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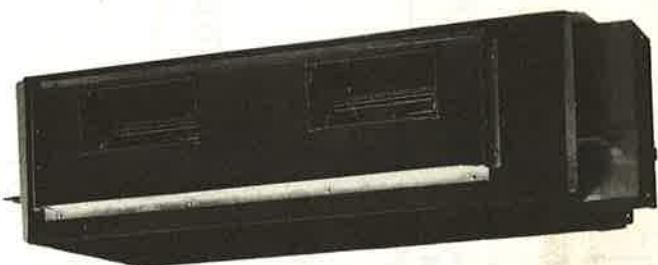
# Service Manual

PACKAGED AIR CONDITIONER  
HIDE AWAY TYPE

**Models:**

CS-71E90HP(CU-71C51HE)  
CS-71E90XP(CU-71C51XE)  
CS-80E90HP(CU-80C51HE)  
CS-80E90XP(CU-80C51XE)

CS-112E90XP(CU-112C51XE)  
CS-140E90XP(CU-140C51XE)  
CS-160E90XP(CU-160C51XE)

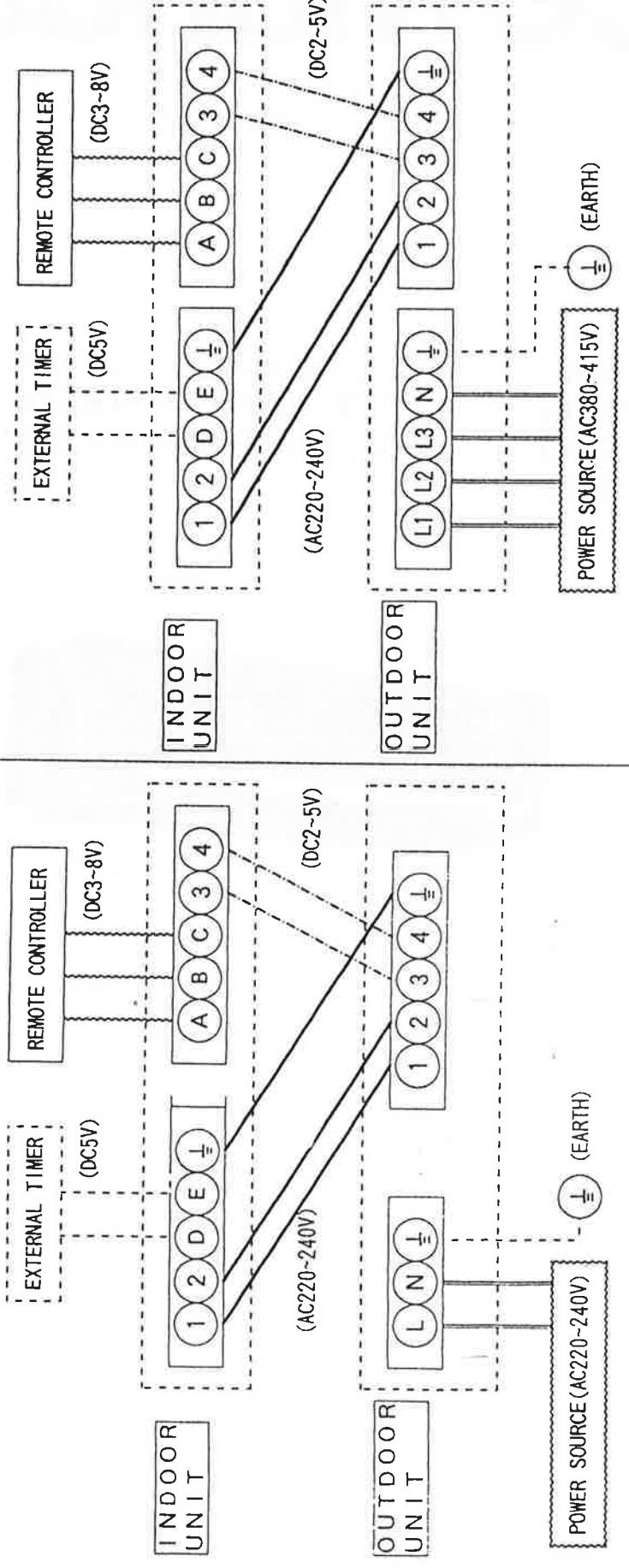


**Panasonic**

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## 1 PHASE (AC220~240V)

## 3 PHASE 4 WIRES (AC380~415V)



## CAUTION

1. There is a polarity for ③, ④ of the control wire between indoor and outdoor. Don't crossover!
2. There is a polarity for A B C of the remote controller wires! Don't crossover!
3. Don't connect ①, ② with ③, ④! Otherwise the P. C. B. in the indoor unit or the outdoor unit will short circuit.
4. This model has the control of "COMPRESSOR INITIAL DELAY START". So, compressor won't start for 3 minutes after power source is reconnected.

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# 1. SPECIFICATIONS

ITEM			MODEL	CS-71E90HP (1φ) (Indoor Unit)	CU-71C51HE (1φ) (Outdoor Unit)		
(1) Cooling Capacity		kW kcal/h BTU/h		7.00 6,000 24,000			
(2) Heating Capacity		kW kcal/h BTU/h		7.44 6,400 25,600			
Standard Air Volume		m³/min (l/s) cfm	25(420) 883		55(917) 1,942		
External Static Pressure		mmAq Pa	(Hi) 10 (Me) 7 (Lo) 5 98 69 49		—		
Air Inlet			Backward Suction		Backward Suction		
Air Outlet			Front Blow-out		Front Blow-out		
Outside Dimension(H×W×D)		mm inch	290×(1,000+100)×400 11-13/32×(39-3/8+3-15/16)×15-3/4		965×790×(320+34) 38×31-3/32×(12-19/32+1-11/32)		
Noise Level (Sound pressure level)		dB(A)	45		54		
Net Weight		kg 1bs	40 88		72 158		
Piping Connection	Refrigerant	Gas Liquid	mm(inch) mm(inch)	O.D. φ 15.88(5/8)Flared type O.D. φ 9.52(3/8)Flared type			
	Drain		inch	Female screw PT1	—		
Compressor	Type, number of set			—	Hermetic-1(Reciprocating)		
	Starting Method			—	Direct on-line starting		
	Capacity Control	%		—	0.100		
	Motor	Type		—	2-pole 3-phase induction motor		
		Input	kW	—	(Cool) 2.44 (Heat) 2.11		
		Rated Output	kW	—	1.87		
Fan	Type, number of set	unit	Sirocco fan-2		Axial-flow fan-2		
	Air Volume Control		3-Step and Auto mode(Remote Controller)		—		
	Motor	Type	4-pole S-phase induction motor		6-pole S-phase induction motor		
		Input	kW	0.20	0.14		
		Rated Output	kW	0.15	0.03×2		
Air-heat exchanger					Louver fin type		
Refrigerant Control			Capillary tube		—		
Refrigeration oil(Charged)			kg	—	CALUMET RO15 or WITCO3GS(1.63)		
Refrigerant(Charged)			lbs	R-22	(3.0) R-22(6.6)		
Running Adjustment	Control Switch		Operation Switch(Remote Controller)		—		
	Pilot Lamp		Single-color		—		
	Room Temperature control		Thermostat		—		
Anti-vibration and Anti-sound Materials			Cabinet (urethane foam attached)		Compressor (Anti-vibration rubber)		
Safety Devices			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.21°C B.D.(69.8°F D.B.)and outdoor air temp.7°C D.B.(44.6°F D.B.),6°C W.D.(42.8°F W.B.)

## ELECTRICAL DATA(240V 50Hz)

MODEL			CS-71E90HP,CU-71C51HE Condition by JIS B 8616
ITEM			
Volts	V		240
Phase			Single
Power Consumption	kW	Cool	2.78
		Heat	2.45
Running Current	A	Cool	12.76
		Heat	11.21
Starting Current	A		56.0
Power Factor	%	Cool	90.8
		Heat	91.0

\*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.

# SPECIFICATIONS

ITEM			MODEL	CS-71E90XP (Indoor Unit)	CU-71C51XE (Outdoor Unit)
(1) Cooling Capacity			kW kcal/h BTU/h	7.00 6,000 24,000	
(2) Heating Capacity			kW kcal/h BTU/h	7.44 6,400 25,600	
Standard Air Volume			m³/min( l/s) cfm	25(420) 883	55(917) 1,942
External Static Pressure			mmAq Pa	(Hi)10 (Me) 7 (Lo) 5 98 69 49	—
Air Inlet				Backward Suction	Backward Suction
Air Outlet				Front Blow-out	Front Blow-out
Outside Dimension(H×W×D)			mm inch	290×(1,000+100)×400 11-13/32×(39-3/8+3-15/16)×15-3/4	965×790×(320+34) 38×31-3/32×(12-19/32+1-11/32)
Noise Level (Sound pressure level)			dB(A)	45	54
Net Weight			kg 1bs	40 88	72 158
Piping Connection	Refrigerant	Gas Liquid	mm(inch) mm(inch)	O.D. φ 15.88(5/8)Flared type O.D. φ 9.52(3/8)Flared type	
	Drain		inch	Female screw PT1	—
Compressor	Type, number of set			—	Hermetic-1(Reciprocating)
	Starting Method			—	Direct on-line starting
	Capacity Control	%		—	0.100
	Motor	Type		—	2-pole 3-phase induction motor
		Input	kW	—	(Cool) 2.38 (Heat) 2.08
		Rated Output	kW	—	1.87
Fan	Type, number of set	unit		Sirocco fan-2	Axial-flow fan-2
	Air Volume Control			3-Step and Auto mode(Remote Controller)	—
	Motor	Type		4-pole S-phase induction motor	6-pole S-phase induction motor
		Input	kW	0.20	0.14
		Rated Output	kW	0.15	0.03×2
Air-heat exchanger					Louver fin type
Refrigerant Control				Capillary tube	—
Refrigeration oil(Charged)		l		—	CALUMET RO15 or WITCO3GS(1.63)
Refrigerant(Charged)		kg lbs		R-22	(3.0) R-22(6.6)
Running Adjustment	Control Switch			Operation Switch(Remote Controller)	—
	Pilot Lamp			Single-color	—
	Room Temperature control			Thermostat	—
Anti-vibration and Anti-sound Materials				Cabinet (urethane foam attached)	Compressor (Anti-vibration rubber)
Safety Devices				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.21°C D.B.(69.8°F D.B.)and outdoor air temp.7°C D.B.(44.6°F D.B.),6°C W.D.(42.8°F W.B.)

## ELECTRICAL DATA(415V 50Hz)

ITEM			MODEL	CS-71E90XP,CU-71C51XE Condition by JIS B 8616
Volts	V			415
Phase				3N
Power Consumption	kW	Cool		2.72
		Heat		2.42
Running Current	A	Cool		4.64
		Heat		4.12
Starting Current	A			22.0
Power Factor	%	Cool		81.6
		Heat		81.7

\*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.

# SPECIFICATIONS

ITEM			MODEL	CS-80E90HP (1φ) (Indoor Unit)	CU-80C51HE (1φ) (Outdoor Unit)
(1) Cooling Capacity		kW kcal/h BTU/h		7.80 6,700 26,800	
(2) Heating Capacity		kW kcal/h BTU/h		8.26 7,100 28,400	
Standard Air Volume		m³/min(ℓ/s) cfm	30(500) 1,060		55(917) 1,942
External Static Pressure		mmAq Pa	(Hi)10 (Me) 7 (Lo) 5 98 69 49		
Air Inlet			Backward Suction		Backward Suction
Air Outlet			Front Blow-out		Front Blow-out
Outside Dimension(H×W×D)		mm inch	290×(1,000+100)×400 11-13/32×(39-3/8+3-15/16)×15-3/4		965×790×(320+34) 38×31-3/32×(12-19/32+1-11/32)
Noise Level (Sound pressure level)		dB(A)	45		54
Net Weight		kg 1bs	40 88		79 174
Piping Connection	Refrigerant	Gas Liquid	mm(inch) mm(inch)	O.D. φ 15.88(5/8)Flared type O.D. φ 9.52(3/8)Flared type	
	Drain	inch	Female screw PT1		—
Compressor	Type, number of set			—	Hermetic-1(Reciprocating)
	Starting Method			—	Direct on-line starting
	Capacity Control	%		—	0.100
	Motor	Type		—	2-pole 3-phase induction motor
		Input	kW	—	(Cool) 2.54 (Heat) 2.21
		Rated Output	kW	—	2.05
Fan	Type, number of set	unit	Sirocco fan-2		Axial-flow fan-2
	Air Volume Control		3-Step and Auto mode(Remote Controller)		—
	Motor	Type	4-pole S- phase induction motor		6-pole S-phase induction motor
		Input	kW	0.20	0.14
		Rated Output	kW	0.15	0.03×2
Air-heat exchanger					Louver fin type
Refrigerant Control			Capillary tube		—
Refrigeration oil(Charged)		ℓ	—	CALUMET RO15 or WITCO3GS(1.63)	
Refrigerant(Charged)		kg lbs	R-22		(3.2) R-22(7.1)
Running Adjustment	Control Switch		Operation Switch(Remote Controller)		—
	Pilot Lamp		Single-color		—
	Room Temperature control		Thermostat		—
Anti-vibration and Anti-sound Metarials			Cabinet (urethane foam attached)	Compressor (Anti-vibration rubber)	
Safety Devices			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.21°C D.B.(69.8°F D.B.)and outdoor air temp.7°C D.B.(44.6°F D.B.),6°C W.D.(42.8°F W.B.)

## ELECTRICAL DATA(240V 50Hz)

MODEL			CS-80E90HP,CU-80C51HE Condition by JIS B 8616
ITEM	V		240
Volts			Single
Power Consumption	kW	Cool	2.88
		Heat	2.55
Running Current	A	Cool	13.41
		Heat	11.89
Starting Current	A		59.0
Power Factor	%	Cool	89.5
		Heat	89.4

\*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.

# SPECIFICATIONS

ITEM			MODEL	CS-80E90XP (Indoor Unit)	CU-80C51XE (Outdoor Unit)
(1) Cooling Capacity		kW kcal/h BTU/h		7.80 6,700 26,800	
(2) Heating Capacity		kW kcal/h BTU/h		8.26 7,100 28,400	
Standard Air Volume		m³/min( l /s) cfm	30(500) 1,060		55(917) 1,942
External Static Pressure		mmAq Pa	(Hi)10 (Me) 7 (Lo) 5 98 69 49		—
Air Inlet			Backward Suction		Backward Suction
Air Outlet			Front Blow-out		Front Blow-out
Outside Dimension(H×W×D)		mm inch	290×(1,000+100)×400 11-13/32×(39-3/8+3-15/16)×15-3/4		965×790×(320+34) 38×31-3/32×(12-19/32+1-11/32)
Noise Level (Sound pressure level)		dB(A)	45		54
Net Weight		kg 1bs	40 88		79 174
Piping Connection	Refrigerant	Gas Liquid	mm(inch) mm(inch)	O.D. φ 15.88(5/8)Flared type O.D. φ 9.52(3/8)Flared type	
	Drain		inch	Female screw PT1	—
Compressor	Type, number of set			—	Hermetic-1(Reciprocating)
	Starting Method			—	Direct on-line starting
	Capacity Control	%		—	0.100
	Motor	Type		—	2-pole 3-phase induction motor
		Input	kW	—	(Cool) 2.60 (Heat) 2.27
		Rated Output	kW	—	2.05
Fan	Type, number of set		unit	Sirocco fan-2	Axial-flow fan-2
	Air Volume Control			3-Step and Auto mode(Remote Controller)	—
	Motor	Type		4-pole S- phase induction motor	6-pole S-phase induction motor
		Input	kW	0.20	0.14
		Rated Output	kW	0.15	0.03×2
Air-heat exchanger					Louver fin type
Refrigerant Control				Capillary tube	—
Refrigeration oil(Charged)		ℓ		—	CALUMET RO15 or WITC03GS(1.63)
Refrigerant(Charged)		kg lbs		R-22	(3.2) R-22(7.1)
Running Adjustment	Control Switch			Operation Switch(Remote Controller)	—
	Pilot Lamp			Single-color	—
	Room Temperature control			Thermostat	—
Anti-vibration and Anti-sound Materials				Cabinet (urethane foam attached)	Compressor (Anti-vibration rubber)
Safety Devices				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.21°C D.B.(69.8° F D.B.)and outdoor air temp.7°C D.B.(44.6° F D.B.),6°C W.D.(42.8° F W.B.)

## ELECTRICAL DATA(415V 50Hz)

ITEM			MODEL	CS-80E90XP,CU-80C51XE Condition by JIS B 8616
Volts	V			415
Phase				3N
Power Consumption	kW	Cool		2.94
		Heat		2.61
Running Current	A	Cool		4.66
		Heat		4.13
Starting Current	A			26.0
Power Factor	%	Cool		87.8
		Heat		87.9

\*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.

# SPECIFICATIONS

ITEM			MODEL	CS-112E90XP (Indoor Unit)	CU-112C51XE (Outdoor Unit)		
(1) Cooling Capacity			kW kcal/h BTU/h	10.45 9,000 36,000			
(2) Heating Capacity			kW kcal/h BTU/h	11.15 9,600 38,400			
Standard Air Volume			m³/min(ℓ/s) clm	42(700) 1,483	75(1,250) 2,648		
External Static Pressure			mmAq Pa	(Hi) 15 (Me) 10 (Lo) 5 147 98 49	—		
Air Inlet				Backward Suction	Backward Suction		
Air Outlet				Front Blow-out	Front Blow-out		
Outside Dimension(H×W×D)			mm inch	430×(1,000+100)×650 16-15/16×(39-3/8+3-15/16)×25-19/32	1,065×880×(370+32) 41×15/16×34-21/32×(14-9/16+1-1/4)		
Noise Level (Sound pressure level)			dB(A)	47	56		
Net Weight			kg 1bs	56 123	96 211		
Piping Connection	Refrigerant	Gas Liquid	mm(inch) mm(inch)	O.D. φ 19.05(3/4)Flared type O.D. φ 9.52(3/8)Flared type			
	Drain		inch	Female screw PT1	—		
Compressor	Type, number of set			—	Hermetic-1(Reciprocating)		
	Starting Method			—	Direct on-line starting		
	Capacity Control	%		—	0.100		
	Motor	Type		—	2-pole 3-phase induction motor		
		Input	kW	—	(Cool) 3.71 (Heat) 3.03		
		Rated Output	kW	—	2.61		
Fan	Type, number of set	unit		Sirocco fan-2	Axial-flow fan-2		
	Air Volume Control			3-Step and Auto mode(Remote Controller)	—		
	Motor	Type		4-pole S-phase induction motor	6-pole S-phase induction motor		
		Input	kW	0.40	0.22		
		Rated Output	kW	0.25	0.07×2		
Air-heat exchanger					Louver fin type		
Refrigerant Control				Capillary tube	—		
Refrigeration oil(Charged)			ℓ	—	CALUMET RO15 or WITCO3GS(1.63)		
Refrigerant(Charged)			kg lbs	R-22	(4.1) R-22(9.0)		
Running Adjustment	Control Switch			Operation Switch(Remote Controller)	—		
	Pilot Lamp			Single-color	—		
	Room Temperature control			Thermostat	—		
Anti-vibration and Anti-sound Materials				Cabinet (urethane foam attached)	Compressor (Anti-vibration rubber)		
Safety Devices				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 F.D.B.),19.0°C W.D.(66.2°F F.W.B.)and outdoor air temp.35°C D.B.(95°F F.D.B.),24°C W.D.(75.2°F F.W.B.)

(2). Heating capacities are based on indoor temp.21°C D.B.(69.8°F F.D.B.)and outdoor air temp.7°C D.B.(44.6°F F.D.B.),6°C W.D.(42.8°F F.W.B.)

## ELECTRICAL DATA(415V 50Hz)

MODEL			CS-112E90XP,CU-112C51XE Condition by JIS B 8616
ITEM	V		415
Volts			3N
Phase			
Power Consumption	kW	Cool	4.33
		Heat	3.65
Running Current	A	Cool	7.44
		Heat	6.39
Starting Current	A		40.0
Power Factor	%	Cool	81.0
		Heat	79.5

\*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.

# SPECIFICATIONS

ITEM			MODEL	CS-140E90XP (Indoor Unit)	CU-140C51XE (Outdoor Unit)		
(1) Cooling Capacity			kW kcal/h BTU/h	13.00 11,200 44,800			
(2) Heating Capacity			kW kcal/h BTU/h	14.15 12,200 48,800			
Standard Air Volume		m³/min( l/s) cfm	50(830) 1,765	85(1,417) 3,001			
External Static Pressure		mmAq Pa	(Hi) 15 (Me)10 (Lo) 5 147 98 49				
Air Inlet				Backward Suction	Backward Suction		
Air Outlet				Front Blow-out	Front Blow-out		
Outside Dimension(H×W×D)		mm inch	430×(1,000+100)×650 16-15/16×(39-3/8+3-15/16)×25-19/32	1,065×1,000×370+32 45×15/16×39-3/8×(14-9/16+1-1/4)			
Noise Level (Sound pressure level)		dB(A)	50		(56)		
Net Weight		kg lbs	57 125		110 242		
Piping Connection	Refrigerant	Gas Liquid	mm(inch) mm(inch)	O.D. φ 19.05(3/4)Flared type O.D. φ 12.70(1/2)Flared type			
	Drain		inch	Female screw PT1	—		
Compressor	Type, number of set			—	Hermetic-1(Reciprocating)		
	Starting Method			—	Direct on-line starting		
	Capacity Control	%		—	0.100		
	Motor	Type		—	2-pole 3-phase induction motor		
		Input	kW	—	(Coil)4.74 (Heat)3.98 <400V>		
		Rated Output	kW	—	3.75		
Fan	Type, number of set	unit	Sirocco fan-2		Axial-flow fan-2		
	Air Volume Control		3-Step and Auto mode(Remote Controller)		—		
	Motor	Type	4-pole S-phase induction motor		6-pole S-phase induction motor		
		Input	kW	0.55	0.22		
		Rated Output	kW	0.35	0.07×2		
Air-heat exchanger					Louver fin type		
Refrigerant Control			Capillary tube		—		
Refrigeration oil(Charged)			l	—	CALUMET RO15 or WITC03GS(2.07)		
Refrigerant(Charged)			kg lbs	R-22	(4.3) R-22(9.5)		
Running Adjustment	Control Switch		Operation Switch(Remote Controller)		—		
	Pilot Lamp		Single-color		—		
	Room Temperature control		Thermostat		—		
Anti-vibration and Anti-sound Metarials			Cabinet (urethane foam attached)		Compressor (Anti-vibration rubber)		
Safety Devices			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.21°C D.B.(69.8°F D.B.)and outdoor air temp.7°C D.B.(44.6°F D.B.),6°C W.D.(42.8°F W.B.)

## ELECTRICAL DATA(415V 50Hz)

ITEM			MODEL	CS-140E90XP,CU-140C51XE Condition by JIS B 8616
Volts	V			415
Phase				3N
Power Consumption	kW	Cool		5.51
		Heat		4.75
Running Current	A	Cool		8.65
		Heat		7.45
Starting Current	A			50.0
Power Factor	%	Cool		88.6
		Heat		88.7

\*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.

# SPECIFICATIONS

ITEM			MODEL	CS-160E90XP (Indoor Unit)	CU-160C51XE (Outdoor Unit)		
(1) Cooling Capacity			kW kcal/h BTU/h	14.50 12,500 50,000			
(2) Heating Capacity			kW kcal/h BTU/h	15.70 13,500 54,000			
Standard Air Volume		m³/min (l/s) cfm	63(1,050) 2,224		95(1,583) 3,355		
External Static Pressure		mmAq Pa	(Hi) 15 (Me)10 (Lo) 5 147 98 49		—		
Air Inlet			Backward Suction		Backward Suction		
Air Outlet			Front Blow-out		Front Blow-out		
Outside Dimension(H×W×D)		mm inch	430×(1,000+100)×650 16-15/16×(39-3/8+3-15/16)×25-19/32		1,065×1,000×(370+32) 41×15/16×39-3/8×(14-9/16+1-1/4)		
Noise Level (Sound pressure level)		dB(A)	52		58		
Net Weight		kg 1bs	60 132		108 238		
Piping Connection	Refrigerant	Gas Liquid	mm(inch) mm(inch)	O.D. φ 19.05(3/4)Flared type O.D. φ 12.70(1/2)Flared type			
	Drain	inch	Female screw PT1		—		
Compressor	Type, number of set			—	Hermetic-1(Scroll)		
	Starting Method			—	Direct on-line starting		
	Capacity Control	%		—	0.100		
	Motor	Type		—	2-pole 3-phase induction motor		
		Input	kW	—	(Cool) 5.12 (Heat) 4.05		
		Rated Output	kW	—	4.1		
Fan	Type, number of set	unit	Sirocco fan-2		Axial-flow fan-2		
	Air Volume Control		3-Step and Auto mode(Remote Controller)		—		
	Motor	Type	4-pole S-phase induction motor		6-pole S-phase induction motor		
		Input	kW	0.71	0.27		
		Rated Output	kW	0.45	0.08×2		
Air-heat exchanger					Louver fin type		
Refrigerant Control			Capillary tube		Capillary tube		
Refrigeration oil(Charged)			ℓ	—	SONTEX200LT(1.77)		
Refrigerant(Charged)			kg lbs	R-22	(4.5) R-22(9.9)		
Running Adjustment	Control Switch		Operation Switch(Remote Controller)		—		
	Pilot Lamp		Single-color		—		
	Room Temperature control		Thermostat		—		
Anti-vibration and Anti-sound Materials			Cabinet (urethane foam attached)		Compressor (Anti-vibration rubber)		
Safety Devices			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.21°C D.B.(69.8°F D.B.)and outdoor air temp.7°C D.B.(44.6°F D.B.),6°C W.D.(42.8°F W.B.)

## ELECTRICAL DATA(415V 50Hz)

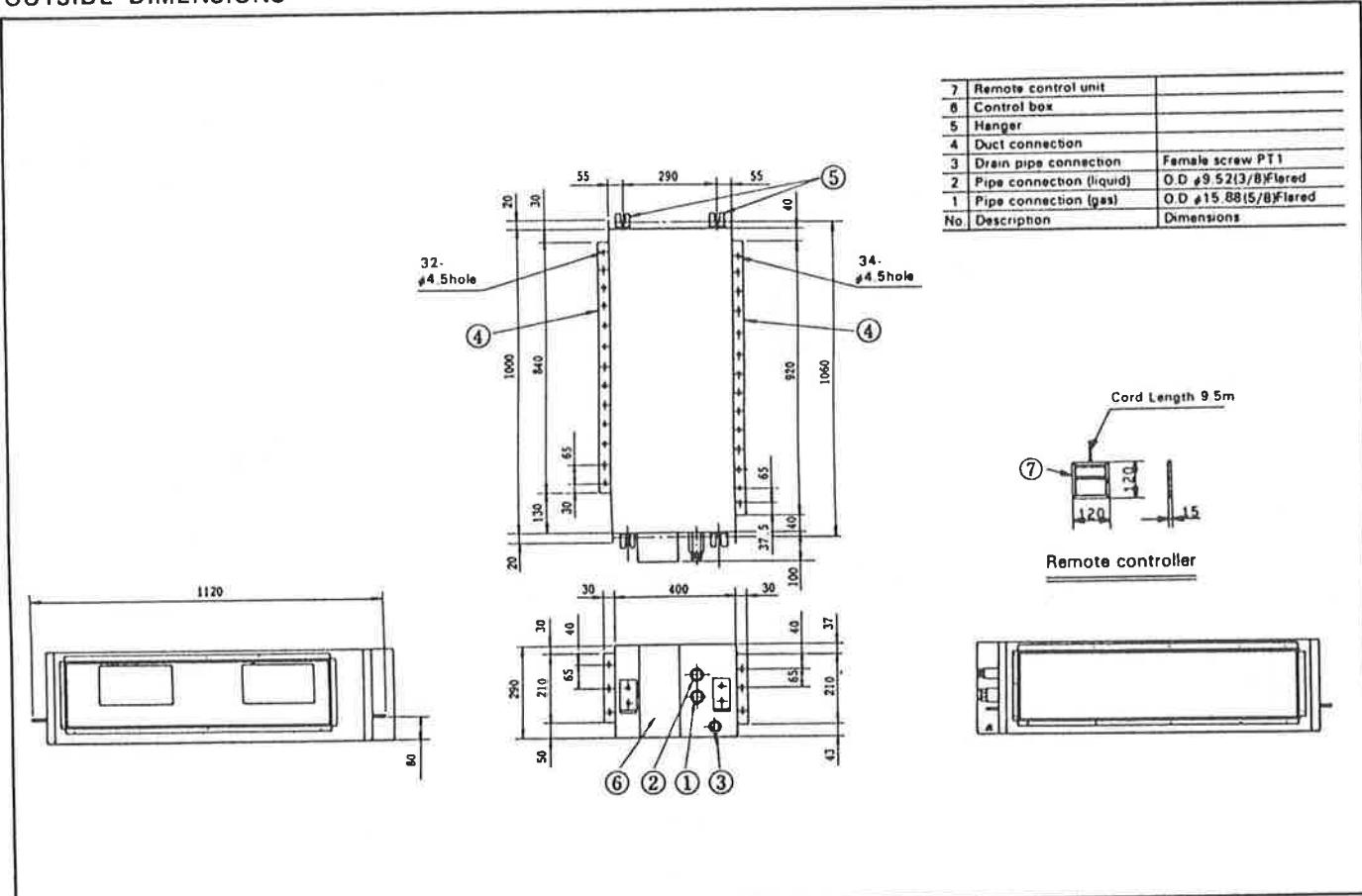
ITEM			MODEL	CS-160E90XP,CU-160C51XE Condition by JIS B 8616
Volts	V			415
Phase				3N
Power Consumption	kW	Cool		6.10
		Heat		5.03
Running Current	A	Cool		10.41
		Heat		8.55
Starting Current	A			55.0
Power Factor	%	Cool		81.5
		Heat		81.8

\*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.

## 2. TECHNICAL DRAWING

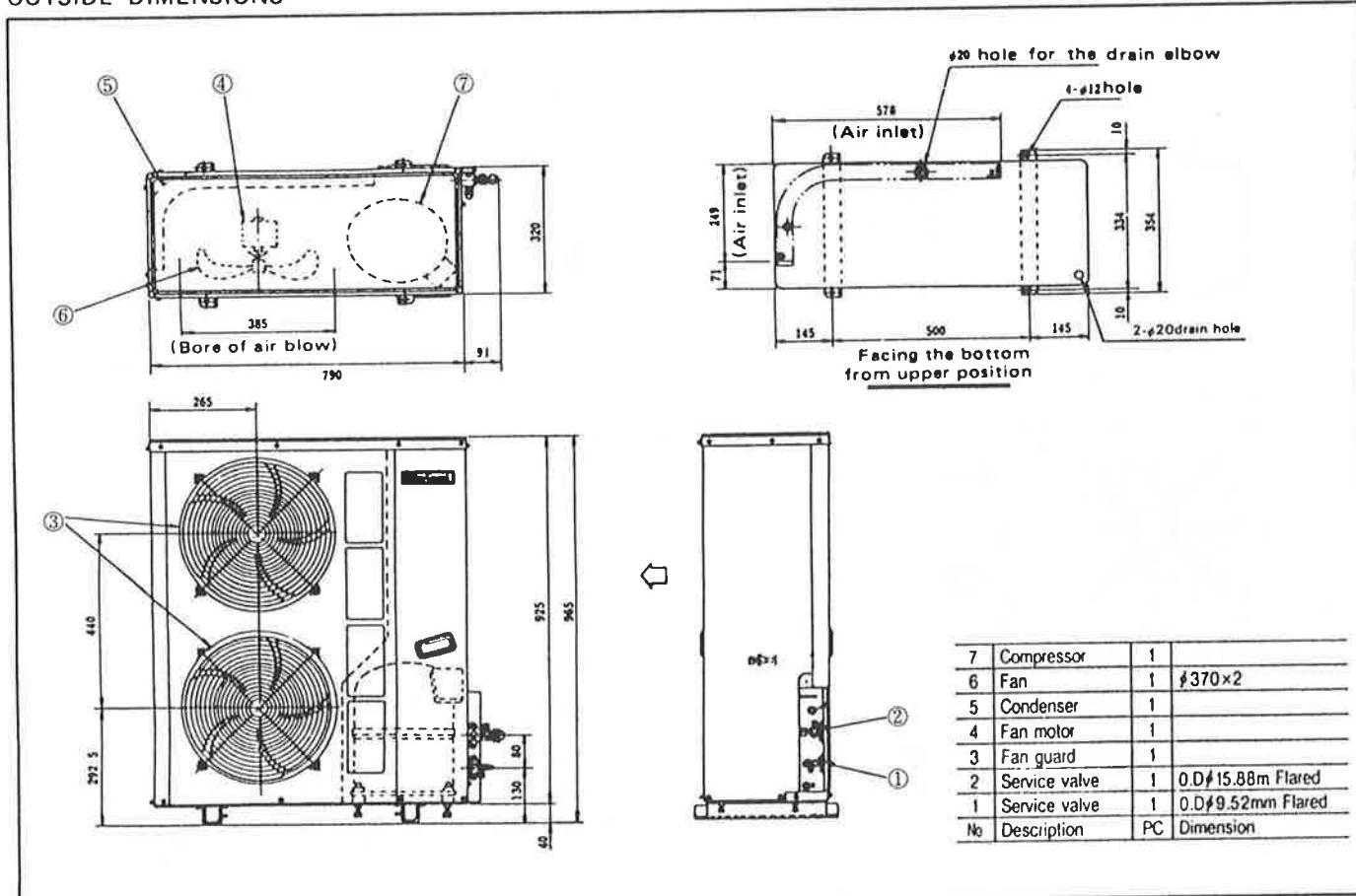
CS-71E90HP, 71E90XP, 80E90HP, 80E90XP

### OUTSIDE DIMENSIONS



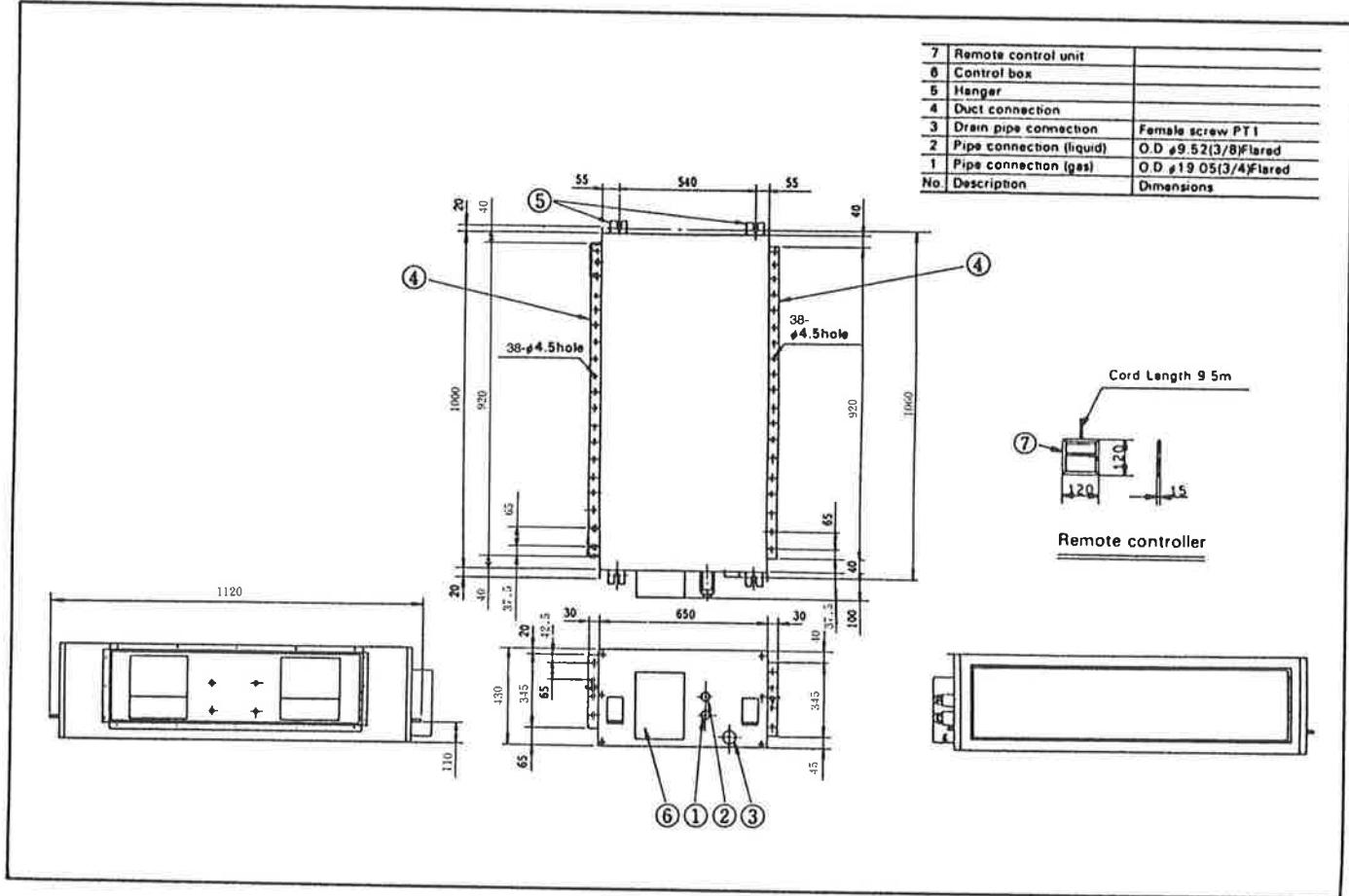
CU-71C51HE, 71C51XE, 80C51HE, 80C51XE

### OUTSIDE DIMENSIONS

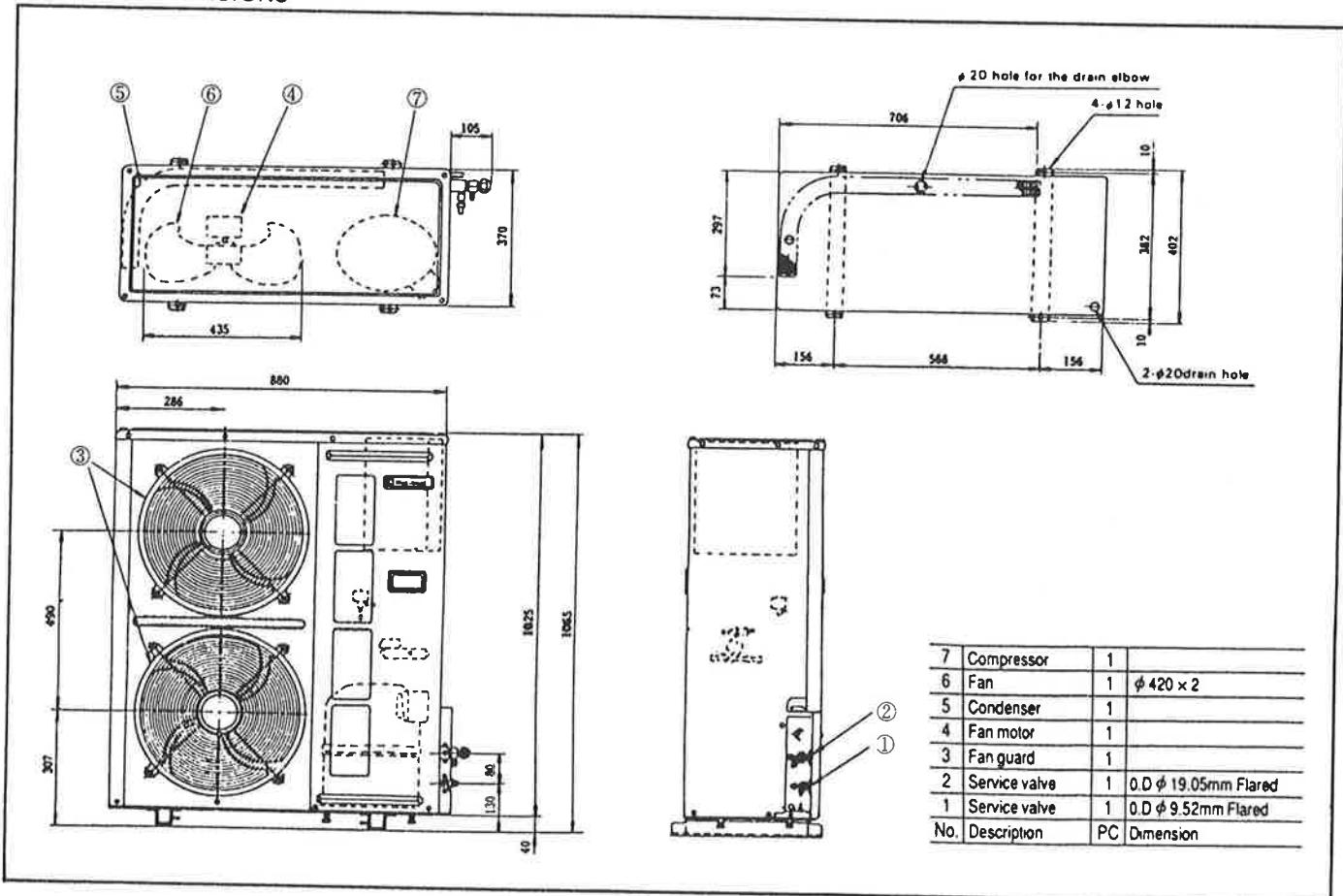


# **TECHNICAL DRAWING**

**CS-112E90XP**  
**OUTSIDE DIMENSIONS**

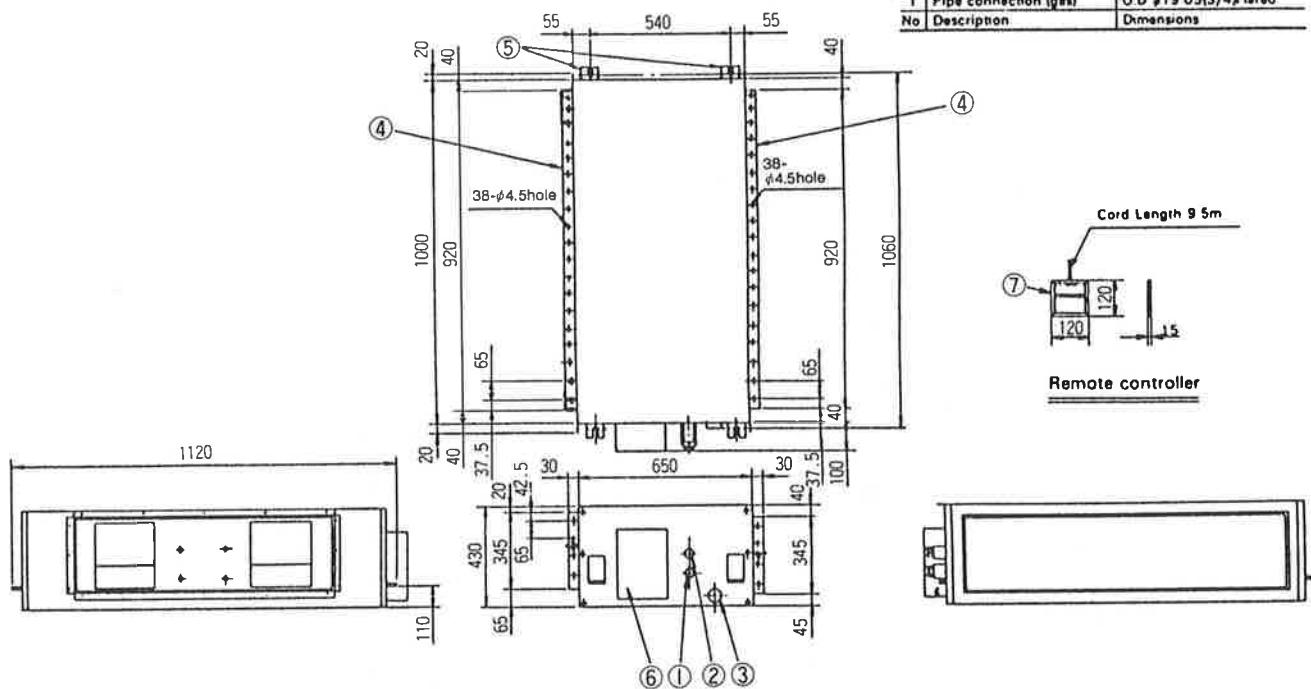


**CU-112C51XE**  
**OUTSIDE DIMENSIONS**

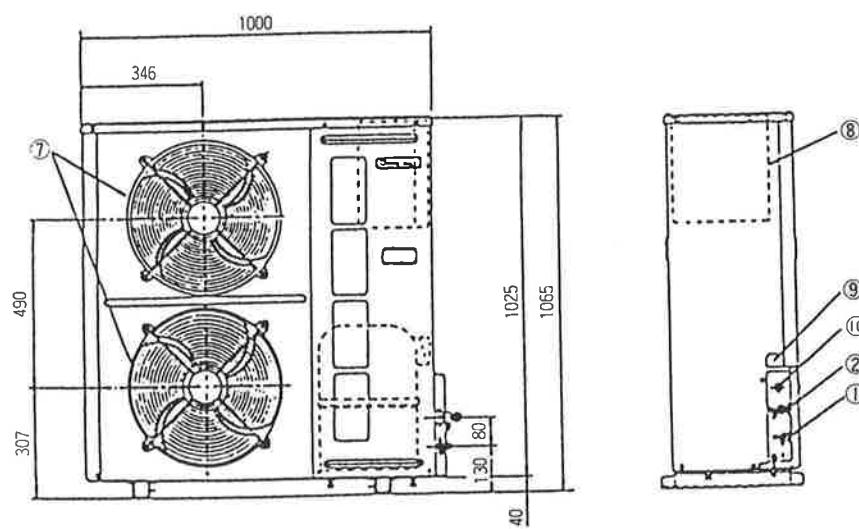
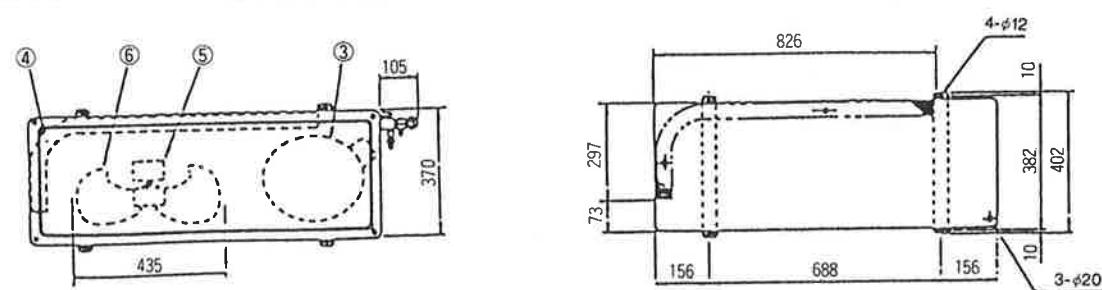


CS-140E90XP, 160E90XP  
OUTSIDE DIMENSIONS

No	Description	Dimensions
7	Remote control unit	
6	Control box	
5	Hanger	
4	Duct connection	
3	Drain pipe connection	Female screw PT1
2	Pipe connection (liquid)	O.D. $\varnothing$ 12.7(1/2) Flared
1	Pipe connection (gas)	O.D. $\varnothing$ 19.05(3/4) Flared
No	Description	Dimensions



CU-140C51XE, 160C51XE  
OUTSIDE DIMENSIONS

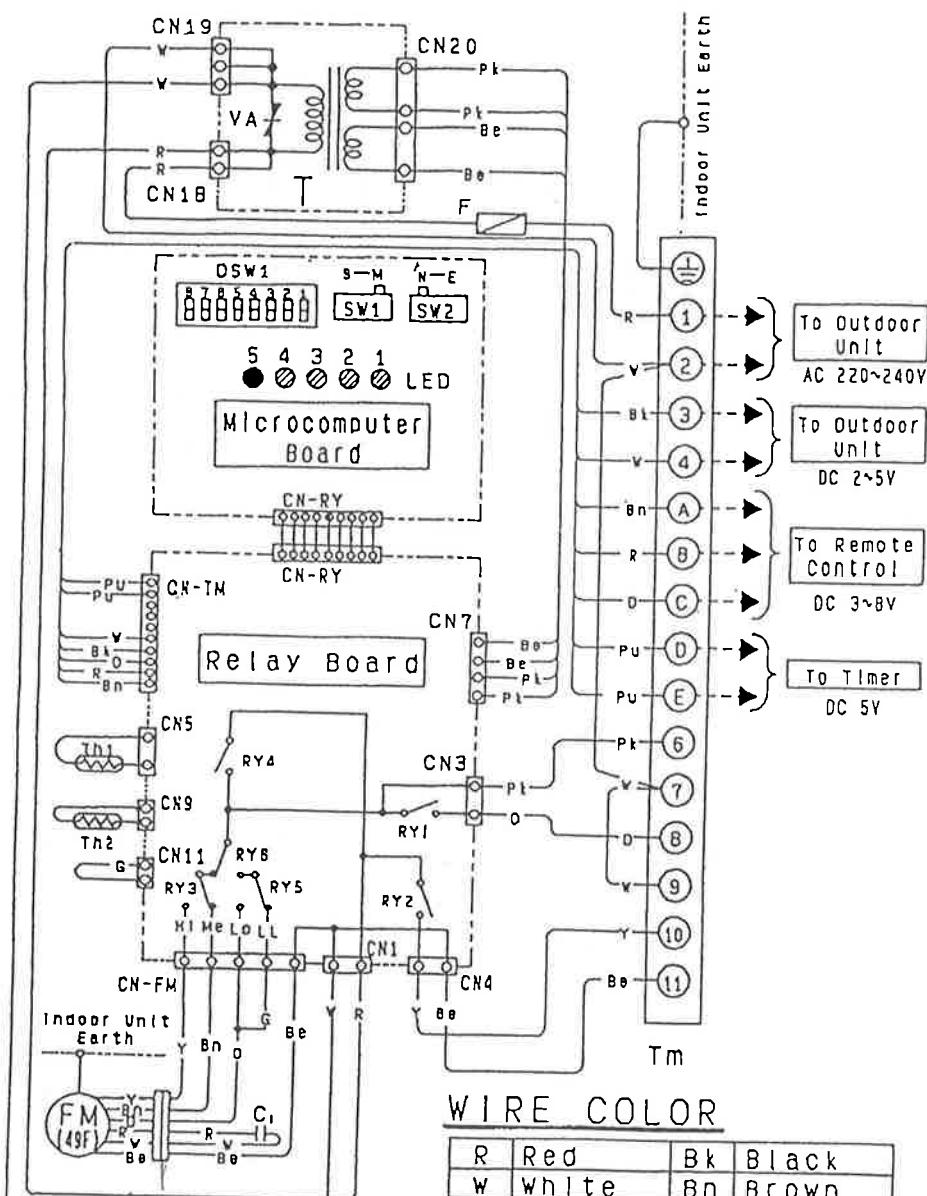


No	Description	Dimensions
10	Wiring connection	
9	Wiring connection	
8	Control box	
7	Fan guard	
6	Fan	
5	Fan motor	
4	Condenser	
3	Compressor	
2	Ball valve	O.D. $\varnothing$ 19.05
1	Serrice valve	O.D. $\varnothing$ 12.7
No	Description	Dimensions

### 3. CIRCUIT DIAGRAM

CS-71E90HP, CS-80E90HP

#### CONNECTION DIAGRAM (Indoor Unit)



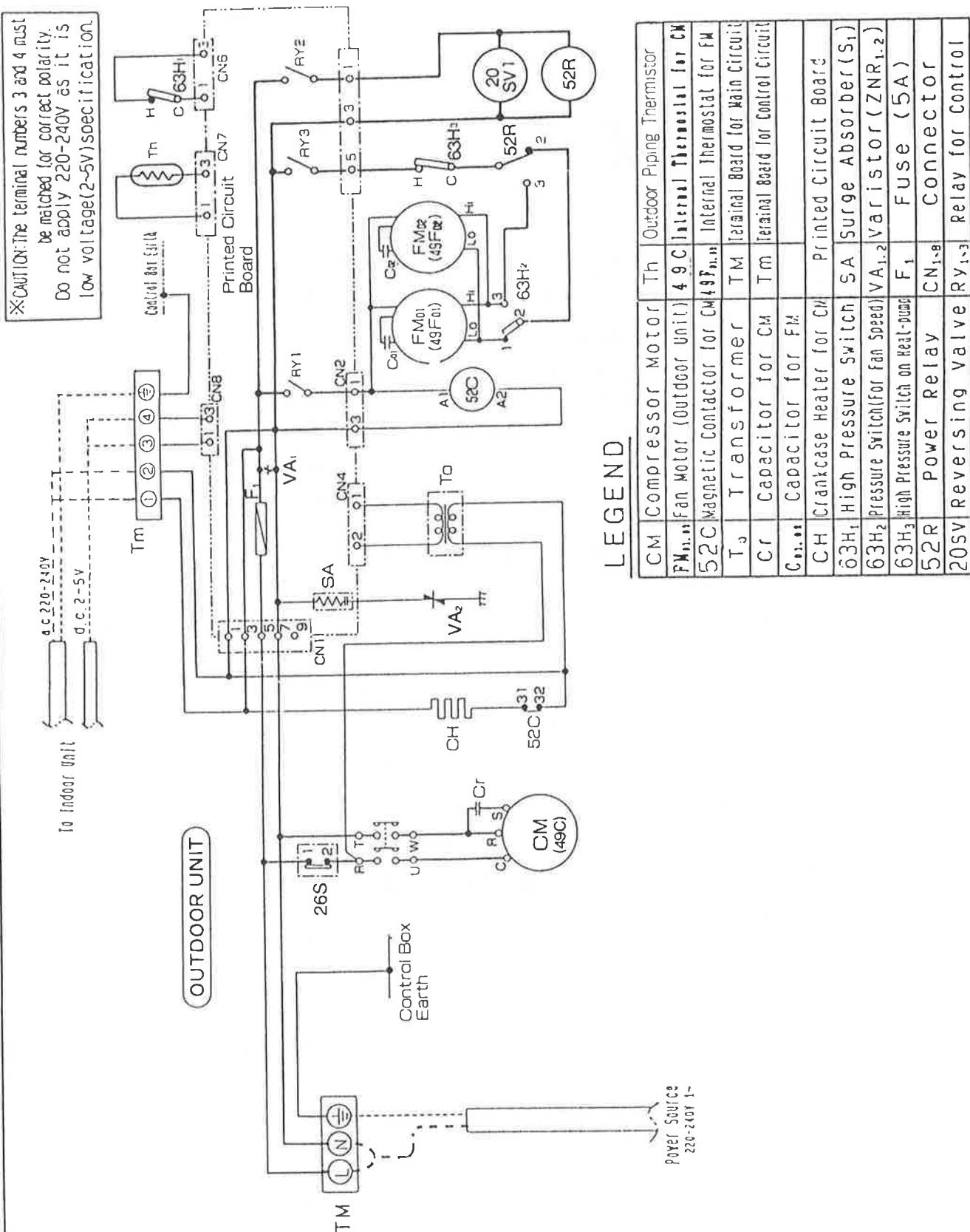
#### LEGEND

FM	Fan Motor	49F	Internal Thermostat for FM
VA	Varistor	C <sub>1</sub>	Capacitor for FM
T	Transformer	Tm	Terminal Board for Control Circuit
F	Fuse	Th1	Thermistor for Indoor Temperature
		Th2	Thermistor for Indoor Piping

# CIRCUIT DIAGRAM

CU-71C51HE, CU-80C51HE

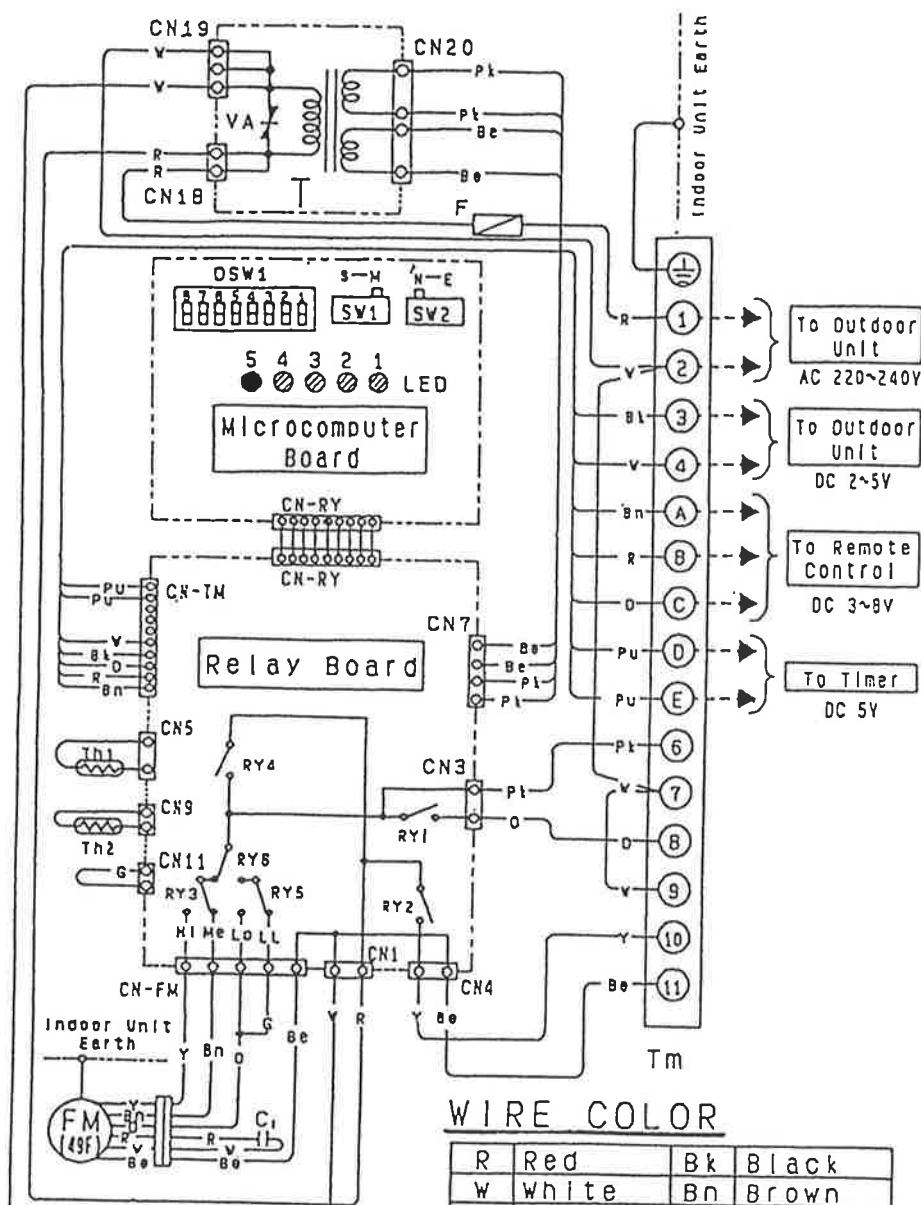
## CONNECTION DIAGRAM (Outdoor Unit)



# CIRCUIT DIAGRAM

CS-71E90XP, CS-80E90XP

## CONNECTION DIAGRAM (Indoor Unit)



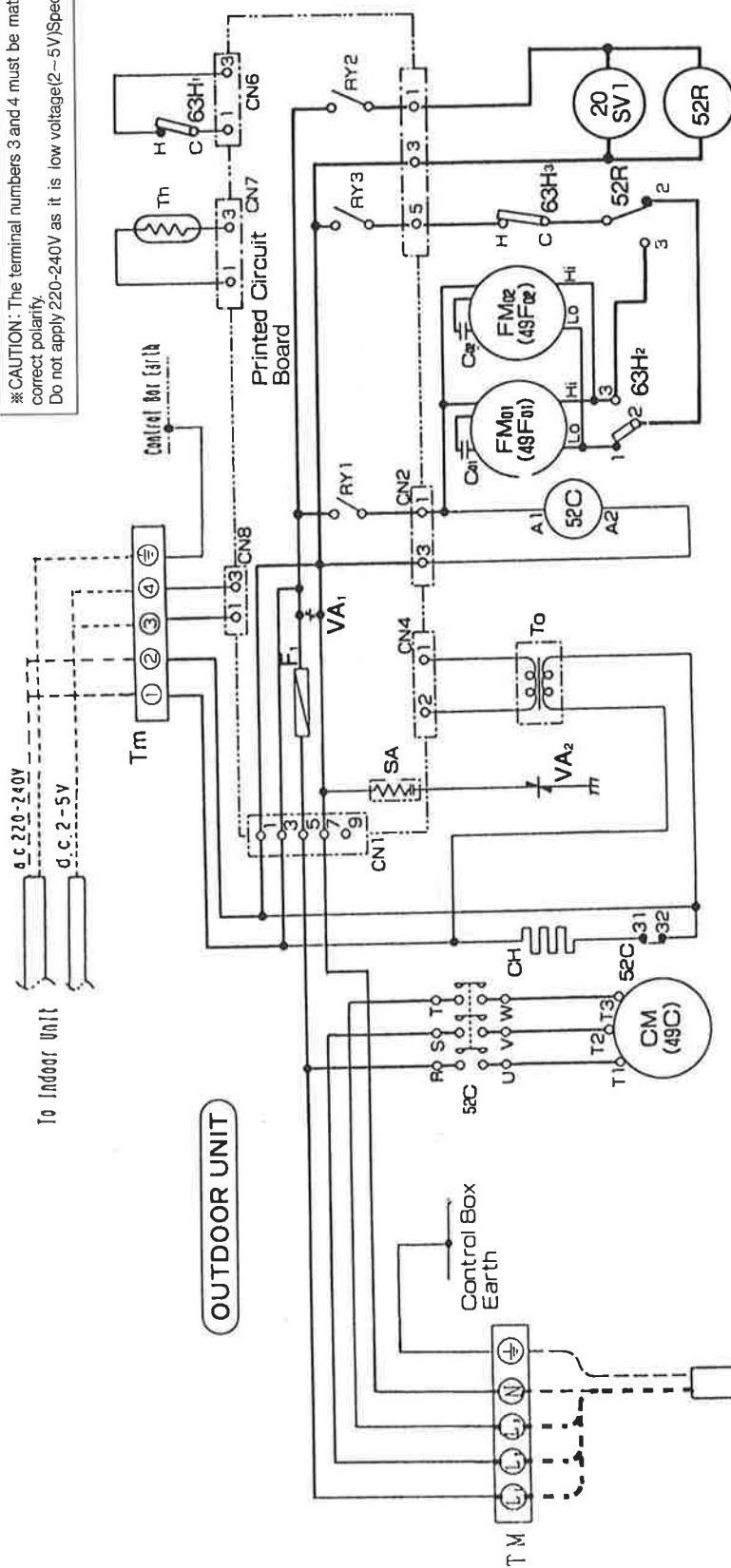
## LEGEND

FM	Fan Motor	49F	Internal Thermostat for FM
VA	Varistor	C <sub>1</sub>	Capacitor for FM
T	Transformer	Tm	Terminal Board for Control Circuit
F	FUSE	Th1	Thermistor for Indoor Temperature
		Th2	Thermistor for Indoor Piping

CU-71C51XE, CU-80C51XE

CONNECTION DIAGRAM (Outdoor Unit)

※CAUTION: The terminal numbers 3 and 4 must be matched for correct polarity.  
Do not apply 220-240V as it is low voltage(2~5V)Specification



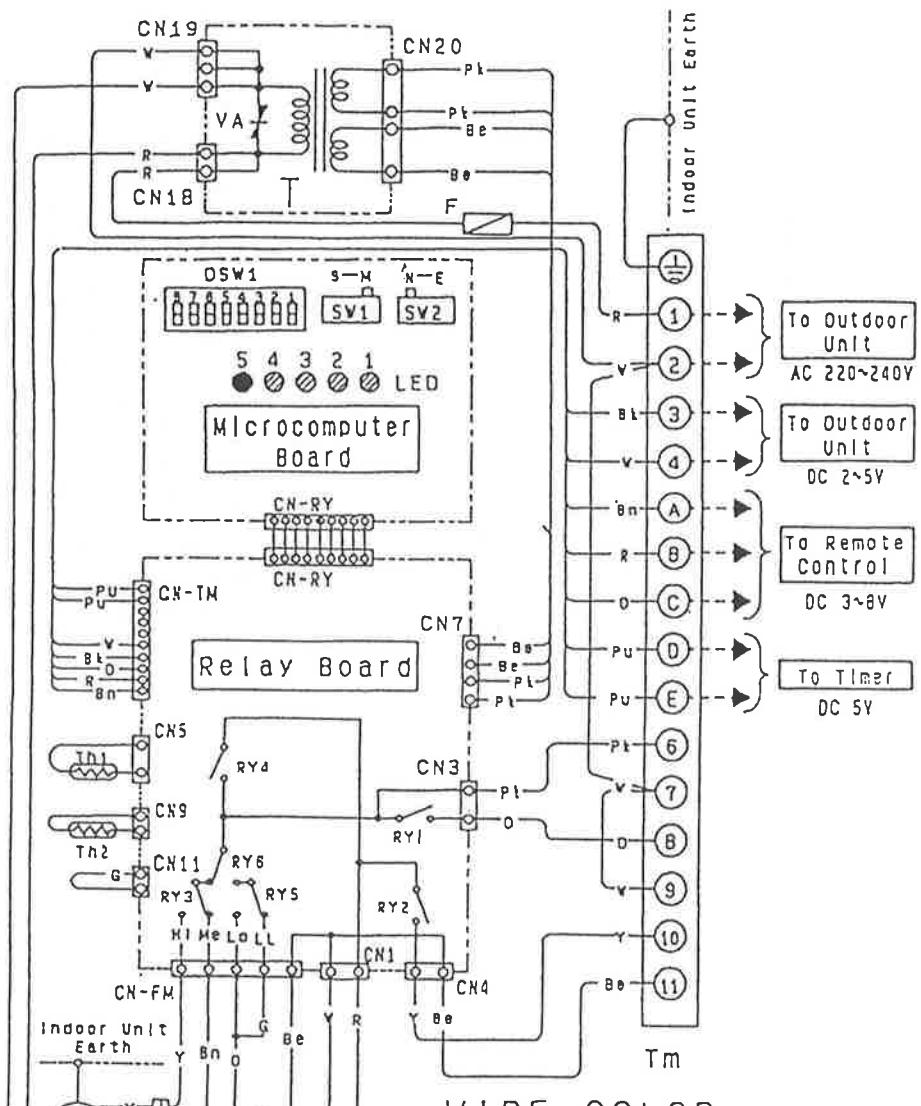
LEGEND	
Th	Outdoor Piping Thermistor
CM	Compressor Motor 205V Reversing Valve
FMn	Fan Motor (Outdoor Unit) 49Fan Internal Thermostat for CN
52C	Relay Contact for CN49Fan Internal Thermostat for FMn
T0	Transformer TM Terminal Board for Main Circuit
Cn1	Capacitor for FMn, TM Terminal Board for Control Circuit
CH	Choke Resistor for CN Printed Circuit Board
63H1	High Pressure Switch SA Surge Absorber (SA)
63H2	Pressure Switch (For Fan Start) VA1, Variistor (ZNR1,2)
63H3	With Pressure Switch in Inlet F1 Fuse (5A)
52R	Power Relay CN1-2 Connector
Cn1-2	Connector RY1-2 Relay for Control

Power Source  
380~415V 3N~

# CIRCUIT DIAGRAM

CS-112E90XP

## CONNECTION DIAGRAM (Indoor Unit)



### WIRE COLOR

R	Red	Bk	Black
W	White	Bn	Brown
G	Gray	Be	Blue
Y	Yellow	Pk	Pink
O	Orange	Pu	Purple

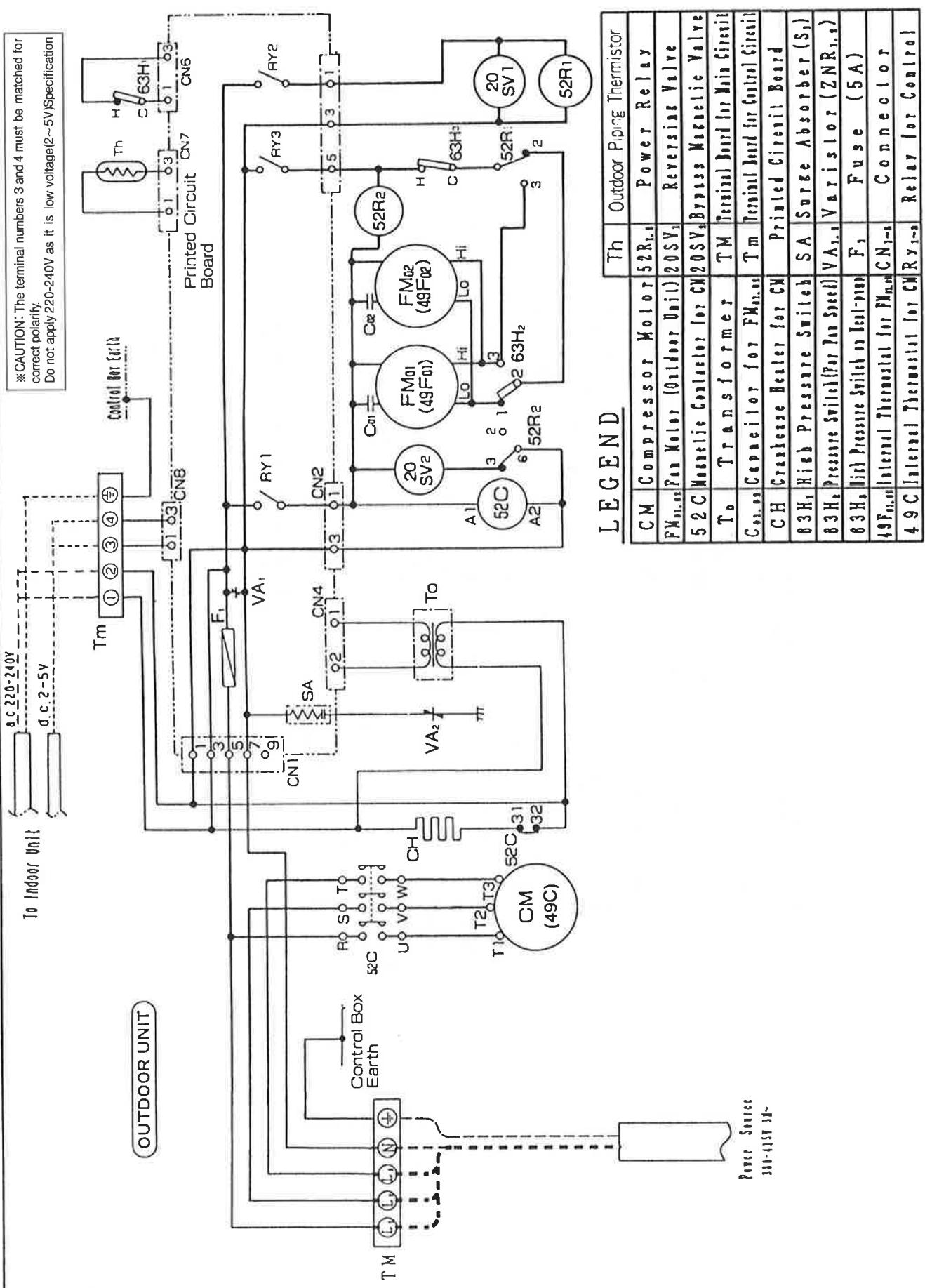
### LEGEND

FM	Fan Motor	49F	Internal Thermostat for FM
VA	Varistor	C <sub>1</sub>	Capacitor for FM
T	Transformer	Tm	Terminal Board for Control Circuit
F	Fuse	Th1	Thermistor for Indoor Temperature
		Th2	Thermistor for Indoor Piping

# CIRCUIT DIAGRAM

CU-112C51XE

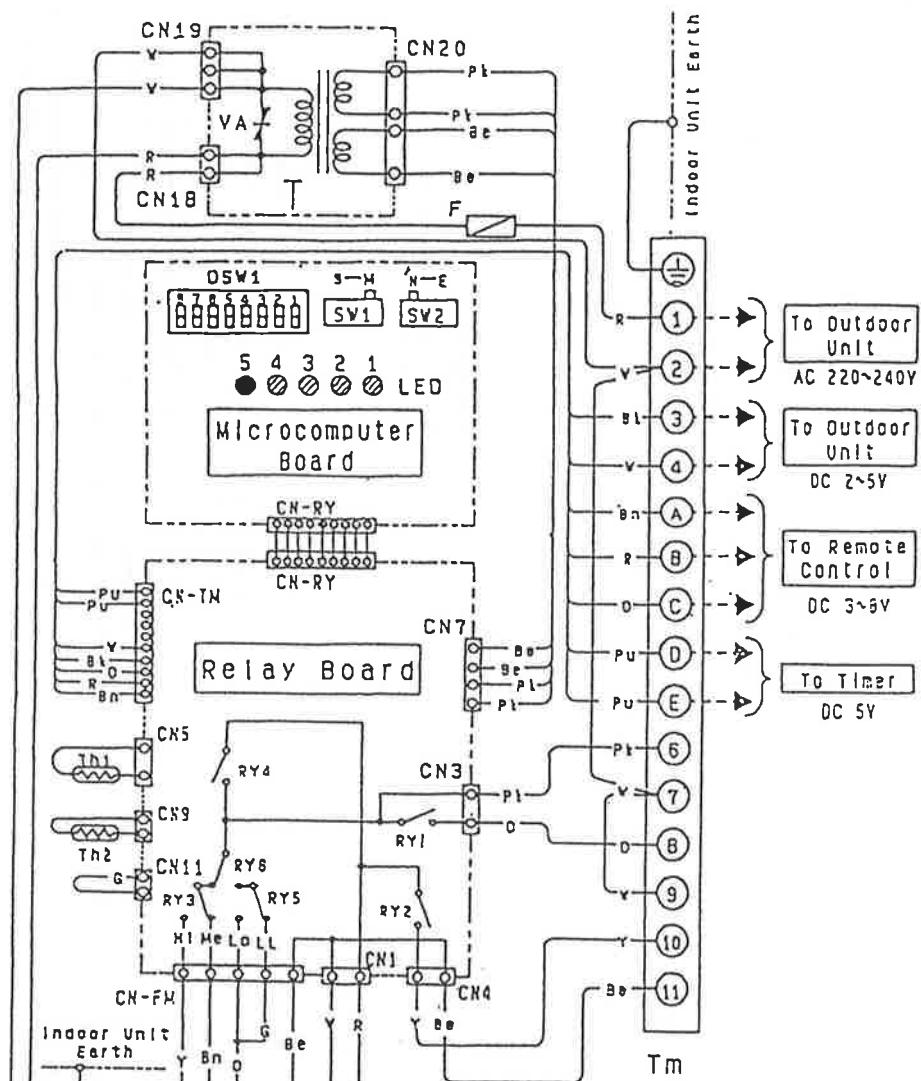
## CONNECTION DIAGRAM (Outdoor Unit)



# CIRCUIT DIAGRAM

CS-140E90XP

## CONNECTION DIAGRAM (Indoor Unit)



## LEGEND

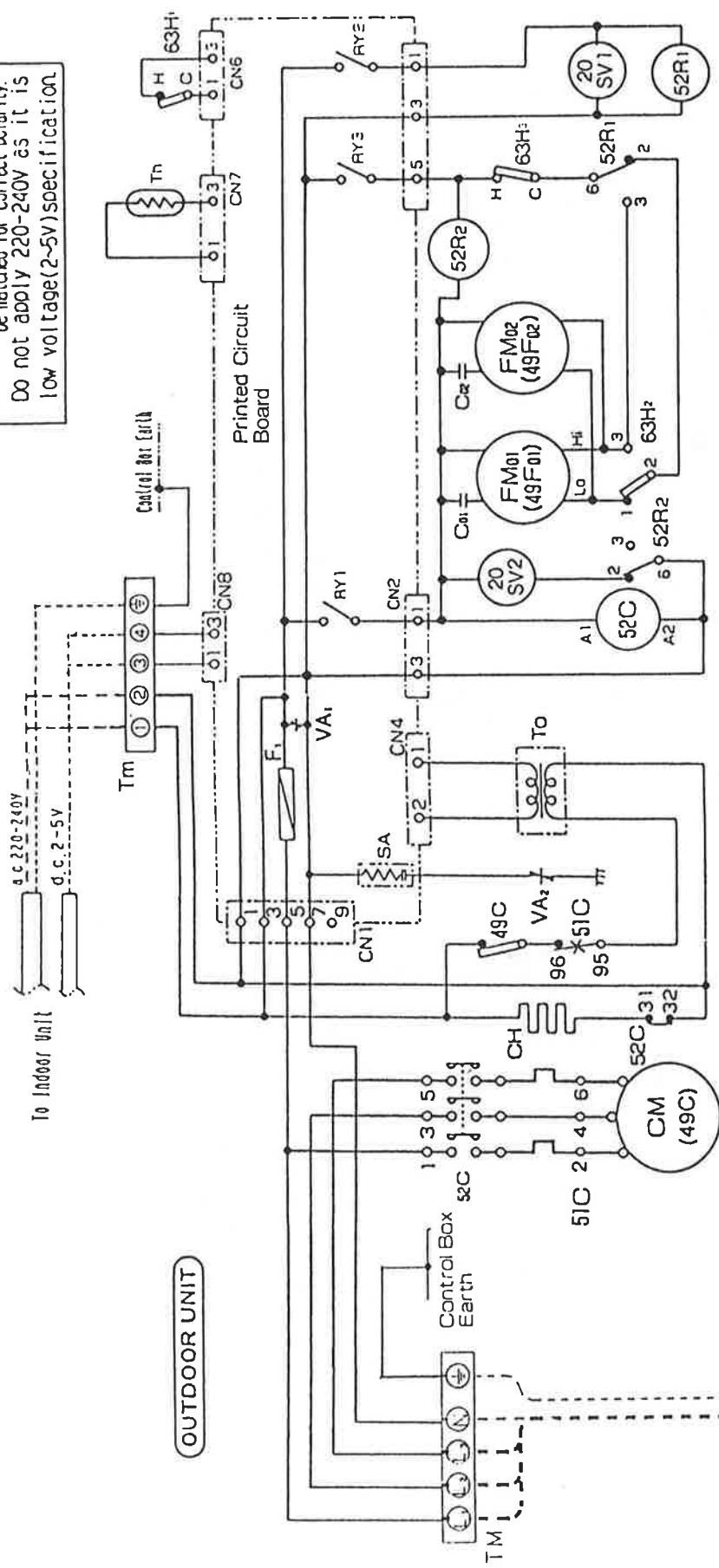
FM	Fan Motor	49F	Internal Thermostat for FM
VA	Varistor	C <sub>1</sub>	Capacitor for FM
T	Transformer	Tm	Terminal Board for Control Circuit
F	Fuse	Th1	Thermistor for Indoor Temperature
		Th2	Thermistor for Indoor Piping

# CIRCUIT DIAGRAM

CU-140C51XE

## CONNECTION DIAGRAM (Outdoor Unit)

**CAUTION:** The terminal numbers 3 and 4 must be matched for correct polarity.  
Do not apply 220-240V as it is low voltage(2-5v) specification.



## LEGEND

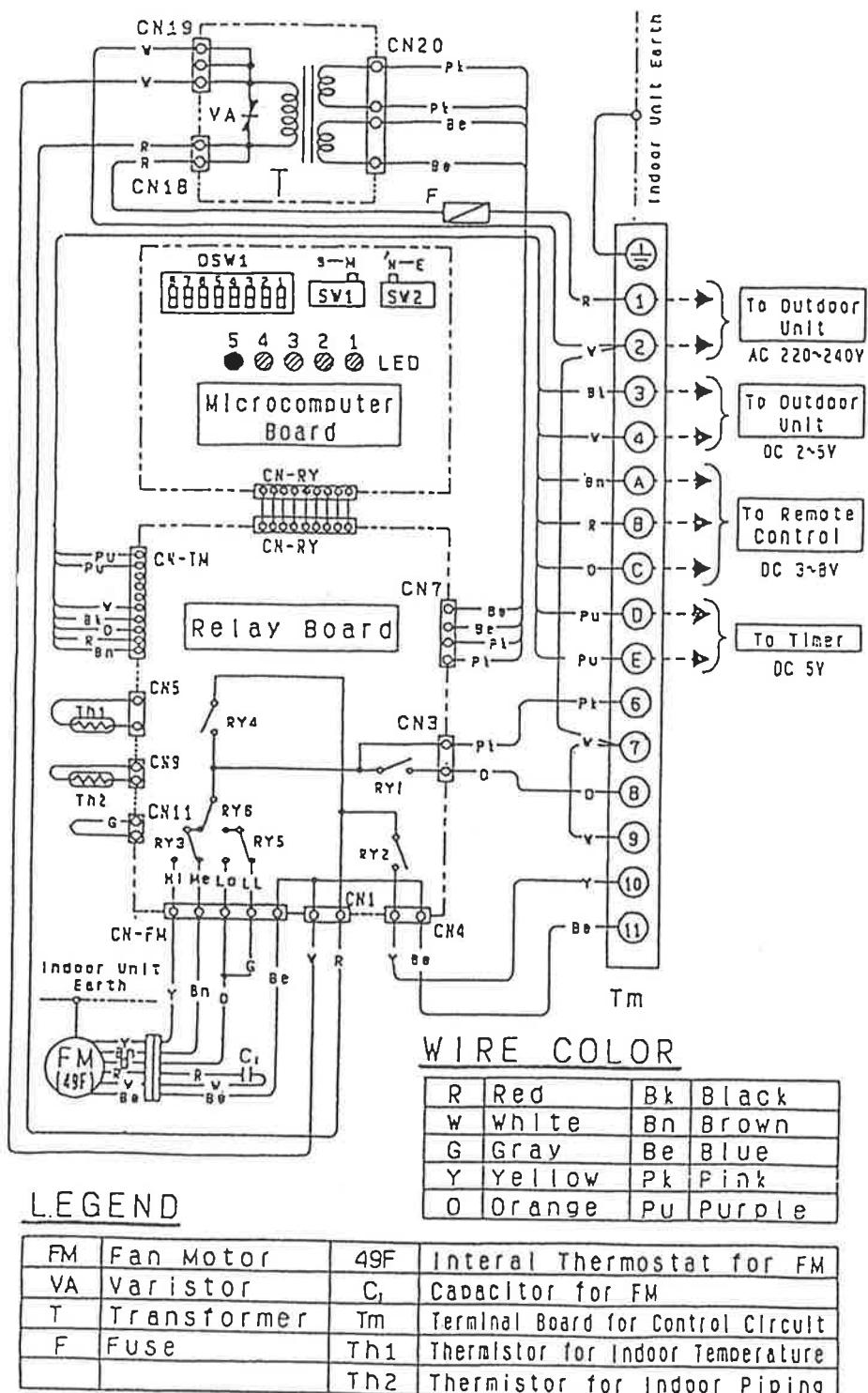
CM	Compressor Motor	52R <sub>1,2</sub>	Power Relay	63H <sub>1</sub>	High Pressure Switch	SA	Surge Absorber (S <sub>1</sub> )
FMan	Fan Motor (Outdoor Unit)	20SV <sub>1</sub>	Reversing Valve	63H <sub>2</sub>	Pressure Switch (Fan Speed)	VA <sub>1,2</sub>	Variistor (ZNR <sub>1,2</sub> )
52C	Magnetic Contactor for CM20SV <sub>1</sub> , Bypass Magnetic Valve			63H <sub>3</sub>	High Pressure Switch on Heat-pump	F <sub>1</sub>	Fuse (5A)
51C	Over current protector relay	TM	Terminal Board for Main Circuit	49C	Internal Thermostat for CH	CN <sub>1,-8</sub>	Connector
T <sub>o</sub>	Transformer	Tm	Terminal Board for Control Circuit	49F <sub>01,02</sub>	Internal Thermostat for FM <sub>01,02</sub>	RY <sub>1,-3</sub>	Relay for Control
C <sub>01,02</sub>	Capacitor for FM <sub>01,02</sub>	CN	Connector				
CH	Crankcase Heater for CM		Printed Circuit Board				

Power Source  
220-240V 50/60Hz

# CIRCUIT DIAGRAM

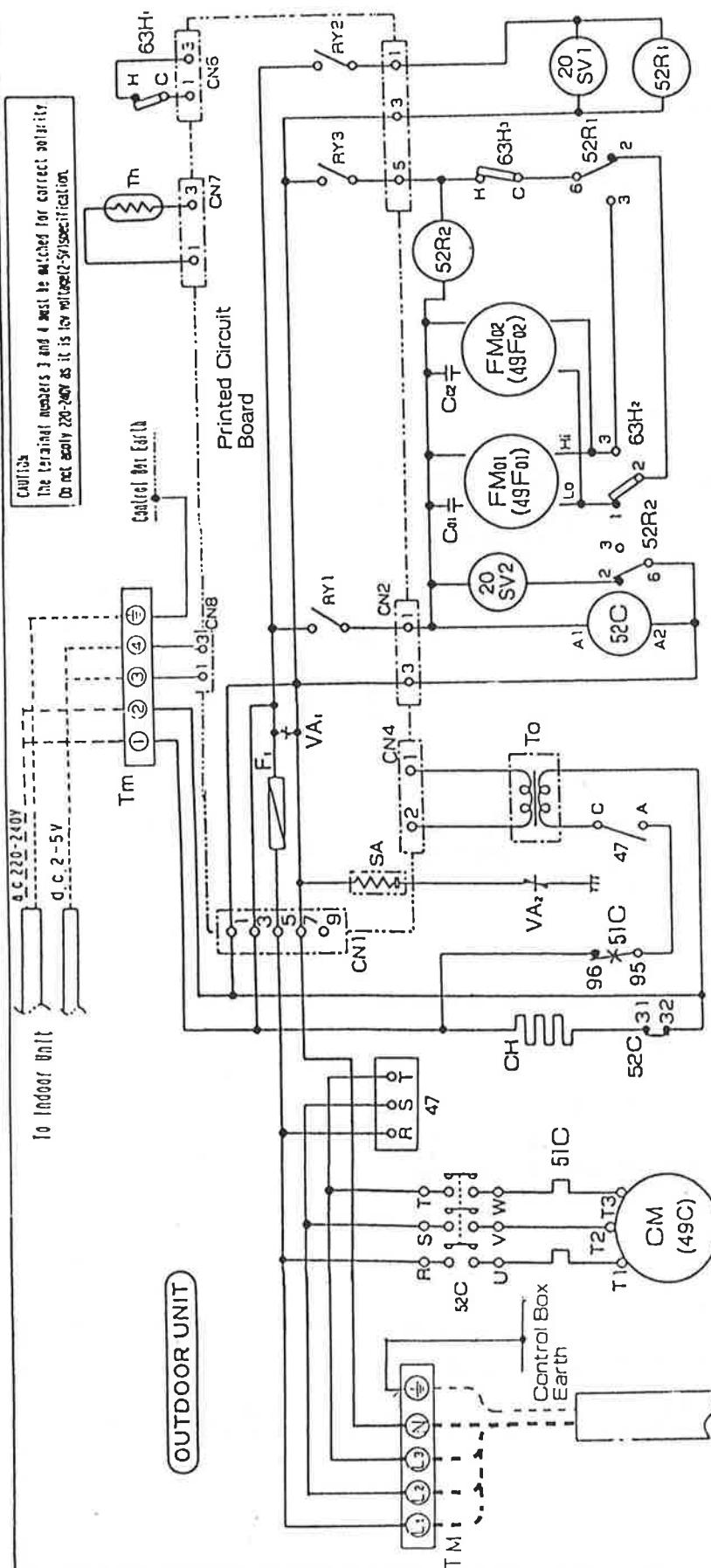
CS-160E90XP

## CONNECTION DIAGRAM (Indoor Unit)



CU-160C51XE

## CONNECTION DIAGRAM (Outdoor Unit)



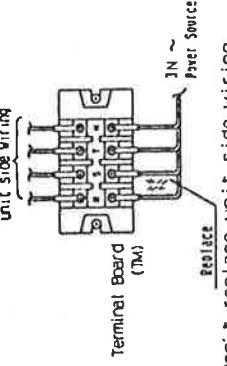
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**LEGEND**

CM	Compressor Motor	52R <sub>1,1</sub>	Power Relay
FH <sub>0,1</sub>	Fan Motor (Outdoor Unit)	20SY <sub>1</sub>	Reversing Valve
52C	Magnetic Contactor for CM	20SY <sub>1</sub>	Bypass Magnetic Valve
51C	Over current protector relay	TM	Terminal Board for Main Circuit
T <sub>0</sub>	Transformer	Tm	Terminal Board for Control Circuit
Cn	Capacitor for FM <sub>0,1,01</sub>	Cn	Connector
CH	Crankcase Heater for CM		Printed Circuit Board
63H	High Pressure Switch	SA	Surge Absorber (S <sub>1</sub> )
63H	Pressure Switch (for fan speed) VA <sub>1,2</sub>	V A <sub>1,2</sub>	Varistor (ZNR <sub>1,2</sub> )
63H	High Pressure Switch on Heat-pump	F <sub>1</sub>	Fuse (SA)
49C	Internal Thermostat for CN	CN <sub>1,1</sub>	Connector
49F <sub>1,1</sub>	Internal Thermostat for F <sub>1,1,1</sub>	RY <sub>1,1</sub>	Relay for Control
			Phase Protector

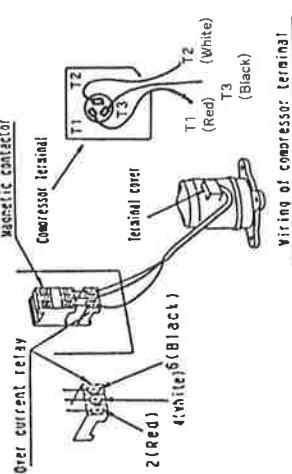
CAUTION FOR CONNECTION OF POWER SOURCE

In the case of negative voltage, compressor does not operate because of phase protector which protects the reversing of the compressor motor. If phase is negative it causes LED5(yellow) to go out. In this case swap the two or the three phases on power source side as figure.



## **CAUTION FOR REPLACEMENT OF COMPRESSOR**

After replacement of compressor - care should be taken to connect the wire to the compressor terminal correctly as figure. (This connection mistake will result in breakage to the compressor because of reversing of compressor motor.)



# CIRCUIT DIAGRAM

**■APPLICABLE MODEL**

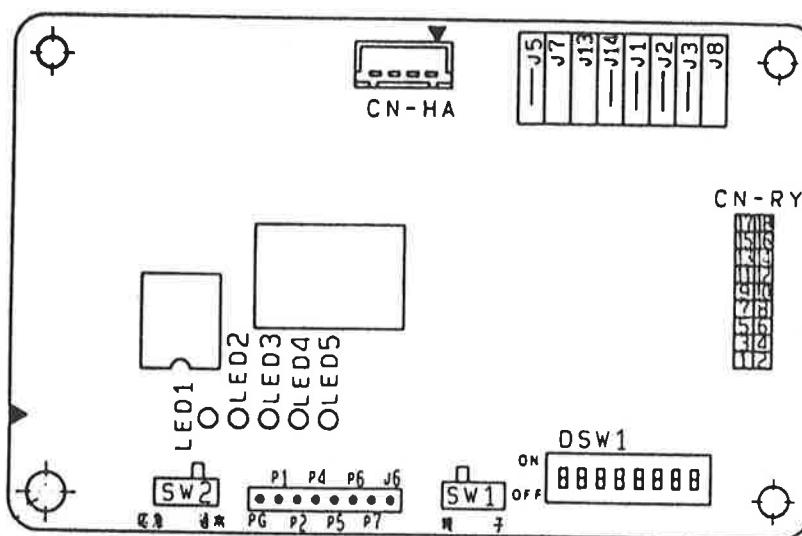
CS-71E90HP, CS-71E90XP, CS-80E90HP, CS-80E90XP, CS-112E90XP, CS-140E90XP, CS-160E90XP

**●INDOOR UNIT**

**PRINTED CIRCUIT BOARD (B)  
(MICROCOMPUTER BOARD)**



**CN-HA**



**CN-RY**

18	ROOM TEMPERATURE
17	PIPE TEMPERATURE
16	COMMUNICATION WITH OUTDOOR UNIT
15	—
14	COMMUNICATION WITH WIRED REMOTE CONTROLLER
13	—
12	—
11	FAN L/LL
10	HA SIGNAL
9	FAN L/LL
8	FLOAT SW
7	—
6	—
5	FAN H/M
4	5V
3	DRAIN PUMP
2	GND
1	HEATER

**USE OF JUMPER WIRE**

J1	J2	DIFFERENTIAL
EXIST	EXIST	2°C
NOT	EXIST	1.5°C
EXIST	NOT	2.5°C

**USE OF SW1**

MASTER ← → SLAVE TWIN+TRIPLE SWITCH

**USE OF SW2**

EMERGENCY ← → NORMAL SWITCH

**USE OF DIP SWITCH(DSW1)**

1~4	ADDRESS SETTING	REFER TO THE BELOW FIGURE
5	—	NO NEED SETTING (DO NOT TOUCH)
6	—	
7	—	
8	—	

**CASE OF GROUP CONTROLLER**


SLAVE UNIT NO 1



SLAVE UNIT NO 2



SLAVE UNIT NO 3



SLAVE UNIT NO 4



SLAVE UNIT NO 5

# CIRCUIT DIAGRAM

## ■ APPLICABLE MODEL

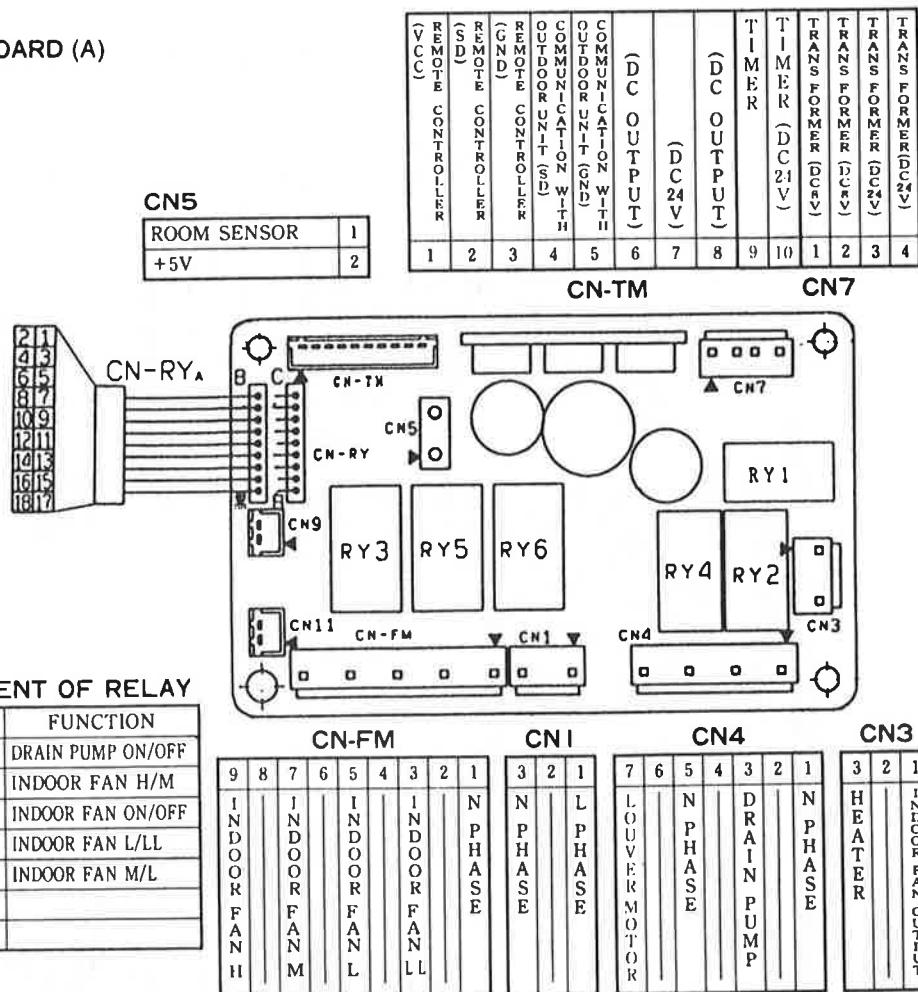
CS-71E90HP, CS-71E90XP, CS-80E90HP, CS-80E90XP, CS-112E90XP, CS-140E90XP, CS-160E90XP  
 CU-71C51HE, CU-71C51XE, CU-80C51HE, CU-80C51XE, CU-112C51XE, CU-140C51XE, CU-160C51XE

## ● INDOOR UNIT

### RELAY PRINTED CIRCUIT BOARD (A) (RELAY BOARD)

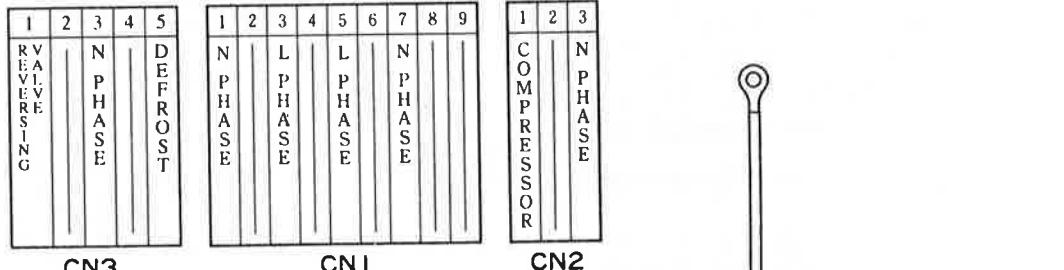
CN-RYA	
HEATER	1
GND	2
DRAIN PUMP	3
5V	4
INDOOR FAN H/M	5
-	6
-	7
FLOAT SW	8
INDOOR FAN L/LL	9
HA SIGNAL	10
INDOOR FAN LL/H.M	11
-	12
-	13
COMMUNICATION WITH REMOTE CONTROLLER	14
-	15
COMMUNICATION WITH OUTDOOR UNIT	16
PIPE TEMPERATURE	17
ROOM TEMPERATURE	18
CN9	
PIPE SENSOR	2
+5V	1
CN11	
FLOAT SW	2
COM	1

NO.	FUNCTION
RY2	DRAIN PUMP ON/OFF
RY3	INDOOR FAN H/M
RY4	INDOOR FAN ON/OFF
RY5	INDOOR FAN L/LL
RY6	INDOOR FAN M/L

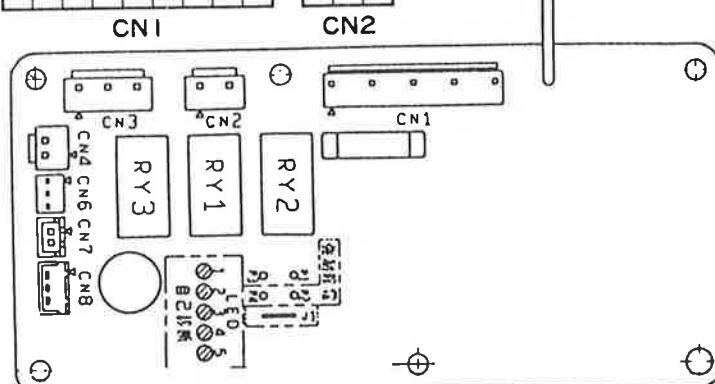


## ● OUTDOOR UNIT

### RELAY PRINTED CIRCUIT BOARD



CN7	1	2	5V
PIR SENSOR TEMPERATURE			
CN4	1	2	TRANSFORMER
TRANSFORMER			
CN6	1	2	3
HIGH PRESSURE			GND
CN8	1	2	3
COMMUNICATION WITH OUTDOOR UNIT			GND



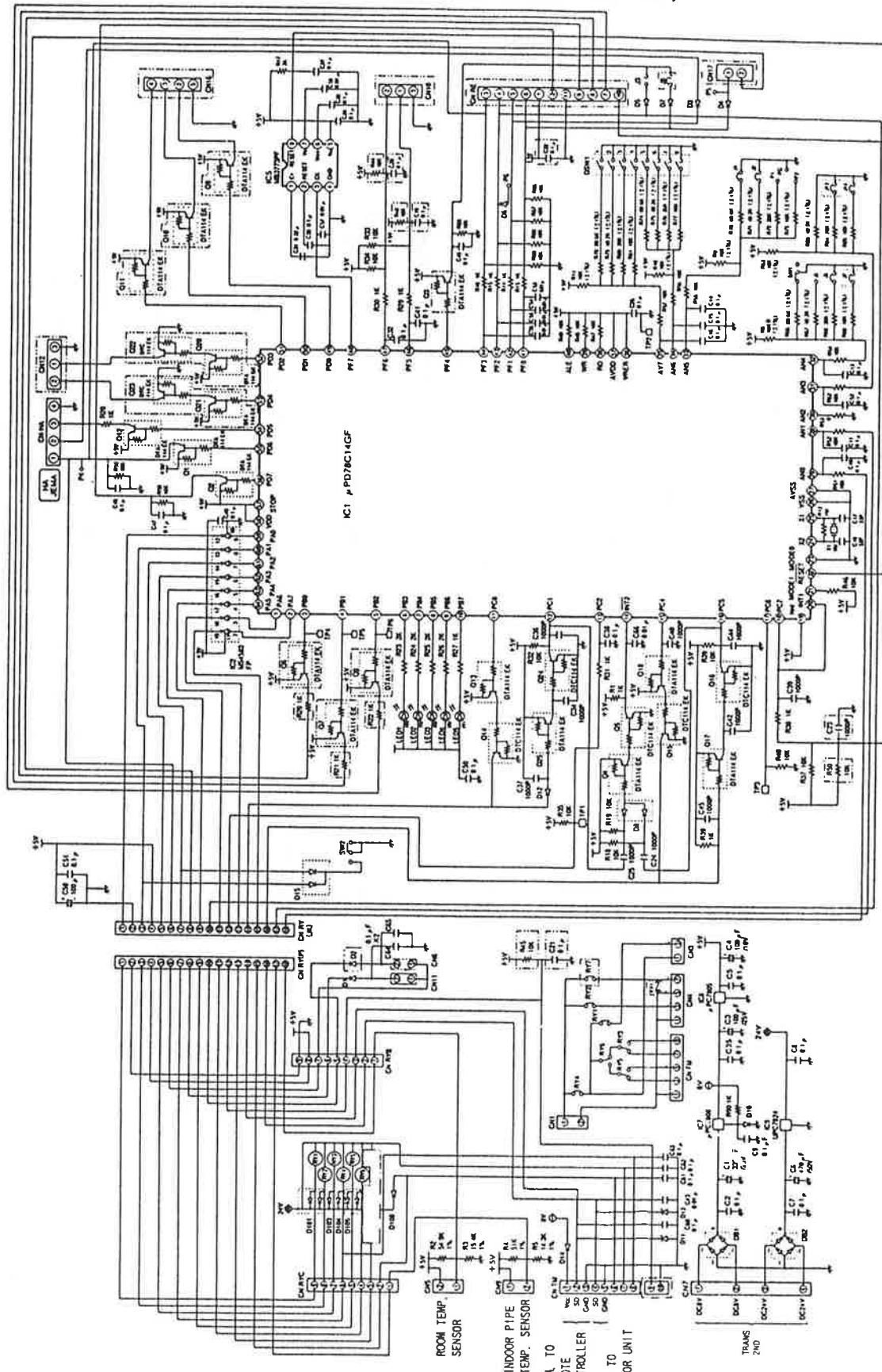
RY3	DEFROST ON/OFF	RY2	REVERSING VALVE ON/OFF	RY1	COMPRESSOR RELAY ON/OFF

# CIRCUIT DIAGRAM

■APPLICABLE MODEL

CS-71E90HP, CS-71E90XP, CS-80E90HP, CS-80E90XP, CS-112E90XP, CS-140E90XP, CS-160E90XP

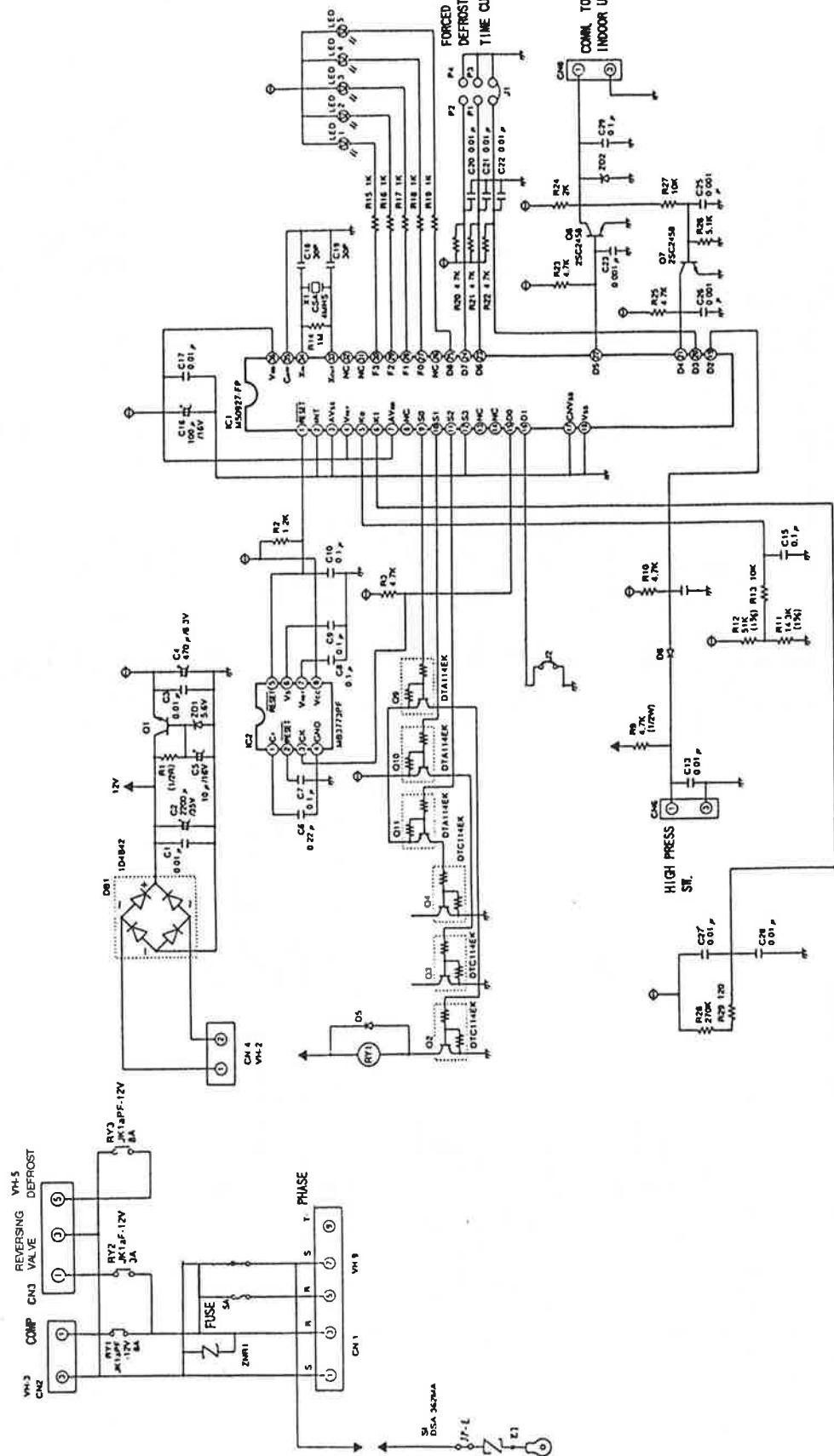
● INDOOR UNIT  
PRINTED CIRCUIT BOARD (SCHEMATIC DIAGRAM)



## ■ APPLICABLE MODEL

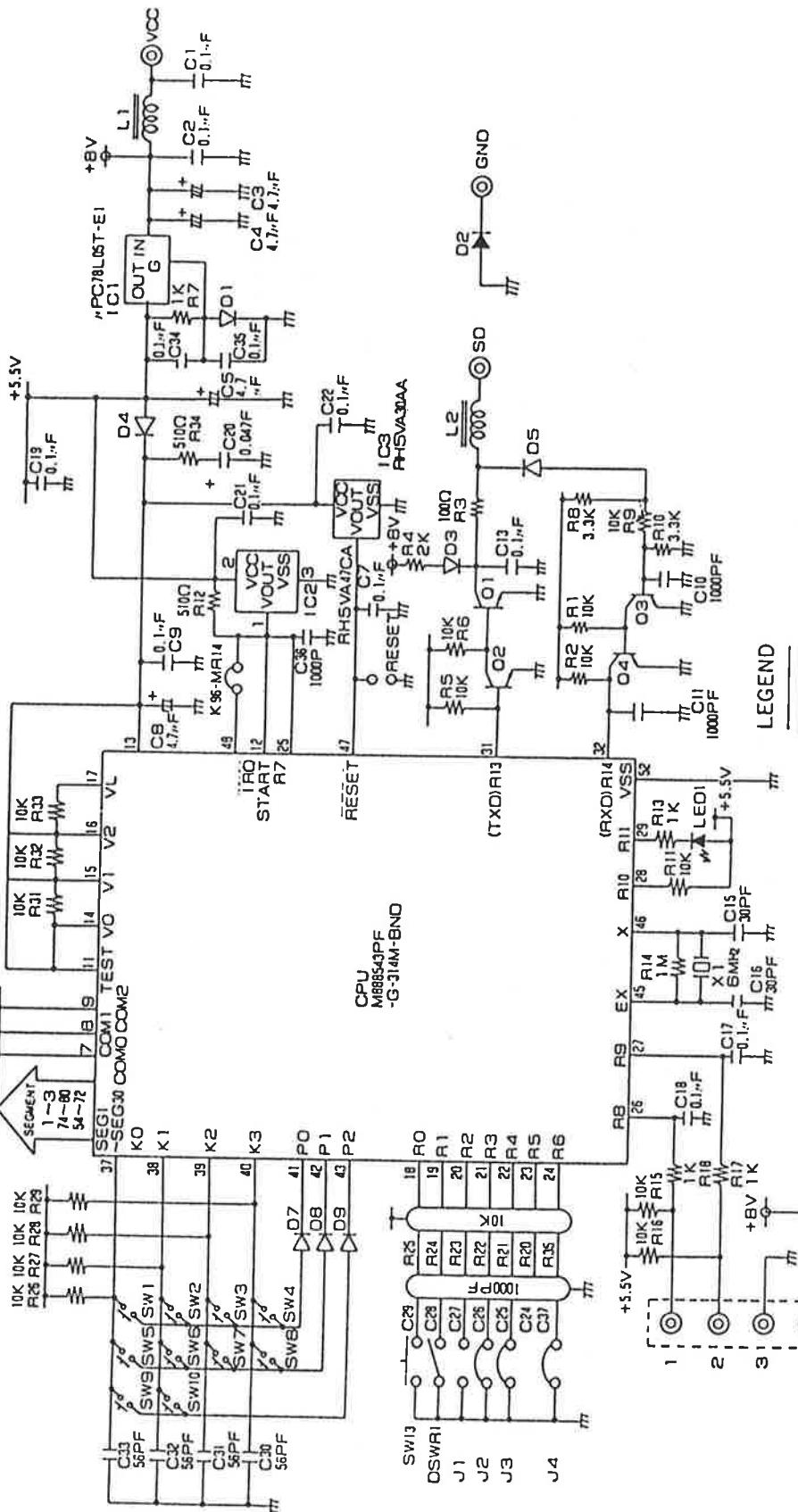
CU-71C51HE, CU-71C51XE, CU-80C51HE, CU-80C51XE, CU-112C51XE, CU-140C51XE, CU-160C51XE

● OUTDOOR UNIT  
PRINTED CIRCUIT BOARD (SCHEMATIC DIAGRAM)

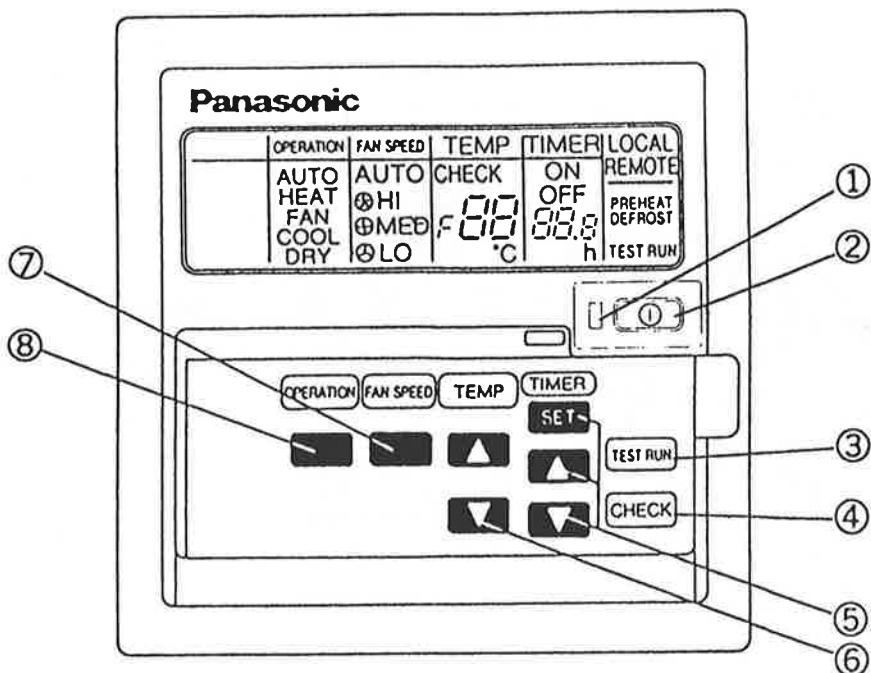


■APPLICABLE MODEL  
ALL MODEL

• WIRED REMOTE CONTROLLER  
PRINTED CIRCUIT BOARD (SCHEMATIC DIAGRAM)



## Remote Controller



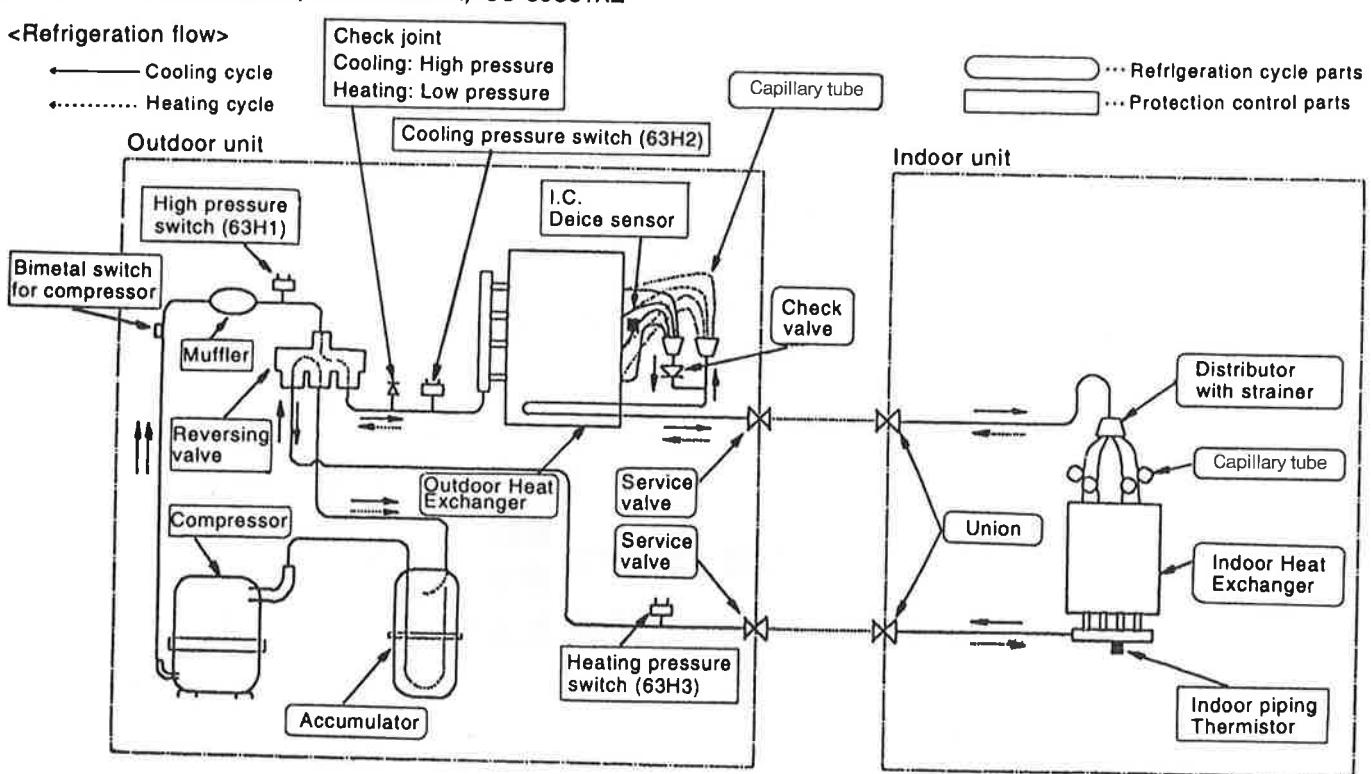
- ① Operation indicator (Red)  
Lights up when the unit is on.
- ② Operation switch  
ON/OFF
- ③ Test run switch  
This switch is used only for test operation of the unit.
- ④ Check switch  
If this switch is pressed when the "CHECK" section is flashing, F2 - F18 which indicate the abnormal part of the unit will appear. However, an ordinary operation should not be affected by this indication.
- ⑤ Timer-set switch  
This switch is used when the timer operation time is to be set.
- ⑥ Temperature-set switch  
The room temperature setting can be made in 1°C units within the range of from 16°C to 31°C, as follows : for cooling the setting range is from 21°C to 31°C and for heating the range is from 16°C to 28°C.
- ⑦ Fan speed switch  
High, Medium, Low and Automatic.
- ⑧ Operation-mode switch  
This switch can be used to select the operation mode : "HEAT", "FAN", "COOL" and AUTO".

## 5. REFRIGERATION CYCLE

CS-71E90HP, CS-71E90XP, CS-80E90HP, CS-80E90XP  
 CU-71C51HE, CU-71C51XE, CU-80C51HE, CU-80C51XE

### <Refrigeration flow>

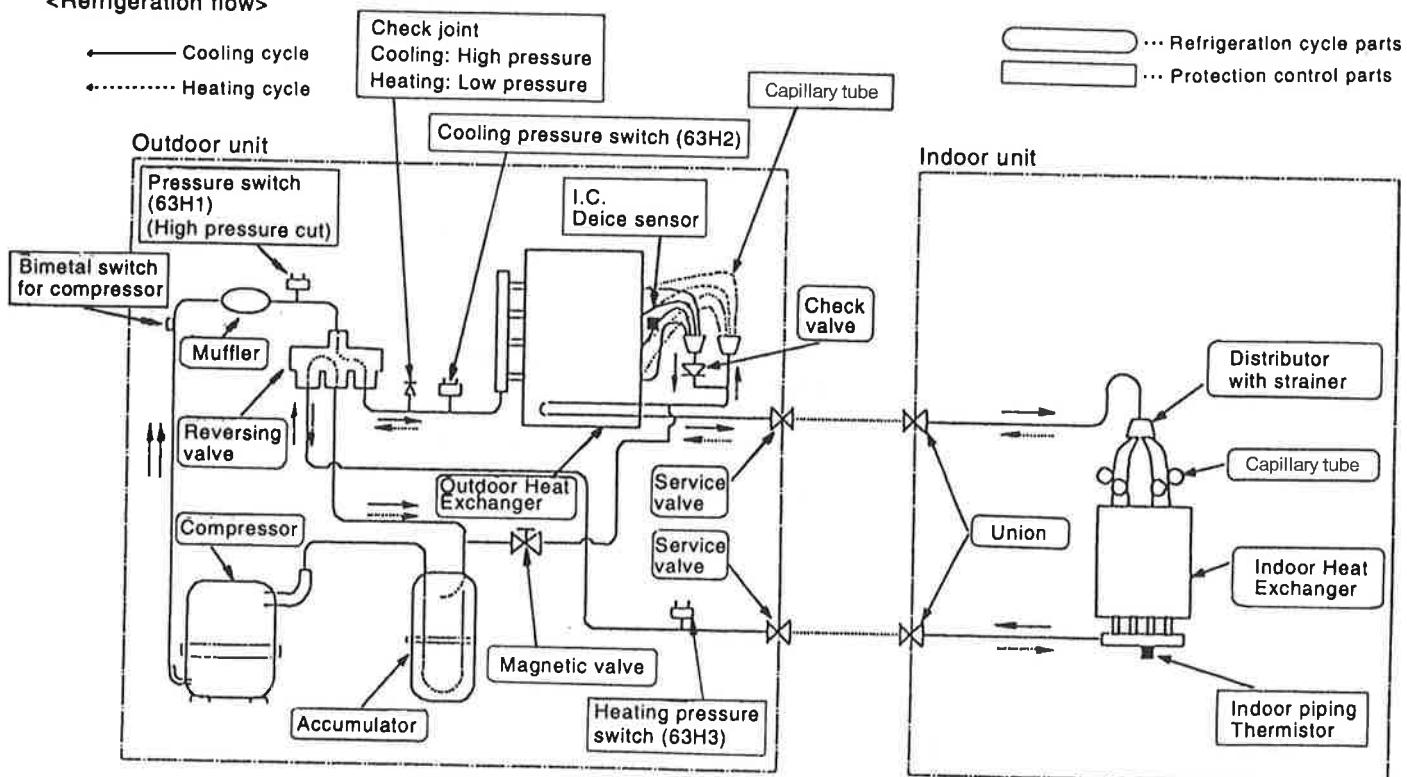
← Cooling cycle  
 ..... Heating cycle



CS-112E90XP  
 CU-112C51XE

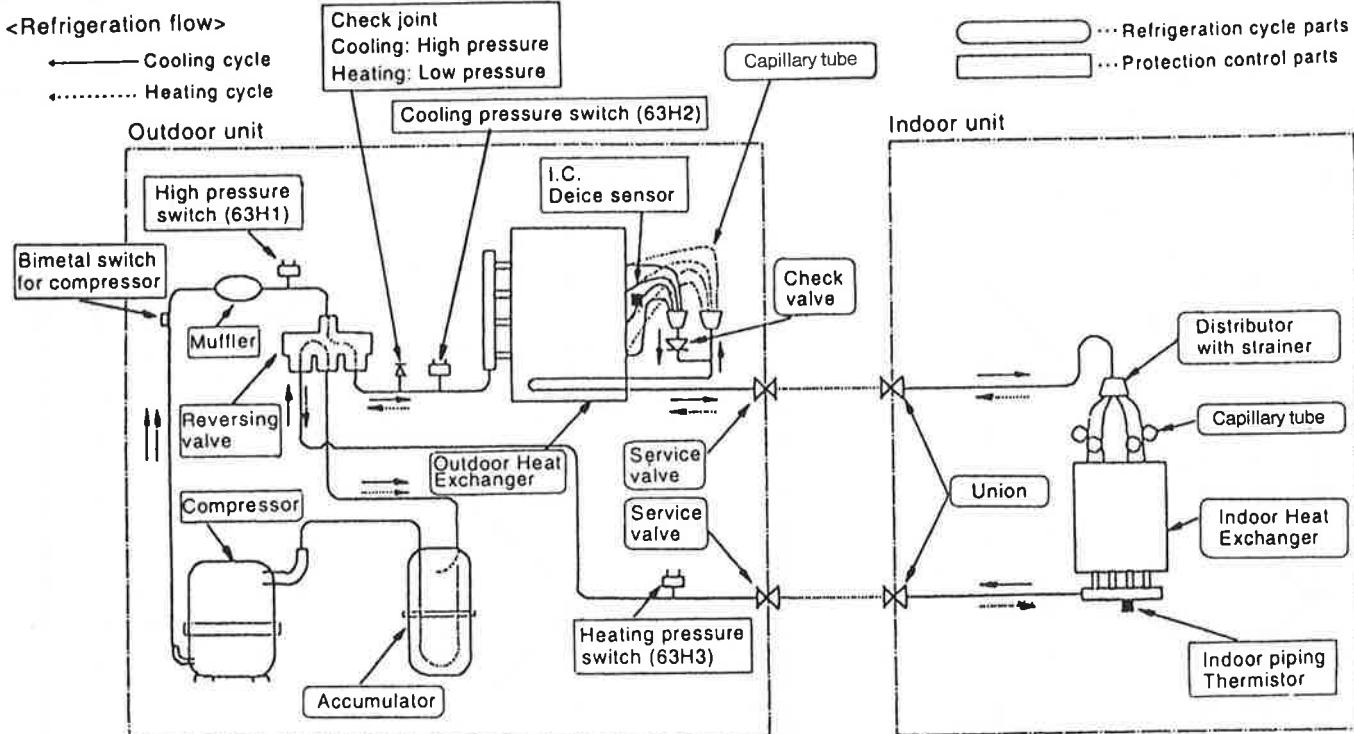
### <Refrigeration flow>

← Cooling cycle  
 ..... Heating cycle



## REFRIGERATION CYCLE

CS-140E90XP, CS-160E90XP  
CU-140C51XE, CU-160C51XE



## 6. OPERATION RANGE

### Power Supply

The applicable voltage range for each unit is given in "the following table". The working voltage among the three phases must be balanced within a 3% deviation from each voltage at the compressor terminals. The starting voltage must be higher than 85% of the rated voltage.

### Power Supply

Model CS-	Unit Main Power		Applicable Voltage	
	Phase, Volts	Hz	Maximum	Minimum
71E90HP, 80E90HP	1~240	50	254	216
71E90XP, 80E90XP 112E90XP 140E90XP, 160E90XP	3N~415	50	440	374

### Indoor and Outdoor Temperature

### All Models

Operating	Hz	Indoor Temp. (D.B./W.B.) (°C)		Outdoor Temp. (D.B./W.B.) (°C)	
		Maximum	Minimum	Maximum	Minimum
Cooling	50	32/22.5	21/15.5	43/-	-2/-
Heating	50	28/-	16/-	21/15.5	-10/-

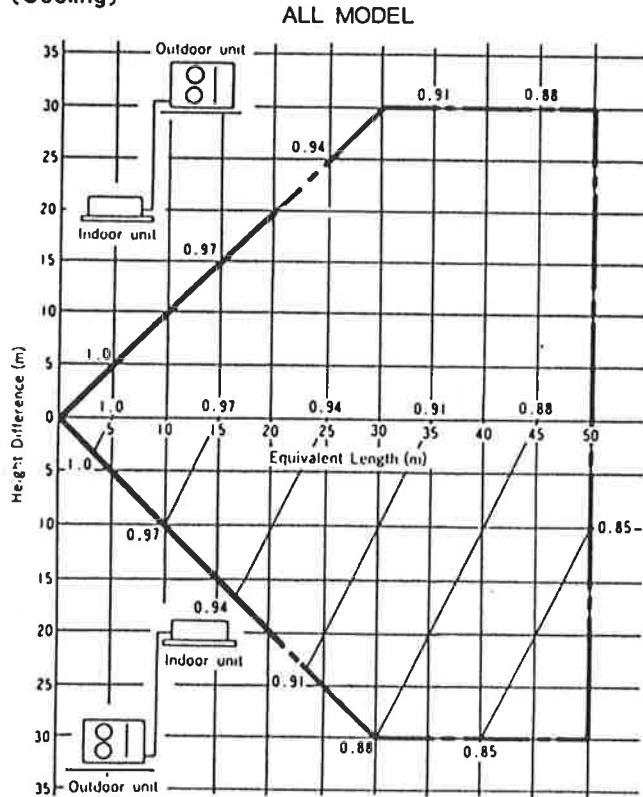
## ■ CORRECTION OF COOLING AND HEATING CAPACITIES

Correction of cooling and heating capacities according to the connecting pipe length.

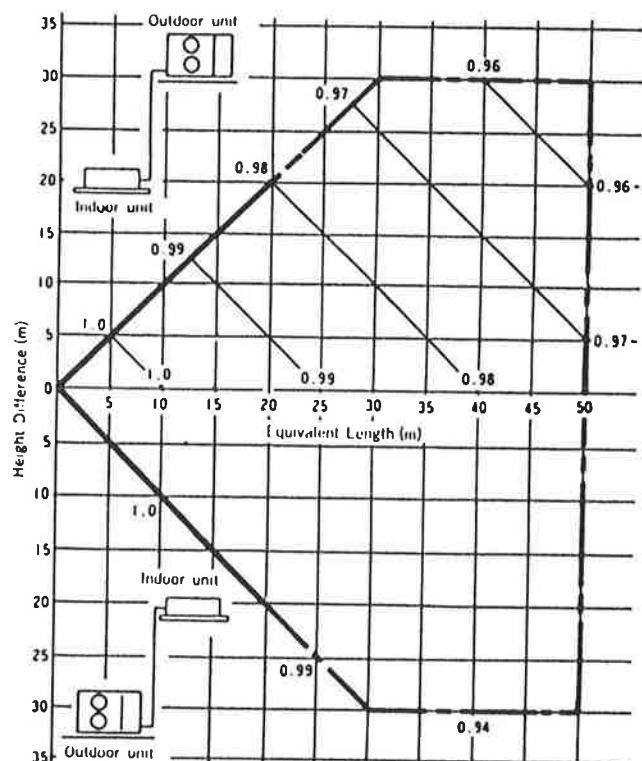
The data of cooling capacities (marked on the name plate) are based on 5 meters connecting pipe and horizontal installation.

For other pipe length of other installation multiply by the following correction factor to determine the revised cooling capacity.

(Cooling)



(Heating)



**Equivalent Length** = actual pipe length + number of elbow x ELE + number of oil trap x ELO

ELE: equivalent length of elbow.

ELO: equivalent length of oil trap.

Outer diameter of gas side pipe mm (inch)	ELE	ELO
12.7 (1/2)	0.20	1.5
15.88 (5/8)	0.25	2.0
19.05 (3/4)	0.35	2.4

## ■ REFRIGERANT ADDITIONAL CHARGE

- The piping length exceeds 20 meters.

Model... CS-71E90HP, CS-80E90HP,  
CS-71E90XP, CS-80E90XP, CS-112E90XP

- The piping length exceeds 5 meters.

Model... CS-140E90XP, CS-160E90XP

Before shipment, this air conditioner is filled with the rated amount of refrigerant subject to 20 m or 5 m piping length. (The rated amount of refrigerant is indicated on the name plate.) But when the piping length exceeds 20 m or 5 m meters, additional charge is required according to the following table.

Model	Ref. Charge
CS-71E90HP,71E90XP, 80E90HP,80E90XP,112E90XP	70g per 1m
CS-140E90XP,160E90XP	100g per 1m

**Example:** CS-71E90XP

In case of 30 m long pipe (one-way), the amount of refrigerant to be replenished is:  $(30-20) \times 70 = 700$  g

CS-140E90XP

In case of 30 m long pipe (one-way), the amount of refrigerant to be replenished is:  $(30-5) \times 100 = 2,500$  g

## 8. OPERATING CHARACTERISTICS

### OPERATING CHARACTERISTICS

Model	Main Power Source		Compressor Motor			Evaporator Fan Motor		Condenser Fan Motor	
	Voltage (V)	Frequency (Hz)	S.C.(A)	R.C(A) Cool/Heat	IPT(kW) Cool/Heat	R.C(A)	IPT(kW)	R.C(A)	IPT(kW)
CS-71E90HP	240	50	56	11.10/9.55	2.44/2.11	0.92	0.20	0.74	0.14
CS-71E90XP	415	50	22	4.09/3.57	2.38/2.08	0.92	0.20	0.74	0.14
CS-80E90HP	240	50	59	11.75/10.23	2.54/2.21	0.92	0.20	0.74	0.14
CS-80E90XP	415	50	26	4.11/3.58	2.60/2.27	0.92	0.20	0.74	0.14
CS-112E90XP	415	50	40	6.45/5.40	3.71/3.03	1.79	0.40	1.20	0.22
CS-140E90XP	415	50	50	7.49/6.29	4.74/3.98	2.47	0.55	1.02	0.22
CS-160E90XP	415	50	55	8.90/7.04	5.12/4.05	3.23	0.71	1.32	0.27

**Legend: S.C.: Starting Current**

**R.C.: Running Current**

**IPT: Power Consumption**

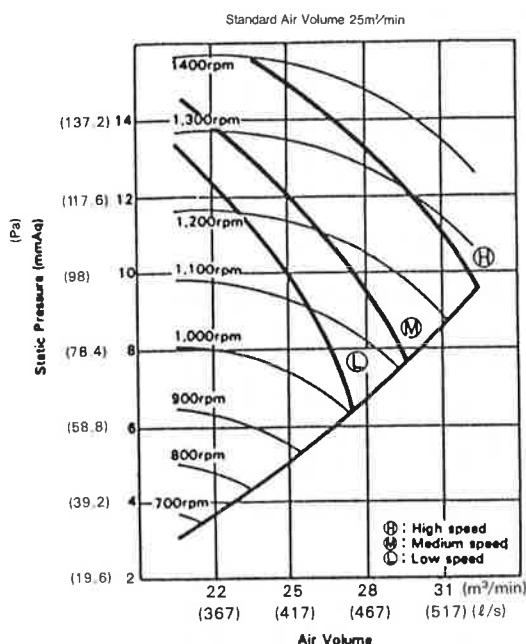
**9. FAN PERFORMANCE**

Model C S -	Power Frequency (Hz)	Air Volume			External Static Pressure in mAq (Pa)						
					0 (0)	2.5 (24.5)	5 (49)	7.5 (73.5)	10 (98)	12.5 (123)	15 (147)
		cfm	m/min.	l/S	r p m						
71E90HP	5 0	777	22	367	735	885	1030	1180	1300		
		883	25	417	875	1005	1135	1250	1375		
		988	28	467	1035	1145	1255				
		1094	31	517	1180	1280					
80E90HP	5 0	953	27	450	750	920	1075	1210	1325		
		1059	30	500	890	1030	1170	1290	1390		
		1165	33	550	1040	1155	1275				
		1271	36	600	1180	1290					
112E90XP	5 0	1200	34	567	770	860	950	1040	1110	1190	1260
		1341	38	633	870	940	1000	1080	1150	1230	
		1487	42	700	950	1025	1090	1150	1225		
		1624	46	767	1000	1060	1130				
140E90XP	5 0	1487	42	700	905	985	1060	1135	1205	1270	1350
		1624	46	767	990	1060	1130	1200	1265	1335	
		1765	50	833	1080	1145	1210	1270	1335		
		1906	54	900	1165	1230	1290				
160E90XP	5 0	1942	55	917	1035	1095	1165	1230	1285	1345	1405
		2083	59	983	1125	1170	1230	1295	1355	1410	
		2224	63	1050	1205	1255	1310	1365	1420		
		2365	67	1117	1290	1340	1395				

r p m : F a n S p e e d

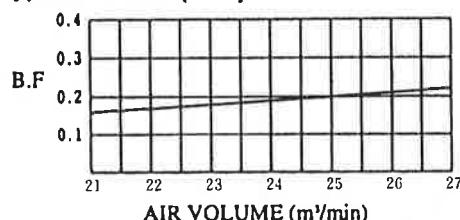
## FAN PERFORMANCE

### ●CS-71E90HP, CS-71E90XP Fan Performance Curve

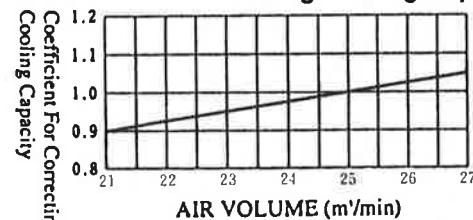


### Bypass factor And Coefficient For Correcting Capacity according to Air volume change

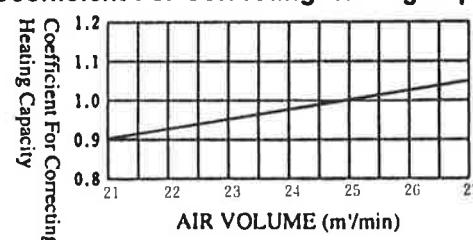
**Bypass factor. (B.F.)**



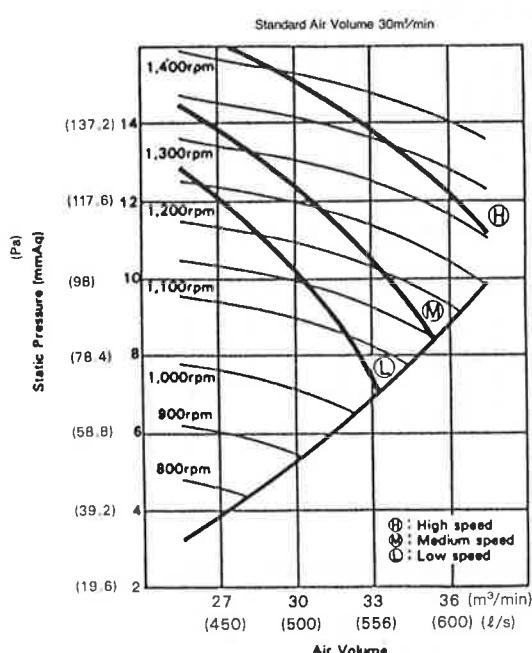
### Coefficient For Correcting Cooling Capacity



### Coefficient For Correcting Heating Capacity

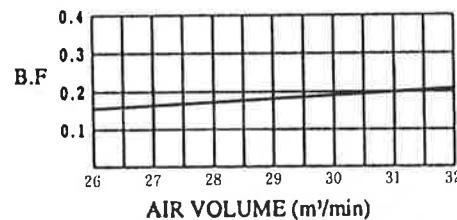


### ●CS-80E90HP, CS-80E90XP Fan Performance Curve

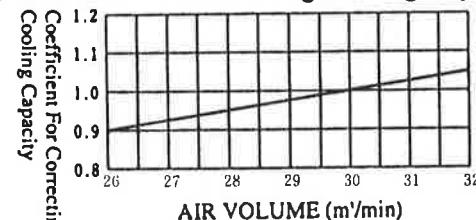


### Bypass factor And Coefficient For Correcting Capacity according to Air volume change

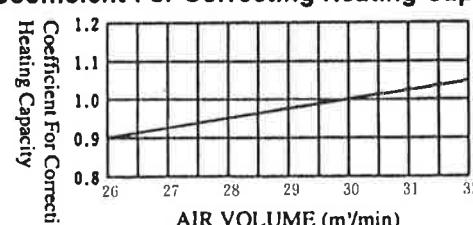
**Bypass factor. (B.F.)**



### Coefficient For Correcting Cooling Capacity

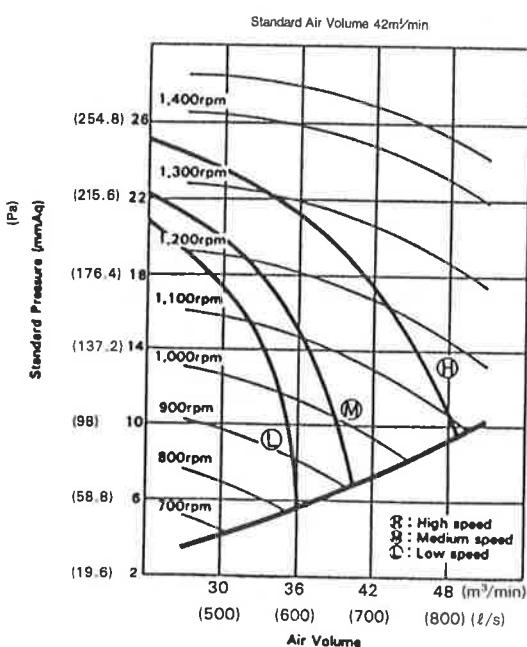


### Coefficient For Correcting Heating Capacity



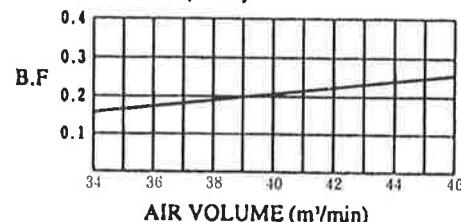
## FAN PERFORMANCE

●CS-112E90XP  
Fan Performance Curve

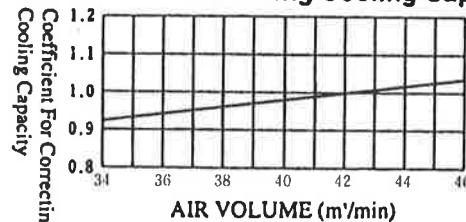


**Bypass factor And Coefficient For Correcting Capacity according to Air volume change**

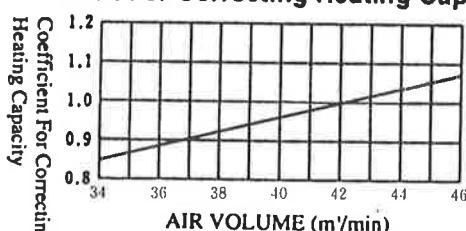
**Bypass factor. (B.F.)**



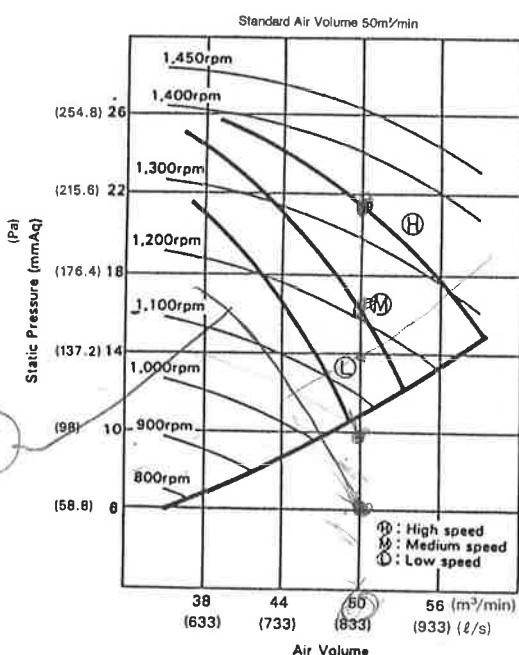
**Coefficient For Correcting Cooling Capacity**



**Coefficient For Correcting Heating Capacity**

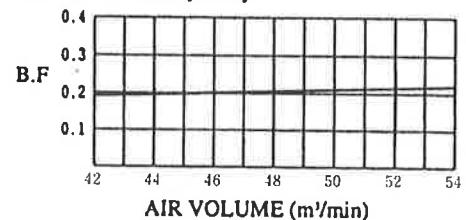


●CS-140E90XP  
Fan Performance Curve

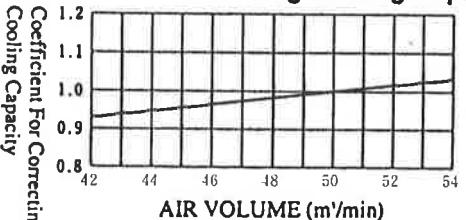


**Bypass factor And Coefficient For Correcting Capacity according to Air volume change**

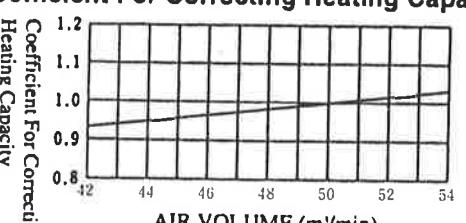
**Bypass factor. (B.F.)**



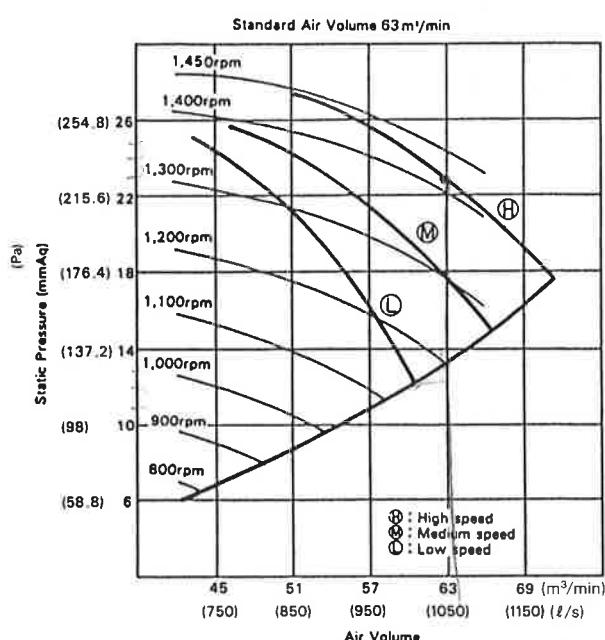
**Coefficient For Correcting Cooling Capacity**



**Coefficient For Correcting Heating Capacity**

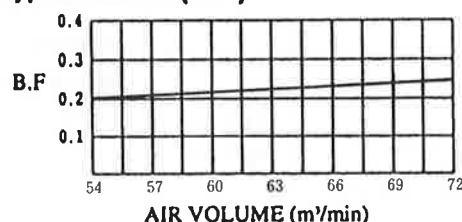


●CS-160E90XP  
Fan Performance Curve

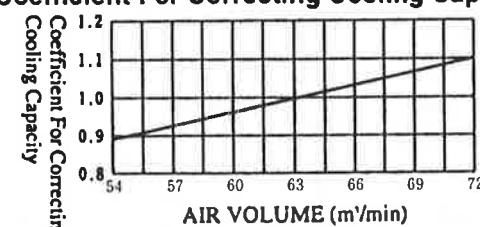


**Bypass factor And Coefficient For Correcting Capacity according to Air volume change**

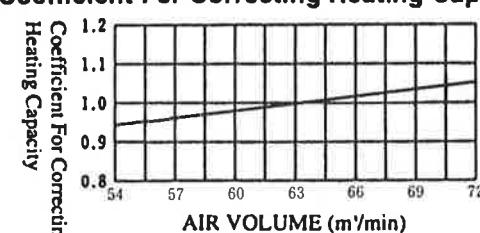
**Bypass factor. (B.F.)**



**Coefficient For Correcting Cooling Capacity**



**Coefficient For Correcting Heating Capacity**



## 10. SAFETY DEVICE

### SAFETY DEVICE

Model		CS-71E90XP CU-71C51HF	CS-71E90XP CU-71C51XE
<b>For Compressor</b>			
High Pressure Switch(63H <sub>1</sub> )		<b>Automatic Reset, Non-Adjustable</b>	<b>Automatic Reset, Non-Adjustable</b>
Cut-Out	kg/cm <sup>2</sup> G	28	28
Cut-In	kg/cm <sup>2</sup> G	23	23
Bimetal thermostat(26S)			
Cut-Out	°C	—	—
Cut-In	°C	—	—
<b>Internal Protector</b>			
(49C)		—	—
220V~240V 50Hz	°C		
(1 φ) OFF	°C	125	
ON	—	61	—
TRIP TIME		3 ~ 9 SEC(AT35A)	
380V~415V 50Hz	°C		
(3 φ) OFF	°C	—	105
ON	—	—	61
TRIP TIME			3~10SEC(AT23A)
<b>For Indoor Fan Motor</b>		<b>Automatic Reset, Non-Adjustable</b>	
Internal Thermostat(49F)			
Cut-Out	°C	135	135
Cut-In	°C	87	87
<b>For Outdoor Unit Control Fuse Motor</b>	A	5	5
<b>For Outdoor Fan Motor</b>		<b>Automatic Reset, Non-Adjustable</b>	
Pressure Switch (63H <sub>2</sub> )			
Cut-Out	kg/cm <sup>2</sup> G	21	21
Cut-In	kg/cm <sup>2</sup> G	11.5	11.5
Internal Thermostat(49F)		<b>Automatic Reset, Non-Adjustable</b>	
Cut-Out	°C	135	135
Cut-In	°C	88	88
<b>Crankcase Heater</b>	W	27	27
<b>For Indoor Unit Control Fuse Capacity</b>	A	3.15	3.15
<b>For Outdoor Fan Motor</b>		<b>Automatic Reset, Non-Adjustable</b>	
Pressure Switch(63H <sub>3</sub> )			
Cut-Out	kg/cm <sup>2</sup> G	24	24
Cut-In	kg/cm <sup>2</sup> G	20	20

	<b>SAFETY DEVICE</b>	
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**SAFETY DEVICE**

Model		CS-80E90HP CU-80C51HE	CS-80E90XP CU-80C51XP	CS-112E90XP CS-112C51XP	CS-140E90XP CU-140C51XE	CS-160E90XP CU-160C51XE
<b>For Compressor</b>						
High Pressure Switch(63H <sub>1</sub> )	<i>VFD</i>	Automatic Reset, Non-Adjustable				
Cut-Out	kg/cm <sup>2</sup> G	28	28	28	28	28
Cut-In	kg/cm <sup>2</sup> G	23	23	23	23	23
<b>Overcurrent Relay(51C)</b>	A	—	—	—	14	14
<b>Bimetal thermostat(26S)</b>						
Cut-Out	°C	—	—	—	—	—
Cut-In	°C	—	—	—	—	—
<b>Internal thermostat(49C)</b>						
Cut-Out	°C	—	—	—	115±5	—
Cut-In	°C	—	—	—	93±7	—
<b>Internal Protector</b>					—	—
220V~240V 50Hz						
(1φ) OFF	°C	130				
ON	°C	69	—	—	—	—
TRIP TIME	—	3-9SEC(AT36A)				
380V~415V 50Hz						
(3φ) OFF	°C		105	110		120
ON	°C	—	57	69	—	61
TRIP TIME	—		3-10 SEC(AT23A)	3-10 SEC(AT29A)		3-10 SEC(AT50A)
<b>For Indoor Fan Motor</b>					Automatic Reset, Non-Adjustable	
<b>Internal Thermostat(49F)</b>						
Cut-Out	°C	135	135	135	135	135
Cut-In	°C	87	87	87	87	87
<b>For Outdoor Unit Control Fuse Motor</b>	A	5	5	5	5	5
<b>For Outdoor Fan Motor</b>					Automatic Reset, Non-Adjustable	
<b>Pressure Switch(63H<sub>2</sub>)</b>						
Cut-Out	kg/cm <sup>2</sup> G	21	21	21	21	21
Cut-In	kg/cm <sup>2</sup> G	11.5	11.5	11.5	11.5	11.5
<b>Internal Thermostat(49F)</b>					Automatic Reset, Non-Adjustable	
Cut-Out	°C	135	135	135	135	135
Cut-In	°C	88	88	86	86	86
<b>Crankcase Heater</b>	W	27	27	27	40	41
<b>For Indoor Unit Control Fuse Capacity</b>	A	3.15	3.15	3.15	3.15	3.15
<b>For Outdoor Fan Motor</b>					Automatic Reset, Non-Adjustable	
<b>Pressure Switch(63H<sub>3</sub>)</b>						
Cut-Out	kg/cm <sup>2</sup> G	24	24	24	24	24
Cut-In	kg/cm <sup>2</sup> G	20	20	20	20	20

## 11. COMPONENT SPECIFICATION

### COMPONENT SPECIFICATION

Unit Model	CS-CU-	71E90HP 71C51HE	71E90XP 71C51XE	80E90HP 80C51HE	80E90XP 80C51XE	112E90XP 112C51XE	140E90XP 140C51XE	160E90XP 160C51XE
Compressor Model		CRGQ-0250 -PFJ	CRGQ-0250 -TFD	CRHQ-0275 -PFJ	CRHQ-0275 -TFD	CRLQ-0350 -TFD	NM0502 HTU5D	ZR68KC-TFD
Compressor Type								
No. of Cylinders		2	2	2	2	2	2	1
Revolution	50Hz	rpm	2,900	2,900	2,900	2,900	2,900	2,900
Piston Displacement	50Hz	m³/h	10.54	10.54	11.07	11.07	14.1	16.6
Motor Type								
Starting Method								
Rated Output	kW	1.87	1.87	2.05	2.05	2.61	3.7	4.1
Poles		2	2	2	2	2	2	2
Insulation Class		E	E	E	E	E	E	E
Oil Type	*							
Charge		Calumet R015 or Witco 3GS					SUNISO 3GSD	SONTEX 200LT
Evaporator(Indoor Unit)		1.63	1.63	1.63	1.63	1.63	2.3	1.77

Models	CS-	71E90HP	71E90XP	80E90HP	80E90XP	112E90XP	140E90XP	160E90XP
Tube Material								
Outer Diameter	mm	9.53	9.53	9.53	9.53	9.53	9.53	9.53
Thickness	mm	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Rows		3	3	3	3	2	3	3
No. of Tubes/Evap.		24	24	30	30	32	40	48
Fin Material								
Thickness	mm	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Fin Pitch	No./inch	12	12	12	12	12	12	12
Fin Surface		Louver-fin						
Total Face Area	m²	0.218	0.218	0.218	0.218	0.360	0.360	0.360
Evaporator Fan								
Type								
No./Unit		2	2	2	2	2	2	2
Evaporator Fan Motor								
Starting Method								
Rated Output	kW	0.15	0.15	0.15	0.15	0.25	0.35	0.45
Poles		4	4	4	4	4	4	4
Phase		Single-Phase						
Insulation Class		E	E	E	E	E	E	E
Condenser(Outdoor Unit)								

Models	CS-	71C51HE	71C51XE	80C51HE	80C51XE	112C51XE	140C51XE	160C51XE
Tube Material								
Outer Diameter	mm	7.94	7.94	9.5	9.5	9.5	9.5	9.5
Thickness	mm	0.35	0.35	0.3	0.3	0.3	0.3	0.3
Rows		2	2	3	3	3	3	3
No. of Tubes/Cond.		72	72	72	72	80	80	80
Fin Material								
Thickness	mm	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Fin Pitch	No./inch	14	14	14	14	14	14	15
Fin Surface		Louver fin						
Total Face Area	m²	0.666	0.667	0.667	0.667	0.922	1.040	1.040
Condenser fan								
Type								
No./Unit		2	2	2	2	2	2	2
Condenser Fan Motor								
Starting Method								
Rated Output	kW	0.03×2	0.03×2	0.03×2	0.03×2	0.07×2	0.07×2	0.08×2
Poles		6	6	6	6	6	6	6
Phase		Single-Phase						
Insulation Class		E	E	E	E	E	E	E

## 12.CAPACITY AND POWER CONSUMPTION

### ■ PERFORMANCE DATA

MODEL  
CS-71E90HP

#### COOLING PERFORMANCE

\*46°C is reference data

		Temperature Air Entering Condenser(°C D.B.)																			
AMBIENT RETURN AIR		30°C				35°C				40°C				43°C				*46°C			
		TC	SHC	IPT	Leav. W.B.	TC	SHC	IPT	Leav. W.B.	TC	SHC	IPT	Leav. W.B.	TC	SHC	IPT	Leav. W.B.	TC	SHC	IPT	Leav. W.B.
D.B.	W.B.	kW	kW	kW	°C	kW	kW	kW	°C	kW	kW	kW	°C	kW	kW	kW	°C	kW	kW	kW	°C
22.5	17	6.51	3.85	2.49	12.1	6.23	3.80	2.59	12.3	5.86	3.58	2.71	12.5	5.64	3.44	2.80	12.6	5.42	3.29	2.87	12.8
	19	7.32	3.11	2.62	14.1	7.00	3.04	2.72	14.3	6.58	2.88	2.86	14.5	6.34	2.77	2.94	14.6	6.09	2.66	3.03	14.8
	22	7.98	2.12	2.74	17.1	7.64	2.11	2.86	17.3	7.21	2.03	3.00	17.5	6.93	1.95	3.08	17.6	6.65	1.87	3.16	17.8
25	17	6.51	4.84	2.51	12.1	6.23	4.79	2.61	12.3	5.86	4.57	2.74	12.5	5.64	4.43	2.83	12.6	5.42	4.28	2.90	12.8
	19	7.32	4.10	2.64	14.1	7.00	4.03	2.75	14.3	6.58	3.87	2.80	14.5	6.34	3.76	2.97	14.6	6.09	3.65	3.06	14.8
	22	7.98	3.11	2.77	17.1	7.64	3.10	2.89	17.3	7.21	3.02	3.03	17.5	6.93	2.94	3.11	17.6	6.65	2.86	3.19	17.8
27	17	6.51	5.64	2.54	12.1	6.23	5.59	2.64	12.3	5.86	5.37	2.77	12.5	5.64	5.23	2.86	12.6	5.42	5.08	2.93	12.8
	19	7.32	4.90	2.67	14.1	7.00	4.83	2.78	14.3	6.58	4.67	2.92	14.5	6.34	4.56	3.00	14.6	6.09	4.45	3.09	14.8
	22	7.98	3.91	2.80	17.1	7.64	3.90	2.92	17.3	7.21	3.82	3.06	17.5	6.93	3.74	3.14	17.6	6.65	3.66	3.22	17.8
29	17	6.51	6.44	2.57	12.1	6.39	6.39	2.67	12.2	6.17	6.17	2.80	12.4	6.03	6.03	2.89	12.6	5.88	5.88	2.96	12.7
	19	7.32	5.70	2.70	14.1	7.00	5.63	2.81	14.3	6.58	5.47	2.95	14.5	6.34	5.36	3.03	14.6	6.09	5.25	3.12	14.8
	22	7.98	4.71	2.83	17.1	7.64	4.70	2.95	17.3	7.21	4.62	3.00	17.5	6.93	4.54	3.17	17.6	6.65	4.46	3.25	17.8
32	17	7.64	7.64	2.59	12.0	7.59	7.59	2.69	12.1	7.37	7.37	2.83	12.3	7.23	7.23	2.92	12.4	7.08	7.08	2.99	12.6
	19	7.32	6.90	2.72	14.1	7.00	6.83	2.84	14.3	6.67	6.67	2.98	14.3	6.56	6.56	3.06	14.4	6.45	6.45	3.15	14.6
	22	7.98	5.91	2.86	17.1	7.64	5.90	2.98	17.3	7.21	5.82	3.12	17.5	6.93	5.74	3.20	17.6	6.65	5.66	3.28	17.8

Legend:BF Bypass Factor 0.20 SHC Sensible Heat Capacity TC Total Cooling Capacity

#### CAPACITY SELECTION NOTES

(1) The table above is based on unit nominal evaporator airflow, correction factors must therefore be applied for selections away from this condition.

#### COOLING CORRECTION FACTORS

EVAP, AIR FLOW m³/min( l /s)	22(367)	25(417)	28(467)	31(517)
SHC Sensible Heat Capacity	0.91	1.0	1.09	1.17
TC Total Cooling Capacity	0.93	1.0	1.07	1.14

MODEL  
CS-71E90XP

#### COOLING PERFORMANCE

\*46°C is reference data

		Temperature Air Entering Condenser(°C D.B.)																			
AMBIENT RETURN AIR		30°C				35°C				40°C				43°C				*46°C			
		TC	SHC	IPT	Leav. W.B.	TC	SHC	IPT	Leav. W.B.	TC	SHC	IPT	Leav. W.B.	TC	SHC	IPT	Leav. W.B.	TC	SHC	IPT	Leav. W.B.
D.B.	W.B.	kW	kW	kW	°C	kW	kW	kW	°C	kW	kW	kW	°C	kW	kW	kW	°C	kW	kW	kW	°C
22.5	17	6.51	3.85	2.43	12.1	6.23	3.80	2.53	12.3	5.86	3.58	2.66	12.5	5.64	3.44	2.73	12.6	5.42	3.29	2.81	12.8
	19	7.32	3.11	2.56	14.1	7.00	3.04	2.67	14.3	6.58	2.88	2.80	14.5	6.34	2.77	2.88	14.6	6.09	2.66	2.96	14.8
	22	7.98	2.12	2.69	17.1	7.64	2.11	2.80	17.3	7.21	2.03	2.94	17.5	6.93	1.95	3.02	17.6	6.65	1.87	3.10	17.8
25	17	6.51	4.84	2.46	12.1	6.23	4.79	2.55	12.3	5.86	4.57	2.68	12.5	5.64	4.43	2.76	12.6	5.42	4.28	2.84	12.8
	19	7.32	4.10	2.58	14.1	7.00	4.03	2.69	14.3	6.58	3.87	2.83	14.5	6.34	3.76	2.91	14.6	6.09	3.65	2.99	14.8
	22	7.98	3.11	2.71	17.1	7.64	3.10	2.83	17.3	7.21	3.02	2.97	17.5	6.93	2.94	3.05	17.6	6.65	2.86	3.13	17.8
27	17	6.51	5.64	2.48	12.1	6.23	5.59	2.58	12.3	5.86	5.37	2.71	12.5	5.64	5.23	2.79	12.6	5.42	5.08	2.87	12.8
	19	7.32	4.90	2.61	14.1	7.00	4.83	2.72	14.3	6.58	4.67	2.86	14.5	6.34	4.56	2.94	14.6	6.09	4.45	3.02	14.8
	22	7.98	3.91	2.74	17.1	7.64	3.90	2.86	17.3	7.21	3.82	3.00	17.5	6.93	3.74	3.08	17.6	6.65	3.66	3.16	17.8
29	17	6.51	6.44	2.50	12.1	6.39	6.39	2.61	12.2	6.17	6.17	2.74	12.4	6.03	6.03	2.82	12.6	5.88	5.88	2.90	12.7
	19	7.32	5.70	2.64	14.1	7.00	5.63	2.75	14.3	6.58	5.47	2.89	14.5	6.34	5.36	2.97	14.6	6.09	5.25	3.05	14.8
	22	7.98	4.71	2.77	17.1	7.64	4.70	2.89	17.3	7.21	4.62	3.03	17.5	6.93	4.54	3.11	17.6	6.65	4.46	3.19	17.8
32	17	7.64	7.64	2.53	12.0	7.59	7.59	2.63	12.1	7.37	7.37	2.77	12.3	7.23	7.23	2.85	12.4	7.08	7.08	2.93	12.6
	19	7.32	6.90	2.66	14.1	7.00	6.83	2.77	14.3	6.67	6.67	2.92	14.3	6.50	6.56	3.00	14.4	6.45	6.45	3.08	14.6
	22	7.98	5.91	2.79	17.1	7.64	5.90	2.92	17.3	7.21	5.82	3.06	17.5	6.93	5.74	3.14	17.6	6.65	5.66	3.22	17.8

Legend:BF Bypass Factor 0.20 SHC Sensible Heat Capacity TC Total Cooling Capacity

#### CAPACITY SELECTION NOTES

(1) The table above is based on unit nominal evaporator airflow, correction factors must therefore be applied for selections away from this condition.

#### COOLING CORRECTION FACTORS

EVAP, AIR FLOW m³/min( l /s)	22(367)	25(417)	28(467)	31(517)
SHC Sensible Heat Capacity	0.91	1.0	1.09	1.17
TC Total Cooling Capacity	0.93	1.0	1.07	1.14

# CAPACITY AND POWER CONSUMPTION

MODEL  
CS-80E90HP

## COOLING PERFORMANCE

※46°C is reference data

AMBIENT RETURN AIR		Temperature Air Entering Condenser(°C D.B.)																							
		30°C				35°C				40°C				43°C				※46°C							
D.B.	W.B.	TC	SHC	IPT	Leav.	W.B.	kW	TC	SHC	IPT	Leav.	W.B.	kW	TC	SHC	IPT	Leav.	W.B.	kW	TC	SHC	IPT	Leav.	W.B.	
22.5	17	7.25	4.14	2.58	12.6	6.94	4.08	2.69	12.9	6.53	3.84	2.81	13.2	6.28	3.67	2.89	13.3	6.04	3.51	2.98	13.5				
	19	8.15	3.64	2.70	14.6	7.80	3.54	2.82	14.9	7.33	3.42	2.96	15.2	7.06	3.32	3.05	15.3	6.79	3.21	3.14	15.5				
	22	8.89	2.21	2.84	17.6	8.52	2.20	2.96	17.9	8.03	2.11	3.11	18.2	7.72	2.02	3.19	18.3	7.41	1.93	3.27	18.5				
25	17	7.25	5.33	2.60	12.6	6.94	5.27	2.71	12.9	6.53	5.03	2.84	13.2	6.28	4.86	2.92	13.3	6.04	4.70	3.01	13.5				
	19	8.15	4.83	2.73	14.6	7.80	4.73	2.85	14.9	7.33	4.61	2.99	15.2	7.06	4.51	3.08	15.3	6.79	4.40	3.17	15.5				
	22	8.89	3.40	2.87	17.6	8.52	3.39	2.99	17.9	8.03	3.30	3.14	18.2	7.72	3.21	3.23	18.3	7.41	3.12	3.31	18.5				
27	17	7.25	6.29	2.63	12.6	6.94	6.23	2.74	12.9	6.53	5.99	2.87	13.2	6.28	5.82	3.95	13.3	6.04	5.66	3.04	13.5				
	19	8.15	5.79	2.76	14.6	7.80	5.69	2.88	14.9	7.33	5.57	3.02	15.2	7.06	5.47	3.11	15.3	6.79	5.36	3.20	15.5				
	22	8.89	4.36	2.90	17.6	8.52	4.35	3.02	17.9	8.03	4.26	3.17	18.2	7.72	4.17	3.26	18.3	7.41	4.08	3.34	18.5				
29	17	7.25	7.25	2.66	12.5	7.19	7.19	2.77	12.8	6.95	6.95	2.90	13.1	6.78	6.78	2.98	13.2	6.62	6.62	3.07	13.4				
	19	8.15	6.75	2.79	14.6	7.80	6.65	2.91	14.9	7.33	6.53	3.05	15.2	7.06	6.43	3.14	15.3	6.79	6.32	3.23	15.5				
	22	8.89	5.32	2.93	17.6	8.52	5.31	3.05	17.9	8.03	5.22	3.20	18.2	7.72	5.13	3.29	18.3	7.41	5.04	3.37	18.5				
32	17	7.55	7.55	2.68	12.3	7.50	7.50	2.79	12.6	7.25	7.25	2.93	12.9	7.05	7.05	3.01	13.0	6.90	6.90	3.10	13.2				
	19	8.15	7.94	2.82	14.6	7.80	7.80	2.94	14.7	7.33	7.33	3.08	14.9	7.05	7.05	3.17	15.0	6.90	6.90	3.26	15.2				
	22	8.89	6.51	2.96	17.6	8.52	6.50	3.08	17.9	8.03	6.41	3.23	18.2	7.72	6.32	3.33	18.3	7.41	6.23	3.41	18.5				

Legend:BF Bypass Factor 0.19 SHC Sensible Heat Capacity TC Total Cooling Capacity

## CAPACITY SELECTION NOTES

- (1) The table above is based on unit nominal evaporator airflow, correction factors must therefore be applied for selections away from this condition.

## COOLING CORRECTION FACTORS

EVAP, AIR FLOW m³/min(ℓ/s)	27(450)	30(500)	33(550)	36(600)
SHC Sensible Heat Capacity	0.91	1.0	1.09	1.17
TC Total Cooling Capacity	0.93	1.0	1.07	1.14

MODEL

CS-80E90XP

## COOLING PERFORMANCE

※46°C is reference data

AMBIENT RETURN AIR		Temperature Air Entering Condenser(°C D.B.)																							
		30°C				35°C				40°C				43°C				※46°C							
D.B.	W.B.	TC	SHC	IPT	Leav.	W.B.	kW	TC	SHC	IPT	Leav.	W.B.	kW	TC	SHC	IPT	Leav.	W.B.	kW	TC	SHC	IPT	Leav.	W.B.	
22.5	17	7.25	4.14	2.63	12.6	6.94	4.08	2.73	12.9	6.53	3.84	2.87	13.2	6.28	3.67	2.96	13.3	6.04	3.51	3.04	13.5				
	19	8.15	3.64	2.76	14.6	7.80	3.54	2.88	14.9	7.33	3.42	3.03	15.2	7.06	3.32	3.11	15.3	6.79	3.21	3.19	15.5				
	22	8.89	2.21	2.90	17.6	8.52	2.20	3.03	17.9	8.03	2.11	3.18	18.2	7.72	2.02	3.26	18.3	7.41	1.93	3.34	18.5				
25	17	7.25	5.33	2.65	12.6	6.94	5.27	2.76	12.9	6.53	5.03	2.90	13.2	6.28	4.86	2.99	13.3	6.04	4.70	3.07	13.5				
	19	8.15	4.83	2.79	14.6	7.80	4.73	2.91	14.9	7.33	4.61	3.06	15.2	7.06	4.51	3.14	15.3	6.79	4.40	3.23	15.5				
	22	8.89	3.40	2.93	17.6	8.52	3.39	3.06	17.9	8.03	3.30	3.21	18.2	7.72	3.21	3.30	18.3	7.41	3.12	3.37	18.5				
27	17	7.25	6.29	2.68	12.6	6.94	6.23	2.79	12.9	6.53	5.99	2.93	13.2	6.28	5.82	3.02	13.3	6.04	5.66	3.10	13.5				
	19	8.15	5.79	2.82	14.6	7.80	5.69	2.94	14.9	7.33	5.57	3.09	15.2	7.06	5.47	3.17	15.3	6.79	5.36	3.26	15.5				
	22	8.89	4.36	2.96	17.6	8.52	4.35	3.09	17.9	8.03	4.26	3.24	18.2	7.72	4.17	3.33	18.3	7.41	4.08	3.41	18.5				
29	17	7.25	7.25	2.71	12.5	7.19	7.19	2.82	12.8	6.95	6.95	2.96	13.1	6.78	6.78	3.05	13.2	6.62	6.62	3.13	13.4				
	19	8.15	6.75	2.85	14.6	7.80	6.65	2.97	14.9	7.33	6.53	3.12	15.2	7.06	6.43	3.20	15.3	6.79	6.32	3.29	15.5				
	22	8.89	5.32	2.99	17.6	8.52	5.31	3.12	17.9	8.03	5.22	3.27	18.2	7.72	5.13	3.36	18.3	7.41	5.04	3.44	18.5				
32	17	7.55	7.55	2.73	12.3	7.50	7.50	2.85	12.6	7.25	7.25	2.96	12.9	7.05	7.05	3.08	13.0	6.90	6.90	3.16	13.2				
	19	8.15	7.94	2.88	14.6	7.80	7.80	3.00	14.7	7.33	7.33	3.15	14.9	7.05	7.05	3.23	15.0	6.90	6.90	3.33	15.2				
	22	8.89	6.51	3.02	17.6	8.52	6.50	3.15	17.9	8.03	6.41	3.30	18.2	7.72	6.32	3.40	18.3	7.41	6.23	3.48	18.5				

Legend:BF Bypass Factor 0.19 SHC Sensible Heat Capacity TC Total Cooling Capacity

## CAPACITY SELECTION NOTES

- (1) The table above is based on unit nominal evaporator airflow, correction factors must therefore be applied for selections away from this condition.

## COOLING CORRECTION FACTORS

EVAP, AIR FLOW m³/min(ℓ/s)	27(450)	30(500)	33(550)	36(600)
SHC Sensible Heat Capacity	0.91	1.0	1.09	1.17
TC Total Cooling Capacity	0.93	1.0	1.07	1.14

# CAPACITY AND POWER CONSUMPTION

MODEL  
CS-112E90XP

## COOLING PERFORMANCE

\*46°C is reference data

		Temperature Air Entering Condenser(°C D.B.)																			
AMBIENT RETURN AIR		30°C				35°C				40°C				43°C				※46°C			
		TC	SHC	IPT	Leav. W.B.	TC	SHC	IPT	Leav. W.B.	TC	SHC	IPT	Leav. W.B.	TC	SHC	IPT	Leav. W.B.	TC	SHC	IPT	Leav. W.B.
D.B.	W.B.	kW	kW	kW	°C	kW	kW	kW	°C	kW	kW	kW	°C	kW	kW	kW	°C	kW	kW	kW	°C
22.5	17	9.72	5.49	3.87	12.9	9.30	5.40	4.03	13.2	8.75	5.08	4.23	13.5	8.41	4.86	4.35	13.6	8.09	4.64	4.48	13.7
	19	10.92	4.81	4.08	14.9	10.45	4.69	4.24	15.2	9.82	4.52	4.46	15.5	9.46	4.39	4.59	15.6	9.09	4.24	4.71	15.7
	22	11.91	2.90	4.27	17.9	11.41	2.88	4.46	18.2	10.76	2.76	4.67	18.5	10.35	2.44	4.80	18.6	9.93	2.52	4.92	18.7
25	17	9.72	7.09	3.91	12.9	9.30	7.00	4.07	13.2	8.75	6.68	4.28	13.5	8.41	6.46	4.40	13.6	8.09	6.24	4.52	13.7
	19	10.92	6.41	4.12	14.9	10.45	6.29	4.29	15.2	9.82	6.12	4.50	15.5	9.46	5.99	4.63	15.6	9.09	5.84	4.76	15.7
	22	11.91	4.50	4.32	17.9	11.41	4.48	4.50	18.2	10.76	4.36	4.72	18.5	10.35	4.04	4.85	18.6	9.93	4.12	4.97	18.7
27	17	9.72	8.43	3.95	12.9	9.30	8.34	4.11	13.2	8.75	8.02	4.32	13.5	8.41	7.80	4.44	13.6	8.09	7.58	4.57	13.7
	19	10.92	7.75	4.16	14.9	10.45	7.63	4.33	15.2	9.82	7.46	4.55	15.5	9.46	7.33	4.68	15.6	9.09	7.18	4.81	15.7
	22	11.91	5.84	4.36	17.9	11.41	5.82	4.55	18.2	10.76	5.70	4.77	18.5	10.35	5.38	4.90	18.6	9.03	5.46	5.02	18.7
29	17	9.72	9.65	3.99	12.8	9.56	9.56	4.15	13.1	9.00	9.00	4.36	13.3	8.65	8.65	4.48	13.4	8.35	8.35	4.61	13.5
	19	10.92	8.97	4.20	14.9	10.45	8.94	4.37	15.2	9.82	8.68	4.60	15.5	9.46	8.55	4.73	15.6	9.09	8.40	4.86	15.7
	22	11.91	7.06	4.40	17.9	11.41	7.04	4.60	18.2	10.76	6.92	4.82	18.5	10.35	6.60	4.95	18.6	9.93	6.68	5.07	18.7
32	17	9.97	9.97	4.03	12.6	9.80	9.80	4.19	12.8	9.25	9.25	4.41	13.0	8.90	8.90	4.53	13.1	8.60	8.60	4.66	13.2
	19	9.97	9.97	4.24	14.9	9.80	9.80	4.42	15.0	9.25	9.25	4.64	15.2	8.90	8.90	4.77	15.3	8.60	8.60	4.91	15.4
	22	11.91	9.11	4.45	17.9	11.41	9.09	4.64	18.2	10.76	8.97	4.87	18.5	10.35	8.65	5.00	18.6	9.93	8.73	5.12	18.7

Legend:BF Bypass Factor 0.22 SHC Sensible Heat Capacity TC Total Cooling Capacity

## CAPACITY SELECTION NOTES

- (1) The table above is based on unit nominal evaporator airflow, correction factors must therefore be applied for selections away from this condition.

COOLING CORRECTION FACTORS				
EVAP, AIR FLOW m/min (l/s)	34(567)	38(633)	42(700)	46(767)
SHC Sensible Heat Capacity	0.91	0.95	1.0	1.05
TC Total Cooling Capacity	0.93	0.97	1.0	1.03

MODEL

CS-140E90XP

## COOLING PERFORMANCE

\*46°C is reference data

		Temperature Air Entering Condenser(°C D.B.)																			
AMBIENT RETURN AIR		30°C				35°C				40°C				43°C				※46°C			
		TC	SHC	IPT	Leav. W.B.	TC	SHC	IPT	Leav. W.B.	TC	SHC	IPT	Leav. W.B.	TC	SHC	IPT	Leav. W.B.	TC	SHC	IPT	Leav. W.B.
D.B.	W.B.	kW	kW	kW	°C	kW	kW	kW	°C	kW	kW	kW	°C	kW	kW	kW	°C	kW	kW	kW	°C
22.5	17	12.09	6.93	4.93	12.8	11.57	6.83	5.13	13.0	10.88	6.43	5.39	13.2	10.47	6.16	5.54	13.3	10.06	6.08	5.69	13.4
	19	13.59	6.10	5.18	14.9	13.00	5.94	5.40	15.1	12.22	5.74	5.67	15.3	11.77	5.57	5.83	15.4	11.31	5.38	6.00	15.5
	22	14.82	3.71	5.44	17.6	14.20	3.69	5.66	17.8	13.39	3.55	5.95	18.0	12.87	3.14	6.11	18.1	12.35	3.24	6.26	18.2
25	17	12.09	8.90	4.98	12.8	11.57	8.81	5.18	13.0	10.88	8.41	5.45	13.2	10.47	8.14	5.59	13.3	10.06	8.06	5.75	13.4
	19	13.59	8.08	5.24	14.8	13.00	7.92	5.45	15.0	12.22	7.72	5.73	15.2	11.77	7.55	5.89	15.3	11.31	7.36	6.06	15.4
	22	14.82	5.69	5.49	17.9	14.20	5.67	5.72	18.1	13.39	5.53	6.01	18.3	12.87	5.12	6.17	18.4	12.35	5.22	6.33	18.5
27	17	12.09	10.48	5.03	12.8	11.57	10.38	5.23	13.0	10.88	9.98	5.50	13.2	10.47	9.71	5.65	13.3	10.06	9.63	5.81	13.4
	19	13.59	9.65	5.29	14.8	13.00	9.49	5.51	15.0	12.22	9.29	5.79	15.2	11.77	9.12	5.95	15.3	11.31	8.93	6.12	15.4
	22	14.82	7.26	5.55	17.9	14.20	7.24	5.78	18.1	13.39	7.10	6.07	18.3	12.87	6.69	6.23	18.4	12.35	6.79	6.39	18.5
29	17	12.30	12.05	5.08	12.7	12.05	11.95	5.28	12.9	11.38	11.38	5.56	13.1	10.97	10.97	5.71	13.2	10.56	10.56	5.87	13.3
	19	13.59	11.22	5.34	14.8	13.59	11.06	5.56	15.0	12.22	10.86	5.85	15.2	11.77	10.69	6.01	15.3	11.31	10.50	6.18	15.4
	22	14.82	8.83	5.60	17.9	14.20	8.81	5.84	18.1	13.39	8.67	6.13	18.3	12.87	8.26	6.29	18.4	12.35	8.36	6.45	18.5
32	17	12.60	12.60	5.13	12.6	13.00	13.00	5.33	12.8	12.40	12.40	5.61	13.0	11.00	11.00	5.76	13.1	10.56	10.56	5.93	13.2
	19	13.59	13.20	5.40	14.8	13.59	13.00	5.62	15.0	12.40	12.40	5.91	15.2	11.77	11.77	6.07	15.3	11.31	11.31	6.24	15.4
	22	14.82	10.81	5.66	17.9	14.20	10.79	5.90	18.1	13.39	10.65	6.19	18.3	12.87	10.24	6.35	18.4	12.35	10.34	6.52	18.5

Legend:BF Bypass Factor 0.21 SHC Sensible Heat Capacity TC Total Cooling Capacity

## CAPACITY SELECTION NOTES

- (1) The table above is based on unit nominal evaporator airflow, correction factors must therefore be applied for selections away from this condition.

COOLING CORRECTION FACTORS				
EVAP, AIR FLOW m/min (l/s)	42(700)	46(767)	50(833)	54(900)
SHC Sensible Heat Capacity	0.91	0.95	1.0	1.05
TC Total Cooling Capacity	0.93	0.97	1.0	1.03

# CAPACITY AND POWER CONSUMPTION

MODEL  
CS-160E90XP

## COOLING PERFORMANCE

		Temperature Air Entering Condenser(°C D.B.)																※46°C is reference data			
AMBIENT RETURN AIR		30°C				35°C				40°C				43°C				※46°C			
		TC	SHC	IPT	Leav. W.B.	TC	SHC	IPT	Leav. W.B.	TC	SHC	IPT	Leav. W.B.	TC	SHC	IPT	Leav. W.B.	TC	SHC	IPT	Leav. W.B.
D.B.	W.B.	kW	kW	kW	°C	kW	kW	kW	°C	kW	kW	kW	°C	kW	kW	kW	°C	kW	kW	kW	°C
22.5	17	13.49	7.29	5.45	13.2	12.91	7.17	5.68	13.4	12.14	6.72	5.97	13.6	11.67	6.41	6.13	13.7	11.22	6.10	6.31	13.8
	19	15.15	6.35	5.74	15.2	14.50	6.18	5.98	15.4	13.63	5.95	6.28	15.6	13.12	5.76	6.46	15.7	12.62	5.56	6.63	15.8
	22	16.53	3.69	6.03	17.8	15.83	3.66	6.28	18.0	14.94	3.51	6.59	18.2	14.36	3.34	6.76	18.3	13.78	3.17	6.94	18.4
25	17	13.49	9.74	5.50	13.2	12.91	9.62	5.74	13.4	12.14	9.17	6.03	13.6	11.67	8.86	6.20	13.7	11.22	8.55	6.37	13.8
	19	15.15	8.80	5.80	15.2	14.50	8.63	6.04	15.4	13.63	8.40	6.35	15.6	13.12	8.21	6.52	15.7	12.62	8.01	6.70	15.8
	22	16.53	6.14	6.09	18.2	15.83	6.11	6.35	18.4	14.94	5.96	6.65	18.6	14.36	5.79	6.83	18.7	13.78	5.62	7.01	18.8
27	17	13.49	11.70	5.56	13.2	12.91	11.58	5.80	13.4	12.14	11.13	6.09	13.6	11.67	10.82	6.26	13.7	11.22	10.51	6.44	13.8
	19	15.15	10.76	5.86	15.2	14.50	10.59	6.10	15.4	13.63	10.36	6.41	15.6	13.12	10.17	6.59	15.7	12.62	9.97	6.77	15.8
	22	16.53	8.10	6.15	18.2	15.83	8.07	6.41	18.4	14.94	7.92	6.72	18.6	14.36	7.75	6.90	18.7	13.78	7.58	7.08	18.8
29	17	14.00	13.66	5.62	13.1	13.50	13.50	5.86	13.3	12.74	12.74	6.15	13.5	12.27	12.27	6.32	13.6	11.82	11.82	6.50	13.7
	19	15.15	12.72	5.92	15.1	14.50	12.55	6.16	15.3	13.63	12.32	6.47	15.5	13.12	12.13	6.66	15.6	12.62	11.93	6.84	15.7
	22	16.53	10.06	6.21	18.1	15.83	10.03	6.47	18.3	14.94	9.88	6.79	18.5	14.36	9.71	6.97	18.6	13.78	9.54	7.15	18.7
32	17	14.50	14.50	5.67	12.9	14.00	14.00	5.92	13.1	13.63	13.63	6.21	13.3	13.12	13.12	6.39	13.4	12.62	12.62	6.57	13.5
	19	15.15	15.15	5.98	15.1	14.50	14.50	6.22	15.3	13.63	13.63	6.54	15.5	13.12	13.12	6.72	15.6	12.62	12.62	6.91	15.7
	22	16.53	12.51	6.27	18.1	15.83	12.48	6.54	18.3	14.94	12.33	6.85	18.5	14.36	12.16	7.04	18.6	13.78	11.99	7.22	18.7

Legend:BF Bypass Factor 0.22 SHC Sensible Heat Capacity TC Total Cooling Capacity

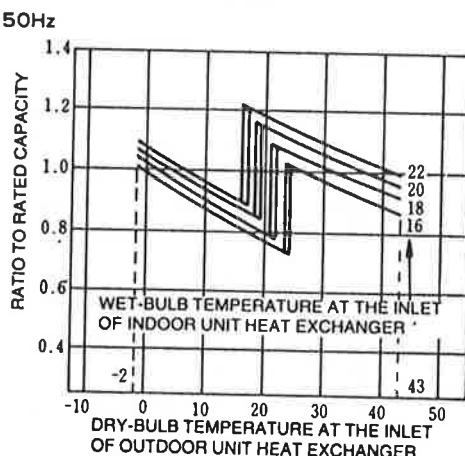
## CAPACITY SELECTION NOTES

(1) The table above is based on unit nominal evaporator airflow, correction factors must therefore be applied for selections away from this condition.

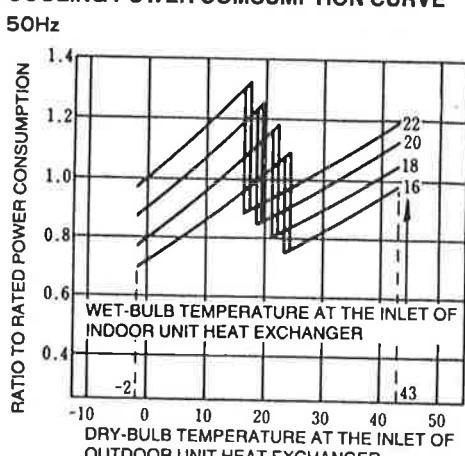
COOLING CORRECTION FACTORS			
EVAP. AIR FLOW m³/min( l /s)	55(917)	59(983)	63(1050)
SHC Sensible Heat Capacity	0.89	0.93	1.0
TC Total Cooling Capacity	0.91	0.96	1.0

## COOLING CAPACITY CURVE, COOLING POWER CONSUMPTION CURVE

### COOLING CAPACITY CURVE



### COOLING POWER CONSUMPTION CURVE



### RATED COOLING CAPACITY, RATED COOLING POWER CONSUMPTION

	RATED COOLING STANDARD	
	CAPACITY(kW)	POWER CONSUMPTION(kW)
CS-71E90HP	7.00	2.78
CS-71E90XP	7.00	2.72
CS-80E90HP	7.80	2.88
CS-80E90XP	7.80	2.94
CS-112E90XP	10.45	4.33
CS-140E90XP	13.00	5.51
CS-160E90XP	14.50	6.10

### Calculation of actual cooling capacity and power consumption

#### Example

CS-80E90XP 400V 50Hz

• Calculation of the actual cooling capacity and power consumption for the following cooling conditions: Indoor temperature of 18°C (wet-bulb temperature) and outdoor temperature of 40°C (dry-bulb temperature).

#### Calculation method

- Find the cooling capacity ratio and power consumption ratio from the cooling capacity graph and power consumption graph for model CS-80E90XP

① The cooling capacity ratio indicated at the intersection between an outdoor unit heat exchanger inlet air temperature of 40°C on the horizontal axis and an indoor unit heat exchanger inlet temperature of 18°C is 0.94.

② The cooling power consumption ratio from the same intersection on the power consumption graph is 1.01.

• Thus,  
Actual cooling capacity = cooling capacity ratio × rated cooling capacity  
= 0.94 × 7.80 = 7.33(kW)

Actual cooling power consumption = cooling power consumption ratio × rated power consumption  
= 1.01 × 2.87 = 2.90(kW)

# CAPACITY AND POWER CONSUMPTION

## ■ PERFORMANCE DATA

### HEATING PERFORMANCE

Model	Heating capacities are based conditions.							
CS-71E90HP	<ul style="list-style-type: none"> <li>Indoor temp.21°C D.B.</li> <li>Outdoor temp.7°C D.B. 6°C W.B.</li> <li>Standard air volume 25 m³/min(417 l/s)</li> <li>External Static Pressure(100Pa)</li> </ul>							
Heating capacity 7.44kW								
	HEATING CORRECTION FACTORS							
	EVAR.AIR FLOW m³/min( l/s)	22(367)	25(417)	28.5(475)	32.5(545)			
	Reference External							
	Static Pressure(Pa)at Hi-notch	118	100	60	0			
	TC Total Heating Capacity	0.93	1.0	1.09	1.18			

Inlet Air		Outdoor Temperature(°C W.B.)							
• External Static Pressure(Pa)	Entering Air Dry Bulb(°C)	-6		0		6		12	
		H.C.	IPT	H.C.	IPT	H.C.	IPT	H.C.	IPT
0pa	16	5.79	—	7.12	—	9.13	—	10.97	—
	21	5.53	—	6.84	—	8.80	—	10.54	—
	26	5.26	—	6.58	—	8.34	—	10.10	—
542 l/s	16	5.35	—	6.57	—	8.44	—	10.14	—
	21	5.11	—	6.32	—	8.11	—	9.73	—
	26	4.86	—	6.08	—	7.71	—	9.33	—
60Pa	16	4.91	1.72	6.03	1.96	7.74	2.33	9.30	2.70
	21	4.69	1.84	5.80	2.11	7.44	2.45	8.93	2.82
	26	4.46	1.90	5.58	2.21	7.07	2.57	8.56	2.94
475 l/s	16	4.91	1.69	6.03	1.94	7.74	2.30	9.30	2.66
	21	4.69	1.82	5.80	2.08	7.44	2.42	8.93	2.78
	26	4.46	1.88	5.58	2.18	7.07	2.54	8.56	2.90
100Pa	16	4.91	1.72	6.03	1.96	7.74	2.33	9.30	2.70
	21	4.69	1.84	5.80	2.11	7.44	2.45	8.93	2.82
	26	4.46	1.90	5.58	2.21	7.07	2.57	8.56	2.94
417 l/s	16	4.91	1.69	6.03	1.94	7.74	2.30	9.30	2.66
	21	4.69	1.82	5.80	2.08	7.44	2.42	8.93	2.78
	26	4.46	1.88	5.58	2.18	7.07	2.54	8.56	2.90

Model	Heating capacities are based conditions.							
CS-71E90XP	<ul style="list-style-type: none"> <li>Indoor temp.21°C D.B.</li> <li>Outdoor temp.7°C D.B. 6°C W.B.</li> <li>Standard air volume 25 m³/min(417 l/s)</li> <li>External Static Pressure(100Pa)</li> </ul>							
Heating capacity 7.44kW								
	HEATING CORRECTION FACTORS							
	EVAR AIR FLOW m³/min( l/s)	22(367)	25(417)	28.5(475)	32.5(545)			
	Reference External							
	Static Pressure(Pa)at Hi-notch	118	100	60	0			
	TC Total Heating Capacity	0.93	1.0	1.09	1.18			

Inlet Air		Outdoor Temperature(°C W.B.)							
• External Static Pressure(Pa)	Entering Air Dry Bulb(°C)	-6		0		6		12	
		H.C.	IPT	H.C.	IPT	H.C.	IPT	H.C.	IPT
0pa	16	5.79	—	7.12	—	9.13	—	10.97	—
	21	5.53	—	6.84	—	8.80	—	10.54	—
	26	5.26	—	6.58	—	8.34	—	10.10	—
542 l/s	16	5.35	—	6.57	—	8.44	—	10.14	—
	21	5.11	—	6.32	—	8.11	—	9.73	—
	26	4.86	—	6.08	—	7.71	—	9.33	—
60Pa	16	5.35	—	6.57	—	8.44	—	10.14	—
	21	5.11	—	6.32	—	8.11	—	9.73	—
	26	4.86	—	6.08	—	7.71	—	9.33	—
475 l/s	16	4.91	1.69	6.03	1.94	7.74	2.30	9.30	2.66
	21	4.69	1.82	5.80	2.08	7.44	2.42	8.93	2.78
	26	4.46	1.88	5.58	2.18	7.07	2.54	8.56	2.90
100Pa	16	4.91	1.72	6.03	1.96	7.74	2.33	9.30	2.70
	21	4.69	1.84	5.80	2.11	7.44	2.45	8.93	2.82
	26	4.46	1.90	5.58	2.21	7.07	2.57	8.56	2.94
417 l/s	16	4.91	1.69	6.03	1.94	7.74	2.30	9.30	2.66
	21	4.69	1.82	5.80	2.08	7.44	2.42	8.93	2.78
	26	4.46	1.88	5.58	2.18	7.07	2.54	8.56	2.90

Model	Heating capacities are based conditions.							
CS-80E90HP	<ul style="list-style-type: none"> <li>Indoor temp.21°C D.B.</li> <li>Outdoor temp.7°C D.B. 6°C W.B.</li> <li>Standard air volume 30 m³/min(500 l/s)</li> <li>External Static Pressure(100Pa)</li> </ul>							
Heating capacity 8.26kW								
	HEATING CORRECTION FACTORS							
	EVAR AIR FLOW m³/min( l/s)	27(450)	30(500)	34(567)	38(633)			
	Reference External							
	Static Pressure(Pa)at Hi-notch	118	100	60	0			
	TC Total Heating Capacity	0.93	1.0	1.10	1.20			

Inlet Air		Outdoor Temperature(°C W.B.)							
• External Static Pressure(Pa)	Entering Air Dry Bulb(°C)	-6		0		6		12	
		H.C.	IPT	H.C.	IPT	H.C.	IPT	H.C.	IPT
0pa	16	6.54	—	8.03	—	10.31	—	12.40	—
	21	6.24	—	7.73	—	9.91	—	11.89	—
	26	5.95	—	7.44	—	9.42	—	11.40	—
633 l/s	16	6.00	—	7.36	—	9.45	—	11.36	—
	21	5.72	—	7.08	—	9.08	—	10.90	—
	26	5.46	—	6.82	—	8.64	—	10.45	—
60Pa	16	5.45	1.83	6.69	2.09	8.59	2.48	10.33	2.87
	21	5.20	1.96	6.44	2.24	8.26	2.61	9.91	3.00
	26	4.96	2.02	6.20	2.35	7.85	2.74	9.50	3.13
567 l/s	16	5.45	1.83	6.69	2.09	8.59	2.48	10.33	2.87
	21	5.20	1.96	6.44	2.24	8.26	2.61	9.91	3.00
	26	4.96	2.02	6.20	2.35	7.85	2.74	9.50	3.13
100Pa	16	5.45	1.83	6.69	2.09	8.59	2.48	10.33	2.87
	21	5.20	1.96	6.44	2.24	8.26	2.61	9.91	3.00
	26	4.96	2.02	6.20	2.35	7.85	2.74	9.50	3.13
500 l/s	16	5.45	1.83	6.69	2.09	8.59	2.48	10.33	2.87
	21	5.20	1.96	6.44	2.24	8.26	2.61	9.91	3.00
	26	4.96	2.02	6.20	2.35	7.85	2.74	9.50	3.13

Legend: HC: Heating Capacity(kW)  
IPT: Input(kW)

# CAPACITY AND POWER CONSUMPTION

## HEATING PERFORMANCE

Model	Heating capacities are based conditions.				HEATING CORRECTION FACTORS			
CS-112E90XP	<ul style="list-style-type: none"> <li>Indoor temp.21°C D.B.</li> <li>Outdoor temp.7°C D.B. 6°C W.B.</li> <li>Standard air volume 42 m³/min(700 l/s)</li> <li>External Static Pressure(100Pa)</li> </ul>				EVAR AIR FLOW m³/min( l/s)	38(633)	42(700)	46(767)
Heating capacity 11.15kW					Reference External Static Pressure(Pa)at Hi-notch	138	100	60
					TC Total Heating Capacity	0.92	1.0	1.07
								1.12

Inlet Air • External Static Pressure(Pa) • Air Volume( l/s)	Entering Air Dry Bulb(°C)	Outdoor Temperature(°C W.B.)							
		-6		0		6		12	
		H.C.	IPT	H.C.	IPT	H.C.	IPT	H.C.	IPT
0pa	16	8.24	—	10.11	—	12.99	—	15.61	—
	21	7.86	—	9.74	—	12.48	—	14.99	—
	26	7.49	—	9.36	—	11.86	—	14.36	—
808 l/s	16	7.88	—	9.66	—	12.41	—	14.92	—
	21	7.51	—	9.31	—	11.93	—	14.32	—
	26	7.16	—	8.95	—	11.33	—	13.72	—
60Pa	16	7.36	2.56	9.03	2.92	11.60	3.47	13.94	4.02
	21	7.02	2.74	8.70	3.14	11.15	3.65	13.38	4.20
	26	6.69	2.83	8.36	3.29	10.59	3.83	12.82	4.38
767 l/s	16	7.36	2.56	9.03	2.92	11.60	3.47	13.94	4.02
	21	7.02	2.74	8.70	3.14	11.15	3.65	13.38	4.20
	26	6.69	2.83	8.36	3.29	10.59	3.83	12.82	4.38
100Pa	16	7.36	2.56	9.03	2.92	11.60	3.47	13.94	4.02
	21	7.02	2.74	8.70	3.14	11.15	3.65	13.38	4.20
	26	6.69	2.83	8.36	3.29	10.59	3.83	12.82	4.38
700 l/s	16	7.36	2.56	9.03	2.92	11.60	3.47	13.94	4.02
	21	7.02	2.74	8.70	3.14	11.15	3.65	13.38	4.20
	26	6.69	2.83	8.36	3.29	10.59	3.83	12.82	4.38

Model	Heating capacities are based conditions.				HEATING CORRECTION FACTORS			
CS-140E90XP	<ul style="list-style-type: none"> <li>Indoor temp.21°C D.B.</li> <li>Outdoor temp.7°C D.B. 6°C W.B.</li> <li>Standard air volume 50 m³/min(830 l/s)</li> <li>External Static Pressure(100Pa)</li> </ul>				EVAR AIR FLOW m³/min( l/s)	46(767)	50(833)	55(917)
Heating capacity 14.15kW					Reference External Static Pressure(Pa)at Hi-notch	138	100	60
					TC Total Heating Capacity	0.97	1.0	1.04
								1.08

Inlet Air • External Static Pressure(Pa) • Air Volume( l/s)	Entering Air Dry Bulb(°C)	Outdoor Temperature(°C W.B.)							
		-6		0		6		12	
		H.C.	IPT	H.C.	IPT	H.C.	IPT	H.C.	IPT
0pa	16	10.09	—	12.38	—	15.90	—	19.11	—
	21	9.62	—	11.92	—	15.28	—	18.34	—
	26	9.17	—	11.46	—	14.52	—	17.57	—
983 l/s	16	9.71	—	11.92	—	15.31	—	18.40	—
	21	9.27	—	11.48	—	14.71	—	17.66	—
	26	8.83	—	11.03	—	13.98	—	16.92	—
60Pa	16	9.34	3.33	11.46	3.80	14.72	4.51	17.69	5.23
	21	8.91	3.56	11.04	4.09	14.15	4.75	16.98	5.46
	26	8.49	3.68	10.61	4.28	13.44	4.99	16.27	5.70
917 l/s	16	9.34	3.33	11.46	3.80	14.72	4.51	17.69	5.23
	21	8.91	3.56	11.04	4.09	14.15	4.75	16.98	5.46
	26	8.49	3.68	10.61	4.28	13.44	4.99	16.27	5.70
100Pa	16	9.34	3.33	11.46	3.80	14.72	4.51	17.69	5.23
	21	8.91	3.56	11.04	4.09	14.15	4.75	16.98	5.46
	26	8.49	3.68	10.61	4.28	13.44	4.99	16.27	5.70
833 l/s	16	9.34	3.33	11.46	3.80	14.72	4.51	17.69	5.23
	21	8.91	3.56	11.04	4.09	14.15	4.75	16.98	5.46
	26	8.49	3.68	10.61	4.28	13.44	4.99	16.27	5.70

Model	Heating capacities are based conditions.				HEATING CORRECTION FACTORS			
CS-160E90XP	<ul style="list-style-type: none"> <li>Indoor temp.21°C D.B.</li> <li>Outdoor temp.7°C D.B. 6°C W.B.</li> <li>Standard air volume 63 m³/min(1050 l/s)</li> <li>External Static Pressure(100Pa)</li> </ul>				EVAR AIR FLOW m³/min( l/s)	59(983)	63(1050)	66(1100)
Heating capacity 15.70kW					Reference External Static Pressure(Pa)at Hi-notch	138	100	60
					TC Total Heating Capacity	0.95	1.0	1.015
								1.05

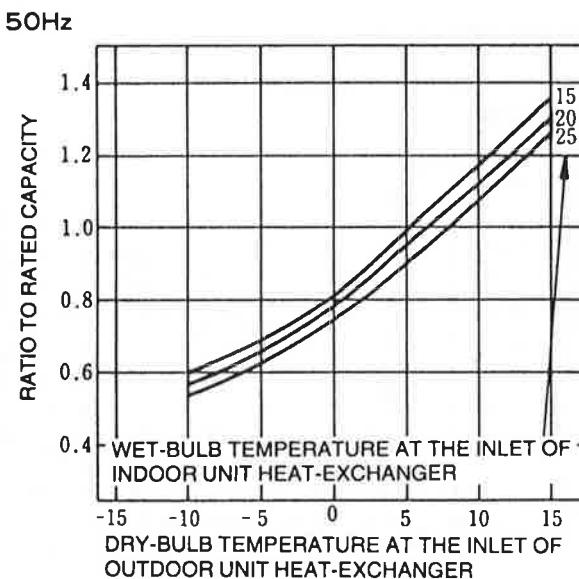
Inlet Air • External Static Pressure(Pa) • Air Volume( l/s)	Entering Air Dry Bulb(°C)	Outdoor Temperature(°C W.B.)							
		-6		0		6		12	
		H.C.	IPT	H.C.	IPT	H.C.	IPT	H.C.	IPT
0pa	16	10.88	—	13.36	—	17.15	—	20.61	—
	21	10.38	—	12.86	—	16.48	—	19.78	—
	26	9.89	—	12.37	—	15.66	—	18.96	—
60Pa	16	10.52	—	12.91	—	16.57	—	19.92	—
	21	10.04	—	12.43	—	15.93	—	19.12	—
	26	9.56	—	11.96	—	15.14	—	18.33	—
1,100 l/s	16	10.36	3.52	12.72	4.02	16.33	4.78	19.63	5.59
	21	9.89	3.77	12.25	4.33	15.70	5.03	18.84	5.78
	26	9.42	3.90	11.78	4.53	14.92	5.28	18.06	6.04
1,050 l/s	16	10.36	3.52	12.72	4.02	16.33	4.78	19.63	5.59
	21	9.89	3.77	12.25	4.33	15.70	5.03	18.84	5.78
	26	9.42	3.90	11.78	4.53	14.92	5.28	18.06	6.04

Legend: HC: Heating Capacity(kW)

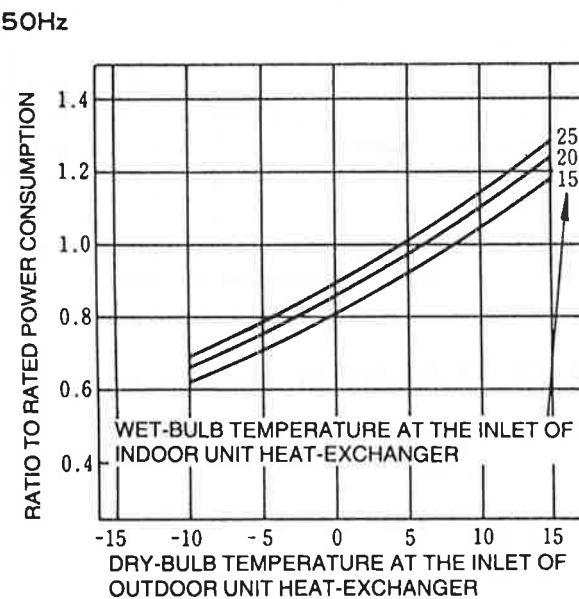
IPT: Input(kW)

## ■ HEATING CAPACITY CURVE, HEATING POWER CONSUMPTION CURVE

### • HEATING CAPACITY CURVE (AUXILIARY HEATER NOT INCLUDED IN DATA)



### • HEATING POWER CONSUMPTION CURVE (AUXILIARY HEATER NOT INCLUDED IN DATA)



### ● RATED HEATING CAPACITY, RATED HEATING POWER CONSUMPTION

	RATED HEATING STANDARD	
	CAPACITY(kW)	POWER CONSUMPTION(kW)
CS-71E90HP	7.44	2.45
CS-71E90XP	7.44	2.42
CS-80E90HP	8.26	2.55
CS-80E90XP	8.26	2.61
CS-112E90XP	11.15	3.65
CS-140E90XP	14.15	4.75
CS-160E90XP	15.70	5.03

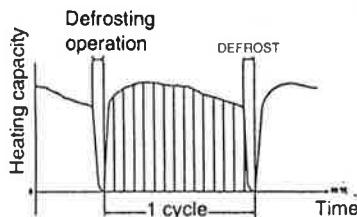
#### <Precautions on using capacity and electrical characteristics curves>

- Heating capacity when the unit is frosted over or while being defrosted will vary depending on outdoor temperature ('CWB) and the amount of frost. Heating capacity performance must be compensated because it does not take into account the capacity drop incurred when the unit is frosted over and while it is being defrosted. Therefore, to obtain the integral heating capacity in consideration of overfrosting and defrost operations, heating capacity must be multiplied by the compensation coefficient below.

- Heating capacity compensation coefficient for heating in frosted situations

Wet-bulb temperature at inlet of outdoor unit heat exchanger ('CWB)	-10	-8	-6	-4	-2	0	1	2	4	6
Heating capacity compensation coefficient	0.93	0.93	0.92	0.89	0.87	0.86	0.87	0.89	0.95	1.0

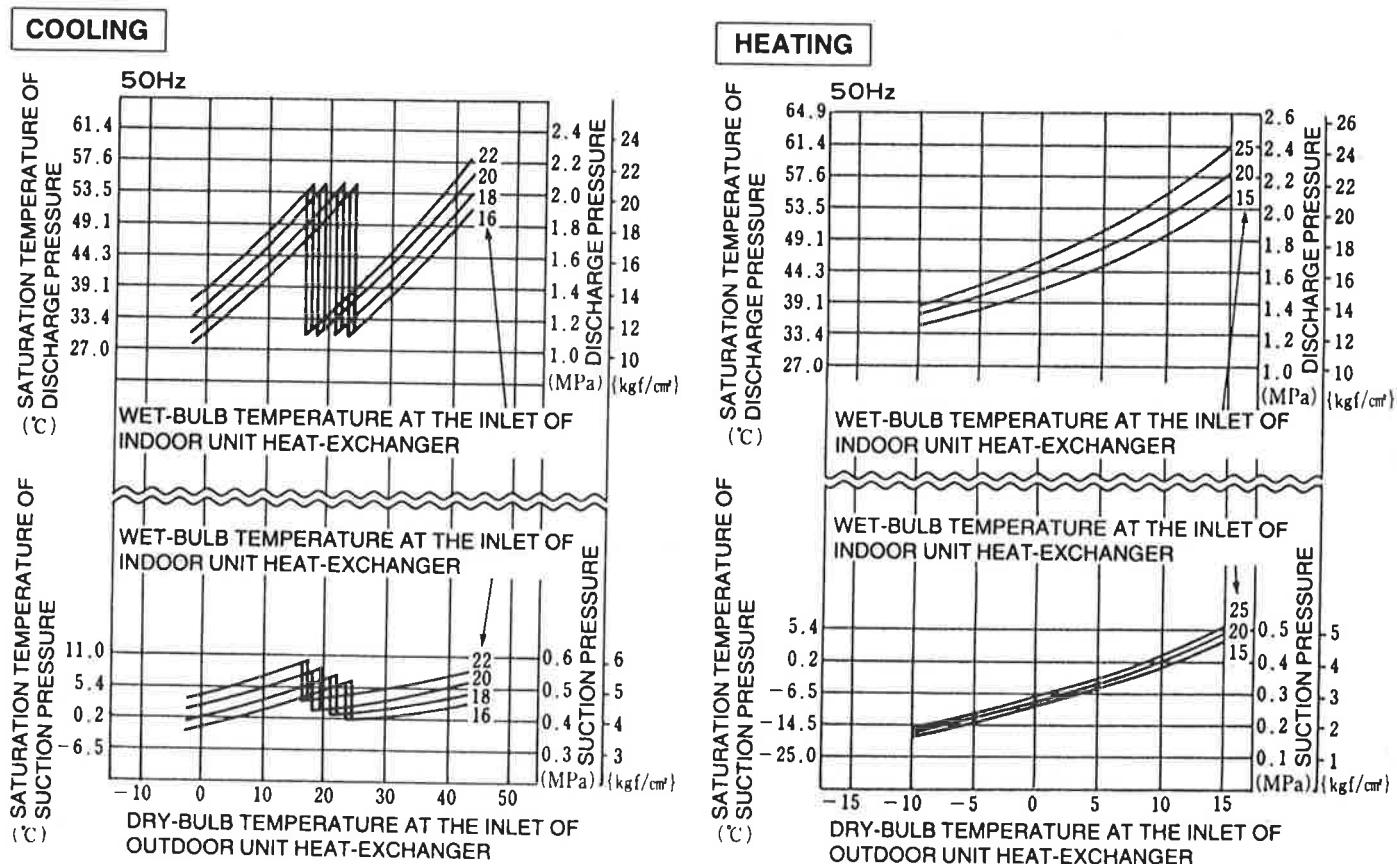
\* 1  
Integral heating capacity = (Heating capacity by heating capacity performance) × (Heating capacity compensation coefficient) <kW>



\* 1  
Integral heating capacity is obtained by integrating the capacity consumed in 1 defrost cycle into the normal heating capacity, and calculating this value as an hourly figure. One defrost cycle is determined as the time from when a defrost operation stops (heating starts) until the next heating operation starts (see figure on left).

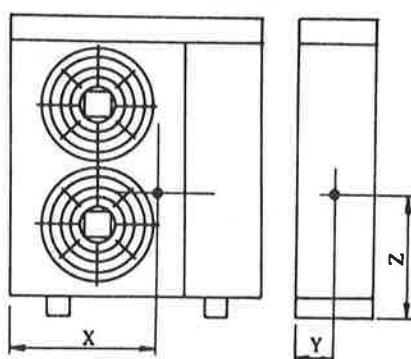
## ■ SATURATION TEMPERATURE OF DISCHARGE AND SUCTION PRESSURE

- COMMON TO ALL MODELS
- SATURATION TEMPERATURE OF DISCHARGE AND SUCTION PRESSURE



## 14. POSITION OF THE CENTER OF GRAVITY

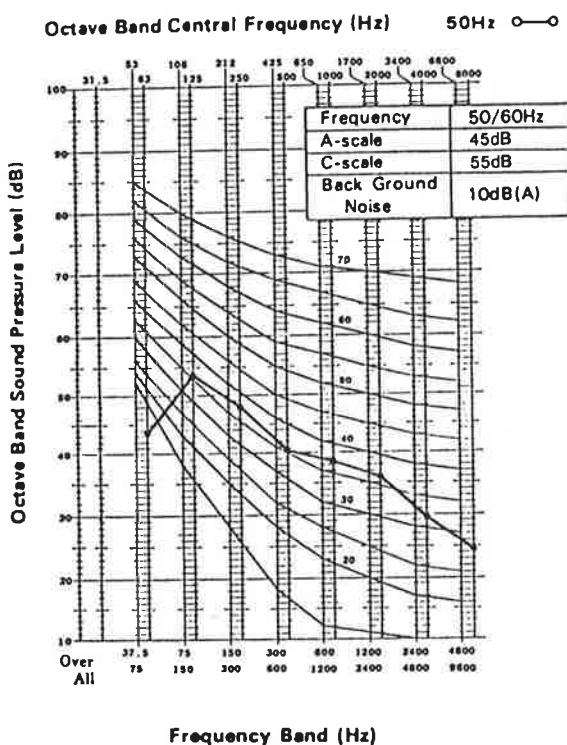
71C51HE ~ 160C51XE



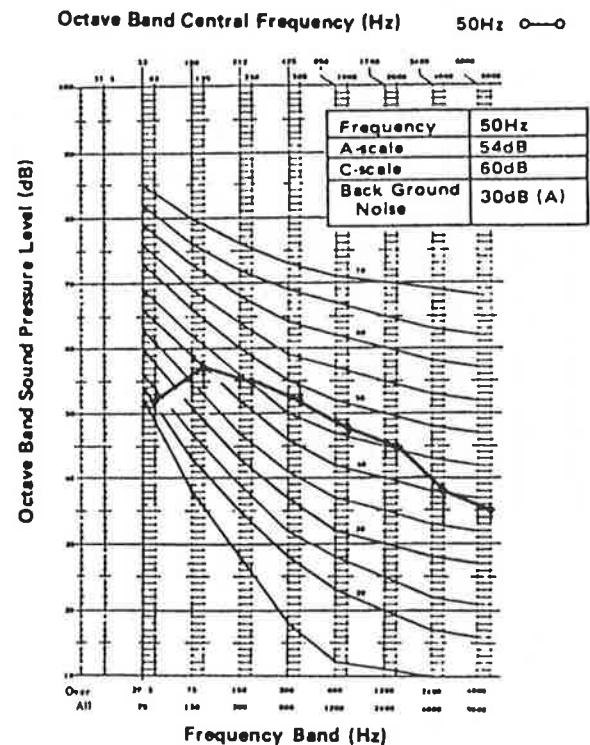
MODEL NAME	OUTSIDE DIMENSIONS			NET WEIGHT kg	CENTER OF GRAVITY		
	WIDTH	DEPTH	HEIGHT		X	Y	Z
CU-71C51HE	790	320	965	72	540	145	350
CU-71C51XE	790	320	965	72	540	145	350
CU-80C51HE	790	320	965	79	540	145	350
CU-80C51XE	790	320	965	79	540	145	350
CU-112C51XE	880	370	1,065	96	620	180	455
CU-140C51XE	1,000	370	1,065	110	690	200	485
CU-160C51XE	1,000	370	1,065	108	690	200	485

## 15. SOUND DATA

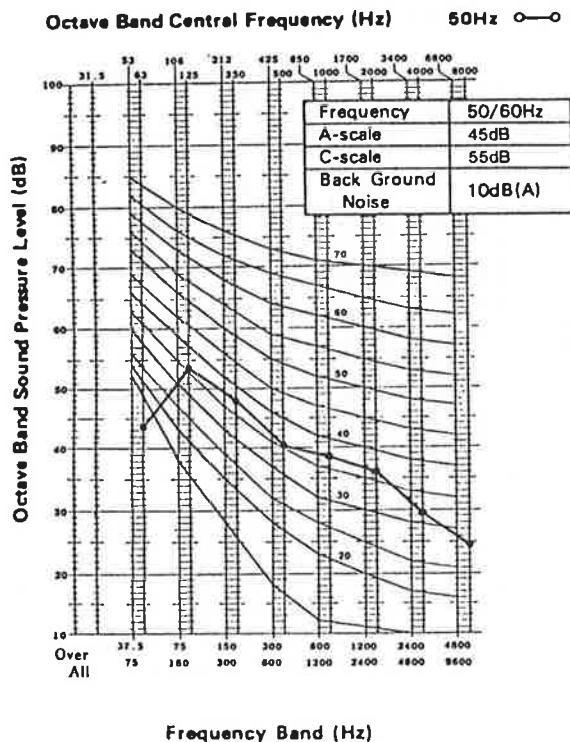
**CS-71E51HE, 71E51XE**



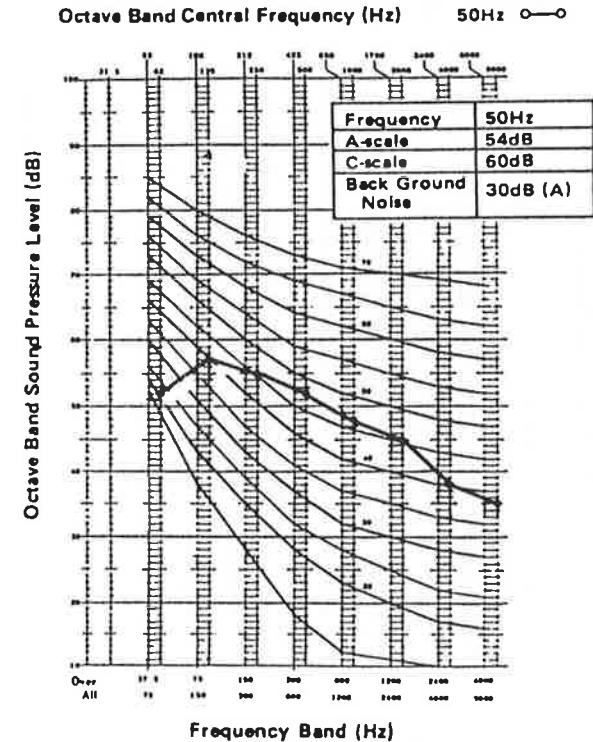
**CU-71C51HE, 71C51XE**



**CS-80E51HE, 80E51XE**

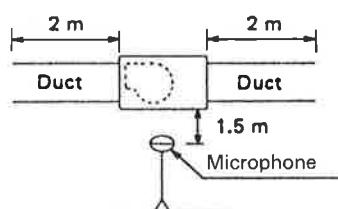


**CU-80C51HE, 80C51XE**

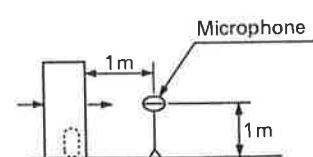


**NOTE:**

: Microphone Position



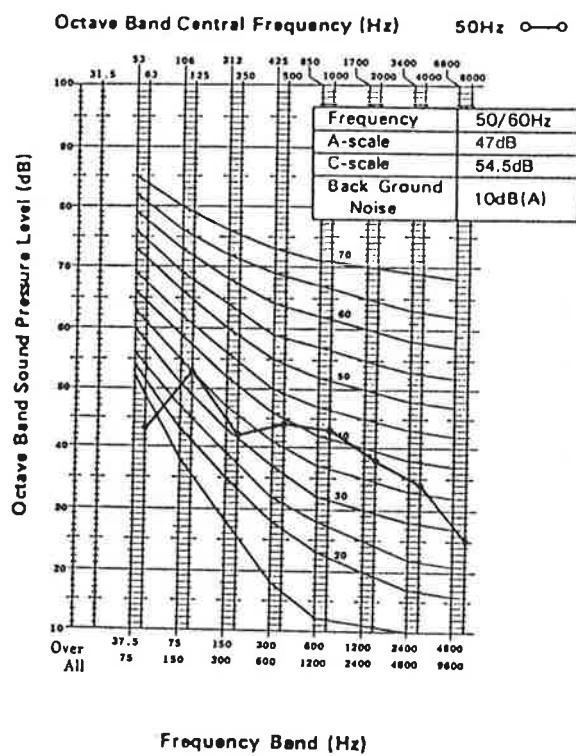
(Indoor Unit)



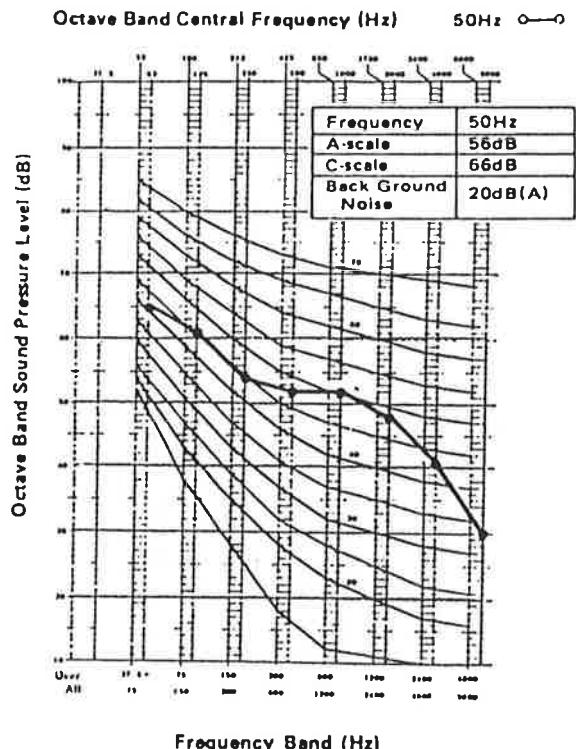
(Outdoor Unit)

# SOUND DATA

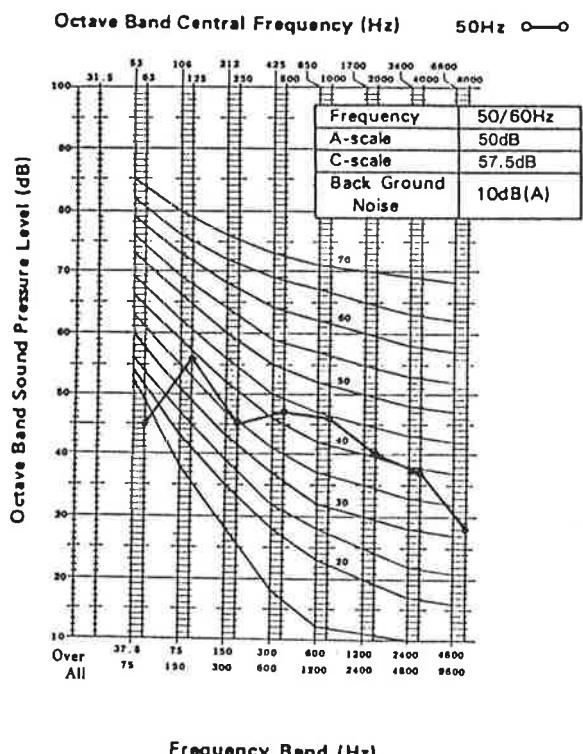
**CS-112E51XE**



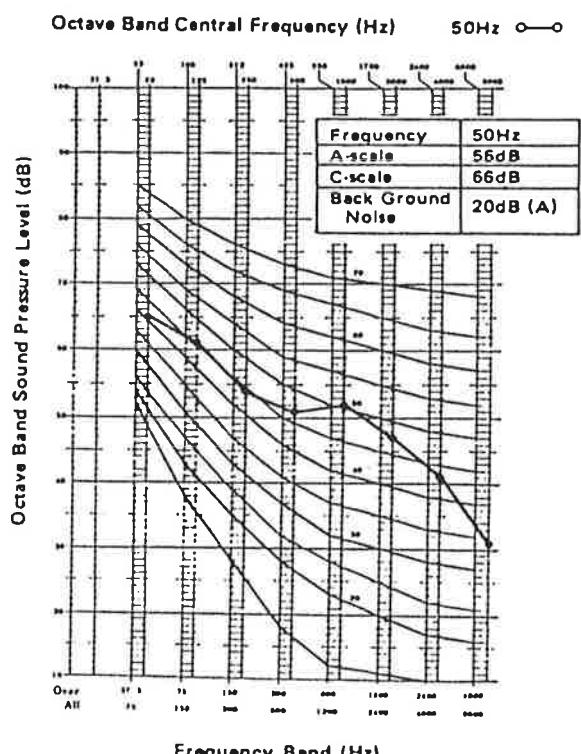
**CU-112C51XE**



**CS-140E51XE**

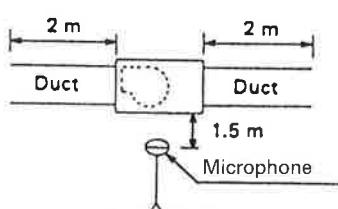


**CU-140C51XE**

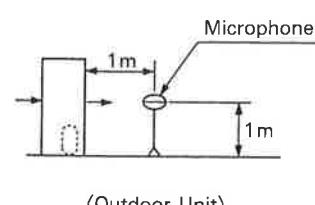


**NOTE:**

: Microphone Position



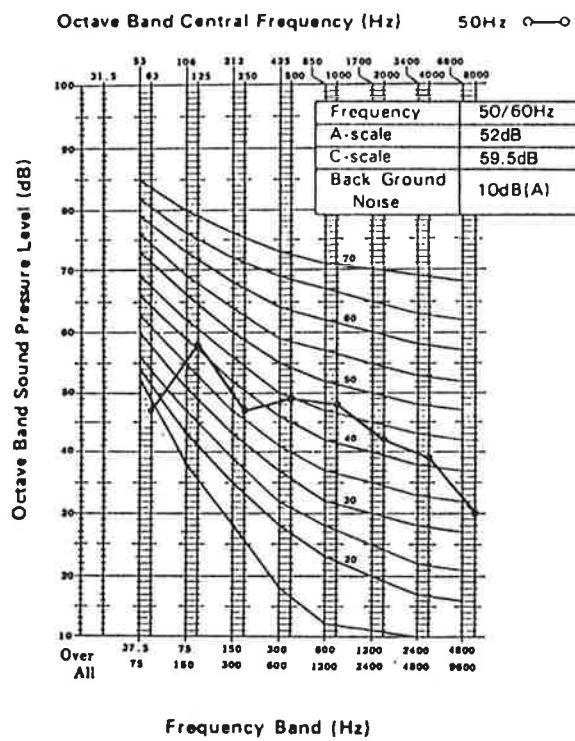
(Indoor Unit)



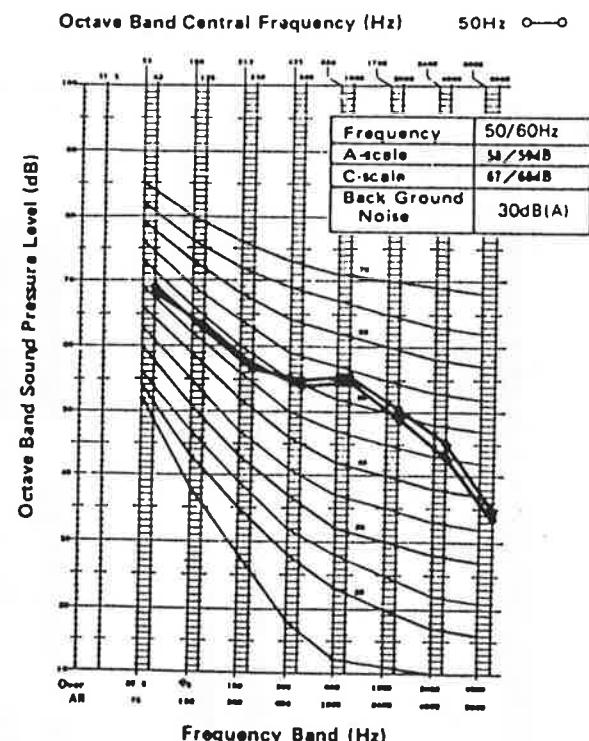
(Outdoor Unit)

# SOUND DATA

CS-160E51XE

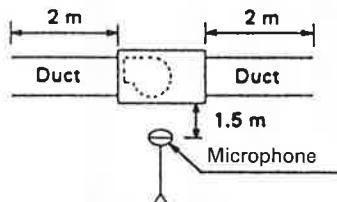


CU-160C51XE

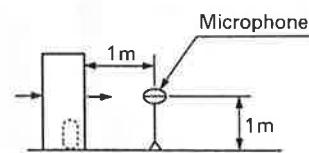


NOTE:

: Microphone Position

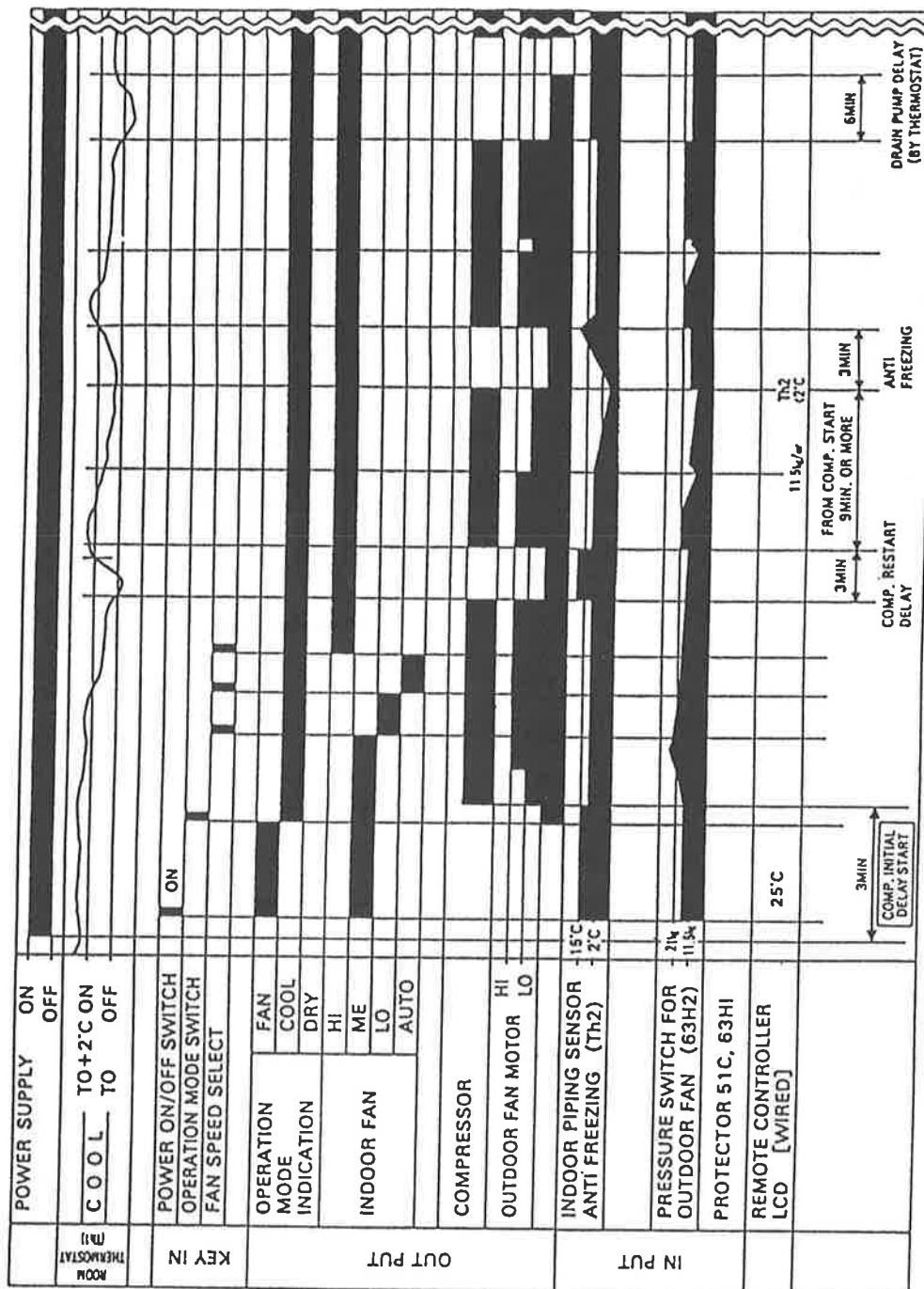


(Indoor Unit)



(Outdoor Unit)

## ■ OPERATION MODE (COOL 2-1)

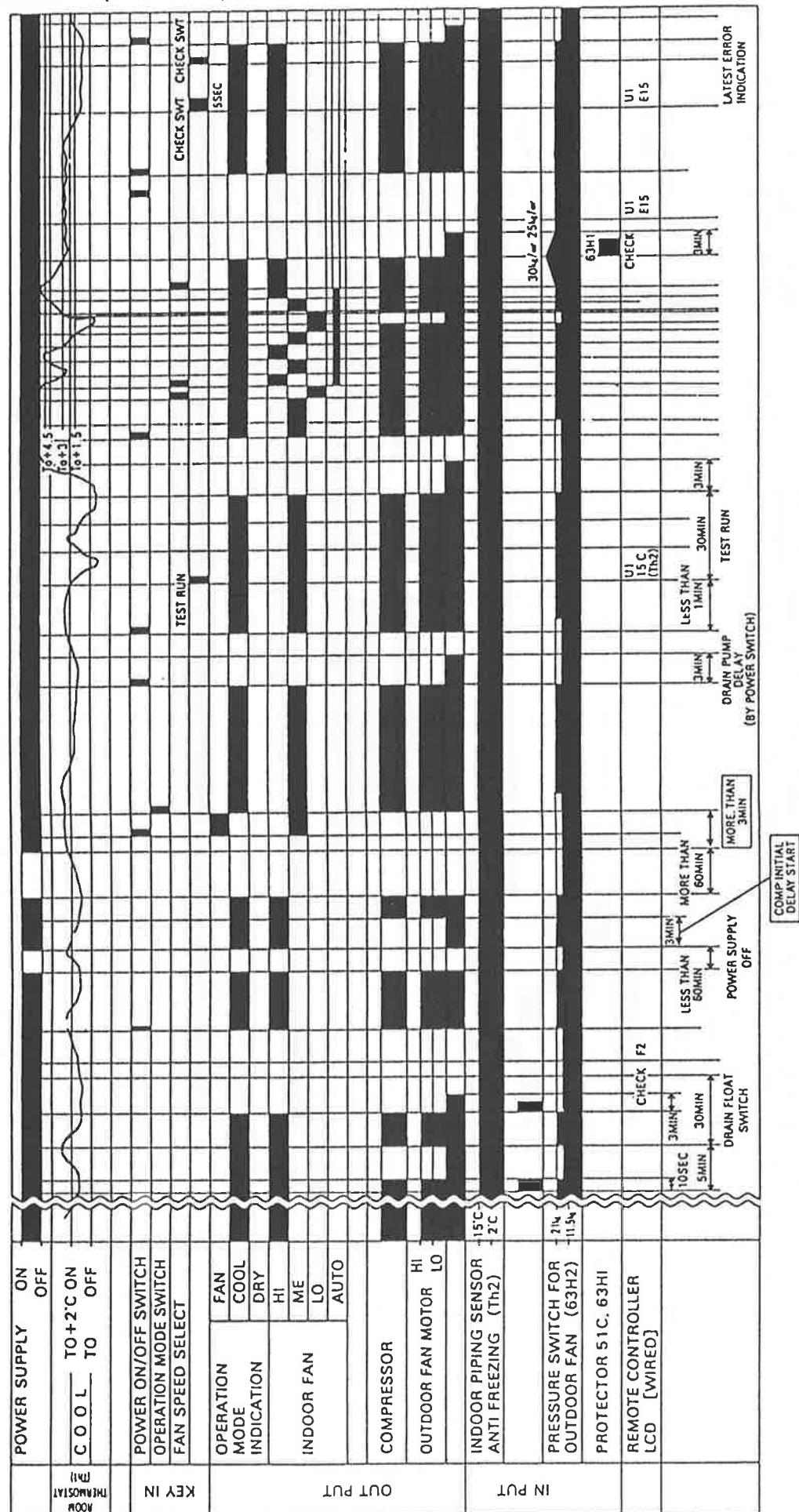


NOTE

This model has the control of "THE COMPRESSOR INITIAL DELAY START". So, compressor won't start for 3 minutes after power Source is reconnected.

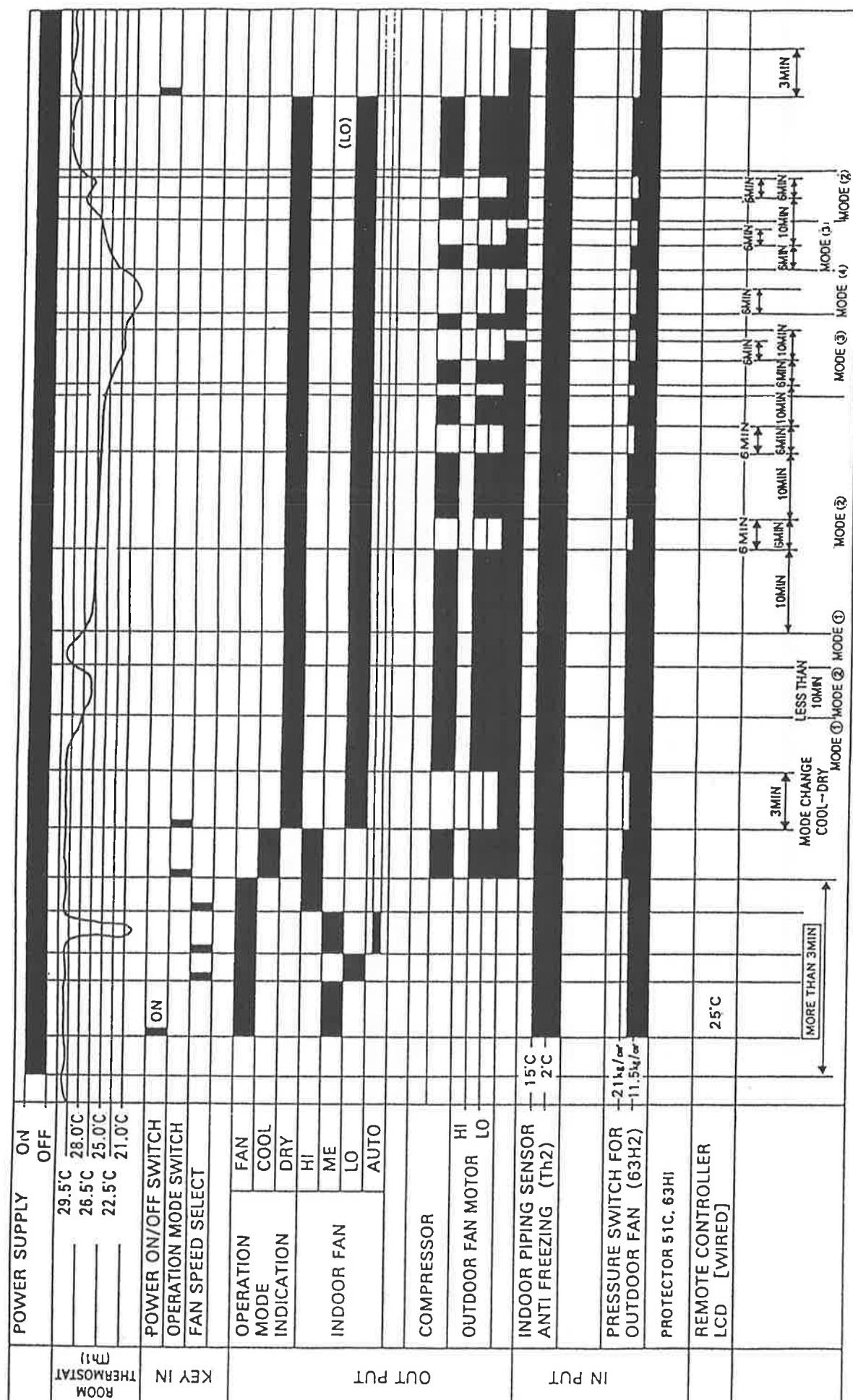
## **CONTROL(TIME CHART)**

## ■ OPERATION MODE (COOL 2-2)



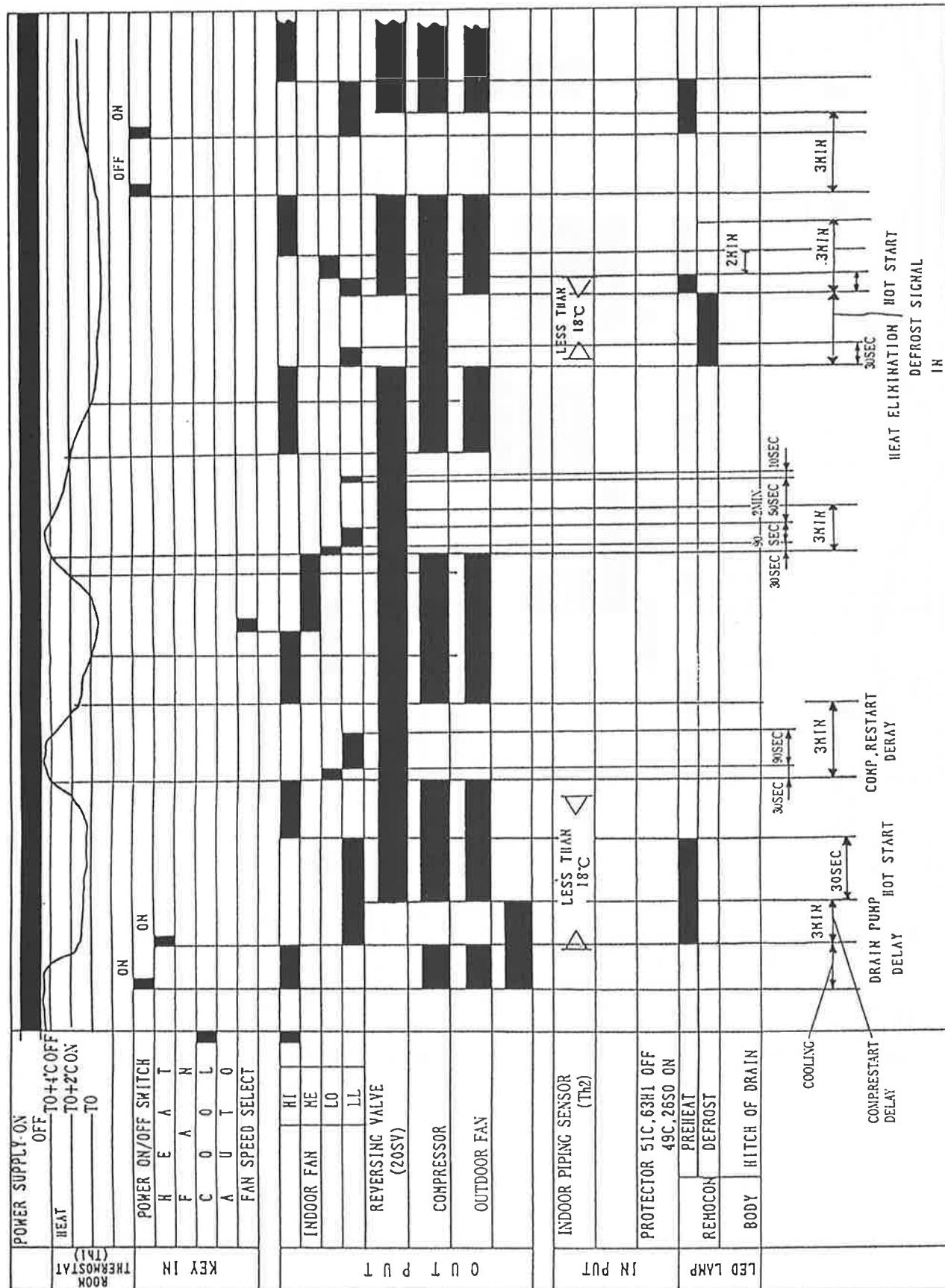
## **CONTROL(TIME CHART)**

#### ■ OPERATION MODE (FAN·DRY)



## **CONTROL(TIME CHART)**

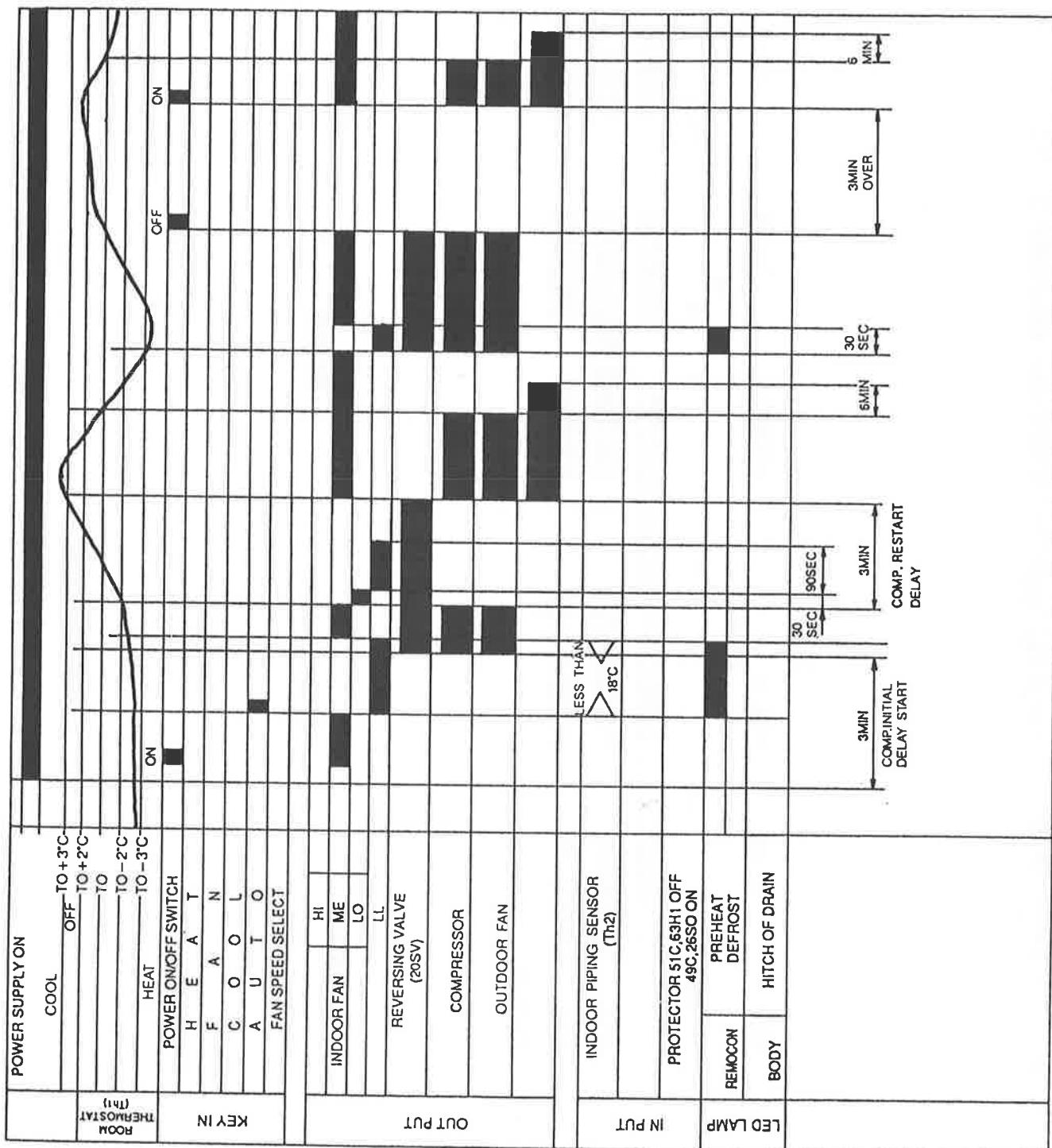
#### **■ OPERATION MODE (HEAT)**



NOTE: THIS PAGE SHOWS THE POSITION CONTINUED FROM PAGE ONE.

## CONTROL(TIME CHART)

### ■ OPERATION MODE (AUTO)



## SELF-DIAGNOSIS FUNCTION

- If LED5 (yellow) is flashing, the microcomputer in the electronic controller is functioning normally
- If LED5 is lighting steady, off, or flashing irregularly, try turning the power off and then on again.

- You can find the fault by the remote controller indicator or the self-diagnoses LEDs on the indoor and outdoor electronic controller.
- CHECK will flash in the remote controller indicator when a problem occurs.
- When the CHECK switch is pushed, the problem will be displayed in the indoor temperature setting display.
- Correct the fault as shown in the table below before restarting Operation.
- Faults are stored in memory.
- During normal operation pressing the CHECK switch for 5 sec or longer will display the contents of the previous accident point.
- Press the CHECK Switch again to restore the normal display.

Remote controller Indicator	Indoor LED				Outdoor LED				ACCIDENT POINT	CHECK POINT
	LED1	LED2	LED3	LED4	LED1	LED2	LED3	LED4		
F3	○				○				Indoor temperature thermistor	Indoor temperature thermistor cord
F4		○			○				Piping thermistor	Piping thermistor cord
F5	○	○	○	○	○				Remote control data transfer error	Data transmission waveform
	○	○			○				Remote control connection cord (disconnect)	Remote controller cord and connection terminals
F6	○	○	○	○					Indoor/outdoor unit data transfer error	Indoor/outdoor unit data transmission waveform
		○	○	○					Indoor/outdoor unit connection cord (disconnect)	Indoor/outdoor unit cord and connection terminals
		○	○	○					Compressor bimetal thermostat operating	Gas leaks, outdoor unit power supply, indoor unit connecting cord
F15	○				○	○			High pressure switch operating	Outdoor unit
F18	○	○				○			Outdoor piping temperature thermistor	Piping temperature thermistor cord

## SPECIFICATION OF SENSORS

Indoor temperature thermistor	
Temp.	Resistance
0°C	67.0KΩ
5°C	51.9KΩ
10°C	40.4KΩ
15°C	31.8KΩ
20°C	25.1KΩ
25°C	20.0KΩ
30°C	16.0KΩ
35°C	12.9KΩ

Indoor piping thermistor	
Temp.	Resistance
0°C	65.8KΩ
5°C	51.5KΩ
10°C	40.0KΩ
15°C	31.5KΩ
20°C	25.0KΩ
25°C	20.0KΩ
30°C	16.1KΩ
35°C	13.0KΩ
40°C	10.6KΩ

Outdoor piping thermistor	
Temp.	Resistance
0°C	65.8KΩ
5°C	51.1KΩ
10°C	40.0KΩ
15°C	31.5KΩ
20°C	25.0KΩ
25°C	20.0KΩ
30°C	16.1KΩ
35°C	13.0KΩ
40°C	10.6KΩ

If the polarities of the wires (-3) and (-4) joining the indoor and outdoor units are not correctly matched, "F6" will be displayed.

If an abnormality occurs with the indoor and outdoor units, operation will stop and the self-diagnosis LEDs will illuminate or flash in accordance with the diagnosed problem.

#### 1. Sensor abnormality

- Indoor sensor abnormality (F3 or F4): When an open or short circuit of the indoor temperature sensor or pipe temperature sensor is detected.
- Outdoor sensor abnormality (F18): When a condition where the pipe temperature sensor has detected a temperature of -45°C continuously for 1 minute is detected.

#### 2. Remote control unit/indoor unit open circuit abnormality (F5)

When communication between the remote control unit and the indoor unit circuit board is halted for 2 minutes or more after even one successful communication has been made.

#### 3. Remote control unit/indoor unit transmission abnormality (F5)

When an error in data transmission between the remote control unit and the indoor unit circuit board is detected after even one successful communication has been made.

#### 4. Indoor unit/outdoor unit open circuit abnormality (F6)

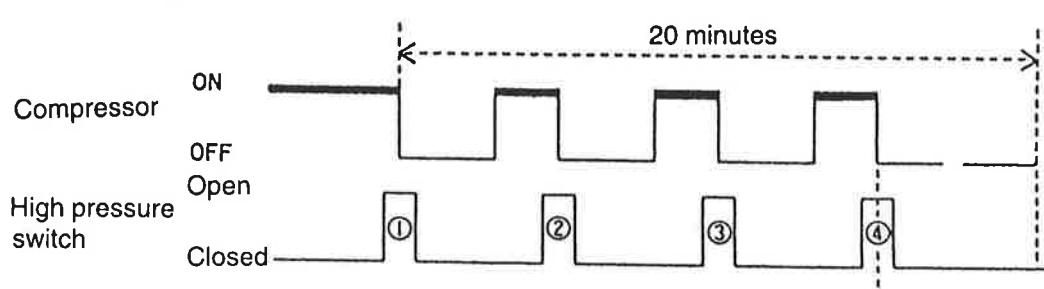
When communication between the indoor unit and the outdoor unit circuit board is halted for 2 minutes or more.

#### 5. Indoor unit/outdoor unit transmission abnormality

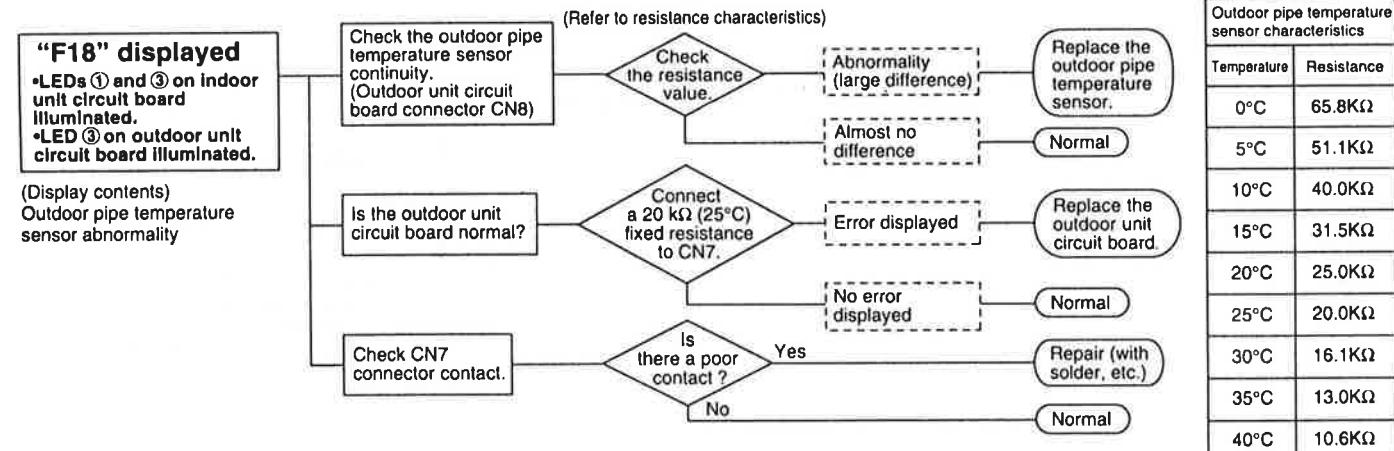
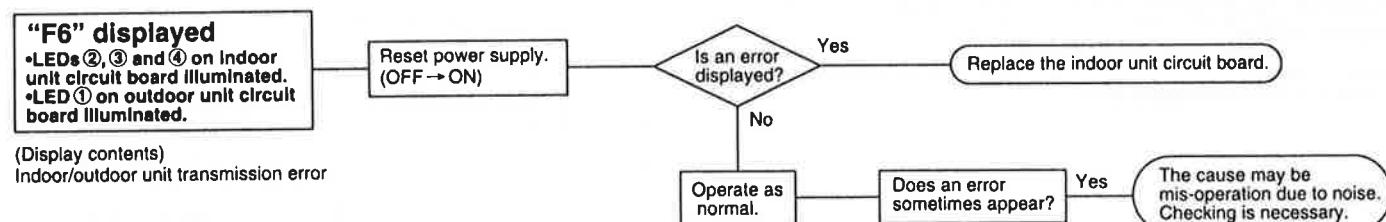
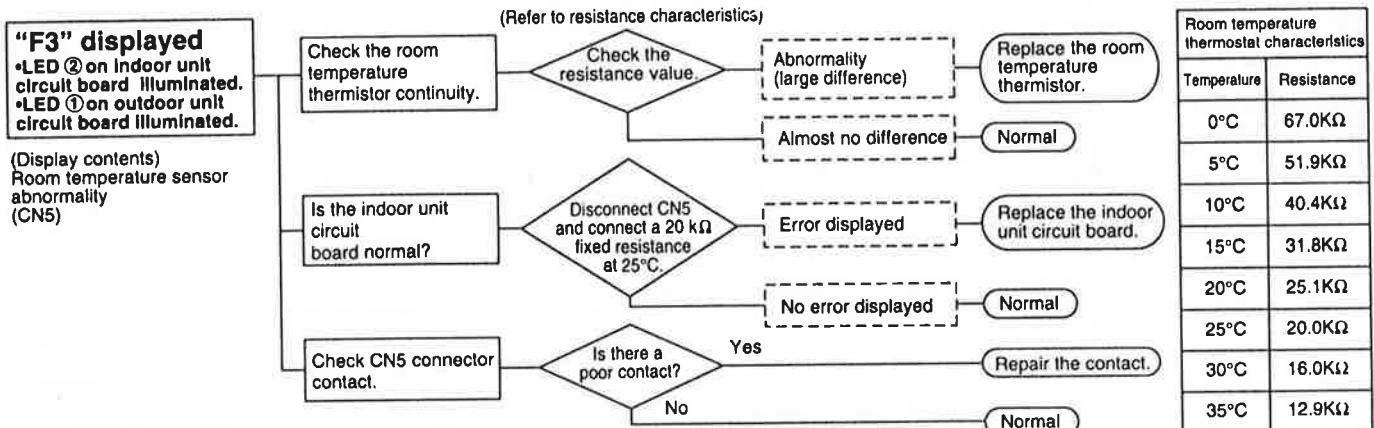
When an error in data transmission between the indoor unit and the outdoor unit circuit board is detected.

#### 7. High-pressure cut (F15)

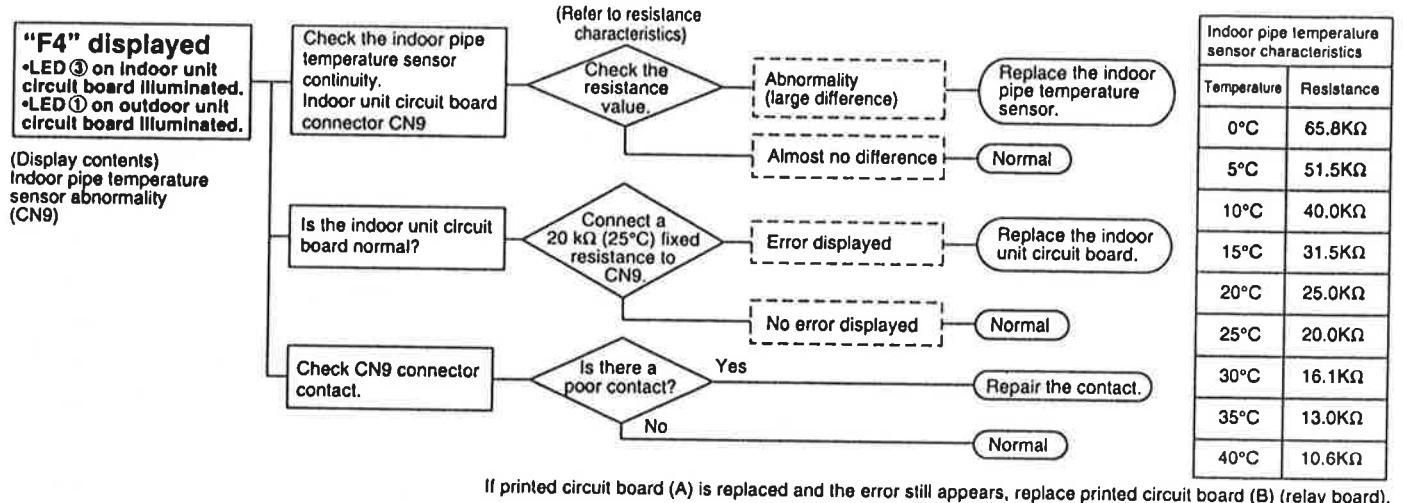
When the high pressure switch operates four times within 20 minutes.



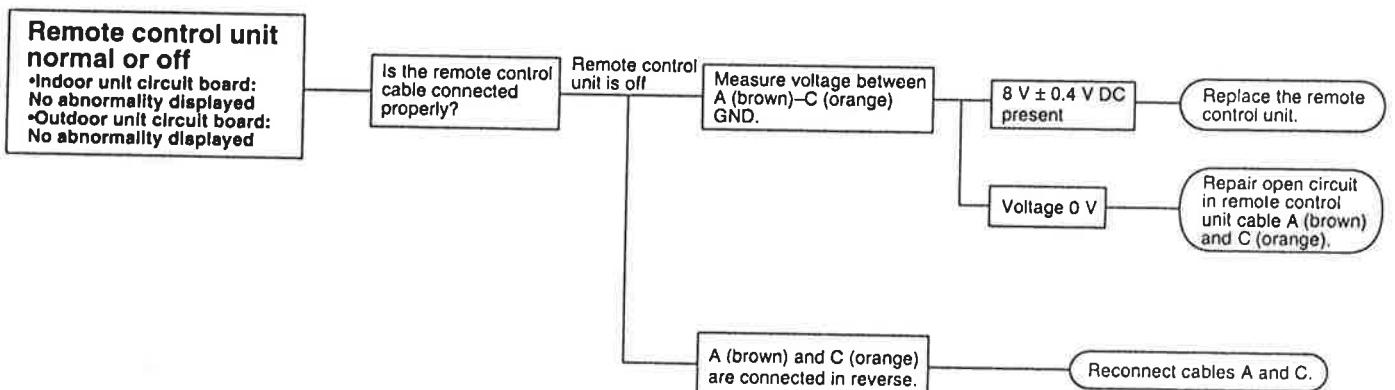
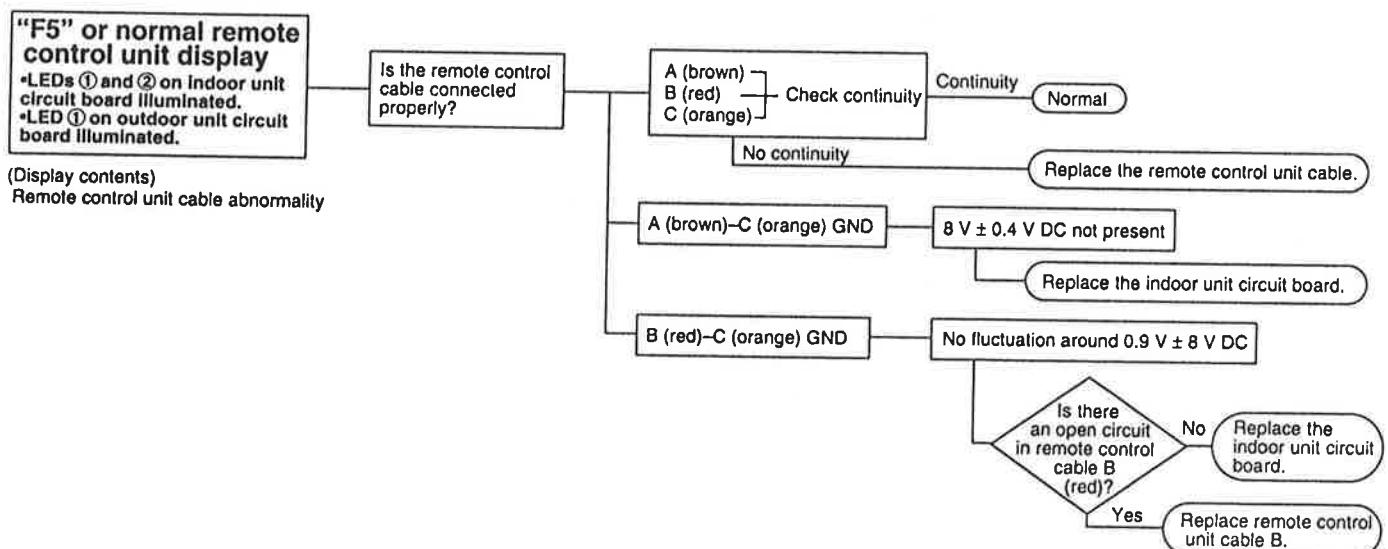
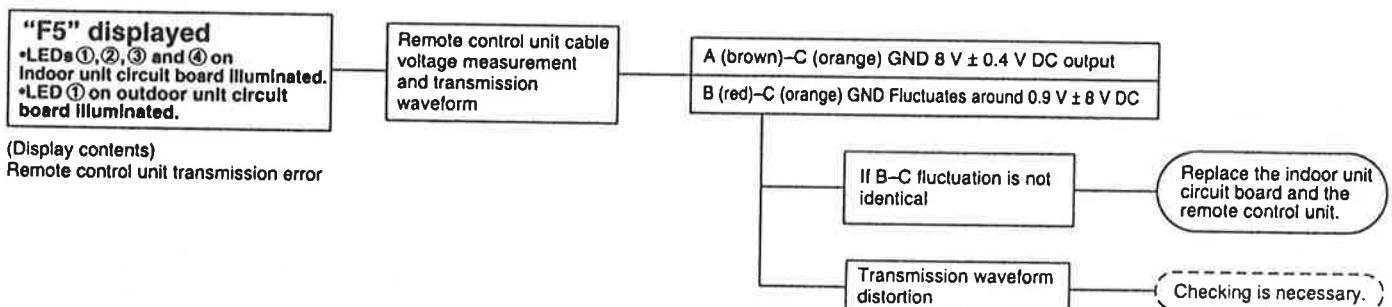
## ■ Problem Diagnosis Flow Charts



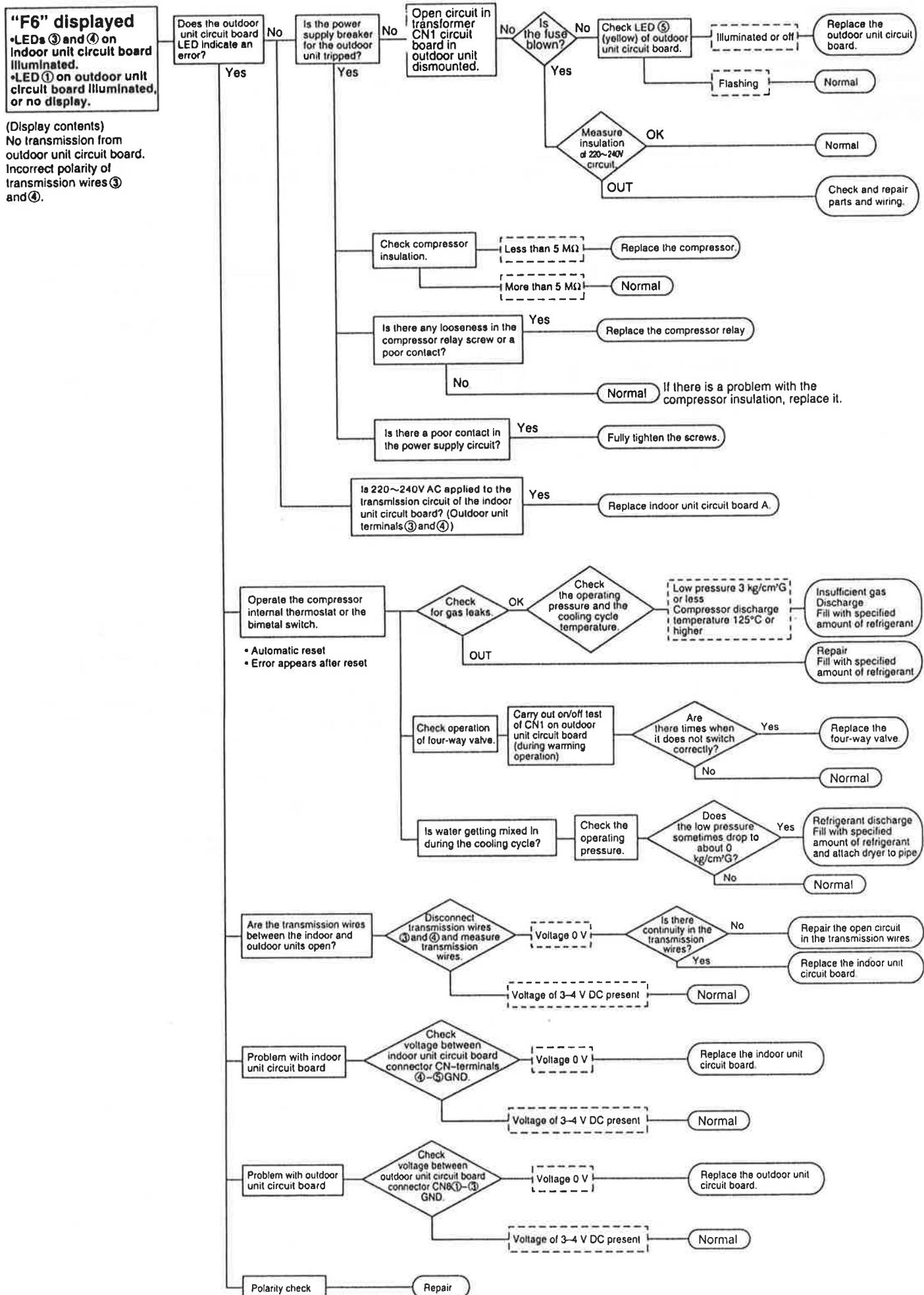
## **CONTROL(SELF-DIAGNOSIS FUNCTION)**



If printed circuit board (A) is replaced and the error still appears, replace printed circuit board (B) (relay board).



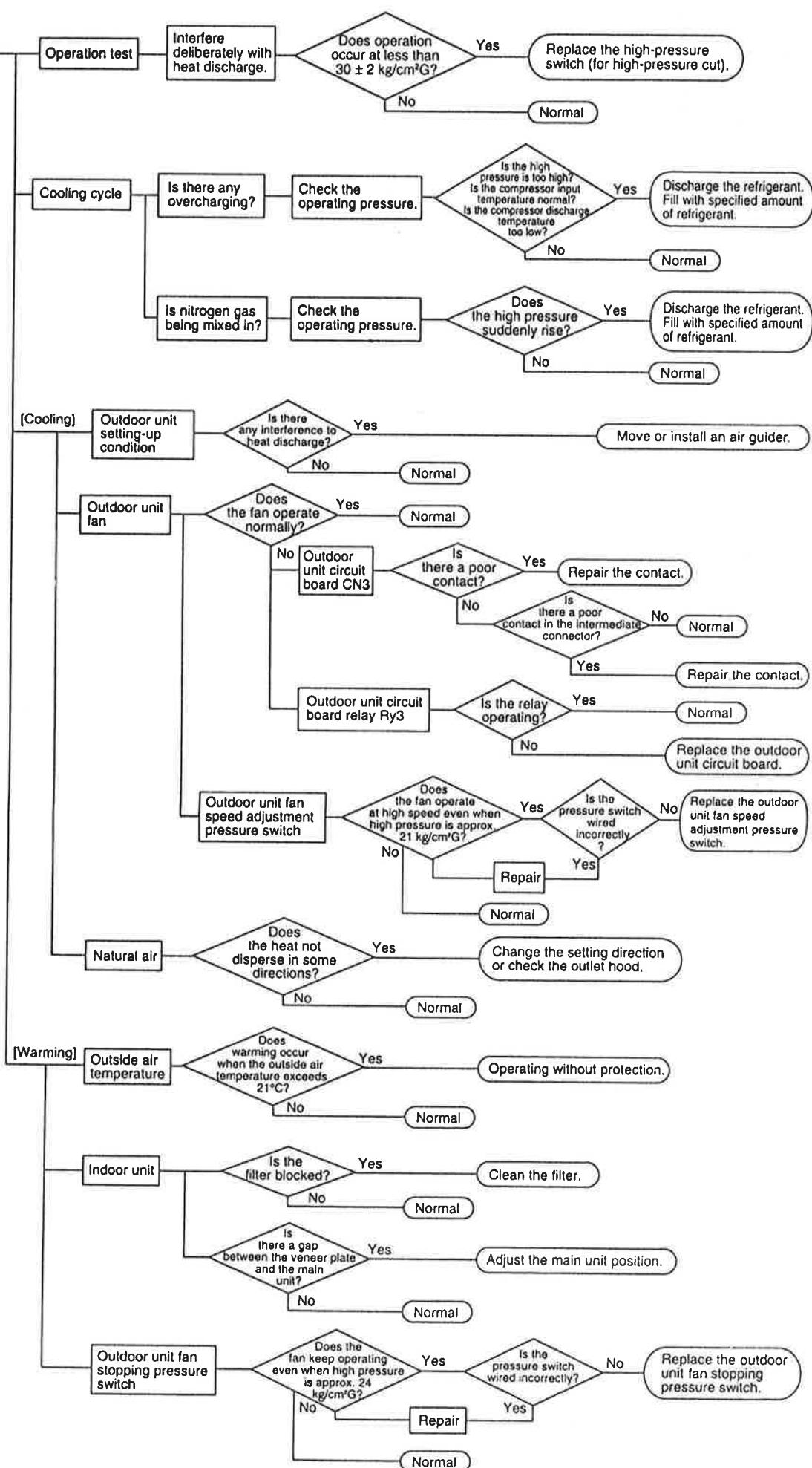
#### **CONTROL(SELF-DIAGNOSIS FUNCTION)**



## CONTROL(SELF-DIAGNOSIS FUNCTION)

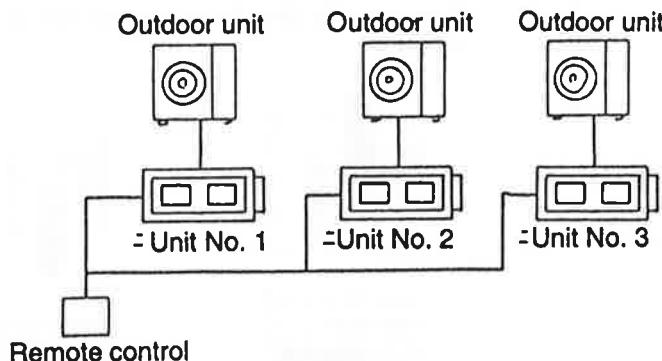
**"F15" displayed**  
 •LED ① on indoor unit circuit board illuminated.  
 •LEDs ① and ② on outdoor unit circuit board illuminated.

(Display contents)  
 High-voltage cut



● **Group control**

From 2 to 16 indoor units can be operated using a single remote control.



● **Setting of the units**

In order to use group control, the address of each indoor unit must be set on the unit's printed circuit board (DSW 1 through 4)

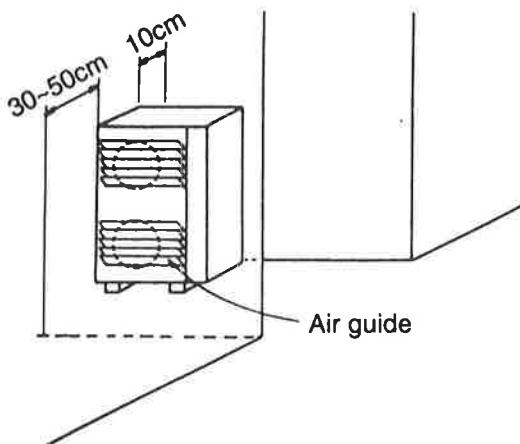
Unit No. 1	Unit No. 2	Unit No. 3	Unit No. 4	Unit No. 5	Unit No. 6	Unit No. 7	Unit No. 8
OFFON							
1 2 3 4							
DSW 1							
Unit No. 9	Unit No. 10	Unit No. 11	Unit No. 12	Unit No. 13	Unit No. 14	Unit No. 15	Unit No. 16
OFFON							
1 2 3 4							
DSW 1							

● **If a malfunction occurs**

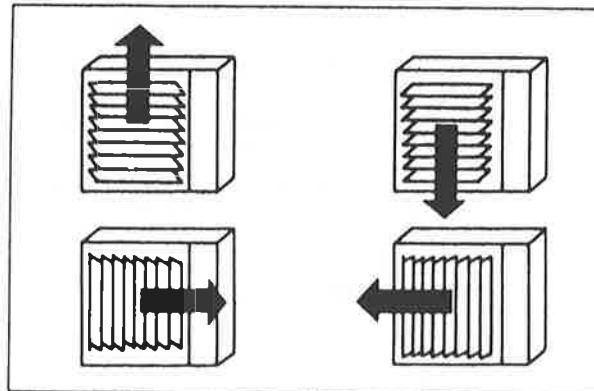
- If a malfunction occurs in an indoor unit other than unit No. 1  
Only the indoor and outdoor units in which the malfunction has occurred will stop; and those indoor and outdoor units in which no malfunction has occurred will continue to operate. The "Check" indication on the remote control will flash on and off.
- If a malfunction occurs in unit No. 1  
All of the units under group control will stop, and the "Check" indication on the remote control will flash on and off.

## ■ Air guide

In order to avoid hindering the dissipation of heat, if the distance between the front of the outdoor unit and an obstruction is 30 to 50 cm but there is no obstruction to the right, left, or above the outdoor unit, use this air guide to provide a smooth flow of the exhaust air.



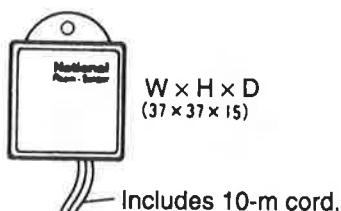
- The airflow can be changed to any direction by changing the direction in which the air guide is mounted.



Model No.	Applicable air conditioner models	Dimensions (mm)	Remarks
CU-03AG2-W	CU-71C51HE, CU-71C51XE CU-80C51HE, CU-80C51XE	408 × 408 × 42	2-fan type; 2 air guides per set
CU-45AG2-W	CU-112C51XE CU-140C51XE CU-160C51XE	458 × 458 × 40	

## ■ Remote thermistor (CZ-RSB2)

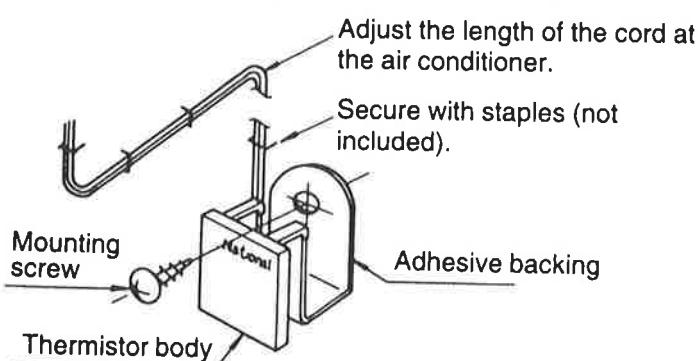
For use when a more effective room temperature distribution can be obtained by detecting the room temperature at some location other than the air intake of the air conditioner. However, it is necessary to select a location that is neither exposed to direct sunlight or some other source of heat, nor to the air outflow from the air conditioner.



### <Installation procedure>

- ① Remove the air intake grille.
- ② Remove the cover relay box.
- ③ Disconnect the printed circuit board's room temperature thermistor connector (CN5) and reconnect it to the remote thermistor's connector.
- ④ Use the mounting screw to secure the mounting plate on the back of the remote thermistor to the wall. (The ideal mounting height is about 1 to 1.5 m above the floor.)

Note: In order to prevent operation errors, keep the remote thermistor cord (10 m) away from the indoor and outdoor unit power supply lines of the air conditioner wiring.



- After completing the wiring connections  
Use the mounting screw to secure the remote thermistor to the wall in the desired location in the room.

- Operation check following installation  
After installing the remote thermistor, confirm that both the cooling and heating operations function properly.

# **INDOOR UNIT**

# **INSTALLATION MANUAL**

## **MODEL NAME**

---

CS-71E90HP  
CS-71E90XP  
CS-80E90HP  
CS-80E90XP

CS-112E90XP  
CS-140E90XP  
CS-160E90XP

# Precautions in terms of safety

**Carry out the installation work with reliability after throughout reading of this "Precautions in terms of safety".**

- Precautions shown here are differentiated between **⚠ Warnings** and **⚠ Cautions**, those that have a high chance of leading to a significant result such as fatality or serious injury if the wrong installation is carried out are listed in the **⚠ Warnings**.

However, even in the case of items which are listed in the column **⚠ Cautions**, such items also offer a chance of leading to a significant result depending on the situations.

In either case, important descriptions regarding the safety are listed, then observe them without fail.

- Description of illustration

	This mark means "Caution" or "Warning".
	This mark means "Prohibition".
	This mark means "Compulsion".

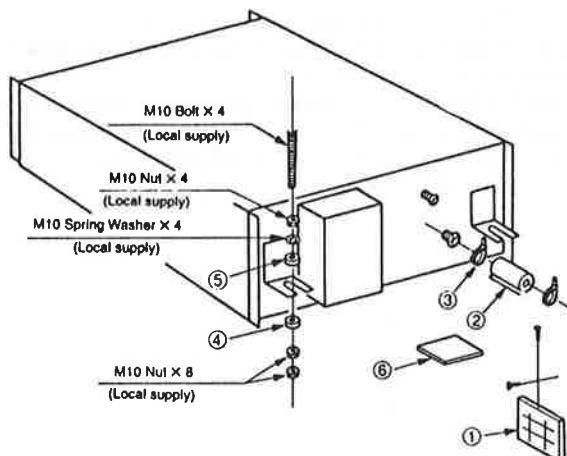
- After installation work has been completed, not only make sure that the unit is free from any abnormal condition through the execution of dry run but also explain how to use and how to perform maintenance of this unit to the customer according to the instruction manual.

In addition, request the customer to keep this manual for installation work together with instruction manual.

<b>Warnings</b>	<b>Cautions</b>
▲ As to installation, request the distributor or vendor to perform it. Imperfection in installation caused by that having been carried out by the customer himself leads to water leakage, electric shock, fire, etc.	▲ Carry out ground work. Do not connect the ground return to the gas pipe, water line pipe, lightening rod, ground return of the telephone. Imperfection in ground return may lead to electric shock.
▲ Carry out the installation work with reliability according to this manual for installation work. Imperfection in installation leads to water leakage, electric shock, fire, etc.	▲ Do not install the unit at the place where the possibility of inflammable gas leakage exists. If such gas leakage should arise and the gas builds up around the unit, such situation may lead to ignition. 
▲ Carry out the installation with reliability on the place that bears the weight of this unit sufficiently. Insufficient strength leads to injury due to falling of the unit.	▲ Mounting of the earth leakage breaker is required. Omission in mounting of the earth leakage breaker may lead to electric shock.
▲ Carry out predetermined installation work in preparation for strong wind such as typhoon, earthquake. Imperfection in installation work may lead to accident arisen from overturn, etc.	▲ Drain piping should be made to ensure secure drainage according to the manual for installation work and carry out the thermal insulation to prevent the occurrence of condensation. Imperfection in piping work leads to water leakage and may cause the house and property, etc. to become wet.
▲ Electric work shall be carried out by the person qualified as an electric worker according to "Technical standards regarding electric installation", and manual for installation work, and use exclusive circuit without fail. Presence of insufficient capacity in power circuit or imperfection in execution leads to electric shock, fire, etc.	
▲ Wiring shall be connected securely using specified cables and fix them securely so that external force of the cables may not transfer to the terminal connection section. Imperfect connection and fixing leads to fire, etc.	

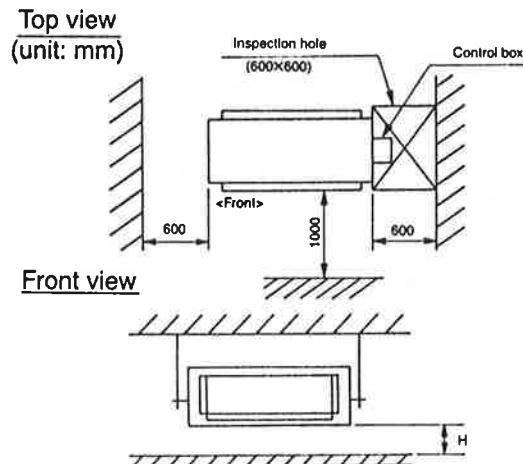
## 1. ACCESSORIES PACKED IN THE INDOOR UNIT CONTAINER

No.	Parts name	Q'ty
1	Remote control box	1
	Plastic cord retainer	4
	φ4 Tapping screw	2
	M4 Screw	2
	φ3 Tapping screw	4
2	Thermal insulator for refrigerant pipe	1
3	Hose clip for thermal insulator	2
4	M10 Flange washer	4
5	M10 Flat washer	4
6	Thermal insulator for drainage hole	1



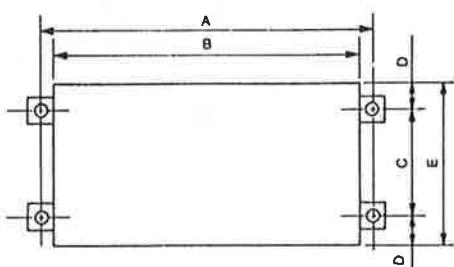
## 2. SELECTING THE LOCATION OF THE INDOOR UNIT

- The place shall easily bear a load exceeding four times the indoor unit's weight.
- The place shall be able to inspect the unit as the figure.
- The place where the unit shall be leveled.
- The place shall allow easy water drainage.  
(Suitable dimension  
"H" is necessary to get slope to drain as figure.)
- The place shall easily connect with the outdoor unit.
- The place where the unit is not affected by an electrical noise.



## 3. INSTALLATION OF INDOOR UNIT

### POSITION OF SUSPENSION BOLT



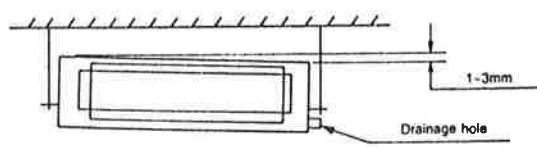
(unit:mm)

	A	B	C	D	E
CS-71E90HP	1,060	1,000	330	35	400
CS-80E90HP					
CS-80E90XP					
CS-112E90XP					
CS-140E90XP	1,060	1,000	540	55	650
CS-160E90XP					

- Apply a joint-canvas between the unit and duct to absorb unnecessary vibration.

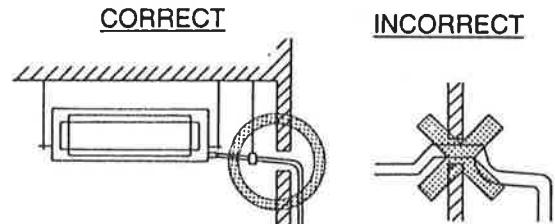
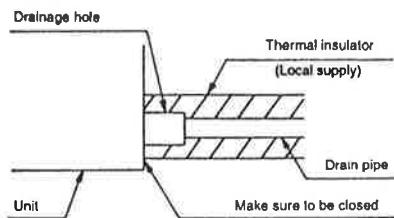
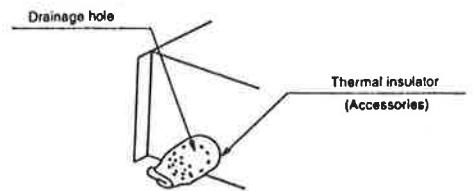
- Apply a filter (local supply) at air return hole.

- Install the unit leaning to a drainage hole side as a figure for easy water drainage.



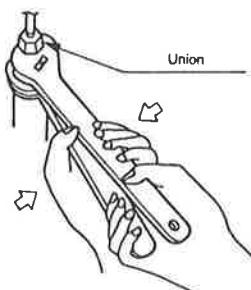
## 4. INDOOR UNIT DRAIN PIPING

- The unit has two drainage holes at both side.  
The drainage hole without connection needs seal and thermal insulation with accessories.
- !** Always lay the drain with downward inclination (1/50 to 1/100). Prevent any upward flow or reverse flow in any part.
- 5mm or thicker formed thermal insulator shall always be provided for the drain pipe.



## 5. PIPING CONNECTION

- Form the piping according to its routing. Avoid bending and bending back the same piping point more than three times. (This will result in hardening the pipe.)
- After deforming the piping, align centers of the union fitting of the indoor unit and the piping, and tighten them firmly with wrenches.
- Connect pipe to the service valve or ball valve which is located below the outdoor unit.
- After completed the piping connection, be sure to check if there is gas leakage in indoor and outdoor connection.



Model name	Liquid side piping	Gas side piping
CS-71E90HP CS-71E90XP CS-80E90HP CS-80E90XP	Φ9.52mm	Φ15.88mm
CS-112E90XP	Φ9.52mm	Φ19.05mm
CS-140E90XP CS-160E90XP	Φ12.7mm	Φ19.05mm

### **!** Vacuum drying

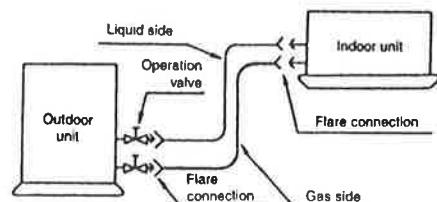
After completing the piping connection, execute vacuum drying for the connecting piping and the indoor unit.

The vacuum drying must be carried out using the service ports of both the liquid and gas side valves.

### CAUTION

Use two wrenches and tighten with regular torque.

Flare nut fastening torque N·m (kgf·cm)			
Φ 6.35	12.7 – 16.7 (130 – 170)	Φ 15.88	39.2 – 44.1 (400 – 450)
Φ 9.52	22.6 – 26.5 (230 – 270)	Φ 19.05	49.0 – 53.9 (500 – 550)
Φ 12.7	32.4 – 36.3 (330 – 370)		



## 6. POINT OF REMOTE CONTROLLER INSTALLATION

- Wire and make sure that terminal number have to be matched on unit side and remote control side.
- Although the room temperature sensor is in the indoor unit, the remote control box should be installed in such places away from direct sunlight and high humidity.

### Installation of the remote control box.

- Select places that is not splashed by water.
- Select control position after receiving customer approval.
- The room temperature sensor of the thermostat for temperature control is built in the indoor unit.
- This remote controller equipped with liquid crystal display. If this position is higher or lower, display is difficult to see.  
(The standard height is 1.2~1.5m high.)

### Routing of the remote control box.

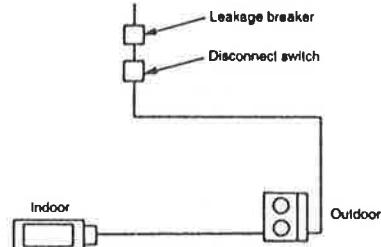
- Keep the remote control cord away from the refrigerant piping and the drain piping.
- To protect the remote control cord from electrical noise, place the cord at least 5cm away from other power cables (audio equipment, television set, etc.)
- If the remote control cord is secured to a wall, provide a trap at the top of the cord to prevent water droplets from running.

ELECTRICAL WIRING TO THE INDOOR UNIT	DISASSEMBLING OF THE REMOTE CONTROL BOX
<p>Air conditioner unit terminal board</p> <p>Terminal number [A]-[B]-[C]</p> <p>Wire and make sure that terminal number have to be matched on unit side and remote controller side.</p> <p>The maximum length of the cord is 200m. If the length of the cord exceed 100m, use wire size greater than 0.5mm<sup>2</sup>.</p> <p>Remote controller wire</p> <p>Air conditioner unit terminal board side</p> <p>Remote controller side</p>	<p>Front case</p> <p>(The lower part)</p> <p>Remote control box body</p> <p>Force the box open using a screw driver, etc.</p>
<b>WHEN THE REMOTE CONTROL BOX IS INSTALLED WITH THE CORD BURIED.</b>	<b>WHEN THE REMOTE CONTROL BOX IS INSTALLED WITH THE CORD EXPOSED.</b>
<p>Procedure of installation.</p> <ol style="list-style-type: none"> <li>1. Fix the under plate on the switch box by screws (accessory). In this case, fit the under plate on the wall, and be careful of deformation.</li> <li>2. Receive the remote control cord in the switch box. Hook the remote control unit on the under plate.</li> </ol> <p>Face of wall</p> <p>Upper notch</p> <p>Under plate</p> <p>Remote control unit</p> <p>Screw (accessory)</p> <p>Remote control cord</p> <p>Lower notch</p> <p>Switch box (locally supplied)</p>	<p>Procedure of installation.</p> <ol style="list-style-type: none"> <li>1. Fix the under plate on the wall by self tapping screws (accessory).</li> <li>2. Make a slit (part A) at the top side of the remote control box by nipper.</li> <li>3. Rout the cord as shown in the following figure. In this case, push the cord into the around of case (Part B).</li> <li>4. Hook the remote control unit on the under plate.</li> </ol> <p>Face of wall</p> <p>Upper notch</p> <p>Under plate</p> <p>Tapping screw (accessory)</p> <p>Remote control cord (Part A)</p> <p>Upper flange</p> <p>Push hand (Part B)</p> <p>Lower notch</p> <p>Cord clamp</p>

- Fixing of remote control cord
1. Fix the cord clamps on the wall by  $\phi 3$  tapping screw (accessory).
  2. Fix the remote control cord.

## 7. ELECTRICAL WIRING

- All wiring must comply with local requirements.
- Select a power source that is capable of supplying the current required by the air conditioner.



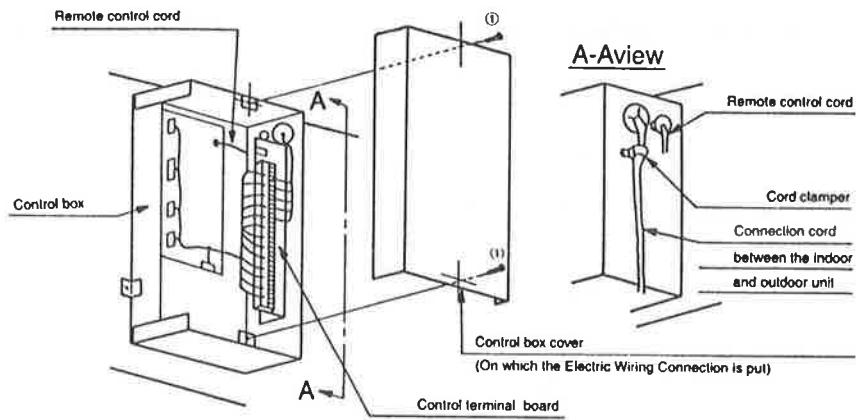
### WIRING CONNECTION

<INDOOR UNIT>

- Remove the control box cover for electrical connection between the indoor and outdoor unit. (Remove two screws ①.)
- Use the cord clamer to fix the cord.

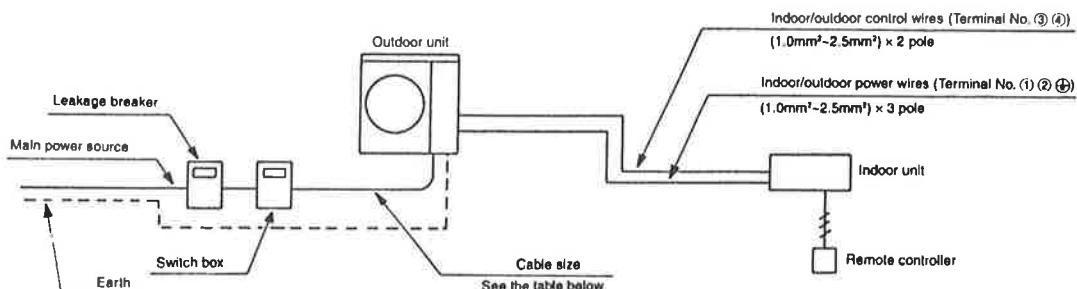
#### Caution

Make sure that screws of the terminals are correctly tightened. Fastening torque  
M4...118N · cm {12kgf · cm}  
M5...196N · cm {20kgf · cm}



## 8. ELECTRICAL WIRING

1. All wiring must comply with LOCAL REGULATIONS.
2. Select a power source that is capable of supplying the current required by the air conditioner.
3. Feed the power source to the unit via a distribution switchboard designed for this purpose.
4. Install a leakage breaker if the electrical wiring is subject to excessive moisture.
5. The terminal screws inside the control box may be loose due to vibration during transport.  
Check the screws for loose connection. (Running the air conditioner with loose connection can overload and damage electrical components.)
6. Check that the cable size, overcurrent devices, and switch specifications comply with those given in the table.
  - The wire diameters in the table indicate values compatible with a metal or resin conduit that can pass up to three such wires.
  - The overall length in the table indicates a value when the main power cord is subject to a voltage drop of 1%.
7. Always ground the air conditioner with a grounding wire and screw to meet the LOCAL REGULATIONS.
8. Be sure to connect the wires correctly to terminal block with connecting the crimp type ring terminal to the wires.



Model	Circuit breaker (A)	Switch box (A)	Minimum power source cable size(mm <sup>2</sup> )	
CS-71E90HP	220~240V	40	60	4
CS-71E90XP	380~415V	15	15	2.5
CS-80E90HP	220~240V	40	60	4
CS-80E90XP	380~415V	20	30	4
CS-112E90XP	380~415V	30	30	4
CS-140E90XP	380~415V	30	30	4
CS-160E90XP	380~415V	40	40	4

\* Cable size based on overall length 20m.

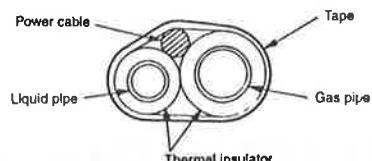
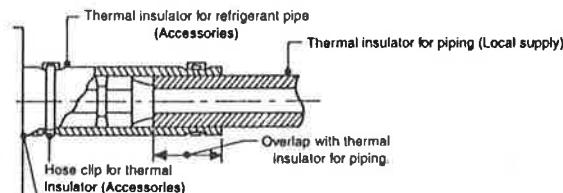
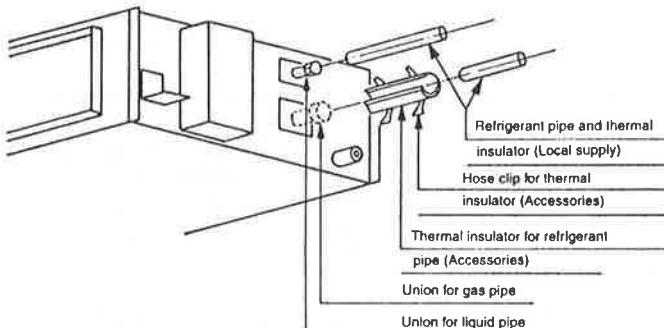
### Cautions

- 🚫 ● Where ground work (earth) is carried out, do not connect the ground return to the gas pipe, water line pipe, grounded circuit of the telephone and lightening rod, or ground circuit of other product in which earth leakage breaker is incorporated. (Such action is prohibited by statute, etc.)
- ⚠ ● In order to prevent malfunction (noise generation) of the equipment, carry out the wiring of the control cable for indoor and outdoor units (signal cable) isolating it from other power cable with separate cable.
- Use a standard power cord for Europe (such as H05RN-F or H07RN-F which conforms to CENELEC (HAR) rating specifications.)

## 9. HEAT INSULATION

### THERMAL INSULATION

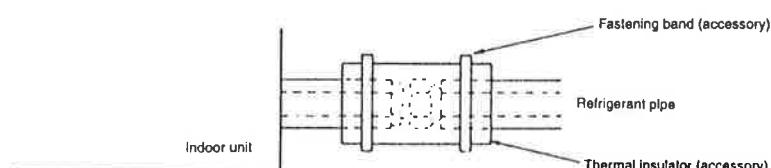
#### <INDOOR UNIT>



#### <REFRIGERANT PIPE>

- Insulate and tape both the gas piping and liquid piping.

- ! 1. For the refrigerant and drain pipings, execute referencing the piping procedure label packed with the unit body.
- 2. Use the heat insulation material for the refrigerant piping which has an excellent heat-resistance (over 120 degree C).



#### 3. Precautions in high humidity circumstance:

This air conditioner has been tested according to the "JIS Standard Conditions with Mist" and confirmed that there is not any fault. However, if it is operated for a long time in high humid atmosphere (dew point temperature: more than 23 degree C), water drops are liable to fall. In this case, add heat insulation material according to the following procedure:

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

## 10. SELF-DIAGNOSES FUNCTION

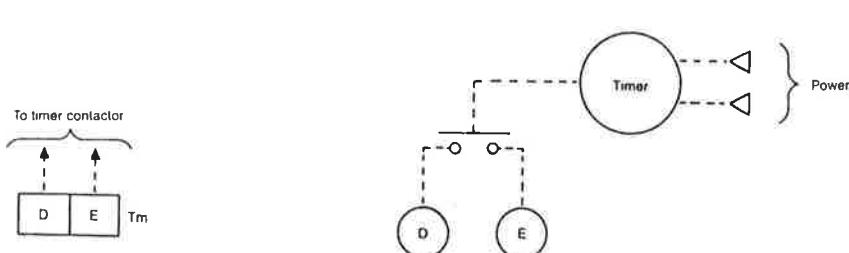
- If LED5 (yellow) is flashing, the microcomputer in the electronic controller is functioning normally. If LED5 is lighting steady, off, or flashing irregularly, try turning the power off and then on again.

- You can find the fault point by the remote controller indicator or the self-diagnoses LEDs on the indoor and outdoor electronic controller.
- CHECK will flash in the remote controller indicator when a problem occurs.
- When the CHECK switch is pushed, the problem will be displayed in the indoor temperature setting display.
- Correct the accident point as shown in the table below before restarting operation.
- Accident point are stored in memory.
- Fault normal operation pressing the CHECK switch for 5 sec or longer will display the contents of the previous accident point.
- Press the CHECK switch again to restore the normal display.

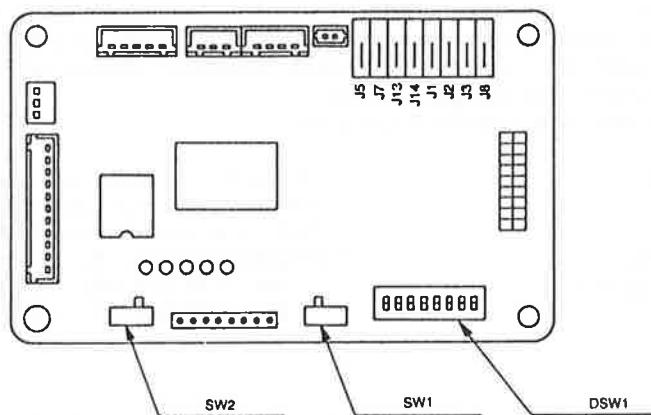
Remote controller indicator	Indoor LED				Outdoor LED				FAULT POINT	CHECK POINT
	LED1	LED2	LED3	LED4	LED1	LED2	LED3	LED4		
F2	○ Light on	○		○	○				Water level float switch	Drain pump and drain piping
F3		○			○				Indoor temperature thermistor	Indoor temperature thermistor cord
F4			○	○					Piping thermistor	Piping thermistor cord
F5	○	○	○	○	○				Remote control data transfer error	Data transmission waveform
	○	○			○				Remote control connection cord (disconnect)	Remote controller cord and connection terminals
F6		○	○	○	○				Indoor/outdoor unit data transfer error	Indoor/outdoor unit data transmission waveform
			○	○	○				Indoor/outdoor unit connection cord (disconnect)	Indoor/outdoor unit cord and connection terminals
			○	○					Compressor bimetal thermostat operating	Gas leaks, outdoor unit power supply, indoor unit connecting cord
			○	○					Outdoor unit over current protector Phase protector operating	Compressor open phase, or locking Outdoor unit power supply negative phase
F15	○				○	○			High pressure switch operating	Outdoor unit
F18	○		○			○			Outdoor piping temperature thermistor	Piping temperature thermistor cord

## 11. USE OF TIMER (LOCAL ARRANGEMENTS)

Connect the contactor of the timer to "TM," D and E.



## 12. INDOOR UNIT PRINTED CIRCUIT BOARD (MICROCOMPUTER BOARD)



### Use of jumper wire

	J1	J2	DIFFERENTIAL
J1	EXIST	EXIST	2C°
J2	NOT	EXIST	1.5C°
	EXIST	NOT	2.5C°

### Use of switch

Switch	Subject	ON/OFF
SW1	Twin • Triple	Master/Slave
SW2	Emergency operation	Emergency/Normal
DSW1 1~4	Indoor Unit address	Please refer the installation instruction sheet
DSW1 5~8	Do not change this switch	If change the switch, unit will not operate properly

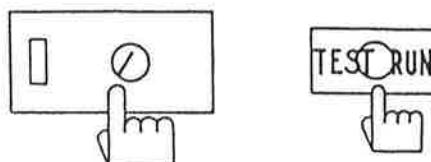
### CAUTION

- Use "SW2" with normal position.
- Emergency position of "SW2" take force operation of indoor Fan & Drain up Motor.
- Do not touch No. 5~8 of "DSW1".

## 13. TEST OPERATION

The initial power supply must provide at least 90% of the rated voltage.  
Otherwise, the air conditioner should not be operated.

- The remote controller is used to execute a test run.
  - Press the ON/OFF (①) switch first.
  - Press the TEST RUN switch within one minute after the ON/OFF(①) switch.
  - Select the operation mode.
  - To cancel the test run, press the TEST RUN switch again.
- ※ The test run terminates automatically after 30 minutes.



For the test operation, press the push buttons in the order shown

POWER-ON → COOLING → TEST RUN-ON (operated for five to eight minutes) → POWER-OFF

## 14. CHECK THE FOLLOWING ITEMS WHEN INSTALLATION IS COMPLETE

- After completing work, be sure to measure and record trial run properties, and store measuring data, etc.
- Measured items are room temperature • outside temperature • suction temperature • blow out temperature • wind speed • wind amount • voltage • current • abnormal vibration • abnormal noise • running pressure • pipe temperature • withstand pressure and air tight pressure.
- As for structure and appearance, check on the below items.

- |   |  |
|---|--|
| <input type="checkbox"/> Is circulation of air adequate?                                | <input type="checkbox"/> Is remote controller switch operated?   |
| <input type="checkbox"/> Is draining smooth?  | <input type="checkbox"/> Are there any faulty wiring?  |
| <input type="checkbox"/> Is heat insulation complete?<br>(refrigerant and drain piping) | <input type="checkbox"/> Are not terminal screws loosened?   |
| <input type="checkbox"/> Is there any leakage of refrigerant?                           | <input type="checkbox"/> Tightening torque (N・cm {kgf・cm})<br>M4...118 {12}, M5...196 {20}<br>M6...245 {25}, M8...588 {61} |

## 15. DELIVERY TO OUR CUSTOMERS

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

As for work specifications of the outdoor unit, read the WORK INSTRUCTION attached to the outdoor unit.

# OUTDOOR UNIT INSTALLATION MANUAL

As to instructions for installation work of the indoor side unit, see the work manual come with indoor unit.

## MODEL NAME

---

CU-71C51HE	CU-112C51XE
CU-71C51XE	CU-140C51XE
CU-80C51HE	CU-160C51XE
CU-80C51XE	

## Selecting the installation location for outdoor unit

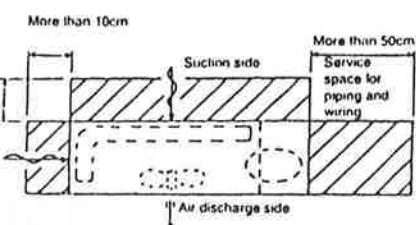
- Install the unit at the place meeting following conditions after obtaining approval of the customer.

1. Place where adequate draft is maintained.
  2. Place being free from rain and direct sunlight and well-ventilated wherever practicable.
  3. Place where the unit does not affect animals (plants) should they receive hot or cold air from air discharge outlet do not present near.
  4. Place where blowing wind or noise do not inconvenience the neighborhoods.
  5. Make sure unit is correctly and securely installed.
  - ⚠** 6. Place where suction inlet and air discharge outlet are not obstructed.
  - 🚫** 7. Do not install the air conditioner at the place where inflammable gas may be generated.
  8. Select the place where adverse wind does not exist where possible.  
(Adverse wind means the wind which blows toward the fan.)  
(Direct blowing of the strong wind to the fan may lead to the hitch in operation.)
  - Where the direction of wind during operation seasons is known, orientate the direction of blowout at right angle to the flow of wind or air discharge side to the wall, fence of the building.
  - Where there is no obstacle around and the direction of wind is not constant, mount the air guider to be sold separately.
  9. Do not put any object which may become an obstacle for the flow of air around suction inlet/air discharge outlet.
  10. In the snowy area, install a roof or enclosure to protect the unit from snow without fail.
  11. Maintain required space in terms of installation function service.
  - Maintain the space from the obstruction as shown in (Figs. 1&2) to prevent the occurrence of shortcircuit. (Where more than two units are installed, maintain required space described in item 4.)  
However, as to upward space, more than 1 meter must be maintained.
  12. Where the space more than 50 cm from air discharge side can not be maintained in the case of installation as shown in (Fig.2), mounting of the air guider for outdoor unit to be sold separately allows installation method shown in (Fig.3).
- Carry out the mounting according to attached manual.

Air guider for outdoor unit (To be sold separately)	
MODEL NAME	PART NUMBER
CU-71C51HE, 71C51XE, 80C51HE, 80C51XE	CU-03AG1-W
CU-112C51XE, 140C51XE, 160C51XE	CU-45AG1-W

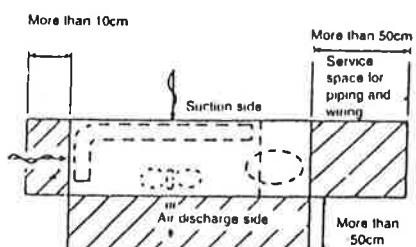
- Where the unit is installed orientating its suction side to the wall side

(Fig 1)



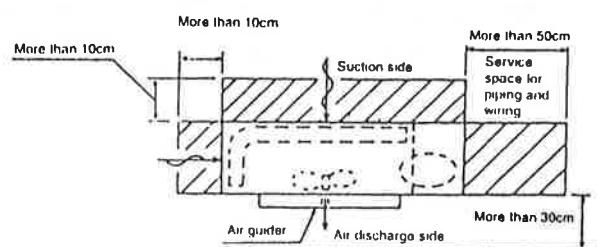
- Where the unit is installed orientating its air discharge side to the wall side

(Fig 2)



- Where air guider for outdoor unit (to be sold separately) is mounted

(Fig 3)



※ Put the upward space opened



### Cautions

- 1) In the case of upward air discharge, upper space shall be free from any obstacle.
- 2) In the case of downward air discharge, right and left space shall be free from any obstacle.
- 3) In the case of air discharge to the right or left, right or left space shall be free from any obstacle.
- 4) Never use this unit in the snowy area. There is a possibility that the snow may build up inside the air guider and freezing of the fan may occur.
- 5) In the case of continuous installation, upward air discharge shall be selected.

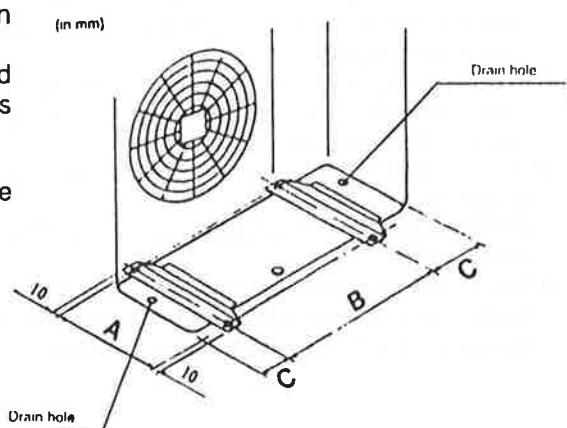
- Abovementioned space is the minimum required space to allow the equipment to exert its satisfactory performance. Maintain the space as large as possible to provide tolerance of the equipment.

## Installing the outdoor unit

1. Install the unit after reading "Selecting the installation location for outdoor unit" throughout.
- 1) 2. Install the unit firmly and horizontally on concrete or rugged bed with bolts and nuts of M10 or W3/8. (Position of the anchor bolts shall be according to the right figure.)
3. Avoid the installation on the roof.
4. If there is a possibility of vibration transfer to the house, fix the unit through the medium of vibration proof rubber, etc.

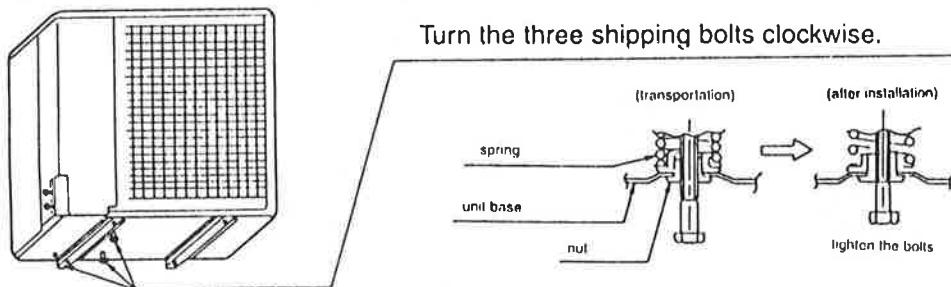
**Anchor bolt position**

MODEL NAME	Amm	Bmm	Cmm
CU-71C51HE			
CU-71C51XE	334	500	145
CU-80C51HE			
CU-80C51XE			
CU-112C51XE	382	568	156
CU-140C51XE	382	688	156
CU-160C51XE			



### Caution (CS-140C51 Only)

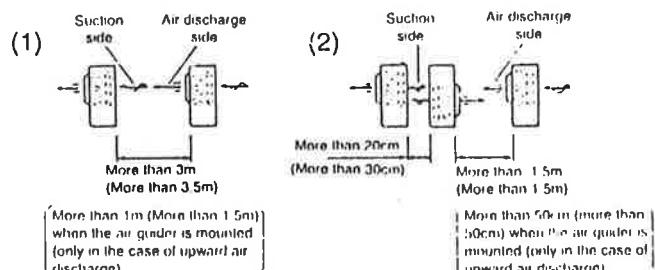
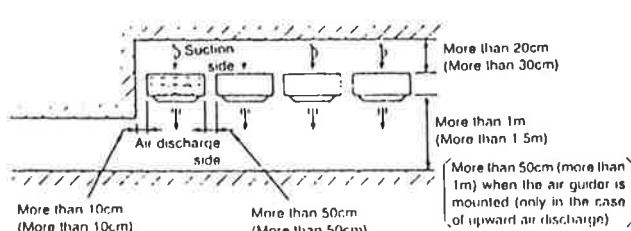
Before installation, turn the shipping bolts clockwise for anti-vibration as following drawing.



## Required space when two or more units are installed

Dimensions in ( ) denote in the case of CS-71, 80, 112, 140, 160C51XP(HP)

1. In the case of lateral continuous and intensive installation
2. Where the units are installed intensively to and fro



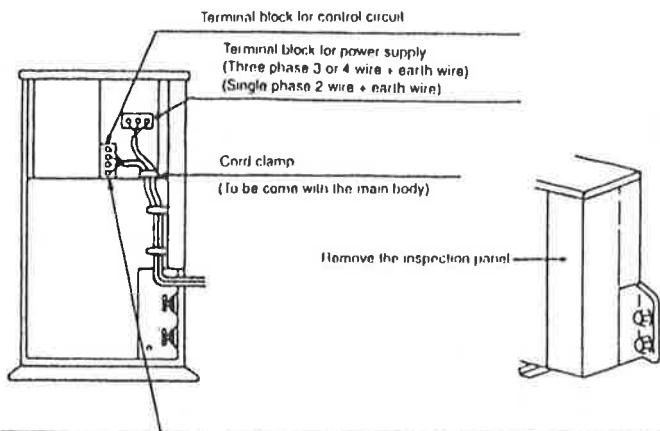
※Put the upward space opened

※Put the upward space opened

## Electrical wiring

- Where wiring work is carried out, remove piping side inspection panel to connect the power cable, cables to connect between outside and inside units based on electric circuit diagram.

- During wiring work, fix cables securely with cord clamp come with the main body so that any force may not apply to the terminal block.
- Do not allow cables to make contact with compressor or piping.  
(Temperature of the compressor in operation may exceed 100°C.)
- ⚠ ● For detailed instructions on the indoor and outdoor connection procedures and power supply connection procedures, refer to the indoor unit installation Instructions.



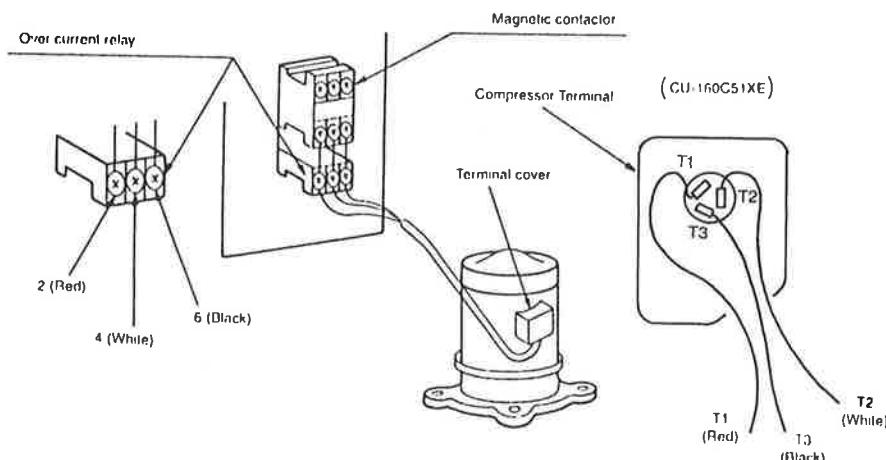
**Caution**  
Do not misconnect the wiring to terminal ① and ②



### ⚠ Caution for replacement of compressor

After replacement of compressor, care should be taken to connect the wire to the compressor terminal correctly as figure.

(Misconnection may result in breakage to the compressor because of reversing of compressor motor.)



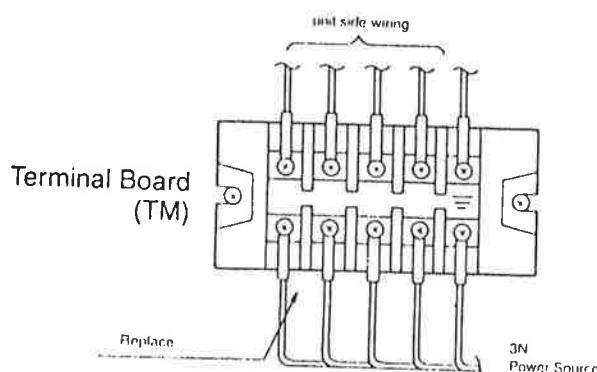
### ⚠ Caution for connection of power of source

Compressor does not operate in the case of negative-phase because of phase protector which protects the reversing of the compressor motor.  
If phase is negative, it causes LED5 (yellow) to go out. In this case, reverse two of the three-phases on power source side as figure.

#### Applicable to models

- CU-160C51XE

Don't replace unit side wiring



## REFRIGERANT PIPING WORK

Refrigerant piping is important in particular.

Refrigeration cycle of the separate type air conditioner is realized by the perfect piping work.

1. As to brazing of piping

- a. Carry out the brazing before fastening the flare nut.
- b. Carry out the brazing together with execution of nitrogen blow without fail. (This prevents the generation of oxide scale within copper pipe.)

2. As to refrigerant volume

- a. Refrigerant volume described in the name plate corresponding to the model has been charged into the main body of the outdoor side air conditioner when it was shipped from the factory.
- b. Because the charging volume of the refrigerant is for piping length of 5m, if the piping length exceeds 5m, carry out additional charging of the volume shown in the upper figure per one meter.

- Where the piping is long and there are many brazed points, install the strainer at midpoint in piping. (strainer shall be procured locally.)
- Use clean copper tube being free from moisture and dust inside. Before attempting to connect it, carry out nitrogen or air blow to blow out the dust.

3. Form the piping according to routing. Do not bend or restore the pipe at same point more than 3 or 4 times. (It may lead to fracture.)

4. Connect the piping to the liquid side service valve and gas side service valve situated under the power source for outdoor unit.

In the case of connection with flare nut, apply refrigerating machine oil on flare section (both inside and outside) and screw it in by hand 3 or 4 times initially.

5. After piping connection has been completed, make sure that terminal areas of the indoor and outdoor units are free from gas leakage by the use of nitrogen, etc.

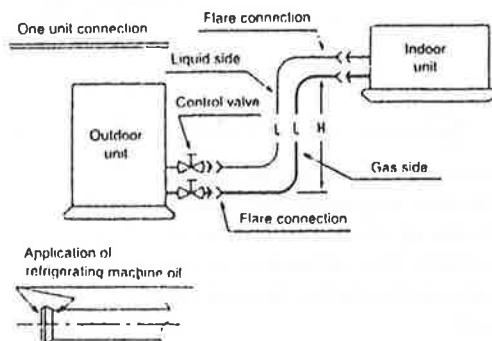
6. Air purge within connection piping shall be carried out by evacuation.

Additional charging volume per 1 meter of piping

Heating only model name	One unit connection	
	L ≤ 20m	L > 20m
CU-71C51HE, 71C51XE	Not required	70g
CU-80C51HE, 80C51XE		
CU-112C51XE		
CU-140C51XE	L ≤ 5m Not required	
CU-160C51XE	L > 5m 100g	

Flare nut fastening torque N·m (kgf·cm)

φ 6.35	12.7~16.7 (130~170)	φ 15.88	39.2~44.1 (400~450)
φ 9.52	22.6~26.5 (230~270)	φ 19.05	49.0~53.9 (500~550)
φ 12.7	32.4~36.3 (330~370)		



Model name	One unit connection			
	Liquid side piping	Gas side piping	Equivalent length (L)	Difference of elevation (H)
CU-71C51HE, 71C51XE	φ 9.52mm	φ 15.88mm	50m	30m
CU-80C51HE, 80C51XE	φ 9.52mm	φ 19.05mm	50m	30m
CU-112C51XE	φ 12.7mm	φ 19.05mm	50m	30m
CU-140C51XE, 160C51XE	φ 12.7mm	φ 19.05mm	50m	30m

### Notice

(Be sure to read this leaflet at the time of piping connection.)

- In performing refrigerant piping work, tighten the flare nuts at the-specified torques by using double spanners so as not to apply a force to the valve body fixing portions.

1/4"	12.7~16.7 (130~170)	5/8"	39.2~44.1 (400~450)	1/2"	32.4~36.3 (330~370)
3/8"	22.6~26.5 (230~270)	3/4"	49.0~53.9 (500~550)		

- Be sure to turn the valve spindle of the service valves on the liquid side and on the gas side fully by using a hexagonal bar spanner.

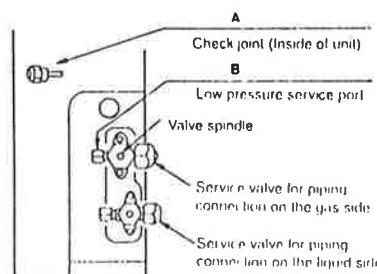
- Use port of the service valve according to the following figure in order to check the pressure.

- Be sure to tighten the cap securely after use of the valve spindle, service port and check joint. Incomplete tightening of them may cause gas leakage.

Check of pressure

Use the service port of the service valve according to the following figure in order to check the pressure.

	High pressure	Low pressure
COOL operation	A	B
HEAT operation	B	A



## Refrigeration pipe insulation

- Use the heat insulating material with good heat resistance (more than 120°C) for refrigerant piping and provide the thermal insulation to both gas and liquid side pipings.

## Precautions in test run

**Operation for test run shall be made from the indoor side unit.**

- Turn on hand switch more than 6 hours before test run. (It causes the crank case heater to be energized)
- The initial power supply must provide at least 90% of the rated voltage.  
Otherwise, the air conditioner should not be operated.

-  **Cautions** ① For test run, carry out the cooling operation firstly even in the heating season. (If heating operation is carried out firstly, it leads to the trouble of compressor. Then, attention must be paid.)
-  ② Carry out the test run more than 5 minutes without fail. (Test run will be canceled 30 minutes later automatically.)

### Self-diagnostic function

The LED on the PC board indicates any defective point. Refer to the table below to remedy the defective point before resuming the operation.

LED on the PCB outdoor unit				Defective point	Point to check
LED1	LED2	LED3	LED4		
				Indoor unit or defective transmission between the indoor and outdoor units.	See the indication of defectiveness on the indoor unit. (See the self-diagnostic table of the indoor unit.)
				Pressure switch worked. (High pressure cut)	Refrigeration system
				Piping thermistor of outdoor unit	Piping thermistor cord and connector
All LEDs (LED1~5) light off				Over current protector worked	Compressor open phase, or locking
				Phase protector worked	Negative-phase

- LED5 (yellow) flashing indicates the normal operation of the microcomputer on the PCB. If it is lit, extinguished or irregularly flashing, switch the power on again.

## Final inspection of completed work

- At the time when the work has been completed, measure and record the characteristics of dry run without fail and keep the measuring data, etc.
- Carry out the measurement regarding room temperature, outside air temperature, suction and air discharge temperatures, wind velocity, wind volume, voltage, current, presence of abnormal vibration, operating pressure, piping temperature, compressive pressure, airtight pressure as items to be measured.
- As to the structure and appearance, check following items.
  - Short circuit of the blowout air.
  - Mistake in wiring
  - Smooth flow of the drain
  - Reliable connection of the ground wire
  - Reliable thermal insulation
  - Looseness in terminal screw, fastening torque M4...118N·cm (12kgf·cm) M5...196N·cm (20kgf·cm).
  - Leakage of refrigerant
- If "Checksheet for dry run" is required, please apply it to the distributor or our company.

**EXPLAINING : Customer operating instructions**

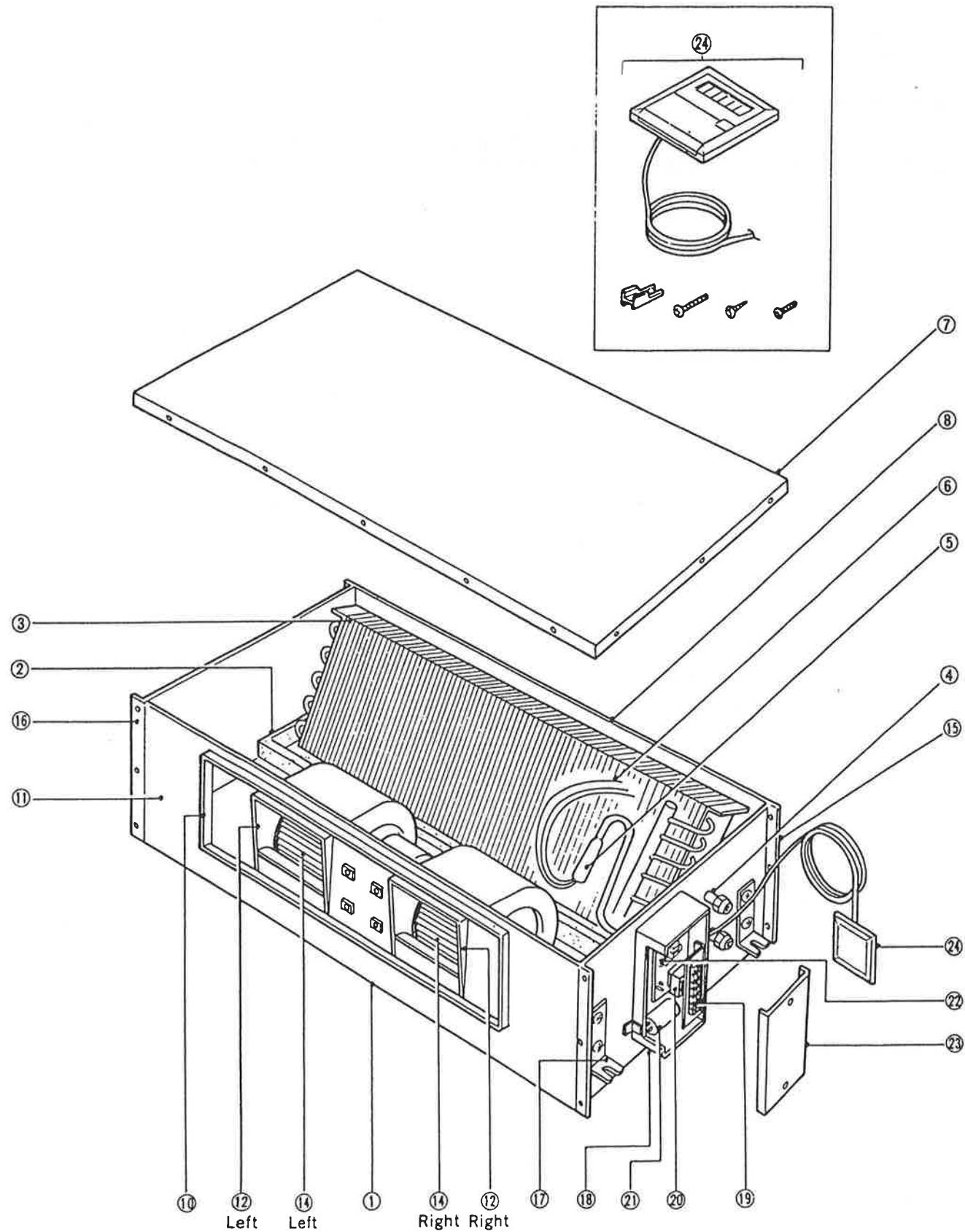
- Request the customer to operate this air conditioner viewing instruction manual come with indoor unit in practice and explain how to operate.
- Deliver the instruction manual to the customer without fail.

**As to parts to be sold separately**

We are preparing air guider for outdoor unit and parts to be sold separately for indoor unit, etc., however, as to details of mounting method, etc., observe respective instruction manual.

## 22. REPLACEMENT PARTS<INDOOR UNIT>

### INDOOR UNIT



**REPLACEMENT PARTS<INDOOR UNIT>**

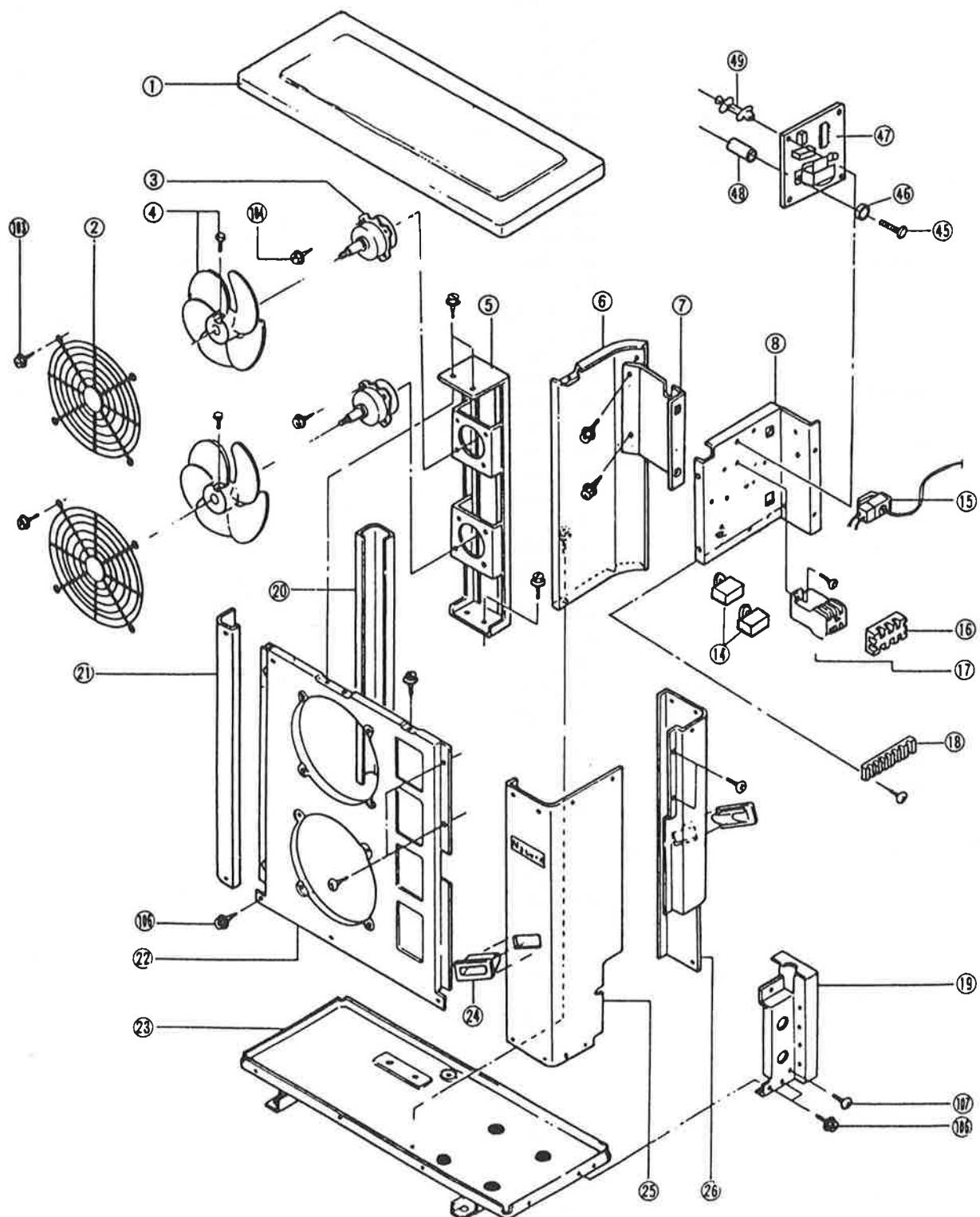
**INDOOR UNIT**

REF. NO.	PARTS NAME	PARTS NUMBER CNR	QUANTITY PER 1 SET							REC. PARTS	
			71E90HE	71E90XE	80E90HE	80E90XE	112E90XE	140E90XE	160E90XE		
1	Cabinet(Bottom)	P42-T02110	1	1	1	1	—	—	—		
		P42-T01900	—	—	—	—	1	1	1		
2	Drain pan	P42-T02100	1	1	1	1	—	—	—		
		P42-T02010	—	—	—	—	1	1	1		
3	Evaporator	P05-T08820	1	1	—	—	—	—	—		
		P05-T08770	—	—	1	1	—	—	—		
		P05-T08460	—	—	—	—	1	—	—		
		P05-T08200	—	—	—	—	—	1	—		
		P05-T08470	—	—	—	—	—	—	1		
4	Union	5/8	P45-T01680	1	1	1	1	—	—	—	
		3/4	P45-T04010	—	—	—	—	1	1	1	
		3/8	P45-T01470	1	1	1	1	1	—	—	
		1/2	P45-T03930	—	—	—	—	—	1	1	
5	Distributor As	P45-T04180	1	1	—	—	—	—	—		
		P45-T04160	—	—	1	1	—	—	—		
		P45-T04020	—	—	—	—	—	1	—		
		P45-T03920	—	—	—	—	—	—	1	—	
		P45-T04030	—	—	—	—	—	—	—	1	
7	Cabinet(Top)	P42-T02120	1	1	1	1	—	—	—		
		P42-T01960	—	—	—	—	1	1	1		
8	Cabinet(Back)	P42-T02050	1	1	1	1	—	—	—		
		P42-T01970	—	—	—	—	1	1	1		
9	Duct flange(Inlet)	P42-T02060	1	1	1	1	—	—	—		
		P42-T01860	—	—	—	—	1	1	1		
10	Duct flange(Outlet)	P42-T02090	1	1	1	1	—	—	—		
		P42-T01860	—	—	—	—	1	1	1		
11	Fan base	P45-T04150	1	1	1	1	—	—	—		
		P45-T03880	—	—	—	—	1	1	—		
		P45-T04040	—	—	—	—	—	—	1		
12	Casing	P05-T08810	2	2	2	2	—	—	—		
		P05-T08290	—	—	—	—	2	2	—		
		P05-T04050	—	—	—	—	—	—	2		
13	Fan motor	AC 150W	P06-T02530	1	1	1	1	—	—	—	*
		AC 250W	P06-T02630	—	—	—	—	1	—	—	*
		AC 350W	P06-T02620	—	—	—	—	—	1	—	*
		AC 450W	P06-T02610	—	—	—	—	—	—	1	*
14		Impeller(R)	P05-T08790	1	1	1	1	—	—	—	
		Impeller(L)	P05-T08800	1	1	1	1	—	—	—	
		Impeller	P05-T08320	—	—	—	—	2	2	—	
		Impeller(R)	P05-T08760	—	—	—	—	—	—	1	
		Impeller(L)	P05-T08780	—	—	—	—	—	—	1	
15	Cabinet(R)	P42-T02080	1	1	1	1	—	—	—		
		P42-T01920	—	—	—	—	1	1	1		
16	Cabinet(L)	P42-T02070	1	1	1	1	—	—	—		
		P42-T01930	—	—	—	—	1	1	1		
19	Terminal board	16P	P06-T02640	1	1	1	1	1	1	1	
20	Transformer	240,415V	46-859322	1	1	1	1	1	1	1	*
21	Capacitor	4MF	P06-T02890	1	1	1	1	—	—	—	*
		5MF	P06-T02680	—	—	—	—	1	—	—	*
		10MF	P06-T01820	—	—	—	—	—	1	—	*
		18MF	P06-T02670	—	—	—	—	—	—	1	*
24	Remote controller	Panasonic	46-929230	1	1	1	1	1	1	1	*
25	Coil sensor		46-813190	1	1	1	1	1	1	1	*
26	Air temperature sensor		06-834820	1	1	1	1	1	1	1	
27	Printed circuit board A		06-850760	1	1	1	1	1	1	1	
28	Printed circuit board B		06-845600	1	1	1	1	1	1	1	

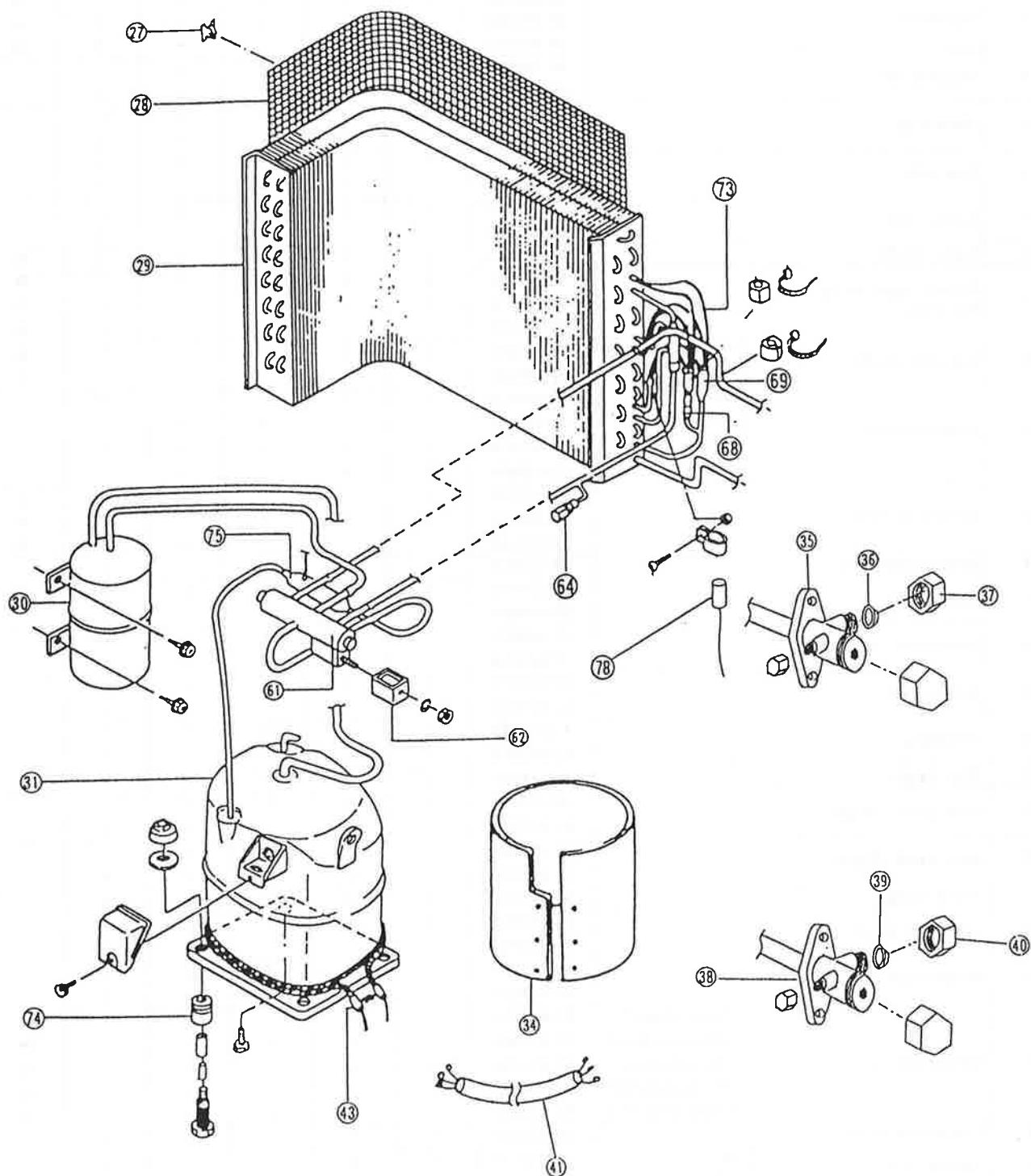
## 23. REPLACEMENT PARTS<OUTDOOR UNIT>

OUTDOOR UNIT

CU-71C51HE, CU-71C51XE, CU-80C51HE,  
CU-80C51XE, CU-112C51XE



**REPLACEMENT PARTS<OUTDOOR UNIT>**



**REPLACEMENT PARTS<OUTDOOR UNIT>**

**OUTOOR UNIT      CU-71C51HE,CU-71C51XE,CU-80C51HE, CU-80C51XE, CU-112C51XE**

REF.NO.	PARTS NAME	PARTS NUMBER CNR	QUANTITY PER 1 UNIT					REC PARTS
			CU-71C51HE	CU-71C51XE	CU-80C51HE	CU-80C51XE	CU-112C51XE	
1	Shell top	02-847000 02-847020	1 —	1 —	1 —	1 —	— 1	
2	Fan guard	02-829810 02-829820	2 —	2 —	2 —	2 —	— 2	
3	Fan motor	06-846340 06-835810 06-835820	2 — —	2 — —	2 — —	2 — —	— 2 —	※ ※ ※
4	Propeller fan	45-591330 05-847030	2 —	2 —	2 —	2 —	— 2	
5	Motor stay	42-562360 42-533550	1 —	1 —	1 —	1 —	— 1	
6	Seal plate	42-533040 42-533530	1 —	1 —	1 —	1 —	— 1	
8	Contron box	46-925910 46-862450	1 —	1 —	1 —	1 —	— 1	
11	Fuse (5A)	06-846320	1	1	1	1	1	※
14	Electric capacitor for Fan motor	06-831080	2	2	2	2	—	※
		06-846200 06-833100	2 —	2 —	— —	— —	— 2	※ ※
15	Pressure switch	Hight Pressure switch Fan control(High-Lo)	06-830840 06-835210	1 1	1 1	1 1	1 1	— ※
16	Terminal board	3P	06-803020	1	—	1	—	—
		5P	06-455360	—	—	1	1	—
		5P	06-850270	—	1	—	1	1
		5P	06-839680	1	1	—	—	1
17	Compressor relay		06-845740	1	—	1	—	—
			06-845730	—	1	—	1	—
			06-844690	—	—	—	—	1
19	Service Valve Stay		05-852510	1	1	1	1	1
20	Corner post		02-829980 02-829960	1 —	1 —	1 —	1 —	
21	Front panel (Left)		02-829920 02-829880	1 —	1 —	1 —	1 —	
22	Orifice plate		02-829830 02-829890	1 —	1 —	1 —	1 —	
23	Unit base		42-562350 42-562960	1 —	1 —	1 —	1 —	
24	Shell hanger		04-414080	2	2	2	2	2
25	Front panel (Right)		02-830010 02-829860	1 —	1 —	1 —	1 —	
26	Back panel (Right)		02-481650 42-548040	1 —	1 —	1 —	1 —	
27	Guard spring		02-446090	4	4	4	4	4
28	Condenser guard		05-398900 05-963760	1 —	1 —	1 —	1 —	
30	Accumulator		45-595250 45-583780	1 —	1 —	1 —	1 —	
31	Compressor	CRGQ-0250-PFJ	05-851730	1	—	—	—	—
		CRGQ-0250-TFD	05-851760	—	1	—	—	—
		CRHQ-0275-PFJ	05-851290	—	—	1	—	—
		CRHQ-0275-TFD	05-851320	—	—	—	1	—
		CRLQ-0350-TFD	05-852850	—	—	—	—	1
34	Compressor cover		05-851340	1	1	1	1	1
35	Service valve	5/8" 3/4"	05-852500 05-852760	1 —	1 —	1 —	1 —	—
36	Bonnet	5/8" 3/4"	05-403040 05-412690	1 —	1 —	1 —	1 —	
29	Condenser		05-976590 05-961010 05-964080	1 — —	1 — —	— 1 —	— 1 —	

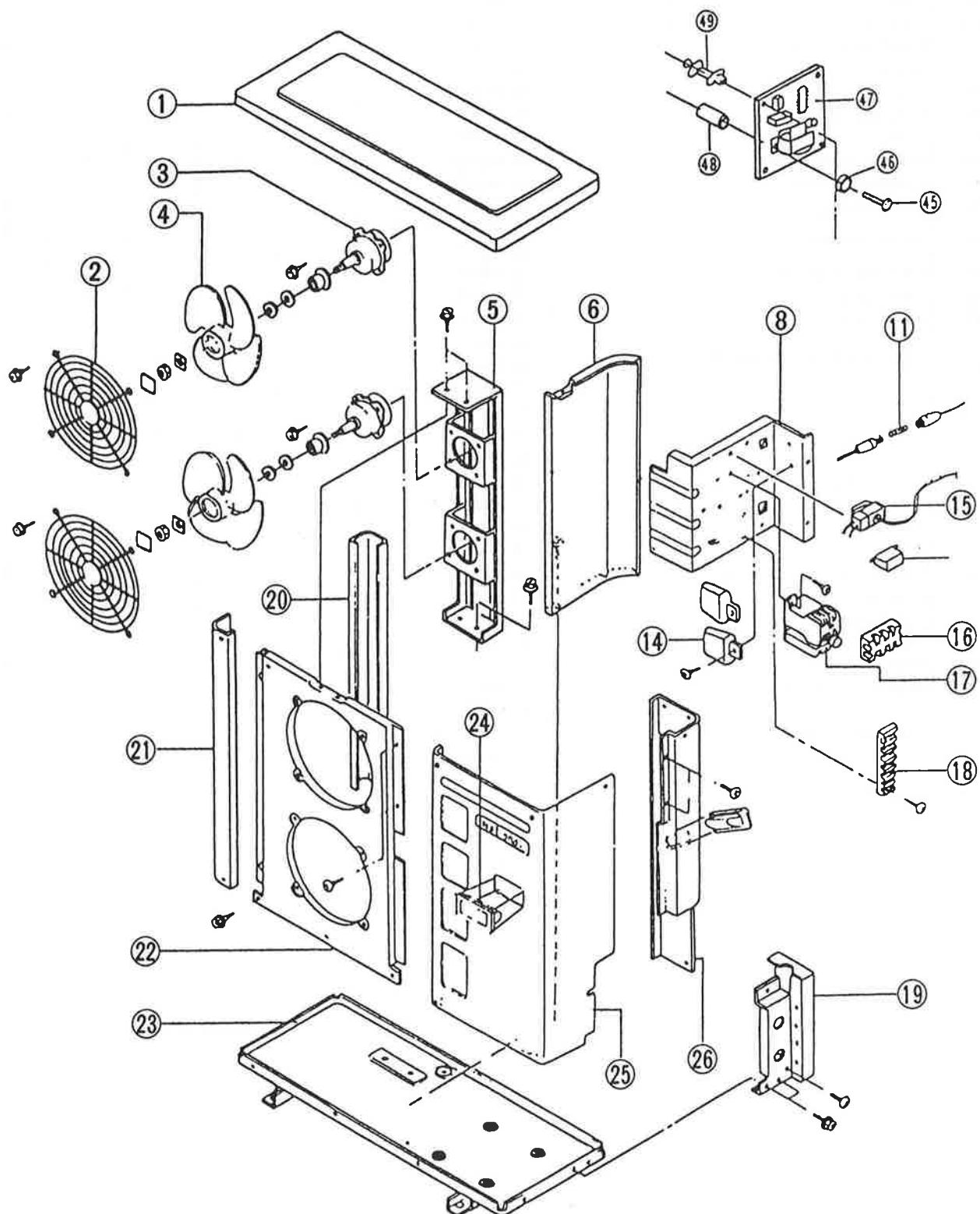
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**REPLACEMENT PARTS<OUTDOOR UNIT>**

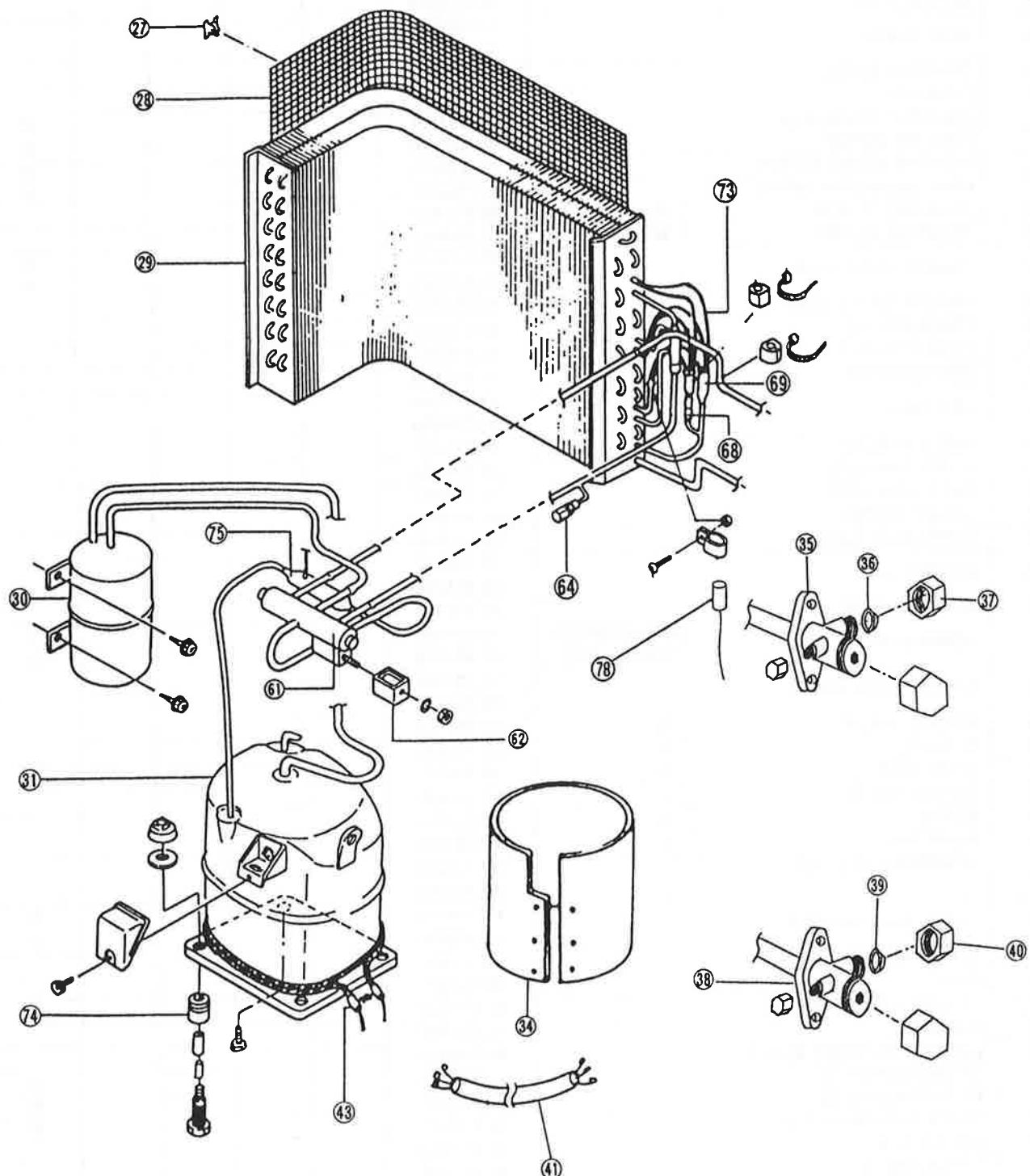
**OUTDOOR UNIT**

REF.NO.	PARTS NAME	PARTS NUMBER CNR	QUANTITY PER 1 UNIT					REC PARTS
			CU-71CS1HE	CU-71CS1XE	CU-80CS1HE	CU-80CS1XE	CU-112CS1XE	
37	Flare nut	5/8" 3/4"	38-890100 38-890110	1 —	1 —	1 —	1 —	— 1
38	Service valve	3/8"	05-852530	1	1	1	1	1
39	Bonnet	3/8"	05-403050	1	1	1	1	1
40	Flare nut	3/8"	38-890080	1	1	1	1	1
43	Crank-case heather		06-845720	1	1	1	1	1
45	Screw M 3 TS25		38-152810	1	1	2	2	2
46	Bush		06-817930	1	1	2	1	2
47	Printed circuit board		06-847920	1	1	1	1	1
48	Collor		06-817460	1	1	1	1	1
49	Locking support board		06-449950	5	5	5	5	5
50	Compressor base		42-562220	1	1	1	1	—
51	Transformer As		46-861820	1	1	1	1	1
			05-401290 05-495730	1 —	1 —	1 —	— —	— 1
61	Reversing valve		06-848080	1	1	1	1	1
62	Reversing valve coil		05-953370	1	1	1	1	1
64	Check joint		05-814310	1	1	1	1	1
68	Check valve		45-559130 45-599120 45-811250	1 — —	1 — —	— — —	— — —	— — 1
73	Capillary		05-492180 05-859250 05-963890	4 — —	4 — —	— 3 —	— 3 —	— — 5
74	Mount rubber		05-851330	1	1	1	1	1
75	Muffler		05-852050 05-954050 05-394400	1 — —	1 — —	1 — —	1 — —	— 1 1
76	Pressure switch for Heating		06-811250	1	1	1	1	1
77	Power relay		06-486360	1	1	1	1	1
78	Thermistor As		46-827980	1	1	1	1	1
79	Strainer A		05-979110	—	—	—	—	1
80	Magnetic valve		05-809320	—	—	—	—	1
81	Magnetic valve coil		06-839510	—	—	—	—	1
			46-860290 46-859900 46-901060	1 — —	— 1 —	1 — —	— 1 —	— — 1
41	Compressor cord							

## OUTDOOR UNIT (CU-140C51XE, CU-160C51XE)



**REPLACEMENT PARTS<OUTDOOR UNIT>**



## REPLACEMENT PARTS&lt;OUTDOOR UNIT&gt;

## OUTDOOR UNIT CU-140C51XE,CU-160C51XE

REF.NO.	PARTS NAME	PARTS NUMBER CNR	QUANTITY PER 1 UNIT		REC PARTS
			CU-140C51XE	CU-160C51XE	
1	SHELL TOP	02-847010	1	1	
2	FAN GUARD	02-829820	2	2	
3	FAN MOTOR	06-835810 05-850860	2 —	— 2	※
4	PROPELLER FAN	05-847030	2	2	※
5	MOTOR STAY	42-533550	1	1	
6	SEAL PLATE	42-533530 42-570490	1 —	— 1	
8	CONTROL PANEL	46-923890	1	1	
11	FUSE(5A)	06-846320	1	1	
14	ELECTRIC CAPACITOR FOR FAN MOTOR	06-833100 06-837790	2 —	— 2	※
15	HIGH PRESSURE SWITCH FAN CONTROL(HIGH-LO)	06-830840 06-835210	1 1	1 1	※
16	TERMINAL BOARD	5P	06-850870	1	1
18	TERMINAL BOARD	5P	06-839680	1	1
17	COMPRESSOR RELAY	06-849370 06-849390	1 —	— 1	※
19	SERVICE VALVE STAY	05-852510	1	1	
20	CORNER POST	02-829960	1	1	
21	FRONT PANEL(L)	02-829880	1	1	
22	ORIFICE PLATE	02-829840	1	1	
23	UNIT BASE	42-533520 42-569080	1 —	— 1	
24	SHELL HANGER	04-414080	2	2	
25	FRONT PANEL(R)	02-829860	1	1	
26	BACK PANEL(R)	42-548040	1	1	
27	GUARD SPRING	02-446090	4	4	
28	CONDENSER GUARD	05-958290	1	1	
29	CONDENSER	05-841070 05-976480	1 —	— 1	
30	ACCUMULATOR	45-579390	1	1	
31	COMPRESSOR	NM0502HTU5D ZR68KC-TFD	91-959060 05-857820	1 —	— 1
34	COMPRESSOR COVER		05-398500 05-854640	1 —	
35	SERVICE VALVE	¾	05-852760	1	1
36	BONNET	¾	05-412690	1	1
37	FLARE NUT	¾	38-890110	1	1
38	SERVICE VALVE	½	05-853610	1	1
39	BONNET	½	05-961750	1	1
40	FLARE NUT	½	38-890090	1	1
41	COMPRESSOR CORD		46-923220 46-923910	1 —	— 1
43	CRANK-CASE HEATER		46-594700 06-849430	1 —	— 1
45	SCREW M3TS25		38-152810	1	1
46	BUSH		06-817930	1	1
47	PRINTED CIRCUIT BOARD		06-847920	1	1
48	COLLOR		06-817460	1	1
49	LOCKING SUPPORT BOARD		06-449950	5	5
51	TRANSFORMER AS		46-861820	1	1
61	REVERSING VALVE		05-814560	1	1
62	REVERSING VALVE COIL		06-848080	1	1
64	CHECK JOINT		05-953370	1	1
68	CHECK VALVE		05-813420	1	1
69	DISTRIBUTOR&CAPILLARY		45-551920 45-596470	1 —	— 1
73	CAILLARY		05-849470 05-963890	6 —	— 6
74	MOUNT RUBBER		05-849460 39-941000	— 1	— —
75	MUFFLER		45-597190 05-950750	1 —	— 1

## OUTDOOR UNIT

REF.NO.	PARTS NAME	PARTS NUMBER CNR	QUANTITY PER 1 UNIT		※REC PARTS
			CU-140C51XE	CU-160C51XE	
76	PRESSURE SWITCH FOR HEAT	06-811250	1	1	※
77	POWER RELAY	06-486360	2	2	※
78	THERMISTOR AS.	46-827980	1	1	
79	STRAINER A	05-979190	1	1	
80	MAGNETIC VALVE	06-809320	1	1	※
81	MAGNETIC VALVE COIL	06-839510	1	—	※
82	PHASE PROTECTOR	06-811210	—	1	※



ISO 9001:1994 / EN ISO 9001:1994 / BS EN ISO 9001:1994 / JIS Z 9901:1994

*approved by* Lloyd's Register Quality Assurance