Error display	Digital display	Display position
		Panel, display box, and wired controller
Error impact	1) The faulty IDU stops running. 2) Other IDUs of the same system: ■ If the address for the faulty IDU has been set, other IDUs will operate normally. ■ If the address of the faulty IDU was not set, other IDUs will display error code "A51"-ODU fault.	
	ODU of the same system: ■ If the address for the faulty IDU has been set, the ODU will operate normally. ■ If the address of the faulty IDU was not set, the ODU will display the error code "C26" -number of IDUs reduced.	
Error trigger	When detecting that the capacity(HP) code for IDU main control board has not been set	
Error recovery	Automatic recovery	
Possible cause	■ The capacity(HP) code has not been set after replacing the IDU main control board. ■ The new IDU main control board is damaged.	
Troubleshooting	<pre> graph TD U12([U12]) --> Step1[Use the dedicated tooling (1) to set the capacity(HP) code for the main control board of IDU, and power on the unit again] Step1 --> Decision{Is the fault cleared?} Decision -- Yes --> End([Fault cleared]) Decision -- No --> Step2[Replace the main control board of the IDU] </pre> Note 1: For specialized tooling and instructions, please contact your local dealer or technical support personnel.	

5.1.9 U38 - Address code not detected

Error display	Digital display	Display position
		Panel, display box, and wired controller
Error impact	1) The faulty IDU stops running. 2) Other IDUs of the same system: The fan continues running, the EEV is closed, and ODU error code "A51" is displayed (V6 platform IDU displays the code "Ed").	
	ODU of the same system: Otherwise, the ODU will display the error code "C26" (number of IDUs reduced) (V6 platform ODU displays the code "H7")	
Error trigger	When detecting that the address code for IDU main control board has not been set	
Error recovery	Automatic recovery	
Possible cause	■ The address code has not been set after replacing the IDU main control board. ■ The new IDU main control board is damaged.	
Troubleshooting	 <pre> graph TD Start([U38]) --> Step[Use the remote controller or wired controller (1) to set the address code for the main control board of IDU, and power on the unit again] Step --> Decision{Is the fault cleared?} Decision -- Yes --> End([Fault cleared]) Decision -- No --> Replace[Replace the main control board of the IDU] </pre> Note 1: For instructions on how to set up addresses for a remote controller or a wired controller, please refer to relevant manuals.	

6 Appendix

6.1 Temperature Sensor Resistance Characteristics

Table 9.1: Indoor temperature sensors resistance characteristics

R25=10K Ω $\pm$ 3% B25/50=4100K $\pm$ 3%

Temperature (°C)	Resistance min(k Ω)	Resistance Normal(k Ω)	Resistance max(k Ω)	Temperature (°C)	Resistance min(k Ω)	Resistance Normal(k Ω)	Resistance max(k Ω)
-40	336.854	383.315	433.108	0	32.44	34.596	36.857
-39	315.212	358.094	404.038	1	30.81	32.807	34.898
-38	295.088	334.677	377.080	2	29.271	31.12	33.055
-37	276.365	312.924	352.071	3	27.815	29.528	31.317
-36	258.939	292.709	328.859	4	26.44	28.026	29.681
-35	242.714	273.916	307.306	5	25.14	26.608	28.138
-34	227.599	256.435	287.285	6	23.909	25.268	26.682
-33	213.514	240.170	268.678	7	22.745	24.003	25.31
-32	200.382	225.029	251.380	8	21.644	22.808	24.016
-31	188.133	210.929	235.291	9	20.601	21.678	22.794
-30	176.705	197.792	220.320	10	19.614	20.61	21.641
-29	166.037	185.547	206.384	11	18.68	19.601	20.553
-28	156.075	174.131	193.407	12	17.794	18.646	19.525
-27	146.768	163.481	181.317	13	16.955	17.743	18.554
-26	138.071	153.543	170.049	14	16.16	16.888	17.636
-25	129.939	144.266	159.543	15	15.406	16.079	16.769
-24	122.333	135.601	149.745	16	14.691	15.313	15.949
-23	115.216	127.507	140.602	17	14.014	14.588	15.174
-22	108.555	119.941	132.067	18	13.372	13.902	14.442
-21	102.318	112.867	124.098	19	12.762	13.251	13.748
-20	96.92	106.732	116.539	20	12.183	12.635	13.093
-19	91.451	100.552	110.231	21	11.634	12.05	12.471
-18	86.328	94.769	103.743	22	11.112	11.496	11.883
-17	81.525	89.353	97.673	23	10.617	10.971	11.327
-16	77.017	84.278	91.99	24	10.147	10.473	10.8
-15	72.788	79.521	86.669	25	9.7	10	10.3
-14	68.815	75.059	81.684	26	9.255	9.551	9.848
-13	65.083	70.873	77.013	27	8.834	9.125	9.418
-12	61.574	66.943	72.632	28	8.434	8.721	9.01
-11	58.274	63.252	68.523	29	8.055	8.337	8.621
-10	55.169	59.784	64.668	30	7.695	7.972	8.252
-9	52.246	56.524	61.048	31	7.353	7.625	7.9
-8	49.492	53.458	57.649	32	7.029	7.296	7.566
-7	46.899	50.575	54.456	33	6.721	6.982	7.247
-6	44.455	47.862	51.456	34	6.428	6.684	6.944
-5	42.15	45.308	48.636	35	6.15	6.401	6.656
-4	39.977	42.903	45.984	36	5.886	6.131	6.381
-3	37.927	40.638	43.49	37	5.634	5.874	6.119
-2	35.992	38.504	41.144	38	5.395	5.63	5.87
-1	34.165	36.492	38.935	39	5.167	5.397	5.631

Table 9.1: Indoor temperature sensors resistance characteristics(continues)

Temperature (°C)	Resistance min(kΩ)	Resistance Normal(kΩ)	Resistance max(kΩ)	Temperature (°C)	Resistance min(kΩ)	Resistance Normal(kΩ)	Resistance max(kΩ)
40	4.951	5.175	5.404	80	1.07	1.151	1.235
41	4.745	4.964	5.188	81	1.034	1.113	1.195
42	4.549	4.763	4.982	82	0.999	1.076	1.156
43	4.362	4.571	4.785	83	0.966	1.041	1.118
44	4.183	4.387	4.596	84	0.934	1.007	1.082
45	4.014	4.213	4.417	85	0.903	0.974	1.047
46	3.851	4.046	4.246	86	0.874	0.942	1.014
47	3.697	3.887	4.082	87	0.845	0.912	0.982
48	3.55	3.735	3.925	88	0.818	0.883	0.951
49	3.409	3.59	3.776	89	0.791	0.855	0.921
50	3.274	3.451	3.632	90	0.766	0.828	0.892
51	3.146	3.318	3.495	91	0.742	0.802	0.864
52	3.023	3.191	3.363	92	0.719	0.777	0.838
53	2.905	3.069	3.237	93	0.696	0.753	0.812
54	2.793	2.952	3.116	94	0.675	0.73	0.787
55	2.685	2.841	3.001	95	0.654	0.708	0.763
56	2.582	2.734	2.89	96	0.634	0.686	0.74
57	2.484	2.632	2.784	97	0.615	0.666	0.718
58	2.39	2.534	2.682	98	0.597	0.646	0.697
59	2.299	2.44	2.585	99	0.579	0.627	0.677
60	2.213	2.35	2.491	100	0.562	0.609	0.657
61	2.13	2.264	2.401	101	0.546	0.591	0.638
62	2.051	2.181	2.315	102	0.53	0.574	0.62
63	1.975	2.102	2.233	103	0.515	0.558	0.602
64	1.903	2.026	2.154	104	0.501	0.542	0.585
65	1.833	1.953	2.077	105	0.485	0.527	0.569
66	1.766	1.883	2.004				
67	1.702	1.816	1.934				
68	1.641	1.752	1.867				
69	1.582	1.69	1.802				
70	1.525	1.631	1.74				
71	1.471	1.574	1.68				
72	1.419	1.519	1.622				
73	1.369	1.466	1.567				
74	1.321	1.416	1.514				
75	1.275	1.367	1.463				
76	1.23	1.321	1.414				
77	1.188	1.276	1.367				
78	1.147	1.233	1.321				
79	1.108	1.191	1.277				

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