Technical Manual

ACSON International
Air Conditioners

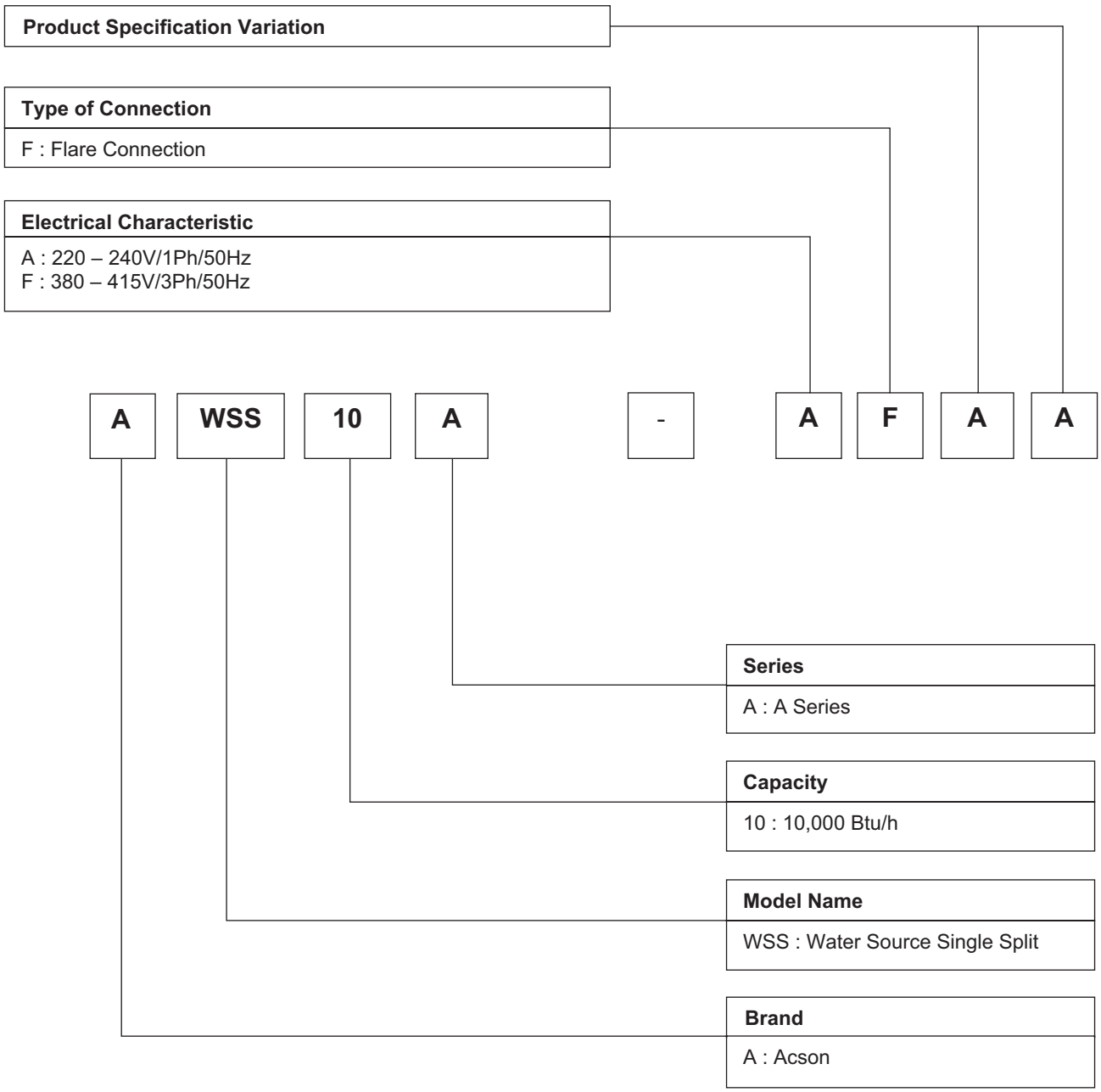
WATER COOLED SINGLE SPLIT

AWSS30A AWSS40A
AWSS50A AWSS60A

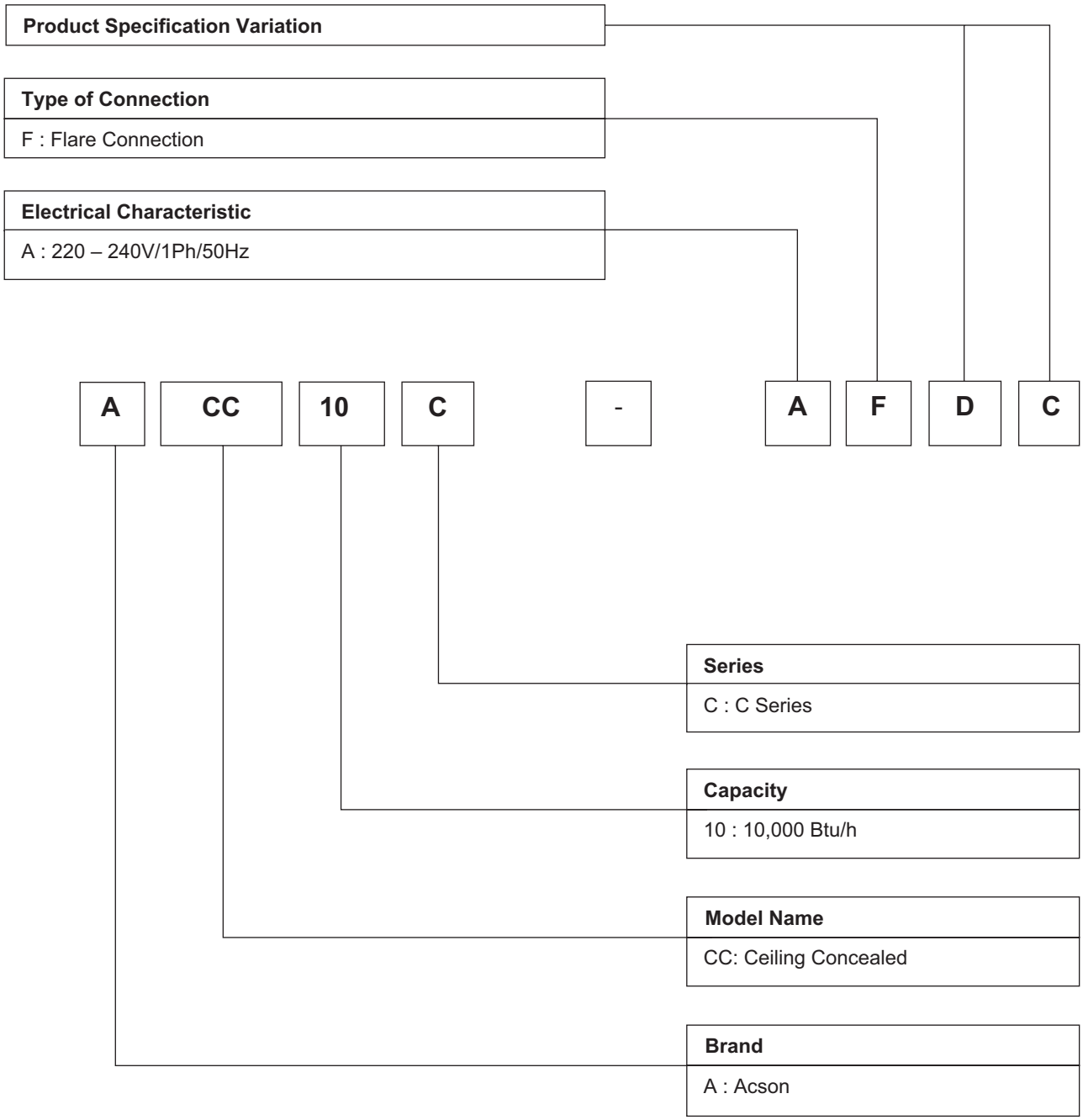
TABLE OF CONTENTS

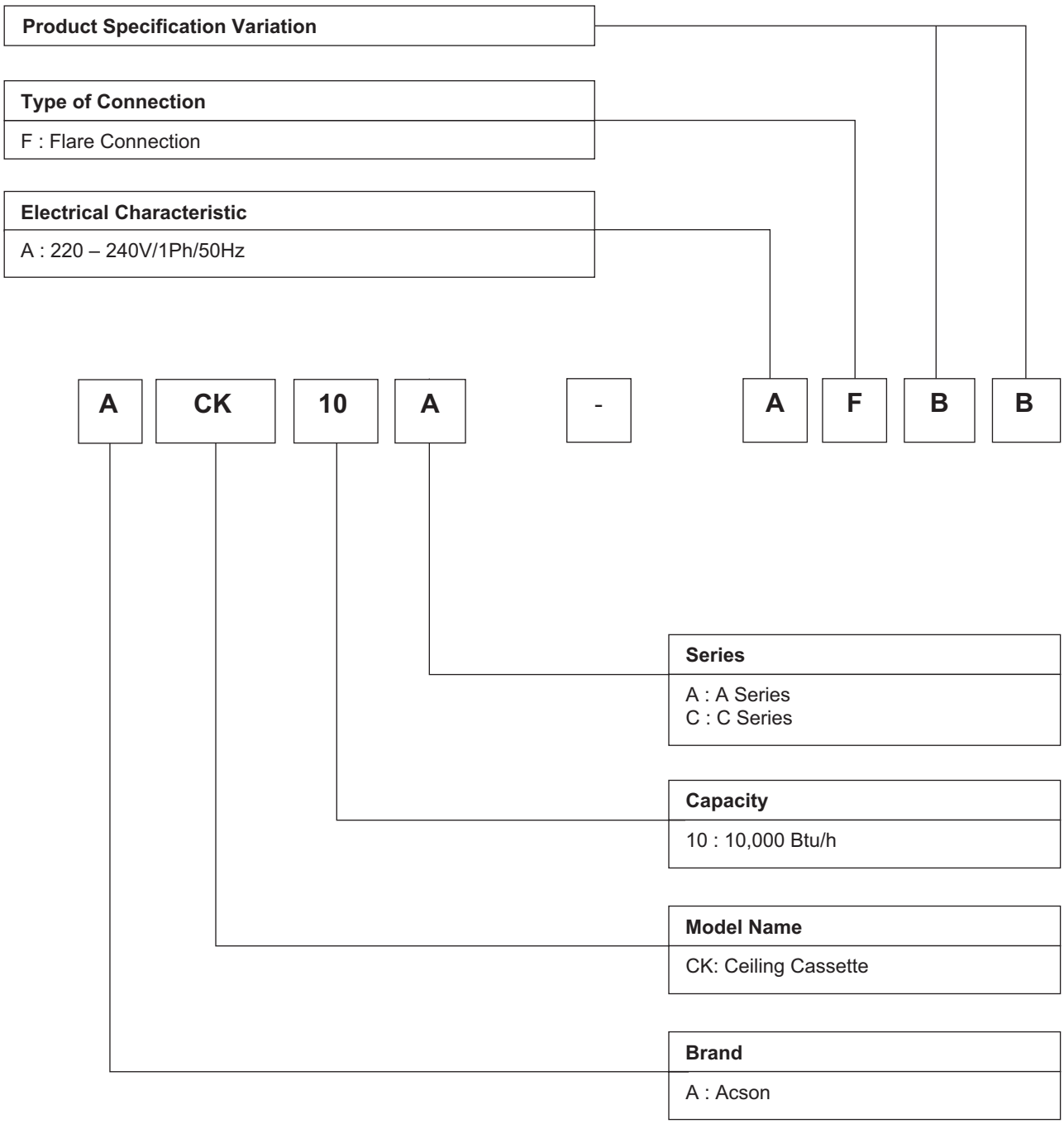
1. NOMENCLATURE

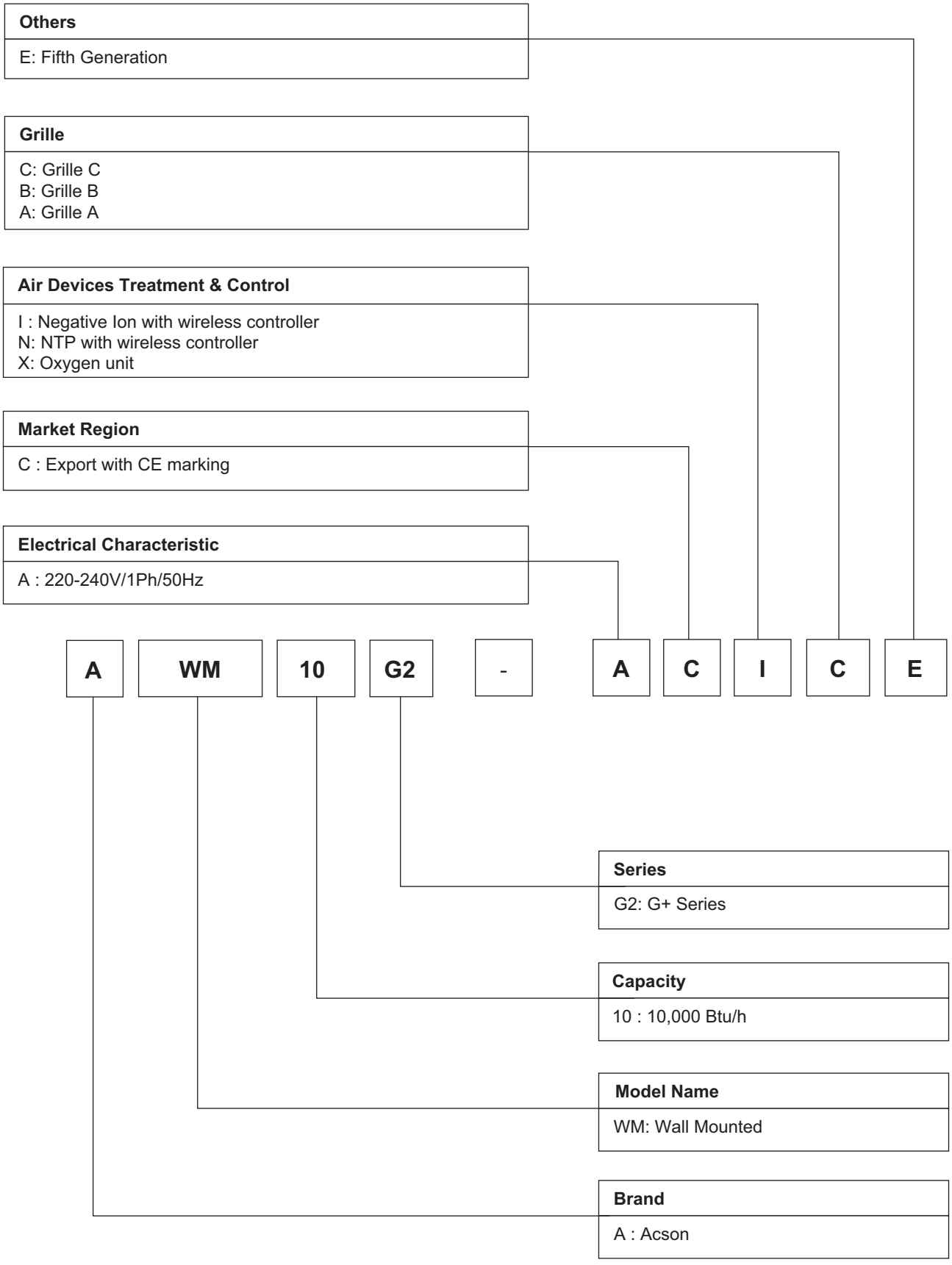
Outdoor

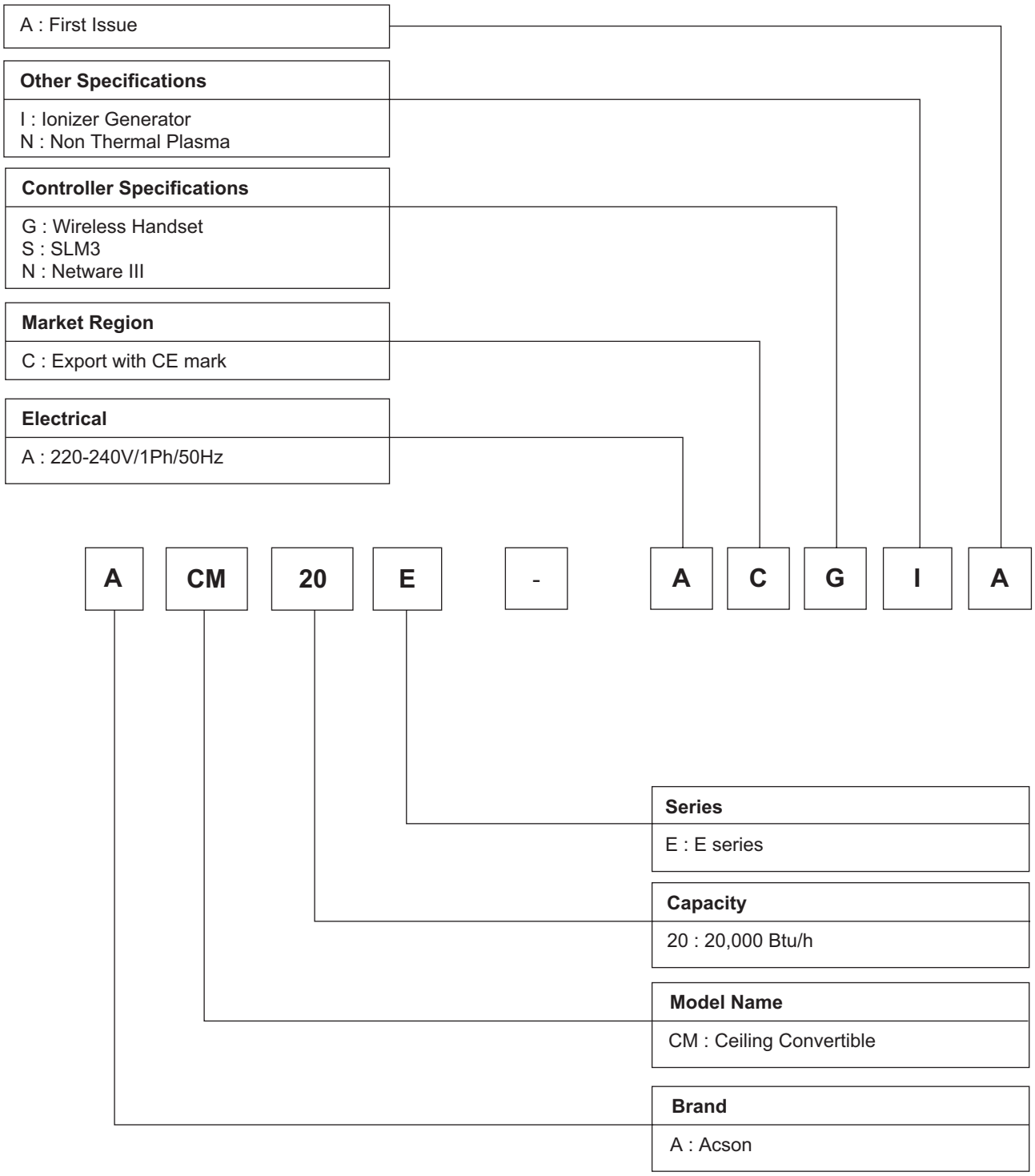


Indoor


Product Specification Variation
Type of Connection
F : Flare Connection
Electrical Characteristic
A : 220 – 240V/1Ph/50Hz
A
CC
10
C
-
A
F
D
C
Series
C : C Series
Capacity
10 : 10,000 Btu/h
Model Name
CC: Ceiling Concealed
Brand
A : Acson


Product Specification Variation
Type of Connection
F : Flare Connection
Electrical Characteristic
A : 220 – 240V/1Ph/50Hz
A
CK
10
A
-
A
F
B
B
Series
A : A Series
C : C Series
Capacity
10 : 10,000 Btu/h
Model Name
CK: Ceiling Cassette
Brand
A : Acson


Others
E: Fifth Generation
Grille
C: Grille C
B: Grille B
A: Grille A
Air Devices Treatment & Control
I : Negative Ion with wireless controller
N: NTP with wireless controller
X: Oxygen unit
Market Region
C : Export with CE marking
Electrical Characteristic
A : 220-240V/1Ph/50Hz
A
WM
10
G2
-
A
C
I
C
E
Series
G2: G+ Series
Capacity
10 : 10,000 Btu/h
Model Name
WM: Wall Mounted
Brand
A : Acson


A : First Issue
Other Specifications
I : Ionizer Generator
N : Non Thermal Plasma
Controller Specifications
G : Wireless Handset
S : SLM3
N : Netware III
Market Region
C : Export with CE mark
Electrical
A : 220-240V/1Ph/50Hz
A
CM
20
E
-
A
C
G
I
A
Series
E : E series
Capacity
20 : 20,000 Btu/h
Model Name
CM : Ceiling Convertible
Brand
A : Acson

Product Line-Up

Outdoor unit
AWSS (R22)

AWSS		NOMENCALTURE	CLASSIFICATION												REMARK
			Control			Marking		Refrigerant Control		Compressor		Base Pan			
			W/out Contactor & Relay	With Contactor & Relay	Phase Sequencer	Without Marking	CE Mark	Cap. Tube	TXV	Rotary	Scroll	Single	Double Isolation		Compressor Model
Cooling Only	30A	AFAA	X			X				X			X		2JS438D3BA02
	40A	FFAA	X		X	X					X		X		ZR45KCTFD522
	50A	FFAA	X		X	X					X		X		ZR54KSTFD
	60A	FFAA	X		X	X					X		X		ZR68KCTFD

Indoor Unit
ACC-C Series (R22)

ACC		NONMENCLATURE	CLASSIFICATION													
			Control	Handset		Marking			Refrigerant Control		Filter		Drain Pan		Low Static Model	Built-in Filter Rail
			L2 08A	SLM3	NETWARE 3	CE Mark	W/out Marking	ETL	Cap. Tube	W/out Cap. Tube	Air Filter	W/out Air Filter	Metal Drain Pan	EPS Drain Pan		
Cooling Model	30C	AFBC	X	X		X			X		X					X
		AFCD	X		X	X			X		X					X
		AFLB	X	X		X			X		X				X	X
	40C	AFBC	X	X		X			X		X					X
		AFCD	X		X	X			X		X					X
		AFLB	X	X		X			X		X				X	X
	50C	AFBC	X	X		X			X		X					X
		AFCD	X		X	X			X		X					X
		AFLB	X	X		X			X		X				X	X
	60C	AFBC	X	X		X			X		X					X
		AFCD	X		X	X			X		X					X
		AFLB	X	X		X			X		X				X	X

ACK-A Series Product Line Up (R22)

ACK		NOMENCALTURE	Classification							
			Control	Marking		Fin		Refrigerant Control		
			L2 08A	CE Mark	ETL	Alum. (Slit)	Hydrophilic (Slit)	Cap. Tube	W/out Cap. Tube	Auto Air Swing
Cooling Only	30A	AFBB	X	X		X		X		X
	40A	AFBB	X	X			X	X		X
	50A	AFBB	X	X			X	X		X

2. FEATURES

Acson Water Source Single Split (AWSS) system is one of the most efficient and high performance systems that can move energy in a building from where it is not needed to where it is needed. It is perfect for buildings that required heating and cooling operation at different zones. With this, different areas or zones can be heated or cooled at different temperature simultaneously. The heat is rejected and added in a water loop using a cooling tower and a boiler. The units are easy to install, operate and maintain.

Energy Saving
AWSS is the most efficient system available for heating and cooling. It will be very cost effective for seasonal operation and can provide greater indoor comfort to the occupants. With the lower power consumption, the operation and maintenance cost is very much lower than the conventional air-conditioning systems.

Easy Installation and Improve Aesthetics
The unit has a great flexibility for installation. With a compact design and a low height profile, it can easily fit the required space layout and allow maximum use of space. The units are concealed from the occupant views as the units are installed above the ceiling and are sheltered inside the building. The units are painted as well. It will improve the aesthetics value of a particular building and eliminates the probability of vandalism and injury.

Quiet Operation
AWSS is developed with double isolation panel (Upper and Lower Panel). Such design has promised the extremely low vibration on the unit itself. Moreover, the heavy gauge cabinet construction together with vibration isolated hanger brackets also minimizes noise and vibration effectively.

Easy Servicing and Maintenance
The two side removable service panels provide easy access to the compressor as well as the heat exchanger.

Fluid-to-Refrigerant Coil
The tube-in-tube coaxial heat exchanger applied in AWSS unit is designed for maximum heat transfer at normal and low water flow rate with minimum pressure drop. The inside refrigerant tube is deeply fluted to enhance heat transfer and minimize fouling. This coaxial heat exchanger is tested perfectly to 1600 psig on the water side and refrigerant side.

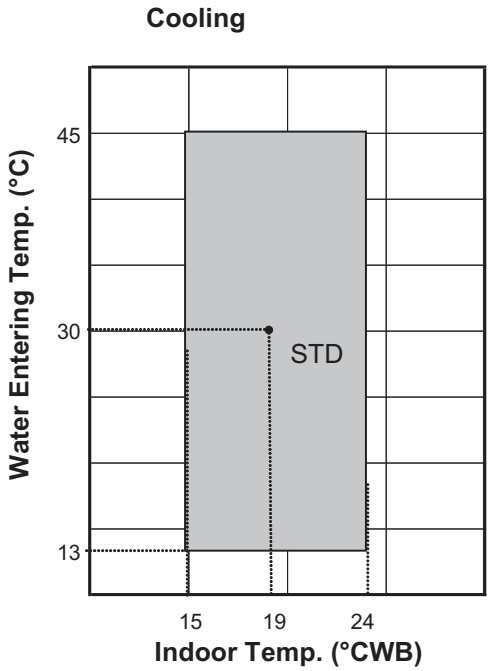
Compressor
AWSS unit is designed around the most advanced compressors in the industry.
The rotary compressor (for sizes 2.37kW to 8.94kW) and scroll compressor (for sizes 11.58kW to 15.77kW) give a quite and reliable performance over a wide operating temperature range.

Thermal Expansion Valve (TXV)
AWSS unit (for sizes 8.94kW to 15.77kW) is included with a thermal expansion valve for refrigerant metering. It can precisely control the exact amount of refrigerant flow through the system to deliver rated cooling and heating capacity.

3. APPLICATION INFORMATION

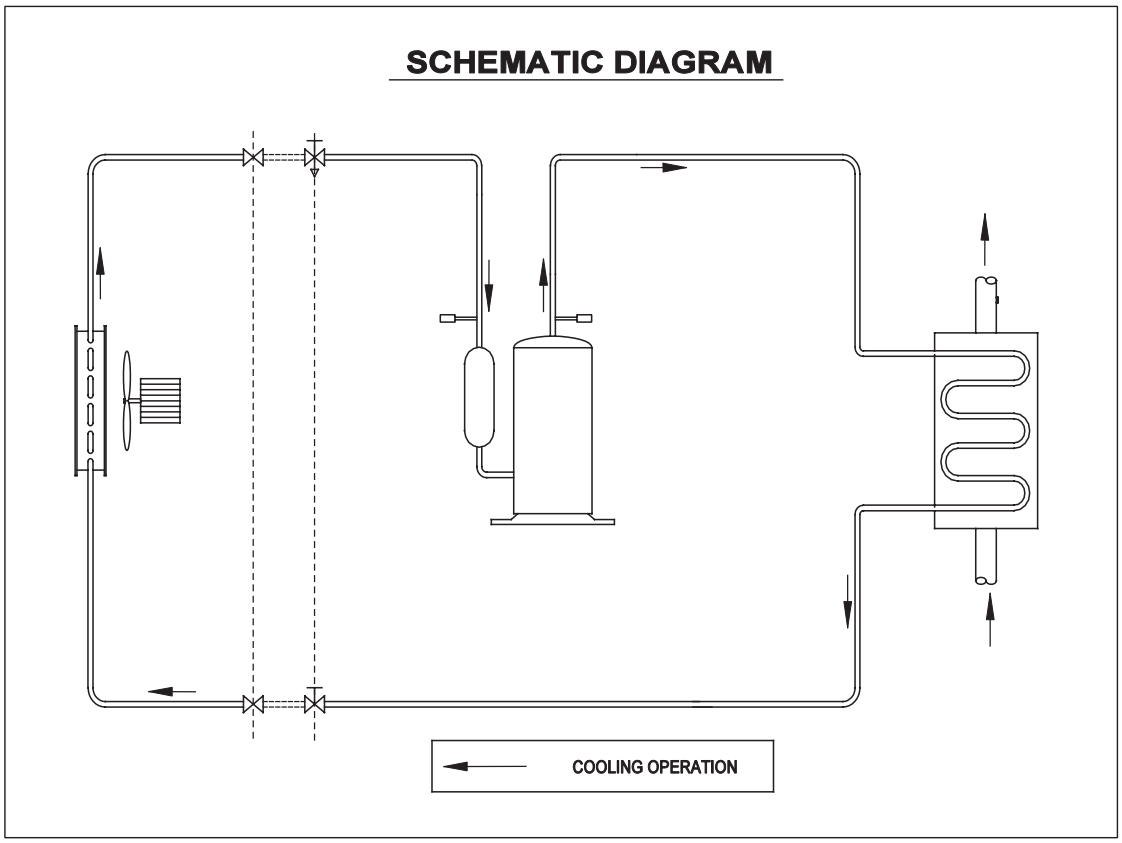
Operating Range

Ensure the operating temperature is in allowable range.



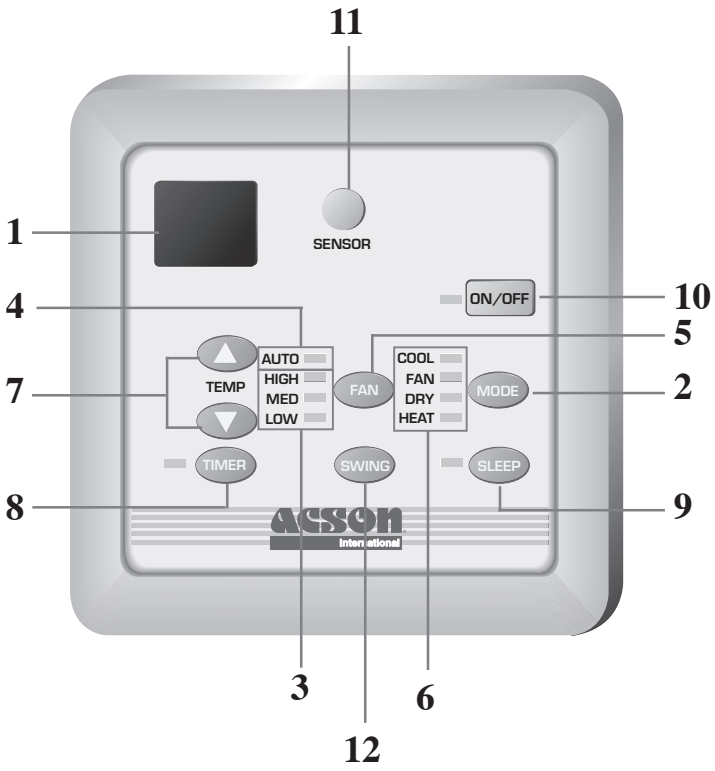
Refrigerant Circuit Diagrams

Model: AWSS 30/40/50/60A



Controller

SLM



1	**Temperature (Seven Segments)** • To indicate the ambient temperature set by the user.
2	**Mode** • To indicate the selected operating mode: HEAT & DRY / COOL / FAN (LED green / yellow / red).
3	**Ventilation Speed** • To indicate the selected ventilation speed: LOW / MED / HIGH • For U1 -SB125 only have single speed: HIGH.
4	**Auto Selection** • Automatic selection for speed, whereby the speed is automatically adjusted according to the room temperature.
5	**Fan and Ventilation Mode** • Press the fan button to set the desired selection.
6	**Operation Selection Mode** • Press the mode button to select the type of operation mode. • Cooling unit: COOL, DRY, FAN. • Heat pump unit: AUTO, COOL, DRY, FAN, HEAT.
7	**Temperature Setting** • Set the desired temperature. • Press ▲ or ▼ button to increase or decrease the set temperature. The setting is between 16°C to 30°C (60°F to 80°F).
8	**Timer Switch Setting** • Press the set button to activate the switch timer of the air conditioner unit (the setting range is between 1 to 10 hours). The unit will be at ON or OFF state in function of operating mode.
9	**"Sleep" Function** • Press the sleep button to select the sleep function. This function cannot be selected if the air conditioner unit is operating under FAN mode only or dry mode. For SLEEP function operating under COOL mode, the setting temperature increases to 0.5°C after 30 minutes, 1°C after 1 hour and 2°C after 2 hours.
10	**"ON/OFF" Switch** • Press once, the air conditioner unit starts. • Press again, the air conditioner unit stops.
11	**IR Receiver**
12	**Automatic Air Swing (Optional)** • Press the SWING button to activate the automatic air swing function. • To distribute the air to a specific direction, press the button and wait until the louver move to the desired direction and press the SWING button once again.

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Operation Guide

1. **Transmission Source**
   - The source where the signal will be transmitted.
2. **Signal Transmission Indication**
   - Blink to confirm that the last setting has been transmitted to the unit.
3. **Temperature Setting**
   - To set the desired room temperature, press the ▲ or ▼ button to increase or decrease the set temperature.
   - The temperature setting range is from 16°C to 30°C (optional setting 20°C to 30°C).
4. **Personalize Setting**
   - Press and hold for 3s, then P1 will blink. Press again to cycle between P1 and P2.
   - Set the desire setting, then leave the handset for 4s without pressing any key and it will save the setting into the programme.
   - Press once to activate the P1 setting, press again to cycle between P1 and P2.
   - Press any key to deactivate the personalize setting.

5. Automatic Air Swing (optional)

- Press the SWING button to activate the automatic air swing function.
- To distribute the air to a specific direction, press the SWING button and wait until the louver move to the desired direction and press the button once again.

6a. Silent Function

- Press for quiet operation.
- Fan speed turn to minimum speed.
- Press again to deactivate the function.

6b. Ionizer Function

- Press button to activate the negative ion function, which will refresh the indoor air effectively.

7. Sleep Mode Setting

- Press the SLEEP button will activate the sleep mode function. This function is available under COOL, HEAT and AUTO mode.
- When the unit is operating under cooling mode, the set temperature is increased by 0.5°C after 30 minutes, 1°C after an hour, and 2°C after 2 hours.
- When the unit is operating under heating mode, the set temperature is decreased by 1°C after 30 minutes, 2°C after an hour, and 3°C after 2 hours.

8. Operating Mode

- Press the MODE button to select the type of operating mode.
- For cooling only unit, the available modes are: COOL ( ), DRY) and FAN).

9. Fan Speed Selection

- Press the button continuously will toggle the fan speed in the following order:

  Low ⟶ Med ⟶ High ⟶ Auto
- Stop pressing when the desired fan speed appears on the display screen.

10. "ON/OFF" Button

- Press one to start the air conditioner unit.
- Press again to stop the unit.

11. Timer Cancel

- Press the TIMER CANCEL button to cancel the on timer setting.

12. OFF Timer Setting

- Press the OFF TIMER button will activate the off timer function.
- Set the desired off time by pressing the OFF TIMER button continuously.

13. ON Timer Setting

- Press the ON TIMER button will activate the on timer function.
- Set the desired on time by pressing the ON TIMER button continuously. If the timer is set to 7.30am, the air conditioner will turn on at 7.30am sharp.

14. Turbo Function

- Press for fast cooling.
- Fan speed turn to maximum speed.
- Press again to deactivate the function.

15. Clock Time Setting

- Press and hold to set the clock time.

OPERATING STATE AND FAULT TABLE

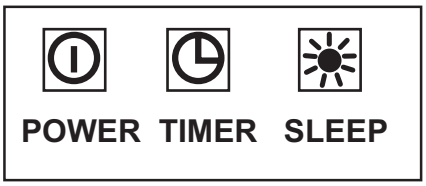
CEILING CONCEALED FAN COIL UNIT
WIRED REMOTE CONTROL

Cooling Only Model (L208 PCB)

Error Code at 7 Segment Display	Operation / Faulty Indication
Blink E1	Room sensor open or short
Blink E2	Indoor coil sensor open
Blink E3	Outdoor coil sensor open
Blink E4	Compressor overload/ Indoorr coil sensor short/ Outdoor Coil sensor short
Blink E5	Gas leak
Blink E6	Water pump fault
Blink Heat LED	Outdoor defrost (for Heatpump only)

Ceiling Cassette Fan Coil unit
Wireless Remote Control

Cooling Only Model
LED Indicator Light Display



POWER	TIMER	SLEEP	HEAT	Operation / Faulty Indication
○				Cool Mode
○	○			Timer On
○		○		Sleep Mode On
○			○	Heat Mode
○			◉	Auto Mode - Cool
○			○	Auto Mode - Heat
	◉ 1 Time			Compressor Overload
	◉ 2 Times			Pump Fault
	◉ 3 Times			Gas Leak
◉ 1 Time				Room sensor open or short
◉ 2 Times				Indoor coil sensor open or short
◉ 3 Times				Outdoor coil sensor open or short

○ ON ○ / ● ON or OFF ◉ BLINKING

WIRED REMOTE CONTROL

Cooling Model

Error Code at 7 Segment Display	Operation / Faulty Indication
Blink E1	Room sensor open or short
Blink E2	Indoor coil sensor open
Blink E3	Outdoor coil sensor open
Blink E4	Compressor overload/ Indoorr coil sensor short/ Outdoor Coil sensor short
Blink E5	Gas leak
Blink E6	Water pump fault
Blink Heat LED	Outdoor defrost (for Heatpump only)

WATER PUMP

The water pump will on if compressor is on during cooling cycle. The pump will remain on for at least 5 minutes after the compressor is off.

During mode change from cooling to non-cooling mode, the pump will on for minimum 5 minutes. During defrost cycle, the pump will on and will on for another 5 minutes once the defrost cycle is terminated.

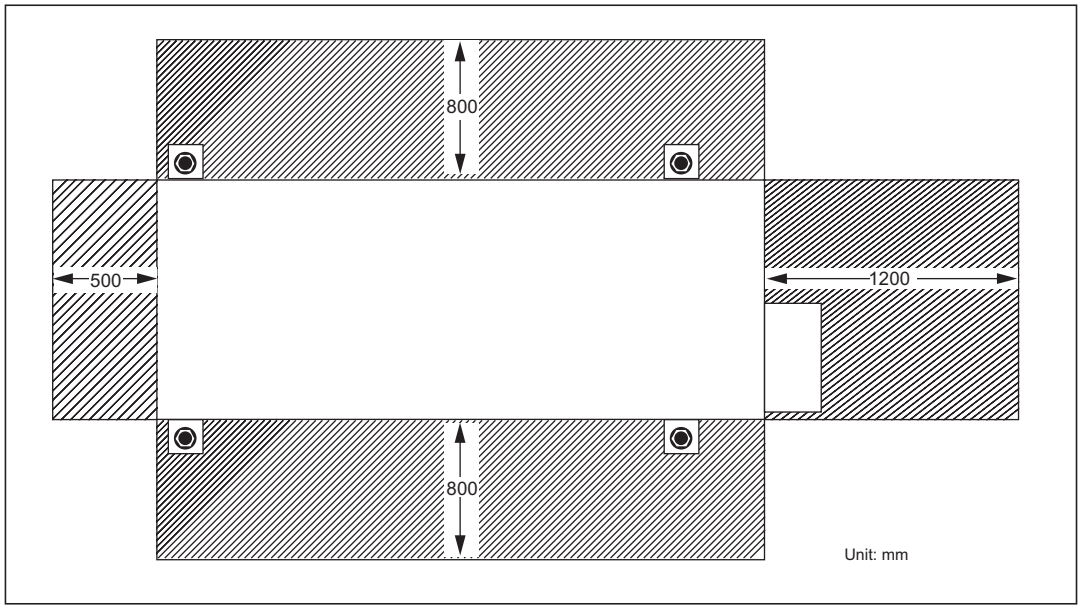
WATER LEVEL SWITCH

This normally close switch is to detect faults in water pump system. It will confirm for 30 seconds for switch open and 60 seconds for switch close.

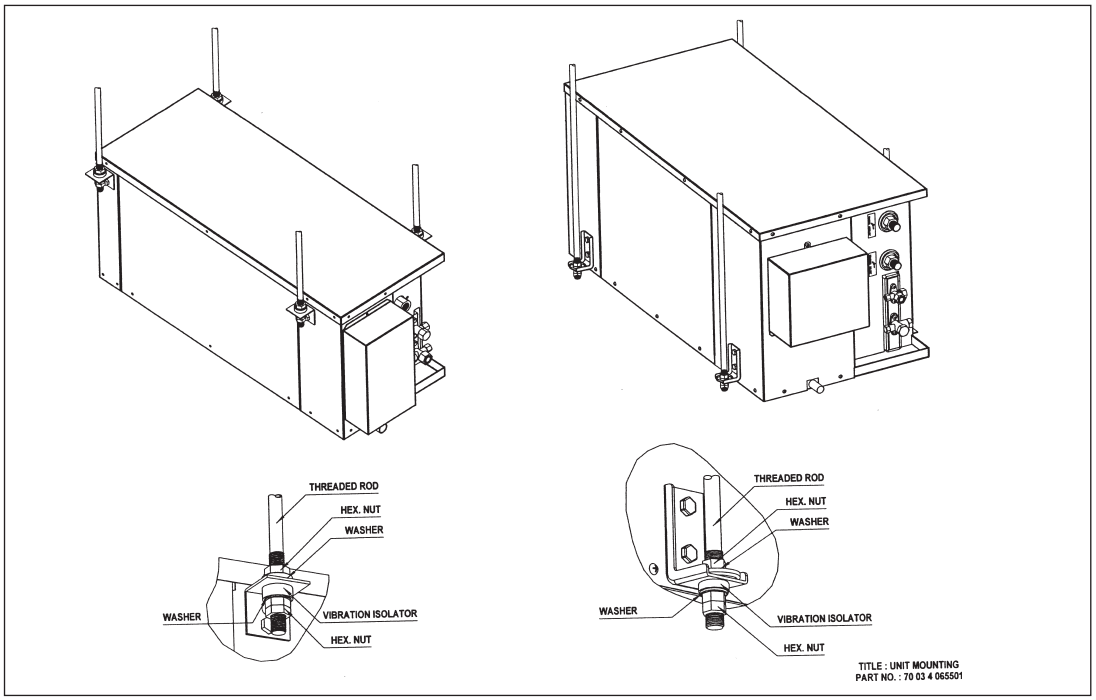
Once switch is confirmed open, it will force compressor to cut off. If the switch is closed within 5 minutes, the compressor is allowed to cut in. If the switch does not close for more than 5 minutes, the system will warn user regarding the fault, the compressor is not allowed to cut in. If the switch is confirmed opened twice within 30 minutes, the system assumes there are faults.

Installation
Installation for outdoor unit AWSS

Location
Both the units are not designed for outdoor installation. Install these units at the INDOOR area that provide easy piping connections and enough space for service or repair works. The area or ceiling must be able to withstand the unit weight and is isolated from noise and vibration. Ensure the area is free from water leakage. Follow the recommended installation clearance as shown below:

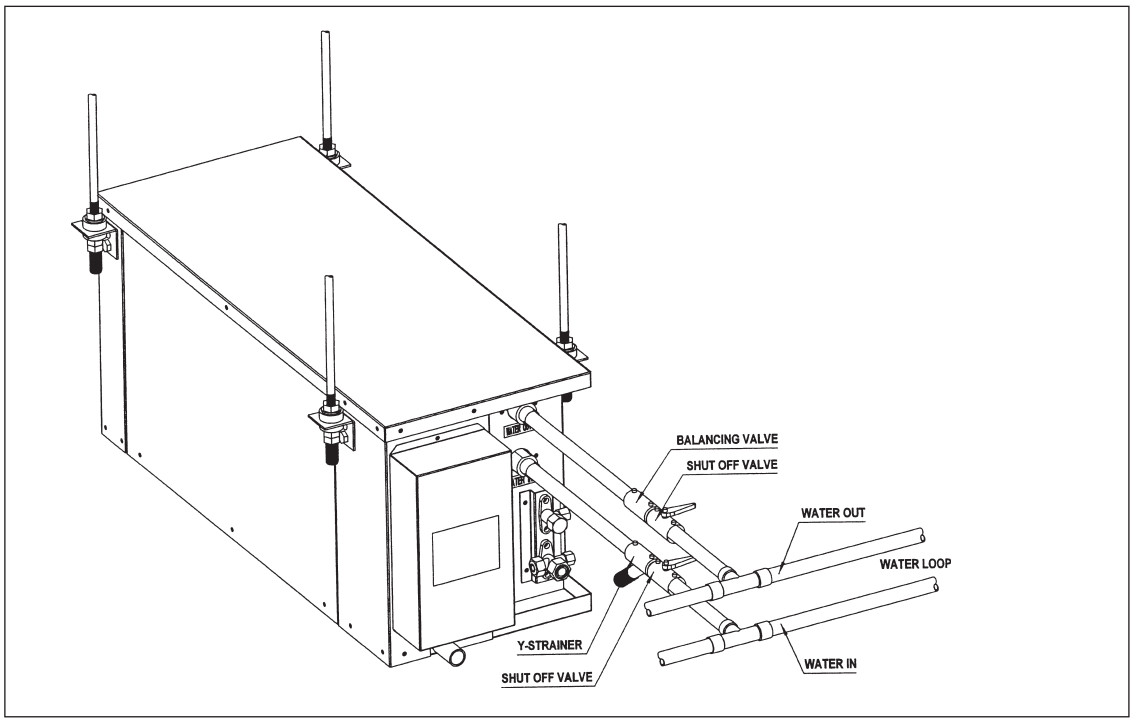


Mounting
Both the units will be mounted on the ceiling by the support of four threaded rod. Use only the supplied hanging bracket. Ensure that the support is strong enough and properly anchored to withstand the weight of the unit.Use isolator rubber for better noise and vibration control. Do not locate the drainage system at any point above the drain connection. Make sure water drainage is good and no leakage before.



Water Loop Piping

The piping connected to the units has to be firmly secured and properly sealed. It is recommended that flexible hoses be used to connect water piping to the unit. It will reduce or eliminate noise transmission (if any) to the main water piping. Do not over tighten the connections. It will cause water leaking or damage the adaptors thread. Shut off valves at supply (water inlet) and water return (water outlet) are required as it will be used for any future service or maintenance work without affecting water flow to other units. The strainer will filter out the dirt or other foreign material. A balancing valve will be used to balance the system. The piping system should be cleaned and flushed prior to operation. Make sure all shut off valves is in the open position before operating the unit. To ensure a proper water flow, the differential water temperature between inlet and outlet should be 5°C (41°F) to 8°C (46.4°F).



Electrical Connections

Wiring regulations differ from country to country. All field wiring must comply with your LOCAL ELECTRICAL CODES. All safety precautions need to strictly adhere.

General Precautions

- Ensure the rated voltage and phase of the unit corresponds to the unit name plate before carrying out wiring.
- Provide a power outlet to be used exclusively for each unit. A power supply disconnect and circuit breaker for over current protection should be provided in the exclusive line.
- The unit must be GROUNDED to prevent hazards due to insulation failures.
- All wiring must be firmly connected.
- All wiring must not touch on the hot refrigerant piping, compressor or any moving parts.

Installation For Indoor Unit ACC

Preliminary Site Survey

Electrical supply and installation is to conform to local authority's codes and regulations. (e.g. National Electricity Board). Voltage supply fluctuation must not exceed +/- 10% of rated voltage. Electricity supply lines must be independent of welding transformers which can cause high supply fluctuation. Ensure that the location is convenient for wiring and piping.

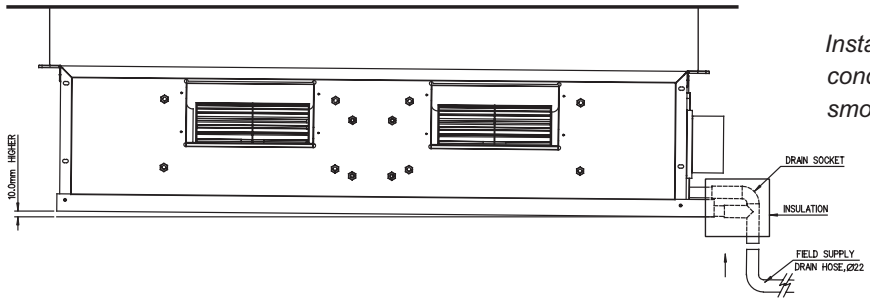
Installation of Indoor Unit

The indoor unit must be installed such a way that there is no short circuit of the cool discharge. Comply to the installation clearance recommended. Do not put the indoor unit where there is direct sunlight on the unit. Make sure the location is suitable for piping and drainage. Precautions steps to be taken:

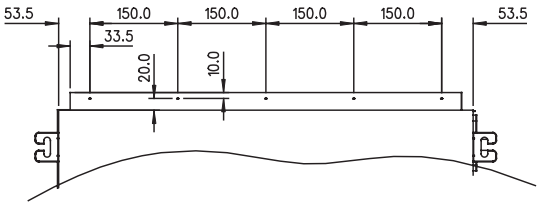
i) Use the hanger supplied with the unit.

ii) Ensure the support is strong enough to withstand the weight of the unit.

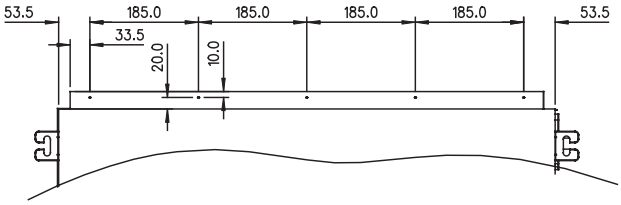
iii) Use the supplied drain socket to connect the drain pipe.



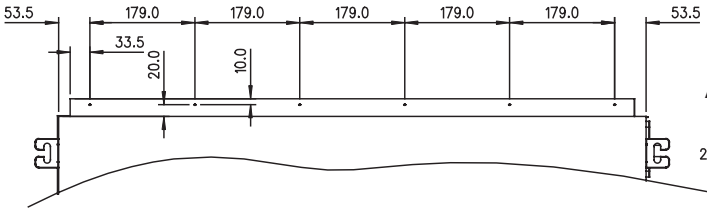
Install the unit in such a way that the condensate water can flow out smoothly.



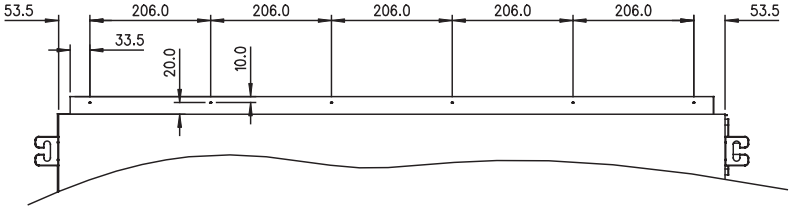
ACC 010C



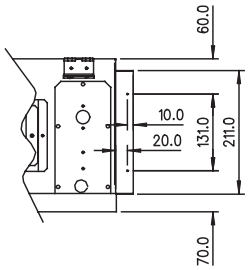
ACC 015C



ACC 020C



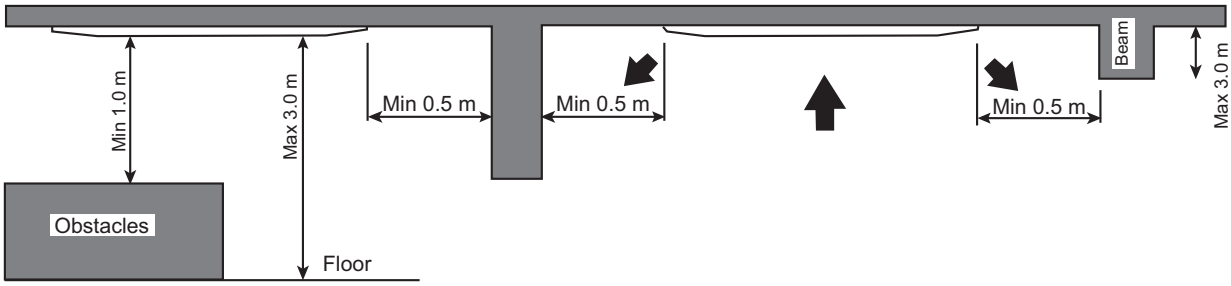
ACC 025C



Installation For Indoor Unit ACK

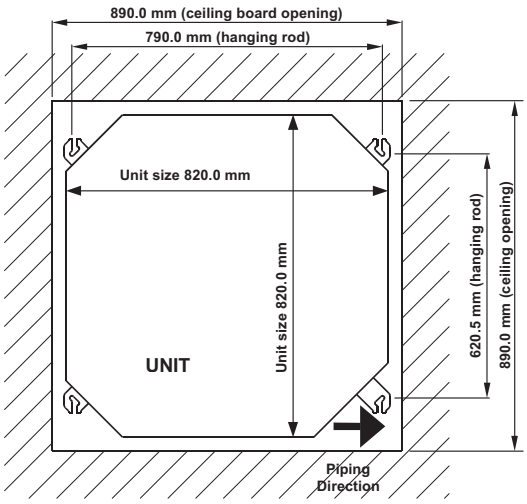
Preliminary Site Survey

- Electrical supply and installation is to conform to local authority's (e.g. National Electrical Board) codes and regulations.
- Voltage supply fluctuation must not exceed ± 10% of rated voltage. Electricity supply lines must be independent of welding transformer which can cause high supply fluctuations.
- Ensure that the location is convenient for wiring, piping and drainage
- The indoor unit must be installed in such that free from any obstacles in path of cool air discharge and warm air return, and must allow spreading of air throughout the room (near the center of the room)
- Clearance must be provided for the indoor unit from the wall and obstacles as shown in the figure.

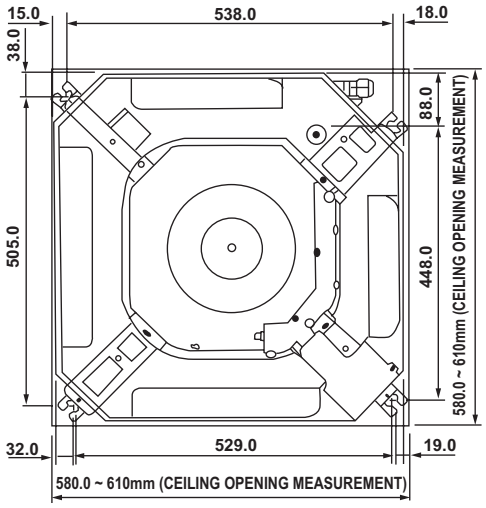


- The installation place must be strong enough to support a load of 4 times the indoor unit weight to avoid amplifying noise and vibration.
- The installation place (handing ceiling surface) must be levelled and the height in the ceiling is 350mm or more.

Unit Installation



ACK-A

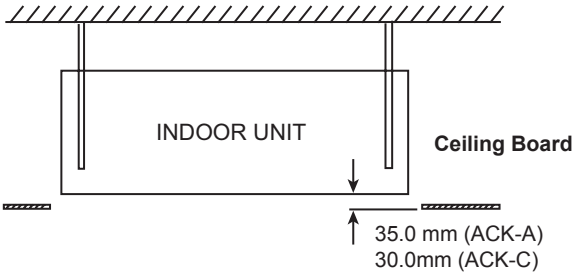


ACK-C

- The indoor unit must be away from heat and steam sources (avoid installing it near an entrance).
- Measure and mark the position for the hanging rod. Drill the hole for the angle nut on the ceiling and fix
- The installation template is extended according to temperature and humidity. Check on dimensions in
- The dimensions of the installation template are same as those of the ceiling opening dimensions.
- Before ceiling laminating work is completed, be sure to fit the installation template to the indoor unit.

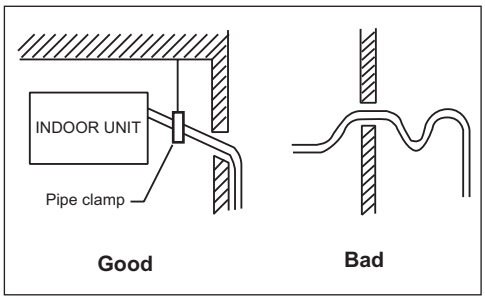
Note : Be Sure to discuss the ceiling driling work with the installers concerned.

Unit Hanging



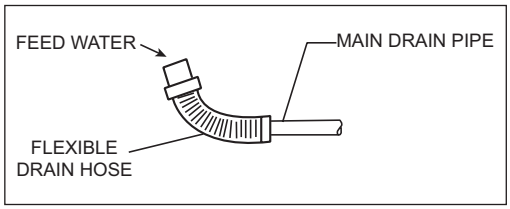
- Confirm the pitch of the hanging rod is 790.0mm x 620.5mm(ACK-A) and 505.0mm x 538.0mm (ACK-C).
- Hold the unit and hang it on the hanging rod with the nut and washer.
- Adjust the unit height to 35.0 mm between the indoor unit bottom surface and the ceiling surface.
- Confirm with a level gauge that the unit is installed horizontally and tighten the nut and bolt to prevent unit falling and vibration.
- Open the ceiling board along the outer edge of the paper installation template.

Drain Piping Work



- Drain pipe must be downward gradient for smooth drainage.
- Avoid the drain pipe from up and down slope to prevent reversal flow.
- During the drain piping connection, be careful not to exert extra force on the drain connector at indoor unit.
- The outside diameter of the drain connection at the flexible drain hose is 20 mm.
- Be sure to provide heat insulation (polyethylene foam with thickness more than 8.0 mm) on the drain piping to avoid the condensed water dripping inside the room.

Drain Test

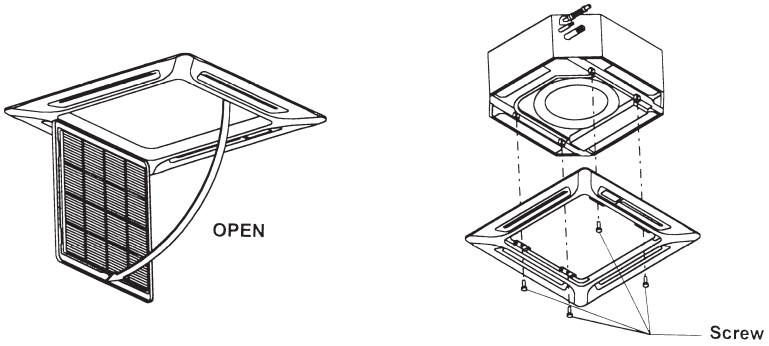


- Connect the main drain pipe to the flexible drain hose.
- Feed water from flexible drain hose and check the piping for leakage.
- When the test is completed, connect the flexible drain hose to the drain connector on the indoor unit.

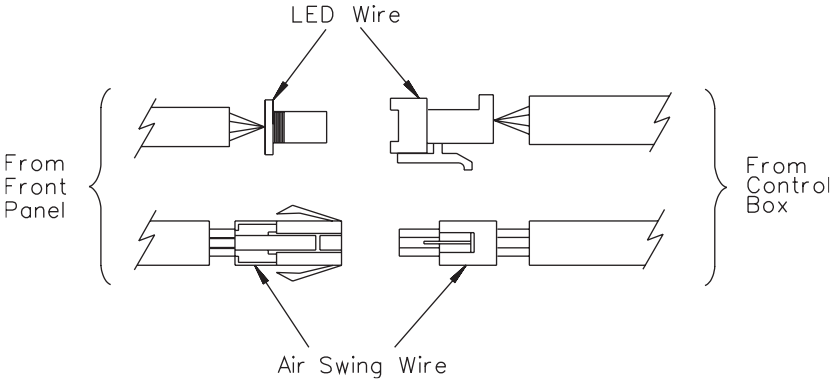
Note: This indoor unit use drain pump for condensed water drainage. Installed the unit horizontally to prevent water leakage or condensation around the air outlet.

Panel Installation

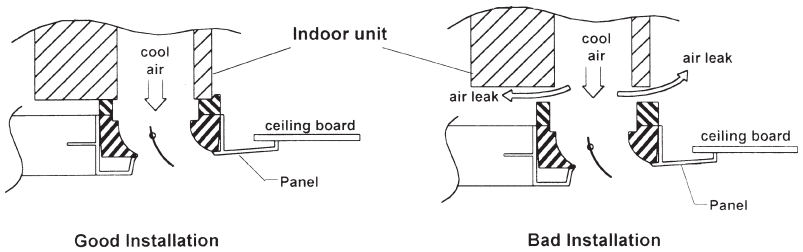
- The front panel can only be fitted in one direction, follow the piping direction. (Follow piping arrow sticker on front panel).
- Be sure to remove the installation template before installing the front panel.



- Open the air intake grille by pulling back the catchers and remove it together with filter from panel.
- Install the front frame panel onto the indoor unit by using 4 screws and tighten it completely to prevent cool air leakage.
- Connect the LED wire and air swing wire to the indoor unit (Optional).



Note: Install the front frame panel firmly to prevent cool air leakage which will cause condensation and water dripping.

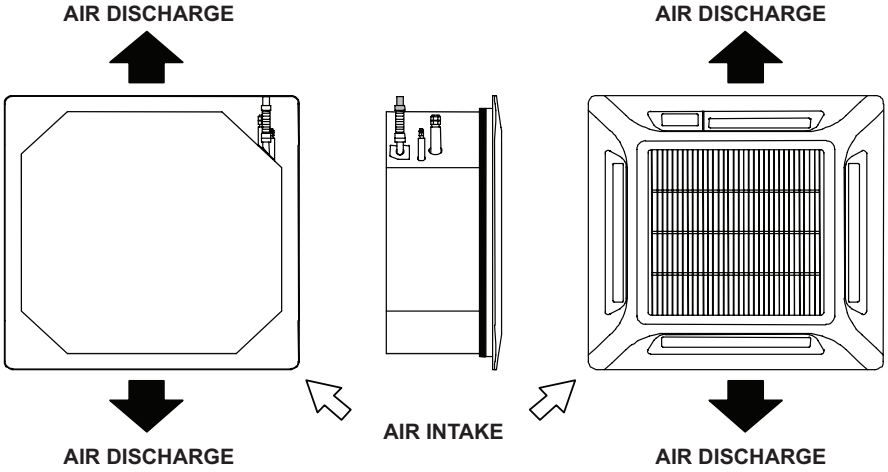


Short Duct Specification
Applicable for ACK-A Series Only

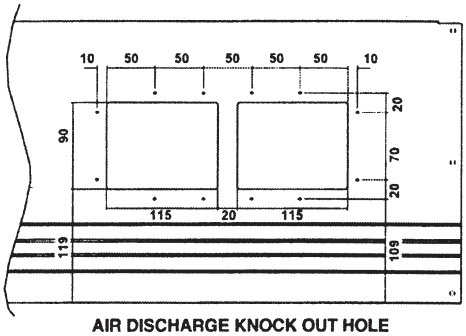
- The indoor unit is provided with air discharge and air intake “knock-out” hole for duct connection. However the connection of the short duct for air discharge is possible on only one side.

- The use of short duct for air discharge will improve air flow distribution if there is an obstruction (such as alighting fixture) or in a long, narrow room or an L-shaped room. It is also used for air-conditioning of two rooms simultaneously.

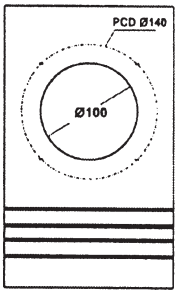
Possible Direction for Air Discharge and Air Intake



Possible Opening Dimension For Duct Connection



AIR DISCHARGE KNOCK OUT HOLE



AIR INTAKE KNOCK OUT HOLE

Note:
1. **Avoid to use the short duct on which the air discharge grille can be completely closed, to prevent evaporator freezing.**
2. **In order to prevent condensation forming, be sure that there is sufficient thermal insulation and no leakage of cool air when installing the short duct.**
3. **Keep the introduction of fresh air intake within 20% of total air flow. Also provide a chamber and use a booster fan.**

Fresh Air Intake for ACK-C Unit

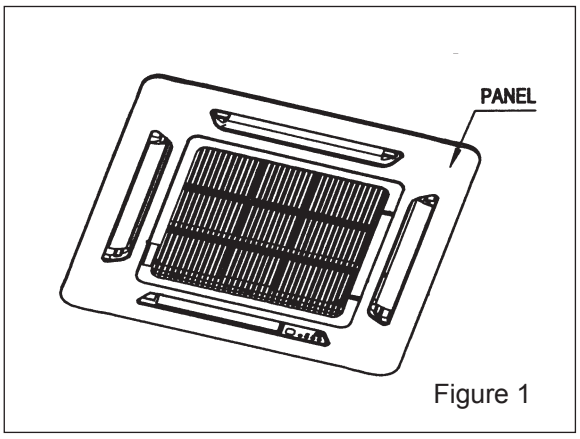


Figure 1

Take off the panel from the indoor unit

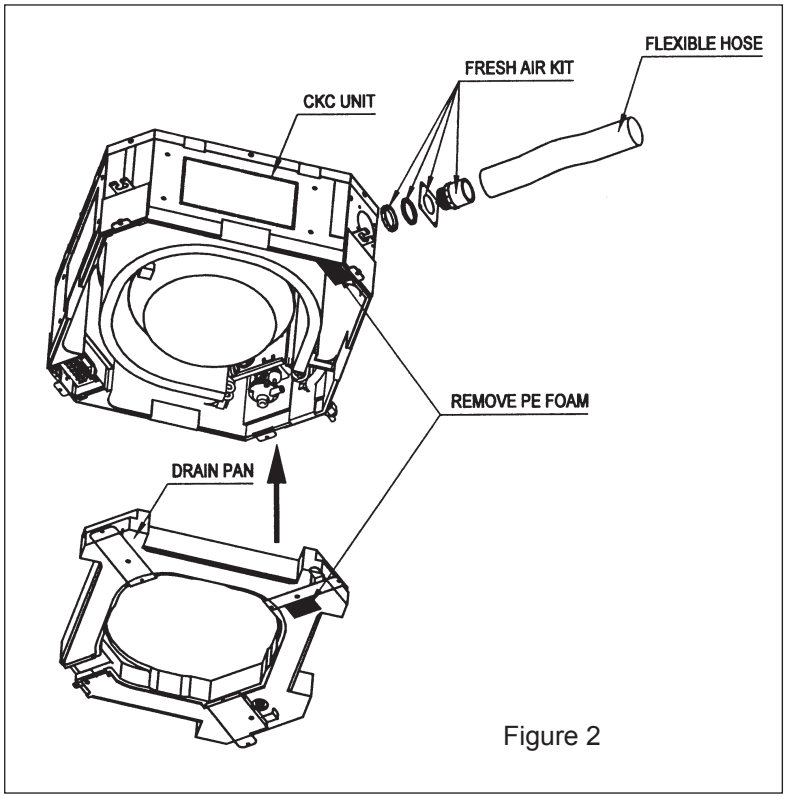


Figure 2

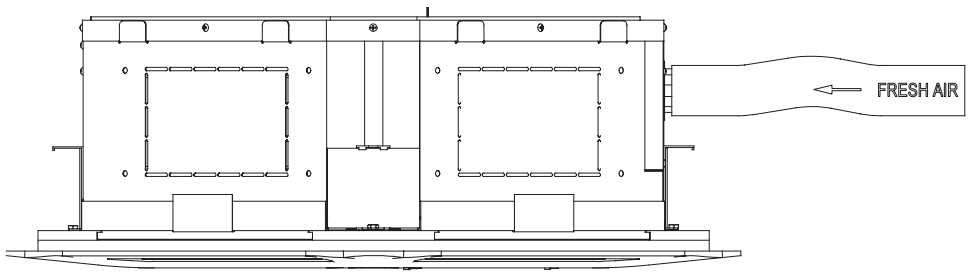
Remove the PE foam from the drain pan and another one on the unit.

Remove the pre-punched panel on the CKC unit with a screwdriver.

The diameter of the air intake knock out hole is 65mm

Then, fix the fresh air kit (refer to parts list) to the hole.

Finally, a flexible duct is connected to let the fresh air moving in.



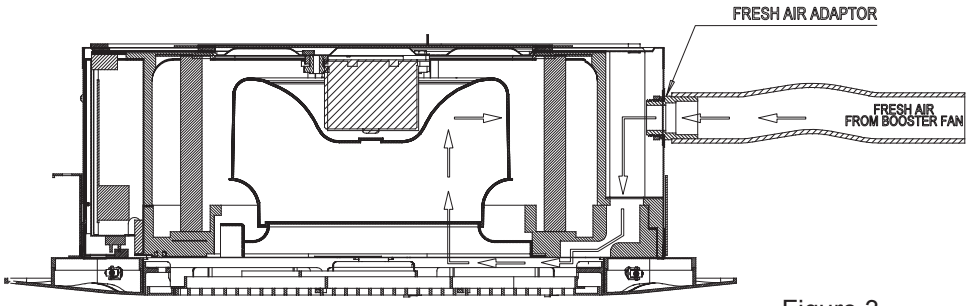


Figure 3

The direction of the fresh air intake is shown as figure 3.

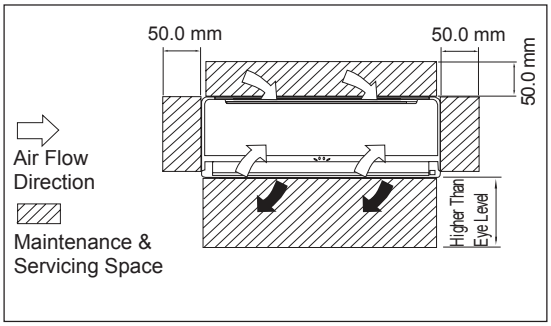
Sealing Material

- It is possible to seal one of the four air discharge outlet (sealing two or more air discharge outlet could cause a malfunction).
- Remove the front panel and inserting the seal material into the air discharge outlet at the indoor unit to seal the air outlet.
- The sealing material is the same length as the length air discharge outlet. If it is desired to seal the shorter air discharge outlet, cut the sealing material to shorten it.
- Push the sealing material in about 10mm beyond the bottom surface of the indoor unit so that it does not touch the air louver. Be sure not to push the sealing material in any father than about 10mm.

Installation For Indoor Unit AWM

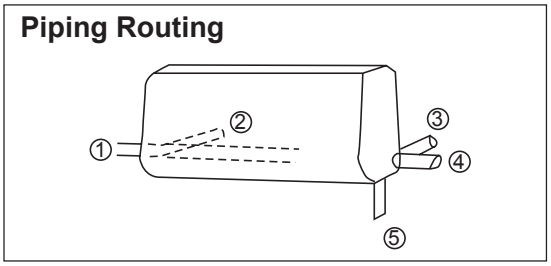
Location and Space

The indoor unit must be installed in such a wayso as to prevent short circuit of the cooldischarged air with the hot return air. Please follow the installation clearance shown in the figure. Do not place the indoor unit where there could be direct sunlight shining on it. Also, this location must be suitable for piping and drainage, and be away from doors or windows.

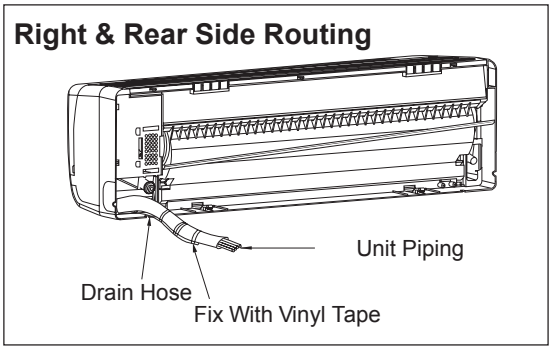


Routing Of Piping

Remove the screw holding the front panel.

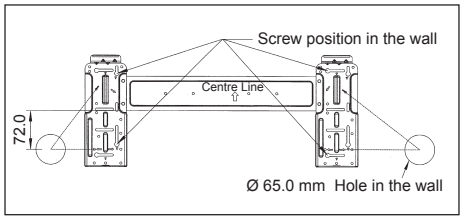


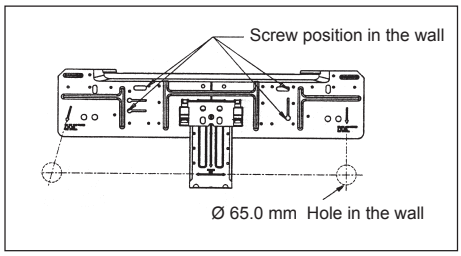
The refrigerant piping can be routed to the unit in a number of ways (left or right from the back of the unit), by using the cut-out holes on the casing of the unit (see figure). Bend the pipes carefully to the required position in order to align it with the holes. For the right hand and rear side out, hold the bottom of the piping and then position it to the required direction (see figure). The condensation drain hose can be taped to the pipes.

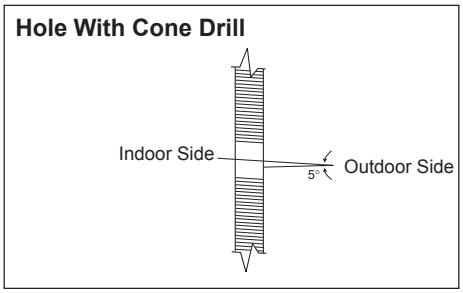


Mounting Installation Plate

Ensure that the wall is strong enough to with stand the weight of the unit. Otherwise, it is necessary to reinforce the wall with plates, beams or pillars. Use the level gauge for horizontal mounting, and fix it with 4 suitable screws. In case the rear piping draws out, drill a hole 65mm in diameter with a cone drill, slightly lower on the outside wall (see figure).

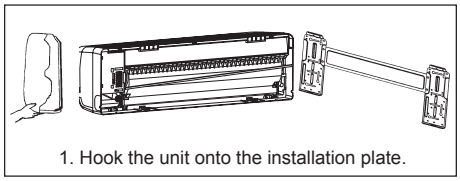






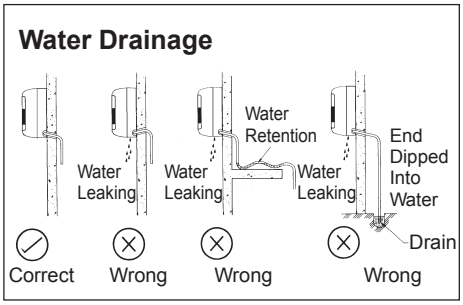
Mount The Unit Onto The Installation Plate

Hook the indoor unit onto the upper portion of the installation plate (Engage the two hooks atthe rear top of the indoor unit with the upper edge of the installation plate). Ensure that the hooks are properly seated on the installation plate by moving it to the left and right.


1. Hook the unit onto the installation plate.

Water Drainage Piping

The indoor drain pipe must be in a downward gradient for smooth drainage. Avoid situations that are likely to cause water to leak.



Refrigerant Piping

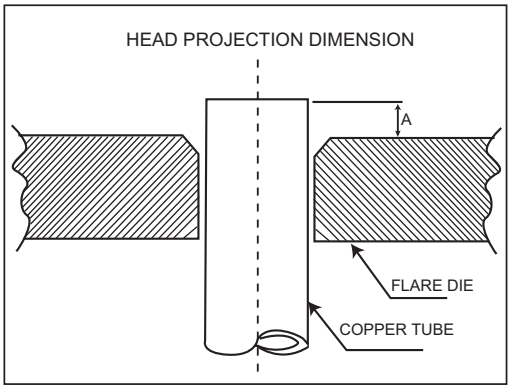
Copper Pipe Connection

Do not use contaminated, dented or used copper tubing. Do not use copper tubes with less than 0.8mm thickness. Remove burns from cut edges of the pipes with remover. Hold the end of the pipe downwards to prevent metal chips from entering the pipe. Use proper torgue wrench to tight the flare nuts. If the torque strength is weak, gas leakage may occur. If it is too tight the flare nut may crack and it may be non-removable. Insulate the piping to prevent capacity losses and water.

Flare Work

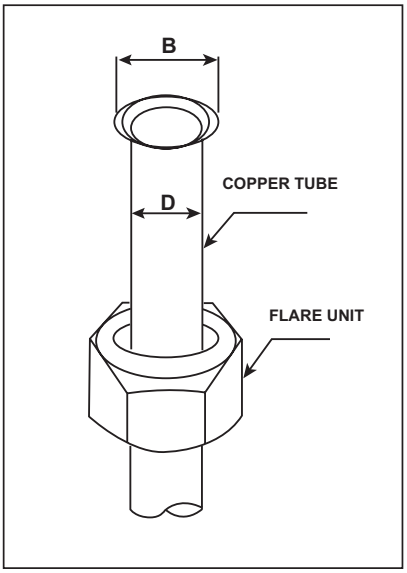
Head projection dimension may differ according to type of flare tool. Refer to table below:

Diameter		A(mm)	
in	mm	Imperial	Rigid
1/4	6.35	1.3	0.7
3/8	9.52	1.6	1.0
1/2	12.70	1.9	1.3
5/8	15.88	2.2	1.7
3/4	19.05	2.5	2.0



Flare section should be uniform or even. Crack on the flare section or burr on the flare edge is not acceptable. Make new flare tubing again to prevent potential gas leak.

Diameter D		Flare End Diameter
in	mm	
1/4	6.35	9.1
3/8	9.52	13.2
1/2	12.70	16.6
5/8	15.88	19.7
3/4	19.05	24.0



Tightening Torque

Use proper torque wrench to tight the flare nuts. If the torque strength is weak, gas leakage may occur. If it is too tight, the flare nut may crack and it may be non-removable.

Diameter D		Torque (Nm)
in	mm	
1/4	6.35	18
3/8	9.52	42
1/2	12.7	55
5/8	15.88	65
3/4	19.05	100

Refrigerant Piping Length, Elevation and Bends

When piping length becomes too long, both the capacity and reliability drop. As the number of bends increases, system-piping resistance to the refrigerant flow increase thus lowering the capacity of the unit and as a result the compressor may become defective. Always choose the shortest path and follow the recommendation as tabulated below.

	AWSS30A	AWSS40A	AWSS50A	AWSS60A
Max Length, L	12m	35m	35m	35m
Max. Elevation, H	5m	10m	10m	10m
Max. No. of bends	10	10	10	10
Liquid Valve Size	9.52mm (3/8”)	9.52mm (3/8”)	9.52mm (3/8”)	12.72mm (1/2”)
Gas Valve Size	15.88mm (5/8”)	19.05mm (3/4”)	19.05mm (3/4”)	19.05mm (3/4”)

Additional Charges

The pre-charged of R22 in the water Cooled Split Type unit is suitable for standard pipe of length up to 7.6m.

When the piping is more than the above stated standard pipe length, kindly add additional charge referring to the table below.

Models	gram/meter
AWSS30A	41
AWSS40A	41
AWSS50A	41
AWSS60A	77

4. SOUND DATA

Water Source Single Split Unit (R22)

Sound Pressure

Model	1/1 Octave Sound Pressure Level (dB, reference 20μPa)							Overall (dBA)	Noise Criteria
	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz		
AWSS30A	50	32	40	26	25	22	19	39	35
AWSS40A	45	38	36	36	30	24	16	39	35
AWSS50A	46	33	32	35	29	27	24	38	34
AWSS60A	48	33	36	34	32	32	26	40	34

Sound Power

Model	1/1 Octave Sound Power Level (dB, reference 1pW)							Overall (dBA)
	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
AWSS30A	60	49	51	42	39	37	32	51
AWSS40A	54	51	51	49	44	42	36	53
AWSS50A	57	47	46	50	43	41	39	53
AWSS60A	61	59	55	51	48	44	42	57

Microphone position: 1.4m below the center of the unit.

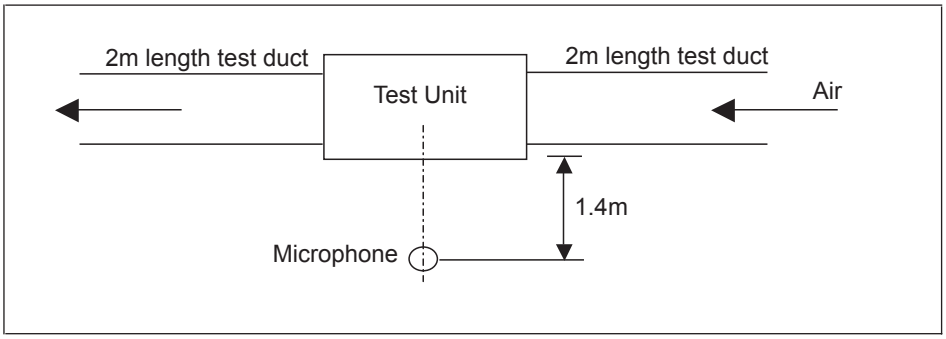
Ceiling Concealed Fan Coil Unit (R22)

Sound Pressure

Model	Ext. Static (mmAq)	Speed	1/1 Octave A-weighted Sound Pressure (dBA), ref 20μPa							Overall A (dBA)	Noise Criteria
			125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz		
ACC 30C	21	Super High	54	50	46	45	40	34	30	49	44
	17	High	50	45	43	42	37	31	26	46	41
	13	Medium	45	40	40	38	32	26	20	42	37
	9	Low	42	36	37	33	28	22	15	38	32
ACC 40C	21	Super High	56	49	49	46	41	37	32	51	45
	18	High	54	47	47	45	39	35	29	49	44
	13	Medium	49	42	43	41	35	31	24	45	40
	9.5	Low	45	39	41	37	30	26	18	41	36
ACC 50C	18	Super High	56	50	50	49	44	38	33	53	48
	16	High	54	49	49	48	43	37	32	52	47
	14	Medium	53	47	46	47	40	35	29	50	46
	11	Low	51	45	44	44	36	32	26	47	43
ACC 60C	18	Super High	57	50	51	51	46	39	35	55	50
	16	High	55	49	49	50	44	37	33	53	49
	14	Medium	53	46	47	47	39	34	28	50	46
	10	Low	51	43	44	43	35	30	24	47	42

Microphone position: 1.4m below the centre of the unit. (GB Standard - GB/D17758)
Tested with 2m length duct at the air discharge outlet and air return inlet.

Measuring Location:



Sound Power

Model	Ext. Static (mmAq)	Speed	1/1 Octave A-weighted Sound Power (dB), ref 1pW							Overall A (dBA)
			125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
ACC 30C	21	Super High	68	69	71	72	69	66	65	76
	17	High	65	66	68	69	65	63	60	73
	13	Medium	61	62	64	65	61	58	55	69
	9	Low	56	58	60	61	57	53	49	64
ACC 40C	21	Super High	69	71	72	74	71	68	67	78
	18	High	65	68	70	72	68	66	64	76
	13	Medium	65	65	67	68	64	62	59	72
	9.5	Low	59	61	63	64	60	57	54	68
ACC 50C	18	Super High	70	71	73	74	72	69	67	78
	16	High	67	69	71	72	69	66	64	76
	14	Medium	66	66	69	69	66	63	61	73
	11	Low	63	64	66	67	62	60	57	70
ACC 60C	18	Super High	70	71	73	75	73	70	68	79
	16	High	69	70	72	74	71	69	68	78
	14	Medium	69	68	70	71	67	65	63	75
	10	Low	64	65	67	67	63	61	59	71

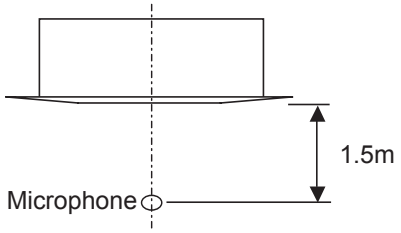
Duct Discharge Sound Power Level: Test with 5ft length discharge duct, terminated flush with internal wall of reverberation room.

Ceiling Casette Fan Coil Unit (R22)

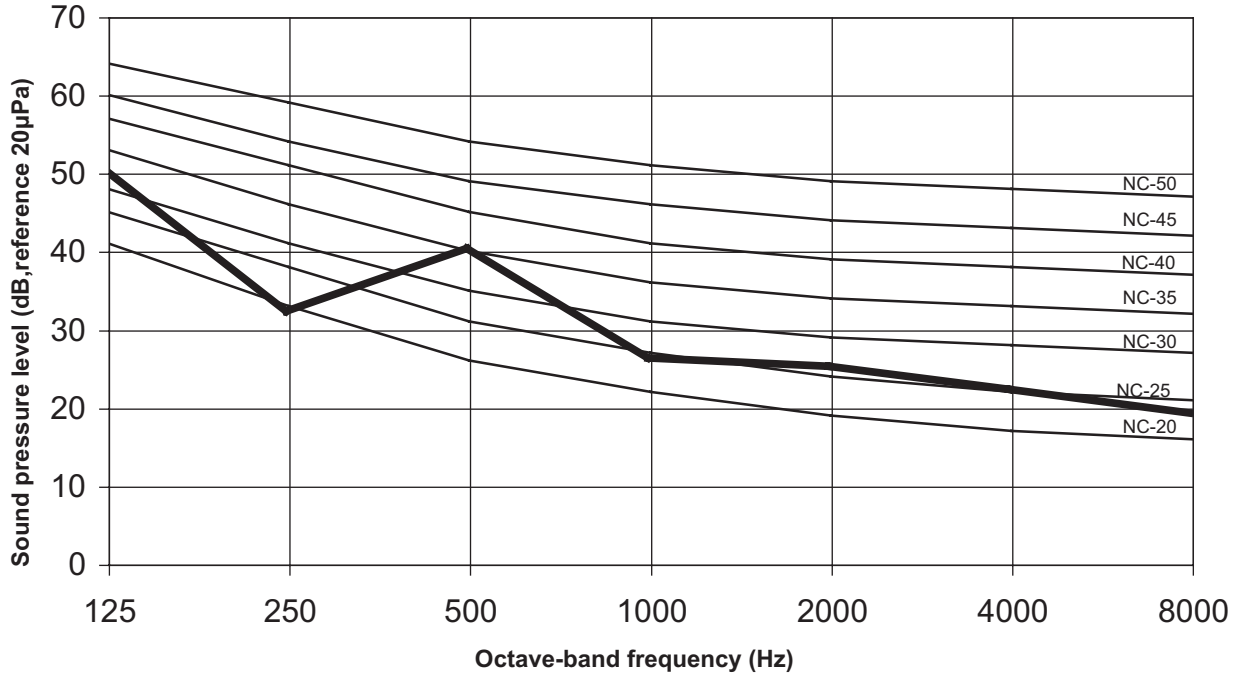
Sound Pressure Level

ACK-A Series

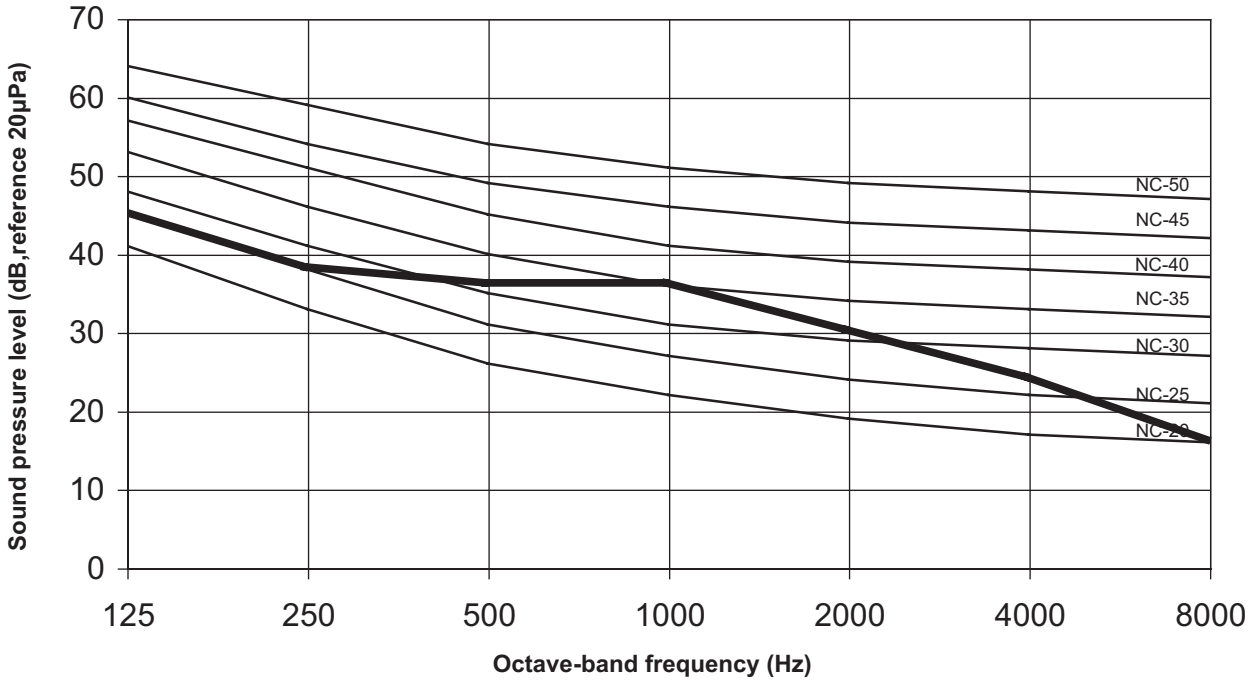
Model	Speed	1/1 Octave A-weighted Sound Pressure (dBA), ref 20μPa							Overall	Noise
		125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	A (dBA)	Criteria
ACK 20A	High	46	45	40	38	32	21	14	42	37
	Medium	44	43	37	33	28	18	12	39	32
	Low	43	42	35	31	26	17	11	37	31
ACK 25A	High	48	46	43	39	33	27	19	45	38
	Medium	45	43	40	35	29	21	15	42	35
	Low	43	42	38	32	27	19	14	40	33
ACK 30A	High	50	48	47	43	37	35	28	49	42
	Medium	48	45	43	38	32	31	27	45	38
	Low	46	43	41	35	30	30	26	43	36
ACK 40A	High	50	49	49	46	39	38	31	51	45
	Medium	48	47	47	43	36	34	25	48	42
	Low	46	45	46	41	34	30	23	46	41
ACK 50A	High	54	52	51	48	43	42	34	53	47
	Medium	52	50	50	46	41	40	32	52	45
	Low	51	49	49	45	39	39	31	50	45

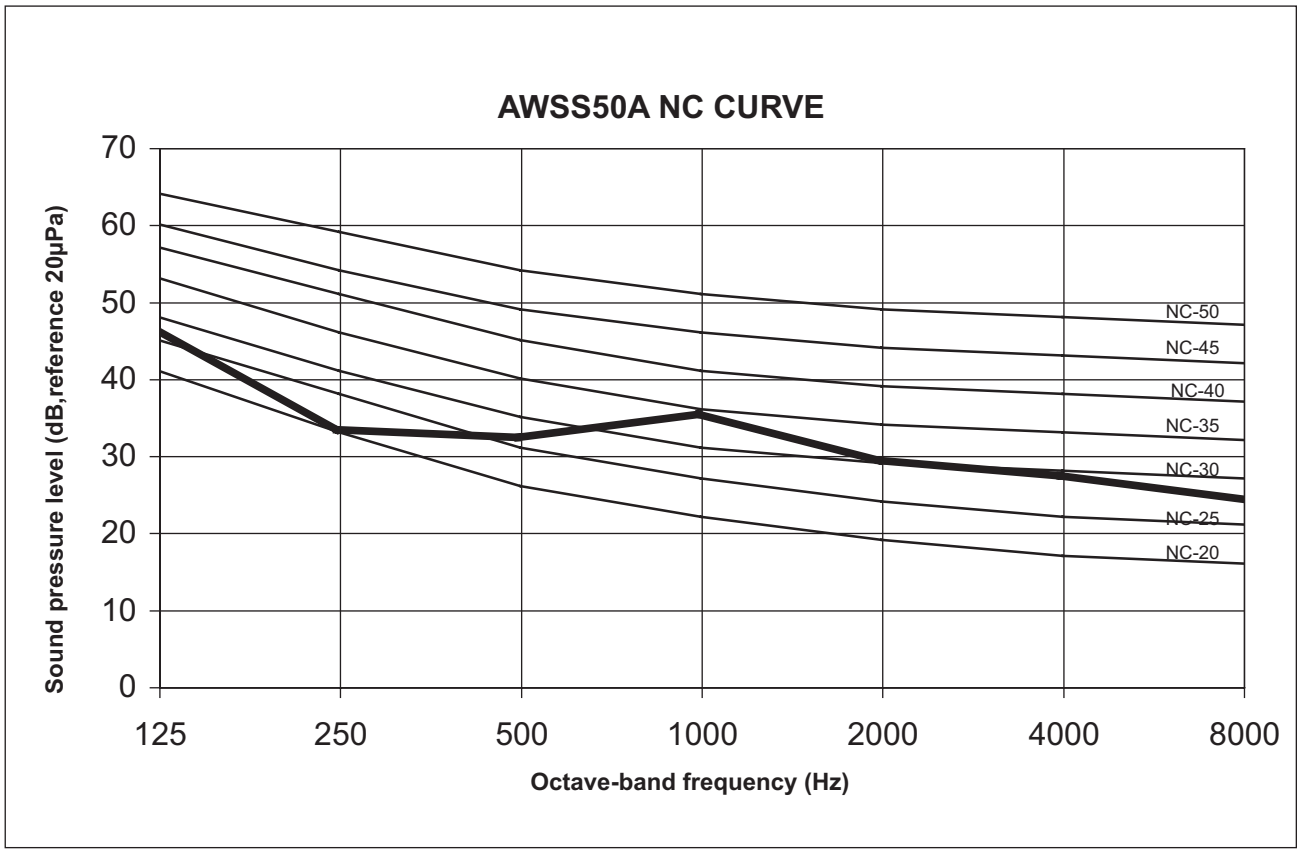
Model	Measuring Location
ACK 30A ACK 40A ACK 50A	 Standard : JIS C 8615

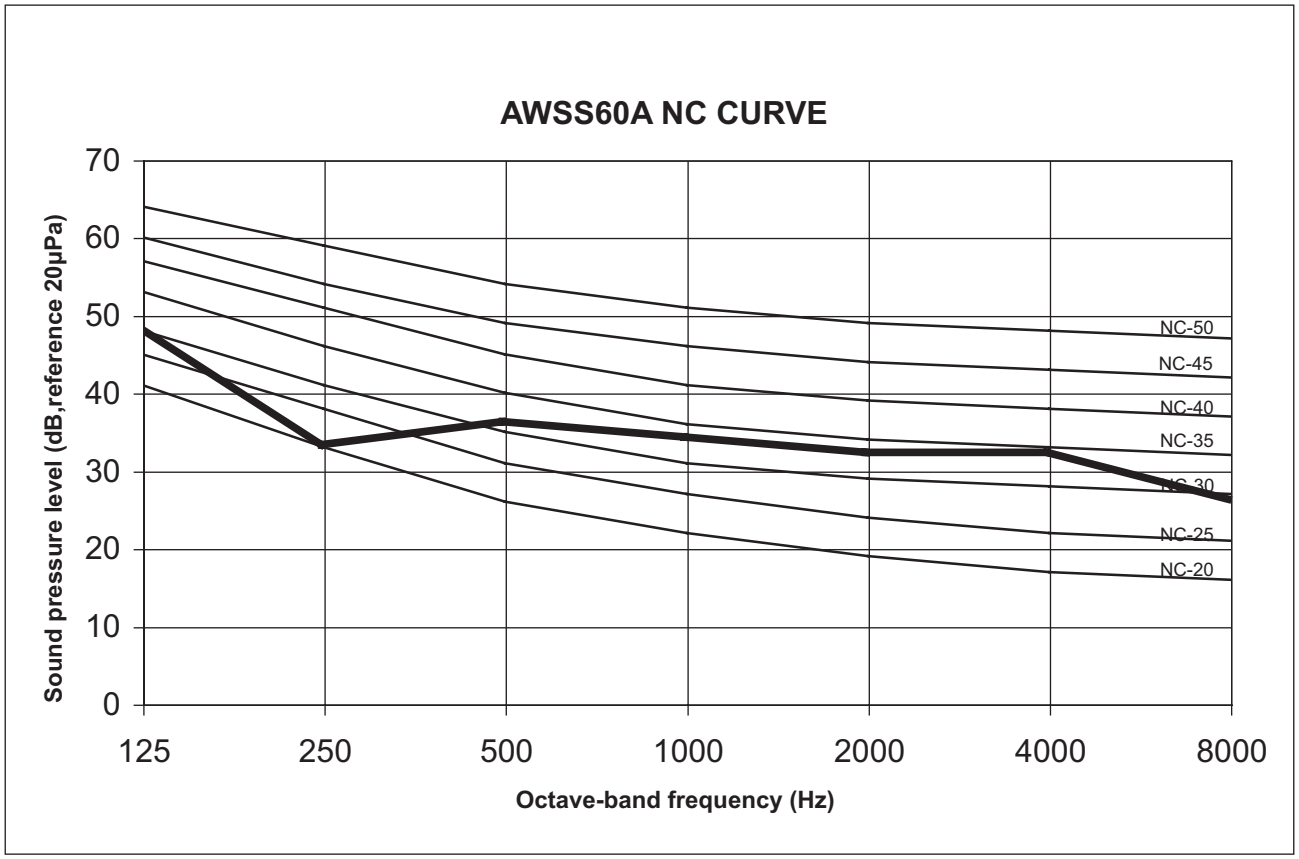
AWSS30A NC CURVE



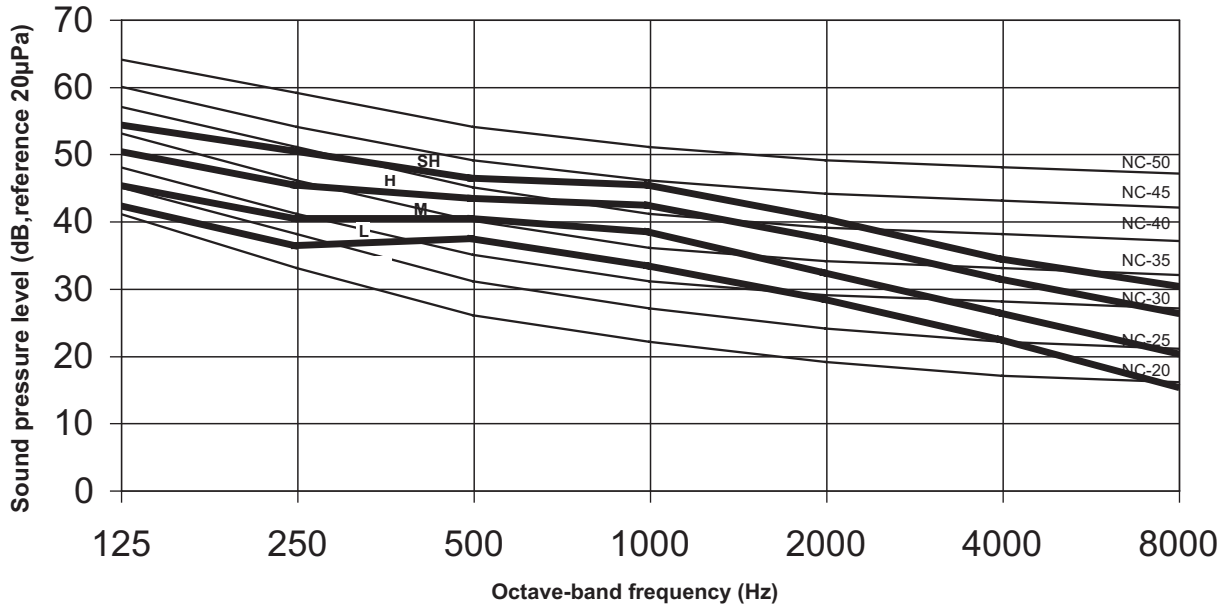
AWSS40A NC CURVE



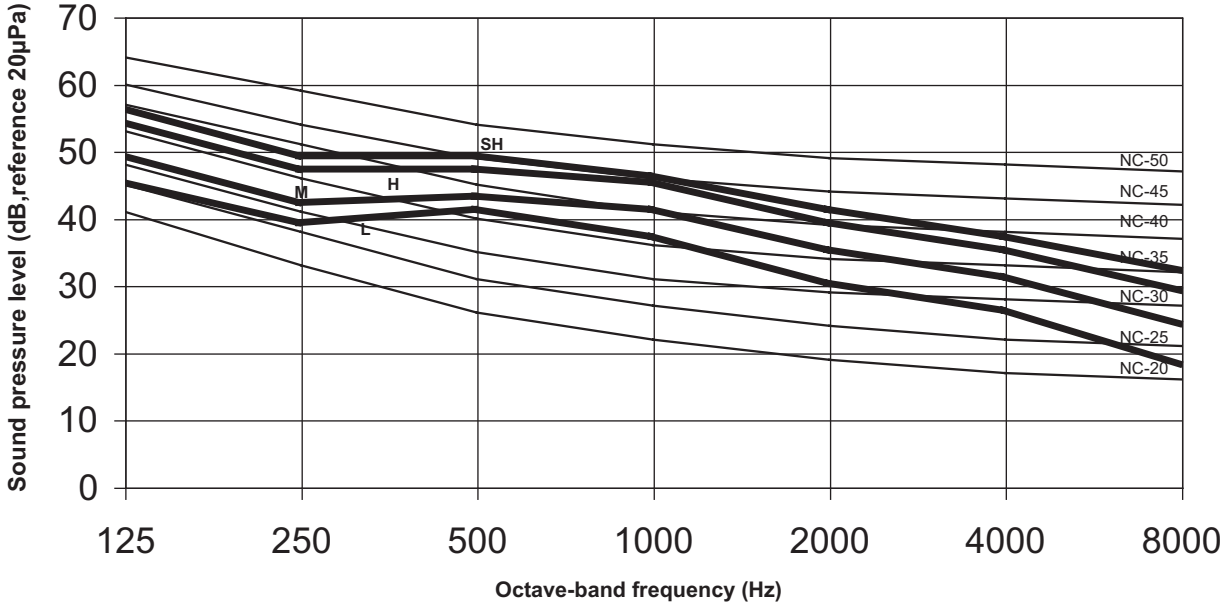

AWSS50A NC CURVE
Sound pressure level (dB,reference 20μPa)
70
60
50
40
30
20
10
0
125
250
500
1000
2000
4000
8000
Octave-band frequency (Hz)
NC-50
NC-45
NC-40
NC-35
NC-30
NC-25
NC-20


AWSS60A NC CURVE
Sound pressure level (dB,reference 20μPa)
70
60
50
40
30
20
10
0
125
250
500
1000
2000
4000
8000
Octave-band frequency (Hz)
NC-50
NC-45
NC-40
NC-35
NC-30
NC-25
NC-20

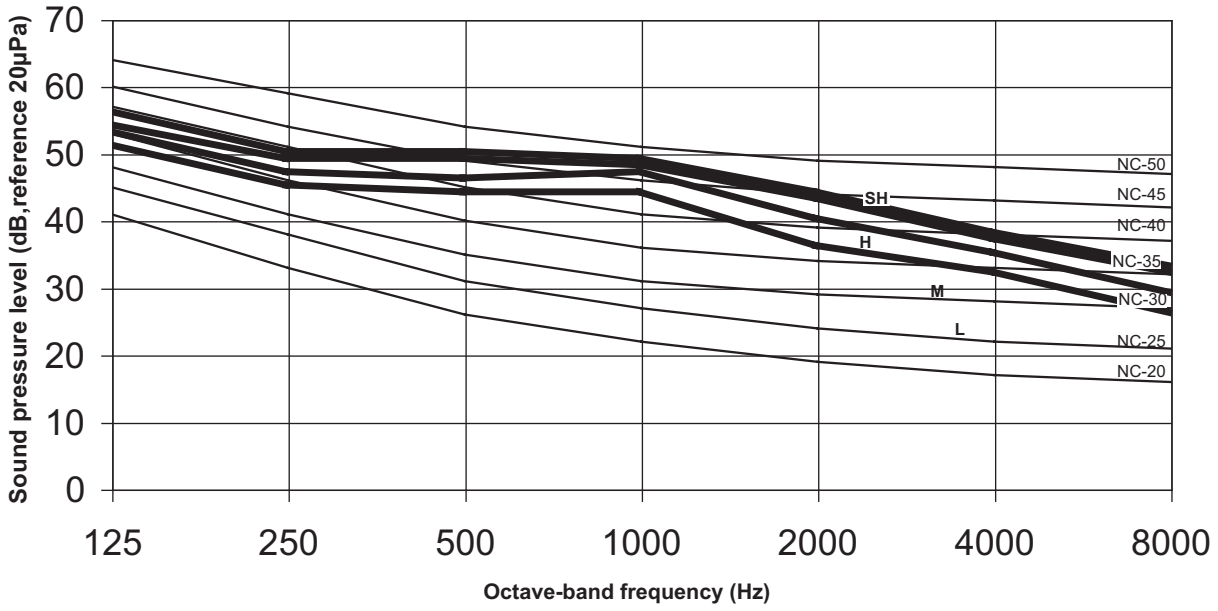
ACC30C NC CURVE



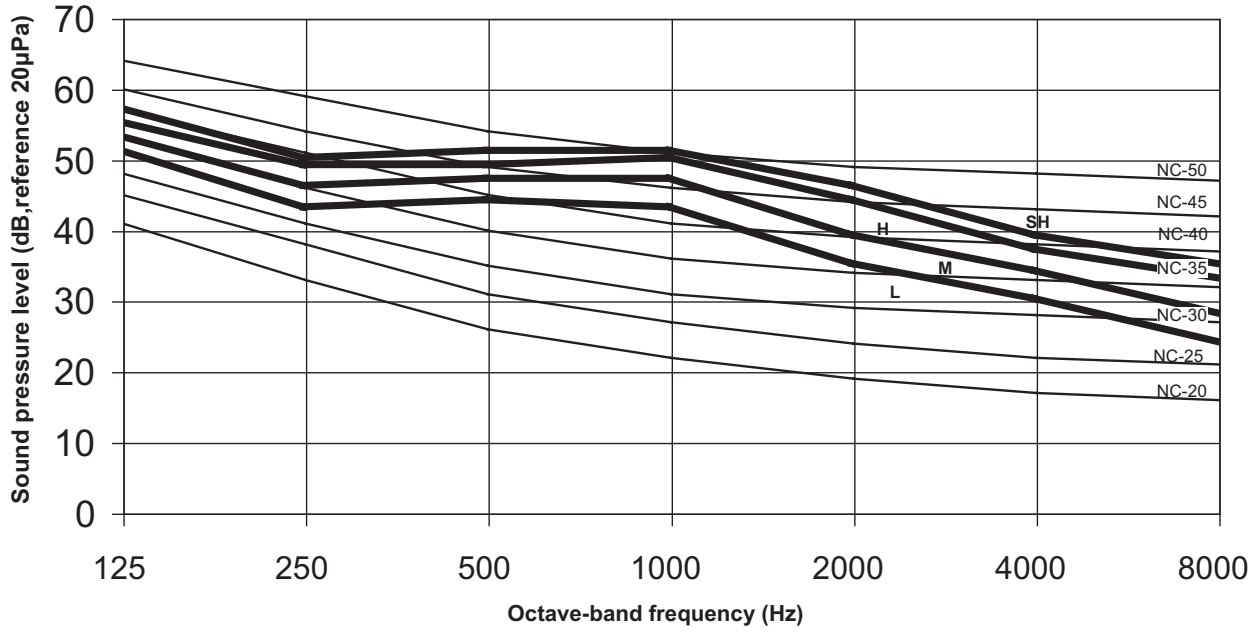
ACC40C NC CURVE



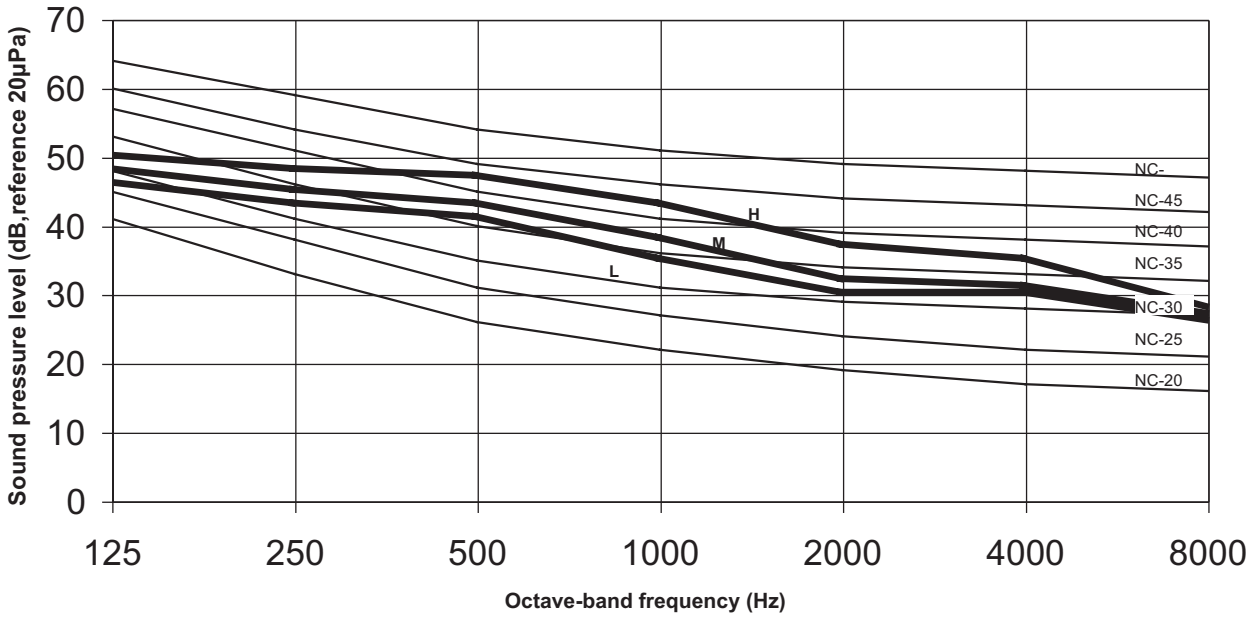
ACC50C NC CURVE



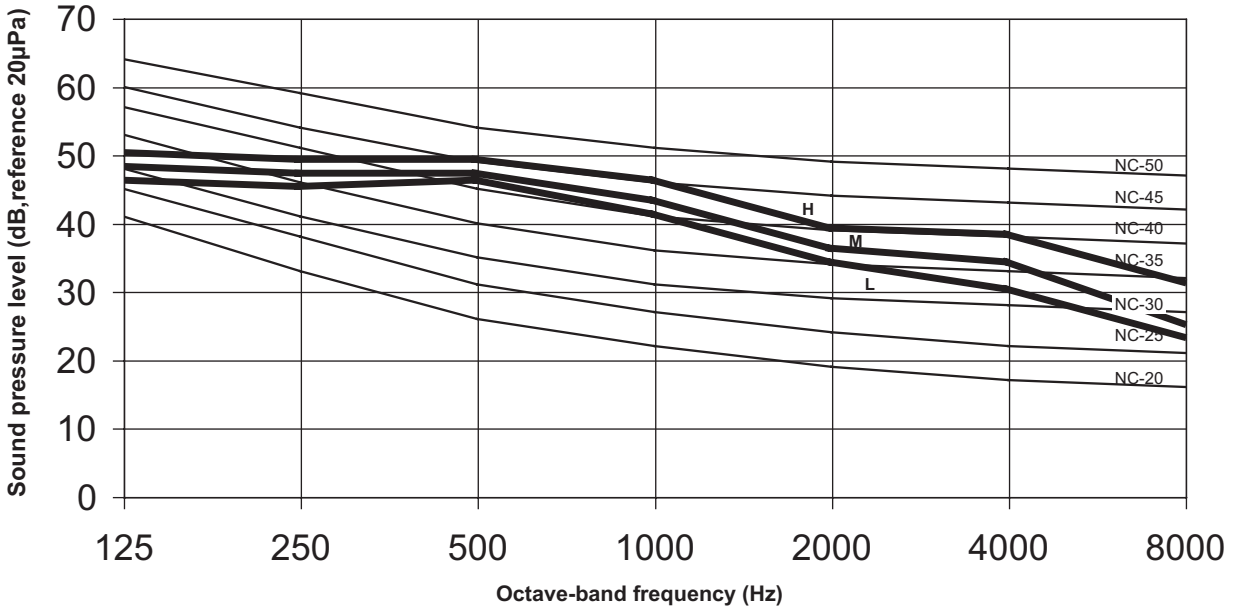
ACC60C NC CURVE

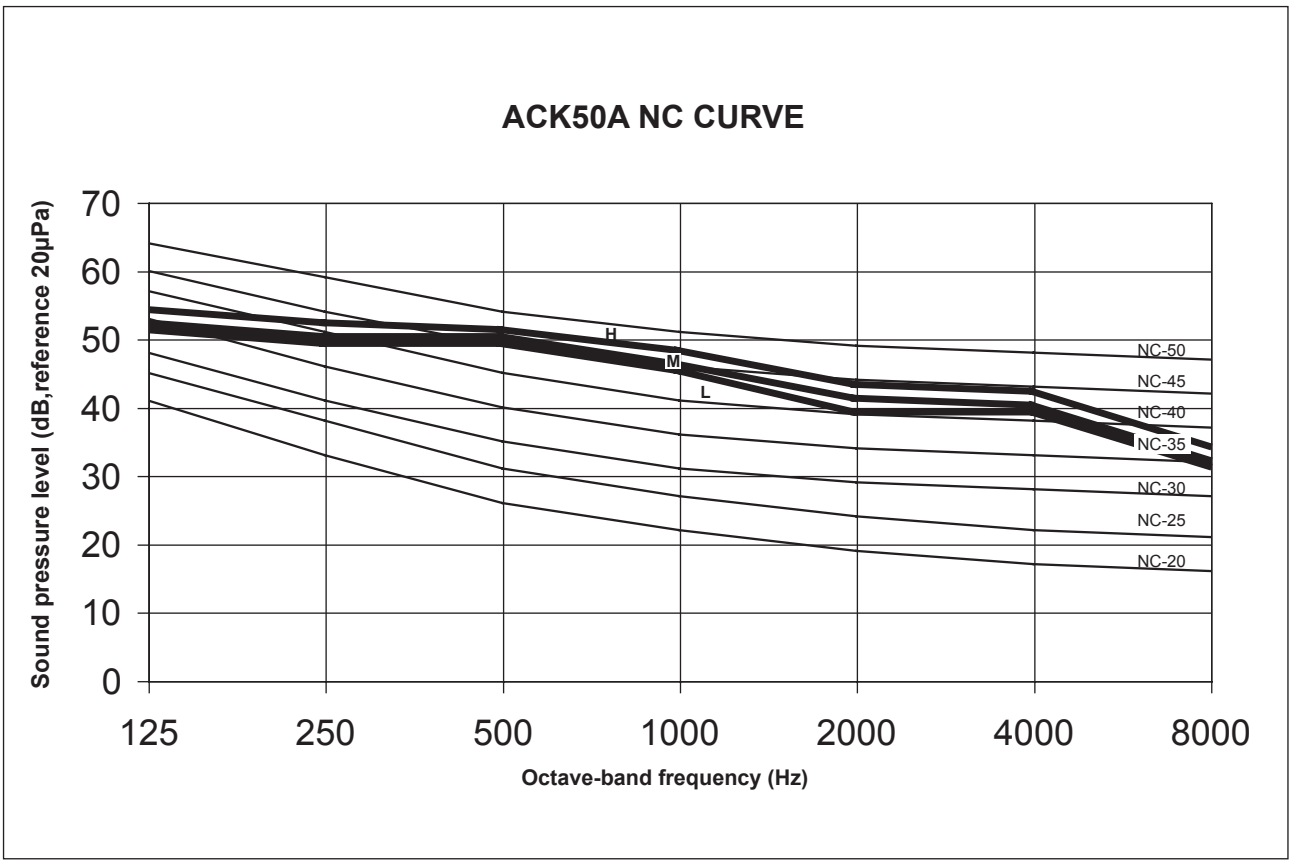


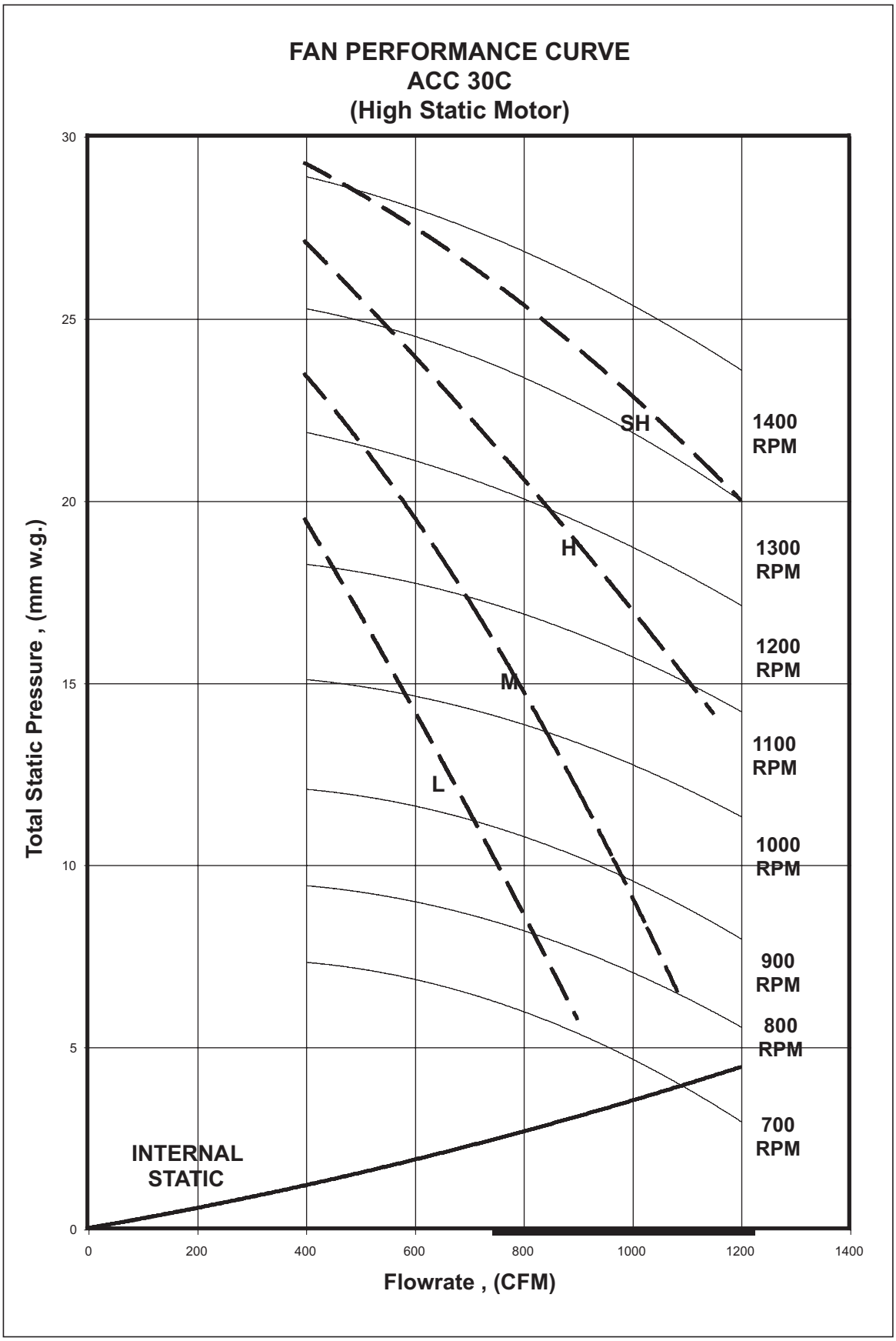
ACK30A NC CURVE



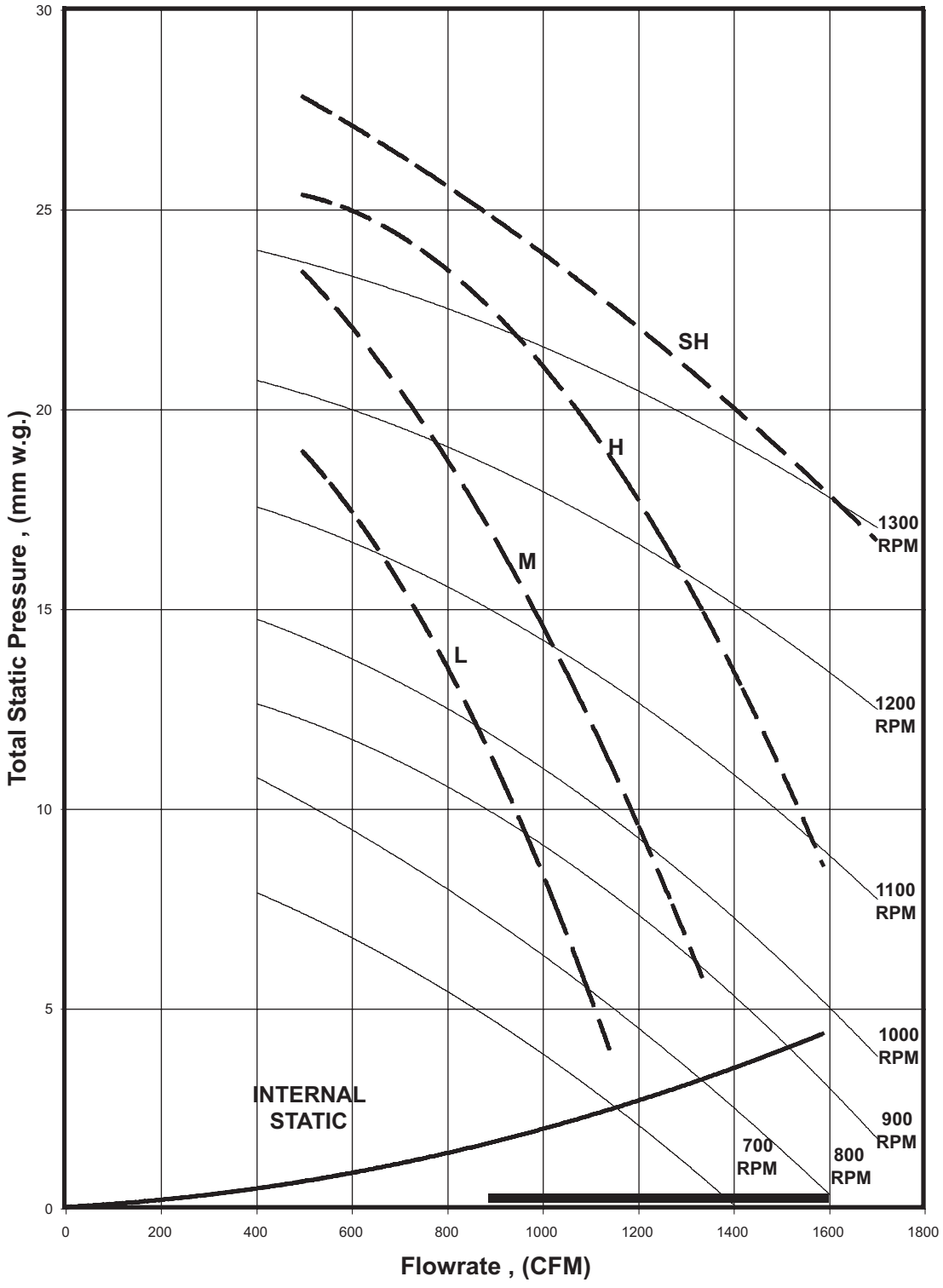
ACK40A NC CURVE



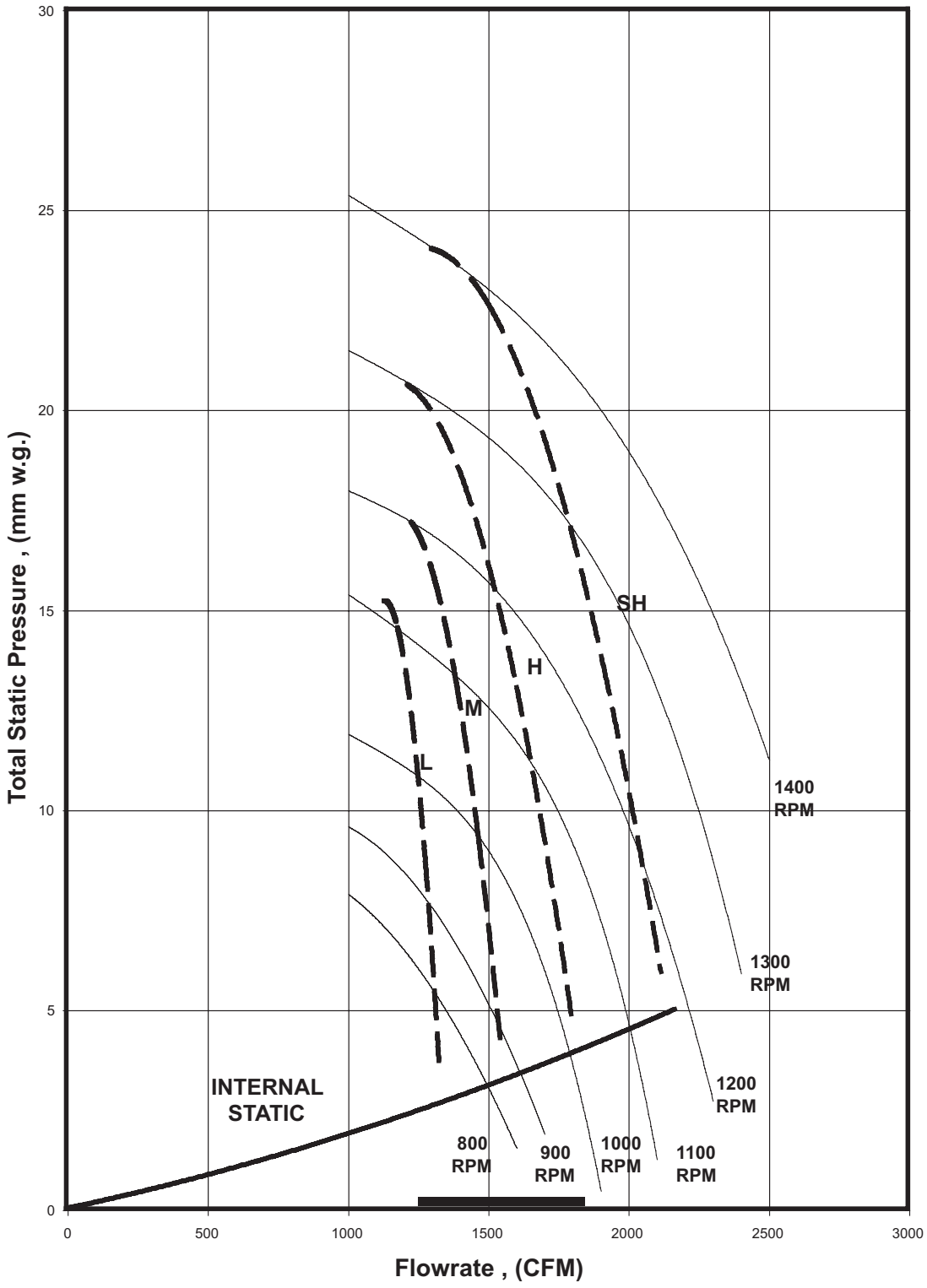

ACK50A NC CURVE
Sound pressure level (dB,reference 20μPa)
70
60
50
40
30
20
10
0
125
250
500
1000
2000
4000
8000
Octave-band frequency (Hz)
H
M
L
NC-50
NC-45
NC-40
NC-35
NC-30
NC-25
NC-20


FAN PERFORMANCE CURVE
ACC 30C
(High Static Motor)
Total Static Pressure , (mm w.g.)
Flowrate , (CFM)
30
25
20
15
10
5
0
0
200
400
600
800
1000
1200
1400
SH
H
M
L
1400 RPM
1300 RPM
1200 RPM
1100 RPM
1000 RPM
900 RPM
800 RPM
700 RPM
INTERNAL STATIC

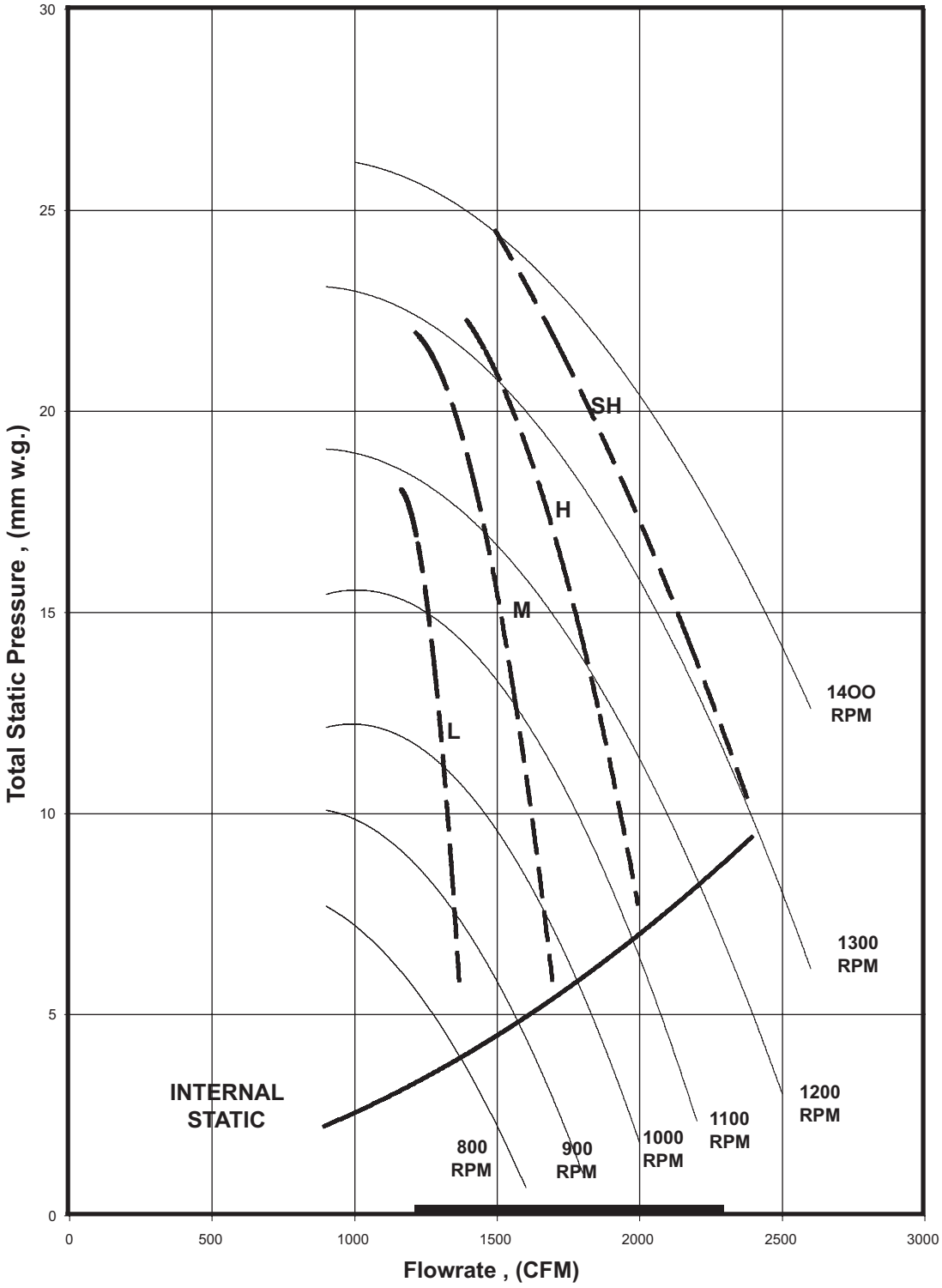
FAN PERFORMANCE CURVE
ACC 40C
(High Static Motor)



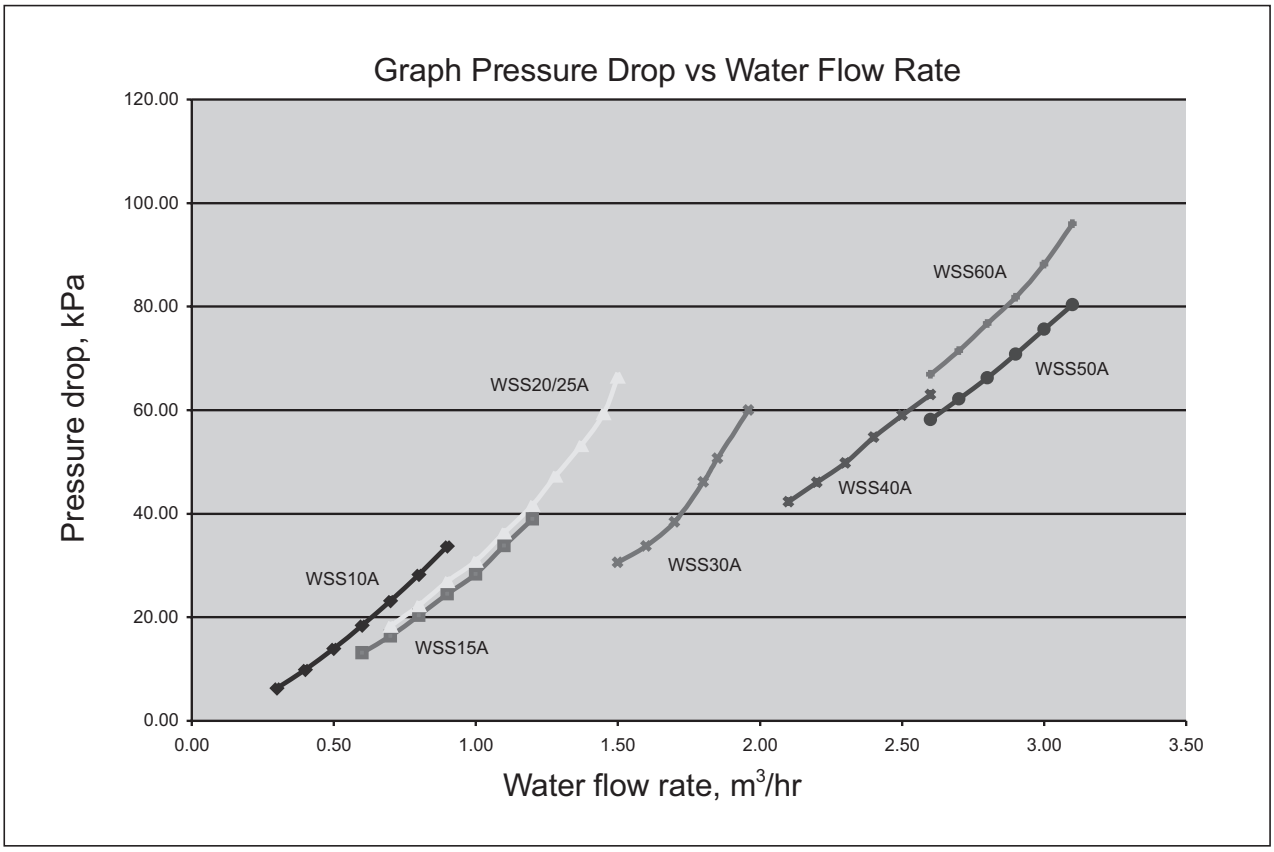
FAN PERFORMANCE CURVE
ACC 50C
(High Static Motor)



FAN PERFORMANCE CURVE
ACC 60C
(High Static Motor)



Water Pressure Drop vs. Water Flow Rate Curve



6. ENGINEERING & PHYSICAL DATA

General Data - Cooling only unit (R22)

MODEL		INDOOR UNIT			ACC 30C	ACC 40C
		OUTDOOR UNIT			AWSS 30A	AWSS 40A
NOMINAL COOLING CAPACITY				Btu/h	27090	40755
				W	7940	11945
NOMINAL TOTAL INPUT POWER				W	2220	3050
NOMINAL RUNNING CURRENT				A	12.20	5.40
POWER SOURCE				V/Ph/Hz	380-415 / 3 / 50	
EER				W/W	3.58	3.92
REFRIGERANT TYPE					R22	
REFRIGERANT CONTROL					INDOOR CAP TUBE	
INDOOR UNIT	CONTROL	AIR DISCHARGE			DUCTED	
		OPERATION			SLM WIRED HANDSET	
	AIR FLOW	SUPER HIGH		l/s / CFM	425 / 900	519 / 1100
		HIGH		l/s / CFM	392 / 830	500 / 1060
		MEDIUM		l/s / CFM	359 / 760	467 / 990
		LOW		l/s / CFM	335 / 710	425 / 900
	EXTERNAL STATIC PRESSURE (SH/H/M/L)			Pa (in.wg.)	206 / 167 / 127 / 88 (0.83 / 0.67 / 0.51 / 0.35)	206 / 176 / 127 / 93 (0.83 / 0.71 / 0.51 / 0.37)
	SOUND PRESSURE LEVEL (SH/H/M/L)			dBA	49 / 46 / 42 / 38	51 / 49 / 45 / 41
	UNIT DIMENSION	HEIGHT		mm/in	378 / 14.9	378 / 14.9
		WIDTH		mm/in	929 / 36.6	1045 / 41.1
		DEPTH		mm/in	541 / 21.3	411 / 16.2
	PACKING DIMENSION	HEIGHT		mm/in	415 / 16.3	415 / 16.3
		WIDTH		mm/in	1126 / 44.3	1245 / 49.0
		DEPTH		mm/in	631 / 24.8	631 / 24.8
	UNIT WEIGHT			kg/lb	39 / 86.0	42 / 92.6
	CONDENSATE DRAIN SIZE			mm/in	19.1 / 3/4	
OUTDOOR UNIT	WATER FLOW RATE			l/s / m^3/h	0.49 / 1.8	0.66 / 2.39
	WATER PRESSURE DROP			kPa	42.20	57.00
	SOUND PRESSURE LEVEL			dBA	39	39
	UNIT DIMENSION	HEIGHT		mm/in	385 / 15.2	460 / 18.1
		WIDTH		mm/in	844 / 33.2	920 / 36.2
		DEPTH		mm/in	418 / 16.5	549 / 21.6
	PACKING DIMENSION	HEIGHT		mm/in	548 / 21.6	610 / 24.0
		WIDTH		mm/in	922 / 36.3	975 / 38.4
		DEPTH		mm/in	472 / 18.6	589 / 23.2
	UNIT WEIGHT			kg/lb	64.1 / 141.3	95.7 / 220.0
	PIPE CONNECTION	TYPE			FLARE VALVE	
		SIZE	LIQUID	mm/in	9.5 / 3/8	9.5 / 3/8
			GAS	mm/in	15.9 / 5/8	19.1 / 3/4
REFRIGERANT CHARGE				kg/lb	1.38 / 3.03	16.8 / 3.69

1) ALL SPECIFICATIONS ARE SUBJECTED TO CHANGE BY THE MANUFACTURER WITHOUT PRIOR NOTICE.
2) NOMINAL COOLING AND HEATING CAPACITY ARE BASED ON THE CONDITIONS BELOW :
a) COOLING - INDOOR 27.0°C DB / 19.0°C WB; ENTERING WATER TEMPERATURE 30.0°C, LEAVING WATER TEMPERATURE 35.0°C

General Data - Cooling only unit (R22)

MODEL		INDOOR UNIT			ACC 50C	ACC 60C
		OUTDOOR UNIT			AWSS 50A	AWSS 60A
NOMINAL COOLING CAPACITY				Btu/h	48450	53675
				W	14200	15730
NOMINAL TOTAL INPUT POWER				W	3650	4430
NOMINAL RUNNING CURRENT				A	6.80	7.90
POWER SOURCE				V/Ph/Hz	380-415 / 3 / 50	
EER				W/W	3.89	3.55
REFRIGERANT TYPE					R22	
REFRIGERANT CONTROL					INDOOR CAP TUBE	
INDOOR UNIT	CONTROL	AIR DISCHARGE			DUCTED	
		OPERATION			SLM WIRED HANDSET	
	AIR FLOW	SUPER HIGH		l/s / CFM	750 / 1590	779 / 1650
		HIGH		l/s / CFM	651 / 1380	722 / 1530
		MEDIUM		l/s / CFM	604 / 1280	675 / 1430
		LOW		l/s / CFM	571 / 1210	609 / 1290
	EXTERNAL STATIC PRESSURE (SH/H/M/L)			Pa (in.wg.)	176 / 157 / 137 / 108 (0.71 / 0.63 / 0.55 / 0.43)	176 / 157 / 137 / 98 (0.71 / 0.63 / 0.55 / 0.39)
	SOUND PRESSURE LEVEL (SH/H/M/L)			dBA	53 / 52 / 50 / 47	55 / 53 / 50 / 47
	UNIT DIMENSION	HEIGHT		mm/in	378 / 14.9	378 / 14.9
		WIDTH		mm/in	1299 / 51.1	1499 / 59.0
		DEPTH		mm/in	541 / 21.3	541 / 21.3
	PACKING DIMENSION	HEIGHT		mm/in	415 / 16.3	415 / 16.3
		WIDTH		mm/in	1497 / 59.0	1701 / 67.0
		DEPTH		mm/in	631 / 24.8	631 / 24.8
	UNIT WEIGHT			kg/lb	54 / 119.1	62 / 136.7
	CONDENSATE DRAIN SIZE			mm/in	19.1 / 3/4	
OUTDOOR UNIT	WATER FLOW RATE			l/s / m^3/h	0.78 / 2.82	0.85 / 3.05
	WATER PRESSURE DROP			kPa	66.20	86.50
	SOUND PRESSURE LEVEL			dBA	38	40
	UNIT DIMENSION	HEIGHT		mm/in	504 / 19.8	504 / 19.8
		WIDTH		mm/in	920 / 36.2	920 / 36.2
		DEPTH		mm/in	648 / 25.5	549 / 21.6
	PACKING DIMENSION	HEIGHT		mm/in	652 / 25.7	652 / 25.7
		WIDTH		mm/in	975 / 38.4	975 / 38.4
		DEPTH		mm/in	683 / 26.9	683 / 26.9
	UNIT WEIGHT			kg/lb	119.6 / 263.7	123.4 / 272.1
	PIPE CONNECTION	TYPE			FLARE VALVE	
		SIZE	LIQUID	mm/in	9.5 / 3/8	12.7 / 1/2
			GAS	mm/in	19.1 / 3/4	19.1 / 3/4
REFRIGERANT CHARGE				kg/lb	2.00 / 4.41	2.23 / 4.91

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2) NOMINAL COOLING AND HEATING CAPACITY ARE BASED ON THE CONDITIONS BELOW :
a) COOLING - INDOOR 27.0°C DB / 19.0°C WB; ENTERING WATER TEMPERATURE 30.0°C, LEAVING WATER TEMPERATURE 35.0°C

General Data - Cooling only unit (R22)

MODEL		INDOOR UNIT			ACK 30A
		OUTDOOR UNIT			AWSS 30A
NOMINAL COOLING CAPACITY				Btu/h	29800
				W	8730
NOMINAL TOTAL INPUT POWER				W	2300
NOMINAL RUNNING CURRENT				A	12.04
POWER SOURCE				V/Ph/Hz	380-415 / 3 / 50
EER				W/W	3.80
REFRIGERANT TYPE					R22
REFRIGERANT CONTROL					INDOOR CAP TUBE
INDOOR UNIT	CONTROL	AIR DISCHARGE			4 WAY AUTOMATIC LOUVER (UP & DOWN)
		OPERATION			WIRELESS OR WIRED MICROCOMPUTER REMOTE CONTROL
	AIR FLOW	HIGH		l/s / CFM	415 / 880
		MEDIUM		l/s / CFM	349 / 740
		LOW		l/s / CFM	321 / 680
	SOUND PRESSURE LEVEL (H/M/L)			dBA	49 / 45 / 43
	UNIT DIMENSION ( )- With Panel	HEIGHT		mm/in	335 (363) / 13.2 (14.3)
		WIDTH		mm/in	820 (930) / 32.2 (36.6)
		DEPTH		mm/in	820 (930) / 32.2 (36.6)
	PACKING DIMENSION ( )- With Panel	HEIGHT		mm/in	380 / (130) / 15.0 (5.1)
		WIDTH		mm/in	920 (1020) / 36.2 (40.2)
		DEPTH		mm/in	920 (1000) / 36.2 (39.4)
	UNIT WEIGHT (UNIT + PANEL)			kg/lb	35 + 4 / 71 + 9
	CONDENSATE DRAIN SIZE			mm/in	19.1 / 3/4
OUTDOOR UNIT	WATER FLOW RATE			l/s / m^3/h	0.49 / 1.8
	WATER PRESSURE DROP			kPa	42.20
	SOUND PRESSURE LEVEL			dBA	39
	UNIT DIMENSION	HEIGHT		mm/in	385 / 15.2
		WIDTH		mm/in	844 / 33.2
		DEPTH		mm/in	418 / 16.5
	PACKING DIMENSION	HEIGHT		mm/in	548 / 21.6
		WIDTH		mm/in	922 / 36.3
		DEPTH		mm/in	472 / 18.6
	UNIT WEIGHT			kg/lb	64.1 / 141.3
	PIPE CONNECTION	TYPE			FLARE VALVE
		SIZE	LIQUID	mm/in	9.5 / 3/8
			GAS	mm/in	15.9 / 5/8
REFRIGERANT CHARGE				kg/lb	13.8 / 3.03

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2) NOMINAL COOLING AND HEATING CAPACITY ARE BASED ON THE CONDITIONS BELOW :
a) COOLING - INDOOR 27.0°C DB / 19.0°C WB; ENTERING WATER TEMPERATURE 30.0°C, LEAVING WATER TEMPERATURE 35.0°C

General Data - Cooling only unit (R22)

MODEL		INDOOR UNIT			ACK 40A	ACK 50A
		OUTDOOR UNIT			AWSS 40A	AWSS 50A
NOMINAL COOLING CAPACITY				Btu/h	37200	46200
				W	10903	13540
NOMINAL TOTAL INPUT POWER				W	2900	3672
NOMINAL RUNNING CURRENT				A	5.41	6.91
POWER SOURCE				V/Ph/Hz	380-415 / 3 / 50	
EER				W/W	3.76	3.69
REFRIGERANT TYPE					R22	
REFRIGERANT CONTROL					INDOOR CAP TUBE	
INDOOR UNIT	CONTROL	AIR DISCHARGE			4 WAY AUTOMATIC LOUVER (UP & DOWN)	
		OPERATION			WIRELESS OR WIRED MICROCOMPUTER REMOTE CONTROL	
	AIR FLOW	HIGH		l/s / CFM	467 / 990	491 / 1040
		MEDIUM		l/s / CFM	406 / 860	448 / 950
		LOW		l/s / CFM	359 / 760	411 / 870
	SOUND PRESSURE LEVEL (H/M/L)			dBA	51 / 48 / 46	53 / 52 / 50
	UNIT DIMENSION ( )- With Panel	HEIGHT		mm/in	335 (363) / 13.2 (14.3)	
		WIDTH		mm/in	820 (930) / 32.2 (36.6)	
		DEPTH		mm/in	820 (930) / 32.2 (36.6)	
	PACKING DIMENSION ( )- With Panel	HEIGHT		mm/in	380 (130) / 15.0 (5.1)	
		WIDTH		mm/in	920 (1020) / 36.2 (40.2)	
		DEPTH		mm/in	920 (1000) / 36.2 (39.4)	
	UNIT WEIGHT (UNIT + PANEL)			kg/lb	38 + 4 / 84 + 9	40 + 4 / 88 + 9
	CONDENSATE DRAIN SIZE			mm/in	19.1 / 3/4	
OUTDOOR UNIT	WATER FLOW RATE			l/s / m^3/h	0.66 / 2.39	0.78 / 2.82
	WATER PRESSURE DROP			kPa	57.00	66.20
	SOUND PRESSURE LEVEL			dBA	39	38
	UNIT DIMENSION	HEIGHT		mm/in	460 / 18.11	504 / 19.84
		WIDTH		mm/in	920 / 36.22	
		DEPTH		mm/in	450 / 17.72	550 / 21.65
	PACKING DIMENSION	HEIGHT		mm/in	610 / 24.02	652 / 25.67
		WIDTH		mm/in	975 / 38.39	
		DEPTH		mm/in	589 / 23.19	683 / 26.89
	UNIT WEIGHT			kg/lb	78.6 / 172.9	92.36 / 203.2
	PIPE CONNECTION	TYPE			FLARE VALVE	
		SIZE	LIQUID	mm/in	9.52 / 3/8	
			GAS	mm/in	19.05 / 3/4	
REFRIGERANT CHARGE				kg/lb	1.675 / 3.69	2.000 / 4.41

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2) NOMINAL COOLING AND HEATING CAPACITY ARE BASED ON THE CONDITIONS BELOW :

a) COOLING - INDOOR 27.0°C DB / 19.0°C WB; ENTERING WATER TEMPERATURE 30.0°C, LEAVING WATER TEMPERATURE 35.0°C

3) EFFECTIVE POWER INPUT IS USED IN THE RATED EER/COP CALCULATION, ACCORDING TO ISO STANDARD: ISO 5151 & ISO 13253.

Components Data (R22)

MODEL	**INDOOR UNIT**				**ACC 30C**	**ACC 40C**
	OUTDOOR UNIT				**AWSS 30A**	**AWSS 40A**
INDOOR FAN	**TYPE**				CENTRIFUGAL	
	Q'TY				2	
	MATERIAL				GALVANIZED STEEL	
	DRIVE				DIRECT	
	DIAMETER			**mm/in**	214 / 8.43	
	LENGTH			**mm/in**	203.2 / 8.00	
INDOOR FAN MOTOR	**TYPE**				INDUCTION	
	Q'TY				1	
	INDEX OF PROTECTION (IP)				N/A	
COMPRESSOR	**TYPE**				ROTARY	
	OIL TYPE				ATMOS M60 or SUNISO 4GDID	
	OIL AMOUNT			**cm^3 / fl.oz**	700 / 26.64	1307 / 46
INDOOR COIL	**TUBE**	**MATERIAL**			SEAMLESS COPPER	SEAMLESS COPPER
		DIAMETER		**mm/in**	9.52 / 3/8	9.52 / 3/8
		THICKNESS		**mm/in**	0.35 / 0.014	0.36 / 0.014
	FIN	**MATERIAL**			ALUMINIUM (CORR. FIN)	ALUMINIUM (CORR. FIN)
		THICKNESS		**mm/in**	0.127 / 0.005	0.127 / 0.005
		FACE AREA		**m^2/ft^2**	0.277 / 2.98	0.31 / 3.44
		ROW			3	3
		FIN PER INCH			12	14
AIR QUALITY	**FILTER**	**TYPE**			WASHABLE SARANET FILTER	
		QUANTITY		**pc**	2	2
		SIZE	**LENGTH**	**mm/in**	449 / 17.68	507 / 19.96
			WIDTH	**mm/in**	305 / 12.01	305 / 12.01
			THICKNESS	**mm/in**	5 / 0.20	
CASING	**INDOOR UNIT**		**MATERIAL**		GALVANIZED STEEL	
			FINISHING		WITH PE INSULATION	
			COLOUR		WITHOUT POWDER PAINT	
	OUTDOOR UNIT		**MATERIAL**		ELETCRO GALVANISED MILD STEEL	
			FINISHING		POLYESTER POWDER COATING	
			COLOUR		WHITE	
OUTDOOR (HEAT EXCHANGER)	**TYPE**				TUBE IN TUBE (COAXIAL COIL)	
	NOMINAL WATER FLOW RATE			**l/s / m^3/h**	0.49 / 1.75	0.66 / 2.39
	NOMINAL WATER PRESSURE DROP			**kPa / psi**	42.20	57.00
	DRAIN PIPE SIZE			**mm / in**	19.05 / 3/4	19.05 / 3/4
	WATER INLET (BSP) MALE			**mm / in**	19.05 / 3/4	19.05 / 3/4
	WATER OUTLET (BSP) MALE			**mm / in**	19.05 / 3/4	19.05 / 3/4

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Components Data (R22)

MODEL	**INDOOR UNIT**				**ACC 50C**	**ACC 60C**
	OUTDOOR UNIT				**AWSS 50A**	**AWSS 60A**
INDOOR FAN	**TYPE**				CENTRIFUGAL	
	Q'TY				2	
	MATERIAL				GALVANIZED STEEL	
	DRIVE				DIRECT	
	DIAMETER			**mm/in**	214 / 8.43	
	LENGTH			**mm/in**	203.2 / 8.00	
INDOOR FAN MOTOR	**TYPE**				INDUCTION	
	Q'TY				1	
	INDEX OF PROTECTION (IP)				N/A	
COMPRESSOR	**TYPE**				SCROLL	
	OIL TYPE				MINERAL (Sontex 200 LT)	
	OIL AMOUNT			**cm^3 / fl.oz**	1193 / 42	1705 / 60
INDOOR COIL	**TUBE**	**MATERIAL**			SEAMLESS COPPER	
		DIAMETER		**mm/in**	9.52 / 3/8	
		THICKNESS		**mm/in**	0.35 / 0.014	
	FIN	**MATERIAL**			ALUMINIUM (CORR. FIN)	
		THICKNESS		**mm/in**	0.127 / 0.005	
		FACE AREA		**m^2/ft^2**	0.40 / 4.40	0.47 / 5.16
		ROW			3	
		FIN PER INCH			14	
AIR QUALITY	**FILTER**	**TYPE**			WASHABLE SARANET FILTER	
		QUANTITY		**pc**	2	
		SIZE	**LENGTH**	**mm/in**	634 / 24.96	734 / 28.90
			WIDTH	**mm/in**	305 / 12.01	
			THICKNESS	**mm/in**	5 / 0.20	
CASING	**INDOOR UNIT**		**MATERIAL**		GALVANIZED STEEL	
			FINISHING		WITH PE INSULATION	
			COLOUR		WITHOUT POWDER PAINT	
	OUTDOOR UNIT		**MATERIAL**		ELETCRO GALVANISED MILD STEEL	
			FINISHING		POLYESTER POWDER COATING	
			COLOUR		WHITE	
OUTDOOR (HEAT EXCHANGER)	**TYPE**				TUBE IN TUBE (COAXIAL COIL)	
	NOMINAL WATER FLOW RATE			**l/s / m^3/h**	0.78 / 2.82	0.85 / 3.05
	NOMINAL WATER PRESSURE DROP			**kPa / psi**	66.20	86.50
	DRAIN PIPE SIZE			**mm / in**	19.05 / 3/4	
	WATER INLET (BSP) MALE			**mm / in**	19.05 / 3/4	
	WATER OUTLET (BSP) MALE			**mm / in**	19.05 / 3/4	

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Components Data (R22)

MODEL	**INDOOR UNIT**				**ACK 30A**
	OUTDOOR UNIT				**AWSS 30A**
INDOOR FAN	**TYPE**				TURBO FAN
	Q'TY				1
	MATERIAL				ASG20
	DRIVE				DIRECT
	DIAMETER			**mm/in**	450 / 17.72
	LENGTH			**mm/in**	169.5 / 6.67
INDOOR FAN MOTOR	**TYPE**				INDUCTION
	Q'TY				1
	INDEX OF PROTECTION (IP)				IP22
COMPRESSOR	**TYPE**				ROTARY
	OIL TYPE				ATMOS M60 or SUNISO 4GDID
	OIL AMOUNT			**cm^3 / fl.oz**	700 / 24.64
INDOOR COIL	**TUBE**	**MATERIAL**			SEAMLESS COPPER
		DIAMETER		**mm/in**	9.52 / 3/8
		THICKNESS		**mm/in**	0.35 / 0.014
	FIN	**MATERIAL**			ALUMINIUM (SLIT FIN)
		THICKNESS		**mm/in**	0.11 / 0.0043
		FACE AREA		**m^2/ft^2**	0.469 / 5.022
		ROW			2
		FIN PER INCH			16
AIR QUALITY	**FILTER**	**TYPE**			WASHABLE SARANET FILTER
		QUANTITY		**pc**	1
		SIZE	**LENGTH**	**mm/in**	576.0 / 22.7
			WIDTH	**mm/in**	556.0 / 21.9
			THICKNESS	**mm/in**	22.0 / 0.87
CASING	**PANEL**			**MATERIAL**	ABS
				FINISHING	N/A
				COLOUR	LIGHT GREY
	INDOOR UNIT			**MATERIAL**	GALVANIZED IRON
				FINISHING	WITH PE INSULATION
				COLOUR	GREY
	OUTDOOR UNIT			**MATERIAL**	ELETCRO GALVANISED MILD STEEL
				FINISHING	POLYESTER POWDER COATING
				COLOUR	WHITE
OUTDOOR (HEAT EXCHANGER)	**TYPE**				TUBE IN TUBE (COAXIAL COIL)
	NOMINAL WATER FLOW RATE			**l/s / m^3/h**	0.49 / 1.75
	NOMINAL WATER PRESSURE DROP			**kPa / psi**	42.20
	DRAIN PIPE SIZE			**mm / in**	19.05 / 3/4
	WATER INLET (BSP) MALE			**mm / in**	19.05 / 3/4
	WATER OUTLET (BSP) MALE			**mm / in**	19.05 / 3/4

1) ALL SPECIFICATIONS ARE SUBJECTED TO CHANGE BY THE MANUFACTURER WITHOUT PRIOR NOTICE.

Components Data (R22)

MODEL	**INDOOR UNIT**				**ACK 40A**	**ACK 50A**
	OUTDOOR UNIT				**AWSS 40A**	**AWSS 50A**
INDOOR FAN	**TYPE**				TURBO FAN	
	Q'TY				1	
	MATERIAL				ASG20	
	DRIVE				DIRECT	
	DIAMETER			**mm/in**	450 / 17.72	
	LENGTH			**mm/in**	169.5 / 6.67	
INDOOR FAN MOTOR	**TYPE**				INDUCTION	
	Q'TY				1	
	INDEX OF PROTECTION (IP)				IP22	
COMPRESSOR	**TYPE**				SCROLL	
	OIL TYPE				MINERAL (Sontex 200 LT)	
	OIL AMOUNT			**cm^3 / fl.oz**	1307 / 46	1193 / 42
INDOOR COIL	**TUBE**	**MATERIAL**			SEAMLESS INNER GROOVED COPPER	
		DIAMETER		**mm/in**	7.00 / 0.28	
		THICKNESS		**mm/in**	0.28 / 0.011	
	FIN	**MATERIAL**			ALUMINIUM (HYDROPHILIC FIN)	
		THICKNESS		**mm/in**	0.11 / 0.0043	
		FACE AREA		**m^2/ft^2**	0.469 / 5.022	
		ROW			3	
		FIN PER INCH			20	
AIR QUALITY	**FILTER**	**TYPE**			WASHABLE SARANET FILTER	
		QUANTITY		**pc**	1	
		SIZE	**LENGTH**	**mm/in**	576.0 / 22.7	
			WIDTH	**mm/in**	556.0 / 21.9	
			THICKNESS	**mm/in**	22.0 / 0.87	
CASING	**PANEL**			**MATERIAL**	ABS	
				FINISHING	N/A	
				COLOUR	LIGHT GREY	
	INDOOR UNIT			**MATERIAL**	GALVANIZED IRON	
				FINISHING	WITH PE INSULATION	
				COLOUR	GREY	
	OUTDOOR UNIT		**MATERIAL**		ELETCRO GALVANISED MILD STEEL	
			FINISHING		POLYESTER POWDER COATING	
			COLOUR		WHITE	
OUTDOOR (HEAT EXCHANGER)	**TYPE**				TUBE IN TUBE (COAXIAL COIL)	
	NOMINAL WATER FLOW RATE			**l/s / m^3/h**	0.66 / 2.39	0.78 / 2.82
	NOMINAL WATER PRESSURE DROP			**kPa / psi**	57.00	66.20
	DRAIN PIPE SIZE			**mm / in**	19.05 / 3/4	
	WATER INLET (BSP) MALE			**mm / in**	19.05 / 3/4	
	WATER OUTLET (BSP) MALE			**mm / in**	19.05 / 3/4	

1) ALL SPECIFICATIONS ARE SUBJECTED TO CHANGE BY THE MANUFACTURER WITHOUT PRIOR NOTICE.

7. PERFORMANCE DATA

ACC30C/AWSS30A

Cooling Only (R22)

Water Flow Rate = 1.75 m^3/hr

Indoor, DB	Indoor, WB	Capacity	Entering Water Temperature, (°C)						
(°C)	(°C)	(kW)	13	20	25	30	35	40	45
27.0	15.5	TC	8.51	8.14	7.88	7.62	7.20	6.78	6.36
		SC	8.32	7.99	7.74	7.50	7.12	6.73	6.35
	17	TC	8.83	8.43	8.15	7.87	7.40	6.94	6.47
		SC	7.63	7.37	7.19	7.01	6.73	6.44	6.16
	19	TC	9.25	8.82	8.52	8.21	7.68	7.15	6.62
		SC	6.70	6.55	6.44	5.83	6.19	6.04	5.91
	20	TC	9.36	8.97	8.70	8.43	7.93	7.43	6.93
		SC	6.15	6.00	5.90	5.81	5.67	5.54	5.41
	23	TC	9.67	9.43	9.25	9.08	8.68	8.27	7.87
		SC	4.53	4.44	4.38	4.31	4.20	4.08	3.97
	24	TC	9.77	9.58	9.44	9.30	8.93	8.55	8.18
		SC	4.01	3.94	3.89	3.84	3.73	3.62	3.51

ACC40C/AWSS40A

Cooling Only (R22)

Water Flow Rate = 2.39 m^3/hr

Indoor, DB	Indoor, WB	Capacity	Entering Water Temperature, (°C)						
(°C)	(°C)	(kW)	13	20	25	30	35	40	45
27.0	15.5	TC	11.39	10.90	10.55	10.20	9.63	9.07	8.51
		SC	11.14	10.69	10.37	10.04	9.53	9.01	8.50
	17	TC	11.82	11.29	10.91	10.54	9.91	9.29	8.66
		SC	10.21	9.87	9.63	9.39	9.00	8.62	8.25
	19	TC	12.39	11.81	11.40	10.99	10.28	9.57	8.87
		SC	8.97	8.76	8.62	8.57	8.29	8.09	7.90
	20	TC	12.53	12.01	11.65	11.28	10.61	9.95	9.28
		SC	8.23	8.04	7.90	7.78	7.59	7.41	7.24
	23	TC	12.94	12.62	12.39	12.15	11.61	11.07	10.53
		SC	6.07	5.95	5.86	5.77	5.62	5.46	5.31
	24	TC	13.08	12.82	12.63	12.45	11.95	11.45	10.95
		SC	5.37	5.28	5.21	5.14	4.99	4.84	4.69

Note:

1. DB = Dry Bulb, WB = Wet Bulb, TC = Total Capacity, SC = Sensible Capacity
2. All datas above are generated at delta T = Leaving Water Temperature - Entering Water Temperature = 5°C

ACC50C/AWSS50A
Cooling Only (R22)

Water Flow Rate = 2.82 m^3/hr

Indoor, DB	Indoor, WB	Capacity	Entering Water Temperature, (°C)						
(°C)	(°C)	(kW)	13	20	25	30	35	40	45
27.0	15.5	TC	14.12	13.51	13.08	12.65	11.95	11.25	10.55
		SC	13.82	13.26	12.86	12.46	11.82	11.18	10.54
	17	TC	14.65	14.00	13.53	13.07	12.29	11.52	10.74
		SC	12.66	12.24	11.94	11.64	11.17	10.69	10.23
	19	TC	15.36	14.65	14.14	13.63	12.75	11.87	11.00
		SC	11.13	10.87	10.69	10.77	10.28	10.03	9.80
	20	TC	15.53	14.90	14.45	13.99	13.16	12.34	11.51
		SC	10.20	9.97	9.80	9.64	9.41	9.19	8.98
	23	TC	16.05	15.65	15.36	15.07	14.40	13.73	13.06
		SC	7.53	7.37	7.27	7.16	6.97	6.78	6.59
	24	TC	16.22	15.90	15.67	15.44	14.82	14.20	13.58
		SC	6.66	6.55	6.46	6.38	6.19	6.00	5.82

ACC60C/AWSS60A
Cooling Only (R22)

Water Flow Rate = 3.05 m^3/hr

Indoor, DB	Indoor, WB	Capacity	Entering Water Temperature, (°C)						
(°C)	(°C)	(kW)	13	20	25	30	35	40	45
27.0	15.5	TC	16.40	15.70	15.19	14.69	13.88	13.07	12.26
		SC	16.05	15.40	14.93	14.47	13.72	12.98	12.24
	17	TC	17.02	16.26	15.72	15.18	14.28	13.38	12.48
		SC	14.71	14.22	13.87	13.52	12.97	12.42	11.88
	19	TC	17.84	17.01	16.42	15.83	14.81	13.79	12.77
		SC	12.92	12.62	12.42	12.35	11.93	11.65	11.39
	20	TC	18.04	17.30	16.78	16.25	15.29	14.33	13.37
		SC	11.85	11.58	11.39	11.20	10.93	10.67	10.43
	23	TC	18.64	18.18	17.84	17.51	16.73	15.95	15.17
		SC	8.74	8.57	8.44	8.32	8.09	7.87	7.65
	24	TC	18.84	18.47	18.20	17.93	17.21	16.49	15.77
		SC	7.74	7.60	7.51	7.41	7.19	6.97	6.76

Note:
1. DB = Dry Bulb, WB = Wet Bulb, TC = Total Capacity, SC = Sensible Capacity
2. All datas above are generated at delta T = Leaving Water Temperature - Entering Water Temperature = 5°C

ACK30A/AWSS30A
Cooling Only (R22)

Water Flow Rate = 1.75 m^3/hr

Indoor, DB	Indoor, WB	Capacity	Entering Water Temperature, (°C)						
(°C)	(°C)	(kW)	13	20	25	30	35	40	45
27.0	15.5	TC	9.05	8.66	8.38	8.10	7.65	7.21	6.76
		SC	8.85	8.49	8.23	7.98	7.57	7.16	6.75
	17	TC	9.39	8.97	8.67	8.37	7.87	7.38	6.88
		SC	8.11	7.84	7.65	7.46	7.15	6.85	6.55
	19	TC	9.84	9.38	9.06	8.73	8.17	7.60	7.04
		SC	7.13	6.96	6.85	6.20	6.58	6.43	6.28
	20	TC	9.95	9.54	9.25	8.96	8.43	7.90	7.37
		SC	6.53	6.38	6.28	6.18	6.03	5.89	5.75
	23	TC	10.28	10.02	9.84	9.65	9.23	8.80	8.37
		SC	4.82	4.72	4.66	4.59	4.46	4.34	4.22
	24	TC	10.39	10.18	10.03	9.89	9.49	9.09	8.70
		SC	4.27	4.19	4.14	4.09	3.96	3.85	3.73

Note:

1. DB = Dry Bulb, WB = Wet Bulb, TC = Total Capacity, SC = Sensible Capacity
2. All datas above are generated at delta T = Leaving Water Temperature - Entering Water Temperature = 5°C

ACK40A/AWSS40A
Cooling Only (R22)

Water Flow Rate = 2.39 m^3/hr

Indoor, DB	Indoor, WB	Capacity	Entering Water Temperature, (°C)						
(°C)	(°C)	(kW)	13	20	25	30	35	40	45
27.0	15.5	TC	11.29	10.81	10.46	10.11	9.56	9.00	8.44
		SC	11.05	10.60	10.28	9.96	9.45	8.94	8.43
	17	TC	11.72	11.20	10.82	10.45	9.83	9.21	8.59
		SC	10.13	9.79	9.55	9.31	8.93	8.55	8.18
	19	TC	12.29	11.72	11.31	10.90	10.20	9.50	8.79
		SC	8.90	8.69	8.55	8.50	8.22	8.02	7.84
	20	TC	12.42	11.91	11.55	11.19	10.53	9.87	9.21
		SC	8.16	7.97	7.84	7.71	7.53	7.35	7.18
	23	TC	12.84	12.51	12.28	12.05	11.52	10.98	10.45
		SC	6.02	5.90	5.81	5.73	5.57	5.42	5.27
	24	TC	12.97	12.71	12.53	12.34	11.85	11.36	10.86
		SC	5.33	5.23	5.17	5.10	4.95	4.80	4.65

ACK50A/AWSS50A
Cooling Only (R22)

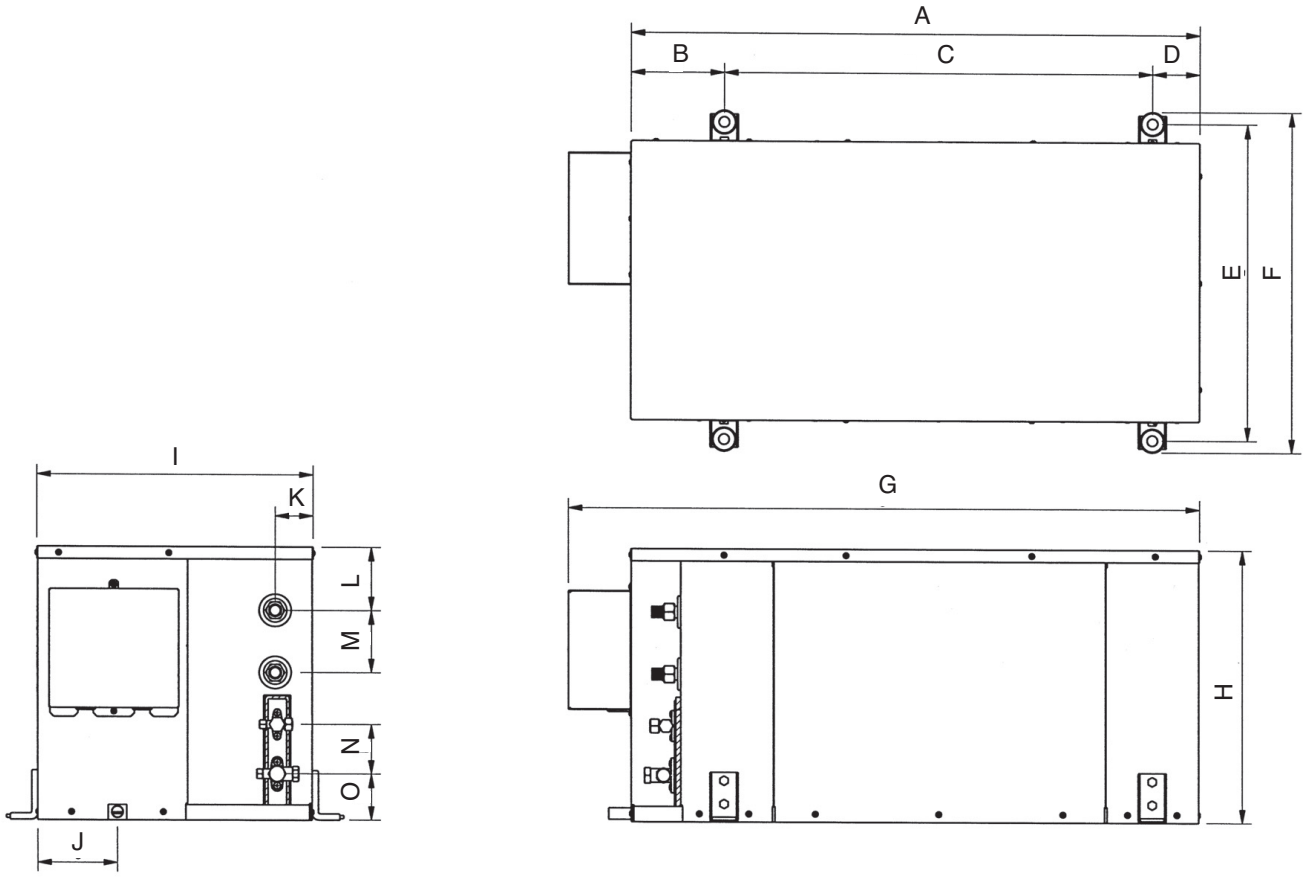
Water Flow Rate = 2.82 m^3/hr

Indoor, DB	Indoor, WB	Capacity	Entering Water Temperature, (°C)						
(°C)	(°C)	(kW)	13	20	25	30	35	40	45
27.0	15.5	TC	14.03	13.43	12.99	12.56	11.87	11.18	10.48
		SC	13.73	13.17	12.77	12.37	11.74	11.10	10.47
	17	TC	14.56	13.91	13.44	12.98	12.21	11.44	10.67
		SC	12.58	12.16	11.86	11.57	11.09	10.62	10.16
	19	TC	15.26	14.55	14.05	13.54	12.67	11.80	10.92
		SC	11.05	10.80	10.62	10.70	10.21	9.97	9.74
	20	TC	15.43	14.80	14.35	13.90	13.08	12.26	11.44
		SC	10.14	9.90	9.74	9.58	9.35	9.13	8.92
	23	TC	15.95	15.55	15.26	14.97	14.31	13.64	12.98
		SC	7.48	7.33	7.22	7.11	6.92	6.73	6.55
	24	TC	16.12	15.79	15.56	15.33	14.72	14.11	13.49
		SC	6.62	6.50	6.42	6.34	6.15	5.96	5.78

8. OUTLINE AND DIMENSION

Outdoor Unit

Model : AWSS 30/40/50/60A



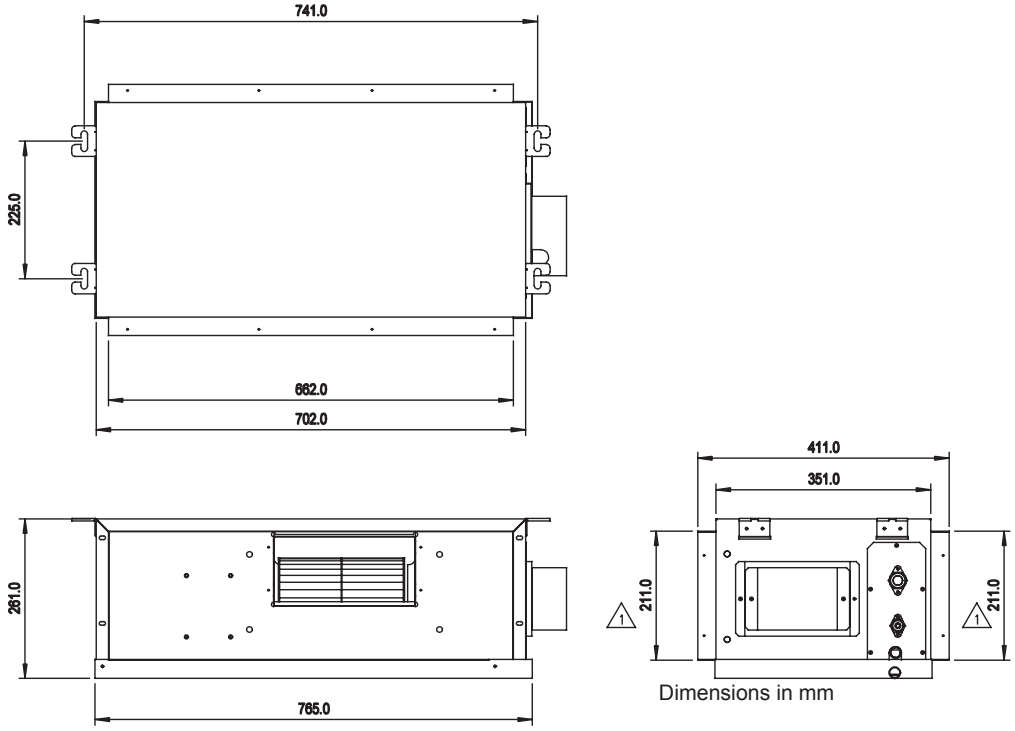
All dimensions in mm

MODEL	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
AWSS30A	780	152	556	72	380	418.5	844	385	320	130	61.5	94	80	60	62
AWSS40A	820	151	548	121	511	549.5	920	460	450	130	61.5	102	100	80	75
AWSS50/60A	820	162	581	77	610	648.5	920	504	550	130	61.5	107	100	80	75

Indoor Unit

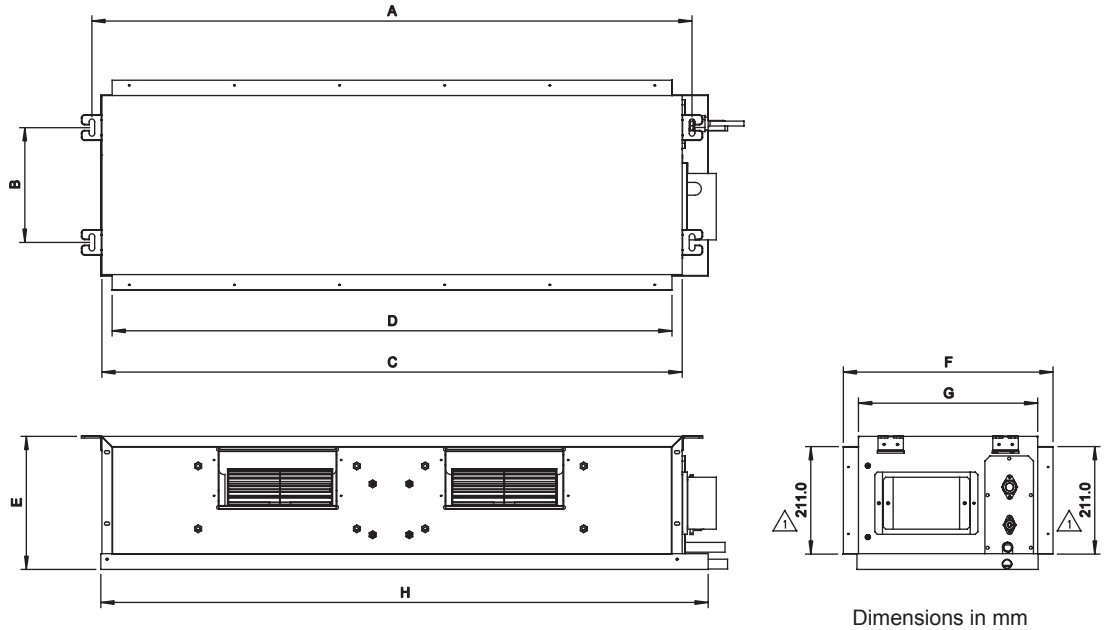
Ceiling Concealed

Model : ACC 10C



Dimensions in mm

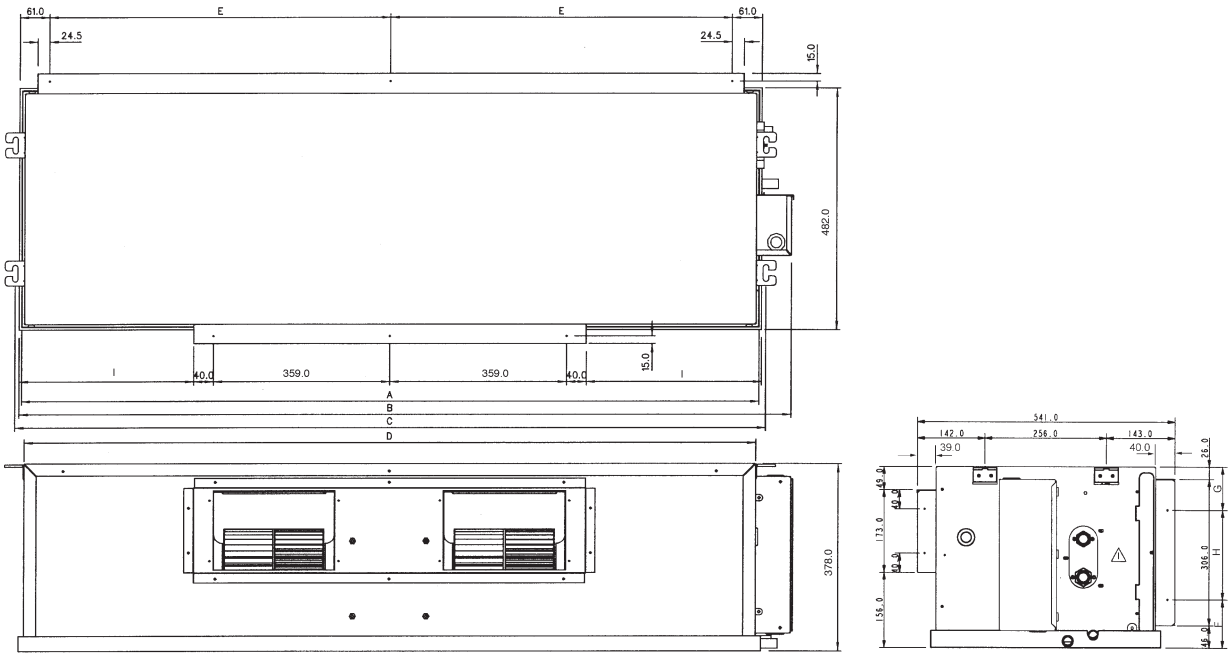
Model : ACC 15/20/25C



Dimensions in mm

MODEL	A	B	C	D	E	F	G	H
ACC15C	881.0	225.0	842.00	802.0	261.0	411.0	351.0	905.0
ACC20C	1041.0	225.0	1002.0	962.0	261.0	411.0	351.0	1065.0
ACC25C	1176.0	225.0	1137.0	1097.0	261.0	411.0	351.0	1200.0

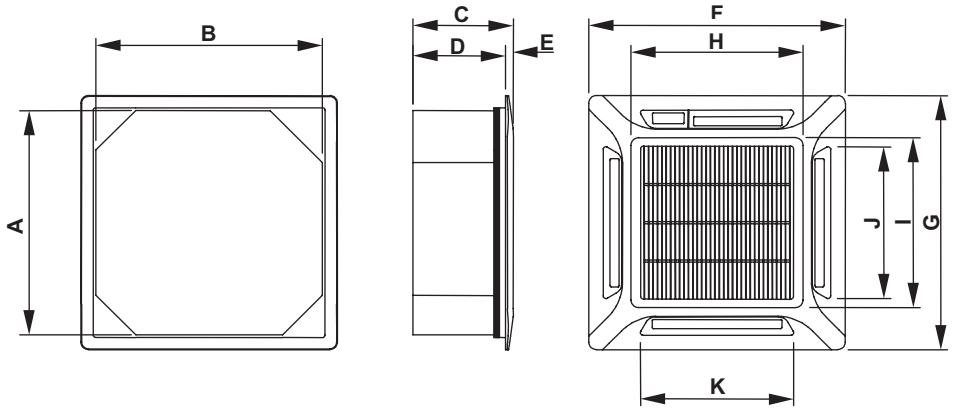
Model : ACC 30/40/50/60C



Dimensions in mm

MODEL	A	B	C	D	E	F	G	H	I
ACC30C	929.0	999.0	956.0	917.0	408.5	105.0	85.5	187.5	70.5
ACC40C	1045.0	1115.0	1072.00	1033.0	466.5	105.0	85.5	187.5	128.5
ACC50C	1299.0	1369.0	1326.0	1287.0	593.5	105.0	90.5	182.5	255.5
ACC60C	1499.0	1569.0	1526.0	1487.0	693.5	100.0	90.5	187.5	355.5

Ceiling Cassette
ACK 20/25/30/40/50A
ACK 10/15/20C



Dimension in mm

MODEL	A	B	C	D	E	F	G	H	I	J	K
ACK-A	820	820	378	350	28	930	930	626	626	555	555
ACK-C	570	570	295	275	20	640	640	408	408	364	364

9. ELECTRICAL DATA

Cooling only (R22)

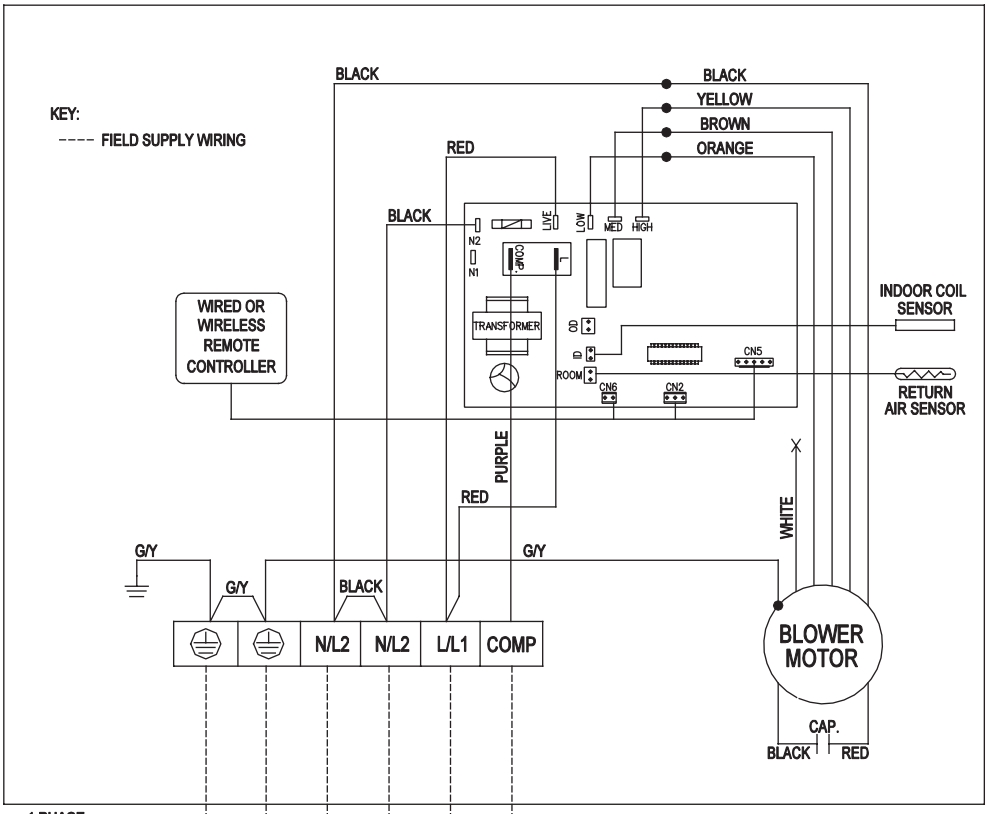
MODEL	INDOOR UNIT		ACC 40C	ACC 50C
	OUTDOOR UNIT		AWSS 40A	AWSS 50A
INDOOR MOTOR	INSULATION GRADE		CLASS E	
	POWER SOURCE	V/Ph/Hz	220 - 240 / 1 / 50	
	RATED INPUT POWER	W	448	510
	RATED RUNNING CURRENT	A	1.98	2.26
	MOTOR OUTPUT	W	400	480
	POLES		4	4
COMPRESSOR	INSULATION GRADE		CLASS B	
	POWER SOURCE	V/Ph/Hz	380-415 / 3 / 50	
	CAPACITOR	μF	-	-
	RATED INPUT POWER	W	2632	3559
	RATED RUNNING CURRENT	A	4.61	5.89
	LOCKED ROTOR AMP.	A	43	56

MODEL	INDOOR UNIT		ACC 60C
	OUTDOOR UNIT		AWSS 60A
INDOOR MOTOR	INSULATION GRADE		CLASS E
	POWER SOURCE	V/Ph/Hz	220 - 240 / 1 / 50
	RATED INPUT POWER	W	748
	RATED RUNNING CURRENT	A	3.20
	MOTOR OUTPUT	W	600
	POLES		4
COMPRESSOR	INSULATION GRADE		CLASS B
	POWER SOURCE	V/Ph/Hz	380-415 / 3 / 50
	CAPACITOR	μF	-
	RATED INPUT POWER	W	3673
	RATED RUNNING CURRENT	A	6.91
	LOCKED ROTOR AMP.	A	67

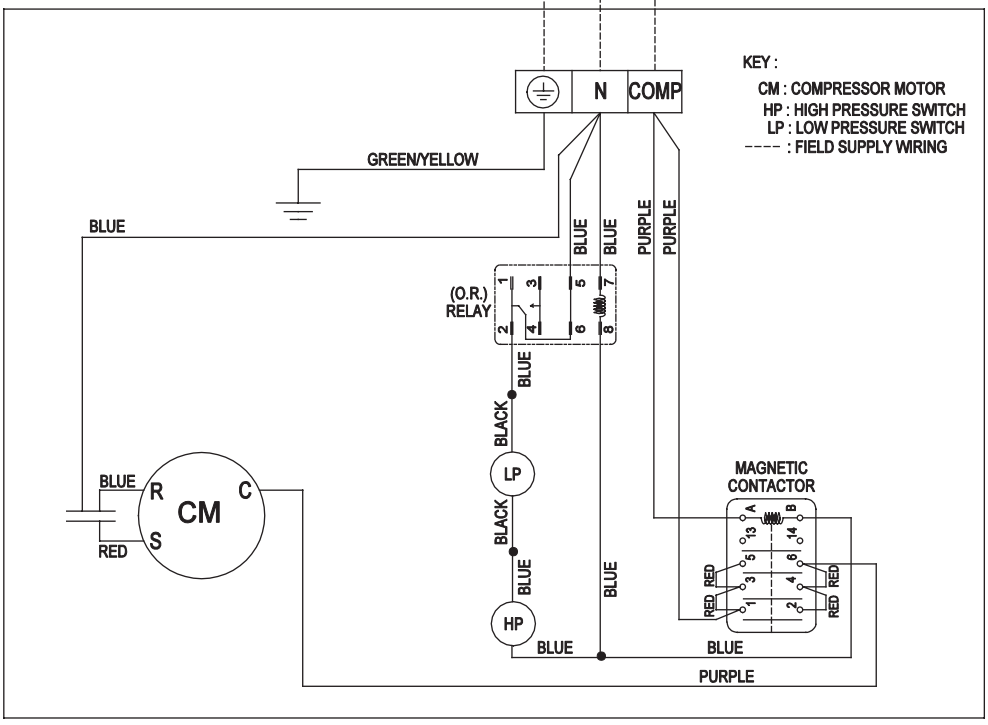
1) ALL SPECIFICATIONS ARE SUBJECTED TO CHANGE BY THE MANUFACTURER WITHOUT PRIOR NOTICE.
2) ALL UNITS ARE BEING TESTED AND COMPLY TO ISO 13256-1.

10. WIRING DIAGRAMS

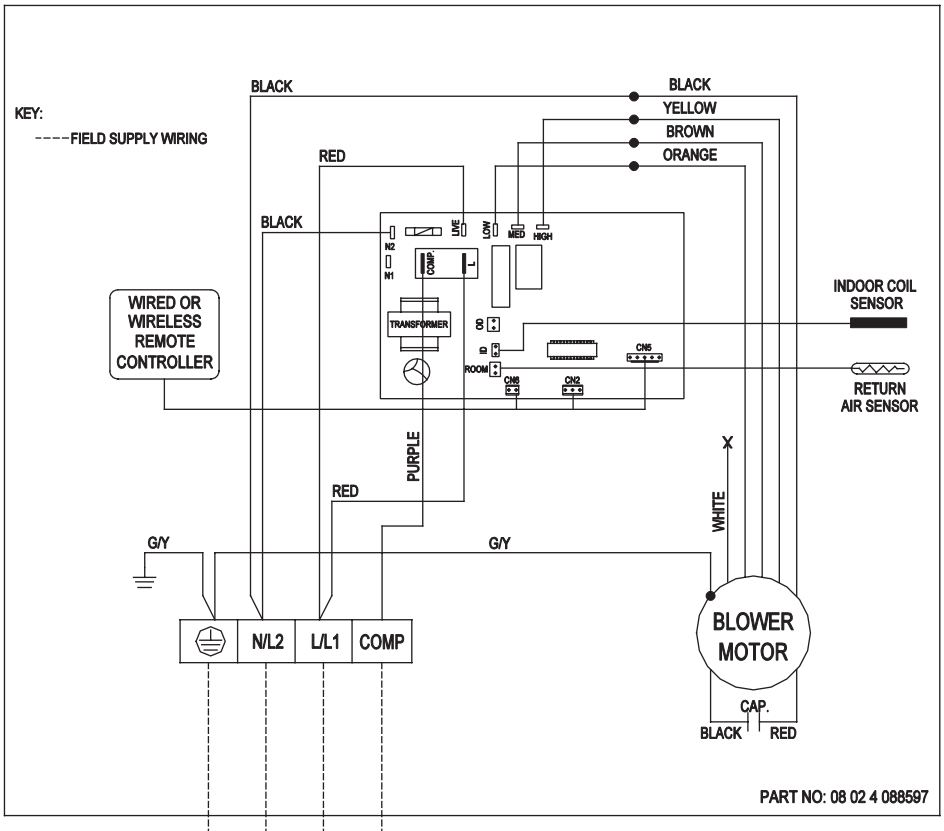
Indoor Unit
MODEL: ACC30C



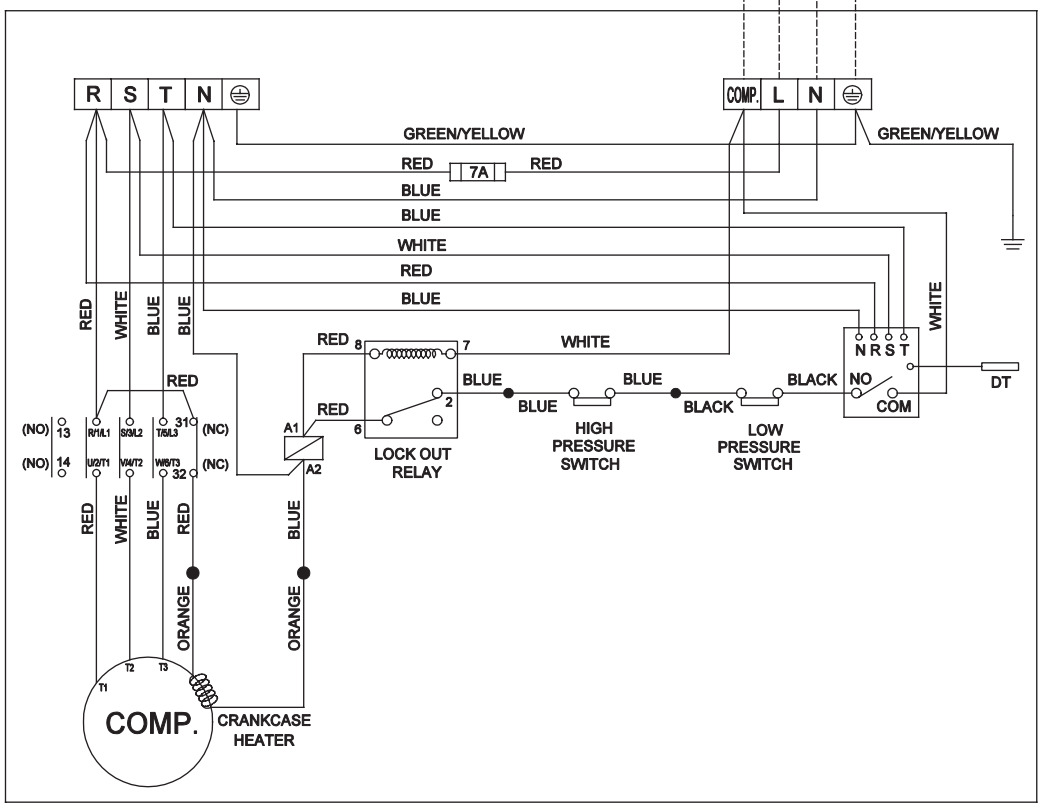
Outdoor Unit
MODEL: AWSS30A



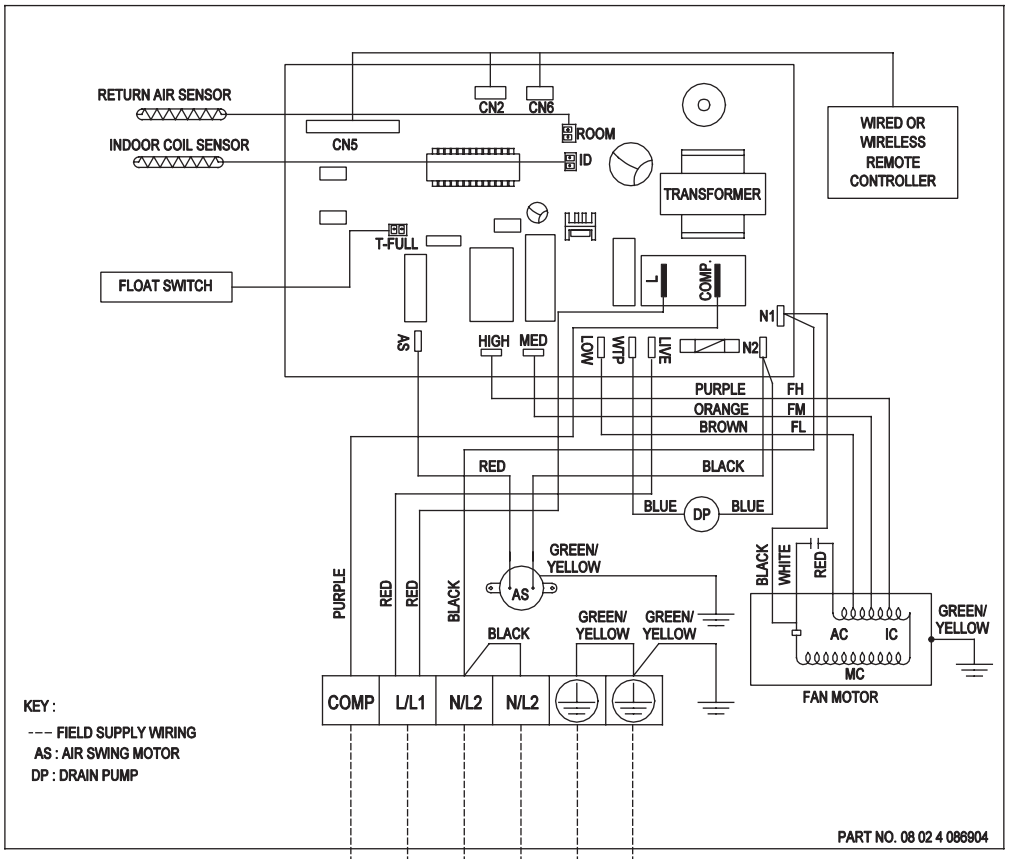
Indoor Unit
Model: ACC40/50/60C



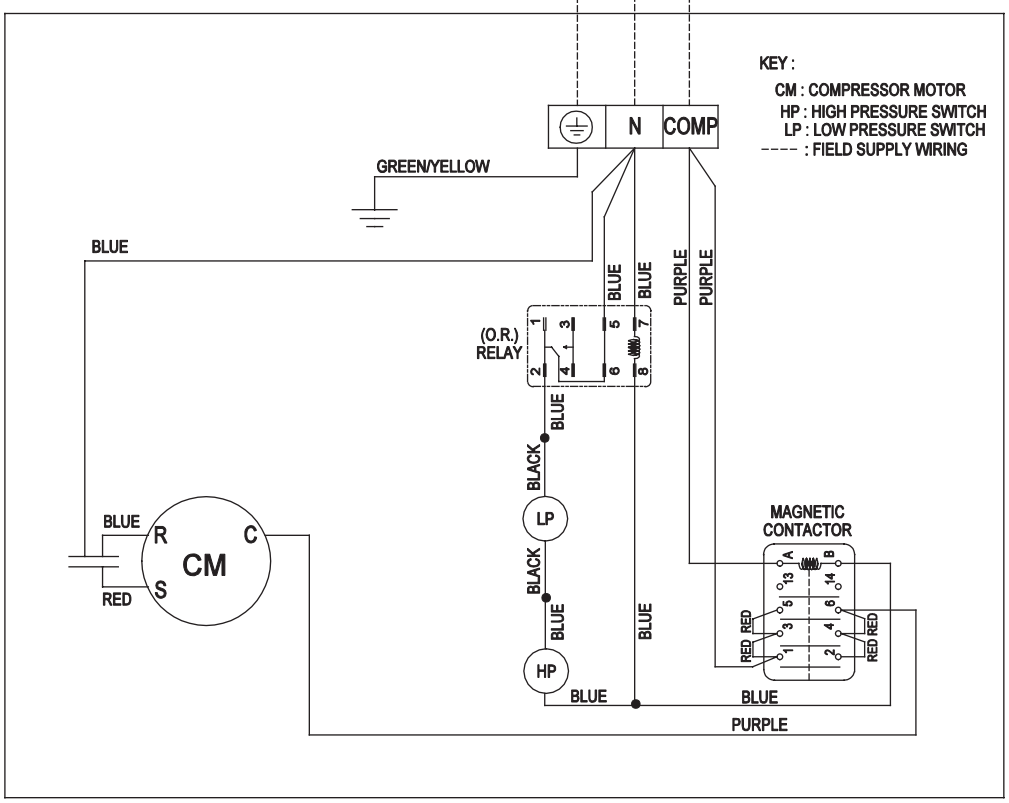
Outdoor Unit
Model: AWSS40/50/60A



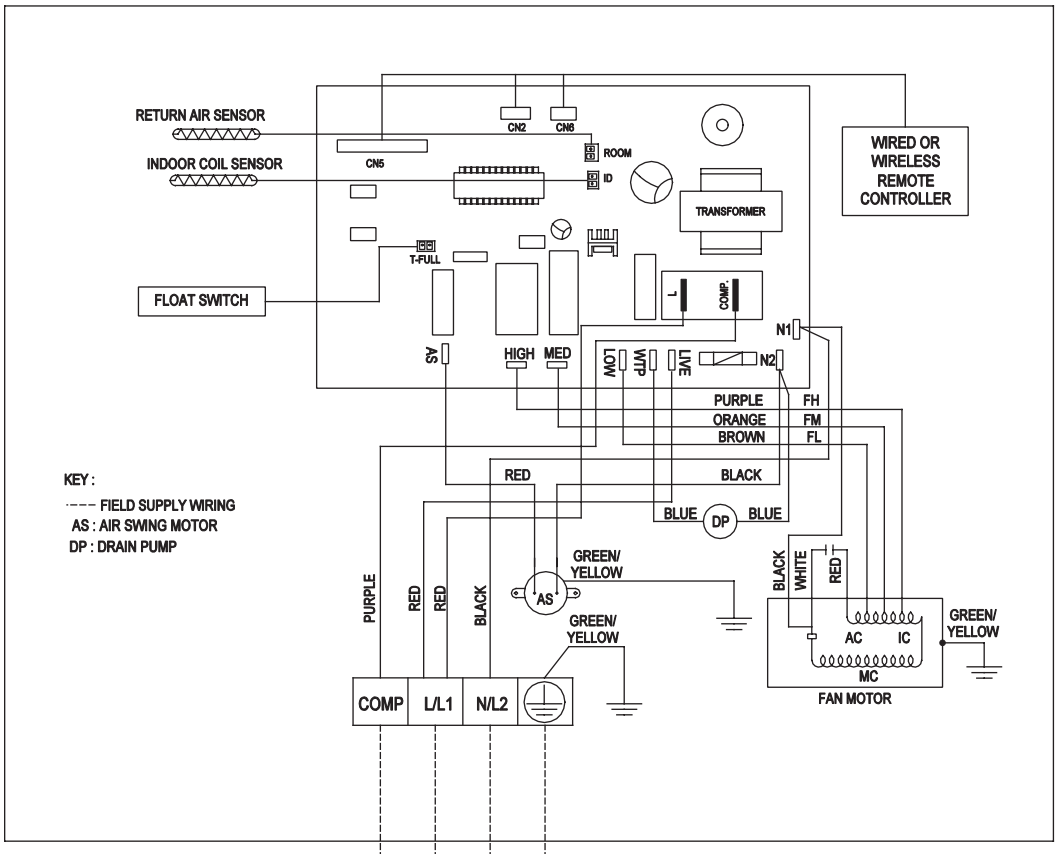
Indoor Unit
Model: ACK30A



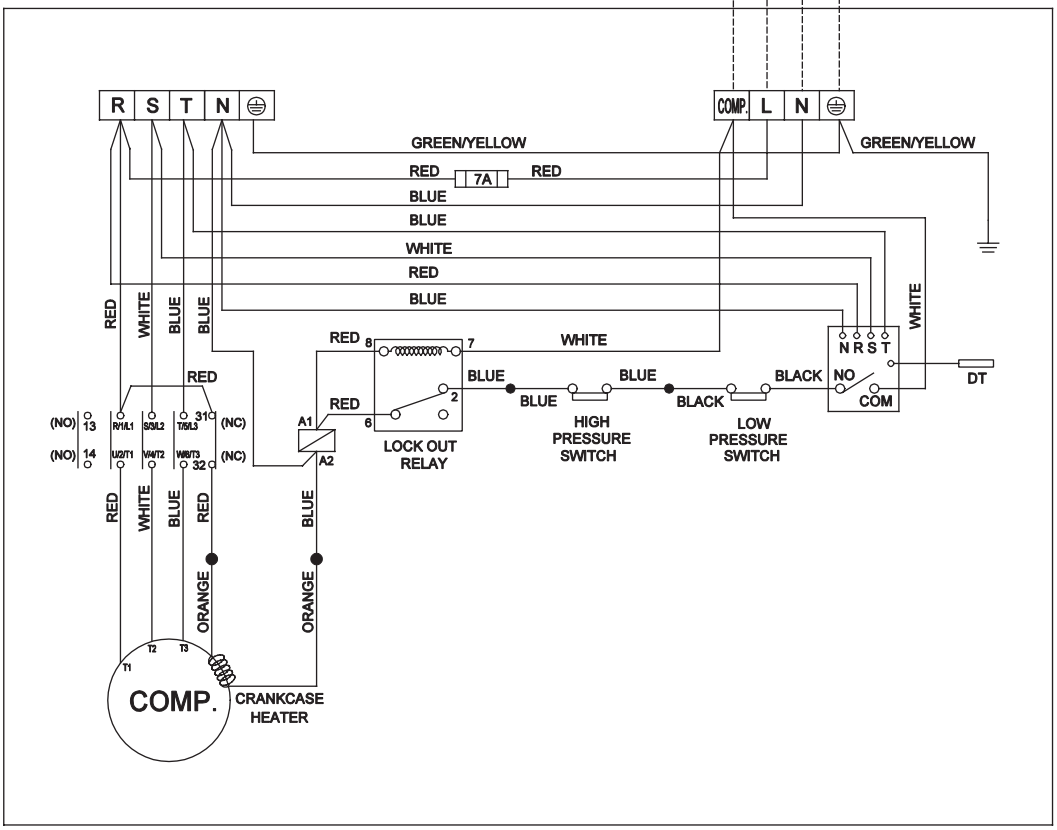
Outdoor Unit
MODEL: AWSS30A



Indoor Unit
Model: ACK40/50A



Outdoor Unit
MODEL: AWSS40/50A



11. SERVICING & MAINTENANCE

Warning

Disconnect from Main Supply before Servicing the air conditioner

The unit is designed to give a long life operation with minimum maintenance required. However, it should be regularly checked and the following items should be given due attention.

Components	Maintenance Procedure	Recommended Schedule
Air Filters	1. Clean with a vacum cleaner, or by tapping lightly and then washing in lukewarm water (below 40°C) with neutral soap. 2. Rinse well to dry before re-installing. 3. Note : Never use petrol, thinner, benzene or any other chemicals	Every 2 weeks. More frequently if required.
Fan Coil Unit (FCU)	1. Clean away dirt or dust on grille or panel by wiping with a soft cloth soaked in lukewarm (or cold) water or neutral detegent solution. 2. Note : Never use petrol, thinner, benzene or any other volatile chemicals, which may cause plastic surface to deform.	Every 2 weeks. More frequently if required.
Condenser Drain Pan & Pipe	1. Check and clean.	Every 3 months
FCU Fan	1. Check for unusual noise.	Every 3 months
FCU Fin Coil	1. Check and remove dirt which are clogged between fins. 2. Check and remove obstacles which hinder air flow in and out of the unit.	Every month. Every month.
Electrical	1. Check voltage, currect and wiring. 2. Check faulty contacts caused by loose connections, foreign matters, etc. 3. Refer to attachment	Every 2 months Every 2 months.
Compressor	1. No maintenance needed if refrigerant circuit remains sealed. However, check for refrigerant leak at joints & fittings.	Every 6 months.
Compressor Lubrication	1. Oil is factory charged. Not necessary to add oil if circuit remains sealed.	No maintenance required.
Fan Motors Lubrication	1. All motors pre-lubricated and sealed at factory.	No maintenance required
Electrical	1. Maintain a log data on measurement of volts, amps, and water temperature difference(heating & cooling) is recommended. A comparison of the data during start-up and periodic data is useful as indicator of general condition of equipment.	Every month / quarterly or annually.

Pre-start Up Maintenance (After Extended Shutdown)

- Inspect thoroughly and clean indoor and outdoor units.
- Clean or replace air filters.
- Clean condensate drain line.
- Clean clogged indoor and outdoor coils.
- Check fan imbalance before operation.
- Tighten all wiring connections and panels.
- Check for refrigerant leakage.

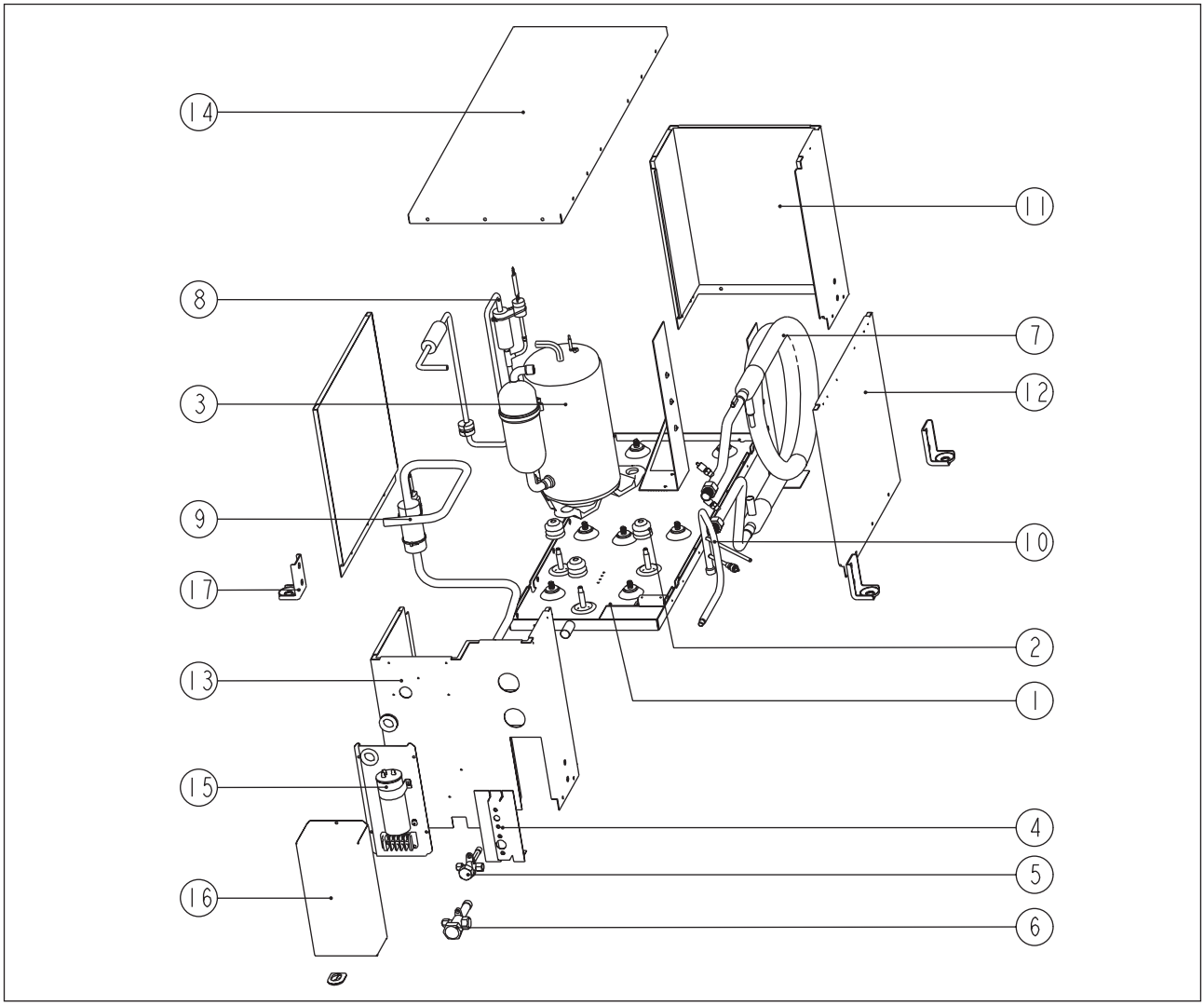
12. TROUBLESHOOOTING

When a malfunction of the air conditioner unit is detected, immediately switch off the main power supply before proceeding with the following troubleshooting procedures.
The following are common fault conditions and simple troubleshooting tips. If any other fault conditions which are not listed occur, contact your nearest local dealer. DO NOT attempt to troubleshoot the unit by yourself.

Fault	Cause/ Check Point
Air conditioner cannot start	1. Power supply plug disconnected. 2. Circuit breaker or fuse tripped / blown. 3. Wiring connection 4. If fault persist, contact your installer
Neither fan coil unit and compressor run	1. The fuse may be blown or circuit breaker opened. 2. Check electrical circuit or motor winding for shorts or grounds. Investigate for possible over loading. Replace fuse if necessary. 3. Check wiring connections. Wire may be loosening. Replace or tighten. 4. Control system may be faulty
Compressor does not operate.	1. Check capacitor if available. Replace capacitor if faulty. 2. Check wiring connection. Wire may be loosening. Replace or tighten. 3. The high pressure switch may tripped due to: a) No or insufficient water flows into and leaves heat exchanger. May be clogged. b) Water entering temperature higher than the maximum operating conditions. c) Not enough air flow into fan coil unit. May be due to dirty filter or block by object, cardboard and etc (heating mode). d) Fan coil motor failure (heating mode). e) Unit over-charged. Release some of the refrigerant charge. 4. The compressor internal/external overload protection is opened. If the compressor body is extremely hot, the overload will not reset until it cooled down. 5. The compressor winding may be grounded to the compressor shell. If so, replace the compressor.
Insufficient cooling or heating.	1. Check controller temperature setting. 2. Filter may be clogged. Check and clean the filter. 3. Check capillary tube for possible restriction of refrigerant flow. Replace capillary tube if proven so. 4. The reversing valve may be defective (valve position is not shifted properly), creating a bypass of refrigerant. Check the reversing valve coil connection. 5. Check for restriction of air and water flow. 6. Refrigerant leakage. Check all piping bends and connection for leakage. Repair the leakage area or replace with new piping. 7. Window or door wide open. 8. Unit may be under-sized.
Remote control display light is too dim.	1. Battery flat. Replace the battery. 2. The batteries are not properly positioned
Insufficient water flow through heat exchanger	1. Valves are not opened fully. 2. Circulating water pump is faulty. 3. Water pipes or strainers are clogged.
Noisy operation	1. Check for loose bolts or screws. 2. Make sure rubber isolators are used for installation. 3. Check for water balance to unit for proper water flow rate. 4. Check for tubing touching compressor or other surface. Readjust tubing by bending it slightly. 5. Fan (fan coil unit) knocking / hitting on its housing. 6. May be due to worn compressor bearing.

13. EXPLODED VIEW & PART LIST

Indoor Unit
Model: AWSS30A



No	Description
1	Assy., Base Pan
2	Rubber Grommet
3	Compressor
4	Assy., Valve Plate
5	Valve, Flare 3/8"
6	Valve, Flare 5/8"
7	Assy., Tube in Tube Main
8	Assy., Tube Discharge
9	Assy., Tube Suction
10	Assy., Tube Liquid
11	Assy., Panel Right

No	Description
12	Panel, Service
13	Assy., Panel Left
14	Panel, Top
15	Assy., Control Box
16	Assy., Cover Control Box
17	Assy., Hanging Bracket
Parts not in Diagram	
1	Capacitor, CMPSR 40μF/450Vac
2	Pressure Switch Saginomiya
3	Pressure Switch, 18psi Nangtong
4	Assy., Access Valve 1/4"

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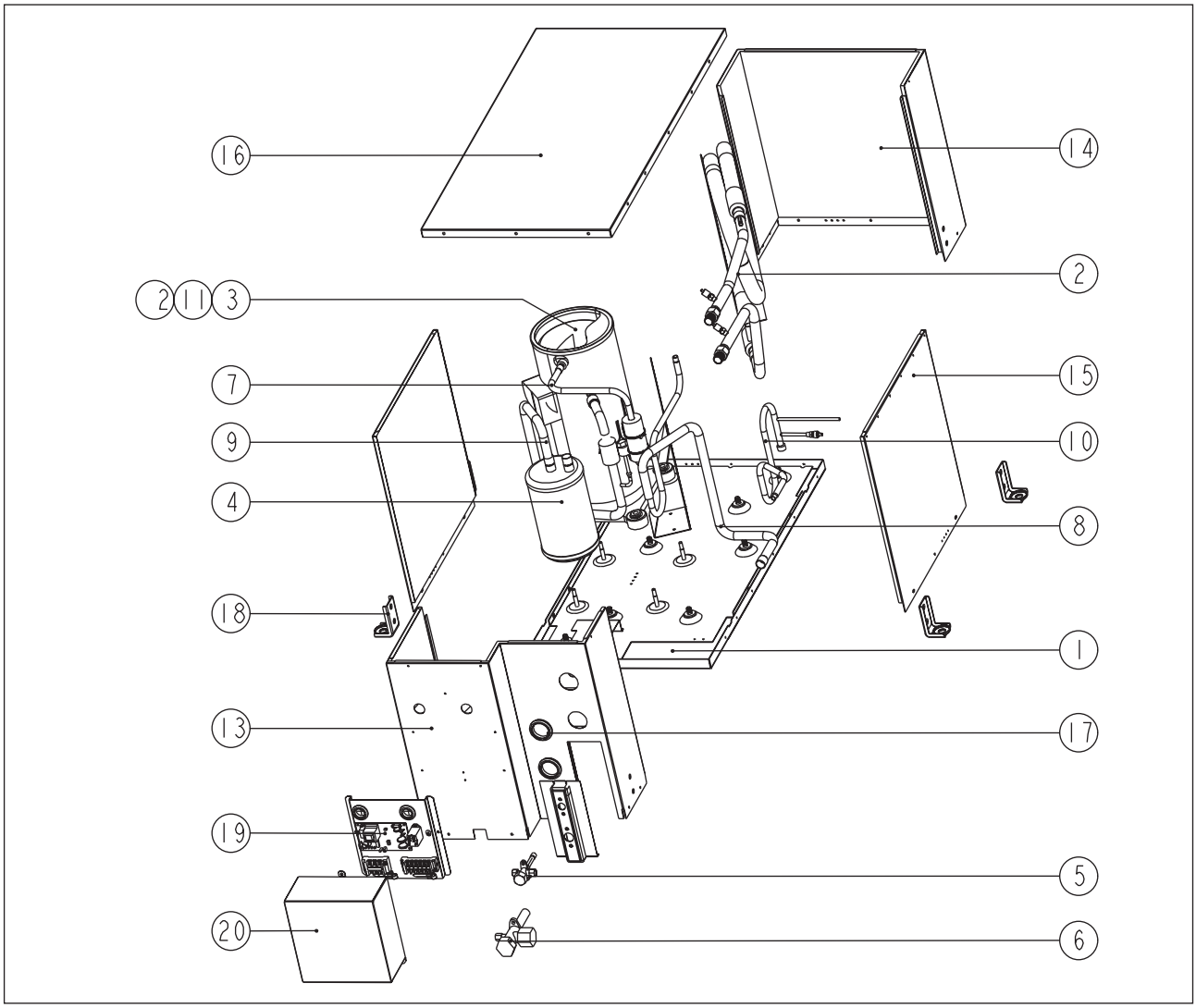
Indoor Unit
Model: AWSS40/50/60A



No	Description
1	Assy., Base Pan
2	Assy., Tube in Tube Main
3	Compressor
4	Accumulator
5	Valve, Flare 3/8"
6	Valve, Flare 3 Way 3/4"
7	Assy., Tube Discharge
8	Tube Gas
9	Assy. Tube Suction
10	Assy., Tube Liquid
11	Jacket, Compressor
12	Jacket, Compressor Cap.
13	Assy., Panel Left

No	Description
14	Assy., Panel Right
15	Panel, Service
16	Panel, Top
17	Bush, Rubber
18	Assy., Hanging Bracket
19	Assy., Control Box
20	Assy., Control Box Cover
Parts not in Diagram	
1	Phase Protector
2	Pressure Switch, 18psi Nangtong
3	Valve, Flare 1/2" (AWSS60A)
4	Assy., Access Valve 1/4"

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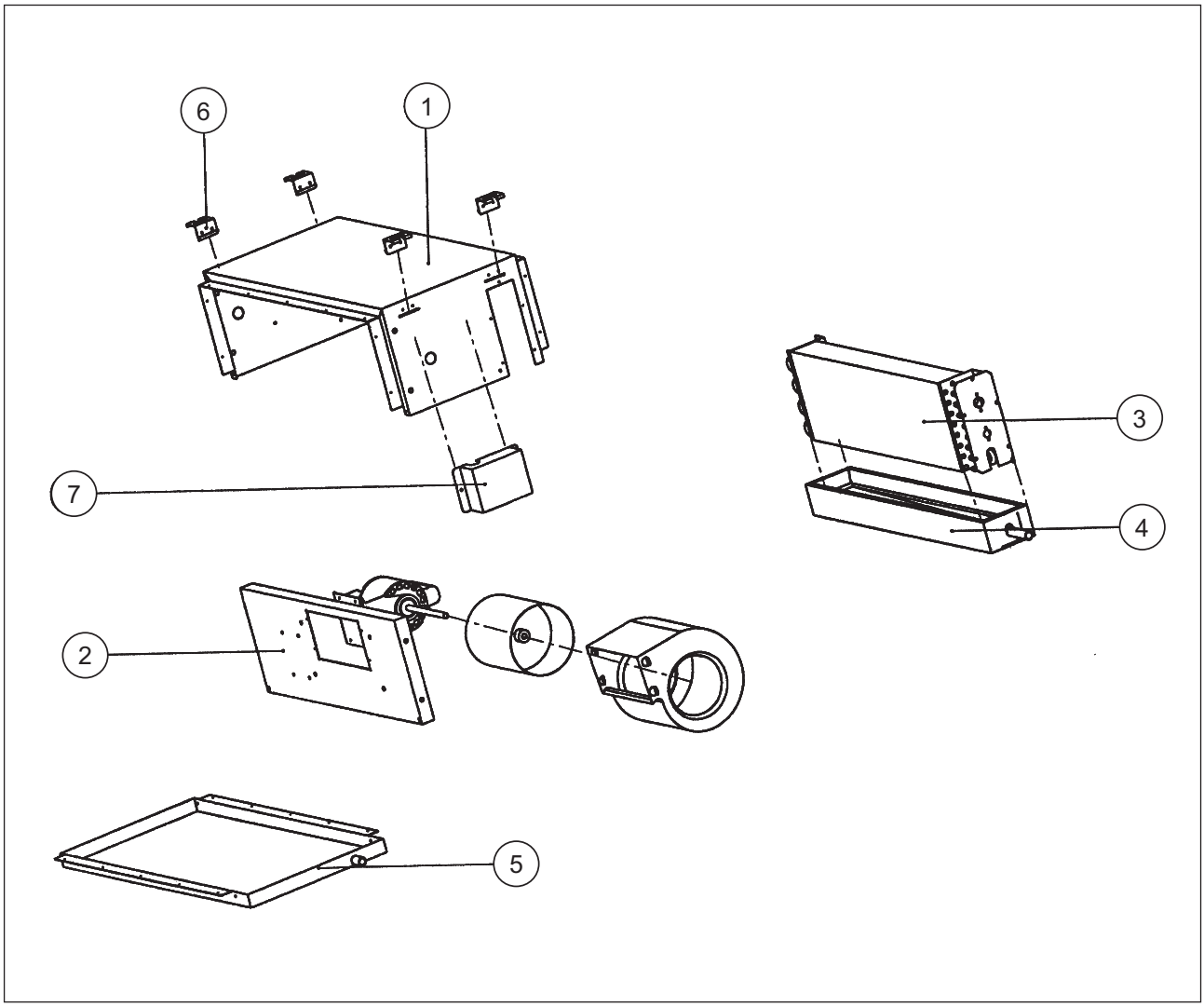
Indoor Unit
Model: ACC10C



No	Description
1	Cabinet
2	Fan Deck
3	Assy., Coil
4	Primary Drain Pan
5	Secondary Drain Pan
6	Hanger
7	-

Parts Not in Diagram	
1	Assy., Wheel & Housing
2	Fan Motor
3	Air Filter
4	Assy., Drain Pipe Joint
5	L2 Control Module
6	Handset

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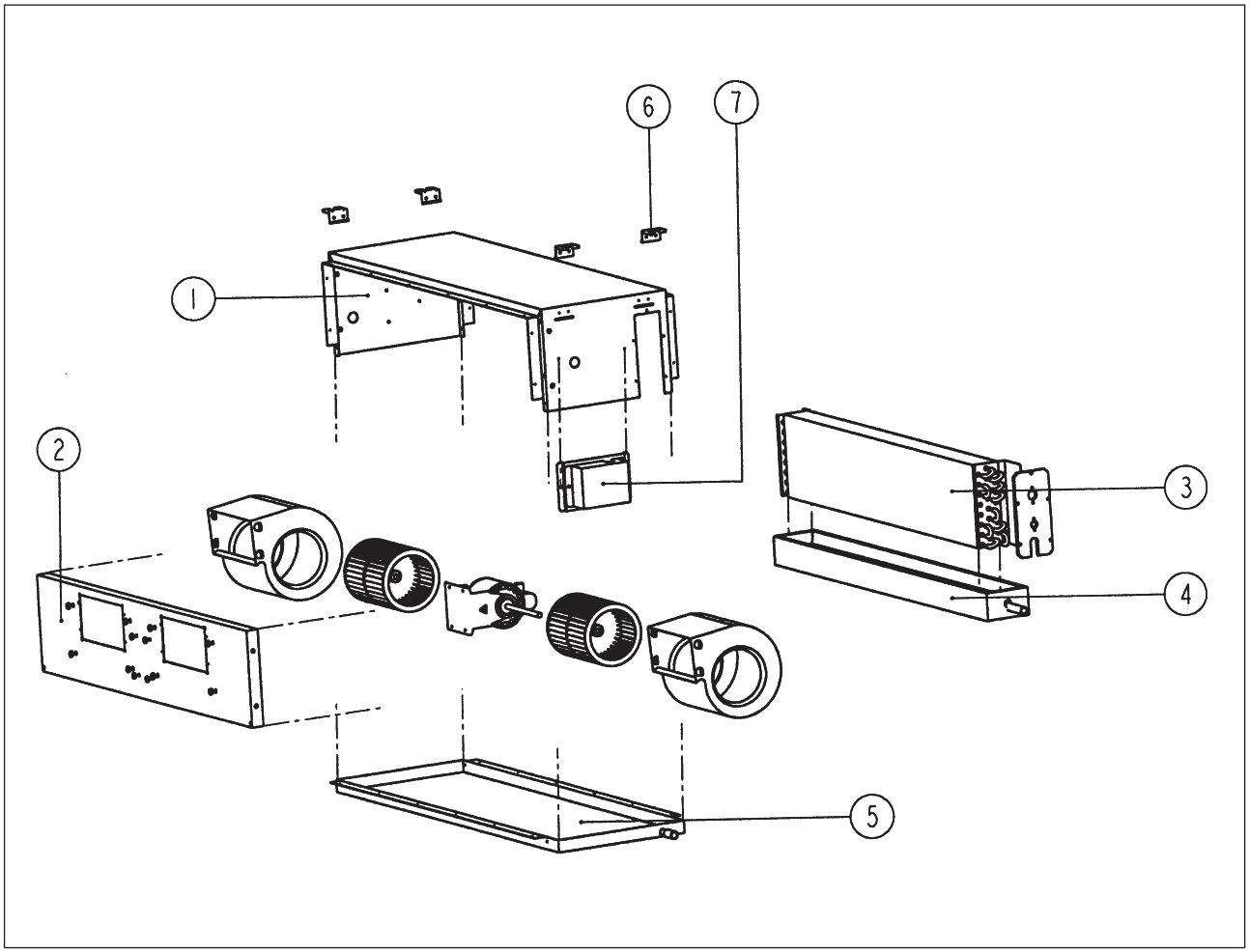
Indoor Unit
Model: ACC15/20C



No	Description
1	Cabinet
2	Fan Deck
3	Assy., Coil
4	Primary Drain Pan
5	Secondary Drain Pan
6	Hanger
7	-

Parts Not in Diagram	
1	Assy., Wheel & Housing - Left
2	Assy., Wheel & Housing - Right
3	Fan Motor
4	Air Filter
5	Assy., Drain Pipe Joint
6	L2 Control Module
7	Handset

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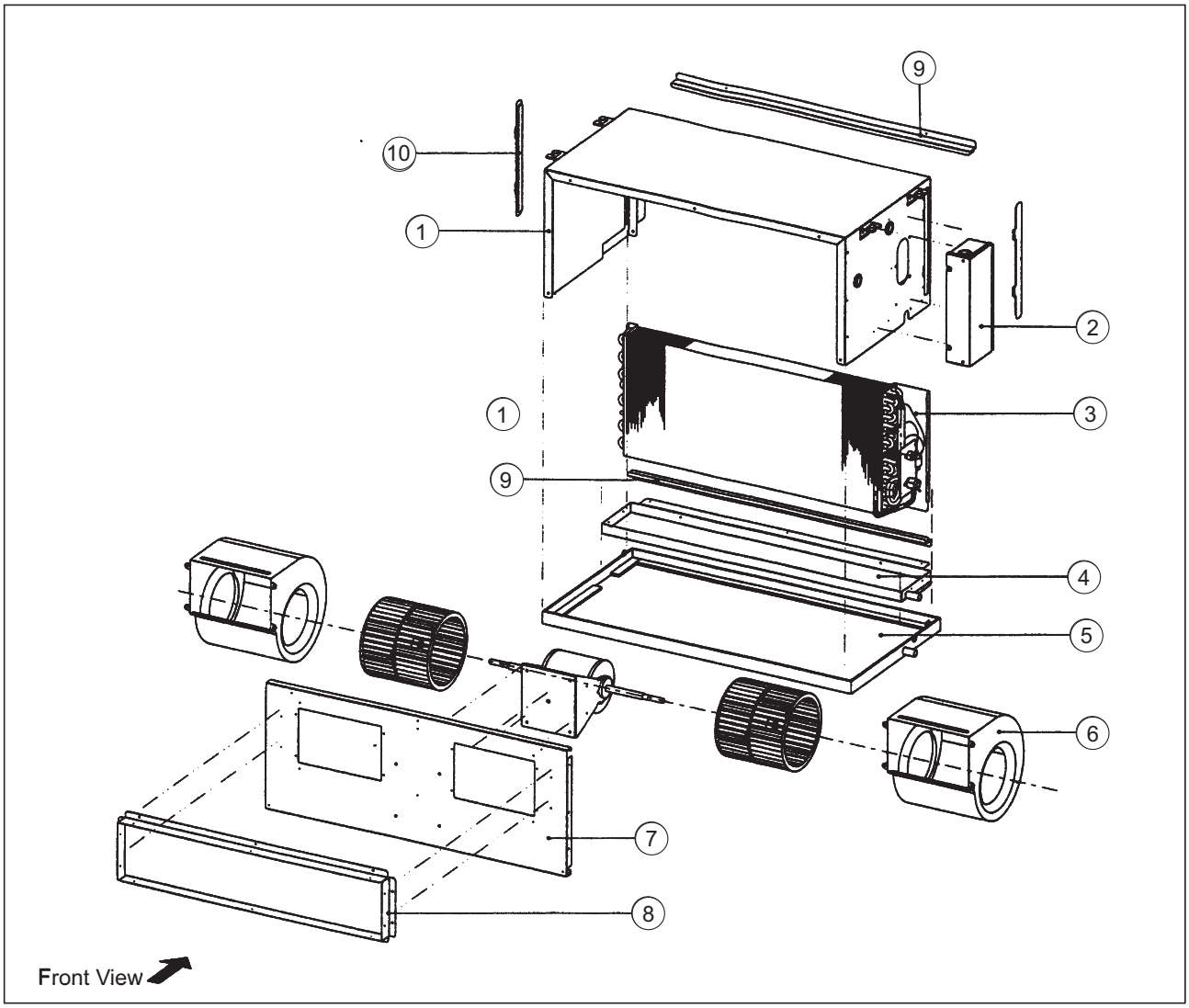
Indoor Unit
Model: ACC30C



No	Description
1	Assy., Top Panel
2	-
3	Assy., Coil
4	Assy., Drain Pan (Small)
5	Assy., Drain Pan (Big)
6	Assy., Wheel & Housing - Left
	Assy., Wheel & Housing - Right
7	Panel, Blower
8	Flange, Blower
9	Filter Rail, Cover

No	Description
10	Filter Rail
Parts not in Diagram	
1	Hanger
2	Fan Motor
3	Bracket, Motor
4	Support, Bracket Motor
5	Air Filter
6	L2 Control Module
7	Handset

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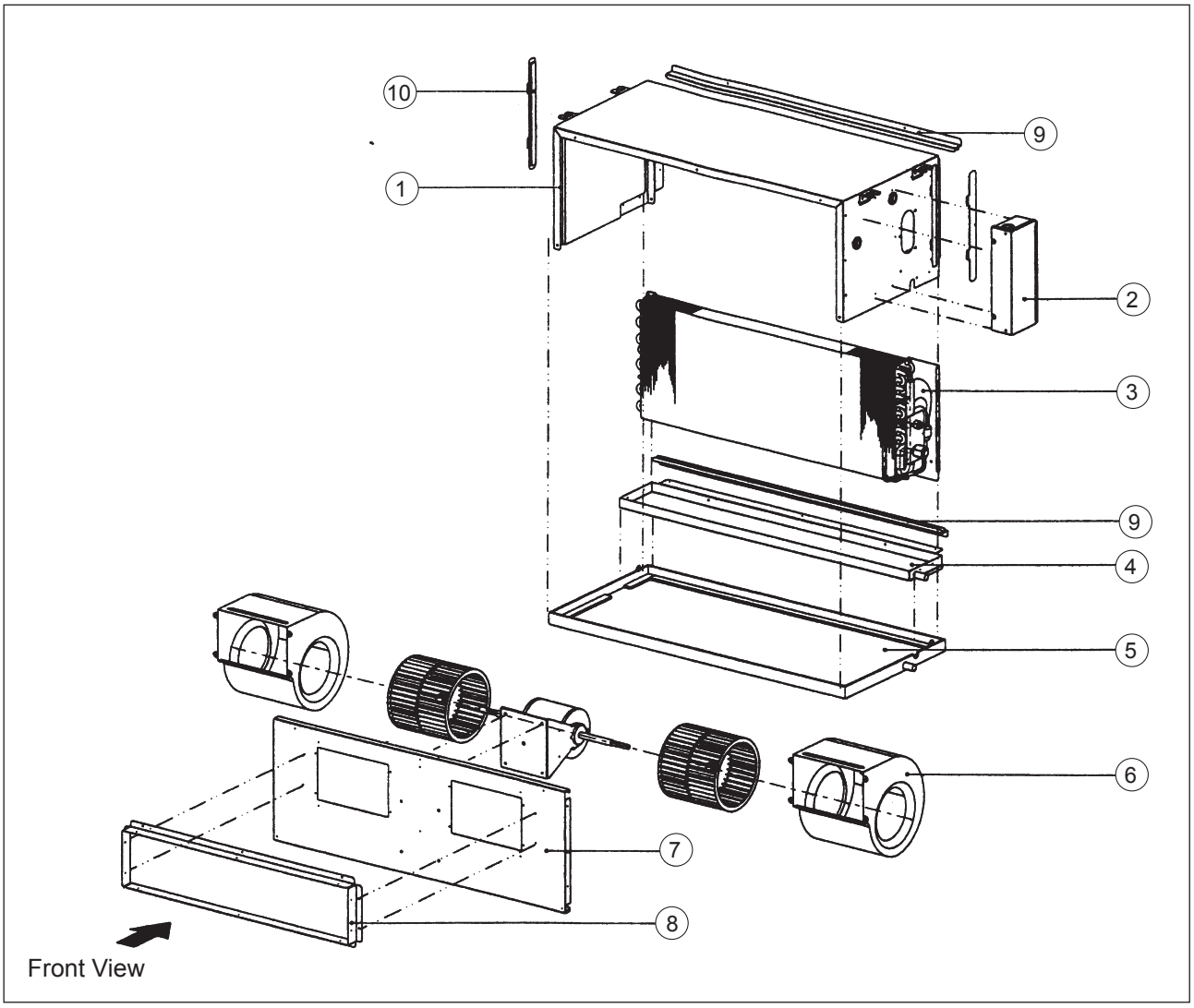
Indoor Unit
Model: ACC40C



No	Description
1	Assy., Top Panel
2	-
3	Assy., Coil
4	Assy., Drain Pan (Small)
5	Assy., Drain Pan (Big)
6	Assy., Wheel & Housing - Left
	Assy., Wheel & Housing - Right
7	Panel, Blower
8	Flange, Blower
9	Filter Rail, Cover

No	Description
10	Filter Rail
Parts not in Diagram	
1	Hanger
2	Fan Motor
3	Bracket, Motor
4	Support, Bracket Motor
5	Air Filter
6	L2 Control Module
7	Handset

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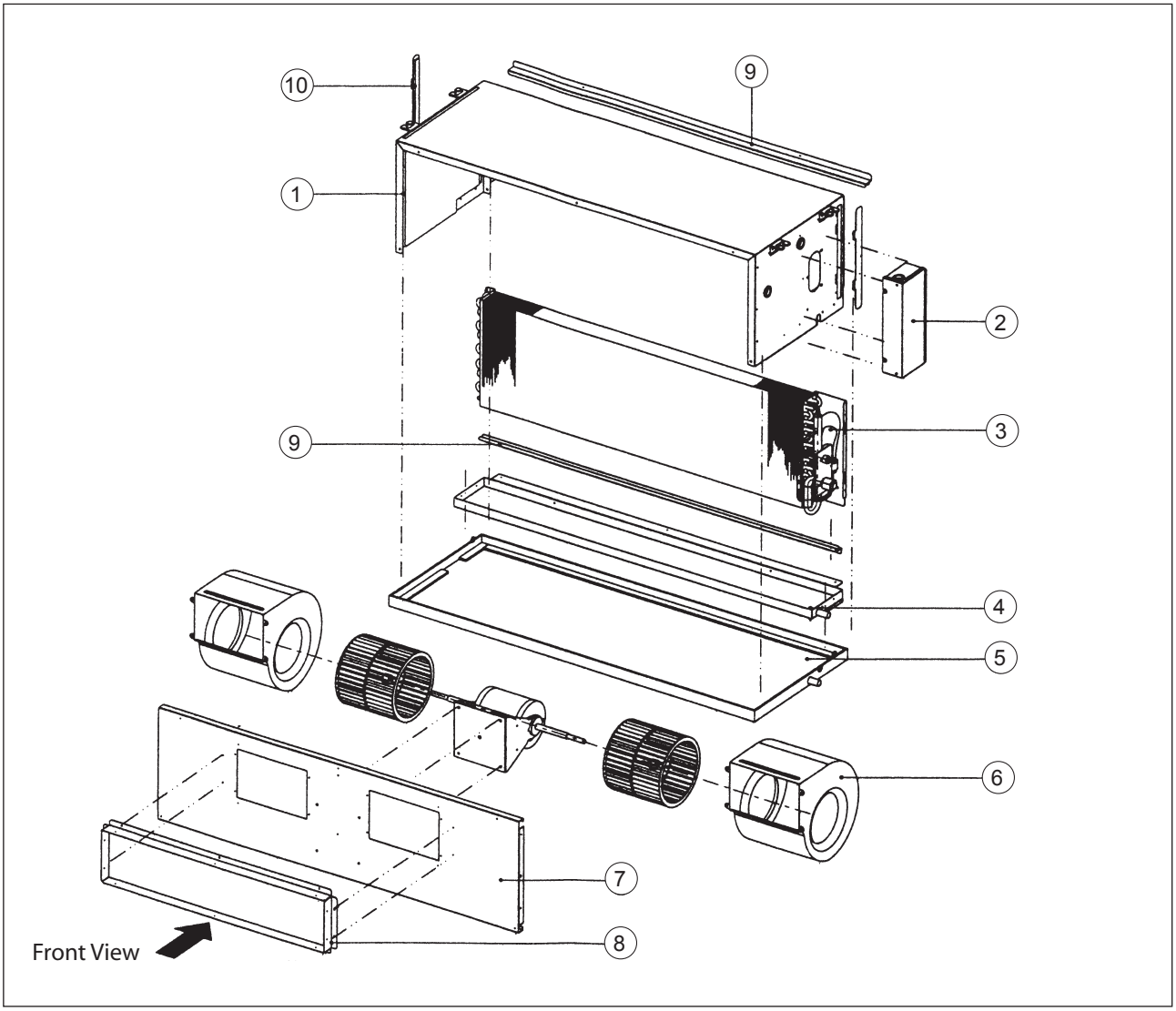
Indoor Unit
Model: ACC50C



No	Description
1	Assy., Top Panel
2	-
3	Assy., Coil
4	Assy., Drain Pan (Small)
5	Assy., Drain Pan (Big)
6	Assy., Wheel & Housing - Left
	Assy., Wheel & Housing - Right
7	Panel, Blower
8	Flange, Blower
9	Filter Rail, Cover

No	Description
10	Filter Rail
Parts not in Diagram	
1	Hanger
2	Fan Motor
3	Bracket, Motor
4	Support, Bracket Motor
5	Air Filter
6	L2 Control Module
7	Handset

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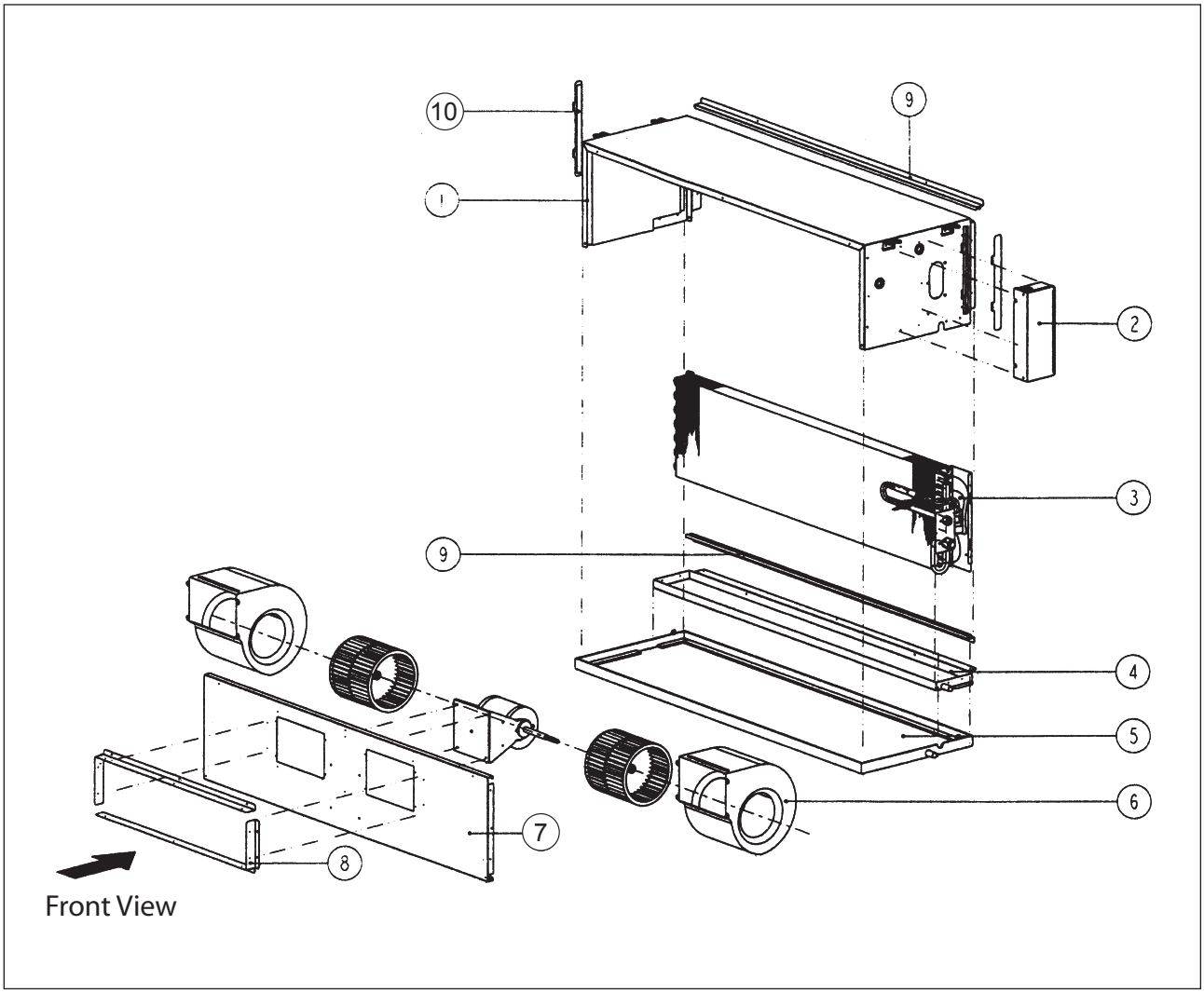
Indoor Unit
Model: ACC60C



No	Description
1	Assy., Top Panel
2	-
3	Assy., Coil
4	Assy., Drain Pan (Small)
5	Assy., Drain Pan (Big)
6	Assy., Wheel & Housing - Left
	Assy., Wheel & Housing - Right
7	Panel, Blower
8	Flange, Blower
9	Filter Rail, Cover

No	Description
10	Filter Rail
Parts not in Diagram	
1	Hanger
2	Fan Motor
3	Bracket, Motor
4	Support, Bracket Motor
5	Air Filter
6	L2 Control Module
7	Handset

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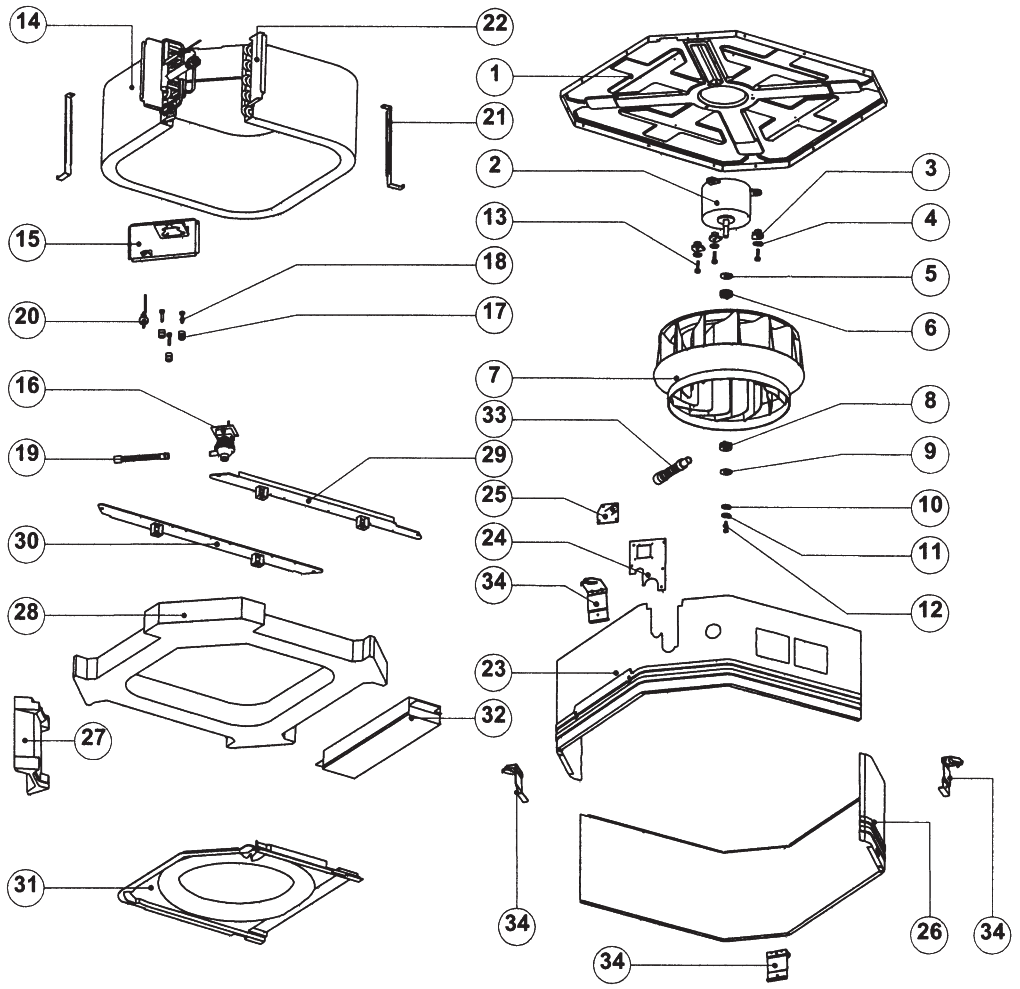
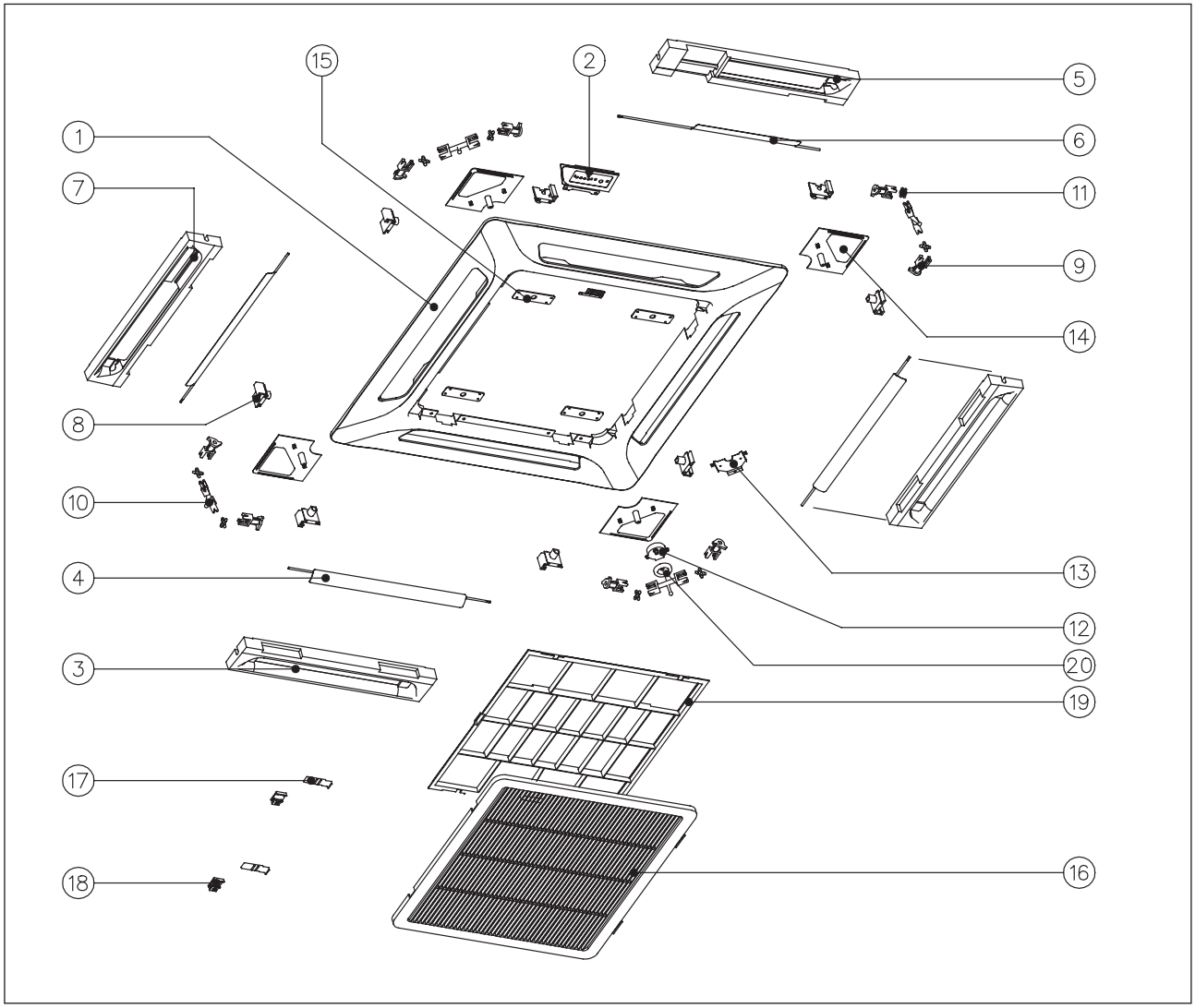
Indoor Unit
Model: ACK-A (R22)



No	Description
1	Base Pan
2	Fan Motor
3	Fan Motor Bush
4	Plain Washer
5	Fan Motor Washer
6	Bottom Coupling
7	Turbo Fan
8	Top Coupling
9	Flat Washer
10	Plain Washer
11	Spring Washer
12	Hexagon Bolt, M8 x 20mm
13	Hexagon Bolt, M8 x 15mm
14	Assy., Coil
15	Drain Pump Bracket
16	Drain Pump
17	Drain Pump Bush
18	Hexagon Bolt, M5 x 27mm
19	Drain Hose

No	Description
20	Level Switch
21	Coil Support
22	Partition
23	Side Panel Front
24	Valve Plate
25	Drain Connector
26	Side Panel Back
27	Air Guide
28	Drain Pan
29	Fix Bracket Front
30	Fix Bracket Back
31	Fan Cover
32	Terminal Box
33	Drain Pipe
34	Hanger A
	Hanger B
	Hanger C
Parts Not in Diagram	
1	L2 Control Module

Indoor Unit
Model: ACK-A Panel



No	Description
1	Front Frame Panel
2	Receiver Bracket
3	Discharge Housing A
4	Assy., Louver A
5	Discharge Housing B
6	Assy., Louver B
7	Discharge Housing D
8	Louver Bracket
9	Crank Shaft
10	Crank Connector
11	Crank Cross

No	Description
12	Swing Motor
13	Swing Motor Bracket
14	Panel Cover
15	Fix Plate
16	Air Intake Grille
17	Grille Lock
18	Grille Lock Bracket
19	Air Filter
20	Air Swing Cap
Parts Not in Diagram	
1	G8 Handset

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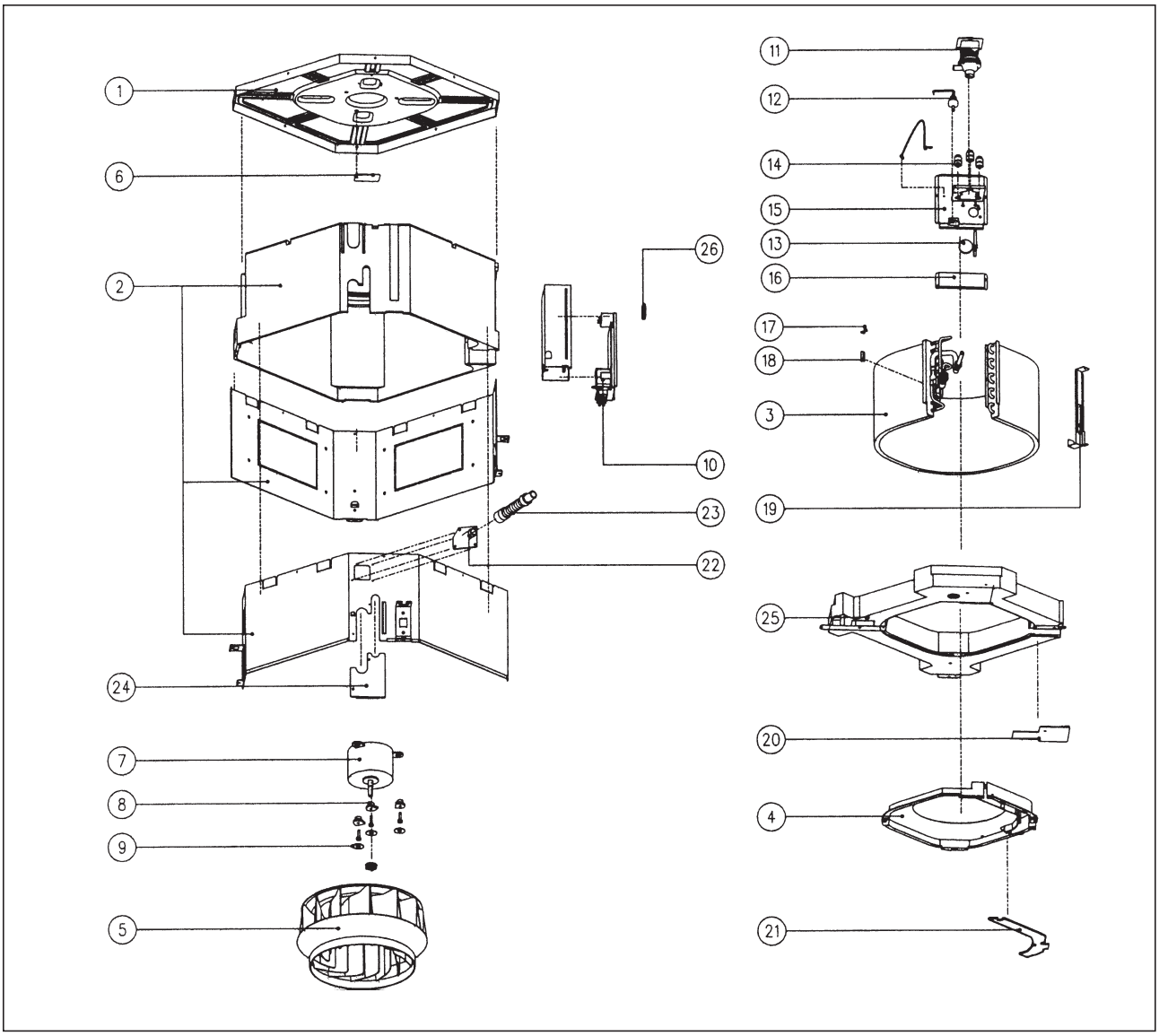
Indoor Unit
Model: ACK-C



No	Description
1	Assy., Base Pan
2	Assy., Casing
3	Assy., Coil
4	Fan Cover
5	Turbo Fan
6	Plate, Wire
7	Fan Motor
8	Bush, Fan Motor
9	Bush, Fan Motor Ring
10	L2 Control Module
11	Drain Pump
12	Level Switch
13	Bush, Wire
14	Bush, Drain Pump

No	Description
15	Assy., Drain Pump Support Bracket
16	Assy., End Plate Support
17	Clip, Coil Sensor
18	Tube, Coil Sensor Holder
19	Bracket, Coil
20	Cover, Terminal
21	Cover, Wire
22	Drain Connector
23	Drain Hose
24	Assy., Valve Cover
25	Assy., Drain Pan
26	Bush, Wire
Parts Not in Diagram	
1	Capacitor

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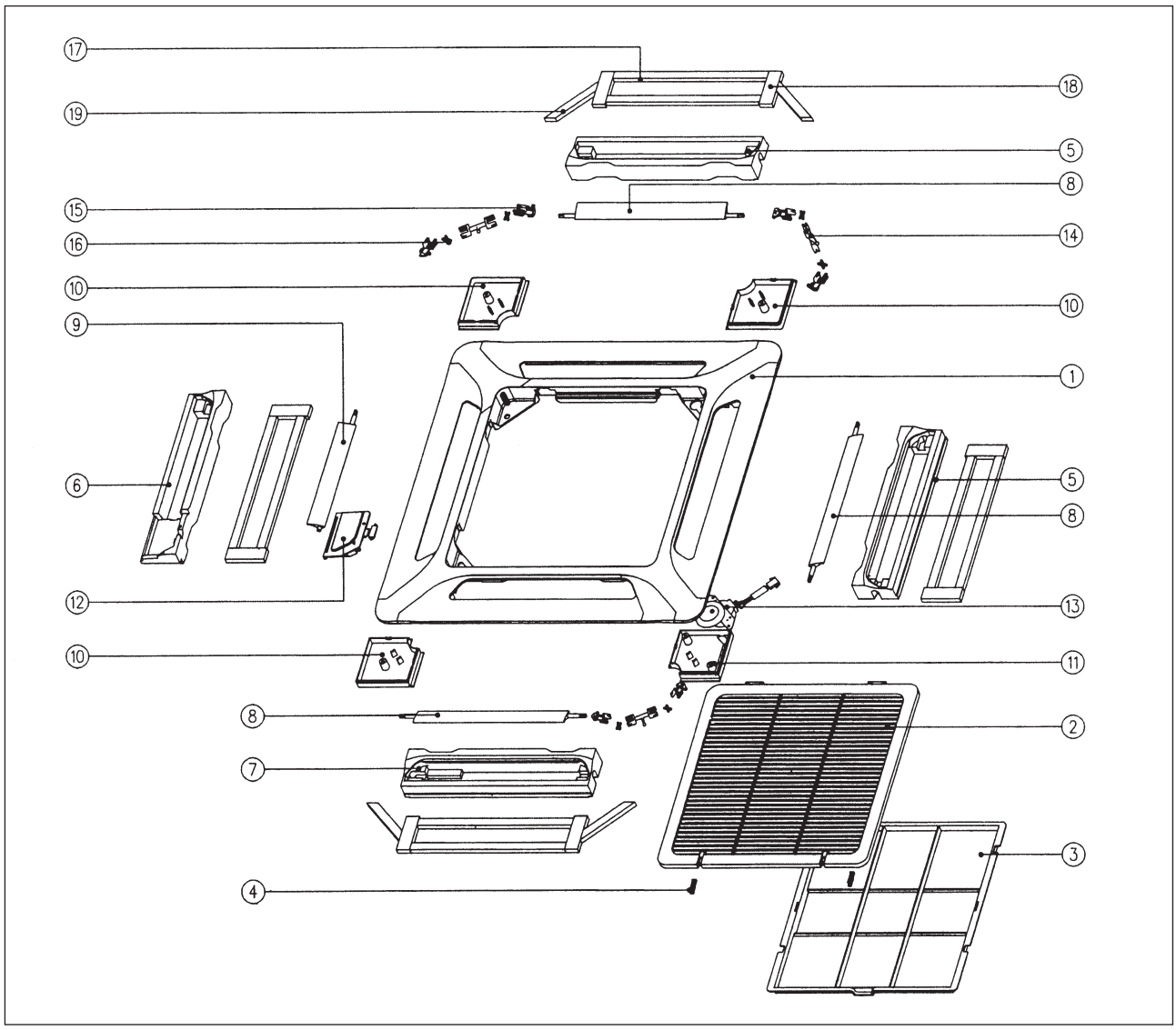
Indoor Unit
Model: ACK-C Panel



No	Description
1	Frame
2	Intake Grille
3	Air Filter
4	Grille Lock
5	Discharge Foam
6	Discharge Foam, LED
7	Discharge Foam, Short
8	Louver
9	Louver, LED
10	Linkage Cover
11	Linkage Cover, Motor

No	Description
12	Assy., Bracket Receiver
13	Air Swing Motor
14	Crank Connector
15	Louver Holder
16	Crank Cross
17	Insulation, Long
18	Insulation, Short
19	Insulation, Corner
Parts Not in Diagram	
1	G8 Handset
2	Assy., LED

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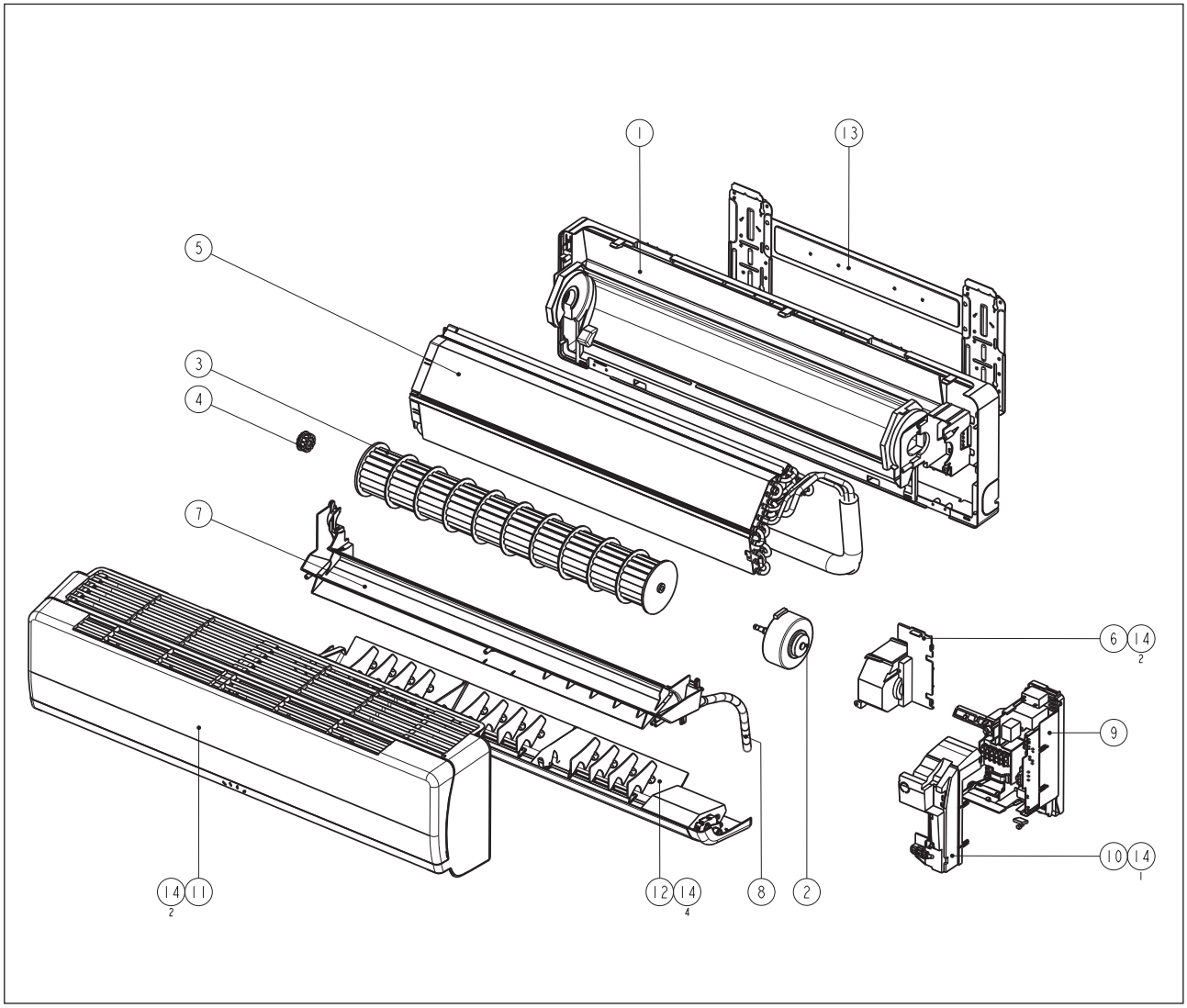
Indoor Unit
Model: AWM10/15G2



No	Description
1	Assy., Chasis
2	Fan, Motor
3	Cross Flow Fan
4	Fan, Bush
5	Assy., Coil
6	Piping, Clamp
7	Assy., Drain Pan

No	Description
8	Drain Hose
9	Assy., Control Box
10	Assy., Control Box Cover
11	Assy., Front Cover
12	Assy., Air Discharge Housing
13	Assy, Mounting Plate
14	Screw, S.T. Round Head BT

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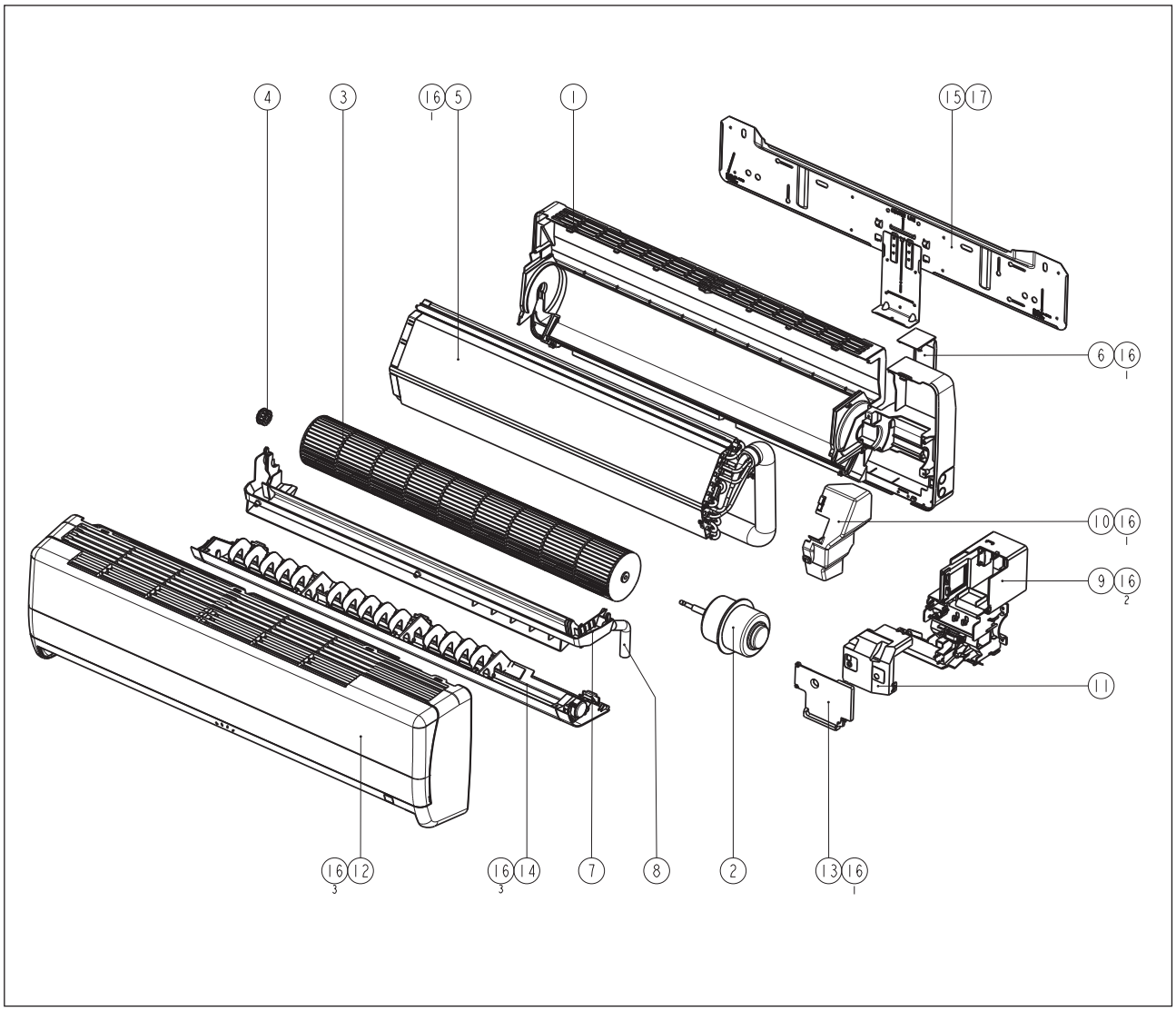
Indoor Unit
Model: AWM20/25G2



No	Description
1	Assy., Chasis
2	Fan, Motor
3	Cross Flow Fan
4	Fan, Bush
5	Assy., Coil
6	Piping, Clamp
7	Assy., Drain Pan
8	Drain Hose
9	Assy., Control Box

No	Description
10	Cover, Piping
11	Assy., Control Box Cover
12	Assy., Front Cover
13	Service Panel
14	Assy., Air Discharge Housing
15	Assy, Mounting Plate
16	Screw, S.T. Round Head BT
17	Rivet

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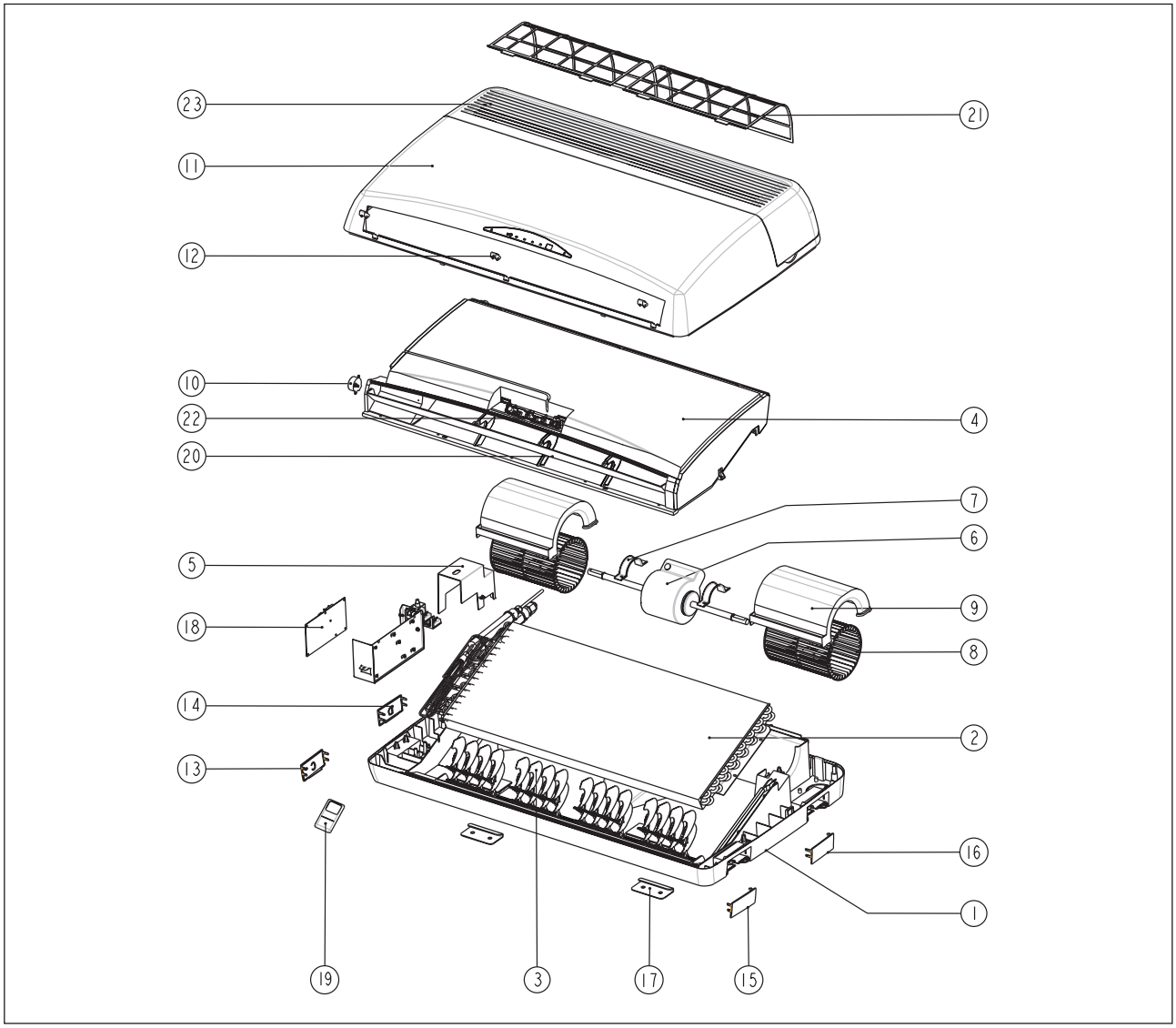
Indoor Unit
Model: ACM20/25E



No	Description
1	Assy., Top Panel
2	Assy., Coil
3	Assy., Vane
4	Assy., Drain Pan
5	Cover, Control Box
6	Motor
7	Motor, Bracket
8	Blower Wheel
9	Blower Housing
10	Motor, Air Swing
11	Assy., Bottom Panel
12	Cap, Screw
13	Cover, Hanger L1 (C)
14	Cover, Hanger L2 (D)
15	Cover, Hanger R1 (A)

No	Description
16	Cover, Hanger R2 (B)
17	Mounting Bracket
18	Control Module
19	G18 Handset (Cooling Only)
	G18 Handset (Heatpump)
20	Louver
21	Saranet Filter
22	Assy., LED Board
23	Air Intake Grille
Parts Not in Diagram	
1	Cover, Back
2	Drain Hose Assy.
3	Assy, Tube Inlet
4	Ionizer, 240V
5	Assy., Control Box

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