# Service Manual

Indoor Unit CS-E10KB4EA

Air Conditioner
Outdoor Unit
CU-E10HBEA



Please file and use this manual together with the service manual for Model No. CU-2E15LBE CU-2E18LBE CU-3E18LBE CU-4E23LBE, Order No. PHAAM1003090C3 and CS-ME10CKPG CS-ME12CKPG CS-ME14CKPG CS-ME18CKPG CS-ME7CKPG CU-2E15CBPG CU-3E23CBPG CU-4E27CBPG Order No. RAC0209005C2

### **⚠ WARNING**

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

## **⚠ PRECAUTION OF LOW TEMPERATURE**

In order to avoid frostbite, be assured of no refrigerant leakage during the installation or repairing of refrigeration circuit.

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# **Panasonic**

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# **Safety Precautions**

- Read the following "SAFETY PRECAUTIONS" carefully before perform any servicing.
- Electrical work must be installed or serviced by a licensed electrician. Be sure to use the correct rating of the power plug and main circuit for the model installed.
- The caution items stated here must be followed because these important contents are related to safety. The meaning of each indication used is as below. Incorrect installation or servicing due to ignoring of the instruction will cause harm or damage, and the seriousness is classified by the following indications.

<u></u> MARNING	This indication shows the possibility of causing death or serious injury.
<u></u> CAUTION	This indication shows the possibility of causing injury or damage to properties.

The items to be followed are classified by the symbols:

$\otimes$	This symbol denotes item that is PROHIBITED from doing.
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· Carry out test run to confirm that no abnormality occurs after the servicing. Then, explain to user the operation, care and maintenance as stated in instructions. Please remind the customer to keep the operating instructions for future reference.

## ∕Î∖ WARNING

- 1. Do not modify the machine, part, material during repairing service.
- 2. If wiring unit is supplied as repairing part, do not repair or connect the wire even only partial wire break. Exchange the whole wiring
- Do not wrench the fasten terminal. Pull it out or insert it straightly.
- 4. Engage dealer or specialist for installation and servicing. If installation of servicing done by the user is defective, it will cause water leakage, electrical shock or fire.
- 5. Install according to this installation instructions strictly. If installation is defective, it will cause water leakage, electric shock or fire.
- 6. Use the attached accessories parts and specified parts for installation and servicing. Otherwise, it will cause the set to fall, water leakage, fire or electrical shock.
- 7. Install at a strong and firm location which is able to withstand the set's weight. If the strength is not enough or installation is not properly done, the set will drop and cause injury.
- 8. For electrical work, follow the local national wiring standard, regulation and the installation instruction. An independent circuit and single outlet must be used. If electrical circuit capacity is not enough or defect found in electrical work, it will cause electrical shock or
- This equipment is strongly recommended to install with Earth Leakage Circuit Breaker (ELCB) or Residual Current Device (RCD). Otherwise, it may cause electrical shock and fire in case equipment breakdown or insulation breakdown.
- 10. Do not use joint cable for indoor / outdoor connection cable. Use the specified Indoor/Outdoor connection cable, refer to installation instruction CONNECT THE CABLE TO THE INDOOR UNIT and connect tightly for indoor / outdoor connection. Clamp the cable so that no external force will be acted on the terminal. If connecting or fixing is not perfect, it will cause heat up or fire at the connection.
- 11. Wire routing must be properly arranged so that control board cover is fixed properly. If control board cover is not fixed perfectly, it will cause heat-up or fire at the connection point of terminal, fire or electrical shock.
- 12. When install or relocate air conditioner, do not let any substance other than the specified refrigerant, eg. air etc. mix into refrigeration cycle (piping). (Mixing of air etc. will cause abnormal high pressure in refrigeration cycle and result in explosion, injury etc.)
- 13. Do not install outdoor unit near handrail of veranda. When installing air-conditioner unit at veranda of high rise building, child may climb up to outdoor unit and cross over the handrail and causing accident.
- 14. This equipment must be properly earthed. Earth line must not be connected to gas pipe, water pipe, earth of lightning rod and

15. Keep away from small children, the thin film may cling to nose and mouth and prevent breathing.

- telephone. Otherwise, it may cause electric shock in case equipment breakdown or insulation breakdown.
- 16. Do not use unspecified cord, modified cord, joint cord or extension cord for power supply cord. Do not share the single outlet with other electrical appliances. Poor contact, poor insulation or over current will cause electrical shock or fire.
- 17. Tighten the flare nut with torque wrench according to specified method. If the flare nut is over-tightened, after a long period, the flare may break and cause refrigerant gas leakage.

	<u></u> ₩ARNING	
18.	For R410A models, when connecting the piping, do not use any existing (R22) pipes and flares nuts. Using such same may cause abnormally high pressure in the refrigeration cycle (piping), and possibly result in explosion and injury. In case of using existing (R22) pipes during installation of R410A models, must carry out pump down properly to collect back the refrigerant and oil before installation new unit.  Thickness of copper pipes used with R410A must be more than 0.6mm. Never use copper pipes thinner than 0.6mm.  It is desirable that the amount of residual oil is less than 40 mg/10m.	$\Diamond$
19.	During installation, install the refrigerant piping properly before run the compressor. (Operation of compressor without fixing refrigeration piping and valves at opened condition will cause suck-in of air, abnormal high pressure in refrigeration cycle and result in explosion, injury etc.).	
20.	During pump down operation, stop the compressor before remove the refrigeration piping. (Removal of compressor while compressor is operating and valves are opened will cause suck-in of air, abnormal high pressure in refrigeration cycle and result in explosion, injury etc.)	
21.	After completion of the installation servicing, confirm there is no leakage of refrigerant gas. It may generate toxic gas when the refrigerant contacts with fire.	
22.	Ventilate if there is refrigerant gas leakage during operation. It may cause toxic gas when the refrigerant contacts with fire.	
23.	Do not insert your fingers or other objects into the unit, high speed rotating fan may cause injury.	$\Diamond$
24.	Must not use other parts except original parts describe in catalog and manual.	
	<u></u> CAUTION	
1.	Do not install the unit at place where leakage of flammable gas may occur. In case gas leaks and accumulates at surrounding of the unit, it may cause fire.	$\Diamond$
2.	Carry out drainage piping as mentioned in installation instructions. If drainage is not perfect, water may enter the room and damage the furniture.	
3.	Tighten the flare nut with torque wrench according to specified method. If the flare nut is over-tightened, after a long period, the flare may break and cause refrigerant gas leakage.	
4.	Do not touch outdoor unit air inlet and aluminium fin. It may cause injury.	$\Diamond$
5.	Select an installation location which is easy for maintenance.	
	Pb free solder has a higher melting point than standard solder; typically the melting point is $50^{\circ}\text{F}$ - $70^{\circ}\text{F}$ ( $30^{\circ}\text{C}$ - $40^{\circ}\text{C}$ ) higher. Please use a high temperature solder iron. In case of the soldering iron with temperature control, please set it to $700 \pm 20^{\circ}\text{F}$ ( $370 \pm 10^{\circ}\text{C}$ ). Pb free solder will tend to splash when heated too high (about $1100^{\circ}\text{F}$ / $600^{\circ}\text{C}$ ).	
7.	Power supply connection to the conditioner. Connect the power supply cord of the air conditioner to the mains using one of the following methods.  Power supply point shall be the place where there is ease for access for the power disconnection in case of emergency. In some countries, permanent connection of this room air conditioner to the power supply is prohibited.  1. Power supply connection to the receptacle using a power plug. Use an approved 15/16A (3/4~1.5HP) or 16A (2.0HP) or 20A (2.5HP) or 25A (3.0HP) power plug with earth pin for the connection to the socket.	

# 2 Specifications

# 2.1. CS-E10KB4EA CU-E10HBEA

MOD	EL			INDOOR			CS-E10	KB4EA			
				OUTDOOR			CU-E1	0HBEA			
Perf	ormance Test (	Condition			EUROVENT / AS						
				Phase, Hz	Single, 50						
Pow	er Supply			V	230				240		
					Min.	Mid.	Max.	Min.	Mid.	Max.	
				kW	0.60	2.50	3.20	0.60	2.50	3.20	
	Capacity	Capacity			2050	8530	10900	2050	8530	10900	
				Kcal/h	520	2150	2750	520	2150	2750	
С	Running Curr	ent		Α	_	2.9	_	_	2.8	_	
0	Input Power			W	145	620	870	145	620	870	
0 	Annual Consu	umption		kWh	_	310	ĺ	_	_	_	
i	EER			W/W	4.14	4.03	3.68	4.14	4.03	3.68	
n	LLIX			Btu/hW	14.1	13.8	12.5	14.1	13.8	12.5	
g	Power Factor			%	_	93		_	92	_	
ı.	Indoor Noise	(H / I / OI o)		dB-A				6 / 23			
	1110001 140100	(117 27 020)		Power Level dB			47 /	' - / -			
	Outdoor Noise (H / L)			dB-A			45 /	' - / -			
	Culadol Holo	O (117 E)		Power Level dB			58 /	- / -			
	0 11			kW	0.60	3.20	5.10	0.60	3.20	5.10	
	Capacity			BTU/h Kcal/h	2050	10900	17400	2050	10900	17400	
Н					520	2750	4390	520	2750	4390	
е	Running Current		Α	_	3.8	_	_	3.7	_		
a t	Input Power		W	125	820	1.45k	125	820	1.45k		
i	COP		W/W	4.80	3.90	3.52	4.80	3.90	3.52		
n	001			Btu/hW	16.4	13.3	12.0	16.4	13.3	12.0	
g	Power Factor			%		94	_	_	92	_	
	Indoor Noise	(H / I / QI o)		dB-A	35 / 28 / 25						
		(, =, \(\infty\)		Power Level dB	48 / - / -						
	Outdoor Noise	e (H / L)		dB-A		46 / - / -					
				Power Level dB	59 / - / -						
		lax Input Powe	r (W)		6.7 / 1.45k						
Start	ing Current (A)				3.8						
Com	proces	Туре			Hermetic Motor						
Com	mpressor Motor Type						s (4-poles)				
		Output Powe	er	W				50			
	Туре				Backward Fan						
	Material				ABS+GF10%						
	Motor Type			100			DC Motor	r (8 poles)			
ı	Input Power			W			-	_			
N	Output Power	T	01	W				.0			
D O		QLo	Cool	rpm				- 350			
0			Heat	rpm				- 410			
R		Lo	Cool	rpm				- 400			
F			Heat	rpm				- 440			
A	Speed	Me	Cool	rpm				- 480 - 510			
N			Heat	rpm							
		Hi	Cool	rpm				- 560			
			Heat	rpm				- 580			
		SHi	Cool	rpm				- 600			
			Heat	rpm			630	- 630			

MOD	MODEL		INDOOR	CS-E10KB4EA			
				OUTDOOR	CU-E10HBEA		
0	Туре				Propeller Fan		
U	Material				PP		
T D	Motor Type				PWM (8-poles)		
0	Input Power		Cool	W	_		
0	·	Heat		VV	_		
K	R Output Power			W	40		
F			Cool	rpm	750		
A N	Speed	Hi	Heat	rpm	720		
Mois	ture Removal	1	,	L/h (Pt/h)	1.5 (3.2)		
		QLo	Cool	m <sup>3</sup> /min (ft <sup>3</sup> /min)	7.1 (250)		
		QLO	Heat	m <sup>3</sup> /min (ft <sup>3</sup> /min)	8.0 (280)		
			Cool	m <sup>3</sup> /min (ft <sup>3</sup> /min)	7.9 (280)		
		Lo	Heat	m <sup>3</sup> /min (ft <sup>3</sup> /min)	8.5 (300)		
	Indoor Airflow		Cool	m <sup>3</sup> /min (ft <sup>3</sup> /min)	9.2 (330)		
Indo	or Airflow	Me	Heat	m <sup>3</sup> /min (ft <sup>3</sup> /min)	9.6 (340)		
Indoor Almow			Cool	m <sup>3</sup> /min (ft <sup>3</sup> /min)	10.5 (370)		
		Hi	Heat	m <sup>3</sup> /min (ft <sup>3</sup> /min)	10.8 (380)		
			Cool	` ,	11.2 (400)		
		SHi		m <sup>3</sup> /min (ft <sup>3</sup> /min)	·		
			Heat	m <sup>3</sup> /min (ft <sup>3</sup> /min)	11.6 (410)		
Outd	oor Airflow	Hi	Cool	m <sup>3</sup> /min (ft <sup>3</sup> /min)	28.8 (1020)		
Outo			Heat	m <sup>3</sup> /min (ft <sup>3</sup> /min)	28.5 (1010)		
		Control Devi		Expansion Valve			
Refri	geration Cycle	Refrigerant Oil		cm <sup>3</sup>	RB68A or Freol Alpha 68M (400)		
		Refrigerant Type		g (oz)	R410A, 1.15k (40.6)		
		Height (I/D / O/D / PANEL)		mm (inch)	260 (10-14) / 540 (21-9/32) / 51 (2-1/32)		
Dime	ension	Width (I/D / C		mm (inch)	575 (22-21/32) / 780 (30-23/32) / 700 (27-9/16)		
			O/D / PANEL)	mm (inch)	575 (22-21/32) / 289 (11-13/32) / 700 (27-9/16)		
Weig	*	Net (I/D / O/I	) / PANEL)	kg (lb)	18 (40) / 35 (77) / 2.5 (6)		
Р				pe Diameter (Liquid / Gas)		mm (inch)	6.35 (1/4) / 9.52 (3/8)
1	Standard Leng			m (ft)	7.5 (24.6)		
Р	Length Range	*		m (ft)	3 (9.8) ~ 20 (65.6)		
N	-	0 & O/D Height Different Iditional Gas Amount		m (ft) g/m (oz/ft)	15.0 (49.2) 20 (0.2)		
G	Length for Add			g/iii (02/it) m (ft)	10.0 (32.8)		
	Lengin for Add	Inner Diamet	er	mm	30		
Drair	n Hose	Length		mm	193		
		Fin Material			Aluminium (Pre Coat)		
		Fin Type			Slit Fin		
	or Heat	Row × Stage	×FPI		2×10×18		
Exchanger		Size (W×H	× L)	mm	1330 × 210 × 25.4 1270		
Fin Material		Aluminium					
Outd	oor Heat	Fin Type			Corrugated Fin		
	anger	Row × Stage	×FPI		2 × 24 × 17		
		Size (W×H	× L)	mm	18.19 × 504 × 713		
Air F	ilter	•	Material		_		
All F	III. <del>C</del> I		Туре				
	er Supply				Outdoor		
	er Supply Cord			Α			
	mostat				Electronic Control		
Prote	ection Device				Electronic Control		

MODEL		INDOOR	CS-E10	KB4EA
		OUTDOOR	CU-E1	0HBEA
			Dry Bulb	Wet Bulb
	Cooling	Maximum	32	23
Indeed Operation Decree	Cooling	Minimum	16	11
Indoor Operation Range	Heating	Maximum	30	_
		Minimum	16	_
	Cooling	Maximum	43	26
Outdoor Operation Banga	Cooling	Minimum	-10	_
Outdoor Operation Range	Heating	Maximum	24	18
	ricating	Minimum	-10	_

- 1. Cooling capacities are based on indoor temperature of 27°C Dry Bulb (80.6°F Dry Bulb), 19.0°C Wet Bulb (66.2°F Wet Bulb) and outdoor air temperature of 35°C Dry Bulb (95°F Dry Bulb), 24°C Wet Bulb (75.2°F Wet Bulb)
- 2. Heating capacities are based on indoor temperature of 20°C Dry Bulb (68°F Dry Bulb) and outdoor air temperature of 7°C Dry Bulb (44.6°F Dry Bulb), 6°C Wet Bulb (42.8°F Wet Bulb)
- 3. Specifications are subject to change without notice for further improvement.

# 2.2. CU-2E15LBE

	tem		Unit	OUTDOO	OR UNIT	
Indoor Unit Combination					+ 2.5kW	
Power Source				1 Phase, 230V, 50Hz (Powe	er supply from outdoor unit)	
	Canadity		kW	4.5 (1.5	5 ~ 5.2)	
	Capacity		BTU/h	15300 (5120 ~ 17700)		
	Flootrical	Running Current	Α	5.7	75	
Cooling Operation	Electrical Data	Power Input	kW	1.23 (0.2	5 ~ 1.52)	
	Data	EER	W/W	3.66 (6.0	0 ~ 3.42)	
	Noise	Sound Pressure Level	dB-A (H/L)	47	/ -	
	NOISC	Sound Power Level	dB (H/L)	62		
	Capacity		kW	5.4 (1.1		
	Cupacity		BTU/h	18400 (375	<u> </u>	
	Electrical	Running Current	Α	5.2		
Heating Operation	Data	Power Input	kW	1.17 (0.2		
		COP	W/W	4.62 (5.2	· ·	
	Noise	Sound Pressure Level	dB-A (H/L)	49		
	110.00	Sound Power Level	dB (H/L)	64		
Maximum Current			Α	12		
Starting Current			Α	5.7		
Circuit Breaker Capacity	1		Α	1		
	Height		mm	54		
Dimension	Width		mm	780 (		
	Depth		mm	28		
Net Weight			kg	3		
Connection Cable				3 + 1 (Earth) ø1.5 mm <sup>2</sup>		
Pipe Length Range (1 room)			m	3 ~ 20		
Maximum Pipe Length (Total Roc			m	30		
Refrigerant Pipe Diameter	Liquid Side		mm (inch)	6.35 (1/4)		
	Gas Side		mm (inch)	9.52 (3/8)		
	Туре			Hermetic Motor		
Compressor	Motor Type			Brushless (4-poles)		
	Rated Out	out	W	1.20k		
	Type			Propeller Fan		
Air Circulation		Motor Type		DC Motor (8-poles)		
	Rated Out		W	40 860 / 860		
Fan Speed		ing / Heating)	RPM			
	Type Type Mate	wio!		Plate fin configuration	,,	
Hoot Evolunger	Tube Mate			Cop		
Heat Exchanger	Fin Materia			Aluminum (Pre Coat) 2 / 20		
	Row / Stag	<del>-</del>		1		
Air Volume		ing / Heating)	34			
	rigii (Cool	ing / nealing)	m <sup>3</sup> /min	33.3 /		
Refrigerant Control Device			Expansion DRGA / Exp			
Refrigerant Oil		~	RB68A / Fre			
Refrigerant (R410A)			g	1.4 Dry Bulb	Wet Bulb	
		Maximum		32	23	
	Cooling	Minimum		32 16	11	
Indoor Operation Range		Maximum		30	——————————————————————————————————————	
	Heating	Minimum		16	<u> </u>	
		Maximum		43	26	
	Cooling	Minimum		16	11	
Outdoor Operation Range		Maximum		24	18	
	Heating	Minimum		-10	-11	
	1			10		

<sup>•</sup> Specifications are subject to change without notice for further improvement.

# 2.3. CU-2E18LBE

	ltem		Unit	OUTDO	OR UNIT	
Indoor Unit Combination					+ 3.2kW	
Power Source				1 Phase, 230V, 50Hz (Powe		
	Capacity	Conneity		5.2 (1.5 ~ 5.4)		
	Capacity		BTU/h	17700 (512	0 ~ 18400)	
	Electrical	Running Current	Α	7.	10	
Cooling Operation	Data	Power Input	kW	1.52 (0.2	5 ~ 1.58)	
	Data	EER	W/W	3.42 (6.0	0 ~ 3.42)	
	Noise	Sound Pressure Level	dB-A (H/L)	49	/-	
	Noise	Sound Power Level	dB (H/L)	64		
	Capacity		kW	5.6 (1.1		
	Capacity		BTU/h	19100 (375	0 ~ 24600)	
	[] atriagl	Running Current	Α	5.3	35	
Heating Operation	Electrical Data	Power Input	kW	1.21 (0.2	1 ~ 1.70)	
	Data	COP	W/W	4.63 (5.2	4 ~ 4.24)	
	Noise	Sound Pressure Level	dB-A (H/L)	51	/-	
	inoise	Sound Power Level	dB (H/L)	66	/-	
Maximum Current	•		Α	12	2.0	
Starting Current			Α	7.	1	
Circuit Breaker Capacity			Α	1	5	
	Height		mm	54	10	
Dimension	Width		mm	780 (	(+70)	
	Depth		mm	28	39	
Net Weight			kg	3	8	
Connection Cable				3 + 1 (Earth) ø1.5 mm <sup>2</sup>		
Pipe Length Range (1 room)			m	3 ~ 20		
Maximum Pipe Length (Total R	Soom)		m	30		
	Liquid Side	<u> </u>	mm (inch)	6.35 (1/4)		
Refrigerant Pipe Diameter	Gas Side		mm (inch)	9.52 (3/8)		
	Туре			Hermetic Motor		
Compressor		Motor Type		Brushless (4-poles)		
		Rated Output		1.50k		
	Type	·		Propeller Fan		
Air Circulation	Motor Type			DC Motor (8-poles)		
7 III Oliodiation		Rated Output		40		
Fan Speed		ing / Heating)	W RPM	890 /		
1 an opecu	Type	ing / ricating)	TXT IVI			
	Tube Mate	rial		Plate fin configuration forced draft type  Copper		
Heat Exchanger	Fin Materia			Aluminum (Pre Coat)		
Ticat Exchange	Row / Stag			2 / 20		
	FPI	<u> </u>		19		
Air Volume		ling / Heating)	m <sup>3</sup> /min	34.5		
	riigii (C00	mig / Healing)	rn~/min			
Refrigerant Control Device				Expansion DRCSA / Fro		
Refrigerant Oil			-	RB68A / Fre	•	
Refrigerant (R410A)			g	1.4		
	T	Marrian		Dry Bulb	Wet Bulb	
	Cooling	Maximum		32	23	
Indoor Operation Range		Minimum		16	11	
. •	Heating	Maximum		30	<del>_</del>	
		Minimum		16	_	
	Cooling	Maximum		43	26	
Outdoor Operation Range		Minimum		16	11	
19-	Heating	Maximum		24	18	
		Minimum		-10	-11	

<sup>•</sup> Specifications are subject to change without notice for further improvement.

# 2.4. CU-3E18LBE

	Item		Unit	OUTDOO	R UNIT	
Indoor Unit Combination				2.0kW + 2.0k	(W + 5.0kW	
Power Source				1 Phase, 230V, 50Hz (Power supply from outdoor unit		
	Capacity	Canacity		5.2 (1.8	~ 7.3)	
	Сараспу		BTU/h	17700 (6140	0 ~ 24900)	
		Running Current	Α	5.3	3	
Cooling Operation	Electrical Data	Power Input	kW	1.20 (0.36	6 ~ 2.18)	
	Data	EER	W/W	4.33 (5.00	) ~ 3.35)	
	Noise	Sound Pressure Level	dB-A (H/L)	46 /	/ <b>-</b>	
	Noise	Sound Power Level	dB (H/L)	60 /	/ <b>-</b>	
	Caracit.		kW	6.8 (1.6	~ 8.3)	
	Capacity		BTU/h	23200 (5460	0 ~ 28300)	
		Running Current	Α	6.5	5	
Heating Operation	Electrical Data	Power Input	kW	1.40 (0.32	2 ~ 2.11)	
	Data	СОР	W/W	4.86 (5.00	) ~ 3.93)	
		Sound Pressure Level	dB-A (H/L)	47 /	/ <b>-</b>	
	Noise	Sound Power Level	dB (H/L)	61 /	<i>I</i> -	
Maximum Current	<u> </u>		Α	15.	2	
Starting Current			Α	6.9	5	
Circuit Breaker Capacity			Α	16		
	Height		mm	79	 5	
Dimension	Width		mm	875 (-		
	Depth		mm	32		
Net Weight	1200		kg	71		
Connection Cable			9	3 + 1 (Earth) Ø1.5 mm <sup>2</sup>		
Pipe Length Range (1 room)			m	3 + 1 (Earth) Ø1.5 mm		
	oom)			50 50		
Maximum Pipe Length (Total Room)		m (in sh)	6.35 (1/4)			
Refrigerant Pipe Diameter	Liquid Side Gas Side		mm (inch)	9.52 (3/8)		
			mm (inch)	9.52 (3/6)  Hermetic Motor		
Compressor	Type Motor Type					
Compressor			W	Brushless (4-poles)		
	Rated Output		VV	1.30k Propeller Fan		
Air Circulation	Motor Type	Туре		DC Motor (8-poles)		
All Circulation	Rated Outp		W			
Face On and	-			60 580 / 580		
Fan Speed		ing / Heating)	RPM			
	Туре	2-1		Plate fin configuration	* * * * * * * * * * * * * * * * * * * *	
Heat Evelopene	Tube Mate			Copper		
Heat Exchanger	Fin Materia			Aluminum (Pre Coat)		
		Row / Stage		2/36		
A'a Malana	FPI		3, .	19		
Air Volume	High		m <sup>3</sup> /min	41.		
Refrigerant Control Device				Expansion Valve		
Refrigerant Oil			FV5			
Refrigerant (R410A)			g	2.64		
		T		Dry Bulb	Wet Bulb	
	Cooling	Maximum		32	23	
Indoor Operation Range	Cooling	Minimum		16	11	
	Heating	Maximum		30	_	
		Minimum		16		
	Cooling	Maximum		46	26	
Outdoor Operation Range		Minimum		-10	_	
Catagor Operation Mange	Heating	Maximum		24	18	
	Ticating	Minimum		-15	-16	

<sup>•</sup> Specifications are subject to change without notice for further improvement.

# 2.5. CU-4E23LBE

	Item		Unit	OUTDOO	OR UNIT
Indoor Unit Combination				2.0kW + 2.0kW -	+ 2.0kW + 5.0kW
Power Source				1 Phase, 230V, 50Hz (Powe	er supply from outdoor unit)
	Cit.		kW	6.8 (1.9	9 ~ 8.8)
	Capacity		BTU/h	23200 (648	0 ~ 30000)
		Running Current	Α	7.	5
Cooling Operation	Electrical	Power Input	kW	1.68 (0.3	4 ~ 2.47)
	Data	EER	W/W	4.05 (5.5	9 ~ 3.56)
		Sound Pressure Level	dB-A (H/L)	48	/-
	Noise	Sound Power Level	dB (H/L)	62	/-
	0 :		kW	8.6 (3.0	~ 10.6)
	Capacity		BTU/h	29300 (1020	00 ~ 36100)
		Running Current	А	8.	
Heating Operation	Electrical	Power Input	kW	1.85 (0.5	8 ~ 2.60)
	Data	COP	W/W	4.65 (5.1	7 ~ 4.08)
		Sound Pressure Level	dB-A (H/L)	49	/-
	Noise	Sound Power Level	dB (H/L)	63	/-
Maximum Current			A	15	.6
Starting Current			Α	8.	6
Circuit Breaker Capacity			Α	2	
	Height		mm	79	95
Dimension	Width		mm	875 (	
2	Depth		mm	32	•
Net Weight	Борин		kg	7.	
Connection Cable			.vg		
				3 + 1 (Earth	
Pipe Length Range (1 room)	>		m	3 ~	
Maximum Pipe Length (Total R			m (Cook)	6	
Refrigerant Pipe Diameter	Liquid Side	)	mm (inch)	6.35	. ,
	Gas Side		mm (inch)	9.52	
	Туре			Hermeti	
Compressor	Motor Type			Brushless	
	Rated Outp	out	W	1.3	
	Туре			Propell	
Air Circulation	Motor Type			DC Motor	· · · · · ·
	Rated Outp		W	6	
Fan Speed		ing / Heating)	RPM	600 /	
	Type			Plate fin configuration	
	Tube Mate			Сор	
Heat Exchanger	Fin Materia			Aluminum	<u>'</u>
	Row /S tag	е		2/	
	FPI			1	
Air Volume	High (Cool	ing / Heating)	m <sup>3</sup> /min	42.5 /	
Refrigerant Control Device				Expansion	
Refrigerant Oil				FV5	50S
Refrigerant (R410A)			g	2.4	6k
				Dry Bulb	Wet Bulb
	Cooling	Maximum		32	23
Indoor Operation Range	Cooling	Minimum		16	11
macor operation range	Heating	Maximum		30	_
	ricality	Minimum		16	_
	Cooling	Maximum		46	26
Outdoor Operation Banco	Cooling	Minimum		-10	_
Outdoor Operation Range	∐ootio~	Maximum		24	18
	Heating	Minimum		-15	-16

<sup>•</sup> Specifications are subject to change without notice for further improvement.

# 2.6. CU-4E27CBPG

	Item		Unit	OUTDOOR UNIT
Indoor Unit Combination				3.2kW + 3.2kW + 3.2kW + 4.0kW
Power Source				Single Phase, 230V, 50Hz (Power supply from outdoor unit)
	Capacity		kW	8.0 (3.0 - 9.2)
		Running Current	Α	8.70
	Electrical Data	Power Input	W	1980 (530 - 2870)
Cooling Operation	Data	EER	W/W	4.04
		Sound Pressure Level	dB	48
	Noise	Sound Power Level	dB	61
	Capacity		kW	9.4 (4.2 - 10.6)
		Running Current	А	9.10
	Electrical	Power Input	W	2080 (700 - 3060)
Heating Operation	Data	COP	W/W	4.52
		Sound Pressure Level	dB	49
	Noise	Sound Power Level	dB	62
Maximum Current	I		Α	19.0
Starting Current			Α	9.10
Circuit Breaker Capacity			Α	20
	Height		mm	908
Dimension	Width		mm	900
	Depth		mm	320
Net Weight	•		kg	73
Connection Cable				3 + 1 (Earth) ø1.5 mm <sup>2</sup>
Pipe Length Range (1 room)			m	3 - 25
Maximum Pipe Length (Total Re	oom)		m	70
D ( ) D D	Liquid Side	)	mm	6.35
Refrigerant Pipe Diameter	Gas Side		mm	9.52
	Туре			Hermetically Sealed Swing Type
Compressor	Motor Type	)		DC Brushless (4-poles)
	Rated Out	out	W	2200
	Туре			Propeller Fan
Air Circulation	Motor Type	)		DC Brushless (8-poles)
	Rated Out	out	W	51
For Spood	Low		rpm	680
Fan Speed	High		rpm	780
	Туре			Plate fin configuration forced draft type
	Tube Mate	rial		Copper
Heat Exchanger	Fin Materia	al		Aluminum
	Row / Stag	е		2 / 40
	FPI			19
A : 1 \ / a	Low Coolin	g (Heating)	m <sup>3</sup> /min	42 (42)
Air Volume	High Coolii	ng (Heating)	m <sup>3</sup> /min	48.5 (45)
Refrigerant Control Device				Expansion Valve
Refrigerant Oil				FOC50K (Ethers)
Refrigerant (R410A)			g	3,100

<sup>•</sup> Specifications are subject to change without notice for further improvement.

#### • Multi Split Combination Possibility:

- A single outdoor unit enables air conditioning of up to two separate rooms for CU-2E15LBE, CU-2E18LBE.
- A single outdoor unit enables air conditioning of up to three separate rooms for CU-3E18LBE.
- A single outdoor unit enables air conditioning of up to four separate rooms for CU-4E23LBE, CU-4E27CBPG.

CONNIE	CTADI	E INDOOR UNIT							OUT	DOOR	UNIT						
COMME	CIABL			15LBE	CU-2E	18LBE	CL	-3E18L	BE		CU-	4E23LB	Ε		CU-4E2	7CBPG	i
Туре		ROOM	Α	В	Α	В	Α	В	С	Α	В	С	D	Α	В	С	D
	2.0kW	CS-E7LKEW CS-XE7LKEW	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	2.5kW	CS-E9LKEW CS-XE9LKEW CS-E10KB4EA CS-E10KD3EA	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Wall	3.2kW	CS-E12LKEW CS-XE12LKEW	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	4.0kW	CS-E15LKEW CS-XE15LKEW	_	_	_	_	•	•	•	•	•	•	•	•	•	•	•
	5.0kW	CS-E18LKEW CS-XE18LKEW	_	_	_	_	•	•	•	•	•	•	•	•	•	•	•
	6.0kW	CS-E21LKEW CS-XE21LKEW	_	_	_	_	_	_	_	•	•	•	•	_	_	I	_
		range of indoor units		4.0kW 1 .6kW	to		4.0kW .4kW	to		m 4.5kV 9.0kW	-		m 4.5kV 11.0kW			m 4.5k\ 13.6kV	
		m maximum e length (m)		20			20			25			25			25	
	Allowab	le elevation (m)		10			10			15			15			15	
<b>5</b> .	I	allowable pipe ength (m)		30			30			50			60			70	
Pipe length	maxim	oipe length for um chargeless ength (m)		20			20			30			30			40	
	an	ditional gas nount over ess length (g/m)		20			20			20			20			20	
					<u>'</u>										Note: "	• " : Av	ailable

## Remarks for CU-2E15LBE / CU-2E18LBE

- 1. At least two indoor units must be connected.
- The total nominal cooling capacity of indoor units that will be connected to outdoor unit must be within connectable capacity range of indoor unit. (as shown in the table above)

Example: The indoor units' combination below is possible to connect to CU-2E15LBE. (Total nominal capacity of indoor units is between 4.0kW to 5.6kW)

- 1) Two CS-E7LKEW only (Total nominal cooling capacity is 4.0kW)
- 2) One CS-E7LKEW and one CS-E9LKEW. (Total nominal cooling capacity is 4.5kW)

#### Remarks for CU-3E18LBE / CU-4E23LBE / CU-4E27CBPG

- 1. At least two indoor units must be connected.
- The total nominal cooling capacity of indoor units that will be connected to outdoor unit must be within connectable capacity range of indoor unit. (as shown in the table above)

Example: The indoor units' combination below is possible to connect to CU-3E18LBE. (Total nominal capacity of indoor units is between 4.5kW to 9.0kW)

- 1) Two CS-E9LKEW only (Total nominal cooling capacity is 5.0kW)
- 2) Three CS-E12LKEW. (Total nominal cooling capacity is 9.6kW)

## • Outdoor Unit : CU-2E15LBE

	Indoor unit capacity	Total			Coolin	g Capac	ity(kW)			In	out Pow	ver (W)		E	ER	ANNUAL ENERGY	Current,	MOISTURE REMOVAL VOLUME
	Cooling	Iotai	Room A	Room B			Total	min	$\sim$ max	Rating	min		nax	W/W	CLASS	CONSUMPTION (kWh)	230V (A)	1/h
	20	20	2.00				2.00	1. 1	~ 2.9	520	220	~ 7	50	3.85	A	260	2. 45	1. 3
1	25	25	2.50	[		[ ]	2.50	1. 1	~ 3.5	670	220	~ 10	000	3.73	A	335	3. 15	1. 5
Room	28	28	2.80	[			2.80	1. 1	~ 3.5	750	220	~ 10	000	3.73	. A	375	3. 50	1. 6
	32	32	3. 20				3. 20	1. 1	~ 4.0	920	220	~ 12	220	3.48	A	460	4. 30	1.8
	20 + 20	40	2.00	2.00			4.00	1.5	~ 5.0	1090	250	~ 13	350	3.66	A	545	5. 10	1.3 + 1.3
	20 + 25	45	2.00	2.50			4. 50	1.5	~ 5.2	1230	250	~ 15	520	3.66	A	615	5. 75	1.3 + 1.5
	20 + 28	48	1.85	2.65			4. 50	1. 5	~ 5.2	1230	250	~ 15	520	3.66	A	615	5. 75	1.2 + 1.6
D	20 + 32	52	1.75	2.75	[		4. 50	1. 5	~ 5.2	1230	250	~ 15	520	3.66	A	615	5. 75	1.1 + 1.6
Room	25 + 25	50	2. 25	2. 25			4. 50	1.5	~ 5.2	1230	250	~ 15	520	3.66	A	615	5. 75	1.5 + 1.5
	25 + 28	53	2.10	2.40			4. 50	1. 5	~ 5.2	1230	250	~ 15	520	3.66	A	615	5. 75	1.4 + 1.5
	28 + 28	56	2. 25	2. 25			4. 50	1. 5	~ 5.2	1230	250	~ 15	520	3.66	A	615	5. 75	1.5 + 1.5

	Indoor unit capacity	T-+-1		Heat	ing Capac	ity(kW)			In	out Pow	er (W)		COP	ANNUAL ENERGY	Current,	MOISTURE REMOVAL VOLUME
	Heating	Total	Room A Ro	oom B		Total	min	~ max	Rating	min	$\sim$ max	W/W	CLASS	CONSUMPTION (kWh)	230V (A)	1/h
	20	20	3. 20			3. 20	0.7	~ 4.8	850	170	~ 1410	3.76	A	425	3. 75	
1	25	25	3. 60			3. 60	0.7	~ 5.5	1030	170	~ 1700	3.50	В	515	4. 55	
Room	28	28	4.00			4.00	0.7	~ 5.5	1150	170	~ 1700	3.48	В	575	5. 10	
	32	32	4.50			4. 50	0.7	~ 6.2	1250	170	~ 1810	3.60	В	625	5. 55	
	20 + 20	40	2.70 2	2.70		5. 40	1.1	~ 7.0	1170	210	~ 1670	4. 62	A	585	5. 20	
1	20 + 25	45	2.40	3.00		5. 40	1.1	~ 7.0	1170	210	~ 1670	4. 62	A	585	5. 20	
	20 + 28	48	2. 25	3. 15		5. 40	1.1	~ 7.0	1170	210	~ 1670	4. 62	A	585	5. 20	
1,2	20 + 32	52	2.10	3. 30		5. 40	1.1	~ 7.0	1170	210	~ 1670	4. 62	A	585	5. 20	
Room	20 + 32 25 + 25	50	2.70 2	2.70		5. 40	1.1	~ 7.0	1170	210	~ 1670	4. 62	] A	585	5. 20	
	25 + 28	53	2. 55	2. 85		5. 40	1.1	~ 7.0	1170	210	~ 1670	4. 62	] A	585	5. 20	
	28 + 28	56	2.70 2	2. 70		5. 40	1.1	~ 7.0	1170	210	~ 1670	4. 62	A	585	5. 20	

## • Outdoor Unit : CU-2E18LBE

	Indoor unit capacity	T 1			Cooling C	Capacity(kW)			In	out Pov	er (W)		El	ER	ANNUAL ENERGY	Current,	MOISTURE REMOVAL VOLUME
	Cooling	lotal	Room A	Room B		Total	min	~ max	Rating	min		max	W/W	CLASS	CONSUMPTION (kWh)	230V (A)	1/h
	20	20	2.00			2.00	1. 1	~ 2.9	520	220	~ 7	750	3.85	A	260	2. 45	1. 3
1	25	25	2.50			2. 50	1. 1	~ 3.5	670	220		000	3.73	A	335	3. 15	1. 5
Room		28	2.80			2.80	1. 1	~ 3.5	750	220	~ 1	000	3.73	A	375	3. 50	1.6
	32	32	3. 20	[		3. 20	1. 1	~ 4.0	920	220	~ 1	220	3.48	A	460	4. 30	1.8
	20 + 20	40	2.00	2.00		4.00	1.5	~ 5.0	1090	250	~ 1	350	3.66	A	545	5. 10	1.3 + 1.3
	20 + 25	45	2.00	2.50		4. 50	1. 5	~ 5.2	1230	250		520	3.66	A	615	5. 75	1.3 + 1.5
	20 + 28	48	1.85	2.65		4. 50	1.5	~ 5.2	1230	250		520	3.66	A	615	5. 75	1.2 + 1.6
	20 + 32	52	1.85	2.95		4. 80	1.5	~ 5.3	1310	250		540	3.66	A	655	6. 10	1.2 + 1.7
2	25 + 25	50	2.40	2.40		4. 80	1. 5	~ 5.2	1310	250		520	3.66	A	655	6. 10	1.5 + 1.5
Room	25 + 28	53	2. 25	2.55		4.80	1.5	~ 5.2	1310	250		520	3.66	A	655	6. 10	1.5 + 1.6
	25 + 32	57	2. 20	2.80		5.00	1.5	~ 5.3	1490	250	~ 1	540	3.36	A	745	6. 95	1.4 + 1.6
	28 + 28	56	2.40	2.40		4.80	1. 5	~ 5.2	1310	250	~ 1	520	3.66	A	655	6. 10	1.5 + 1.5
	28 + 32	60	2.35	2.65		5. 00	1. 5	~ 5.3	1490	250		540	3.36	A	745	6. 95	1.5 + 1.6
	32 + 32	64	2.60	2.60		5. 20	1. 5	~ 5.4	1520	250	~ 1	580	3.42	A	760	7. 10	1.6 + 1.6

	Indoor unit capacity	m . 1	T	Hea	ting Capa	city(kW)			Inp	out Pow	ver (W)		C	OP	ANNUAL ENERGY	Current,	MOISTURE REMOVAL VOLUME
	Heating	lotal	Room A	Room B	T .	Total	min	~ max	Rating	min	~ n	nax	W/W	CLASS	CONSUMPTION (kWh)	230V (A)	1/h
	20	20	3. 20			3. 20	0.7	~ 4.8	850	170	~ 14	110	3.76	A	425	3. 75	
1	25	25	3.60			3.60	0.7	~ 5.5	1030	170	~ 17	700	3.50	В	515	4. 55	
Room	28	28	4.00	1		4.00	0.7	~ 5.5	1150	170	~ 17	700	3.48	В	575	5. 10	L
	32	32	4.50			4. 50	0.7	~ 6.2	1250	170		310	3.60	В	625	5. 55	
	20 + 20	40	2.70	2.70		5. 40	1. 1	~ 7.0	1170	210		570	4.62	A	585	5. 20	
1	20 + 25	45	2.40	3.00		5. 40	1.1	~ 7.0	1170	210		570	4.62	A	585	5. 20	
	20 + 28	48	2. 25	3. 15		5. 40	1.1	~ 7.0	1170	210	~ 16	370	4.62	A	585	5. 20	
	20 + 32	52	2.15	3. 45		5. 60	1.1	~ 7.2	1230	210		720	4.55	A	615	5. 45	
2	25 + 25	50	2.80	2.80		5. 60	1.1	~ 7.2	1250	210	~ 17	740	4.48	A	625	5. 55	L
Room	25 + 28	53	2, 65	2.95		5. 60	1.1	~ 7.2	1250	210	~ 17	740	4.48	A	625	5. 55	
1	25 + 32	57	2, 45	3. 15		5. 60	1.1	~ 7.2	1230	210	~ 17	720	4.55	A	615	5. 45	
	28 + 28	56	2.80	2.80		5. 60	1.1	~ 7.2	1250	210	~ 17	740	4.48	A	625	5. 55	
	28 + 32	60	2, 60	3.00		5. 60	1.1	~ 7.2	1230	210	~ 17	720	4. 55	A	615	5. 45	
	32 + 32	64	2, 80	2.80		5. 60	1.1	~ 7.2	1210	210	~ 17	700	4.63	A	605	5. 35	

## • Outdoor Unit : CU-3E18LBE

Indoor unit capacity	m . 1	Т		Cooling	g Capacity(k	W)			Inr	out Po	ower (W	1)	E	ER	ANNUAL ENERGY	Current,	MOISTURE REMOVAL VOLUME
Cooling	Total	Room A	Room B		Tota		min	~ max	Rating	min	1 ~	max	W/W	CLASS	CONSUMPTION (kWh)	230V (A)	1/h
20	20	2.00			2.00	) ]	1.8	~ 2.9	500	340	~	810	4.00	A	250	2.5	1. 3
20 25	20 25	2.50	1		2. 50	1	1.8	~ 2.9	630	340	~	810	4.00	A	315	3. 0	1.5
1 28	28	2.80	1	1	2. 80	1	1.8	~ 2.9	700	340	~	810	4.00	A	350	3. 3	1. 6
1 28 Room 32	28 32	3. 20	, , , , , , ,	T	3. 20	7 7 7	1.8	~ 3.8	800	340	~	1360	4.00	A	400	3. 3 3. 7	1.8
40	40	4.00	1	1	4.00	1	1. 8	~ 4.3	1240	340	~	1990	3. 23	A	620	5. 6	2. 3
50	50	5.00	1	1	5. 00	1		~ 5.7	1550	340	~	2130	3. 23	A	775	6.8	2.7
20 + 20	40	2.00	2.00		4.00	1		~ 6.2	1010	350	~	2100	3.96	A	505 635	4. 5	1.3 + 1.3
20 + 25	40 45 48	2.00	2.50	[	4. 50	1	1. 9	~ 6.2	1270	350	~	2100	3. 55	A	635	5.6	1.3 + 1.5
20 + 28	48	2.00	2.80	[	4.80		1. 9	~ 6.2	1350	350		2100	3. 55	A	675	6.0	1.3 + 1.6
20 + 32	52	2.00	3. 20	TI	5. 20	71	ί. 9	~ 6.3	1490	350	~	2110	3. 49	A	745	6.6	1.3 + 1.8
20 + 40	60	1. 73	3.47	T	5. 20	- 1 i	1. 9	~ 6.4	1450	350	~	2110	3. 59	A	725	6.4	1.1 + 2.0
20 + 50	70	1.49	3.71	T	5. 20	1	1. 9	~ 6.8	1290	360		2150	4.03	A	645 770	5. 7	0.9 + 2.2
25 + 25 25 + 28 25 + 32 2 25 + 40	50	2.50	2.50		5. 00	1	ί. 9	~ 6.2	1540	350	~	2100	3. 25	A	770	6.8	1.5 + 1.5
25 + 28	53	2. 45	2.75		5. 20	1	1. 9	~ 6.2	1540	350		2100	3. 38	A	770	6.8	1.5 + 1.6
25 + 32	57	2. 28	2. 92	I I	5. 20			~ 6.3	1480	350	~	2110	3. 51	A	740	6. 5	1.5 + 1.7
2 25 + 40	65	2.00	3. 20		5. 20		1. 9	~ 6.4	1440	350		2110	3.61	A	720	6. 4	1.3 + 1.8
Room 25 + 50	75	1. 73	3.47	I I	5. 20	1	1. 9	~ 6.8	1290	360	~ :	2150	4.03	A	645 770	5. 7	1.1 + 2.0
28 + 28	56	2.60	2.60		5. 20	1	1.9	~ 6.2	1540	350	~	2100	3. 38	A		6.8	1.6 + 1.6
28 + 32	60	2. 43	2.77	I I	5. 20	1	1. 9	~ 6.3	1480	350		2110	3. 51	A	740	6. 5	1.5 + 1.6
28 + 40	68	2. 14	3.06	[	5. 20			~ 6.4	1440	350		2110	3.61	A	720 645	6. 4	1.4 + 1.7
28 + 50 32 + 32	78 64	1.87	3.33	I I	5. 20	1	. 9	~ 6.8	1290	360		2150	4.03	A	645	5. 7	1.2 + 1.9
32 + 32	64	2.60	2.60	[ ]	5. 20		. 9	~ 6.4	1450	350		2120	3. 59	A	725 705	6. 4	1.6 + 1.6
32 + 40	72	2. 31	2.89	[	5. 20			~ 6.5	1410	350		2120	3.69	A	705	6. 3	1.5 + 1.7
32 + 50 40 + 40	72 82	2. 03	3. 17		5. 20		. 9	~ 6.9	1250	360	~	2150	4. 16	A	625 705	5. 5	1.3 + 1.8
40 + 40	80	2.60	2.60		5. 20	] ]	. 9	~ 6.5	1410	350		2120	3.69	A		6. 2	1.6 + 1.6
40 + 50	90	2. 31	2.89		5. 20	1	. 9	~ 6.9	1250	360		2160	4. 16	A	625	5. 5	1.5 + 1.7
20 + 20 + 20	60	1. 73	1.73	1. 73	5. 19		. 9	~ 7.2	1220	360		2170	4. 25	A	610	5. 3	1.1 + 1.1 + 1.1
20 + 20 + 25	65	1.60	1.60	2.00	5. 20	1	. 9	~ 7.2	1220	360		2170	4. 26	A	610	5. 3 5. 3	1.0 + 1.0 + 1.3
20 + 20 + 28	68	1. 53	1.53	2.14	5. 20		. 9	~ 7.2	1220	360		2170	4. 26	A	610	5. 3	1.0 + 1.0 + 1.4
20 + 20 + 32	72	1. 44	1.44	2. 32	5. 20	1		~ 7.2	1210	360		2180	4. 30	A	605	5. 3	0.9 + 0.9 + 1.5
20 + 20 + 40	80	1. 30	1.30	2.60	5. 20			~ 7.3	1210	360	~	2180	4. 30	<u> </u>	605	5. 3	0.8 + 0.8 + 1.6
20 + 20 + 50	90	1.16	1. 16	2.88	5. 20	1	. 8	~ 7.3	1200	360		2180	4. 33	A	600	5. 3	0.7 + 0.7 + 1.7
20 + 25 + 25	70	1.48	1.86	1.86	5. 20	1		~ 7.2	1220	360		2170	4. 26	A	610	5, 3	0.9 + 1.2 + 1.2
20 + 25 + 28	73	1.42	1.78	2.00	5. 20			~ 7.2	1220	360		2170	4. 26	A	610	5. 3	0.9 + 1.1 + 1.3
20 + 25 + 32	77	1. 35	1.69	2.16	5. 20			~ 7.2	1210	360		2180	4. 30	<u>A</u>	605	5. 3	0.9 + 1.1 + 1.4
20 + 25 + 40	85	1. 22	1.53	2. 45	5. 20			~ 7.3	1200	360		2180	4. 33	A	600 610	5. 3	0.8 + 1.0 + 1.5
3 Room 20 + 28 + 28 20 + 28 + 32 20 + 28 + 40	76	1.36	1.92	1.92	5. 20	_ 1		~ 7.2	1220	360		2170	4. 26	A	610	5, 3	0.9 + 1.2 + 1.2
Room 20 + 28 + 32	80	1. 30	1.82	2.08	5. 20			~ 7.2	1210	360		2180	4. 30	A	605 600	5. 3	0.8 + 1.2 + 1.3
20 + 28 + 40	88	1.18	1.65	2. 37	5. 20		·	~ 7.3	1200	360		2180	4. 33	A	600	5. 3	0.7 + 1.1 + 1.5
20 + 32 + 32	84	1. 24	1.98	1.98	5. 20			~ 7.3	1200	360		2180	4. 33	A	600 610	5. 3	0.8 + 1.3 + 1.3
25 + 25 + 25	75	1. 73	1.73	1.73	5. 19			~ 7.2	1220	360		2170	4. 25	A	610	5. 3	1.1 + 1.1 + 1.1
25 + 25 + 28	78	1.67	1.67	1.86	5. 20			~ 7.2	1220	360		2170	4. 26	<u>A</u>	610	5. 3	1.1 + 1.1 + 1.2
25 + 25 + 32	82	1.59	1.59	2.02	5. 20			~ 7.2	1210	360		2180	4. 30	<u>A</u>	605 600	5. 3	1.0 + 1.0 + 1.3
25 + 25 + 40	90	1.44	1.44	2. 32	5. 20			~ 7.3	1200	360		2180	4. 33	A	600	5. 3	0.9 + 0.9 + 1.5
25 + 28 + 28	81	1.60	1.80	1.80	5. 20			~ 7.2	1220	360		2170	4. 26	A	610	5. 3	1.0 + 1.2 + 1.2
25 + 28 + 32 25 + 32 + 32	85	1. 53	1.71	1.96	5. 20			~ 7.2	1210	360		2180	4. 30	A	605	5. 3	1.0 + 1.1 + 1.3
25 + 32 + 32	89	1.46	1.87	1.87	5. 20			~ 7.3	1200	360		2180	4. 33	A	600	5. 3	0.9 + 1.2 + 1.2
28 + 28 + 28	84	1.73		1.73	5. 19			~ 7.2	1220	360		2170	4. 25	A	610	5. 3	1.1 + 1.1 + 1.1
28 + 28 + 32	88	1.65	1.65	1.90	5. 20	1	. 9	~ 7.2	1210	360	~ 2	2180	4.30	A	605	5. 3	1.1 + 1.1 + 1.2

Heat Ing	Indoor unit capacity		Heati	ng Capacity(kW	)	Int	out Power (W)	Г с	OP	ANNUAL ENERGY	Current,	MOISTURE REMOVAL VOLUME
20		Total			min ~ max			W/W	CLASS		230V (A)	1/h
\$\frac{5}{8}\$		20								370	3, 7	
1 28	56		1-3-60-1						A	470		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	1 20		1-4-00-1						A	525	5. 0	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$				+	1.2 ~ 5.8				A	615	5. 8	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$			1-5-60-1						С	860	7. 7	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			1-6-80-1						Ċ			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			2.90 2.90						A	725		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	20 + 25	45	2 84 1 3 56		1.4 ~ 7.0		310 ~ 2550	3. 72	A	860	7. 6	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	20 + 28				1.4 ~ 7.0	1720	310 ~ 2550	3. 72	A	860	7. 6	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	20 + 32			6, 80	1.4 ~ 7.3	1840		3. 70	A	920	8. 2	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$				6.80	$1.4 \sim 7.3$	1800	310 ~ 2510	3. 78	A	900	7. 9	
\$\frac{5}{25} + \frac{25}{25}				6, 80		1520	310 ~ 2200	4. 47	A		6. 7	
\$\frac{25}{5}, \frac{28}{32}\$   \$\frac{53}{3}\$   \$\frac{3}{57}\$   \$2,98\$   \$\frac{6}{5}\$   \$\frac{6}{5}\$   \$\frac{6}{5}\$   \$\frac{1}{4}\$ \cdot 7, 0, 1990   \$310 \cdot 2500   \$3.52 \cdot 8, 1 \cdot 9, 20 \cdot 8, 1 \cdot 1 \cdot 7, 3 \cdot 1800   \$310 \cdot 2500   \$3.70 \cdot A \cdot 900   \$8.0 \cdot 8, 0 \cdot 8, 1 \cdot 4 \cdot 7, 3 \cdot 1800   \$310 \cdot 2500   \$3.78 \cdot A \cdot 900   \$8.0 \cdot 8, 0 \cdot 8, 1 \cdot 4 \cdot 7, 3 \cdot 1800   \$310 \cdot 2500   \$3.78 \cdot A \cdot 900   \$8.0 \cdot 8, 0 \cdot 8, 1 \cdot 4 \cdot 7, 3 \cdot 8, 0 \cdot 1800   \$2.50 \cdot 5, 6 \cdot 8, 1 \cdot 7, 3 \cdot 8, 0 \cdot 1800   \$3.00 \cdot 2500   \$3.70 \cdot A \cdot 900   \$8.0 \cdot 8, 0 \cdot 8, 1 \cdot 7, 2 \cdot 1800   \$3.00 \cdot 2500   \$3.70 \cdot A \cdot 900   \$8.1 \cdot 8, 1 \cdot 1, 2 \cdot 1, 2 \cdot 18, 2					1.4 ~ 7.0	1930	310 ~ 2550	3. 52	В	965	8. 5	
\$\frac{5}{25} \cdot 32	25 + 28	53		6.80	1.4 ~ 7.0	1930			В	965		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	25 + 32	57		6.80	1.4 ~ 7.3	1840			A	920		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		65		6.80	1.4 ~ 7.3	1800		3. 78	A	900	8. 0	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Room 25 + 50	75		6.80	1.4 ~ 8.0					760		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		56	3. 40   3. 40	6.80	$1.4 \sim 7.0$				В	965		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	28 + 32	60	3. 17 3. 63	6.80					A	920		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	28 + 40	68		6.80	1.4 ~ 7.3				A	900	8.0	
\$\frac{32}{2} + \frac{40}{60}	28 + 50	78		6.80	1.4 ~ 8.0				Α	760	6. 7	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	32 + 32	64		6.80	1.4 ~ 7.5				A	875		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	32 + 40	72	3. 02 3. 78							875		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	32 + 50	82							A	750	6.6	
10 + 30 + 20 + 20   60   2.26   2.26   6.72   2.26   6.80   1.5 - 8.1   1510   320 - 2120   4.49   A   755   6.7	40 + 40							3. 98	A	855		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$										750		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	20 + 20 + 20									755	6. 7	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	20 + 20 + 25									755		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$					4-2-2				A	705		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$							320 ~ 2110	4. 03	A	720		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	20 + 20 + 40						320 - 2110		A	700		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	20 + 20 + 50								A	755		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$									A	755		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$									A	735		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$									Δ	700		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$									A	755		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	3 20 + 28 + 28				4-7-2				A	735		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Room 20 + 28 + 32								A	700	6. 5	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	20 + 28 + 40								<del> </del>	705	6. 3	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$									A	755		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$					4-4-5				Ä	755		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$					1-1		320 ~ 2110		Ā	735		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$									A	700		
28 + 28 + 28					4-2-2				A	755	6. 7	
28 + 28 + 28	25 1 28 1 32						320 ~ 2110		A	735	6. 5	
28 + 28 + 28	25 + 20 + 30								A	705	6. 3	
20 20 20 705 6 5									A	755	6. 7	
	28 + 28 + 32		2. 16   2. 16   2. 48			1470		4.63	A	735	6. 5	

## • Outdoor Unit : CU-4E23LBE

	Indoor unit capacity	Total	D . 4		Cooling	Capacity(	kW)				ower (W)		EF		JAL ENERGY MPTION (kWh)	Current,	MOISTURE REMOVAL VOLUME
	Cooling 20	20	2. 00	Room B	Room C	2.0	0 1	$\frac{\text{min}}{1.8} \sim \frac{\text{max}}{2.9}$	Rating 500	340	~ 81		W/W 4.00	A	250	230V (A)	1/h 1.3 1.5
1	25 28	25 28	2. 50 2. 80			2. 5	0 1	$\begin{array}{cccc} 1.8 & \sim & 2.9 \\ 1.8 & \sim & 2.9 \end{array}$	630 700	340 340	$\sim$ 81 $\sim$ 81	10	4. 00 4. 00	A	315 350	3. 2 3. 5	1. 6
Room	32 40	32 -	3. 20 4. 00			3. 2 4. 0	0 - 1	$1.8 \sim 3.8$ $1.8 \sim 4.3$	800 1240	340 340	$\frac{\sim}{\sim} \frac{13}{19}$	60 90	4. 00 3. 23	A	400 620	3. 9 5. 8	1.8 2.3
	50 60	50 60	5. 00 6. 00			5. 0 6. 0	0 1 0 1	$\begin{array}{cccc} 1.8 & \sim & 4.3 \\ 1.9 & \sim & 5.7 \\ 1.9 & \sim & 6.2 \end{array}$	1550 2030	340 340	$\sim$ 21 $\sim$ 23	30 30	3. 23 2. 96	A	775 1015	7. <u>2</u> 9. <u>2</u>	2. 7
	20 + 20 20 + 25	40 45	2.00	2.00		4. 0 4. 5	10 [1	$\begin{array}{ccc} 1.9 & \sim & 6.4 \\ 1.9 & \sim & 6.4 \end{array}$	1010 1270	340 340			3. 96 3. 55	A	505 635	4. 5 5. 7	1. 3 + 1. 3 1. 3 + 1. 5
	20 + 28 20 + 32	48	2.00	2.80 3.20		4. 8	0 [1	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1350 1510	340 340	$\sim \frac{21}{24}$	50	3.55	<u>À</u>	675 755	6.1	1.3 + 1.6 1.3 + 1.8
	20 + 40	60	2.00	4.00		6.0	0 [1	l.9 ∼ 6.9	1810	330	~ 24	10	3. 32	A	905	8. 1	1.3 + 2.3
	20 + 50 20 + 60	70 80	1. 94 1. 70	4. 86 5. 10		6. 8	0 [2	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1800 1800	320 320	$\sim$ 24 $\sim$ 24	40	3. 78 3. 78	A	900	8. I 8. I	1. 3 + 2. 6 1. 1 + 2. 8
	25 + 25 25 + 28	50 53	2. 50 2. 50	2. 50		5. C	0 [1	$1.9 \sim 6.8$ $1.9 \sim 6.8$	1380 1470	340 340	$\sim$ 240 $\sim$ 240	00	3.61 3.61	A	690 735	6. 2	1.5 + 1.5 1.5 + 1.6
	25 + 32 25 + 40	57 65	2. 50 2. 50	3. 20 4. 00		5. 7 6. 5		$\begin{array}{ccc} 1.9 & \sim & 6.9 \\ 1.9 & \sim & 6.9 \end{array}$	1660 2070	340 330	$\sim$ 24 $\sim$ 24		3. 43		830 1035	7. 4 9. 2	1.5 + 1.8 1.5 + 2.3
	25 + 50 25 + 60	75 85	2. 27 2. 00	4. 53 4. 80		6.8	0 1	$1.9 \sim 7.5$ $1.9 \sim 7.5$	1970 1970	320 320	$\begin{array}{ccc} \sim & 24 \\ \sim & 24 \end{array}$		3. 45 3. 45		985 985	8. 8 8. 8	1. 5 + 2. 5 1. 3 + 2. 6
2 Room	28 + 28 28 + 32	56 60	2.80	2.80 3.20		5. 6 6. 0	0 1	$\begin{array}{ccc} 1.9 & \sim & 7.5 \\ 1.9 & \sim & 6.8 \\ 1.9 & \sim & 6.9 \end{array}$	1550 1750	340 340	$\sim$ 240 $\sim$ 24	00	3. 61 3. 43	A	775 875	6. 9 7. 8	1.6 + 1.6 1.6 + 1.8
	28 + 40 28 + 50	68 78	2. 80 2. 80 2. 44	4. 00 4. 36		6.8	0 1	$\begin{array}{ccc} 1.9 & \sim & 6.9 \\ 1.9 & \sim & 7.5 \end{array}$	2170 1970	330 320	$\sim$ 24 $\sim$ 24	10	3. 13 3. 45	В	1085 985	9. 7 8. 8	1.6 + 2.3 1.5 + 2.4
	28 + 60	88	2.16	4. 64 3. 20		6. 8	0 [1	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1970 1960	320 330	$\sim$ $\stackrel{24}{\sim}$ $\stackrel{24}{\sim}$	40	3.45	A	985	8. 8 8. 8	1. 4 + 2. 5 1. 8 + 1. 8
	32 + 32 32 + 40	72	3. 20	3. 78	:	6.8	0 [1	$1.9 \sim 7.1$	2070	330	~ 242	20 [	3. 29	A	1035	9. 3	1.7 + 2.2
	32 + 50 32 + 60	82 92	2. 65 2. 37	4. 15		6. 8 6. 8	0 [2	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1890 1890	320 320	$\sim$ 245 $\sim$ 245	50 [	3. 60 3. 60	A	945 945	8. 5 8. 5	1. 6 + 2. 4 1. 5 + 2. 5
	40 + 40 40 + 50	80 90	3. 40 3. 02	3. 40		6.8	0 [2	$\begin{array}{ccc} .9 & \sim & 7.1 \\ 2.0 & \sim & 7.6 \end{array}$	2270 1890	330 320	$\sim$ 242 $\sim$ 245	50	3.00	A	1135 945	10. 2 8. 5	1. 9 + 1. 9 1. 7 + 2. 2
	40 + 60 50 + 50	100	2. 72 3. 40	4. 08 3. 40		6.8		$\begin{array}{ccc} 2.0 & \sim & 7.6 \\ 2.1 & \sim & 8.1 \end{array}$	1890 1780	320 310	$\sim$ 248 $\sim$ 246	60 [	3. 60 3. 82	A	945 890	8. 5 8. 0	1.6 + 2.3 1.9 + 1.9
	50 + 60 20 + 20 + 20	110 60	3. 09 2. 00	3. 71 2. 00	2.00	6.8 6.0	$ \begin{array}{c c} 0 & 2 \\ 0 & 1 \end{array} $	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1780 1650	310 340	~ 246 ~ 246	60	3. 82 3. 63	A A	890 825	8. 0 7. 4	1. 7 + 2. 2 1. 3 + 1. 3 + 1. 3
	20 + 20 + 25 20 + 20 + 28	65	2.00 2.00	2.00	2. 50 2. 80	6.5	0   1 0   1	$\begin{array}{ccc} .9 & \sim & 8.0 \\ .9 & \sim & 8.0 \end{array}$	1830 1910	340 340	$\sim$ 246 $\sim$ 246	60 [	3. 56 3. 56	A	915 955	8. <u>2</u> 8. 6	1.3 + 1.3 + 1.5 1.3 + 1.3 + 1.6
	20 + 20 + 32 20 + 20 + 40	72	1.89	1.89	3. 02	6. 8	0   1	.9 ~ 8.0 .9 ~ 8.1	1910 1860	340 340	$\sim$ 246 $\sim$ 246	60 [	3. 56 3. 66	A	955 930	8. 6 8. 3	1.2 + 1.2 + 1.7 1.1 + 1.1 + 1.9
	20 + 20 + 50 20 + 20 + 60	90	1. 51	1.51	3. 78 4. 08	6. 8		$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1730 1730	340 340	$\sim$ 246 $\sim$ 246	60	3. 93 3. 93	A	865 865	7. 8 7. 8	1.0 + 1.0 + 2.2 0.9 + 0.9 + 2.3
	20 + 25 + 25	70	1.94	2. 43	2. 43	6. 8	0 [1	$.9 \sim 8.0$	1910	340 340	$\sim$ $\frac{246}{246}$	60 [	3. 56 3. 56	A	955 955	8. 6 8. 6	1.3 + 1.5 + 1.5
	20 + 25 + 28 20 + 25 + 32	73	1. 76	2.33	2. 61	6.8	0 [1	.9 ~ 8.0	1910	340	~ 246	60	3.56	A	955	8.6	1. 2 + 1. 5 + 1. 6 1. 1 + 1. 4 + 1. 7
	20 + 25 + 40 20 + 25 + 50 20 + 25 + 60	85 95	1.60 1.43	2.00 1.79	3, 20 3, 58	6. 8 6. 8	0 [2	$2.0 \sim 8.5$	1860 1730	340	$\sim$ 246 $\sim$ 246	60	3.66 3.93	A	930 865	8. 3 7. 8	1. 0 + 1. 3 + 1. 8 0. 9 + 1. 2 + 2. 1
	20 + 28 + 28	105 76	1. 29 1. 78	1. 62 2. 51	3. 89 2. 51	6. 8 6. 8	$\begin{array}{c c} 0 & 2 \\ 0 & 1 \end{array}$	$\begin{array}{ccc} 0 & \sim 8.5 \\ 0 & \sim 8.0 \end{array}$	1730 1910	340 340	$\sim 246$ $\sim 246$	60 ] [	3, 93 3, 56	Ā	865 955	7. 8 8. 6	0.8 + 1.0 + 2.3 1.1 + 1.5 + 1.5
	20 + 28 + 32 20 + 28 + 40	80	1. 70 1. 55	2. 38	2. 72 3. 09	6.8	$\begin{array}{c c} 0 & 1 \\ 0 & 1 \end{array}$	$.9 \sim 8.0$ $.9 \sim 8.1$	1910 1860	340 340	$\sim$ 246 $\sim$ 246	60 [	3. 56 3. 66	A	955 930	8. 6 8. 3	1. 1 + 1. 5 + 1. 6 1. 0 + 1. 4 + 1. 7
	20 + 28 + 50 20 + 28 + 60	98 108	1.39 1.26	1. 76	3. 47	6. 8 6. 8	0 2 0 2	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1730 1730	340 340	$\sim 246$ $\sim 246$		3. 93 3. 93	A	865 865	7. 8 7. 8	0.9 + 1.3 + 2.0 0.8 + 1.1 + 2.2
	20 + 32 + 32 20 + 32 + 40	84 92	1. 62 1. 47	2. 59 2. 37	2. 59 2. 96	6. 8 6. 8	0   1 0   1	$\begin{array}{ccc}9 & \sim & 8.1 \\9 & \sim & 8.2 \end{array}$	1860 1860	340 340	$\sim$ 246 $\sim$ 246		3. 66 3. 66		930 930	8. 3 8. 3	1.0 + 1.6 + 1.6 0.9 + 1.5 + 1.7
	20 + 32 + 50 20 + 40 + 40	102	1. 33 1. 36	2. 13 2. 72	3. 34 2. 72	6. 8 6. 8	0 [2	$\begin{array}{ccc} 0 & \sim & 8.5 \\ 0 & \sim & 8.2 \end{array}$	1730 1820	340 340	$\sim$ 246 $\sim$ 246	60 [	3. 93 3. 74	A	865 910	7. 8 8. 2	0.8 + 1.4 + 1.9 0.9 + 1.6 + 1.6
3	20 + 40 + 50 25 + 25 + 25	110 75	1. 24 2. 26	2. 47 2. 26	3. 09 2. 26	6. 8 6. 7	0 [2	$\begin{array}{ccc} 0 & \sim & 8.5 \\ 0 & \sim & 8.0 \end{array}$	1730 1910	340 340	$\begin{array}{ccc} \sim & 246 \\ \sim & 246 \end{array}$	60 [	3. 93 3. 55	A	865 955	7. 8 8. 6	0.8 + 1.5 + 1.7 1.5 + 1.5 + 1.5
Room	25 + 25 + 28	78 82	2.18	2. 18 2. 07	2. 44	6. 8 6. 8	0 [1	$\begin{array}{ccc} .9 & \sim & 8.0 \\ .9 & \sim & 8.0 \end{array}$	1910 1910	340	$\sim$ 246 $\sim$ 246	60 [	3. 56 3. 56	A	955 955	8.6	1.4 + 1.4 + 1.5
	25 + 25 + 40	90	1.89	1. 89	3.02	6.8	0 [1	$0.9 \sim 8.1$ $0.0 \sim 8.5$	1860 1730	340 340	$\sim$ 246 $\sim$ 246	60	3. 66	A	930 865	8. 6 8. 3 7. 8 7. 8	1. 2 + 1. 2 + 1. 7 1. 1 + 1. 1 + 1. 9
	25 + 25 + 50 25 + 25 + 60	100	1. 70 1. 55	1. 55	3. 40	6.8	0 [2	$.0 \sim 8.5$	1730	340	~ 246	60 [	3.93	A	865	7.8	1.0 + 1.0 + 2.2
	25 + 28 + 28 25 + 28 + 32	81 85	2. 10 2. 00	2. 35 2. 24	2. 35	6. 8 6. 8	0 [1	$\begin{array}{ccc} .9 & \sim & 8.0 \\ .9 & \sim & 8.0 \end{array}$	1910 1910	340	$\sim$ 246 $\sim$ 246	60 [	3. 56 3. 56	A	955 955	8. 6 8. 6	1. 4 + 1. 5 + 1. 5 1. 3 + 1. 5 + 1. 6
	25 + 28 + 40 25 + 28 + 50	93 103	1.65	2. 05 1. 85	2. 92 3. 30	6. 8 6. 8	0 [2	$\begin{array}{ccc} .9 & \sim & 8.1 \\ .0 & \sim & 8.5 \end{array}$	1860 1730	340 340	$\sim$ 246 $\sim$ 246	60 [	3. 66 3. 93	A	930 865	8. 3 7. 8	1.2 + 1.3 + 1.7 1.1 + 1.2 + 1.9
	25 + 32 + 32 25 + 32 + 40	89 97	1. 92 1. 75	2. 44 2. 24	2. 44 2. 81	6. 8 6. 8	0 [1	$\begin{array}{ccc} .9 & \sim & 8.1 \\ .9 & \sim & 8.2 \end{array}$	1860 1860	340	$\sim$ 246 $\sim$ 246	60 [	3. 66 3. 66	A	930 930	8. 3 8. 3	1. 2 + 1. 5 + 1. 5 1. 1 + 1. 5 + 1. 6
	25 + 32 + 50 25 + 40 + 40	107	1. 59 1. 62	2. 03	3. 18 2. 59	6.8		$\begin{array}{ccc} 0 & \sim & 8.5 \\ 0 & \sim & 8.2 \end{array}$	1730 1820	340	$\sim$ 246 $\sim$ 246		3. 93 3. 74		865 910	7. 8 8. 2	1. 0 + 1. 3 + 1. 8 1. 0 + 1. 6 + 1. 6
	28 + 28 + 28 28 + 28 + 32	84 88	2. 26 2. 16	2. 26	2. 26 2. 48	6.7	8   1 0   1	$\begin{array}{ccc} .9 & \sim & 8.0 \\ .9 & \sim & 8.0 \end{array}$	1910 1910	340 340	$\sim$ 246 $\sim$ 246		3. 55 3. 56		955 955	8. 6 8. 6	1.5 + 1.5 + 1.5 1.4 + 1.4 + 1.5
	28 + 28 + 40 28 + 28 + 50	96 106	1. 98 1. 80	1.98	2. 84 3. 20	6. 8 6. 8		$\begin{array}{ccc} .9 & \sim & 8.1 \\ .0 & \sim & 8.5 \end{array}$	1860 1730	340 340	$\sim$ 246 $\sim$ 246		3. 66 3. 93		930 865	8.3 7.8	1.3 + 1.3 + 1.7 1.2 + 1.2 + 1.8
	28 + 32 + 32 28 + 32 + 40	92	2.06	2.37	2. 37	6.8	0 1	$\frac{.9}{9} \sim 8.1$	1860	340	~ 246 ~ 246	60 [	3. 66		930 930	8.3	1.3 + 1.5 + 1.5 1.2 + 1.4 + 1.6
	28 + 32 + 50 28 + 40 + 40	110	1.73	1. 98 2. 52	3. 09 2. 52	6.8	$0   \frac{1}{2}$	.0 ~ 8.5 9 ~ 8 ?	1730 1820	340 340	$\sim 246$ $\sim 246$	60	3. 93 3. 74		865 910	7.8	1.1 + 1.3 + 1.7
	32 + 32 + 32 32 + 32 + 40	96 104	2. 26	2. 26	2. 26	6.7	8   1	9 ~ 8.2	1820 1820	340 340	$\begin{array}{cccc} \sim & 246 \\ \sim & 246 \\ \sim & 246 \\ \sim & 246 \end{array}$	60 [	3.73	A	910 910	7.8 8.2 8.2 8.2	1. 1 + 1. 3 + 1. 7 1. 1 + 1. 5 + 1. 5 1. 5 + 1. 5 + 1. 5 1. 4 + 1. 4 + 1. 6
	20 + 20 + 20 + 20 20 + 20 + 20 + 20	80	1.70	1.70	1.70	1.70 6.8 2.00 6.8	0   1	\$\\\ \begin{align*} \	1690	340	~ 246	50	4. 02 4. 02	Α	845	7.6	1. 4 + 1. 4 + 1. 0 1. 1 + 1. 1 + 1. 1 + 1. 1 1. 0 + 1. 0 + 1. 0 + 1. 3 1. 0 + 1. 0 + 1. 0 + 1. 4
	20 + 20 + 20 + 20 20 + 20 + 20 + 25 20 + 20 + 20 + 28 20 + 20 + 20 + 32	85 88	1. 60	1.60	1. 55	2. 15 6. 8	0 1	9 ~ 8.7	1690	340 340	$\begin{array}{ccc} \sim & 246 \\ \sim & 246 \\ \sim & 246 \\ \sim & 247 \end{array}$	60	4.02	A	845 845	7.6	1. 1 + 1. 1 + 1. 1 + 1. 1 1. 0 + 1. 0 + 1. 0 + 1. 3 1. 0 + 1. 0 + 1. 0 + 1. 4 0. 9 + 0. 9 + 0. 9 + 1. 5
	20 + 20 + 20 + 40	92 100	1. 48 1. 36 1. 24	1. 48	1. 48 1. 36	2. 36   6. 8 2. 72   6. 8	0 1	.9 ∼ 8.8 .9 ∼ 8.8	1650 1650	340 340	$\sim$ 247	70	4. 12 4. 12	A	825 825	P	
	20 + 20 + 20 + 50 20 + 20 + 25 + 25	110 90	1. 24 1. 51	1. 24	1. 24 1. 89	3. 08   6. 8 1. 89   6. 8	0   1 0   1	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1680 1690	340	$\sim$ 247 $\sim$ 246	60	4. 05 4. 02	A	840 845	7.5	$\begin{array}{c} 0.9 + 0.9 + 0.9 + 1.6 \\ 0.8 + 0.8 + 0.8 + 1.6 \\ 1.0 + 1.0 + 1.2 + 1.2 \\ 0.9 + 0.9 + 1.2 + 1.3 \\ 0.9 + 0.9 + 1.1 + 1.5 \\ 0.8 + 0.8 + 1.0 + 1.6 \\ 0.9 + 0.9 + 1.3 + 1.3 \\$
	20 + 20 + 25 + 28 20 + 20 + 25 + 32 20 + 20 + 25 + 32 20 + 20 + 25 + 40 20 + 20 + 28 + 28 20 + 20 + 28 + 32	93 97	1. 51 1. 46 1. 40	1.46	1. 83 1. 75	2. 05   6. 8 2. 25   6. 8	0 1	$.9 \sim 8.7$ $.9 \sim 8.8$	1690 1650	340 340	$\sim$ 246 $\sim$ 247	50 70	4. 02	A	845 825	7. 6 7. 4 7. 4	0.9 + 0.9 + 1.2 + 1.3 0.9 + 0.9 + 1.1 + 1.5
	20 + 20 + 25 + 40 20 + 20 + 28 + 28	105 96	1. 30	1. 30	1. 61	2. 59   6. 8 1. 98   6. 8	0 [1. 0 [1.	$\begin{array}{ccc} .9 & \sim & 8.8 \\ .9 & \sim & 8.7 \end{array}$	1650 1690	340 340	$\sim$ 247 $\sim$ 246	60	4. 12 4. 02	A	825 845	7. <u>4</u> 7. 6	0.8 + 0.8 + 1.0 + 1.6 0.9 + 0.9 + 1.3 + 1.3
	20 + 20 + 28 + 32 20 + 20 + 28 + 40	100	1. 36	1. 36	1. 90	2. 18   6. 8 2. 52   6. 8	0 1	$\begin{array}{ccc} .9 & \sim & 8.8 \\ .9 & \sim & 8.8 \end{array}$	1650 1650	340 340	$\sim$ 247 $\sim$ 247	70 70	4. 12 4. 12	A	825 825		0.9 + 0.9 + 1.1 + 1.4
4	20 + 20 + 28 + 40 20 + 20 + 28 + 32 20 + 25 + 25 + 25 20 + 25 + 25 + 25 20 + 26 + 25 + 25 20 + 26 + 25 + 32 20 + 26 + 25 + 32 20 + 26 + 28 + 28 20 + 26 + 28 + 32 20 + 26 + 28 + 32 20 + 26 + 36 + 36 20 + 36 + 36 + 36	104 95	1 31	1 31	2 09	2. 09   6. 8 1. 79   6. 8		.9 ~ 8.8 .9 ~ 8.7	1650 1690	340 340	$\sim$ $\frac{243}{246}$	30 [	4. 12 4. 02	A	825 845	7. 4	0.8 + 0.8 + 1.4 + 1.4 0.9 + 1.2 + 1.2 + 1.2 0.9 + 1.1 + 1.1 + 1.3 0.8 + 1.1 + 1.1 + 1.4
Room	20 + 25 + 25 + 28 20 + 25 + 25 + 29	98	1. 39	1. 79 1. 73 1. 67 1. 55	1.73	1. 95   6. 8	0 1	9 ~ 8.7	1690	340 340		50	4. 02 4. 12	A	845 825	7. 6 7. 4	0.9 + 1.1 + 1.1 + 1.3
	20 + 25 + 25 + 32 20 + 25 + 25 + 40	110	1. 23	1.55	1.55	2. 47 6. 8		$\frac{1}{2}$ $\sim \frac{1}{8}$	1680	340	$\sim$ 247	70L	4.05	A	840	7.5	0.8 + 1.0 + 1.1 + 1.3 0.8 + 1.1 + 1.1 + 1.4 0.8 + 1.0 + 1.0 + 1.5 0.8 + 1.1 + 1.2 + 1.2 0.8 + 1.0 + 1.2 + 1.2 0.8 + 1.0 + 1.2 + 1.3 0.8 + 1.0 + 1.3 + 1.3 0.8 + 1.1 + 1.1 + 1.1 0.8 + 1.1 + 1.1 + 1.1 1.1 + 1.1 + 1.1 + 1.1 1.1 + 1.1 + 1.1 + 1.1 1.1 + 1.1 + 1.1 + 1.2 1.0 + 1.0 + 1.0 + 1.3 1.1 + 1.1 + 1.1 + 1.2 1.1 + 1.1 + 1.1 + 1.2 + 1.2 1.1 + 1.1 + 1.2 +
	20 + 25 + 28 + 28 20 + 25 + 28 + 32	101	1. 34	1.68	1.89	1.89 6.80 2.07 6.80		$\frac{1}{2}$ $\sim 8.7$ $\frac{1}{2}$ $\sim 8.8$	1690 1650	340	~ 247	70	4. 02 4. 12	A	845 825	7. 4	0.8 + 1.0 + 1.2 + 1.3
	20 + 25 + 32 + 32 20 + 28 + 28 + 28	104	1. 31	1.83	2. 00 1. 83 1. 76	2. 00   6. 80 1. 83   6. 80	0 1	$\begin{array}{ccc} .9 & \sim & 8.8 \\ .9 & \sim & 8.7 \end{array}$	1650 1690	340 340	$\begin{array}{ccc} \sim & 243 \\ \sim & 246 \end{array}$	50 	4. 12 4. 02	A	825 845	7. <u>4</u> 7. 6 7. 5	0.8 + 1.0 + 1.3 + 1.3 0.8 + 1.2 + 1.2 + 1.2
	20 + 28 + 28 + 32 25 + 25 + 25 + 25	108 100	1. 26 1. 70	1.70	1.70	2. 02   6. 80 1. 70   6. 80	0 1	$\begin{array}{ccc} .9 & \sim & 8.8 \\ .9 & \sim & 8.7 \end{array}$	1680 1690	340	$\sim$ 247 $\sim$ 246	0	4. 05 4. 02	A	840 845	7. 5 7. 6	0.8 + 1.1 + 1.1 + 1.3 1.1 + 1.1 + 1.1 + 1.1
	25 + 25 + 25 + 28 25 + 25 + 25 + 32	103 107	1.65 1.59	1.65 1.59	1. 65	1. 85 6. 8 2. 03 6. 8		$\begin{array}{ccc} .9 & \sim & 8.7 \\ .9 & \sim & 8.8 \end{array}$	1690 1650	340 340	$\begin{array}{ccc} \sim & 246 \\ \sim & 247 \end{array}$	50 70	4. 02 4. 12	A A	845 825	7. 6 7. 4	1. 1 + 1. 1 + 1. 1 + 1. 2 1. 0 + 1. 0 + 1. 0 + 1. 3
	20 + 28 + 28 + 28 20 + 28 + 28 + 32 25 + 25 + 25 + 25 + 25 25 + 25 + 25 + 25 + 28 26 + 25 + 25 + 28 + 32 26 + 25 + 26 + 28 + 32 27 + 28 + 28 + 28 + 32 28 + 28 + 28 + 28	106	1.60	1.60	1.80	1.80 6.80 1.98 6.80	0 1	$\begin{array}{ccc} .9 & \sim & 8.7 \\ .9 & \sim & 8.8 \end{array}$	1000	340 340	$egin{array}{cccc} \sim & 246 \\ \sim & 247 \\ \sim & 246 \end{array}$	60 70	4. 02 4. 05	A	845 840	7. 6 7. 5 7. 6	1. 0 + 1. 0 + 1. 0 + 1. 3 1. 0 + 1. 0 + 1. 2 + 1. 2 1. 0 + 1. 0 + 1. 1 + 1. 3 1. 0 + 1. 1 + 1. 1 + 1. 1
	25 + 28 + 28 + 28	109	1. 55	1.75	1. 75	1. 75   6. 8	0 1	$\begin{array}{ccc} .9 & \sim & 8.8 \\ .9 & \sim & 8.7 \end{array}$	1690	340	~ 246	60 T	4. 02	A	845	7. 6	1.0 + 1.1 + 1.1 + 1.1

	Indoor unit capacity Heating	Total	Poor A	Poo- 1		ng Capac			n ~ 1	max	Inpu Rating	ut P	Power (W) n ∼ max	W/W	OP CLASS	VNNn	AL ENERGY PTION (kWh)	Current, 230V (A)	MOISTURE REMOVAL VOLUME
	20	20	3. 20	KOOIII J		Room D	3. 20			. 1	740	300	) ~ 1230	4. 32	A		370	3. 7	1/11
1	28	25	3. 60 4. 00	ļ	1	ļ	3.60 4.00			. 3	940 1050	300	) ~ 1230	3.83	A		470 525	4. 7 5. 2	
Room	32   40	32	4.50 5.60				4. 50 5. 60	$\frac{1.2}{1.2}$	$\frac{2}{2} \sim \frac{5}{6}$	. 8	1230 1720	300 300	) ~ 2930	3. 66	<u>A</u>		615 860	6. 0 8. 0	
	50 60	50	6.80 8.50	ļ		<u> </u>	6.80 8.50	1.2	$2 \sim 6$	. 9	2100	300 620		3. 24	C B		050 200	9. 7 11. 1	
	20 + 20	40 - 45	2. 90	2. 90 3. 39			5. 80 6. 10	2. 7	7 ~ 9	. 8	1450 1640	610	~ 2800	4.00	A		725 820	6. 7 7. 6	
	20 + 25 20 + 28	48	2. 67	3.73		<u> </u>	6.40	2. 7	7 ~ 9	. 8	1720	610	~ 2800	3.72	A		860	8. 0	
	20 + 32 20 + 40	- 52 60	2. 69 2. 73	4. 31 5. 47			7.00 8.20	$\frac{2.7}{2.7}$	7 ~ 9	. 9	1840 2210	590 590	~ 2800	3.80 3.71	A	1	920 .105	8. 5 10. 2	
	20 + 50 20 + 60	70	2. 46	6. 14 6. 45		[]	8.60 8.60	2.8		0. 2 0. 2	2140 2290	530 530		4. 02 3. 76	A.		.070 145	9. 9 10. 6	
	25 + 25	50	3. 20	3.20			6.40	2. 7	7 ~ 9	. 8	1700	610	~ 2800	3, 77	A		850	7. 8	
	25 + 28 25 + 32	53 57	3.30 3.55	3. 70 4. 55	·		7. 00 8. 10	2.7		. 8 . 9	1860 2170	610 590	~ 2800	3. 77 3. 73	A A	1	930 .085	8. 6 10. 0	
	25 + 40 25 + 50	65 75	3.31 2.87	5. 29 5. 73			8. 60 8. 60	2. 7	$7 \sim 9$ $3 \sim 10$	. 9 0. 2	2320 2140	590 530		3.71 4.02	A		160 070	10.7 9.9	
2	25 + 60	85	2.53	6.07			8. 60 8. 00	2.8	3 ~ 10	0.2	2140	530 610	~ 2760	4.02 3.77	A	]	.070	9. 9	
Room	28 + 28 28 + 32	56 60	3.97	4.00		<u> </u>	8. 50	2. 7	7 ~ 9	. 8	2120 2280	590	~ 2800	3.73	A	]	060 140	10.5	
	28 + 40 28 + 50	68 78	3.54	5. 06 5. 51	·		- <u>8. 60</u> 8. 60	2. 7		0. 2	2320	590 530		3.71 4.02	<u>A</u>		160 070	10. 7 9. 9	
	28 + 60 32 + 32	88 64	2.74 4.30	5.86		ļļ	8. 60 8. 60	2.8	3 ~ 10	0. 2 0. 0	2140 2270	530 580	~ 2760	4. 02 3. 79	A	1	.070 .135	9. 9 10. 5	
	32 + 40	72	3, 82	4. 30	1	<u> </u>	8.60	2.8	3 ~ 10	0.0	2270	570	~ 2800	3. 79	A	1	135	10.5	
	32 + 50 32 + 60	82 92	3.36 2.99	5. 24	ł	ļ	8.60 8.60	2.8		0.3	2090	520 520	~ 2740	4. 11 4. 11	A		045 045	9. 7 9. 7	
	40 + 40 40 + 50	80	4.30 3.82	4.30			8. 60 8. 60	2. 8		0. 0	2260 2080	560 510	~ 2800	3.81 4.13	<u>A</u>		130 040	10.5 9.6	
	40 + 60	100	3.44	5. 16	1	ļ	8. 60	2.8	~ 10	0. 3	2080	510	~ 2740	4.13	A	1	040	9. 6	
	50 + 50 50 + 60	100	4.30 3.91	4. 30	1		8, 60 8, 60	2. 8 2. 8	~ 10	0. 5 0. 5	1960 1960	$\frac{480}{480}$	~ 2650	4.39 4.39	<u>A</u>		980 980	9. 1 9. 1	
	20 + 20 + 20 20 + 20 + 25	65	2.86 2.65	2.86	2.86 3.30		8. 58 8. 60	3, 3		0.4	2090	600 600	~ 2840	4.11 4.11	A A		045 045	9. 7 9. 7	
	20 + 20 + 28	68	2.53	2.53	3.54	ļ	8. 60	3.3	$\sim 10$	0.4	2090	600	~ 2840	4.11	A	1	045	9. 7	
	20 + 20 + 32 20 + 20 + 40	72 80	2. 39 2. 15	2. 39 2. 15	3.82 4.30	<u> </u>	8. 60 8. 60	3. 3	3 ~ 10	0.5	2070 2060	590 590	~ 2810	4. 15 4. 17	A.	1	035 030	9. 6 9. 5	
	20 + 20 + 50 20 + 20 + 60	100	1. 91 1. 72	1. 91 1. 72	-4.78 5.16	} <u></u>	8.60 8.60	3. 2	$\sim 10$	0. 6 0. 6	1930 1930	570 570		$\frac{4.46}{4.46}$	<u>A</u>		965 965	8. 9 8. 9	
	20 + 25 + 25 20 + 25 + 28	70	2.46	3.07	3.07		8.60	3. 3	3 ~ 10	). 4	2090	600	$\sim$ 2840	4.11	A	1	045	9. 7	
	20 + 25 + 32	73	2.35 2.23	2. 95 2. 79	3.30	<u> </u>	8. 60 8. 60	3. 3	3 ~ 10	0.4	2090 2070	600 590	~ 2820	4.11	A	1	045 035	9. 7 9. 6	
	20 + 25 + 40 20 + 25 + 50	85 95	2.02 1.81	2. 53 2. 26	4.05		8. 60 8. 60	3. 3		) <u>. 5</u> ). 6	2060 1930	590 570	~ 2710	4.17 4.46	<u>A</u>		030 965	9. 5 8. 9	
	20 + 25 + 50 20 + 25 + 60 20 + 28 + 28	105 76	1.64 2.26	2.05 3.17	4. 91 3. 17		8. 60 8. 60	3. 2	~ 10	). 6 ). 4	1930 2090	570 600	~ 2710	4.46 4.11	A A		965 045	8. 9 9. 7	
	20 + 28 + 32	80	2. 15	3.01	3.44	<u> </u>	8.60	3. 3	~ 10	). 4	2070	590	~ 2820	4. 15	Ā	1	035	9. 6	
	20 + 28 + 40 20 + 28 + 50	98	1. 95	2.74	3. 91 4. 39		8. 60 8. 60	3. 3	~ 10	). 5 ). 6	2060 1930	590 570	~ 2710	$\frac{4.17}{4.46}$	A		030 965	9. <u>5</u> 8. 9	
	20 + 28 + 60 20 + 32 + 32	108 84	1.59 2.04	2. 23 3. 28	3. 28	[]	8. 60 8. 60	3. 2	~ 10	). 6 ). 5	1930 2050	570 590	$\begin{array}{ccc} \sim & 2710 \\ \sim & 2800 \end{array}$	4.46	A		965 025	8. 9 9. 5	
	20 + 32 + 40	92	1.87	2. 99	3.74	ļ	8.60	3. 3	~ 10	). 5	2040	580	~ 2790	4. 22	Ä	1	020	9. 4	
ŀ	20 + 40 + 40	102 100	1.68 1.72	3.44	4. 22 3. 44	<u></u>	8.60 8.60	3. 2	~ 10	). 6 ). 5	1910 2030	570 580	~ 2780	4. 50 4. 24	A	1	955 015	8. 8 9. 4	
3	20 + 40 + 50 25 + 25 + 25	75	1.56 2.86	3. 13 2. 86	3. 91 2. 86		8. 60 8. 58	3. 2		). 6 ). 4	1910	570 600		$\frac{4.50}{4.11}$	<u>A</u>		955 045	8. 8 9. 7	
Room	25 + 25 + 25 25 + 25 + 28	78	2.76	2.76	3.08		8. 60 8. 60	3. 3	~ 10	). 4 ). 4	2090	600 590	~ 2840	4.11	Ā	1	045 035	9. 7	
ŀ	25 + 25 + 32 25 + 25 + 40	82 90	2. 62 2. 39 2. 15	2. 62 2. 39	3.82	<u> </u>	8, 60	3. 3	$\sim 10$	). 5	2060	590	~ 2810	4. 15 4. 17	A	1	030	9. 6 9. 5	
-	25 + 25 + 50 25 + 25 + 60	100	2. 15 1. 95	2. 15 1. 95	4.30		8. 60 8. 60	3. 2	$\sim \frac{10}{\sim 10}$	). 6 ). 6	1930	570 570	$\begin{array}{ccc} \sim & 2710 \\ \sim & 2710 \end{array}$	4.46	<u>A</u>		965 965	8. 9 8. 9 9. 7	
	25 + 28 + 28 25 + 28 + 32	- 81 - 85	2.66 2.53	2. 97 2. 83	3. 24		8. 60 8. 60	3. 3		). 4	2090 2070	600 590		4.11	A.		045 035	9. 7 9. 6	
	25 + 28 + 40	93	2.31	2. 59	3.70	ļ	8.60	3. 3	~ 10	). 5	2060	590	~ 2810	4.17	A	1	030	9. 5	
ŀ	25 + 28 + 50 25 + 32 + 32 25 + 32 + 40	103 89	2. 09 2. 42	3.09	3.09		8. 60 8. 60	3. 2		). 6		570 590	~ 2800	$\frac{4.46}{4.20}$	<u>A</u>		965 025	8. 9 9. 5	
ļ	25 + 32 + 32 25 + 32 + 40 25 + 32 + 50	97 107	2. 21 2. 01	2.84 2.57	3.55 4.02	[]	8. 60 8. 60	3. 3		). 5 ). 6	2040 1910	580 570	$ \begin{array}{ccc} \sim & 2790 \\ \sim & 2680 \end{array} $	4. 22 4. 50	A		020 955	9. <u>4</u> 8. 8	
	25 + 40 + 40	105	2.04	3. 28	3. 28		8.60	3. 3	$\sim 10$	), 5	2030	580	$\sim 2780$	4. 24	<u>A</u>	1	015	9.4	
ł	28 + 28 + 28 28 + 28 + 32	84	2.86 2.74	2.74	2.86 3.12	<u> </u>	8. 58 8. 60	3. 3	$\sim 10$	0.4	2070	600 590	~ 2820	4.11 4.15	A	1	045 035	9. 7 9. 6	
F	28 + 28 + 40 28 + 28 + 50	96 106	2.51 2.27		3.58 4.06		8. 60 8. 60	3. 3	$\sim 10$			590 570	~ 2810	4.17	<u>A</u>		030 965	9. 5 8. 9	
,	28 + 32 + 32	92	2.62	2.99	2.99		8.60		~ 10	5		590		4.20	<u>Ā</u>		025 025	9.5	
ŀ	28 + 32 + 40 28 + 32 + 50 28 + 40 + 40 32 + 32 + 32	110	2. 19	2. 50	3. 44	<u> </u>	8. 60	3. 3	$\sim 10$ $\sim 10$	. 6		570	~ 2790 ~ 2680	4. 22	A	<u>1</u>	020 955	9. 4 8. 8	
-	28 + 40 + 40 32 + 32 + 32	108 96	2.19	3. 19 2. 86	3. 19 2. 86		8. 60 8. 58	3. 3 3. 3	$ \begin{array}{c} \sim 10 \\ \sim 10 \\ \sim 10 \\ \sim 10 \\ \sim 10 \end{array} $	. <u>5</u> . <u>5</u>	1990	580 580	~ 2770	4. 24 4. 31	A	6	015 195	9. 4 9. 2	
1	32 + 32 + 40	104 80	2.65	2.65	3.30	2.15	8.60	3. 3	~ 10	. 5	1980	580	~ 2760 ~ 2620	4.34 4.60	A	6	90 35	9. 2 8. 6	
ŀ	20 + 20 + 20 + 20 20 + 20 + 20 + 25 20 + 20 + 20 + 25 20 + 20 + 20 + 28 20 + 20 + 20 + 32 20 + 20 + 20 + 40	85	2. 15 2. 02 1. 95	2.02	2.15	2. 15 2. 54 2. 75 2. 99	8. 60 8. 60	3.1	$\frac{\sim 10}{\sim 10}$	6	1870	580 580	~ 2620 ~ 2620	4.60	A	9	35	8. 6	
}	20 + 20 + 20 + 28 20 + 20 + 20 + 32	- 88 - 92	1.87	1. 95	1.95	2. 75	8. 60 8. 60	3. 1	$\sim \frac{10}{\sim 10}$	. 6 . 6	1850	580 580	~ 2600	4. 60 4. 65	<u>A</u>	ç	35 25	8. 6 8. 6 8. 5 8. 6 8. 6	
ļ	20 + 20 + 20 + 40 20 + 20 + 20 + 50	100 110	1.72	1.72	1.72	3.44	8.60	3.0			1840	590 580	~ 2590	4.67	A	ç	)20 )25	8.5	
Г	20 + 20 + 25 + 25	90	1.91	1.56	2.39	2.39	8.60	3.1	$\stackrel{\sim}{\sim} 10$	6	1870	580	~ 2620 ~ 2620	4.60	A	g	35	8.6	
}	20 + 20 + 25 + 28 20 + 20 + 25 + 32 20 + 20 + 25 + 32 20 + 20 + 25 + 40 20 + 20 + 28 + 28 20 + 20 + 28 + 32	93	1.85 1.77	1.85 1.77	2. 39 2. 31 2. 22 2. 04 2. 51 2. 41	2. 59	8. 60 8. 60	$\frac{3.1}{3.0}$	~ 10 ~ 10 ~ 10 ~ 10 ~ 10 ~ 10 ~ 10 ~ 10 ~ 10	. 6 . 6	1870	580 580	$\sim \frac{2620}{\sim 2600}$	4.60 4.65	<u>A</u>		35 25	8.6	
ţ	20 + 20 + 25 + 40	105	1. 64 1. 79	1. 64 1. 79	2.04	3. 28	8.60	3.0	~ 10	. 6	1840	590	$ \begin{array}{r} \sim 2590 \\ \sim 2620 \end{array} $	4.67	A	9	20 35	8. 6 8. 5 8. 6	
ŀ	20 + 20 + 28 + 32	96 100	1.72	1.72	2.41	2.75	8. 60 8. 60	3. 0	$\sim 10$	6	1850	580 580	~ 2600	4. 60 4. 65	<u>A</u>	g	25	8.6	
	20 + 20 + 28 + 40	108 104	1.65	1. 59 1. 65			8. 60 8. 60	3.0	$\sim 10$ $\sim 10$	. 6	1830	590 590	$\begin{array}{ccc} \sim & 2590 \\ \sim & 2570 \\ \sim & 2620 \end{array}$	4. 67 4. 70	A	g	20 15	8. 5 8. 5	
Room	20 + 25 + 25 + 25	95	1.82	2. 26 2. 19	2. 65 2. 26 2. 19 2. 11 1. 95	2.26	8.60	3.1	$ \begin{array}{c} \sim 10 \\ \sim 10 \end{array} $	. 6	1870	580 580	$\begin{array}{ccc} \sim & 2620 \\ \sim & 2620 \end{array}$	4.60	A	g	35 35	8. 6	
ŀ	20 + 25 + 25 + 28 20 + 25 + 25 + 32 20 + 25 + 25 + 40 20 + 25 + 26 + 40 20 + 25 + 28 + 28 20 + 25 + 28 + 32	102	1.68	[ 2, 11 .	2.11	2.70	8. 60 8. 60	3. 0	$\sim 10$	6	1850	580	~ 2600	4.65	A	g	25	8. 6 8. 6 8. 6	
F	20 + 25 + 25 + 40 20 + 25 + 28 + 28	110 101	1.56 1.70	1. 95 2. 14	2.38	3. 14 2. 38	8. 60 8. 60	3. 0	$\sim 10$ $\sim 10$	6 6		590 580	$\begin{array}{ccc} \sim & 2600 \\ \sim & 2620 \end{array}$	4.65	<u>A</u>	g	25 35	8.6	
		105	1.64	2.05	1 2 29 1	2 62	8.60	3.0	- 10	. 0	1850	580	~ 2600	4.65	A	9	35 25	8. 6 8. 5	
		109 104	1.58	1. 98 2. 32	2. 52	2.32	8. 60 8. 60	3.0	$\begin{array}{c} \sim 10 \\ \sim 10 \end{array}$	. b . 6	1870	590 580	~ 2620	4.70 4.60	<u>A</u>	9	15 35	8.6	
ļ	20 + 28 + 28 + 32	108 100	2. 15	2. 32 2. 23 2. 15 2. 09	2. 23 2. 15	2.55	8. 60 8. 60	3. 0	$\begin{array}{c} \sim 10 \\ \sim 10 \end{array}$	6	1850	580 580	$\begin{array}{ccc} \sim & 2600 \\ \sim & 2620 \end{array}$	4. 65 4. 60	Ā	9	25 35	8. 6 8. 6	
t	25 + 25 + 25 + 28	103	2. 09	2. 15	2. 15	2. 33	8.60	3.1	$\sim 10$	6	1870	580	~ 2620	4.60	A	9	35	8.6	
F	25 + 25 + 25 + 32 25 + 25 + 28 + 28	107 106	2.01	2.01	2. 27	2. 27	8.60 8.60	3. 0	~ 10 ~ 10	6	1850 1870	580 580	~ 2600	4. 65 4. 60	<u>A</u>	<u>9</u>	25 35	8.6	
ţ	20 + 2b + 32 + 32 20 + 28 + 28 + 28 20 + 28 + 28 + 32 20 + 28 + 28 + 32 25 + 25 + 25 + 25 + 25 25 + 25 + 25 + 35 + 32 25 + 25 + 25 + 32 25 + 25 + 28 + 28 25 + 25 + 28 + 28 25 + 28 + 28 + 28	110 109	1.95	1. 95	2. 19	2. 51 2. 21	8.60	3. 0	~ 10	6	1850	580 580	~ 2600	4.65	A	9	25 35	8. 6 8. 6 8. 6	
	40 + 28 + 28 + 28	109	1.97	2. 21	2.21	2. 21	0.00	J 3. I	10	. 0	1010	J0U	2020	4.00	Α	9	00	ο, τ	

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20	1.1.15 1.15 1
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2 2 2 20 40 80 1,95 1,95 1,95 2,90 7,80 2,6 8 3,3 240 400 2830 3,35 A 1250 1,00 1,2 1,2 1,6 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	2.3
20 25 48 27 77 195 2.46 3.0 7.60 2.55 2.85 7.40 2.5 -1. 2140 460 -2700 3.46 A 1070 9.40 1.3 +1.5 2 2.5 2.5 2.5 1.0 1.0 1.2 +1.5 2.5 2.5 2.5 1.0 1.0 1.2 +1.5 2.5 2.5 2.5 1.0 1.0 1.2 +1.5 2.5 2.5 2.5 1.0 1.0 1.2 +1.5 2.5 2.5 2.5 1.0 1.0 1.2 +1.5 2.5 2.5 2.5 1.0 1.0 1.2 +1.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2	1 6
\$\frac{5}{20} \cdot \frac{7}{28} \cdot \frac{7}{2	1.7
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$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1.6 1.7
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	2. 1 2. 3
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22 + 32 + 50	2.3
25 + 50 + 50	1.9 2.2 1.7
1   100 - 100 - 100 - 100   1   2   2   2   2   2   2   2   2   2	2. 0 1. 8
1   28 + 28 + 40   1   96   2,35   2,35   3,30     8,00   2,8 ~ 8,2   2510   490 ~ 2790   3,19   10   1255   111.00   11.5 + 1.5 +	1.6
28 + 28 + 50	2. 2 1. 6
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32 + 32 + 50 114 2 25 2 25 3 50 8 00 2 8 ~ 8,4 2390 490 ~ 2830 3 35 A 1195 10.50 11.5 + 1.5 +	2. 0 1. 7
$\begin{vmatrix} 32 + 40 + 50 \end{vmatrix}$ $\begin{vmatrix} 122 & 2 & 10 & 2 & 60 & 3 & 30 \end{vmatrix}$ $\begin{vmatrix} 8.00 & 2.9 & 8.4 & 2350 & 490 & 2820 & 3.40 & A & 1175 & 10.30 & 13.4 & 1.5 & $	1.9
40 + 40 + 50 130 2.49 2.49 3.10 8.00 2.90 8.00 2.7 ~ 8.8 2150 490 ~ 2840 3.72 A 1075 9.50 1.3 +	1.7 1.3 +1.3
20 + 20 + 25   85   1.90   1.90   1.90   2.30   8.00   2.8   2.8   2140   490   2.80   3.74   A   1070   9.40   1.2 + 1.2 + 1.2 + 1.2 + 1.2   1.2 + 1.2   1.2 + 1.2   1.2 + 1.2   1.2 + 1.2   1.2	1. 2 + 1. 5 1. 2 + 1. 6
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1.1 + 1.6
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22 2 2 2 3 2 3 2 3 3 2 3 3 3 3 3 3 3 3	1.6 + 1.6
20 + 25 + 40 + 50	1.3 + 1.5
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1.2 + 1.8 1.5 + 1.5
	1.4 + 1.6
Dec   20   O   O   O   O   DO   1.85   1.85   2.65   2.66   2.00   0   0   0   0   0   0   0   0   0	1,   1,   1,   1,   1,   1,   1,   1,
20 + 32 + 32 + 40	1.2 + 1.7 1.5 + 1.5
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	1.3 + 1.3
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1. 2 + 1. 5 1. 1 + 1. 6 1. 0 + 1. 8
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1.4 + 1.4 1.3 + 1.5
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1, 2 + 1, 6 1, 1 + 1, 8
22 + 22 + 28 + 40	1. 5 + 1. 5 1. 4 + 1. 6 1. 3 + 1. 7
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1, 5 + 1, 5 1, 3 + 1, 3
22 + 28 + 28 + 32	1.3 + 1.5
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1.4 + 1.4
25 + 28 + 32 + 10	1.2 + 1.7 1.5 + 1.5
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$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1. 3 + 1. 3 1. 3 + 1. 4 1. 2 + 1. 6 1. 1 + 1. 7 1. 4 + 1. 4
22 + 25 + 26 + 30	1. 4 + 1. 4 1. 3 + 1. 5 1. 3 + 1. 3 1. 3 + 1. 4 1. 2 + 1. 6 1. 1 + 1. 7 1. 4 + 1. 4 1. 3 + 1. 5 1. 5 + 1. 5
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1.3 + 1.5
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32 + 32 + 32 + 32 + 40	1.5 + 1.5 1.3 + 1.3 1.3 + 1.5 1.3 + 1.5 1.2 + 1.3

	Indoor unit capacity Heating	Total	Poor All	Heating (	apacity	(kW)	min o	~ max	Ing Rating	ut Po	wer (₩) ~ max	W/W	COP CLASS	ANNUA	L ENERGY TION (kWh)	Curr 230V		MOISTURE REMOVAL VOLUME 1/h
Т	20 25	-20 25	3, 20		3.		1.7 - 2	~ 4.7 ~ 4.8	840 1090	min -370 -370	~	3.81	- A C		20 45	- 3.8	35 35	
1 oom	28 32	-28 -32	4.00		4.	50	1.7 ~ 1.7 ~	4. 8 5. 8	1210 1310	370	$\sim \frac{1900}{2290}$	3.31	C B	16	05 55	5.4	10 35	
-	40 50	-40 50	4, 50 5, 60 7, 10		7.	60 10	2.1	7.2	1900 2840	370 430	$\frac{\sim}{\sim} \frac{3560}{3560}$	2.95	F F	1	50 120	<u>8.</u> 12.	40	
- 1	20 + 20 20 + 25	_40 _45	3, 20	3. 20 3. 95	7.	10	2.1	9.4 9.4	1480 1700	400	~ 3550 ~ 3510	4.32	A A	8	40 50 50	6. 7. 7.	50 55 	
	20 + 28 20 + 32	48 52 60	2. 90	4.15	7.	10 50 30	2.1	9.4	1700 1740 2060	420 420 440	~ 3510 ~ 3490 ~ 3440	4.18 4.31 4.03	- A	1 8	70	7. 6 9. 0	35	
- 1	20 + 40 20 + 50 25 + 25	- 70 - 50	2, 50	5.55 6.30 3.55	8.	80 10	3. 2	9.8 9.9 9.4	2260 1860	530 440	~ 3400 ~ 3480	3.89	A	1	130	9.9	90	
	25 + 28	53		3.95	7.	50 10	2.3	9.4	1970	- 440 - 440 - 440	~ 3480 ~ 3460	3.81	A		85	8.	55 70	
2	25 + 40	65	3, 55	4.55 5.30	8.	60	2.1	9.8	2175	530 530	~ 3390 ~ 3370	3.95	Ā	1	588 195	9.6	35	
oom	25 + 50 28 + 28 28 + 32	75 56 60	3. 85	6.00 3.85 4.30	7.	70 10	2.3	9.4	2020	440 440	~ 3480 ~ 3460	3.81	Ä.	1	90	8.8	35	
	28 + 40	-68 -78	3. 80 3. 55 3. 25	5.05	8.	60	2.1	9.8	2175	530 530	~ 3390 ~ 3370	3.95	A	1	088 195	9.6	35	
	28 + 50 32 + 32 32 + 40	-64 -72	4. 25	4.25	8.	50 80	2.5	10.1	2110	470 530	~ 3390 ~ 3340	4.03 3.95	A		055 115	10. 9. 9.	35	
	32 + 50 40 + 40	82 80	3, 60 4, 55	5.60 4.55	9.	20	3. 2	- 10. I	2390 2360	530	~	3.85	A	1	195 180	10.	50 30	
	40 + 50 50 + 50	90	4. 20	5.20	9.	40 40	3. 2	- 10. 2 - 10. 2	2480 2470	530 590	~ 3300 -	3.79	A	1	240 235	10.	90	
- 1	20 + 20 + 20 - 25	60	2. 87	2.87 2.87 2.70 3.40	8. 8.	61 80	3.1 - 2	~ 10.4 ~ 10.4	1990 2010	- 500 510	$-\frac{\sim}{\sim} \frac{3250}{3220}$	4.33	- A	1	95 005	8.1 8.1	30 35	
	20 + 20 + 28 20 + 20 + 32	68	2, 60 2, 45	2.60 3.60 2.45 4.00	8.	80 90	3. 2	~ 10.4 ~ 10.4	2010 2030	510 510	- ~ <u>3220</u> -	4.38	A	î	005 015	8. 8 8. 9	35  95	
	20 + 20 + 40 20 + 20 + 50	72 80 90	2, 30 2, 10	2. 30 4. 60 2. 10 5. 20	9.	20 40	3. 2	~ 10.4 ~ 10.4	2150 2120	510 510	~ 3180 ~ 3180	4.28	A .	1	075 060	9.	30	
	20 + 25 + 25 20 + 25 + 28	70	2 60	3. 20 3. 20 3. 10 3. 45	9.	00	3. 2	~ 10.4 ~ 10.4	2090 2090	510 510	$\stackrel{\sim}{\sim} \frac{3190}{3190}$	4.31	- A	1	045 045	9. 9.	20	
	20 + 25 + 32	73 77 85	2. 45 2. 40 2. 20 2. 00 2. 40 2. 30	3.00 3.80 2.75 4.45	9.	20 40	3.2	- 10.4 - 10.4	2110 2160	510 510	$\stackrel{\sim}{\sim} \frac{3180}{3140}$	4.36	- A	1	055 080	9.	50	
	20 + 25 + 40 20 + 25 + 50 20 + 28 + 28	95 76	2. 40	2.45 4.95 3.30 3.30	9.	40 00	3.5	~ 10.4 ~ 10.4	2080 2090	560 510	$\begin{array}{c} \sim & 3150 \\ \sim & 3190 \end{array}$	4.52	<u> </u>	1	040 045	9.	20	
- 1	20 + 28 + 32 20 + 28 + 40	88	2. 15	3. 20 3. 70 3. 00 4. 25	9.	20 40	3.2	- 10. 4 - 10. 4	2110 2160	510 510	$\stackrel{\sim}{\sim} \frac{3180}{3140}$	4.36	- A	1	055 080	9. 9.	50	
- 1	20 + 28 + 50 20 + 32 + 32	98 84	1. 90 2. 20	2.70 4.80 3.55 3.55	9.		3.5	~ 10.4 ~ 10.5	2080 2130	560	$\sim \frac{3150}{3180}$	4.52	A -	1	040 065	9.	10	
	20 + 32 + 40 20 + 32 + 50	92 102	2. 05 1. 85	3, 25 4, 10 2, 95 4, 60	9.	40 40	3. 2	~ 10.5 ~ 10.5	2150 2170	500 620	~ 3140 ~ 3140	4.37	A	1	075 085 055	9.	55	
- 1	20 + 40 + 40 20 + 40 + 50	110	1.70	3.75 3.75 3.40 4.30	9.	40 40	3.6	10.5	2110	620 660 700	$\begin{array}{c} \sim & 3110 \\ \sim & 3110 \\ \sim & 3120 \\ \end{array}$	4.45 4.43 4.33	- A	1	060 085	9. 9. 9.	30 55	
	20 + 50 + 50 25 + 25 + 25	120 75 78	1, 60 3, 08	3.90 3.90 3.08 3.08 2.96 3.32	9.	40 24 24	3.2	~ 10. 5 ~ 10. 4 ~ 10. 4	2170 2170 2170	- 510 - 510	~ 3120 ~ 3160 ~ 3160	4.26	A	1	085 085	9.	55	
	25 + 25 + 28 25 + 25 + 32	-78 -82 -90	2, 96 2, 85 2, 60	2.85 3.70	9.		3.2	- 10. 4 - 10. 4	2170 2190 2140	- 510 - 510 - 530	~ 3150 ~ 3150 ~ 3130	4.29	A A	1	095 070	9.6	55 10	
- 1	25 + 25 + 40 25 + 25 + 50 25 + 28 + 28	100 81	2. 35	2.60 4.20 2.35 4.70 3.20 3.20	9.	40	3.8	~ 10. 4 ~ 10. 4 ~ 10. 4	2100 2170	640 510	~ 3120 ~ 3160	4.48	A	1	050	9. i	20 55	
oom	25 + 28 + 32	-81 -85 -93	2. 84 2. 75 2. 50	3. 10 3. 55 2. 85 4. 05	9.	40 40	3.2	~ 10. 4 ~ 10. 4 ~ 10. 4	2190 2140	510 530	~ 3150 ~ 3130	4.29	A -	1	095 070	9.6	55 10	
	25 + 28 + 50	103	2.30	2.85 4.05 2.55 4.55 3.40 3.40	9.	40 40 40	3.8	~ 10. 4 ~ 10. 4 ~ 10. 5	2100	- 640 - 500	~ 3120 ~	4.48	Ā	1	050 085	9.	20 55	
	25 + 32 + 32 25 + 32 + 40 25 + 32 + 50	97	2, 40	3. 10 3. 90 2. 80 4. 40	9.		3.5	10.5	2130 2150	560 660	~ 3120 -	4.41	A A	1	065 075	9. 9. 9.	10	
	25 + 40 + 40 25 + 40 + 50	105	2. 20 2. 20 2. 05	3.60 3.60	9.		3.8	~ 10.5 ~ 10.5	2060 2100	640	~ 3080 ~ 3080	4.56	A	1	030 050	9.1	20	
	25 + 50 + 50 28 + 28 + 28	125	3.08	3.25 4.10 3.75 3.75 3.08 3.08	9.	40 24	4. 2	~ 10.5 ~ 10.4	2140 2170	700 510	$\stackrel{\sim}{\sim} \frac{3080}{3160}$	4.39	- A	1	070 085	9.	55	
- 1	28 + 28 + 32 28 + 28 + 40	- 88 - 96	3. 00 2. 75	3.00 3.40 2.75 3.90	9.		3. 2	~ 10.4 ~ 10.4	2190 2140	510	~ 3150 ~ 3130	4. 29	A -	1	095 070	9.	10	
- 1	28 + 28 + 50 28 + 32 + 32	106 92	2.50	2.50 4.40 3.25 3.25	9.	40	3.8	~ 10.4 ~ 10.5	2100 2170	640 500	$\stackrel{\sim}{\sim} \frac{3120}{3150}$	4.48	A A	1	050 085	9.	55	
	28 + 32 + 40 28 + 32 + 50	100	2. 65	3.00 3.75 2.75 4.25	9.		3.5	~ 10.5 ~ 10.5	2130 2150	560 660	~ 3120 ~ 3120	4.41	- <del>^</del> -		065 075 030	9, 9 9, 1	50	
	28 + 40 + 40 28 + 40 + 50	108 118	2, 40 2, 20	3. 50 3. 50 3. 20 4. 00	9.		4.0	~ 10.5 ~ 10.5	2060 2100	640	~ 3080 ~ 3080	4. 48	<b>⊹</b> -^-	1	050 070	9. 9.	20	
	28 + 50 + 50 32 + 32 + 32	128 96	2, 10 3, 13	3, 65 3, 65 3, 13 3, 13	9.	39	3.3	- 10.5 - 10.5	2140 2160	700 520	~ 3080 ~ 3180	4.39	:: <u> </u>	1	080 070	9.	50	
	32 + 32 + 40 32 + 32 + 50	104 114	2. 90 2. 65 2. 70	2. 90 3. 60 2. 65 4. 10	9.	40	4.0	~ 10.5 ~ 10.5	2140 2130	620	~ 3150 ~ 3120	4.39 4.41 4.43	<del> </del>	1	065	9.	10 10 30	
	32 + 40 + 40 32 + 40 + 50	112	2, 70	3, 35 3, 35 3, 10 3, 85	9.	40	3.9 4.1	~ 10.5 ~ 10.5 ~ 10.5	2120 2100 2060	660 700 700	~ 3120 ~ 3100 ~ 3080	4.48	-^-	1	050	9.7	20	
	32 + 50 + 50 40 + 40 + 40	132 120 130	2. 45 2. 30 3. 13	3.55 3.55 3.13 3.13 2.90 3.60	9.	39	4.2 4.0 4.2	~ 10.5 ~ 10.5	2100 2080	- 680 - 700	~ 3080 ~ 3080	4.47	Â	1	050	<del>9</del> .	20	
	40 + 40 + 50 20 + 20 + 20 + 20	80		2.35 2.35 2	35 9. 80 9.		3. 2 3. 2 3. 2		2080	- 550 - 550	$-\frac{\sim}{\sim} \frac{3140}{3120}$	4.52	Ā	1	040	9.	15	
	20 + 20 + 20 + 25 20 + 20 + 20 + 28 20 + 20 + 20 + 32	85 88 92	2, 20 2, 15 2, 05	2. 15 2. 15 2 2. 05 2. 05 3	95 9.	40	3.2	10.5	2060 2120	550 590	~ 3120 ~ 3180	4.56	Ä	1	030	9. ( 9. ( 9. :	30	
	20 + 20 + 20 + 40	100	1.90	1.90 1.90 3 1.70 1.70 4	70 9.		3.8	10.5	2090 2120	640	$\stackrel{\sim}{\sim} \frac{3140}{3110}$	4.50	A	1	045	9.	30	
	20 + 20 + 20 + 50 20 + 20 + 25 + 25 20 + 20 + 25 + 28	90	2.10	2.10 2.60 2 2.00 2.55 2	60 9.	40 40	3.5	~ 10.5 ~ 10.5	2050	610	$-\frac{\sim}{\sim} -\frac{3110}{3110} -$	4. 59	- A	1	025 025	9.	05	
	20 + 20 + 25 + 32 20 + 20 + 25 + 40	97	1.95 1.80	1.95 2.40 3			3.7	~ 10.5 ~ 10.5	2100 2070	620 660	~ 3160 ~ 3110	4. 48	A -	1	050	9. 9. 9.	20 10	
	20 + 20 + 25 + 50 20 + 20 + 28 + 28	96	1.65	1.65 2.00 4 1.95 2.75 2	75 9.	40	4. I - 1 3. 5	~ 10.5 ~ 10.5	2090 2050	700 610	$\stackrel{\sim}{\sim} \frac{3100}{3110}$	4.50	A -	11	045 025	9.4	05	
	20 + 20 + 28 + 32	100	1.90 1.75	1. 90 2. 60 3 1. 75 2. 40 3	50 9.	40 40	3.7	- 10.5 - 10.5	2100 2070	620	$\sim \frac{3160}{3110}$	4. 48	:: <del>:</del>	11	050 035 045	9. 9. 9.	10	
	20 + 20 + 28 + 40 20 + 20 + 28 + 50 20 + 20 + 32 + 32	118 104	1.60 1.80	1.60 2.20 4 1.80 2.90 2	90 9.	40	3.8	~ 10.5 ~ 10.5	2090 2110 2080	700 - 640 - 680	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	4. 50 4. 45 4. 52	:‡:À:	1	055 040	9.5	30	
	20 + 20 + 32 + 40 20 + 20 + 32 + 50 20 + 20 + 40 + 40	112 122	1,70 1,55	1.55 2.45 3	35 9. 85 9. 15 9.	40	4.1	~ 10.5 ~ 10.5 ~ 10.5	2110	700	~ 3080 ~	4.45	Ţ	1	055	9.	30	
	20 + 20 + 40 + 40 20 + 20 + 40 + 50	120 130 95	1.55 1.45 2.05	1.55 3.15 3 1.45 2.90 3 2.45 2.45 2	60 9.	40	4.1	- 10.5	2080	700	~ 3060 ~ 3080	4.52	Ä	1	040	<del>9</del> .		
	20 + 25 + 25 + 25 - 25 - 25 - 25 - 25 - 25	98	1.90	2.40 2.40 2 2.30 2.30 2	70 0	40	3.8	- 10.5	2040	640	~ 3080 ~ 3130	4.61	A A	1	020	8.5	95 15	
	20 + 20 + 20 + 20 + 20 + 20 + 20 + 20 +	110	1.70	2. 15 2. 15 3 1. 95 1. 95 3	40 9. 95 9.	40 40 40 40 40 40	4.0	10. 5 6 6 6 10. 10. 5 6 6 6 10. 10. 5 6 6 6 10. 10. 5 6 6 6 10. 10. 5 6 6 6 10. 10. 5 6 6 6 10. 10. 5 6 6 6 10. 10. 5 6 6 6 10. 10. 5 6 6 6 10. 10. 5 6 6 6 10. 10. 5 6 6 6 10. 10. 5 6 6 6 10. 10. 5 6 6 6 10. 10. 5 6 6 10. 10. 5 6 6 10. 10. 5 6 6 10. 10. 5 6 10.	2050 2080	- 680 700	~ 3080 -	4.59	A	1	025	<del>9</del> .	05 15	
	20 + 25 + 28 + 28 20 + 25 + 28 + 32	101	1.85	2.35 2.60 2 2.25 2.50 2	60 9. 85 9.	40 40	3.8	~ 10.5 ~ 10.5	2040	660	~ 3080 ~ 3130	4.61	A	}	020	8. ! 9.	95 15	
	20 + 25 + 28 + 40 20 + 25 + 28 + 50	113	1.60	2. 10 2. 35 3 1. 90 2. 15 3	80 9.	40	4.0	~ 10.5 ~ 10.5	2050 2080	680 700	$\stackrel{\sim}{\sim} \frac{3080}{3080}$	4.59	- A	i	025 040	9.	15	
	20 + 25 + 32 + 32 20 + 25 + 32 + 40	109 117	1.70	2.00   2.55   3	75 9.	40 40	4.0	~ 10.5 ~ 10.5	2090 2060	680 700	~ 3180 ~ 3120	4.56	<del>-</del>	1	045	9.	05	
	20 + 25 + 32 + 50 20 + 25 + 40 + 40	127	1.50	1.85 2.35 3 1.90 3.00 3	.70 9. .00 9.	40 40	4. 0 4. 1 4. 2 4. 2 4. 2 3. 8 3. 9	~ 10.5 ~ 10.5	2090	700	~ 3080 ~ 3080	4.63	<b>.</b>	1	045 015 040	9.1 8.1	95	
	20 + 25 + 40 + 50 20 + 28 + 28 + 28	135 104	1.35	1.75 2.80 3 2.55 2.55 2	50 9.	40 40	3.8	~ 10.5 ~ 10.5	2080	700 640 660	~ 3060 ~ 3080 ~ 3130	4.52		1	020 040	9. 8. 9.	95 15	
	20 + 28 + 28 + 32 20 + 28 + 28 + 40	116	1.60	2, 25   2, 25   3	. 80 _ 9. . 30 _ 9.	40 40	3.9 4.0 4.2	- 10.5 - 10.5	2080 2050 2080	- 660 - 680 - 700	~ 3130 ~ 3080 ~ 3080	4.52 4.59 4.52	- A - A	1	025 040	9. 9. 9.	05	
	20 + 28 + 28 + 50 20 + 28 + 32 + 32	126 112	1. 45 1. 65	2.35   2.70   2	70 9.	40	4.0	10.5	2080	- 700 - 680 - 700	~ 3080 ~ 3180 ~ 3120	4.50 4.56	A - A	11	045	9. 9. 9.	20	
i om	20 + 28 + 28 + 28 + 28 - 20 + 28 + 28 + 32 - 20 + 28 + 28 + 32 - 20 + 28 + 28 + 40 - 20 + 28 + 28 + 50 - 20 + 28 + 32 + 32 - 20 + 28 + 32 + 32 - 20 + 28 + 32 + 32 - 20 + 28 + 32 + 50 - 20 + 28 + 32 + 50 - 20 + 28 + 32 + 50 - 20 + 28 + 40 + 40 - 20 + 28 + 40 + 40 - 20 + 32 + 32 + 32 - 20 + 32 + 32 + 32 - 20 + 32 + 32 + 32 - 32 - 32 - 32 + 32 + 32	120	1.45	2.00 2.30 3	65 9.	40 40	4. 1 4. 2 4. 2 4. 0	~ 10.5 ~ 10.5	2060 2090 2030	700 700 700	~ 3120 ~ 3080 ~ 3080	4.50	A -	1000	045 015	9.	20	
-	20 + 28 + 40 + 40 20 + 32 + 32 + 32	128	1.45	2,05 2.95 2 2.60 2.60 2	95 9. 60 9.	40 40 40	4.0	10.5	2110	- 700 - 680 - 700	~ 3080 ~ 3120 ~ 3080	4.45	A A	1	055 040	- 8. 9. 9.	15	
-	20 + 28 + 40 + 40 20 + 32 + 32 + 32 20 + 32 + 32 + 40 20 + 32 + 32 + 40 20 + 32 + 32 + 40 20 + 32 + 40 + 40 25 + 25 + 25 + 25 25 + 25 + 25 + 25 25 + 25 + 25 + 25 25 + 25 + 25 + 40 25 + 25 + 25 + 40 25 + 25 + 25 + 40 25 + 25 + 25 + 40	134	1.45	2.60 2.60 2 2.45 2.45 3 2.25 2.25 3	. 50   9.		4.1	10.6 10.6	2080 2110 2060	- 700 - 700 - 700	~ 3060 ~ 3060	4.52	A A		055	<del>9</del> .	30 05	
-	20 + 32 + 40 + 40 25 + 25 + 25 + 25	132	1. 40 2. 35 2. 30	2.30 2.85 2 2.35 2.35 2	. 35 9.	40 40	4. 2 3. 9 3. 9 4. 0	10.5	2030	660	~ 3080	4. 56 4. 63 4. 63	<u> </u>	11	015	8.	95 95	
	25 + 25 + 25 + 28 25 + 25 + 25 + 32	103	2. 20	2, 30 2, 30 2 2, 20 2, 20 2 2, 05 2, 05 3	50 9. 80 9. 25 9.	40 40 40	4.0	- 10.5 - 10.5	2060 2040	- 680 - 700	~ 3100 ~ 3070	4, 56	Â	1	030 020	9.	05 95	
	25 + 25 + 25 + 40 25 + 25 + 25 + 50	115 125 106	2, 05 1, 90 2, 20	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	. 70 9.	40 40	4.1 4.2 3.9	- 10.5 - 10.5	2070	- 700 - 660	~ 3070 ~ 3080	4. 63	- Â		035 015	9.	15 95	
- 1	25 - 25 - 20 - 22	110	2.15	2. 15 2. 35 2	75 9.	40	4.0	10.5	2060	680 700	~ 3100 ~	4.56	_ L _ A	<u>1</u>	030	9.	05 95	
	25 + 25 + 28 + 40 25 + 25 + 28 + 50	118	1.85	2.00   2.20   3 1.85   2.05   3	65 9. 65 9.	40 40 40	4.2	~ 10.5 ~ 10.5 ~ 10.5	2070	700	~ 3070 ~ 3140	4.54	- Â-	1	035	9.	15	
	25 + 25 + 28 + 40 25 + 25 + 28 + 50 25 + 25 + 32 + 32 25 + 25 + 32 + 40 25 + 25 + 32 + 50 25 + 25 + 32 + 50 25 + 25 + 32 + 40	114	1. 95		. 10   9.	40	4. 2 4. 2 4. 2	~ 10.5 ~ 10.5 ~ 10.5	2040	- 700 - 700	~ 3080 ~ 3080	4.61	<u> </u>	1 1	020	8. 9.	95 20	
	25 + 25 + 32 + 50 25 + 25 + 40 + 40	132 130 109	1.80	1 80 2 90 2	90 9.	40	4.2	~ 10.5 ~ 10.5 ~ 10.5	2020	700	~ 3070 ~ 3080	4.65	Â	1	010 015	- 8.	85 95	
	25 + 28 + 28 + 32	113	2. 20	2. 40 2. 40 2 2. 35 2. 35 2 2. 20 2. 20 3 2. 00 2. 00 3 2. 30 2. 55 2 2. 10 2. 40 3	65 9.	40 40	4.0	~ 10.5 ~ 10.5 ~ 10.5	2060	- 680 - 700	~ 3100 ~ 3070	4.56	Â	<u>î</u>	030	- 9. 8.	05 95	
	25 + 28 + 28 + 40 25 + 28 + 28 + 50 25 + 28 + 32 + 32	131	1. 90	2. 20 2. 20 3 2. 00 2. 00 3 2. 30 2. 55 2	.60 9.	40	4. 1 4. 2 4. 0	~ 10.5 ~ 10.5 ~ 10.5	2070	700	~ 3070 ~	4.54	Ā	<u>1</u>	035 045	9.	15 20	
	25 + 28 + 32 + 32	125	2. 00 1. 90 1. 70	2.30 2.55 2 2.10 2.40 3	.00 9.	40	4.1	~ 10.5 ~ 10.5 ~ 10.5	2060	- 700 - 700	~ 3120 ~ 3080	4.56	- <del>A</del> -	<u>1</u>	030 045	9.	05 20	
-	25 + 28 + 32 + 40 25 + 28 + 32 + 50 25 + 28 + 40 + 40	135	1.70	2 00 2 85 2	. 85 9. . 50 9.	40	4.2	~ 10.5 ~ 10.6	2030	700	~ 3080 ~ 3100	4.63	À	1	015 045	8.	95 20	
	25 + 32 + 32 + 32 25 + 32 + 32 + 40 28 + 28 + 28 + 28	121 129 112	1, 90 1, 80 2, 35	2. 50 2. 50 2 2. 35 2. 35 2 2. 35 2. 35 2 2. 25 2. 25 2	. 90 9. . 35 9.	40 40	4. 1 3. 9	~ 10.6 ~ 10.5	2080	700	~ 3080	4.52 4.63 4.56	Ā	11	040 015	9.	95	
	28 + 28 + 28 + 32	112 116 124	2. 35 2. 25 2. 10	2. 35 2. 35 2 2. 25 2. 25 2 2. 10 2. 10 3	.65 9.	40	4.0	~ 10.5 ~ 10.5	2060	680 700	~ 3100 ~ 3070	4.56	A -	}	030 020	9. 8. 9.	05	
	28 + 28 + 28 + 32 28 + 28 + 28 + 32 28 + 28 + 28 + 40 28 + 28 + 28 + 50 28 + 28 + 32 + 32	134 120	1. 95 2. 20	1.95 1.95 3	. 55 9.	40	4.2	~ 10.5 ~ 10.5	2070	700 680	$\sim \frac{3070}{3140}$	4.54	A -	3	035 035	9.	15	
- 1	28 + 28 + 32 + 40	128 136			95 9	40	4.2	~ 10.5 ~ 10.5	2040	700 700	~ 3080 ~ 3070	4.61	A	1	020 010	8.	95 85	
- 1	28 + 28 + 40 + 40	124	1. 95 2. 05	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	.45 9.	40	4.1	~ 10.6	2090	700	~ 3100	4.50	A	11	045	9.	20	
	28 + 32 + 32 + 32 28 + 32 + 32 + 40	132	1, 95	2.30 2.30 5	.85 9	40	4.2	~ 10.6 ~ 10.6	2070 2110	700	~ 3080	4.45	A -	4 "	055	9.		

# 3 Features

#### • Inverter Technology

- Wider output power range
- Energy saving
- Quick Cooling
- Quick Heating
- More precise temperature control

#### • Environment Protection

- Non-ozone depletion substances refrigerant (R410A)

#### Long Installation Piping

- Long piping up to 20 meter

#### · Easy to use remote control

### Quality Improvement

- Random auto restart after power failure for safety restart operation
- Gas leakage protection
- Prevent compressor reverse cycle
- Inner protector to protect compressor
- Noise prevention during soft dry operation

#### • Operation Improvement

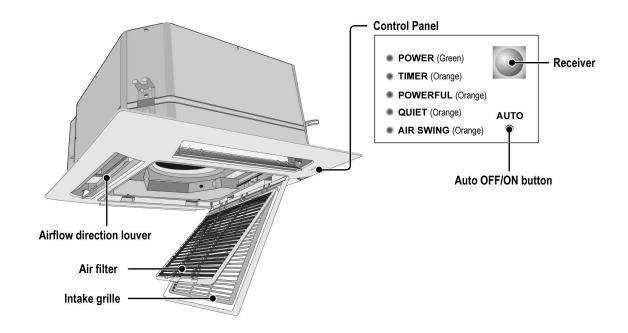
- Quiet mode to reduce the indoor unit operating sound
- Powerful mode to reach the desired room temperature quickly
- 24-hour timer setting

#### • Serviceability Improvement

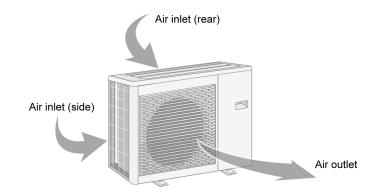
- Breakdown Self Diagnosis function

# 4 Location of Controls and Components

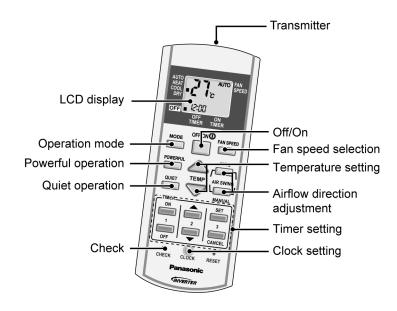
# 4.1. Indoor Unit



## 4.2. Outdoor Unit

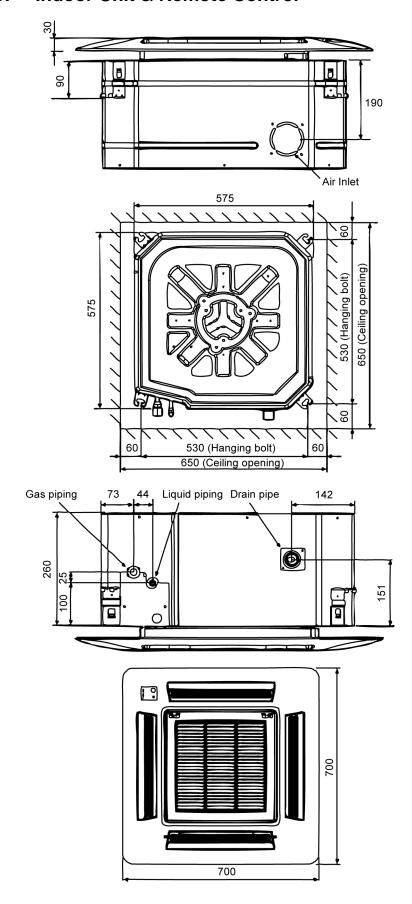


# 4.3. Remote Control

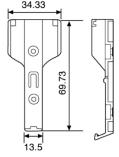


# 5 Dimensions

# 5.1. Indoor Unit & Remote Control

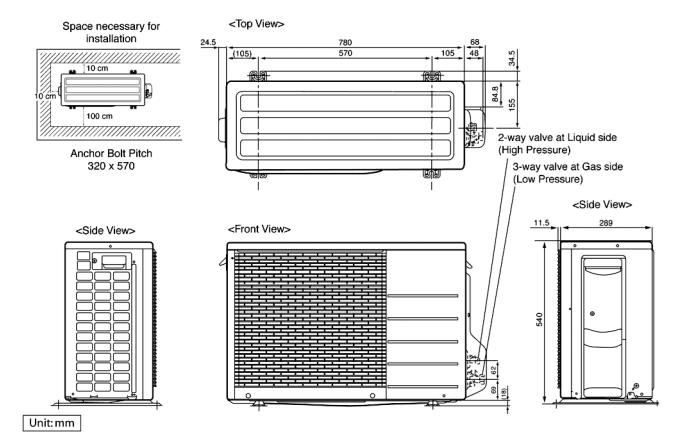




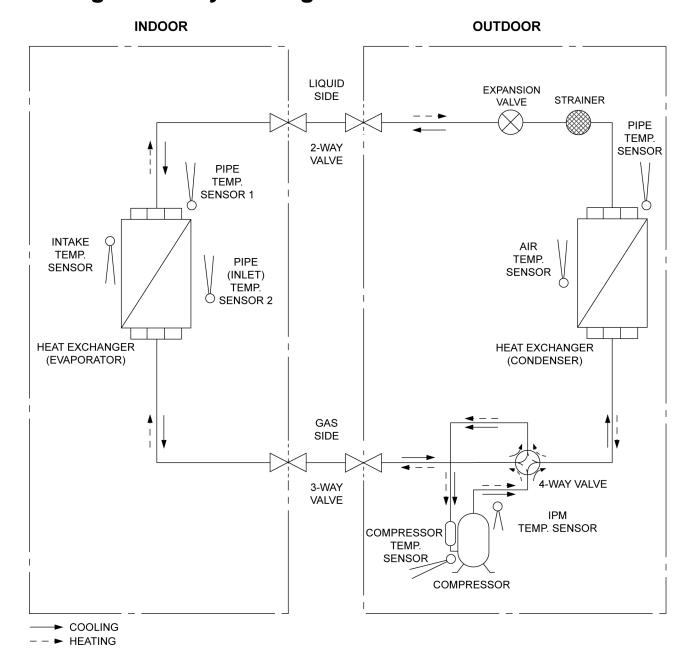


Unit:mm

# 5.2. Outdoor Unit



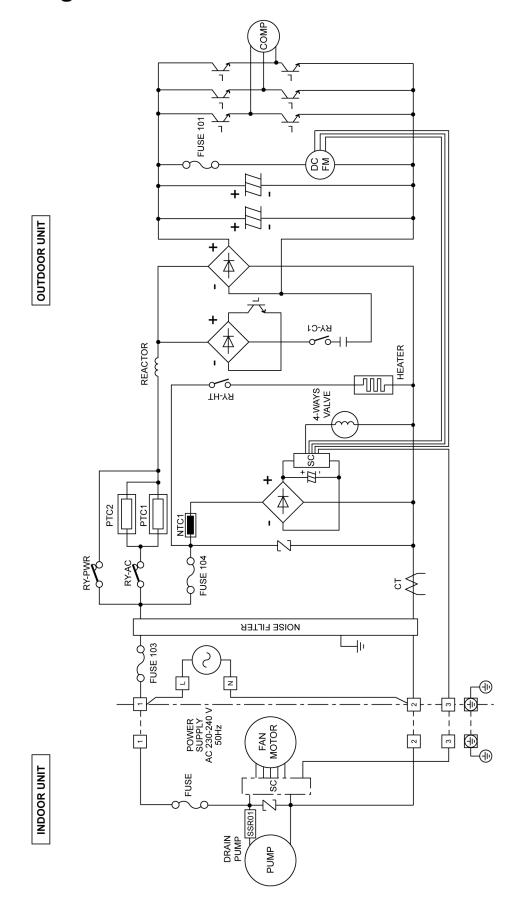
# 6 Refrigeration Cycle Diagram



Model	Pipinę Gas	g size Liquid	Rated Length (m)	Max Elevation (m)	Min. Piping Length (m)	Max. Piping Length (m)	Additional Refrigerant (g/m)
E10HBEA	3/8"	1/4"	7.5	15	3	20	20

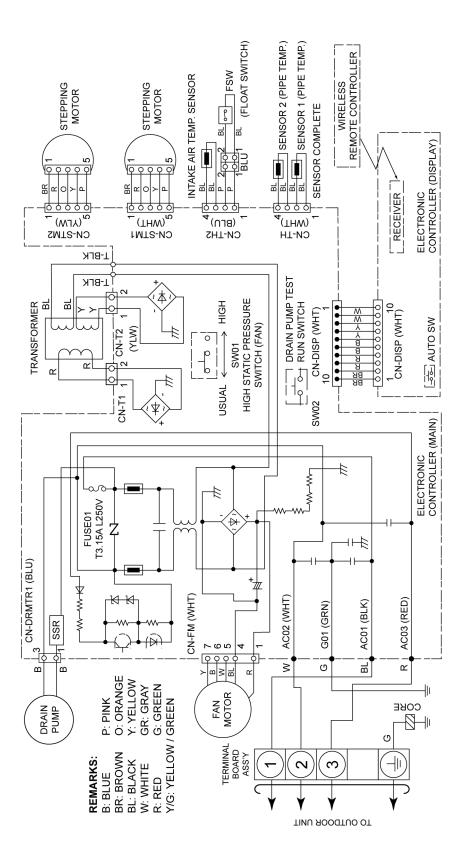
<sup>\*</sup> If piping length is over common length, additional refrigerant should be added as shown in the table.

# 7 Block Diagram

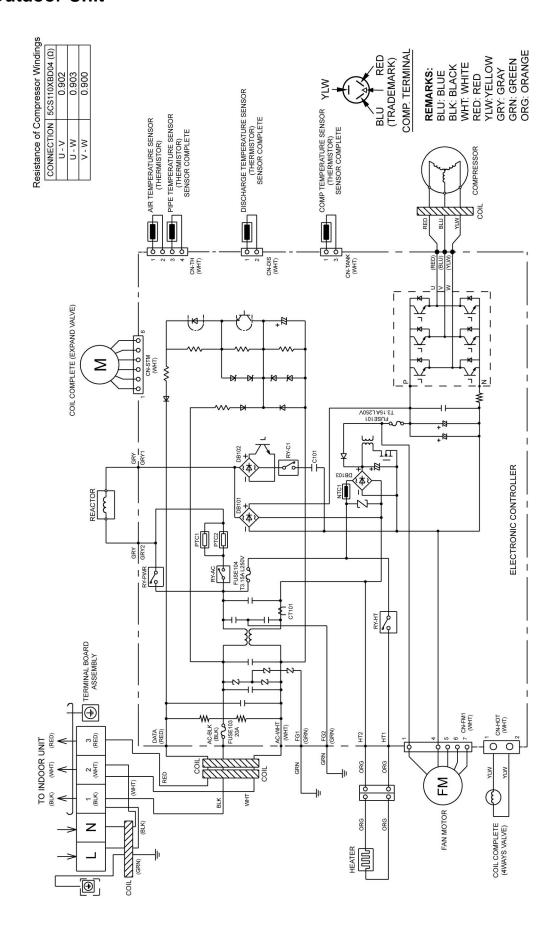


# 8 Wiring Connection Diagram

# 8.1. Indoor Unit

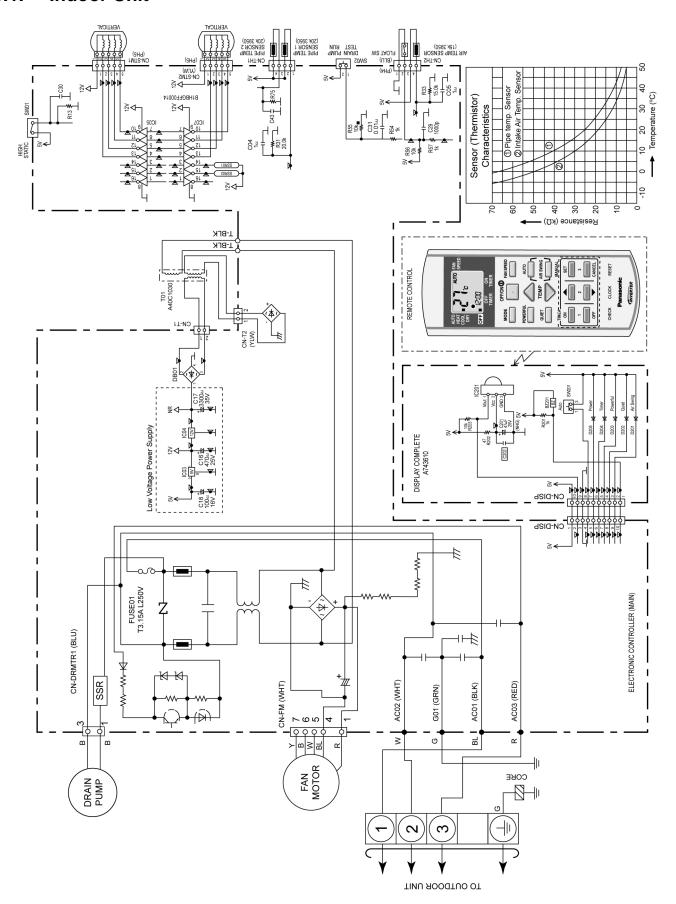


# 8.2. Outdoor Unit

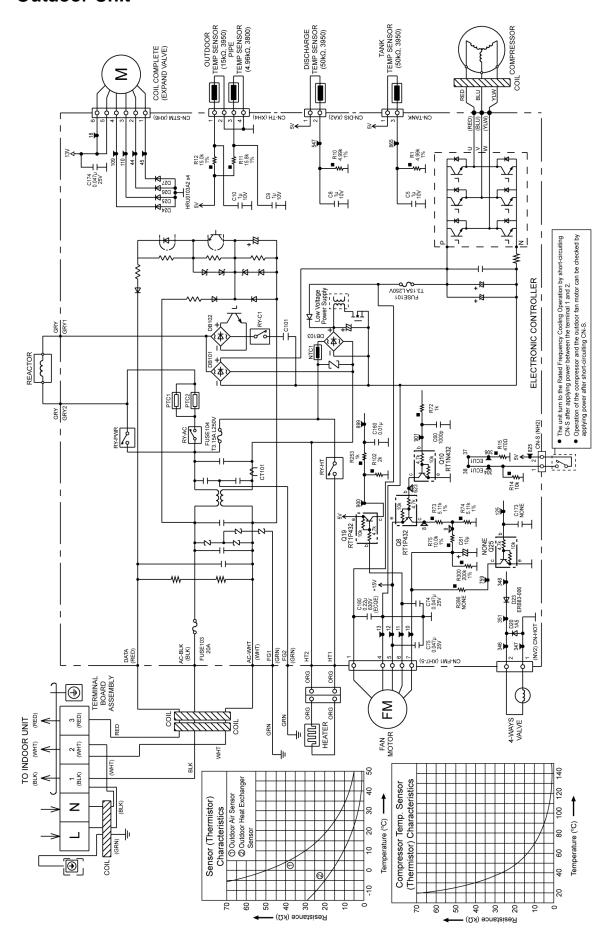


# 9 Electronic Circuit Diagram

# 9.1. Indoor Unit



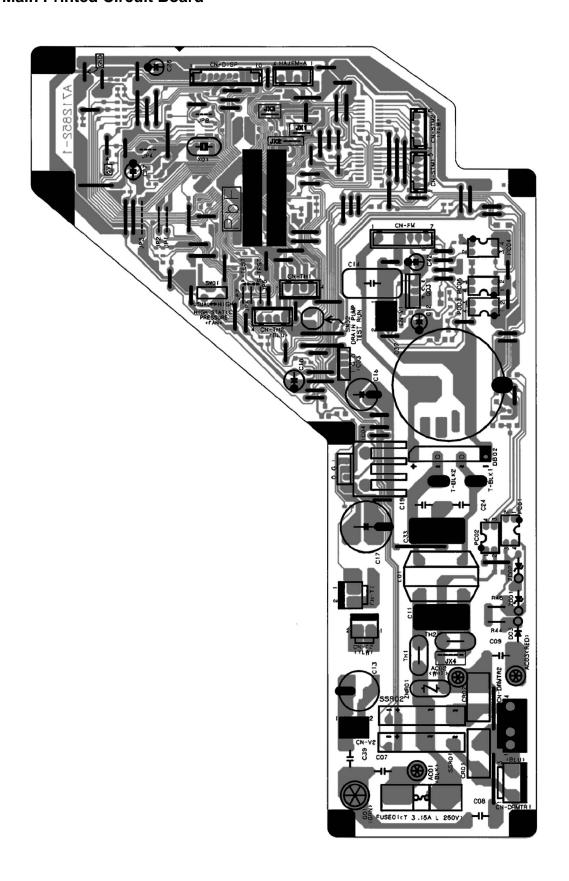
# 9.2. Outdoor Unit



# **10 Printed Circuit Board**

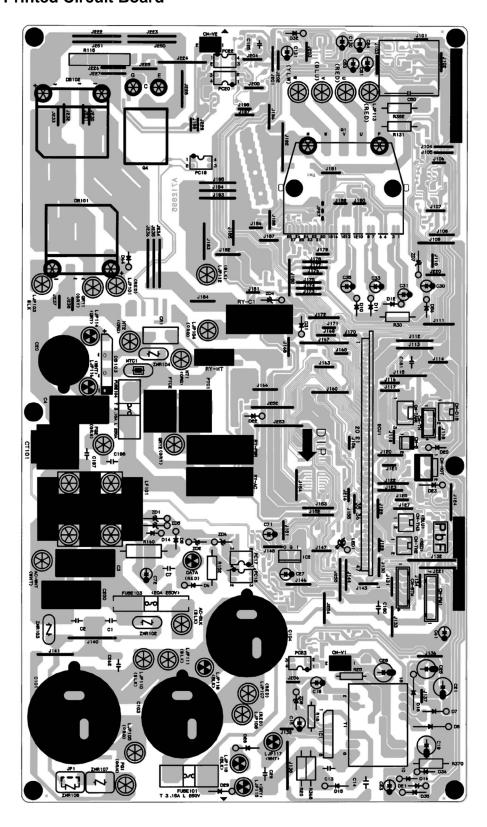
# 10.1. Indoor Unit

# 10.1.1. Main Printed Circuit Board

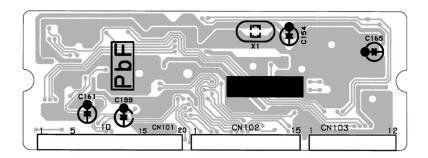


# 10.2. Outdoor Unit

# 10.2.1. Main Printed Circuit Board



# 10.2.2. CPU Printed Circuit Board



# 11 Installation Instruction

## 11.1. Select The Best Location

#### **OUTDOOR UNIT**

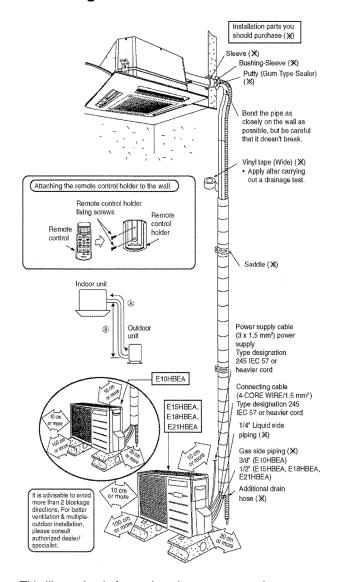
- If an awning is built over the unit to prevent direct sunlight or rain, be careful that heat radiation from the condenser is not obstructed.
- There should not be any animal or plant which could be affected by hot air discharged.
- Keep the spaces indicated by arrows from wall, ceiling, fence or other obstacles.
- Do not place any obstacles which may cause a short circuit of the discharged air.
- If piping length is over 10m, additional refrigerant should be added as shown in the table.

	Pipir	ng size	Rated	Max	Min.	Max.	Additional
			_	Elevation			Refrigerant
Model	Gas	Liquid	(m)	(m)	Length	Length	(g/m)
					A	(A)	
					(m)	(m)	
E10HBEA	3/8"	1/4"	7.5	15	3	20	20
E15HBEA	1/2"	1/4"	7.5	15	3	20	20
E18HBEA, E21HBEA	1/2"	1/4"	5	20	3	30	20

#### Example:

If the unit is installed at a 12m distance, the quantity of additional refrigerant should be  $40g \dots (12 - 10) \text{ m x } 20g/m = 40g$ 

# 11.2. Indoor/Outdoor Unit Installation Diagram



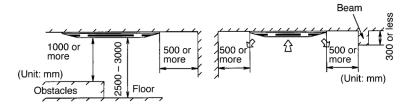
This illustration is for explanation purposes only.
 The indoor unit will actually face a different way.

#### 11.3. Indoor Unit

#### 11.3.1. SELECTING THE LOCATION FOR THE INDOOR UNIT

Provide a check port on the piping side ceiling for repair and maintenance.

- Install the indoor unit once the following conditions are satisfied and after receiving the customer approval.
  - 1. The indoor unit must be within a maintenance space.
  - 2. The indoor unit must be free from any obstacles in path of the air inlet and outlet, and must allow spreading of air throughout the room.
  - 3. Recommended installation height for indoor unit shall be at least 2.5 m.



<sup>\*</sup> If the height from the floor to ceiling exceeds three meters, air flow distribution deteriorates and the effect is decreased.

## / WARNING

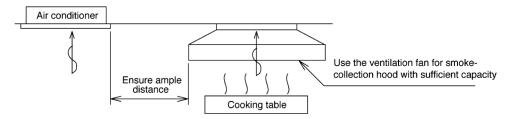
- 4. The installation position must be able to support a load four times the indoor unit weight.
- 5. The indoor unit must be away from heat and steam sources, but avoid installing it near an entrance.
- 6. The indoor unit must allow easy draining.
- 7. The indoor unit must allow easy connection to the outdoor unit.
- 8. Place the indoor unit according to the height from the ceiling shown in the illustration below.
- 9. The indoor unit must be from at least 3m away from any noise-generating equipment. The electrical wiring must be shielded with a steel conduit.
- 10. If the power supply is subject to noise generation, add a suppressor.
- 11. Do not install the indoor unit in a laundry. Electric shocks may result.

#### NOTE

- Thoroughly study the following installation locations
  - 1. In such places as restaurants and kitchens, considerable amount of oil steam and flour adhere to the turbo fan, the fin of the heat exchanger and the drain pump, resulting in heat exchange reduction, spraying, dispersing of water drops, drain pump malfunction, etc.

In these cases, take the following actions:

- Make sure that the ventilation fan for smoke-collecting hood on a cooking table has sufficient capacity so that it draws oily steam which should not flow into the suction of the air conditioner.
- Make enough distance from the cooking room to install the air conditioner in such place where it may not suck in oily steam.



- 2. Avoid installing the air conditioner in such circumstances where cutting oil mist or iron powder exist especially in factories, etc.
- 3. Avoid places where inflammable gas is generated, flows-in, contaminated, or leaked.
- 4. Avoid places where sulphurous acid gas or corrosive gas can be generated.
- 5. Avoid places near high frequency generators.

Model Name	Height in the ceiling
CS-E10HB4** CS-E15HB4** CS-E18HB4** CS-E21HB4**	280 mm or more

#### 11.3.2. INSTALLATION OF INDOOR UNIT

This air conditioner uses a drain up motor. Horizontally install the unit using a level gauge.

CEILING OPENING DIMENSIONS AND HANGING BOLT LOCATION

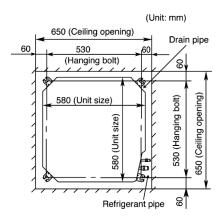
The paper model for installation expand or shrink according to temperature and humidity.

Check on dimensions before using it.

CAUTION	During the installation, care must be taken not to
	damage electric wires.

• The dimensions of the paper model for installation are the same as those of the ceiling opening dimensions.

 Be sure to discuss the ceiling drilling work with the workers concerned.

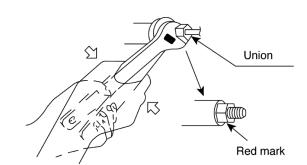


#### POSITIONS OF AIR CONDITIONER BODY AND CEILING SURFACE Hanging bolt Keep the length of the bolt (W3/8 or M10) and above from the bracket to 40 mm Nut 113 mm (W3/8 or M10) Flat washer for M10 Ceiling Air conditioner body M10 Spring washer (accessory) Flat washer for M10 (accessory) Paper model Set screw for paper model (4 pieces) for installation Adjust to the same height Nut (W3/8 or M10) Open the ceiling board along the outer edge of the paper model. **∆**Warning Tighten the nut and bolt to prevent unit from falling

### 11.3.3. REFRIGERANT PIPING

Refrigerant is charged to the outdoor unit. For details, see the manual for installation work of outdoor unit. (Additional charging, etc.)

- 1. Brazing for piping.
  - a. Execute brazing before tightening the flare nut.
  - Brazing must be executed while blowing nitrogen gas.
     (This prevents generation of oxidized scale in copper pipe.)
- 2. When there is a lot of brazings for long piping, install a strainer midway of the piping. (The strainer is locally supplied.)
- Use clean copper pipe with inner wall surface free from mist and dust. Blow nitrogen gas or air to blow off dust in the pipe before connection.
- 4. Form the piping according to its routing. Avoid bending and bending back the same piping point more than three times.
  - (This will result in hardening of the pipe).
- 5. After deforming the pipe, align centers of the union fitting of the indoor unit and the piping, and tighten them firmly with wrenches.
- 6. Connect pipe to the service valve or ball valve which is located below the outdoor unit.
- 7. After completed the piping connection, be sure to check if there is gas leakage in indoor and outdoor connection.



 Confirm the red mark of the union (thin side) is always at lower direction after connecting piping.

#### Vacuum drying

After completing the piping connection, execute vacuum drying for the connecting piping and the indoor unit. The vacuum drying must be carried out by using the service ports of both the liquid and gas side valves.

**CAUTION** Use two wrenches and tighten with regular torque.

	FI	are nut fastening	torque N·m (kgf·cr	n)	
ø6.35 mm	18 (180)	ø12.7 mm	55 (560)	ø19.05 mm	100 (1020)
ø9.52 mm	42 (430)	ø15.88 mm	65 (660)		

Liquid size piping	Gas side piping
ø6.35 mm (1/4")	ø12.7 mm (1/2")

#### 11.3.4. INDOOR UNIT DRAIN PIPING

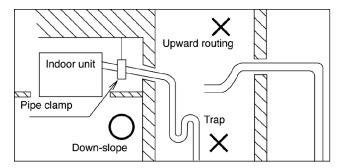
- During drain piping connection, be careful not to exert extra force on the drain port at the indoor unit.
- The outside diameter of the drain connection at the indoor unit is 32mm.

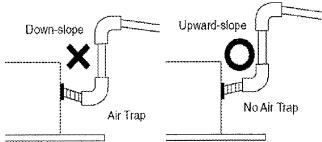
Piping material: Polyvinyl chloride pipe VP-25 and pipe fittings.

• Be sure to perform heat insulation on the drain piping.

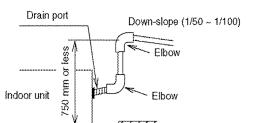
Heat insulation material: Polyethylene foam with thickness more than 8 mm (local supply).

- Drain piping must have down-slope (1/50 to 1/100); be sure not to provide up-and-down slope to prevent reversal flow.
- Be sure to check no air trap on drain hose and to ensure smooth water flow and no abnormal sound.

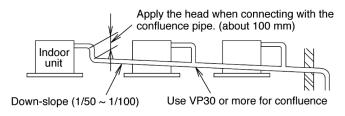




• The height of drain may be possible up to 750 mm.

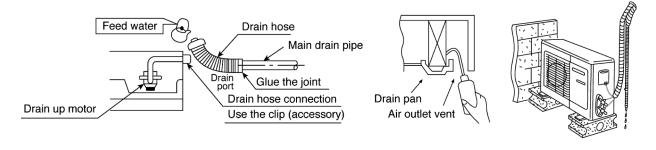


• When drain set piping, install as shown in the figure below.



**Drain Test** The air conditioner uses a drain up motor to drain water. Use the following procedure to test the drain up motor operation.

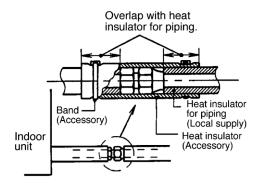
- · Connect the main drain pipe to exterior and leave it provisionally until the test comes to an end.
- Feed water to the flexible drain hose and check the piping for leakage.
- Be sure to check the drain up motor for normal operating and noise when electric wiring is complete.
- When the test is complete, connect the flexible drain hose to the drain port.
- Pour about 600-700cc of water in the drain pan of the indoor unit. (Pour from the position specified in the drawing by using a water supply bottle or other suitable tool.)
- Press the drain pump test run on pcb to start the drain motor, and verity water drainage. (The drain motor will automatically stop after operating for about five minutes.)

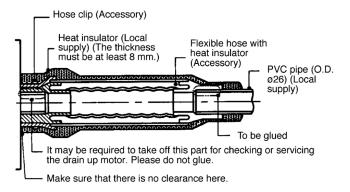


## 11.3.5. HEAT INSULATION

CAUTION Be sure to perform heat insulation on the drain, liquid and gas piping. Imperfection in heat insulation work leads to water leakage.

1. Use the heat insulation material for the refrigerant piping which has an excellent heat-resistance (over 120°C).





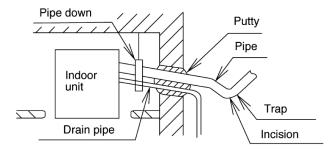
2. Precautions in high humidity circumstance.

This air conditioner has been tested according to the "JIS Standard Conditions with Mist" and have been confirmed that there are no faults. However, if it is operated for a long time in high humid atmosphere (dew point temperature: more than 23°C), water drops are liable to fall. In this case, add heat insulation material according to the following procedure:

- Heat insulation material to be prepared... Adiabatic glass wool with thickness 10 to 20 mm.
- Stick glass wool on all air conditioners that are located in ceiling atmosphere.
- In addition to the normal heat insulation (thickness: more than 8 mm) for refrigerant piping (gas piping: thick piping) and drain piping, add a further of 10 mm to 30 mm thickness material.

# Wall seal

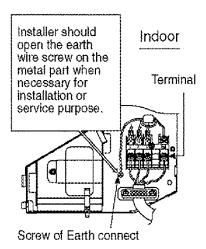
- When the outdoor unit is installed on a higher position than the indoor unit, install the trap so as not to instill rain water into the wall by transmitting in piping.
- Stuff the space among piping, the electric wire, and the drain hose with "Putty" and seal the penetration wall hole.
   Make sure that rain water do not instill into the wall.



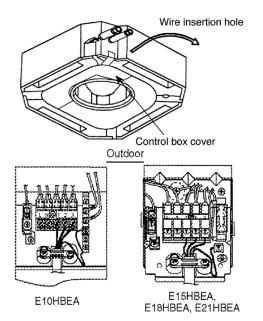
Put the incision at the trap part of the heat insulator (for water drain)

# 11.3.6. CONNECTING THE CABLE TO THE INDOOR

 Remove the mounting screw, remove the control box cover, and then connect the wires by following the procedure given in the illustration.

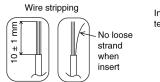


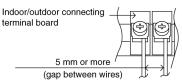
Earth lead wire shall be longer than other wires as shown in the figure for the electrical safety in case of the slipping out of the cord from anchorage.



Terminals on the indoor unit	1	2	3	
Colour of wires				
Terminals on the outdoor unit	1	2	3	

# 11.3.6.1. WIRE STRIPPING AND CONNECTING REQUIREMENT







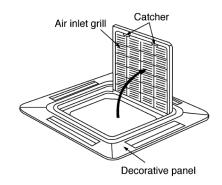


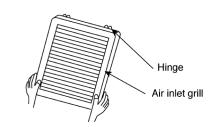


# 11.3.7. INSTALLATION OF DECORATIVE PANEL

The decorative panel has its installation direction. Confirm the direction by displaying the piping side.

1. Remove the air inlet grille by moving the catchers to center.



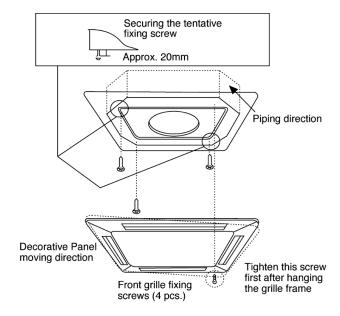


Hang the hinge on the hole of decorative panel.
 (The direction of the installation is free.)

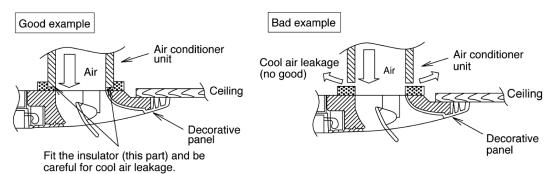
- 2. Fitting the decorative panel
  - Temporarily secure the fixing screws (3 pcs.) before fitting the decorative panel. (For temporarily securing the front grille.)
  - Place decorative panel on the screws (3 pcs.) before fitting, move decorative panel as illustrated and tighten all the screws (4 pcs.).

#### **⚠** CAUTION

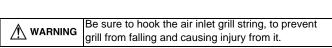
- Check before hand the height from the ceiling to the unit.
- The front grille fitting direction is determined by the unit direction.
- Only use the screws with the length of 35mm which is provided, to fix the decorative panel.
- Do not use other screw which is longer it may cause damage to the drain-pan and other components.

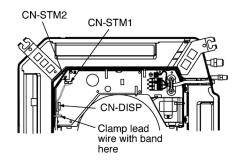


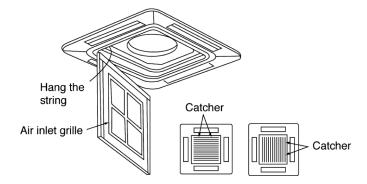
3. Fit the decorative panel and ceiling wall together and confirm no gap in between. Readjust indoor unit height, if there is a gap between ceiling wall and decorative panel.



- 4. Open the indoor control box cover. (2 pcs)
- Insert firmly the connector of cosmetic louver to indoor pcb CN-STM1, CN-STM2 and CN-DISP.
   Be caution not to clamp the cord in between control board and control board cover.
- 6. After complete, install back removed part follow opposite procedure.





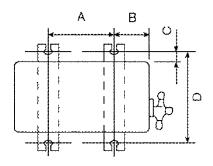


# 11.4. Outdoor Unit

# 11.4.1. SELECT THE BEST LOCATION (Refer to "Select the best location" section)

## 11.4.2. INSTALL THE OUTDOOR UNIT

- After selecting the best location, start installation according to Indoor/Outdoor Unit Installation Diagram.
  - 1. Fix the unit on concrete or rigid frame firmly and horizontally by bolt nut. (ø10 mm).
  - When installing at roof, please consider strong wind and earthquake. Please fasten the installation stand firmly with bolt or nails.



Model	А	В	С	D
E10HBEA	570 mm	105 mm	18.5 mm	320 mm
E15HBEA, E18HBEA, E21HBEA	612.5 mm	131 mm	19 mm	383 mm

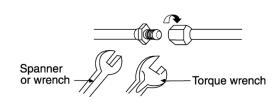
# 11.4.3. CONNECTING THE PIPING

## **Connect The Piping To Indoor Unit**

Please make flare after inserting flare nut (locate at joint portion of tube assembly) onto the copper pipe. (In case of using long piping)

Connect the piping

- Align the center of piping and sufficiently tighten the flare nut with fingers.
- Further tighten the flare nut with torque wrench in specified torque as stated in the table.



Model	Piping size (Torque)			
	Gas	Liquid		
E10HBEA	3/8" (42 N.m)	1/4" (18 N.m)		
E15HBEA, E18HBEA, E21HBEA	1/2" (55 N.m)	1/4" (18 N.m)		
Do not over tighten, over tightening cause gas leakage.				

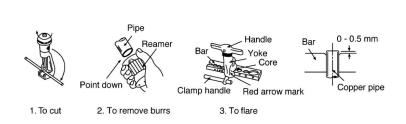
# **Connecting The Piping To Outdoor Unit**

Decide piping length and then cut by using pipe cutter. Remove burrs from cut edge. Make flare after inserting the flare nut (locate at valve) onto the copper pipe.

Align center of piping to valves and then tighten with torque wrench to the specified torque as stated in the table.

# **CUTTING AND FLARING THE PIPING**

- 1. Please cut using pipe cutter and then remove the burrs.
- 2. Remove the burrs by using reamer. If burrs is not removed, gas leakage may be caused. Turn the piping end down to avoid the metal powder entering the pipe.
- 3. Please make flare after inserting the flare nut onto the copper pipes.

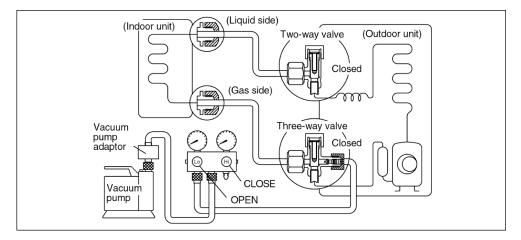




When properly flared, the internal surface of the flare will evenly shine and be of even thickness. Since the flare part comes into contact with the connections, carefully check the flare finish.

# 11.4.4. EVACUATION OF THE EQUIPMENT

WHEN INSTALLING AN AIR CONDITIONER, BE SURE TO EVACUATE THE AIR INSIDE THE INDOOR UNIT AND PIPES in the following procedure.



- 1. Connect a charging hose with a push pin to the Low side of a charging set and the service port of the 3-way valve.
  - Be sure to connect the end of the charging hose with the push pin to the service port.
- 2. Connect the center hose of the charging set to a vacuum pump with check valve, or vacuum pump and vacuum pump adaptor.
- 3. Turn on the power switch of the vacuum pump and make sure that the needle in the gauge moves from 0 cmHg (0 MPa) to -76 cmHg (-0.1 MPa). Then evacuate the air approximately ten minutes.
- 4. Close the Low side valve of the charging set and turn off the vacuum pump. Make sure that the needle in the gauge does not move after approximately five minutes.
  - Note: BE SURE TO FOLLOW THIS PROCEDURE IN ORDER TO AVOID REFRIGERANT GAS LEAKAGE.
- 5. Disconnect the charging hose from the vacuum pump and from the service port of the 3-way valve.
- 6. Tighten the service port caps of both of the 3-way valve at a torque of 18 N.m with a torque wrench.
- 7. Remove the valve caps of both of the 2-way valve and 3-way valve. Position both of the valves to "OPEN" using a hexagonal wrench (4 mm).
- 8. Mount valve caps onto the 2-way valve and the 3-way valve.
  - Be sure to check for gas leakage.

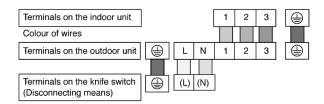
#### **CAUTION**

- $\bullet \ \, \text{If gauge needle does not move from 0 cmHg (0 MPa) to -76 cmHg (-0.1 MPa), in step @ above take the following measure: } \\$
- If the leak stops when the piping connections are tightened further, continue working from step ③.
- If the leak does not stop when the connections are retightened, repair the location of leak.
- Do not release refrigerant during piping work for installation and reinstallation. Take care of the liquid refrigerant, it may cause frostbite.

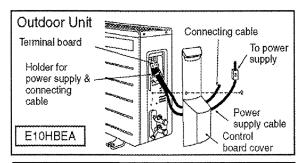
#### 11.4.5. CONNECT THE CABLE TO THE OUTDOOR UNIT

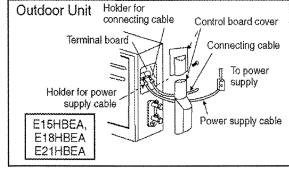
(FOR DETAIL REFER TO WIRING DIAGRAM AT UNIT)

- 1. Remove the control board cover from the unit by loosening the screw.
- 2. Connecting cable between indoor unit and outdoor unit shall be approved polychloroprene sheathed 4 x 1.5 mm<sup>2</sup> flexible cord, type designation 245 IEC 57 or heavier cord.



- Secure the cable onto the control board with the holder (clamper).
- Cable connection to the power supply through knife switch (Disconnecting means).
  - Connect the approved polychloroprene sheathed power supply cable (3 x 1.5 mm<sup>2</sup>), type designation 245 IEC 57 or heavier cord to the terminal board, and connect the other end of the cable to knife switch (Disconnecting means).
- 5. For wire stripping and connection requirement, refer to CONNECT THE CABLE TO THE INDOOR.
  - Note: Knife switch (Disconnecting means) should have minimum 3.5 mm contact gap.
  - Secure the cable onto the control board with the holder (clamper).
  - Power supply earth cable must connect to the left earth terminal.



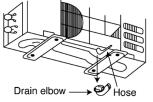


#### 11.4.6. PIPE INSULATION

- 1. Please carry out insulation at pipe connection portion as mentioned in Indoor/Outdoor Unit Installation Diagram. Please wrap the insulated piping end to prevent water from going inside the piping.
- 2. If drain hose or connecting piping is in the room (where dew may form), please increase the insulation by using POLY-E FOAM with thickness 6 mm or above.

#### DISPOSAL OF OUTDOOR UNIT DRAIN WATER

- If a drain elbow is used, the unit should be placed on a stand which is taller than 3 cm.
- If the unit is used in an area where temperature falls below 0°C for 2 or 3 days in succession, it is recommended not to use a drain elbow, for the drain water freezes and the fan will not rotate.



Install the hose at an angle so that the water smoothly flows out.

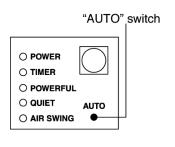
# **AUTO SWITCH OPERATION**

The following operations can be performed by pressing the "AUTO" switch.

- AUTO OPERATION MODE
   The Auto operation will be activated immediately once the
- 2. TEST RUN OPERATION (FOR PUMP DOWN/ SERVICING PURPOSE)

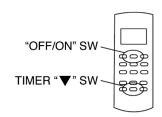
Auto Switch is pressed.

The Test Run operation will be activated if the Auto Switch is pressed continuously for more than 5 sec. to below 8 sec. A "pep" sound will occur at the fifth sec., in order to identify the starting of Test Run operation.



# CHANGING THE REMOTE CONTROL TRANSMISSION CODE

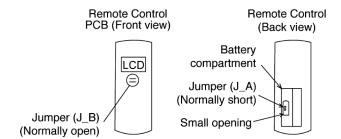
- 1. Press AUTO SW continuously for 11 seconds (buzzer sound = pep pep pep)
- After 11 seconds, release AUTO SW, then press Remo-Con TIMER "▼" SW continuously for 5 seconds. Reset code will be transmitted. After the reset code is transmitted, release TIMER "▼" SW.
- Press Remo-Con "OFF/ON" button. The new Remo-Con No. will be accepted and memorized, after which the new Remo-Con No. can be used.



## **REMO-CON NO. CHANGE IN REMOTE CONTROL**

- 1. Remove the batteries from the battery compartment of the Remote Control.
- On the left side of the battery compartment, there is a small opening in the centre in which Jumper (J\_A) can be seen. In the accepted Remo-Con PCB shown beside, Jumper (J\_B) can be seen.

J_A	J_B	Remo-Con No.
Short	Open	A (Default)
Open	Open	В
Short	Short	С
Open	Short	D



CHEC	K ITEN	IS
Is there any gas leakage at flare nut connections?		Is the cooling/heating operation normal?
Has the heat insulation been carried out at flare nut connections'	?	Is the indoor unit properly secured to the installation plate?
Is the connecting cable being fixed to the terminal board firmly?		Is the power supply voltage complied with rated value?
Is the connecting cable being clamped firmly?		Is there any abnormal sound?
Is the drainage OK?		Is the thermostat operation normal?
Is the Earth wire connection properly done?		Is the remote control's LCD operation normal?

#### HAND OVER

• Teach the customer the operation and maintenance procedures, using the operation manual (air filter cleaning, temperature control, etc.)

## As to parts to be sold separately

• With regards to installation of the parts sold separately, follow the installation manual which is provided with the parts sold separately.

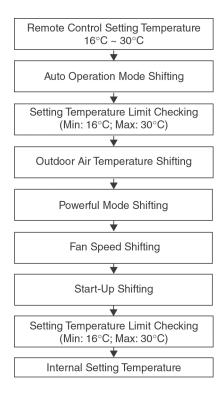
# 12 Operation and Control

# 12.1. Basic Function

Inverter control, which equipped with a microcomputer in determining the most suitable operating mode as time passes, automatically adjusts output power for maximum comfort always. In order to achieve the suitable operating mode, the microcomputer maintains the set temperature by measuring the temperature of the environment and performing temperature shifting. The compressor at outdoor unit is operating following the frequency instructed by the microcomputer at indoor unit that judging the condition according to internal setting temperature and intake air temperature.

# 12.1.1. Internal Setting Temperature

Once the operation starts, remote control setting temperature will be taken as base value for temperature shifting processes. These shifting processes are depending on the air conditioner settings and the operation environment. The final shifted value will be used as internal setting temperature and it is updated continuously whenever the electrical power is supplied to the unit.



# 12.1.2. Cooling Operation

#### 12.1.2.1. Thermostat control

- $\bullet$  Compressor is OFF when Intake Air Temperature Internal Setting Temperature < -1.5  $^{\circ}\text{C}.$
- Compressor is ON after waiting for 3 minutes, if the Intake Air Temperature Internal Setting Temperature > Compressor OFF
  point.

# 12.1.3. Soft Dry Operation

#### 12.1.3.1. Thermostat control

- Compressor is OFF when Intake Air Temperature Internal Setting Temperate < -2.0°C.
- Compressor is ON after waiting for 3 minutes, if the Intake Air Temperature Internal Setting Temperature > Compressor OFF
  point.

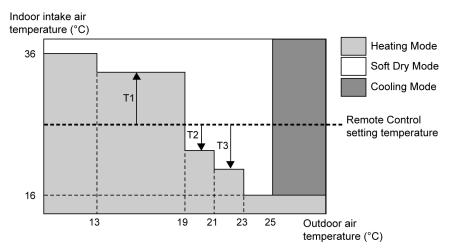
# 12.1.4. Heating Operation

# 12.1.4.1. Thermostat control

- Compressor is OFF when Intake Air Temperature Internal Setting Temperate > +2.0°C.
- Compressor is ON after waiting for 3 minutes, if the Intake Air Temperature Internal Setting Temperature < Compressor OFF
  point.</li>

# 12.1.5. Automatic Operation

- This mode can be set using remote control and the operation is decided by remote control setting temperature, remote control operation mode, indoor intake air temperature and outdoor air temperature.
- During operation mode judgment, indoor fan motor (with speed of Lo-) and outdoor fan motor are running for 30 seconds to detect the indoor intake and outdoor air temperature. The operation mode is decided based on below chart.



Every 30 minutes, the indoor and outdoor temperature is judged. Based on remote control setting temperature, the value of T1 will increase up to 10°C, T2 will decreased by 3°C and T3 will decreased up to 8°C.

The Auto Operation Mode shifting will take place whenever operation mode changed from Cooling/Soft Dry to Heating or vice versa.

# 12.1.6. Indoor Fan Motor Operation

# A. Basic Rotation Speed (rpm)

i. Manual Fan Speed

[Cooling, Dry]

• Fan motor's number of rotation is determined according to remote control setting.

Remote Control	0	0	0	0	0
Tab (rpm)	Hi	Me+	Me	Me-	Lo

#### [Heating]

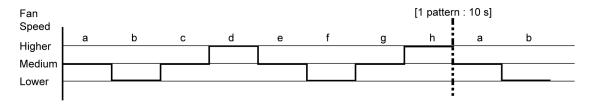
• Fan motor's number of rotation is determined according to remote control setting.

Remote Control	0	0	0	0	0
Tab (rpm)	Shi	Me+	Me	Me-	Lo

# ii. Auto Fan Speed

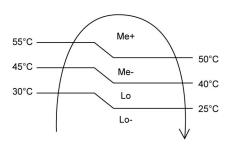
[Cooling, Dry]

- · According to room temperature and setting temperature, indoor fan speed is determined automatically.
- The indoor fan will operate according to pattern below.



#### [Heating]

• According to indoor pipe temperature, automatic heating fan speed is determined as follows.

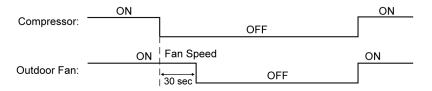


#### B. Feedback control

- Immediately after the fan motor started, feedback control is performed once every second.
- During fan motor on, if fan motor feedback ≥ 2550 rpm or < 50 rpm continue for 10 seconds, then fan motor error counter increase, fan motor is then stop and restart. If the fan motor counter becomes 7 times, then H19 fan motor error is detected. Operation stops and cannot on back.

# 12.1.7. Outdoor Fan Motor Operation

Outdoor fan motor is operated with 15 fan speed. It starts when compressor starts operation and it stops 30 seconds after compressor stops operation.



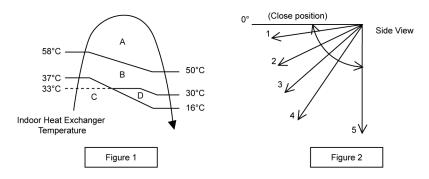
# 12.2. Airflow Direction

- 1. There is one type of airflow, vertical airflow (directed by horizontal vane).
- 2. Control of airflow direction can be automatic (angles of direction is determined by operation mode, heat exchanger temperature and intake air temperature) and manual (angles of direction can be adjusted using remote control).

#### 12.2.1. Vertical Airflow

Operation Mode	Airflow Direction				Va	ne Angle	(°)	
				1	2	3	4	5
Heating	Auto with Heat Exchanger	Α	Downward fix			70		
		В	Downward fix			70		
	Temperature		Upward fix	20				
			Upward fix	20				
	Manual			20	33	45	58	70
Cooling	Auto			20 ~ 70				
	Manual			20	33	45	58	70
Soft Dry	Auto				•	20 ~ 70		
	Manual			20	33	45	58	70

- 1. Automatic vertical airflow direction can be set using remote control; the vane swings up and down within the angles as stated above. For heating mode operation, the angle of the vane depends on the indoor heat exchanger temperature as Figure 1 below. When the air conditioner is stopped using remote control, the vane will shift to close position.
- 2. Manual vertical airflow direction can be set using remote control; the angles of the vane are as stated above and the positions of the vane are as Figure 2 below. When the air conditioner is stopped using remote control, the vane will shift to close position.



# 12.3. Quiet operation (Cooling Mode/Cooling area of Soft Dry Mode)

# A. Purpose

To provide quiet cooling operation compare to normal operation.

#### **B.** Control condition

- a. Quiet operation start condition
- When "quiet" button at remote control is pressed.

Quiet LED illuminates.

- b. Quiet operation stop condition
- 1. When one of the following conditions is satisfied, quiet operation stops:
  - a. Powerful button is pressed.
  - b. Stop by OFF/ON switch.
  - c. Timer "off" activates.
  - d. Quiet button is pressed again.
- 2. When quiet operation is stopped, operation is shifted to normal operation with previous setting.
- 3. When fan speed is changed, quiet operation is shifted to quiet operation of the new fan speed.
- 4. When operation mode is changed, quiet operation is shifted to quiet operation of the new mode.
- 5. During quiet operation, if timer "on" activates, quiet operation maintains.
- 6. After off, when on back, quiet operation is not memorised.

#### C. Control contents

- 1. Auto fan speed is changed from normal setting to quiet setting of respective fan speed. This is to reduce sound of Hi, Me, Lo for 3dB.
- 2. Manual fan speed for quiet operation is 1 step from setting fan speed.
- 3. Outdoor fan speed is changed to Q-Lo
- 4. Compressor frequency reduced.

# 12.3.1. Quiet operation (Heating)

# A. Purpose

To provide quiet heating operation compare to normal operation.

#### **B.** Control condition

- a. Quiet operation start condition
- When "quiet" button at remote control is pressed.
   Quiet LED illuminates.
- b. Quiet operation stop condition
- 1. When one of the following conditions is satisfied, quiet operation stops:
  - a. Powerful button is pressed.
  - b. Stop by OFF/ON switch.
  - c. Timer "off" activates.
  - d. Quiet button is pressed again.
- 2. When quiet operation is stopped, operation is shifted to normal operation with previous setting.
- 3. When fan speed is changed, quiet operation is shifted to quiet operation of the new fan speed.
- 4. When operation mode is changed, quiet operation is shifted to quiet operation of the new mode, except fan only mode.
- 5. During quiet operation, if timer "on" activates, quiet operation maintains.
- 6. After off, when on back, quiet operation is not memorised.

# C. Control contents

- a. Fan Speed Auto
- Indoor FM RPM depends on pipe temperature sensor of indoor heat exchanger.
   Auto fan speed is changed from normal setting to quiet setting of respective fan speed.
   This is to reduce sound of Hi, Me, Lo for 3dB.
- b. Fan Speed Manual
- Manual fan speed for quiet operation is 1 step from setting fan speed.
- c. Compressor frequency reduced.

# 12.4. Powerful Mode Operation

When the powerful mode is selected, the internal setting temperature will shift higher up to 3.5°C (for Heating) or lower up to 2°C (for Cooling/Soft Dry) than remote control setting temperature for 20 minutes to achieve the setting temperature quickly.

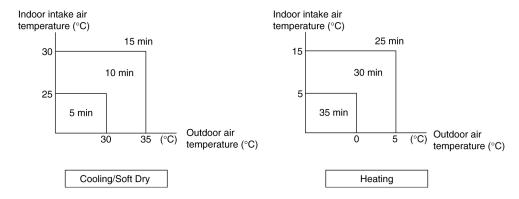
# 12.5. Timer Control

#### 12.5.1. ON Timer Control

ON timer can be set using remote control, the unit with timer set will start operate earlier than the setting time. This is to provide a comfortable environment when reaching the set ON time.

60 minutes before the set time, indoor (at fan speed of Lo-) and outdoor fan motor start operate for 30 seconds to determine the indoor intake air temperature and outdoor air temperature in order to judge the operation starting time.

From the above judgment, the decided operation will start operate earlier than the set time as shown below.



# 12.5.2. OFF Timer Control

OFF timer can be set using remote control, the unit with timer set will stop operate at set time.

## 12.6. Auto Restart Control

- 1. When the power supply is cut off during the operation of air conditioner, the compressor will re-operate within three to four minutes (there are 10 patterns between 2 minutes 58 seconds and 3 minutes 52 seconds to be selected randomly) after power supply resumes.
- 2. This type of control is not applicable during ON/OFF Timer setting.

# 12.7. Indication Panel

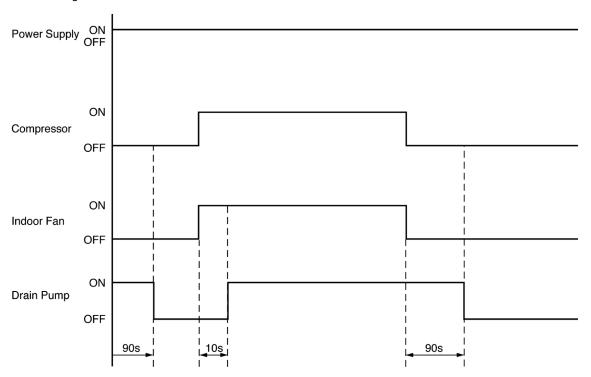
LED	POWER	TIMER	QUIET	POWERFUL	AIR SWING
Color	Green	Orange	Orange	Orange	Orange
Light ON	Operation ON	Timer Setting ON	Quiet Mode ON	Powerful Mode ON	Auto Air Swing ON
Light OFF	Operation OFF	Timer Setting OFF	Quiet Mode OFF	Powerful Mode OFF	Auto Air Swing OFF

#### Note:

- If POWER LED is blinking, the possible operation of the unit are Hot Start, during Deice operation, operation mode judgment, or ON timer sampling.
- If Timer LED is blinking, there is an abnormality operation occurs.

# 12.8. Drain Pump Control Operation

• To drain out the condensed water trapped in the drain pan in order to prevent the condensed water from overflowing from the drain pan and leaking.



- Drain Pump starts to operate 10 sec. after compressor and Indoor fan ON.
- Drain Pump stop to operate 90 sec. after compressor OFF.

# **Drain Pump Error**

Drain Pump Error occurs when:

- Within 20 minutes, the float switch is ON twice.
- Float switch is ON continuously for 2 minutes 30 seconds.

When error occurs, the timer indicator blinks and the unit stops its operation.

# **13 Protection Control**

# 13.1. Protection Control For All Operations

# 13.1.1. Restart Control (Time Delay Safety Control)

- The Compressor will not turn on within 3 minutes from the moment operation stops, although the unit is turned on again by pressing OFF/ON button at remote control within this period.
- This control is not applicable if the power supply is cut off and on again.
- This phenomenon is to balance the pressure inside the refrigerant cycle.

# 13.1.2. 30 Seconds Forced Operation

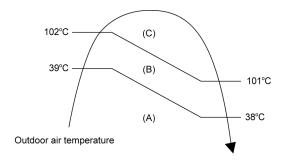
- Once the air conditioner is turned on, the compressor will not stop within 30 seconds in a normal operation although the intake air temperature has reached the thermo-off temperature. However, force stop by pressing the OFF/ON button at the remote control is permitted or the Auto OFF/ON button at indoor unit.
- The reason for the compressor to force operation for minimum 30 seconds is to allow the refrigerant oil run in a full cycle and return back to the outdoor unit.

# 13.1.3. Total Running Current Control

- 1. When the outdoor unit total running current (AC) exceeds X value, the frequency instructed for compressor operation will be decreased.
- 2. If the running current does not exceed X value for five seconds, the frequency instructed will be increased.
- 3. However, if total outdoor unit running current exceeds Y value, compressor will be stopped immediately for 3 minutes.

	E10HB		
Operation Mode	X (A)	Y (A)	
Cooling/Soft Dry (A) & (C)	4.95	15.06	
Cooling/Soft Dry (B)	4.43	15.06	
Heating	6.21	15.06	

4. The first 30 minutes of cooling operation, (A) will be applied.



# 13.1.4. IPM (Power transistor) Prevention Control

- A. Overheating Prevention Control
- 1. When the IPM temperature rises to 110°C, compressor operation will stop immediately.
- 2. Compressor operation restarts after three minutes the temperature decreases to 95°C.

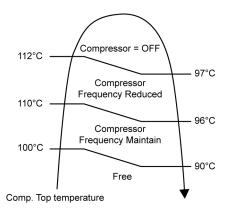
#### B. DC Peak Current Control

- 1. When electric current to IPM exceeds set value of 22.33 ± 5.0 A, the compressor will stop operate. Then, operation will restart after three minutes.
- 2. If the set value is exceeded again more than 30 seconds after the compressor starts, the operation will restart after two minutes.
- 3. If the set value is exceeded again within 30 seconds after the compressor starts, the operation will restart after one minute. If this condition repeats continuously for seven times, all indoor and outdoor relays will be cut off.

# 13.1.5. Compressor Overheating Prevention Control

Instructed frequency for compressor operation will be regulated by compressor discharge temperature. The changes of frequency are as below figure.

If compressor discharge temperature exceeds 112°C, compressor will be stop, occurs 4 times per 20 minutes, timer LED will be blinking ("F97" is to be confirmed).

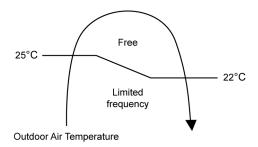


# 13.2. Protection Control For Cooling & Soft Dry Operation

## 13.2.1. Outdoor Air Temperature Control

The compressor operating frequency is regulated in accordance to the outdoor air temperature as shown in the diagram below. This control will begin 1 minute after the compressor starts.

Compressor frequency will adjust base on Outdoor Air Temperature.



# 13.2.2. Cooling Overload Control

- i. Pipe temperature limitation/restriction
- Detects the Outdoor pipe temperature and carry out below restriction/limitation (Limit the compressor Operation frequency)
- The compressor stop if outdoor pipe temperature exceeds 63°C.
- If the compressor stops 4 times in 20 minutes, Timer LED blinking (F95: outdoor high pressure rise protection)

## 13.2.3. Dew Prevention Control 1

- 1. To prevent dew formation at indoor unit discharge area.
- 2. This control activated if:
- Outdoor air temperature and Indoor pipe temperature judgment by microcontroller if fulfilled.
- When Cooling or Dry mode is operated more than 20 minutes or more.
- 3. This control stopped if:
  - Compressor stopped.
  - Remote control setting changed. (fan speed / temperature)
  - Outdoor air temperature and indoor intake temperature changed.
- 4. Fan speed, angle of louver (vertical airflow angle) will be adjusted accordingly in this control.
  - Fan speed will be increased slowly if the unit is in quiet mode but no change in normal cooling mode.
  - The angle of horizontal louver will be changed as table below:

Operation Mode	Airflow Direction	Vane Angle (°)				
		1	2	3	4	5
Cooling	Auto			30 ~ 60		
	Manual	30	37.5	45	52.5	60

#### 13.2.4. Dew Prevention Control 2

- 1. To prevent dew formation at indoor unit discharge area.
- 2. This control starts if all conditions continue for 20 minutes:
  - Operated with Cooling or Soft Dry Mode.
  - Indoor intake temperature is between 25°C and 29°C.
  - Outdoor air temperature is less than 30°C.
  - Quiet Lo fan speed.
- 3. This control stopped if:
  - When receive air swing change signal from Remote Control.
- 4. The horizontal louver will be fixed at 24° (regardless of Auto or Manual Airflow Direction Setting)

# 13.2.5. Freeze Prevention Control

- 1. When indoor heat exchanger temperature is lower than 7°C continuously for six minutes, compressor will stop operating.
- 2. Compressor will resume its operation 3 minutes after the indoor heat exchanger is higher than 13°C.
- 3. At the same time, indoor fan speed will be higher than during its normal operation.
- 4. If indoor heat exchanger temperature is higher than 13°C for 5 minutes, the fan speed will return to its normal operation.

# 13.3. Protection Control For Heating Operation

# 13.3.1. Intake Air Temperature Control

Compressor will operate at maximum frequency if below conditions occur:

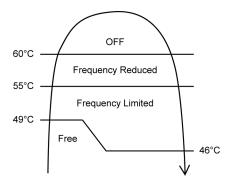
1. When the indoor intake air temperature is 30°C or above.

# 13.3.2. Outdoor Air Temperature Control

The maximum current value is regulated when the outdoor air temperature rises above 14°C in order to avoid compressor overloading.

## 13.3.3. Overload Protection Control

The compressor operating frequency is regulated in accordance to indoor heat exchanger temperature as shown in below figures. If the heat exchanger temperature exceeds 60°C, compressor will stop.



# 13.3.4. Cold Draught Operation

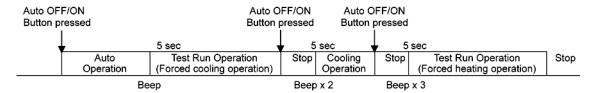
When indoor pipe temperature is low, cold draught operation start where indoor fan speed will be reduced.

# 13.3.5. Deice Operation

When outdoor pipe temperature and outdoor temperature is low, deice operation start where indoor fan motor and outdoor fan motor stop and operation LED blinks.

# 14 Servicing Mode

# 14.1. Auto OFF/ON Button



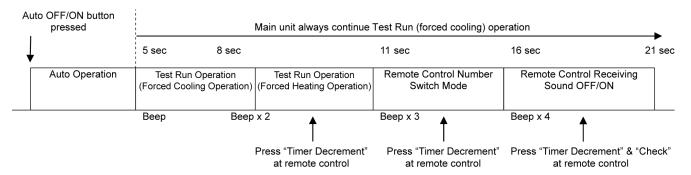
#### 1. AUTO OPERATION MODE

The Auto operation will be activated immediately once the Auto OFF/ON button is pressed. This operation can be used to operate air conditioner with limited function if remote control is misplaced or malfunction.

#### 2. TEST RUN OPERATION (FOR PUMP DOWN/SERVICING PURPOSE)

The Test Run operation will be activated if the Auto OFF/ON button is pressed continuously for more than 5 seconds. A "beep" sound will occur at the fifth seconds, in order to identify the starting of Test Run operation (Forced cooling operation). Within 5 minutes after Forced cooling operation start, the Auto OFF/ON button is pressed for more than 5 seconds. A 2 "beep" sounds will occur at the fifth seconds, in order to identify the starting of cooling operation. Within 5 minutes after cooling operation start, the Auto OFF/ON button is pressed for more than 5 seconds. A 3 "beep" sounds will occur at the fifth seconds, in order to identify the starting of Forced heating operation.

The Auto OFF/ON button may be used together with remote control to set / change the advance setting of air conditioner operation.



## 3. REMOTE CONTROL NUMBER SWITCH MODE

The Remote Control Number Switch Mode will be activated if the Auto OFF/ON button is pressed continuously for more than 11 seconds (3 "beep" sounds will occur at 11th seconds to identify the Remote Control Number Switch Mode is in standby condition) and press "Timer Decrement" button at remote control to transmit and store the desired transmission code to the EEPROM.

For transmission code selection explanation, please refer to "Select Remote Control Transmission Code".

#### 4. REMOTE CONTROL RECEIVING SOUND OFF/ON MODE

The Remote Control Receiving Sound OFF/ON Mode will be activated if the Auto OFF/ON button is pressed continuously for more than 16 seconds (4 "beep" sounds will occur at 16th seconds to identify the Remote Control Receiving Sound Off/On Mode is in standby condition) and press "Timer Decrement" and then press "Check" button at remote control.

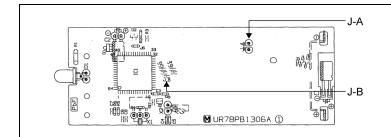
Press "Auto OFF/ON button" to toggle remote control receiving sound.

- Short "beep": Turn OFF remote control receiving sound.
- Long "beep": Turn ON remote control receiving sound.

After Auto OFF/ON Button is pressed, the 20 seconds counter for Remote Control Receiving Sound OFF/ON Mode is restarted.

# 14.2. Select Remote Control Transmission Code

- There are 4 types of remote control transmission code could be selected and stored in EEPROM of indoor unit. The indoor unit will only operate when received signal with same transmission code from remote control. This could prevent signal interference when there are 2 or more indoor units installed nearby together.
- To change remote control transmission code, short or open jumpers at the remote control printed circuit board.



Remote Control Printed Circuit Board					
Jumper A (J-A)	Jumper B (J-B)	Remote Control No.			
Short	Open	A (Default)			
Open	Open	В			
Short	Short	С			
Open	Short	D			

# 15 Troubleshooting Guide

# 15.1. Refrigeration Cycle System

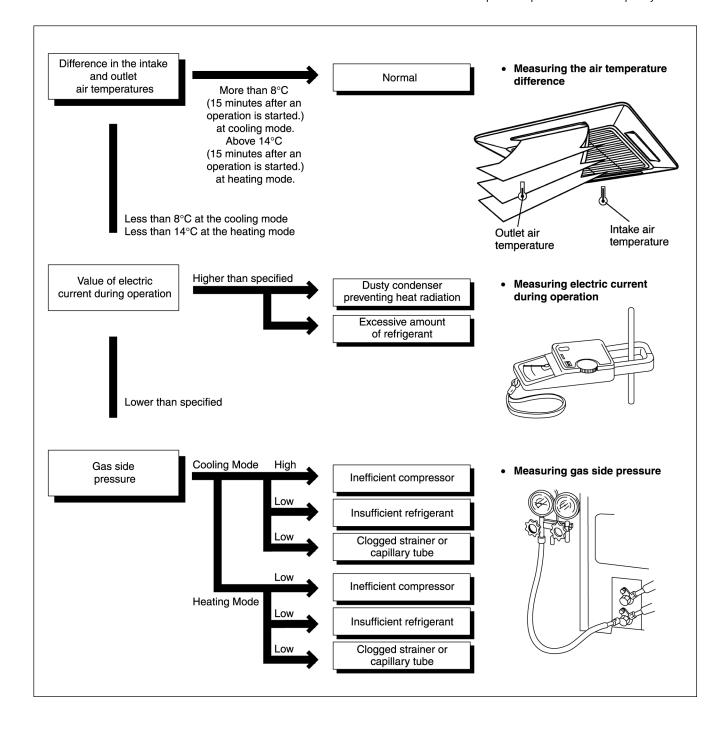
In order to diagnose malfunctions, make sure that there are no electrical problems before inspecting the refrigeration cycle. Such problems include insufficient insulation, problem with the power source, malfunction of a compressor and a fan.

The normal outlet air temperature and pressure of the refrigeration cycle depends on various conditions, the standard values for them are shown in the table on the right.

Normal Pressure and Outlet Air Temperature (Standard)

	Gas pressure MPa (kg/cm²G)	Outlet air temperature (°C)		
Cooling Mode	0.9 ~ 1.2 (9 ~ 12)	12 ~ 16		
Heating Mode	2.3 ~ 2.9 (23 ~ 29)	36 ~ 45		

- ★ Condition: Indoor fan speed; High
  - Outdoor temperature 35°C at cooling mode and 7°C at heating mode.
  - · Compressor operates at rated frequency



# 15.2. Relationship Between The Condition Of The Air Conditioner And Pressure And Electric Current

	Cooling Mode			Heating Mode		
Condition of the air conditioner	Low Pressure	High Pressure	Electric current during operation	Low Pressure	High Pressure	Electric current during operation
Insufficient refrigerant (gas leakage)	*	*	1	1	*	*
Clogged capillary tube or Strainer	*	*	1	*	-	-
Short circuit in the indoor unit	1	1	1	1	-	-
Heat radiation deficiency of the outdoor unit	-	-	1	1	1	1
Inefficient compression	-	*	1	*	*	*

<sup>•</sup> Carry out the measurements of pressure, electric current, and temperature fifteen minutes after an operation is started.

# 15.3. Breakdown Self Diagnosis Function

# 15.3.1. Self Diagnosis Function (Three Digits Alphanumeric Code)

- Once abnormality has occurred during operation, the unit will stop its operation, and Timer LED blinks.
- Although Timer LED goes off when power supply is turned off, if the unit is operated under a breakdown condition, the LED will light up again.
- In operation after breakdown repair, the Timer LED will no more blink. The last error code (abnormality) will be stored in IC memory.

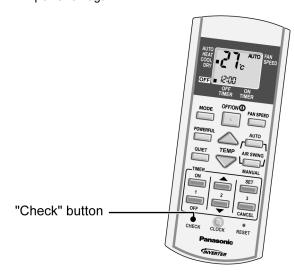
#### • To make a diagnosis

- 1. Timer LED start to blink and the unit automatically stops the operation.
- 2. Press the CHECK button on the remote controller continuously for 5 seconds.
- "--" will be displayed on the remote controller display.
   Note: Display only for "--". (No transmitting signal, no receiving sound and no Power LED blinking.)
- 4. Press the "TIMER" ▲ or ▼ button on the remote controller. The code "H00" (no abnormality) will be displayed and signal will be transmitted to the main unit.
- Every press of the button (up or down) will increase abnormality numbers and transmit abnormality code signal to the main unit.
- 6. When the latest abnormality code on the main unit and code transmitted from the remote controller are matched, power LED will light up for 30 seconds and a beep sound (continuously for 4 seconds) will be heard. If no codes are matched, power LED will light up for 0.5 seconds and no sound will be heard.
- 7. The breakdown diagnosis mode will be canceled unless pressing the CHECK button continuously for 5 seconds or operation the unit for 30 seconds.
- 8. The LED will be off if the unit is turned off or the RESET button on the main unit is pressed.

# • To display memorized error (Protective operation) status:

- 1. Turn power on.
- 2. Press the CHECK button on the remote controller continuously for 5 seconds.
- 3. "--" will be displayed on the remote controller display. Note: Display only for "--". (No transmitting signal, no receiving sound and no Power LED blinking.)
- 4. Press the "TIMER" ▲ or ▼ button on the remote controller. The code "H00" (no abnormality) will be displayed and signal will be transmitted to the main unit. The power LED lights up. If no abnormality is stored in the memory, three beeps sound will be heard.
- 5. Every press of the button (up or down) will increase abnormality numbers and transmit abnormality code signal to the main unit.
- 6. When the latest abnormality code on the main unit and code transmitted from the remote controller are matched, power LED will light up for 30 seconds and a beep sound (continuously for 4 seconds) will be heard. If no codes are matched, power LED will light up for 0.5 seconds and no sound will be heard.
- 7. The breakdown diagnosis mode will be canceled

- unless pressing the CHECK button continuously for 5 seconds or operating the unit for 30 seconds.
- 8. The same diagnosis can be repeated by turning power on again.



# • To clear memorized error (Protective operation) status after repair:

- 1. Turn power on (in standby condition).
- Press the AUTO button for 5 seconds (A beep receiving sound) on the main unit to operate the unit at Forced Cooling Operation mode.
- Press the CHECK button on the remote controller for about 1 second with a pointed object to transmit signal to main unit. A beep sound is heard from main unit and the data is cleared.

# • Temporary Operation (Depending on breakdown status)

- Press the AUTO button (A beep receiving sound) on the main unit to operate the unit. (Remote control will become possible.)
- 2. The unit can temporarily be used until repaired.

Error Code	Operation	Temporary items	
H23	Cooling	Emergency Operation with limite	
H27, H28	Cooling, Heating	power	
H26	Cooling, Heating	Emergency Operation without power limit	

# 15.4. Error Codes Table

Diagnosis display	Abnormality / Protection control	Abnormality Judgement	Emergency operation	Primary location to verify	
H00	No abnormality detected	_	Normal operation	_	
H11	Indoor / outdoor abnormal communication	> 1 min. after start- ing operation	Indoor fan operation only	Internal / external cable connections     Indoor / Outdoor PCB	
H12	Connection capability rank abnormal	_	_	_	
H14	Indoor intake air temperature sensor abnormality	Continue for 5 sec.	_	Intake air temperature sensor (defective or disconnected)	
H15	Outdoor compressor temperature sensor abnormality	Continue for 5 sec.	_	Compressor temperature sensor (defective or disconnected)	
H16	Outdoor Current Transformer open circuit	<del></del>	_	Outdoor PCB     IPM (Power transistor) module	
H19	Indoor fan motor merchanism lock	_	_	Indoor PCB     Fan motor	
H21	Indoor float switch operation abnormal		_	_	
H23	Indoor heat exchanger temperature sensor 1 abnormality	Continue for 5 sec.	O (Cooling only)	Heat exchanger temperature sensor     (defective or disconnected)	
H24	Indoor heat exchanger temperature sensor 2 abnormality	Continue for 5 sec.	_	Heat exchanger temperature sensor 2 (defective or disconnected)	
H27	Outdoor air temperature sensor abnormality	Continue for 5 sec.	0	Outdoor temperature sensor (defective or disconnected)	
H28	Outdoor heat exchanger temperature sensor abnormality	Continue for 5 sec.	0	Outdoor heat exchanger temperature sensor (defective or disconnected)	
H30	Discharge temperature sensor abnormality	Continue for 5 sec.	_	Discharge temperature sensor	
H33	Indoor/Outdoor wrong connection	_	_	Indoor/Outdoor supply voltage	
H35	Indoor drain water adverse current abnormal	_	_	<del></del>	
H38	Indoor/Outdoor mismatch	_	_	_	
H97	Outdoor Fan Motor lock abnormality	2 times occurrence within 30 minutes	_	Outdoor PCB    Outdoor Fan Motor	
H98	Indoor high pressure protection	_	_	Air filter dirty     Air circulation short circuit	
H99	Indoor heat exchanger anti-freezing protection	_	_	Insufficient refrigerant     Air filter dirty	
F11	Cooling / Heating cycle changeover abnormality	4 times occurrence within 30 minutes	_	4-way valve     V-coil	
F90	PFC control	4 times occurrence within 10 minutes	_	Voltage at PFC	
F91	Refrigeration cycle abnormality	2 times occurrence within 20 minutes	_	No refrigerant     (3-way valve is closed)	
F93	Outdoor compressor abnormal revolution	4 times occurrence within 20 minutes	_	Outdoor compressor	
F95	Cool high pressure protection	4 times occurrence within 20 minutes	_	Outdoor refrigerant circuit	
F96	IPM (power transistor) overheating protection	_	_	Excess refrigerant     Improper heat radiation     IPM (Power transistor)	
F97	Outdoor compressor overheating protection	4 times occurrence within 20 minutes	_	Insufficient refrigerant     Compressor	
F98	Total running current protection	3 times occurrence within 20 minutes	_	Excess refrigerant     Improper heat radiation	
F99	Outdoor Direct Current (DC) peak detection	7 times occurrence continuously	_	Outdoor PCB    IPM (Power transistor)    Compressor	

#### Note:

The memory data of error code is erased when the power supply is cut off, or press the Auto Switch until "beep" sound heard following by pressing the "CHECK" button at Remote Control.

Although operation forced to stop when abnormality detected, emergency operation is possible for certain errors (refer to Error Codes Table) by using Remote Control or Auto Switch at indoor unit. However, the Remote Control signal receiving sound is changed from one "beep" to four "beep" sounds.

<sup>&</sup>quot;O" - Frequency measured and fan speed fixed.

# 15.5. Self-diagnosis Method

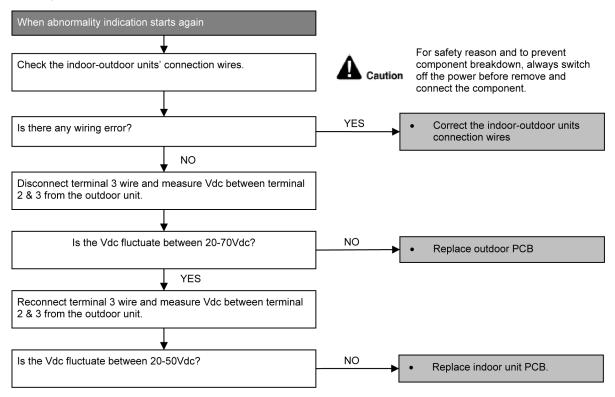
# 15.5.1. H11 (Indoor/Outdoor Abnormal Communication)

#### **Malfunction Decision Conditions**

• During startup and operation of cooling and heating, the data received from outdoor unit in indoor unit signal transmission is checked whether it is normal.

#### **Malfunction Caused**

- Faulty indoor unit PCB.
- Faulty outdoor unit PCB.
- Indoor unit-outdoor unit signal transmission error due to wrong wiring.
- Indoor unit-outdoor unit signal transmission error due to breaking of wire in the connection wires between the indoor and outdoor units.
- Indoor unit-outdoor unit signal transmission error due to disturbed power supply waveform.



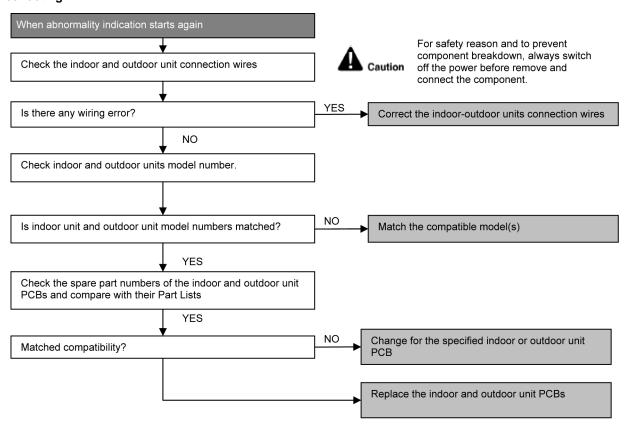
# 15.5.2. H12 (Indoor/Outdoor Capacity Rank Mismatched)

## **Malfunction Decision Conditions**

• During startup, error code appears when different types of indoor and outdoor units are interconnected.

#### **Malfunction Caused**

- Wrong models interconnected.
- Wrong indoor unit or outdoor unit PCBs mounted.
- Indoor unit or outdoor unit PCBs defective.
- Indoor-outdoor unit signal transmission error due to wrong wiring.
- Indoor-outdoor unit signal transmission error due to breaking of wire 3 in the connection wires between the indoor and outdoor units.



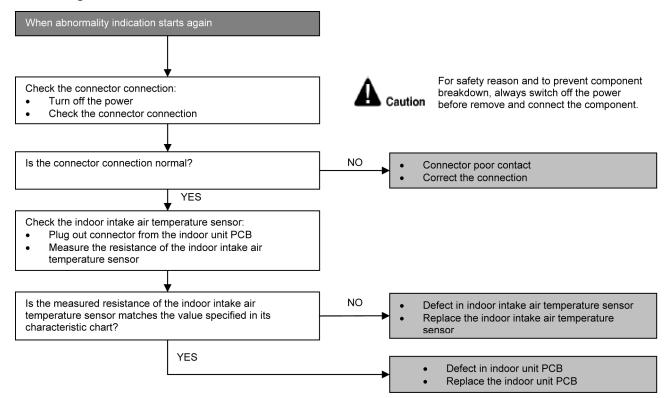
# 15.5.3. H14 (Indoor Intake Air Temperature Sensor Abnormality)

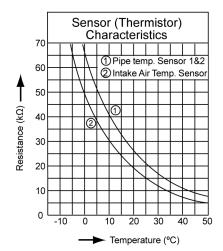
## **Malfunction Decision Conditions**

• During startup and operation of cooling and heating, the temperatures detected by the indoor intake air temperature sensor are used to determine sensor errors.

#### **Malfunction Caused**

- Faulty connector connection.
- Faulty sensor.
- Faulty PCB.





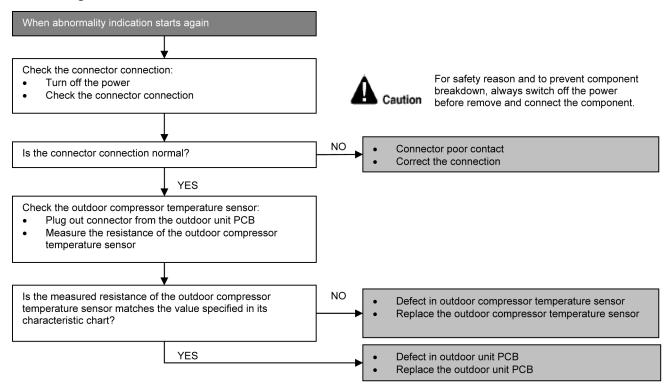
# 15.5.4. H15 (Compressor Temperature Sensor Abnormality)

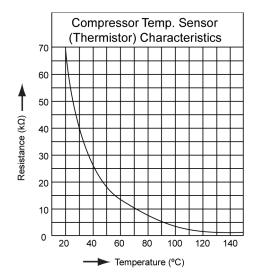
## **Malfunction Decision Conditions**

• During startup and operation of cooling and heating, the temperatures detected by the outdoor compressor temperature sensor are used to determine sensor errors.

#### **Malfunction Caused**

- Faulty connector connection.
- Faulty sensor.
- Faulty PCB.





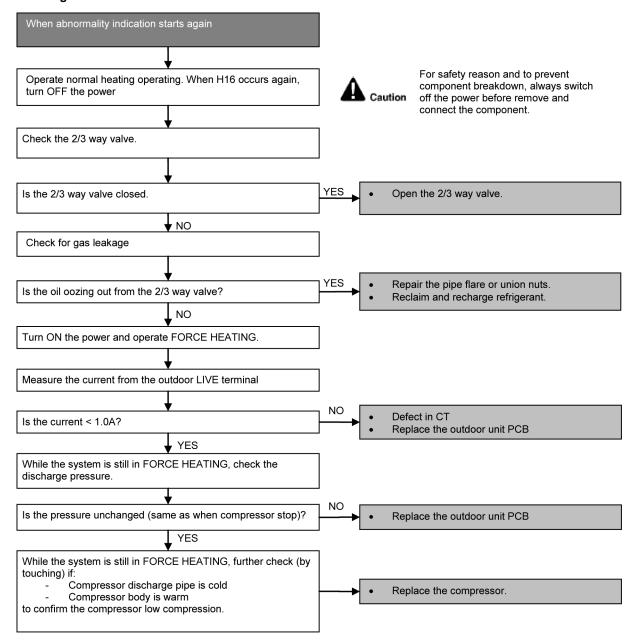
# 15.5.5. H16 (Outdoor Current Transformer Open Circuit)

## **Malfunction Decision Conditions**

• A current transformer (CT) is detected by checking the compressor running frequency (≥ rated frequency) and CT detected input current (less than 0.65A) for continuously 20 seconds.

#### **Malfunction Caused**

- CT defective.
- Outdoor PCB defective.
- Compressor defective (low compression).



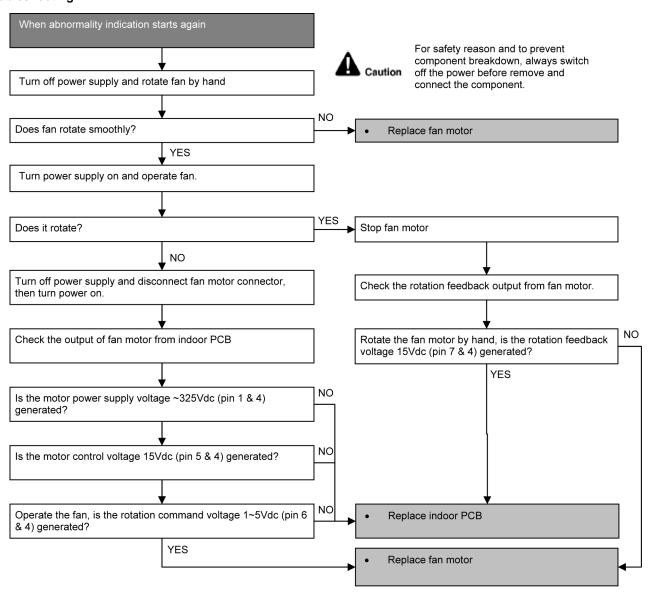
# 15.5.6. H19 (Indoor Fan Motor – DC Motor Mechanism Locked)

## **Malfunction Decision Conditions**

• The rotation speed detected by the Hall IC during fan motor operation is used to determine abnormal fan motor (feedback of rotation > 2550rpm or < 50rpm).

#### **Malfunction Caused**

- Operation stops due to short circuit inside the fan motor winding.
- Operation stops due to breaking of wire inside the fan motor.
- Operation stops due to breaking of fan motor lead wires.
- Operation stops due to Hall IC malfunction.
- Operation error due to faulty indoor unit PCB.



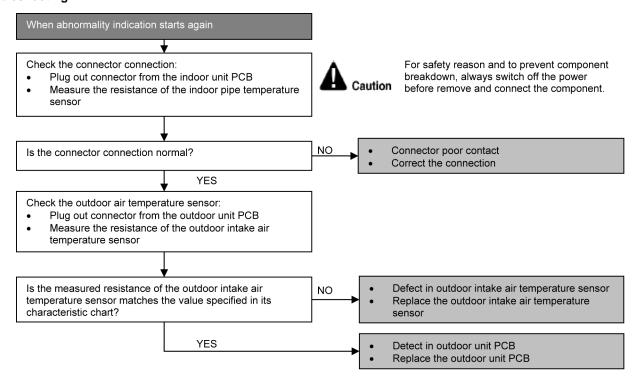
# 15.5.7. H23 (Indoor Pipe Temperature Sensor Abnormality)

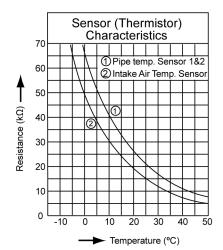
## **Malfunction Decision Conditions**

• During startup and operation of cooling and heating, the temperatures detected by the indoor heat exchanger temperature sensor are used to determine sensor errors.

#### **Malfunction Caused**

- Faulty connector connection.
- Faulty sensor.
- Faulty PCB.





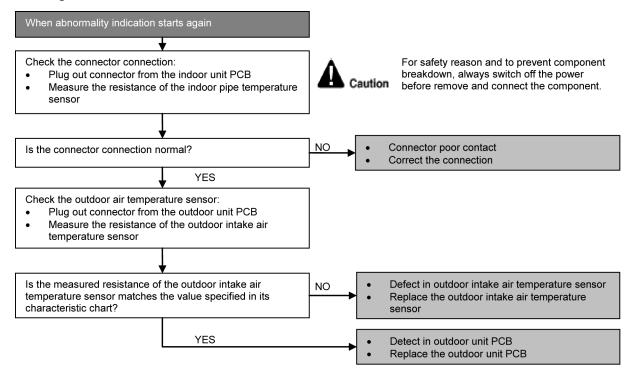
# 15.5.8. H24 (Indoor Pipe Temperature Sensor 2 Abnormality)

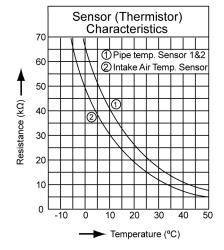
## **Malfunction Decision Conditions**

• During startup and operation of cooling and heating, the temperatures detected by the indoor heat exchanger temperature sensor 2 are used to determine sensor errors.

#### **Malfunction Caused**

- Faulty connector connection.
- Faulty sensor.
- Faulty PCB.





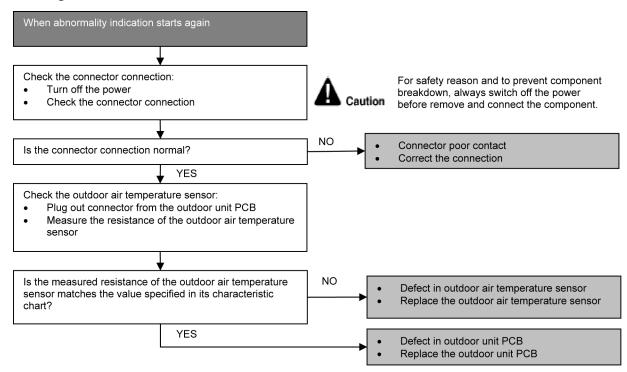
# 15.5.9. H27 (Outdoor Air Temperature Sensor Abnormality)

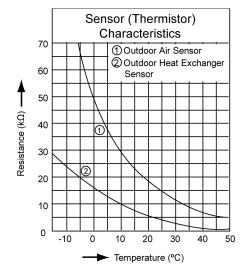
## **Malfunction Decision Conditions**

• During startup and operation of cooling and heating, the temperatures detected by the outdoor air temperature sensor are used to determine sensor errors.

#### **Malfunction Caused**

- Faulty connector connection.
- Faulty sensor.
- Faulty PCB.





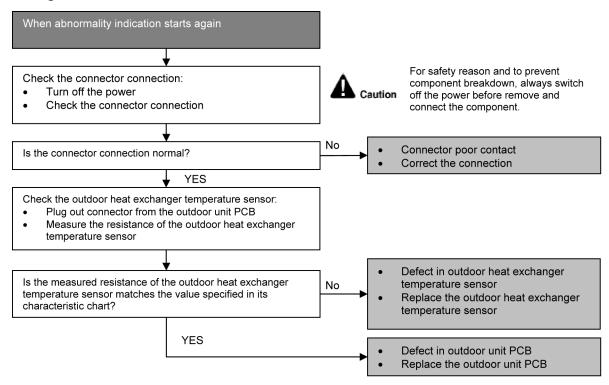
# 15.5.10. H28 (Outdoor Pipe Temperature Sensor Abnormality)

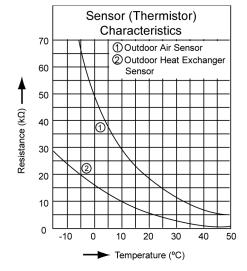
## **Malfunction Decision Conditions**

• During startup and operation of cooling and heating, the temperatures detected by the outdoor pipe temperature sensor are used to determine sensor errors.

#### **Malfunction Caused**

- Faulty connector connection.
- Faulty sensor.
- Faulty PCB.





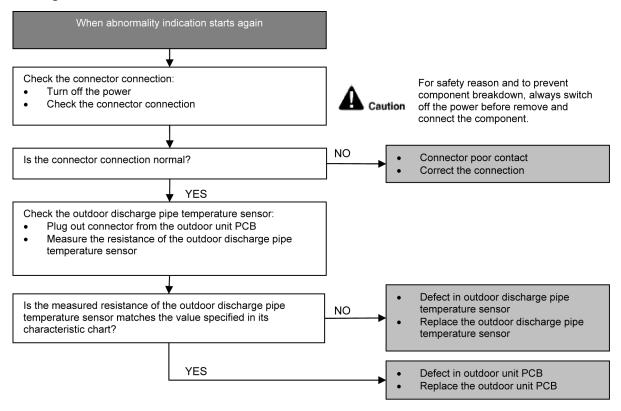
# 15.5.11. H30 (Compressor Discharge Temperature Sensor Abnormality)

## **Malfunction Decision Conditions**

• During startup and operation of cooling and heating, the temperatures detected by the outdoor discharge pipe temperature sensor are used to determine sensor errors.

#### **Malfunction Caused**

- Faulty connector connection.
- Faulty sensor.
- Faulty PCB.



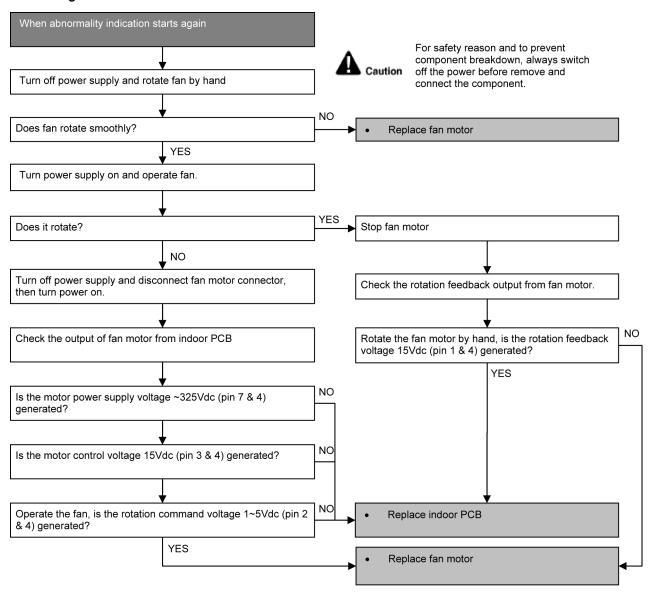
# 15.5.12. H97 (Outdoor Fan Motor – DC Motor Mechanism Locked)

## **Malfunction Decision Conditions**

• The rotation speed detected by the Hall IC during fan motor operation is used to determine abnormal fan motor.

#### **Malfunction Caused**

- Operation stops due to short circuit inside the fan motor winding.
- Operation stops due to breaking of wire inside the fan motor.
- Operation stops due to breaking of fan motor lead wires.
- Operation stops due to Hall IC malfunction.
- Operation error due to faulty outdoor unit PCB.



## 15.5.13. H98 (Indoor High Pressure Protection)

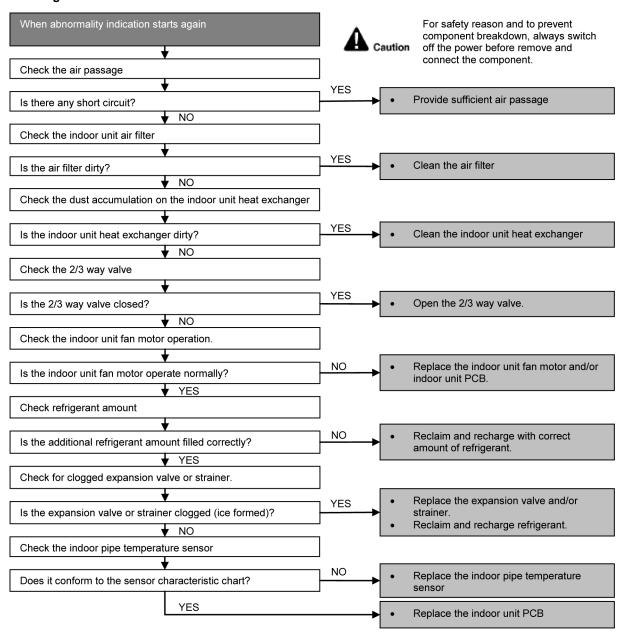
#### Error Code will not display (no Timer LED blinking) but store in EEPROM

#### **Malfunction Decision Conditions**

• During heating operation, the temperature detected by the indoor pipe temperature sensor is above 60°C.

#### **Malfunction Caused**

- · Air short circuit.
- Clogged air filter of the indoor unit.
- Dust accumulation on the indoor unit heat exchanger.
- 2/3 way valve closed.
- Detection error due to faulty indoor fan motor.
- Excessive refrigerant.
- · Clogged expansion valve or strainer.
- Detection error due to faulty indoor pipe temperature sensor.
- Detection error due to faulty indoor unit PCB.



### 15.5.14. H99 (Indoor Freeze Prevention Protection: Cooling or Soft Dry)

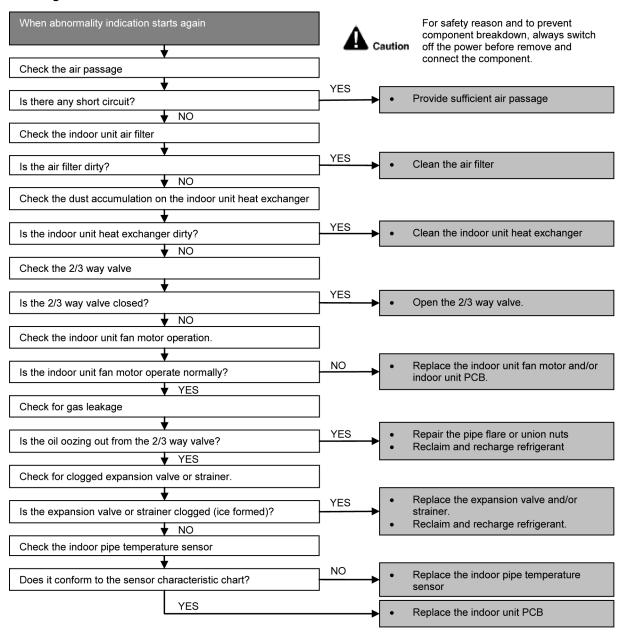
Error code will not display (no TIMER LED blinking) but store in EEPROM

#### **Malfunction Decision Conditions**

Freeze prevention control takes place (when indoor pipe temperature is lower than 2°C).

#### **Malfunction Caused**

- · Air short circuit.
- · Clogged air filter of the indoor unit.
- Dust accumulation on the indoor unit heat exchanger.
- 2/3 way valve closed.
- Faulty indoor fan motor.
- Refrigerant shortage (refrigerant leakage).
- Detection error due to faulty indoor pipe temperature sensor.
- Detection error due to faulty indoor unit PCB.



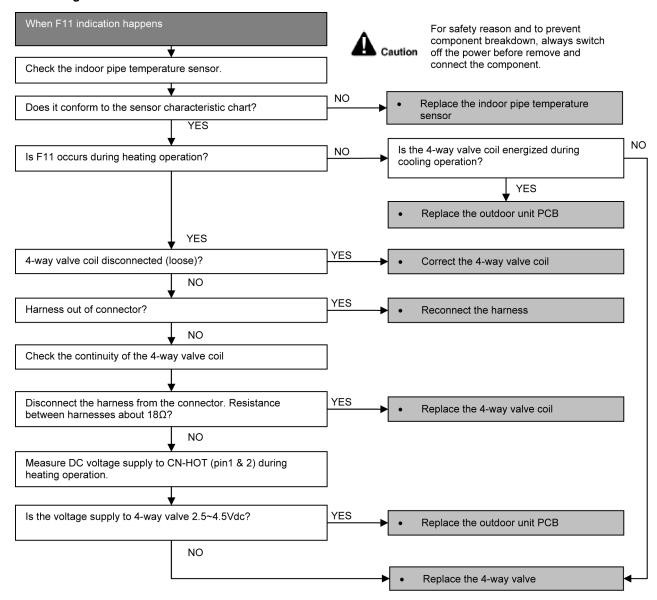
# 15.5.15. F11 (4-way valve Abnormality)

#### **Malfunction Decision Conditions**

- When heating operation, when indoor pipe temperature is below 10°C.
- When cooling operation, when indoor pipe temperature is above 45°C.

#### **Malfunction Caused**

- Connector in poor contact.
- Faulty sensor.
- Faulty outdoor unit PCB.
- 4-way valve defective.



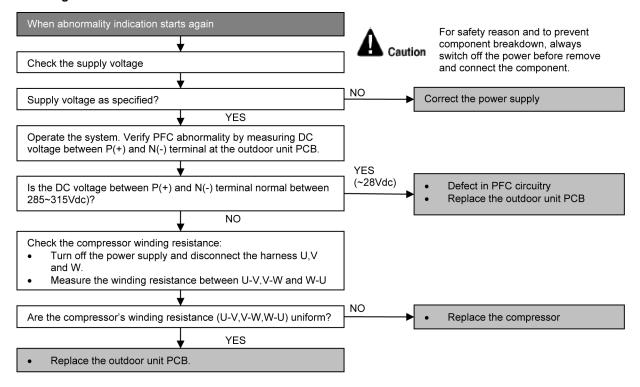
# 15.5.16. F90 (Power Factor Correction Protection)

#### **Malfunction Decision Conditions**

• During startup and operation of cooling and heating, when Power Factor Correction (PFC) protection circuitry at the outdoor unit main PCB senses abnormal high DC voltage level.

#### **Malfunction Caused**

- DC voltage peak due to power supply surge.
- DC voltage peak due to compressor windings not uniform.
- Faulty outdoor PCB.



### 15.5.17. F91 (Refrigeration Cycle Abnormality)

#### **Malfunction Decision Conditions**

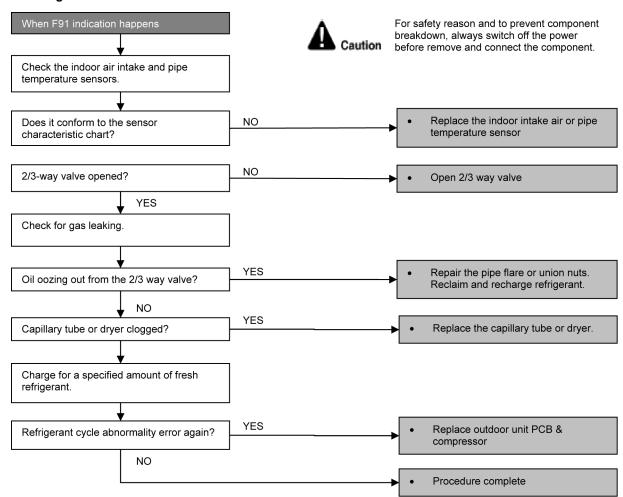
- During cooling, compressor frequency = Fcmax.
- During heating, compressor frequency > Fhrated.
- During cooling and heating operation, running current: 0.65A < I < 1.65A.
- During cooling, indoor intake indoor pipe < 4°C.</li>
- $\bullet$  During heating, indoor pipe indoor intake <  $5^{\circ}\text{C}.$

#### Multi Models Only

- Gas shortage detection 1: A gas shortage is detected by checking the CT-detected input current value and the compressor running frequency. During startup and operating of cooling and heating, input current < 8.78/256 (A/Hz) × compressor running frequency + 0.25.
- Gas shortage detection 2: A gas shortage is detected by checking the difference between indoor pipe temperature and indoor intake air temperature during cooling and heating.

#### **Malfunction Caused**

- Refrigerant shortage (refrigerant leakage).
- Poor compression performance of compressor.
- 2/3 way valve closed.
- Detection error due to faulty indoor intake air or indoor pipe temperature sensors.



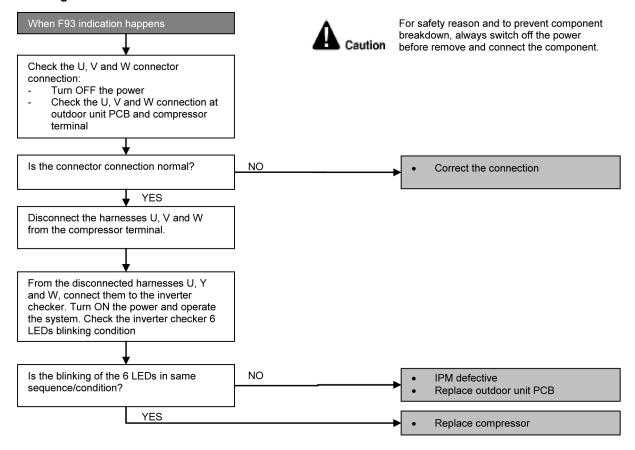
# 15.5.18. F93 (Compressor Rotation Failure)

#### **Malfunction Decision Conditions**

A compressor rotation failure is detected by checking the compressor running condition through the position detection circuit.

#### **Malfunction Caused**

- Compressor terminal disconnect.
- Outdoor PCB malfunction.
- Compressor malfunction.



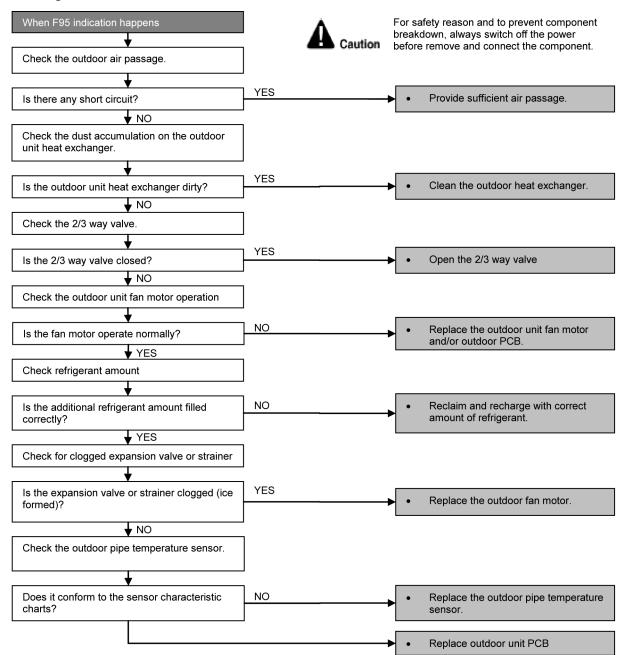
## 15.5.19. F95 (Cooling High Pressure Abnormality)

#### **Malfunction Decision Conditions**

During operation of cooling, when outdoor unit heat exchanger high temperature data (61°C) is detected by the outdoor pipe temperature sensor.

#### **Malfunction Caused**

- Air short circuit at outdoor unit.
- Dust accumulation on the outdoor unit heat exchanger.
- 2/3 way valve closed.
- Faulty outdoor unit fan motor.
- Excessive refrigerant.
- Clogged expansion valve or strainer.
- Faulty outdoor pipe temperature sensor.
- Faulty outdoor unit PCB.



### 15.5.20. F96 (IPM Overheating)

#### **Malfunction Decision Conditions**

During operating of cooling and heating, when IPM temperature data (100°C) is detected by the IPM temperature sensor. Multi Models Only

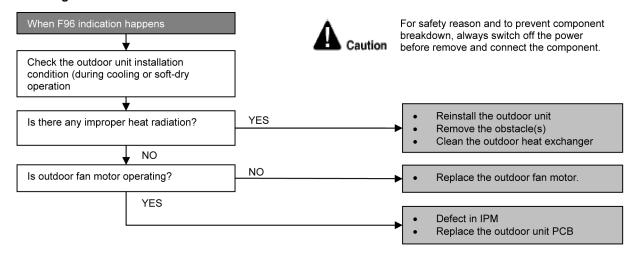
- Compressor Overheating: During operation of cooling and heating, when the compressor OL is activated.
- Heat Sink Overheating: During operation of cooling and heating, when heat sink temperature data (90°C) is detected by the heat sink temperature sensor.

#### **Malfunction Caused**

- IPM overheats due to short circuit of hot discharge air flow.
- IPM overheats due to defective of outdoor fan motor.
- IPM overheats due to defective of internal circuitry of IPM.
- IPM overheats due to defective IPM temperature sensor.

#### Multi Models Only

- Compressor OL connector poor contact.
- · Compressor OL faulty.



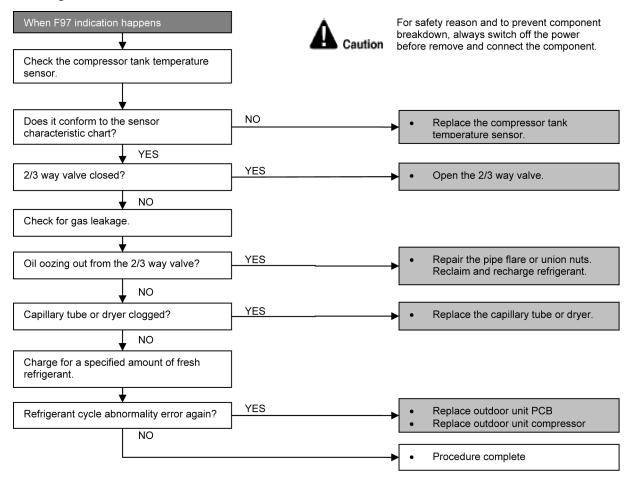
# 15.5.21. F97 (Compressor Overheating)

#### **Malfunction Decision Conditions**

During operation of cooling and heating, when compressor tank temperature data (112°C) is detected by the compressor tank temperature sensor.

#### **Malfunction Caused**

- Refrigerant shortage (refrigerant leakage).
- 2/3 way valve closed.
- Detection error due to faulty compressor tank temperature sensor.



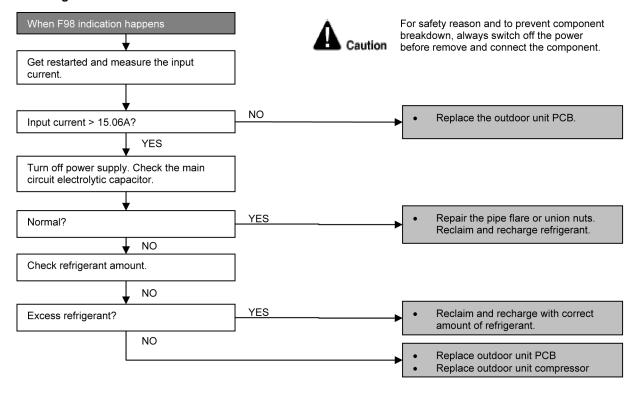
## 15.5.22. F98 (Input Over Current Detection)

#### **Malfunction Decision Conditions**

During operation of cooling and heating, when an input over-current (15.06A) is detected by checking the input current value being detected by current transformer (CT) with the compressor running.

#### **Malfunction Caused**

- Over-current due to compressor failure.
- Over-current due to defective outdoor unit PCB.
- Over-current due to defective inverter main circuit electrolytic capacitor.
- Over-current due to excessive refrigerant.



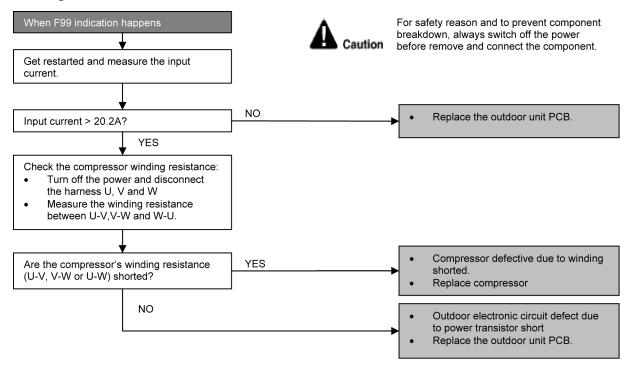
### 15.5.23. F99 (Output Over Current Detection)

#### **Malfunction Decision Conditions**

During operation of cooling and heating, when an output over-current (20.2A) is detected by checking the current that flows in the inverter DC peak sensing circuitry.

#### **Malfunction Caused**

- DC peak due to compressor failure.
- DC peak due to defective power transistor(s).
- DC peak due to defective outdoor unit PCB.



- Checking the power transistor.
- Never touch any live parts for at least 10 minutes after turning off the circuit breaker.
- If unavoidable necessary to touch a live part, make sure the power transistor's supply voltage is below 50V using the tester.
- For the UVW, make measurement at the Faston terminal on the board of the relay connector.

Tester's negative terminal	Power transistor (+)	UVW	Power transistor (-)	UVW		
Tester's positive terminal	UVW	Power transistor (+)	UVW	Power transistor (-)		
Normal resistance	Several $k\Omega$ to several $M\Omega$					
Abnormal resistance	0 or ∞					

# 16 Disassembly and Assembly Instructions

# **⚠** WARNING

High Voltage are generated in the electrical parts area by the capacitor. Ensure that the capacitor has discharged sufficiently before proceeding with repair work. Failure to heed tis caution may result in electric shocks.

# 16.1. Disassembly of Parts

1. Open the Intake Grille from the Front Grille by moving the catchers to center (Fig.1).

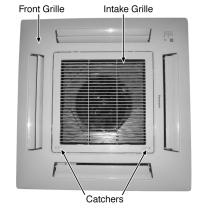


Fig. 1

2. Remove the Control Board Cover by removing the screws (Fig. 2).



Fig. 2

- 3. Release the (Fig. 3):
  - CN-STM1 (WHT) connector.
  - CN-STM2 (YLW) connector.
  - CN-DISP (WHT) connector.
  - CN-FM (WHT) connector.
  - CN-TH1 (WHT) connector.CN-TH2 (BLU) connector.
  - CN-DRMTR1 (BLU) connector.
  - AC01 (BLK), AC02 (WHT) and CN-DRMTR2 (RED) from Terminal Board.
  - G01 (GRN) screw.
  - Two T-BLK connectors.
  - CN-T1 (WHT).
  - CN-T2 (YLW).

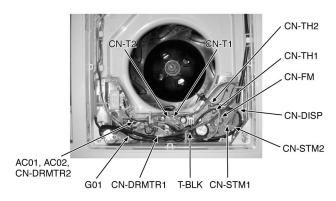
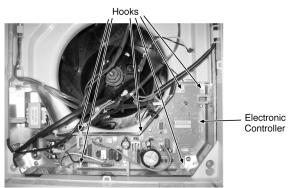


Fig. 3

4. To remove the Electronic Controller, release the 6 hooks that hold it to the Control Board (Fig. 4).



5. Remove the Front Grille by removing the screw A and screws B, C & D half way open (Fig. 5).

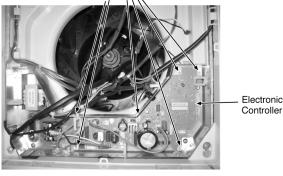
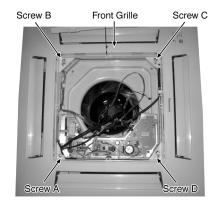


Fig. 4



6. Remove the Air Guider and Drain Pan complete by removing the screws (Fig. 6).

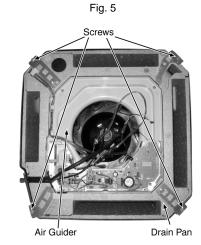


Fig. 6

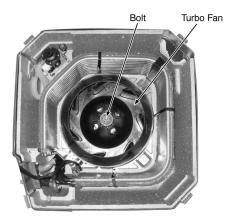


Fig. 7

7. Remove the Turbo Fan by removing the bolt (Fig. 7).

8. Remove the Fan Motor by release the Fan Motor lead wire connectors and Fan Motor screws (Fig. 8).

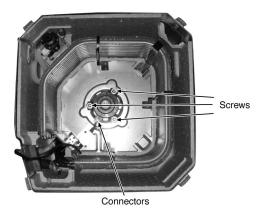


Fig. 8

Outdoor Electronic Controller Removal Procedure

1. Remove the top panel and front panel

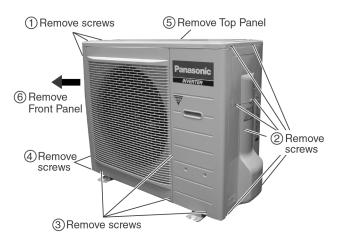


Fig. 9

# MARNING

- Be save to return the wiring to its original position
- There are many high voltage components within the heat sink cover so never touch the interior during operation. Wait at least two minutes after power has been turned off.

#### 2. Remove the Outdoor Electronic Controller

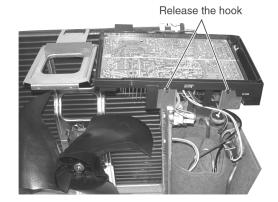


Fig. 10

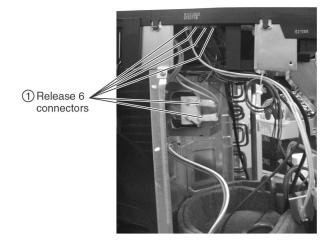


Fig. 11

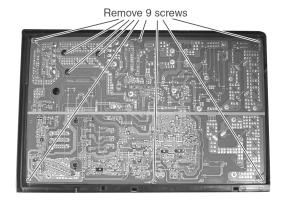


Fig. 12

# 17 Technical Data

# 17.1. Operation Characteristics

# 17.1.1. CS-E10KB4EA CU-E10HBEA

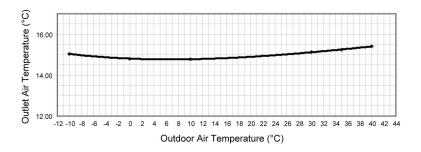
A. COOL: OUTDOOR TEMPERATURE CHANGE

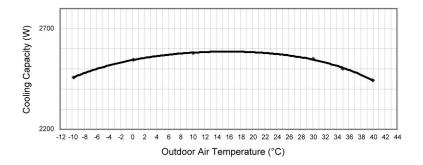
INDOOR TEMP.: 27/19°C

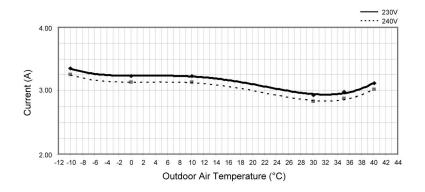
REMOTE CON.: HI FAN, COOL 16°C

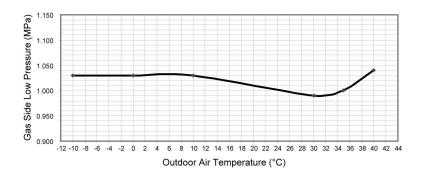
COMP. Hz : Fc

VOLTAGE: 230V - 240V



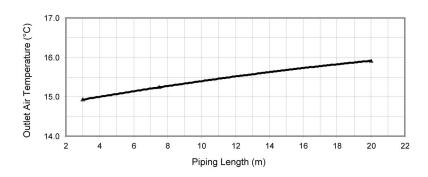


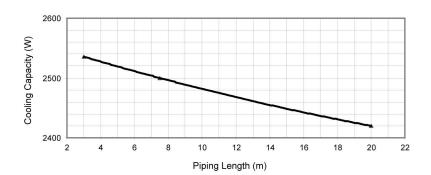


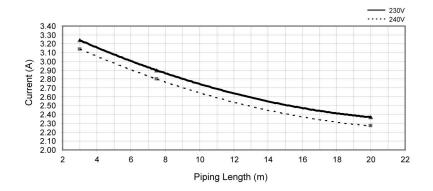


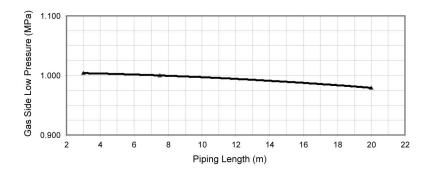
B. COOL : PIPE LENGTH CHANGE INDOOR TEMP. : 27/19°C, 35/-°C REMOTE CON. : HI FAN , COOL 16°C

COMP. Hz : Fc VOLTAGE : 230V - 240V





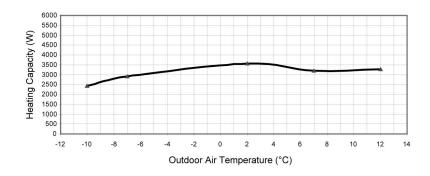


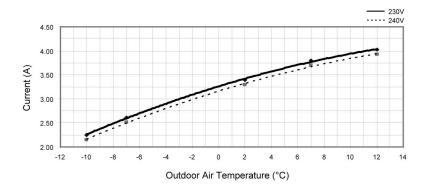


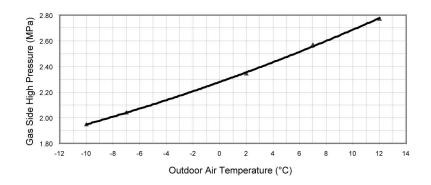
C. HEAT: OUTDOOR TEMPERATURE CHANGE

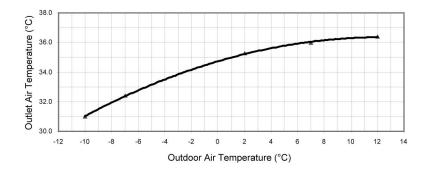
INDOOR TEMP. : 20/-°C REMOTE CON. : HI FAN , HEAT 30°C

COMP. Hz : Fh VOLTAGE : 230V - 240V



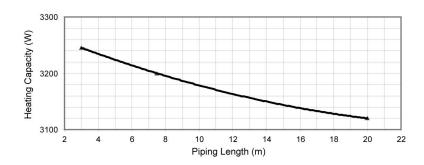


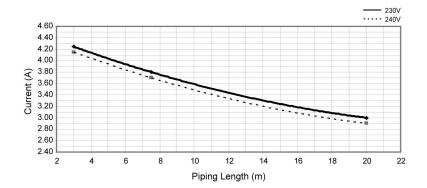


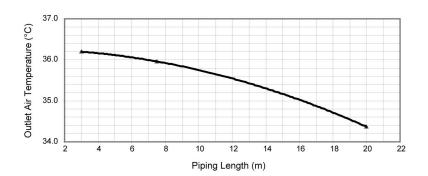


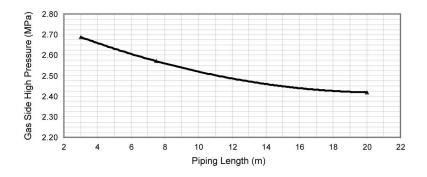
D. HEAT : PIPE LENGTH CHANGE INDOOR TEMP. : 20/-°C, 7/6°C REMOTE CON. : HI FAN , HEAT 30°C

COMP. Hz : Fh VOLTAGE : 230V - 240V









# 17.2. Sensible Capacity Chart

# ● CS-E10KB4EA CU-E10HBEA

	Outdoor Temp. (°C)											
Indoor wet	30		35		40		46					
bulb temp.	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
17.0°C	2.48	1.88	0.57	2.32	1.80	0.61	2.16	1.73	0.65	1.96	1.65	0.70
19.0°C				2.50		0.62						
19.5°C	2.72	1.97	0.58	2.55	1.89	0.62	2.37	1.82	0.67	2.15	1.73	0.72
22.0°C	2.97	2.04	0.59	2.77	1.96	0.63	2.58	1.89	0.68	2.35	1.81	0.73

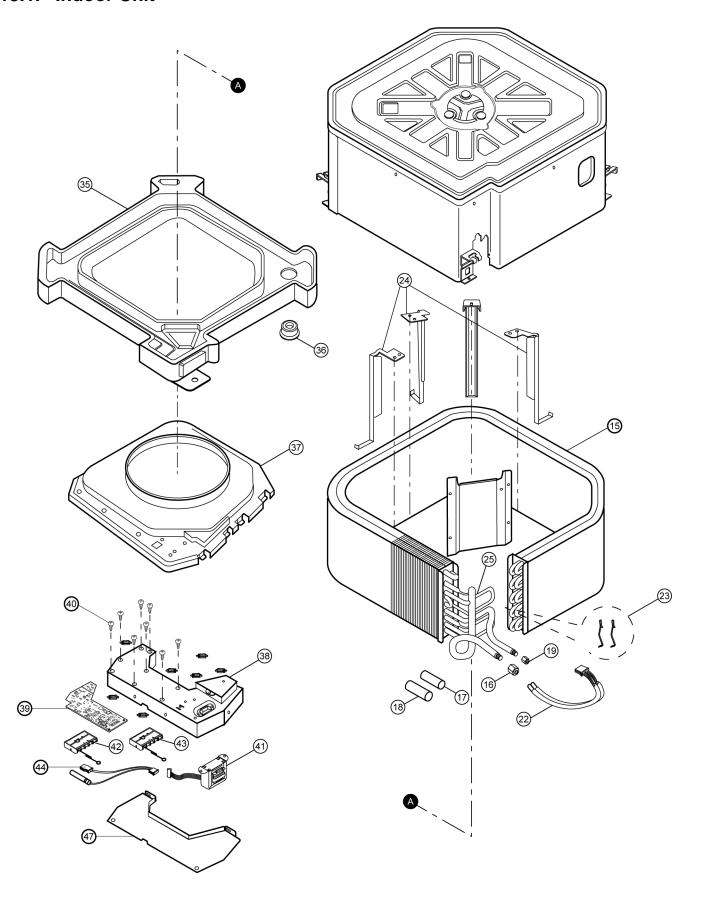
TC - Total Cooling Capacity (kW) SHC - Sensible Heat Capacity (kW)

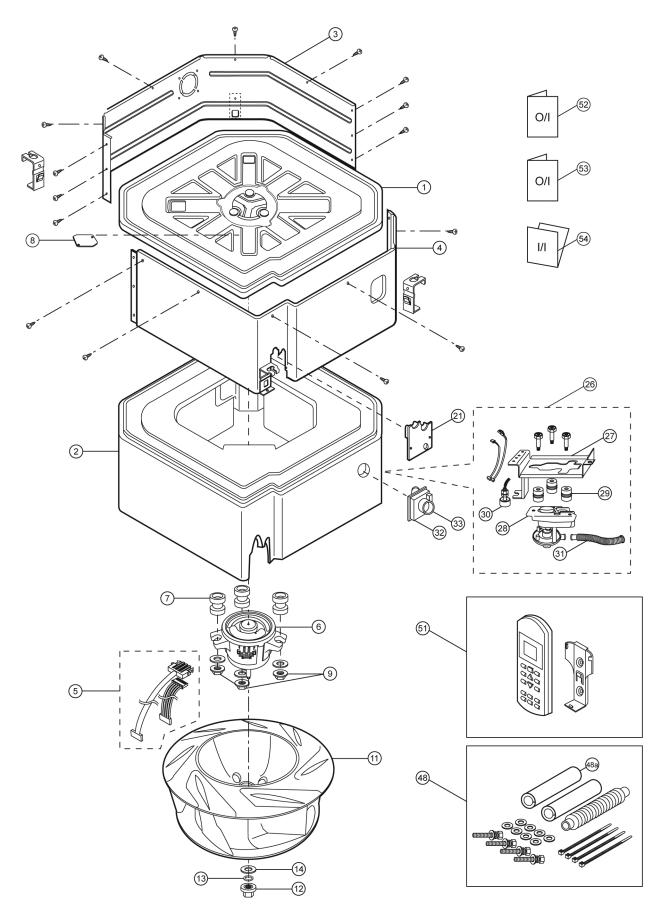
IP - Input Power (kW)

Indoor 27°C/19°C Outdoor 35°C/24°C

# **18 Exploded View and Replacement Parts List**

# 18.1. Indoor Unit





Note:

The above exploded view is for the purpose of parts disassembly and replacement. The non-numbered parts are not kept as standard service parts.

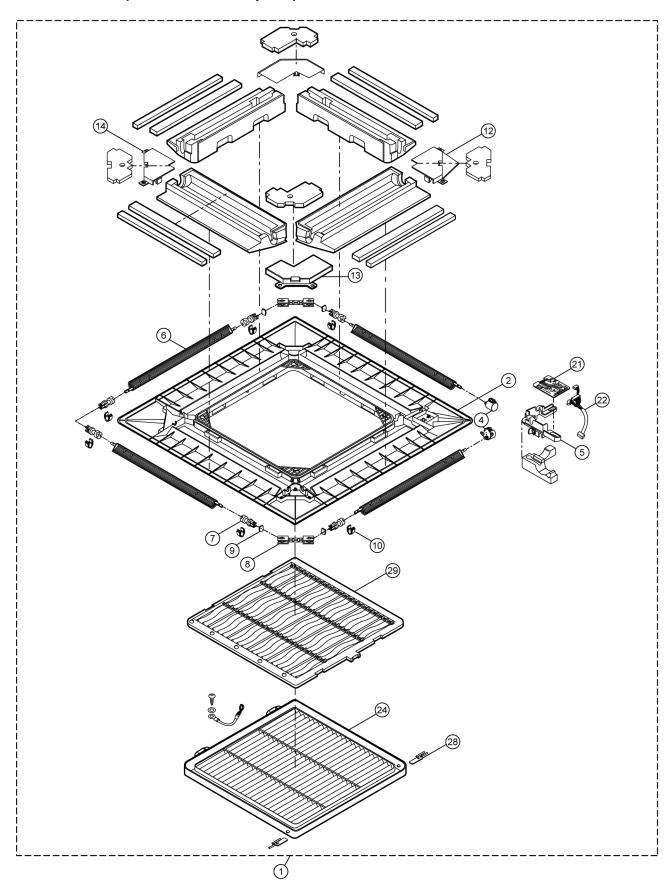
### <Model: CS-E10KB4EA>

REF. NO.	PARTS NAME & DESCRIPTION	QTY	CS-E10KB4EA	REMARKS
1	BASE PAN ASS'Y	1	CWD52K1100	
2	INNER POLYSTYRENE COMPLETE	1	CWG07C1047	
3	CABINET SIDE PLATE ASS'Y	1	CWE041121	
4	CABINET SIDE PLATE ASS'Y	1	CWE041122	
5	LEAD WIRE - FAN MOTOR	1	CWA67C5136	
6	FAN MOTOR	1	EHDS50A40AC	0
7	ANTI - VIBRATION BUSHING	3	CWH501065	
8	CORD HOLDER	1	CWD741024	
9	SCREW - FAN MOTOR	3	CWH561058	
11	TURBO FAN	1	CWH03K1022	
12	NUT for TURBO FAN	1	CWH561042	
13	SP WASHER	1	XWA8BFJ	
14	WASHER	1	XWG8H22FJ	
15	EVAPORATOR COMPLETE	1	CWB30C2522	
16	FLARE NUT (1/2")	1	CWT251031	
17	HEATPROOF TUBE	1	CWG021024	
18	HEATPROOF TUBE	1	CWG021064	
19	FLARE NUT (1/4")	1	CWT251030	
21	PIPE COVER	1	CWD93C1050	
22	SENSOR - EVAPORATOR	1	CWA50C2549	
23	HOLDER SENSOR	1	CWH32143	
24	EVAPORATOR SUPPORTER	3	CWD911529A	
25	TUBE ASS'Y (CAPIL. TUBE)	1	CWT07K1188	
26	DRAIN PUMP COMPLETE	1	CWB53C1015	
27	PANEL DRAIN PUMP ASS'Y	1	CWD93K1021	
28	DRAIN PUMP	1	CWB532043J	
29	ANTI - VIBRATION BUSHING	3	CWH501080	
30	FLOAT SWITCH - DRAIN PUMP	1	CWA121233	
31	FLEXIBLE PIPE	1	CWH85C1033	
32	DRAIN NOZZLE	1	CWH411011	
33	DRAIN HOSE HEAT INSULATION	1	CWG321050	
35	DRAIN PAN - COMPLETE	1	CWH40C1034	
36	DRAIN PLUG	1	CWB821008	
37	AIR GUIDER BLOWER WHEEL	1	CWD321058	
38	CONTROL BOARD CASING	1	CWH10K1102	
39	ELECTRONIC CONTROLLER (MAIN)	1	CWA73C4648	0
40	SPACER	6	CWH541026	<del>-  </del>
41	TRANSFORMER	1	CWA40C1030	
42	TERMINAL BOARD ASS'Y	1	CWA28K1191	0
43	TERMINAL BOARD ASS'Y	1	CWA28K1192	0
44	LEADWIRE-AIR TEMP. SENSOR	1	CWA67C5751	
47	CONTROL BOARD COVER	1	CWH13C1182	
48	ACCESSORY COMPLETE	1	CWH82C1270	
48A	HEATPROOF TUBE	1	CWG021025	
51	WIRELESS REMOTE CONTROL COMPLETE	1	CWA75C3208	0
52	OPERATING INSTRUCTION	1	CWF567377	
53	OPERATING INSTRUCTION	1	CWF567378	
54	INSTALLATION INSTRUCTION	1	CWF613465	

## (Note)

- All parts are supplied from PHAAM, Malaysia (Vendor Code: 061).
- "O" marked parts are recommended to be kept in stock.

# 18.2. CZ-BT20E (Front Grille Complete)



Note:

The above exploded view is for the purpose of parts disassembly and replacement.

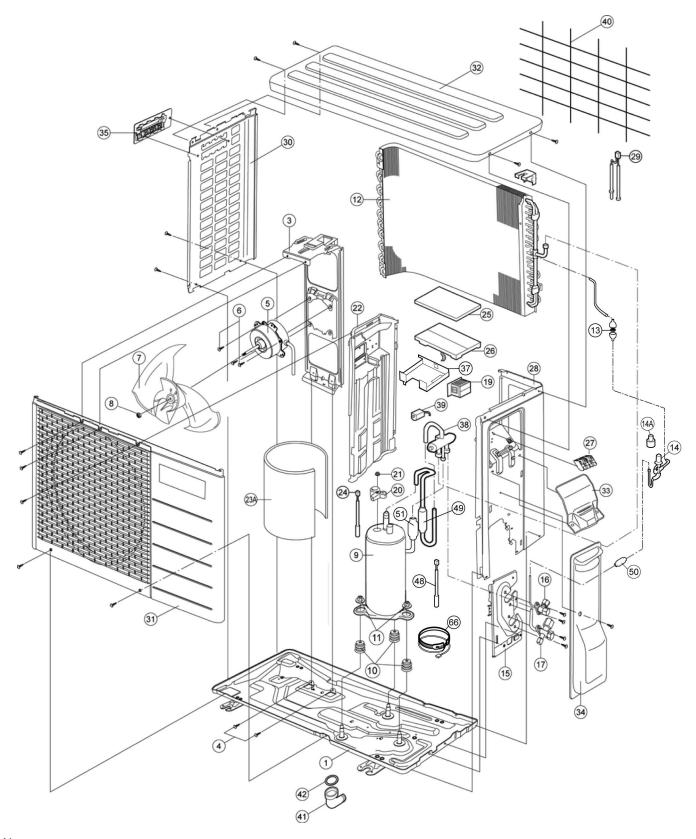
The non-numbered parts are not kept as standard service parts.

REF. NO.	PART DESCRIPTION	QTY	PART NO.
1	FRONT GRILLE - COMPLETE	1	CWE11C3105
2	FRONE - FRONT GRILLE CO.	1	CWE11C3353
4	A.S MOTOR DC SINGLE 12V 250 OHM	2	CWA981105J
5	BRACKET - A.S.MOTOR	1	CWD932522
6	VANE	4	CWE241159
7	SHAFT	6	CWH631038
8	SHAFT	2	CWH631045
9	CONNECTOR - SHAFT	4	CWH081007
10	BEARING	6	CWH641008
12	PLATE COVER FOR A.S.MOTOR	1	CWD911459
13	PLATE COVER FOR CONNECTING SHAFT	2	CWD911460
14	PLATE COVER FOR END SHAFT	1	CWD911461
21	ELECTRONIC CONT. (RECEIVER & INDICATOR)	1	CWA743610
22	LEAD WIRE - COMPLETE	1	CWA67C5576
24	INTAKE GRILLE	1	CWE221131
28	LEVER ARM	2	CWH651029
29	AIR FILTER	1	CWD001142

# (Note)

- All parts are supplied from PHAAM, Malaysia (Vendor Code: 061).
- "O" marked parts are recommended to be kept in stock.

# 18.3. Outdoor Unit



Note:

The above exploded view is for the purpose of parts disassembly and replacement.

The non-numbered parts are not kept as standard service parts.

#### <Model: CU-E10HBEA>

REF. NO.	DESCRIPTION & NAME	QTY.	CU-E10HBEA	REMARKS
1	CHASSY ASS'Y	1	CWD50K2176	
3	FAN MOTOR BRACKET	1	CWD541089	
4	SCREW - FAN MOTOR BRACKET	3	CWH551217	
5	FAN MOTOR	1	ARW44W8P40AC	0
6	SCREW - FAN MOTOR MOUNT	4	CWH55252J	
7	PROPELLER FAN ASSY	1	CWH03K1014	
8	NUT - PROPELLER FAN	1	CWH56053J	
9	COMPRESSOR	1	5CS110XBD04	0
10	ANTI-VIBRATION BUSHING	3	CWH50077	
11	NUT-COMPRESSOR MOUNT	3	CWH56000J	
12	CONDENSER	1	CWB32C2456	
13	STRAINER	1	CWB11094	
14	TUBE ASS'Y (EXP. VALVE)	1	CWT01C3643	
14A	V-COIL COMPLETE (EXP. VALVE)	1	CWA43C2058J	
15	HOLDER - COUPLING	1	CWH351025	
16	2 WAYS VALVE (LIQUID)	1	CWB021333	0
17	3 WAYS VALVE (GAS)	1	CWB011434	0
19	REACTOR	1	G0C193J00003	0
20	TERMINAL COVER	1	CWH171039A	
21	NUT-TERMINAL COVER	1	CWH7080300J	
22	SOUND PROOF BOARD	1	CWH151188	
23A	SOUND PROOF MATERIAL	1	CWG302466	
24	SENSOR COMPLETE ( DISCHARGE TEMP.)	1	CWA50C2281	0
25	CONTROL BOARD COVER	1	CWH131264	
26	ELECTRONIC CONTROLLER - MAIN	1	CWA73C3342R	0
27	TERMINAL BOARD ASSY	1	CWA28K1110J	0
28	CABINET SIDE PLATE CO.	1	CWE04C1116	
29	SENSOR COMPLETE (AIR TEMP. & PIPE TEMP.)	1	CWA50C2402	0
30	CABINET SIDE PLATE	1	CWE041248A	
31	CABINET FRONT PLATE CO.	1	CWE06C1136	
32	CABINET TOP PLATE	1	CWE031014A	
33	PLATE - C.B.COVER	1	CWH131301	
34	CONTROL BOARD COVER CO.	1	CWH13C1064	
35	HANDLE	1	CWE161010	
37	CONTROL BOARD CASING (BOTTOM)	1	CWH102371	
38	4 WAYS VALVE	1	CWB001037J	0
39	V-COIL COMPLETE (4-WAYS VALVE)	1	CWA43C2144J	0
40	WIRE NET	1	CWD041111A	
41	L - TUBE	1	CWH5850080	
42	PACKING - L.TUBE	1	CWB81012	
48	SENSOR COMPLETE (COMP. TEMP.)	1	CWA50C2205	
49	RECEIVER	1	CWB14011	
50	DISCHARGE MUFFLER	1	CWB121021	
51	STRAINER	1	CWB111004	
66	CRANKCASE HEATER	1	CWA341050	

# (Note)

- All parts are supplied from PHAAM, Malaysia (Vendor Code: 061).
- "O" marked parts are recommended to be kept in stock.