ORDER No. PACD 990101CO

Service Manual

PACKAGED AIR CONDITIONER
SYSTEM MULTI TYPE FOR BUILDING

■OUTDOOR UNIT

CU-224MA51SB	CU-280MA51SB	CU-224MA51TE	CU-280MA51TE
CU-224MB51SB	CU-280MB51SB	CU-224MB51TE	CU-280MB51TE

■INDOOR UNIT

ONE WAY CASSETTE TYPE

CS-28DR51FB	CS-28DR51ER

FOUR WAY CASSETTE TYPE

CS-45UR51FB	CS-80UR51FB	CS-45UR51ER	CS-80UR51ER
CS-56UR51FB	CS-112UR51FB	CS-56UR51ER	CS-112UR51ER
CS-71UR51FB	CS-140UR51FB	CS-71UR51ER	CS-140UR51ER

HIDE AWAY TYPE

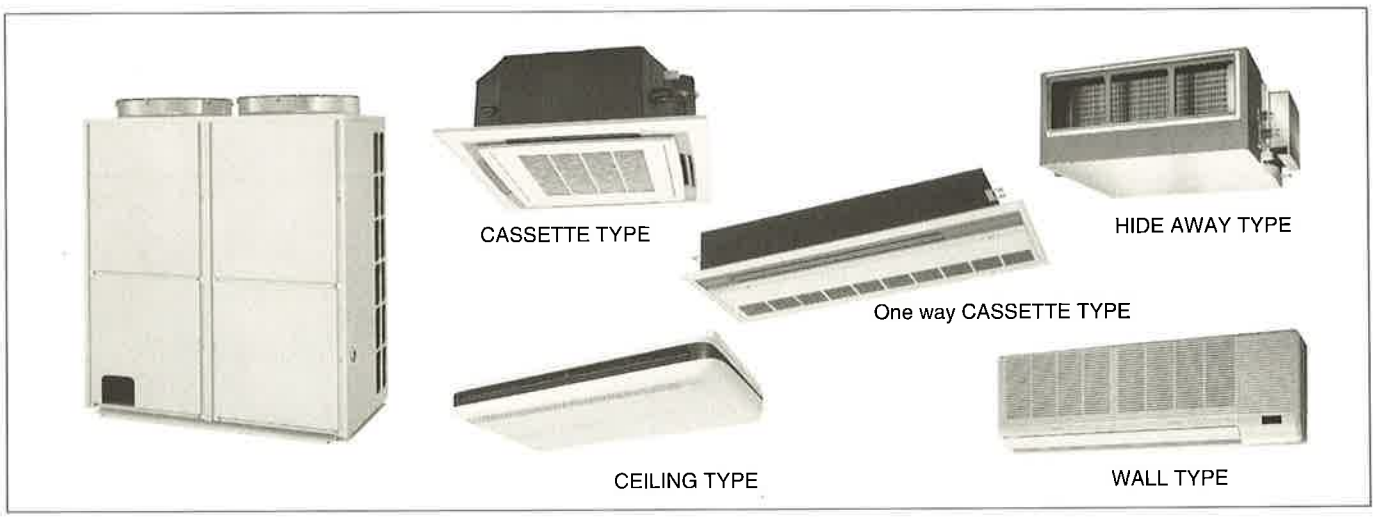
CS-45ER51FB	CS-80ER51FB	CS-45ER51ER	CS-80ER51ER
CS-56ER51FB	CS-112ER51FB	CS-56ER51ER	CS-112ER51ER
CS-71ER51FB	CS-140ER51FB	CS-71ER51ER	CS-140ER51ER

CEILING TYPE

CS-71TR51FB	CS-112TR51FB	CS-140TR51FB
CS-71TR51ER	CS-112TR51ER	CS-140TR51ER

WALL TYPE

CS-22KR51FB	CS-56KR51FB	CS-22KR51ER	CS-56KR51ER
CS-45KR51FB	CS-71KR51FB	CS-45KR51ER	CS-71KR51ER



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1 GENERAL INFORMATION

1.MULTI SYSTEM AND MODEL COMPOSITION

■Outdoor units

Heat Pump Type

CAPACITY RANGE			20.0kW (8.0HP)		25.0kW (10.0HP)	
Model Name			MASTER	SLAVE	MASTER	SLAVE
	Power Source	380, 400V 50Hz, 3 ϕ	CU-224MA51SB	CU-224MB51SB	CU-280MA51SB	CU-280MB51SB
		415V 50Hz, 3 ϕ	CU-224MA51TE	CU-224MB51TE	CU-280MA51TE	CU-280MB51TE
Cooling capacity(kW)			20.0		25.0	
Heating capacity(kW)			22.4		28.0	

■Table of Outdoor Units

Heat Pump Type

Outdoor unit	Equivalent HP		8HP	10HP	16HP	18HP	20HP	24HP	26HP	28HP	30HP	32HP	34HP	36HP	38HP
	Capacity(kW)		20.0	25.0	40.0	45.0	50.0	60.0	65.0	70.0	75.0	80.0	85.0	90.0	95.0
	Basic unit	Main unit	CU-224MA51	CU-280MA51	CU-224MA51	CU-280MA51	CU-280MA51	CU-224MA51	CU-280MA51	CU-280MA51	CU-280MA51	CU-224MA51	CU-280MA51	CU-280MA51	CU-280MA51
		Sub unit	—	—	CU-224MB51	CU-224MB51	CU-280MB51	CU-224MB51 224MB51	CU-224MB51 224MB51	CU-280MB51 224MB51	CU-280MB51 280MB51	CU-224MB51 224MB51 224MB51	CU-224MB51 224MB51 224MB51	CU-280MB51 224MB51 224MB51	CU-280MB51 280MB51 224MB51
Connectable indoor unit conditions	No. of connectable units per system		Max. 10	Max. 13	Max. 21	Max. 24	Max. 26	Max. 32	Max. 32	Max. 32	Max. 32	Max. 32	Max. 32	Max. 32	Max. 32
	Capacity(kW)		2.2～14.0(0.8HP—5HP)												
	Total capacity(kW)		50%～120% of outdoor unit rated capacity(kW)												

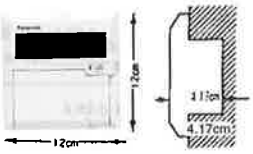
Indoor Unit Connection Range

- The capacity range that can be connented is within 50%-120% of the outdoor unit capacity.
- The capacities given for the indoor units,and outdoor units,are as per JIS conditions.

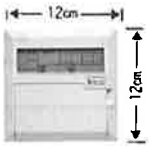
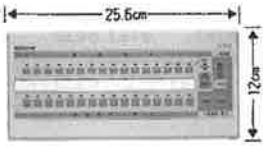
Type		Power source 1 ϕ	CAPACITY RANGE							
			2.2kW (0.8HP)	2.8kW (1.0HP)	4.5kW (1.5HP)	5.6kW (2HP)	7.1kw (2.5HP)	8.0kW (3.0HP)	11.2kW (4.0HP)	14.0kW (5.0HP)
Four way cassette	Heat pump	220,230V 50Hz		CS-28DR51FB One Way Cassette	CS-45UR51FB	CS-56UR51FB	CS-71UR51FB	CS-80UR51FB	CS-112UR51FB	CS-140UR51FB
		240V 50Hz		CS-28DR51ER One Way Cassette	CS-45UR51ER	CS-56UR51ER	CS-71UR51ER	CS-80UR51ER	CS-112UR51ER	CS-140UR51ER
Hide-away	Heat pump	220,230V 50Hz			CS-45ER51FB	CS-56ER51FB	CS-71ER51FB	CS-80ER51FB	CS-112ER51FB	CS-140ER51FB
		240V 50Hz			CS-45ER51ER	CS-56ER51ER	CS-71ER51ER	CS-80ER51ER	CS-112ER51ER	CS-140ER51ER
Ceiling	Heat pump	220,230V 50Hz					CS-71TR51FB		CS-112TR51FB	CS-140TR51FB
		240V 50Hz					CS-71TR51ER		CS-112TR51ER	CS-140TR51ER
Wall	Heat pump	220,230V 50Hz	CS-22KR51FB		CS-45KR51FB	CS-56KR51FB	CS-71KR51FB			
		240V 50Hz	CS-22KR51ER		CS-45KR51ER	CS-56KR51ER	CS-71KR51ER			

Accessary Parts

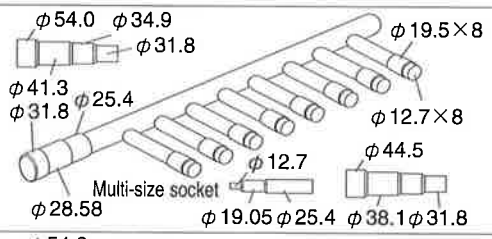
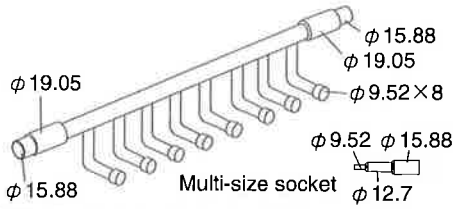
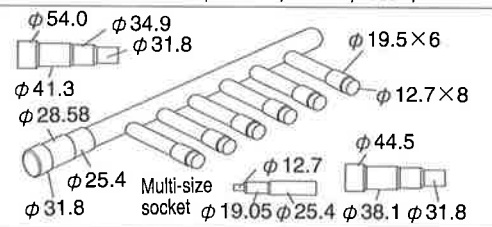
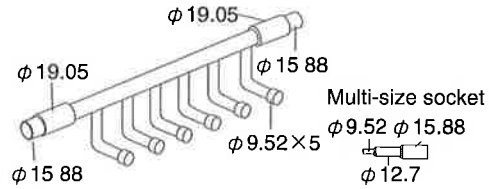
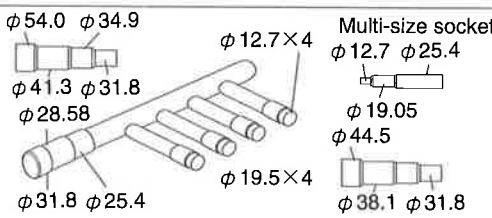
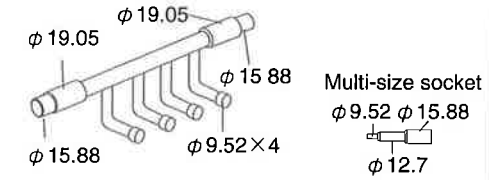
- Remote Controller (sold separately)

Indoor unit	4 way Cassette	1 way Cassette	Hide-Away	Ceiling	Wall
Heatpump	CZ-02REM51P	CZ-04REM51P	CZ-04REM51P	CZ-01REM51P	CZ-06REM51P
Model					

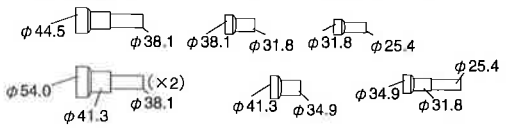
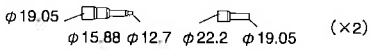
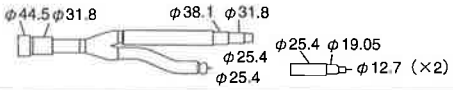
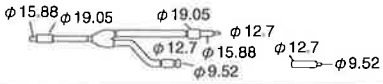
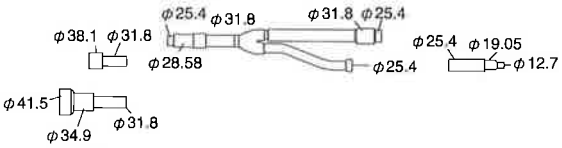
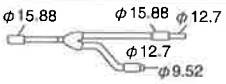
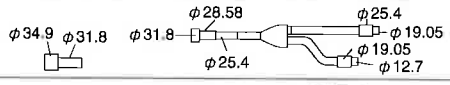
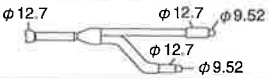
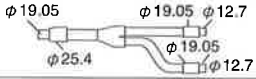
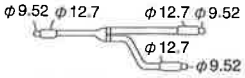
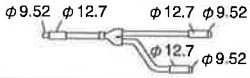
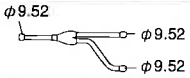
- Central Controller

		Central Controller	Annunciator	Centralized control board
Model (Maximum Control numbers)		 (Maximum 16 units)	 (Maximum 16 units)	(Maximum 200 units)
Heatpump	220~230V 50Hz	CZ-ESS51P	CZ-EAN51FP	CZ-ESM51FP
	240V 50Hz		CZ-EAN51RP	CZ-ESM51RP

■Header branch pipe

Part name	Gas Pipe	Liguid Pipe
CZ-08JHKV3 8 Branch		
CZ-06JHKV3 6 Branch		
CZ-04JHKV3 4 Branch		

■Line branch pipe

Part name	Gas pipe	Liquid pipe
CZ-78JBKV3B		
CZ-78JBKV3		
CZ-50JBKV3		
CZ-39JBKV3		
CZ-19JBKV3		
CZ-09JBKV3		

2 OUTDOOR UNIT

1.SPECIFICATIONS (OUTDOOR UNIT)

HEAT PUMP TYPE

ITEM				Basic Unit	
Model Name	Power Source		380, 400V 50Hz, 3 ϕ	CU-224MA51SB	CU-280MA51SB
			415V 50Hz, 3 ϕ	CU-224MA51TE	CU-280MA51TE
(1) Cooling Capacity			kW kcal/h BTU/h	20.0 17,200 68,800	25.0 21,500 86,000
(2) Heating Capacity			kW kcal/h BTU/h	22.4 19,300 77,200	28.0 24,100 96,400
Standard Air Volume			m^3/min (ℓ /s) cfm	150 (2500) 5,296	
External Static Pressure			mAq Pa	— —	
Air Inlet				Both sided Suction	
Air Outlet				Upper Blow-out	
Outside Dimensions (H×W×D)			mm inch	1,510×1,300× (700+50) 59-3/64×51-3/16× (27-9/16+1-31/32)	
Noise Level			dB (A)	54	
Net Weight			kg lbs	280 617	290 639
Piping Connection	Refrigerant	Gas	mm (inch)	0.D. ϕ 25.4(1) Brazing type	
		Liquid	mm (inch)	0.D. ϕ 12.7(1/2) Flared type	
		Oil	mm (inch)	0.D. ϕ 9.52(3/8) Flared type	
	Drain		mm	Natural drainage; 9 drain holes ϕ 12	
Compressor	Type, number of set			Hermetic・2	
	Starting Method			Direct on-line starting	
	Capacity Control		%	0. 50. 100 (※1)	
	Motor	Type		2-pole 3-phase induction motor	
		Input	kW	(Cool) 7.08 (Heat) 6.50	(Cool) 9.40 (Heat) 8.56
		Rated Output	kW	2.61+2.61	3.73+3.73
Fan	Type, number of set		unit	Axial-flow fan-2	
	Air Volume Control			—	
	Motor	Type		8-pole Single-phase induction motor	
		Input	kW	0.36	
		Rated Output	kW	0.11×2	
Air-heat exchanger				Louver fin type	
Defrost control				Microprocessor control(reverse cycle defrost)	
Refrigerant Control				Electronic expansion valve	
Refrigeration Oil (Charged)			ℓ	WITCO-3GS(1.63×2)	WITCO-3GS(2.07×2)
Refrigerant (Charged)			kg lbs	R-22(12.0) 26.5	R-22(13.0) 28.7
Safety Devices				Crankcase heater, Fusible plug High-pressure switch, Internal thermostat	
Finish				Galvanized steel plate finished with baked acrylic-resin	

(1) Cooling capacities are based on indoor temp. 27°C D.B. (80.6°F D.B.), 19.0°C W.D. (66.2°F W.B.) and outdoor air temp. 35°C D.B. (95°F D.B.), 24°C W.D. (75.2°F W.B.)
(2) Heating capacities are based on indoor temp. 20°C D.B. (68.0°F D.B.) and outdoor temp. 7°C D.B. (44.6°F D. B.), 6°C W.D. (42.8°F W.B.)
(※1) The power consumption and running current will be changed from standard value when operate gas bypass and/or liquid bypass valve.

ELECTRICAL DATA [OUTDOOR UNIT] (50Hz)

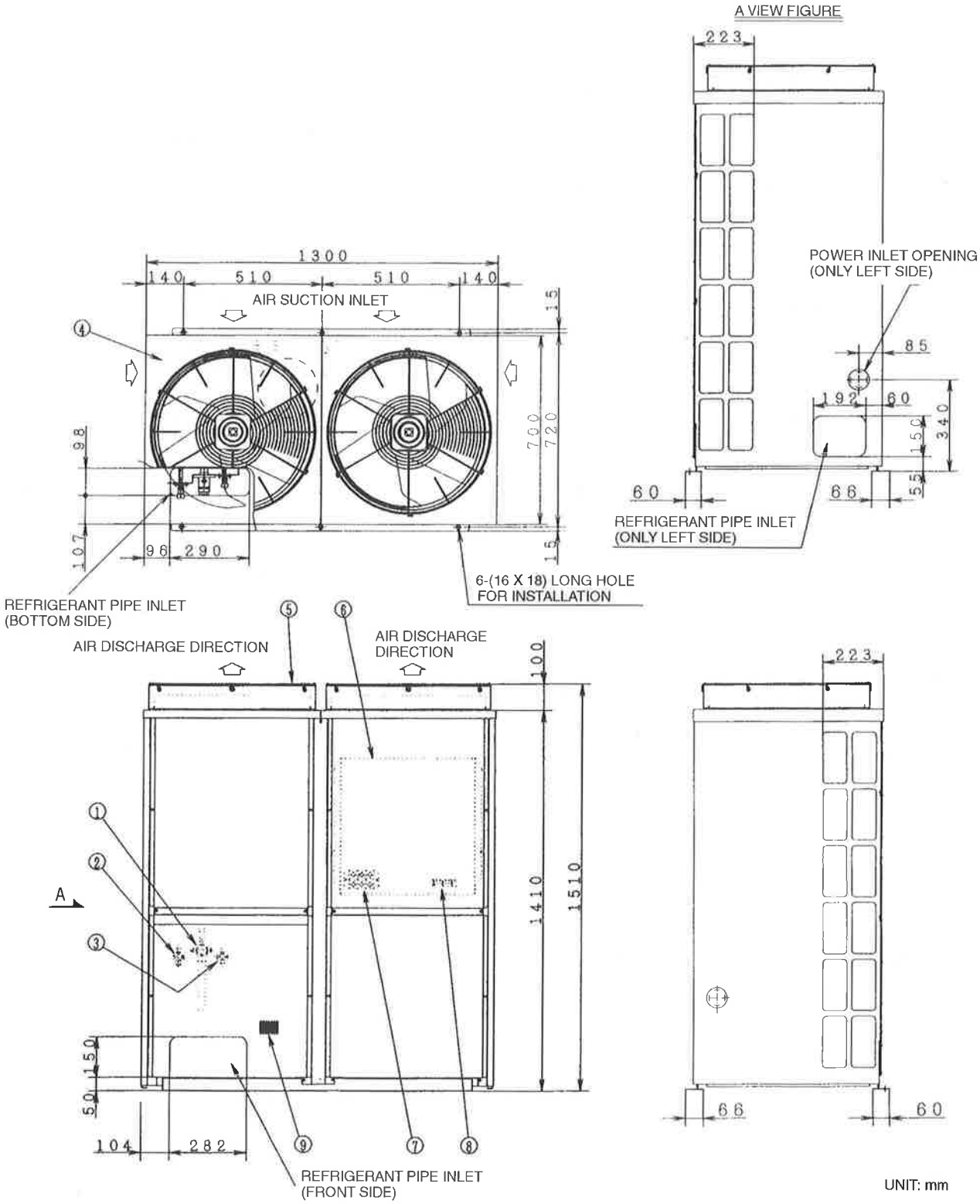
ITEM \ MODEL			CU-224MA51SB		CU-224MA51TE	CU-280MA51SB		CU-280MA51TE
Volts	V		380	400	415	380	400	415
Phase			3N	3N	3N	3N	3N	3N
Power Consumption	kW	Cool	7.44	7.44	7.44	9.76	9.76	9.76
		Heat	6.86	6.86	6.86	8.92	8.92	8.92
Running Current	A	Cool	13.2	12.5	12.1	17.3	16.4	15.8
		Heat	12.1	11.5	11.1	15.7	14.9	14.4
Starting Current	A		48.5	48.5	48.5	73.5	73.5	73.5
Power Factor	%	Cool	85.6	85.9	85.5	85.7	85.9	85.9
		Heat	86.1	86.1	86.0	86.3	86.4	86.2

2.OUTSIDE DIMENSIONS

●OUTDOOR UNIT [BASIC UNIT]

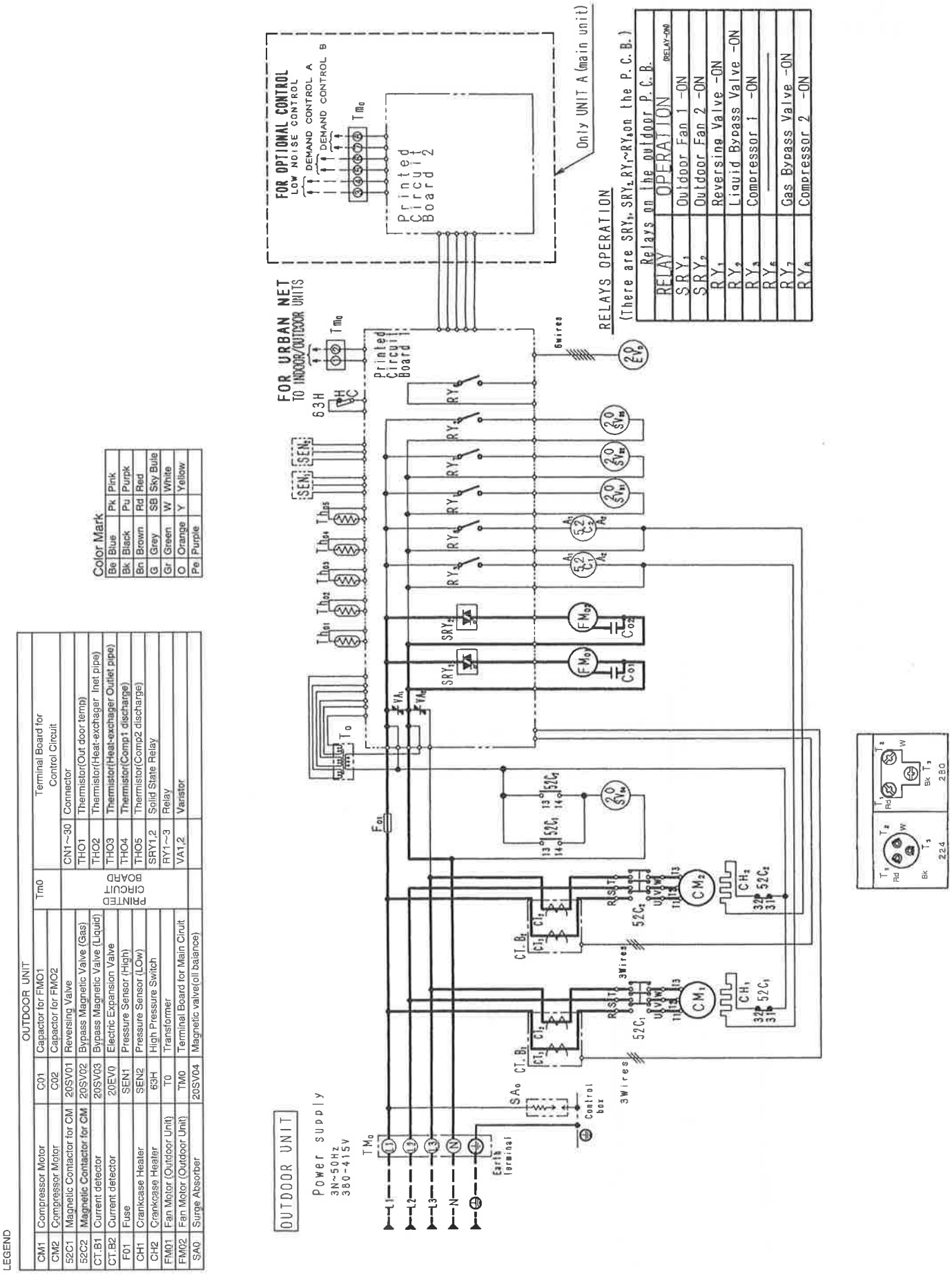
8HP	10HP
CU-224MA51SB	CU-280MA51SB
CU-224MB51SB	CU-280MB51SB
CU-224MA51TE	CU-280MA51TE
CU-224MB51TE	CU-280MB51TE

NO.	DESCRIPTION	Q'TY	DIMENSIONS	
			(8HP)	(10HP)
1	SERVICE VALVE	1	O.D. ϕ 25.4 BRAZED	O.D. ϕ 25.4 BRAZED
2	SERVICE VALVE	1	O.D. ϕ 12.7 FLARED	O.D. ϕ 12.7 FLARED
3	SERVICE VALVE	1	O.D. ϕ 9.52 FLARED	O.D. ϕ 9.52 FLARED
4	CONDENSER	1		
5	FAN GUARD	2		
6	CONTROL BOX	1		
7	POWER SOURCE TERMINAL	1		
8	CONTROL TERMINAL	1		
9	SLIT HOLE	1	FOR SENSING OUTSIDE TEMP.	FOR SENSING OUTSIDE TEMP.



3.CIRCUIT DIAGRAM (Master unit - A unit, Slave unit - B unit)

CU-224MA51SB, CU-224MA51TE, CU-224MB51SB, CU-224MB51TE
CU-280MA51SB, CU-280MA51TE, CU-280MB51SB, CU-280MB51TE

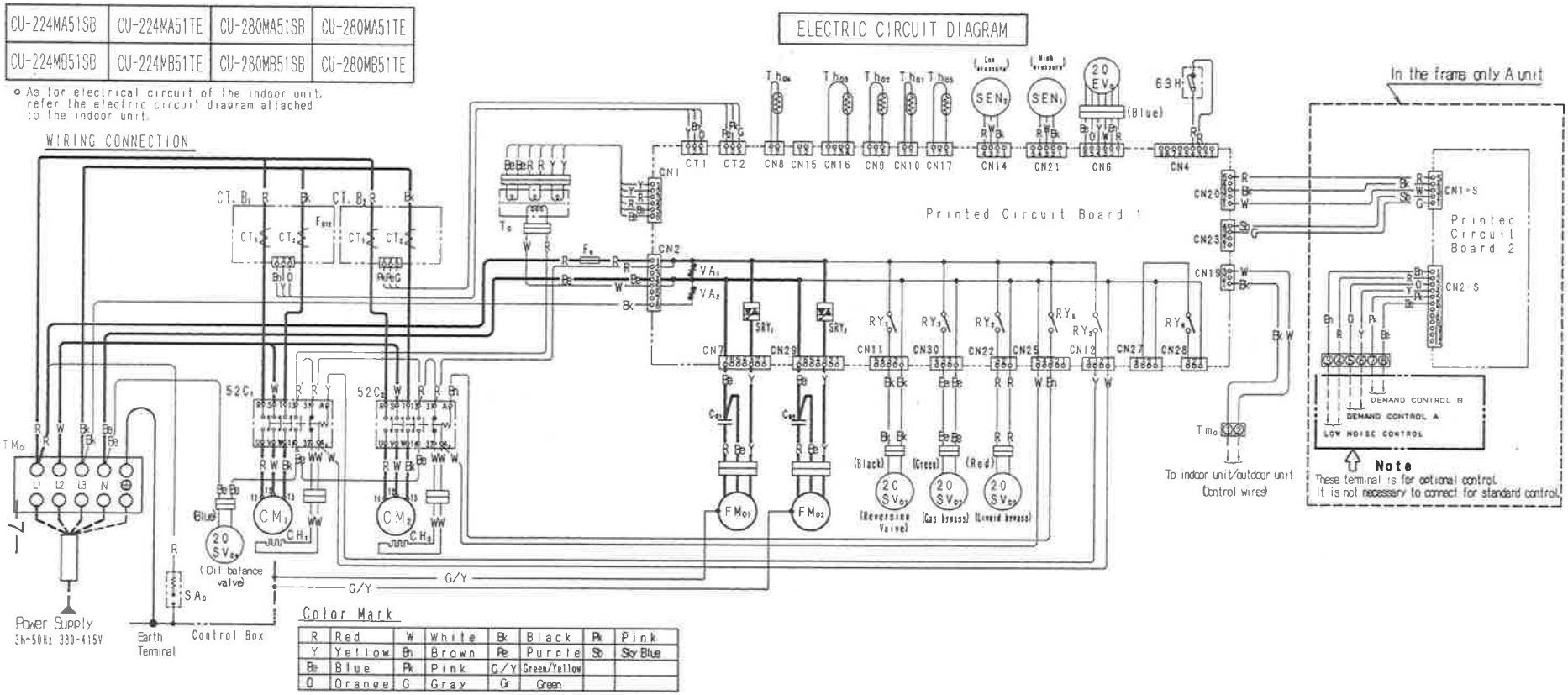


■WIRING CONNECTION

CU-224・280MA51SB
CU-224・280MB51SB
CU-224・280MA51TE
CU-224・280MB51TE

CU-224MA51SB	CU-224MA51TE	CU-280MA51SB	CU-280MA51TE
CU-224MB51SB	CU-224MB51TE	CU-280MB51SB	CU-280MB51TE

○ As for electrical circuit of the indoor unit, refer the electric circuit diagram attached to the indoor unit.



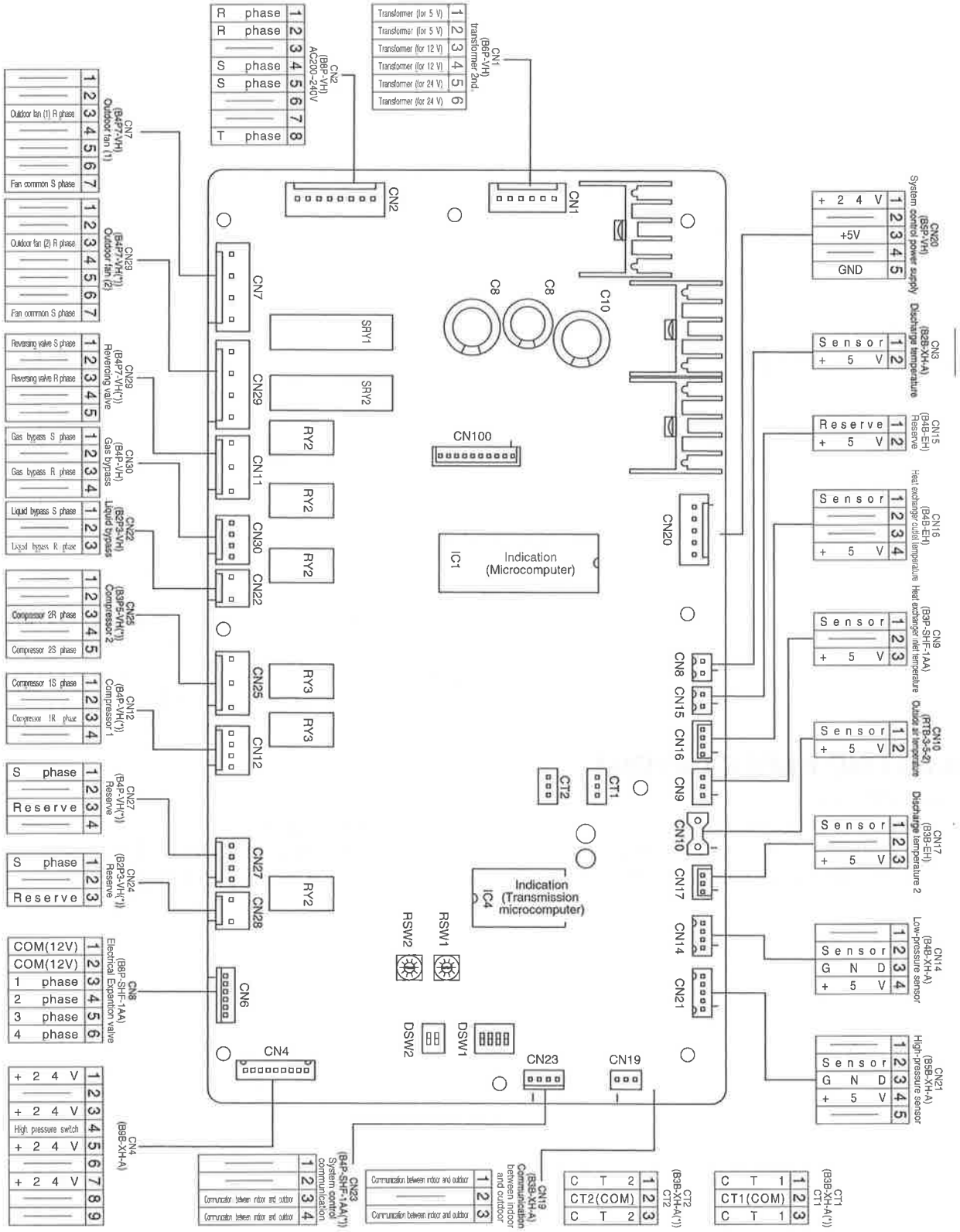
LEGEND

OUTDOOR UNIT						
CM1	Compressor Motor	C01	Capactor for FM01	Tm0	Terminal Board for Control Circuit	
CM2	Compressor Motor	C02	Capactor for FM02			
52C1	Magnetic Contactor for CM	20SV01	Reversing Valve	PRINTED CIRCUIT BOARD	CN1~30	Connector
52C2	Magnetic Contactor for CM	20SV02	Bypass Magnetic Valve (Gas)		Th01	Thermistor(Outdoor temp)
CT.B1	Current detector	20SV03	Bypass Magnetic Valve (Liquid)		Th02	Thermistor(Heat-exchanger inlet pipe)
CT.B2	Current detector	20EV0	Electric Expansion Valve		Th03	Thermistor(Heat-exchangerOutlet pipe)
F01	Fuse	SEN1	Pressure Sensor (High)		Th04	Thermistor(Comp1 discharge)
CH1	Crankcase Heater	SEN2	Pressure Sensor (Low)		Th05	Thermistor(Comp2 discharge)
CH2	Crankcase Heater	63H	High Pressure Switch		SRY1,2	Solid State Relay
FM01	Fan Motor (Outdoor Unit)	T0	Transformer		RY1~8	Relay
FM02	Fan Motor (Outdoor Unit)	TM0	Terminal Board for Main Circuit		VA1,2	Varistor
SA0	Serge Absorber	20SV04	Magnetic valve (Oil balance)			

THE MOVEMENT OF THE RELAYS
(There are SRY1・SRY2・RY1~RY2 in the P.C.B.)

THE MOVEMENT OF THE RELAYS (IN THE OUTDOOR P.C.B.)								
RELAY	SRY1	SRY2	RY1	RY2	RY3	RY6	RY7	RY8
MOVEMENT	OUTDOOR FAN1 OPERATION	OUTDOOR FAN2 OPERATION	REVERSING VALVE ON	LIQUID BYPASS VALVE ON	COMPRESSOR 1 ON	—	GAS BYPASS VALVE ON	COMPRESSOR 2 ON

4.OUTDOOR UNIT CONTROLLER RELAY PRINTED CIRCUIT BOARD1
[MASTER UNIT · SLAVE UNIT]
ALL UNIT

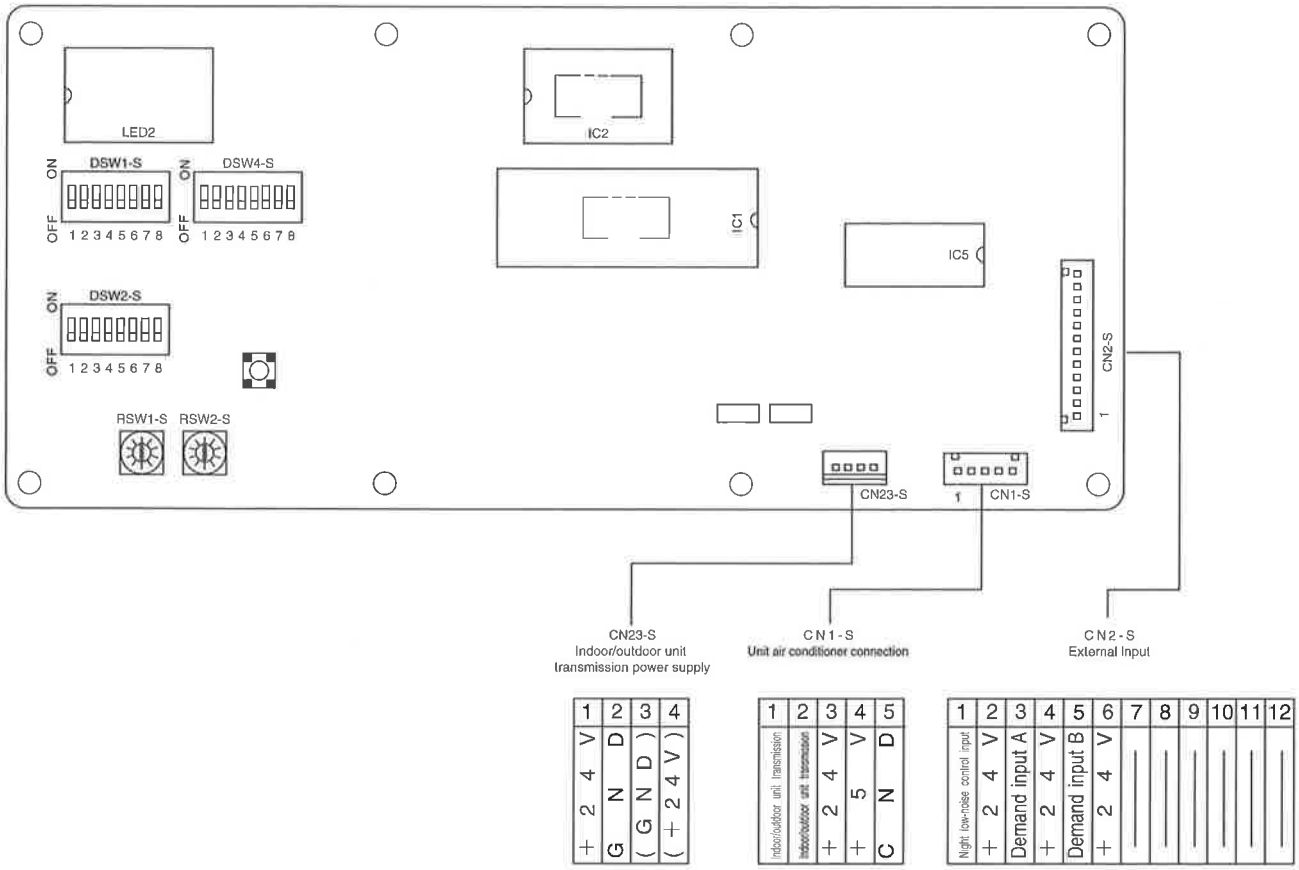


Relay operation table

Relay name	SRY1	SRY2	RY1	RY2	RY3	RY6	RY7	RY8
Operation when relay ON	Outdoor fan 1 Operation	Outdoor fan 2 Operation	Reversing valve ON	Magnetic valve for liquid bypass ON	Compressor 1 Operation	Reserve RY7	Magnetic valve for gas bypass ON	Compressor 2 Operation

5.SYSTEM CONTROL PRINTED BOARD.[MASTER UNIT]

(OUTDOOR UNIT)
CU-224MA51SB,CU-280MA51SB
CU-224MA51TE,CU-280MA51TE

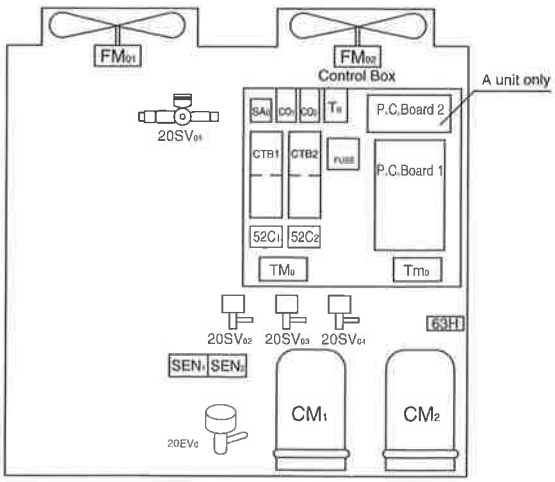


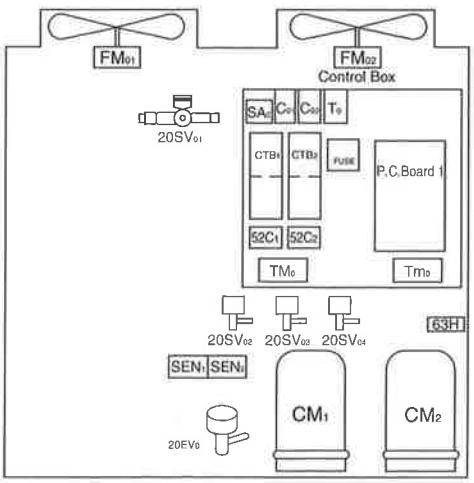
6.ELECTRIC PARTS LAYOUT

(OUTDOOR UNIT)

Main unit (A)
CU-224MA51SB,CU-280MA51SB
CU-224MA51TE,CU-280MA51TE

Slave unit (B)
CU-224MB51SB,CU-280MB51SB
CU-224MB51TE,CU-280MB51TE





3 INDOOR UNIT

1.SPECIFICATIONS (INDOOR UNIT) One way cassette type
HEAT PUMP TYPE

ITEM				1.0HP
Model Name	Main Unit	Power Source	220, 230V 50Hz 1 ϕ	CS-28DR51FB
			240V 50Hz 1 ϕ	CS-28DR51ER
	Panel			CZ-01KPD01P
(1)Cooling Capacity			kW kcal/h BUT/h	2.8 2,400 9,600
(2)Heating Capacity			kW kcal/h BUT/h	3.2 2,800 11,200
Standard Air Volume			m³/min(ℓ /s) cfm	Hi7.5 Me6.5 Lo5.5 Hi265 Me229 Lo194
External Static Pressure			mmAq Pa	0 0
Air Inlet				Lower sided Suction
Air Outlet				Front Blow-out
Duct connection				Not possible
Outside Dimensions (H×W×D)		Indoor unit main body	mm inch	210×900×385 8-17/64×35-7/16×15-5/32
		Panel	mm inch	9×1,090×430 11/32×42-29/32×16-15/16
Noise Level			dB(A)	Hi38 Me36 Lo31
Net Weight		Indoor unit main body	kg	17
			lbs	37.4
		Panel	kg	6
			lbs	13.2
Piping Connection	Refrigerant	Gas	mm(inch)	O.D. ϕ 12.7(1/2) Flared type
		Liquid	mm(inch)	O.D. ϕ 9.52(3/8) Flared type
	Drain	Upper	mm	O.D. ϕ 32(Accessory drain hose:I.D. ϕ 32)
		Lower	mm	O.D. ϕ 20(Emergency drain port)
Fan	Type,number of set		unit	Cross-flow fan-1
	Air Volume Control			Three-Step mode(Remote Controller)
	Motor	Type		4-pole Sigle-phase induction motor
		Input	kW	0.039
		Rated Output	kW	0.015
Air-heat exchanger				Louver fin type
Refrigerant Control				Electronic expansion valve
Refrigerant				R-22
Safety Device				Internal thermostat(Fan motor), Float switch
Accessory				Installation panel Flexible drain hose
External Finish				Glvanized steel plate finished with baked acrylic-resin
Air Filter(Factory set)				Polypropylene resin Honeycomb(Washable)
Running Adjustment		Control Switch		Remote controller CZ-04REM51P(Option)
		Room temperature		Thermostat(Main body)

(1) Cooling capacities are based on indoor temp. 27°C D.B. (80.6°F D.B.), 19.0°C W.D. (66.2°F W.B.) and outdoor air temp. 35°C D.B. (95°F D.B.), 24°C W.D. (75.2°F W.B.)
(2) Heating capacities are based on indoor temp. 20°C D.B. (68.0°F D.B.) and outdoor temp. 7°C D.B. (44.6°F D.B.), 6°C W.D. (42.8°F W.B.)

ELECTRICAL DATA [INDOOR UNIT] (50Hz)

ITEM \ MODEL			CS-28DR51FB		CS-28DR 51ER
Volts	V		220	230	240
Phase			Single	Single	Single
Power Consumption	kW	Cool	0.039	0.039	0.039
		Heat	0.039	0.039	0.039
Running Current	A	Cool	0.19	0.18	0.18
		Heat	0.19	0.18	0.18
Starting Current	A		0.38	0.38	0.38
Power Factor	%	Cool	93.3	94.2	90.2
		Heat	93.3	94.2	90.2

1.SPECIFICATIONS (INDOOR UNIT) Four way cassette type
HEAT PUMP TYPE

ITEM				1.6HP	2HP
Model Name	Main Unit	Power Source	220, 230V 50Hz 1 ϕ	CS-45UR51FB	CS-56UR51FB
			240V 50Hz 1 ϕ	CS-45UR51ER	CS-56UR51ER
	Panel			CZ-03KPV5P	CZ-03KPV5P
(1)Cooling Capacity			kW kcal/h BUT/h	4.5 3,900 15,600	5.6 4,800 19,200
(2)Heating Capacity			kW kcal/h BUT/h	5.0 4,300 17,200	6.3 5,400 21,600
Standard Air Volume			m^3/min(ℓ /s) cfm	Hi15 Me12 Lo10 529 424 353	Hi15 Me12 Lo10 529 424 353
External Static Pressure			mmAq Pa	0 0	
Air Inlet				Lower sided Suction	
Air Outlet				Lower sided Blow-out	
Duct Connection				＊1 Available	
Outside Dimensions (H×W×D)			mm inch	※Set the panel(240+30)×930×930 (9・9/16+1・3/16)×36・39/64×36・39/64	
Net Weight			kg lbs	33(26+7) 72.7(57.3+15.4)	34(27+7) 74.9(59.5+15.4)
Piping Connection	Refrigerant	Gas	mm(inch)	O.D. ϕ 12.7(1/2) Flared type	
		Liquid	mm(inch)	O.D. ϕ 9.52(3/8) Flared type	
	Drain		mm	O.D. ϕ 32(Accessory drain hose: I.D. ϕ 32)	
Fan	Type, number of set		unit	Turbo fan-1	
	Air Volume Control			Three-Step mode(Remote Controller)	
	Motor	Type		6-pole Single-phase induction motor	
		Input	kW	0.06	0.06
		Rated Output	kW	0.02	
Air-heat exchanger				Louver fin type	
Refrigerant Control				Electronic expansion valve	
Refrigerant				R-22	
Safety Device				Internal thermostat(Fan motor)	
Accessory				Flexible drain hose	
External Finish				ABS resin(Decorative panel)	
Air Filter (Factory set)				Polyropylene Honeycomb(Washable)	
Noise level			dB(A)	Hi39 Me36 Lo35	Hi39 Me36 Lo33
Running Adijustment		Control Switch		Remote Controller CZ-02REM51P (option)	
		Room temperature		Thermstat(Main body)	

(1) Cooling capacities are based on indoor temp. 27°C D.B. (80.6°F D.B.), 19.0°C W.D. (66.2°F W.B.) and outdoor air temp. 35°C D.B. (95°F D.B.), 24°C W.D. (75.2°F W.B.)
(2) Heating capacities are based on indoor temp. 20°C D.B. (68.0°F D.B.) and outdoor temp. 7°C D.B. (44.6°F D. B.), 6°C W.D. (42.8°F W.B.)
(3) *1 Supply duct and fresh air duct are connectable. Suppy duct requires the special parts.

ELECTRICAL DATA [INDOOR UNIT] (50Hz)

ITEM \ MODEL			CS-45UR51FB		CS-45UR 51ER	CS-56UR51FB		CS-56UR 51ER
Volts	V		220	230	240	220	230	240
Phase			Single	Single	Single	Single	Single	Single
Power Consumption	kW	Cool	0.06	0.06	0.06	0.06	0.06	0.06
		Heat	0.06	0.06	0.06	0.06	0.06	0.06
Running Current	A	Cool	0.30	0.29	0.28	0.30	0.29	0.28
		Heat	0.30	0.29	0.28	0.30	0.29	0.28
Starting Current	A		0.38	0.38	0.38	0.38	0.38	0.38
Power Factor	%	Cool	90.0	90.0	89.3	90.9	90.0	89.3
		Heat	90.0	90.0	89.3	90.9	90.0	89.3

SPECIFICATIONS (INDOOR UNIT) Four way cassette type
HEAT PUMP TYPE

ITEM				2.5HP	3HP	4HP	5HP
Model Name	Main Unit	Power Source	220, 230V 50Hz 1 ϕ	CS-71UR51FB	CS-80UR51FB	CS-112UR51FB	CS-140UR51FB
			240V 50Hz 1 ϕ	CS-71UR51ER	CS-80UR51ER	CS-112UR51ER	CS-140UR51ER
	Panel			CZ-03KPV5P	CZ-03KPV5P	CZ-06KPV5P	CZ-06KPV5P
(1)Cooling Capacity			kW	7.1	8.0	11.2	14.0
			kcal/h	6,100	6,900	9,600	12,050
			BUT/h	24,400	27,600	38,400	48,200
(2)Heating Capacity			kW	8.0	9.0	12.5	16.0
			kcal/h	6,900	7,750	10,750	13,750
			BUT/h	27,600	31,000	43,000	55,000
Standard Air Volume			m³/min(ℓ /s)	Hi20 Me17 Lo15	Hi21 Me18 Lo16	Hi31 Me25 Lo20	Hi34 Me29 Lo24
			cfm	705 600 529	741 635 565	1094 883 706	1200 1024 847
External Static Pressure			mmAq	0			
			Pa	0			
Air Inlet				Lower sided Suction		Lower sided Suction	
Air Outlet				Lower sided Blow-out		Lower sided Blow-out	
Duct Connection				*1 Available			
Outside Dimensions (H×W×D)			mm	(290+30)×930×930		(290+30)×1350×930	(320+30)×1350×930
※Set the panel			inch	(11·27/64+1·3/16)×36·39/64×36·39/64		(11·27/64+1·3/16)×53·5/32×36·39/64	(12·19/32+1·3/16)×53·5/32×36·39/64
Net Weight			kg	36(29+7)	37(30+7)	60(48+12)	64(52+12)
			lbs	79.2(63.8+15.4)	81.4(66+15.4)	132(105.6+26.4)	140.8(114.4+26.4)
Piping Connection	Refrigerant	Gas	mm(inch)	O.D. ϕ 12.7(1/2) Flared type		O.D. ϕ 19.05(3/4) Flared type	
		Liquid	mm(inch)	O.D. ϕ 9.52(3/8) Flared type		O.D. ϕ 9.52(3/8) Flared type	
	Drain		mm	O.D. ϕ 32(Accessory drain hose:I.D. ϕ 32)		O.D. ϕ 32(Accessory drain hose:I.D. ϕ 32)	
Fan	Type, number of set		unit	Turbo fan-1		Turbo fan-1	
	Air Volume Control			Three-Step mode(Remote Controller)		Three-Step mode(Remote Controller)	
	Motor	Type		6-pole Single-phase induction motor		6-pole Single-phase induction motor	
		Input	kW	0.09	0.11	0.17	0.21
		Rated Output	kW	0.035		0.11	0.12
Air-heat exchanger				Louver fin type		Louver fin type	
Refngerant Control				Electronic expansion valve		Electronic expansion valve	
Refngerant				R-22		R-22	
Selety Devuces				Internal thermostat		Internal thermostat	
Accessory				Flexible drain hose		Flexible drain hose	
External Finish				ABS resin(Decorative panel)		ABS resin(Decorative panel)	
Air Filter (Factory set)				Polypropylene resin Honeycomb(Washable)		Polypropylene resin Honeycomb(Washable)	
Noise level			dB(A)	Hi40 Me37 Lo34	Hi43 Me40 Lo37	Hi44 Me40 Lo37	Hi46 Me43 Lo38
Running Adijustment	Control Switch			Remote Controller CZ-02REM51P (option)			
	Room temperature			Thermstat(Main body)			

(1) Cooling capacities are based on indoor temp. 27°C D.B. (80.6°F D.B.), 19.0°C W.D. (66.2°F W.B.) and outdoor air temp. 35°C D.B. (95°F D.B.), 24°C W.D. (75.2°F W.B.)
(2) Heating capacities are based on indoor temp. 20°C D.B. (68.0°F D.B.) and outdoor temp. 7°C D.B. (44.6°F D. B.), 6°C W.D. (42.8°F W.B.)
(3) *1 Supply duct and fresh air duct are connectable. Suppy duct requires the special parts.

ELECTRICAL DATA [INDOOR UNIT] (50Hz)

ITEM \ MODEL			CS-71UR51FB		CS-71UR 51ER	CS-80UR51FB		CS-80UR 51ER	CS-112UR51FB		CS-112UR 51ER	CS-140UR51FB		CS-140UR 51ER
Volts	V		220	230	240	220	230	240	220	230	240	220	230	240
Phase			Single	Single	Single	Single	Single	Single	Single	Single	Single	Single	Single	Single
Power Consumption	kW	Cool	0.09	0.09	0.09	0.13	0.13	0.14	0.17	0.17	0.17	0.21	0.21	0.21
		Heat	0.09	0.09	0.09	0.13	0.13	0.14	0.17	0.17	0.17	0.21	0.21	0.21
Running Current	A	Cool	0.42	0.40	0.38	0.68	0.69	0.70	0.81	0.77	0.74	0.99	0.95	0.91
		Heat	0.42	0.40	0.38	0.68	0.69	0.70	0.81	0.77	0.74	0.99	0.95	0.91
Starting Current	A		0.58	0.58	0.58	0.73	0.73	0.73	0.95	0.95	0.95	1.22	1.22	1.22
Power Factor	%	Cool	97.4	97.8	98.7	86.9	81.9	83.3	95.4	96.0	95.7	96.4	96.1	96.1
		Heat	97.4	97.8	98.7	86.9	81.9	83.3	95.4	96.0	95.7	96.4	96.1	96.1

SPECIFICATIONS (INDOOR UNIT) Hide Away type
HEAT PUMP TYPE

ITEM				1.6HP	2HP
Model Name	Power Source		220, 230V 50Hz 1 ϕ	CS-45ER51FB	CS-56ER51FB
			240V 50Hz 1 ϕ	CS-45ER51ER	CS-56ER51ER
(1)Cooling Capacity			kW kcal/h BUT/h	4.5 3,900 15,600	5.6 4,800 19,200
(2)Heating Capacity			kW kcal/h BUT/h	5.0 4,300 17,200	6.3 5,400 21,600
Standard Air Volume			m³/min(ℓ /s) cfm	Hi15 Me13 Lo11 529 459 388	Hi17 Me15 Lo13 600 529 459
External Static Pressure			mmAq Pa	7, 10 (69, 98) (Factory setting 10, 98)	
Air Inlet				Backward Suction	
Air Outlet				Front blow-out	
Outside Dimensions (H×W×D)			mm inch	385×650×790 15•5/32×25•19/32×31•7/64	385×850×790 15•5/32×33•15/32×31•7/64
Noise Level Extemal Static Pressure 7mmAq (49Pa) 10mmAq (98Pa)			dB(A)	Hi Me Lo 37 34 32 38 35 33	Hi Me Lo 37 34 32 38 35 33
Net Weight			kg lbs	42 92.6	52 114.6
Piping Connection	Refrigerant	Gas	mm(inch) mm(inch)	O.D. ϕ 12.7(1/2) Flared type O.D. ϕ 9.52(3/8) Flared type	
	Drain	Upper	mm	(At the time of setting up CZ-06DMEV4F(option), O.D. ϕ 32)	
		Lower		O.D. ϕ 32(Right and left both sides can be connected.)	
Fan	Type, number of set		unit	Sirocco fan-1	Sirocco fan-2
	Air Volume Control			Three-Step mode(Remote Controller)	
	Motor	Type		4-pole Single-phase induction motor	
		Input	kW	0.21	0.20
		Rated Output	kW	0.13	0.15
Air-heat exchanger				Louver fin type	
Refrigerant Control				Electronic expansion valve	
Refrigerant				R-22	
Safety Device				Intemal thermostat(Fan motor)	
Accessory				Flexible drain hose(I.D. ϕ 32mm)	
External Finish				Galvanized steel plate	
Running Adjustment		Control Switch		Remote Controller CZ-04REM51P(option)	
		Room temperature		Thermostat(Main Body)	
Filter Box (Option)				CZ-02FCE01	CZ-03FCE01N
Pre-filter (Option)				Long life filter(Washable) CZ-02LFE01	Long life filter(Washable) CZ-03LEF01
Middle efficiency filter (Option)				CZ-02HFE01(colormetric 70%)	CZ-03HEF01(colormetric 70%)
High-efficiency filter (Option)				CZ-02SHFE01(colormetric 90%)	CZ-03SHFE01(colormetric 90%)

ELECTRICAL DATA [INDOOR UNIT] (50Hz)

ITEM \ MODEL			CS-45ER51FB		CS-45ER 51ER	CS-56ER51FB		CS-56ER 51ER
Volts	V		220	230	240	220	230	40
Phase			Single	Single	Single	Single	Single	Single
Power Consumption	kW	Cool	0.21	0.21	0.21	0.20	0.20	0.20
		Heat	0.21	0.21	0.21	0.20	0.20	0.20
Running Current	A	Cool	0.99	0.95	0.91	0.95	0.90	0.86
		Heat	0.99	0.95	0.91	0.95	0.90	0.86
Starting Current	A		2.1	2.1	2.1	2.1	2.1	2.1
Power Factor	%	Cool	96.4	96.1	96.2	95.7	96.6	96.9
		Heat	96.4	96.1	96.2	95.7	96.6	96.9

SPECIFICATIONS (INDOOR UNIT) Hide Away type
HEAT PUMP TYPE

ITEM				2.5HP	3.0HP
Model Name	Power Source		220, 230V 50Hz 1 ϕ	CS-71ER51FB	CS-80ER51FB
			240V 50Hz 1 ϕ	CS-71ER51ER	CS-80ER51ER
(1)Cooling Capacity			kW kcal/h BUT/h	7.1 6,100 24,400	8.0 6,900 27,600
(2)Heating Capacity			kW kcal/h BUT/h	8.0 6,900 27,600	9.0 7,750 31,000
Standard Air Volume			m^3/min(ℓ /s) cfm	Hi20 Me18 Lo16 706 635 565	Hi25 Me22 Lo19 883 778 671
External Static Pressure			mmAq Pa	10, 15 (Factory setting 10) (98, 147) 98	
Air Inlet				Backward Suction	
Air Outlet				Front blow-out	
Outside Dimensions (H×W×D)			mm inch	385×850×790 15•5/32×33•15/32×31•7/64	
Noise Level Extemal Static Pressure 10mmAq (98Pa) 15mmAq (157Pa)			dB(A)	Hi Me Lo 39 36 33 42 39 36	Hi Me Lo 40 37 34 43 40 37
Net Weight			kg lbs	52 114.6	55 121.3
Piping Connection	Refrigerant	Gas	mm(inch) mm(inch)	O.D. ϕ 12.7(1/2) Flared type O.D. ϕ 9.52(3/8) Flared type	
	Drain	Upper	mm	(At the time of setting up CZ-06DMEV4F(option), O.D. ϕ 32)	
		Lower		O.D. ϕ 32(Right and left both sides can be connected.)	
Fan	Type, number of set		unit	Sirocco fan-2	
	Air Volume Control			Three-Step mode(Remote Controller)	
	Motor	Type		4-pole Single-phase induction motor	
		Input	kW	0.24	0.25
		Rated Output	kW	0.19	0.21
Air-heat exchanger				Louver fin type	
Refrigerant Control				Electronic expansion valve	
Refrigerant				R-22	
Safety Device				Intemal thermostat(Fan motor)	
Accessory				Flexible drain hose(I.D. ϕ 32mm)	
External Finish				Galvanized steel plate	
Running Adjustment		Control Switch		Remote Controller CZ-04REM51P(option)	
		Room temperature		Thermostat(Main Body)	
Filter Box (Option)				CZ-03FCE01	
Pre-filter (Option)				Long life filter(Washable) CZ-03LEF01	
Middle efficiency filter (Option)				CZ-03HFE01(colorimetric 70%)	
High-efficiency filter (Option)				CZ-03SHFE01(colorimetric 90%)	

(1) Cooling capacities are based on indoor temp. 27°C D.B. (80.6°F D.B.), 19.0°C W.D. (66.2°F W.B.) and outdoor air temp. 35°C D.B. (95°F D.B.), 24°C W.D. (75.2°F W.B.)
(2) Heating capacities are based on indoor temp. 20°C D.B. (68.0°F D.B.) and outdoor temp. 7°C D.B. (44.6°F D. B.), 6°C W.D. (42.8°F W.B.)

ELECTRICAL DATA [INDOOR UNIT] (50Hz)

ITEM \ MODEL			CS-71ER51FB		CS-71ER 51ER	CS-80ER51FB		CS-80ER 51ER
Volts	V		220	230	240	220	230	240
Phase			Single	Single	Single	Single	Single	Single
Power Consumption	kW	Cool	0.29	0.31	0.33	0.29	0.32	0.33
		Heat	0.29	0.31	0.33	0.29	0.32	0.33
Running Current	A	Cool	1.44	1.47	1.55	1.32	1.37	1.41
		Heat	1.44	1.47	1.55	1.32	1.37	1.41
Starting Current	A		2.7	2.7	2.7	3.0	3.0	3.0
Power Factor	%	Cool	98.3	98.4	98.0	95.5	95.3	95.6
		Heat	98.3	98.4	98.0	95.5	95.3	95.6

SPECIFICATIONS (INDOOR UNIT) Hide Away type
HEAT PUMP TYPE

ITEM				4HP	5HP
Model Name	Power Source		220, 230V 50Hz 1 ϕ	CS-112ER51FB	CS-140ER51FB
			240V 50Hz 1 ϕ	CS-112ER51ER	CS-140ER51ER
(1)Cooling Capacity			kW kcal/h BUT/h	11.2 9,600 38,400	14.0 12,050 48,200
(2)Heating Capacity			kW kcal/h BUT/h	12.5 10,750 43,000	16.0 13,750 55,000
Standard Air Volume			m^3/min(ℓ /s) cfm	Hi35 Me30 Lo25 1,236 1,059 883	Hi40 Me35 Lo30 1,413 1,236 1,059
External Static Pressure			mmAq Pa	10, 15 (Factory setting 15) (98, 147) (Factory setting 147)	
Air Inlet				Backward Suction	
Air Outlet				Front blow-out	
Outside Dimensions (H×W×D)			mm inch	385×1,350×790 15•5/32×53•5/32×31•7/64	
Noise Level Extemal Static Pressure 10mmAq (98Pa) 15mmAq (157Pa)			dB(A)	Hi Me Lo 41 37 34 43 40 37	Hi Me Lo 42 38 35 44 42 40
Net Weight			kg lbs	81 178.6	82 180.8
Piping Connection	Refrigerant	Gas	mm(inch) mm(inch)	O.D. ϕ 19.05(3/4) Flared type O.D. ϕ 9.52(3/8) Flared type	
	Drain	Upper	mm	(At the time of setting up CZ-06DMEV4F(option), O.D. ϕ 32)	
		Lower		O.D. ϕ 32(Right and left both sides can be connected.)	
Fan	Type, number of set		unit	Sirocco fan-2	
	Air Volume Control			Three-Step mode(Remote Controller)	
	Motor	Type		4-pole Single-phase induction motor	
		Input	kW	0.45	0.57
		Rated Output	kW	0.26	0.35
Air-heat exchanger				Louver fin type	
Refrigerant Control				Electronic expansion valve	
Refrigerant				R-22	
Safety Devices				Intemal thermostat(Fan motor)	
Accessory				Flexible drain hose(I.D. ϕ 32mm)	
External Finish				Galvanized steel plate	
Running Adjustment		Control Switch		Remote Controller CZ-04REM51P(option)	
		Room temperature		Thermostat(Main Body)	
Filter Box (Option)				CZ-06FCE01	
Pre-filter (Option)				Long life filter(Washable) CZ-06LEF01	
Middle efficiency filter (Option)				CZ-06HFE01(colorimetric 70%)	
High-efficiency filter (Option)				CZ-06SHFE01(colorimetric 90%)	

(1) Cooling capacities are based on indoor temp. 27°C D.B. (80.6°F D.B.), 19.0°C W.D. (66.2°F W.B.) and outdoor air temp. 35°C D.B. (95°F D.B.), 24°C W.D. (75.2°F W.B.)
(2) Heating capacities are based on indoor temp. 20°C D.B. (68.0°F D.B.) and outdoor temp. 7°C D.B. (44.6°F D. B.), 6°C W.D. (42.8°F W.B.)

ELECTRICAL DATA [INDOOR UNIT] (50Hz)

ITEM \ MODEL			CS-112ER51FB		CS-112ER 51ER	CS-140ER51FB		CS-140ER 51ER
Volts	V		220	230	240	220	230	240
Phase			Single	Single	Single	Single	Single	Single
Power Consumption	kW	Cool	0.45	0.45	0.45	0.49	0.52	0.51
		Heat	0.45	0.45	0.45	0.49	0.52	0.51
Running Current	A	Cool	2.18	2.09	2.00	2.28	2.31	2.15
		Heat	2.18	2.09	2.00	2.28	2.31	2.15
Starting Current	A		4.1	4.1	4.1	4.8	4.8	4.8
Power Factor	%	Cool	93.8	93.6	93.8	97.2	97.2	97.7
		Heat	93.8	93.6	93.8	97.2	97.2	97.7

SPECIFICATIONS (INDOOR UNIT) Ceiling type
HEAT PUMP TYPE

ITEM				2.5HP	4HP	5HP
Model Name	Power Source		220, 230V 50Hz 1 ϕ	CS-71TR51FB	CS-112TR51FB	CS-140TR51FB
			240V 50Hz 1 ϕ	CS-71TR51ER	CS-112TR51ER	CS-140TR51ER
(1) Cooling Capacity			kW	7.1	11.2	14.0
			kcal/h	6,100	9,600	12,050
			BTU/h	24,400	38,400	48,200
(2) Heating Capacity			kW	8.0	12.5	16.0
			kcal/h	6,900	10,750	13,750
			BTU/h	27,600	43,000	55,000
Standard Air Volume			m^3/min (ℓ /s)	Hi18 Me15 Lo13	Hi25 Me22 Lo20	Hi32 Me28 Lo24
			cfm	635 530 459	883 777 706	1130 988 847
External Static Pressure			mmAq	—		
			Pa	—		
Air Inlet				Bottom Suction		
Air Outlet				Front Blow-out		
Outside Dimensions (H x W x D)			mm	195X1260X650	250X1260X700	250X1600X700
			inch	7-43/64X49-39/64X25-10/32	9-27/32X49-39/64X27-9/16	9-27/32X63X27-9/16
Noise Level			dB (A)	Hi40 Me38 Lo37	Hi44 Me42 Lo40	
Net Weight			kg	36	45	56
			lbs	79.2	99	123.2
Piping Connection	Refrigerant	Gas	mm (inch)	O.D. ϕ 12.7 (1/2) Flared type	O.D. ϕ 19.05 (3/4) Flared type	
		Liquid	mm (inch)	O.D. ϕ 9.52 (3/8) Flared type		
	Drain		mm	O.D. ϕ 32 (Accessory drain hose: I.D. ϕ 32)		
Fan	Type, number of set		unit	Sirocco fan-4	Sirocco fan-3	Sirocco fan-4
	Air Volume Control			Three-Step mode (Remote Controller)		
	Motor	Type		4-pole Single-phase induction motor		
		Input	kW	0.09	0.13	0.16
		Rated Output	kW	0.05	0.08	0.12
Air-heat exchanger				Louver fin type		
Refrigerant Control				Electronic expansion valve		
Refrigerant				R-22		
Safety Devices				Internal thermostat		
Accessory				Flexible drain hose		
External Finish				Galvanized steel plate finished with baked acrylic-resin		
Air Filter (Factory set)				Polyropylene resin Honeycomb (Washable)		
Running Adijustment	Control Switch			Remote Controller CZ-01REM51P (option)		
	Room temperature			Thermstat(Main body)		

(1) Cooling capacities are based on indoor temp. 27°C D.B. (80.6°F D.B.), 19.0°C W.D. (66.2°F W.B.) and outdoor air temp. 35°C D.B. (95°F D.B.), 24°C W.D. (75.2°F W.B.)
(2) Heating capacities are based on indoor temp. 20°C D.B. (68.0°F D.B.) and outdoor temp. 7°C D.B. (44.6°F D. B.), 6°C W.D. (42.8°F W.B.)

ELECTRICAL DATA Ceiling[INDOOR UNIT] (50Hz)

ITEM / MODEL			CS-71TR51FB		CS-71TR 51ER	CS-112TR51FB		CS-112TR 51ER	CS-140TR51FB		CS-140TR 51ER
Volts	V		220	230	240	220	230	240	220	230	240
Phase			Single	Single	Single	Single	Single	Single	Single	Single	Single
Power Consumption	kW	Cool	0.09	0.09	0.09	0.13	0.13	0.13	0.16	0.16	0.16
		Heat	0.09	0.09	0.09	0.13	0.13	0.13	0.16	0.16	0.16
Running Current	A	Cool	0.45	0.43	0.42	0.64	0.61	0.58	0.80	0.77	0.73
		Heat	0.45	0.43	0.42	0.64	0.61	0.58	0.80	0.77	0.73
Starting Current	A		1.0	1.0	1.0	1.5	1.5	1.5	1.6	1.6	1.6
Power Factor	%	Cool	90.9	91.0	89.3	92.3	92.6	93.4	90.9	90.3	91.3
		Heat	90.9	91.0	89.3	92.3	92.6	93.4	90.9	90.3	91.3

SPECIFICATIONS (INDOOR UNIT) Wall type
HEAT PUMP TYPE

ITEM				0.8HP	1.6HP	2HP	2.5HP
Model Name	Power Source		220, 230V 50Hz 1 ϕ	CS-22KR51FB	CS-45KR51FB	CS-56KR51FB	CS-71KR51FB
			240V 50Hz 1 ϕ	CS-22KR51ER	CS-45KR51ER	CS-56KR51ER	CS-71KR51ER
(1)Cooling Capacity			kW	2.2	4.5	5.6	7.1
			kcal/h	1,900	3,900	4,800	6,100
			BUT/h	7,600	15,600	19,200	24,400
(2)Heating Capacity			kW	2.5	5.0	6.3	8.0
			kcal/h	2,200	4,300	5,400	6,900
			BUT/h	7,600	17,200	21,600	27,600
Standard Air Volume			m^3/min(ℓ /s)	Hi13 Me11 Lo9	Hi14 Me12 Lo10	Hi18 Me16 Lo13	Hi18 Me16 Lo13
			cfm	459 388 318	494 424 353	636 565 459	636 565 459
External Static Pressure			mmAq	0	0	0	0
			Pa	0	0	0	0
Air Inlet				Front sunction			
Air Outlet				Front blow-out			
Outside Dimensions (H×W×D)			mm	360×1,130×200	360×1,130×200	360×1,390×200	360×1,390×200
			inch	14•11/64×44•31/64×7•7/8	14•11/64×44•31/64×7•7/8	14•11/64×54•23/32×7•7/8	14•11/64×54•23/32×7•7/8
Noise Level			dB(A)	Hi38 Me35 Lo33	Hi39 Me36 Lo34	Hi40 Me37 Lo35	Hi40 Me37 Lo35
Net Weight			kg	18	18	22	22
			lbs	39.7	39.7	48.5	48.5
Piping Connection	Refrigerant	Gas	mm(inch)	O.D. ϕ 12.7(1/2) Flared type			
		Liquid	mm(inch)	O.D. ϕ 9.52(3/8) Flared type			
	Drain		mm	O.D. ϕ 20			
Fan	Type, number of set		unit	Cross-flow fan-1			
	Air Volume Control			Three-Step mode(Remote Controller)			
	Motor	Type		4-pole Single-phase induction motor			
		Input	kW	0.04	0.04	0.05	0.05
		Rated Output	kW	0.02	0.02	0.025	0.025
Air-heat exchanger				Louver fin type			
Refrigerant Control				Electronic expansion valve			
Refrigerant				R-22			
Safety Device				Internal thermostat(Fan motor)			
Accessory				Installation panel Felxible drain hose			
External Finish				Galvanized steel plate finished with baked acrylic-resin			
Air Filter (Factory set)				Polyropylene resin Honeycomb(Washable)			
Running Adjustment	Control Switch			Remote Controller CZ-06REM51P(option)			
	Room temperature			Thermstat(Main body)			

(1) Cooling capacities are based on indoor temp. 27°C D.B. (80.6°F D.B.), 19.0°C W.D. (66.2°F W.B.) and outdoor air temp. 35°C D.B. (95°F D.B.), 24°C W.D. (75.2°F W.B.)
(2) Heating capacities are based on indoor temp. 20°C D.B. (68.0°F D.B.) and outdoor temp. 7°C D.B. (44.6°F D. B.), 6°C W.D. (42.8°F W.B.)

ELECTRICAL DATA [INDOOR UNIT] (50Hz)

ITEM \ MODEL			CS-22KR51FB		CS-22KR 51ER	CS-45KR51FB		CS-45KR 51ER	CS-56KR51FB		CS-56KR 51ER	CS-71KR51FB		CS-71KR 51ER
Volts	V		220	230	240	220	230	240	220	230	240	220	230	240
Phase			Single	Single	Single	Single	Single	Single	Single	Single	Single	Single	Single	Single
Power Consumption	kW	Cool	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05
		Heat	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05
Running Current	A	Cool	0.19	0.18	0.18	0.19	0.18	0.18	0.24	0.23	0.22	0.24	0.23	0.22
		Heat	0.19	0.18	0.18	0.19	0.18	0.18	0.24	0.23	0.22	0.24	0.23	0.22
Starting Current	A		0.31	0.31	0.31	0.31	0.31	0.31	0.39	0.39	0.39	0.39	0.39	0.39
Power Factor	%	Cool	95.7	96.6	92.6	95.7	96.6	92.6	94.7	94.5	94.7	94.7	94.5	94.7
		Heat	95.7	96.6	92.6	95.7	96.6	92.6	94.7	94.5	94.7	94.7	94.5	94.7

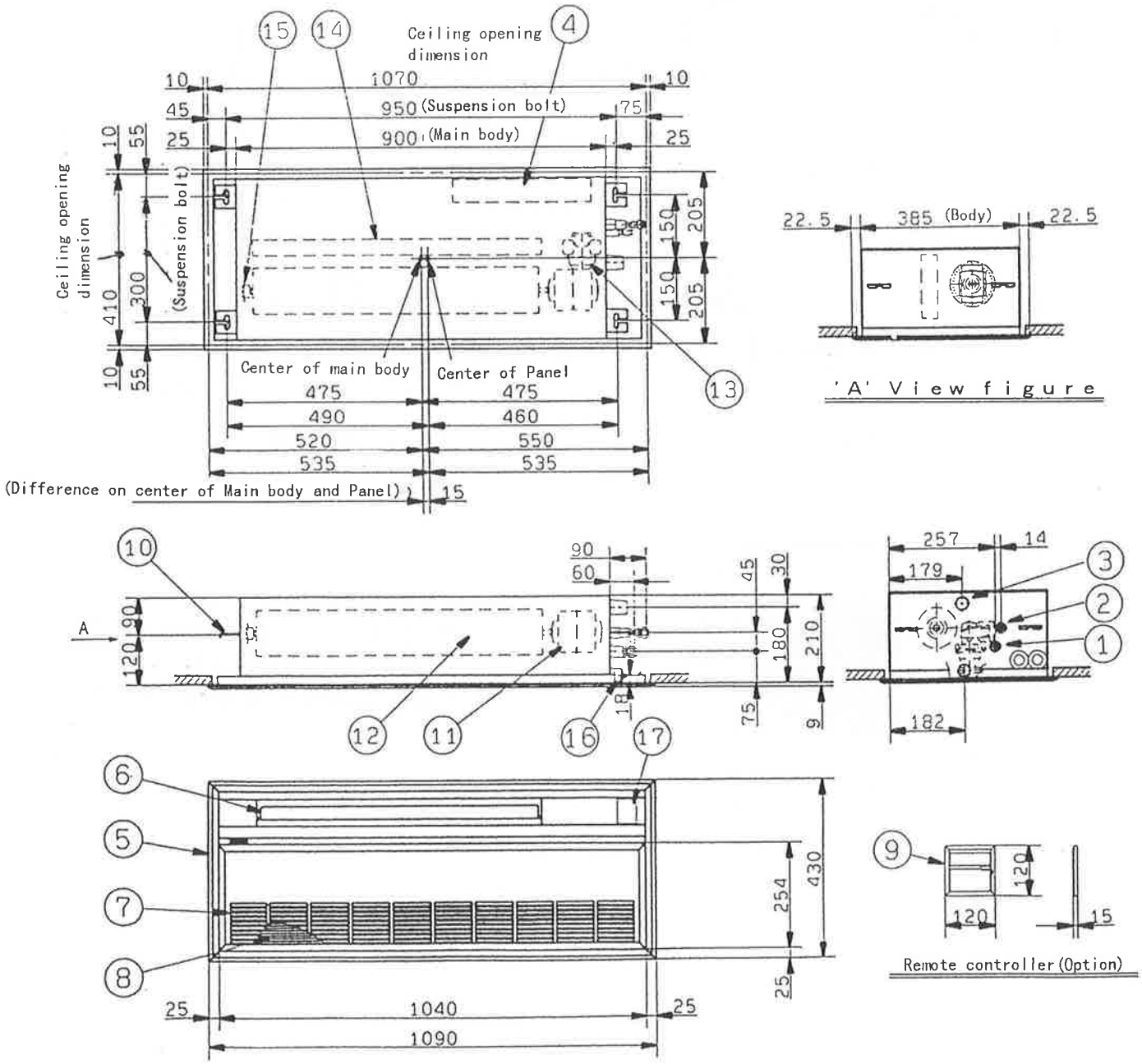
2.OUTSIDE DIMENSION

One-way cassete type

■Heat pump type

CS-28DR51FB
CS-28DR51ER
Decorative panel
CZ-01KPD01P

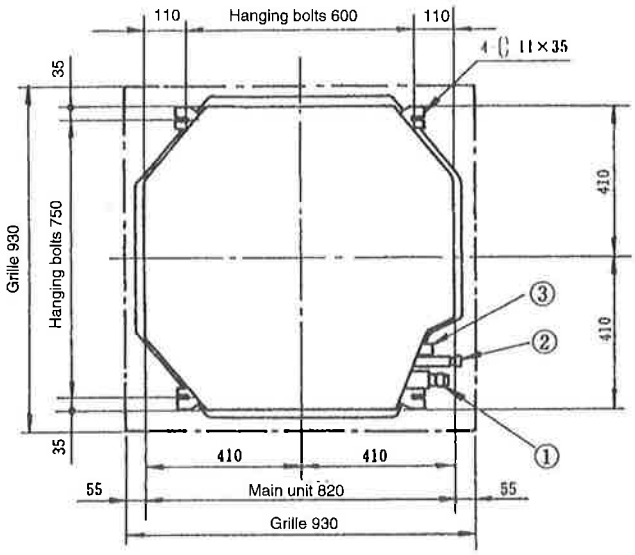
No.	NAME	QTY PER UNIT	Remarks	No.	NAME	QTY PER UNIT	Remarks
1	Gas-side pipe connection port	1	O.D.s12.7mm(flare type)	10	Suspension braket	4	
2	Liquid-side pipe connection port	1	O.D. ϕ9.52mm(flare type)	11	Fan motor	1	
3	Drain pipe connection port	1	O.D. ϕ32mm	12	Cross-flow fan	1	
4	Control box	1		13	Drain- up motor	1	
5	Decoratie panel	1		14	Heat exchanger	1	
6	Air outlet	1		15	Bearing	1	
7	Air Inlet	1		16	Emergency drain port	1	O.D. ϕ20mm
8	Air filter	1	Long-life filter	17	Receiver unit position for Wireless remote controller	—	
9	Remote controller(Option)	1					



Four-way cassette type

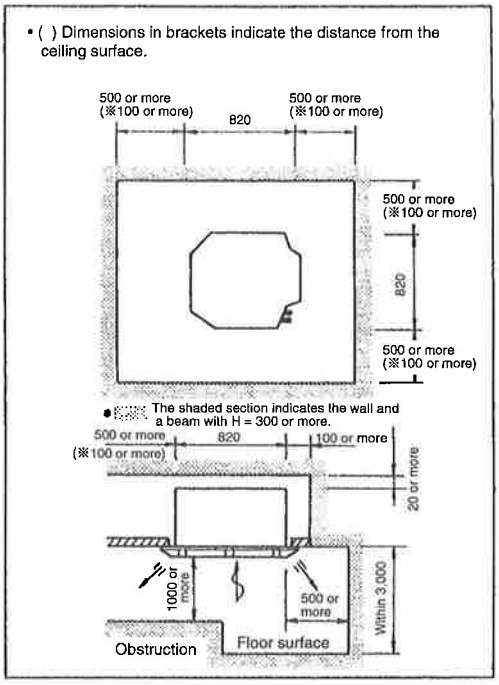
■Heat pump type

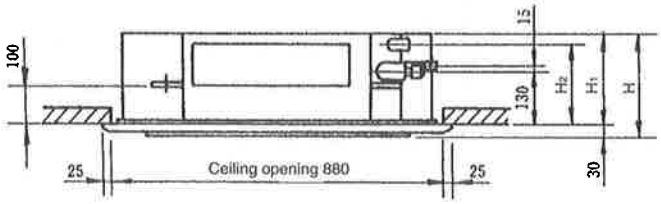
CS-45UR51FB
CS-45UR51ER
CS-56UR51FB
CS-56UR51ER
CS-71UR51FB
CS-71UR51ER
CS-80UR51FB
CS-80UR51ER



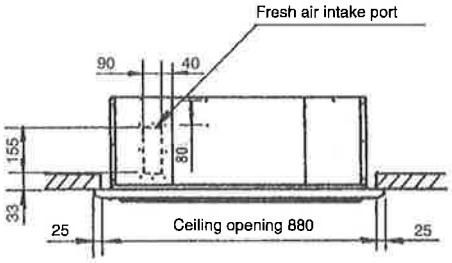
Top view

■Space required for installation

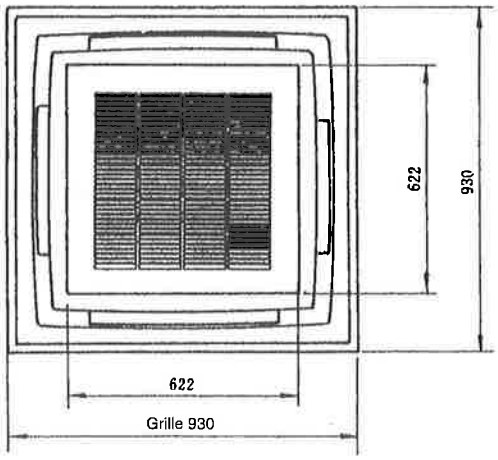


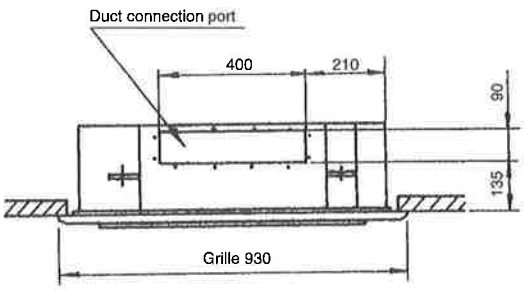


Front view



Left view





Rear view

No.	Name	Qty.	Remarks
1	Gas pipe connection port	1	Flare type, outer dia. φ 12.7 mm
2	Liquid pipe connection port	1	Flare type, outer dia. φ 9.52 mm
3	Drain pipe connection port	1	VP25 (accessory hose inner dia φ 32 L = 170)

(Units: mm)

Dimensions H

MODEL TYPE	H	H_1	H_2
CS-45UR CS-56UR	270	240	210
CS-71UR CS-80UR	320	290	260

※Decorative panel product no.: CZ-03KPV5P(Panasonic)

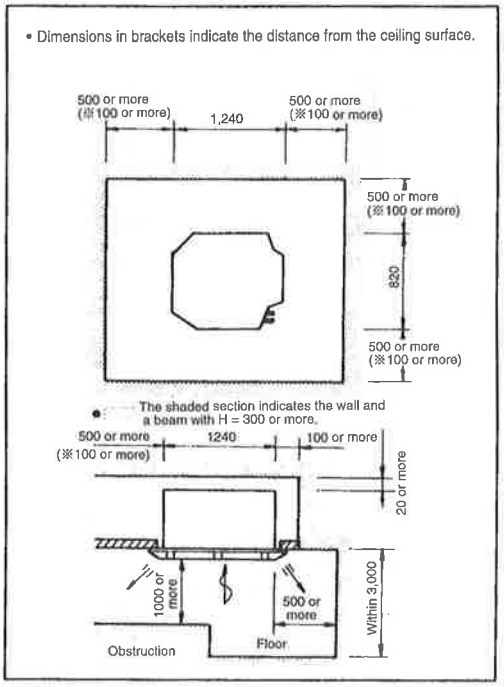
NOTE
Leave 10mm or more of space between the top of the unit and the ceiling slab.

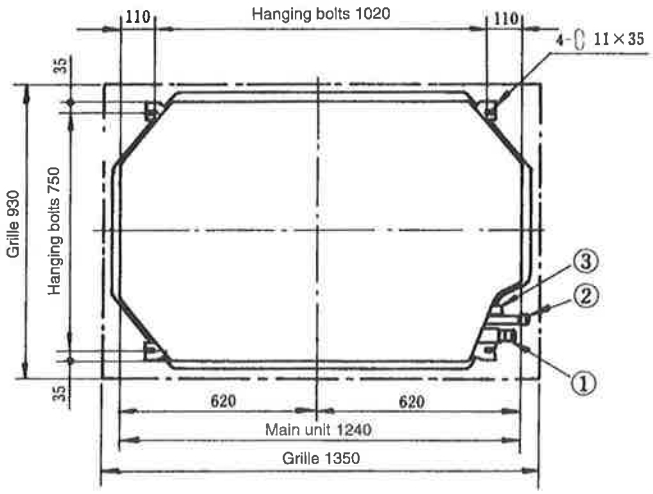
Four-way cassette type

■Heat pump type

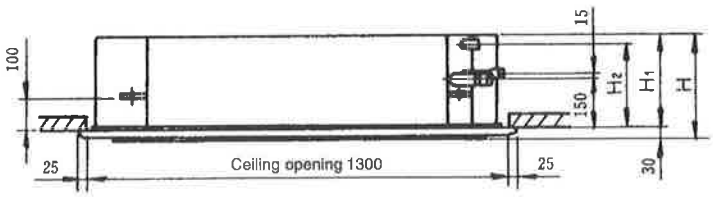
CS-112UR51FB
CS-112UR51ER
CS-140UR51FB
CS-140UR51ER

■Space required for installation

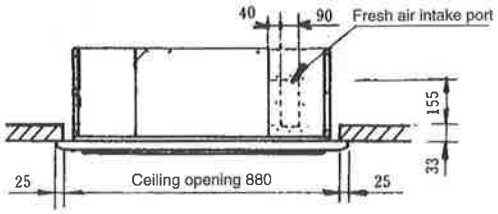




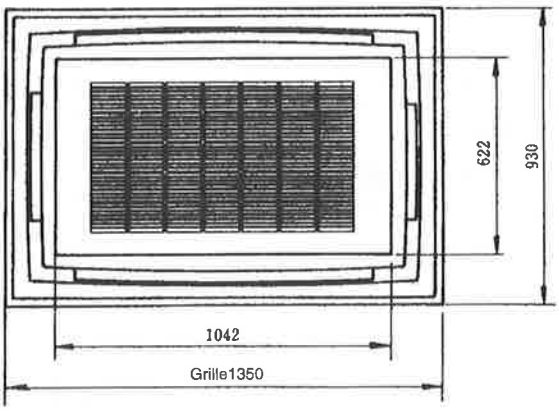
Top view

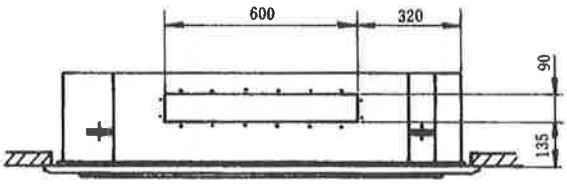


Front view



Left view





Rear view

No.	Name	Qty.	Remarks
1	Gas pipe connection port	1	Flare type, outer dia. φ 19.05 mm
2	Liquid pipe connection port	1	Flare type, outer dia. φ 9.52 mm
3	Drain pipe connection port	1	VP25 (accessory hose inner dia φ 32 L=170)

(Units: mm)

Dimensions H (Units: mm)

	H	H_1	H_2
CS-112UR	320	290	260
CS-140UR	350	320	290

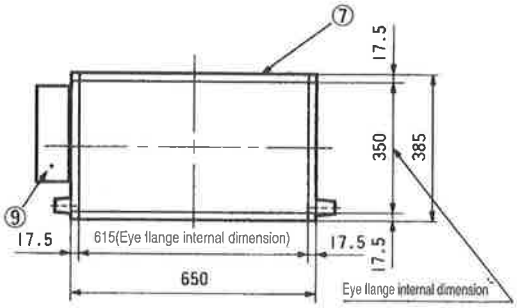
※Decorative panel product no.: CZ-06KPV5P (Panasonic)

NOTE
Leave 10mm or more of space between the top of the unit and the ceiling slab.

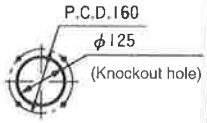
Hide-Away type

■Heat pump type

CS-45ER51FB
CS-45ER51ER



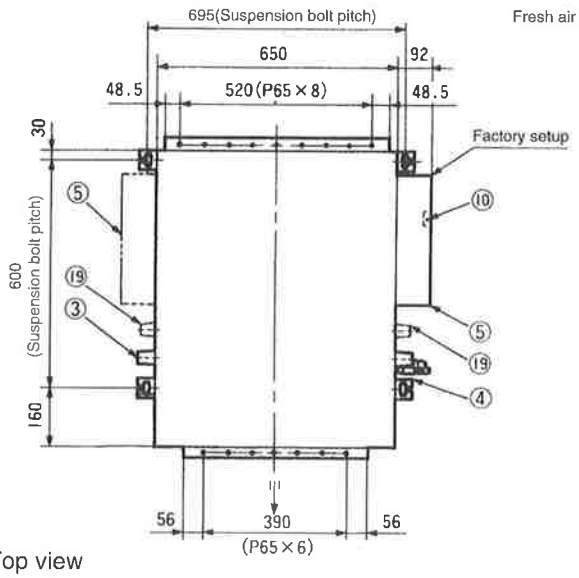
Rear view (suction side)



Fresh air inlet port detail

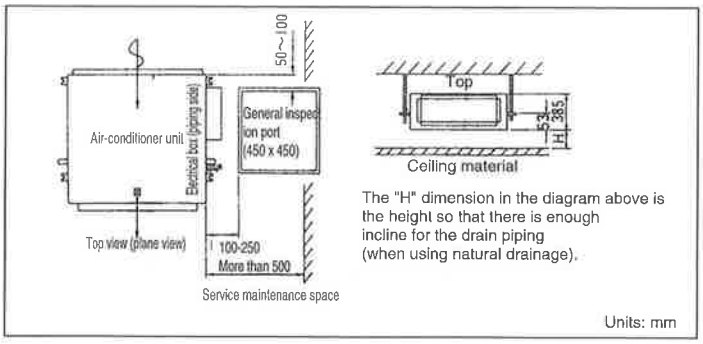
No.	Name	No.	Remarks
1	Gas-side pipe connection port	1	O.D. ø 12.7 mm (flare type)
2	Liquid-side pipe connection port	1	O.D. ø 9.52 mm (flare type)
3	Drain pipe connection port	2	O.D. ø 32 mm (natural water discharge)
4	Suspension bracket	4	4-C=11X35
5	Control box	1	
6	Discharge duct connection port	1	
7	Suction duct connection port	1	
8	Fresh air inlet port	2	Use the one without the control box
9	Earth terminal	1	M4 screw
10	Power supply inlet port	1	
11	Suction temperature sensor	1	
14	Circular duct discharge connection port (optional part)	2	For connection of circular-type flexible duct (O.D. ø 200 mm)
15	Filter box (optional part)	1	
16	Pre-filter (optional part)	1	346 x 600 x 20 (two divisions)
17	Mid/high-efficiency filter (optional part)	1	346 x 615 x 70 (two divisions)
18	Drain-up unit (optional part)	1	
19	Drain pipe connection port	1	O.D. 32 (optional parts)

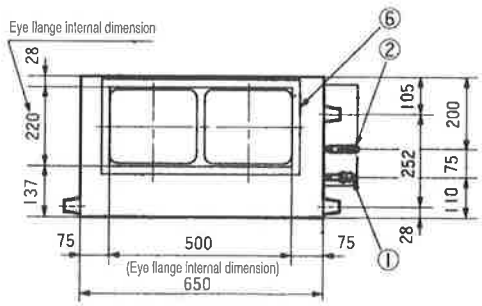
Note:Leave at least 10mm between the top of the unit and the ceiling



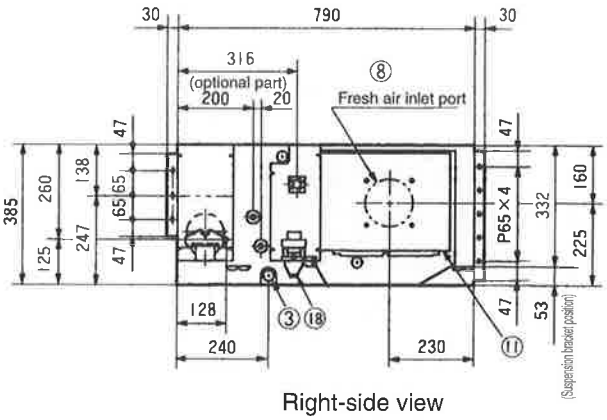
Top view
(3, 5, and 19 can be installed on either the left or right)

• Installation space requirements

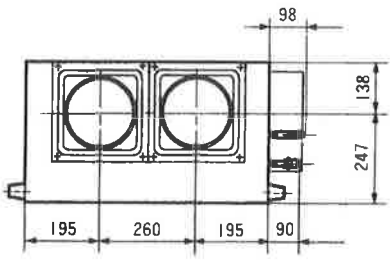




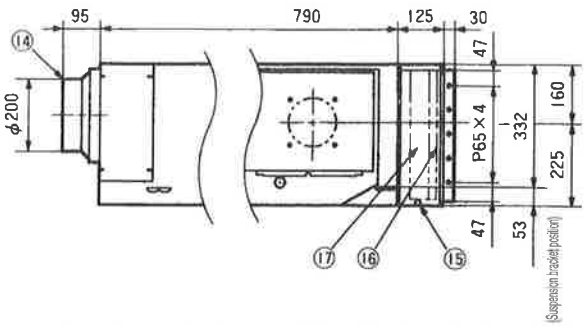
Front view (discharge side)



Right-side view



Front view (when optional circular flange is installed)



Side view of the circular flange

When filter box is installed (optional part)

Units: mm

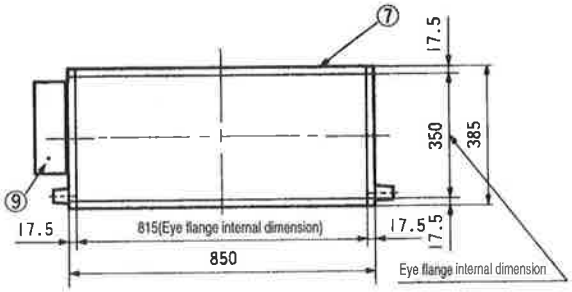
Hide-Away type

■Heat pump type

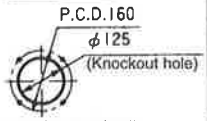
CS-56ER51FB
CS-56ER51ER
CS-71ER51FB
CS-71ER51ER
CS-80ER51FB
CS-80ER51ER

No.	Name	No.	Remarks
1	Gas-side pipe connection port	1	O.D. ø 12.7 mm (flare type)
2	Liquid-side pipe connection port	1	O.D. ø 9.52 mm (flare type)
3	Drain pipe connection port	2	O.D. ø 32 mm (natural water discharge)
4	Suspension bracket	4	
5	Control box	1	
6	Discharge duct connection port	1	
7	Suction duct connection port	1	
8	Fresh air inlet port	2	Use the one without the control box
9	Earth terminal	1	M4 screw
10	Power supply inlet port	1	
11	Suction temperature sensor	1	
14	Circular duct discharge connection port (optional part)	2	For connection of circular-type flexible duct (O.D. ø 200 mm)
15	Filter box (optional part)	1	
16	Pre-filter (optional part)	1	346 x 800 x 20 (two divisions)
17	Mid/high-efficiency filter (optional part)	1	346 x 815 x 70 (two divisions)
18	Drain-up unit (optional part)	1	
19	Drain pipe connection port	1	O.D. 32 (optional parts)

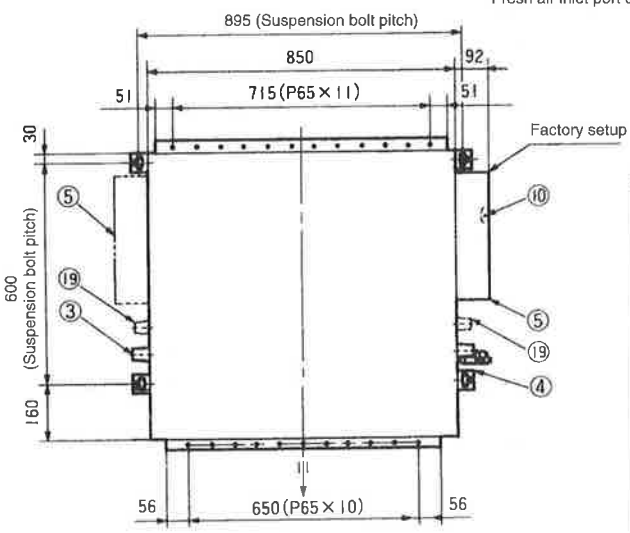
Note:Leave at least 10mm between the top of the unit and the ceiling



Rear view (suction side)

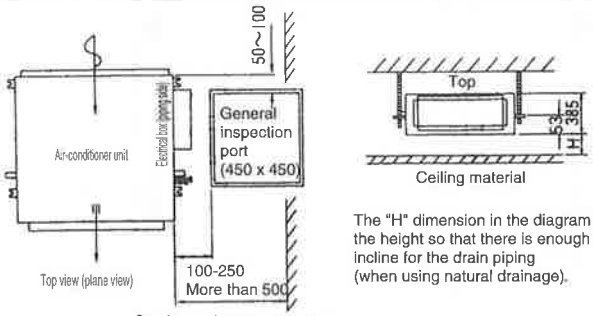


Fresh air inlet port detail

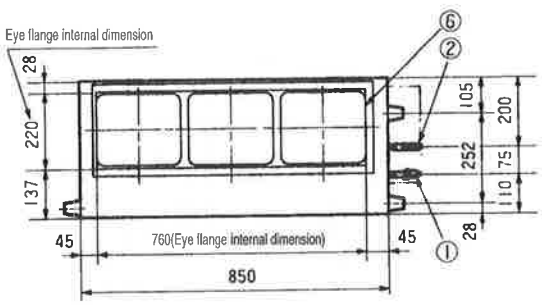


Top view
(3, 5, and 19 can be installed on either the left or right)

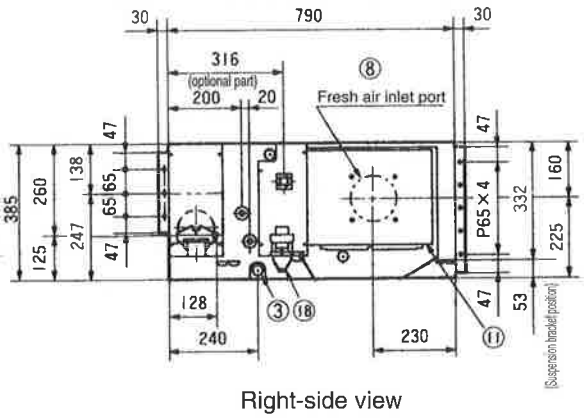
- Installation space requirements



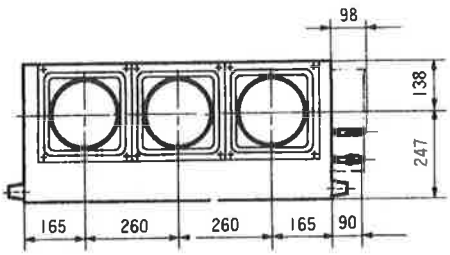
Units: mm



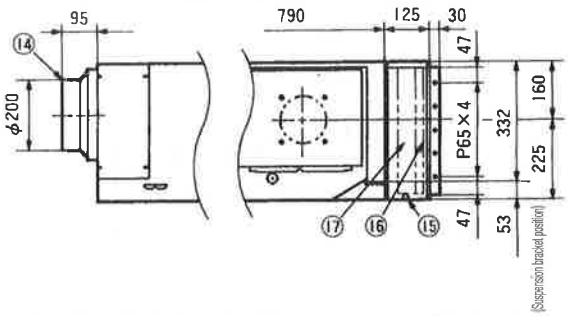
Front view (discharge side)



Right-side view



Front view (when optional circular flange is installed)



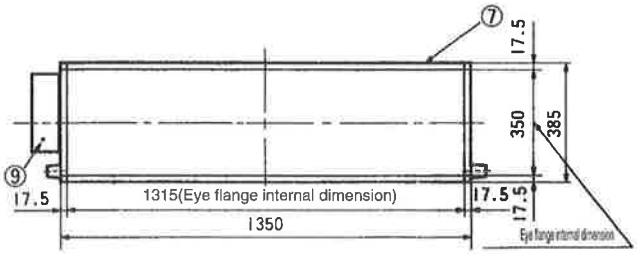
Side view of the circular flange When filter box is installed (optional part)

Units: mm

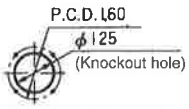
Hide-Away type

■Heat pump type

CS-112ER51FB
CS-112ER51ER
CS-140ER51FB
CS-140ER51ER



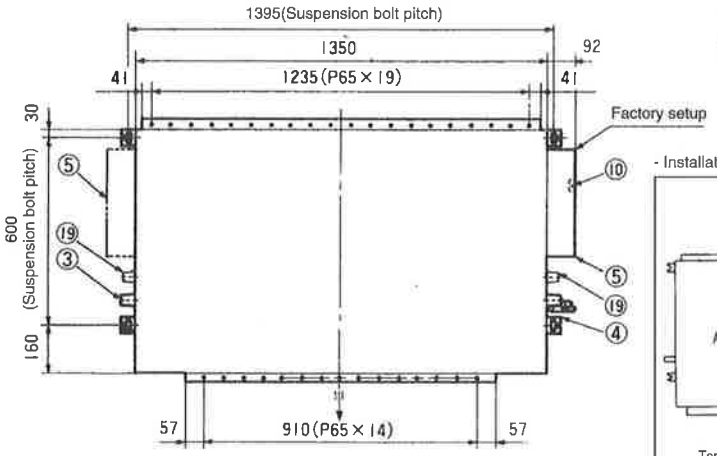
Rear view (suction side)



Fresh air inlet port detail

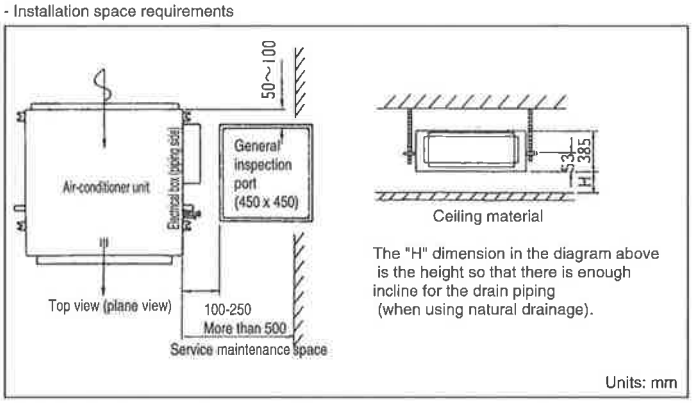
No.	Name	No.	Remarks
1	Gas-side pipe connection port	1	O.D. ø 12.7 mm (flare type)
2	Liquid-side pipe connection port	1	O.D. ø 9.52 mm (flare type)
3	Drain pipe connection port	2	O.D. ø 32 mm (natural water discharge)
4	Suspension bracket	4	4-C=11X35
5	Control box	1	
6	Discharge duct connection port	1	
7	Suction duct connection port	1	
8	Fresh air inlet port	2	Use the one without the control box
9	Earth terminal	1	M4 screw
10	Power supply inlet port	1	
11	Suction temperature sensor	1	
14	Circular duct discharge connection port (optional part)	2	For connection of circular-type flexible duct (O.D. ø 200 mm)
15	Filter box (optional part)	1	
16	Pre-filter (optional part)	1	346 x 1300 x 20 (two divisions)
17	Mid/high-efficiency filter (optional part)	1	346 x 1315 x 70 (two divisions)
18	Drain-up unit (optional part)	1	
19	Drain pipe connection port	1	O.D. 32 (optional parts)

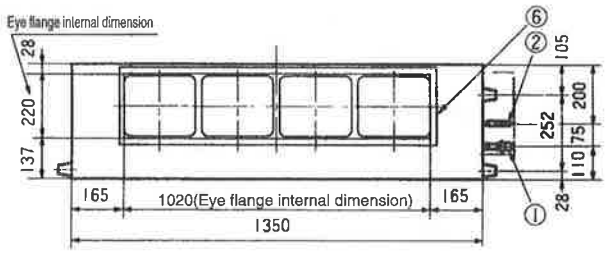
Note:Leave at least 10mm between the top of the unit and the ceiling



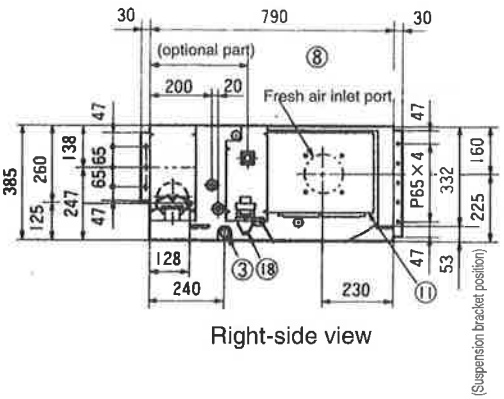
Front view
(3, 5, 12 and 19 can be installed on either the left or right)

- Installation space requirements

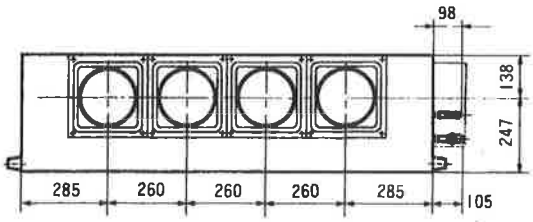




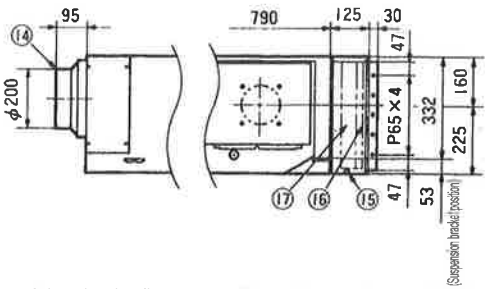
Front view (discharge side)



Right-side view



Front view (when optional circular flange is installed)



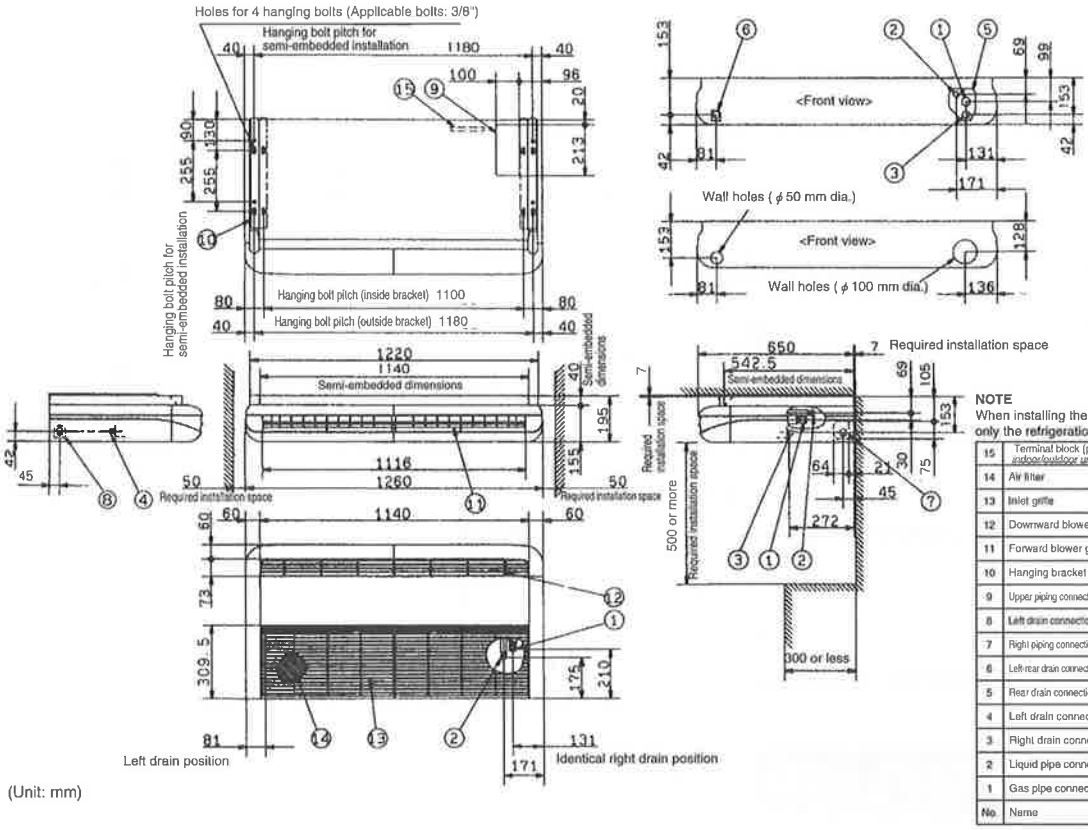
Side view of the circular flange

When filter box is installed (optional part)

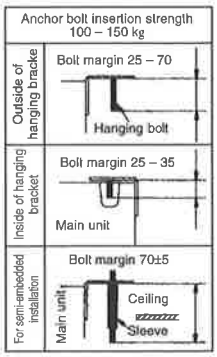
Units: mm

Ceilinge type

■Heat pump type···CS-71TR51FB,CS-71TR51ER



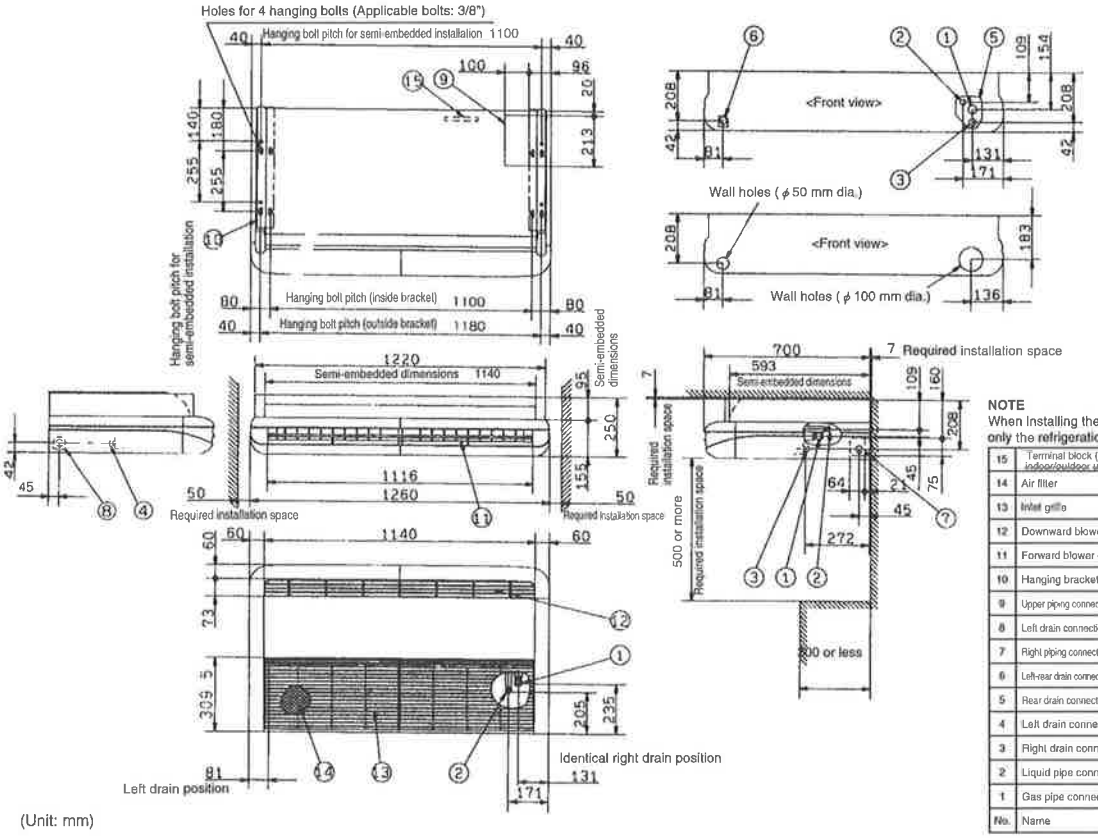
(Unit: mm)



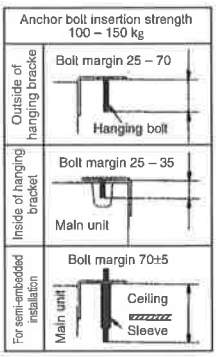
NOTE
When installing the raised draining mechanism (sold separately), only the refrigeration hoses can be connected as above.

No.	Name	Qty.	Remarks
15	Terminal block (power supply, indoor/outdoor unit connection)	1	
14	Air filter	2	
13	Inlet grille	2	
12	Downward blower grille	—	
11	Forward blower grille	—	
10	Hanging bracket	1 each at left & right	
9	Upper piping connection through hole	1	Slit (refrigerant & drain pipes)
8	Left drain connection through hole	1	Slit (drain pipe)
7	Right piping connection through hole	1	Slit (refrigerant & drain pipes)
6	Left-rear drain connection through hole	1	Slit (drain pipe)
5	Rear drain connection through hole	1	Slit (refrigerant & drain pipes)
4	Left drain connection port	1	Outer dia. 20
3	Right drain connection port	1	Outer dia. 20
2	Liquid pipe connection port	1	Outer dia. φ9.52 with flare
1	Gas pipe connection port	1	Outer dia. φ12.7 with flare

■Heat pump type···CS-112TR51FB,CS-112TR51ER



(Unit: mm)

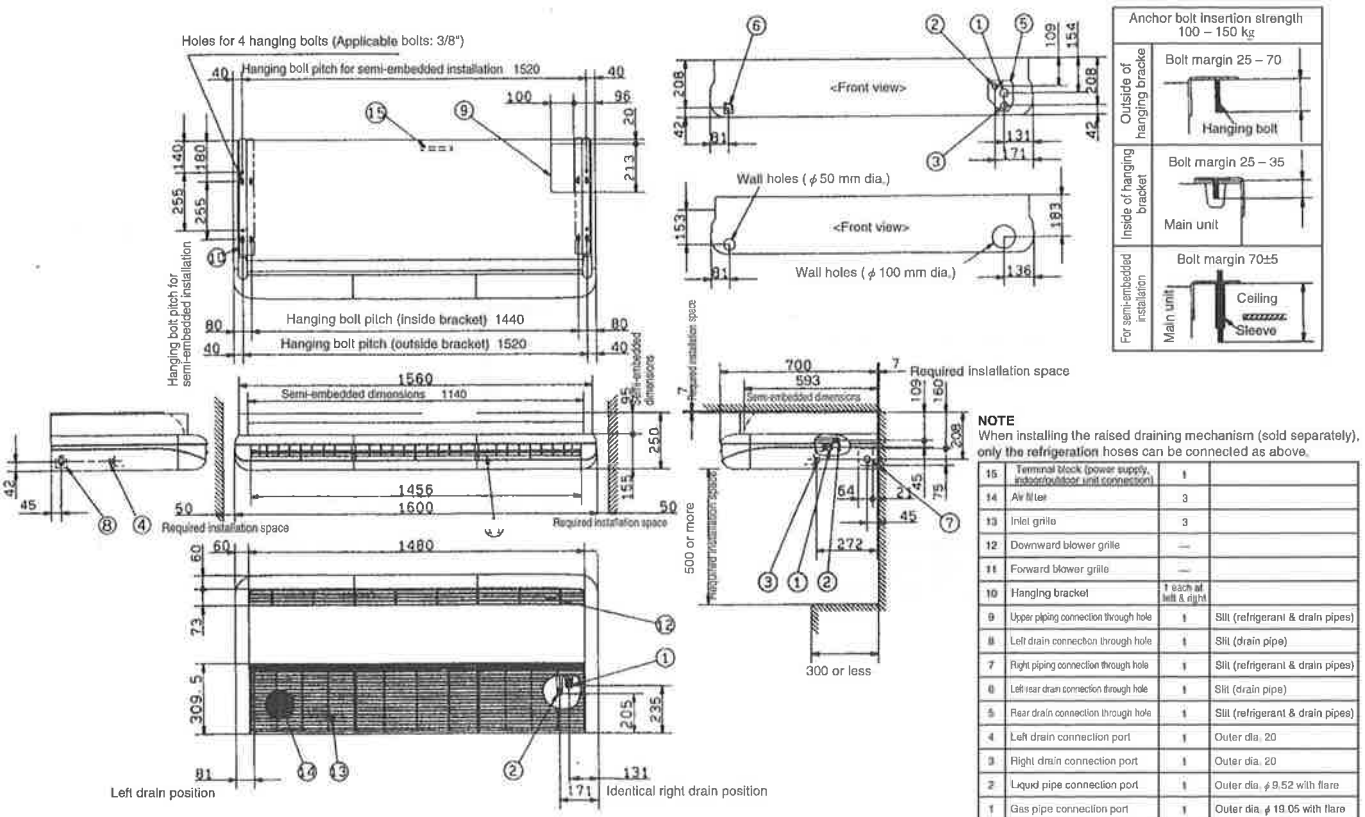


NOTE
When installing the raised draining mechanism (sold separately), only the refrigeration hoses can be connected as above.

No.	Name	Qty.	Remarks
15	Terminal block (power supply, indoor/outdoor unit connection)	1	
14	Air filter	2	
13	Inlet grille	2	
12	Downward blower grille	—	
11	Forward blower grille	—	
10	Hanging bracket	1 each at left & right	
9	Upper piping connection through hole	1	Slit (refrigerant & drain pipes)
8	Left drain connection through hole	1	Slit (drain pipe)
7	Right piping connection through hole	1	Slit (refrigerant & drain pipes)
6	Left-rear drain connection through hole	1	Slit (drain pipe)
5	Rear drain connection through hole	1	Slit (refrigerant & drain pipes)
4	Left drain connection port	1	Outer dia. 20
3	Right drain connection port	1	Outer dia. 20
2	Liquid pipe connection port	1	Outer dia. φ9.52 with flare
1	Gas pipe connection port	1	Outer dia. φ19.05 with flare

Ceiling type

■Heat pump type···CS-140TR51FB,CS-140TR51ER



(Unit: mm)

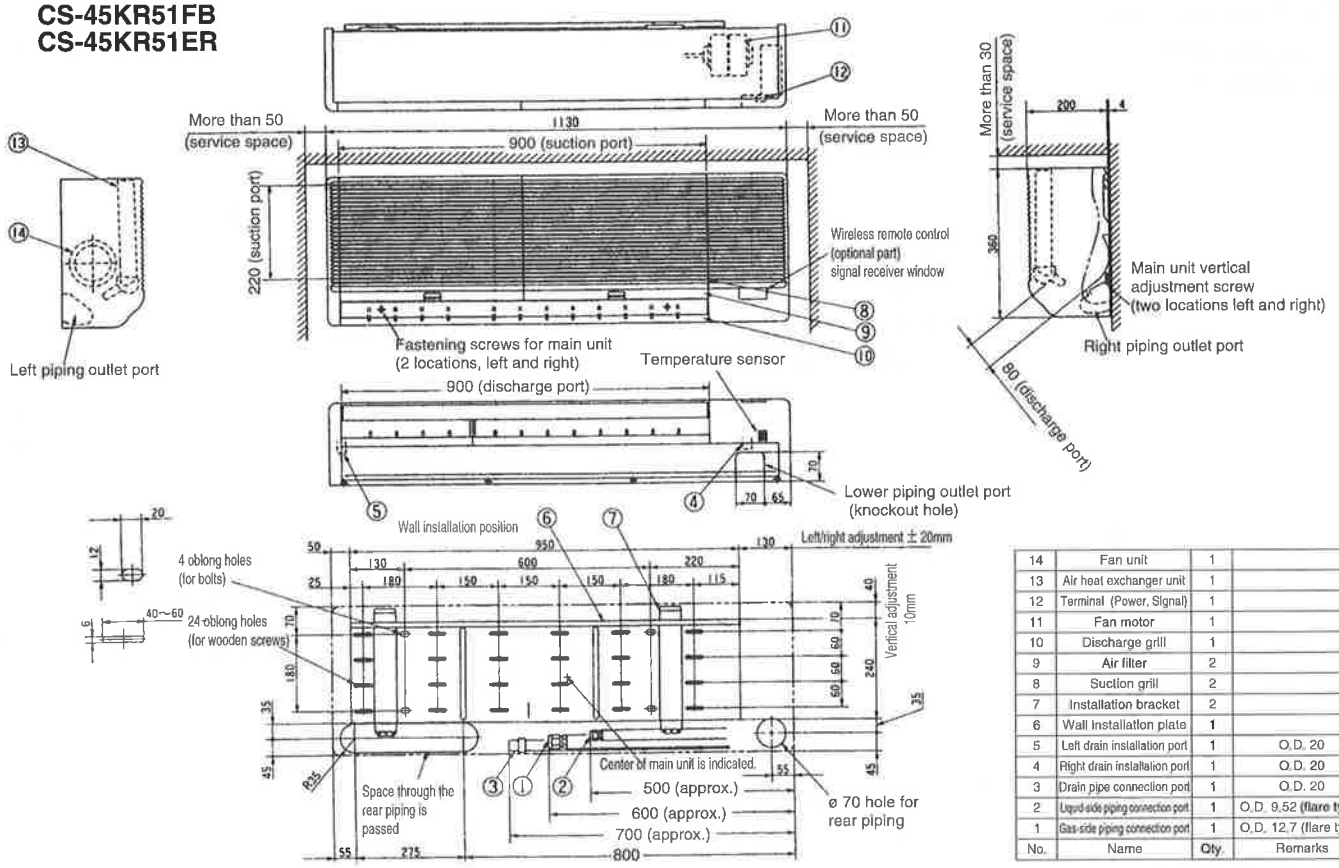
NOTE
When installing the raised draining mechanism (sold separately), only the refrigeration hoses can be connected as above.

No.	Name	Qty.	Remarks
15	Terminal block (power supply, indoor/outdoor unit connection)	1	
14	Air filter	3	
13	Inlet grille	3	
12	Downward blower grille	—	
11	Forward blower grille	—	
10	Hanging bracket	1 each at left & right	
9	Upper piping connection through hole	1	Slit (refrigerant & drain pipes)
8	Left drain connection through hole	1	Slit (drain pipe)
7	Right piping connection through hole	1	Slit (refrigerant & drain pipes)
6	Left rear drain connection through hole	1	Slit (drain pipe)
5	Rear drain connection through hole	1	Slit (refrigerant & drain pipes)
4	Left drain connection port	1	Outer dia. 20
3	Right drain connection port	1	Outer dia. 20
2	Liquid pipe connection port	1	Outer dia. φ9.52 with flare
1	Gas pipe connection port	1	Outer dia. φ19.05 with flare

Wall type

■Heat pump type

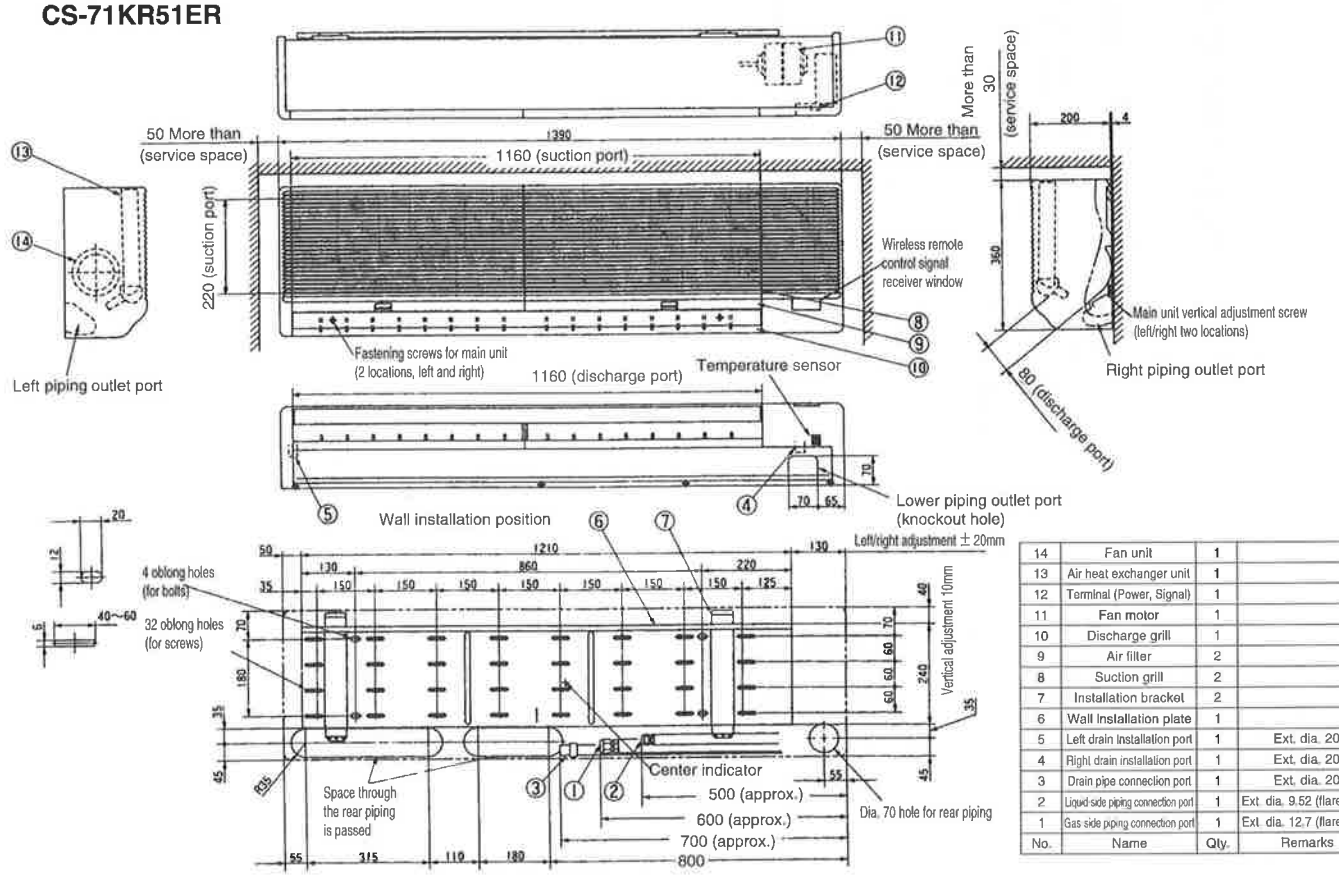
CS-22KR51FB
CS-22KR51ER
CS-45KR51FB
CS-45KR51ER



No.	Name	Qty.	Remarks
14	Fan unit	1	
13	Air heat exchanger unit	1	
12	Terminal (Power, Signal)	1	
11	Fan motor	1	
10	Discharge grill	1	
9	Air filter	2	
8	Suction grill	2	
7	Installation bracket	2	
6	Wall installation plate	1	
5	Left drain installation port	1	O.D. 20
4	Right drain installation port	1	O.D. 20
3	Drain pipe connection port	1	O.D. 20
2	Liquid-side piping connection port	1	O.D. 9.52 (flare type)
1	Gas-side piping connection port	1	O.D. 12.7 (flare type)

■Heat pump type

CS-56KR51FB
CS-56KR51ER
CS-71KR51FB
CS-71KR51ER



No.	Name	Qty.	Remarks
14	Fan unit	1	
13	Air heat exchanger unit	1	
12	Terminal (Power, Signal)	1	
11	Fan motor	1	
10	Discharge grill	1	
9	Air filter	2	
8	Suction grill	2	
7	Installation bracket	2	
6	Wall installation plate	1	
5	Left drain installation port	1	Ext. dia. 20
4	Right drain installation port	1	Ext. dia. 20
3	Drain pipe connection port	1	Ext. dia. 20
2	Liquid-side piping connection port	1	Ext. dia. 9.52 (flare type)
1	Gas-side piping connection port	1	Ext. dia. 12.7 (flare type)

Units: mm

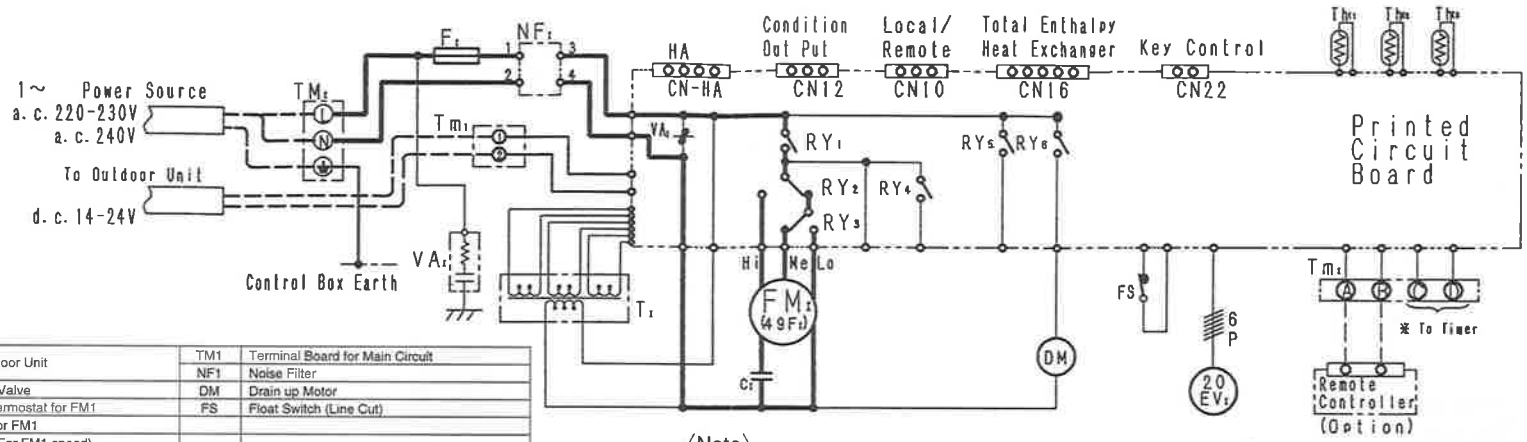
3.CIRECUIT DIAGRAM

One way cassette type

■Heat pump type

CS-28DR51FB
CS-28DR51ER

ELECTRIC CIRCUIT DIAGRAM



LEGEND

Indoor Unit		TM1	Terminal Board for Main Circuit
		NF1	Noise Filter
20EV1	Expansion Valve	DM	Drain up Motor
49F1	Internal Thermostat for FM1	FS	Float Switch (Line Cut)
C1	Capacitor for FM1		
Cn	Connector(For FM1 speed)		
F1	Fuse 250V T5A	Printed Wiring Board	
FM1	Fan Motor(Indoor Unit)	RY1-7	Relay for IC Control
T1	Transformer	Th11	Thermistor(Indoor Temperature)
Tm1	Terminal Board for Control Circuit	Th12	Thermistor(Indoor Heat Exchanger Entrance)
VA1	Varistor	Th13	Thermistor(Indoor Heat Exchanger Exit)
		VA1	Varistor

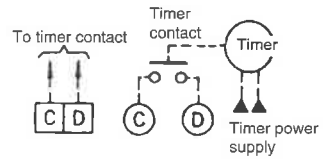
〈Note〉
※For use of a timer(locally supplied)
1-1 Connect the contactor of the timer to "Tm1" Ⓒ and Ⓓ

Relay / Operation / Relay-ON	RY1	RY2	RY3	RY4
	Indoor fan Motor-ON	Indoor Fan Motor Speed (Hi Me Lo)		Swing Motor-ON

Symbol table

Indoor unit				
20EV1	Electromagnetic expansion valve (indoor unit)	T1		Transformer
49F1	Internal thermo (for FM1)	NF1		Noise filter
FM1	Fan motor			
DM	Drain discharge motor (sold separately)			
C1	Capacitor (for FM1)	Printed circuit board	VA1	Varistor
F11,12	Fuse (5A)		Th11	Thermistor (room temperature)
FS	Float switch (line cut)		Th12	Thermistor (heat exchanger outlet)
TM1	Main circuit terminal block		Th13	Thermistor (heat exchanger inlet)
			RY1-8	Relay
Symbol	Name	Symbol		Name

Note:
*3. When starting and stopping the unit with the timer.
- Connect the separate circuit contact for the timer to terminals Ⓒ and Ⓓ in the control box.
- Procure the timer locally.



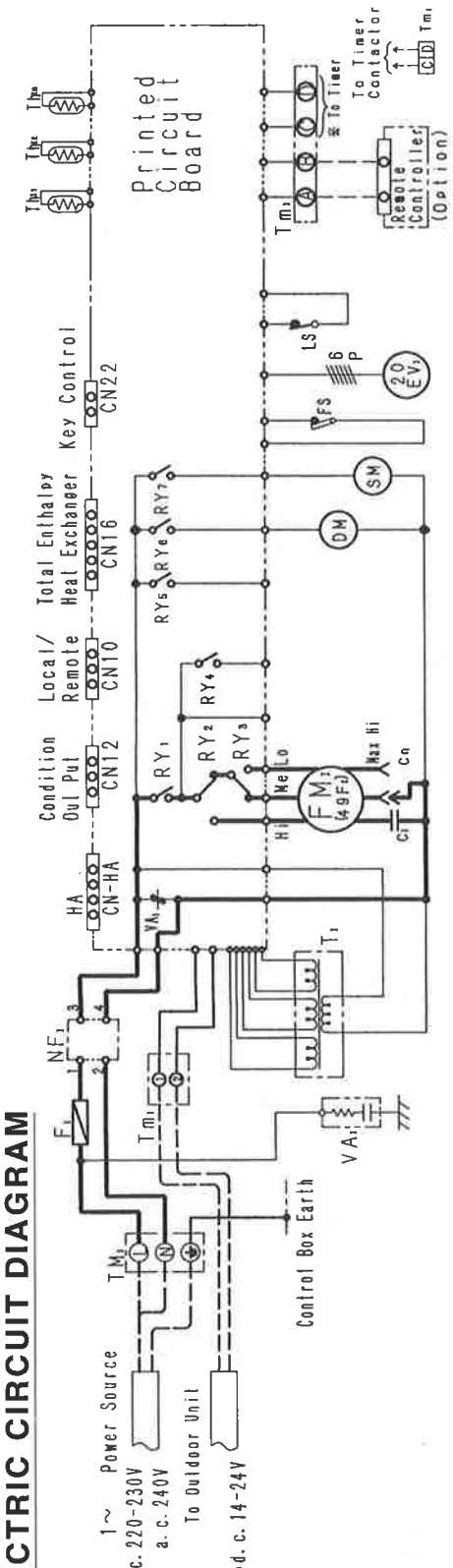
5. The dotted area is the PCB.
6. This wiring diagram applies to the indoor side unit only.
- About the external pressure adjustment unit

■Four way cassette type

Heat pump model

CS-45UR51FB CS-45UR51ER
CS-56UR51FB CS-56UR51ER
CS-71UR51FB CS-71UR51ER
CS-80UR51FB CS-80UR51ER
CS-112UR51FB CS-112UR51ER
CS-140UR51FB CS-140UR51ER

ELECTRIC CIRCUIT DIAGRAM



〈Note〉
※For use of a timer(locally supplied)
1-1 Connect the contactor of the timer to "Tm1"
Ⓒ and Ⓓ

Operation \ Relay	RY1	RY2	RY3	RY4	RY7
Relay-ON	Indoor fan Motor-ON	Indoor Fan Motor Speed (Hi Me Lo)		Drain up Motor-ON	Swing Motor-ON

LEGEND

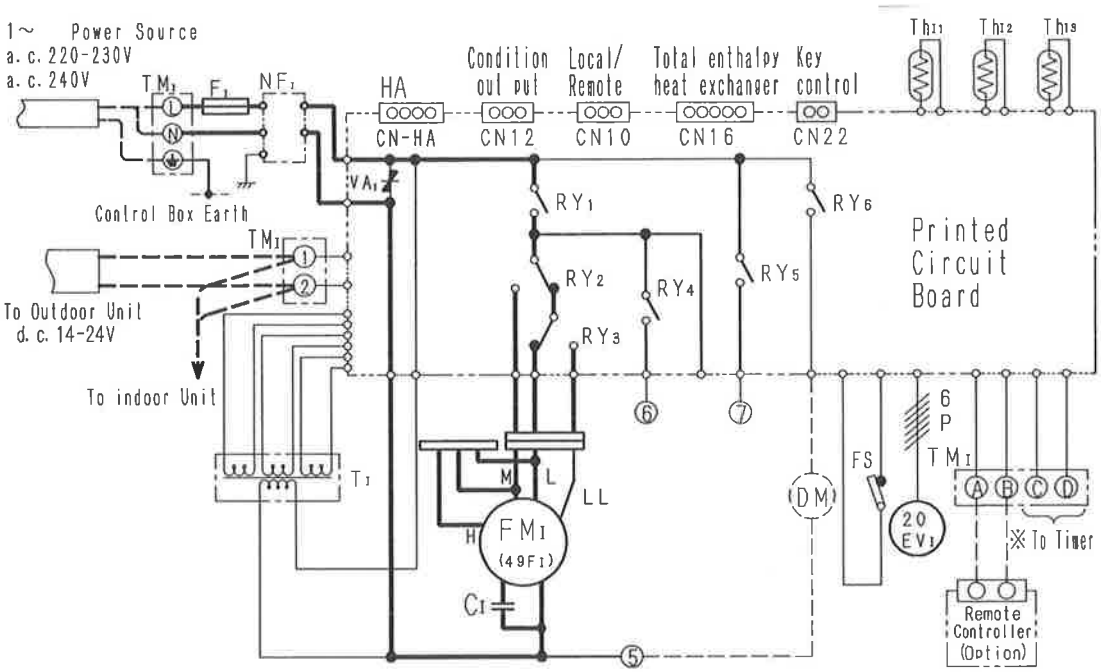
	Indoor Unit	TM1	Terminal Board for Main Circuit
		NF1	Noise Filter
20EV1	Expansion Valve	SM	Swing Motor
49F1	Internal Thermostat for FM1	LS	Limit Switch
C1	Capacitor for FM1		
Cn	Connector(For FM1 speed)		
DM	Drain up Motor		Printed Wiring Board
F1	Fuse 250V T5A	RY1-7	Relay for IC Control
FM1	Fan Motor(Indoor Unit)	Th11	Thermistor(Indoor Temperature)
FS	Float switch(Line Out)	Th12	Thermistor(Indoor Heat Exchanger Entrance)
T1	Transformer	Th13	Thermistor(Indoor Heat Exchanger Exit)
Tm2	Terminal Board for Control Circuit	VA1	Varistor
VA1	Varistor		

Hide-Away type

■Heat pump type

CS-45ER51FB,CS-45ER51ER
CS-56ER51FB,CS-56ER51ER
CS-71ER51FB,CS-71ER51ER
CS-80ER51FB,CS-80ER51ER
CS-112ER51FB,CS-112ER51ER
CS-140ER51FB,CS-140ER51ER

ELECTRIC CIRCUIT DIAGRAM

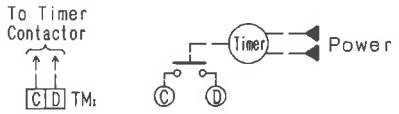


Relay	RY1	RY2	RY3	RY6
Operation / Relay - ON	Indoor Fan Motor-ON	Indoor Fan Motor Speed (Hi Me Lo)		Drain up Motor-ON (Option)

LEGEND

Indoor Unit		NF1	Noise Filter
FM1	Fan Motor(Indoor Unit)		
DM	Drain-up motor		
C1	Capacitor for FM1	Printed Wiring Board	
49F1	Internal Thermostat for FM1		
20EV1	Expansion Valve	VA1	Varistor
F1	Fuse 250V T5A	Th11	Thermistor(Indoor Temperature)
FS	Float switch	Th12	Thermistor(Indoor Heat Exchanger Entrance)
TM1	Terminal Board for Main Circuit	Th13	Thermistor(Indoor Heat Exchanger Exit)
T1	Transformer	RY1~6	Relay for IC Control

〈Note〉
※For use of a timer(locally supplied)
1-1 Connect the contactor of the timer to "Tm1"
Ⓒ and Ⓓ

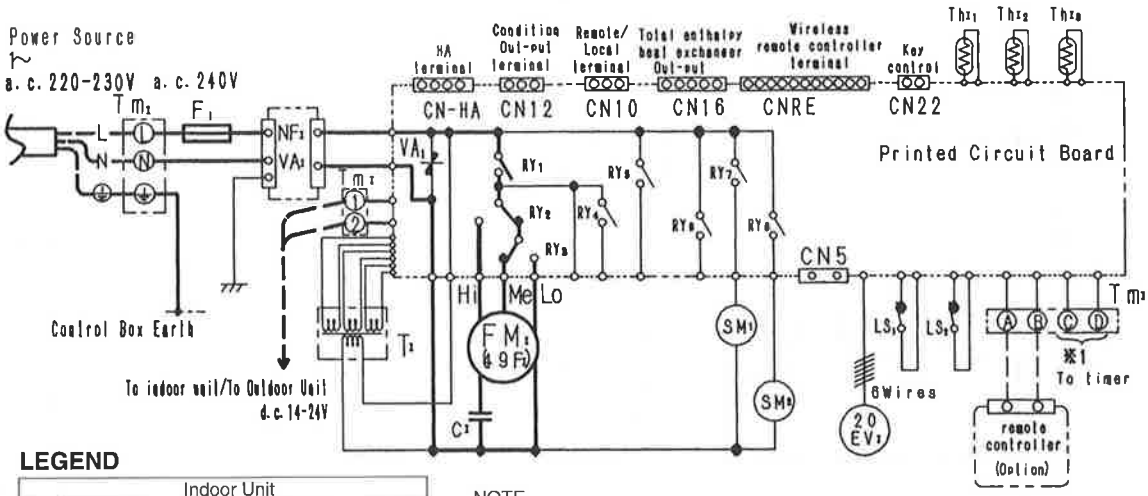


■Ceiling type

Heat pump model

CS-71TR51FB CS-71TR51ER
CS-112TR51FB CS-112TR51ER
CS-140TR51FB CS-140TR51ER

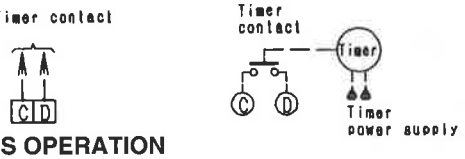
ELECTRIC CIRCUIT DIAGRAM



LEGEND

Indoor Unit		
FM1	Fan Motor(Indoor Unit)	
C1	Capacitor for FM1	
49F1	Internal Thermostat for FM1	
20EV2	Electric Expansion Valve	
F1	Fuse 250V T5A	
T1	Transformer	
Tm1	Terminal Board	
NF1	Noise Filter	
VA1	Varistor	
SM1	Swing Motor(for louver)	
SM2	Swing Motor (for downward flap)	
LS1	Limit Switch(for Louver)	
LS2	Limit Switch(for downward flap)	
Printed Circuit Board	VA1	Varistor
	Th11	Thermistor 1 (Indoor Temperature)
	Th12	Thermistor 2 (Indoor Heat Excanger Outlet)
	Th13	Thermistor 3 (Indoor Heat Exchanger Inlet)
	RY1-8	Relay

NOTE
※1 When turning operation on and off using a timer.
Connect the contact of timer circuit to terminal (C) and (D) in the terminal box.
●The timer should be obtained at the installation location.



RELAYS OPERATION

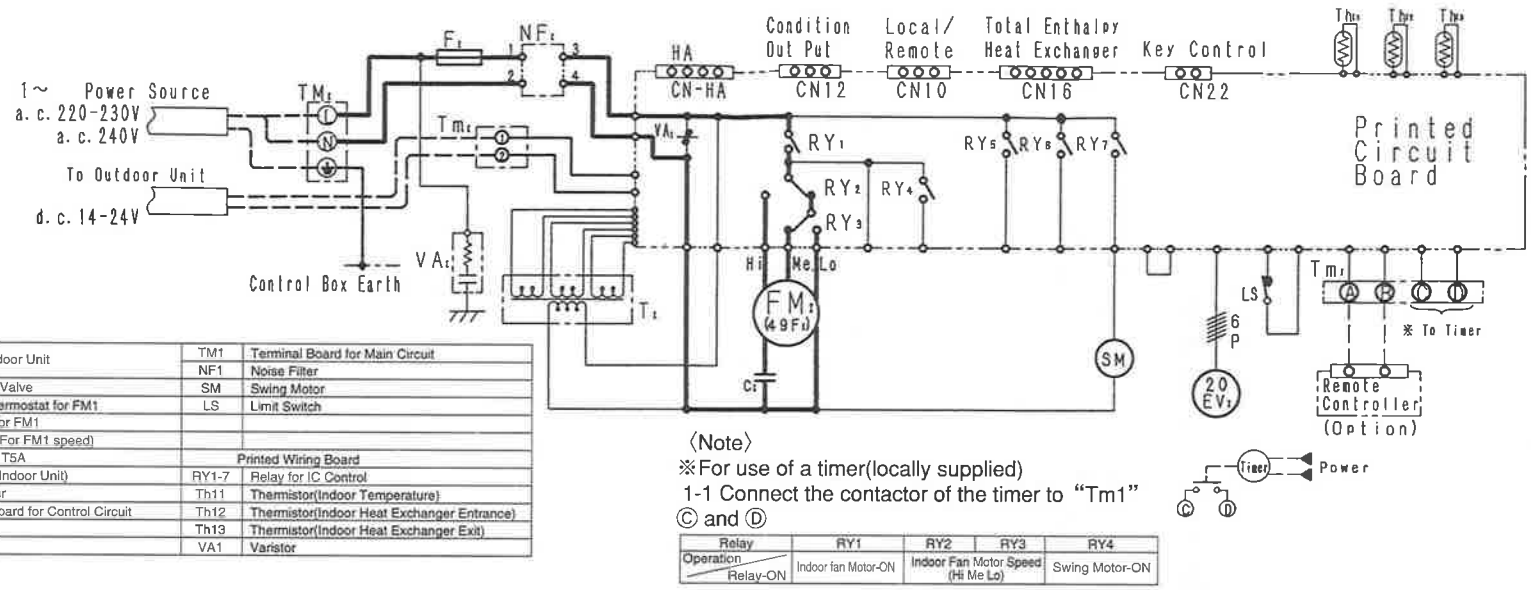
RELAY	OPERATION (RELAY-ON)
RY1	Indoor unit fan-ON
RY2	Indoor unit fan speed changeover (Hi, Me, Low)
RY3	
RY7	Swing Motor(for louver)-ON
RY8	Swing Motor(for downward flap)-ON

■Wall type

Heat pump model

CS-22KR51FB,CS-22KR51ER
CS-45KR51FB,CS-45KR51ER
CS-56KR51FB,CS-56KR51ER
CS-71KR51FB,CS-71KR51ER

ELECTRIC CIRCUIT DIAGRAM



LEGEND

Indoor Unit		TM1	Terminal Board for Main Circuit
		NF1	Noise Filter
20EV1	Expansion Valve	SM	Swing Motor
49F1	Internal Thermostat for FM1	LS	Limit Switch
C1	Capacitor for FM1		
Cn	Connector(For FM1 speed)		
F1	Fuse 250V T5A	Printed Wiring Board	
FM1	Fan Motor(Indoor Unit)	RY1-7	Relay for IC Control
T1	Transformer	Th11	Thermistor(Indoor Temperature)
Tm1	Terminal Board for Control Circuit	Th12	Thermistor(Indoor Heat Exchanger Entrance)
VA1	Varistor	Th13	Thermistor(Indoor Heat Exchanger Exit)
		VA1	Varistor

〈Note〉
※For use of a timer(locally supplied)
1-1 Connect the contactor of the timer to "Tm1" Ⓒ and Ⓓ

Relay / Operation	RY1	RY2	RY3	RY4
Relay-ON	Indoor fan Motor-ON	Indoor Fan Motor Speed (Hi Me Lo)		Swing Motor-ON

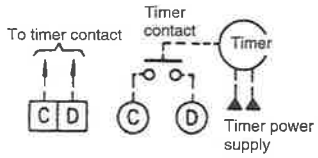
Relay operation table

	Operation of the relays on the indoor PCB				
Relay name	RY1	RY2	RY3	RY6	RY7
Operation when relay is on	Indoor unit fan operates	High/med./low fan operation		—	Louver motor on

Symbol table

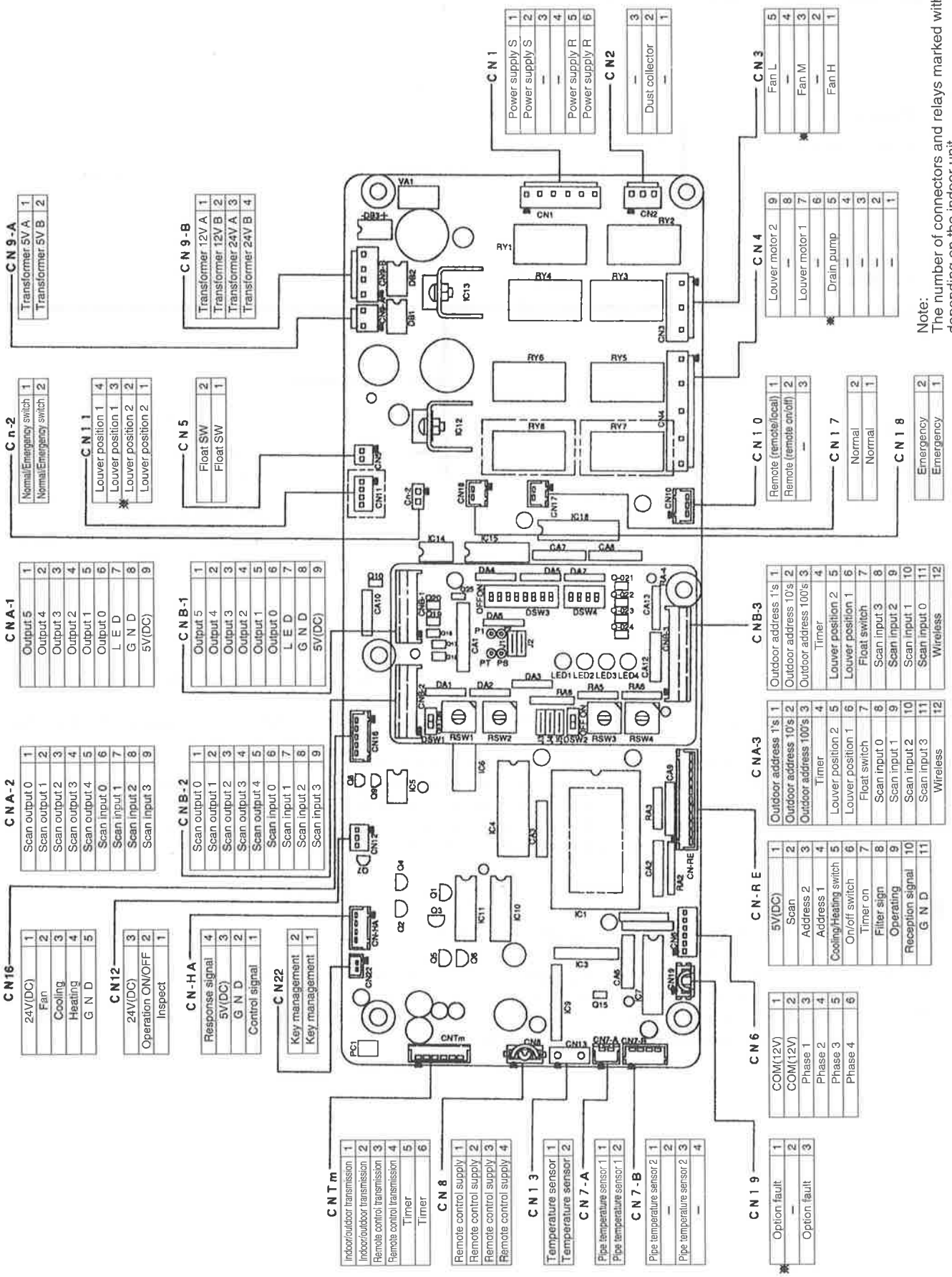
Indoor unit						
20EV1	Electromagnetic expansion valve (indoor unit)	T1	Transformer	Printed circuit board	VA1	Varistor
49F1	Internal thermo (for FM1)	Tm1	Control circuit terminal block		Th11	Thermistor (room temperature)
FM1	Fan motor (indoor unit)	NF1	Noise filter		Th12	Thermistor (heat exchanger)
C1	Capacitor (for FM1)	VA1	Varistor		Th13	Thermistor (heat exchanger)
F11.12	Fuse (5A)	SM	Auto louver motor for fan		RY1~8	Relay
TM1	Main circuit terminal block	LS	Limit switch (louver)			
Symbol	Name	Symbol	Name	Symbol	Name	

Note:
*1. When starting and stopping the unit with the timer.
- Connect the separate circuit contact for the timer to terminals C and D in the control box.
- Procure the timer locally.



4. The dotted area is the PCB.
5. This wiring diagram applies to the indoor side unit only.

4 PRINTED CIRCUIT BOARD OF INDOR UNIT



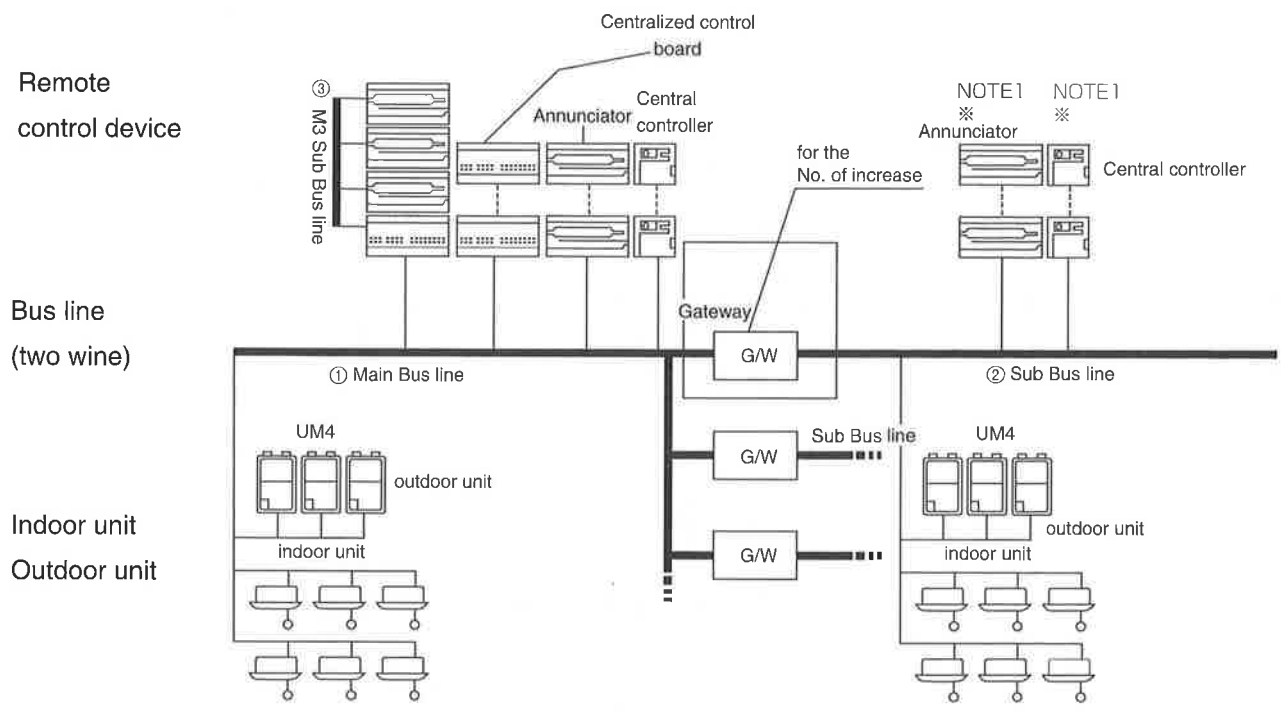
Note:
The number of connectors and relays marked with an asterisk varies depending on the indoor unit.

5 CONTROL SYSTEM

1.URBAN-NET method of Bus line

■Bus line

URBAN-NET communicate mutually the indoor, outdoor unit and each control device which is connecting to Bus line.
*The control voltage of Main Bus line and Sub Bus line is DC24V (feeding power is necessary)
*Please do not use a loop wiring on terminal or etc. for Bus line method.



NOTE

1.The annunciator and central controller which connected to Sub Bus line (※) cannot control the indoor unit, which connected to Main Bus line.
2.The indoor, outdoor unit which is in one system of same refrigerant pipe, please do not connect separately for Main Bus line and Sub Bus line.
3.If connect the 10 or more number of central controller, increase the number of G/W and compose a Sub Bus line.
4.The indoor, outdoor unit and each control device are necessary the address setting for the communication for both parties. Address number have to set on the network sequentially and please do not overlap.
5.Remote control device which can be controlled one indoor unit is up to two. (However, Remote control unit (Amunciator CZ-EAN) connected to M3 Sub Bus line does not contain.)

■Kind of Bus line

①MAIN BUS LINE— A basic Bus line which connect the system device (indoor, outdoor unit and each control system) up to 128 and control.
②SUB BUS LINE— A Bus line which be composed by a gateway (CZ-01EAN) when the number of the system device exceeded 128 on the main Bus line.
③M3 SUB BUS LINE—Exclusive Bus line between the control system which connect some annunciator (CZ—EAN) with centralized a control board(CZ—ESM).

■Detailed specification of each bus line

Transmission Bus line length

Transmission length of bus line (cable length)	Max.1,000m	Total wiring length to the connected equi devices of sub-Bus line and Main Bus line
Transmission length of M3 sub-bus line (cable length)	Max.200m	Total wiring length to the connected device

		①Main bus line	②M3 sub-Bus line	③Sub-Bus line
Numbers of device which can be connected		128 units ☆		128 units ☆
Connected device	UM4 indoor unit	○		○
	UM4 outdoor unit	○		○*
	Centralized control board (CZ-ESM)	○*		
	Annunciator (CZ-EAN)	○	○	○
	Central controler (CZ-ESS)	○		○
	Gate way (CZ-01GWM)	○*		*
Polarity of bus line		No polarity	Polarity(+,−)	No polarity

Remarks (1) ○: Connectable models
(2) ＊: Power-feeder equipment
(3) ☆: The number of CZ-EAN which are connected to M3 Sub Bus Line is noy counted in the number of 128 units

■Power feeding to the Bus line (supply for control circuit: DC 24V)

In case that the main Bus line or the main Bus line + sub-Bus line are composed, the voltage supply is needed from the device specified without fail by the content of the system configuration to each bus line. Please do the feeding power setting in the local.

■The roll of the gate way for expansion (CZ-01GWM)

① For expansion of the number of the units It expands the numbers of the units, and compose the sub-Bus line.
② For the power feeding: In case that the connection number of the central controller (CZ-ESS) is three or more, the Gate way can be used for the power feeding device. (It is only possible to feed the power to either Main Bus line or Sub-Bus line. It is not possible to feed both of them simultaneously.)

■Wiring for control

①Bus line wire

- For the wiring between indoor units and outdoor unit and between the each control devices, please use a instrument cable (twisted 2-wire cable (0.75㎟).) or city pair cable.
- Example KPEV or KPEE (without sealed) for instrument cable : 1 pair (2 wires) ・0.75㎡

②The remote controller wire
Please use the sheathed vinyl cord or the cable of 0.5-2.0㎟ as the following specification.

vinyl cabtyre round cord	VCTF JISC3306
vinyl cabtyre oval cord	VCTFK JISC3306
vinyl insulated vinyl sheathed cable for control	CVV JISC3401
vinyl insulated vinyl sheathed cable for control	CVS JISC3401
round type vinyl insulated vinyl sheathed cable (600V)	VVR JISC3342
flat type vinyl insulated vinyl sheathed cable (600V)	VVF JISC3342
vinyl insulated vinyl cabtyre cable (600V)	VVT JISC3312

Remarks: In order to avoid malfunction, please install the power supply line, Bus line wiring, and the remote controller wiring separately (30cm or more)

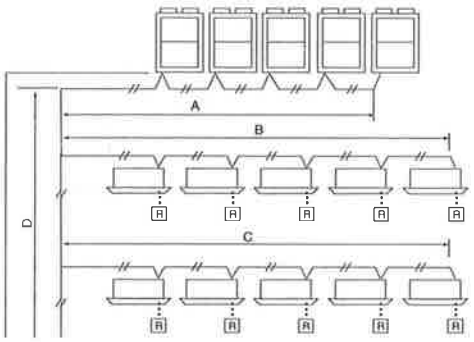
2.Basic design specifications

- The URBAN-NET control system can control and connect centralized control boards, annunciators, and central controllers to anywhere on the bus line.
- Please observe the following limitations relating to the bus line length and the number of connected the control devices when designing the wiring system.

(1) Bus line cable length

Centralized control board~Indoor units~Outdoor units
The total wiring length is up to 1000 m (main bus line + sub bus line)

Calculation example: A + B + C + D + ...
The total wiring length
are less than or equal to 1000m.



(2) Number of units connected to the bus line

Up to total 256 units of indoor units, outdoor units, and controllers (centralized control board, annunciator etc.) can be connected to one bus line system (main bus line/sub bus line). (main bus line + sub bus line ≦ 256 units)

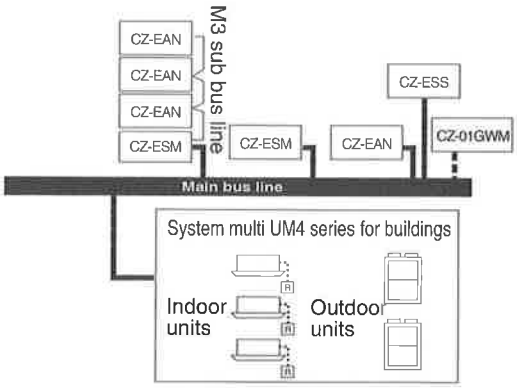
- Connected units on the bus line

Bus line \ control unit	Indoor Outdoor	CZ-ESS	CZ-EAN	CZ-ESM
Main bus line	●	●	●	●
Sub bus line	●	●	●	
M3 sub bus line			●	

* The M3 sub bus line is a specialized bus line from the centralized control board to the control devices.

Mid-size and small buildings	Network system When 128 or fewer units are connected, the system construction is one main bus line.

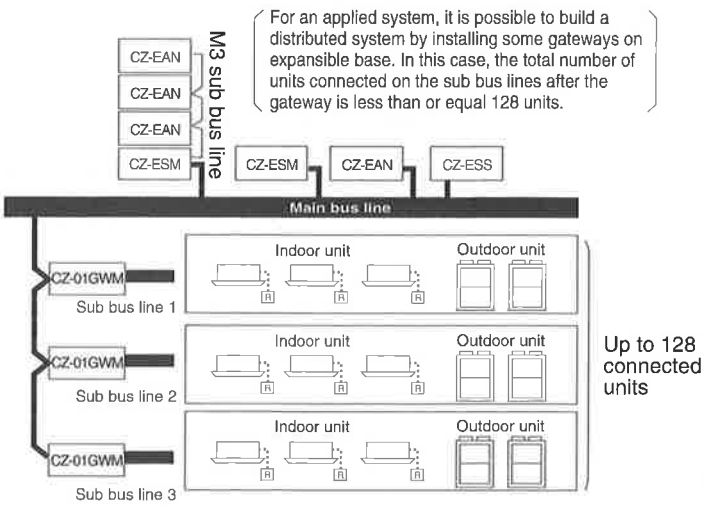
■Control system layout



Mid-size and large buildings	Network system When 256 or fewer units are connected, the system construction is one main bus line and some sub bus lines.

- When building a distributed system, it is possible to use an expansion gateway, and connect indoor and outdoor units on the sub bus line.
- It is possible to control indoor and outdoor units on the sub bus line by using the control units on the main bus line.

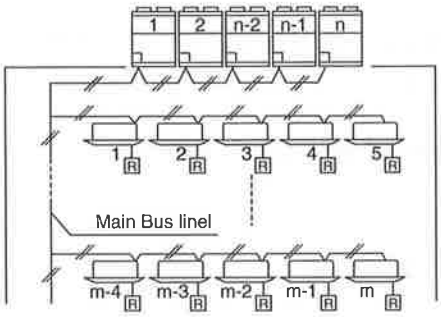
■An applied control system construction example



Note:
The number of units connected to each sub bus line after the expansion gateway must be 128 or less.
*You cannot connect one more CZ-01GWM again to a sub bus line.

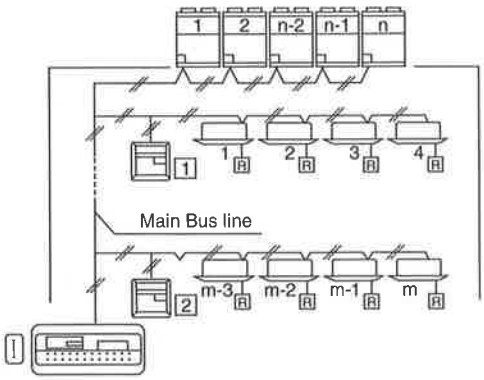
Calculation example (a)

When connect only indoor and outdoor unit
*Indoor unit "m"
*Outdoor unit "n"
m(Indoor unit)+n(Outdoor unti) ≦ 128



Calculation example (b)

When connect Indoor unit+Outdoor unit+Central controller×2
+Centralized control board ×1 is:
m(Indoor unit)+n(Outdoor unti)+Central controller×2
+Centralized control board ×1 ≦ 128

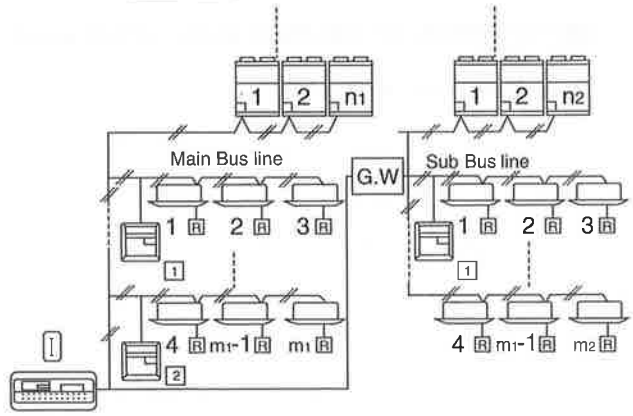


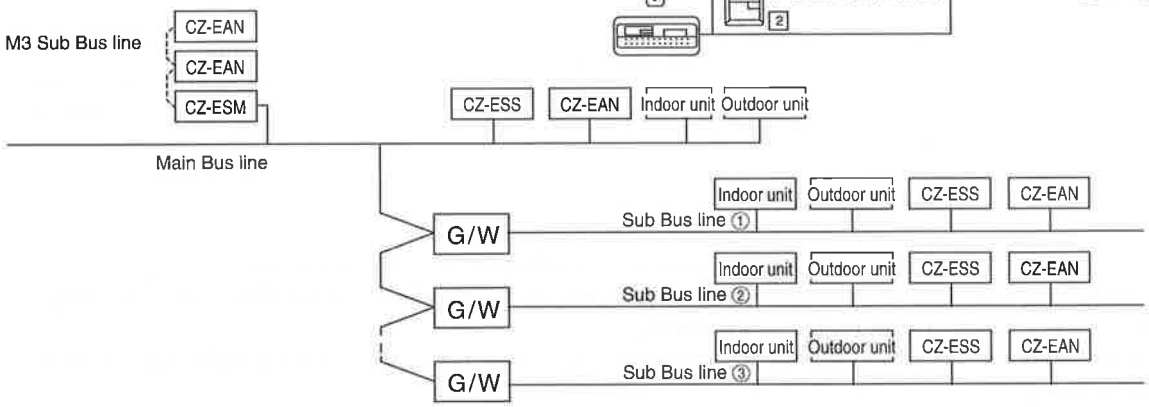
Calculation example (c)

When connect Indoor unit+Outdoor unit
+Central controller×3+Centralized control board ×1+Gateway is:
Main Bus line

m1(Indoor unit)+n1(Outdoor unit)+Central controller×2
+Centralized control board ×1+Gateway ≦ 128

m2(Indoor unit)+n2(Outdoor unit)+Central controller×1
+Gateway ≦ 128





	1 network (1 Bus line)	
Number of units which can be connect	256	Main Bus line:128
		Sub Bus line:128 (Sub Bus line①+Sub Bus line②+···Sub Bus line③)
Number of indoor unit which can be connect	200	

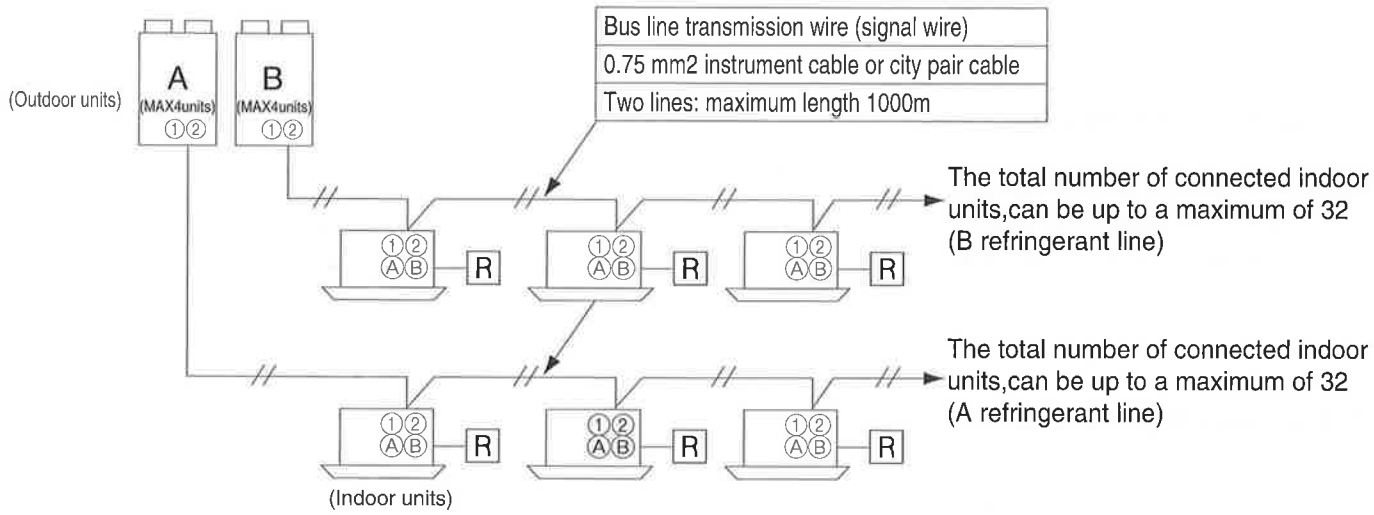
NOTE

1) :Cannot install more units again by connecting the CZ−01GWM (for more install) to Sub Bus line.

3.CONTROL WIRING OUTLINE

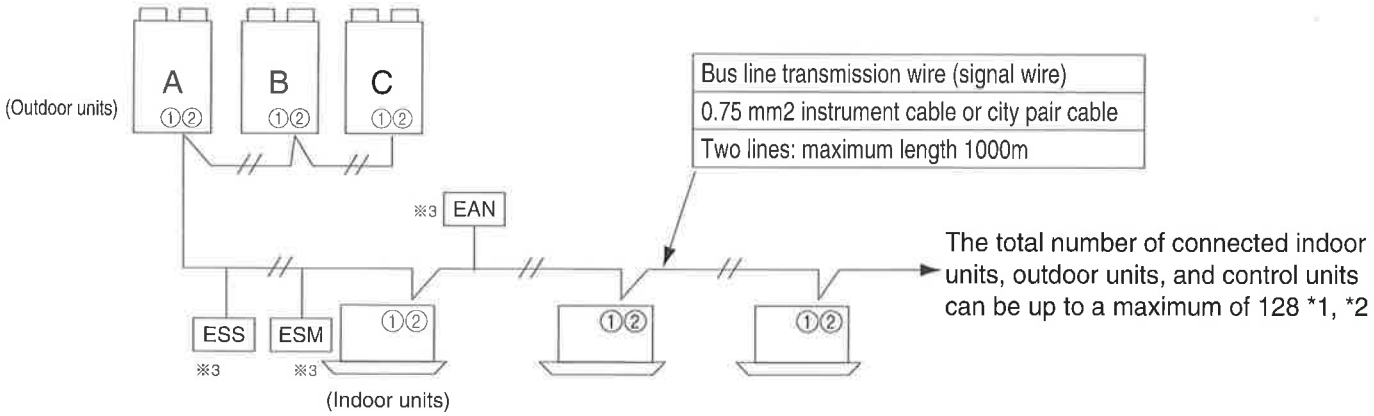
The URBAN-NET control wiring method and Refrigerant piping pair method are used for UM4 control wiring.

❶Refrigerant piping pair method



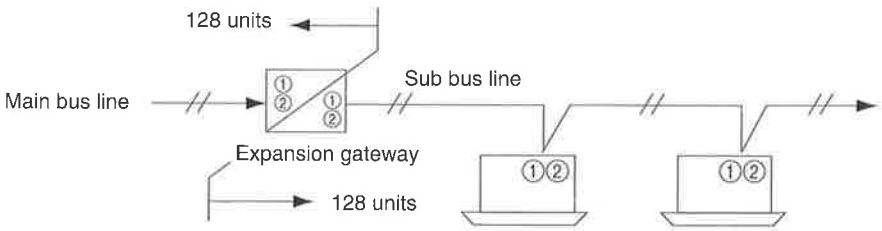
❷THe URBAN-NET method (new control way)

- Up to 128 connected units



*1 It is possible to ignore the refrigerant piping system when connecting the control wiring.
*2 In case of connecting 129 or more units, it is necessary to use the CZ-01GWM (sold separately) expansion gateway (refer to the figure below).
*3 Control units are also counted the control device (CZ-ESS, CZ-EAN and CZ-ESM), but remote controls are not included.

- To connect 129 or more units

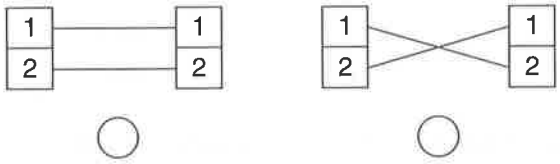


Note: Main bus + sub bus ≦ 256

Up to total 128 units of the indoor units, outdoor units, expansion gateway, and control devices can be connected to the sub bus line. Note, however, that 256 units can be connected to the main bus + sub bus.
When using a sub bus line, the total wiring distance for the main bus line + sub bus line is 1000m or less.

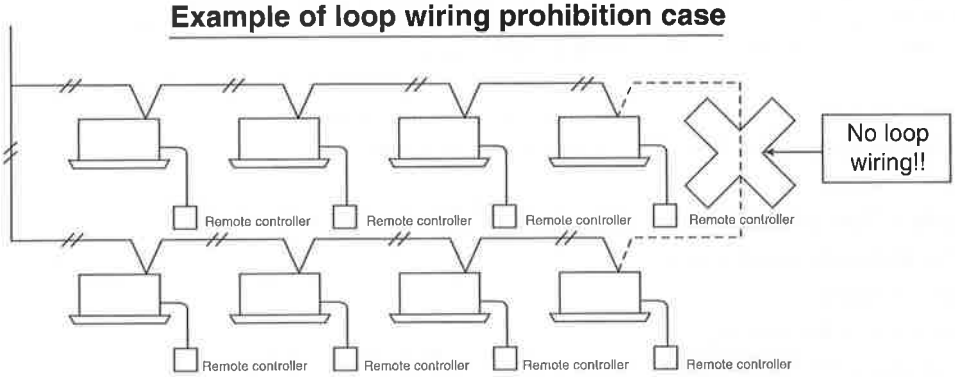
NOTE

(1) Bus line wire (Main bus line · Sub bus line) is 2 wire type without polarity.



(2) Bus line have to enforce no loop wiring as much as one point either.
(PCB might be damaged)

Example of loop wiring prohibition case



(3) For Bus line, have to use **the specified instrumentation cable (twist pair cable) or city pair cable.** (no shield)
For new control system URBAN-NET Bus line, have to use following maker's cable or same designed instrumentation cable.

Maker	Instrumentation cable	City pair cable	
Furukawa electric	KPEV or KPEE		0.75㎟ pair (2 wires) (No shield)※1
Hitachi electric wire	KPEV or KPEE	H-CPEV	
Nihon electric wire	KNPEVR or KNPEER	CPEV-R	
Fujikura electric wire	IPEV or IPEE		
Sumitomo electric wire	JKPEV or JKPEE	S-CPEV.R	
Tatsuta electric wire	JKEV or JKEE		

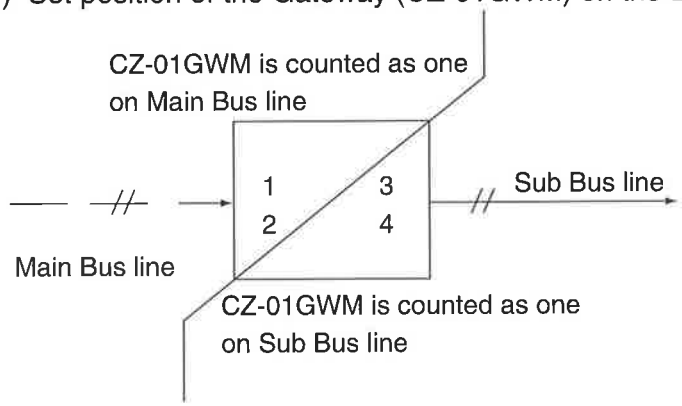
※1 The use of cable with shield is a strict prohibition.

Conductor size: 0.75㎟-1.25㎟
pair number: 1 pair (2 wires)
Insulator Material: polyethylene

Shield No [strict prohibition]
Electric characteristic status Resistnace: within 27Ω /km
static capacity: within 52nF/km

NOTE:You can order the instrumentation cable to PACD (Packaged Air-Conditioner Div.) Refer to Page 87.

(4) Set position of the Gateway (CZ-01GWM) on the Bus line



As shown left figure, Gateway is counted as one in Main Bus line and as one is Sub Bus line

4.POWER SUPPLY (DC24V) TO THE CONTROL LINE (BUS LINE)

For Bus line , power supply (DC24V) is necessary.
The device which can supply DC24V are 3 types:

UM4 Outdoor unit
Centralized control board (CZ-ESM)
Gate way (CZ-01GWM)

Power supply unit is selected according to the install place, and please set to supply the power(DC24V)

Point of the power supply device selection

The point of power supply device selection is number of central controller which connect on the Bus line.

■Number of central contoller which can be connect when set up power supply

Power supply device	Number of the central controller Which can be connect
UM4 Outdoor unit	0 to 2
Centralized control board (CZ-ESM)	0 to 5
Gateway for the no. increase (CZ-01GWM)	0 to 10

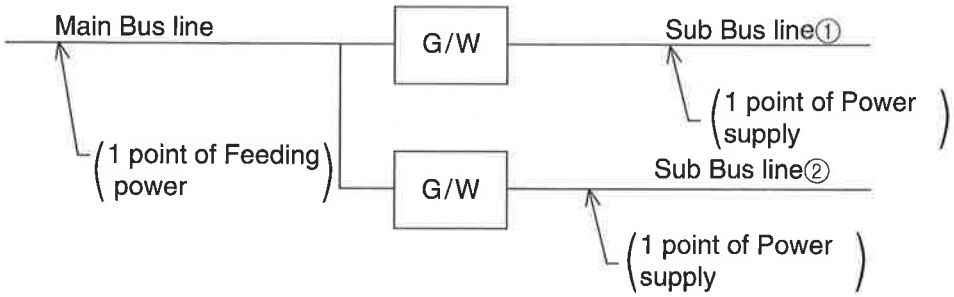
Note

(1) Even when central controller is not connected, power supply is necessary.

(2) Power supply set device have to do the power supplying set up only one point respectively on Main Bus line, Sub Bus line①, Sub Bus line②

If set up the power supply or more two, power supply device will be damage.

(3) When no power supply, URBAN-NET system do not operate normally.

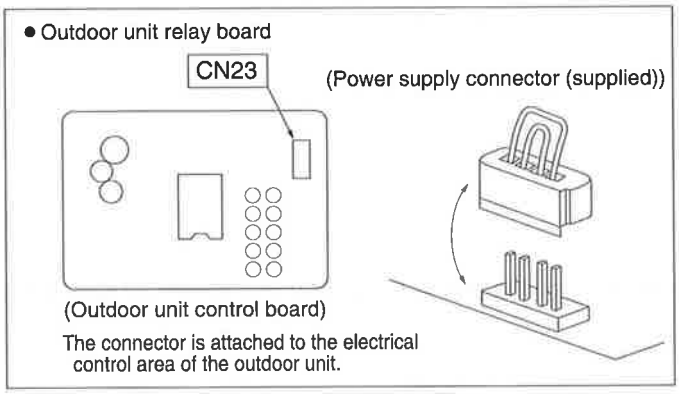


❶Points regarding setting of power supplies for the main and sub bus lines

(1) Setting power supply from an outdoor unit

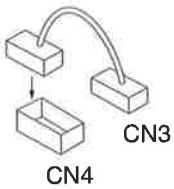
Insert the CN23 connector (an outdoor unit accessory) into the outdoor unit relay board.

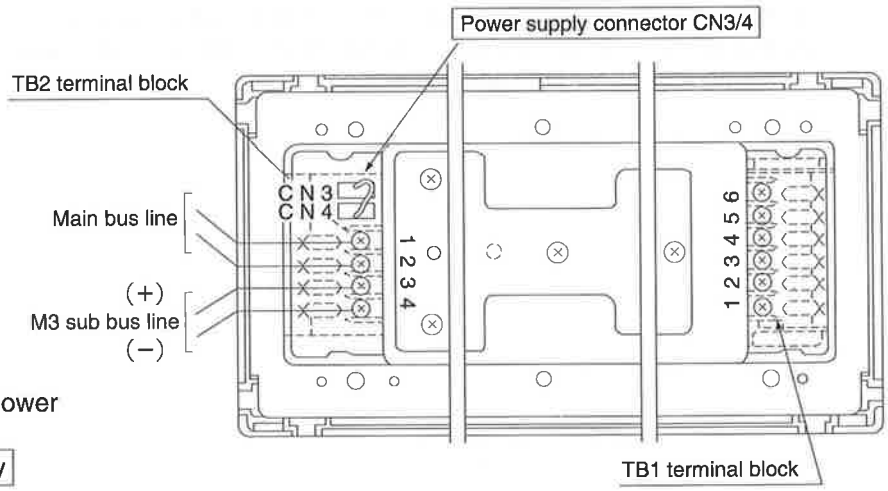
Factory setting: no power supply



(2) Setting power supply from a centralized control board (CZ-ESM)

Insert the CN4 connector on the side of the TB2 terminal block of the centralized control board.



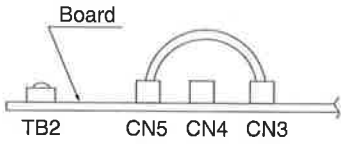


Connect CN3 to CN4 to supply power

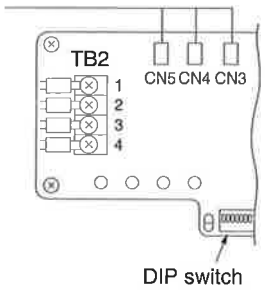
Factory setting: no power supply

(3) Gateway (CZ-01GWM)

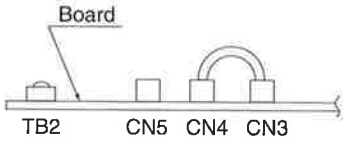
①Case of supplying power to the main bus line➡Connect CN3 and CN5 on the board.



Power supply connector CN5 · 4 · 3



②Case of supplying power to the sub bus line➡Connect CN3 and CN4 on the board.



Factory setting: no power supply

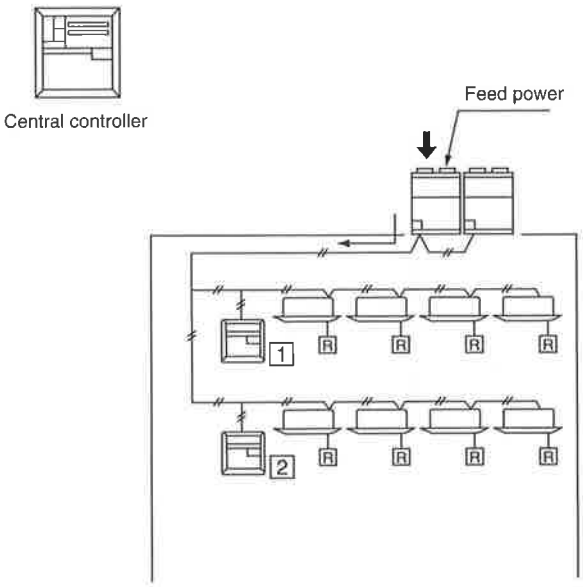
Notes:
(1) Supply power from one location only. If two or more units are set to supply power to the same bus line, the printed board will be broken.
(2) When connecting a gateway unit to supply power only, DIP switch 8 must be switched on.
(3) Factory settings: no power supply (connectors not plugged in).
(4) Even if there are no central controllers (CZ-ESS), a power supply device must be set (same applies for auto address setting).

Examples of Feeding power set up (DC24V supply to Bus line)

Selection of the feeding power device to Bus line

When feed power from Outdoor unit

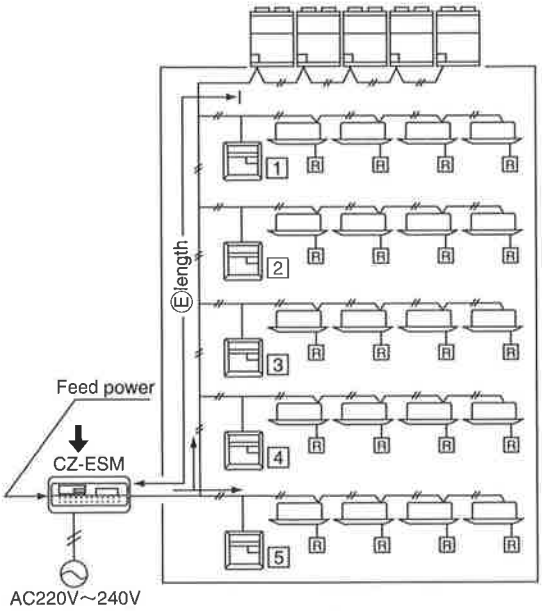
*Can feed power to the central controller[CZ-ESS] up to 2.



*Please set feed power even when do not use a Central controller.

When feed power from centralized control board [CZ-ESM]

*Can feed power to the central controller up to 5.

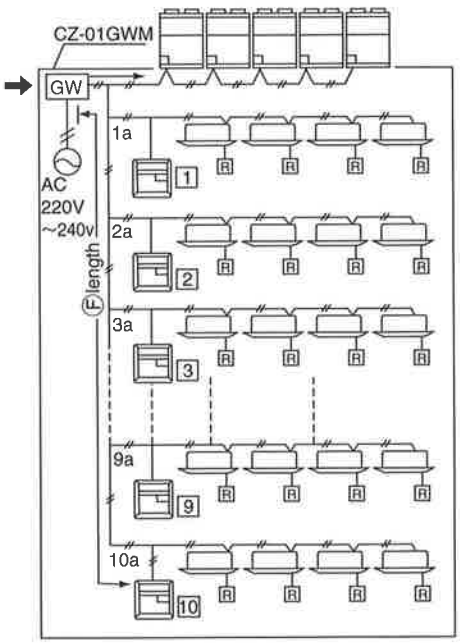


*If feed power with Centralized control board, have to install the centra l controller within 500m (lengthⒺ) from the centralized control board.

When feed power from Gateway [CZ-01GWM]

*Can feed power the central conroller up to 10.

As figure below, when use the Gateway only for the feed power unit, please switch on the Gateway DSW8.

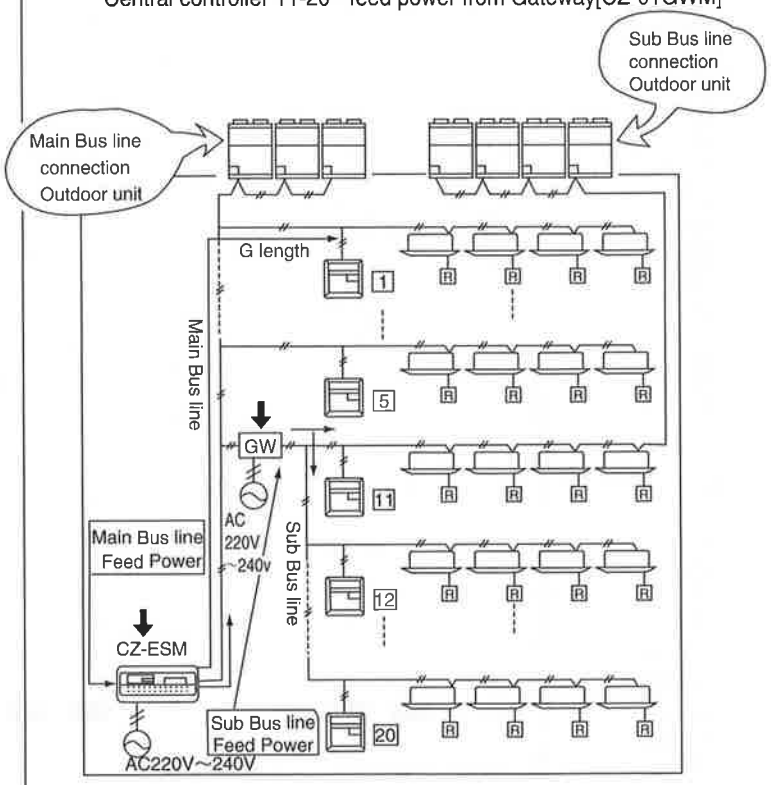


*If feed power with Gateway, have to install the central controler within 300m (lengthⒻ) from Gateway.

When complex control

*Central controller 1-5…feed power from centralized control board.[CZ-ESM]

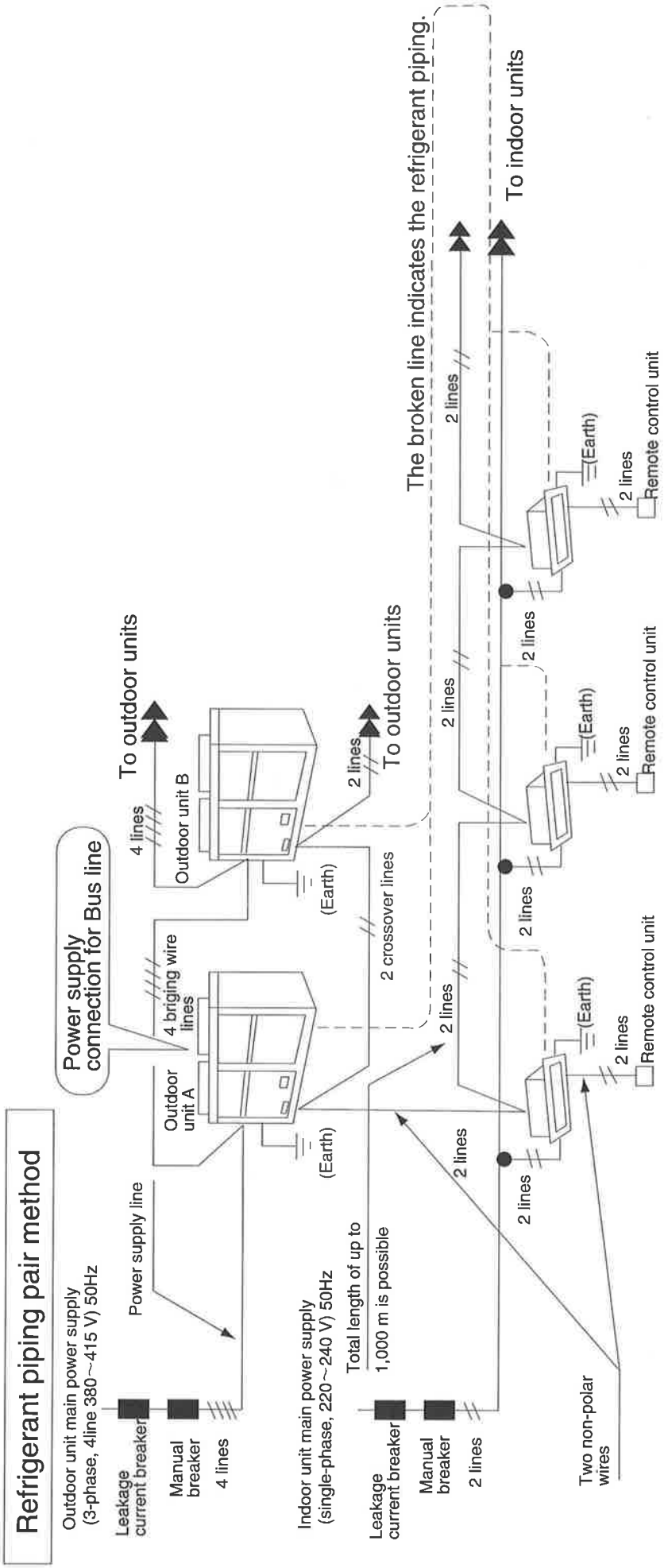
*Central controller 11-20…feed power from Gateway[CZ-01GWM]



*Length Ⓖ is within 500m same as above (b).

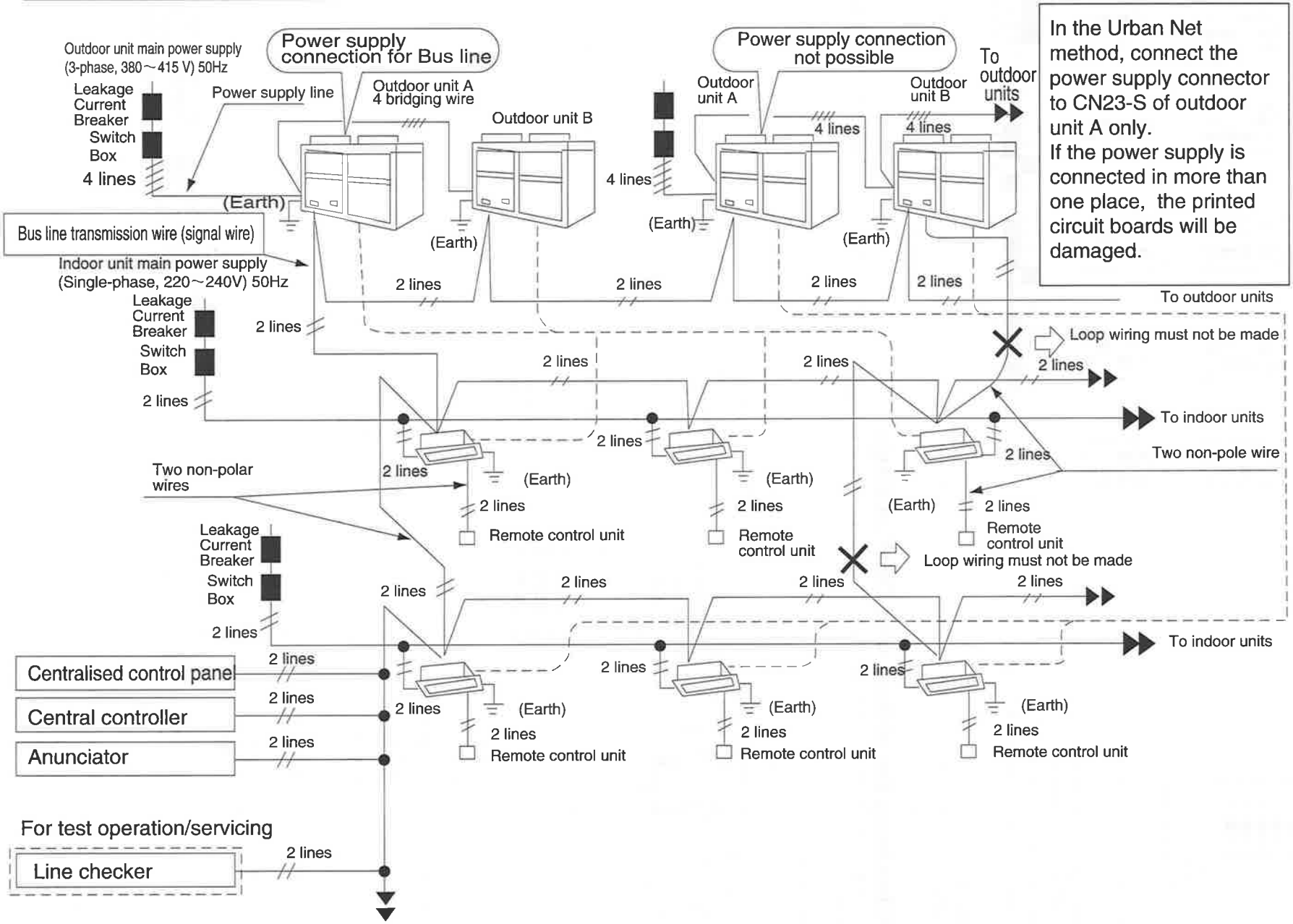
5.CONNECTION OF THE ELECTRICAL WIRE

Connection examples: The method used to connect the control cables can be selected from the following two methods.



URBAN-NET method

(All units can be connected to a single bus line regardless of the refrigerant pipes.)



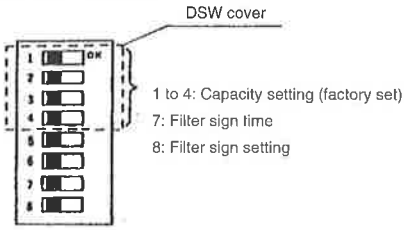
In the Urban Net method, connect the power supply connector to CN23-S of outdoor unit A only.
If the power supply is connected in more than one place, the printed circuit boards will be damaged.

The broken lines indicate the refrigerant pipe.

6.DIP SWITCH SETTING

❶Functions and settings for the indoor unit DIP switches

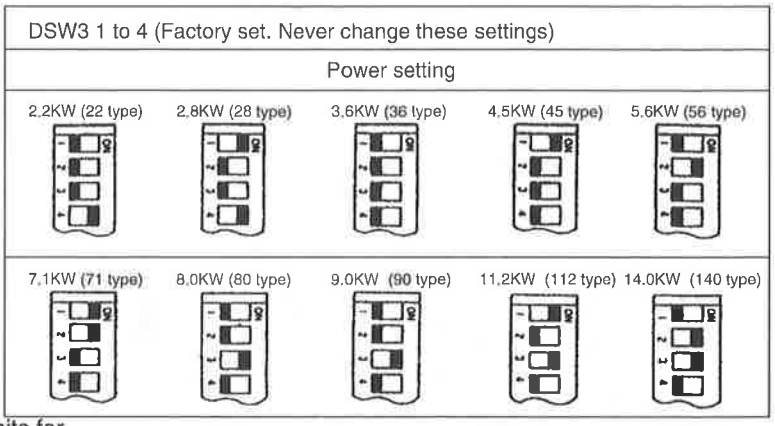
• Indoor unit DIP switch



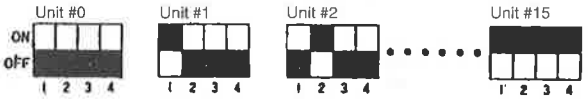
1 ~ 4	Capacity setting (Factory set. Never change these settings)
7	Filter sign time: On 100 hr./Off 200 hr.
8	Filter sign setting: On/Off

* DSW 3 is set to off at the time of shipment.

Printed circuit board



DSW 4 (Set for one remote controller group control)
Use DSW 4 to set the address for each of the indoor units for group control. By setting DSW 4 of eact indoor unit, can be set the address of each indoor unit for group control.



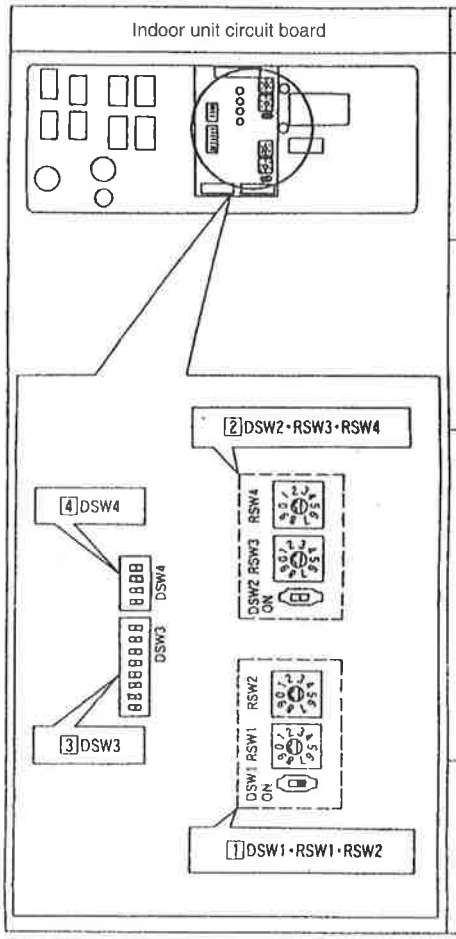
⚠Warning

Disconnect the CN-8 connector from the circuit board of each of the indoor slave units (unit #1 to #15). If connect the CN-8 connector,the printed circuit board is broken.

❷Checking the indoor unit DSW settings

Check if the DIP switches for the indoor units and outdoor units are correctly set. If the units are not set correctly,they will not operate correctly.

1. Indoor unit

Indoor unit circuit board	DIP switch	Setting	What to check
	1 DSW1 RSW1 RSW2	Indoor unit address	1. When setting the address manually: • Are the three DIP switches set correctly? • Is the address unique (not duplicated on another unit)? 2. In the case of automatic address setting or remote control address setting: • Are all indoor unit addresses set to 000 (setting at time of shipment)?
	2 DSW2 RSW3 RSW4	Corresponding outdoor unit address	1. When setting the address manually: • Are they set to the same address as the outdoor unit connected by refrigerant piping? • Are the three DIP switches set correctly? 2. In the case of automatic address setting or remote control address setting: • Are all indoor unit addresses set to 000 (setting at time of shipment)?
	3 DSW3	Indoor unit capacity setting (do not set) Filter sign time Filter sign setting	DSW 3 (all off at time of shipment) Numbers 1 to 4: factory set. Do not change. Number 7: It should be 「ON」 when the filter sign time is 200 hrs., and 「OFF」 when the filter sign time is 100 hrs. Number 8: It should be 「ON」 when filter sign is set, and 「OFF」 when filter sign is not set.
	4 DSW4	Group control sequence starting setting (one remote controller group control)	• Are the settings as shown below when one remote controller group control is used?

Indoor unit no.		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
DSW4	1	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON
	2	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF	ON	ON
	3	OFF	OFF	OFF	OFF	ON	ON	ON	ON	OFF	OFF	OFF	OFF	ON	ON	ON	ON
	4	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON	ON	ON

Note: Disconnect the CN-8 connectors from the p.c.board of the slave units.

• You can check an indoor unit address, and its corresponding outdoor unit address using the remote controller (sold separately).
Refer to the section on checking indoor unit and outdoor unit addresses using the remote controller.
• When changing an address, you have to set them in the power supply to the indoor unit.

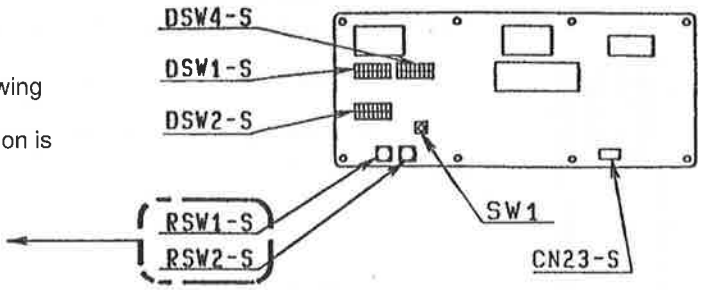
❸Functions and settings for the outdoor unit DIP switches

Important: Note the following with regard to the DIP switches and shorting connector for supplying power on PCB 2 (unit A only).

PCB 2 is installed in unit A only.

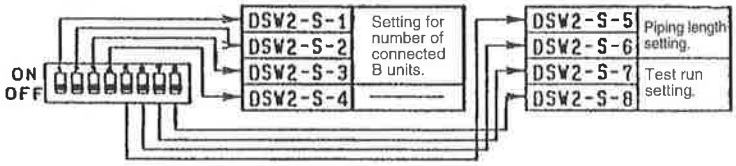
To ensure correct operation, read the following outline and perform and check DIP switch settings. If the switches are not set, operation is not possible.

Used for address setting. Refer to the attached information on address setting.(page 48)



Setting for the number of B units, piping length, and test run settings.

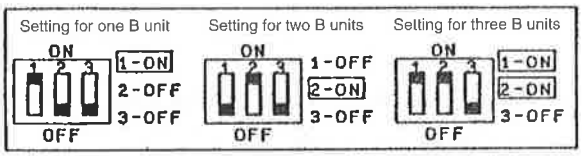
The above three settings are made using DSW-2-S. Refer to the diagram on the right, and make the settings as described below.



Setting the number of B units.

Make this setting on DSW-2-S of the outdoor unit. The setting is done using switches 1 to 3 (set to off at time of shipment).

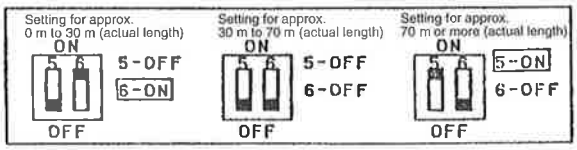
Note: To ensure correct unit operation, read the following outline and perform and check DIP switch settings. If the switches are not set, operation is not possible.



* Do not change DSW-2-S switch number 3

Piping length setting

Make this setting on DSW-2-S of the outdoor unit. The setting is done using switches 5 and 6 (set to 30 m to 70 m at time of shipment).

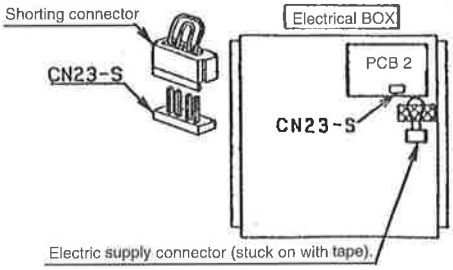


Supply power shorting plug connector (for CN23-S) (accessory item)

The shorting plug connector is provided with unit A only.

To ensure correct operation, when the wiring construction work is complete, connect the shorting plug connector to CN23-S on PCB 2 as shown in the diagram on the right.

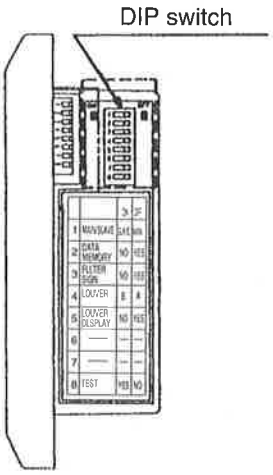
However, when all indoor units and outdoor units are connected to the bus line using URBAN NET, only connect the shorting plug connector to CN23-S on PCB 2 on the first unit A. If you connect it on other units as well, damage to the equipment may occur.



Re-executing automatic address.

With the power on, press SW1 for more than four seconds. This will automatically perform the setting of the addresses for the indoor units again.

❹Remote controller DIP switch functions and settings



1. When using two remote controllers, switches between main/slave (set to off (main) at time of shipment)
2. Data storage switch (backup yes/no switch) (set to off (yes) at time of shipment)
3. Filter sign yes/no switch (shipment setting differs depending on unit type)
4. Louver up (A)/down (B) angle setting (shipment setting differs depending on unit type)
5. Louver control display yes/no switch (shipment setting differs depending on unit type)
6. No function (set to off (no) at time of shipment)
7. No function (set to off (no) at time of shipment)
8. Used by the test program (set to off (no) at time of shipment)

   Note: DSW 2 to 8 are set at the factory.

• Two-location remote controller installation

Additional remote controllers can be purchased separately.

- Up to two remote controllers can be installed for each indoor unit, and the indoor unit can be controlled from either one.
- The one operated last has priority over stopping and operation of the indoor unit.

Installation procedure

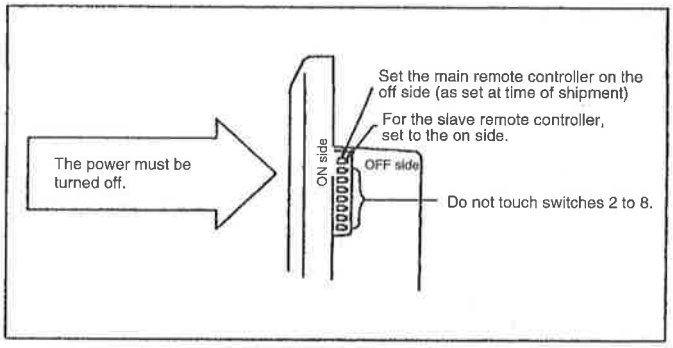
1. Set the DIP switches as shown in the diagram on the right (this must be done with the power off).
2. Decide which will be the main remote controller and which will be the slave

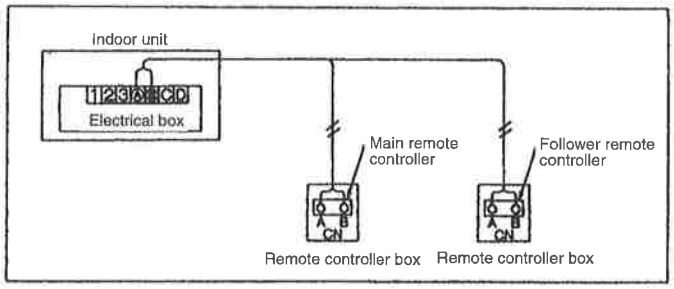
Caution:

DIP switch setting is essential if you install two remote controllers. If this is not done, damage to the indoor unit will result.

Wiring

Both remote controllers are connected to the A and B terminals in the indoor unit terminal block (there is no polarity to observe).





7.ADDRESS SETTING

❶Setting the addresses for the indoor and outdoor units.

There are three ways to set the addresses「Manual address setting」,「Remote controller address seiting」, and「Automatic address setting」 Use one of these methods to set the address.

Setting addresses of units

1. It is necessary to set addresses for the indoor units, the outdoor A and B units, and the remote controllers as indicated in the table below. If these settings are not done, the equipment will not operate correctly.

	Address type	Units for which the address on the left are set.	Address setting method
A. Addresses required for communication between indoor units and outdoor units.	Indoor unit address	Indoor unit	Refer to page 45～50
	Outdoor unit address	Indoor unit, outdoor A units, outdoor B units	
	Outdoor B unit address	Outdoor B units	
B. Required address for group control by one remote controller.	Group address	Indoor unit	Refer to page 45
C. Required address for control by two remote controllers.	Main/slave setting	Remote controller	Refer to page 48

- The address setting for A. will be explained here.
- The indoor unit address is used to distinguish between indoor units. Make absolutely sure that you do not set the same address into more than one unit. If an address is duplicated, control will not be possible.
- The outdoor unit address is in the outdoor A units (two places), the outdoor B units, and the indoor units. This address indicates which outdoor units are connected by refrigerant piping to which indoor units. Connected units have the same address. If each addresses are different in one refrigerant system, the control will not be possible.
- The outdoor B unit address is used to distinguish between outdoor B units. If an address is duplicated in one refrigerant system,
  the control will not be possible.

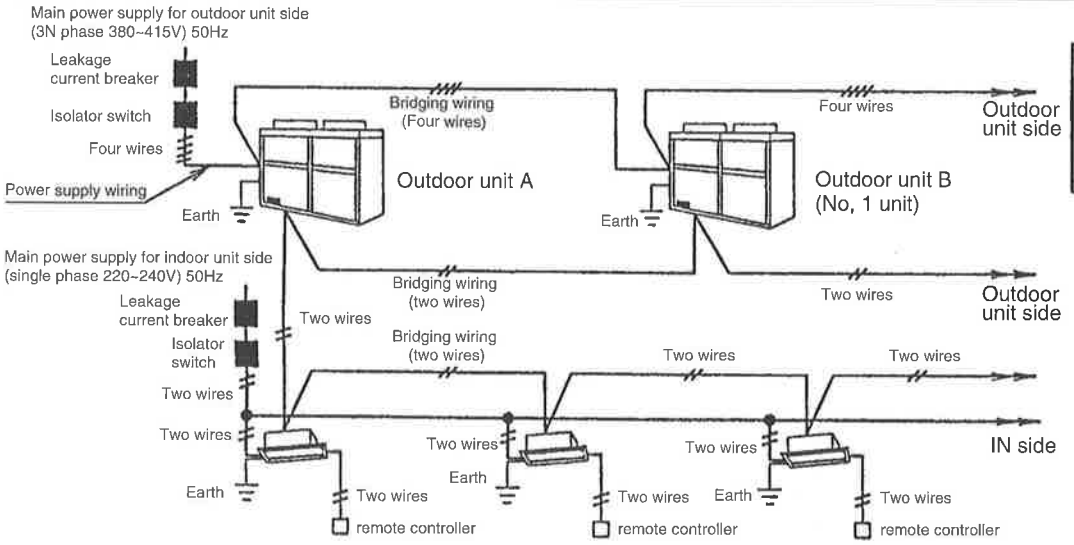
2. Set the address for A. as outlined in the table below.
There are three ways to set addresses,「1. Automatic address setting,」「2. Mauual address setting, and」「3. Remote controller address setting.」 Select the method you will use depending on the type of address and the type of wiring.

Type of address / Wiring method / Setting the addresses	Indoor unit				Outdoor unit A		Outdoor unit B			
	Indoor unit address		Outdoor unit address		Outdoor unit address (2 locations)		Outdoor unit address		Outdoor unit B address	
	Refrigerant piping pair method	URBAN NET method	Refrigerant piping pair method	URBAN NET method	Refrigerant piping pair method	URBAN NET method	Refrigerant piping pair method	URBAN NET method	Refrigerant piping pair method	URBAN NET method
1. Automatic	Address setting (000)	Not possible	Address setting (000)	Not possible	Address setting (00)	Not possible	Address setting (00)	Not possible	Automatic setting not possible.	Not possible
2. Manual	Address setting (from 001 to 199)	Address setting (from 001 to 199)	Address setting (001)	Address setting (from 001 to 031)	Address setting (01)	Address setting (from 01 to 31)	Address setting (01)	Address setting (from 01 to 31)	Address setting (from 1 to 3)	
3. Remote controller					Setting via remote controller not possible.		Setting via remote controller not possible.		Setting via remote controller not possible.	

- For outdoor B units with the same refrigerant piping systems, set the addresses manually for both wiring methods.
- Automatic address setting is only possible for the refrigerant piping pair method.
- With the refrigerant piping pair method, the refrigerant piping and transmission wiring are one system.
- With the URBAN NET method, multiple refrigerant piping systems and transmission wires form one system.

❷ Automatic address setting

When the wiring is done using the pair method, it is possible to set the addresses for each indoor unit automatically (it is not possible when the central control equipments is connected).

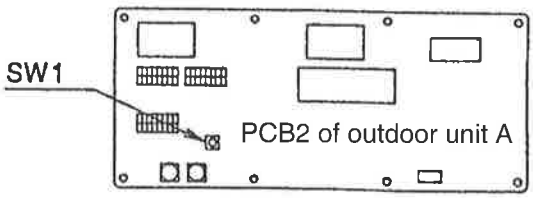


Note: Four units cannot be wired using bridging wiring method for power source wiring Use a switch box, and use branch wiring

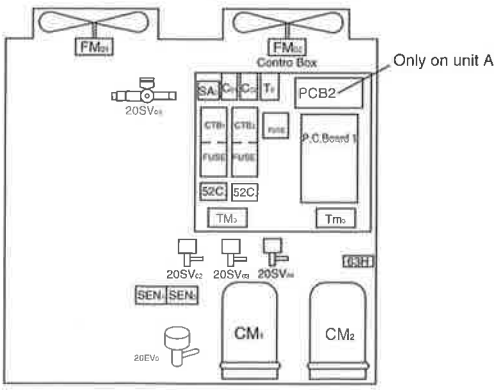
		Settings for PCB 1 DSW2 in outdoor unit B (refer to the diagram on the right for the position).
Address for outdoor unit B	0	Unit A setting 1-OFF 2-OFF
	1	Number 1 unit B setting 1-ON 2-OFF
	2	Number 2 unit B setting 1-OFF 2-ON
	3	Number 3 unit B setting 1-ON 2-ON

Note:
Before performing automatic setting, manually set the address of the outdoor B unit. (refer to the table on the right).

1. Set the address of the indoor units to 000, and the unit addresses of the outdoor units to 00.
   (At the time of shipment, the indoor unit are set to 「000」 and outdoor unit addresses are set to 「00」 respectively.)
2. Set the outdoor unit B address so that there is no address duplication within the same refrigerant piping system. The setting is made using switches 1 and 2 of DSW2 on outdoor PCB 1. (At the time of shipment, it is set to 0.)(Refer to the diagram on the right).
3. Turn the power to the indoor units on before turning the outdoor units on. (They can also be turned on at the same time.)
   When the power to the outdoor units is turned on, the addresses are automatically set. (The addresses are set approximately one minute after the power comes on.)
   However, if even one of the indoor units is not ,turned on, the address will not be set when the outdoor units are turned on.
4. After automatic setting, press the remote controller RUN switch and 「Fan」, 「Medium」, and 「Temperature」 will be displayed. In this state, press the TEST RUN switch, and after approximately 10 seconds, press the CHECK switch, and the address of the indoor unit will be displayed.
5. Automatic address setting is also done with one remote controller group control (however, the group address is not set automatically).
6. Once the addresses have been automatically set, they are stored even when the power is off. To reset the addresses, delete all the addresses of the indoor units using the remote controller, and repeat the automatic setting procedure from step 3 above, or from step 9 below.
7. When the wiring has been done using the refrigerant piping pair method, 「Manual address setting (on the PCB)」 and 「Address setting using the remote controller」 is also possible.
8. It is not possible to bridge wire the indoor units for different outdoor unit systems.
   - When the power to the indoor units is switched on, the check display comes on, but after automatic address setting, pressing the RUN switch on the remote controller clears the check display.
   - If the check display (E25) is not cleared, supply the power to the outdoor units on again.
   - If the check display (E25) is not cleared, even after supplying the power to the outdoor units on again, reset all the indoor unit addresses to 「000」 using the remote controller, and continue from step 3 above, or step 9 below.
9. To read automatic address re-setting, carry out the following procedure.
   Turn on the power to all indoor units and outdoor units, the continuously press SW1 on PCB 2 (shown below) of outdoor unit A for at least four seconds. Automatic address setting will be performed again.
   (LED 2 on PCB 2 of outdoor unit A will show the for the remaining time at 0.5 sec. steps).
   When LED 2 displays 「000」 release SW1 to perform automatic setting.
   * If the unit addresses of the outdoor units are not set to 「00」 and the outdoor unit addresses for the indoor units are not set to 「000」 respectively, automatic address setting will not be done.

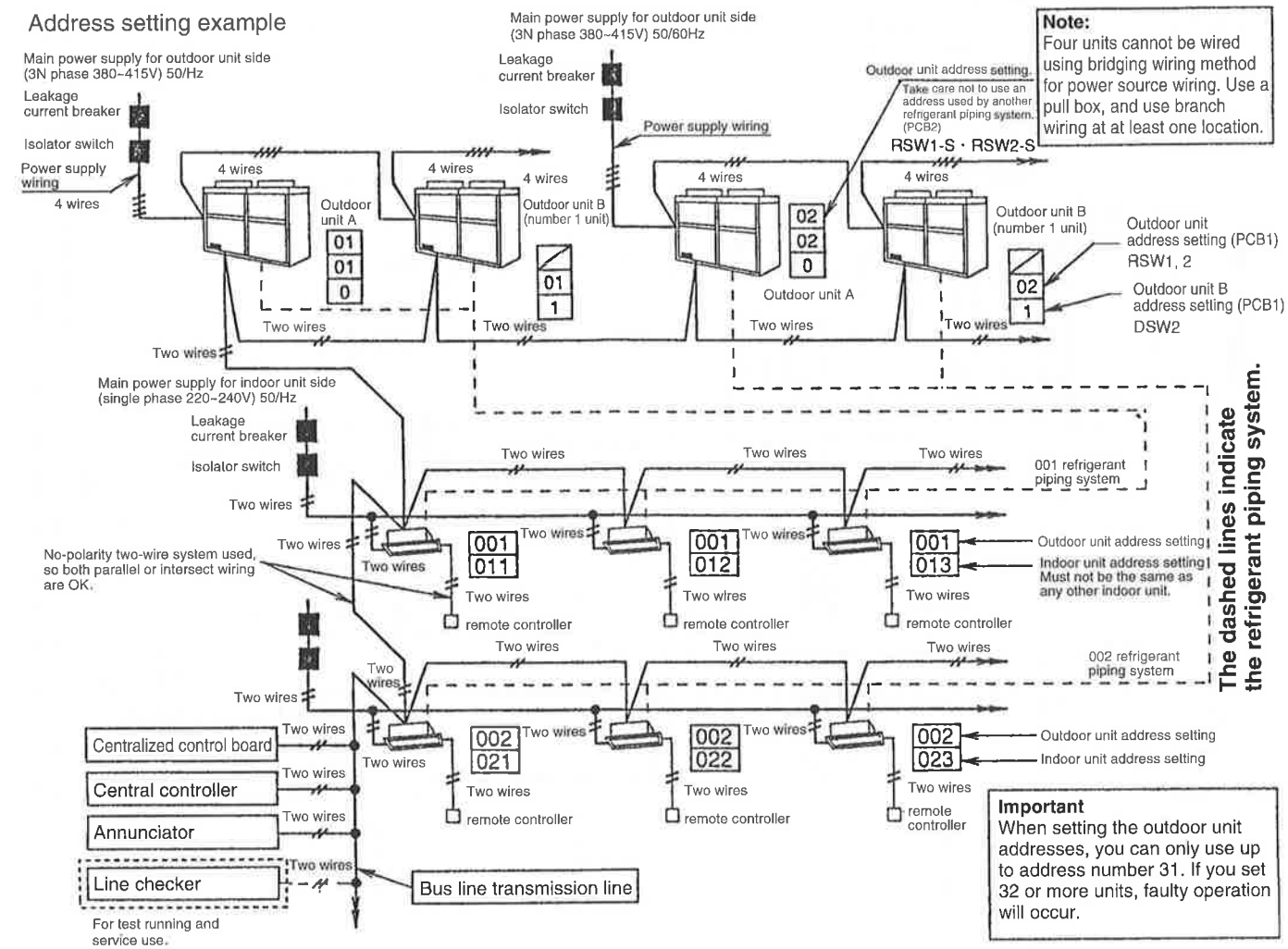


Main component parts diagram for outdoor unit



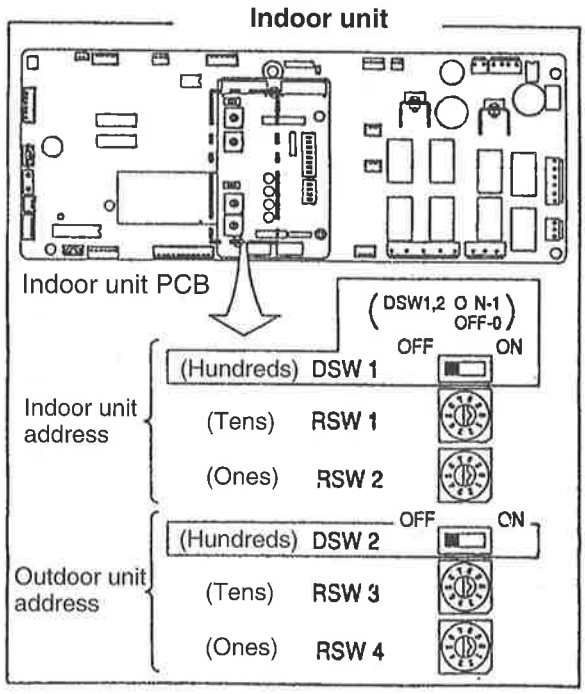
❸ Manual address setting

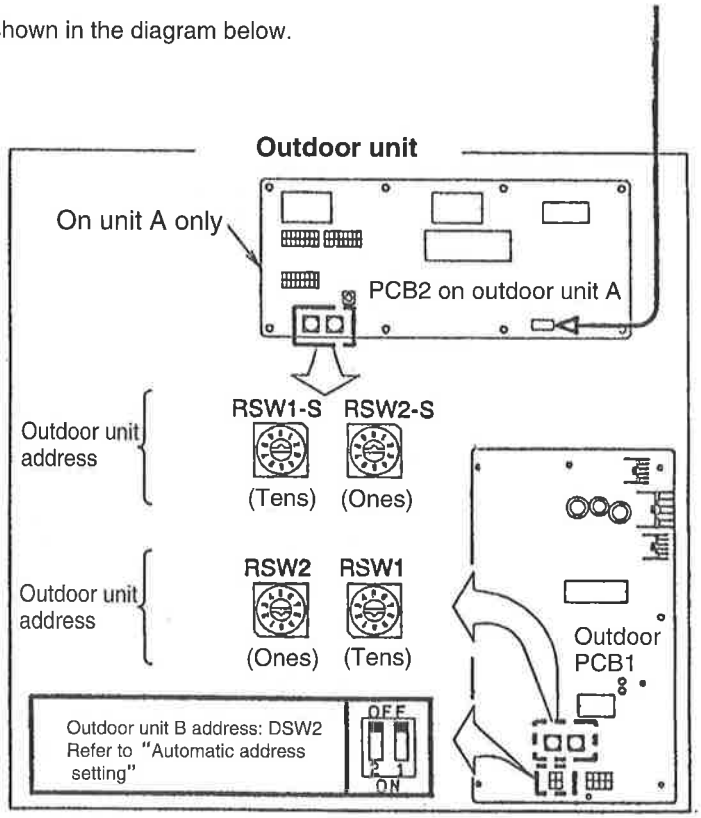
Manual address setting is possible for all wiring methods including URBAN NET (all units connected to a single bus line regardless of their refrigerant piping system).



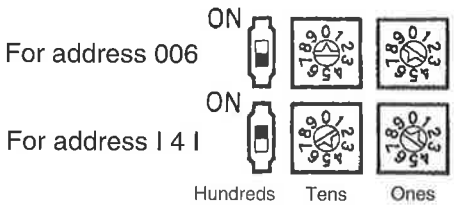
1. Set the addresses using the switches on the PCB's of each unit (see following page).
2. Make the initial address setting for each unit with the power off. The address you set is stored when the power is turned on.
3. Refer to the following list when setting addresses.
   (1) For the outdoor unit A, make the settings for the 「outdoor unit addresses」 on outdoor PCB number 1 and 2 (two locations).
   (2) For the outdoor unit B, set the 「outdoor unit address」 and the 「outdoor unit B address.」
   (3) For the indoor units, set the 「outdoor unit address」 and 「indoor unit address.」
   (4) Refer to the address setting example given in the above diagram.
   (5) Refer to "Automatic address setting" with regard to setting the 「outdoor unit B address.」

4. The indoor unit's 「indoor unit address 」 and outdoor unit's 「outdoor unit address 」 for the same refrigerant piping system are set to the same number (refer to the previous page, address 001 and 01 are the same number).
   - The 「indoor unit address 」 must be unique for all indoor units.
   - The outdoor unit's 「outdoor unit address 」 must not be duplicated on outdoor units of other refrigerant piping systems.
   - To change a stored address, turn the power on, and reset the address that you wish to change. Addresses cannot be changed with the power off.
   - At first The outdoor side power supply should be connected to the supply power unit (the unit with CN23-S connected).
   - Addresses 「000 」 and 「00 」 cannot be used.
5. The position of the numbers on the PCB switches are as shown in the diagram below.





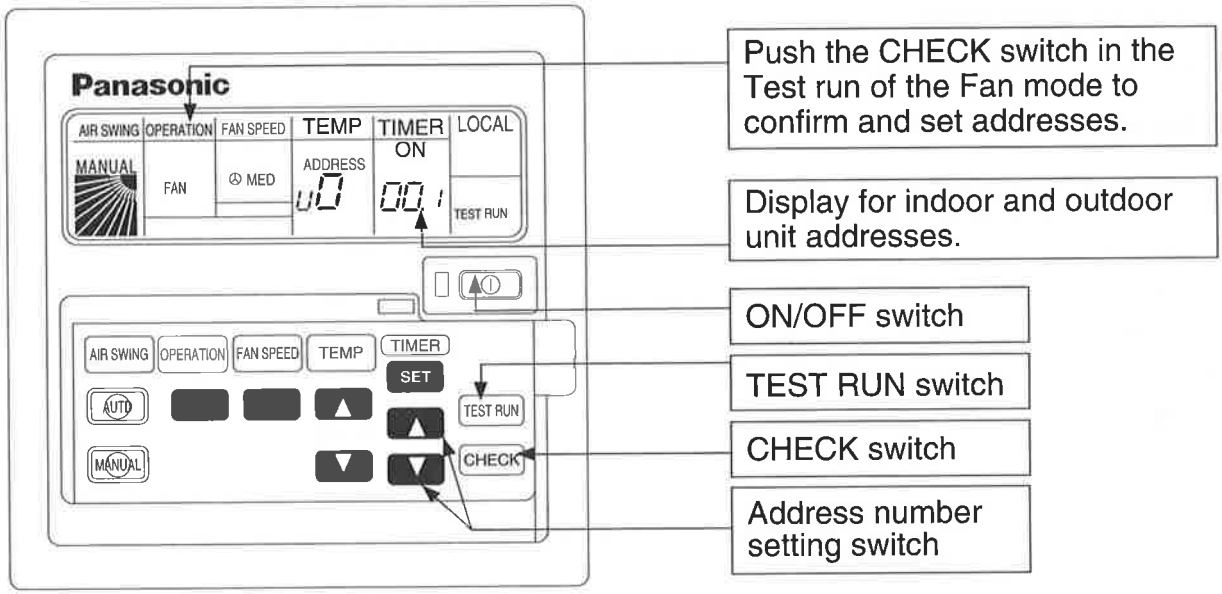
Address setting example



Note: The positions of the tens and ones for the outdoor unit address setting switches on outdoor PCBs 1 and 2 are reversed. Take due care.

❹ Setting addresses using the remote control

Applies when all indoor units have a remote controller (one remote controller group control is also possible)



1. Turn the power to the indoor side on. It is now possible to set the address of the indoor units by using the remote controller.
   - The addresses for the outdoor units are set using the DIP switches on the outdoor unit PCBs. They cannot be set using the remote controller.
   - The address settings for outdoor unit A are done on outdoor PCBs 1 and 2 (two locations)
   - The address settings for outdoor unit B are necessary to the 「Outdoor unit address」 and the 「Outdoor unit B addres」
   - Refer to "Manual address setting" regarding setting of the outdoor unit addresses.

   ◎For the indoor units, two address settings are required, the 「Outdoor unit address」 for the refrigerant piping system,and the 「Indoor unit address」 for the same bus line. These two addresses can be set using the remote controller.

   ◎Address number 「000」 cannot be used (「000」 is used when an address is cleared).
2. Push the 「CHECK」 switch 10 seconds after pushing Test Run in Fan mode. You can now 「Confirm 」and 「Set」 addresses (it will take a maximum of about one minute before the address is displayed).
   The address setting number is displayed in the timer setting display section.
   Use "Timer on"to set the indoor unit adresses and "Timer off" to set the outdoor unit addresses (the display will illuminate). Refer to the table on the right.

Display	Setting address
Timer on	⇨ Indoor unit address
Timer off	⇨ Outdoor unit address

3. Use the ▲ and ▼ keys for the timer setting to set the addresses.
   ▲ increases the address number, and ▼ decreases it.
   The display flashes when the address number is being changed.
4. Push the 「CHECK」 switch to complete address setting. The display will stop flashing and stay lit.
5. Push the 「Set」 switch to change the mode. Repeat the same procedure to set the addresses for both the indoor and outdoor units.
6. Push the 「Check」 switch again and the address display will go off, and the address will be stored even when the power is switched off.

Change an address setting

Do steps 1 to 6 on the previous page again.

Deleting an address number.

Set 「000」 for the displayed address to delete it.

Remote controller address setting example.

Turn the power to the indoor and outdoor units on, and press the RUN switch.

Press the TEST RUN switch in FAN mode, and after about 10 secs. press the CHECK switch.

It will take a maximum of about 1 minute before the display arrears.

Setting the indoor unit address.

Press the timer 「SET」 switch and display "Timer on".

Press the timer setting [▲] or [▼] switch to display the address number.
The number will flash on the display.
Example:
If you display 「003」 on the display, 「003」 will be set as the address for the intdoor unit.

Setting the outdoor unit address.

Press the timer 「SET」 switch and display "Timer off".

Press the timer setting [▲] or [▼] switch to display the address number.
The number will flash on the display.
Example:
If you display 「001」 on the display, 「001」 will be set as the address for the outdoor unit.

Press the 「CHECK」 switch, and the address number will stop flashing and stay lit, and the address will be set.

To set again

Press the 「CHECK」 switch again to store the addresses. The remote controller will return to the stopped state display (if a problem has occurred, the Test Run display will appear).

Checking the indoor and outdoor unit addresses using the remote controller (sold separately).

Checking indoor unit addresses.

Checking outdoor unit addresses.

① Turn on the power to the indoor and outdoor units, and press 「OPERATION」 switch on the remote controller (the Fan mode display will be displayed).

② Press the 「Test Run」 switch (the Test Run display will appear)

③ After about 10 secs., press the 「Check」 switch. "ON" and the indoor unit "address" will be displayed.

④ Confirm that the indoor unit address is (***).

If it is not (***), use the timer setting switches [▲] and [▼] to change the address to (***), and then press the 「CHECK」 switch.

④Press 「SET」 switch.
"OFF", and the outdoor unit "address" will be displayed.

⑤ Confirm that the indoor unit address is(***).

If it is not (***), use the timer setting switches [▲] and [▼] to change the address to(***), then press the CHECK switch.

After about 10 seconds, press the CHECK switch again. The remote controller will go off, and the display will disappear.

*After checking the addresses, be certain to turn the power supplies to all indoor and outdoor units off.

6 SAFETY DEVICE

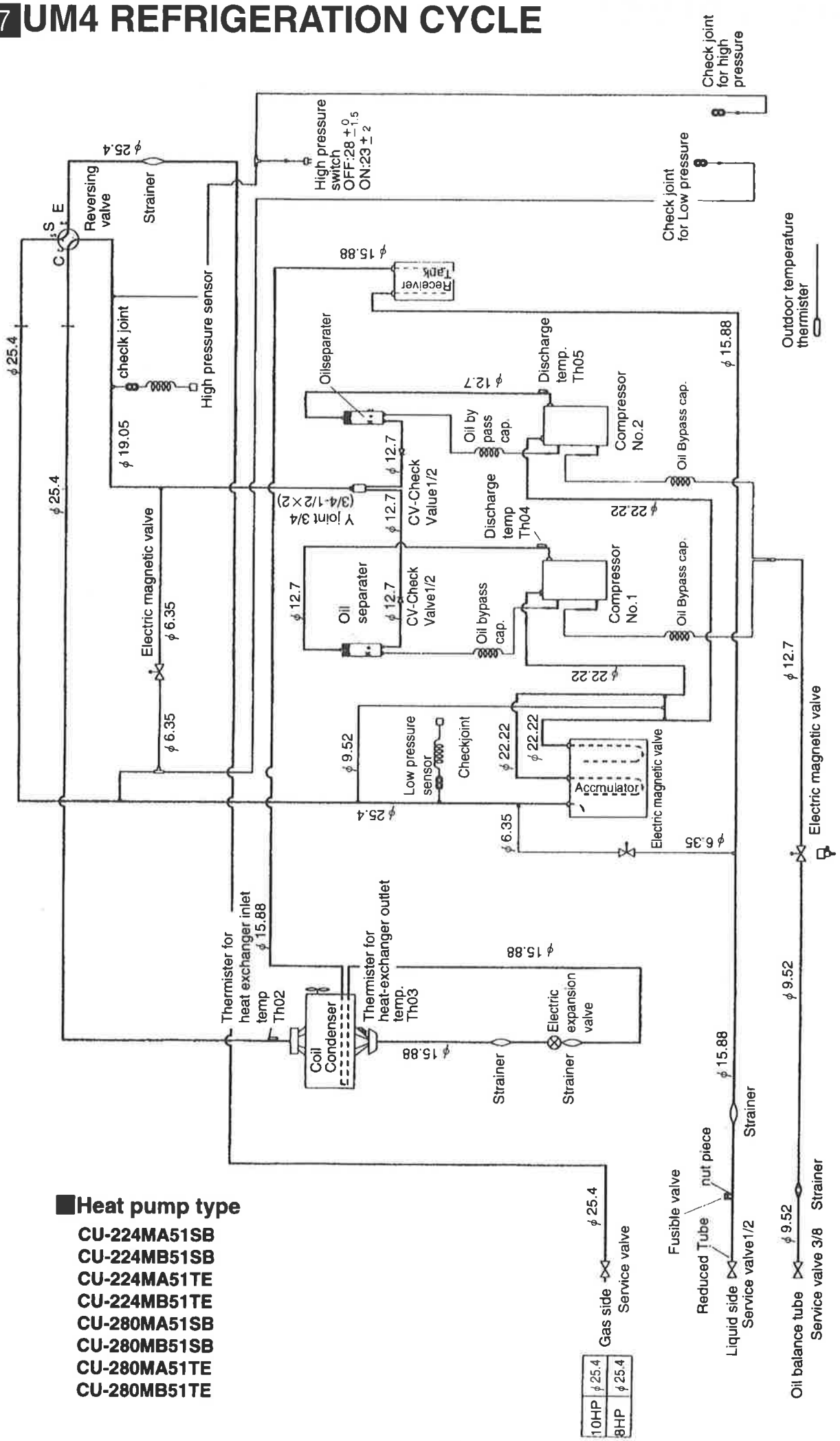
• Outdoor Unit

CAPACITY RANGE				20.0Kw (8.0HP)		25.0Kw (10.0HP)	
				MASTER	SLAVE	MASTER	SLAVE
Heating Type	Power Source		380,400V 50Hz,3 ϕ	CU-224MA51SB	CU-224MB51SB	CU-280MA51SB	CU-280MB51SB
			415V 50Hz,3 ϕ	CU-224MA51TE	CU-224MB51TE	CU-280MA51TE	CU-280MB51TE
High Pressure Switch		OFF (MPa)		2.74		2.74	
		ON (MPa)		2.25		2.25	
Internal Thermostat	Compressor	OFF (°C)		130		130	
		ON (°C)		78		78	
	Fan	OFF (°C)		135		135	
		ON (°C)		86		86	
Over current Relay for Compressor		OFF (A)		24		24/30	
		ON (A)		Automatic Reset		Automatic Reset	
Fusible Plug		°C		75		75	
Fuse for Compressor		A		40 (20+20)		40 (20+20)	
Crank case Heater		W		27×4		27×4	

• Indoor Unit

Safety Device \ Model			Wall Type	One-way Cassette type	Four-way cassette type	Ceiling type	Hide-Away
	Heat Pump Type		CS-KR51series	CS-DR51series	CS-UR51series	CS-TR51series	CS-ER51series
For Indoor Fan Motor Internal Thermostat	OFF	°C	135	135	135	135	135
	ON	°C	88	88	88	88	88
Float Switch			–	○	○	–	–

7 UM4 REFRIGERATION CYCLE



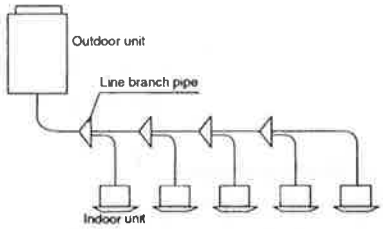
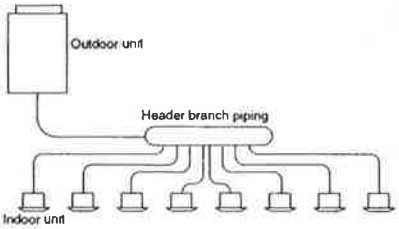
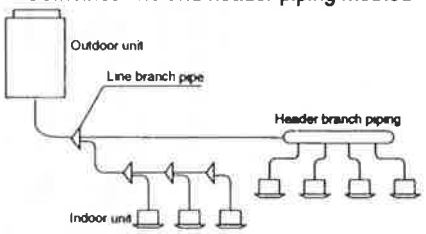
■Heat pump type

CU-224MA51SB
CU-224MB51SB
CU-224MA51TE
CU-224MB51TE
CU-280MA51SB
CU-280MB51SB
CU-280MA51TE
CU-280MB51TE

8 REFRIGERANT PIPING SYSTEM

1.PIPING INSTALLATION PROCEDURE

■Refrigerant piping method

● Line piping method	● Header piping method	● Combined line and header piping method
		 Branches (A) and (B) can be either line branches or header branches.

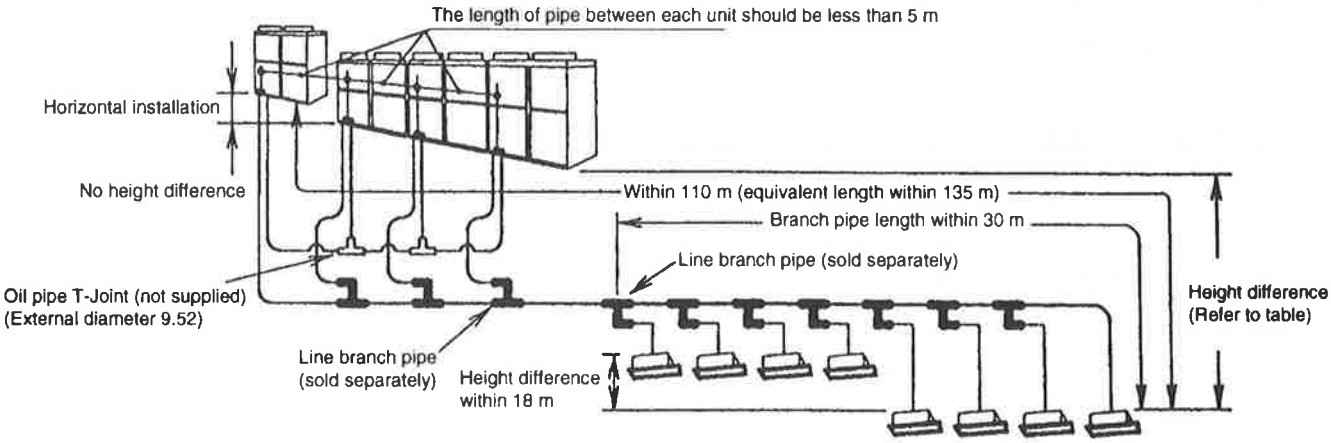
■Allowable ranges for refrigeration piping

(1)Pipe lengths	•Actual pipe length: within 110 m •Equivalent length: within 135 m •Distance from first branch to indoor unit: within 30 m •Overall pipe length: within 250 m	(1)Pipe lengths	•Height difference between indoor and outdoor units: within 50m (40 m if indoor unit is lower) •Maximum height difference between each indoor unit: within 18 m

❶Refrigerant piping installation procedure

• Determining the refrigerant piping method and refrigerant piping materials

(1) Line piping method

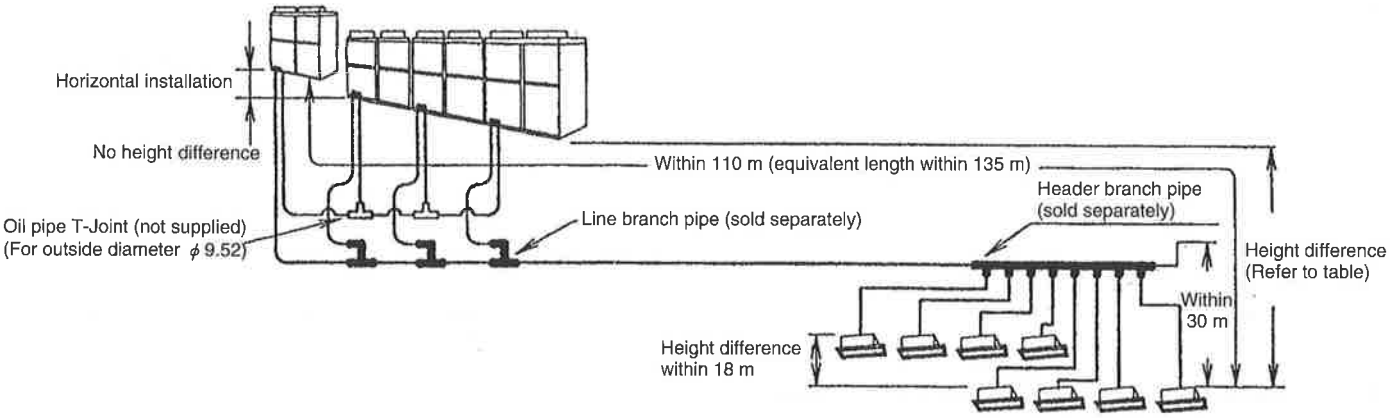


• Piping conditions

Maximum piping height difference conditions	Between indoor and outdoor units	Within 50 m when outdoor unit raised
		Within 40 m when outdoor unit lowered
	Between indoor units	Within 18 m
	Between outdoor units	Horizontal

Piping length conditions	Max. distance from outdoor units to indoor units	Within 110 m (equivalent length 135 m)
	From first branch to furthest indoor unit	Within 30 m
	Overall piping extensions	Within 250 m
	Between outdoor units	Within 5 m

(2) Header piping method



• Piping conditions

Maximum piping height difference conditions	Between indoor and outdoor units	Within 50 m when outdoor unit raised
		Within 40 m when outdoor unit lowered
	Between indoor units	Within 18 m
	Between outdoor units	Horizontal setting

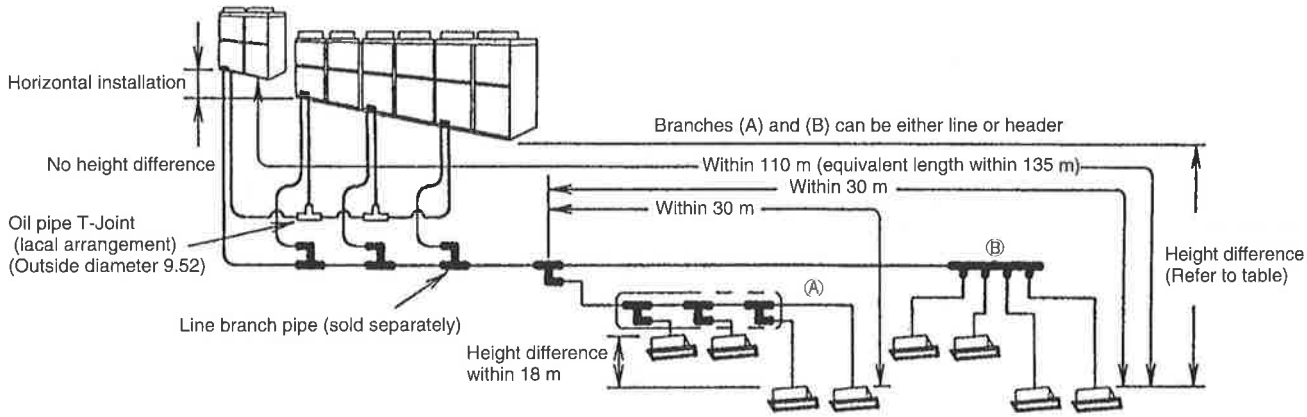
Piping length conditions	Max. distance from outdoor units to indoor units	Within 110 m (equivalent length 135 m)
	From first branch to furthest indoor unit	Within 30 m
	Total actual piping extensions	Within 250 m
	Between outdoor units	Within 5 m

NOTE:

If the header branch pipes listed below are used, add the equivalent length given below to the actual length.
Total equivalent length = Actual length + Elbow oil trap equivalent length + Branch pipe equivalent length

Header branch pipe model No.	Total capacity(kw)	Equivalent length (m)
CZ-06JHKV3	78.4 up to 84.0	2
CZ-08JHKV3	78.4 up to 84.0	2
	84.0 up to 98.0	3
	98.0 up	4

(3) Combination piping method



• Piping conditions

Maximum piping height difference conditions	Between indoor and outdoor units	Within 50 m when outdoor unit raised
		Within 40 m when outdoor unit lowered
	Between indoor units	Within 18 m
	Between outdoor units	Horizontal setting

Piping length conditions	Max. distance from outdoor units to indoor units	Within 110 m (equivalent length 135 m)
	From first branch to furthest indoor unit	Within 30 m
	Total actual piping extensions	Within 250 m
	Between outdoor units	Within 5 m

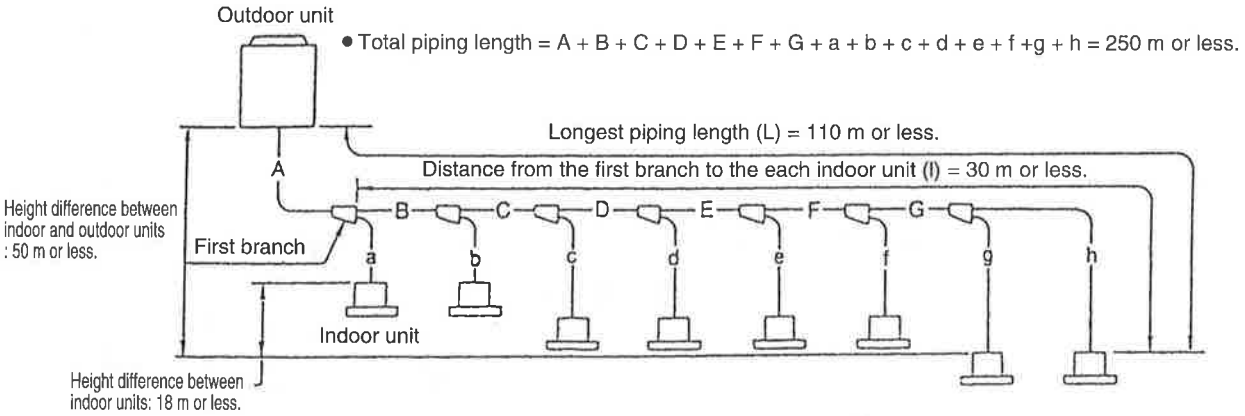
NOTE:

If the header branch pipes listed below are used, add the equivalent length given below to the actual length.
Total equivalent length = Actual length + Elbow oil trap equivalent length + Branch pipe equivalent length

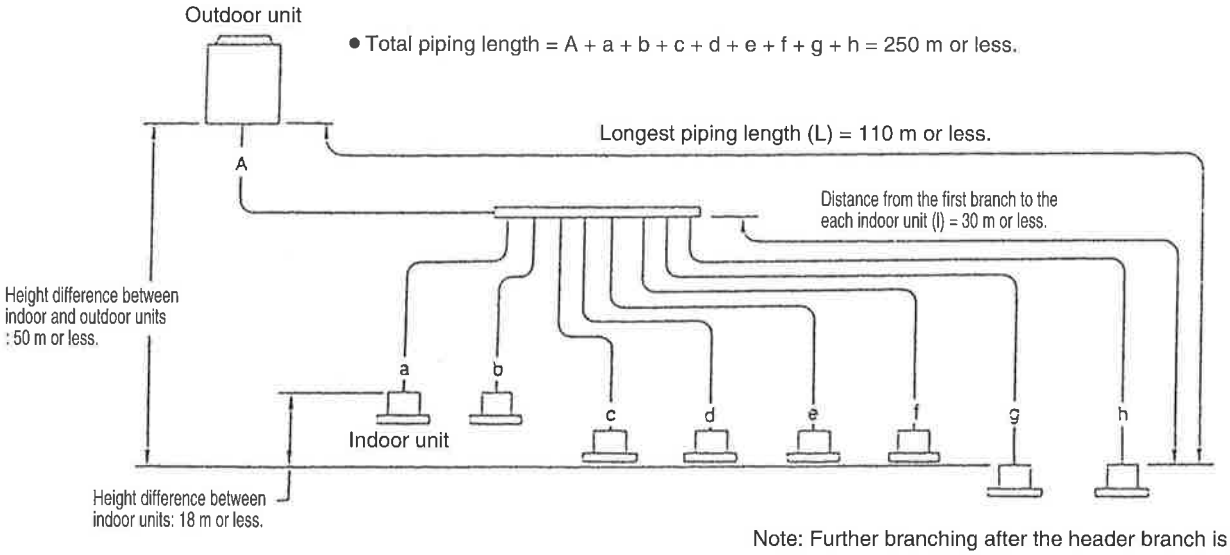
Header branch pipe model No.	Total capacity(kw)	Equivalent length (m)
CZ-06JHKV3	78.4 up to 84.0	2
CZ-08JHKV3	78.4 up to 84.0	2
	84.0 up to 98.0	3
	98.0 up	4

❷Calculation examples for three piping methods

(1) Line piping method

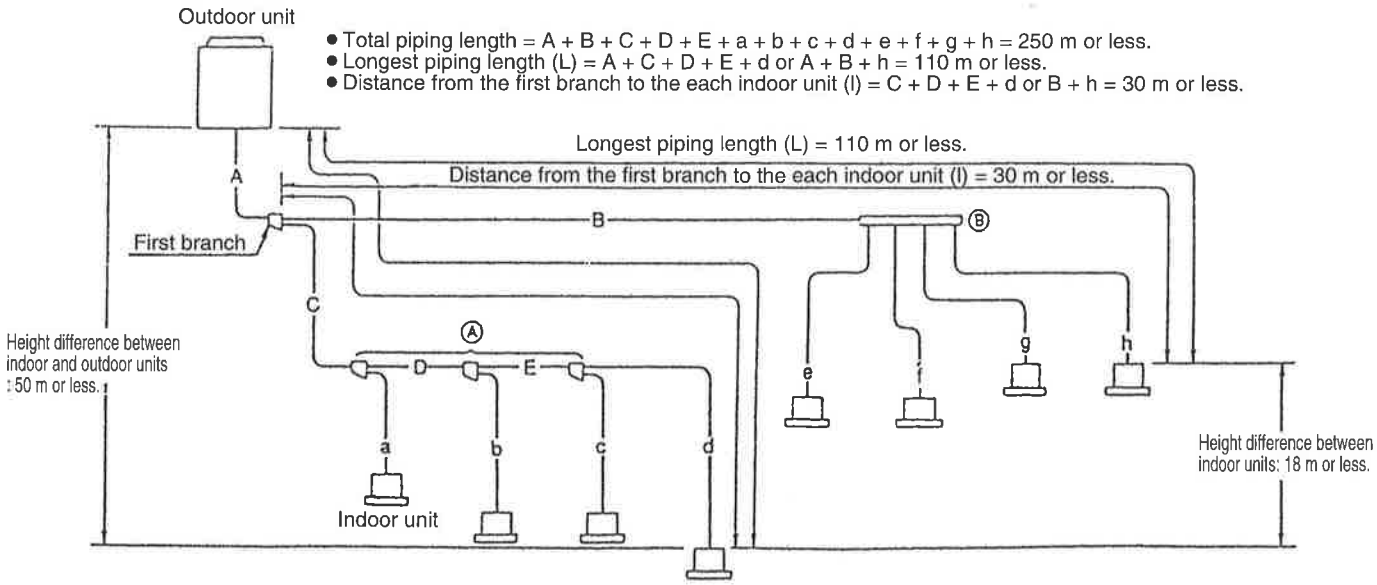


(2) Header piping method



Note: Further branching after the header branch is prohibited.

(3) Line/header combination piping method



Note: Branches A and B can be either a line or header branch.
Further branching after the header branch is prohibited.

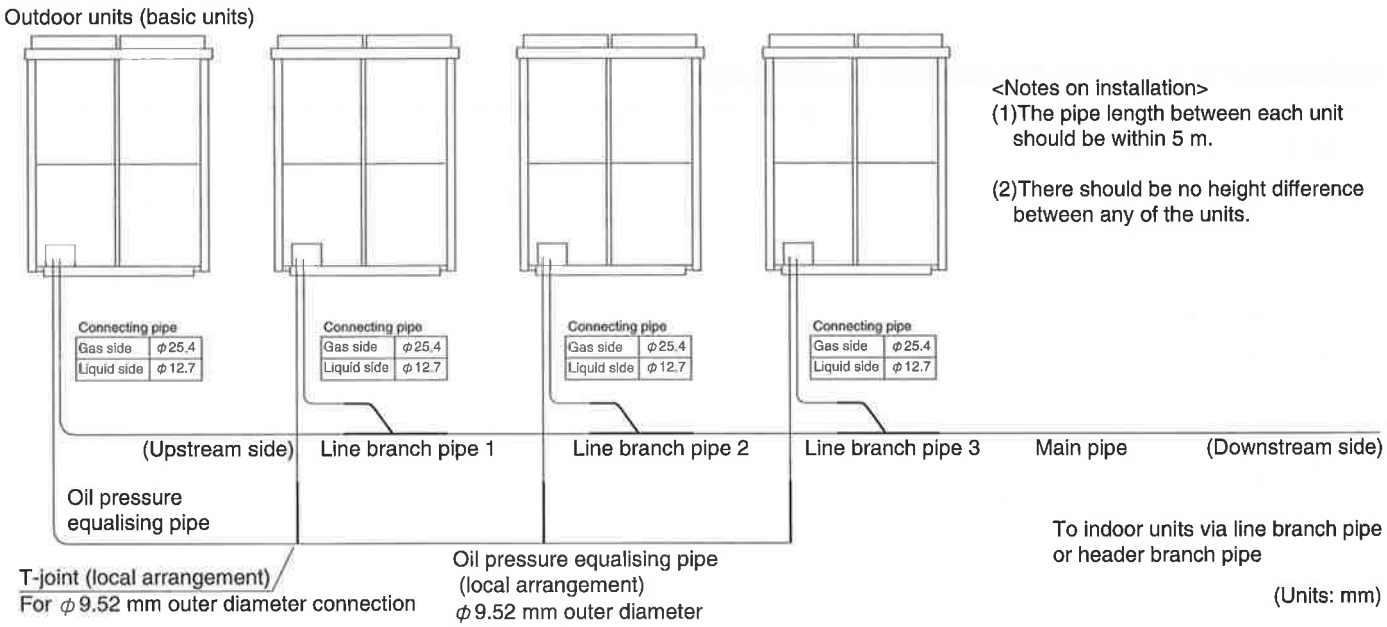
❸Outdoor unit piping method

■Selecting the refrigerant piping diameter and branch piping

Line branch piping selection procedure

Selecting the refrigerant piping diameter when combining outdoor units (basic units)

Outdoor unit and pipe names



<Notes on installation>
(1)The pipe length between each unit should be within 5 m.

(2)There should be no height difference between any of the units.

■Oil pressure equalising pipe

This pipe connects each of the compressors in order to maintain the oil pressure between the basic units at a constant level.

■Pipe diameter selection procedure

(1)Select the diameter for the connecting pipes.

- This is the same as the diameter of the outdoor unit (basic unit) pipes.

☐Outdoor unit (basic unit)

Table (1)	Connecting pipe diameter (mm)	
Outdoor unit (basic unit)	Gas side	Liquid side
CU-224MA51, CU-224MB51 CU-280MA51, CU-280MB51	φ25.4	φ12.7

(2)Select the diameters for the main branch pipes and main pipe.

- Determine from the total capacity (calculated capacity in kW) for the upstream-side outdoor units (basic units)

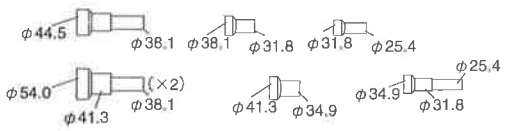
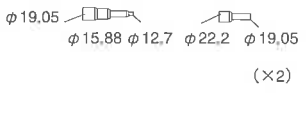
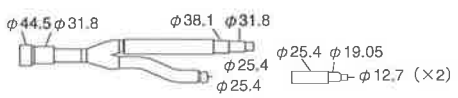
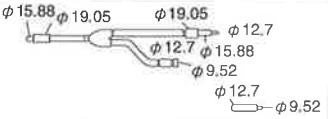
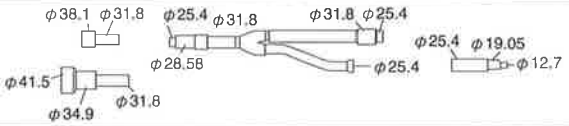
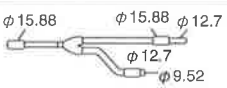
☐Main branch pipes and main pipe

	Table (2) - Total upstream capacity(kw)	Gas side (mm)	Liquid side (mm)
a	70 (28 HP) ~95 (38 HP)	φ44.5	φ22.22
b	60 (24 HP) ~65 (26 HP)	φ38.1	φ19.05
c	50 (20 HP)	φ38.1	φ15.88
d	40 (16 HP), 45 (18 HP)	φ31.8	φ15.88

(3)Select the diameter for the line branch pipe.

•Determine from the total capacity (calculated capacity in kW) for the upstream-side outdoor units (basic units).

☐Line branch pipe

Table (3)	Applicable part: Upstream basic unit Total capacity (kW)	Gas side (mm)	Liquid side (mm)	Part No.	Gas side	Liquid side
Line branch pipe for UM4	a 70 (28 HP) or more 95 (38 HP) or less	φ44.5	φ22.22	CZ-78JBKV3B + CZ-78JBKV3		
	b 60 (24 HP) 65 (26 HP)	φ38.1	φ19.05	CZ-78JBKV3		
	c 50 (20 HP)	φ38.1	φ15.88			
	d 40 (16 HP) 45 (18 HP)	φ31.8	φ15.88	CZ-50JBKV3		

■Examples of system combinations (38 HP)

Procedure (1): Connecting pipe diameters

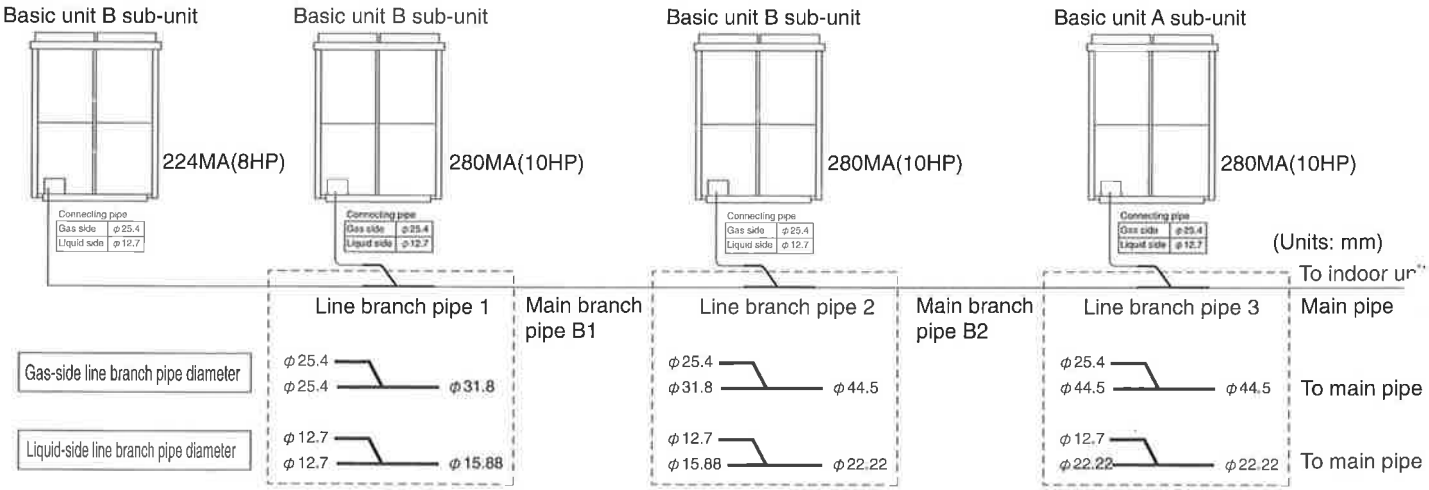
	Gas pipe	Liquid pipe	(Reference)
Connecting pipe	φ25.4	φ12.7	Table (1)

Procedure (2): Main branch pipe and main pipe diameters

	Total upstream capacity (kW)	(Reference)	Gas pipe	Liquid pipe
Main branch pipe B1	20+25=45	Table (2) [d]	φ31.8	φ15.88
Main branch pipe B2	20+25+25=70	Table (2) [a]	φ44.5	φ22.22
Main pipe	20+25+25+25=95	Table (2) [a]	φ44.5	φ22.22

Procedure (3): Line branch pipe and adapter socket diameters

	Total upstream capacity (kW)	(Reference)	Gas pipe	Liquid pipe	Part No.
Line branch pipe 1	20+25=45	Table (3) [d]	φ31.8	φ15.88	CZ-50JBKV3
Line branch pipe 2	20+25+25=70	Table (3) [a]	φ44.5	φ22.22	CZ-78JBKV3+CZ-78JBKV3
Line branch pipe 3	20+25+25+25=95	Table (3) [a]	φ44.5	φ22.22	CZ-78JBKV3+CZ-78JBKV3



■Selection table for outdoor unit branch piping

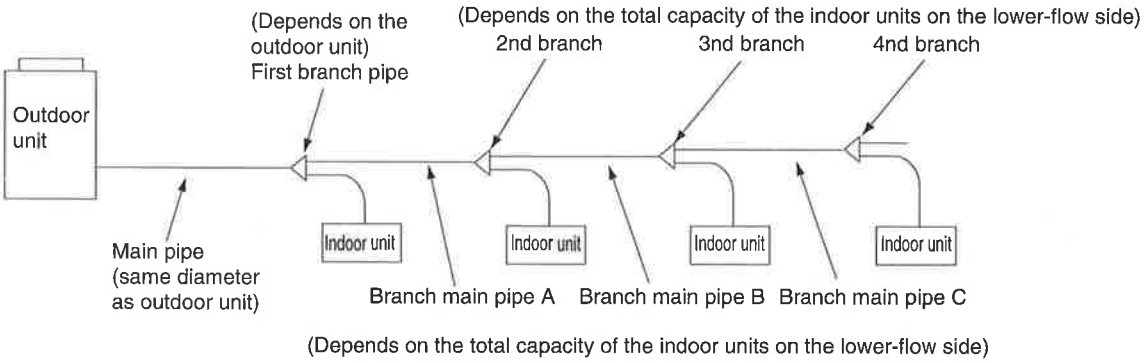
- This table shows selection examples for line branch piping for typical combinations of outdoor units A and outdoor units B.
- The branch piping will change depending on the basic unit arrangement, so that calculation of the selected capacity is necessary.

(Capacity Range)	Typical combination (Example) Installation layout	Outdoor unit line branch piping (Model No.) (< indicates adapter sockets.)			
		First branch (▷ mark in illustration)	Second branch (► mark in illustration)	Third branch (►< mark in illustration)	Total
40kw (16HP)	CU-224MA51SB CU-224MB51SB First branch To indoor units	CZ-50JBKV3	—	—	1
45kw (18HP)	CU-280MA51SB CU-224MB51SB	CZ-50JBKV3	—	—	1
50kw (20HP)	CU-280MA51SB CU-280MB51SB	CZ-78JBKV3	—	—	1
60kw (24HP)	CU-224MA51SB CU-224MB51SB CU-224MB51SB Second branch To indoor units	CZ-50JBKV3	CZ-78JBKV3	—	2
65kw (26HP)	CU-280MA51SB CU-224MB51SB CU-224MB51SB	CZ-50JBKV3	CZ-78JBKV3	—	2
70kw (28HP)	CU-280MA51SB CU-224MB51SB CU-280MB51SB	CZ-50JBKV3	CZ-78JBKV3 ⊕ CZ-78JBK3B	—	3
75kw (30HP)	CU-280MA51SB CU-280MB51SB CU-280MB51SB	CZ-78JBKV3	CZ-78JBKV3 ⊕ CZ-78JBK3B	—	3
80kw (32HP)	CU-224MA51SB CU-224MB51SB CU-224MB51SB CU-224MB51SB To indoor units	CZ-50JBKV3	CZ-78JBKV3	CZ-78JBKV3 ⊕ CZ-78JBKV3B	4
85kw (34HP)	CU-224MA51SB CU-224MB51SB CU-224MB51SB CU-280MB51SB	CZ-50JBKV3	CZ-78JBKV3	CZ-78JBKV3 ⊕ CZ-78JBKV3B	4
90kw (36HP)	CU-280MA51SB CU-224MB51SB CU-224MB51SB CU-280MB51SB	CZ-50JBKV3	CZ-78JBKV3	CZ-78JBKV3 ⊕ CZ-78JBKV3B	4
95kw (38HP)	CU-280MA51SB CU-224MB51SB CU-280MB51SB CU-280MB51SB	CZ-50JBKV3	CZ-78JBKV3 ⊕ CZ-78JBK3B	CZ-78JBKV3 ⊕ CZ-78JBKV3B	4

❹Indoor unit piping method

(1)Line piping method

Selection outline The total capacity of the connected indoor units can be from 50% to 120% of the total capacity of the outdoor units.



Note: When the equivalent piping length exceeds 90 m, increase the diameter of the gas-side pipe.

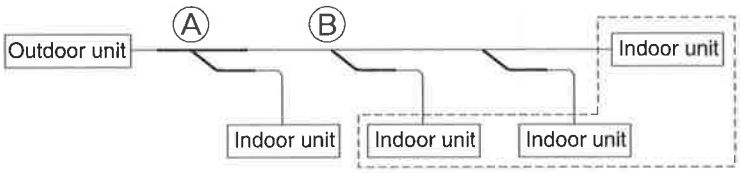
●Main pipe only

Outdoor unit	Standard liquid-side pipe diameter	Standard gas-side pipe diameter	Increased gas pipe size
20.0 kw (8 HP)	φ12.7 X t1.0	φ25.4 X t1.2	φ28.58 X t1.4
25.0 kw (10 HP)			
40.0 kw (16 HP)	φ15.88 X t1.0	φ31.8 X t1.4	φ38.1 X t1.4
45.0 kw (18 HP)			
50.0 kw (20 HP)		φ38.1 X t1.4	φ44.5 X t2.0
60.0 kw (24 HP)	φ19.05 X t1.0	φ38.1 X t1.4	φ44.5 X t2.0
65.0 kw (26 HP)			
70.0 kw (28 HP)	φ22.2 X t1.0	φ44.5 X t2.0	φ50.8 X t2.0
75.0 kw (30 HP)			
80.0 kw (32 HP)			
85.0 kw (34 HP)			
90.0 kw (36 HP)			
95.0 kw (38 HP)			

Minimum capacity of connected indoor units		Max. no. of indoor units
Outdoor unit type		
20.0 kw (8 HP)	CS-22 type (2.2 kW)	10
25.0 kw (10 HP)		13
40.0 kw (16 HP)		21
45.0 kw (18 HP)		24
50.0 kw (20 HP)		26
60.0 kw (24 HP)		32
65.0 kw (26 HP)		32
70.0 kw (28 HP)		32
75.0 kw (30 HP)		32
80.0 kw (32 HP)		32
85.0 kw (34 HP)		32
90.0 kw (36 HP)		32
95.0 kw (38 HP)		32

Calculated indoor unit capacity		Indoor unit piping diameter x thickness	
Indoor unit type	Capacity (kW)	Gas side	Liquid side
CS-22	2.2	φ12.7 X t1.0	φ9.52 X t1.0
CS-28	2.8		
CS-45	4.5		
CS-56	5.6		
CS-71	7.1		
CS-80	8.0		
CS-112	11.2	φ19.05 X t1.0	
CS-140	14.0		

Main pipe branches (between branches)



Outside dia. x min. thickness

Total capacity (kW)	Gas side	Liquid side
Less than 9.0	φ 12.7 X 1.0	φ 9.52 X 1.0
9.0-19.0	φ 19.05 X 1.0	φ 12.7 X 1.0
19.0-39.5	φ 25.4 X 1.2	φ 12.7 X 1.0
39.5-50.5	φ 31.8 X 1.4	φ 15.88 X1.0
50.5-61.5	φ 38.1 X 1.4	φ 15.88 X 1.0
61.5-78.4	φ 38.1 X 1.4	φ 19.05 X 1.0
78.4 or more	φ 44.5 X 1.4	φ 22.22 X 1.0

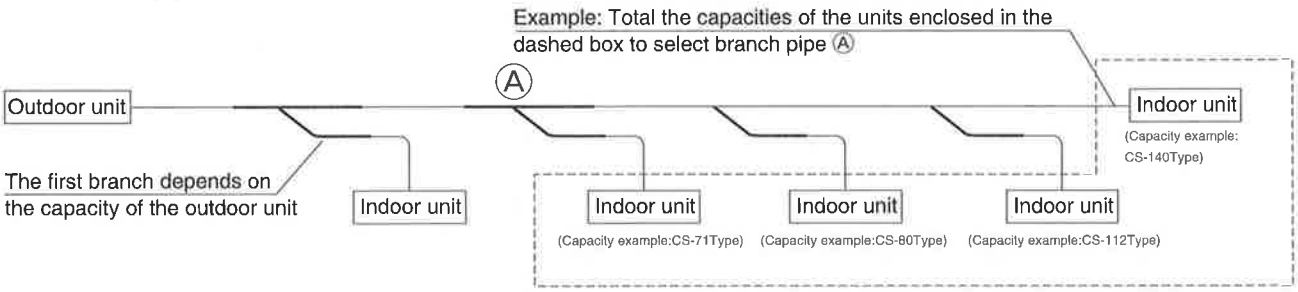
- In order to calculate the diameter of the main branch pipe which runs in between the two branch pipes, first calculate the total capacity of all of the indoor units which are downstream from the branch pipes of the downstream side.
  Next, use this calclated value to obtain the pipe diameter from the table at right.
  In the diagram above, the main branch pipe between branch pipes (A) and (B) should be selected based on the total capacity of the indoor units inside the dotted line.

Piping between branches and indoor units

Use pipe matched to the size of the indoor unit connection pipe size.

(2) Branch pipe selection

Line branch pipe selection

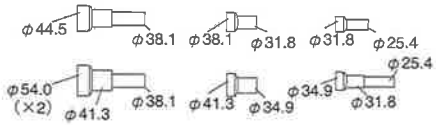
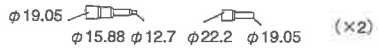
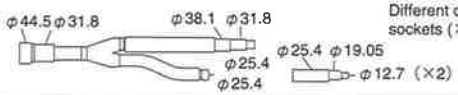
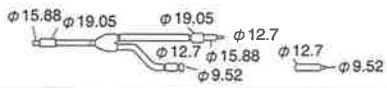
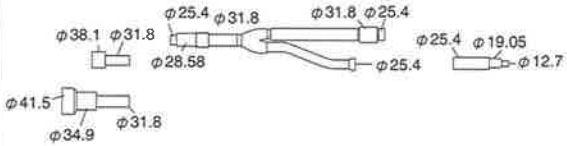
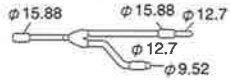
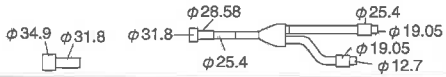
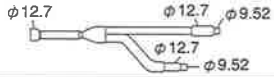
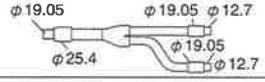
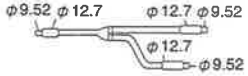
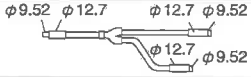


- Total the capacities of the indoor units connected to the branch pipe that you want to select, and select the pipe that matches from the table below. With regard to selection for the branch pipe Ⓐ shown in the diagram above, the total capacity of the section enclosed in the dashed box is the region used for selection. Use this region to select the branch pipe for the successive branch pipes. Note, however, that the first branch pipe depends on the capacity of the outdoor unit*.

Total capacity (kW)	Appropriate branch pipe part number
Less than 9.0	CZ-09JBKV3
9.0-19.0	CZ-19JBKV3
19.0-39.5	CZ-39JBKV3
39.5-50.5	CZ-50JBKV3
50.5-78.4	CZ-78JBKV3
78.4 or more	CZ-78JBKV3 CZ-78JBK3VB

Selection example: Selecting using the capacities in the above example gives branch pipe CZ-50JBKV3 for Ⓐ from the formula below.
7.1+8.0+11.2+14.0=40.3

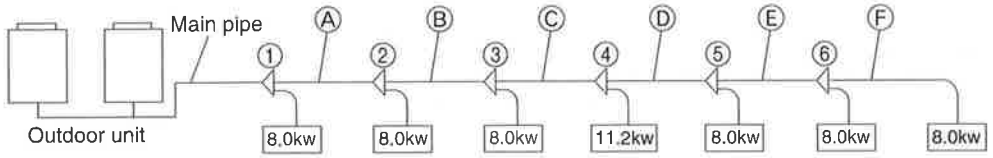
■Line branch pipe

Part name	When the total lower flow capacity(Kw) is as follows from the 2nd branch	Gas pipe	Liquid pipe	Gas pipe	Liquid pipe
CZ-78JBKV3B +CZ-78JBK3	78.4 or more	ϕ44.5	ϕ22.22	 Different diameter sockeis CZ-78JBKV3 (sold separately (Use in combination with CZ-78JBKV3))	
CZ-78JBKV3	61.5~78.4	ϕ38.1	ϕ19.05	 Different diameter sockets (×2)	
	50.5~61.5	ϕ38.1	ϕ15.88		
CZ-50JBKV3	39.5~50.5	ϕ31.8	ϕ15.88		
CZ-39JBKV3	19.0~39.5	ϕ25.4	ϕ12.7		
CZ-19JBKV3	9.0~19.0	ϕ19.05	ϕ12.7		
CZ-09JBKV3	Less than 9.0	ϕ12.7	ϕ9.52		

●When the equivalent piping length exceeds 90 m, increase the diameter of the gas-side pipe (procure the socket locally).

Connection example 1 (equivalent length 90 m or less)

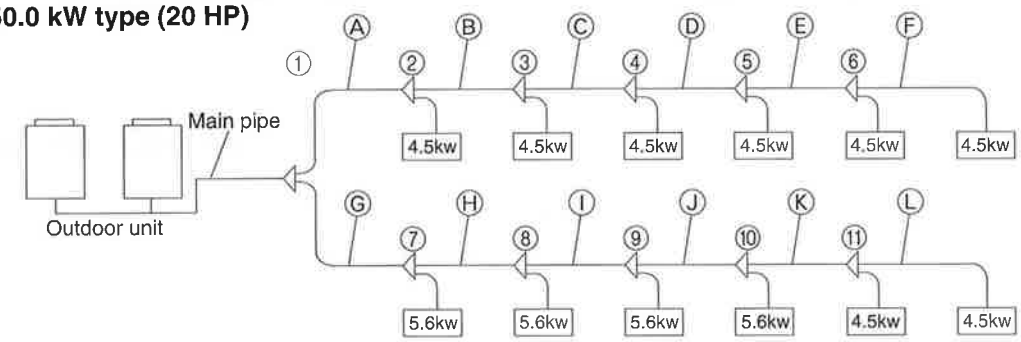
50.0 kW type (20 HP)



Connection example 1						
	Total capacity of downstream indoor units (kW)	Branch pipe used			Gas pipe diameter	Liquid pipe diameter
1	Branch No. 1	①	CZ-78JBKV3	Main pipe	φ38.1	φ15.88
2	8.0+8.0+8.0+11.2+8.0+8.0=51.2	②	CZ-78JBKV3	Ⓐ	φ38.1	φ15.88
3	8.0+8.0+8.0+11.2+8.0=43.2	③	CZ-50JBKV3	Ⓑ	φ31.8	φ15.88
4	8.0+8.0+8.0+11.2=35.2	④	CZ-39JBKV3	Ⓒ	φ25.4	φ12.7
5	8.0+8.0+8.0=24.0	⑤	CZ-39JBKV3	Ⓓ	φ25.4	φ12.7
6	8.0+8.0=16.0	⑥	CZ-19JBKV3	Ⓔ	φ19.05	φ12.7
	8.0		——	Ⓕ	φ12.7	φ9.52

Connection example 2 (equivalent length 90 m or less)

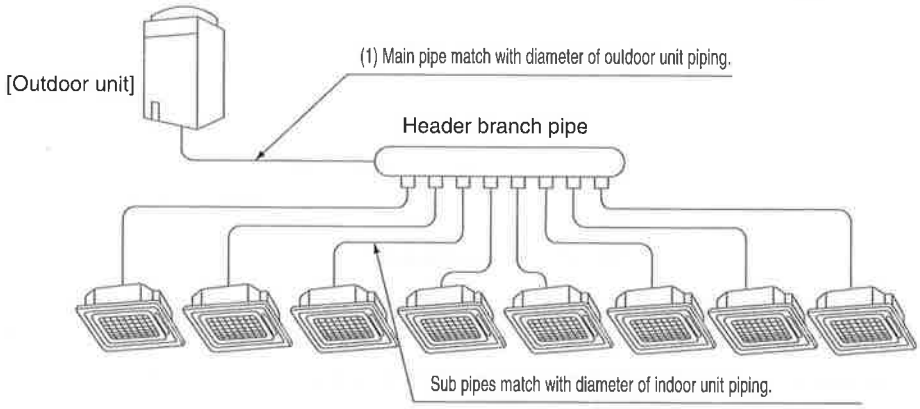
50.0 kW type (20 HP)



Connection example 2						
	Total capacity of downstream indoor units (kW)	Branch pipe used			Gas pipe diameter	Liquid pipe diameter
1	Branch No. 1	①	CZ-78JBKV3	Main pipe	φ38.1	φ15.88
2	4.5+4.5+4.5+4.5+4.5+4.5=27.0	②	CZ-39JBKV3	Ⓐ	φ25.4	φ12.7
3	4.5+4.5+4.5+4.5+4.5=22.5	③	CZ-39JBKV3	Ⓑ	φ25.4	φ12.7
4	4.5+4.5+4.5+4.5=18.0	④	CZ-19JBKV3	Ⓒ	φ19.05	φ12.7
5	4.5+4.5+4.5=13.5	⑤	CZ-19JBKV3	Ⓓ	φ19.05	φ12.7
6	4.5+4.5=9.0	⑥	CZ-19JBKV3	Ⓔ	φ19.05	φ12.7
	4.5		——	Ⓕ	φ12.7	φ9.52
7	5.6+5.6+5.6+5.6+4.5+4.5=31.4	⑦	CZ-39JBKV3	Ⓖ	φ25.4	φ12.7
8	5.6+5.6+5.6+4.5+4.5=25.8	⑧	CZ-39JBKV3	Ⓗ	φ25.4	φ12.7
9	5.6+5.6+4.5+4.5=20.2	⑨	CZ-39JBKV3	Ⓘ	φ25.4	φ12.7
10	5.6+4.5+4.5=14.6	⑩	CZ-19JBKV3	Ⓙ	φ19.05	φ12.7
11	4.5+4.5=9.0	⑪	CZ-19JBKV3	Ⓚ	φ19.05	φ12.7
12	4.5		——	Ⓛ	φ12.7	φ9.52

(3) Header piping method

(1)Selecting the main refrigerant pipe and branch pipe
•[Main pipe] (Outdoor unit - Branch No.1) Match with diameter of outdoor unit piping.
•[Branch pipes] Match with diameter of indoor unit piping.

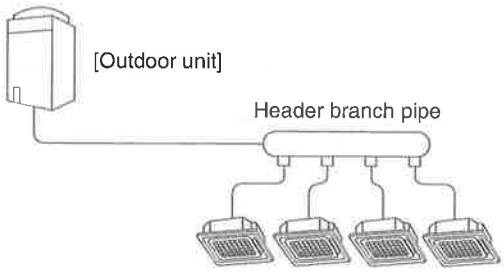


(2)Selecting the branch pipes
(Select the header branch pipes on the basis of the number of indoor units.)

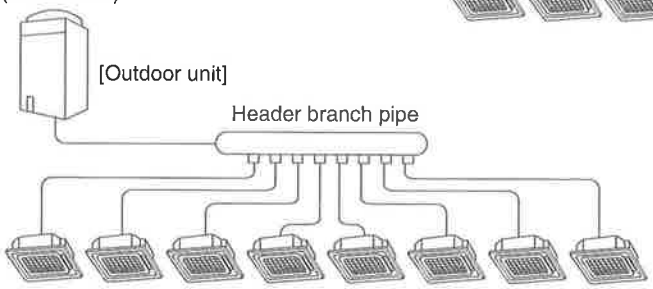
4 units or less	CZ-04JHKV3 (4 branches)
5 - 6 units	CZ-06JHKV3 (6 branches)
7 - 8 units	CZ-08JHKV3 (8 branches)

NOTE:
Attach a stopper pipe to branches which are not being used.

(4 branches)



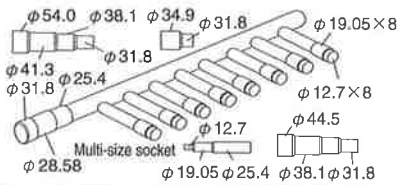
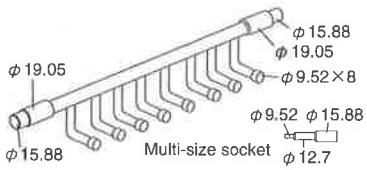
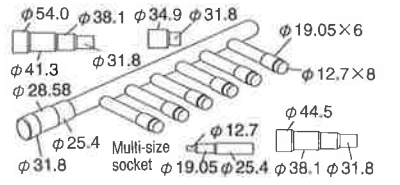
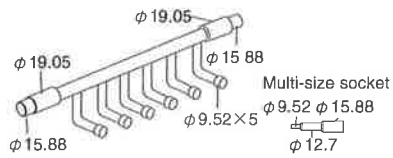
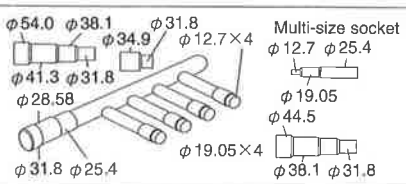
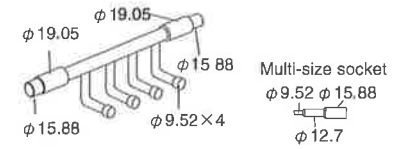
(8 branches)



■Header branch pipe

NOTE:If using 6 branches or 8 branches when the total capacity is 78.4 kW or more, increase the diameter of the liquid-side pipes to 22.22 mm.

For 8 - 38 HP

CZ-08JHKV3 8 branches		
CZ-06JHKV3 6 branches		
CZ-04JHKV3 4 branches		

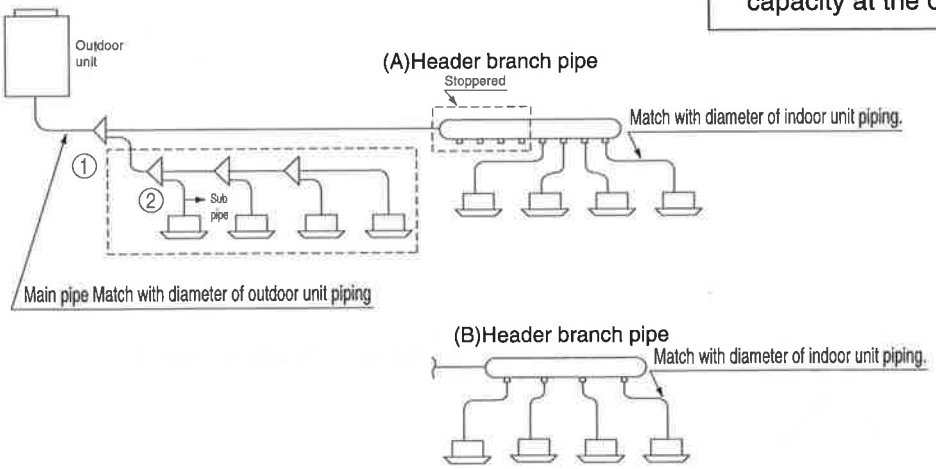
(4)Combination piping method

(1)Selecting the refrigerant piping and branch piping

When using the combination method, be sure to select starting from the linebranch pipe.

(1)Branch pipe No. 1	Be sure to use a line branch pipe.

(2)For other branch pipes except for the first branch pipe, use either line branch pipes or header branch pipes, depending on the desired application.
Determine by calculating the total indoor unit capacity at the downstream side.



(2)Selecting the line branch pipes and main and sub branch pipe diameters

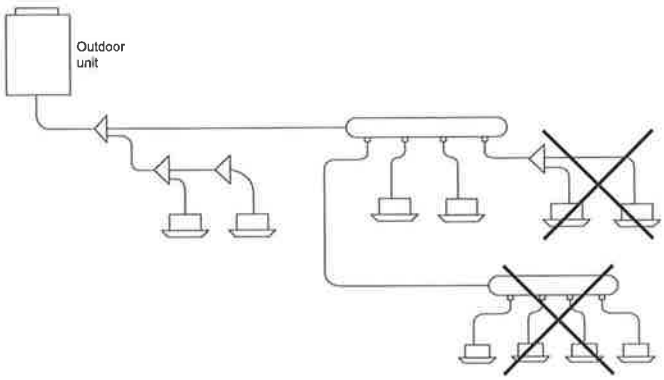
Select in the same way as for the selecting ot the line branch method.

(3)Selecting the header branch pipes and sub branch pipe diameters

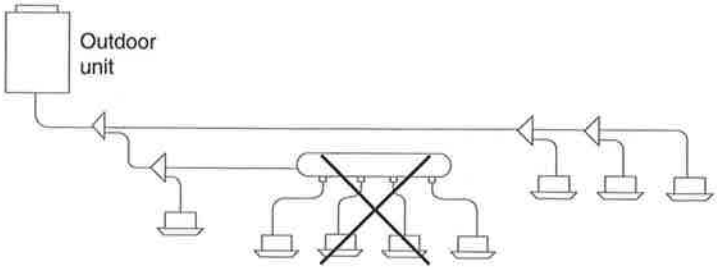
Select in the same way as for the selecting ot the header branch method.

(4)Points to note

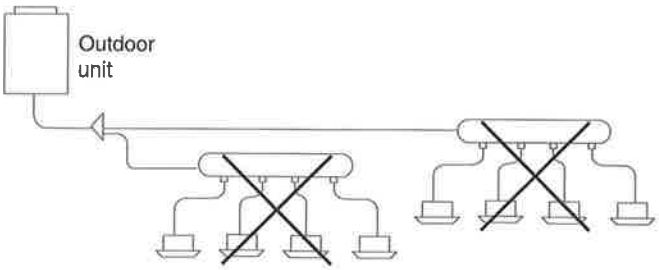
The following types of combination is not possible.



After branching from a header branch, it is not possible to make further branches using either line branch pipes or header branch pipes.



Header branch pipes cannot be used for No. 2 branches or subsequent branches.

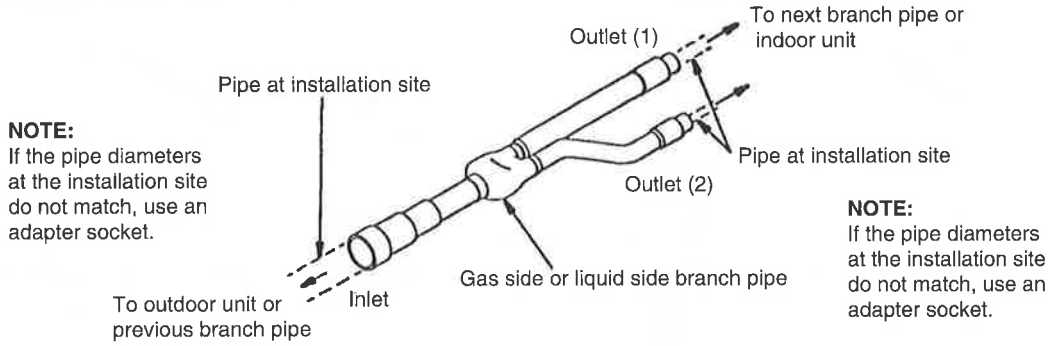


Two or more header branch pipes cannot be used together

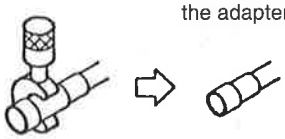
❺Installation procedure-Branch pipe

■Line branch pipe

(Gas side and liquid side)
(If using combination multi outdoor units, the inlet and outlet ends are reversed.)



- If the size of the pipe at the installation site does not match the branch size, use a pipe cutter to cut the joint as shown below.
- If using the adapter socket at the CZ-50JBK3 gas branch pipe inlet, cut the joint to a diameter of ϕ 31.8 mm as shown below and then weld on the adapter socket.

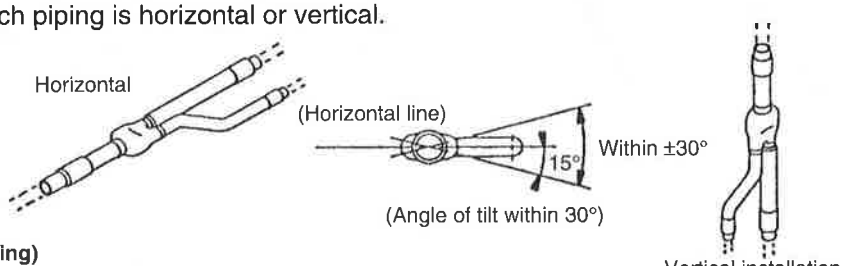


- To increase the pipe diameter of the CZ-78JBKV3 gas side or liquid side branch pipe, weld on the CZ-78JBKV3B adapter socket.

Gas side	If outlet side diameter is ϕ 44.5 mm If outlet side diameter is ϕ 31.8 mm If outlet side diameter is ϕ 38.1 mm	Cut to ϕ 38.1 mm diameter and weld on adapter socket. Weld on adapter socket. Weld on two adapter sockets.
Liquid side	If inlet side diameter is ϕ 22.2 mm If outlet side diameter is ϕ 22.2 mm If outlet side diameter is ϕ 19.05 mm If outlet side diameter is ϕ 15.88 mm	Weld on adapter socket. Cut to ϕ 19.05 mm diameter and weld on adapter socket. Cut to ϕ 12.7 mm diameter and weld on adapter socket. Cut to ϕ 12.7 mm diameter and weld on adapter socket. (Cut adapter socket to ϕ 15.88 mm diameter also.)

■Notes when connecting piping

Please install the branch piping is horizontal or vertical.

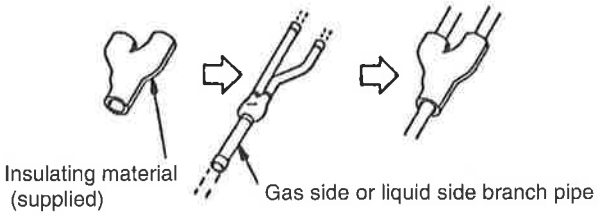


(Note when brazing)
When brazing, be sure to blow the pipes by using nitrogen after clearing of any dirt or dust (in order to prevent generation of corrosion scale in the pipe).

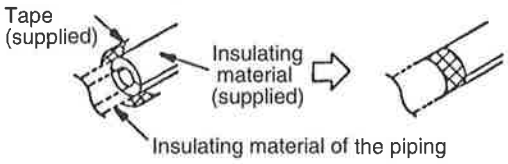
■Heat insulating procedure

Insulate the branch pipes on the gas side and liquid side against heat.
NOTE: Use an insulation material that can with stand heat of 120°C on the gas side.

1) Insulate the gas side and liquid side with the heat insulating material.



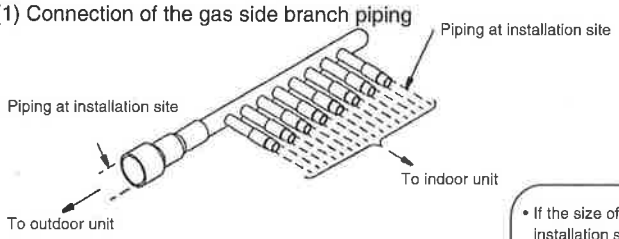
2) Use tape to seal the joints between the insulating material and the insulating material of the piping.



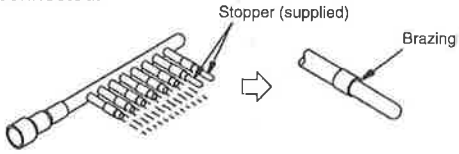
■Connection procedure for header branch piping

(1) Connection of the gas side branch piping
(2) Connection of the liquid side branch piping

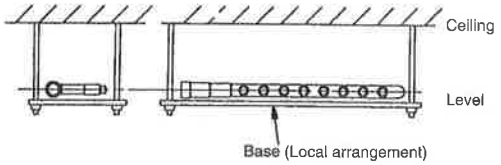
(1) Connection of the gas side branch piping



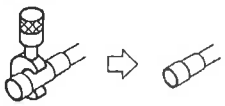
1) Attach stoppers to the places which are not to be connected.



2) Place the unit on the base and make sure that the installation location is level.

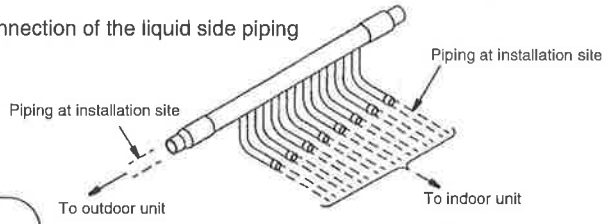


• If the size of the pipe at the installation site does not match the branch size, use a pipe cutter to cut the joint as shown below, or use an adapter socket.



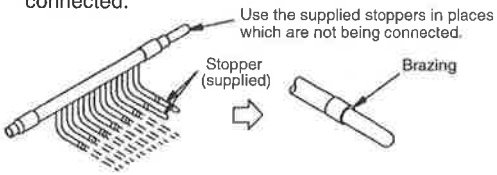
• If using the adapter socket at the gas branch pipe inlet, cut the joint to a diameter of ϕ 25.4 mm as shown below and then weld on the adapter socket.

(2) Connection of the liquid side piping

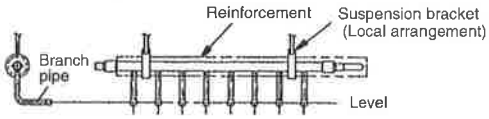


NOTE: If the total capacity of the indoor units is 78.4kw or greater, expand the inside diameter of the liquid side pipes (outside diameter ϕ 22.22 mm) to ϕ 22.22 mm.

1) Attach stoppers to the places which are not to be connected.



2) Suspend the unit from the ceiling and make sure that the installation location is level.

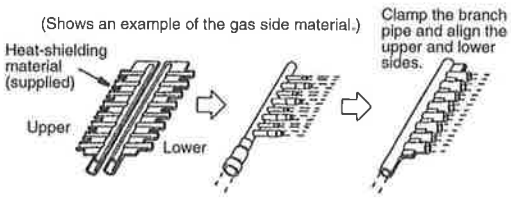


• Install so that the pipes point downward as shown in the illustration.
• Install after attaching insulation material to the suspension brackets.

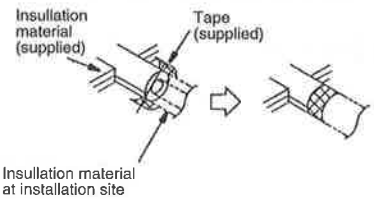
■Heat insulating procedure

Insulate the branch pipes on the gas side and liquid side against heat.
NOTE: Use an insulation material that can withstand heat of 120°C on the gas side.

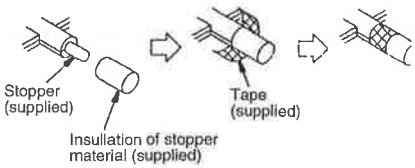
1) Insulate the gas side and liquid side header with the heat insulating material.



2) Use tape to seal the joints between the insulating material and the insulating material already at the installation site.



3) Attach Insulation material to the stopper installation locations and secure it with tape.



2. PIPING WORK OUTLINE

Units: N.m (kgf.cm)

Pipe out. dia.	Torque	Notes
ϕ9.52	22.55~26.47 (230~270)	Equalizing oil pipe service valve
ϕ12.7	32.36~36.28 (330~370)	Liquid-side service valve

(1) Liquid-side piping connection
Flare the liquid-side pipe, and connect it to the liquid-side service valve. Tighten the flare nut to the torque value given in the table on the right.

(2) Gas-side piping connection
Braise an elbow or socket (procure locally) onto the gas-side service valve, taking note of the direction of the pipe.
※When braising, cool the valve using a wet cloth to ensure that heat is not transferred to the valve body.

(3) Equalizing oil pipe connection
Flare the equalizing oil pipe, and connect it to the equalizing oil pipe service valve. Tighten the flare nut to the torque value given in the table above.
※Braise the equalizing oil pipe using a pipe connection joint (procure locally).

(4) Branch pipe connection
Refer to the attached installation manual regarding connection of the branch kit that you have selected (purchased separately).

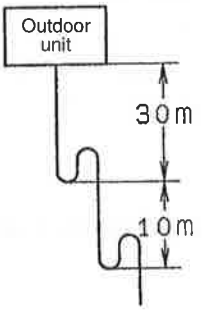
(5) Piping insulation
Use the insulation material specified on the table on the right to insulate all piping and branches.
※Insulate the piping after you have completed the air-tightness in tegrity check (described later).

Liquid-side and equalizing oil piping	Should withstand a temperature of at least 70°C
Gas-side piping	Should withstand a temperature of at least 120°C
Branch pipe	Use the material supplied with the branch

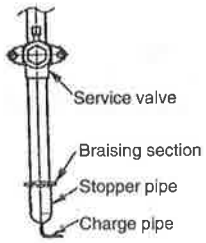
(6) Points of caution regarding piping installation

When braising:
After remove all dirt and dust, and braise under a stream of nitrogen gas (to prevent oxidization scale from forming inside the piping).

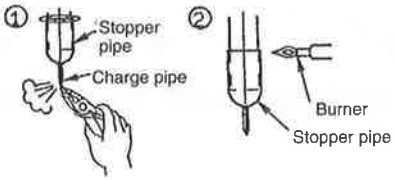
When the height difference between indoor and outdoor units exceeds 30 m:
When the height difference between indoor and outdoor units will exceed 30 m, an oil trap must be installed on the gas suction pipe (refer to the diagram on the right). Install one oil trap at a distance of 30 m from the outdoor unit, and at 10 m intervals thereafter.



CAUTION
When you remove the stopper, discharge any accumulated gas.



WARNING
Do not bring the burner flame into contact with the pipe until you have released the internal pressure. There is a possibility that the pipe may burst.

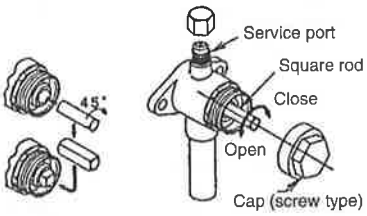


Discharge any gas that has accumulated in the stopper pipe.

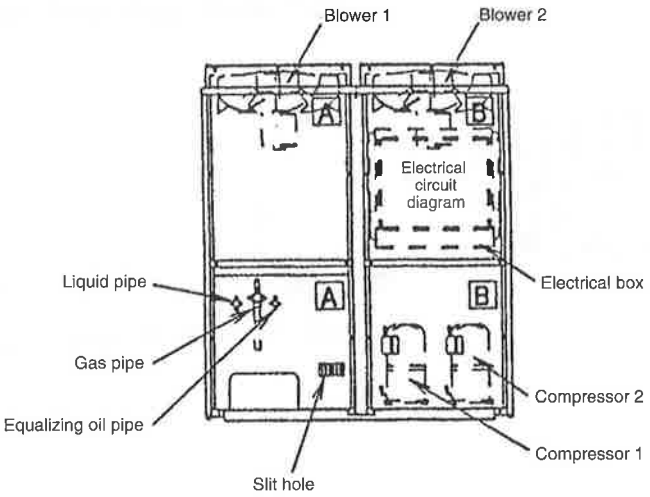
Remove the braised stopper pipe section from the body.

Service valve operation
- Remove the cap, and turn the square rod with a monkey wrench to open and close it.
- To fully open or close the valve, rotate the square rod until it stops.

When fully open:
- After inserting the square rod to the rear as described in the outline below, and replace the cap in its original position.
  (1) Pull out the square rod.
  (2) Turn 45 degrees.
  (3) Insert the square rod to the rear once more.



Principle parts are in the locations shown in the diagram below. After removing the panel, attach the outside cover panel so that the panel compartment labels are aligned as shown in the diagram below.
※If you do not install the external cover panels in the correctly, the internal parts may not function correctly.



■Procedures to carry out after piping is connected

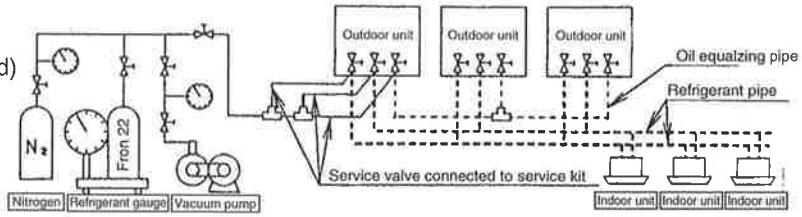
(1) Checking of the airtightness, the state of the vacuuming and additional charging of refrigerant

Check the airtightness along the dotted lines in the illustration, vacuuming and the charging of additional refrigerant in that order.

① Airtightness inspection (with service valve closed)
Gas used: Nitrogen
Test pressure: 2.74 MPa {28 kgf/cm²}
Test time: 24 hours
Check that there are no gas leaks under the conditions given above.

② Vacuuming
(liquid pipes, gas pipes and the oil equalizing pipes)
Be sure to draw a vacuum in the oil equalizing pipes also.
(The liquid pipes and gas pipes are not connect to the oil equalizing pipes.)

③ Charging of additional refrigerant
Refer to "Refrigerant additional charging amount" below for details on the refrigerant charging amount.

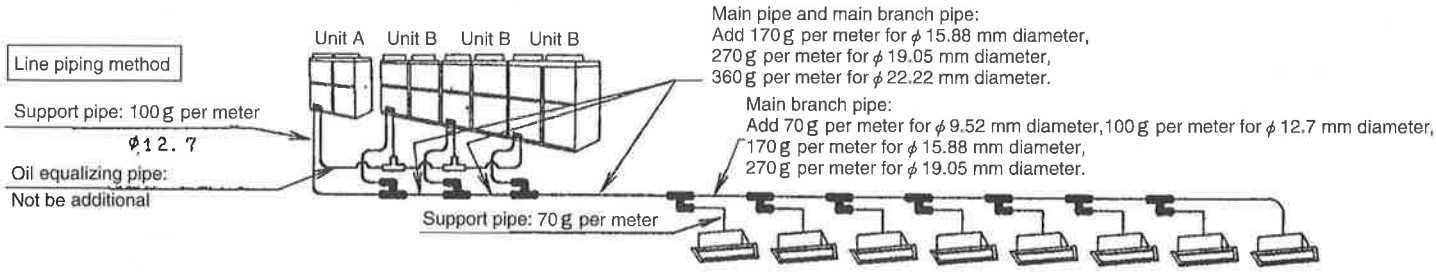


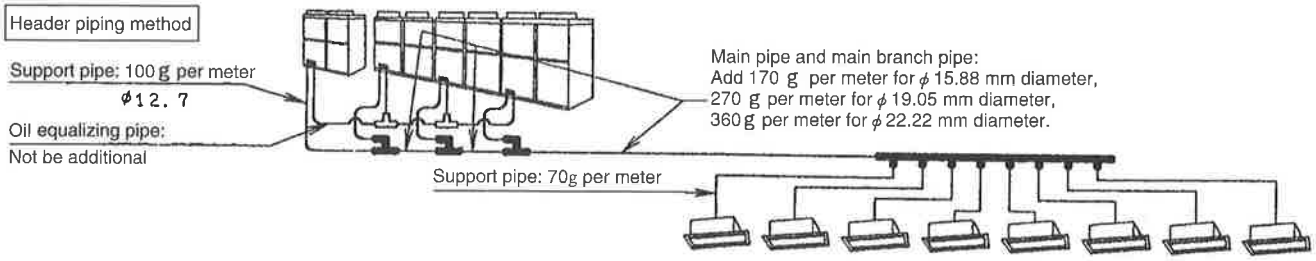
3. ADDITIONAL REFRIGERANT CHARGING AMOUNT

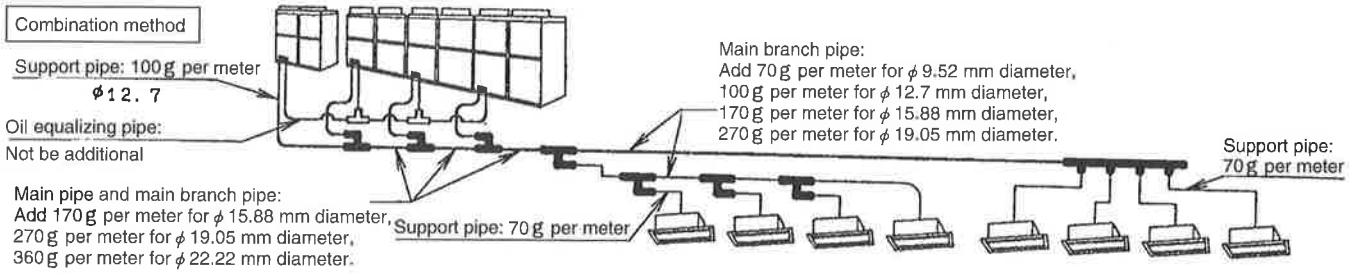
Refer to the table below to calculate the refrigerant additional charging amount based to the liquid side pipe diameter and the actual pipe length. (But, it is not necessary to charge to the oil equalizing pipe additionally.)

Liquid side pipe diameter	φ9.52 (3/8")	φ12.7 (1/2")	φ15.88 (5/8")	φ19.05 (3/4")	φ22.22 (7/8")
Refrigerant additional charging amount per meter of pipe	70g	100g	170g	270g	360g

• Example of refrigerant additional charging







4.CORRECTION OF COOLING AND HEATING CAPACITY

•Calculate the length of pipe for each indoor unit, and then use this length to make the capacity correction according to the bellow figure.
•Calculation method for refrigeration capacity (Maximum capacity when using in combination with standard indoor units)

Refrigeration capacity =
Cooling capacity calculated from the capacity curve (Page 177~181) x
Rate of change in each capacity

•During cooling and heating, set the pipe length switch (on outdoor unit printed circuit board) in accordance with the pipe used. The rate of change in capacity at maximum operating load under standard running conditions will then be displayed for a system incorporating
standard indoor units.
•If the equivalent pipe length is 90 m or more, the main pipe at the gas side (from outdoor unit to first branch pipe) must be one size larger in diameter than normal.

Equivalent pipe length	Equivalent length (Overall pipe length) = Actual pipe length + No. of elbows x (Equivalent length of lower elbow) + Oil trap x (Equivalent length of lower oil trap)	
Type / Pipe diameter (mm)	Elbow (Units: m)	Oil trap (Units: m)
9.52	0.18	1.3
12.70	0.20	1.5
15.88	0.25	2.0
19.05	0.35	2.4
22.22	0.40	3.0
25.40	0.45	3.4
28.58	0.50	3.7
31.80	0.55	4.0
38.10	0.65	4.8
44.50	0.80	5.9

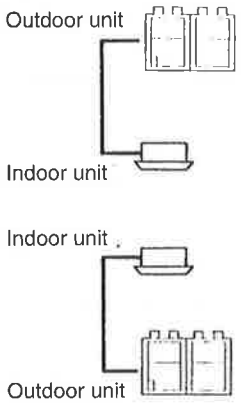
•In order to maintain the ideal level of performance for the equipment, the refrigerant piping used should be of the specified diameter.
•One oil trap is required each 10 meters when the height difference is 30 meters or more. (gas side only)

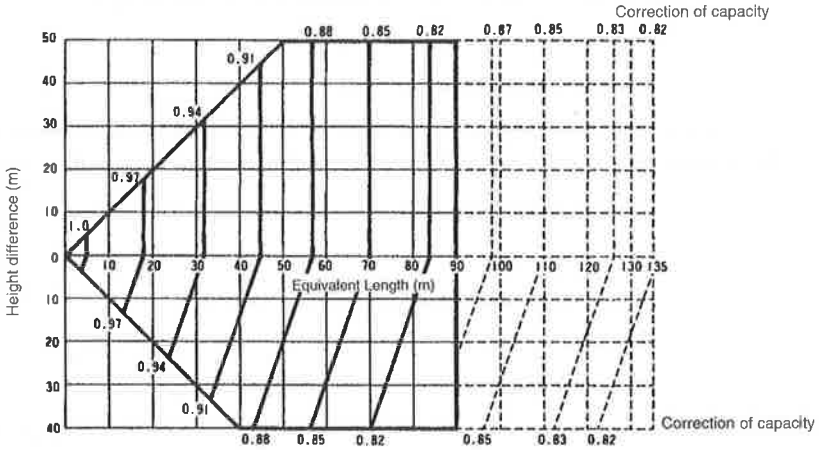
●Main pipe

Outdoor unit capacity	Gas side	Size-up diameter
20.0kw(8HP)	φ25.4	φ28.58
25.0kw(10HP)		
40.0kw(16HP)	φ31.8	φ38.1
45.0kw(18HP)		
50.0kw(20HP)	φ38.1	φ44.5
60.0kw(24HP)		
65.0kw(26HP)		
70.0kw(28HP)	φ44.5	φ50.8
75.0kw(30HP)		
80.0kw(32HP)		
85.0kw(34HP)		
90.0kw(36HP)		
95.0kw(38HP)		

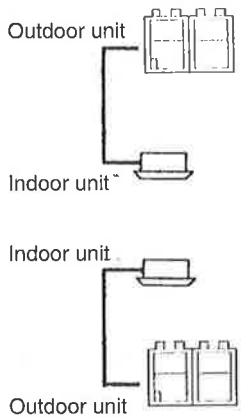
•Rate of change in capacity according to the pipe length

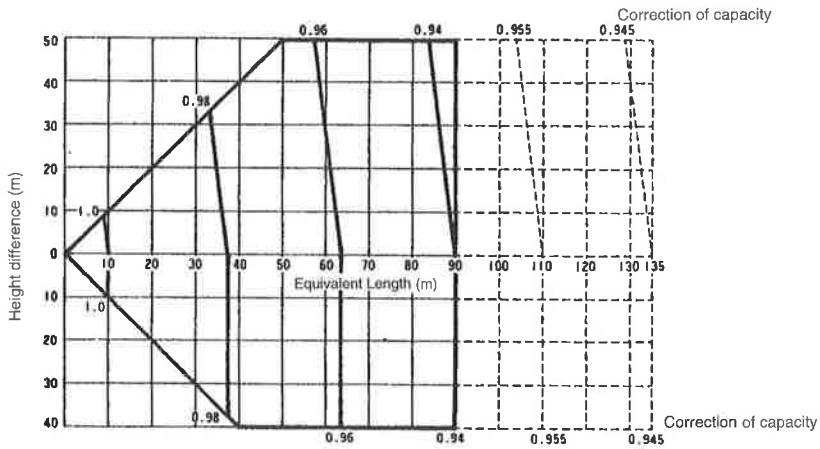
Cooling





Heating





※The broken lines indicate the capacity correction when the equivalent length of the branch pipe is 30 m and the main gas- side pipe is one size larger.
•If the main gas-side pipe (the section from the outdoor unit to the first branch) is one size larger, calculate the overall equivalent length from the following formula to adjust the capacity from that shown in the graph.

Overall effective length = (Main pipe eguivalent length) x 0.5 + (Branch pipe eguivalent length)

5. SAFETY PRECAUTIONS TO AVOID REFRIGERANT GAS LEAKS

The rooms in which the air conditioners installed must be prepared so that even if refrigerant gas should leak, the concentration of leaked gas does not reach the maximum permissible concentration.

1.The Fron 22 refrigerant gas which is used in the air conditioners is not toxic or inflammble. However, it is not the same as air, so that if large quantities of this gas should happen to leak into a room, it may interfere with normal breathing and cause discomfort to the occupants of the room. As a consequence, it is necessary to check the concentration of the gas if it should happen to leak.

- If the leak is coming from an indoor unit, check that the concentration of gas in that room will not exceed the maximum permissible concentration, even if all refrigerant shoud leak out from that system.
- If the concentration has reached the maximum permissible concentration, doors to neighboring rooms must be opened, or ventilation equipment which is activated by means of gas leak sensors must be installed in the room.

※The maximum permissible concentration is the concentration at which urgent measures can be taken without any obstacles.

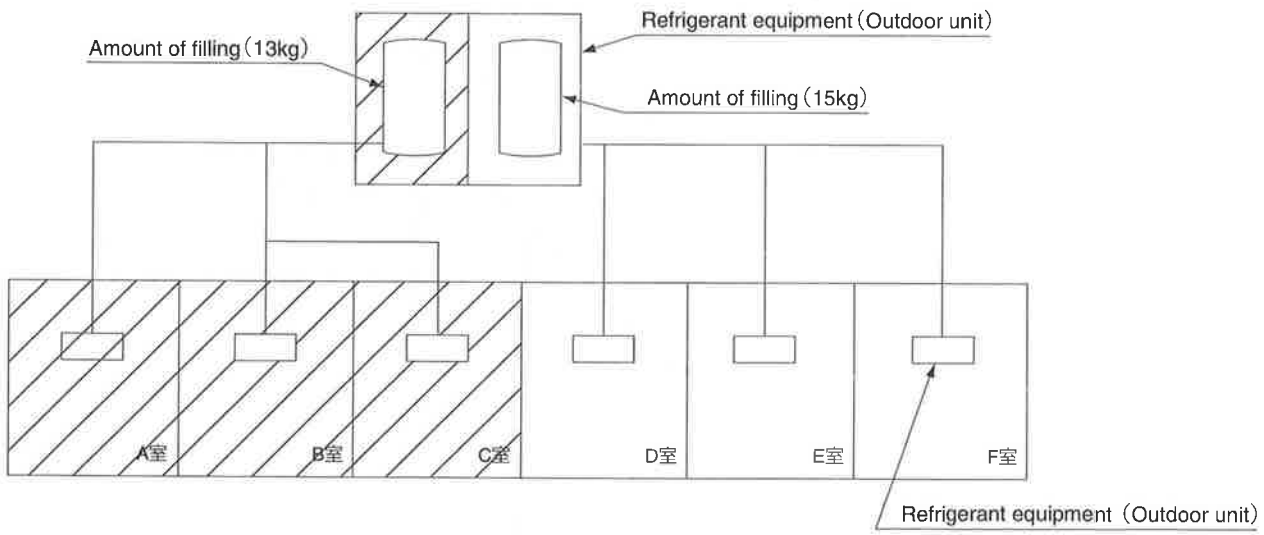
2.Checking of the maximum permissible concentration depends on the following.

$$\frac{\text{Total charging amount in the system(kg)}}{\text{Minimum volume of the room where the air conditioner is located}} <= \text{Maximum permissible concentration(kg/m}^3\text{)}$$

- The From 22 maximum permissible concentration is 0.30 kg/m³

The basic method of calculation is given in the KHKS 0010 "installation Standards for Refrigerant Air Conditioners" issued by the Japan High-pressure Gas Safety Association.

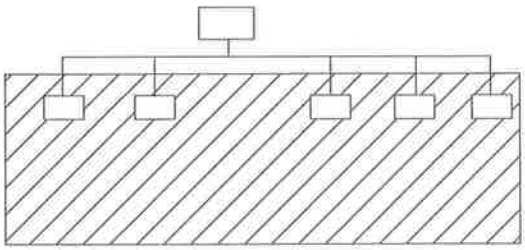
3. 3-1 In the refrigerant equipment that is divided in two refrigerant systems or more and of each is independent, the amount of the refrigerant filling gas at each refrigerant equipment is basic of the calculation.



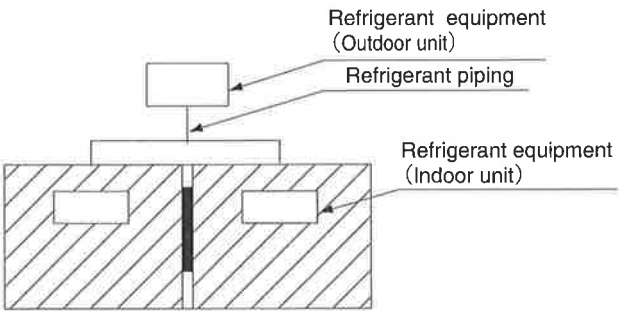
For the amount of the filling gas of this example,
The amount of the leakage refrigerant gas to ①A, B or C room is 13kg respectively.
The amount of the leakage refrigerant gas to ②D, E or F room is 15kg respectively.

3-2 The standard of the minimum room size depends on the following.

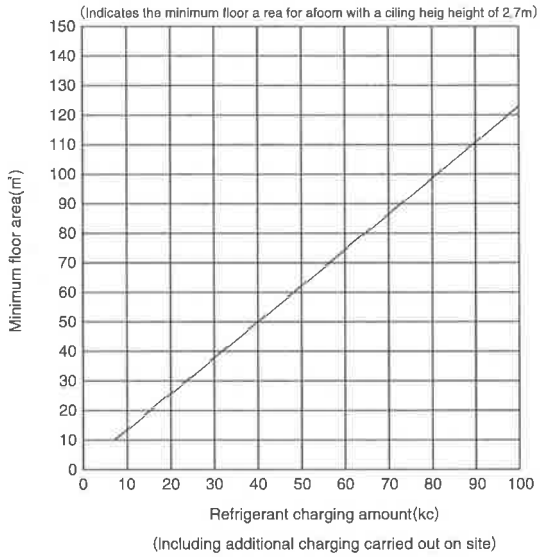
(1) When there is no partition between
(The part shown in □ is an object.)



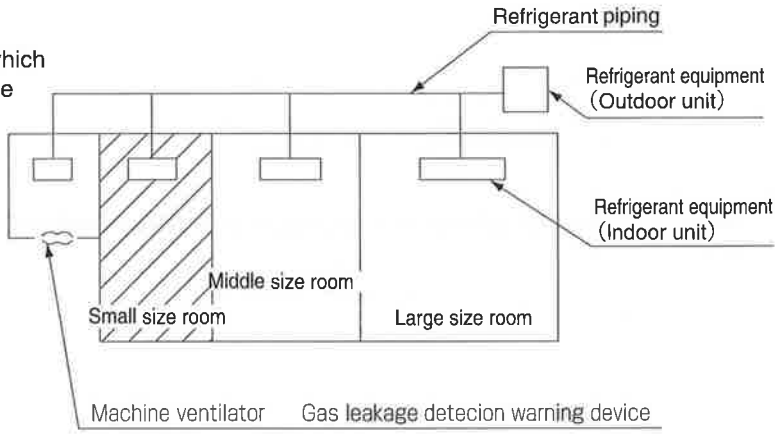
(2)When there is an effective opening to the ventilation of the leaking refrigerant gas in the partition between this room and the next room
(Where there is an opening without a door or where there are openings above and below the door which are each equipment in size to 0.15% or more of the floor area.)



■ The following graph gives a guide to the minium floor area with respect to refrigerant volume.



(3) When the refrigerant equipment (Indoor unit) is installed in each room partitioned between and they are connected by the refrigerant piping,
Naturally, the smallest room is the object.
But, when you install the gas leakage detection warning equipment and the machine ventilator which synchronizes with this in the smallest room where exceed the permissible concentration, the next smaller room is the object.



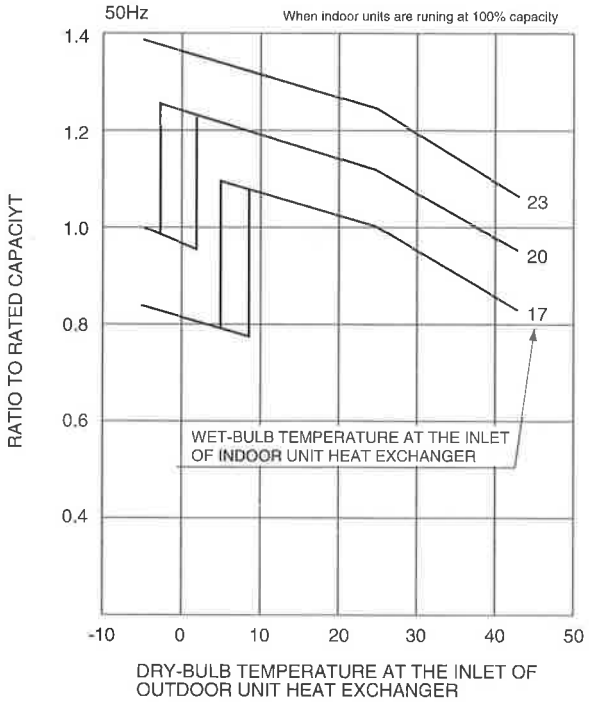
9 PERFORMANCE DATA(UM4 SYSTEM)

1. CAPACITY CURVE AND POWER CONSUMPTION

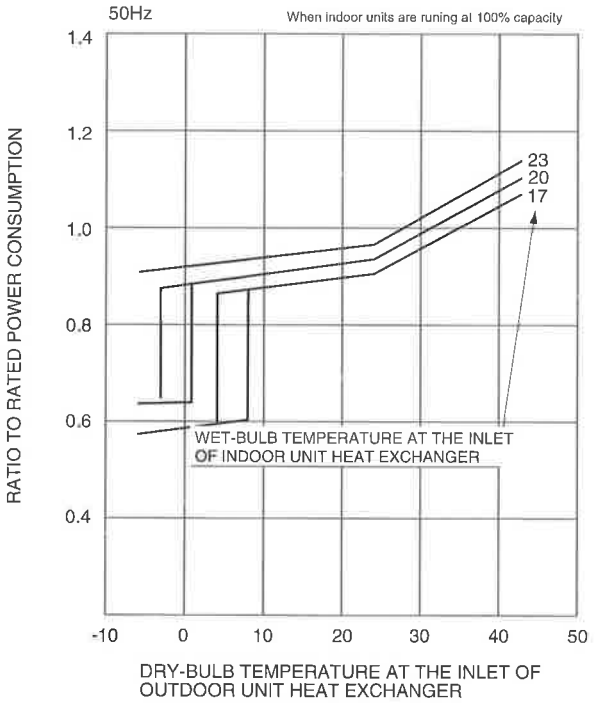
❶Cooling capacity curve, cooling power consumption

●8HP, 10HP

• **COOLING CAPACITY CURVE**

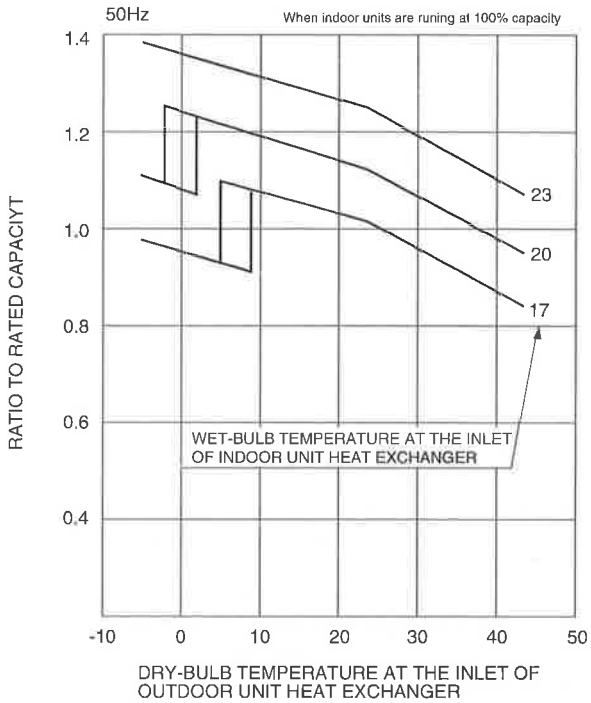


• **COOLING POWER COMSUMPTION CURVE**

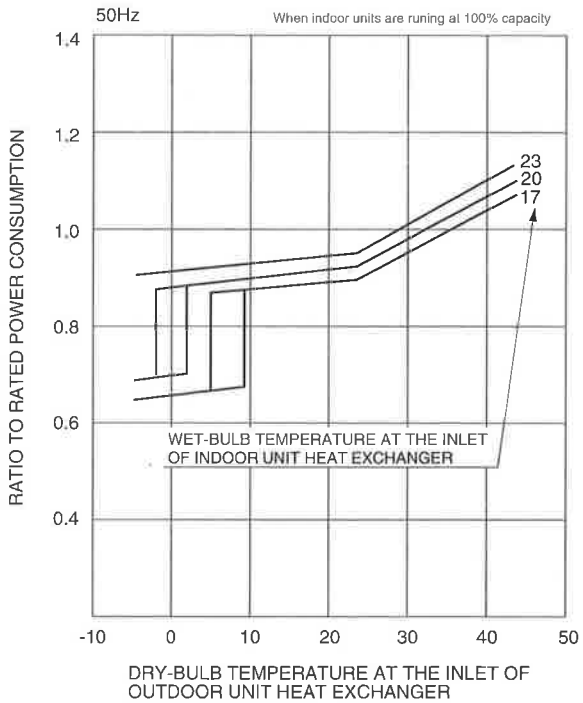


●16HP, 18HP, 20HP

• **COOLING CAPACITY CURVE**



• **COOLING POWER COMSUMPTION CURVE**

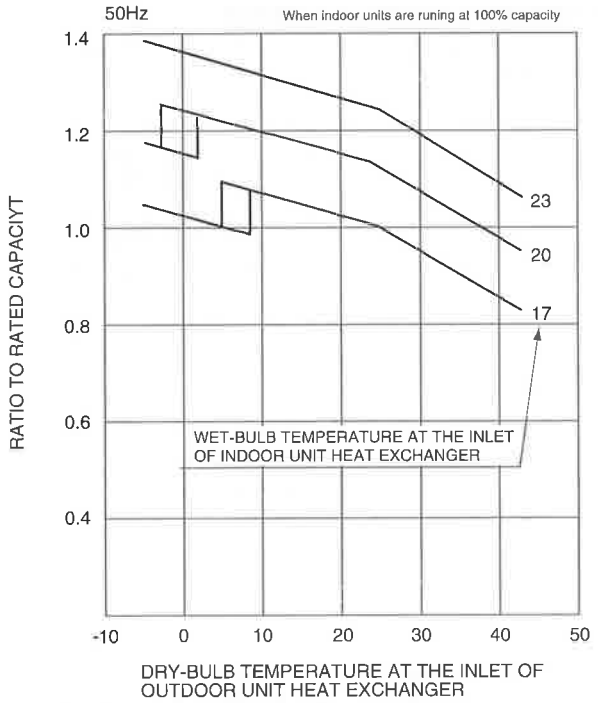


• **RATED COOLING CAPACITY, RATED COOLING POWER CONSUMPTION**

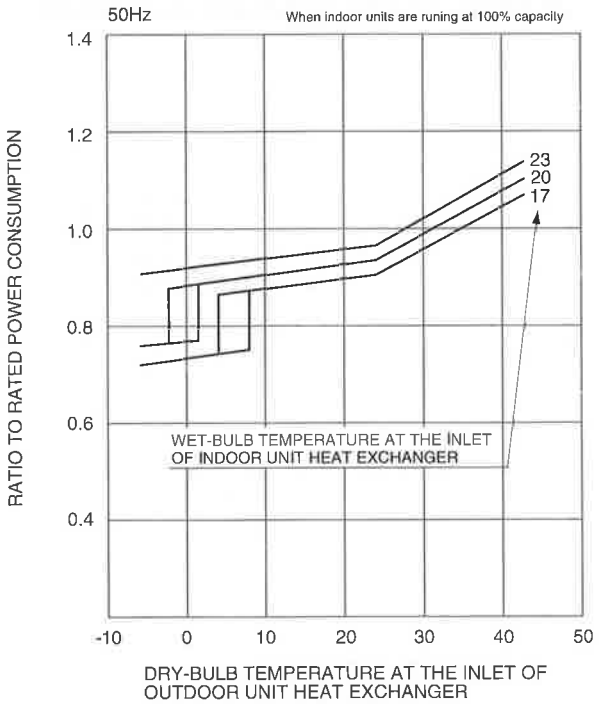
Equivalent HP	MODEL	RATED COOLING STANDARD	
	HEAT PUMP TYPE	CAPACITY (kw)	POWER CONSUMPTION (kW)
8HP	CU-224MA51	20.0	7.44
10HP	CU-280MA51	25.0	9.76
16HP	CU-224MA51, 224MB51	40.0	14.9
18HP	CU-280MA51, 224MB51	45.0	17.2
20HP	CU-280MA51, 280MB51	50.0	19.5

●24HP, 26HP, 28HP, 30HP

• COOLING CAPACITY CURVE

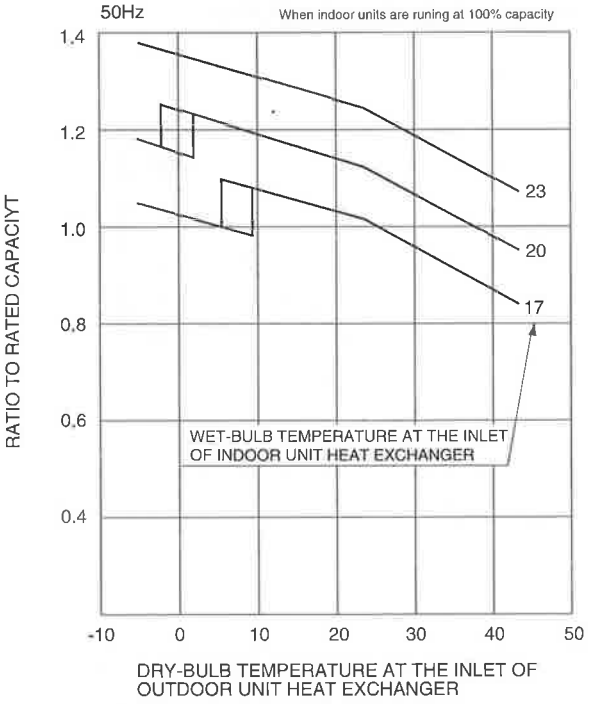


• COOLING POWER CONSUMPTION CURVE

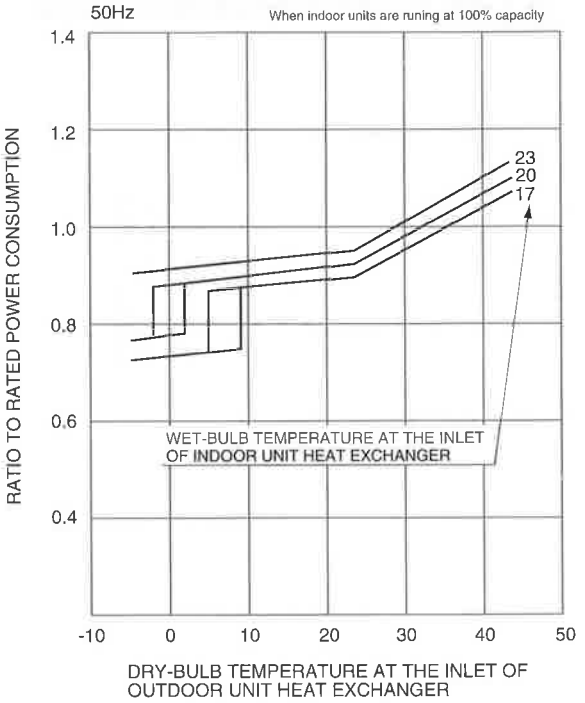


●32HP, 34HP, 36HP, 38HP

• COOLING CAPACITY CURVE



• COOLING POWER CONSUMPTION CURVE



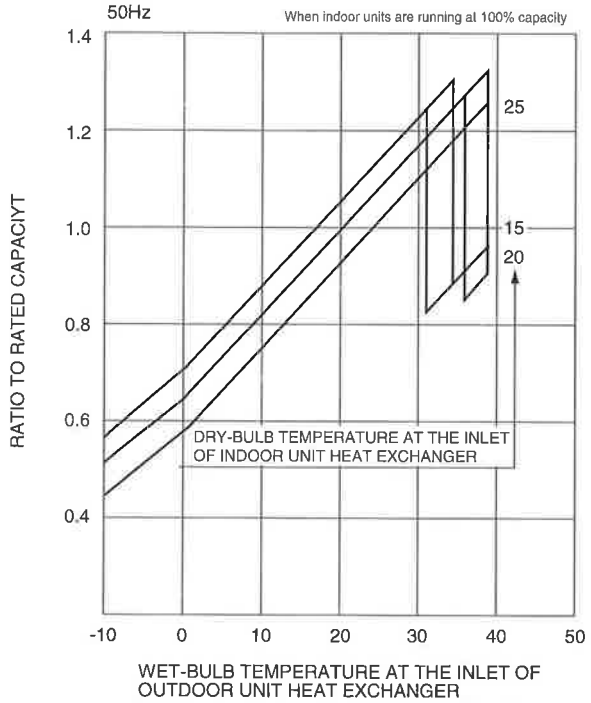
• RATED COOLING CAPACITY, RATED COOLING POWER CONSUMPTION

Equivalent HP	MODEL	RATED COOLING STANDARD	
	HEAT PUMP TYPE	CAPACITY (kw)	POWER CONSUMPTION (kW)
24HP	CU-224MA51, 224MB51 224MB51	60.0	22.3
26HP	CU-280MA51, 224MB51 224MB51	65.0	24.6
28HP	CU-280MA51, 280MB51 224MB51	70.0	27.0
30HP	CU-280MA51, 280MB51 280MB51	75.0	29.3
32HP	CU-224MA51, 224MB51×3	80.0	29.8
34HP	CU-280MA51, 224MB51×3	85.0	32.1
36HP	CU-280MA51, 280MB51224MB51×2	90.0	34.4
38HP	CU-280MA51, 280MB51280MB51×2	95.0	36.7

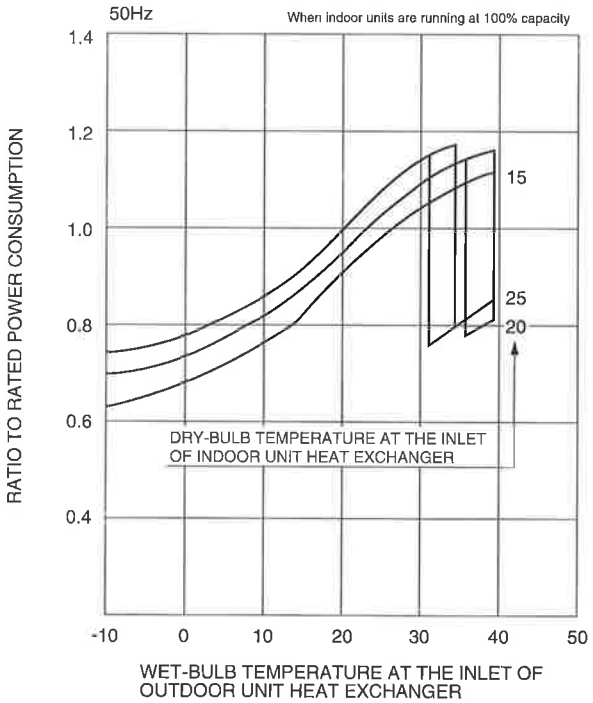
❷Heating capacity curve, heating power consumption

●8HP, 10HP

• **HEATING CAPACITY CURVE**

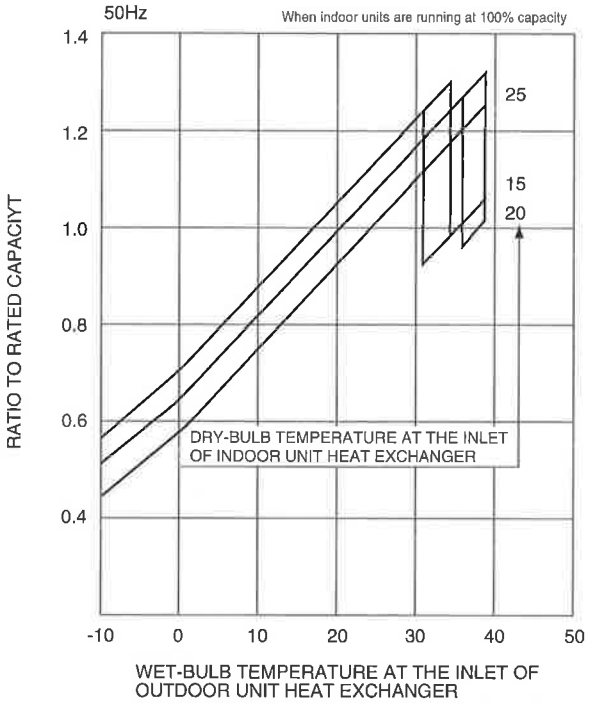


• **HEATING POWER CONSUMPTION CURVE**

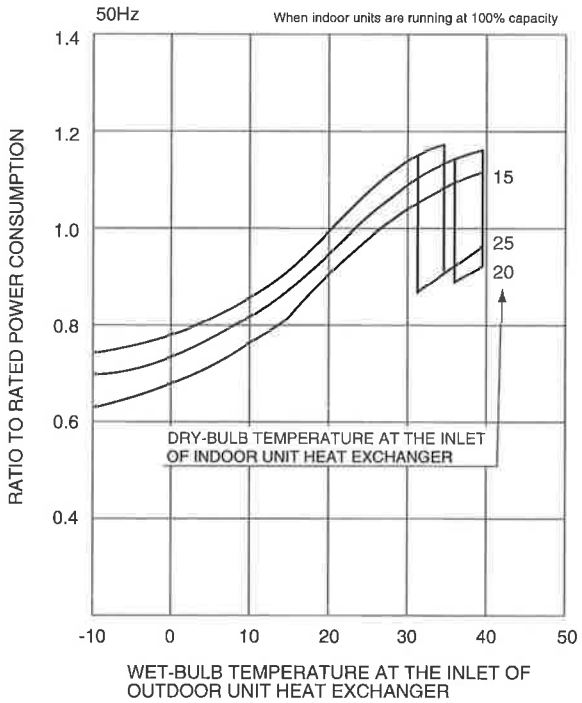


●16HP, 18HP, 20HP

• **HEATING CAPACITY CURVE**



• **HEATING POWER CONSUMPTION CURVE**

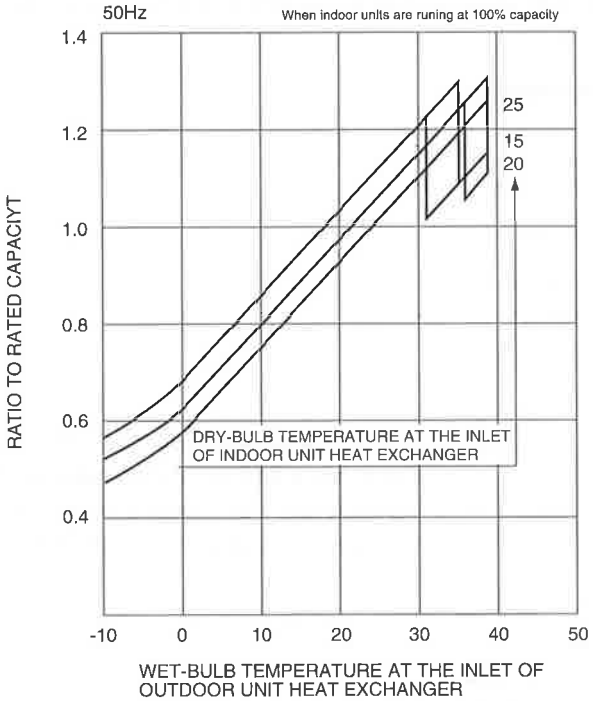


• **RATED HEATING CAPACITY, RATED HEATING POWER CONSUMPTION**

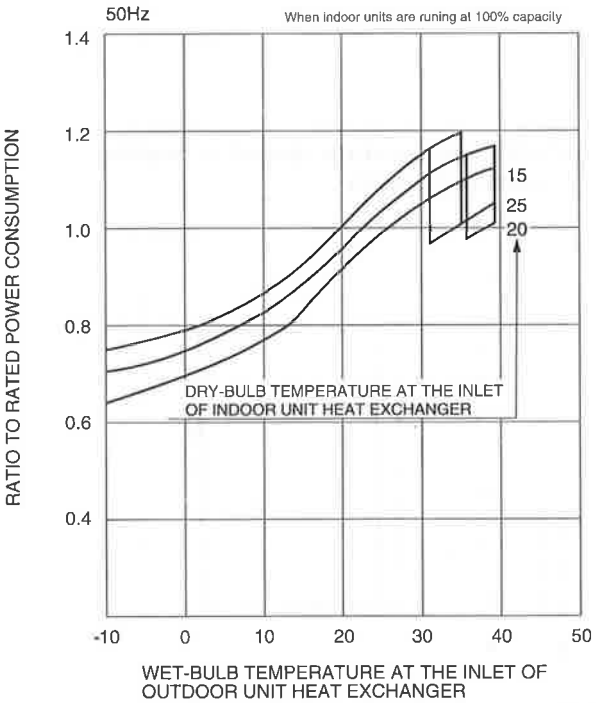
Equivalent HP	MODEL	RATED COOLING STANDARD	
	HEAT PUMP TYPE	CAPACITY (kcal/h)	POWER CONSUMPTION (kW)
8HP	CU-224MA51	22.4	6.87
10HP	CU-280MA51	28.0	8.92
16HP	CU-224MA51, 224MB51	44.8	13.7
18HP	CU-280MA51, 224MB51	50.4	15.8
20HP	CU-280MA51, 280MB51	56.0	17.8

●24HP, 26HP, 28HP, 30HP

• HEATING CAPACITY CURVE

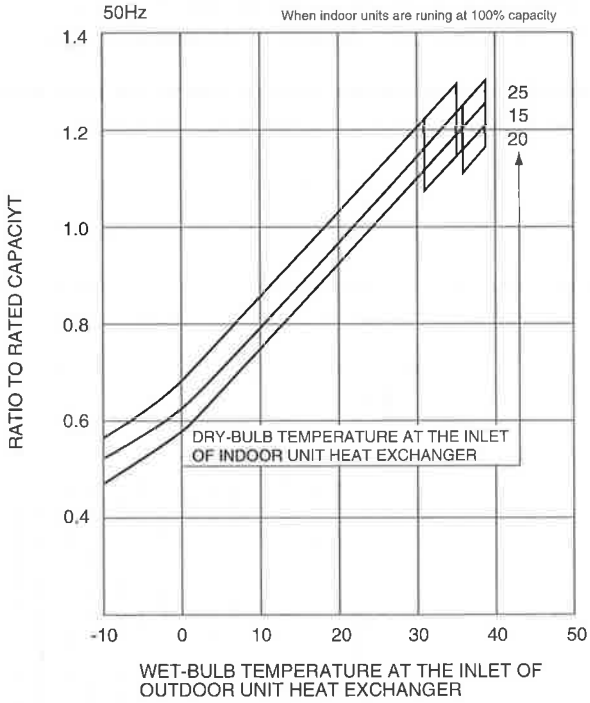


• HEATING POWER CONSUMPTION CURVE

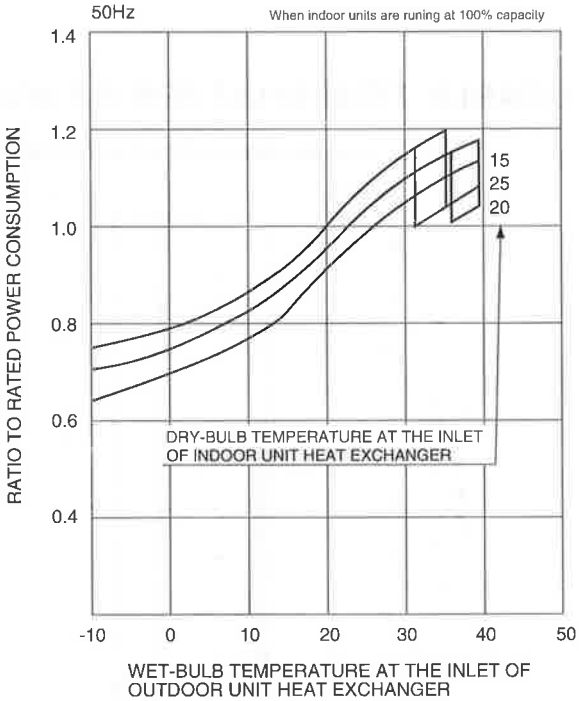


●32HP, 34HP, 36HP, 38HP

• HEATING CAPACITY CURVE



• HEATING POWER CONSUMPTION CURVE



• RATED HEATING CAPACITY, RATED HEATING POWER CONSUMPTION

Equivalent HP	MODEL	RATED COOLING STANDARD	
	HEAT PUMP TYPE	CAPACITY (kcal/h)	POWER CONSUMPTION (kW)
24HP	CU-224MA51, 224MB51 224MB51	67.2	20.6
26HP	CU-280MA51, 224MB51 224MB51	72.8	22.6
28HP	CU-280MA51, 280MB51 224MB51	78.4	24.7
30HP	CU-280MA51, 280MB51 280MB51	84.0	26.8
32HP	CU-224MA51, 224MB51×3	89.6	27.4
34HP	CU-280MA51, 224MB51×3	95.2	29.5
36HP	CU-280MA51, 280MB51 224MB51×2	100.8	31.6
38HP	CU-280MA51, 280MB51×2 224MB51	106.4	33.6

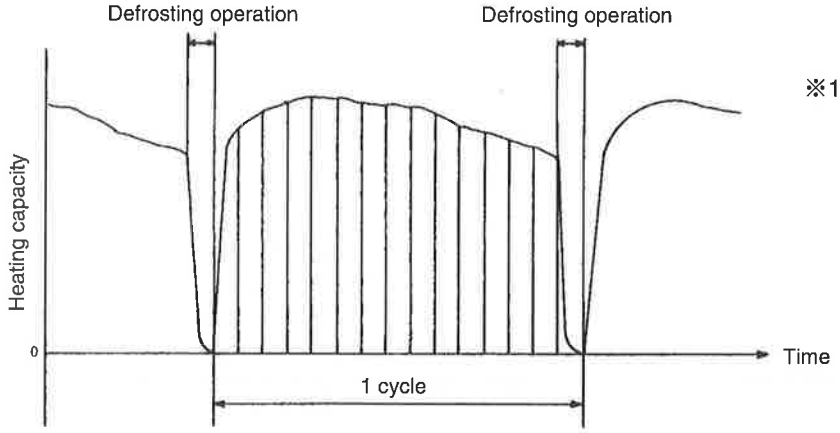
• Table of Capacity correction coefficients for frost build-up during heating (Heat pump type)

The heating Capacity during frost build-up and during defrosting operation varies in accordance with the outdoor air temperature (°C WB) and the amount of frost build-up. Graphs of the heating Capacity for each HP do not include the capacity drop which occurs during frost build-up and during defrosting operation, so that corrections must be made according to the figures in the following table.

• Table of Capacity correction coefficients for frost build-up during heating

Outdoor intake air temperature (°C WB)	−10	−8	−6	−4	−2	0	1	2	4	6
Correction coefficient	0.93	0.93	0.92	0.89	0.87	0.86	0.87	0.89	0.95	1.0

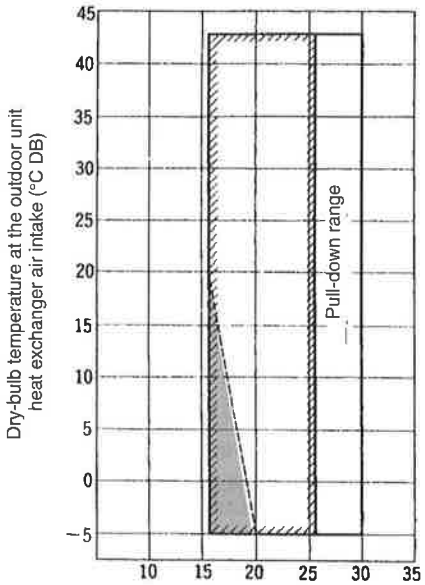
※1
Integral heating Capacity = (Heating Capacity in specification sheet) x (Correction coefficient) <kW>



※1 The integral heating Capacity is the value that is integrated the heating capacity of the cycle and then converted to the value per hour, as shown in the graph at left.

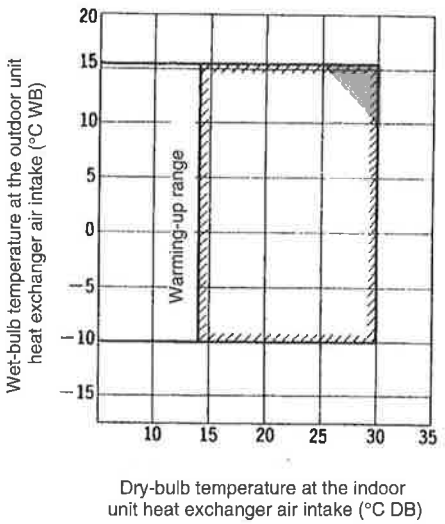
2. USABLE TEMPERATURE RANGE

• Usable temperature range for cooling



NOTE:
If the indoor unit usage rate is 25% greater than the capacity of the outdoor units, cooling operation is possible down to outdoor air temperature of −5°C. Furthermore, if the indoor unit usage rate is less than 25%, cooling is possible down to −2°C.

• Usable temperature range for heating (Heat pump type)



NOTE 1:
During cooling and heating operation, the system requires indoor units with a capacity of 2.5 HP or greater within the black-finished section.

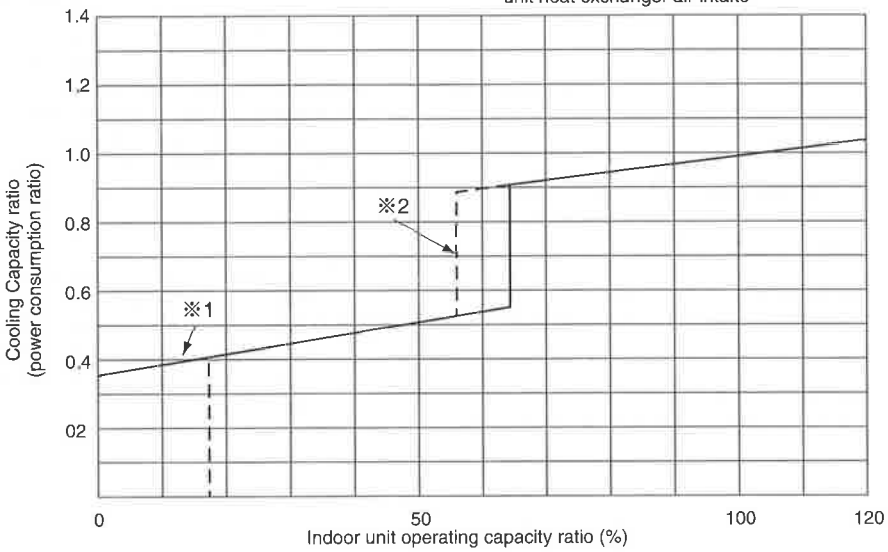
NOTE 2:
The values in the diagram are for effective pipe length of 10m and high/low difference of 0 m.

3.COMBINATION CHARACTERISTICS

• **8HP, 10HP**

COOLING

• Indoor unit operation capacity characteristics (capacity, power consumption)



This graph shows the cooling Capacity of the outdoor unit with respect to the indoor unit capacity, and the power consumption characteristics during cooling (when the wet-bulb temperature at the indoor unit heat exchanger air intake is 19°C).

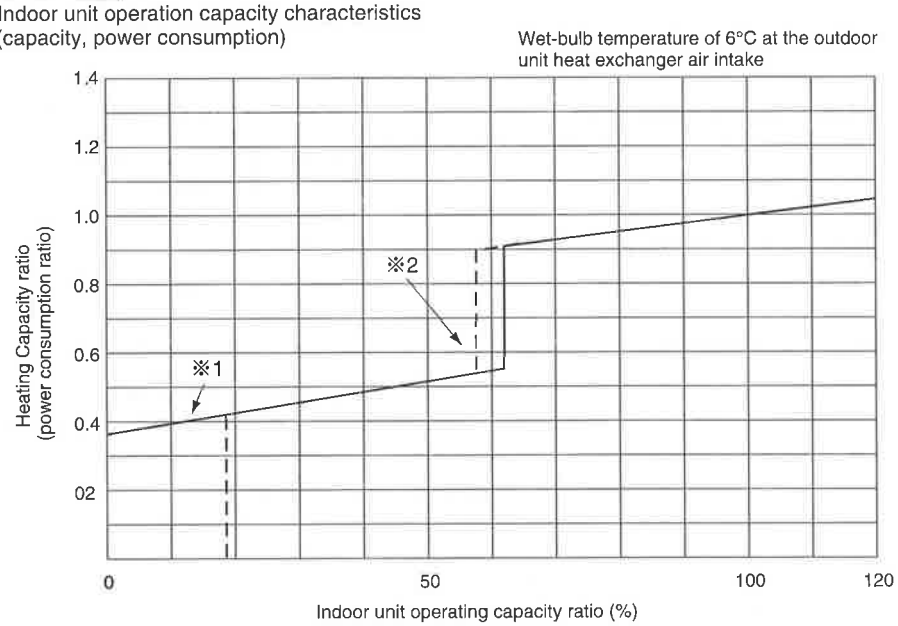
※1 The system may repeatedly start and stop at certain times.
※2 Depending on the refrigerant pressure conditions, hysteresis may develop in order for compressor control to be carried out.

Rated Cooling capacity, Rated Cooling power consumption (50Hz)

Equivalent HP	MODEL	Rated cooling standard	
	HEAT PUMP TYPE	Capacity (kW)	Power consumption (kW)
8HP	CU-224MA51	20.0	7.44
10HP	CU-280MA51	25.0	9.76

HEATING **(Heat pump type only)**

• Indoor unit operation capacity characteristics (capacity, power consumption)



This graph shows the heating Capacity of the outdoor unit with respect to the indoor unit capacity, and the power consumption characteristics during heating (when the dry-bulb temperature at the indoor unit heat exchanger air intake is 20°C).

※1 The system may repeatedly start and stop at certain times.
※2 Depending on the refrigerant pressure conditions, hysteresis may develop in order for compressor control to be carried out.

Rated heating capacity, Rated heating power consumption (50Hz)

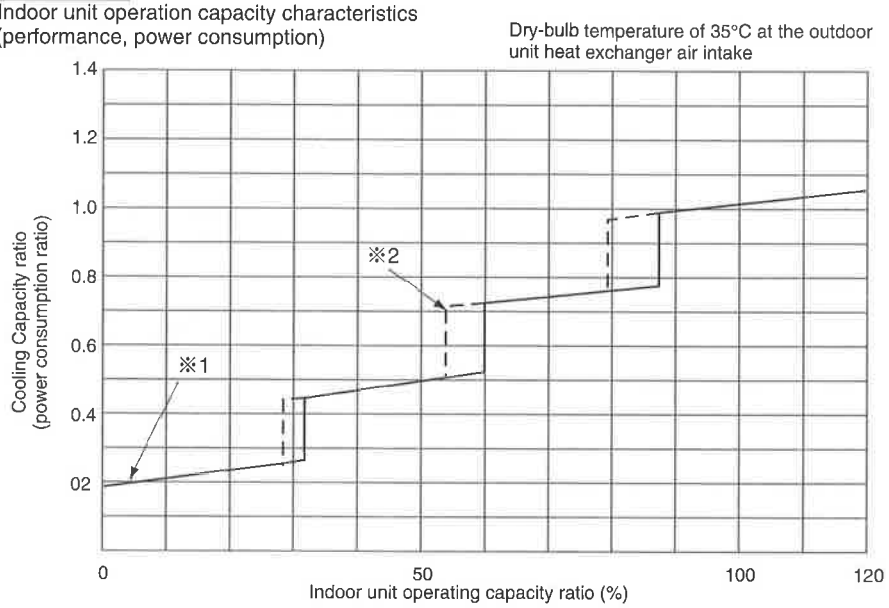
Equivalent HP	MODEL	Rated heating standard	
	HEAT PUMP TYPE	Capacity (kW)	Power consumption (kW)
8HP	CU-224MA51	22.4	6.86
10HP	CU-280MA51	28.0	8.92

■Combination characteristics

• **16HP, 18HP, 20HP**

COOLING

• Indoor unit operation capacity characteristics (performance, power consumption)



This graph shows the cooling Capacity of the outdoor unit with respect to the indoor unit capacity, and the power consumption characteristics during cooling (when the wet-bulb temperature at the indoor unit heat exchanger air intake is 19°C).

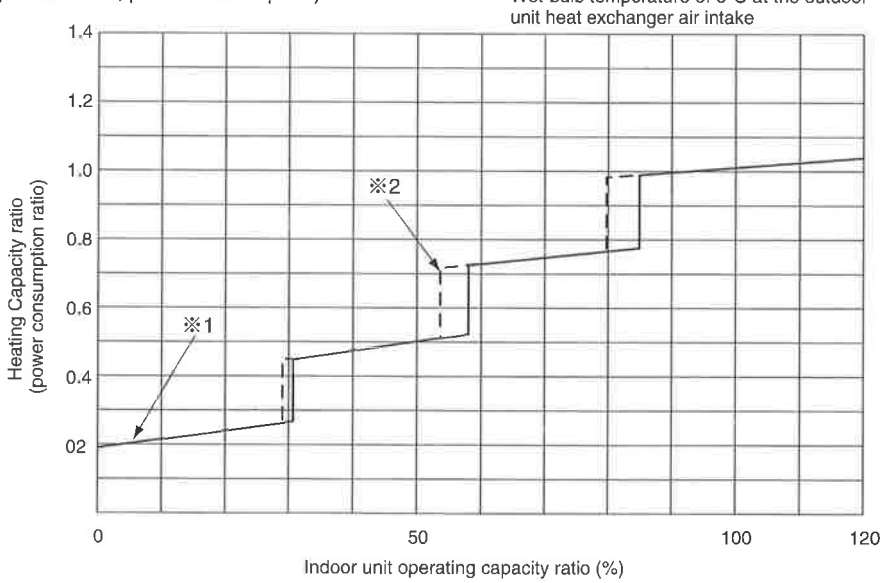
※1 The system may repeatedly start and stop at certain times.
※2 Depending on the refrigerant pressure conditions, hysteresis may develop in order for compressor control to be carried out.

Rated cooling capacity, Rated cooling power consumption (50 Hz)

Equivalent HP	MODEL	Rated cooling standard	
	HEAT PUMP TYPE	Capacity (kW)	Power consumption (kW)
16HP	CU-224MA51, 224MB51	40.0	14.9
18HP	CU-280MA51, 224MB51	45.0	17.2
20HP	CU-280MA51, 280MB51	50.0	19.5

HEATING **(Heat pump type only)**

• Indoor unit operation capacity characteristics (performance, power consumption)



This graph shows the heating Capacity of the outdoor unit with respect to the indoor unit capacity, and the power consumption characteristics during heating (when the dry-bulb temperature at the indoor unit heat exchanger air intake is 20°C).

※1 The system may repeatedly start and stop at certain times.
※2 Depending on the refrigerant pressure conditions, hysteresis may develop in order for compressor control to be carried out.

Rated heating capacity, Rated heating power consumption (50 Hz)

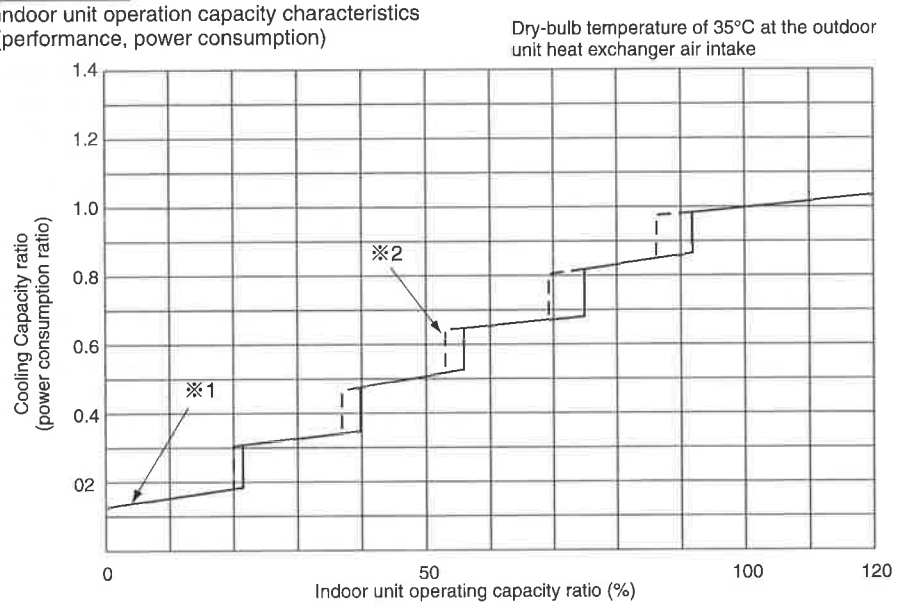
Equivalent HP	MODEL	Rated heating standard	
	HEAT PUMP TYPE	Capacity (kW)	Power consumption (kW)
16HP	CU-224MA51, 224MB51	44.8	13.7
18HP	CU-280MA51, 224MB51	50.4	15.8
20HP	CU-280MA51, 280MB51	56.0	17.8

Combination characteristics

• 24HP, 26HP, 28HP, 30HP

COOLING

• Indoor unit operation capacity characteristics (performance, power consumption)



This graph shows the cooling Capacity of the outdoor unit with respect to the indoor unit capacity, and the power consumption characteristics during cooling (when the wet-bulb temperature at the indoor unit heat exchanger air intake is 19°C).

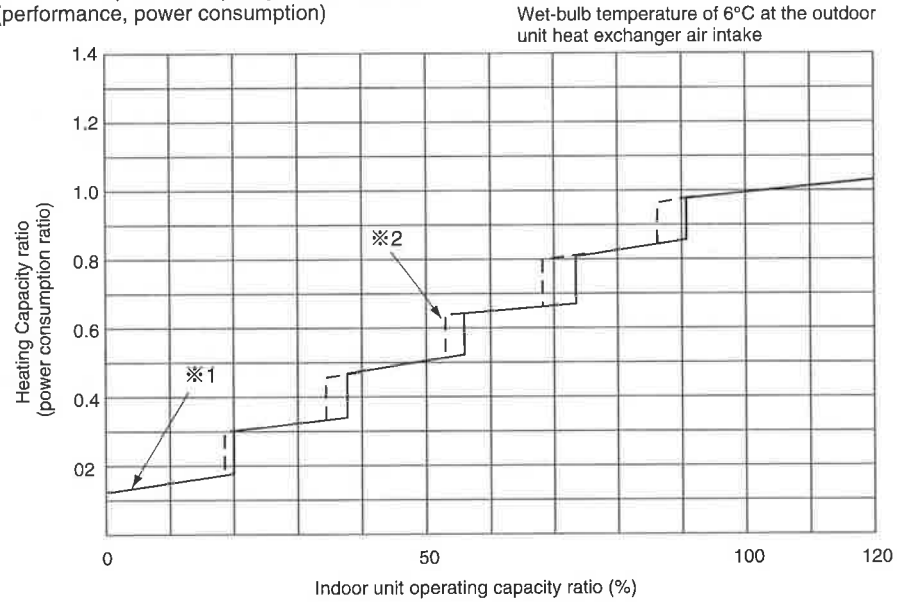
※1 The system may repeatedly start and stop at certain times.
※2 Depending on the refrigerant pressure conditions, hysteresis may develop in order for compressor control to be carried out.

Rated cooling capacity, Rated cooling power consumption (50 Hz)

Equivalent HP	MODEL	RATED COOLING STANDARD	
	HEAT PUMP TYPE	Capacity (kW)	Power consumption (kW)
24HP	CU-224MA51, 224MB51 224MB51	60.0	22.3
26HP	CU-280MA51, 224MB51 224MB51	65.0	24.6
28HP	CU-280MA51, 280MB51 224MB51	70.0	27.0
30HP	CU-280MA51, 280MB51 280MB51	75.0	29.3

HEATING (Heat pump type only)

• Indoor unit operation capacity characteristics (performance, power consumption)



This graph shows the heating Capacity of the outdoor unit with respect to the indoor unit capacity, and the power consumption characteristics during heating (when the dry-bulb temperature at the indoor unit heat exchanger air intake is 20°C).

※1 The system may repeatedly start and stop at certain times.
※2 Depending on the refrigerant pressure conditions, hysteresis may develop in order for compressor control to be carried out.

Rated heating capacity, Rated heating power consumption (50 Hz)

Equivalent HP	MODEL	RATED COOLING STANDARD	
	HEAT PUMP TYPE	Capacity (kW)	Power consumption (kW)
24HP	CU-224MA51, 224MB51 224MB51	67.2	20.6
26HP	CU-280MA51, 224MB51 224MB51	72.8	22.6
28HP	CU-280MA51, 280MB51 224MB51	78.4	24.7
30HP	CU-280MA51, 280MB51 280MB51	84.0	26.8

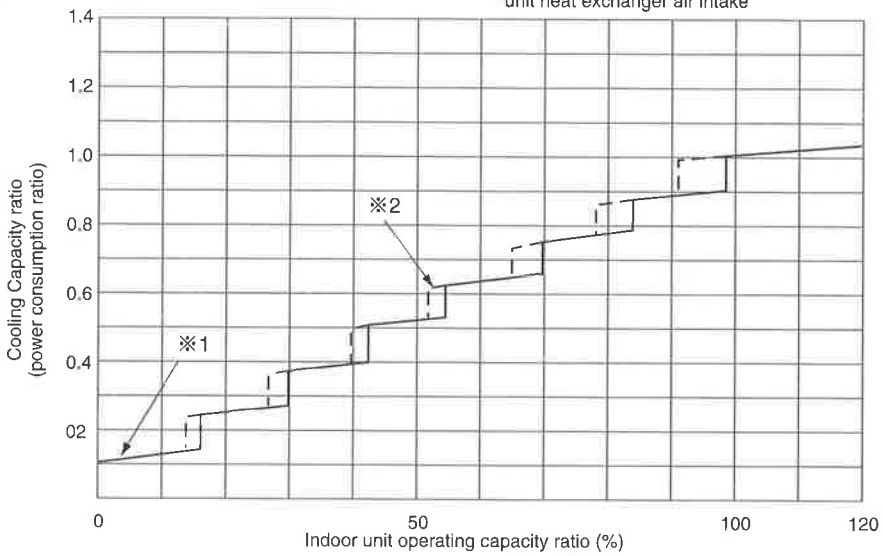
Combination characteristics

• 32HP, 34HP, 36HP, 38HP

COOLING

• Indoor unit operation capacity characteristics (performance, power consumption)

Dry-bulb temperature of 35°C at the outdoor unit heat exchanger air intake



This graph shows the cooling Capacity of the outdoor unit with respect to the indoor unit capacity, and the power consumption characteristics during cooling (when the wet-bulb temperature at the indoor unit heat exchanger air intake is 19°C).

※1 The system may repeatedly start and stop at certain times.
※2 Depending on the refrigerant pressure conditions, hysteresis may develop in order for compressor control to be carried out.

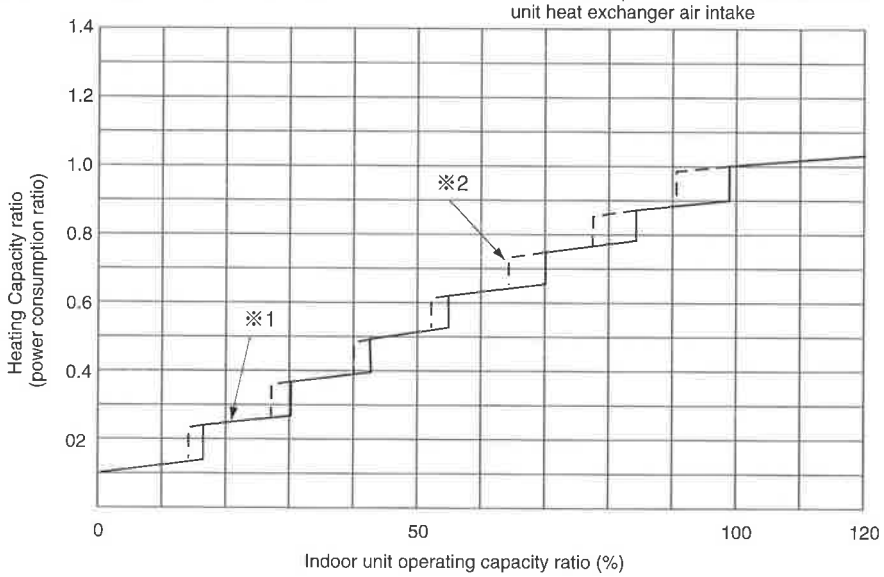
Rated cooling capacity, Rated cooling power consumption (50 Hz)

Equivalent HP	MDEL	RATED COOLING STANDARD	
	HEAT PUMP TYPE	Capacity (kW)	Power consumption (kW)
32HP	CU-224MA51, 224MB51×3	80.0	29.8
34HP	CU-280MA51, 224MB51×3	85.0	32.1
36HP	CU-280MA51, 280MB51 224MB51×2	90.0	34.4
38HP	CU-280MA51, 280MB51×2 224MB51	95.0	36.7

HEATING (Heat pump type only)

• Indoor unit operation capacity characteristics (performance, power consumption)

Wet-bulb temperature of 6°C at the outdoor unit heat exchanger air intake



This graph shows the heating Capacity of the outdoor unit with respect to the indoor unit capacity, and the power consumption characteristics during heating (when the dry-bulb temperature at the indoor unit heat exchanger air intake is 20°C).

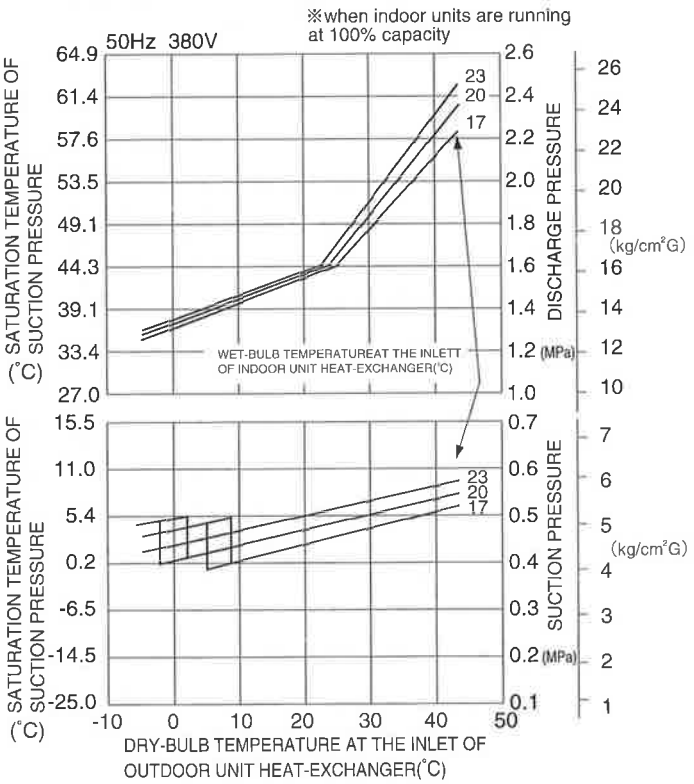
※1 The system may repeatedly start and stop at certain times.
※2 Depending on the refrigerant pressure conditions, hysteresis may develop in order for compressor control to be carried out.

Rated heating capacity, Rated heating power consumption (50 Hz)

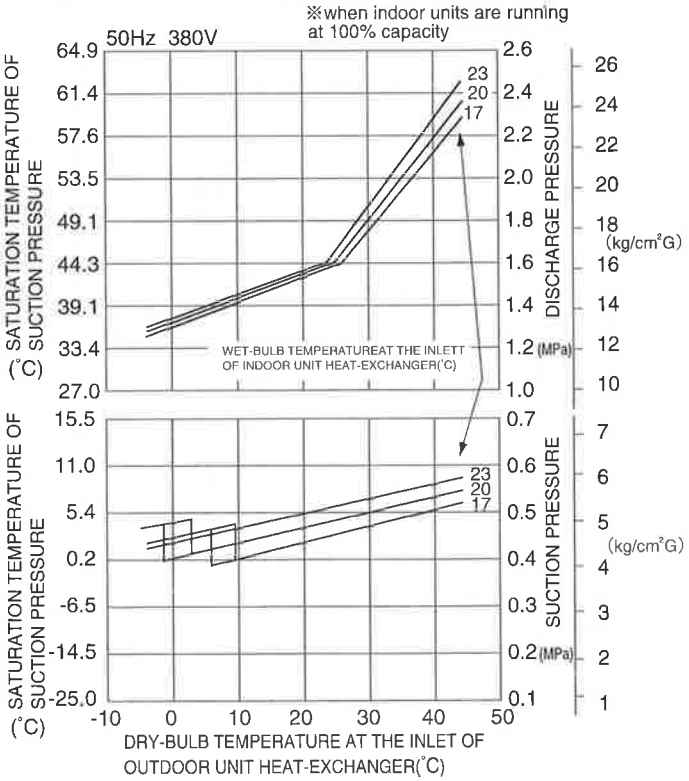
Equivalent HP	MODEL	RATED COOLING STANDARD	
	HEAT PUMP TYPE	Capacity (kW)	Power consumption (kW)
32HP	CU-224MA51, 224MB51×3	89.6	27.4
34HP	CU-280MA51, 224MB51×3	95.2	29.5
36HP	CU-280MA51, 280MB51 224MB51×2	100.8	31.6
38HP	CU-280MA51, 280MB51×2 224MB51	106.4	33.6

4. COOLING SATURATION TEMPERATURE CURVE OF DISCHARGE AND SUCTION PRESSURE

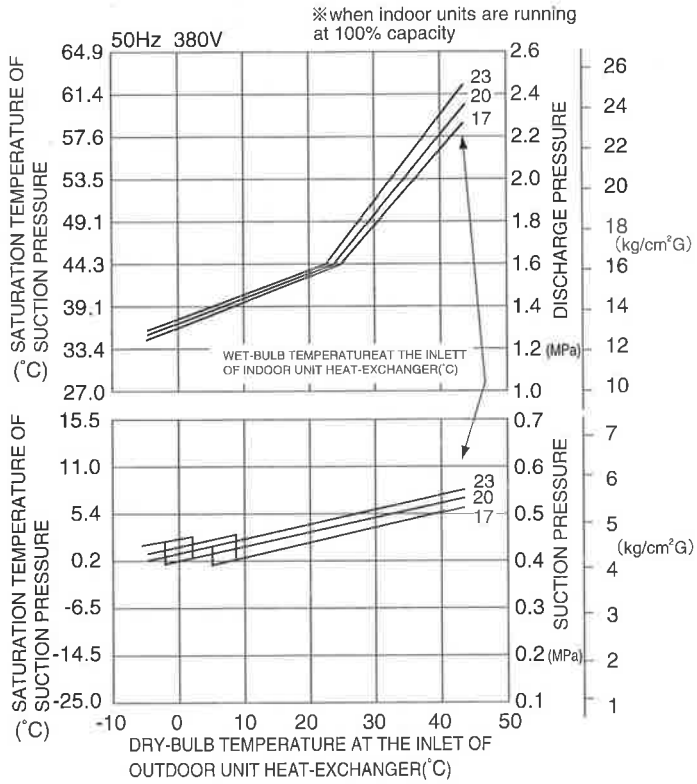
• **8HP, 10HP**



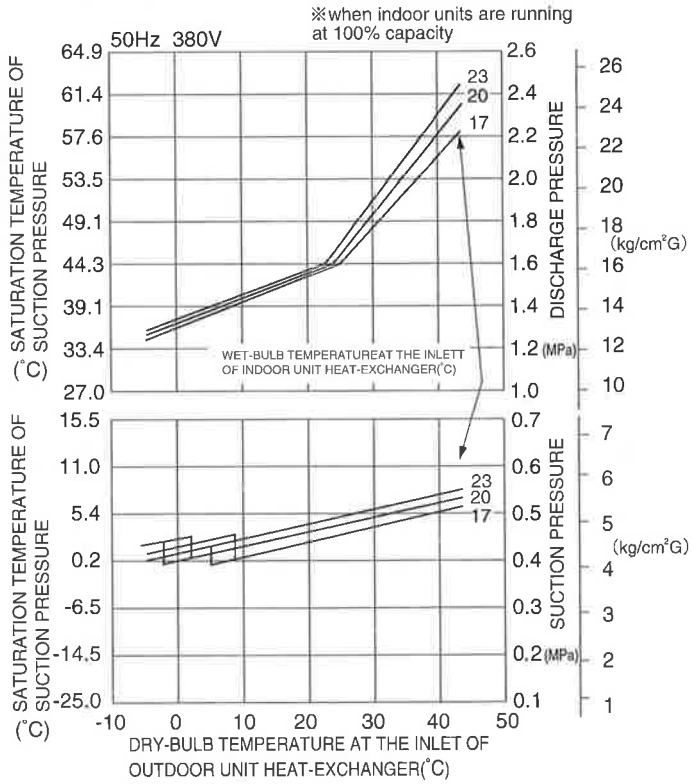
• **16HP, 18HP, 20HP**



• **24HP, 26HP, 28HP, 30HP**

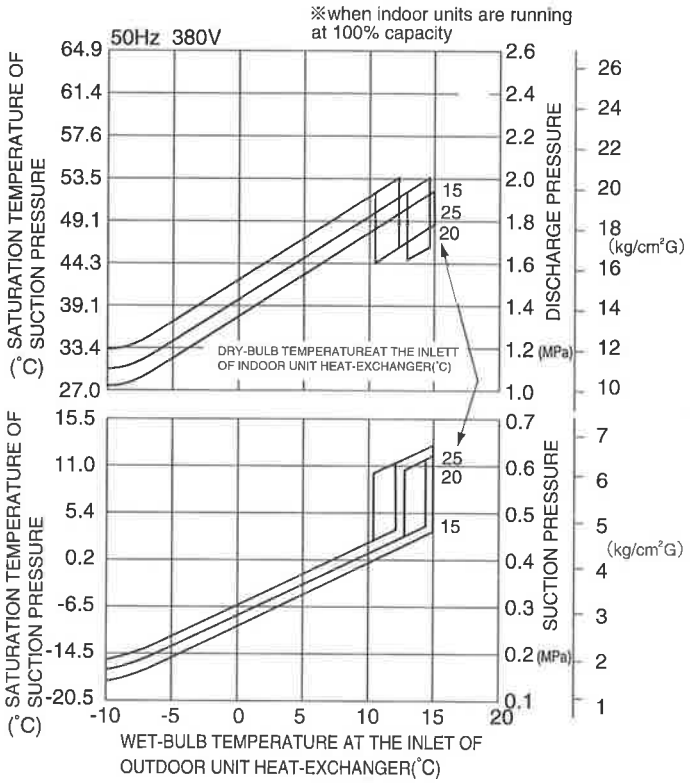


• **32HP, 34HP, 36HP, 38HP**

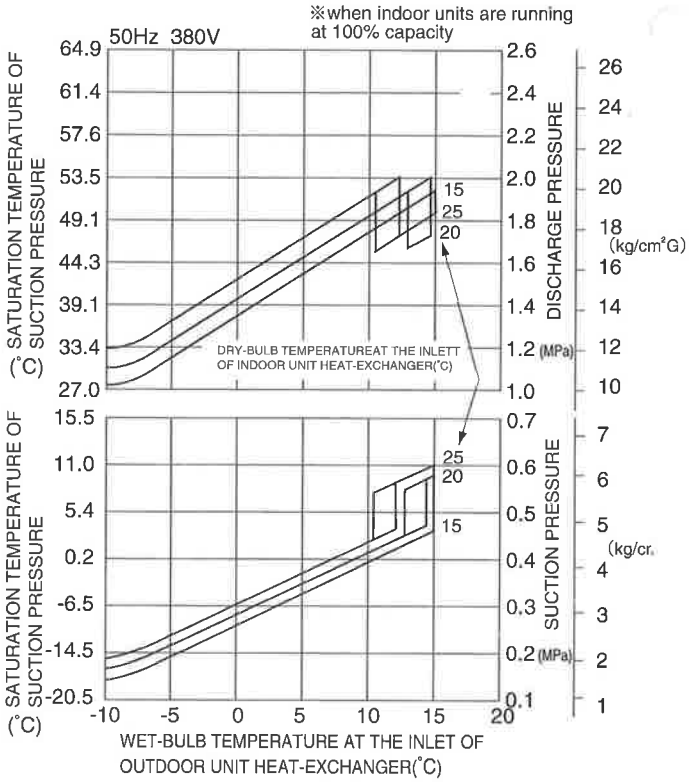


5. HEATING SATURATION TEMPERATURE CURVE OF DISCHARGE AND SUCTION PRESSURE

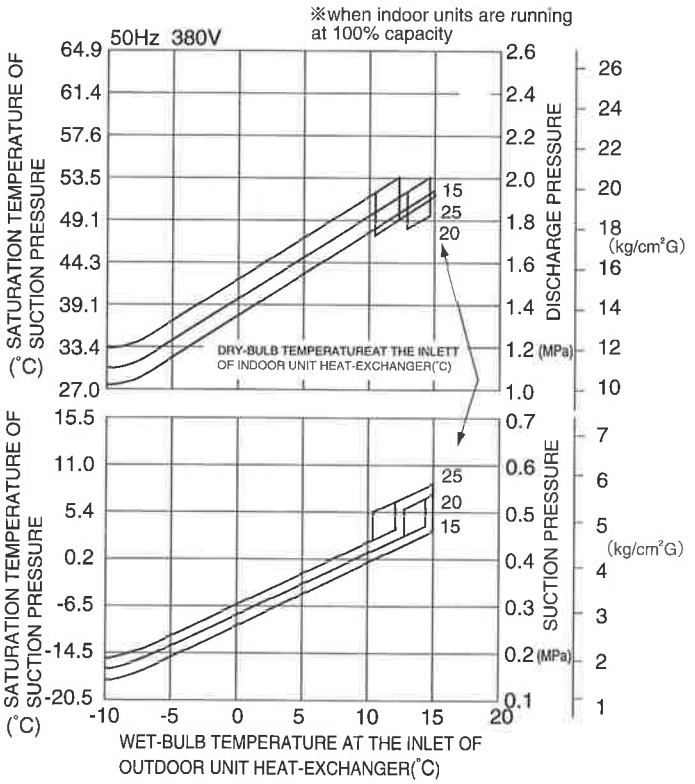
• **8HP, 10HP**



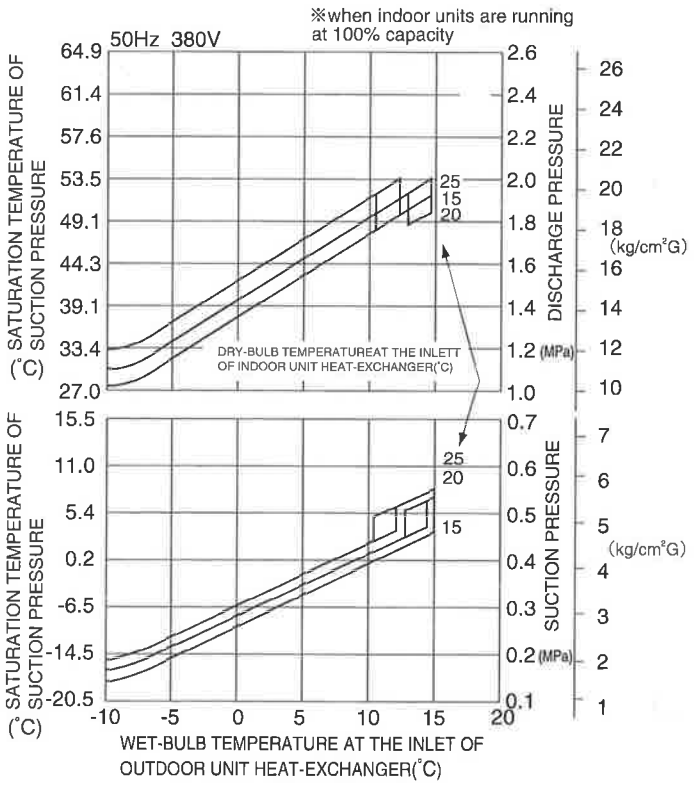
• **16HP, 18HP, 20HP**



• **24HP, 26HP, 28HP, 30HP**



• **32HP, 34HP, 36HP, 38HP**



6. PERFORMANCE DATA (OUTDOOR UNIT)

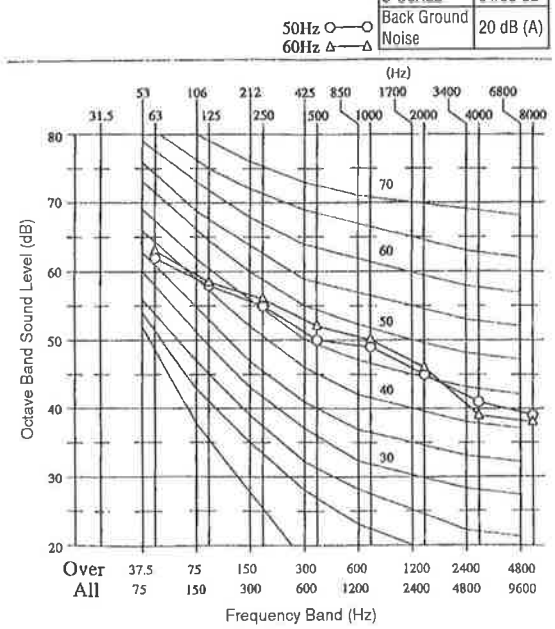
❶Fan performance
[OUTDOOR UNIT]

(HP)	8		10	16	18	20	24	26	28	30	32	34	36	38
Power Source	Single 50Hz			Single 50Hz			Single 50Hz				Single 50Hz			
	220V	230V	230V	220V	230V	240V	220V	230V	240V		220V	230V	240V	
Air Volume (m^3/min)	150			300			450				600			
Running Current (A)	1.68	1.61	1.54	3.36	3.22	3.08	5.05	4.83	4.62		6.73	6.43	6.17	
Power Consumption (kW)	0.36			0.72			1.08				1.44			
Fan Speed (rpm)	670			670			670				670			

❷Sound data

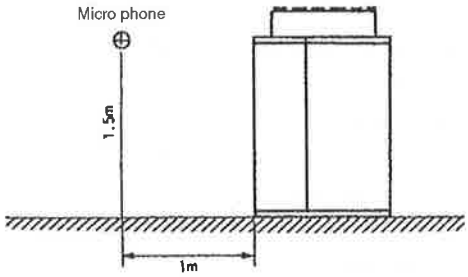
[OUTDOOR UNIT]
8,10HP
- **CU-224MA51TYPE**
- **CU-224MB51TYPE**
- **CU-224MA01TYPE**
- **CU-224MB01TYPE**
- **CU-280MA51TYPE**
- **CU-280MB51TYPE**
- **CU-280MA01TYPE**
- **CU-280MB01TYPE**

Frequency	50/60 Hz
A-SCALE	54/55 dB
C-SCALE	64/55 dB
Back Ground Noise	20 dB (A)

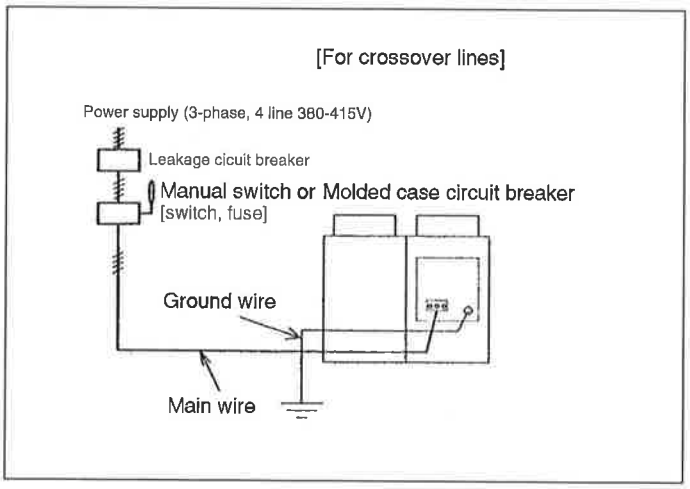


■Micro phone Position Testing in no sound room

OUTDOOR UNIT

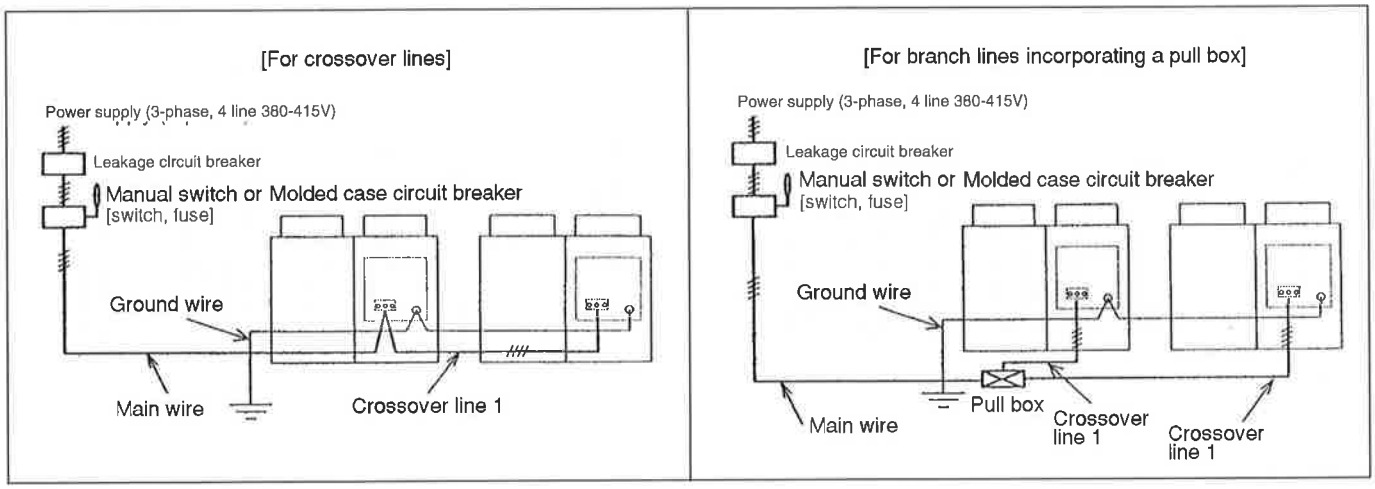


❸Specification of power source
[COMBINATION OF OUTDOOR UNIT]



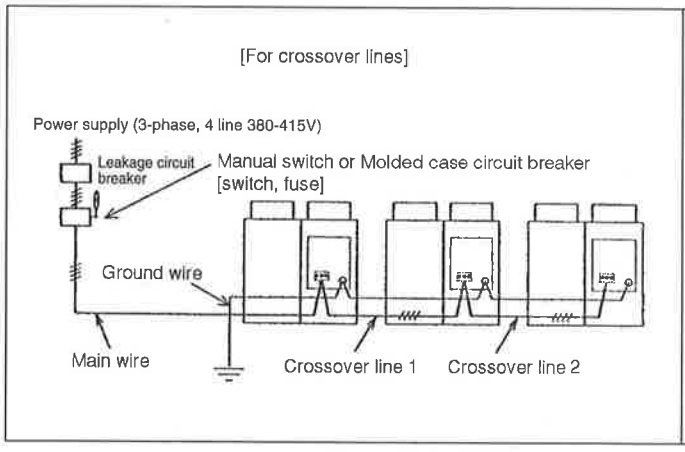
Item		HP	8HP			10HP		
Power Source			380V 50Hz	400V 50Hz	415V 50Hz	380V 50Hz	400V 50Hz	415V 50Hz
Cooling Capacity	Power Consumption	kW	7.44			9.76		
	Running Current	A	13.2	12.5	12.1	17.3	16.4	15.8
Heating Capacity	Power Consumption	kW	6.86			8.92		
	Running Current	A	12.1	11.5	11.1	15.7	14.7	14.4
Maximum Running Current		A	16.5	15.6	15.1	21.6	20.5	19.8
Power Capacity		kVA	10.8			14.2		
Starting Current		A	48.5	48.5	48.5	73.5	73.5	73.5
Isolator switch rating		A	60			100		
Element fuse size		A	50			75		
Molded case circuit breaker		A	50			75		
Isolator circuit breaker		–	50A, 100mA 0.1s Under			75A, 100mA 0.1s Under		
Earth		mm^2	5.5			5.5		
Minimum wire size	Main	mm^2	5.5			5.5		
	Distance	m	22			16		

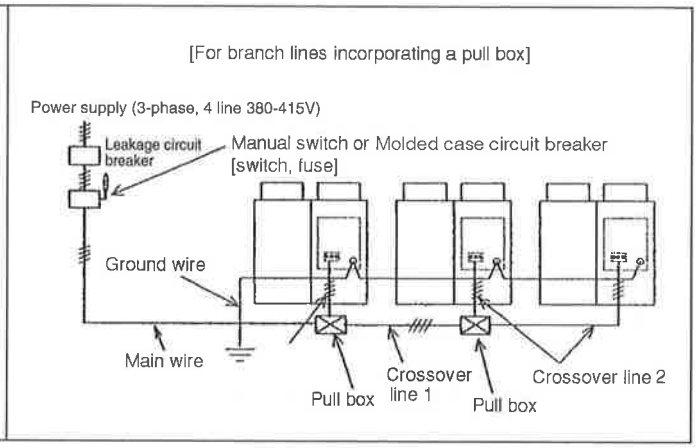
Specification of power source
[COMBINATION OF OUTDOOR UNIT]



Item			HP	16HP			18HP			20HP		
Power Source				380V 50Hz	400V 50Hz	415V 50Hz	380V 50Hz	400V 50Hz	415V 50Hz	380V 50Hz	400V 50Hz	415V 50Hz
Cooling Capacity	Power Consumption		kW	14.9			17.2			19.5		
	Running Current		A	26.4	25.0	24.2	30.5	28.9	27.9	34.6	32.8	31.6
Heating Capacity	Power Consumption		kW	13.7			15.8			17.8		
	Running Current		A	24.3	23.0	22.3	27.8	26.4	25.5	31.4	29.8	28.8
Maximum Running Current			A	33.0	31.3	30.3	36.6	36.1	34.9	43.3	41.0	39.5
Power Capacity			kVA	21.7			25.1			28.5		
Starting Current			A	61.7	61.0	60.6	86.7	86.0	85.6	90.8	89.9	89.3
Switch box	Swich		A	100			100			100		
	Fuse		A	75			100			100		
Molded case circuit breaker			A	75			100			100		
Isolator circuit breaker			–	100A, 100mA 0.1S Under			100A, 100mA 0.1S Under			100A, 100mA 0.1S Under		
Earth			mm^2	5.5			5.5			5.5		
Mini-mum wire size	Crossover line	Main	mm^2	8			14			14		
		Distance	m	16			24			21		
		Crossover 1	mm^2	5.5			5.5			5.5		
		Distance	m	22			17			16		
	Branch line	Main	mm^2	8			14			14		
		Distance	m	16			24			21		
		Crossover 1	mm^2	5.5			5.5			5.5		
		Distance	m	22			17			16		

Specification of power source
[COMBINATION OF OUTDOOR UNIT]



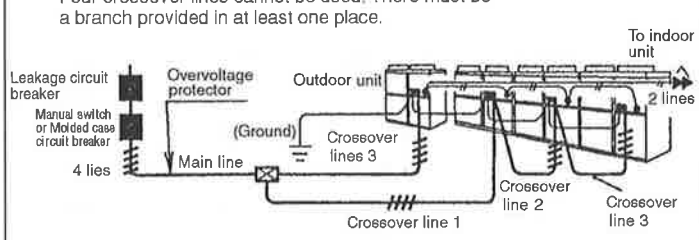


Item			HP	24HP			26HP			28HP			30HP		
Power Source				380V 50Hz	400V 50Hz	415V 50Hz	380V 50Hz	400V 50Hz	415V 50Hz	380V 50Hz	400V 50Hz	415V 50Hz	380V 50Hz	400V 50Hz	415V 50Hz
Cooling Capacity	Power Consumption		kW	22.3			24.6			27.0			29.3		
	Running Current		A	39.6	37.5	36.3	43.7	41.4	40.0	47.8	45.3	43.7	51.9	49.2	47.4
Heating Capacity	Power Consumption		kW	20.6			22.6			24.7			26.8		
	Running Current		A	36.3	34.5	33.3	39.9	37.9	36.6	43.5	41.3	39.9	47.1	44.7	43.2
Maximum Running Current			A	49.5	46.9	45.4	54.6	51.8	50.0	59.8	56.6	54.6	64.9	61.5	59.4
Power Capacity			kVA	32.6			36.0			39.4			42.7		
Starting Current			A	74.9	73.5	72.7	99.9	98.5	97.7	104.0	102.4	101.4	108.1	106.3	105.1
Switch box	Swich		A	200			200			200			200		
	Fuse		A	150			150			150			150		
Molded case circuit breaker			A	150			150			150			150		
Isolator circuit breaker			–	150A, 100mA 0.1S Under			150A, 100mA 0.1S Under			150A 100mA 0.1S Under			150A 100mA 0.1S Under		
Earth			mm²	8			8			8			8		
Mini-mum wire size	Crossover line	Main	mm²	14			22			22			22		
		Distance	m	18			26			24			22		
		Crossover 1	mm²	8			14			14			14		
		Distance	m	16			24			21			21		
		Crossover 2	mm²	5.5			8			8			8		
		Distance	m	22			25			24			24		
	Branch line	Main	mm²	14			22			22			22		
		Distance	m	18			26			24			22		
		Crossover 1	mm²	8			14			14			14		
		Distance	m	16			24			21			21		
		Crossover 2	mm²	5.5			8			8			8		
		Distance	m	22			25			24			24		

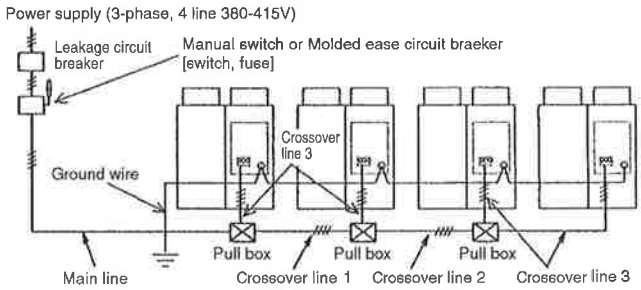
Specification of power source
[COMBINATION OF OUTDOOR UNIT]

[For crossover lines]

NOTE
Four crossover lines cannot be used. There must be a branch provided in at least one place.



[For branch lines incorporating a pull box]



Item			HP	32HP			34HP			36HP			38HP		
Power Source				380V 50Hz	400V 50Hz	415V 50Hz	380V 50Hz	400V 50Hz	415V 50Hz	380V 50Hz	400V 50Hz	415V 50Hz	380V 50Hz	400V 50Hz	415V 50Hz
Cooling Capacity	Power Consumption		kW	29.8			32.1			34.4			36.7		
	Running Current		A	52.8	50.2	48.4	56.9	53.9	52.1	61.0	57.8	55.8	65.1	61.7	59.5
Heating Capacity	Power Consumption		kW	27.4			29.5			31.6			33.6		
	Running Current		A	48.4	46.1	44.4	52.0	49.4	47.7	55.6	52.8	51.0	59.2	56.2	54.3
Maximum Running Current			A	66.0	62.8	60.5	71.1	67.4	65.1	76.3	72.3	69.8	81.4	77.1	74.4
Power Capacity			kVA	43.5			46.9			50.2			53.6		
Starting Current			A	88.1	86.0	84.8	113.1	111.0	109.8	117.2	114.9	113.5	121.3	118.8	117.2
Isolator switch rating			A	200			200			200			200		
Element fuse size			A	150			150			150			150		
Molded case circuit breaker			A	150			150			150			150		
Isolator circuit breaker			–	150A, 100mA 0.1S Under			150A, 100mA 0.1S Under			150A, 100mA 0.1S Under			150A, 100mA 0.1S Under		
Earth			mm²	8			8			8			8		
Mini-mum wire size	Crossover line	Main	mm²	22			22			38			38		
		Distance	m	22			20			32			30		
		Crossover 1	mm²	14			14			22			22		
		Distance	m	18			16			24			22		
		Crossover 2	mm²	8			14			14			14		
		Distance	m	16			24			21			21		
		Crossover 3	mm²	5.5			5.5			8			8		
		Distance	m	22			17			25			24		
	Branch line	Main	mm²	22			22			38			38		
		Distance	m	22			20			32			30		
		Crossover 1	mm²	14			14			22			22		
		Distance	m	18			16			24			22		
		Crossover 2	mm²	8			14			14			14		
		Distance	m	16			24			21			21		
		Crossover 3	mm²	5.5			5.5			8			8		
		Distance	m	22			17			25			24		

7. PERFORMANCE DATA (INDOOR UNIT)

❶Fan performance

[INDOOR UNIT]

Type	Model	Fan Speed	Air Volume (m^3/min)	Running Current (A) Single Phase			Power Consumption	Fan Speed
				220V 50Hz	230V 50Hz	240V 50Hz	kW	rpm
Wall	CS-22KR51	High	14	0.19	0.18	0.18	0.04	1180
		Mid	12	0.16	0.16	0.15	0.035	1090
		Low	10	0.15	0.14	0.13	0.03	990
	CS-45KR51	High	14	0.19	0.18	0.18	0.04	1180
		Mid	12	0.16	0.16	0.15	0.035	1090
		Low	10	0.15	0.14	0.13	0.03	990
	CS-56KR51	High	18	0.24	0.23	0.22	0.05	1160
		Mid	16	0.21	0.20	0.19	0.045	1050
		Low	13	0.19	0.18	0.18	0.04	940
	CS-71KR51	High	18	0.24	0.23	0.22	0.05	1160
		Mid	16	0.21	0.20	0.19	0.045	1050
		Low	13	0.19	0.18	0.18	0.04	940
Four-way cassette	CS-45UR51	High	15	0.30	0.29	0.28	0.06	510
		Mid	12	0.24	0.23	0.22	0.05	425
		Low	10	0.17	0.17	0.16	0.03	365
	CS-56UR51	High	15	0.30	0.29	0.28	0.06	510
		Mid	12	0.24	0.23	0.22	0.05	425
		Low	10	0.17	0.17	0.16	0.03	365
	CS-71UR51	High	20	0.42	0.40	0.38	0.09	580
		Mid	17	0.35	0.33	0.32	0.07	525
		Low	15	0.29	0.28	0.27	0.06	475
	CS-80UR51	High	21	0.68	0.69	0.70	0.13	650
		Mid	18	0.55	0.57	0.57	0.11	570
		Low	16	0.41	0.41	0.42	0.07	485
	CS-112UR51	High	31	0.81	0.77	0.74	0.17	570
		Mid	25	0.62	0.59	0.57	0.13	480
		Low	20	0.52	0.49	0.47	0.11	400
	CS-140UR51	High	34	0.99	0.95	0.91	0.21	620
		Mid	29	0.85	0.82	0.78	0.18	540
		Low	24	0.66	0.63	0.61	0.14	460
Ceiling	CS-71TR51	High	18	0.45	0.43	0.42	0.09	1230
		Mid	15	0.40	0.38	0.37	0.08	1130
		Low	13	0.35	0.33	0.32	0.07	1050
	CS-112TR51	High	25	0.64	0.61	0.58	0.13	1300
		Mid	22	0.55	0.52	0.50	0.11	1180
		Low	20	0.45	0.43	0.42	0.09	1100
	CS-140TR51	High	32	0.80	0.77	0.73	0.16	1280
		Mid	28	0.70	0.67	0.64	0.14	1150
		Low	24	0.60	0.57	0.55	0.12	1030
1-way cassete	CS-28DR51	High	7.5	0.11	0.11	0.11	0.03	1250
		Mid	6.5	0.10	0.10	0.10	0.028	1120
		Low	5.5	0.09	0.09	0.09	0.026	980

Fan performance

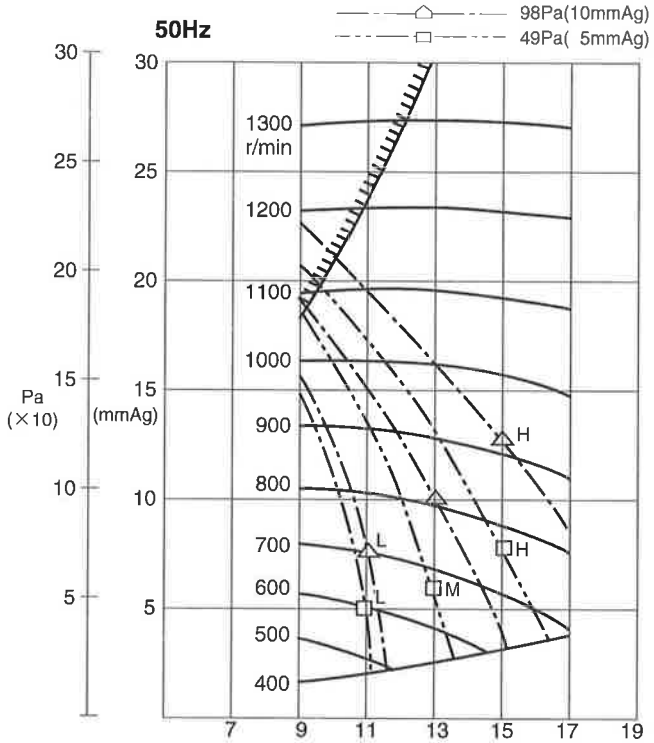
[INDOOR UNIT]

Type	Model	External Static Pressure	Fan Speed	Air Volume (m^3/min)	Running Current (A) Single Phase			Power Consumption	Fan Speed
					220V 50Hz	230V 50Hz	240V 50Hz	kW	rpm
Hide-Away	CS-45ER51	7mmAq (69Pa)	High	15	0.99	0.95	0.91	0.21	840
			Mid	13	0.71	0.68	0.65	0.16	740
			Low	11	0.65	0.62	0.59	0.15	640
		10mmAq (98Pa)	High	15	0.99	0.95	0.91	0.21	930
			Mid	13	0.71	0.68	0.65	0.16	820
			Low	11	0.65	0.62	0.59	0.15	700
	CS-56ER51	7mmAq (69Pa)	High	17	0.95	0.90	0.86	0.20	770
			Mid	15	0.85	0.80	0.77	0.18	680
			Low	13	0.76	0.72	0.66	0.17	600
		10mmAq (98Pa)	High	17	0.95	0.90	0.86	0.20	890
			Mid	15	0.85	0.80	0.77	0.18	800
			Low	13	0.76	0.72	0.66	0.17	700
	CS-71ER51	10mmAq (98Pa)	High	20	1.39	1.43	1.49	0.30	960
			Mid	18	1.26	1.29	1.35	0.24	860
			Low	16	1.13	1.15	1.22	0.22	780
		15mmAq (147Pa)	High	20	1.44	1.47	1.55	0.31	1140
			Mid	18	1.30	1.33	1.40	0.26	1040
			Low	16	1.17	1.19	1.26	0.23	930
	CS-80ER51	10mmAq (98Pa)	High	25	1.27	1.32	1.37	0.31	1040
			Mid	22	1.18	1.23	1.27	0.27	930
			Low	19	1.04	1.08	1.11	0.26	810
		15mmAq (147Pa)	High	25	1.32	1.37	1.41	0.32	1210
			Mid	22	1.22	1.26	1.31	0.28	1080
			Low	19	1.06	1.12	1.14	0.27	940
Hide-Away	CS-112ER51	Mid 10mmAq (98Pa)	High	35	2.11	2.02	1.93	0.44	950
			Mid	30	1.85	1.77	1.70	0.36	810
			Low	25	1.58	1.51	1.45	0.34	700
		High 15mmAq (147Pa)	High	35	2.18	2.09	2.00	0.45	1130
			Mid	30	1.91	1.83	1.75	0.37	980
			Low	25	1.64	1.57	1.50	0.35	830
	CS-140ER51	Mid 10mmAq (98Pa)	High	40	2.21	1.90	2.00	0.50	1020
			Mid	35	1.91	1.93	1.80	0.45	900
			Low	30	1.90	1.92	1.80	0.37	790
		High 15mmAq (147Pa)	High	40	2.28	2.31	2.15	0.52	1190
			Mid	35	1.97	1.99	1.85	0.46	1050
			Low	30	1.96	1.99	1.84	0.38	920

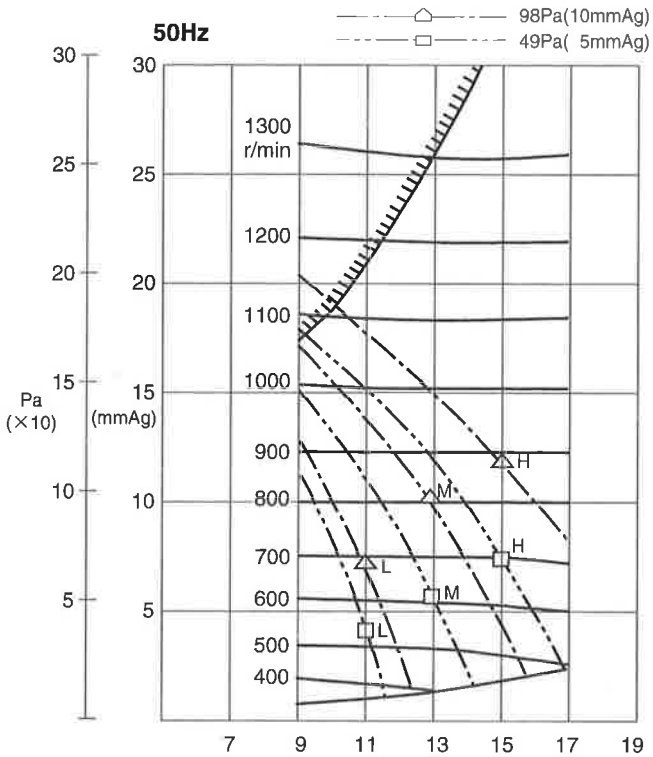
❷Fan performance curve

Hide-Away type

● CS-45ER51



● CS-56ER51



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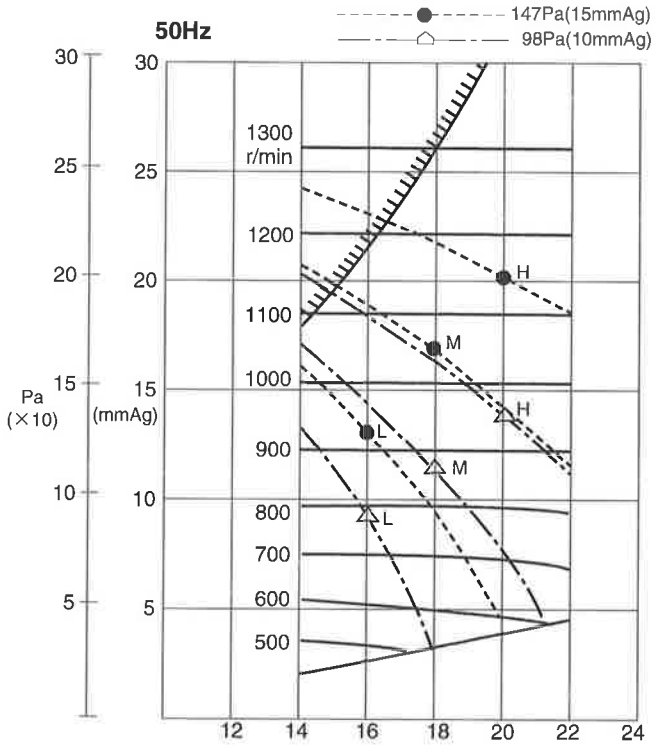

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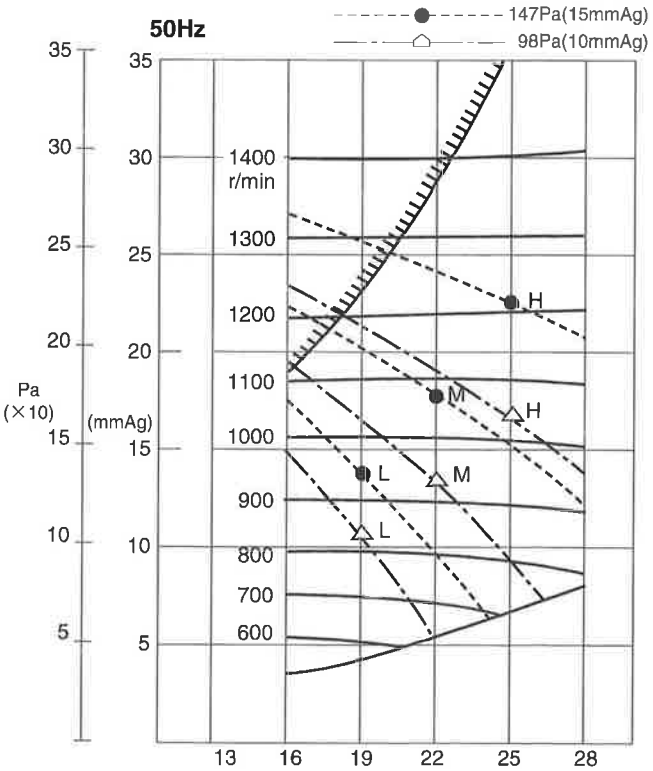
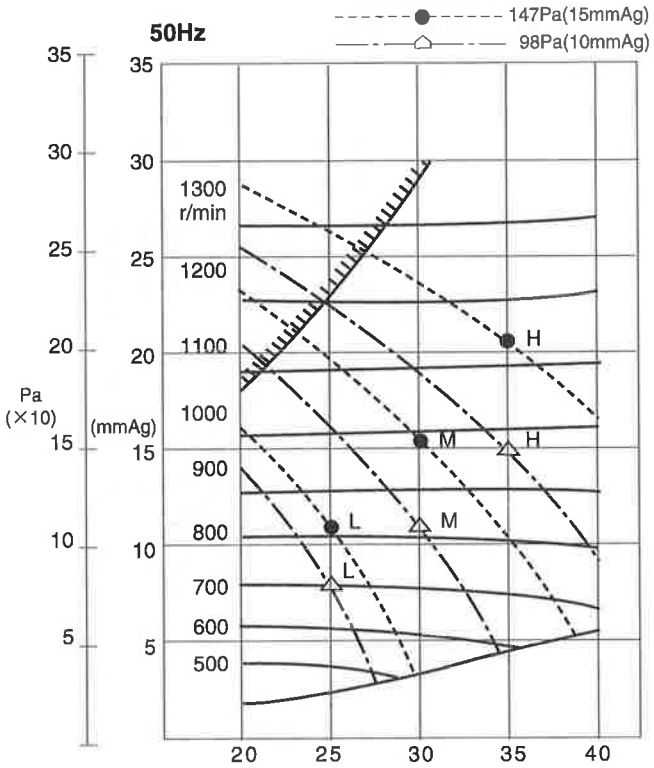
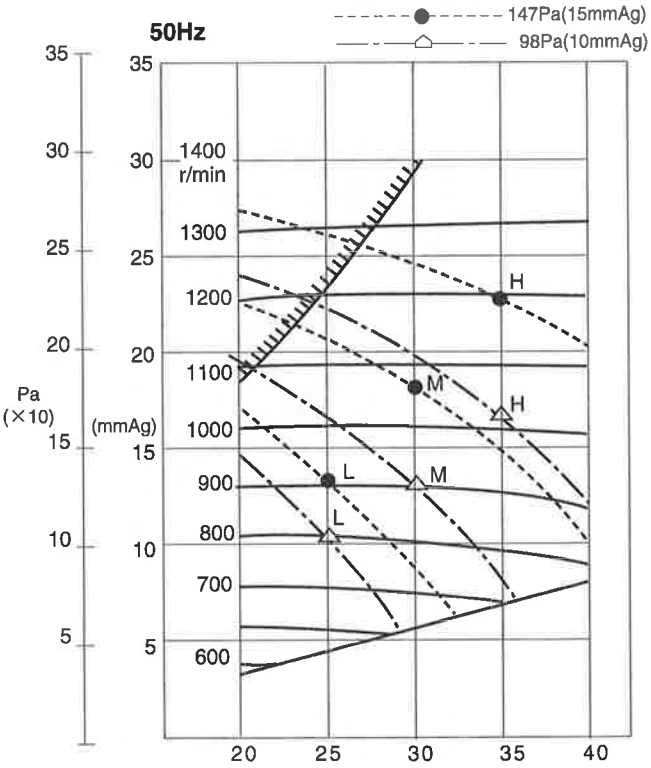


● **CS-112ER51**



● **CS-140ER51**

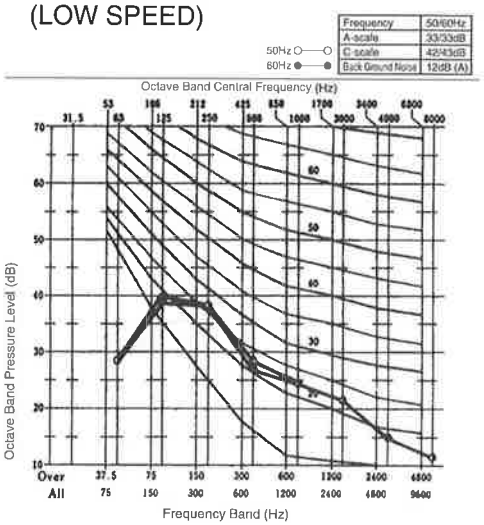


❸Sound data

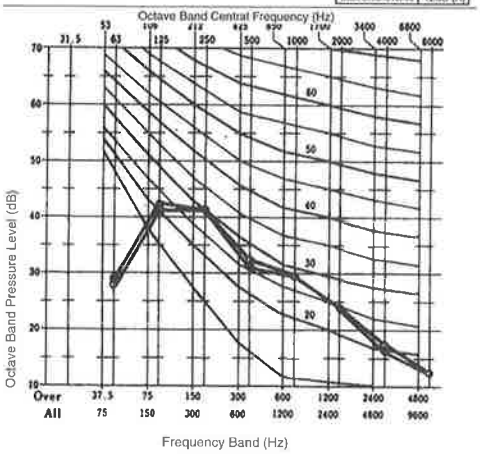
FOUR WAY CASSETTE TYPE

• CS-45UR51,CS-56UR51

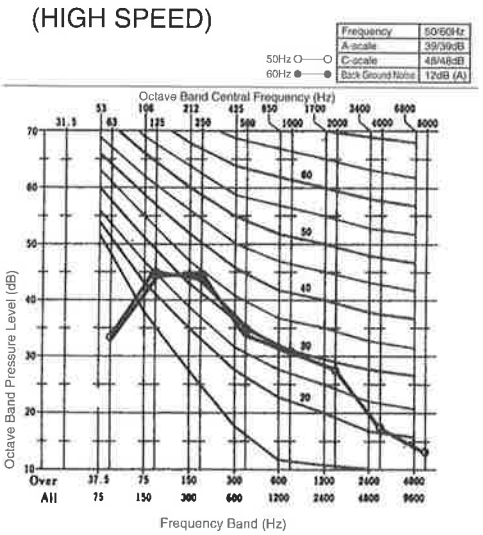
(LOW SPEED)



(MEDIUM SPEED)

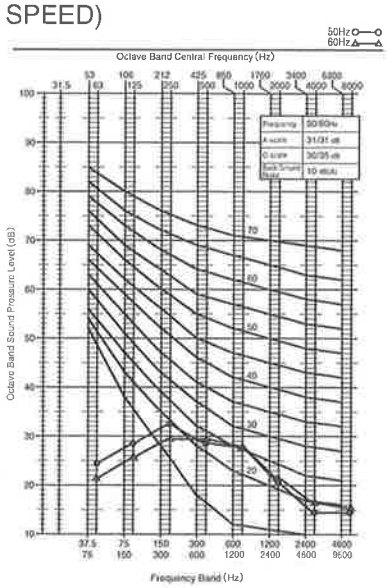


(HIGH SPEED)

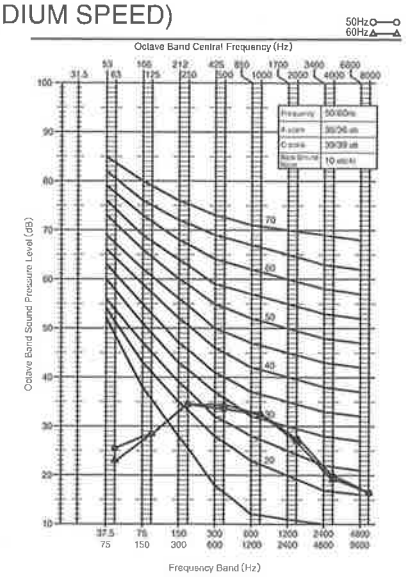


ONE WAY CASSETTE TYPE

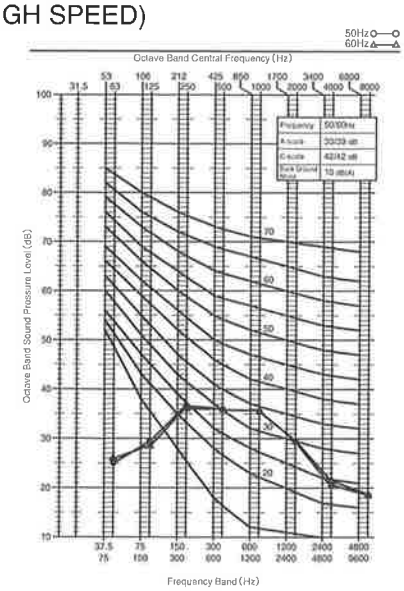
•CS-28DR51FB
•CS-28DR51ER
(LOW SPEED)



(MEDIUM SPEED)



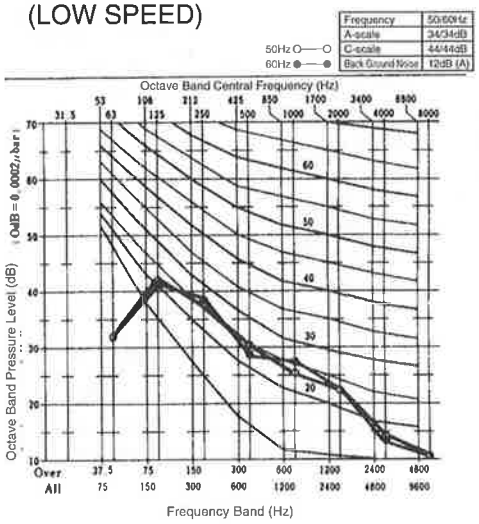
(HIGH SPEED)



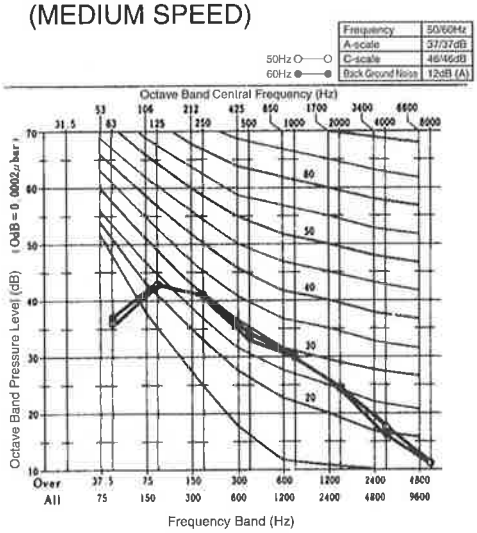
Sound data FOUR WAY CASSETTE TYPE

• CS-71UR51

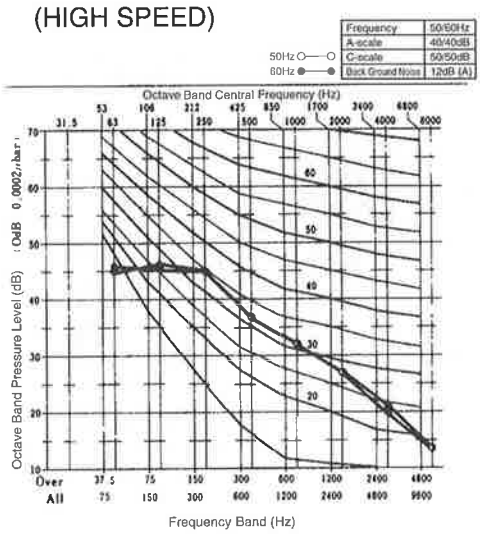
(LOW SPEED)



(MEDIUM SPEED)

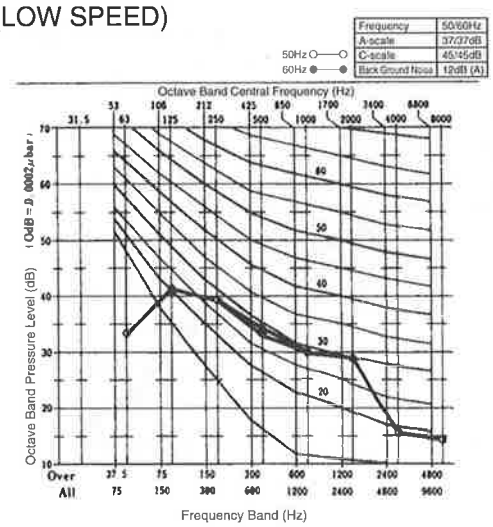


(HIGH SPEED)

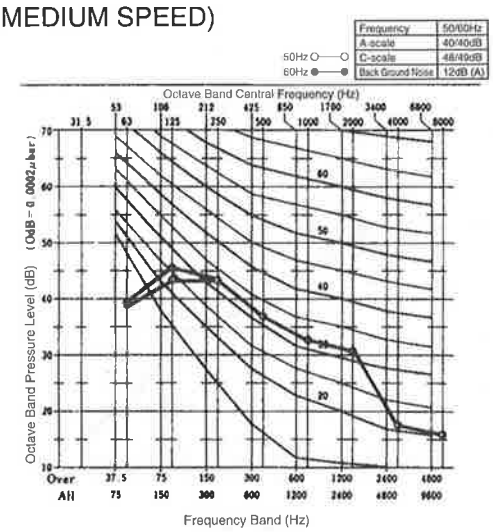


• CS-80UR51

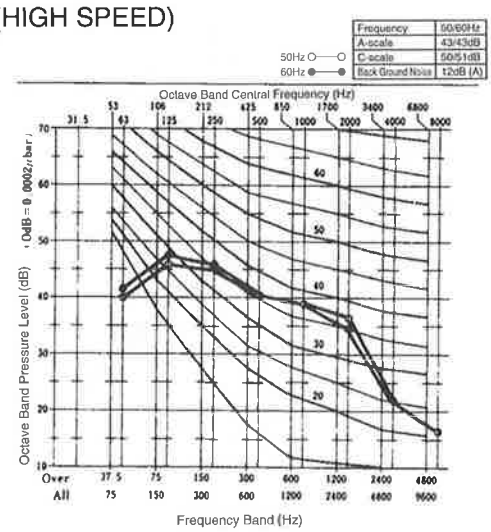
(LOW SPEED)



(MEDIUM SPEED)



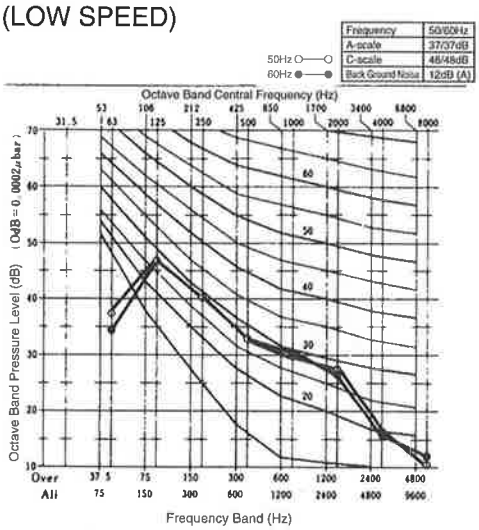
(HIGH SPEED)



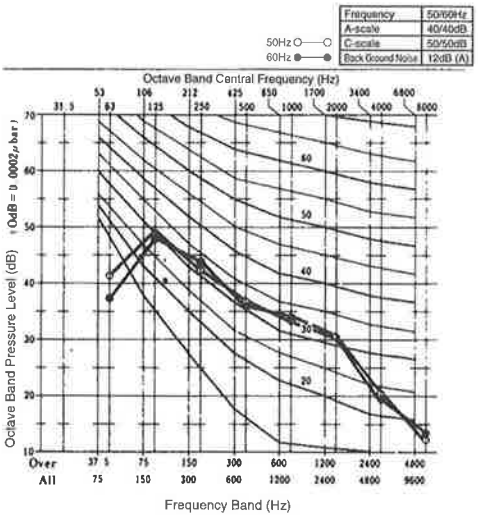
Sound data FOUR WAY CASSETTE TYPE

• CS-112UR51

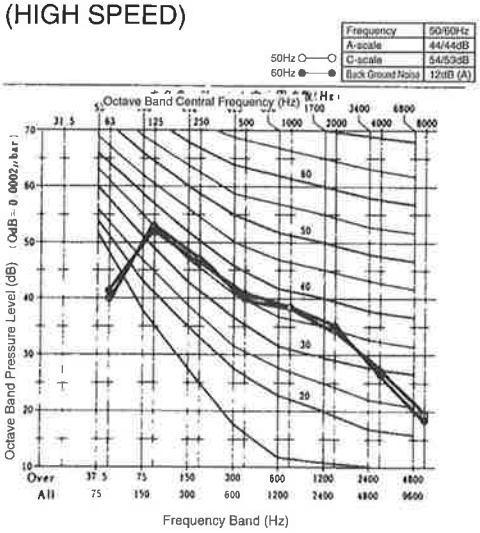
(LOW SPEED)



(MEDIUM SPEED)

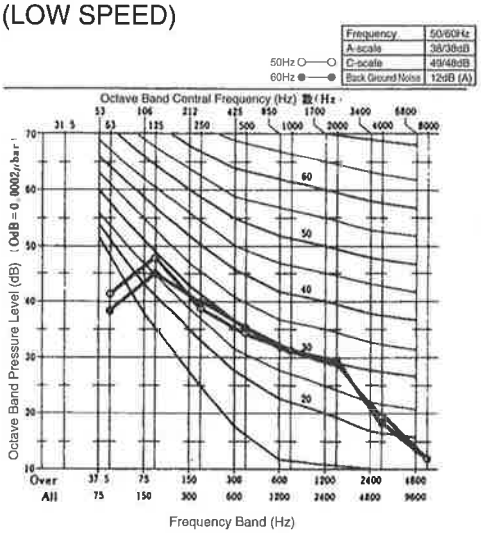


(HIGH SPEED)

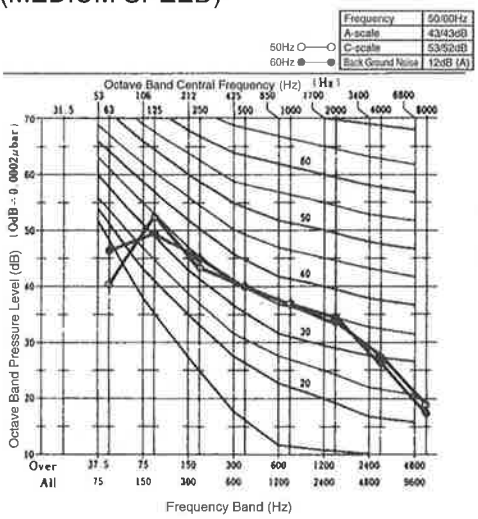


• CS-140UR51

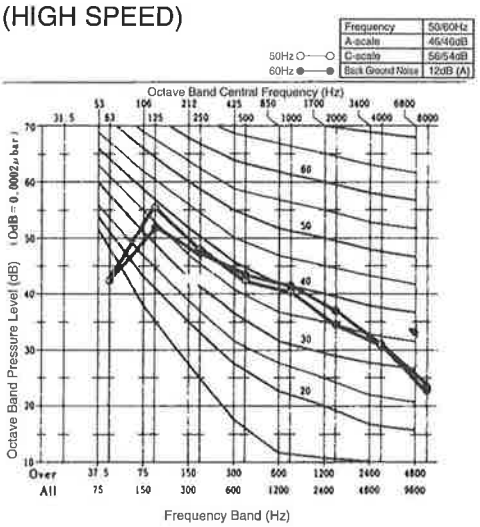
(LOW SPEED)



(MEDIUM SPEED)



(HIGH SPEED)



Sound data HIDE-AWAY TYPE

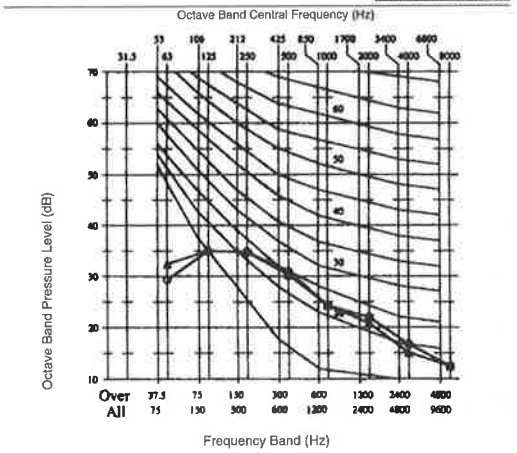
CS-45ER51FB
CS-45ER51ER

69Pa(7mmAq)

(LOW SPEED)

Frequency	50/60Hz
A-scale	32/32dB
C-scale	39/40dB
Back Ground Noise	10dB (A)

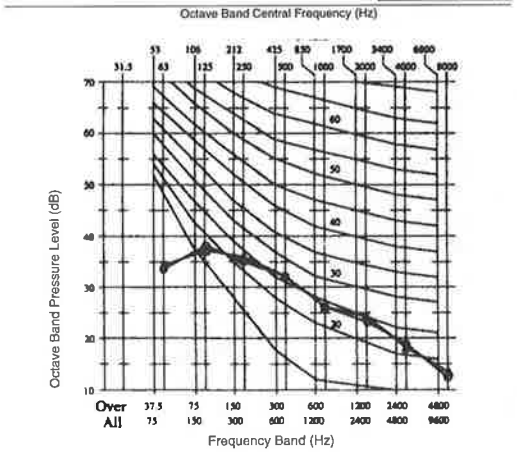
50Hz O——O
60Hz Δ——Δ



(MEDIUM SPEED)

Frequency	50/60Hz
A-scale	34/34dB
C-scale	42/42dB
Back Ground Noise	10dB (A)

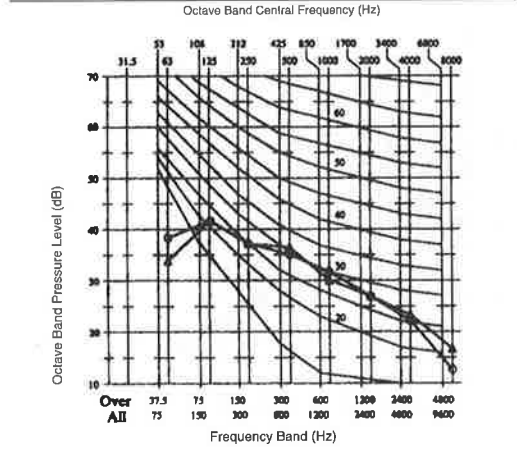
50Hz O——O
60Hz Δ——Δ



(HIGH SPEED)

Frequency	50/60Hz
A-scale	37/37dB
C-scale	45/44dB
Back Ground Noise	10dB (A)

50Hz O——O
60Hz Δ——Δ

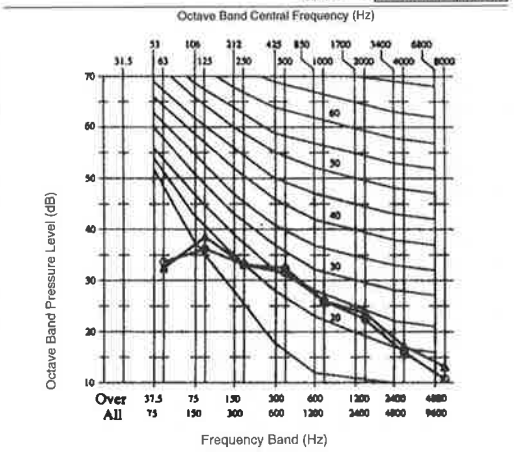


98Pa(10mmAq)

(LOW SPEED)

Frequency	50/60Hz
A-scale	33/33dB
C-scale	40/41dB
Back Ground Noise	10dB (A)

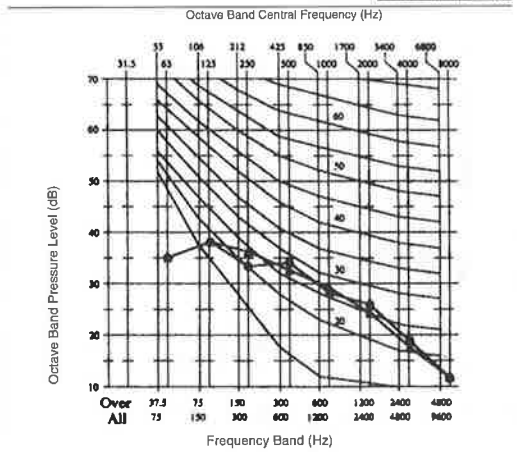
50Hz O——O
60Hz Δ——Δ



(MEDIUM SPEED)

Frequency	50/60Hz
A-scale	35/35dB
C-scale	42/42dB
Back Ground Noise	10dB (A)

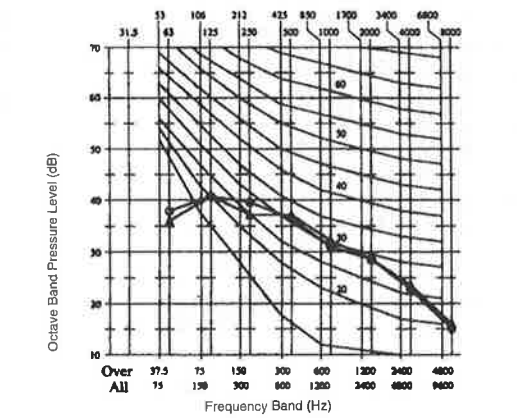
50Hz O——O
60Hz Δ——Δ



(HIGH SPEED)

Frequency	50/60Hz
A-scale	38/38dB
C-scale	45/45dB
Back Ground Noise	10dB (A)

50Hz O——O
60Hz Δ——Δ



Sound data HIDE-AWAY TYPE

CS-56ER51FB
CS-56ER51ER

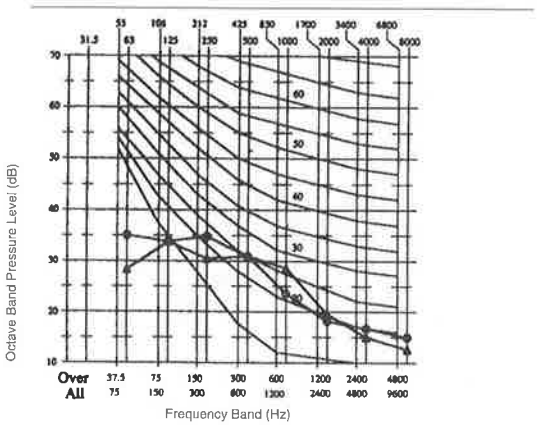
69Pa(7mmAq)

(LOW SPEED)

Frequency	50/60Hz
A-scale	32/32dB
C-scale	40/38dB
Back Ground Noise	10dB (A)

50Hz O——O
60Hz Δ——Δ

Octave Band Central Frequency (Hz)

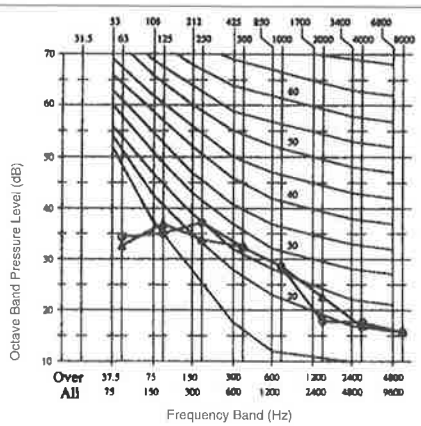


(MEDIUM SPEED)

Frequency	50/60Hz
A-scale	34/34dB
C-scale	41/40dB
Back Ground Noise	10dB (A)

50Hz O——O
60Hz Δ——Δ

Octave Band Central Frequency (Hz)

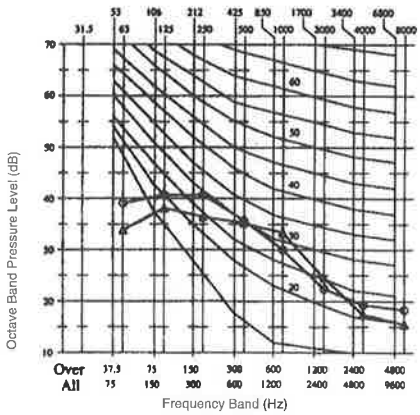


(HIGH SPEED)

Frequency	50/60Hz
A-scale	37/37dB
C-scale	45/43dB
Back Ground Noise	10dB (A)

50Hz O——O
60Hz Δ——Δ

Octave Band Central Frequency (Hz)



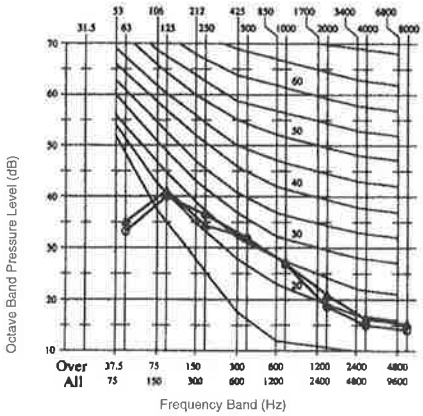
98Pa(10mmAq)

(LOW SPEED)

Frequency	50/60Hz
A-scale	33/33dB
C-scale	43/43dB
Back Ground Noise	10dB (A)

50Hz O——O
60Hz Δ——Δ

Octave Band Central Frequency (Hz)

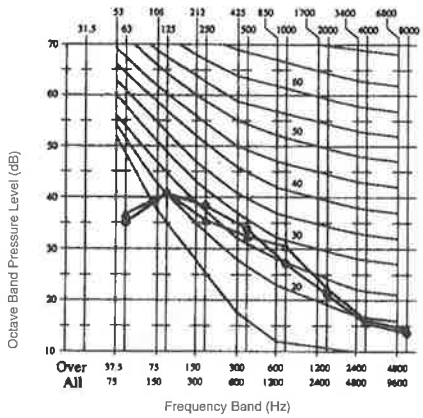


(MEDIUM SPEED)

Frequency	50/60Hz
A-scale	35/35dB
C-scale	44/44dB
Back Ground Noise	10dB (A)

50Hz O——O
60Hz Δ——Δ

Octave Band Central Frequency (Hz)

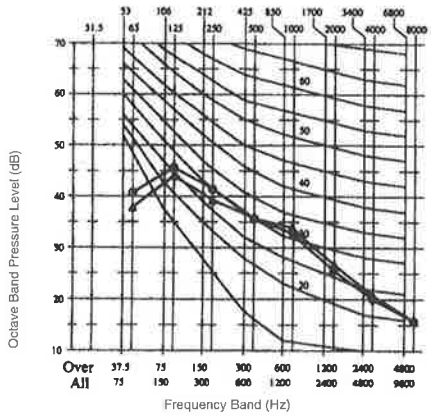


(HIGH SPEED)

Frequency	50/60Hz
A-scale	36/36dB
C-scale	48/47dB
Back Ground Noise	10dB (A)

50Hz O——O
60Hz Δ——Δ

Octave Band Central Frequency (Hz)



Sound data HIDE-AWAY TYPE

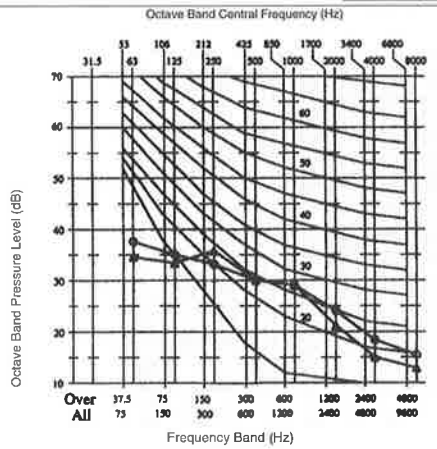
CS-71ER51FB
CS-71ER51ER

98Pa(10mmAq)

(LOW SPEED)

Frequency	50/60Hz
A-scale	33/33dB
C-scale	41/40dB
Back Ground Noise	10dB (A)

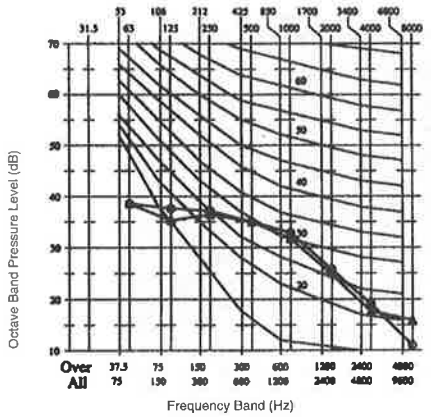
50Hz O——O
60Hz Δ——Δ



(MEDIUM SPEED)

Frequency	50/60Hz
A-scale	36/36dB
C-scale	43/43dB
Back Ground Noise	10dB (A)

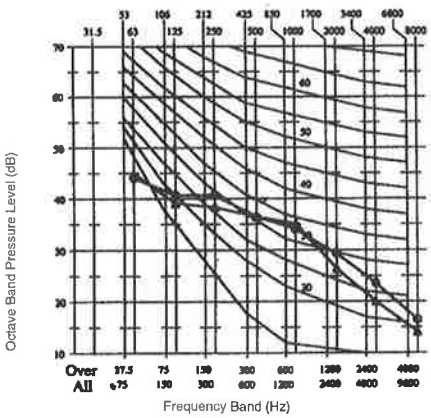
50Hz O——O
60Hz Δ——Δ



(HIGH SPEED)

Frequency	50/60Hz
A-scale	39/39dB
C-scale	47/47dB
Back Ground Noise	10dB (A)

50Hz O——O
60Hz Δ——Δ

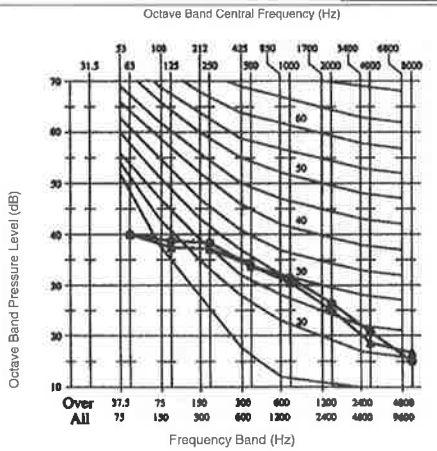


147Pa(15mmAq)

(LOW SPEED)

Frequency	50/60Hz
A-scale	36/36dB
C-scale	44/44dB
Back Ground Noise	10dB (A)

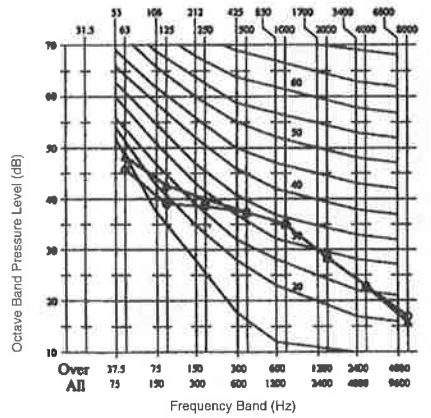
50Hz O——O
60Hz Δ——Δ



(MEDIUM SPEED)

Frequency	50/60Hz
A-scale	39/39dB
C-scale	47/50dB
Back Ground Noise	10dB (A)

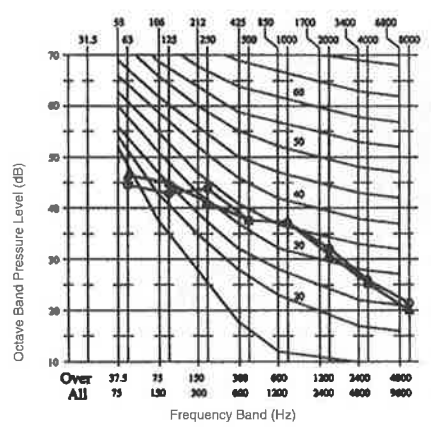
50Hz O——O
60Hz Δ——Δ



(HIGH SPEED)

Frequency	50/60Hz
A-scale	42/42dB
C-scale	49/50dB
Back Ground Noise	10dB (A)

50Hz O——O
60Hz Δ——Δ



Sound data HIDE-AWAY TYPE

CS-80ER51FB
CS-80ER51ER

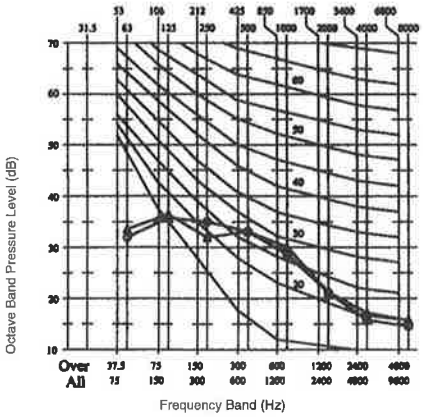
98Pa(10mmAq)

(LOW SPEED)

Frequency	50/60Hz
A-scale	34/34dB
C-scale	41/41dB
Back Ground Noise	10dB (A)

50Hz O——O
60Hz Δ——Δ

Octave Band Central Frequency (Hz)

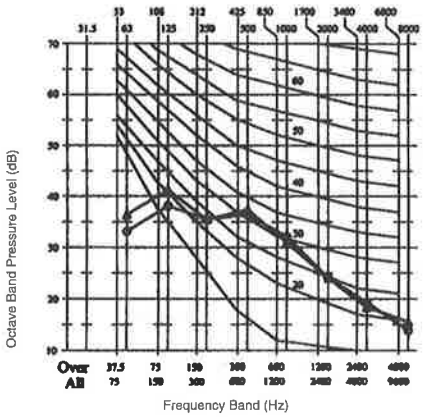


(MEDIUM SPEED)

Frequency	50/60Hz
A-scale	37/37dB
C-scale	43/44dB
Back Ground Noise	10dB (A)

50Hz O——O
60Hz Δ——Δ

Octave Band Central Frequency (Hz)

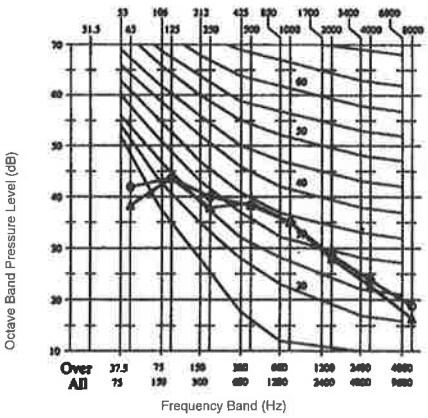


(HIGH SPEED)

Frequency	50/60Hz
A-scale	40/40dB
C-scale	48/47dB
Back Ground Noise	10dB (A)

50Hz O——O
60Hz Δ——Δ

Octave Band Central Frequency (Hz)



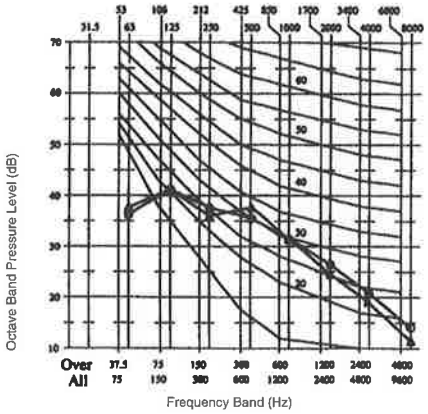
147Pa(15mmAq)

(LOW SPEED)

Frequency	50/60Hz
A-scale	37/37dB
C-scale	44/45dB
Back Ground Noise	10dB (A)

50Hz O——O
60Hz Δ——Δ

Octave Band Central Frequency (Hz)

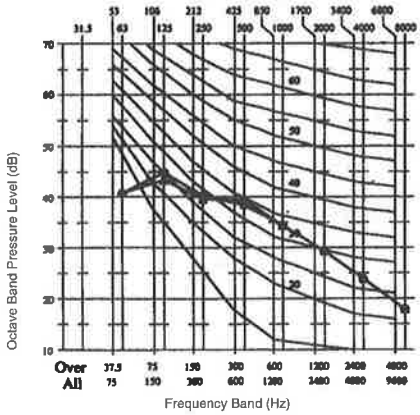


(MEDIUM SPEED)

Frequency	50/60Hz
A-scale	40/40dB
C-scale	48/47dB
Back Ground Noise	10dB (A)

50Hz O——O
60Hz Δ——Δ

Octave Band Central Frequency (Hz)

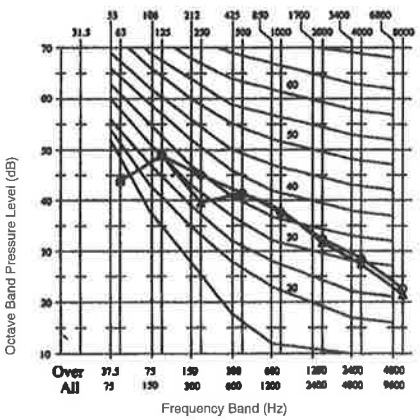


(HIGH SPEED)

Frequency	50/60Hz
A-scale	43/43dB
C-scale	52/51dB
Back Ground Noise	10dB (A)

50Hz O——O
60Hz Δ——Δ

Octave Band Central Frequency (Hz)



Sound data HIDE-AWAY TYPE

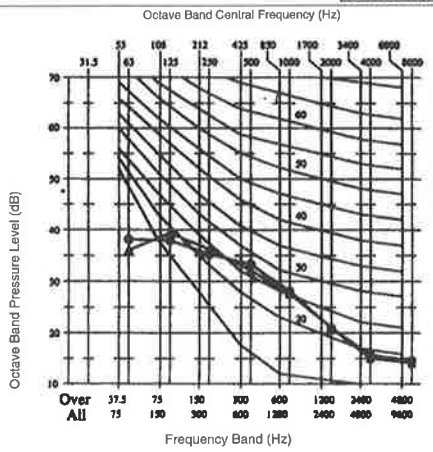
CS-112ER51FB
CS-112ER51ER

98Pa(10mmAq)

(LOW SPEED)

Frequency	50/60Hz
A-scale	34/34dB
C-scale	42/43dB
Back Ground Noise	10dB (A)

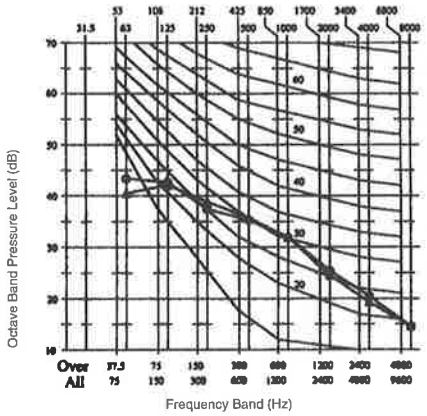
50Hz O——O
60Hz Δ——Δ



(MEDIUM SPEED)

Frequency	50/60Hz
A-scale	37/37dB
C-scale	47/46dB
Back Ground Noise	10dB (A)

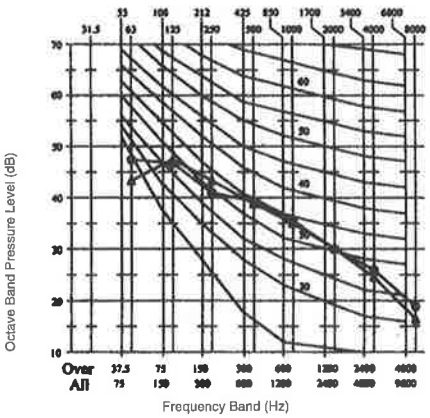
50Hz O——O
60Hz Δ——Δ



(HIGH SPEED)

Frequency	50/60Hz
A-scale	41/41dB
C-scale	50/50dB
Back Ground Noise	10dB (A)

50Hz O——O
60Hz Δ——Δ

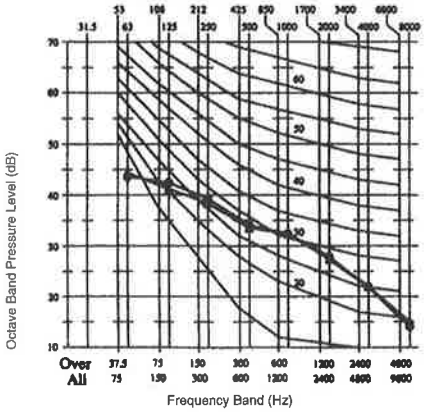


147Pa(15mmAq)

(LOW SPEED)

Frequency	50/60Hz
A-scale	37/37dB
C-scale	47/47dB
Back Ground Noise	10dB (A)

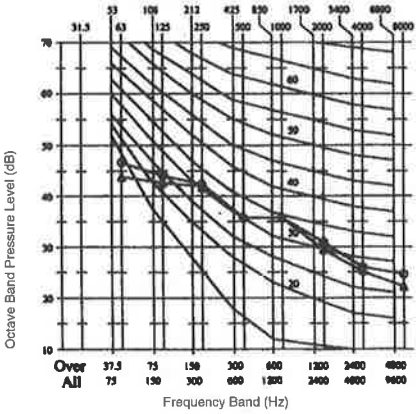
50Hz O——O
60Hz Δ——Δ



(MEDIUM SPEED)

Frequency	50/60Hz
A-scale	40/40dB
C-scale	50/48dB
Back Ground Noise	10dB (A)

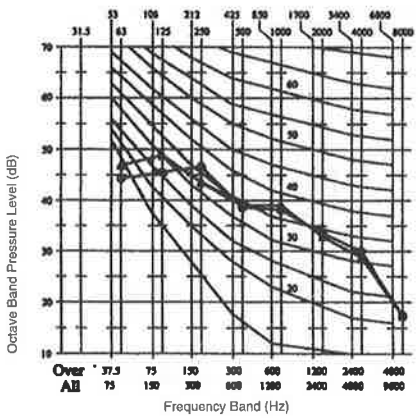
50Hz O——O
60Hz Δ——Δ



(HIGH SPEED)

Frequency	50/60Hz
A-scale	43/43dB
C-scale	51/52dB
Back Ground Noise	10dB (A)

50Hz O——O
60Hz Δ——Δ



Sound data HIDE-AWAY TYPE

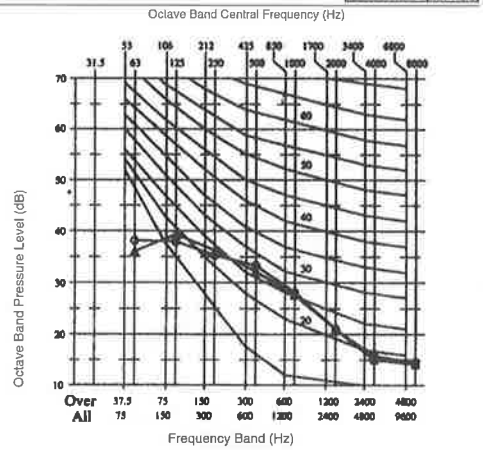
CS-140ER51FB
CS-140ER51ER

98Pa(10mmAq)

(LOW SPEED)

Frequency	50/60Hz
A-scale	34/34dB
C-scale	42/43dB
Back Ground Noise	10dB (A)

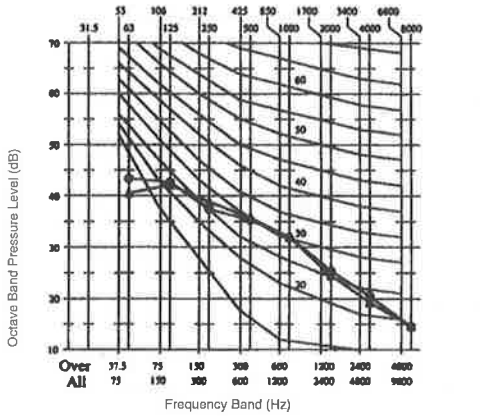
50Hz O——O
60Hz Δ——Δ



(MEDIUM SPEED)

Frequency	50/60Hz
A-scale	37/37dB
C-scale	47/46dB
Back Ground Noise	10dB (A)

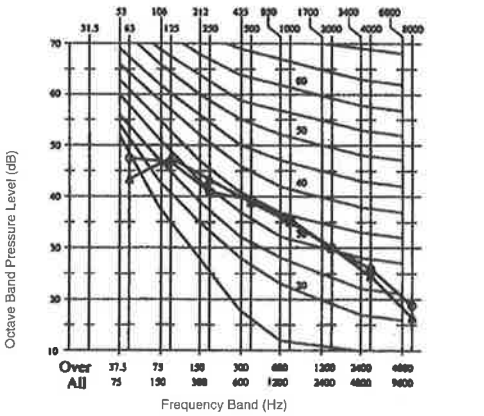
50Hz O——O
60Hz Δ——Δ



(HIGH SPEED)

Frequency	50/60Hz
A-scale	41/41dB
C-scale	50/50dB
Back Ground Noise	10dB (A)

50Hz O——O
60Hz Δ——Δ

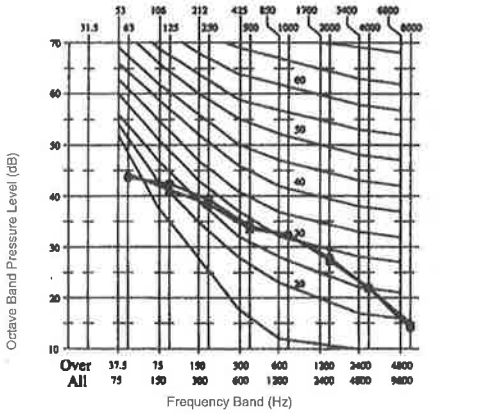


147Pa(15mmAq)

(LOW SPEED)

Frequency	50/60Hz
A-scale	37/37dB
C-scale	47/47dB
Back Ground Noise	10dB (A)

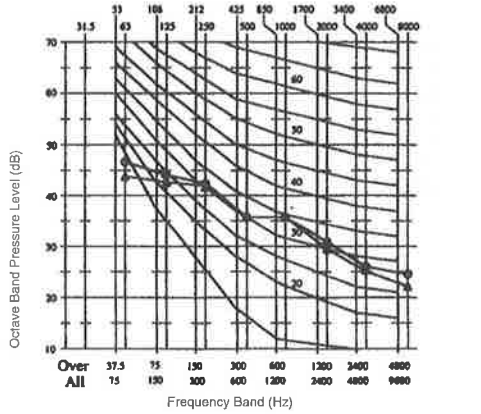
50Hz O——O
60Hz Δ——Δ



(MEDIUM SPEED)

Frequency	50/60Hz
A-scale	40/40dB
C-scale	50/48dB
Back Ground Noise	10dB (A)

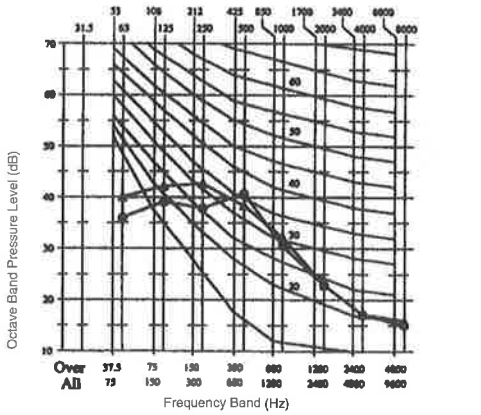
50Hz O——O
60Hz Δ——Δ



(HIGH SPEED)

Frequency	50/60Hz
A-scale	43/43dB
C-scale	51/52dB
Back Ground Noise	10dB (A)

50Hz O——O
60Hz Δ——Δ



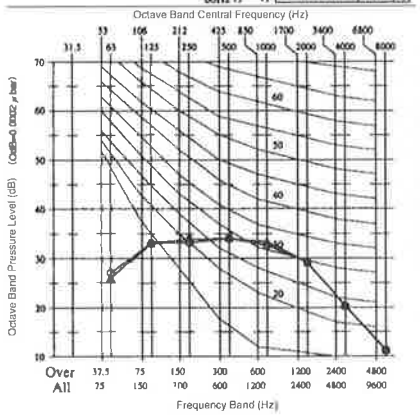
Sound data CEILING TYPE

• CS-71TR51FB
CS-71TR51ER

(LOW SPEED)

Frequency	50/60Hz
A-scale	37/37dB
C-scale	40/40dB
Back Ground Noise	12dB (A)

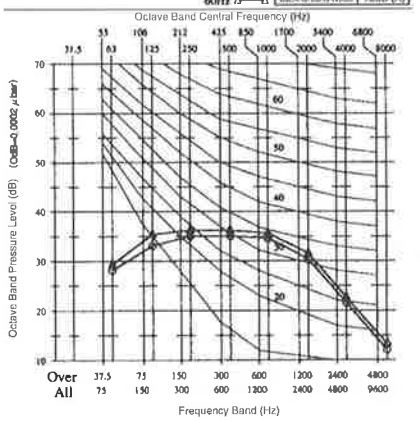
50Hz ○—○
60Hz △—△



(MEDIUM SPEED)

Frequency	50/60Hz
A-scale	38/39dB
C-scale	41/42dB
Back Ground Noise	12dB (A)

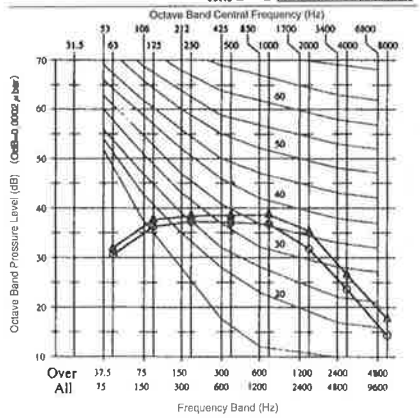
50Hz ○—○
60Hz △—△



(HIGH SPEED)

Frequency	50/60Hz
A-scale	40/42dB
C-scale	43/45dB
Back Ground Noise	12dB (A)

50Hz ○—○
60Hz △—△

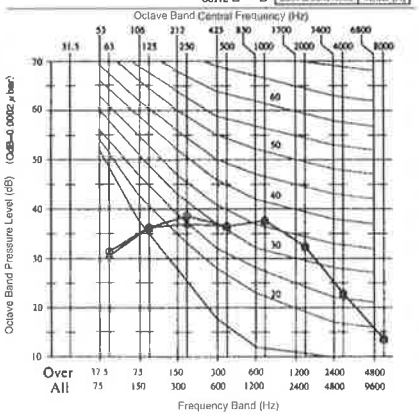


• CS-112TR51FB
CS-112TR51ER

(LOW SPEED)

Frequency	50/60Hz
A-scale	40/40dB
C-scale	43/43dB
Back Ground Noise	12dB (A)

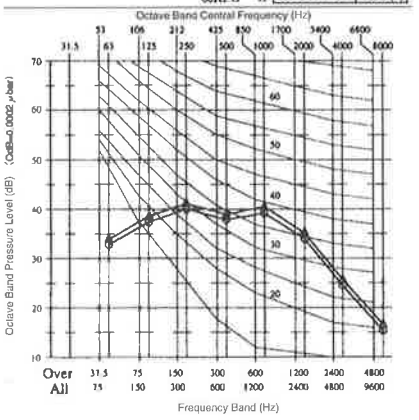
50Hz ○—○
60Hz △—△



(MEDIUM SPEED)

Frequency	50/60Hz
A-scale	42/43dB
C-scale	45/46dB
Back Ground Noise	12dB (A)

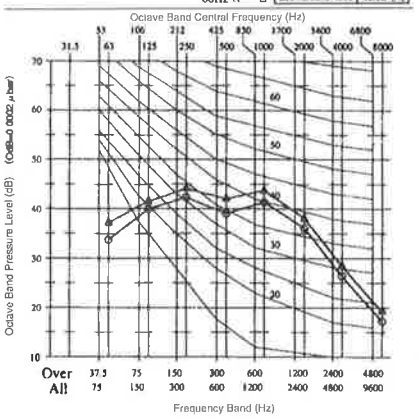
50Hz ○—○
60Hz △—△



(HIGH SPEED)

Frequency	50/60Hz
A-scale	44/46dB
C-scale	47/49dB
Back Ground Noise	12dB (A)

50Hz ○—○
60Hz △—△

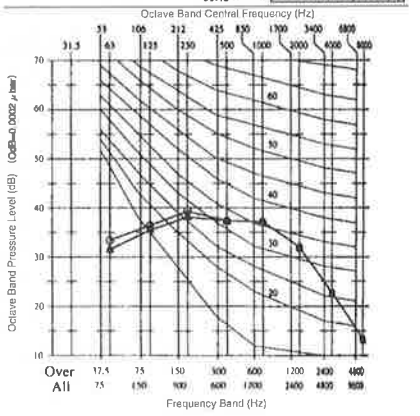


• CS-140TR51FB
CS-140TR51ER

(LOW SPEED)

Frequency	50/60Hz
A-scale	40/40dB
C-scale	44/44dB
Back Ground Noise	12dB (A)

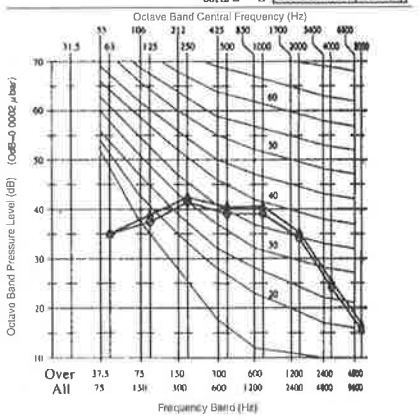
50Hz ○—○
60Hz △—△



(MEDIUM SPEED)

Frequency	50/60Hz
A-scale	42/43dB
C-scale	46/47dB
Back Ground Noise	12dB (A)

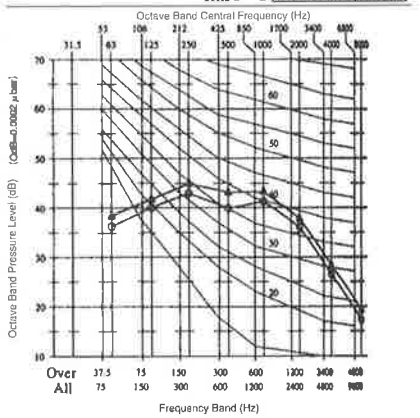
50Hz ○—○
60Hz △—△



(HIGH SPEED)

Frequency	50/60Hz
A-scale	44/46dB
C-scale	48/50dB
Back Ground Noise	12dB (A)

50Hz ○—○
60Hz △—△



Sound data WALL TYPE

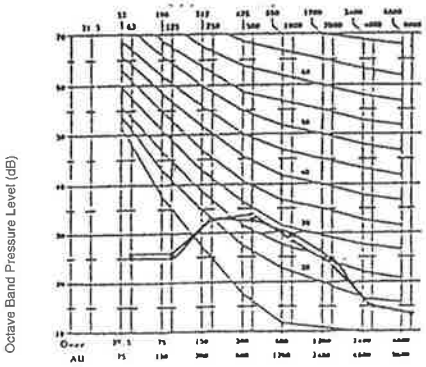
- CS-22KR51FB,CS-45KR51FB
  CS-22KR51ER,CS-45KR51ER

(LOW SPEED)

Frequency	50/60Hz
A-scale	34/34dB
C-scale	37/37dB
Back Ground Noise	12dB (A)

50Hz O——O
60Hz Δ——Δ

Octave Band Central Frequency (Hz)

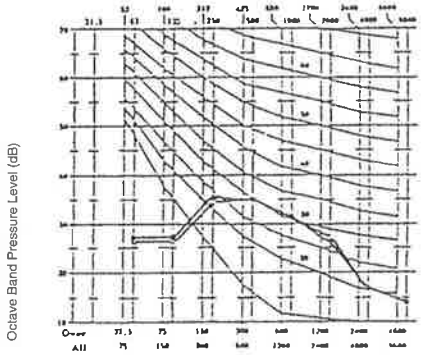


(MEDIUM SPEED)

Frequency	50/60Hz
A-scale	36/36dB
C-scale	39/39dB
Back Ground Noise	12dB (A)

50Hz O——O
60Hz Δ——Δ

Octave Band Central Frequency (Hz)

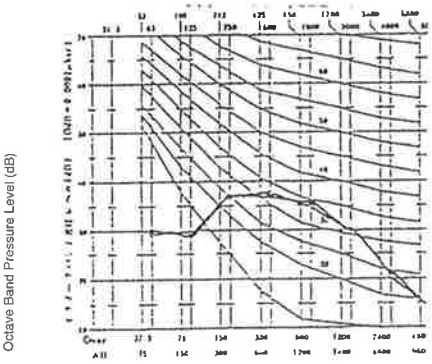


(HIGH SPEED)

Frequency	50/60Hz
A-scale	39/39dB
C-scale	42/42dB
Back Ground Noise	12dB (A)

50Hz O——O
60Hz Δ——Δ

Octave Band Central Frequency (Hz)



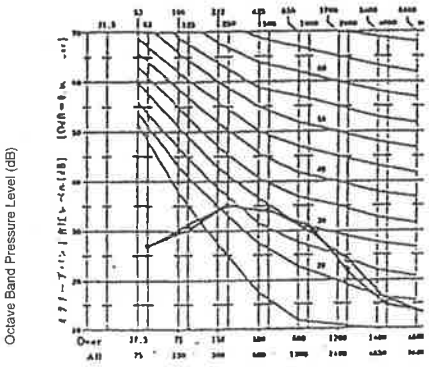
- CS-56KR51FB,CS-71KR51FB
  CS-56KR51ER,CS-71KR51ER

(LOW SPEED)

Frequency	50/60Hz
A-scale	35/35dB
C-scale	39/39dB
Back Ground Noise	12dB (A)

50Hz O——O
60Hz Δ——Δ

Octave Band Central Frequency (Hz)

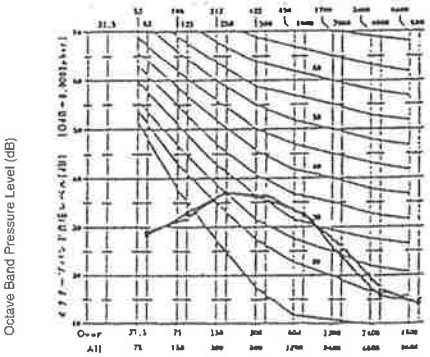


(MEDIUM SPEED)

Frequency	50/60Hz
A-scale	37/37dB
C-scale	41/41dB
Back Ground Noise	12dB (A)

50Hz O——O
60Hz Δ——Δ

Octave Band Central Frequency (Hz)

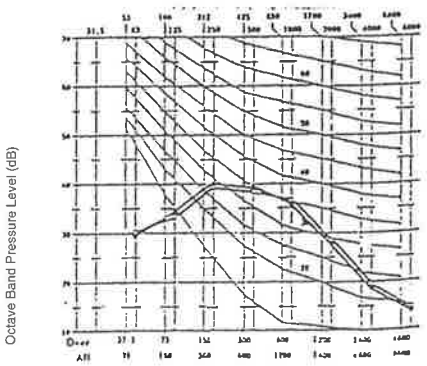


(HIGH SPEED)

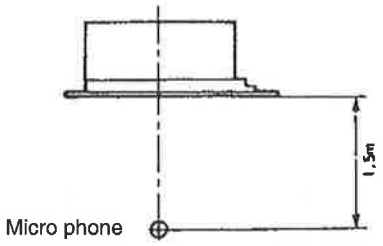
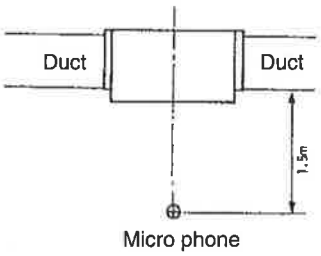
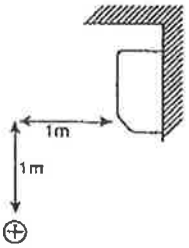
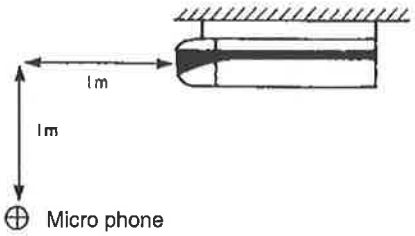
Frequency	50/60Hz
A-scale	40/40dB
C-scale	43/43dB
Back Ground Noise	12dB (A)

50Hz O——O
60Hz Δ——Δ

Octave Band Central Frequency (Hz)



■Sound data measurement
MICRO PHONE POSITION

Four-way Cassette Type One-way Cassette Type	
Hide-Away Type	
Wall Type	
Ceiling Type	

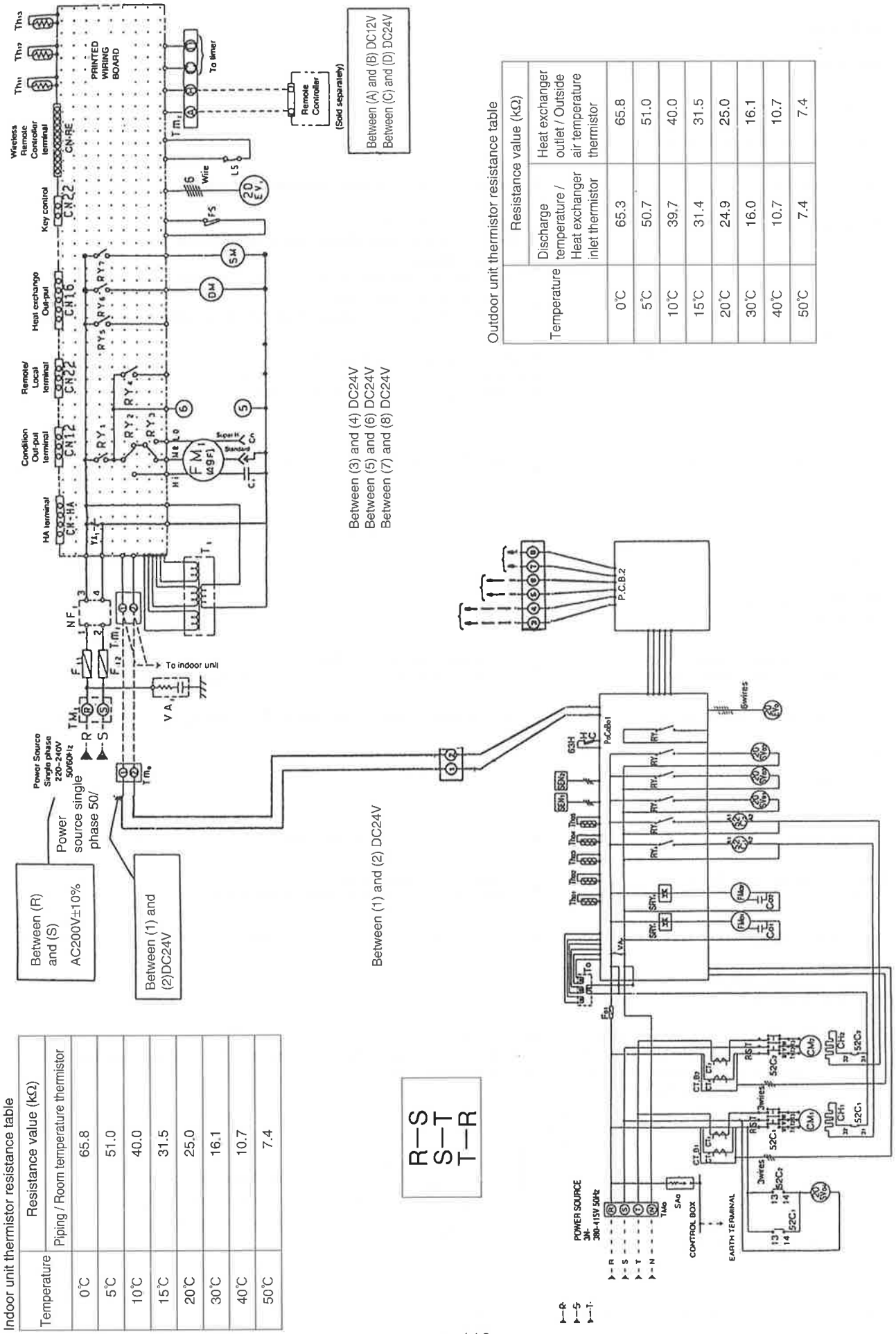
❺Specification of power source
[INDOOR UNIT]

Type	Model	Power Source			Power Consumption	Running Current	Wire Size (Minimum)		Distance	Circuit Breaker	Switch box		Earth	
		Phase	Volts	Frequency							Switch	Fuse Size		
		ϕ	V	Hz	kW	A	mm²	ϕ mm	m	A	A	A	mm²	ϕ mm
One-way cassette	CS-28DR51	Single	220	50	0.03	0.14	2	1.6	–	15	15	10	2	1.6
			230			0.14								
			240			0.14								
Four-way cassette	CS-45UR51	Single	220	50	0.06	0.3	2	1.6	–	15	15	10	2	1.6
			230			0.29								
			240			0.28								
	CS-56UR51	Single	220	50	0.06	0.3	2	1.6	–	15	15	10	2	1.6
			230			0.29								
			240			0.28								
	CS-71UR51	Single	220	50	0.09	0.42	2	1.6	–	15	15	10	2	1.6
			230			0.4								
			240			0.38								
	CS-80UR51	Single	220	50	0.13	0.68	2	1.6	–	15	15	10	2	1.6
			230			0.69								
			240			0.7								
	CS-112UR51	Single	220	50	0.17	0.81	2	1.6	–	15	15	10	2	1.6
			230			0.77								
			240			0.74								
	CS-140UR51	Single	220	50	0.21	0.99	2	1.6	–	15	15	10	2	1.6
			230			0.95								
			240			0.91								
Hide-Away	CS-45ER51	Single	220	50	0.21	0.99	2	1.6	–	15	15	10	2	1.6
			230			0.95								
			240			0.91								
	CS-56ER51	Single	220	50	0.2	0.95	2	1.6	–	15	15	10	2	1.6
			230			0.9								
			240			0.86								
	CS-71ER51	Single	220	50	0.31	1.41	2	1.6	–	15	15	10	2	1.6
			230			1.47								
			240			1.55								
	CS-80ER51	Single	220	50	0.32	1.32	2	1.6	–	15	15	10	2	1.6
			230			1.37								
			240			1.41								
	CS-112ER51	Single	220	50	0.45	2.18	2	1.6	–	15	15	10	2	1.6
			230			2.09								
			240			2								
	CS-140ER51	Single	220	50	0.52	2.28	2	1.6	–	15	15	10	2	1.6
			230			2.31								
			240			2.15								
Wall	CS-22KR51 CS-45KR51	Single	220	50	0.04	0.19	2	1.6	–	15	15	10	2	1.6
			230			0.18								
			240			0.18								
	CS-56KR51	Single	220	50	0.05	0.24	2	1.6	–	15	15	10	2	1.6
			230			0.23								
			240			0.22								
	CS-71KR51	Single	220	50	0.05	0.45	2	1.6	–	15	15	10	2	1.6
			230			0.43								
			240			0.42								
Ceiling	CS-71TR51	Single	220	50	0.09	0.45	2	1.6	–	15	15	10	2	1.6
			230			0.43								
			240			0.42								
	CS-112TR51	Single	220	50	0.13	0.64	2	1.6	–	15	15	10	2	1.6
			230			0.61								
			240			0.58								
	CS-140TR51	Single	220	50	0.16	0.8	2	1.6	–	15	15	10	2	1.6
			230			0.77								
			240			0.73								

10 TEST OPERATION

1. TEST OPERATION

■Voltages and thermistor resistance values during normal operation



Outdoor unit thermistor resistance table

Temperature	Resistance value (kΩ)	
	Discharge temperature / Heat exchanger inlet thermistor	Heat exchanger outlet / Outside air temperature thermistor
0°C	65.3	65.8
5°C	50.7	51.0
10°C	39,7	40.0
15°C	31.4	31.5
20°C	24.9	25.0
30°C	16.0	16.1
40°C	10.7	10.7
50°C	7.4	7.4

Indoor unit thermistor resistance table

Temperature	Resistance value (kΩ)
	Piping / Room temperature thermistor
0°C	65.8
5°C	51.0
10°C	40.0
15°C	31.5
20°C	25.0
30°C	16.1
40°C	10.7
50°C	7.4

Test Run Flowchart

1 Test Run Pre-check

(Procedure Flow)	(Procedure Flow)
① Charge with nitrogen Check piping welds and connections for leaks	
② Vacuum out	
③ Open service valve fully	
④ Check for loose screws/nuts	
⑤ Insulation measurement and check	
⑥ Fill in test run checklist	Prepare equipment schematic and coolant piping and wiring system diagrams
⑦ Set dip switches	For manual addressing (Indoor/Outdoor address setting), (Indoor/Outdoor DSW setting) For auto-addressing (Indoor/Outdoor address setting not needed), (Indoor/Outdoor DSW setting not needed) For remote control-addressing (Indoor/Outdoor address setting not needed), (DSW setting for outdoor unit only)
⑧ Check the method of power supply to Urban-Net	a.Power supply from outdoor unit b.Power supply from CZ-ESM (Central control board) c.Power supply from CZ-01GWM51 (Gateway) Power supply to Urban Net is from one location

2 Power On

⑨ Power on outdoor unit to activate crankcase heater.	Turn on the power supply 6 hours before the test run.
⑩ Power off outdoor unit once.	
⑪ Power on indoor unit.	
⑫ After all indoor unit is powered on, power on all outdoor unit again.	
⑬ Remote control address setting (Case of Remote controller address setting)	Set address by remote controller. (Manual and auto-address can also be checked by remote controller.)
⑭ Check control wiring for each system	Check number of indoor units connected from outdoor unit (Use line checker)

3 Test Run

⑮ With outdoor unit cooling operation, perform additional refrigerant gas charging.	
⑯ Test run	As first, always operate cooling for 5 minutes or more, even during heating season.
⑰ Check piping temperature for each system	Carry out normal operation for 2-3 hours. (Cooling operation in summer; Heating operation in winter.)
⑱ Collect test run data	On cooling/heating pressure, temperature, and current (Perform for each indoor unit.)

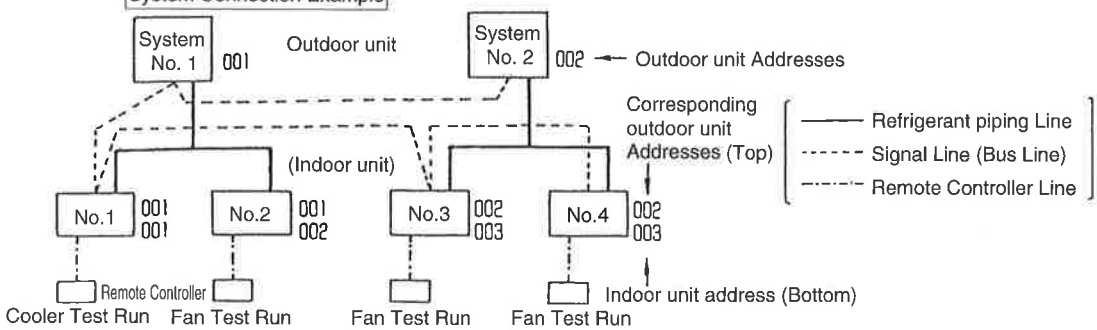
4 Delivery

⑲ Operating instructions

Check Procedures (See system diagram below)

*Switch on indoor unit No.1 for cooling test run, and switch on indoor unit No.2 for fan test run. If Unit No.1 piping temperature drops, Unit No.2 piping temperature will drop. (Check that this is System No. 1)

System Connection Example

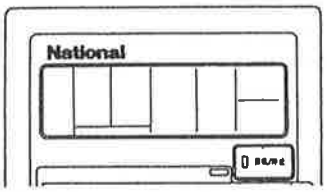


■Test Run With Remote Controller Sold Separately

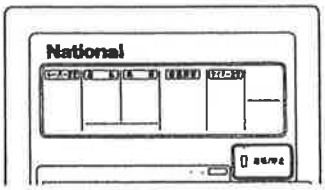
When Power supply

Remote control display changes as follows.

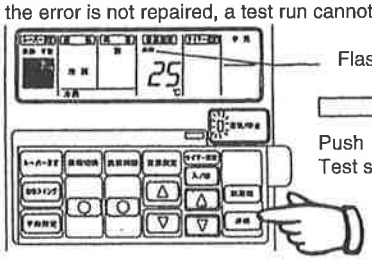
(Power OFF)

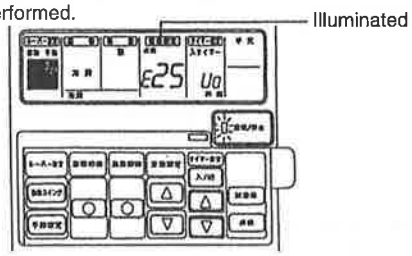


(Power ON)

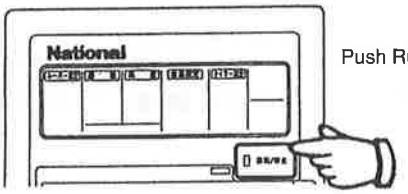


(Note) The indoor remote controller check display may flash.
This indicates that an error has occurred. (See pages 116-117 for details)
If the error is not repaired, a test run cannot be performed.

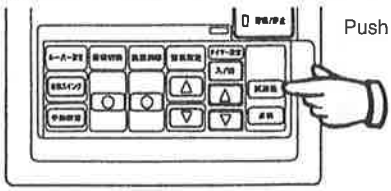




1 Push Run switch

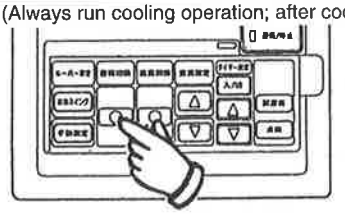


2 Within 1 minute, push Test Run switch.



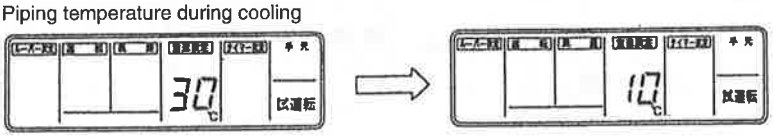
3 Push operation mode Change switch to set cooling operation.

(Always run cooling operation; after cooling test run data is collected, run heating operation.)



Refrigerant piping temperature data is displayed on the remote controller temperature display.
After several minutes, the temperature on the temperature display unit will drop.
If the temperature drops from 6-14°C, operation is normal.

Piping temperature during cooling



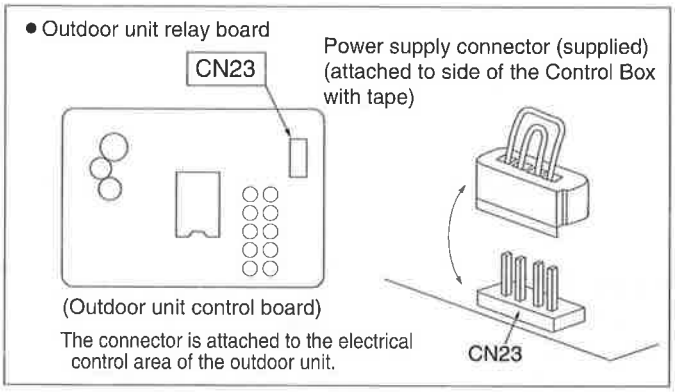
(Note) If display temperature does not drop: piping system and wiring system may be crossed, or outdoor unit addresses may be wrong.
Stop operation immediately and check.
If operation is continued in this status, the remote controller flashes and an "E27" error results.
The outdoor unit compressor will also overheat, the bimetal thermistor will operate (OFF at 130°C), and compressor operation will stop.
*Piping temperature is displayed at 1°C gradations from -30°C to 75°C.

4 To stop test run, push Test Run switch again.

(Test run is cancelled automatically after 30 minutes.)

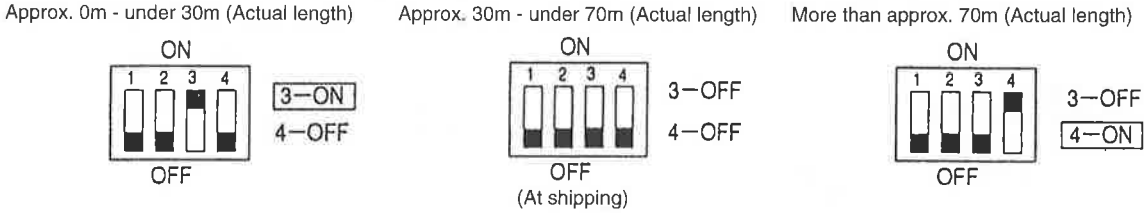
■Test Run From outdoor unit

Use of short-circuit connector for power supply (CN23)
For proper operation, after work on wiring is complete, connect the included power supply connector to CN23 on the printed circuit board as shown below. However, when all indoor unit and outdoor unit is wired to the bus line as Urban-Net, connect to CN23 only at No. 1 unit of outdoor unit.
The printed circuit board may be broken by connection at multiple locations.



●Piping Length Setting (DSW 1)

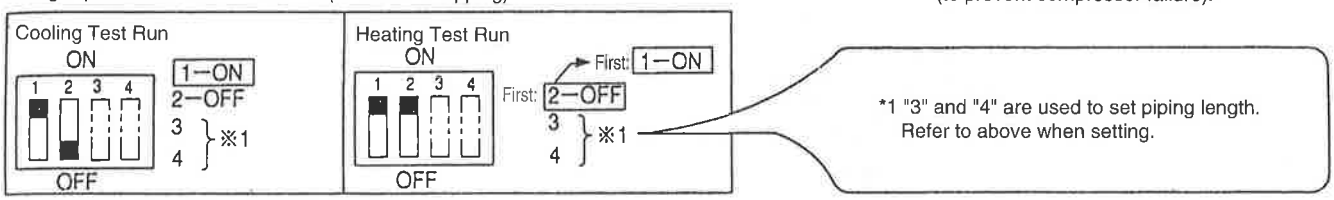
Set dip switch DSW1 of outdoor unit.
Setting is performed with "3" and "4".

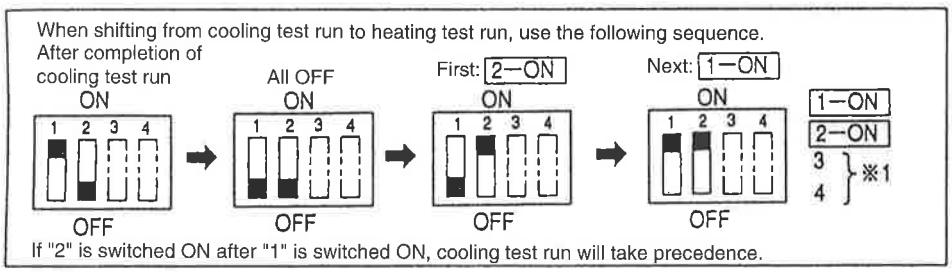


●Settings Control circuit board During Test Run (DSW1)

Set dip switch DSW1 of outdoor unit.
Setting is performed with "1" and "2". (All OFF at shipping)

(Note) When performing test run, always operate cooling first for at least 5 minutes (to prevent compressor failure).





(Note) After completion of test run, always turn DSW1 "1" and "2" OFF.
(When not turned OFF, operation can continue and cause malfunction.)

- Test run ends when "1" and "2" of outdoor unit dip switch DSW1 are switched OFF or when stopped by indoor unit remote controller.
- After start, several minutes' protection is sometimes carried out for heating operation when outside temperature is high and for cooling operation when outside temperature is low.
(When operated by outdoor unit, test run is performed for all indoor unit.
When operated from indoor unit (by remote controller), test run is performed only for indoor unit operated.)

■When Test Run is Unsuccessful

•Consult the following suggestions

1 Check all remote controller diagnostic failure display.

Check all indoor unit remote controllers of the system identical to failing unit. Check for diagnostic failure display (E codes). Check the status of LEDs on each board (indoor/outdoor) of failing unit, also.

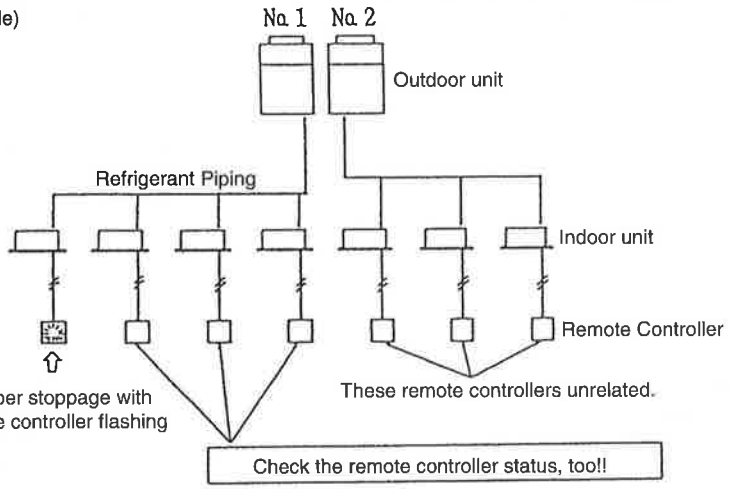
⇩

Once these items are checked thoroughly, use the self-diagnostic function table for trouble shooting.

If multiple failures occur simultaneously, repair each system separately.

2 Consider outdoor unit systems independently.

(Example)



3 After power is switched (OFF), perform basic check.

After power is switched (OFF) for both indoor and outdoor unit, make the following basic checks, power on again, and check run status.
(1)Are connectors loose or detached?
(2)Are wires broken, or have connections to terminal blocks been forgotten?
(3)Are screws loose, or is there separation at terminals?
(4)Have dip switches and addresses been set properly?

4 Use remote controller sold separately and perform independent runs to draw problems.

Reference Package air-conditioner test operation check sheet

For System Multi UM4

Customer	Name		Signature	Tel:
	Address			

Supplier	Name	Tel:
	Address	
Equipment installer (representative office)		Tel:
Construction company		Tel:
Sales office		Tel:

Test operator	Date		Company name			Name		
System name				Outdoor unit		A unit		
					Serial No.			
System No.	No1 (No9)	No2 (No10)	No3 (No11)	No4 (No12)	No5 (No13)	No6 (No14)	No7 (No15)	No8 (No16)
Indoor unit Model								
Indoor unit Serial No.								

<Important check points>

You must observe the following points:

- Switch the power on at least six hours before starting the test operation (to run current through the compressor's protection heater (crank case heater) and prevent damage to the valves due to liquid compression when started).
- You must run the unit in cooling mode first, even if the test operation is for heating mode.
- Power supply installation (URBAN NET).

Checks before operation

	Tick as appropriate	
• Are the current leakage breaker capacity, wiring thickness, wiring length, and tightening torque of the screws as stipulated?	☐ Done	☐ Not done
• Is the electrical resistance at least 1 MΩ?	☐ Done	☐ Not done
• Has the earthing construction been performed to grade three standard?	☐ Done	☐ Not done
• Has the drain piping slopling down been done, and the piping connection and thermal in sulation of the drain piping in the indoor side been done securely such that water leaks will not occur?	☐ Done	☐ Not done
• Has the refrigerant piping thermal insulation work for the gas and liquid piping been done separately so that there will be no water leakage?	☐ Done	☐ Not done
• Is the air-conditioner unit firmly secured to the decorative panel so that water leaks due to leaking cold air will not occur?	☐ Done	☐ Not done
• Are the indoor units and outdoor units installed securely, and firmly bolted down?	☐ Done	☐ Not done
• Have the refrigerant piping connections been done in such a way that there are no gas leaks?	☐ Done	☐ Not done
◎Have the PCBs for each unit been setup correctly?	☐ Done	☐ Not done

If there are any additional items, please write them below.

Operation checks ☐ Cooling operation ☐ Heating operation

Obey the following points

- Test operation characteristics should be measured, recorded, and the recorded measurement data stored.
- The items to be measured are listed on the following page, or on the separate sheets.

	Tick as appropriate	
Judgement	☐ Good	☐ Poor
• Power supply voltage, operating voltage, and operating current measurements.	☐ Good	☐ Poor
• Temperature measurements for each part.	☐ Good	☐ Poor
• Pressure measurements for each part.	☐ Good	☐ Poor
• Air flow and flow rate measurements (mainly for the duct-type units).	☐ Good	☐ Poor
• Vibration check	☐ Good	☐ Poor
• Noise check	☐ Good	☐ Poor

Customer comments at time of delivery

Service history record

※When more than 17 indoor units are installed, use two of these check sheets (make a photocopy).

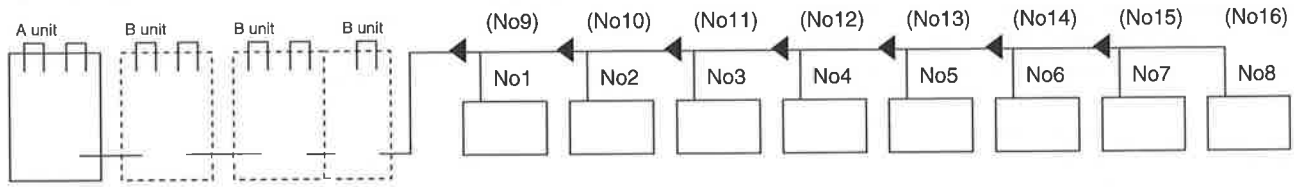
Reference Package air-conditioner test operation check sheet

For System Multi UM4

Test operator	Date	Company name		Name	

• System diagram

System name [ ]



Outdoor unit	Outdoor unit address No.	Outdoor unit address	Outdoor unit address	Outdoor unit B address		Outdoor temperature	(DB: °C) (WB: °C)			
	Unit A setting Unit B setting Unit B setting Unit B setting	Setting for No. of B units connected ☐ DSW-2S (1 to 3)				Height difference	m [Outdoor units high low]			
						Piping length	m [Additional charge amount g]			
						Power supply voltage				
	Pipe length setting	DSW-2S No. 5 (ON, OFF) No. 6 (ON ,OFF)								
Cooling test operation	High-pressure pressure value	MPa(kgf/cm²)G				Heeting test operation: High-pressure pressure value	MPa(kgf/cm²)G			
	Low-pressure pressure value	MPa(kgf/cm²)G				Low-pressure pressure value	MPa(kgf/cm²)G			
	Discharge pipe temperature	Unit A °C	°C	°C	°C	Discharge pipe temperature	Unit A °C	°C	°C	°C
	Suction pipe temperature	Unit A °C	°C	°C	°C	Suction pipe temperature	Unit A °C	°C	°C	°C
	Operating current					Operating current				
	Judgement on cooling operation test	Good Poor				Judgement on heating operation test	Good Poor			

Indoor unit	Room or System No.	No1 (9)	No2 (10)	No3 (11)	No4 (12)	No5 (13)	No6 (14)	No7 (15)	No8 (16)
	Indoor unit address No.								
	Corresponding outdoor unit address No.								
Remote control	Remote controller yes/no	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No
	Group control yes/no	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No
	One remote controller group control Master/slave setting	Master/Slave	Master/Slave	Master/Slave	Master/Slave	Master/Slave	Master/Slave	Master/Slave	Master/Slave
	DIP switch On	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4
	Relay board CN8 yes/no	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No
Cooling/heating	Piping temperature	°C	°C	°C	°C	°C	°C	°C	°C
	Suction air temperature	°C	°C	°C	°C	°C	°C	°C	°C
	Discharge air temperature	°C	°C	°C	°C	°C	°C	°C	°C
	Air flow vol./rate (duct type)	m³/min	m³/min	m³/min	m³/min	m³/min	m³/min	m³/min	m³/min
	Suction/discharge temperature difference	deg	deg	deg	deg	deg	deg	deg	deg
	Performance decision	Good/Poor	Good/Poor	Good/Poor	Good/Poor	Good/Poor	Good/Poor	Good/Poor	Good/Poor
Indoor unit/outdoor unit common		• Abnormal vibration yes/no • Abnormal noise yes/no				Judgement for total system	Good : Poor		
Remarks									

※If the system is comprised of nine or more units, use a second copy of this sheet.

■Maintenance of air-conditioning equipment

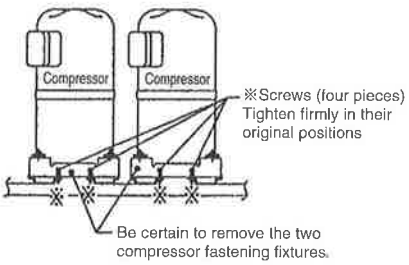
The design, construction, and selection of materials for parts of this product that handle high-pressure gas have been done in accordance with the laws relating to high-pressure equipment, and pressure testing

Model Type		CU-224MA51, MB51	CU-280MA51, MB51
Ton of refrigeration 50Hz		3.32	4.18
Refrigerant		R-22	
Refrigerant charge amount kg		14.0	15.0
Design pressure (high-pressure section) kg/cm² (MPa)		28 (2.7)	
(low-pressure section) kg/cm² (MPa)		13 (1.3)	
Pressure cut off device setting pressure kg/cm² (MPa)		28 (2.7)	
Compressor	No. of units	2	
	Design pressure kg/cm² (MPa)	13 (1.3)	
Condenser	No. of units	1	
	Design pressure kg/cm² (MPa)	28 (2.7)	
Liquid receiver	No. of units	1	
	Design pressure kg/cm² (MPa)	28 (2.7)	
	Fusible plug radius mm	ϕ2.4	
	Plug melting temperature °C	75	
Other vessels (accumulator)	No. of units	1	
	Design pressure kg/cm² (MPa)	13 (1.3)	
Manufacturer		Matsushita Refrigeration Company	

For all refrigerant piping work done with locally procured piping, perform an air-tightness test at above the design pressure (28 kg/cm² (2.7 MPa)).

■Checks to be conducted after installation work is complete

- When installation work is complete, perform an operation test check, and measure, record and store the operating characteristics of the system.
- Items to check before performing test operation
  - Are the current leakage breaker capacity, wiring thickness, wiring length, and tightening torque of the screws as stipulated?
  - Is the electrical resistance at least 1 MΩ?
  - Has the earthing construction been performed?
  - Are the drain piping connections, and thermal insulation of the indoor unit piping such that water leaks will not occur?
  - Has the refrigerant piping thermal insulation work for the gas piping, liquid piping, and equalizing hydraulic piping been done separately so that there will be no water leakage?
  - Is the air-conditioner unit firmly secured to the decorative panel so that water leaks due to leaking cold air will not occur?
  - Are the indoor units and outdoor units installed securely, and firmly bolted down?
  - Have the refrigerant piping connections been done in such a way that there are no gas leaks?
  - Have all fastening fixtures been removed from the compressors, and the screws firmly fastened in their original positions?
- Perform the test run check as per the test run check sheet.
- The following items must be measured and checked: room temperature, atmospheric temperature, suction inlet temperature, discharge temperature, air flow rate, air flow amount, voltage, current, presence of abnormal vibration and noise, operating pressure, piping temperatures, and air tightness pressure.
- With regard to construction and external appearance, check the following items.
  - ☐ Is the discharged air short circuiting?
  - ☐ Is the drain water flowing smoothly?
  - ☐ Is the thermal insulation installed securely (refrigerant, gas, and equalizing hydraulic piping)?
  - ☐ Are all connection screws tightly secured (refer to the tightening torque specifications)?
  - ☐ Refrigerant is not leaking?
  - ☐ Have you checked the switch operations of the outdoor unit PCB?
  - ☐ Has all wiring been done correctly?
  - ☐ Has power supply connector CN23-S (outdoor unit A only) been connected to bus line transmission line 1 only? (make sure that there are not two or more connected)



- The attached test run check sheet is the original. If there are more than nine indoor units connected, make a copy of it.

■Delivery acceptance by end users

- When making delivery to end users, explain that results of the test run sheet, and show that there were no problems. Be certain to have the end user and installation personnel fill in their names in the space provided and hand the instruction manual for the indoor unit to the end user. We recommend that you make a contract with the end user with regard to maintenance of the following items.

User check points:
- Filter and grill cleaning
- External cleaning

Checks to be done by professionals
- Equipment operating condition
- Cleaning of drain piping
- Cleaning of heat exchangers
- Rust prevention treatment

2. THE SELF-DIAGNOSIS FUNCTION

- When a fault occurs, one of the protective devices will operate to bring the unit safety to a stop, and an error message will be displayed on the indoor unit remote controller, CZ-ESM (centralized control board), or CZ-ESS (central controller).
- Do not attempt to restart the unit until you have investigated the cause of the problem and rectified it.

Error codes

Self-diagnosis function

You can determine the fault by looking at the self-diagnosis LEDs on the outdoor unit A PCB, indoor unit PCB, or the remote controller display.
Refer to the table below to fix the problem before attempting to restart. (⁜ indicates flashing)

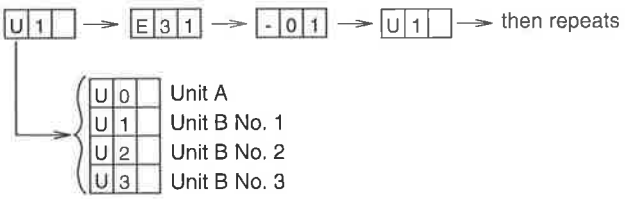
Remote controller display	LEDs on the indoor unit 1	2	3	4	Outdoor unit A PCB2 ※2 LED2	Fault	Check location
E15		⁜				Drain pipe, float switch (FS)	Drain pump, float switch, or drain pipe
E16	⁜			⁜		Louver switch (LS)	Louver motor or connection terminal
E17	⁜	⁜	⁜			Option fault	Humidifier or electrical dust collector
E20			⁜			Room temp. thermistor	Indoor unit connector CN13 or lead wire
E21				⁜		Indoor piping temp. thermistor 1	Indoor unit connector CN7-A or lead wire
E22				⁜		Indoor piping temp. thermistor 2	Indoor unit connector CN7-B or lead wire
※1 E25	⁜	⁜		⁜		Indoor unit address duplicated	Check the DIP switch address settings for indoor units
E26	⁜	⁜	⁜	⁜		Remote control transmission error	Check the remote control transmission waveform
	⁜	⁜				Remote control code error (broken wire)	Check the remote control code and connection terminal
※1 E27		⁜	⁜	⁜	E27-02	Indoor unit/outdoor unit transmission error	Check the indoor unit/outdoor unit transmission waveform
					E45-01	Outdoor unit address duplicated	Check the {RSW1.2(-S)} DIP switch address settings for outdoor unit
			⁜	⁜	U⁜ E45-01	Outdoor unit B address duplicated	Check the DSW2 DIP switch address settings for outdoor unit
					E30-01	System error	Indoor unit/outdoor unit wiring and wiring connections
					E27-01	Indoor unit/outdoor unit connection code error (broken wire)	Indoor unit/outdoor unit wiring and wiring connections
※1 E30	⁜				E30-01	System error	Total capacity for the number of indoor units is insufficient, too many indoor units are connected, or the HP DIP switch settings in the outdoor unit DSW1 are wrong.
					E30-05	Setting error in outdoor unit B for number of connected units, or outdoor unit address setting error	Check the DIP switch settings for outdoor unit A DSW2-S, or outdoor unit DIP switch {RSW1.2(-S)}
E31	⁜				U⁜ E31-01	Suction pressure protection	Suction pressure fault
					U⁜ E31-02	Discharge pressure protection	Discharge pressure fault
E33	⁜				U⁜ E33-02	Discharge temp. too high (compressor 1)	Compressor 1 discharge temperature fault
					U⁜ E33-12	Discharge temp. too high (compressor 2)	Compressor 2 discharge temperature fault
					U⁜ E33-01	Over current protection (compressor 1)	Compressor 1 fault (check for missing phase or lock)
					U⁜ E33-11	Over current protection (compressor 2)	Compressor 2 fault (check for missing phase or lock)
E35	⁜				U⁜ E35-01	Four-way valve (20SV01)	Four-way valve fault, outdoor unit connector CN11 faulty connection or broken wire
E40	⁜		⁜		U⁜ E40-01	Thermistor Th01 (outdoor temp.)	Outdoor unit connector CN10 faulty connection or broken wire
					U⁜ E40-61	Thermistor Th02 (outdoor heat exchanger 1 inlet temp.)	Outdoor unit connector CN9 faulty connection or broken wire
					U⁜ E40-21	Thermistor Th03 (outdoor heat exchanger 1 outlet temp.)	Outdoor unit connector CN16 faulty connection or broken wire
					U⁜ E40-41	Thermistor Th04 (compressor 1 discharge temp.)	Outdoor unit connector CN8 faulty connection or broken wire
					U⁜ E40-42	Thermistor Th05 (compressor 2 discharge temp.)	Outdoor unit connector CN17 faulty connection or broken wire
E41	⁜		⁜		U⁜ E41-01	Pressure sensor (SEN1) high-pressure side	Outdoor unit connector CN21 faulty connection or broken wire
					U⁜ E41-11	Pressure sensor (SEN2) low-pressure side	Outdoor unit connector CN14 faulty connection or broken wire
E42	⁜		⁜		U⁜ E42-01	Current detector (CT.B1)	Outdoor unit connector CT1 faulty connection or broken wire
					U⁜ E42-02	Current detector (CT.B2)	Outdoor unit connector CT2 faulty connection or broken wire
E46	⁜		⁜		E46-01	Code error between outdoor units (broken wire)	Outdoor unit wiring and connection terminals

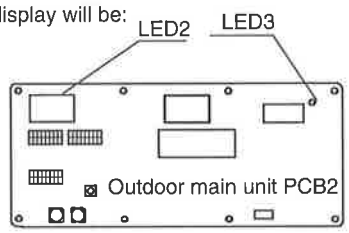
Caution:

※1 For E25, E27, and E30, in addition to those given above, check the DIP switch address settings for the indoor units and outdoor units.

※2 The LED2 error display codes are displayed as three characters in sequence.

Example: in the case of U1 E31-01 (Unit B number 1 suction pressure protection) the display will be:





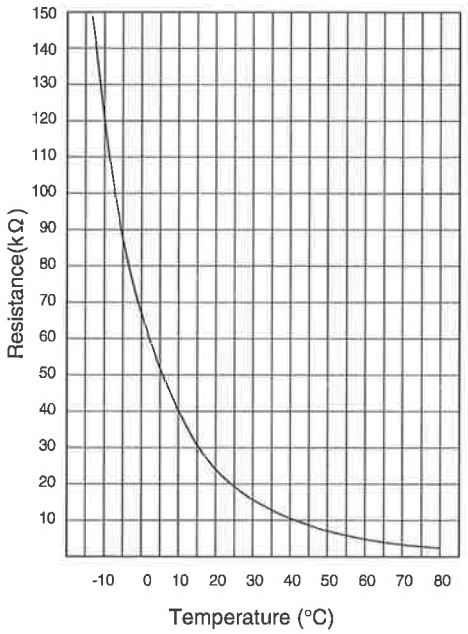
Flashing LED3 (yellow, indoor/outdoor communication) indicates that the microprocessor is operating correctly.

☼ flashing ○ Light on

Remote control ESM, ESS display	Indoor unit LED display				Outdoor unit LED display								Fault	Check location and countermeasure
	1	2	3	4	1	2	3	4	5	6	10	11		
E50 ※1													Gateway fault	Check the number of units connected to the gateway
E65 ※1													Central controller address duplication	Check the central controller DIP switch settings
													Centralized control board address duplication	Central control board DIP switch settings
E66 ※1													Transmission error between central controller and indoor unit	Check for broken wires in the indoor unit and check the waveform
													Transmission error between centralized control board and indoor unit	Check for broken wires in the indoor unit and check for loss of power

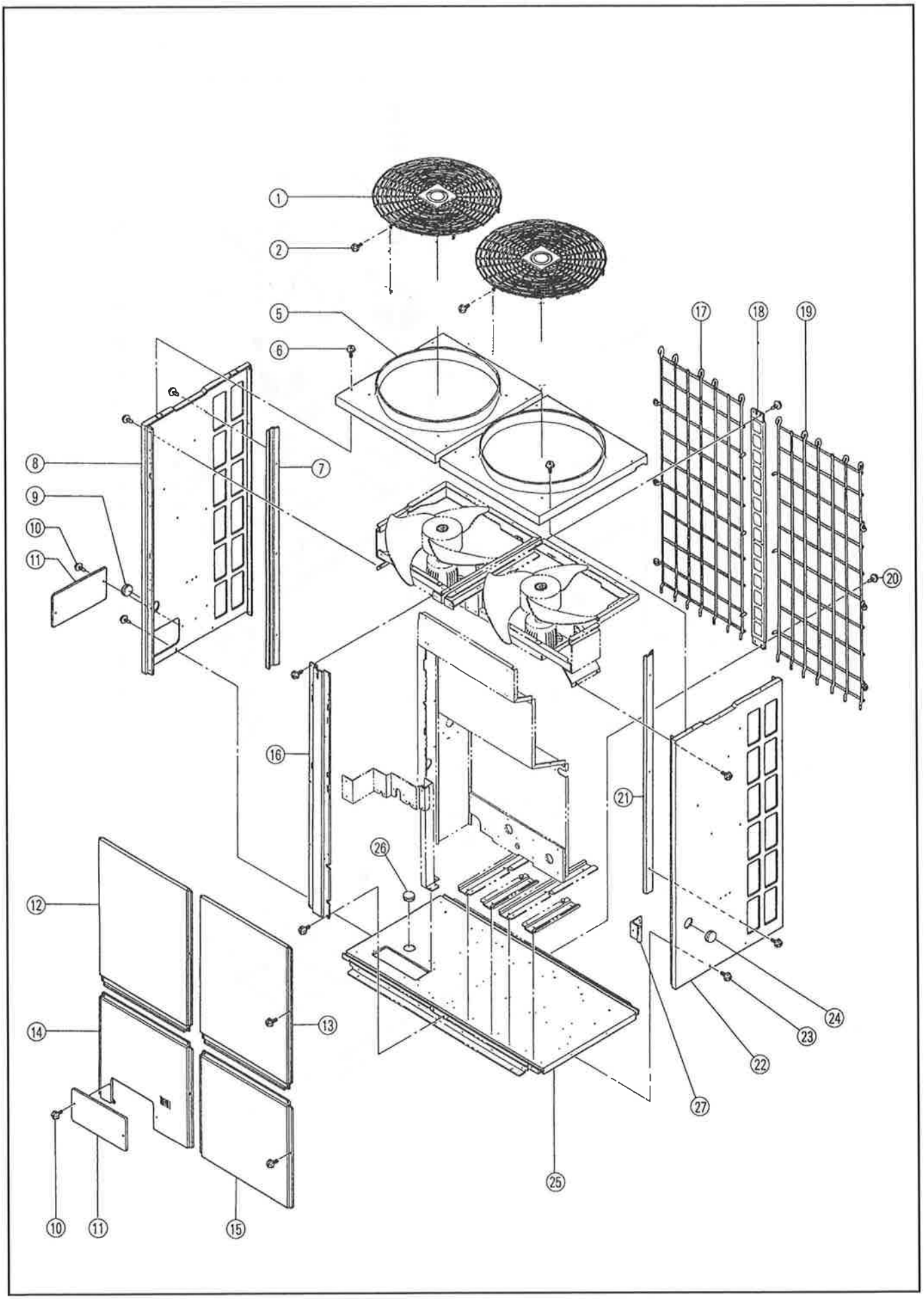
※1. Error codes E50, E65, and E66 are displayed on the CZ-ESM (centralized control board) and CZ-ESS (central controller), and not the remote controller.

Indoor heat exchanger thermistor characteristics

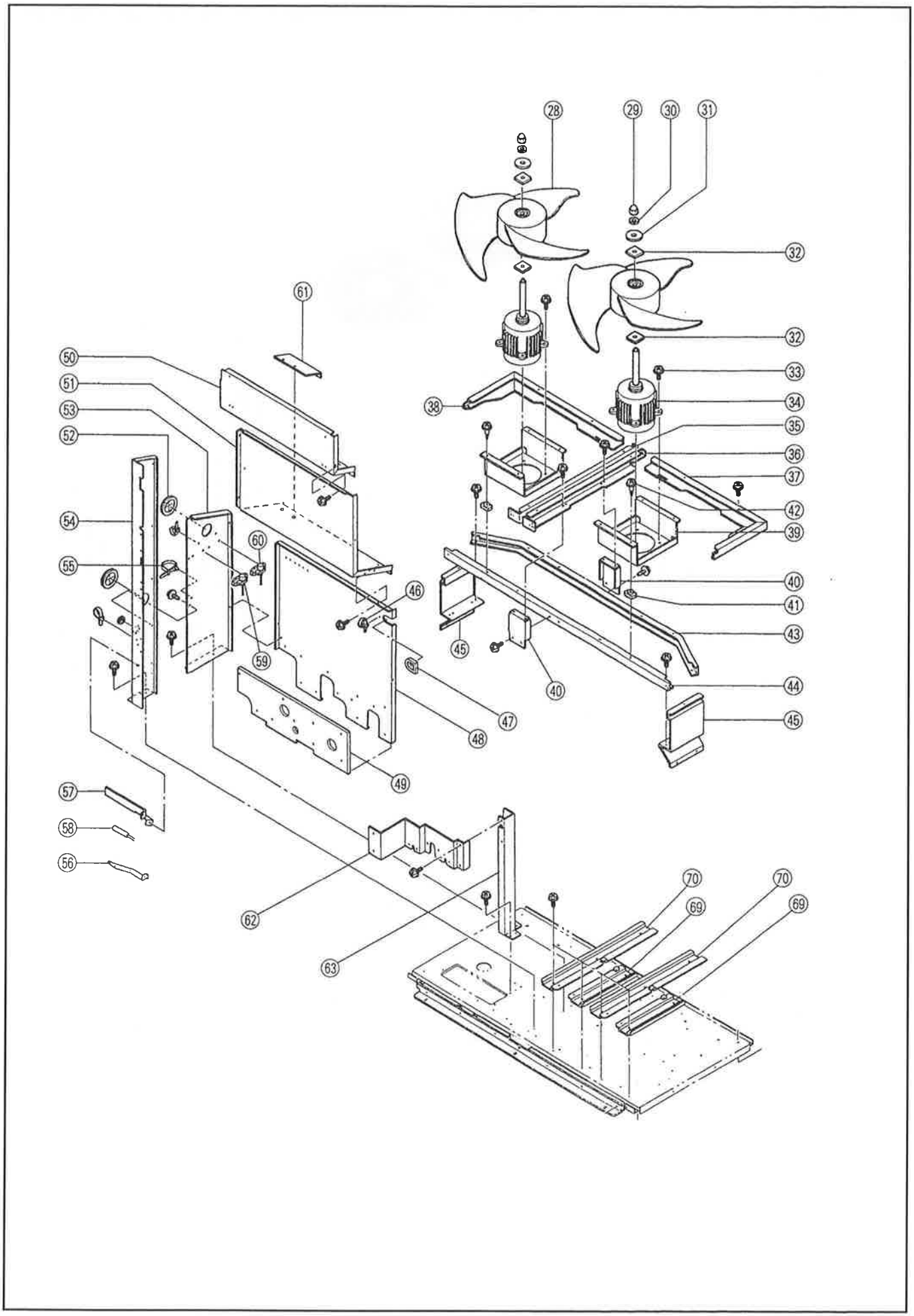


11 REPLACEMENT PARTS 〈Outdoor unit〉

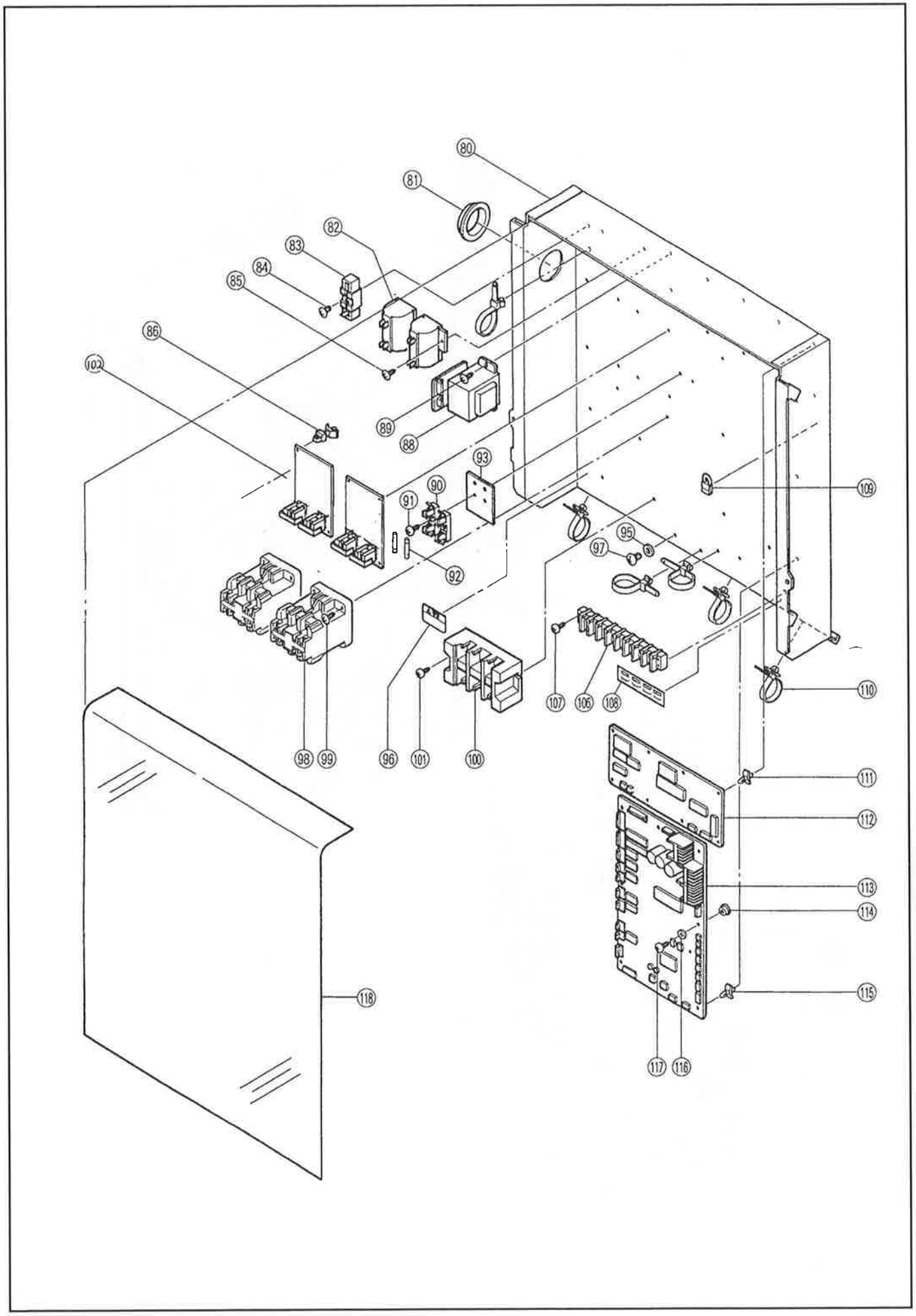
■CU-224MA51SB,224MA51TE,224MB51SB,224MB51TE,280MA51SB,280MA51TE,280MB51SB,280MB51TE



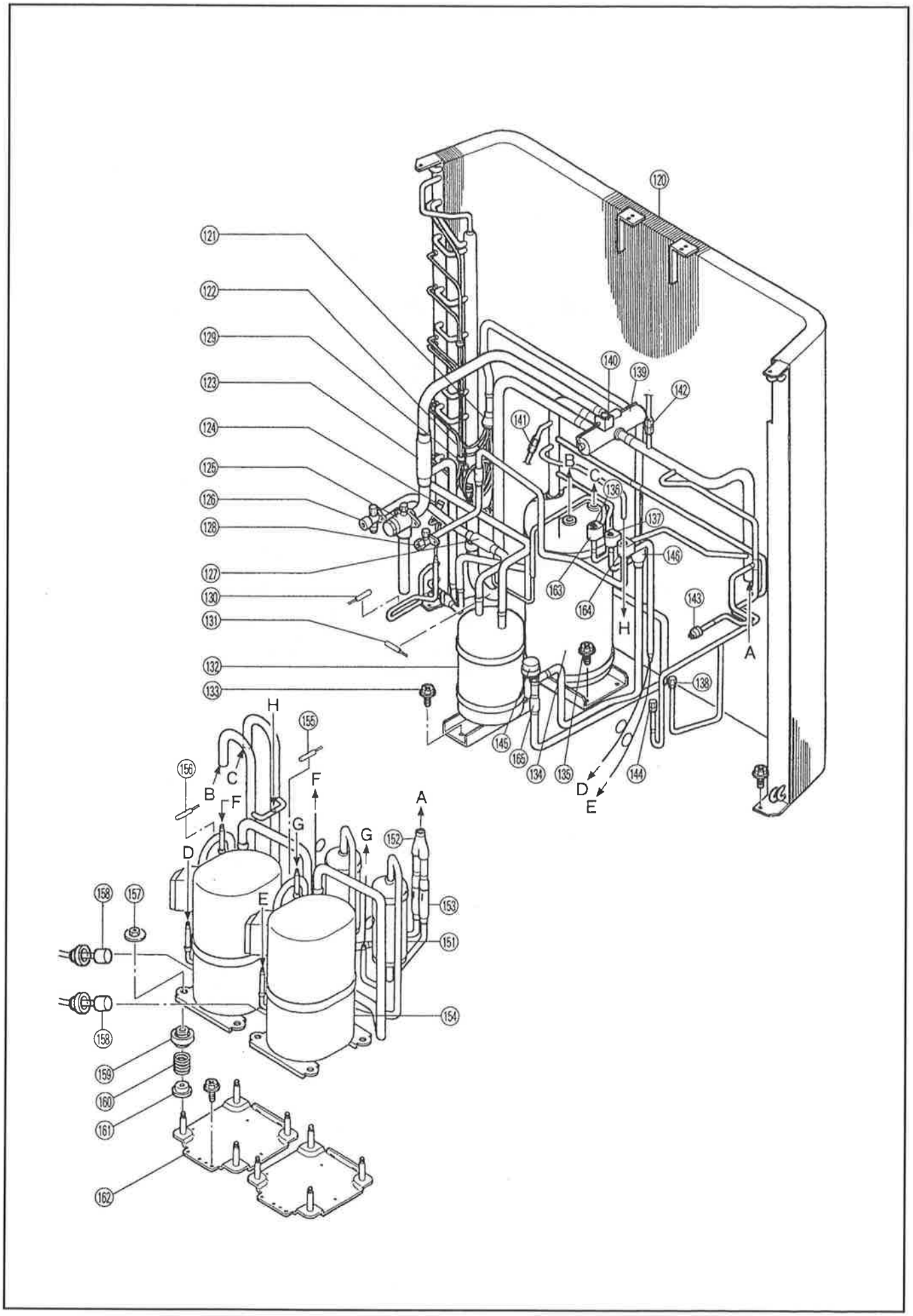
■CU-224MA51SB,224MA51TE,224MB51SB,224MB51TE,280MA51SB,280MA51TE,280MB51SB,280MB51TE



■CU-224MA51SB,224MA51TE,224MB51SB,224MB51TE,280MA51SB,280MA51TE,280MB51SB,280MB51TE



■CU-224MA51SB,224MA51TE,224MB51SB,224MB51TE,280MA51SB,280MA51TE,280MB51SB,280MB51TE



CU-224MA51SB,224MA51TE,224MB51SB,224MB51TE,280MA51SB,280MA51TE,280MB51SB, 280MB51TE

REF.NO.	PARTS NAME	PARTS NUMBER CNR	QUANTITY PER 1 UNIT								※REC PARTS
			224MA51SB	224MA51TE	224MB51SB	224MB51TE	280MA51SB	280MA51TE	280MB51SB	280MB51TE	
1	Fan guard As	02-880080	2	2	2	2	2	2	2	2	
2	Hexagonal screw 5TS12 with Flange	38-194120	12	12	12	12	12	12	12	12	
5	Panel top As	02-880090	2	2	2	2	2	2	2	2	
6	Hexagonal screw 5TS12 with Flange	38-194120	12	12	12	12	12	12	12	12	
7	Seal plate coil L	02-842670	1	1	1	1	1	1	1	1	
8	Panel side L As	E2-100080	1	1	1	1	1	1	1	1	
9	Rubber bush 60	08-405730	1	1	1	1	1	1	1	1	
10	Hexagonal screw 5TS12 with Flange	38-194120	15	15	15	15	15	15	15	15	
11	Panel seal cover	02-859980	1	1	1	1	1	1	1	1	
12	Panel front top As	42-573640	1	1	1	1	1	1	1	1	
13	Panel front top	02-863920	1	1	1	1	1	1	1	1	
14	Panel front bottom A	02-880520	1	1	1	1	1	1	1	1	
15	Panel front bottom B As	02-864530	1	1	1	1	1	1	1	1	
16	Panel center front As	E2-100210	1	1	1	1	1	1	1	1	
17	Condenser guard R	02-843110	1	1	1	1	1	1	1	1	
18	Panel back center	02-842900	1	1	1	1	1	1	1	1	
19	Condenser guard L	02-844200	1	1	1	1	1	1	1	1	
20	Hexagonal screw 5TS12 with Flange	38-194120	6	6	6	6	6	6	6	6	
21	Seal plate coil R	02-844440	1	1	1	1	1	1	1	1	
22	Panel side R As	E2-100060	1	1	1	1	1	1	1	1	
23	Hexagonal screw 5TS12 with Flange	38-194120	15	15	15	15	15	15	15	15	
24	Rubber bush 60	08-405730	1	1	1	1	1	1	1	1	
25	Unit base As	42-573830	1	1	1	1	1	1	1	1	
26	Rubber bush 60	08-405730	1	1	1	1	1	1	1	1	
27	Check joint holder	02-874430	1	1	1	1	1	1	1	1	
28	Propeller fan 550	05-857360	2	2	2	2	2	2	2	2	
29	Hexagonal nut 10	08-405980	2	2	2	2	2	2	2	2	
30	10 spring washer	38-491150	2	2	2	2	2	2	2	2	
31	10 washer	38-491220	2	2	2	2	2	2	2	2	
32	Washer for fan	05-857790	4	4	4	4	4	4	4	4	
33	Hexagonal screw 6TS25	38-194990	8	8	8	8	8	8	8	8	
34	Fan motor	06-854170	2	2	2	2	2	2	2	2	※
35	Panel top stay L As	42-553390	1	1	1	1	1	1	1	1	
36	Panel top stay R As	42-553400	1	1	1	1	1	1	1	1	
37	Coil top seal stay R	02-842690	1	1	1	1	1	1	1	1	
38	Coil top seal stay L	02-842680	1	1	1	1	1	1	1	1	
39	Motor base As	45-591040	2	2	2	2	2	2	2	2	
40	Motor stay support	02-842930	2	2	2	2	2	2	2	2	
41	Mount fan motor	06-849930	8	8	8	8	8	8	8	8	
42	Hexagonal screw 6TS30 with Flange	08-406010	8	8	8	8	8	8	8	8	
43	Motor stay angle R	02-873760	1	1	1	1	1	1	1	1	
44	Motor stay angle F	02-873750	1	1	1	1	1	1	1	1	
45	Motor stayt holder	02-880310	2	2	2	2	2	2	2	2	
46	Code cramp	06-460100	3	3	3	3	3	3	3	3	
47	Rubber bush B	06-420840	1	1	1	1	1	1	1	1	
48	Seal panel bottom	02-873700	1	1	1	1	1	1	1	1	
49	Cover seal plate	02-874000	1	1	1	1	1	1	1	1	
50	Seal panel top A As	42-570530	1	1	1	1	1	1	1	1	

CU-224MA51SB,224MA51TE,224MB51SB,224MB51TE,280MA51SB,280MA51TE,280MB51SB, 280MB51TE

REF.NO.	PARTS NAME	PARTS NUMBER CNR	QUANTITY PER 1 UNIT								※REC PARTS
			224MA51SB	224MA51TE	224MB51SB	224MB51TE	280MA51SB	280MA51TE	280MB51SB	280MB51TE	
51	Seal panel top As	42-570520	1	1	1	1	1	1	1	1	
52	Rubber bush 60	08-405730	1	1	1	1	1	1	1	1	
53	Seal panel side bottom	02-873710	1	1	1	1	1	1	1	1	
54	Seal panel side As	42-570510	1	1	1	1	1	1	1	1	
55	Base band	06-844220	1	1	1	1	1	1	1	1	
55	Band	06-844230	1	1	1	1	1	1	1	1	
56	Thermostat holder 140	06-820220	1	1	1	1	1	1	1	1	
57	Thermostat holder guider	06-843210	1	1	1	1	1	1	1	1	
58	Thermostat As(Outdoor temp.)	46-813490	1	1	1	1	1	1	1	1	※
59	Low pressure sensor	06-849500	1	1	1	1	1	1	1	1	※
60	High pressure sensor	06-849490	1	1	1	1	1	1	1	1	※
61	Electrical valve guider	02-873740	1	1	1	1	1	1	1	1	
62	Valve holder	45-597260	1	1	1	1	1	1	1	1	
63	Service valve stay	05-847830	1	1	1	1	1	1	1	1	
69	Stay compressor R	02-873690	2	2	2	2	2	2	2	2	
70	Stay compressor L	02-873680	2	2	2	2	2	2	2	2	
80	Control box As	46-933950	1	1	1	1	1	1	1	1	
81	Standard bushing	02-865010	1	1	1	1	1	1	1	1	
82	Running capacitor	06-844190	2	2	2	2	2	2	2	2	※
83	Serge absorber	06-498370	1	1	1	1	1	1	1	1	※
84	Truss 4 screw 8	38-714110	1	1	1	1	1	1	1	1	
85	Truss 4TS10	38-114210	2	2	2	2	2	2	2	2	
86	Locking support board	06-449951	8	8	8	8	8	8	8	8	
88	Transformer	46-933330	1	—	1	—	1	—	1	—	※
		46-933340	—	1	—	1	—	1	—	1	※
89	Truss 4TS8	38-114110	2	2	2	2	2	2	2	2	
90	Fuse holder	06-854190	1	1	1	1	1	1	1	1	
91	Pan-head 4TS12	38-152210	1	1	1	1	1	1	1	1	
92	Fuse	06-850790	1	1	1	1	1	1	1	1	※
93	Sheet fuse holder	06-854810	1	1	1	1	1	1	1	1	
95	6 washer	38-416040	1	1	1	1	1	1	1	1	
98	Compressor relay	06-845740	2	2	2	2	2	2	2	2	※
99	Truss 4TS16	38-114510	4	4	4	4	4	4	4	4	
100	Power supply terminal(3P)	06-854180	1	1	1	1	1	1	1	1	
101	Pan-head 5TS25	38-155810	2	2	2	2	2	2	2	2	
102	Current transformer As	46-837840	2	2	2	2	2	2	2	2	※
106	Control terminal(8P)	06-844260	1	1	—	—	1	1	—	—	
107	Control terminal(2P)	06-838520	—	—	1	1	—	—	1	1	

CU-224MA51SB,224MA51TE,224MB51SB,224MB51TE,280MA51SB,280MA51TE,280MB51SB, 280MB51TE

REF.NO.	PARTS NAME	PARTS NUMBER CNR	QUANTITY PER 1 UNIT								※REC PARTS
			224MA51SB	224MA51TE	224MB51SB	224MB51TE	280MA51SB	280MA51TE	280MB51SB	280MB51TE	
107	Pan-head 4TS12	38-154310	2	2	2	2	2	2	2	2	
108	Junction No.	07-963740	1	1	—	—	1	1	—	—	
108	Junction No.	07-963750	—	—	1	1	—	—	1	1	
109	Shorting connector As	46-840730	1	1	1	1	1	1	1	1	※
110	Code cramp	06-460100	6	6	6	6	6	6	6	6	
111	Rocking card spacer	06-496230	8	8	—	—	8	8	—	—	
112	Printed circuit board 2	06-849470	1	1	—	—	1	1	—	—	※
113	Printed circuit board 1	06-854650	1	1	1	1	1	1	1	1	※
114	Spacer of p.c.board	06-496240	1	1	1	1	1	1	1	1	
115	Locking card spacer	06-496230	8	8	8	8	8	8	8	8	
116	Packing	07-359260	1	1	1	1	1	1	1	1	
117	Pan-head 3TS18	38-152610	1	1	1	1	1	1	1	1	
118	Sheet box L	06-842260	1	1	1	1	1	1	1	1	
120	Coil condenser As	05-832580	1	1	1	1	—	—	—	—	
120	Coil condenser As	05-830130	—	—	—	—	1	1	1	1	
121	Distributer	05-426990	1	1	1	1	1	1	1	1	
122	Distributer joint pipe	05-832290	9	9	9	9	9	9	9	9	
123	Strainer	05-965200	1	1	1	1	1	1	1	1	
125	Service valve 1 inch	05-857600	1	1	1	1	1	1	1	1	
126	Service valve 4/8 inch	05-852560	1	1	1	1	1	1	1	1	
127	Strainer	05-485150	1	1	1	1	1	1	1	1	
128	Service valve 3/8 inch	05-852570	1	1	1	1	1	1	1	1	
129	Strainer	05-985310	1	1	1	1	1	1	1	1	
130	Thermistor As(Condenser outlet)	46-825640	1	1	1	1	1	1	1	1	※
131	Thermistor As(Condenser inlet)	46-821620	1	1	1	1	1	1	1	1	※
132	Receiver As	45-900640	1	1	1	1	1	1	1	1	
133	Hexagonal screw 5TS12 with Flange	38-194120	2	2	2	2	2	2	2	2	
134	Accumulator As	05-862310	1	1	1	1	1	1	1	1	
135	Hexagonal screw 5TS12 with Flange	38-194120	4	4	4	4	4	4	4	4	
136	Electrical magnetic valve(Oil)	05-809320	1	1	1	1	1	1	1	1	※
136	Electrical magnetic valve(Liquid)	05-809320	1	1	1	1	1	1	1	1	※
136	Electrical magnetic valve(Gas)	05-809320	1	1	1	1	1	1	1	1	※
137	Electrical magnetic valve coil(Gas)	06-854140	1	—	1	—	1	—	1	—	※
		06-854150	—	1	—	1	—	1	—	1	※
138	Check joint MC	05-822330	1	1	1	1	1	1	1	1	
139	Revercing valve	05-814570	1	1	1	1	1	1	1	1	※
140	Revercing valve coil	06-854160	1	1	1	1	1	1	1	1	※
141	Check joint R1	05-960230	1	1	1	1	1	1	1	1	
142	Check joint R	05-960240	1	1	1	1	1	1	1	1	
143	High pressure SW	06-826220	1	1	1	1	1	1	1	1	※
144	Check joint MC	05-822330	1	1	1	1	1	1	1	1	
145	Electrical expansion valve	05-851910	1	1	1	1	1	1	1	1	※
146	Strainer	05-485150	1	1	1	1	1	1	1	1	
150	Hexagonal screw 5TS12 with Flange	38-195430	4	4	4	4	4	4	4	4	
151	Oil separator As	45-900630	2	2	2	2	2	2	2	2	
152	Y joint 6/8 inch	05-967100	1	1	1	1	1	1	1	1	

CU-224MA51SB,224MA51TE,224MB51SB,224MB51TE,280MA51SB,280MA51TE,280MB51SB, 280MB51TE

REF.NO.	PARTS NAME	PARTS NUMBER CNR	QUANTITY PER 1 UNIT								※REC PARTS
			224MA51SB	224MA51TE	224MB51SB	224MB51TE	280MA51SB	280MA51TE	280MB51SB	280MB51TE	
153	Check valve 4/8 inch	05-979220	2	2	2	2	2	2	2	2	
154	Compressor As	05-866110	2	2	2	2	—	—	—	—	※
		05-866120	—	—	—	—	2	2	2	2	※
155	Thermistor As(Compressor No.2)	46-837600	1	1	1	1	1	1	1	1	※
156	Thermistor As(Compressor No.1)	46-837590	1	1	1	1	1	1	1	1	※
157	Hexagonal 8 nut with washer	08-405360	8	8	8	8	8	8	8	8	
158	Crankcase heater	06-845720	2	2	2	2	2	2	2	2	※
159	Top mount	05-858460	4	4	4	4	4	4	4	4	
160	Spring rubber	05-858480	4	4	4	4	4	4	4	4	
161	Lower mount	05-858470	4	4	4	4	4	4	4	4	
162	Compressor base As	42-570700	2	2	2	2	2	2	2	2	
163	Electrical magnetic valve coil (Liquid)	06-854100	1	—	1	—	1	—	1	—	※
		06-854110	—	1	—	1	—	1	—	1	※
164	Electric magnetic valve coil (Oil)	06-854120	1	—	1	—	1	—	1	—	※
		06-854130	—	1	—	1	—	1	—	1	※
165	Strainer	05-815820	1	1	1	1	1	1	1	1	

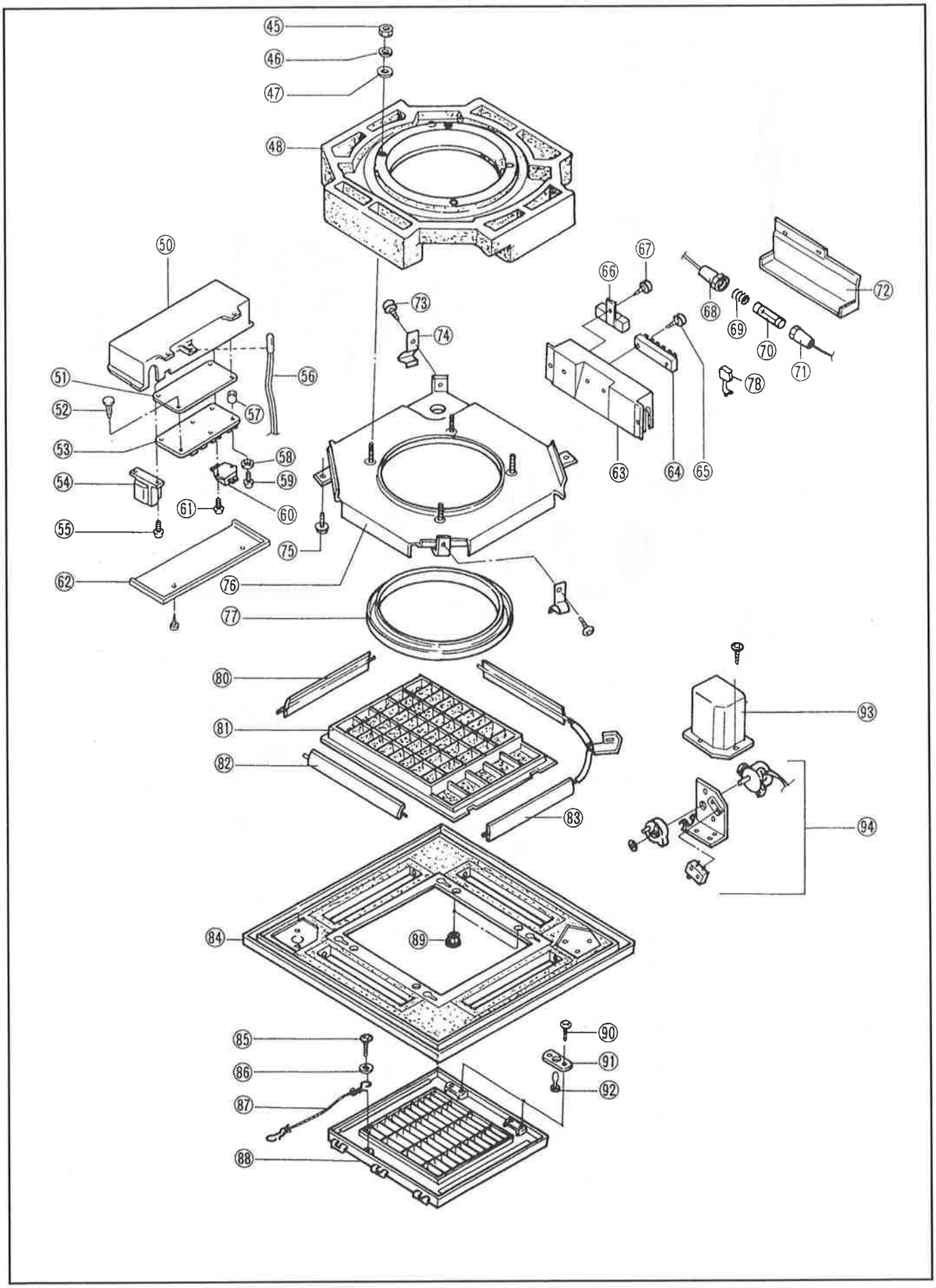
Attachment Parts

REF.NO.	PARTS NAME	PARTS NUMBER CNR	QUANTITY PER 1 UNIT								※REC PARTS
			224MA51SB	224MA51TE	224MB51SB	224MB51TE	280MA51SB	280MA51TE	280MB51SB	280MB51TE	
	Test run check sheet	07-963850	1	1	1	1	1	1	1	1	
	Installation manual	07-963810	1	1	1	1	1	1	1	1	
	Address setting manual	07-963820	1	1	1	1	1	1	1	1	

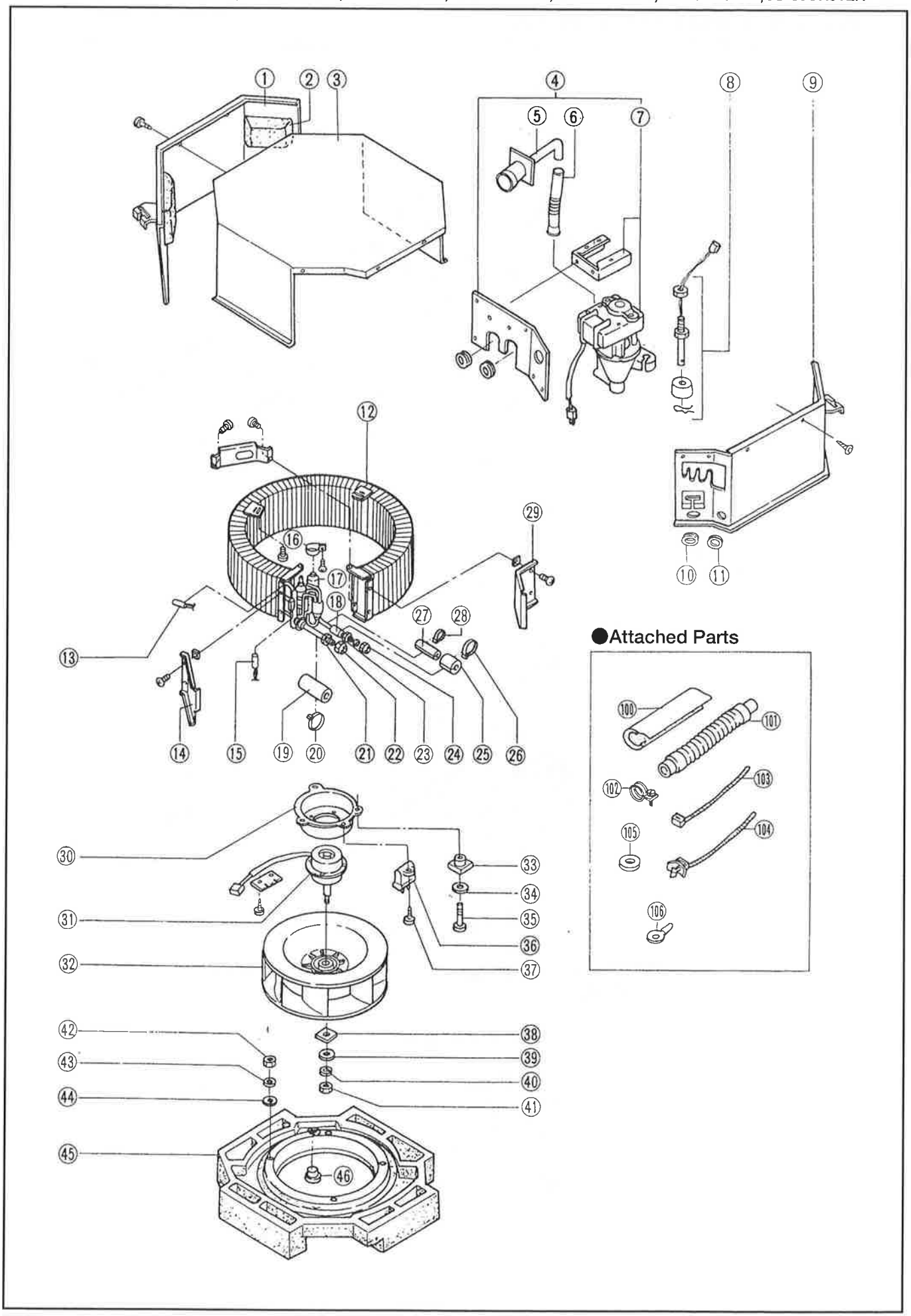
12 REPLACEMENT PARTS <INDOOR UNIT>

1.FOUR WAY CASSETTE TYPE UNIT

■CS-45UR51FB,CS-45UR51ER,CS-56UR51FB,CS-56UR51ER,CS-71UR51FB,CS-71UR51ER,CS-80UR51FB,CS-80UR51ER



■CS-45UR51FB,CS-45UR51ER,CS-56UR51FB,CS-56UR51ER,CS-71UR51FB,CS-71UR51ER,CS-80UR51FB,CS-80UR51ER



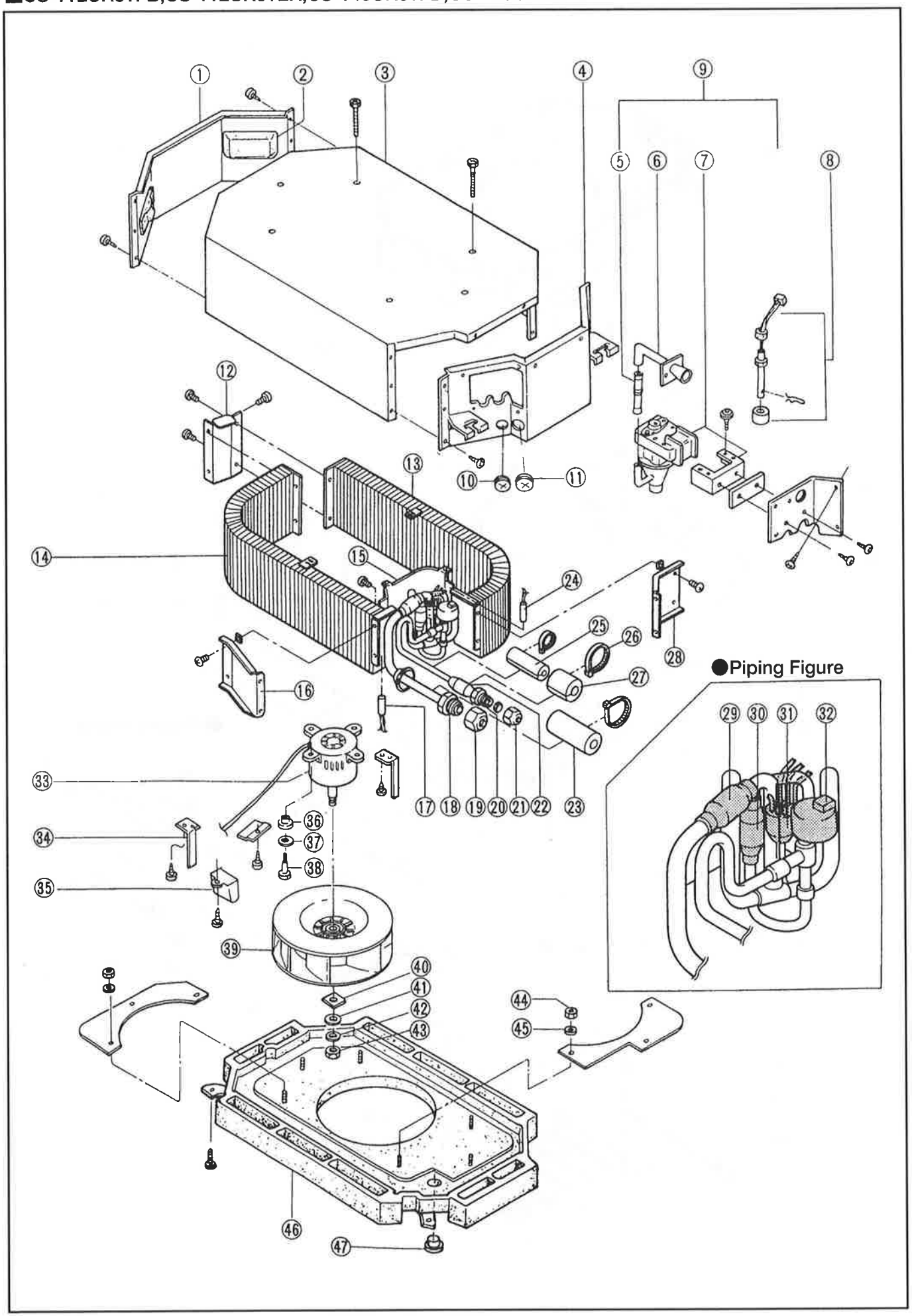
CS-45UR51FB, CS-45UR51ER, CS-56UR51FB, CS-56UR51ER, CS-71UR51FB, CS-71UR51ER, CS-80UR51FB, CS-80UR51ER

REF.NO.	PARTS NAME		PARTS NUMBER CNR	QUANTITY PER 1 UNIT				※REC PARTS
				45UR51	56UR51	71UR51	80UR51	
1	Shell side B As		42-549730	1	1	—	—	
			42-549520	—	—	1	1	
2	Duct cover		05-820290	2	2	2	2	
3	Shell As		42-549710	1	1	—	—	
			42-549500	—	—	1	1	
4	Panel drain pumb As	(FB model)	46-836130	1	1	—	—	
		(ER model)	46-935020	1	1	—	—	
		(FB model)	46-836120	—	—	1	1	
		(ER model)	46-935030	—	—	1	1	
5	Lead pipe drain		06-826060	1	1	1	1	
6	Tube drain		06-826210	1	1	—	—	
			06-826050	—	—	1	1	
7	Drain pumb	(FB model)	06-831820	1	1	1	1	※
		(ER model)	06-830680	1	1	1	1	※
8	Float switch		06-828110	1	1	1	1	※
9	Shell side F As		42-549750	1	1	—	—	
			42-549540	—	—	1	1	
10	Rubber bush 45		39-251090	1	1	1	1	
11	Rubber bush 29		39-251070	1	1	1	1	
12	Evaporater		05-833380	1	—	—	—	
			05-833390	—	1	—	—	
			05-833400	—	—	1	—	
			05-833410	—	—	—	1	
13	Heatexchanger inlet temp.sensor		46-838600	1	1	1	1	※
14	Seal plate Eva.L		05-821020	1	1	—	—	
			05-820420	—	—	1	1	
15	Heatexchanger outlet temp.sensor		46-838820	1	1	1	1	※
16	Expantion holder		05-854480	1	1	1	1	
17	Electric expantion valve		05-830860	1	—	—	—	
			05-830870	—	1	1	1	
18	Strainer		05-831880	1	1	—	—	
20	Tube banding 197		39-220050	1	1	1	1	
21	Union 4/8		05-962170	1	1	1	1	
22	Flare nut 4/8		38-890090	1	1	1	1	
23	Union 3/8		05-399710	1	1	1	1	
24	Flare nut 3/8		38-890080	1	1	1	1	
25	Inslating tube 13		05-970230	1	1	1	1	
26	Tube banding 197		39-220050	1	1	1	1	
27	Inslating tube 10		05-825950	1	1	1	1	
28	Tube banding 94		39-220010	1	1	1	1	
29	Seal plate Eva.R		05-821010	1	1	—	—	
			05-820410	—	—	1	1	
30	Motor stay		06-826900	1	1	—	—	
			06-825890	—	—	1	1	
31	Fan motor		06-832740	1	1	—	—	※
			06-830530	—	—	1	—	※
			06-854630	—	—	—	1	※
32	Turbo fan As		45-589540	1	1	—	—	
			45-589550	—	—	1	1	
33	Mount fan motor		06-817950	3	3	3	3	
34	Washer 6		38-490120	3	3	3	3	
35	Hexagonal screw 5TS27		38-193610	3	3	3	3	

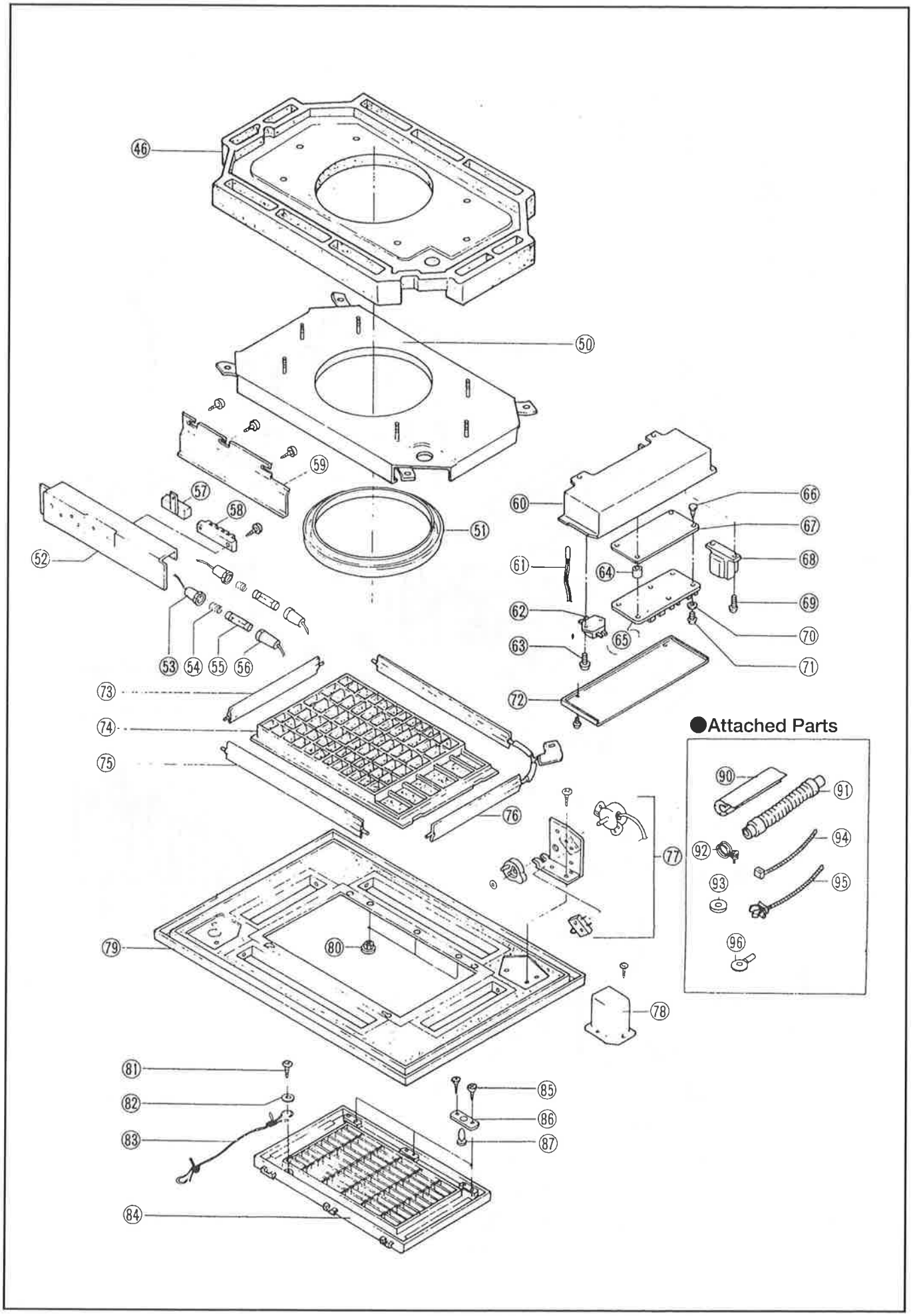
CS-45UR51FB, CS-45UR51ER, CS-56UR51FB, CS-56UR51ER, CS-71UR51FB, CS-71UR51ER, CS-80UR51FB, CS-80UR51ER

REF.NO.	PARTS NAME		PARTS NUMBER CNR	QUANTITY PER 1 UNIT				※REC PARTS
				45UR51	56UR51	71UR51	80UR51	
36	Running capacitor		06-831080	1	1	—	—	※
			06-832990	—	—	1	—	※
			06-833000	—	—	—	1	※
38	Washer for turbo fan		05-820310	1	1	1	1	
40	8 spring washer		38-427080	1	1	1	1	
41	Hexagonal nut 8		38-817010	1	1	1	1	
42	Hexagonal nut 5		38-815010	4	4	4	4	
44	Washer 5		38-490640	4	4	4	4	
45	Drain pan As		45-593520	1	1	—	—	
			45-591610	—	—	1	1	
46	Drain pan cap		05-811470	1	1	1	1	
50	Relay box		06-837990	1	1	1	1	
51	Stay relay board		06-833800	1	1	1	1	
52	Locking card spacer		06-805290	5	5	5	5	
53	Printed circuit board		06-853320	1	1	1	1	※
54	Transformer	(FB model)	06-854610	1	1	1	1	※
		(ER model)	06-854620	1	1	1	1	※
55	Screw 4TS8		38-114110	2	2	2	2	
56	Thermistor		06-834420	1	1	1	1	※
57	P.C.board collor		06-835140	1	1	1	1	
58	P.C.board bush		06-817930	1	1	1	1	
59	Screw 3TS16		38-152510	1	1	1	1	
60	Electric noise filter		06-814720	1	1	1	1	※
61	Screw 3TS10		38-152210	1	1	1	1	
62	Cover P.C.board Box		06-835860	1	1	1	1	
63	Power supply Box		06-854820	1	1	1	1	
64	Terminal board(10P)		06-838860	1	1	1	1	
65	Screw 4TS14		38-154410	2	2	2	2	
66	Serge absorber		06-498370	1	1	1	1	※
67	Screw 4S6		38-714010	2	2	2	2	
68	Fuse case top		06-850080	1	1	1	1	
69	Fuse case spring		06-850090	1	1	1	1	
70	Fuse 5A		06-850780	1	1	1	1	
71	Fuse case bottom		06-850100	1	1	1	1	
72	Cover power supply box		06-826680	1	1	1	1	
73	Screw 4TS8		38-114110	2	2	2	2	
74	Drain pan holder		02-832050	2	2	2	2	
75	Hexagonal screw with frange 5TS10		38-191540	2	2	2	2	
76	Panel drain pan As		42-554460	1	1	1	1	
77	Orifice ring		05-822150	1	1	—	—	
			05-820490	—	—	1	1	
78	Spark killer		06-838310	2	2	2	2	※

■CS-112UR51FB,CS-112UR51ER,CS-140UR51FB,CS-140UR51ER



■CS-112UR51FB,CS-112UR51ER,CS-140UR51FB,CS-140UR51ER



CS-112UR51FB, CS-112UR51ER, CS-140UR51FB, CS-140UR51ER

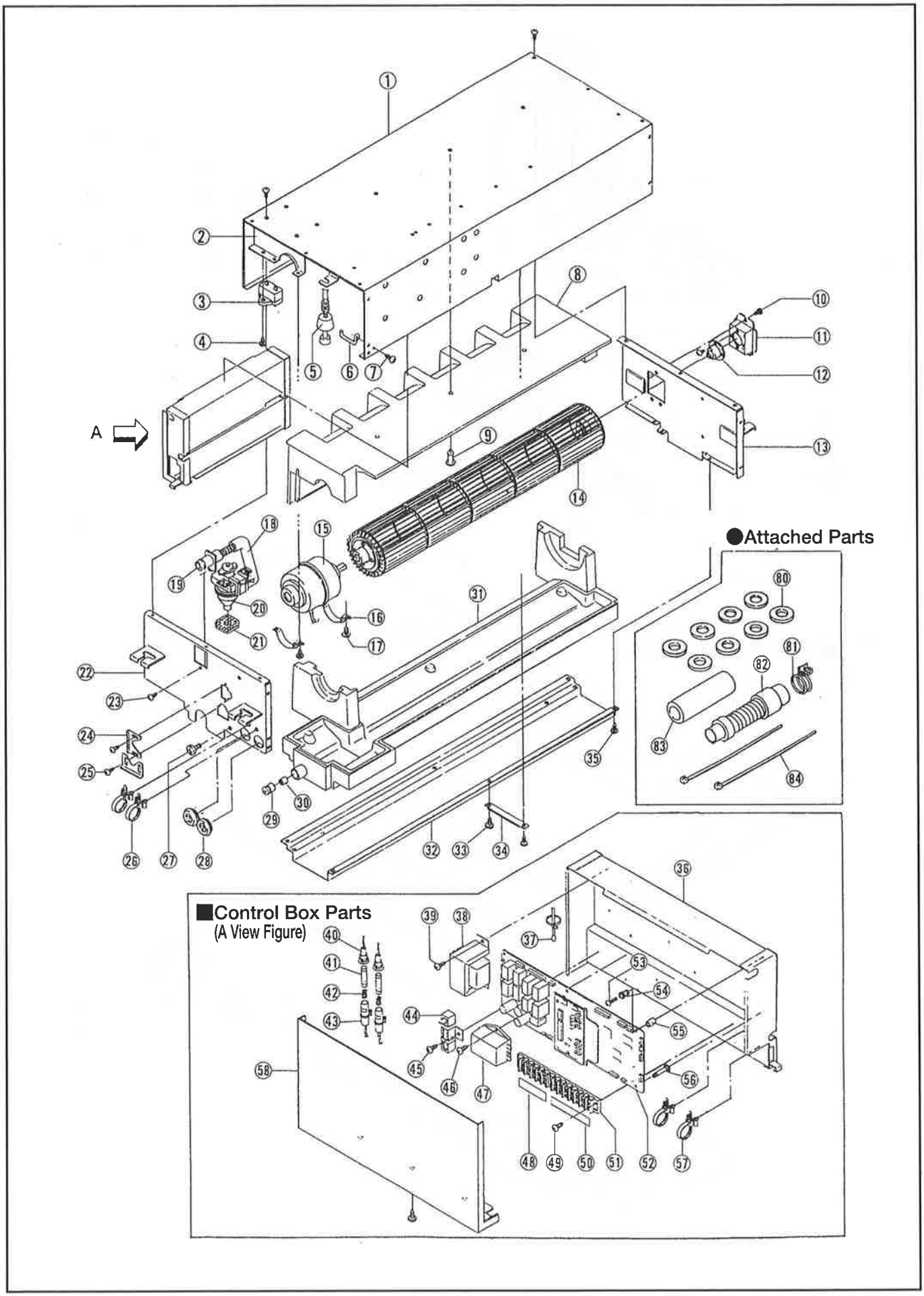
REF.NO.	PARTS NAME		PARTS NUMBER CNR	QUANTITY PER 1 UNIT		※REC PARTS
				112UR51	140UR51	
1	Shell side B As		42-552450	1	—	
			42-551460	—	1	
2	Duct cover		05-820290	2	2	
3	Shell As		42-551070	1	—	
			42-551440	—	1	
4	Shell side F As		42-552470	1	—	
			42-551480	—	1	
5	Tube drain		06-826050	1	—	
			06-829960	—	1	
6	Lead pipe drain		06-826060	1	1	
7	Drain pumb	(FB model)	06-831820	1	1	※
		(ER model)	06-830680	1	1	※
8	Float switch		06-828110	1	1	※
9	Panel drain pumb As	(FB model)	46-834690	1	—	
		(ER model)	46-832310	1	—	
		(FB model)	46-934580	—	1	
		(ER model)	46-934590	—	1	
10	Rubber bush 29		39-251070	1	1	
11	Rubber bush 45		39-251090	1	1	
12	Seal plate back		05-827350	1	—	
			05-827360	—	1	
13	Evaporater B		05-833540	1	—	
			05-833550	—	1	
14	Evaporater A		05-833520	1	—	
			05-833530	—	1	
15	Seal plate center. As		45-574430	1	—	
			45-574440	—	1	
16	Seal plate Eva.L		05-824840	1	—	
			05-826530	—	1	
17	Heatexchanger outlet temp.sensor		46-838820	1	1	※
18	Union 6/8		05-950050	1	1	
19	Flare nut 6/8		38-890110	1	1	
20	Union 3/8		05-399710	1	1	
21	Flare nut 3/8		38-890080	1	1	
22	Strainer		05-811570	1	1	
23	Inslating tube 22		05-964620	1	1	
24	Heatexchanger inlet temp.sensor		46-838600	1	1	※
25	Inslating tube 10		05-974240	1	1	
26	Tube banding 197		39-220050	2	2	
28	Seal plate Eva.R		05-824830	1	—	
			05-826520	—	1	
29	Strainer		05-985040	1	1	
30	Muffler		05-836120	1	1	
31	Distributer		05-438390	1	1	
32	Electric expantion valve		05-832720	1	—	※
			05-832730	—	1	※
33	Fan motor		06-831270	1	—	※
			06-854600	—	1	※
34	Rectifier plate		02-838910	2	2	
35	Running capacitor		06-832990	1	—	※
			06-833000	—	1	※
36	Mount fan motor		06-830250	4	4	

CS-112UR51FB, CS-112UR51ER, CS-140UR51FB, CS-140UR51ER

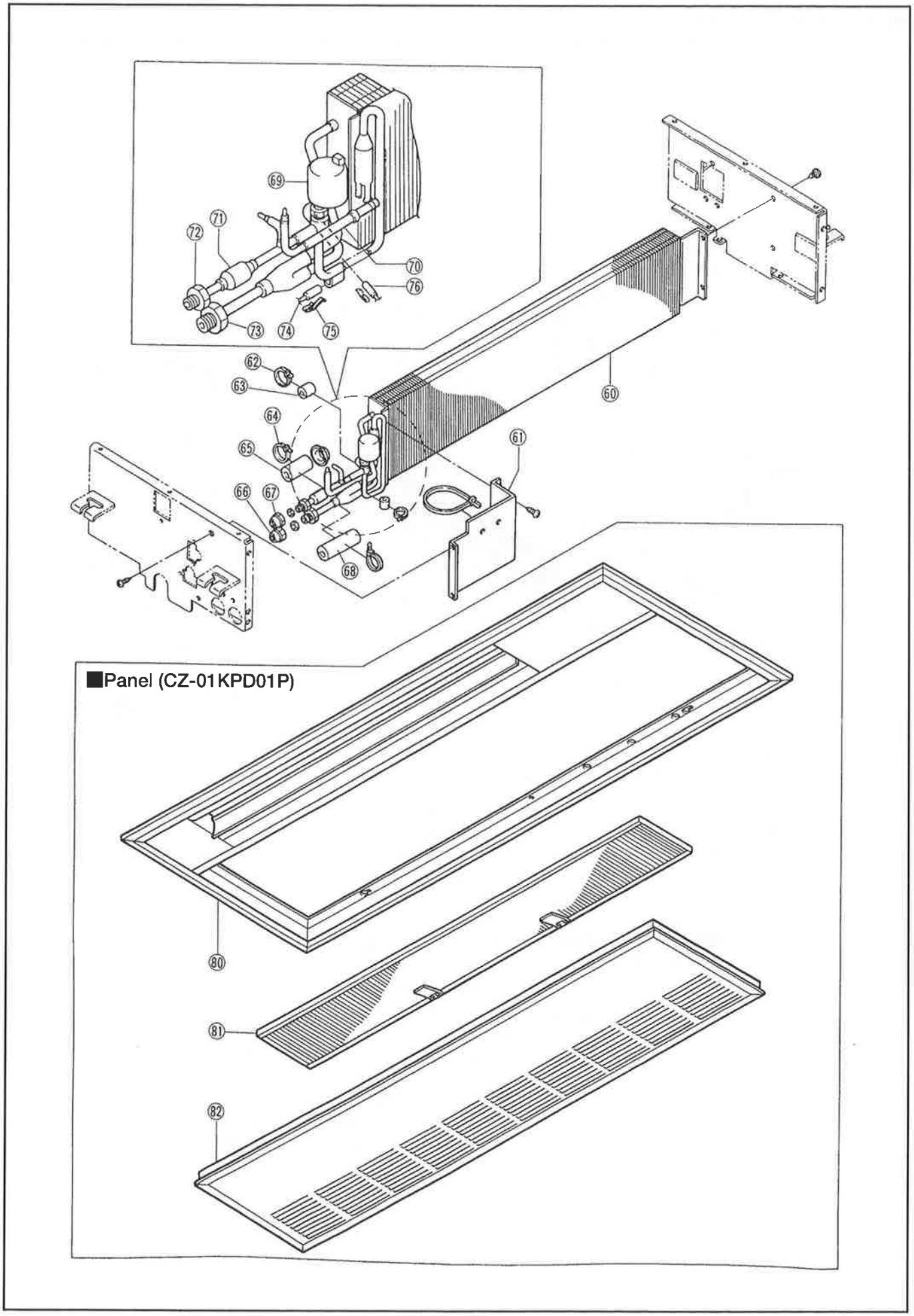
REF.NO.	PARTS NAME		PARTS NUMBER CNR	QUANTITY PER 1 UNIT		※REC PARTS
				112UR51	140UR51	
37	Washer 6		38-490120	4	4	
38	Hexagonal screw 5TS27		38-193610	4	4	
39	Turbo fan As		05-821350	1	1	
40	Washer for turbo fan		05-860050	1	1	
41	Washer 10		38-418010	1	1	
42	10 spring washer		38-428080	1	1	
43	Hexagonal nut 10		38-818010	1	1	
45	Washer 5		38-490640	4	4	
46	Drain pan As		45-597420	1	1	
47	Drain pan cap		05-811470	1	1	
50	Panel drain pan As		02-847710	1	1	
51	Orifice ring		05-824940	1	—	
			05-827270	—	1	
52	Power supply Box		06-854830	1	1	
53	Fuse case top		06-850080	1	1	
54	Fuse case spring		06-850090	1	1	
55	Fuse 5A		06-850780	1	1	※
56	Fuse case bottom		06-850100	1	1	
57	Serge absorber		06-498370	1	1	※
58	Terminal board	(10P)	06-838860	1	1	
59	Cover power supply box		06-830200	1	1	
60	Relay Box		06-837990	1	1	
61	Thermistor		06-834420	1	1	
62	Electric noise filter		06-814720	1	1	※
64	P.C.board collor		06-835140	1	1	
65	Printed circuit board		06-853320	1	1	※
66	Locking card spacer		06-805290	5	5	
67	Stay relay board		06-833800	1	1	
68	Transformer	(FB model)	06-854610	1	1	※
		(ER model)	06-854620	1	1	※
69	Screw 4S6		38-114010	2	2	
70	P.C.board bush		06-817930	1	1	
71	Screw 3TS16		38-152510	1	1	
72	Cover P.C.board Box		06-835860	1	1	
	Hexagonal screw with frange 5TS10		38-191540	4	4	
	Spark killer		06-838310	2	2	※
	Drain Pan support plate R		42-553740	1	1	
	Drain Pan support plate L		42-553750	1	1	

2.ONE WAY CASSETTE TYPE UNIT

■CS-28DR51FB, CS-28DR51ER



■CS-28DR51FB, CS-28DR51ER



CS-28DR51FB, CS-28DR51ER

REF.NO.	PARTS NAME		PARTS NUMBER CNR	QUANTITY PER 1 UNIT CS-28DR51	※REC PARTS
1	Cabinet As.		42-561220	1	※
2	Motor holder		05-849480	1	
3	Electrical capacitor		06-828170	1	
4	Screw 4TS8		38-114110	1	
5	Float switch As		46-848140	1	
	Float switch		06-828110	1	
	Cover float switch		06-813380	1	
6	Hock P.C.box		06-843760	1	
7	Screw 4TS8		38-114110	1	
8	Air guider		02-866230	1	
9	Canuu clip		08-405140	1	
10	Screw 4TS8		38-114110	7	
11	Bearing holder		02-866340	1	
12	Bearing		05-803270	1	
13	Cabinet side As(R)		42-561230	1	
14	Cross flow fan		06-843670	1	
15	Fan motor		06-843660	1	
16	Motor cramper		05-838330	2	
17	Screw 4TS8		38-114110	4	
18	Tube drain		02-882370	1	
19	Lead pipe drain		02-498640	1	
20	Drain pumb As		46-938930	1	
	Drain pumb		06-856480	1	
21	Drain filter		02-498620	1	
22	Cabinet side As(L)		42-561240	1	
23	Screw 4TS8		38-114210	7	
24	Pipe holder		05-980970	2	
25	Screw 4TS8		38-114110	4	
26	Code cramp 105		06-821190	3	
28	Rubber bush(29)		39-251070	2	
29	Drain cap		45-533160	1	
30	Cap lead pipe		05-955980	1	
31	Drain pan		45-589260	1	
32	Drain pan stay As		42-561200	1	
33	Screw 4TS8		38-114110	8	
34	Shell support stay		02-866810	1	
36	Relay P.C.box As		46-939240	1	
37	Thermistor(Room temp.)		06-834420	1	
	Tube banding 94		39-220010	1	
38	Transformer	(FB model)	06-854610	1	
		(ER model)	06-854620	1	
39	Screw 4TS8		38-114110	1	
40	Fuse holder top		06-850080	1	
41	Fuse(5A)		06-850780	1	
42	Fuse holder spring		06-850090	1	
43	Fuse holder bottom		06-850100	1	
44	Serge absorber		06-498370	1	
45	Screw 4S6		38-714010	1	
46	Pan head screw 3TS6		38-152010	2	
47	Electrical noise filter		06-814720	1	
49	Pan head screw 4TS14		38-154410	2	
50	Terminal No.		07-965200	1	
51	Terminal(9P)		06-838470	1	
52	Printed circuit board		06-854730	1	
53	Pan head screw 3TS14		38-152410	1	
54	P.C.bush		06-817930	1	
55	P.C.collar		06-835140	1	
56	Rocking guard spacer 8		06-805290	1	

CS-28DR51FB, CS-28DR51ER

REF.NO.	PARTS NAME	PARTS NUMBER CNR	QUANTITY PER 1 UNIT CS-28DR51	※REC PARTS
57	Code cramp 105	06-821190	2	
58	Cover P.C.box	06-843750	1	
60	Evaporator	05-851590	1	
61	Evaporator stay	05-849530	1	
62	Tube banding 154	39-220030	1	
63	Pipe cramp rubber	05-959720	1	
64	Tube banding 197	39-220050	1	
65	Heat insulation tube(13)	05-811700	1	
66	Flare nut(4/8)	38-890090	1	
67	Flare nut(3/8)	38-890080	1	
68	Heat insulation tube(10)	05-956290	1	
69	Electrical expansion valve	05-828130	1	
70	Check valve(2/8)	05-853950	1	
71	Strainer	05-811570	1	
72	Union(3/8)	05-399710	1	
73	Union(4/8)	05-962170	1	
74	Thermostor As(Liquid pipe inlet)	46-820820	1	
75	Spring for sensor	05-840710	1	
76	Thermistor As(Liquid pipe outlet)	46-835690	1	

◎Attached parts

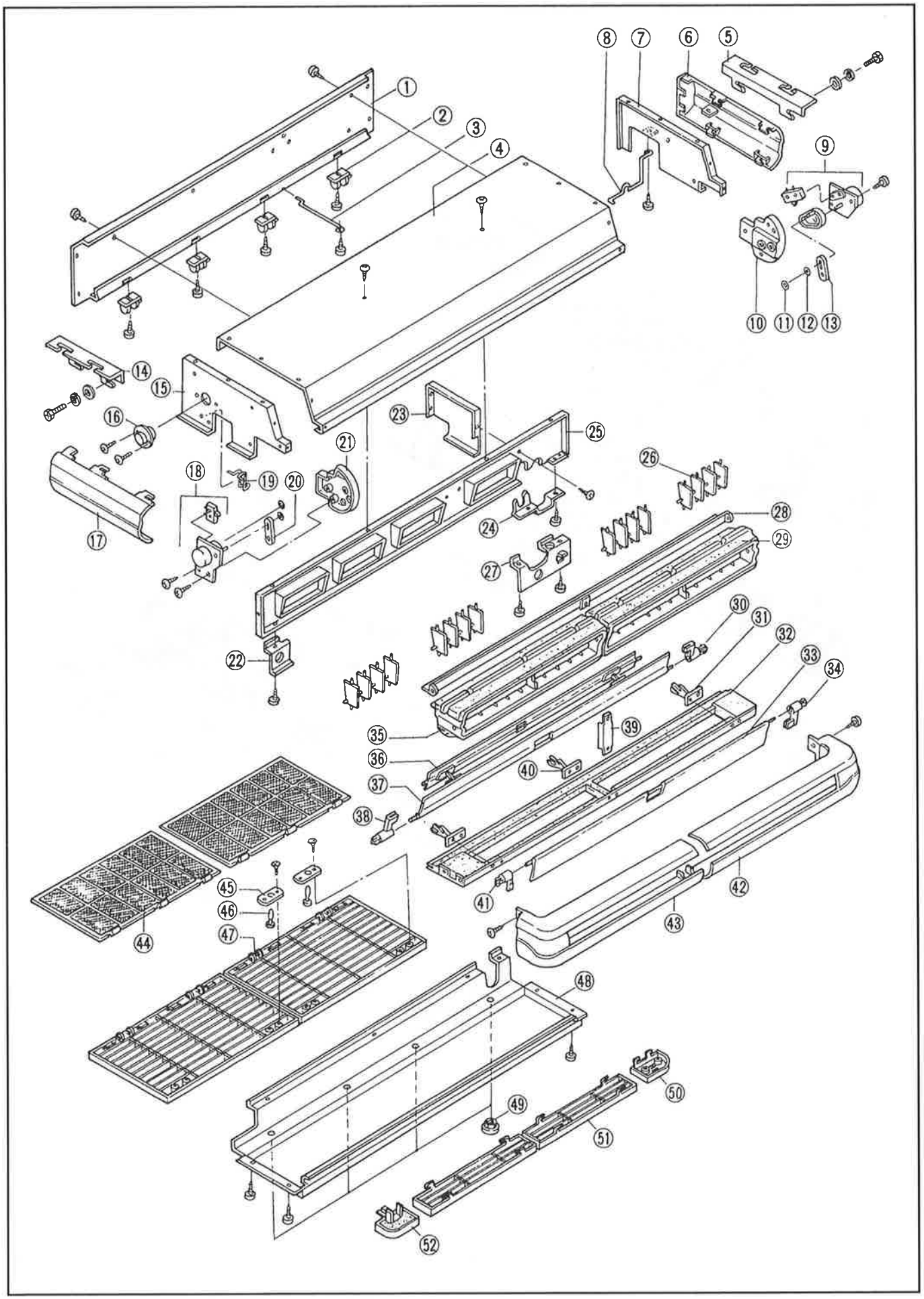
80	10 washer	38-490450	1	
81	Clip drain	05-955910	1	
82	Drain horse	05-865700	1	
83	Heat tube(30)	05-801270	1	
84	Tube banding 245	39-220060	1	
	Paper pattern of installation	07-923510	1	
	6 washer	38-490120	1	
	Hexagonal 5TS27	38-193610	1	

Optional accessory part (Decorated panel CZ-01KPD01P)

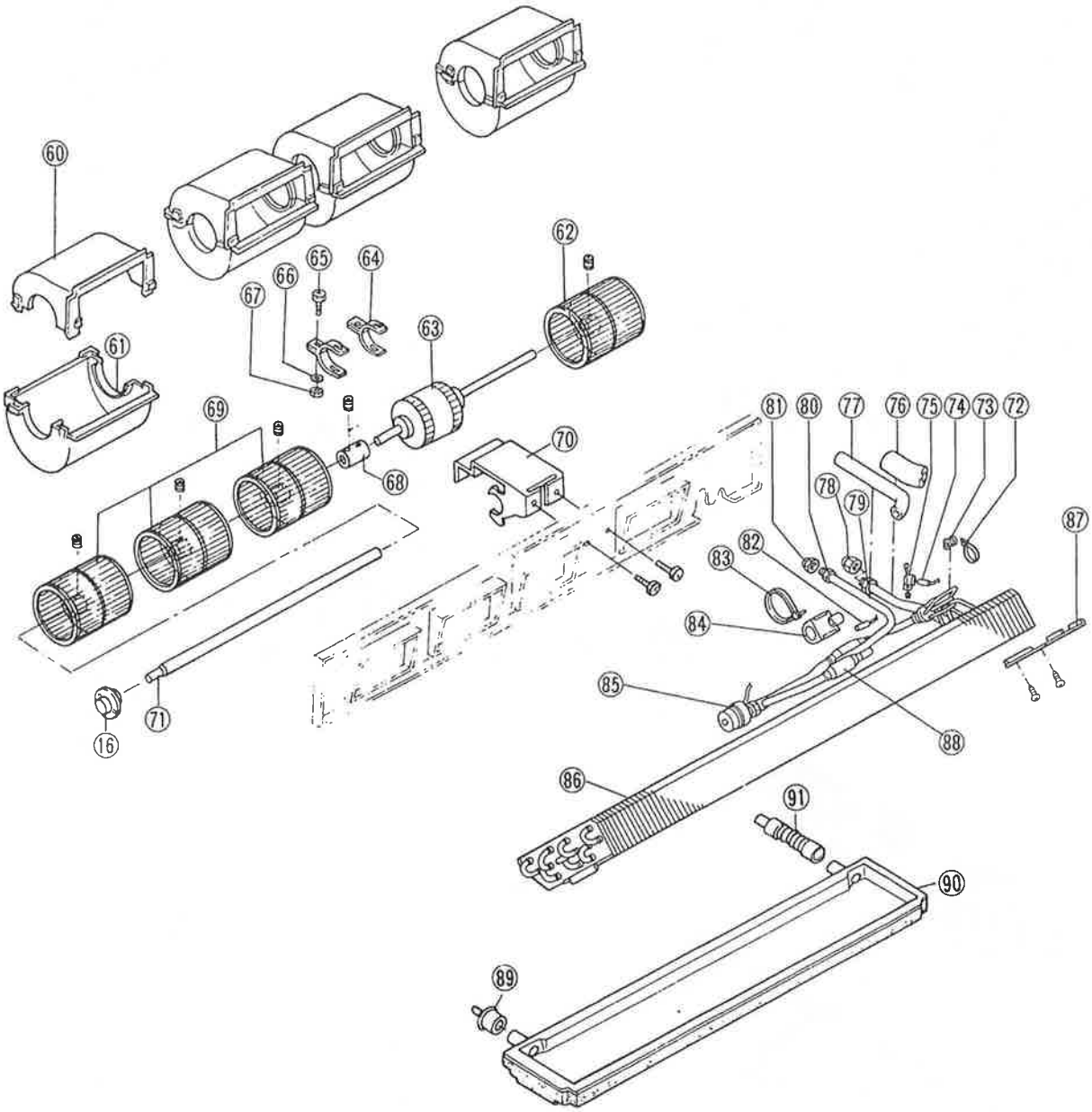
90	Grille outer As	70-414200	1	
91	Filter	70-414210	1	
92	Inlet grillep	70-414220	1	
	Hexagonal 5S30	08-405340	1	

3.CEILING TYPE UNIT

■CS-71TR51FB, CS-71TR51ER



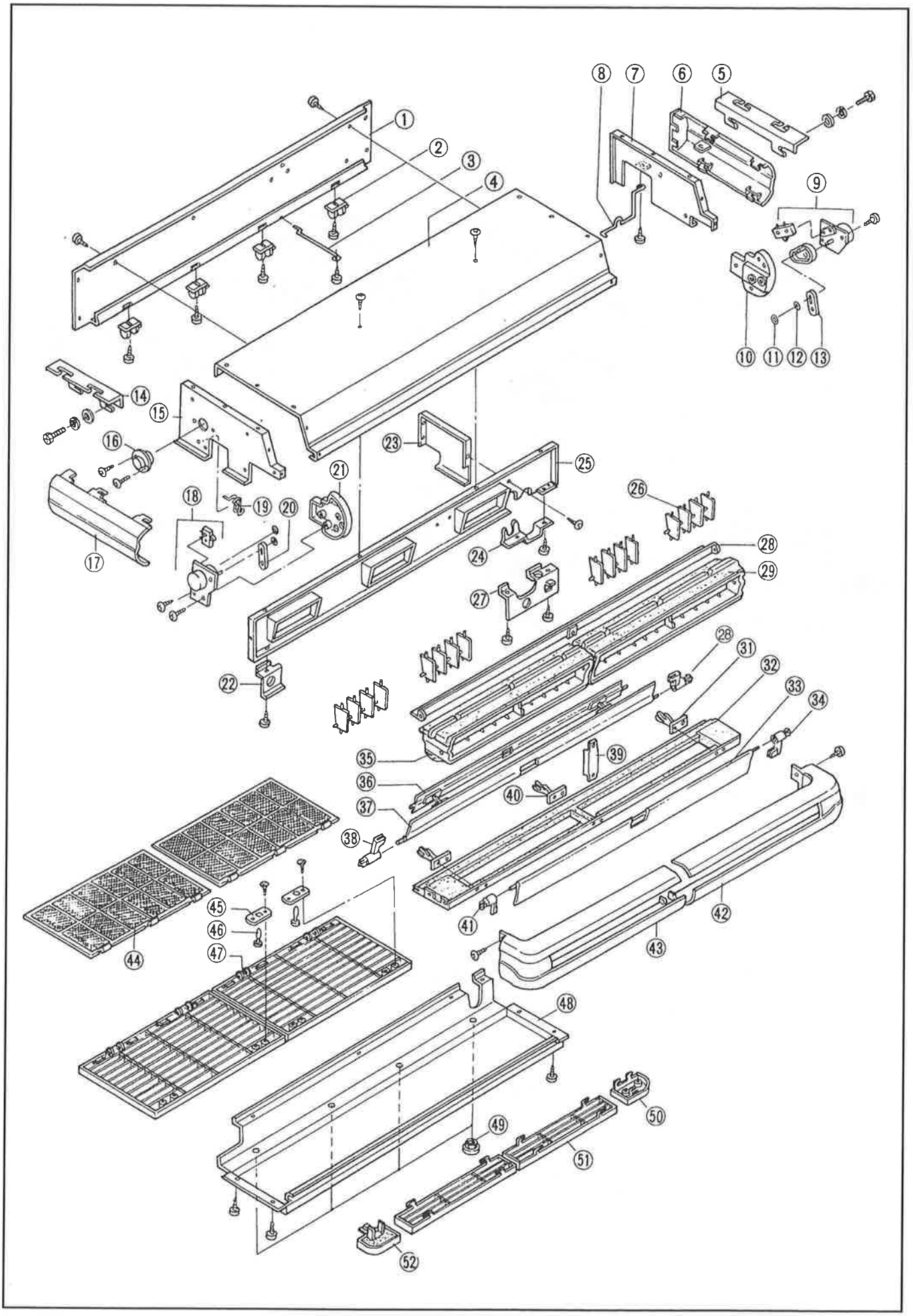
■CS-71TR51FB, CS-71TR51ER



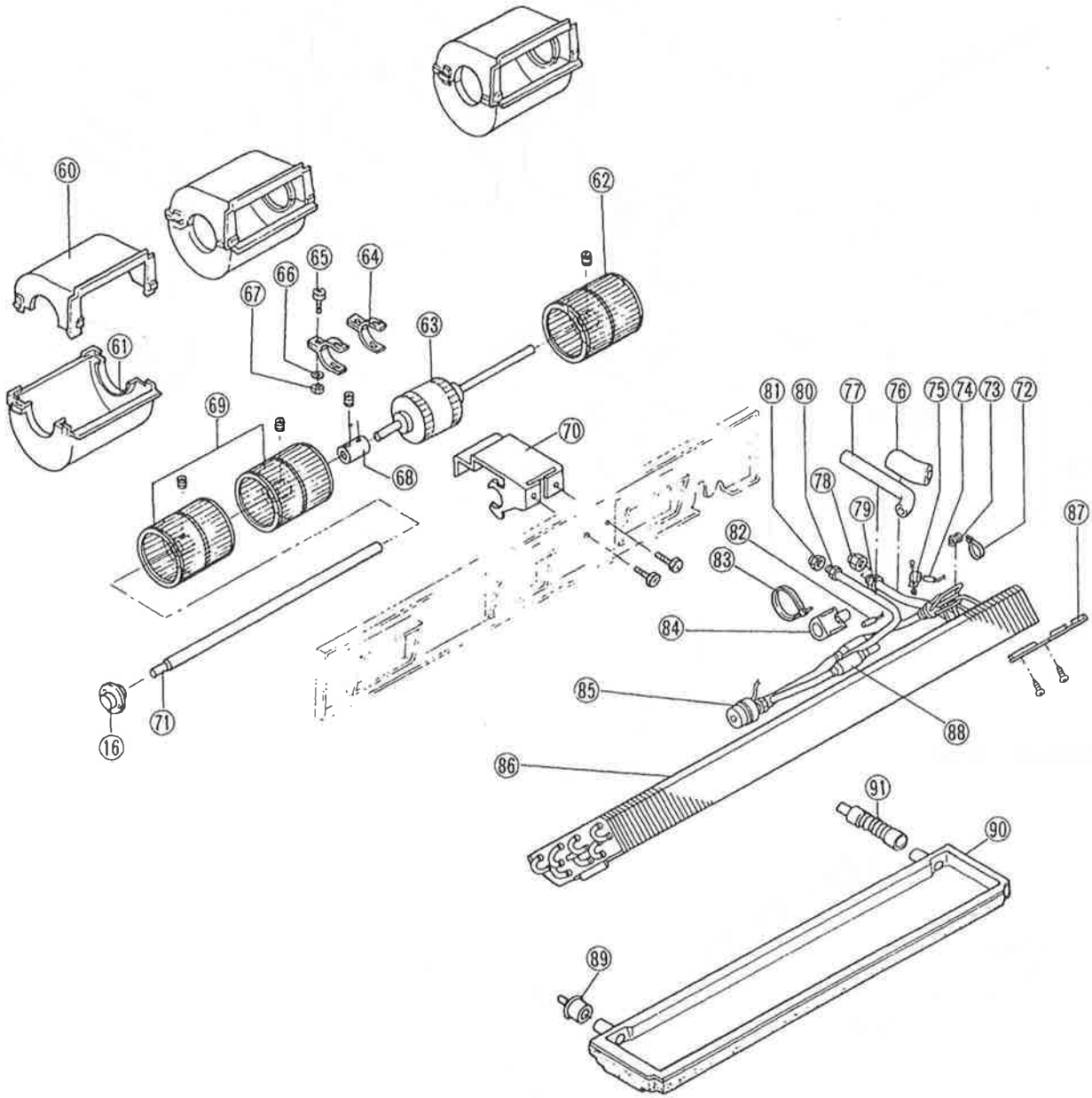
■CS-71TR51FB, CS-71TR51ER

●Attached Parts

■CS-112TR51FB, CS-112TR51ER



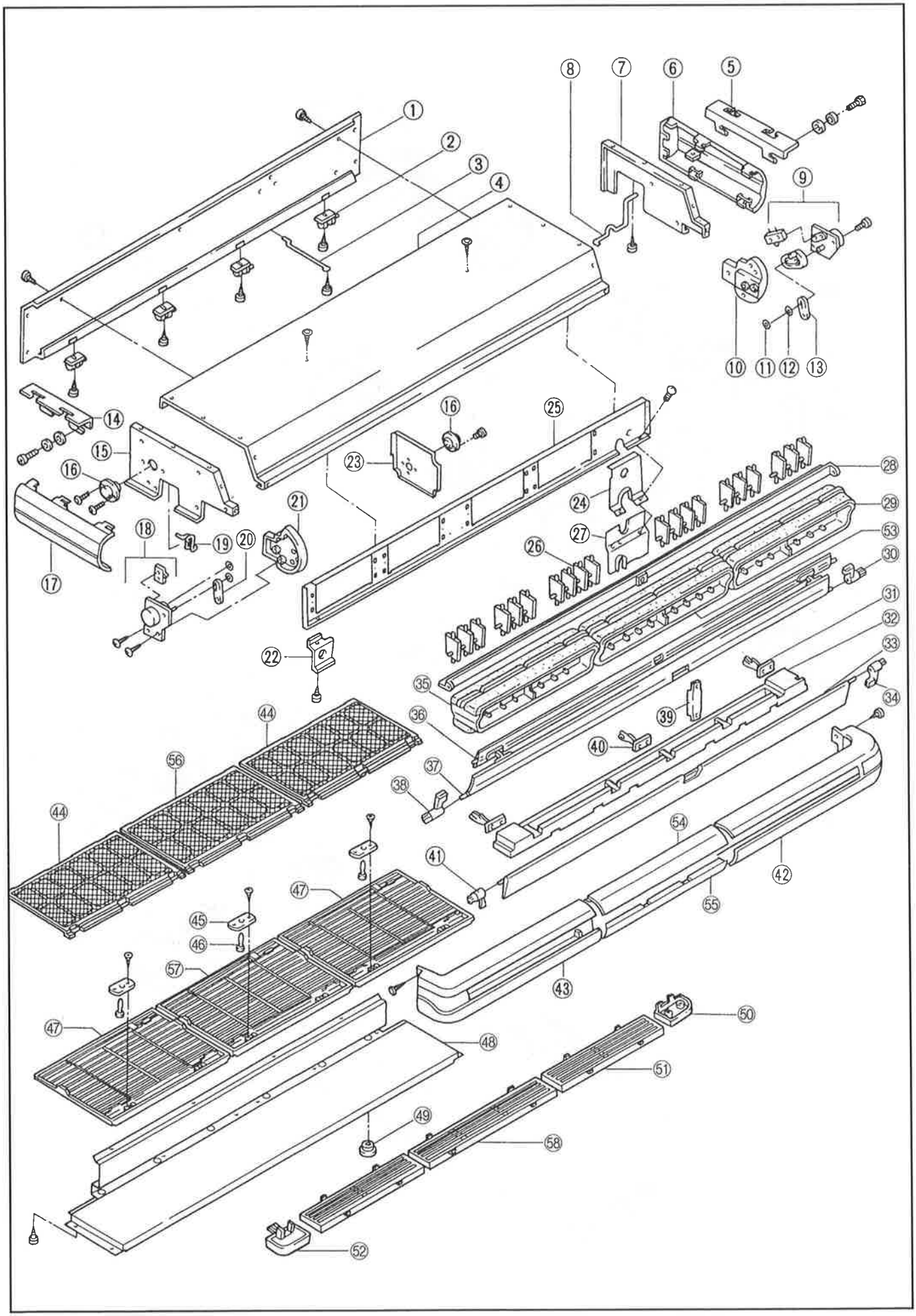
■CS-112TR51FB, CS-112TR51ER



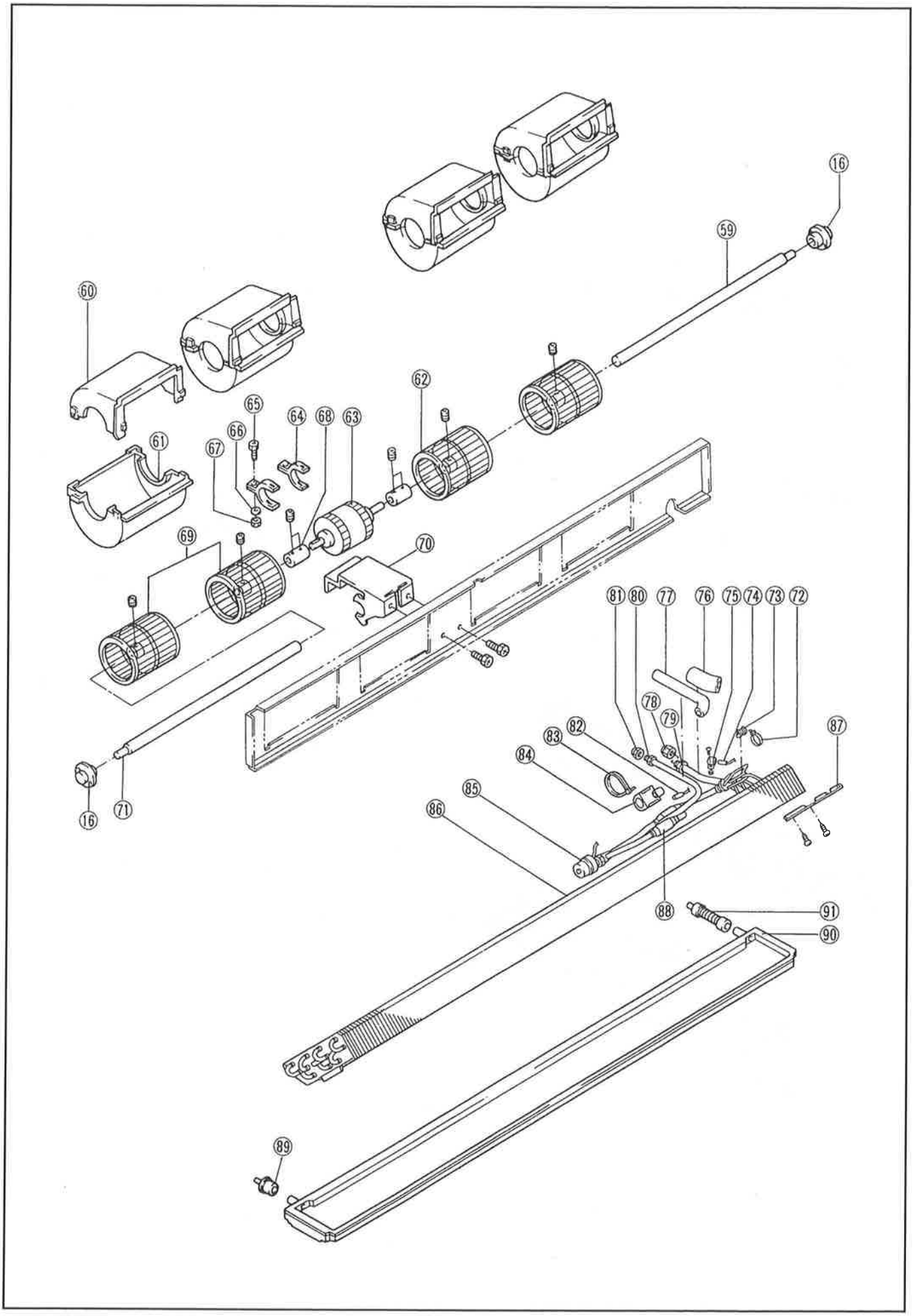
■CS-112TR51FB, CS-112TR51ER

●Attached Parts

■CS-140TR51FB, CS-140TR51ER



■CS-140TR51FB, CS-140TR51ER



■CS-140TR51FB, CS-140TR51ER

●Attached Parts

CS-71TR51FB, CS-112TR51FB, CS-140TR51FB
CS-71TR51ER, CS-112TR51ER, CS-140TR51ER

REF.NO.	PARTS NAME	PARTS NUMBER CNR	QUANTITY PER 1 UNIT			※REC PARTS
			CS-71TR51	CS-112TR51	CS-140TR51	
1	Shell back	02-840390	1	—	—	
		02-873910	—	1	—	
		02-879920	—	—	1	
2	Grill hinge	02-840560	4	4	6	
3	Center wire	02-840540	1	1	1	
4	Shell top	02-840380	1	—	—	
		02-841890	—	1	—	
		02-841900	—	—	1	
5	Hanger bracket R	02-869020	1	—	—	
		02-869040	—	1	1	
6	Side cover R As	42-553800	1	—	—	
		42-553820	—	1	1	
7	Shell side R As	42-552370	1	—	—	
		42-552710	—	1	1	
8	Drain horse guider	02-840530	1	1	1	※
9	Louver motor R	06-854450	1	1	1	
10	Grill side R	02-840030	1	1	1	
11	5 push nut	06-826400	1	1	1	
12	5 washer	06-828710	2	2	2	
13	Lever horizontal louver R	02-840200	1	1	1	
14	Hanger bracket L	02-869030	1	—	—	
		02-869050	—	1	1	
15	Shell side L As	42-552380	1	—	—	
		42-552720	—	1	1	
16	Bearing 8	05-857010	1	—	—	
	Bearing 10	05-857020	—	1	2	
17	Side cover L As	42-553810	1	—	—	
	Side cover L As	42-553830	—	1	1	※
18	Damper motor L	06-854460	1	1	1	
19	Drain guider top	02-499290	1	1	1	
20	Lever damper L	02-840210	1	1	1	
21	Grill side L	02-840040	1	1	1	
22	Bracket drain pan L	02-841270	1	—	—	
		02-842310	—	1	1	
23	Seal plate	02-840440	1	—	—	
		02-842010	—	1	—	
		02-842550	—	—	1	
24	Pipe holder R	05-829010	1	—	—	
		05-830050	—	1	1	
25	Reflector As	42-558150	1	—	—	
		42-558160	—	1	—	
		42-558250	—	—	1	
26	Vertical wing	02-840090	16	16	20	
	Connector wing	02-840100	4	4	2	
		02-841480	—	—	4	
27	Bracket drain pan R	02-841260	1	—	—	
		02-842300	—	1	1	
28	Grill stay	02-840010	1	1	—	
		02-842380	—	—	1	
29	Grill front R	02-839980	1	1	—	
		02-841310	—	—	1	
30	Supporter rod damper	02-840190	1	1	2	
31	Support damper side	02-840160	2	2	2	
32	Polythetil damper As	42-552440	1	—	—	
		42-554400	—	1	—	
		42-552840	—	—	1	
33	Horizontal louver As	42-552570	1	1	—	
		42-552780	—	—	1	

CS-71TR51FB, CS-112TR51FB, CS-140TR51FB
CS-71TR51ER, CS-112TR51ER, CS-140TR51ER

REF.NO.	PARTS NAME	PARTS NUMBER CNR	QUANTITY PER 1 UNIT			※REC PARTS
			CS-71TR51	CS-112TR51	CS-140TR51	
34	Supporter rod louver R	02-840070	1	1	1	
35	Grill front L	02-839990	1	1	—	
		02-841320	—	—	1	
36	Damper front As	42-559720	1	1	—	
		42-559740	—	—	1	
37	Damper bottom As	42-557950	1	1	—	
		42-557970	—	—	1	
38	Supporter rod damper	02-840190	1	1	1	
39	Center stay outlet	02-840140	—	1	2	
40	Support damper center	02-840150	1	1	1	
41	Supporter rod luver L	02-840080	1	1	1	
42	Cover grill R AS	42-553760	1	1	—	
		42-553780	—	—	1	
43	Cover grill L As	42-553770	1	1	—	
		42-553790	—	—	1	
44	Filter	02-848470	2	—	—	
		02-840570	—	2	—	
		02-841500	—	—	2	
45	Plastic latch hole	03-406440	4	4	6	
46	Plastic latch bar	03-406430	4	4	6	
47	Grill inlet	02-840310	2	2	—	
		02-841490	—	—	2	
48	Shell bottom	02-840510	1	—	—	
		02-842320	—	1	—	
		02-842330	—	—	1	
49	Latch	03-418500	4	4	6	
50	Grill bottom corner R	02-840230	1	1	1	
51	Grill bottom As	02-840220	2	—	—	
		42-554380	—	2	—	
		42-554370	—	—	2	
52	Grill bottom corner L	02-840240	1	1	1	
53	Grill front C	02-841720	—	—	1	
54	Cover grill top C	02-841750	—	—	1	
55	Cover grill bottom C	02-841760	—	—	1	
56	Filter C	02-842520	—	—	1	
57	Grill inlet C	02-841740	—	—	1	
58	Grill bottom As C	42-554390	—	—	1	
59	Shaft fan R	05-829820	—	—	1	
60	Casing top	05-828760	4	—	—	
		05-829760	—	3	4	
61	Casing bottom	05-828770	4	—	—	
		05-829770	—	3	4	
62	Sicocco fan A	05-828690	1	—	—	
		05-829550	—	1	2	
63	Fan motor	06-855060	1	—	—	※
		06-855070	—	1	—	※
		06-855080	—	—	1	※
64	Fan motor installing plate	05-409550	4	4	4	
65	Hexagonal 5 bolt 40	38-991270	2	2	2	
66	5 SP washer	38-425080	2	2	2	
67	Hexagonal 5 nut	38-815010	2	2	2	
68	Capling shaft	05-398720	1	1	2	
69	Sirocco fan B	05-829540	3	—	—	
		05-829560	—	2	2	
70	Bracket motor As	45-574880	1	—	—	
		45-577310	—	1	—	
		45-575540	—	—	1	

CS-71TR51FB, CS-112TR51FB, CS-140TR51FB
CS-71TR51ER, CS-112TR51ER, CS-140TR51ER

REF.NO.	PARTS NAME	PARTS NUMBER CNR	QUANTITY PER 1 UNIT			※REC PARTS
			CS-71TR51	CS-112TR51	CS-140TR51	
71	Shaft fan	05-828870	1	—	—	
		05-831220	—	1	—	
	Shaft fan L	05-829810	—	—	1	
72	Tube banding 180	39-220040	1	1	1	
73	Rubber for pipe cramp	05-964890	1	1	1	
74	Termister(Heatexchanger outlet pipe)	06-833080	1	1	1	※
75	Sensor band	05-800020	1	—	—	
		05-808620	—	1	1	
	Hexagonal 5 nut	38-815010	1	1	1	
	Pan head 5 Screw 10	38-755210	1	1	1	
76	1nsulating tube 16	05-829000	1	—	—	
	1nsulating tube 22	05-830040	—	1	1	
77	1nsulating tube 10	05-828990	1	1	1	
78	Flare nut 4/8	38-890090	1	—	—	
	Flare nut 6/8	38-890110	—	1	1	
79	Union 4/8	05-962170	1	—	—	
	Union 6/8	05-950050	—	1	1	
80	union 3/8	05-399710	1	1	1	
81	Flare nut 3/8	38-890080	1	1	1	
82	Thermister(Heatexchanger inlet pipe)	46-836470	1	1	1	※
83	Tube banding 180	39-220040	1	1	2	
84	Pipe cramp rubber 6/8	05-968060	1	1	1	
85	Electric expansion valve	05-839880	1	—	—	※
		05-840260	—	1	—	※
		05-840450	—	—	1	※
86	Evaporator	05-839860	1	—	—	
		05-840160	—	1	—	
		05-840440	—	—	1	
87	Evaporator stay R	05-828910	1	—	—	
		05-829890	—	1	1	
88	Strainer	05-985310	2	—	—	
		05-979900	—	2	2	
89	Drain pan cap	45-533160	1	1	1	
90	Drain pan As	42-552390	1	—	—	
		42-552730	—	1	—	
		42-552740	—	—	1	
92	Locking card spacer 8	06-805290	4	4	4	
93	Code cramp	06-824150	1	1	1	
94	Noise filter	06-854770	1	1	1	
96	Fuse case bottom	06-850100	1	1	1	
97	Fuse case Spring	06-850090	1	1	1	
98	Fuse	06-850780	1	1	1	
99	Fuse case top	06-850080	1	1	1	
100	Box cover	06-831350	1	1	1	
101	Running capacitor	06-831080	1	—	—	※
		06-837780	—	1	—	※
		06-837170	—	1	—	※
		06-833100	—	—	1	※
		06-833000	—	—	1	※
102	Terminal base As	46-847120	1	—	—	
		46-847430	—	1	1	
103	Terminal 9P	06-838470	1	1	1	
104	Junction number	07-965200	1	1	1	
105	P.C.board box As	46-847170	1	1	1	
106	Code cramp 114	06-460100	1	1	1	
107	Code cramp	06-824150	1	1	1	
108	Thermister(Room temp.)	06-846680	1	1	1	※
109	P.C.board color	06-835140	1	1	1	
110	P.C.board bush	06-817930	1	1	1	

CS-71TR51FB, CS-112TR51FB, CS-140TR51FB
CS-71TR51ER, CS-112TR51ER, CS-140TR51ER

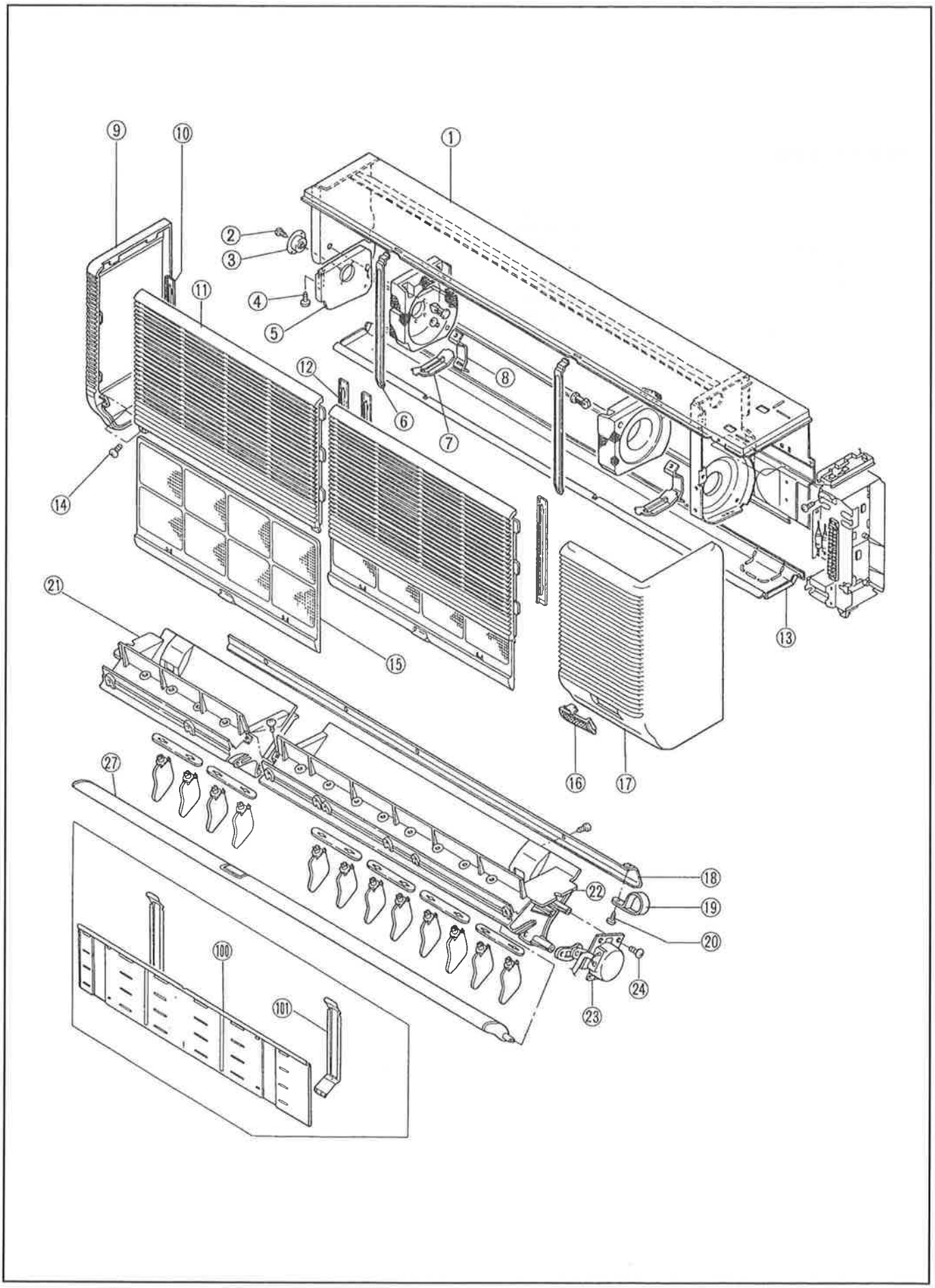
REF.NO.	PARTS NAME	PARTS NUMBER CNR	QUANTITY PER 1 UNIT			※REC PARTS
			CS-71TR51	CS-112TR51	CS-140TR51	
111	Screw 3TS 16	38-152510	1	1	1	
112	P.C.board	06-855050	1	1	1	※
113	Locking card spacer 8	06-805290	5	5	5	
114	Cable strap 1775	06-818980	1	1	1	
115	Spark killer	06-838310	4	4	4	
116	Transformer	06-854610	1	1	1	※
		06-854620	1	1	1	※
117	P.C.board cover	06-831410	1	1	1	

◎Attached parts

120	Cover hanging bracket R	02-840340	1	—	—	
		02-841770	—	1	1	
121	Cover hanging bracket L	02-840350	1	—	—	
		02-841780	—	1	1	
122	Insulating 34	05-957540	1	—	—	
	Insulating 43	05-957680	—	1	1	
123	Drain horse As	42-537970	1	1	1	
124	Grommet	02-840600	1	1	1	
125	Tube banding 245	39-220060	2	2	2	
126	Hanging bracket holder	02-840050	4	4	4	

4.WALL TYPE UNIT

■CS-22KR51FB, CS-22KR51ER, CS-45KR51FB, CS-45KR51ER, CS-56KR51FB, CS-56KR51ER, CS-71KR51FB, CS-71KR51ER



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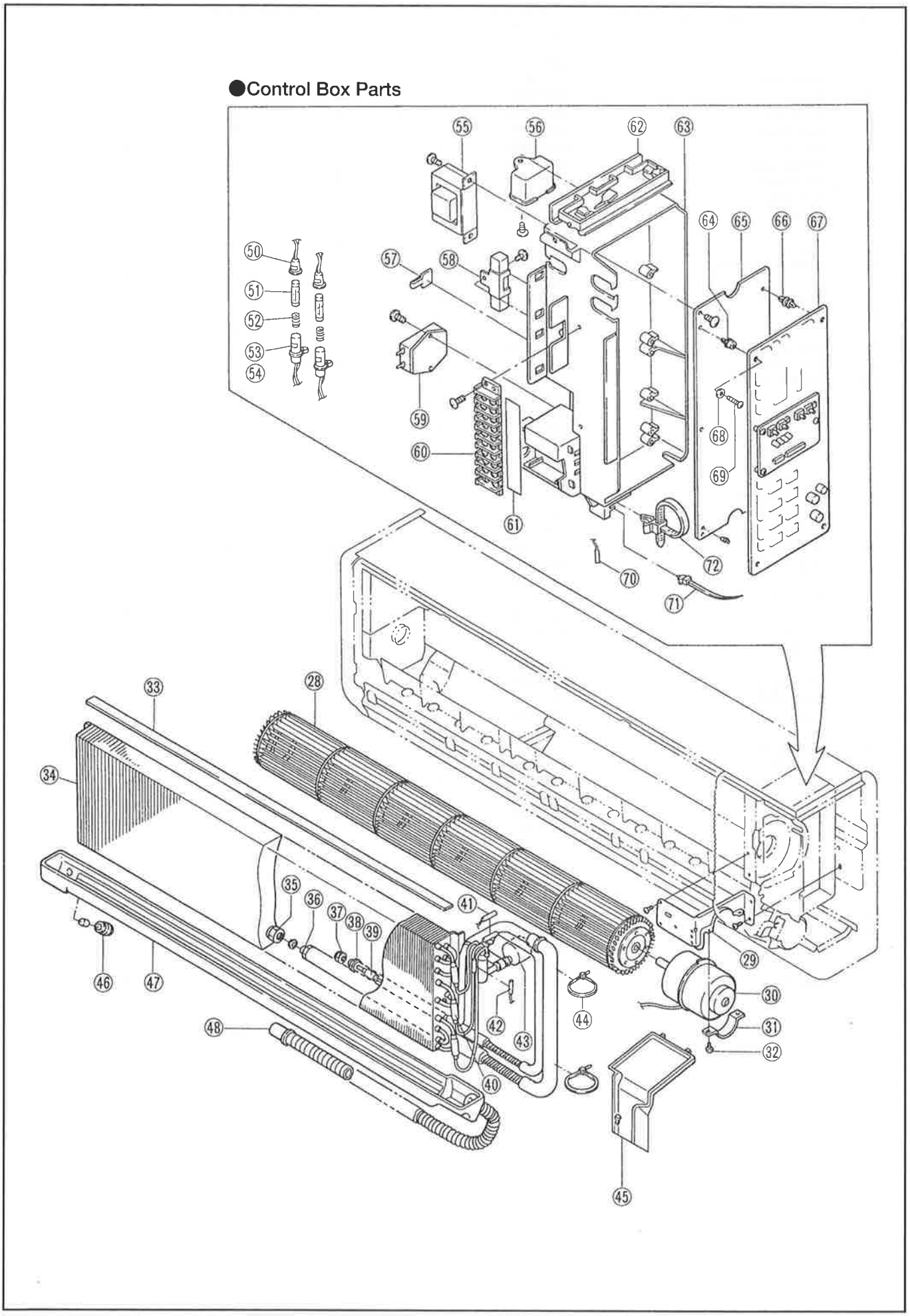


CS-22KR51FB, CS-45KR51FB, CS-71KR51FB
CS-22KR51ER, CS-45KR51ER, CS-71KR51ER

REF.NO.	PARTS NAME	PARTS NUMBER CNR	QUANTITY PER 1 UNIT				※REC PARTS
			CS-22KR51	CS-45KR51	CS-56KR51	CS-71KR51	
1	Cabinet As.	42-557750	1	1	—	—	※
		42-557300	—	—	1	1	
2	Screw 4TS8	38-114110	2	2	2	2	
3	Bearing	05-803270	1	1	1	1	
4	Screw 4TS8	38-114110	4	4	4	4	
5	Bearing holder	02-858390	1	1	1	1	
6	Joint stay	02-858440	1	1	1	1	
8	Cabinet holder	02-858450	2	2	2	2	
9	Side cover(L)	02-857680	1	1	1	1	
10	Rail filter(L)	02-857660	1	1	1	1	
11	Inlet grille	02-859620	1	1	—	—	
		02-857690	—	—	1	1	
12	Rail filter(L)	02-857670	1	1	1	1	
13	Cover panel bottom	02-859640	1	1	—	—	
		02-858420	—	—	1	1	
14	Screw 4TS12	38-114310	1	1	1	1	
15	Filter	02-859630	1	1	—	—	
		02-857650	—	—	1	1	
16	Cover photo receiver	02-858000	1	1	1	1	
17	Side cover(R)	02-858010	1	1	1	1	
18	Grill joint stay As	42-559160	1	1	—	—	
		42-559150	—	—	1	1	
19	Screw 4TS8	38-114110	5	5	6	6	
20	Drain horse cramp	05-838510	1	1	1	1	
21	Outlet grille(L)	42-558720	1	1	—	—	
		42-557420	—	—	1	1	
22	Outlet grille(R)	42-558700	1	1	1	1	
23	Louver motor As	46-935430	1	1	1	1	
24	Screw 4TS8	38-114110	3	3	3	3	
25	Connector wing	02-857960	6	6	8	8	
26	Vertical wing	02-857970	12	12	16	16	
27	Wing As	42-558760	1	1	—	—	
		42-558750	—	—	1	1	
28	Cross flow fan	06-838190	1	1	—	—	
		06-837940	—	—	1	1	
29	Bracket motor	45-584330	1	1	1	1	
30	Fan motor	06-854970	1	1	—	—	
		06-854980	—	—	1	1	
31	Motor cramper	05-838330	1	1	1	1	
32	Screw 4TS8	38-114110	2	2	2	2	
34	Evaporator	05-843090	1	1	—	—	
		05-843100	—	—	1	1	
35	Flare nut(4/8)	38-890090	1	1	1	1	
36	Union(4/8)	05-962170	1	1	1	1	
37	Flare nut(3/8)	38-890082	1	1	1	1	
38	Union(3/8)	05-399710	1	1	1	1	
39	Strainer	05-815080	1	1	1	1	
40	Muffler	05-843000	3	3	4	4	
41	Thermistor As	46-853150	1	1	1	1	
42	Thermistor As	46-819880	1	1	1	1	
43	Electrical expansion valve	05-812920	1	1	—	—	
		05-844180	—	—	1	1	
45	Sub drain pan	05-837690	1	1	1	1	
46	Drain cap As	45-533160	1	1	1	1	
47	Drain pan As	45-582550	1	1	—	—	
		45-581640	—	—	1	1	
48	Drain horse	05-838500	1	1	1	1	

CS-22KR51FB, CS-45KR51FB, CS-71KR51FB
CS-22KR51ER, CS-45KR51ER, CS-71KR51ER

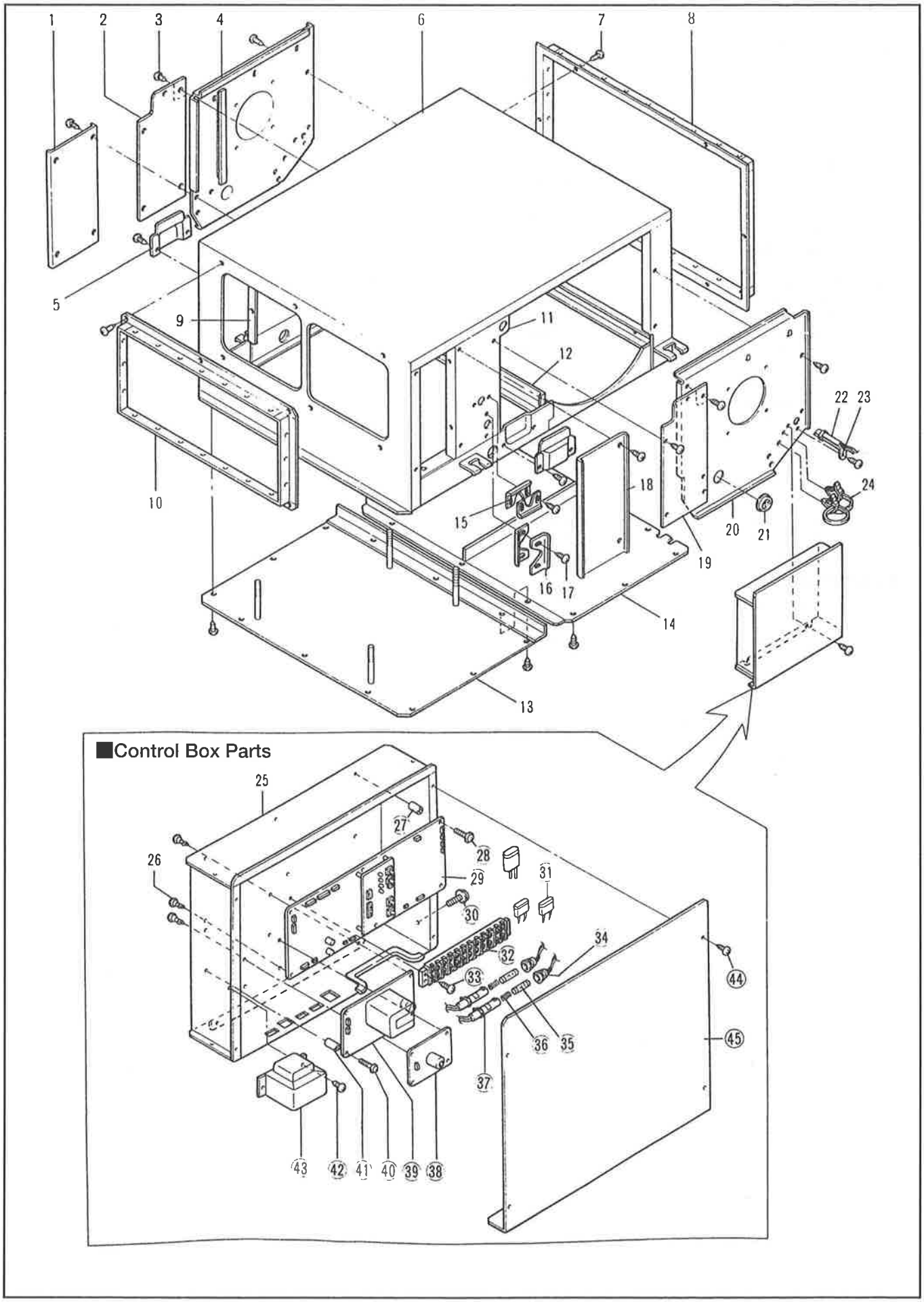
REF.NO.	PARTS NAME	PARTS NUMBER CNR	QUANTITY PER 1 UNIT				※REC PARTS
			CS-22KR51	CS-45KR51	CS-56KR51	CS-71KR51	
50	Fuse holder top	06-850080	1	1	1	1	
51	Fuse	06-850780	1	1	1	1	
52	Fuse holder spring	06-850090	1	1	1	1	
53	Fuse holder bottom	06-850100	1	1	1	1	
54	Label of fuse	07-977190	1	1	1	1	
55	Transformer(FB model)	06-855020	1	1	1	1	
	Transformer(ER model)	06-855030	1	1	1	1	
	Screw 4TS8	38-114110	1	1	1	1	
56	Electric capacitor(FB model)	06-834120	1	1	1	1	
		06-835340	—	—	—	—	
	Electric capacitor(ER model)	06-833540	1	1	1	1	
		06-835440	—	—	—	—	
	Screw 4TS12	38-114310	1	1	1	1	
57	Code keep	06-818270	10	10	10	10	
58	Serge absorber	06-498370	1	1	1	1	
	Screw 4TS12	38-114310	1	1	1	1	
59	Noise filter	06-814720	1	1	1	1	
	Pan head screw 3TS8	38-152110	1	1	1	1	
60	Terminal board(9P)	06-838470	1	1	1	1	
	Pan head screw 4TS16	38-154510	2	2	2	2	
61	Terminal No.	07-965200	1	1	1	1	
63	Relay box	06-837320	1	1	1	1	
64	Screw grommet	06-840300	1	1	1	1	
65	Stay relay board	06-840210	1	1	1	1	
66	PC support 2	06-840280	4	4	4	4	
	PC support 5	06-840290	1	1	1	1	
67	Printed circuit board	06-855010	1	1	1	1	
68	Packin	07-359260	1	1	1	1	
69	Pan head screw 4TS12	38-114310	1	1	1	1	
70	Thermistor(Room temp.)	06-834420	1	1	1	1	
71	Snap band(130)	06-836220	1	1	1	1	
72	Code cramp(105)	06-821190	1	1	1	1	

◎Attached parts

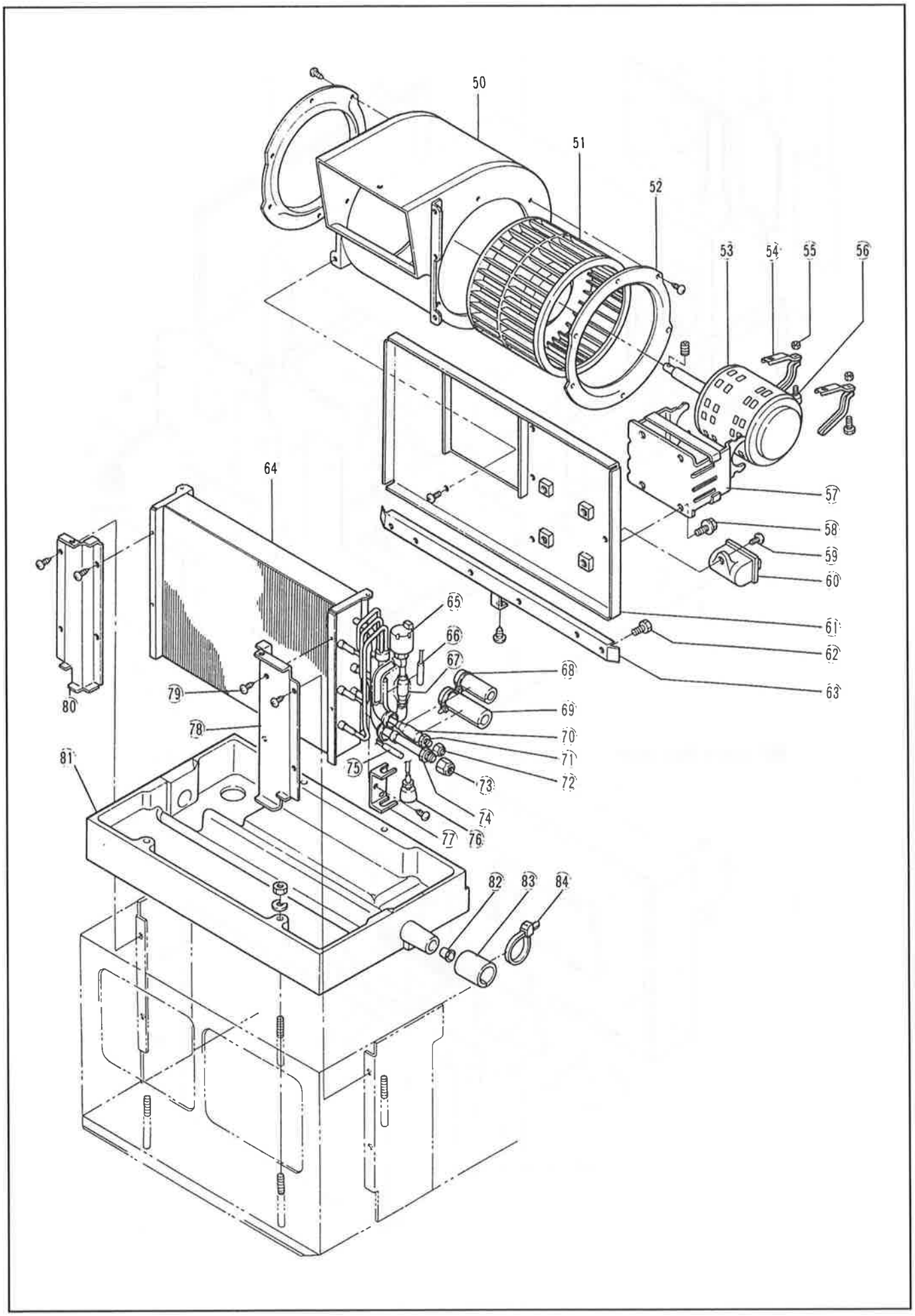
100	Installation board	42-557800	1	1	—	—	
		42-557460	—	—	1	1	
101	Hanging bracket	02-858410	1	1	1	1	
	Hexagonal 5S25	08-404960	1	1	1	1	
	Piping holder	05-838200	2	2	2	2	
	Tube banding 245	39-220060	1	1	1	1	
	Heat insulating tube(30)	05-801270	1	1	1	1	
	E"5 Screw 25 for woody board	38-190260	1	1	1	1	
	Screw 4TS12	42-558910	1	1	1	1	
	Paper pattern of installation	07-919170	1	1	—	—	
		07-919160	—	—	1	1	

5.HIDE AWAY TYPE UNIT

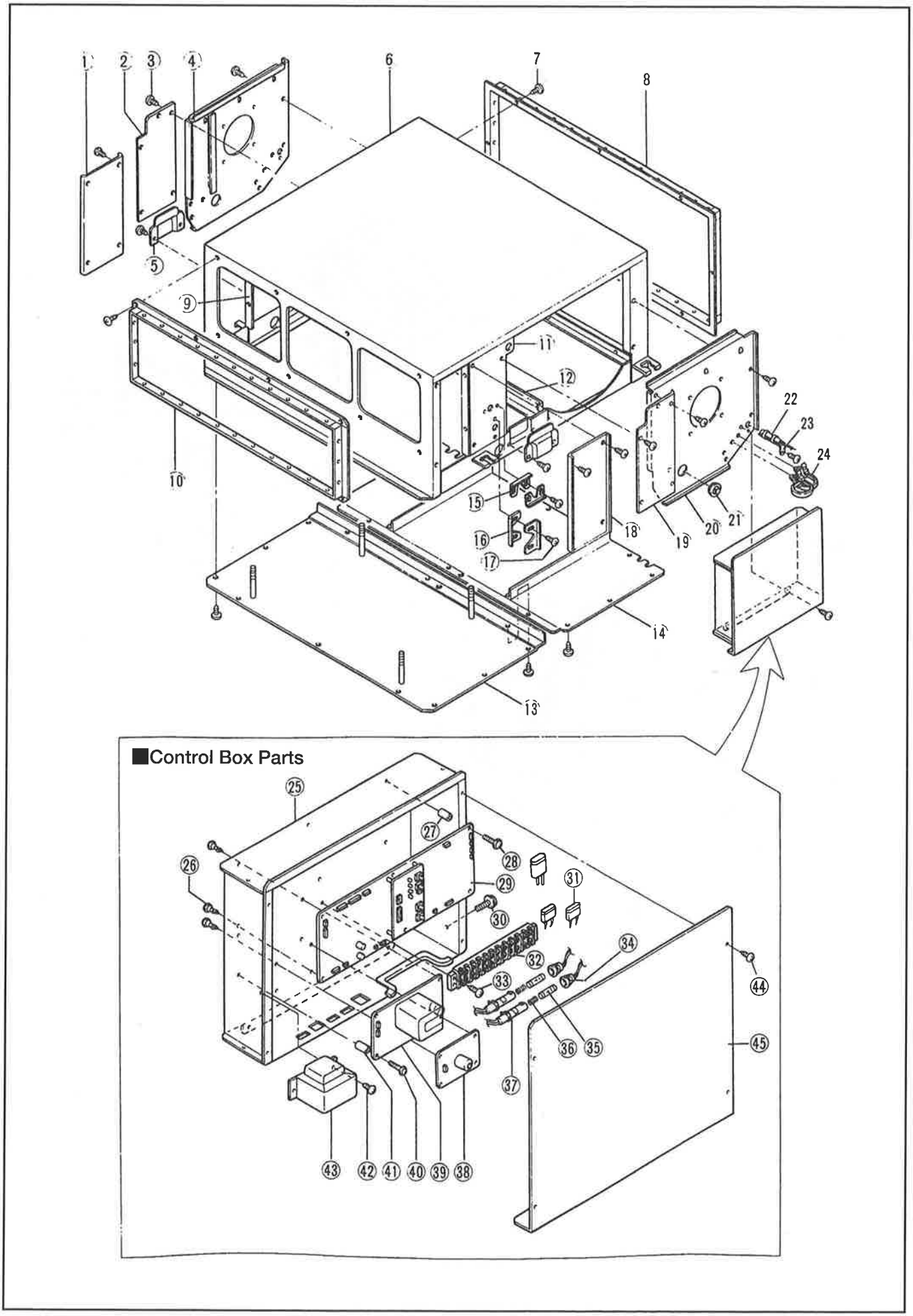
■CS-45ER51FB, CS-45ER51ER



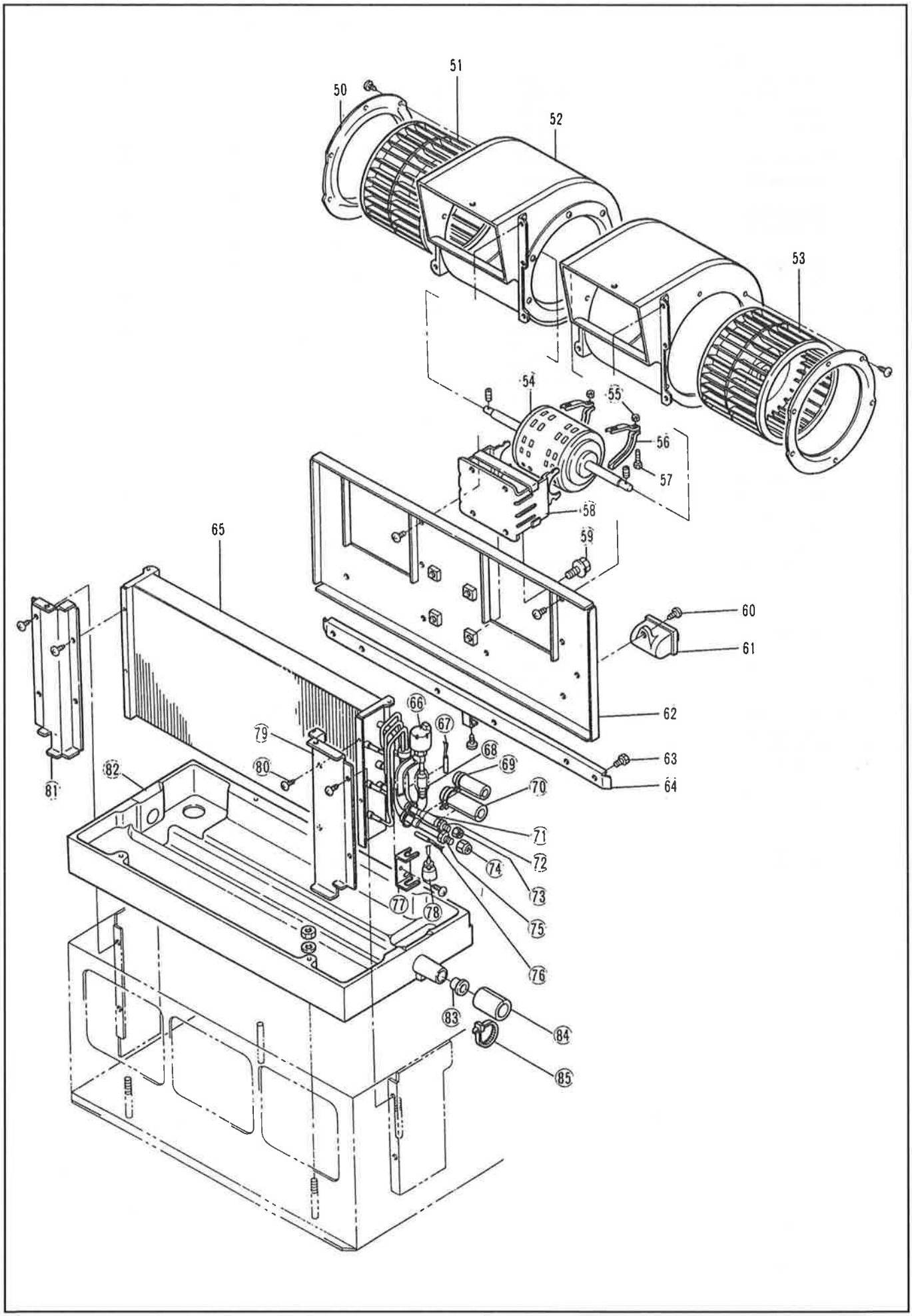
■CS-45ER51FB, CS-45ER51ER



■CS-56ER51FB, CS-56ER51ER, CS-71ER51FB, CS-71ER51ER, CS-80ER51FB, CS-80ER51ER



■CS-56ER51FB, CS-56ER51ER, CS-71ER51FB, CS-71ER51ER, CS-80ER51FB, CS-80ER51ER



CS-45ER51FB, CS-45ER51ER, CS-56ER51FB, CS-56ER51ER, CS-71ER51FB, CS-71ER51ER, CS-80ER51FB, CS-80ER51ER

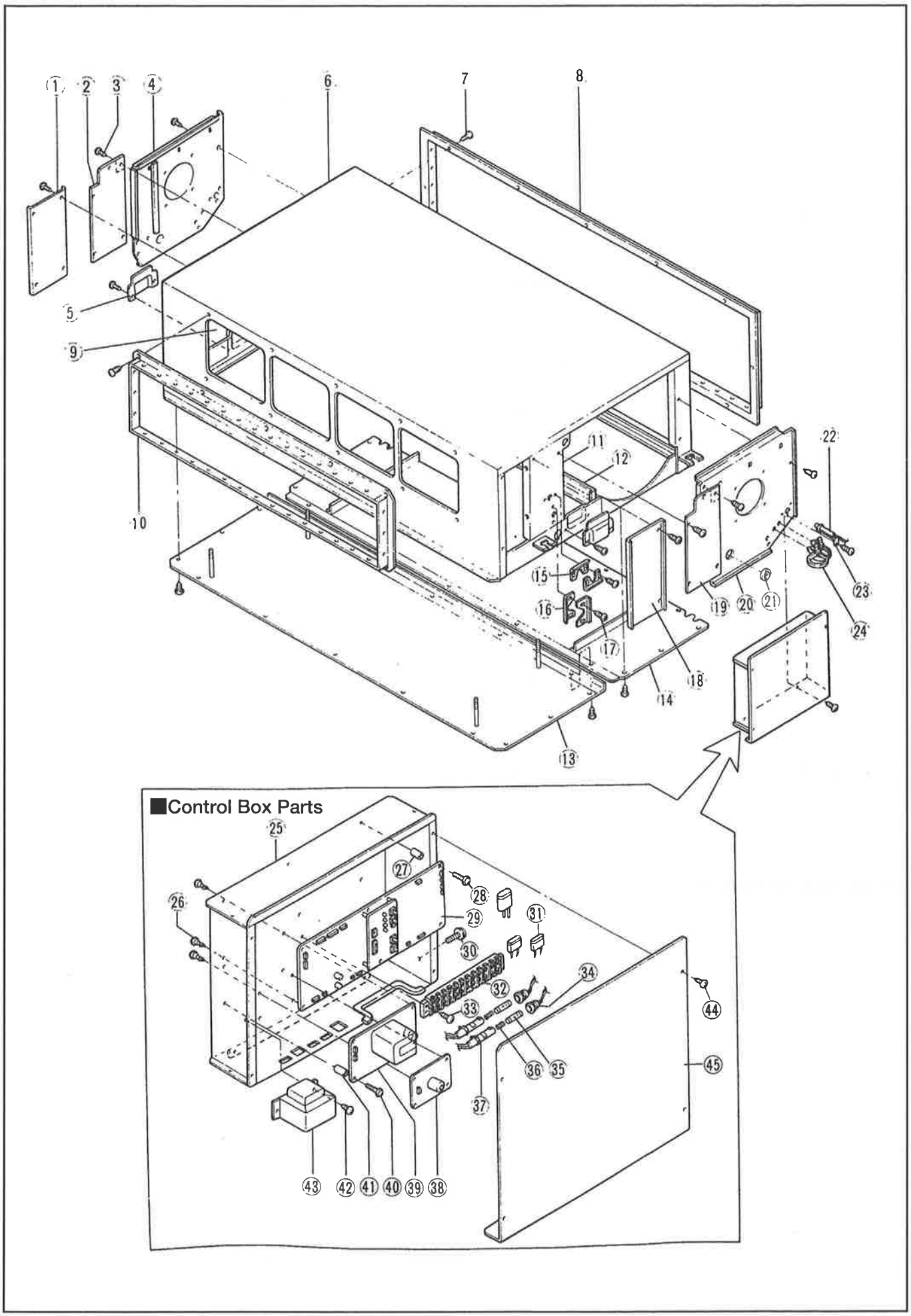
REF.NO.	PARTS NAME	PARTS NUMBER CNR	QUANTITY PER 1 UNIT				※REC PARTS
			45ER51	56ER51	71ER51	80ER51	
1	Service panel eva As	42-555720	1	1	1	1	
2	Service panel center R As	42-555640	1	1	1	1	
3	Screw 4TS8	38-114110	4	4	4	4	
4	Cover side R As	42-555630	1	1	1	1	
5	Code cramp stay	02-857080	2	2	2	2	
6	Shell As	42-556660	1	—	—	—	
		42-555600	—	1	1	1	
7	Screw 4TS12	38-114310	6	8	8	8	
8	Inlet flange AS	42-556720	1	—	—	—	
		42-555730	—	1	1	1	
9	Shell side R As	42-556160	1	1	1	1	
10	Duct flange As	42-554130	1	—	—	—	
		42-554140	—	1	1	1	
11	Shell side L As	42-556120	1	1	1	1	
12	Rail fan base bottom	02-857880	1	—	—	—	
		02-856000	—	1	1	1	
13	Panel drain pan	42-556680	1	—	—	—	
		42-555660	—	1	1	1	
14	Shell bottom As	42-556700	1	—	—	—	
		42-555670	—	1	1	1	
15	Pipe holder	05-980970	2	2	2	2	
16	Pipe holder	05-980980	2	2	2	2	
17	Screw 4TS8	38-114110	5	5	5	5	
18	Service panel eva As	42-555720	1	1	1	1	
19	Service panel center L As	42-555700	1	1	1	1	
20	Cover side L As	42-555680	1	1	1	1	
21	Rubber bush 34	08-404770	1	1	1	1	
22	Thermistor(room temp.)	06-834420	1	1	1	1	※
23	Sensor holder	06-835830	1	1	1	1	
24	Cable strap 1775	06-818980	2	2	2	2	
25	Relay box As	46-934530	1	1	1	1	
26	Locking card spacer 8	06-805290	8	8	8	8	
27	Board color	06-835140	1	1	1	1	
28	3 screw 16	38-752510	1	1	1	1	
29	P.C.board	06-854730	1	1	1	1	※
31	Spark killer	06-838310	3	3	3	3	※
32	Terminal(12P)	06-838480	1	1	1	1	
33	Screw 4TS14	38-154410	2	2	2	2	
34	Fuse case top	06-850080	1	1	1	1	
35	Fuse	06-850780	1	1	1	1	※
36	Fuse case spring	06-850090	1	1	1	1	
37	Fuse case bottom	06-850100	1	1	1	1	
38	Noise filter	06-854770	1	1	1	1	※
42	Screw 4TS6	38-114010	1	1	1	1	
43	Transformer(FB model)	06-854610	1	1	1	1	※
	Transformer(ER model)	06-854620	1	1	1	1	※
44	Screw 4TS8	38-114110	4	4	4	4	
45	Cover relay box	46-836570	1	1	1	1	
50	Inlet ring	05-837180	2	4	4	4	
51	Impeller R	05-837190	1	1	1	1	

REF.NO.	PARTS NAME	PARTS NUMBER CNR	QUANTITY PER 1 UNIT				※REC PARTS
			45ER51	56ER51	71ER51	80ER51	
52	Casing As	45-580310	1	2	2	2	
53	Impeller L	05-837200	—	1	1	1	
54	Fan motor	06-854530	1	—	—	—	※
		06-854540	—	1	—	—	※
		06-854560	—	—	1	1	※
55	nut 4	08-405710	2	2	2	2	
56	Fan motor installing plate	05-837360	1	1	1	1	
57	4 screw 20	08-405630	2	2	2	2	
58	Fan motor installing stay	05-837370	1	1	1	1	
59	Hexagonal 8 bolt 14	38-990980	4	4	4	4	
60	Screw 4TS8	38-114110	1	1	1	1	
61	Running Capacitor	06-833670	1	1	1	—	※
		06-834530	—	—	—	1	※
62	Fan base As	45-581690	1	—	—	—	
		45-580300	—	1	1	1	
63	Hexagonal 5TS12	38-190190	4	5	5	5	
64	Stay guider fan base As	02-858040	1	—	—	—	
		42-557980	—	1	1	1	
65	Evaporator As	45-581520	1	—	—	—	
		45-580250	—	1	—	—	
		45-580340	—	—	1	—	
		45-581530	—	—	—	1	
66	Eletrcic expansion valve	05-830900	1	—	—	—	※
		05-833980	—	1	1	—	※
		05-832710	—	—	—	1	※
67	Thermistor(Evaporator Inlet pipe)	46-838600	1	1	1	1	※
68	Strainer	05-837060	1	1	1	1	
69	Tube banding 197	39-220050	3	3	3	3	
70	Insulating tube 16	05-974380	2	2	2	1	
	Insulating tube 22	05-970240	—	—	—	1	
71	Strainer	05-979040	1	1	1	—	
		05-814790	—	—	—	1	
72	Union 3/8	05-399710	1	1	1	1	
73	Flare nut 3/8	38-890080	1	1	1	1	
74	Flare nut 4/8	38-890090	1	1	1	—	
	Flare nut 6/8	38-890110	—	—	—	1	
75	Union 4/8	05-962170	1	1	1	—	
	Union 6/8	05-950050	—	—	—	1	
76	Thermistor(Evaporator outlet pipe)	06-826390	1	1	1	1	※
77	Stay float switch	02-857120	1	1	1	1	
78	Float switch	46-843490	1	1	1	1	※
79	Seal panel Eva. L	02-856330	1	1	1	1	
80	Screw 4TS8	38-114110	4	4	4	4	
81	Seal panel Eva. R	02-856300	1	1	1	1	
82	Drain pan As	45-581730	1	—	—	—	
		45-580330	—	1	1	1	
83	Drain cap	02-847090	1	1	1	1	
84	Insulating tube 28	05-816760	1	1	1	1	
85	Tube banding 197	39-220050	1	1	1	1	

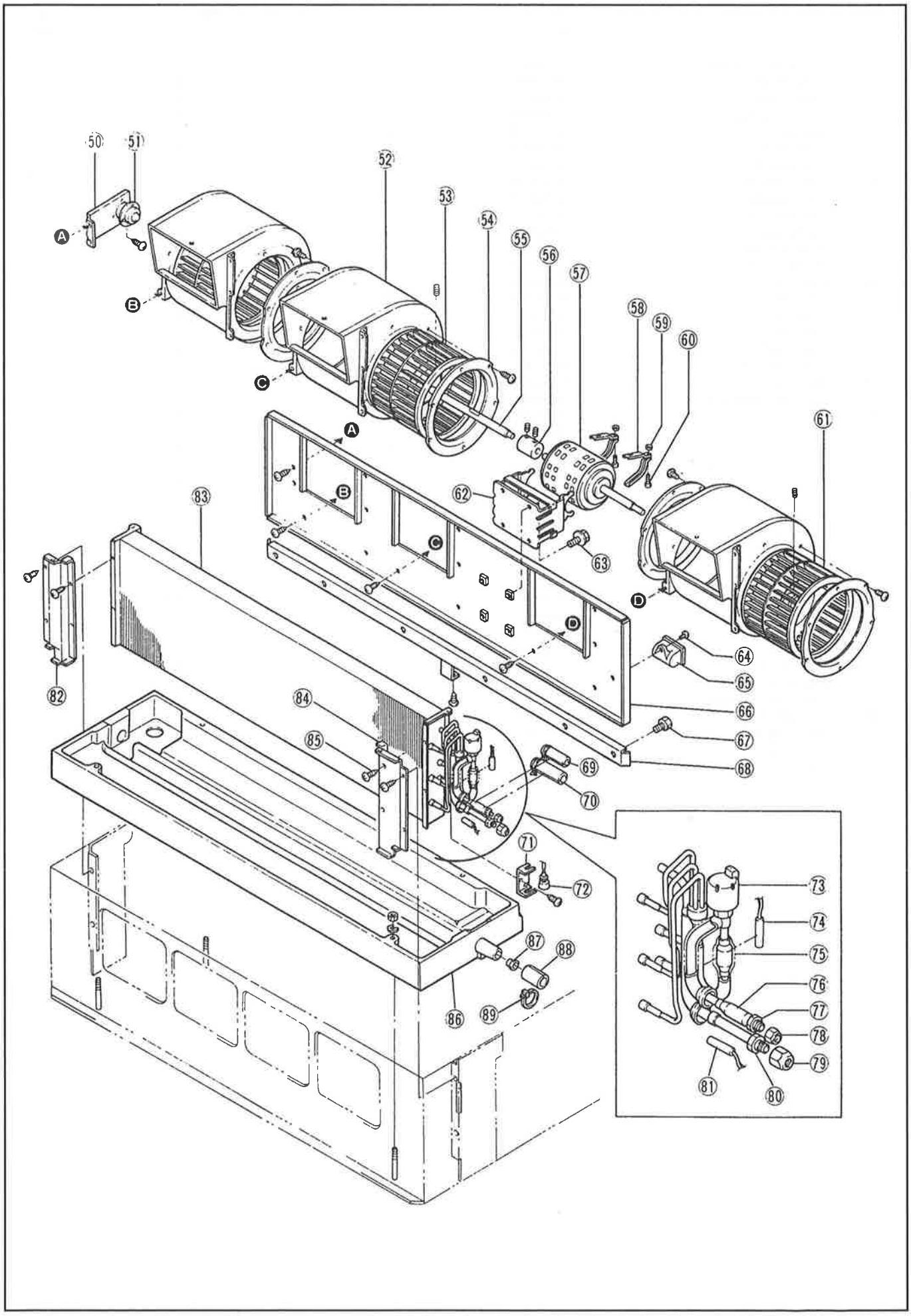
ATTACHMENT PARTS

	Crip drain	05-955910	1	1	1	1	
	Drain horse	05-809090	1	1	1	1	
	Polyethylene drain horse	02-484830	1	1	1	1	
	Insulating tube 26	05-975080	1	1	1	1	
	Insulating tube 43	05-957680	1	1	1	1	
	Tube banding 245	39-220060	2	2	2	2	
	Code cramp 114	06-460100	2	2	2	2	
	10 washer	38-490450	8	8	8	8	

■CS-112ER51FB, CS-112ER51ER, CS-140ER51FB, CS-140ER51ER



■CS-112ER51FB, CS-112ER51ER, CS-140ER51FB, CS-140ER51ER



CS-112ER51FB, CS-112ER51ER, CS-140ER51FB, CS-140ER51ER

REF.NO.	PARTS NAME	PARTS NUMBER CNR	QUANTITY PER 1 UNIT		※REC PARTS
			112ER51	140ER51	
1	Service panel eva As	42-555720	1	1	
2	Service panel center R As	42-555640	1	1	
3	Screw 4TS8	38-114110	5	5	
4	Cover side R As	42-555620	1	1	
5	Code cramp stay	02-857080	2	2	
6	Shell As	42-556650	1	1	
7	Screw 4TS12	38-114310	10	10	
8	Inlet flange AS	42-556730	1	1	
9	Shell side R As	42-556160	1	1	
10	Duct flange As	42-554150	1	1	
11	Shell side L As	42-556120	1	1	
12	Rail fan base bottom	02-857890	1	1	
13	Panel drain pan	42-556690	1	1	
14	Shell bottom As	42-556710	1	1	
15	Pipe holder	05-980970	2	2	
16	Pipe holder	05-980980	2	2	
17	Screw 4TS8	38-114110	4	4	
18	Service panel eva As	42-555720	1	1	
19	Service panel center L As	42-555700	1	1	
20	Cover side L As	42-555680	1	1	
21	Rubber bush 34	08-404770	2	2	
22	Thermistor(room temp.)	06-834420	1	1	※
23	Sensor holder	06-835830	1	1	
24	Cable strap 1775	06-818980	2	2	
25	Relay box As	46-934530	1	1	
26	Locking card spacer 8	06-805290	8	8	
27	Board color	06-835140	1	1	
28	3 screw 16	38-752510	1	1	
29	P.C.board	06-854730	1	1	※
31	Spark killer	06-838310	3	3	※
32	Terminal(12P)	06-838480	1	1	
33	Screw 4TS14	38-154410	2	2	
34	Fuse case top	06-850080	1	1	
35	Fuse	06-850780	1	1	※
36	Fuse case spring	06-850090	1	1	
37	Fuse case bottom	06-850100	1	1	
38	Noise filter	06-854770	1	1	※
42	Screw 4TS6	38-114010	1	1	
43	Transformer(FB model)	06-854610	1	1	※
	Transformer(ER model)	06-854620	1	1	※
44	Screw 4TS8	38-114110	4	4	
45	Cover relay box	06-836570	1	1	
50	Bering support As	05-837900	1	1	
51	Bering	05-399270	1	1	※

CS-112ER51FB, CS-112ER51ER, CS-140ER51FB, CS-140ER51ER

REF.NO.	PARTS NAME	PARTS NUMBER CNR	QUANTITY PER 1 UNIT		※REC PARTS
			112ER51	140ER51	
52	Casing As	45-580310	1	1	
53	Impeller R	05-838070	1	1	
54	Inlet ring	05-837180	6	6	
55	Shaft	05-839310	1	1	
56	Capling shaft	05-832750	1	1	
57	Fan motor	06-854570	1	—	※
		06-854580	—	1	※
58	Fan motor installing plate	05-839420	1	1	
59	nut 4	08-405710	1	1	
60	Screw 4TS20	08-405630	1	1	
61	Impeller L	05-838080	2	2	
62	Fan motor installing stay	05-839280	1	1	
63	Hexagonal 8 bolt 14	38-990980	4	4	
64	Screw 4TS8	38-114110	1	1	
65	Running Capacitor	06-838820	1	1	※
66	Fan base As	45-581700	1	1	
67	Hexagonal 5TS12	38-190190	6	6	
68	Stay guider fan base As	42-557990	1	1	
69	Insulating tube 16	05-974380	1	1	
70	Insulating tube 22	05-970240	1	1	
71	Stay float switch	02-827120	1	1	
72	Float switch	46-843490	1	1	※
73	Electric expansion valve	05-832720	1	—	※
		05-832730	—	1	※
74	Thermistor(Evaporator Inlet pipe)	46-838600	1	1	※
75	Strainer	05-837060	1	1	
76	Strainer	05-814790	1	1	
77	Union 3/8	05-399710	1	1	
78	Flare nut 3/8	38-890080	1	1	
79	Flare nut 6/8	38-890110	1	1	
80	Union 6/8	05-950050	1	1	
81	Thermistor(Evaporator outlet pipe)	06-826390	1	1	※
82	Seal panel Eva. R	02-856300	1	1	
83	Evaporator As	45-581540	1	—	
		45-581550	—	1	
84	Seal panle Eva. L	02-856330	1	1	
85	Screw 4TS8	38-114110	1	1	
86	Drain pan As	45-581740	1	1	
87	Drain cap	02-847090	1	1	
88	Insulating tube 28	05-816760	1	1	
89	Tube banding 197	39-220050	1	1	

ATTACHMENT PARTS

	Crip drain	05-955910	1	1	
	Drain horse	05-809090	1	1	
	Polyethylene drain horse	02-484830	1	1	
	Insulating tube 43	05-957680	1	1	
	Tube banding 245	39-220060	2	2	
	Code cramp	06-460400	2	2	
	10 washer	38-490450	8	8	

approved by Lloyd's Register Quality Assurance

(Packaged Air Conditioner Division of Matsushita Refrigeration Co., Ltd., has been certified to comply with the International Organization for Standardization's ISO-9001 standard for quality assurance.)

Packaged Air Conditioner Division of Matsushita Refrigeration Co., Ltd. has been certified to comply with the International Organization for Standardization's ISO-14001 standard for environmental management systems.

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