KSAIC0501230

Installation Instructions

24V Interface Kit for Ductless Systems

IMPORTANT: Read and become familiar with these instructions before beginning the installation.

Fig. 1 — 24V Interface

TABLE OF CONTENTS

SAFETY CONSIDERATIONS

Read these instructions thoroughly and follow all warnings or cautions included in the literature and attached to the unit. Consult the local building codes and National Electrical Code (NEC) for special requirements. Recognize safety information.

This is the safety-alert symbol ⚠. When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury. Understand these signal words: **DANGER**, **WARNING**, and **CAUTION**. These words are used with the safety-alert symbol.

DANGER identifies the most serious hazards which may result in severe personal injury or death. **WARNING** signifies hazards which could also result in personal injury or death. **CAUTION** is used to identify unsafe practices which may result in minor personal injury or product and property damage. **NOTE** is used to highlight suggestions which result in enhanced installation, reliability, or operation.

⚠ WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

Before beginning any modification or installation of this kit, ensure the main electrical disconnect is in the **OFF** position.

Ensure the power is not connected to the fan coil unit. On some systems, both the fan coil and the outdoor unit may be on the same disconnect. Tag the disconnect switch with a suitable warning label. There may be more than one disconnect.

⚠ CAUTION

EQUIPMENT DAMAGE HAZARD

Failure to follow this warning may result in equipment damage.

DO NOT install the wired controller in an area subjected to excessive steam, oil or sulfide gas. Doing so may cause the controller to deform and/or fail.

⚠ CAUTION

INSTALLATION

Entrust a licensed contractor to install the unit. Installation by unskilled persons may lead to improper installation, electric shock, or fire. Re-installation must be performed by authorized professionals. Non-compliance may lead to electric shock or fire.

NOTES: Images are for illustration purposes only. Actual models may differ slightly.

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PREPARATION BEFORE INSTALLING

24 Volt Interface Adapter

This adapter is designed for controlling Ductless (DLS) products designed to use a 24V thermostat.

- Any installation of third-party Furnaces /Coil/IDU/ODU applications are not supported with R454b systems
- Compatible with RS485 and current loop two-way communication methods.
- Supports dry contact DIY control.

⚠ WARNING

EXPLOSION HAZARD

- Wires must be properly sized according to the NEC/NFPA 70, CEC and all prevailing codes, ordinances and standards.
- All conductors must be installed through conduit or 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.
- Installation, Maintenance or Repair must comply with all safety conditions

⚠ CAUTION

- When connecting with RS 485 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).
- Read this manual carefully before installing or operating your new air conditioning unit. Make sure to save this manual for future reference.

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DIMENSIONS

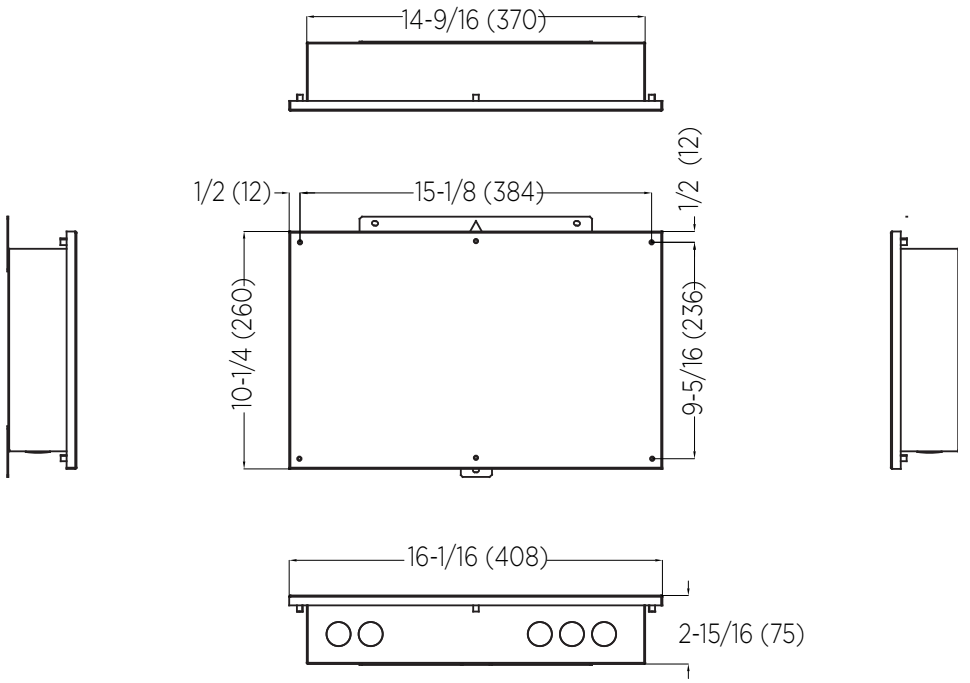

Fig. 2 — 24V Interface Structure Size

CLEARANCES

IMPORTANT: Maintain at least 5.9"(150mm) spacing to the floor and ensure it is elevated from areas that can retain water.

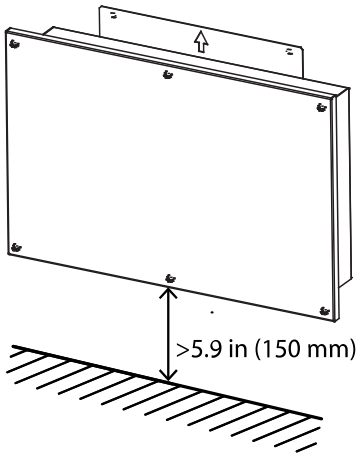

Fig. 3 — Clearances

ACCESSORIES

The system is shipped with the following accessories (see Table 1). Use all of the installation parts and accessories to install the system. Improper installation may result in, electrical shock and fire, or cause the equipment to fail.

Keep the installation manual in a safe place and do not discard any accessories until the installation has been completed.

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Table 1 — Included Accessories

NO.	DESCRIPTION	PICTURE	QTY	REMARKS
1	Control box, with gasket		1	Gasket RCD part number 12600701003029
2	Screws		4	M4*35 (For mounting on the wall)
3	Anchors		3	For mounting on the wall
4	Return Air Thermistor Assembly (T1)		1	RCD part number 11201007003448
5	Return Air Thermistor (T1) Assembly Extension Wires (16 ft (5m))		1	For connecting Sensor RCD part number 17401204010126
6	Coil Temperature Thermistor Sensor (T2) (5 ft (1.6m))		1	RCD part number 11201007003464
7	Zip Tie		3	N/A
8	24V Transformer	N/A	1	**

**For 115V Ductless applications, the 24V transformer must be replaced in the field.

Table 2 — Optional Accessories (not included)

NO.	DESCRIPTION	QTY
1	Switch Box	1
2	Wiring Tube (insulating sleeve and tightening screw)	1

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INSTALLATION

Installation Location

⚠ WARNING

FIRE HAZARD
DO NOT install the 24V INTERFACE KIT near flammable liquids or gases such as gasoline or hydrogen sulfide. Doing so creates a fire hazard.

The 24V INTERFACE KIT is rated for outdoor and indoor mounting (depending on the application). It is recommended that the kit installation be as close as possible to the indoor unit and the thermostat.

When the Interface Adapter is installed outdoors, it must be vertical, and the direction of the arrow on the cover, must point up;

IMPORTANT: Follow the recommended clearances (See Fig. 3 — on page 3) and install in an area above the ground away from locations where water could enter.

STEP 1

Remove the cover of the 24V INTERFACE KIT by removing all 6 exposed screws with a Phillips head screwdriver. Next, remove the cover (NOTICE: this may be tight due to the silicone gasket seal).

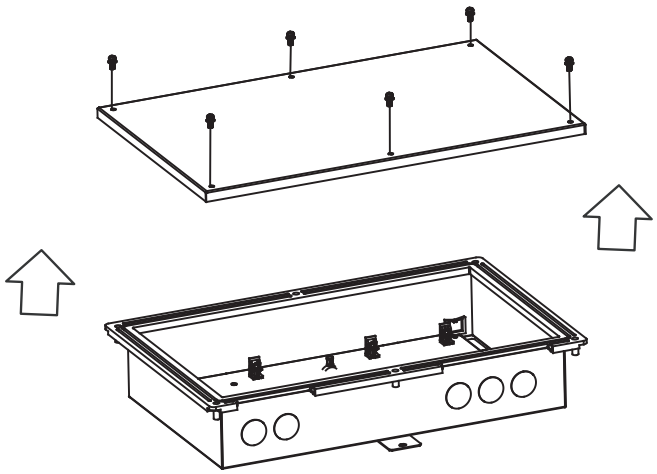

Fig. 4 — Remove Cover

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

STEP 2

Mount the back plate of the 24V INTERFACE KIT. Mount 24V INTERFACE KIT vertically, fasten the back plate to the wall with 3 screws (M4*35) and anchors.

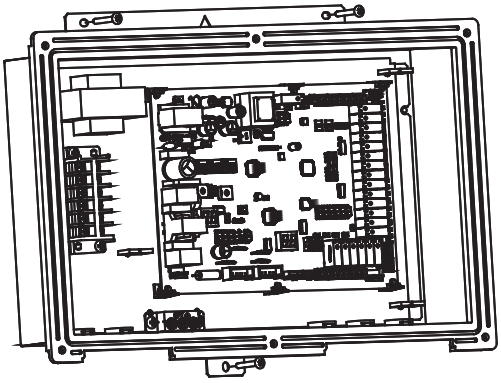

Fig. 5 — Installation Mount View

⚠ CAUTION

Place the unit on a flat surface. Be careful not to distort the back plate of the 24V INTERFACE KIT by over tightening the screws. When installed vertically, the direction of the arrow, must point up.

Step 3 Wiring

⚠ CAUTION

The power to the unit must be disconnected before any wiring. 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.

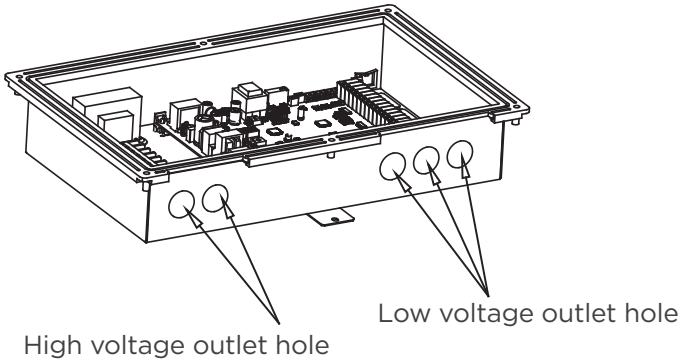

Fig. 6 —Wiring

STEP 4

After the wiring is complete, reattach the cover, being sure not to pinch any wiring and tightening the 6 attachment screws.

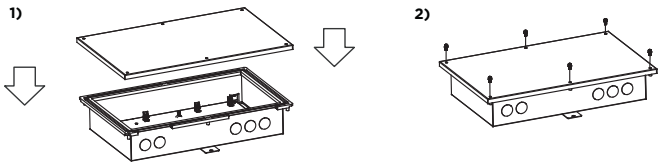

Fig. 7 — Reattach the Cover

SYSTEM CONFIGURATION

Once configured, only the 24V connected thermostat control should be used to operate the air conditioning system. If other controllers had been connected, please remove. However, the Swing and LED functions on some indoor units will remain functional.

Table 3 — Connection Wiring Specification

Connection Wiring	Outdoor (L1)1,(L2)2,(S)3	Indoor (L1)1,(L2)2,(S)3	R/C/Y1/Y2/G/W/W1/B/O/E/AUX/DH/L/DF/WI-out/G1,G2,G3/Work/Alarm
Size	Refer to the outdoor connecting wires size	Refer to the indoor connecting wires size	24AWG (minimum)

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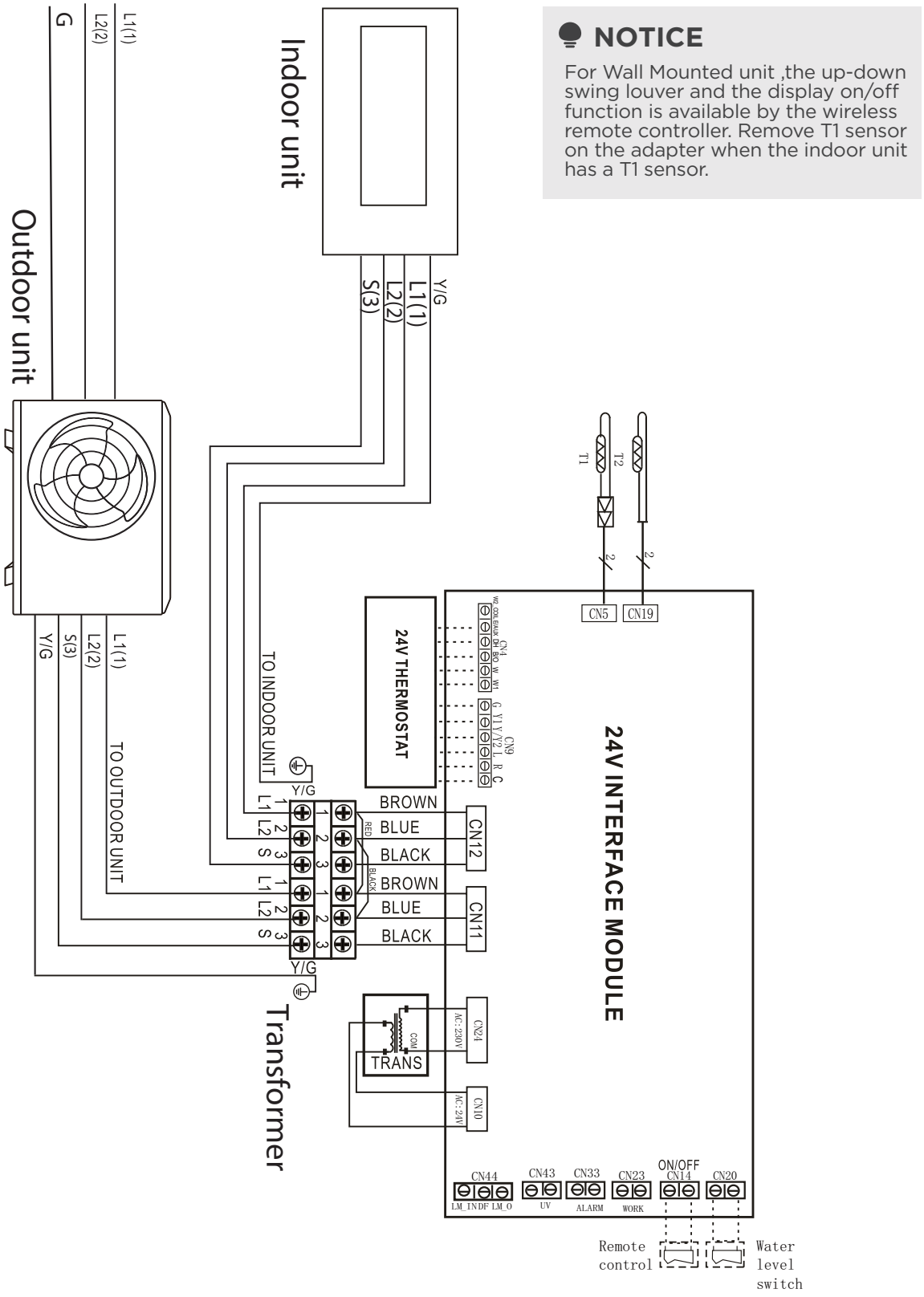
APPLICATION

The KSAIC0501230 is designed to enable pairing of ductless indoor units with a 24VAC HVAC thermostat.

Configuration

Current loop (L1 L2 S or 1 2 3) inverter outdoor unit match with current loop inverter indoor unit. Match the following indoor units with the corresponding compatible SINGLE ZONE and multi-zone outdoor units:



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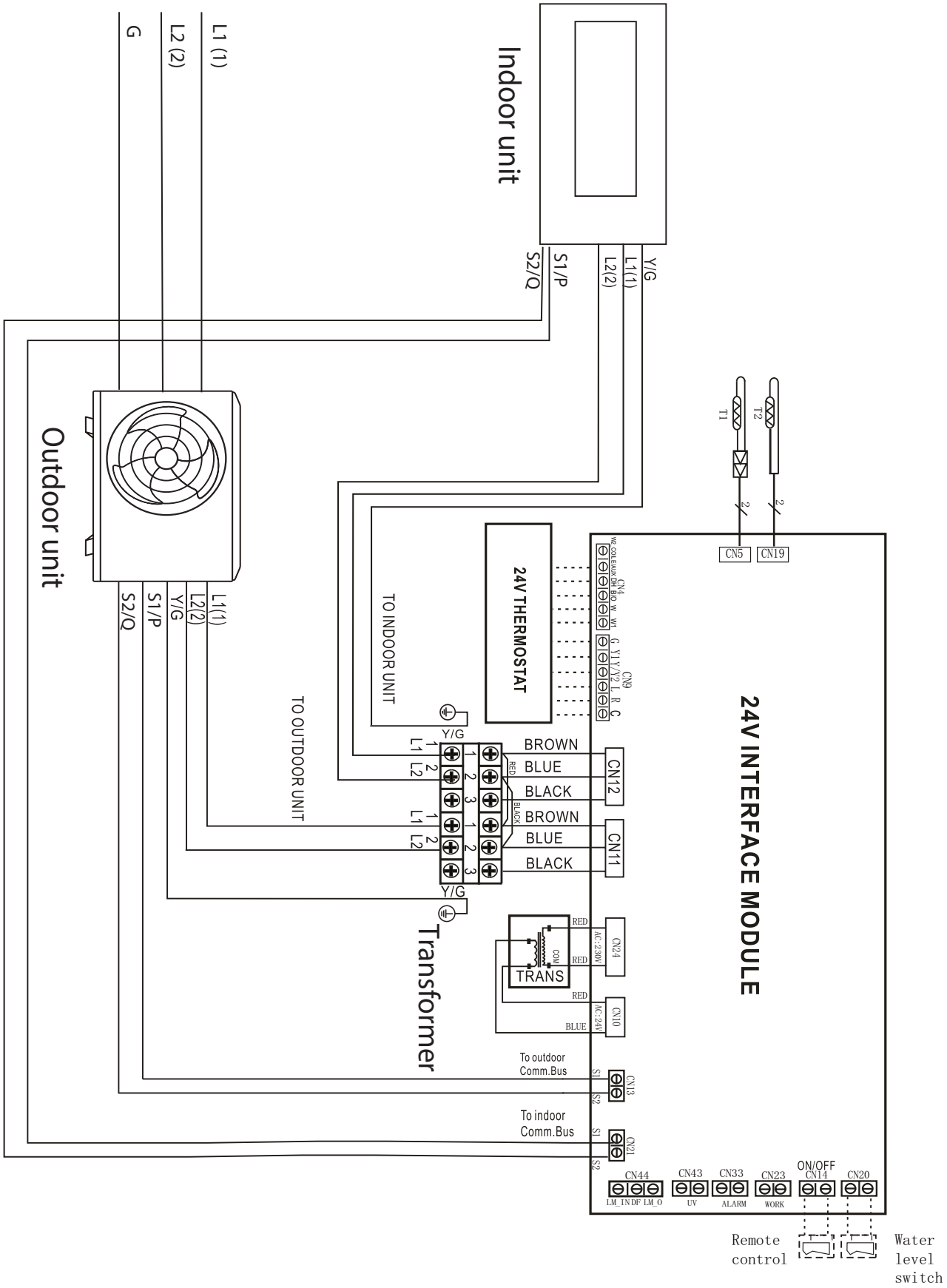
485 Inverter Configuration

485 (P Q) or (S1 S2) inverter outdoor unit match with 485 inverter indoor unit; Match the following indoor units with the corresponding compatible SINGLE ZONE outdoor units:



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AUXILIARY CONTACTS

WORK terminal port CN23 – DRY CONTACT – OUTPUT

- The WORK port is linked to the unit's indoor blower
- When the indoor blower is off, the contact is open
- When the indoor blower is running, the contact is closed
- There is no voltage from CN23, power is provided from the external control system and not from the unit
- The contacts are rated at 250VAC and 10 AMP maximum
- If an active 24V signal output is required, G and C ports (thermostat connections) may be used instead

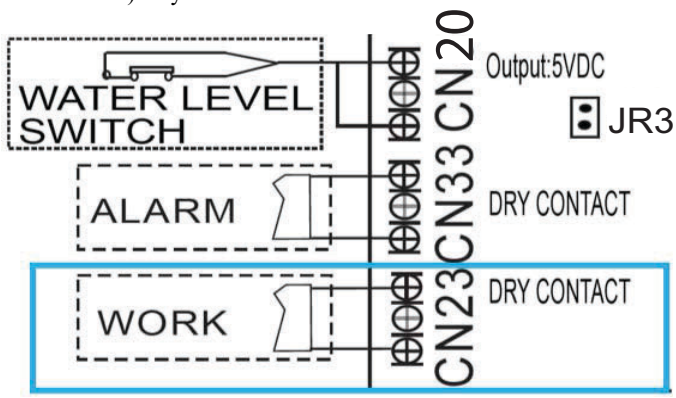

Fig. 8 — WORK Terminal Port CN23

ALARM terminal port CN33 – NORMALLY OPEN DRY CONTACT (OUTPUT)

- Allows the terminal port to connect to an external ALARM interface or annunciator
- There is no voltage from CN33, power is provided from the ALARM system and not from the unit
- The contacts are rated at 250VAC and 10 AMP maximum
- When the unit experiences a problem, the contact closes, and the ALARM is triggered. When the unit experiences a problem, the relay closes, and the ALARM is triggered.

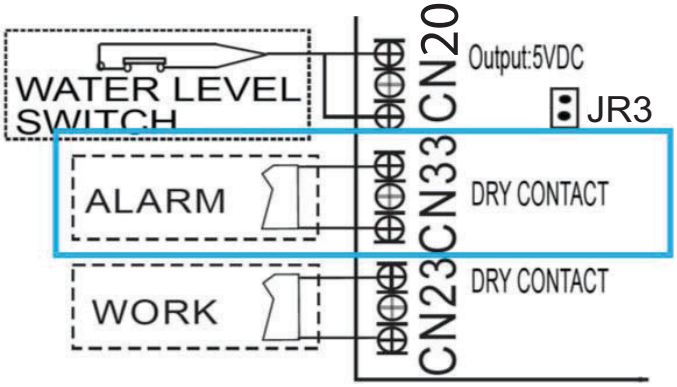

Fig. 9 — ALARM Terminal Port CN33

WATER LEVEL switch terminal port CN5 – SWITCH INPUT

- To enable this switch, jumper JR3 must be removed
- A field supplied float switch can be directly connected to CN5
- CLOSED contacts = normal
- OPEN contacts = overflow
- When an overflow condition occurs, a signal is sent to the system to turn it off: Alarm EE is displayed.

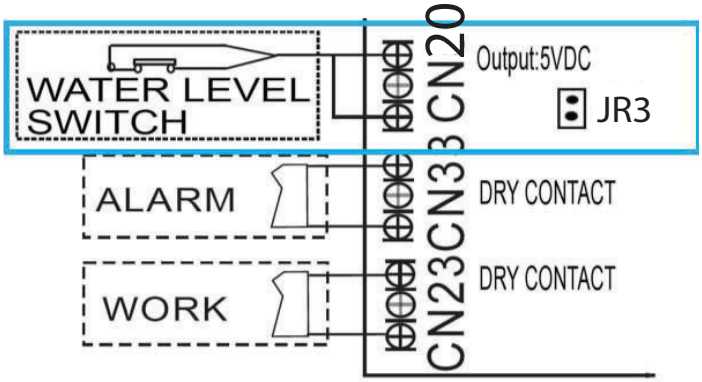

Fig. 10 — WATER LEVEL Terminal Port CN20

UV LED terminal port CN43 – OUTPUT 24VAC:

- The UV LED port is linked to the unit's fan
- When the fan is running, the relay is closed and there is an output of 24VAC through the contacts that can be used to power a compatible UV LED LIGHT

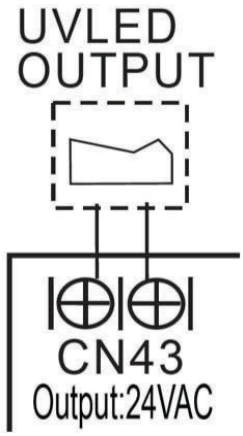

Fig. 11 — UV LED Terminal Port CN43

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Remote control (ON-OFF) terminal port CN14 and jumper JR1 – OUTPUT 12VDC:

- **Remove the jumper JR1** to enable the ON-OFF function
- When the remote switch is off (OPEN); the unit is OFF
- When remote switch is on (CLOSE); the unit is ON
- When the remote switch is close/open, the unit responds to the demand within 2 seconds
- When the remote switch is on, you can use the included remote controller or wired controller to operate the unit as normal. When the remote switch off, the unit would not respond the command from the remote controller or wired controller and a CP code would be displayed on the board.
- The voltage of the port is 12V DC, design Max. current is 5mA.

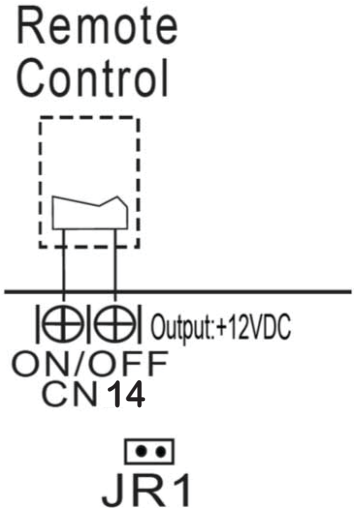

Fig. 12 — Remote Control Terminal Port CN14 and Jumper JR1

Control Logic

Table 4 — Indoor Unit Connector

Connector	Purpose
R	24V
C	COMMON
G	FAN
Y	First stage cooling
Y Y2	Second stage cooling
B	Heating (Four-way valve)
W	Heating operation
W1	Electric Heating Operation 1
W2	Electric Heating Operation 2
E/AUX	Emergency Heat / Auxiliary Heat
DH	Dehumidification
L	Error Signal

LED Display

The control displays active faults switches on the **LED** display. If the control displays the fault switch and the **LED** flashes quickly, the unit has malfunctioned. Refer to the detailed fault switches.

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DIP SWITCH DEFINITIONS

Dial Code

DIAL CODE OPTION	EXPLANATION
SW2-3: OFF SW1-1: ON	1. IDU and ODU Connect to the 24V interface adapter by L1+L2+S/S1+S2 2. Wiring Methods - See:“Configuration” on page 6.

DIP Switch Explanation

DIAL CODE	FUNCTION	ON	OFF	NOTE
SW1-2	Maximum continuous run-time before automatic capacity rise	60 minutes	[Default] 30 minutes	The purpose is to make the room temperature reach the set point, by rising the capacity
SW1-3	Set whether auxiliary heat is associated with the continuous running time of the compressor	auxiliary heat automatically activates after 60 minutes of accumulated compressor running time	[Default] auxiliary heat is not associated with the running time of compressor	Only valid for heat pump + Electric heat modes
SW1-4	Anti-cold air protection option	NO	[Default] YES	
SW2-1	Auxiliary heat on-of temperature difference according to T4 limits(T4_W1_ TEMP)	2°F(1°C)	[Default] 4°F(2°C)	T4_W1_TEMP set by DIP Switch ENC2.
ENC2 (S3)	Set outdoor temperature Limitation:T4_ W1_TEMP (for auxiliary heating)	See “Table A” on page 11		
SW3-2/ SW3-1	Set the fan speed of the indoor unit	SW3-2/SW3-1: OFF/OFF: Auto Fan OFF/ON: Low Fan ON/OFF: Med Fan ON/ON: High Fan		SW3-2 SW3-1 working together
S4-2	DH function selection	[Default] Dehumidification control not available	Dehumidification feature is enabled through thermostat	
ENC1	Capacity Selection	See “Table B” on page 11		

KEY EXPLANATION	
KEY1	You can start the forced defrost mode by pressing the KEY. Press the KEY more than 3 seconds, for entering defrost mode, and press the KEY more than 3 seconds again exit defrost mode

INPUT CONNECTOR	PURPOSE
G	Fan control
Y1	Low Demand
Y2	High Demand
B/O	Heating Revering Valve
W	Heating control
W1	Electric auxiliary heating
E/AUX	Emergency heating
DH	Dehumidification

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OUTPUT CONNECTOR	PURPOSE
L	Malfunction signal
DF	Defrost control
W1-OUT	Electric auxiliary control signal
WORK	Output synchronized with run signal
ALARM	Output synchronized with system fault signal
LM_O	Output when refrigerant sensor Fault or refrigerant leakage detected by IDU (Not currently supported)

* W1-out output remains active and synchronized with W1 or Aux signal even when the indoor fan motor is stopped.

Table A

ENC2(S3)	T4(°C)	T4(°F)
0	**OFF**	**OFF**
1	-20	-4
2	-18	0
3	-16	3
4	-14	7
5	-12	10
6	-10	14
7	-8	18
8	-6	21
9	-4	25
A	-2	28
B	0	32
C	2	36
D	4	39
E	6	43
F	8	46

Table B

ENC1/ENC3	CAPACITY	ENC1/ENC3	CAPACITY
0	6K	8	36K
1	9K	9	42K
2	12K	A	48K
3	reserved	B	60K
4	18K	C	reserved
5	24K	D	reserved
6	reserved	E	reserved
7	30K	F	reserved

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24V Signal Chart

MATRIX				DEMAND FROM 24V THERMOSTAT								DLS ODU+ DLS IDU
	MODE	PRIORITY	DISPLAY	G	Y1	Y/Y2	B	W	W1	E/AUX	DH	FAN SPEED OUTPUT TO IDU
SW2-3 OFF	OFF	/	00	0	0	0	0	0	0	0	*	OFF
	FAN	6	01	1	0	0	*	0	0	0	*	Dip switch select Auto/low/Med/High
	COOLING STAGE 1	5	02	*	1	0	0	0	0	0	1	Dip switch select Auto/low/Med/High
	COOLING STAGE 2		03	*	*	1	0	0	0	0	1	Dip switch select Auto/low/Med/High
	DEHUMIDIFICATION 1		04	*	1	0	0	0	0	0	0	Auto
	DEHUMIDIFICATION 2		05	*	*	1	0	0	0	0	0	Auto
	HEAT PUMP STAGE 1	4	06	*	1	0	1	0	0	0	*	Dip switch select Auto/low/Med/High
	HEAT PUMP STAGE 2		07	*	*	1	1	0	0	0	*	Dip switch select Auto/low/Med/High
	HEAT PUMP STAGE 2			*	*	*	*	1	0	0	*	Dip switch select Auto/low/Med/High
	ELECTRIC HEATER 1	2	08	*	0	0	*	0	1	0	*	High
	HEAT PUMP STAGE 1 + ELECTRIC HEATER 1	3	10	*	1	0	1	0	1	0	*	High
	HEAT PUMP STAGE 2 + ELECTRIC HEATER 1			*	*	1	1	0	1	0	*	High
	HEAT PUMP STAGE 3 + ELECTRIC HEATER 1			*	*	*	*	1	1	0	*	High
	EMERGENCY HEAT	1	12	*	*	*	*	*	*	1	*	High

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MATRIX				DEMAND FROM 24V THERMOSTAT								
	MODE	PRIORITY	DISPLAY	G	Y1	Y/Y2	B	W	W1	W2_COIL	E/AUX	DH
SW2-3 ON SW1-3 OFF (COOLING & HEATING)	OFF	/	00	0	0	0	0	0	0	0	0	*
	FAN	7	01	1	0	0	*	0	0	0	0	*
	COOLING STAGE 1	6	02	*	1	0	0	0	0	0	0	1
	COOLING STAGE 2		03	*	*	1	0	0	0	0	0	1
	DEHUMIDIFICATION 1		04	*	1	0	0	0	0	0	0	0
	DEHUMIDIFICATION 2		05	*	*	1	0	0	0	0	0	0
	HEAT PUMP STAGE 1	5	06	*	1	0	1	0	0	0	0	1
	HEAT PUMP STAGE 2		07	*	*	1	1	0	0	0	0	1
	HEAT PUMP STAGE 2			*	*	*	*	1	0	0	0	1
	FURNACE	3	12	*	0	0	*	0	1	0	0	*
				*	0	0	*	0	0	1	0	*
				*	0	0	*	0	1	1	0	*
		4		*	1	0	1	0	1	0	0	1
				*	1	0	1	0	0	1	0	1
				*	*	1	1	0	1	0	0	1
				*	*	*	*	1	1	0	0	1
				*	*	1	1	0	0	1	0	1
				*	*	*	*	1	0	1	0	1
				*	1	0	1	0	1	1	0	1
				*	*	1	1	0	1	1	0	1
				*	*	*	*	1	1	1	0	1
		1		*	*	*	*	*	*	*	1	*
	HEATING ZONE CONTROL	2	13	*	1	0	1	0	*	*	0	0
	HEATING ZONE CONTROL			*	*	1	1	0	*	*	0	0
	HEATING ZONE CONTROL			*	*	*	*	1	*	*	0	0

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	MATRIX			DEMAND FROM 24V THERMOSTAT								
	MODE	PRIORITY	DISPLAY	G	Y1	Y/Y2	B	W	W1	W2_COIL	E/AUX	DH
SW2-3 ON SW1-3 ON (COOLING ONLY)	OFF	/	00	0	0	0	0	0	0	0	0	*
	FAN	7	01	1	0	0	*	0	0	0	0	*
	COOLING STAGE 1	6	02	*	1	0	0	0	0	0	0	1
	COOLING STAGE 2		03	*	*	1	0	0	0	0	0	1
	DEHUMIDIFICATION 1		04	*	1	0	0	0	0	0	0	0
	DEHUMIDIFICATION 2		05	*	*	1	0	0	0	0	0	0
	FURNACE	5	12	*	1	0	1	0	0	0	0	1
				*	*	1	1	0	0	0	0	1
				*	*	*	*	1	0	0	0	1
		3		*	0	0	*	0	1	0	0	*
				*	0	0	*	0	0	1	0	*
				*	0	0	*	0	1	1	0	*
		4		*	1	0	1	0	1	0	0	1
				*	1	0	1	0	0	1	0	1
				*	*	1	1	0	1	0	0	1
				*	*	*	*	1	1	0	0	1
				*	*	1	1	0	0	1	0	1
				*	*	*	*	1	0	1	0	1
				*	1	0	1	0	1	1	0	1
				*	*	1	1	0	1	1	0	1
				*	*	*	*	1	1	1	0	1
		1		*	*	*	*	*	*	*	1	*
		2		*	1	0	1	0	*	*	0	0
				*	*	1	1	0	*	*	0	0
				*	*	*	*	1	*	*	0	0

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