



**Quality Assurance**  
Certificate Reg. No:  
04 100 950420



Subject to change without notice

Manufacturer's Name: Saudi Airconditioning Manufacturing Co. Ltd.

Country of origin : Jeddah, Saudi Arabia

Nearest port of embarkation: Jeddah Islamic port

Product classification: Commercial and Residential

## Product Data Catalog

### **FB4P – 60Hz** **Nominal Cooling Capacity 4.0 to 5.0 Tons** **HFC R-410A Refrigerant**

FB4P direct expansion multi-poise fan coil units is available in 4.0 to 5.0 ton nominal cooling capacity range.

The unit is designed to occupy a minimum space. No complex system controls are required for Carrier fan coil units. Piping, drain, and wiring connections are readily accessible and mounting holes and slots are predrilled to save installation time and field labor expense. They are compact and ready to fit where needed in the basement, crawlspace, attic, utility room, or closet.

Contact your local Carrier representative for additional reference materials. [www.carrier.com](http://www.carrier.com)

# Table of Contents

Features / Benefits.....	2
Model Number Nomenclature.....	3
Physical Data / Electrical Data / Combination Matrix .....	4
Unit Dimensional Drawing .....	5
Fan Performance / Sound Power .....	6
Typical Wiring Schematic .....	7
Controller For Ducted Fan Coil Units.....	8
Carrier Accessories.....	10
Guide Specification .....	11

## Features / Benefits

- 4.0 to 5.0 ton cooling capacity
- High static up to 0.6 water (150Pa) for all sizes
- A-coil design
- Efficient lanced sine-wave aluminum fins
- High-impact thermal plastic condensate pan
- Primary and secondary drain connection with brass inserts
- Multipoise design for maximum versatility
- Field installation heater packages
- Solid state interlock control board with built-in fuse
- Sweat type connection
- Multiple electric entries
- Inspection plate to facilitate cleaning the coil
- 3-speed motors, with in field selection
- Polyester powder painted steel cabinet to with-stand harsh Middle Eastern climatic conditions
- 40VA, 208/230V transformer
- Permanent filter with aluminum frame 1 inch, flame retardant polyester fibers

FB4P direct expansion fan coil is designed for medium and high static pressure, up to 0.6 inches water (150Pa).

FB4A series is available with an cabinet insulation with density 32 kg/m<sup>3</sup> and polyester powder painted zinc coated galvanized steel casing.

Coils are made of efficient lanced sine-wave aluminum fins mechanically bonded to copper tubes for superior heat transfer. 1-inch thick rubber cabinet insulation with density 32 kg/m<sup>3</sup> minimize energy losses and increase unit efficiency.

FB4P series can be installed vertical or horizontal, and comes with super quite multi 3 speed motor for field selection & electric heaters are available option at field installation.

# MODEL NUMBER NOMENCLATURE - FB4P - R410A SERIES

1	2	3	4	5	6	7	8	9	10	11	12	13	14
F	B	4	P	S	N	F	A	4	8	0	0	0	E

**Model Type**  
F Series Fan Coils

**Model Series**  
B = Standard

**Positioning**  
4 = Multipoise

**Series Version**  
P = Puron ® Series

**Source**  
S = SAMCO

**Power Supply (V/Ph/Hz)**  
N = 230/1/60

**Cabinet**  
F = Single Piece Cabinet

**Design Series**  
A  
B

**Unit Size**  
48 = 48,000 Btuh  
60 = 60,000 Btuh

**Factory Assigned**  
000 = Default

**Controls**  
E = Electronic

# Physical Data - FB4P Series

Unit Model	A48	B48	A60	B60
Unit Size (Tons)	4.0		5.0	
Motor HP	3/4			
Number of Motor Speeds	3			
<b>Evaporator Coil</b>				
Configuration Coil Type	A			
Coil Material (HP Tube)	Grooved Copper Tubes			
Coil Material (Finplate)	Aluminium Fins With Double Wavy Fins			
Number of Rows / Fins Per Inch	3 / 14.5		3 / 14	
Coil Connection Type	Sweat type			
Suction Coil Connection Size (Inch)	3/4"			
Liquid Connection Size (Inch)	3/8"			
Drain Diameter (Inch)	3/4"			
<b>Refrigerant</b>				
Metering Device	Bypass AccuRater			
Piston Size	0.0073"		0.088"	0.086"
Blower Model	Blower Double Inlet, Forward Curved Blades			
Blower Type	Galvanized Steel			
Blower Diameter / Width, mm	282.4 / 241.3		311.15/ 241.3	
Filter Type	Washable Aluminum Filter			
Filter Qty.	1			
Filter Size (mm)	547.0 x 505.5 x 21			
<b>Electrical Data</b>				
Power Supply (V-Ph-Hz)	230 - 1 - 60			
Voltage (Min-Max)	207 - 253			
Fan FLA	5.4			
MCA	6.8			
MOCP	15			
<b>Unit Dimensions</b>				
Width, mm	560.4			
Depth, mm	536.5			
Height, mm	1260.5		1503.0	1394.3
Net Weight, kg	71.2		91.1	79.4

## Combination Matchup Matrix

Indoor Model	Outdoor Model
FB4PSNFA48000E	38PKS48DS31-11
FB4PSNFB48000E	38PKS48DS21-11
FB4PSNFA60000E	38PKS60DS31-21
FB4PSNFB60000E	38PKS60DS21-11

### Legend and Notes

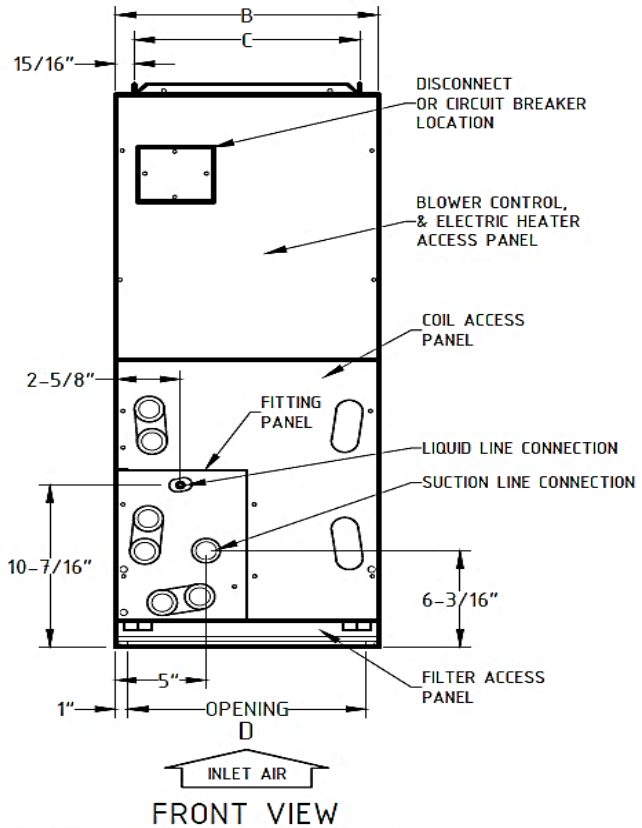
FLA - Full Load Amps

MCA - Minimum Circuit Amps

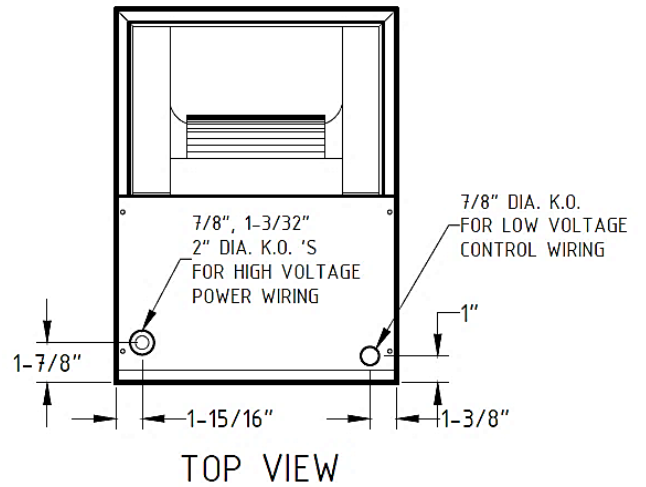
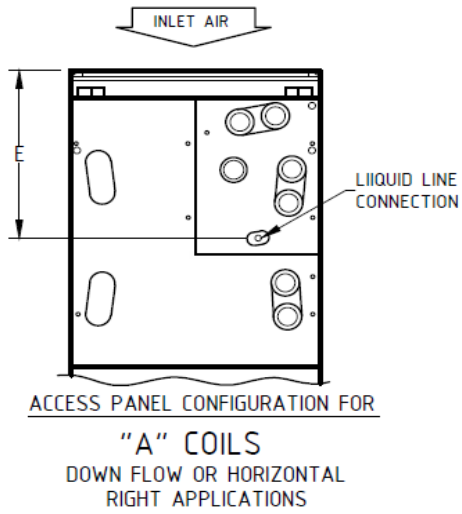
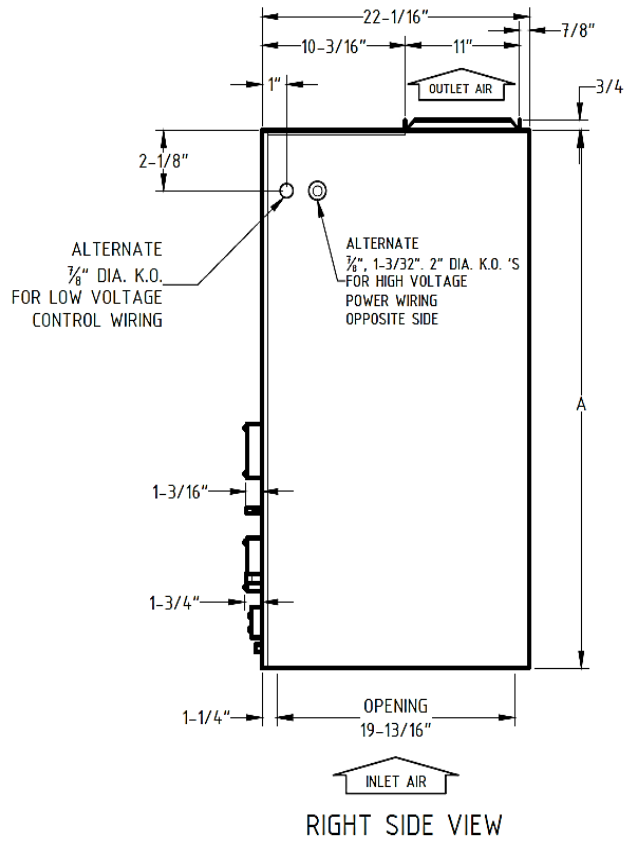
MOCP - Maximum Overcurrent Protection

For detailed performance and matchup ratings please refer to corresponding outdoor product catalog.

# Unit Dimensional Drawing



SHOWN WITH "A" COIL DETAILS CONNECTION LOCATIONS FOR UPFLOW OR HORIZONTAL APPLICATIONS



Unit Size	Coil Type	A		B		C		D		E	
		in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.
A48	A	49-5/8	1260.5	21-1/8	536.5	19-1/4	489.0	19-1/8	485.8	15-11/16	398.3
B48	A	49-5/8	1260.5	21-1/8	536.5	19-1/4	489.0	19-1/8	485.8	15-11/16	398.3
A60	A	59-3/16	1503.4	24-11/16	627.0	22-3/4	577.9	22-11/16	576.2	25-1/4	641.5
B60	A	53-7/16	1375.3	21-1/8	536.5	19-1/4	489.0	19-1/8	485.8	19-1/2	495.3

# Fan Performance

## Fan Performance English - FB4P Air Flow (CFM)

E.S.P. in.wg.	0.2			0.3			0.4			0.5		
	Unit	H	M	L	H	M	L	H	M	L	H	M
FB4PSNFA48000E	1614	1432	1340	1569	1381	1245	1526	1344	1198	1484	1305	1178
FB4PSNFB48000E	1538	1374	1285	1486	1317	1237	1437	1272	1187	1385	1229	1140
FB4PSNFA60000E	2250	2125	1783	2198	2092	1743	2150	2045	1697	2096	1989	1658
FB4PSNFB60000E	1785	1660	1395	1700	1585	1360	1615	1510	1315	1520	1435	1255

## Fan Performance SI - FB4P Air Flow (m<sup>3</sup>/hr)

E.S.P. in.wg.	50			75			100			125		
	Unit	H	M	L	H	M	L	H	M	L	H	M
FB4PSNFA48000E	2742	2433	2277	2666	2346	2115	2593	2283	2035	2521	2217	2001
FB4PSNFB48000E	2613	2334	2183	2525	2238	2102	2441	2161	2017	2353	2088	1937
FB4PSNFA60000E	3823	3610	3029	3734	3554	2961	3653	3474	2883	3561	3379	2817
FB4PSNFB60000E	3033	2820	2370	2888	2693	2311	2744	2566	2234	2582	2438	2132

## Estimated Sound Power Level 60Hz (dBA)

Unit	Conditions		Octave Band Center Frequency*						
	CFM	E.S.P	63	125	250	500	1000	2000	4000
FB4PSNFA48000E	1428	0.2	69	65	61	58	56	54	50
FB4PSNFB48000E	1520	0.2	69	65	61	58	56	54	50
FB4PSNFA60000E	2250	0.2	73	69	65	62	60	58	54
FB4PSNFB60000E	1785	0.2	70	66	62	59	57	55	51

## Factory Installed Filter Static Pressure Drop (in.wg.)

Unit	CFM								
	400	600	800	1000	1200	1400	1600	1800	2000
FB4PSNFA48000E	—	—	—	—	—	0.092	0.12	0.152	—
FB4PSNFB48000E	—	—	—	—	—	0.092	0.12	0.152	—
FB4PSNFA60000E	—	—	—	—	—	—	0.086	0.105	0.130
FB4PSNFB60000E	—	—	—	—	—	0.092	0.120	0.152	0.187

## Electric Heater Static Pressure Drop (in.wg.)

Unit Size: 48 - 60		
Heater Elements	kW	E.S.P Correction
0	0	+ .04
2	8, 10	+ .02
3	9, 15	0
4	20	- .02
6	18, 24, 30	- .10

Notes: Sound pressure assumes "standard room", 3 meters from exit, no ducts, ducts will further reduce sound.

### Legend:

CFM - Cubic Feet per Minute

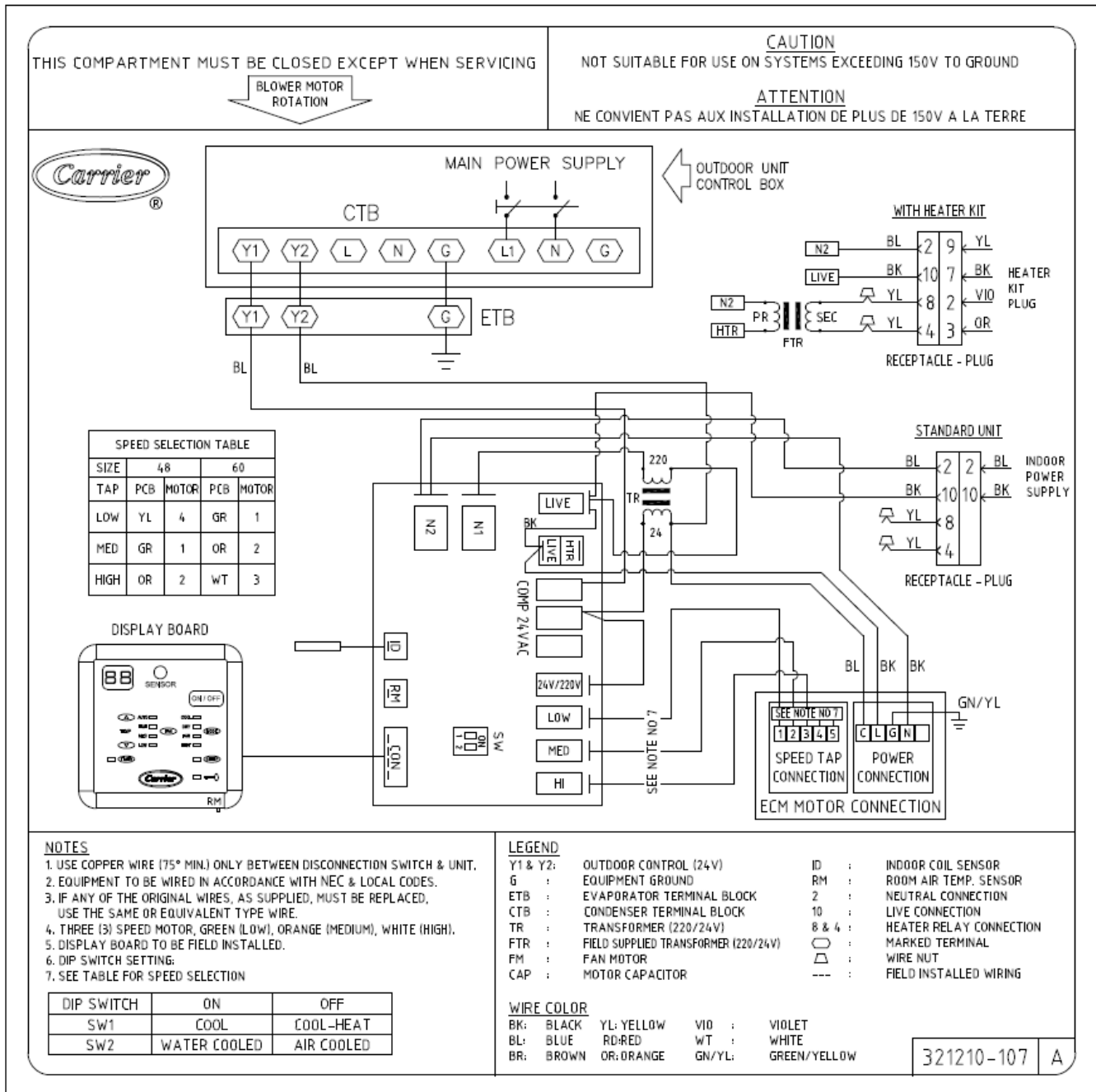
in.wg - Inch Water Gage

Pa - Pascal

dBA - Decibel

E.S.P - External Static Pressure

# Typical Wiring Schematic



**Wiring Diagram: FCU FB ECM Motor Cool and Electric Heater**

# Controller For Ducted Fan Coil Units

**Features:** The controller is used to control (DX/CW) cooled ducted split unit, supports the following functions:

- Modes: Cool, Dry, Fan, Heat | Indoor fan speed: Auto, High, Medium, Low
- Sleep mode, Programmable On/Off timer
- Compressor protections: Compressor 3 minutes restart protection, indoor coil anti-freeze, room sensor and indoor coil sensor failure monitoring
- Random restart to minimize voltage dip during compressor first cut in cycle upon power up.

**Hardware Setting:** A 2 way DIP switch is used to configure:

DIP Switch	On	Off
SW1	Cool	Cool-Heat
SW2	Water System	DX System

**Error Code:** The corresponding error code will be shown one after another, in-case if multiple faults.

<b>Error code</b>	E1	E2	E4
<b>Fault</b>	Room sensor	Indoor coil sensor	Compressor

## Split System Description

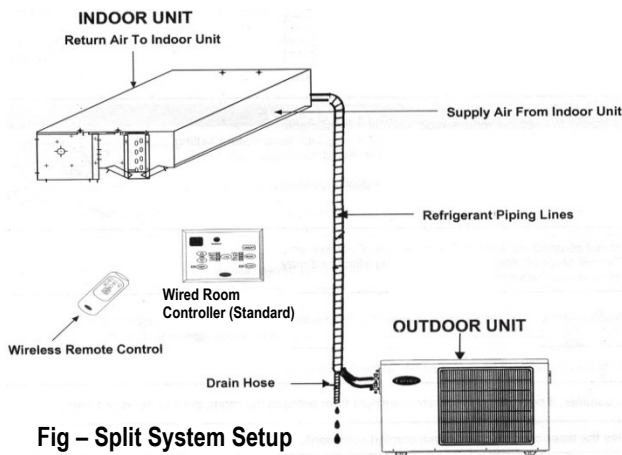


Fig – Split System Setup

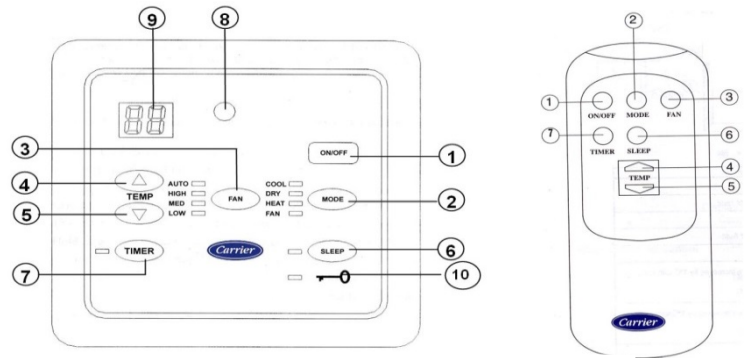


Fig - System Room Controllers

**Notes:** The wired room controller is mounted on the wall and can control all system functions without wireless remote control.

**1) On/Off Key:** If you press this key, the system will begin operation, Press the key again, and operation stops. (You can hear a receiving beep). If you press this key immediately after turning off the system, the compressor will not operate for 3 minutes to prevent overloading.


**2) Operation Mode Selection Key:** Toggles the operation mode: Cool, Dry, Heat, or Fan only

“COOL” Led	Lights on when selecting COOL mode.	“HEAT” Led	Lights on when selecting Heat mode.
“DRY” Led	Lights on when selecting DRY mode.	“FAN” Led	Lights on when selecting FAN mode.

**3) Fan Speed Selection Key:** Toggles the fan speed: Auto, High, Medium, or Low, Note: Fan key is invalid in Dry mode.

“AUTO” Led	Lights on when selecting Auto fan speed.	“MED” Led	Lights on when selecting Med fan speed.
“HIGH” Led	Lights on when selecting High fan speed.	“LOW” Led	Lights on when selecting Low fan speed.

**4) Temperature Up Key:** By pressing Temp Up  the setting temperature increases by 1°C with each press.

**5) Temperature Down Key:** By pressing Temp Down  the setting temperature decreases by 1°C with each press. If you set the desired room temperature, then system will maintain the room temperature as set. Upon setting the desired room temperature the system will maintain the room temperature.

**Cool Mode:** If the room temperature is higher than the setting, the compressor will automatically turn on provide a cooling effect. On the hand, if the room temperature is lower than the setting, the compressor will automatically turn off to stop cooling operation. If indoor fan is programed to be turned off with compressor signal, it will turn off once compressor is cut off.

**Heat Mode:** If the room temperature is lower than the setting, the electric heater will automatically turn on to provide a heating effect. If the room temperature is higher than the setting, the heater will automatically turn off to top heating operation. If indoor fan is programed to be turned off with heater signal, it will turn off once heater is cut off but subject to 30 sec dispersing remaining heat timing.



**Dry Mode:** The fan speed runs automatically at low speed and compressor stopping and running is controlled by the difference between room and setting temperatures and by continuous running time. If indoor fan is programmed to be turned off with comp signal, it will turn off once comp is cut off, In Dry mode, the humidity is reduced in the space to be air-conditioned.

**Fan Mode:** There will be no cooling or heating effects; only the fans of indoor unit will run for ventilation at the selected speed (High, Med, and Low).


- In COOL or HEAT mode and if AUTO fan speed is selected; Fan speed is automatically selected by controller according to the difference between setting temperature and room temperature, fan will be continuously running at low speed after setting temperature is achieved.

**Notes:**

a) Temperature setting range is 16°C to 30°C (60°F to 85°F). **For optimum operation set the temperature between 21°C to 24°C (70 to 75°F)**

b) Hold TEMP Down  and fan  keys at the same time for about 5 seconds, to toggle the temperature setting from degree C to degree F and vice versa, temperature keys are invalid in Fan mode.

c) Press any temperature key will flash the current setting temperature for 4 seconds, with no further key press; it will revert to room temperature display. Temperature display range is 0°C to 50°C (32°F to 99°F).

**6) Sleep Key:** Press SLEEP  key to set the timer turning the sleep led will light on, to cancel the timer press again, sleep function stop automatically the operation of the air conditioner after certain set off time.  
 - Sleep mode is valid in cool or heat mode and invalid in Fan mode.

**7) Timer Key:** Upon count down of the set hours, the system will switch from OFF to ON or vice-versa.

- OFF Timer Function to stop automatically, the air conditioner after certain set OFF time.
- ON Timer Function to start automatically, the air conditioner after certain set ON time.





\* Timer setting is 1 Hour to 24 Hour. The timer led will light on when operating the Timer Function First key press will flash the digital display and Timer Led for 3 seconds.

**Notes:**









- a) The digital displays show the number of hours previously set, only the Timer Led flashes.
- b) Subsequent 3 seconds will show the number of hours previously set; only the timer led flashes.
- c) Should there be no further key press, it will revert to normal mode.
- d) Should Timer key is not released timer setting will increase automatically every 0.5-second.

**8) Sensor:** Receives the remote controller's signal

**9) Display Screen:** Displays the set temperature and displays also the TIMER settings when adjusting it.

**10) Key Lock Mode:** Hold down TEMP Down  and MODE  keys together for 3 seconds to activate key lock mode – in that mode the light will come on for the KEY display  , similarly to unlock.

In key lock mode, all keys are not valid except the below functions:

- a) ON/OFF Key to turn ON/OFF the system.
- b) Hold down TEMP Down  and SLEEP  button for 1 second to enter into coil temp display mode. Press Temp Up  key to display indoor coil temp, High Fan LED flashes; with the same sequence to exit coil temp display mode. Temperature display range is -9C to 78C.
- c) Hold down TEMP Down  and Fan  buttons together for 1 second to activate the system control parameter setting – AUTO (FAN) Led will flash continuously, Press MODE  button to select the desire menu as following table. Press TEMP key Up  or Down  to change the setting to 1 or 2 for following functions:

Led Flash	Functions	Default Value	Set Range	Description
Auto Fan	Temperature Display	1	1 or 2	1: Disable room temp. display 2: Enable room temp. display
Auto & High Fan	Cool Mode Fan Control	1	1 or 2	1: Compressor OFF, Fan ON 2: Compressor OFF, Fan OFF
Auto & Med Fan	Heat Mode Fan Control	1	1 or 2	1: Heater OFF, Fan ON 2: Heater OFF, Fan OFF

# Carrier Accessories

## Electric Heaters

Heater Part No.	kW @ 240V	Volts/Ph	Stages (kW Operating)	Internal Circuit Protection	Fan Coil Size Used With	Heating Cap** @ 230V
KFCEH0501N05	5	230/1	5	None	048 - 060	15,700
KFCEH0801N08	8	230/1	8	None	048 - 060	25,100
KFCEH0901N10	10	230/1	10	None	048 - 060	31,400
KFCEH3201F20	20	230/1	5, 20	Fuse‡	048 - 060	62,800
KFCEH1601315	15	230/3	5,15	None	048 - 060	47,100
KFCEH2001318	18	230/3	6, 12, 18	None	048 - 060	56,500
KFCEH3401F24	24	230/3*	8, 16, 24	Fuse	048 - 060	78,300
KFCEH3501F30	30	230/3*	10, 20, 30	Fuse	048 - 060	94,100
KFCEH2401C05	5	230/1	5	Circuit Breaker	048 - 060	15,700
KFCEH2501C08	8	230/1	8	Circuit Breaker	048 - 060	25,100
KFCEH2601C10	10	230/1	10	Circuit Breaker	048 - 060	31,400
KFCEH3301C20	20	230/1	5, 20	Circuit Breaker	048 - 060	62,800
KFCEH2901N09	9	230/1†	3, 9	None	048 - 060	28,200
KFCEH3001F15	15	230/1	5, 15	Fuse‡	048 - 060	47,100
KFCEH3101C15	15	230/1	5, 15	Circuit Breaker	048 - 060	47,100

\* Field convertible to 1 phase.

† Field convertible to 3 phase.

‡ Single point wiring kit required for these heaters.

\*\* Blower motor heat not included.

## Smart Heat

Heater Part No.	kW @ 240V	Volts/Ph	Stages (kW Operating)	Internal Circuit Protection	Fan Coil Size Used With	Heating Cap* @ 230V
KFCEH0201H15	15	230/1	3, 8, 11, 15	Fuse	48	47,100
KFCEH0301H20	20	230/1	5, 10, 15, 20	Fuse	60	62,800

\* Blower motor heat not included.

When using units with 20-, 24-, and 30-kw electric heaters, maintain a 1-in. clearance from combustible materials to discharge plenum and ductwork and maintain a distance of 36 in. from the unit. Use an accessory downflow base to maintain proper clearance on downflow installations.

Use flexible connectors between ductwork and unit to prevent transmission of vibration. When electric heater is installed, use heat resistant material for flexible connector between ductwork and unit at discharge connection. Ductwork passing through unconditioned space must be insulated and covered with vapor barrier.

## Accessories

Item	Accessory Part No*	Fan Coil Size Used With
Disconnect Kit	KFADK0101DSC	48-60
Downflow Base Kit	KFACB0301CFB	
Downflow Conversion Kit	KFADC0401ACL	
Single-Point Wiring Kit	KFASP0101SPK	
Filter Kit (12 Pack)	KFAFK0312LRG	
Power Plug Kit (25 Pack)	KFAPP0125PLG	
PVC Condensate Trap Kit (50 Pack)	KFAET0150ETK	
Air Cleaner 240-volt Conversion Kit	KEAVC0201240	
Downflow/Horizontal Conversion Gasket Kit	KFAHD0101SLP	

\* Factory-authorized and listed, field installed.

# Guide Specifications

## Cooling Only/Electric Heat Fan Coil Unit

### HVAC Guide Specifications

#### Size Range: 4.0 to 5.0 Nominal Tons

#### General

#### System Description

The fan coil unit is designed for outdoor (or under ceiling) installation, electrically controlled cooling and heating (option). Unit shall be designed for vertical and horizontal installation. Standard unit shall include permanent filter with aluminum frame. Unit shall be designed for medium and high external static pressure up to 0.7 inch water.

#### Quality Assurance

- A. Unit shall be rated in accordance with applicable SASO standard.
- B. Unit shall be designed in accordance with ISO 9001:2015, and shall be manufactured in a facility registered by ISO 9001:2015.
- C. Unit casing shall be capable of withstanding 500 hour salt spray exposure per ASTM B117.
- D. Installation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.

#### Products

- A. The unit shall be factory assembled single piece cooling unit, with optional electric heat (field installation). Unit cabinet shall be constructed of galvanized steel bonderized and powder painted enamel finish. The unit shall be insulated with rubber insulation that is 10 mm thickness & 32 kg/m<sup>3</sup> density.
- B. Unit cabinet panels shall be single skin. Cabinet panels shall be easily removable for service.
- C. Unit shall have a permanent type filter with 1 inch aluminum frame. Filter shall be flame retardant polyester fibers. Filters shall be accessible through an access panel.
- D. Units shall have high impact thermal plastic sloped condensate pan. Unit shall have primary and secondary drain connection with brass inserts. Unit shall have additional external drain pan for the coil connection condensate water.
- E. The unit fan wheel shall be directly connected to the motor. The fan wheel shall be made from steel with a corrosion resistance finish, it shall be a dynamically balanced and double inlet forward curved blades. Unit fan wheel chamber shall be made from galvanized steel.
- F. Unit coil shall have aluminum fins mechanically bonded to seamless smooth copper tubes with all joints brazed. Unit coil shall be accessible through an access panel for cleaning. The coil connection shall be sweat type.
- G. The unit fan motor shall have permanently lubricated sleeve bearing. The motor shall have overload protection and B class insulation. Unit shall have multiple electric entries for more flexibility.
- H. Unit control board shall be 24 VAC and UL listed.

