KSAIC0201230 (208−230V)

24V Interface Kit for Ductless Outdoor Single Zone matched with Air Handler

Installation Instructions

Read and become familiar with these instructions before beginning installation.

SAFETY CONSIDERATIONS

Read these instructions thoroughly and follow all warnings or cautions included in the literature and attached to the unit. Consult 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 **will** result in severe personal injury or death. **WARNING** signifies hazards which **could** 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 **will** 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, be sure the main electrical disconnect is in the OFF position. Ensure power is disconnected 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.

⚠ WARNING

INSTALLATION

Entrust the distributor or authorized professionals 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.

TABLE OF CONTENTS

OVERVIEW

The 24V INTERFACE KIT is used to connect a SINGLE ZONE Ductless Outdoor Unit to a Fan Coil and a 3rd party single stage conventional thermostat.

NOTE: Images are for illustration purposes only. Actual models may be slightly different.

Table 1 – Kit Contents:
Confirm the following parts are included

No.	Description	Qty	Remarks
1	Control box	1	n/a
2	Installation Manual	1	n/a
3	Screws	3	M4X20 (for wall mounting)
4	Wall anchors	3	For wall mounting
7	Return Air Thermistor Assembly	1	Required and installed near or on the unit and on the air inlet side
8	16.4ft. (5m) Return Air Thermistor Assembly Extension Wires	1	For a Return Air Temperature Sensor

Table 2 – Field Supplied Components:
Prepare the following assemblies on site

No.	Description	Qty	Type	Remarks
1	Switch Box	1	n/a	n/a
2	Wiring Tube (insulating sleeve and tightening screw)	1	n/a	n/a

⚠ WARNING

- The wiring should adapt to the wire control current. Otherwise, electric leakage or overheating may occur and result in a fire.
- The specified cables shall be used in the wiring. No external force may be applied to the terminal. Otherwise, the wire may be damages and heating may occur and result in a fire.

⚠ CAUTION

- The shielded wire must be grounded.
- Sensor connecting cable should not be longer than 23in. (7m).
- The control box operates on low voltage circuit loops. DO NOT connect a 220V or 380V cable to the circuit loop.
- Ensure the configured tubes are 12−20in. (30−50cm) or more.
- DO NOT use a ohmmeter to detect the insulation after wiring the control box.

DIMENSIONS

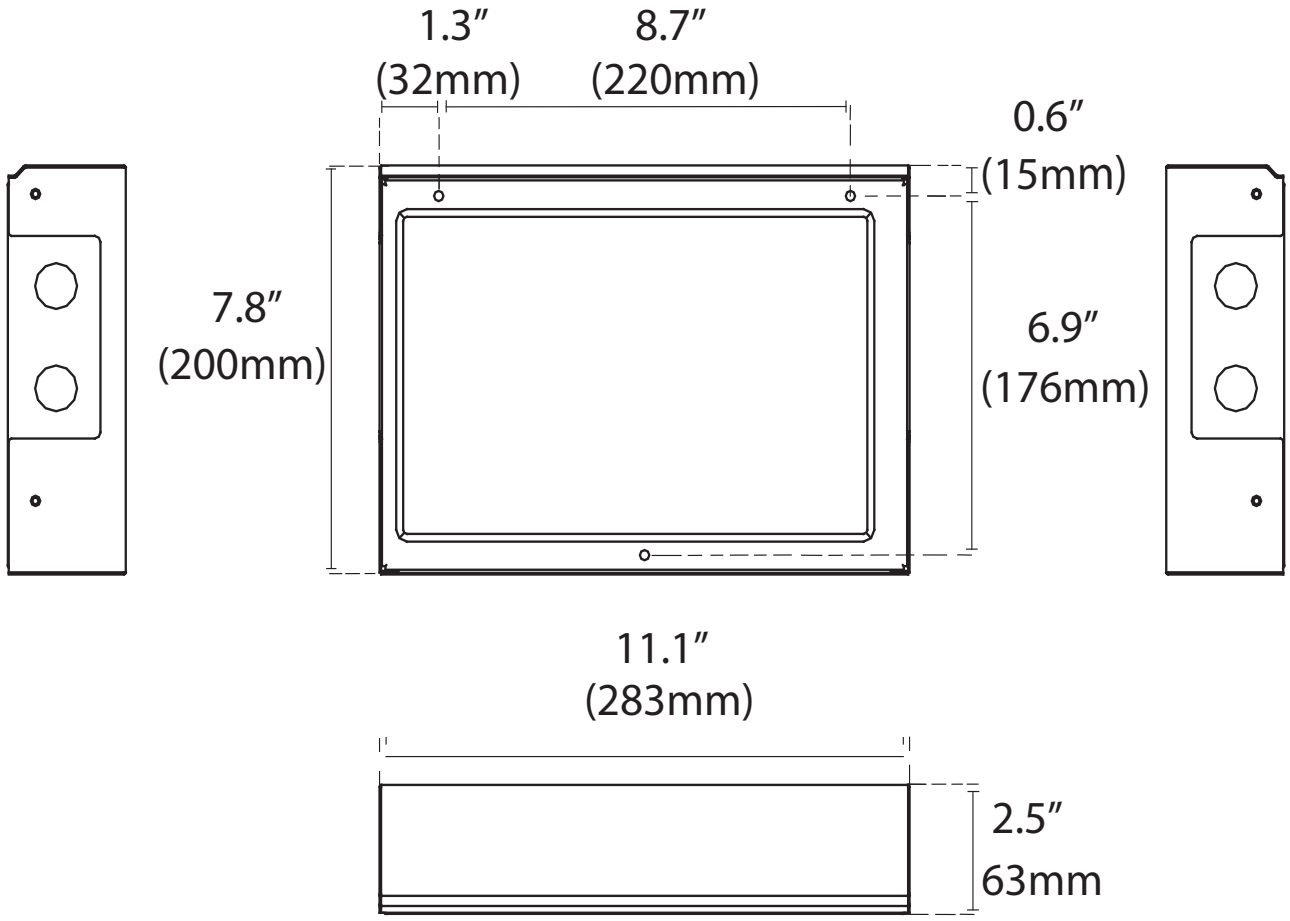


Fig. 1 − 24V interface structure size

CLEARANCES

Table 3 – 24VAC Interface Clearance Dimensions

Clearances	
Unit	Minimum Value In (mm)
Sides	3.5 (89)
Front	24 (610)*
Top and Bottom	3 (76.2)

NOTE: *24 in (610mm) minimum for service access or use local code.

INSTALLATION

Installation Location

The 24V INTERFACE KIT is rated for outdoor and indoor mounting (depending on the application).

⚠ CAUTION

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

1. Remove the cover of the 24V INTERFACE KIT. Remove the six screws of the 24V INTERFACE KIT with a screwdriver or similar tool. Rotate the lid along the hem to disassemble.

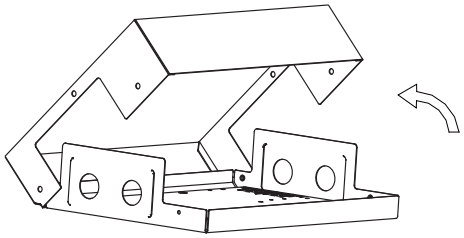


Fig. 2 − Remove the Cover

2. Mount the 24V INTERFACE KIT horizontally (see Fig. 3), by fastening the back plate to the wall with 3 screws (M4x20) and anchors.

⚠ CAUTION

The 24V Interface kit cover has a directional arrow on the cover. In case of outdoors installation verify, during the mounting process, that this arrow will point UP upon installation. Failure to mount the kit correctly can cause water ingress into the box which may compromise the electrical component integrity.

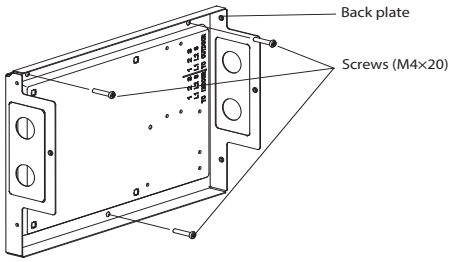


Fig. 3 − 24V Interface Kit

NOTE: Place the unit in a flat surface. Be careful not to distort the back plate of the 24V INTERFACE KIT by over tightening the screws.

3. WIRING − Based on the system used, wire the unit as shown on the System Configuration Section.
4. Cover the 24V INTERFACE KIT Lid, and lock back in place using the six screws previously removed.

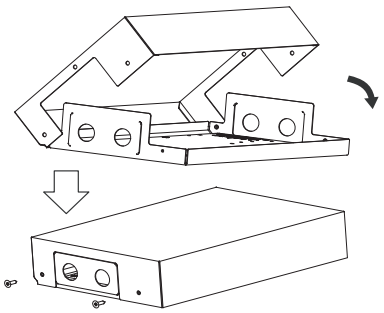


Fig. 4 − Cover the screw

⚠ CAUTION

Before installing the system, ensure the indoor unit's TXV/Piston is removed.

Line sets to be sized on the connection size of the indoor unit. Each pipe should be insulated individually.

SYSTEM CONFIGURATION

Match the following fan coil indoor units with the corresponding compatible **SINGLE ZONE** outdoor units:

- FFM
- FPM

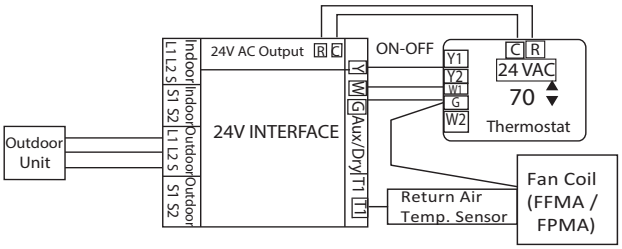


Fig. 5 − Connection Diagram

NOTE: The T1 (Return air temperature) sensor should be near or on the unit and on the air inlet side. The thermistor must be installed pointing down into the duct between 2.5 and 4ft. from the return side of the fan coil. Use a 1/2" drill and insert the thermistor no less than 6 in. into the duct and seal air tight.

WIRING

All wires must be sized per NEC (National Electrical Code) or CEC (Canadian Electrical Code) and local codes. Use Electrical Data table MCA (minimum circuit amps) and MOCP (maximum over current protection) to correctly size the wires and the disconnect fuse or breakers respectively.

Per the caution note, only stranded copper conductors with a 600 volt insulation rating wire must be used.

Separate power supplies are required for the OUTDOOR UNIT and the INDOOR UNIT.

The field supplied 14/3 stranded wire with ground with a 600 volt insulation rating, power/communication wiring from the OUTDOOR UNIT to 24V INTERFACE KIT consists of four (4) wires and provides the power for the indoor unit. Two wires are line voltage AC power, one is communication wiring (S) and the other is a ground wire. Wiring between the OUTDOOR UNIT to 24V INTERFACE KIT is polarity sensitive.

The use of BX wire is NOT recommended.

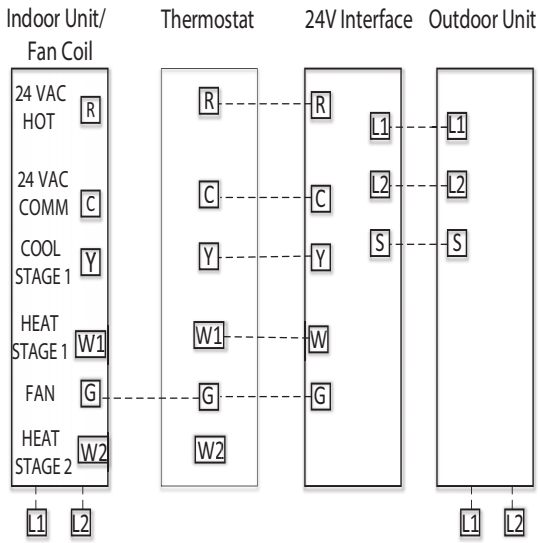


Fig. 6 − Wiring Diagram

Auxiliary Heating: In order to energize an Auxiliary Heater connect W2 on the thermostat directly to the an electric heat relay(s) (field supplied) and complete the circuit to the heater element(s). The thermostat must be setup to use different heating priorities.

⚠ CAUTION

The conventional thermostat must be configured for use with a single stage air conditioner (Y output ONLY) and a single stage heating (W) system.

Control Logic

Table 4 – Conventional Thermostat Connections

Connector	Purpose
R/C	24VAC Output
Y	Cooling
W	Heating
G	Fan−Auto Speed
G1/G2/G3	Fan Speed Low/Medium/High
AUX/DRY	Aux−Heat/Dry

Table 5 – Mode Setting

Y	W	G	G1	G2	G3	Aux/Dry	Setting Mode
√	X	☆	☆	☆	☆	☆	Cooling
X	√	☆	☆	☆	☆	X	Heating (without aux−heater)
X	√	☆	☆	☆	☆	√	Heating (with aux−heater)
X	X	√	☆	☆	☆	X	Fan only (Auto Fan Speed)
X	X	X	√	☆	☆	X	Fan only (Low Fan Speed) Not applicable
X	X	X	X	√	☆	X	Fan only (Medium Fan Speed) Not applicable
X	X	X	X	X	√	X	Fan only (High Fan Speed)
√	√	☆	☆	☆	☆	☆	OFF
X	X	X	X	X	X	X	OFF
X	X	☆	☆	☆	☆	√	DRY

FAN SPEED INPUT − G (Auto), G1 (Low), G2 (Medium) or G3 (High) Airflow

The 24V interface Kit contains different fan speed inputs for the indoor unit, these are typically used on other applications.

When the 24V interface Kit is matched with the FFM or FPM fan coils only one of the following options should be selected:

- **G (Auto)**: Used when the application does not require low ambient temperatures (above 32°F).
- **G3 (High)**: Used when the application requires low ambient temperatures (below 32°F)
- **G2 (Med) and G1 (Low) should not be selected**.

DIP SWITCHES CONFIGURATION

The 24V INTERFACE KIT must be configured to operate properly with the system components with which it is installed. To successfully configure the system, move the Dip Switches to match the components and functions used.

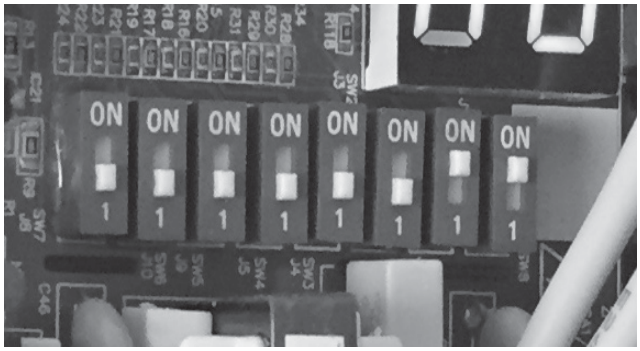


Fig. 7 − DIP Switch Definitions

Dip Switch 1

Used for selection of the indoor unit type.

Table 6 – Dip Switch 1

SW1	Result	Note
ON	Sets – Both Ductless Indoor and Outdoor Units	
OFF	Ductless Outdoor matched with FFM/FPM Air Handler	Default

⚠ CAUTION

This dip switch should be checked at time of install to verify it is **OFF** to permit compatibility with the FFM and FPM series of Fan Coil Units.

Dip Switch 2

Used for selection of the system: Cooling Only or Heat Pump.

Table 7 – Dip Switch 2

SW2	Result	Note
ON	Cooling Only	
OFF	Heat Pump	Default

Dip Switch 3

Used for freeze protection of the indoor coil.

Table 8 – Dip Switch 3

SW3	Result	Note
ON	Fan does not stop	
OFF	Fan stops if the indoor coil temperature is low	Default

NOTE: **Not Applicable when matched with FFM/FPM Air Handlers.**

Dip Switch 4

Dry is used for thermostats with a Dry Mode output. An auxiliary heater is used to control a secondary Heat Source.

Table 9 – Dip Switch 4

SW4	Result	Note
ON	Dry	
OFF	Aux Heater	Default

⚠ CAUTION

Dry mode is not available when matched with the FFM and FPM series of Fan Coil Units.

Dip Switch 5

Used to increase the compressor frequency in case the set point has not been reached after 1 hour or 3 hours of operation.

Table 10 – Dip Switch 5

SW5	Result	Note
ON	1h	
OFF	3h	Default

Dip Switch 8

Used to turn ON or OFF the diagnostic code display LED on the control board of the 24V Interface Kit.

Table 11 – Dip Switch 8

SW8	Result	Note
ON	Display on	Default
OFF	Display off	

NOTE: **Dip Switches 6 and 7 not used. They are reserved for future applications.**

ERROR CODES

For ease of service, the 24V Interface is equipped with a diagnostic code display LED on the control board.

Table 12 – Error Codes

Display	Malfunction and Protection Indication
E0	Indoor EEPROM error
E2	Cross−zero detection error
E3	Indoor fan speed malfunction
E4	Indoor room temperature sensor error
E5	Evaporator coil temperature sensor error
EC	Refrigerant leak detection system malfunction
F0	Current overload protection
F1	Outdoor ambient temperature sensor (T4) malfunction
F2	Condenser coil temperature sensor (T3) malfunction
F3	Condenser coil temperature sensor (T5) malfunction
F4	Outdoor unit EEPROM parameter error
F5	Outdoor fan speed has been out of control
F6	T2b sensor error
P0	Inverter module (IPM) malfunction
P1	Over−voltage or under−voltage protection
P2	Compressor top high temperature protection (OLP)
P3	Low ambient temperature cut off in heating
P4	Compressor drive malfunction
−−	Mode conflict
P6	Compressor low−pressure protection
00	Module boot mode and indoor running mode for power off
IN	Module and indoor unit communication malfunction
OU	Module and outdoor unit communication malfunction

COMPATIBILITY

The 24V INTERFACE KIT is compatible with most thermostats matched with the Fan Coils listed below. Before installation, check the compatibility of your Outdoor and Indoor Fan Coil. Professional installation is recommended.

Table 13 – Compatibility with FFM & FFM Fan Coils

Indoor	Volt—Ph @ 60Hz	Kit Number	Nominal System Size MBTUH	Indoor Model Number	Outdoor Model Number	Indoor Fan Speed Tap Number
FFM Vertical Fan Coil	208/230 — 1	KSAIC0201230	12	FFMANP019T00	38MAQB12R——3	Tap 1
			18	FFMANP019T00	38MAQB18R——3	Tap 2
			24	FFMANP025T00	38MAQB24R——3	Tap 5
			30	FFMANP031T00	38MAQB30R——3	Tap 2
			36	FFMANP031T00	38MAQB36R——3	Tap 4

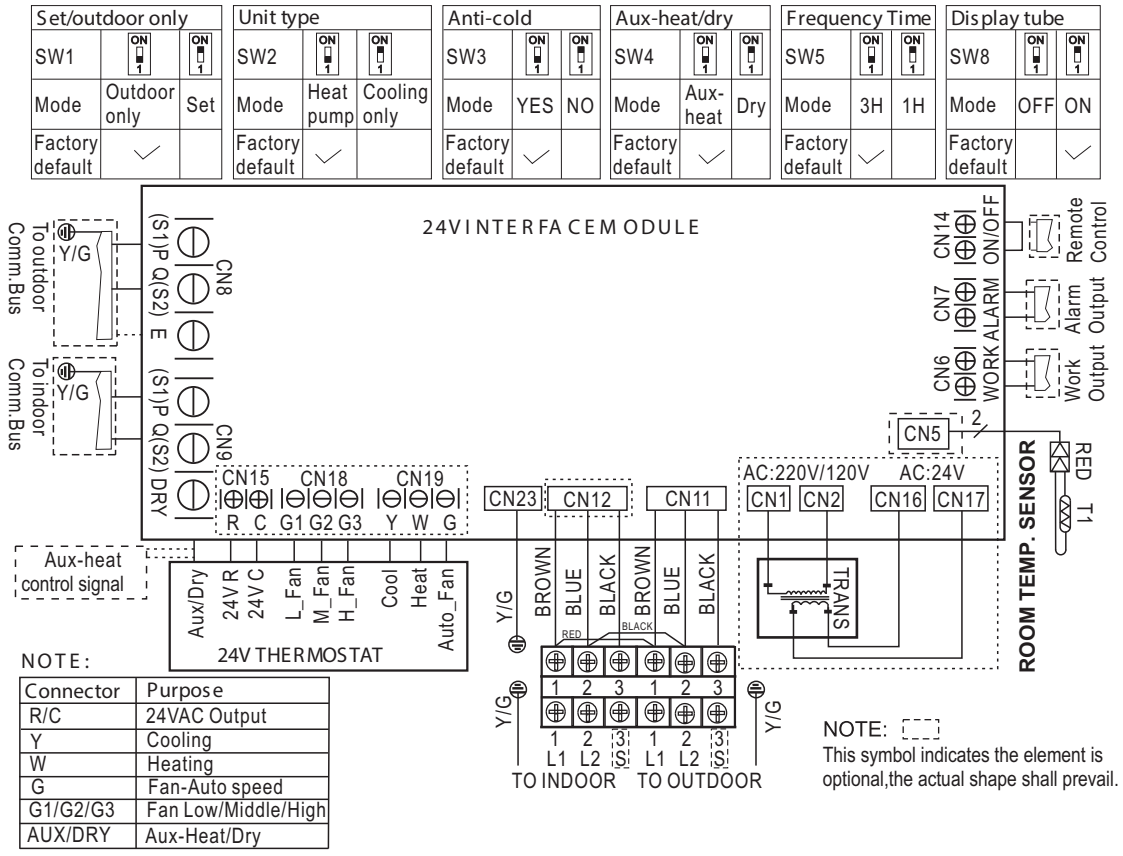
Table 14 – Compatibility with FFM & FFM Fan Coils

Indoor	Volt—Ph @ 60Hz	Kit Number	Nominal System Size MBTUH	Indoor Model Number	Outdoor Model Number	Indoor Fan Speed
FPM Horizontal Fan Coil	208/230 — 1	KSAIC0201230	12	FPMBNU018T00	38MAQB12R——3	Low (Blue)
			18	FPMBNU018T00	38MAQB18R——3	Medium (Red)
			24	FPMBNU024T00	38MAQB24R——3	Medium (Red)
			30	FPMBNU030T00	38MAQB30R——3	Low (Blue)
			36	N/A	N/A	N/A

Select Proper Blower Speed

Before operating unit, ensure that the proper blower speed has been selected. Fan speeds are selected manually. Refer to the installation manual of the indoor unit for instructions on how to change the fan speed and select the taps (see Table 14) for the proper matches.

24V INTERFACE CONNECTION DIAGRAM



NOTE:

Connector	Purpose
R/C	24VAC Output
Y	Cooling
W	Heating
G	Fan-Auto speed
G1/G2/G3	Fan Low/Middle/High
AUX/DRY	Aux-Heat/Dry

Fig. 8 − 24V Interface Wiring Diagram

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