A-COIL Control Box Adapter

INSTALLATION/ APPLICATION MANUAL

115/208/230V~ 60Hz

IMPORTANT NOTE:

Read this manual carefully before installing or operating your new A-COIL Control Box Adapter. Make sure to save this manual for future reference.

INSTALLATION MANUAL

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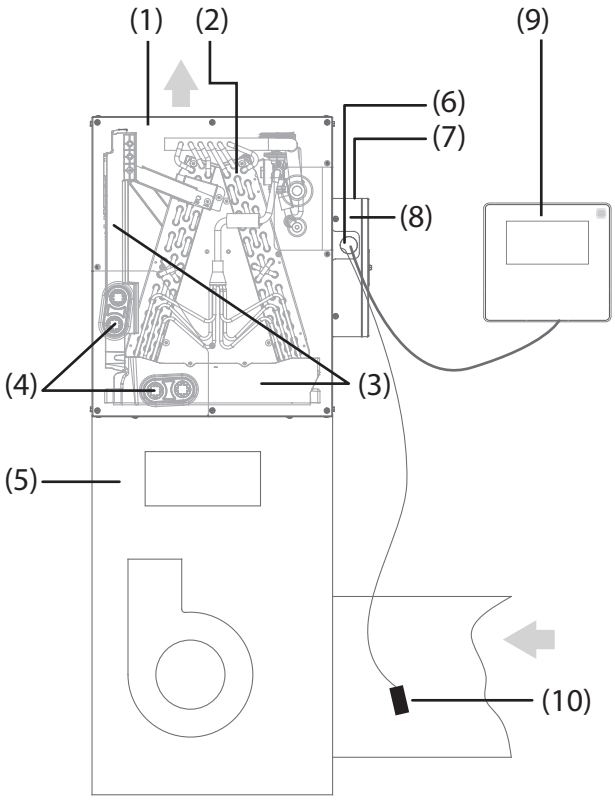
Read this manual

Inside you'll find many helpful hints on how to use and maintain your air conditioner properly. Much more preventive maintenance can reduce the cost of time and money by users. These instructions may not cover every possible condition of use, so common sense and attention to safety is required when installing, operating and maintaining this product.

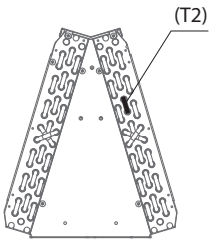
1. System introduction.



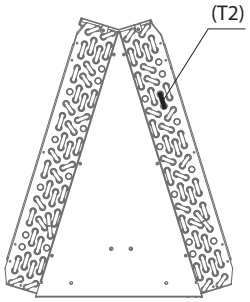
(1). A-COIL
(2). Pipe temperature sensor（T2）
(3). Drain pan
(4). Condensate drain connection
(5). Furnace
(6). Indoor and outdoor unit communication cable
(7). Power supply system
(8). Control box
(9). Wired wall controller
(10). Room temperature sensor（T1）

NOTE: The 1/2-inch wiring holes on the box needs to be connected to standard conduit fitting and conduit (flexible or rigid).

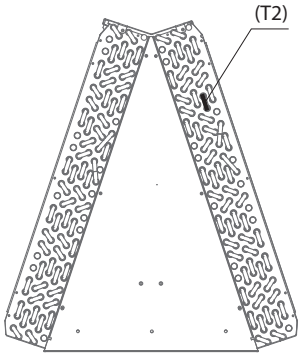
Position of the pipe temperature sensor(T2)



(3-row evaporator)



(4-row evaporator)



(5-row evaporator)

WARNING

- Before obtaining access to terminals, all supply circuits must be disconnected.
- Risk of electric shock. Can cause injury or death. Disconnect all remote electric power supplies before servicing.

2. The Control Box Adapter

2.1 Main functions of the control box

(1) Communicates the difference in space temperature and space setpoint temperature to the control that sets compressor speed;
(2) Provides a signal to the indoor fan to set fan speed appropriate for compressor staging;

Features:

- The control box is connected to the outdoor unit via RS485 communication and to the furnace via 24V control.
- It also supports wired controller and thermostat control.
- Room temperature sensor and pipe temperature sensor are equipped as standard.

⚠ WARNING

- Wires must be properly sized according to the NEC/NFPA 70, CEC and all prevailing codes, ordinances and standards.
- All conductors must be installed with a strain relief eliminating stress on the wire following installation which may result in wire damage and/or overheating with a potential for fire.
- Installation must be performed in accordance with the requirement of NEC and CEC by authorized personnel only.
- All wiring to be rated for the control box amperage rating.
- All wiring installed to meet general industry standards and practices.
- Do not install adapter near flammable liquids or gases.
- Do not operate the unit with wet hands, as this could lead to electrical shock.

⚠ CAUTION

- When connecting with RS485 communication to the outdoor unit, shielded wire must be used and grounded at one end only.
- When using shielded wire the cable should be grounded at one end to reduce EMI.
- T1 sensor cable shall not exceed 23' (7 m).

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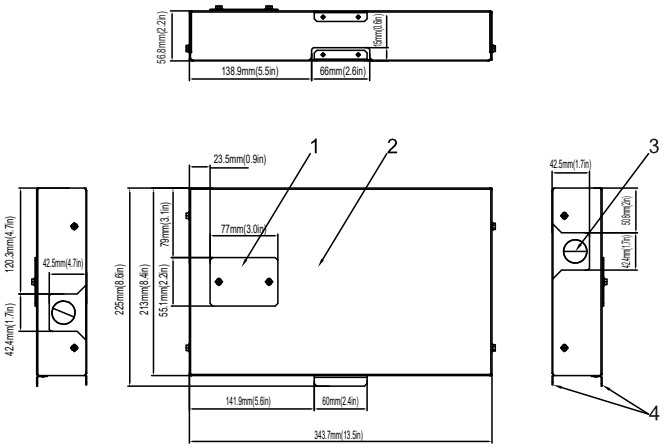
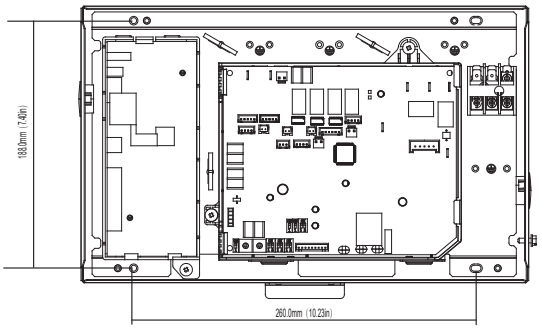
Make sure to save this manual for future reference.

2.2 Ensure you have the following parts

No	Name	Quantity	Remarks	No	Name	Quantity	Remarks
1	Control box	1		6	Ferrite Clamp	1	
2	Screws	5	M4*25 (For mounting on the wall)	7	Coil Temp. Sensor (T2) (1.6m)	1	
3	Anchors	5	For mounting on the wall	8	Zip tie	3	
4	Room Temp. Sensor (T1)	1	For connecting the sensor	9	Wired remote controller	1	
5	Room Temp. Sensor line (T1) (5m)	1		10	Screws	4	For mounting on the A-coil

3. Dimensions

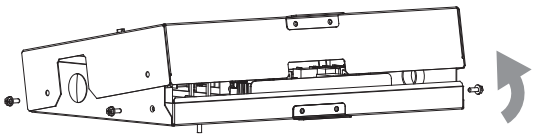




Serial number	Materials	Wall thickness
1	DX51D+Z	0.8mm
2	DX51D+Z	0.8mm
3	PA	11.6mm
4	DX51D+Z	1.0mm

4. Installation Method

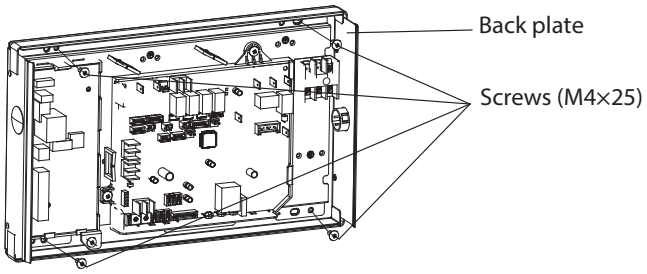
4.1. Remove the cover of the control box by removing all 4 exposed screws with a phillips head screwdriver. Next, remove the cover (NOTICE: this may by tight due to the foam gasket seal).



Minimum clearance required around the kit is 7"(180mm).

4.2. Mount the back plate of the control box.

Mount control box vertically, and folding in on, fasten the back plate to the wall with 4 screws (M4x25) and anchors.



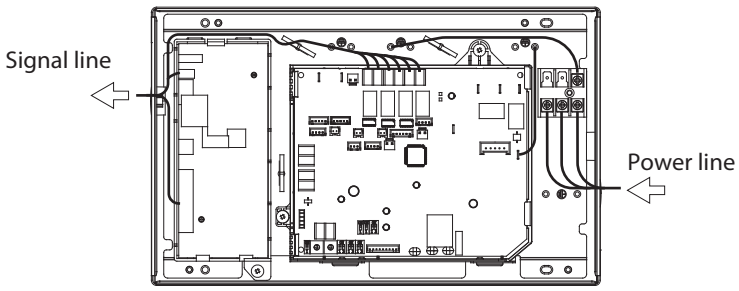
NOTICE

Place the unit on a flat surface. Be careful not to distort the back plate of the control box by over tightening the screws.
When installed vertically, the direction of the arrow on the cover, must point up.

4.3. Wiring.

The power to the unit must be disconnected before any wiring. Be sure to show application of ferrite clamp and room temp sensor and cable. Make note to review the different application (scenarios) options for proper wiring. Make sure strain relief and proper conduit are used when connecting to the box, recommended use of metal-clab cable.

NOTE: Use copper wire only.Separate the power supply leads and communication leads by the strain relif or segregate the power supply leads from communication leads.



LINES GAUGE		
POWER LINE	LINE DIAMETER(AWG)	16
OUTDOOR-INDOOR SIGNAL LINE	LINE DIAMETER(AWG)	20
24V SIGNAL LINE	LINE DIAMETER(AWG)	18

RATINGS:

Electrical –INPUTS:

Main Board:

Input Type	Input Rating	Terminals	Recommend Wire Range / Torque
Power Input	115/208/230 V ac, 60 Hz, 50mA	Terminal Block (L1)-N, (L2)-L	16-10AWG / 1.2 N.m
Earth Ground	N/A	CN18	-
Water Level Signal Input	5 V DC, SELV, Limited Energy (≦ 15 W)	CN5	14-22 AWG / 0.5 N.m

Data Conversion Board:

Input Type	Input Rating	Terminals	Recommend Wire Range / Torque
Remote Control Signal Input	12 V DC, SELV	CN2	14-22 AWG / 0.5 N.m

COMMUNICATION:

Main Board:

Type	Rating	Terminal	Recommend Wire Range / Torque
Communication Between Indoor and Outdoor Unit	5 V DC, SELV, Limited Energy (≦ 15 W)	CN20	14-22 AWG / 0.5 N.m

Data Conversion Board:

Type	Rating	Terminal	Recommend Wire Range / Torque
Communication Between Data Conversion Board and External Thermostat	24 V ac, 60 Hz, SELV	CN9, CN10, CN11	14-22 AWG / 0.5 N.m
Communication Between Data Conversion Module PWB and Centralized Controller	12 V DC, SELV	CN3	14-22 AWG / 0.5 N.m
External Communication	15 V DC, SELV	CN7	14-22 AWG / 0.5 N.m

OUTPUTS:

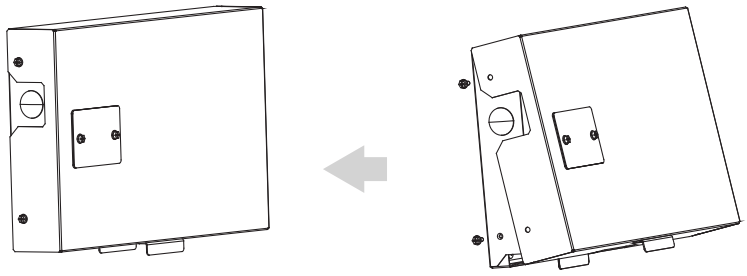
Main Board:

Type	Rating	Terminal	Recommend Wire Range / Torque
Control Signal/Power for External Device (Relay RY8, RY9)	24 V ac, 60 Hz, SELV, General Use(Signal Use)	CN12	14-22 AWG / 0.5 N.m
Control Signal/Power for External Device (Relay RY5, RY6)	24 V ac, 60 Hz, SELV, General Use(Signal Use)	CN17	14-22 AWG / 0.5 N.m
Control Signal/Power for External Device (Relay RY7)	24 V ac, 60 Hz, SELV, General Use(Signal Use)	CN19	14-22 AWG / 0.5 N.m
Alarm (Relay RY11)	24 V ac, 60 Hz, SELV, General Use(Signal Use)	CN33	14-22 AWG / 0.5 N.m

Data Conversion Board:

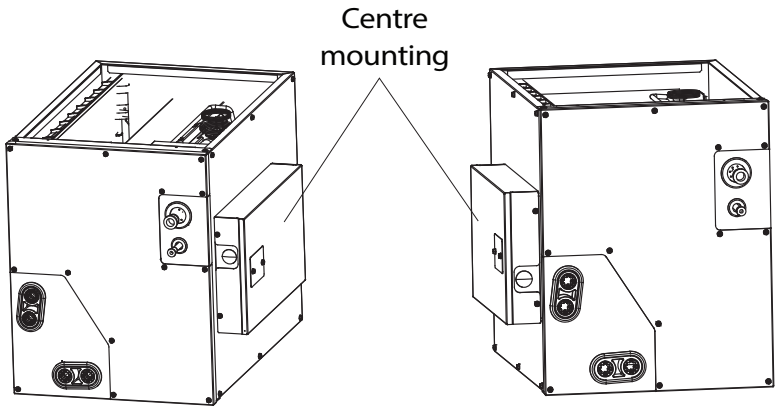
Type	Rating	Terminal	Recommend Wire Range / Torque
External Thermostat	24 V ac, 60 Hz, SELV	CN6	14-22 AWG / 0.5 N.m

4.4. After the wiring is complete, reattach the cover, being sure not to pinch any wiring and tightening the 4 attachment screws. Cover the control box lid, locking screw.



4.5. Installing the control box

The primary function of the control box is to control the operation of a heating and air conditioning system.
The control box is shipped with the COIL unit and can be installed on the cabinet as shown below or externally (not attached to the cabinet) at a location designated by the customer. If installed on the cabinet, control box must be installed in the designated location, depending on the COIL unit orientation.

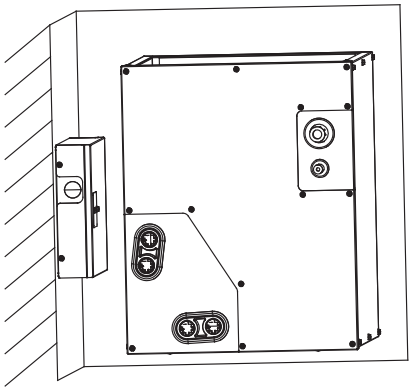


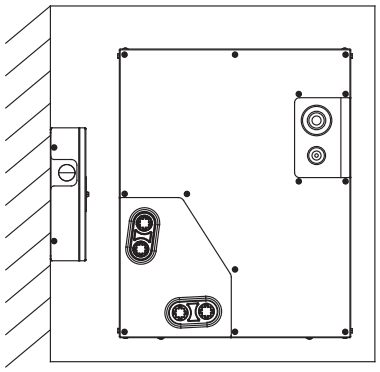
NOTE: Recommended control box orientations on the cabinet as shown below.

4.6. Control box - external installation

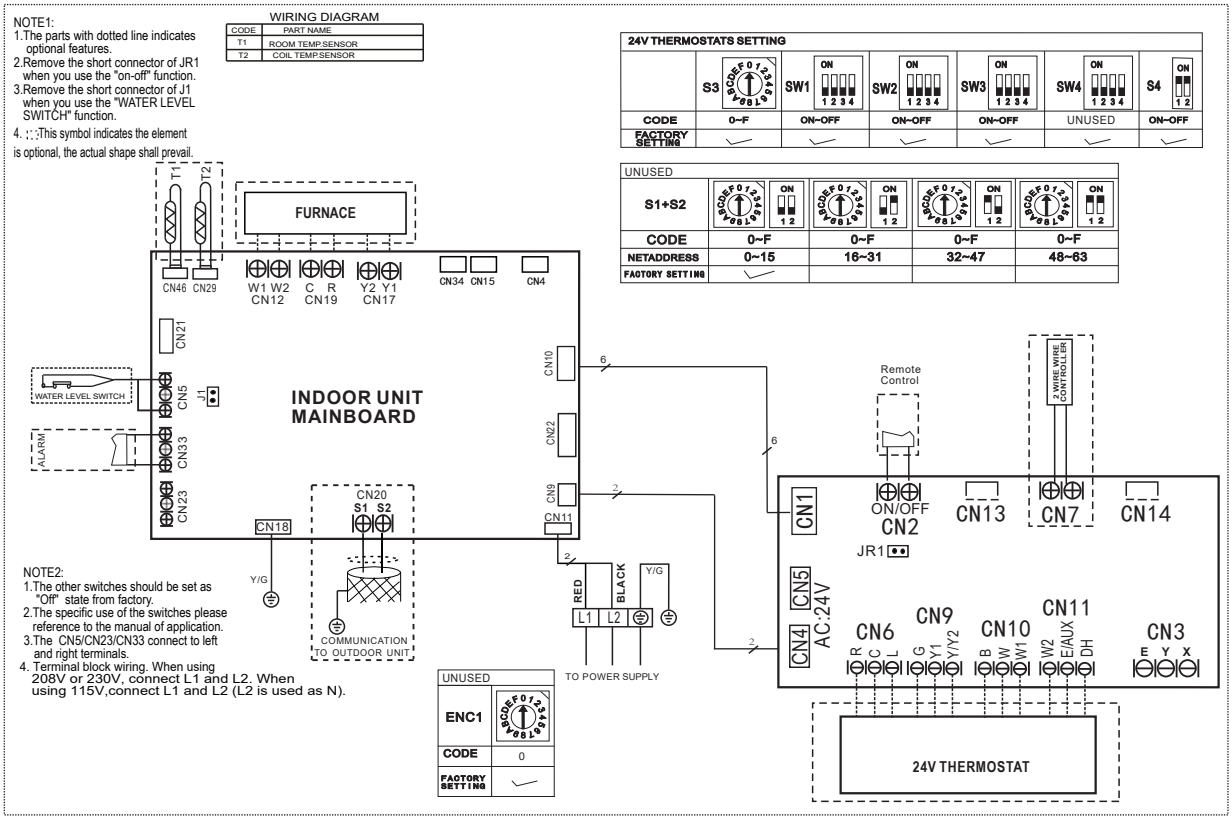
NOTE: Mounting the control box on a secured wall close to the cabinet is an acceptable mounting method.

If the control box is to be installed on an alternative location, it is the responsibility of the installer to secure the control box properly and ensure all wiring between the control box and cabinet reaches and is secure. The distance between the cabinet and control box is limited by the length of the thermistor cables (approximately 3 meters) that come installed on the cabinet. Please consider this when locating the control box from the cabinet.





5. Electrical wiring



6. Control signals to the furnace

Control signals to the furnace are the standard thermostat control signals R,C,W1,W2,Y2 and Y1.

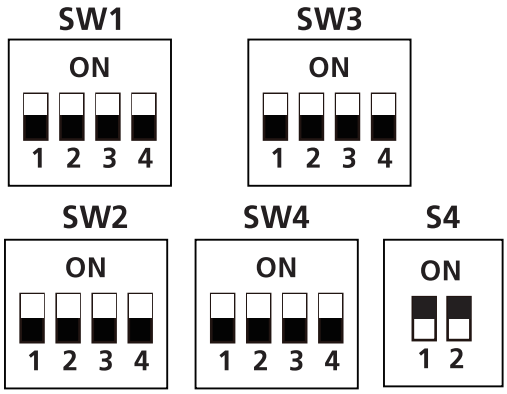
Connector	Usage
R	Provides 24VAC power from the furnace to the board.
C	The 24VAC common wire between the furnace and the board.
W1	First stage of furnace command line from the board to the furnace. If the furnaces that only have a W and do not have a W2, connect W1 to the W of the furnace and make no connection with the W2 signal wire.
W2	Second stage of furnace command line from the board to the furnace. W2 cannot be ON unless W1 is already ON.
Y1/G	For 1-speed configuration, connect this signal to G of the furnace. For 2-speed configuration, connect this signal to G and Y1 of the furnace.
Y2/Y	For 1-speed configuration, connect this signal to Y of the furnace. In this configuration, the Y2/Y signal turns on when fan is requested while in Cool mode or Heat mode using the heat pump. For 2-speed configuration, connect this signal to Y2 of the furnace. In this configuration, the Y/Y2 signal turns on as follows: In Fan mode, Cool mode or Heat mode with HP when high speed fan is requested. In Auto Fan and Cool mode, the signal goes to high speed when the difference between room temperature and set point temperature is more than or equal to 1.5° C. The signal goes back to low speed when the temperature difference is less than 1° C. In Auto Fan and Heat mode with the HP, the signal goes to high speed when the difference between room temperature and set point temperature is less than or equal to -1.5° C. The signal goes back to low speed when the temperature difference is more than 0° C.

In addition:
Room temperature sensor to be installed in the return air.
Duct temperature sensor to be installed on the COIL as specified.

7. DIP switch definitions

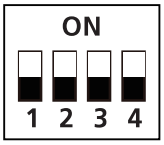
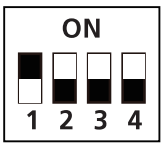
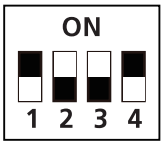
Function DIP switch settings:

The 24V thermostat mode needs to refer to the following settings:



SW4	Unused

Function combination table of SW1-1 and SW1-4:

SW1	Control type
	Wired controller/ 24V thermostat
	Wired controller
	24V Thermostat
	24V Thermostat

Control Box Dial code

No.	Dial Code	Control Scenario	Function	ON	OFF	Note
1	SW1-2	1,2	Anti-cold blow protection option	NO	[Default] YES	
2	SW1-3	1,2	Single cooling / heating and and cooling options	Cooling	[Default] Cooling & Heating	
3	SW2-1	1	Temperature differential to active first stage furnace heating for HP+furnace mode.	4℃	[Default] 3℃	
4	SW2-4	1	Compressor	The operation of heat pump is limited by the outdoor temperature, and the operation of furnace heat is not limited.The system makes judgments according to the following rules: 1) The compressor can be operated when the outdoor temperature is ≥S3 DIP switch temperature +2 °C. 2) The compressor cannot be operated when the outdoor temperature is lower than the S3 DIP switch temperature.	[Default]The operation of heat pump is limited by the outdoor temperature, and the operation of furnace heat is not limited. The system makes judgments based on the following rules: 1) The compressor cannot be operated when the outdoor temperature is lower than the S3 DIP switch. 2) The compressor can be operated when the outdoor temperature is ≥S3 DIP switch temperature +2 °C.	SW2-4 and S3 need to working together
5	SW2-4	2	Compressor/Auxiliary heat outdoor ambient lockout	The operation of heat pump is limited by the outdoor temperature, and the operation of auxiliary heat is not limited.The system makes judgments according to the following rules: 1) The compressor can be operated when the outdoor temperature is ≥S3 DIP switch temperature +2 °C. 2) The compressor cannot be operated when the outdoor temperature is lower than the S3 DIP switch temperature.	[Default]Only one heat pump or auxiliary heat can be operated .The system makes judgments according to the following rules: 1) When the outdoor temperature is lower than the S3 DIP switch temperature,the compressor is not allowed to operated, but auxiliary heat is allowed to operated ; 2) When the outdoor temperature is ≥ S3 DIP switch temperature +2(℃), the compressor can be operated, but auxiliary heat cannot be operated.	
6	Rotary Switch S3	1,2	Set outdoor temperature Limitation (for auxiliary heating or compressor)	Table A		
7	SW3-1	1	Maximum continuous runtime allowed before system automatically stages up capacity to satisfy set point. This adds 1 to 5°F to the user set point in the calculated control point to increase capacity and satisfy user set point	30 minutes	[Default] 90 minutes	
8	SW3-2	1	Cooling and heating Y/Y2 temperature differential adjustment.	Compressor slower speed	[Default] Faster Compressor	Only affects compressor
9	SW3-3	2	Temperature differential to active second stage furnace heating for furnace only or HP+furnace mode.	5℃	[Default]4℃	

No.	Dial Code	Control Scenario	Function	ON	OFF	Note
10	S4-4	1,3	Default ON	[Default] For single stage supplemental heat,W1 and W2 are connected	For dual stage supplemental heat, W1 and W2 are controlled independently.	
11	S4-2	1,3	DH function selection	[Default] Dehumidification control not available	Dehumidification feature is enabled through thermostat	

Control Scenario	24V Tstat, S1+S2	1
	Wired Controller S1+S2	2

Table A

S3	S3 (°F)	S3 (°C)
0	OFF	OFF
1	-22	-30
2	-18	-28
3	-15	-26
4	-11	-24
5	-8	-22
6	-4	-20
7	3	-16
8	10	-12
9	18	-8
A	25	-4
B	32	0
C	36	2
D	39	4
E	43	6
F	46	8

8. Description of wired controller control modes

AUX	Single-furnace heating
Heat	HP heating
AUX+Heat	Furnace heating, HP heating automatic control

9.Error Code

Display	Malfunction & protection indication
EH00	Indoor EEPROM malfunction
EH0A	Indoor EEPROM parameter error
EL01	Communication malfunction between indoor and outdoor units
EL11	Communication malfunction between main unit and secondary units
EH12	Main unit or secondary units malfunction
EC50	Outdoor temperature sensor error
EC51	Outdoor EEPROM malfunction
EC52	Condenser coil temperature sensor (T3) malfunction
EC53	Outdoor ambient temperature sensor (T4) malfunction
EC54	Outdoor unit exhaust temperature sensor error
EC0d	Outdoor unit malfunction or protection
EH60	Indoor room temperature sensor T1 error
EH61	Indoor evaporator coil temperature sensor T2 error
EC07	Outdoor DC fan speed malfunction
EH0b	Indoor PCB and display board communication error
EHb3	Conmunication malfunction between wire and master control
FL09	New and old platform match malfunction
PC00	Inverter module (IPM) protection
PC01	Over high voltage or over low voltage protection
PC02	High temperature protection of compressor top/ IPM temperature protection
PC04	Inverter compressor drive error
PC60	Discharge high temperature error
PC03	Pressure protection
PC0L	Low temperature protection of outdoor unit

SPECIFICATIONS			
MODEL NUMBER	JYDK. ACOIL. KZH. V1	TEMPERATURE LIMITS OF MOUNTING SURFACES (Ts)	-22-133°F
POWER SOURCE	115/208/230V~60Hz		
INPUT CURRENT	50mA/100mA	OPERATING CONTROL	Type 1
LOAD TYPE	GENERAL USE (SIGNAL USE)	POLLUTION DEGREE	2
MAX.FUSE	15A	RATED IMPULSE VOLTAGE	2500V
PROTECTION AGAINST ELECTRIC SHOCK	Class I	DEGREE OF PROTECTION	IP20

The design and specifications are subject to change without prior notice for product improvement. Consult with the sales agency or manufacturer for details. Any updates to the manual will be uploaded to the service website, please check for the latest version.

QS001UI-External controller (A-coil)
16100101008802
20240627

此面无需印刷

技术 要求:

1. 双胶纸(说明书)80g非E项目大度

2.尺寸：A4

3.颜色：黑白

4.注意：排版时注意页码数字都是居中的，以便翻阅

5.装订。

更改版本A:增加115V电压说明　贾晓慧 20240627