6. INVERTER MULTI-SPLIT SYSTEM ROOM AIR-CONDITIONER

(Air cooled cooling only type)

(OUTDOOR UNIT)

SCM452CENG-L

(INDOOR UNIT)

SKM222CENG-L
SKM252CENG-L
SKM402CENG-L

CONTENTS

6.1 GENERAL INFORMATION

6.1.1 Specific features

(1) Equipped with an inverter scroll compressor.

- Low noise. Low vibration and compact.

(2) The long piping makes the location of the inside and units flexible.

- No need for additional charge of refrigerant : 20 m
- Maximum piping length : 30 m

(3) Connectable indoor capacity

Number of connectable units : 1 to 2 units

Total of indoor units (class kW) : 6.5 kW

(4) Indoor units are available with 3 capacities.

3 capacities ····· 22, 25, 40

(5) Inverter (Frequency converter) for multi-steps power control

- Cooling

  The rotational speed of a compressor is changed in step in relation to varying load, to interlock with the indoor and outdoor unit fans controlled to changes in frequency, thus controlling the power.

- Allowing quick cooling operation during start-up period. Constant room temperature by fine-tuned control after the unit has stabilized.

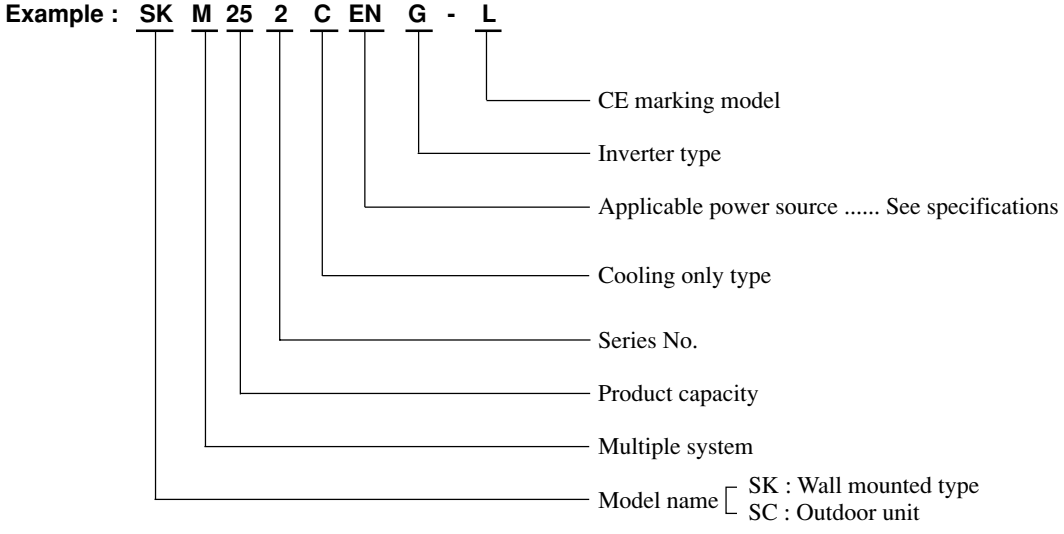
(6) Fuzzy control

Fuzzy control calculates the amount of variation in the difference between the suction air temperature and the setting temperature in compliance with the fuzzy rules in order to control the air capacity and the inverter frequency.

(7) Self diagnosis function

We are constantly trying to do better service to our customers by installing such judges that show abnormality of operation as follows. (See Page 212)

6.1.2 How to read the model name



6.2 SELECTION DATA

6.2.1 Specifications

(1) Indoor unit

Models SKM222CENG-L, 252CENG-L, 402CENG-L

Item \ Models				SKM222CENG-L	SKM252CENG-L	SKM402CENG-L
Cooling capacity			W	2200	2500	4000
Noise level(3)			dB (A)	38		42
Exterior dimensions Height × Width × Depth			mm	250 × 750 × 178		275 × 790 × 174
Color				Ivory white		
Net weight			kg	7.5		8.0
Air handling equipment Fan type & Q'ty				Tangential fan × 1		
Motor			W	17		18
Air flow (at high)			CMM	7.0		9.5
Air filter, Q'ty				Polypropylene net × 2 (Washable)		
Operation switch				Wireless-Remote controller		
Room temperature control				M.C thermostat		
Pilot lamp				RUN (Green), TIMER (Yellow)		
Safety equipment				Frost protection, Serial error protection Fan motor error protection		
Refrigerant piping	O.D	Liquid line	mm (in)	ϕ 6.35 (1/4″)		
		Gas line		ϕ 9.52 (3/8″)		ϕ 12.7 (1/2″)
	Connecting method			Flare connecting		
	Attached length of piping			Liquid line : 0.4m Gas line : 0.35m		
	Insulation			Necessary (Both Liquid & Gas lines)		
Drain hose				Connectable		
Accessories (including)				Mounting kit		
Optional parts				—		
Outdoor units to be combined				SCM452CENG-L		

Notes (1) The data are measured at the following conditions.

Item \ Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27ºC	19ºC	35ºC	24ºC	JIS C9612

(2) Capacity indicated is the rated capacity with one unit operating under JIS standards conditions.

(3) Expressed in sound pressure level.

(2) Outdoor unit

Model SCM452CENG-L

Item \ Model			SCM452CENG-L
Cooling capacity		W	4500 (2000 ~ 5100)
Power source			1 Phase 220/240V 50Hz
Power consumption		W	1820 (680~2050)
Running current		A	8.4/7.7
Noise level(4)		dB (A)	46
Exterior dimensions Height × Width × Depth		mm	595 × 720 × 290
Color			Stucco white
Net weight		kg	36
Refrigerant equipment Compressor type & Q'ty			GR5490FD41 × 1
Motor		kW	1.2
Starting method			Direct start
Refrigerant control			Capillary tubes + Electric expansion valve
Refrigerant		kg	R22 1.3 (Pre-charged up to the piping length of 20m)
Refrigerant oil		ℓ	0.45 (BARREL FREEZE 32SAM)
Air handling equipment Fan type & Q'ty			Propeller fan × 1
Motor		W	24
Air flow (at high)		CMM	26
Shock & vibration absorber			Rubber (for compressor)
Safety equipment			Compressor overheat protection, Overcurrent protection Serial signal error protection
Refrigerant piping	Size × Core × Number	mm (in)	Liquid line: ϕ 6.35 (1/4″) × 2
			Gas line: ϕ 9.52 (3/8″) × 2
	Connecting method		Flare connecting
	Attached length piping		—
	Insulation		Necessary (Both Liquid & Gas lines)
Power source supply			Terminal block (Screw fixing type)
Connection wiring	Size × Core number		1.5 mm² × 4 cores (Including earth cable)
	Connecting method		Terminal block (Screw fixing type)
Accessories (included)			Union : (ϕ 9.52 → ϕ 12.7) × 1 Installation sheet, Manual instruction
Indoor units to be combined			SKM22, 25, 40 type

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27ºC	19ºC	35ºC	24ºC	JIS C9612

(2) The values for capacity and power consumption shown in a range ( ) indicate the minimum and maximum of the range.

(3) If the piping length exceeds 20m, additional charging is required. (20g/m)

(4) Expressed in sound pressure level.

(3) Operation data

- The combinations of the indoor units is indicated by numbers. They are read as follows.
  (Example) SKM222CENG → 22 SKM402CENG → 40
- The capacity of the indoor units is shown by rooms. If this exceeds the maximum capacity of the outdoor unit, the demand capacity will be proportionally distributed.
- If units are to be combined, use the table below to make the proper selection.

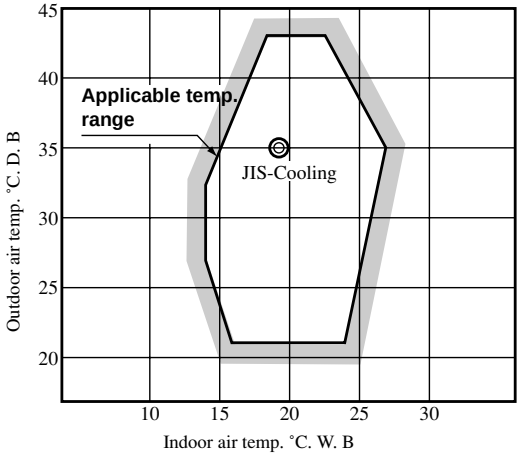
Model SCM452CENG-L

Indoor unit combination		Cooling capacity (kW)					Power consumption (W)			Running current (A)
		Room cooling capacity (kW)		Total capacity (kW)			Min.	Standard	Max.	Standard
		A room	B room	Min.	Standard	Max.				
1 room	22	2.2		1.1	2.2	2.5	350	750	900	3.44/3.16
	25	2.5		1.1	2.5	2.8	350	900	1040	4.13/3.79
	40	4.0		1.1	4.0	4.5	350	1580	1850	7.25/6.65
2 room	22+22	2.2	2.2	2.0	4.4	4.7	680	1750	1950	8.03/7.37
	22+25	2.1	2.4	2.0	4.5	4.8	680	1820	2020	8.36/7.66
	22+40	1.7	3.1	2.0	4.8	5.1	680	1850	2050	8.49/7.79
	25+25	2.25	2.25	2.0	4.5	4.8	680	1820	2020	8.36/7.66
	25+40	1.8	3.0	2.0	4.8	5.1	680	1850	2050	8.49/7.79

6.2.2 Range of usage & limitations

(1) Inlet air temperature

(a) Cooling operation

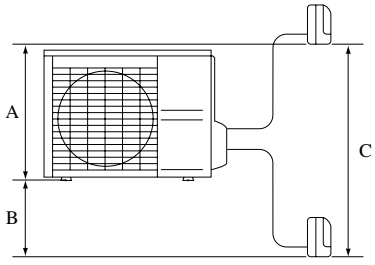


Note: The chart is result from the continuous operation under constant air temperature conditions, however, excludes the initial pull-down stage.

(2) Total one way piping length and vertical height difference.

The maximum permissible length of the refrigerant pipes for the outdoor units, and the maximum permissible height difference for the outdoor units are as shown below.

Length for one indoor unit		Under 25m
Total length for all rooms		Under 30m
Height difference	Lower installation spot of the indoor unit A	Under 15m
	Upper installation spot of the indoor unit B	Under 10m
	Maximum height difference of the indoor units C	Under 10m
Length of chargeless refrigerant pipe		20m



(3) Indoor units that can be used in combination

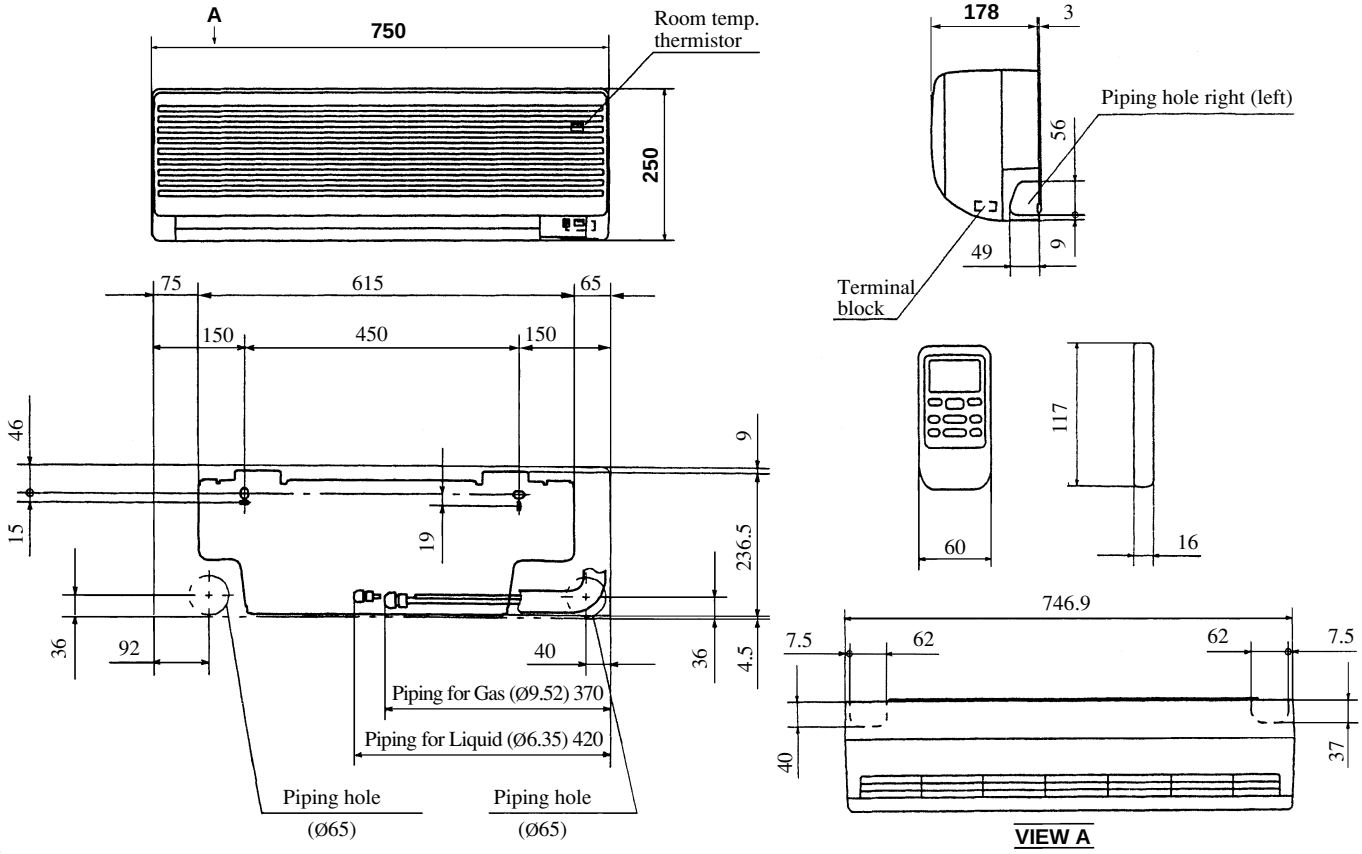
Item \ Model	SCM452CENG-L
Number of connected units	2 units
Total of indoor units (class kW)	6.5 kW

6.2.3 Exterior dimensions

(1) Indoor unit

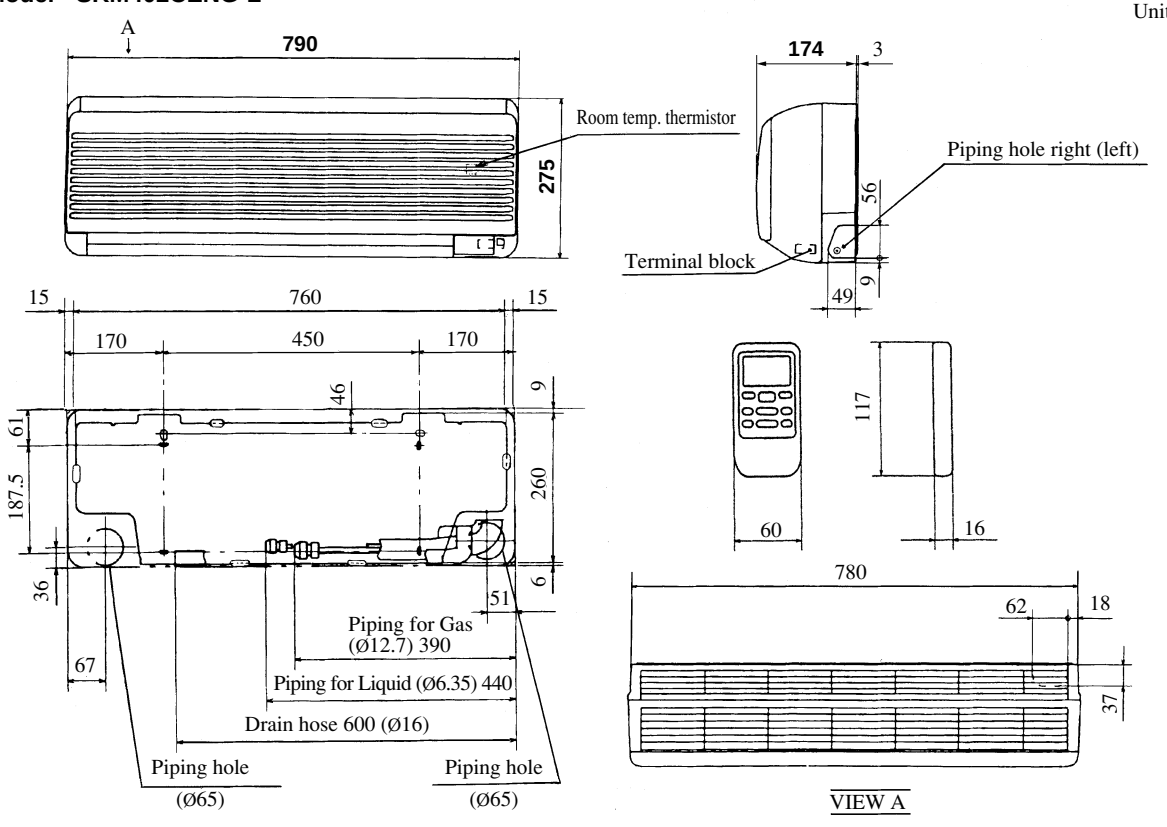
Models SKM222CENG-L, 252CENG-L

Unit: mm



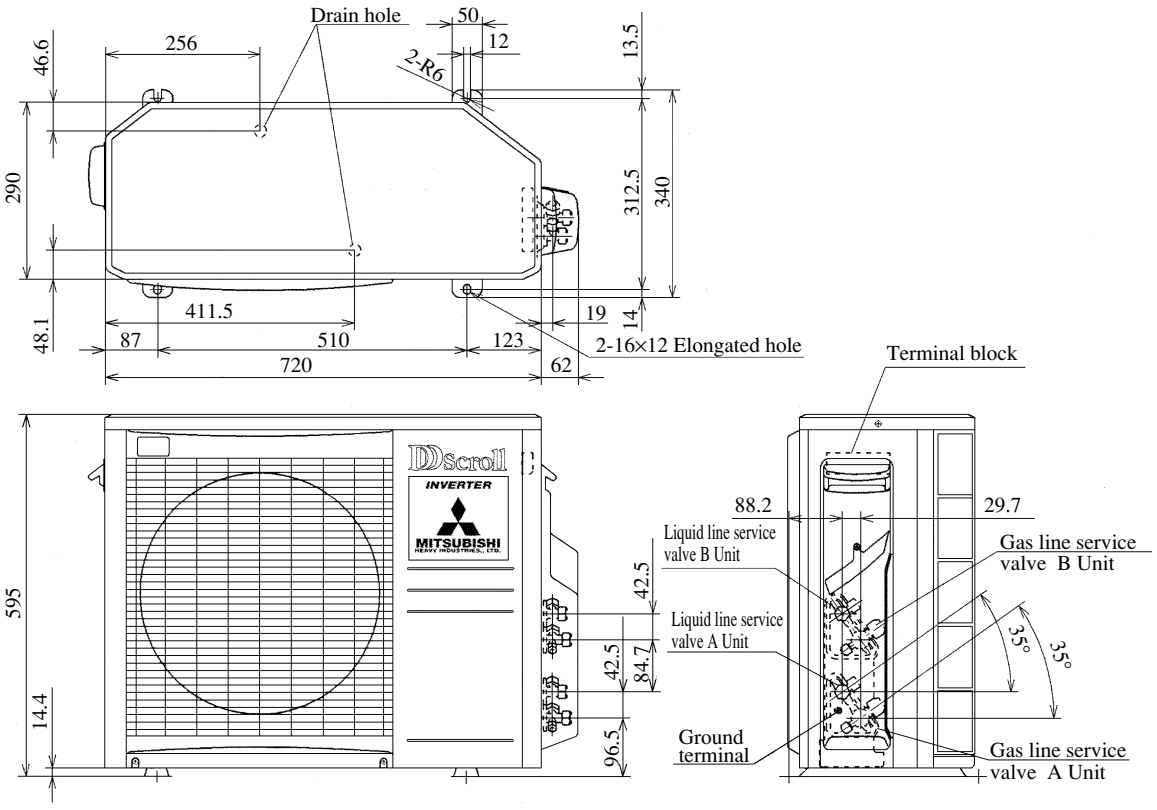
Model SKM402CENG-L

Unit: mm



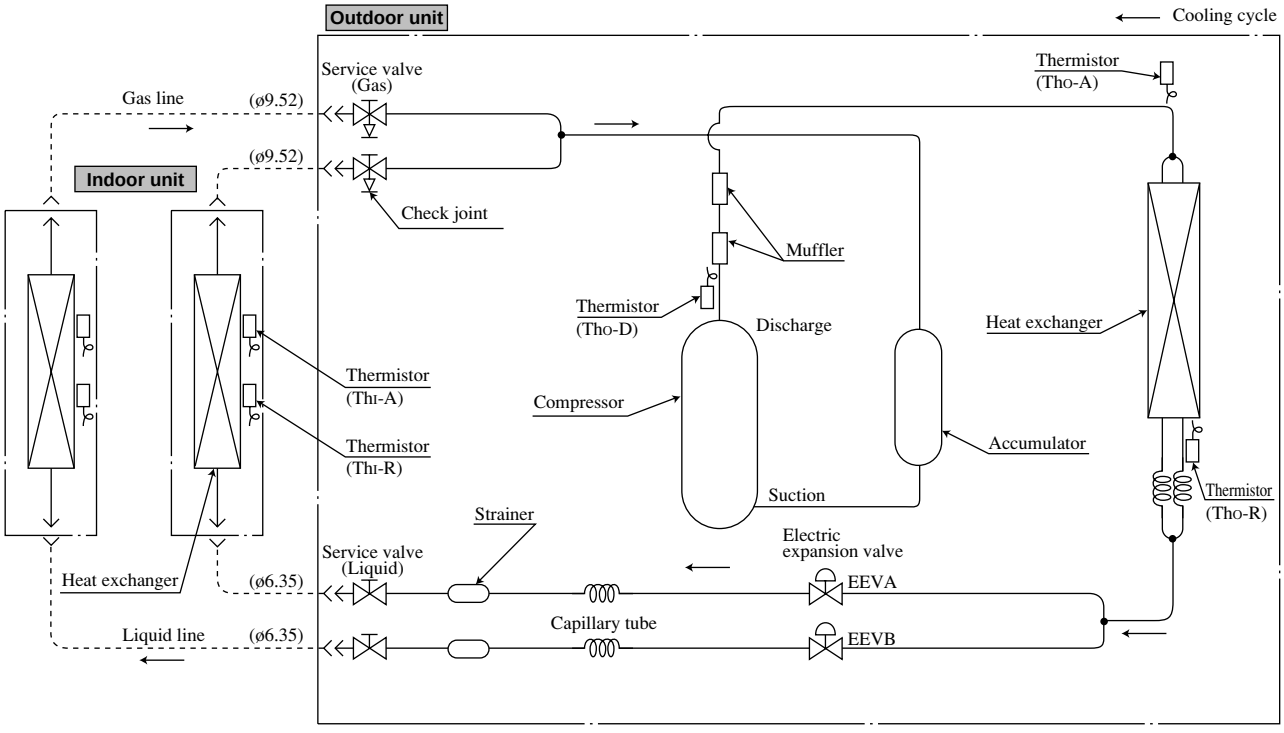
(2) Outdoor unit

Model SCM452CENG-L



6.2.4 Piping system

Model SCM452CENG-L



6.3 ELECTRICAL DATA

Meaning of marks

• Outdoor Unit

Symbol	Parts name	Symbol	Parts name
CM	Compressor motor	Tho-A	Thermistor (outdoor air temp.)
FM_0	Fan motor	Tho-R	Thermistor (outdoor H.X temp.)
L	Reactor	Tho-D	Thermistor (comp. dome temp.)
DS	Diode stack	LED2	Warning lamp (Red)
EEVA, B	Electric expansion valve	LED1, 3	Serial signal lamp (Green)

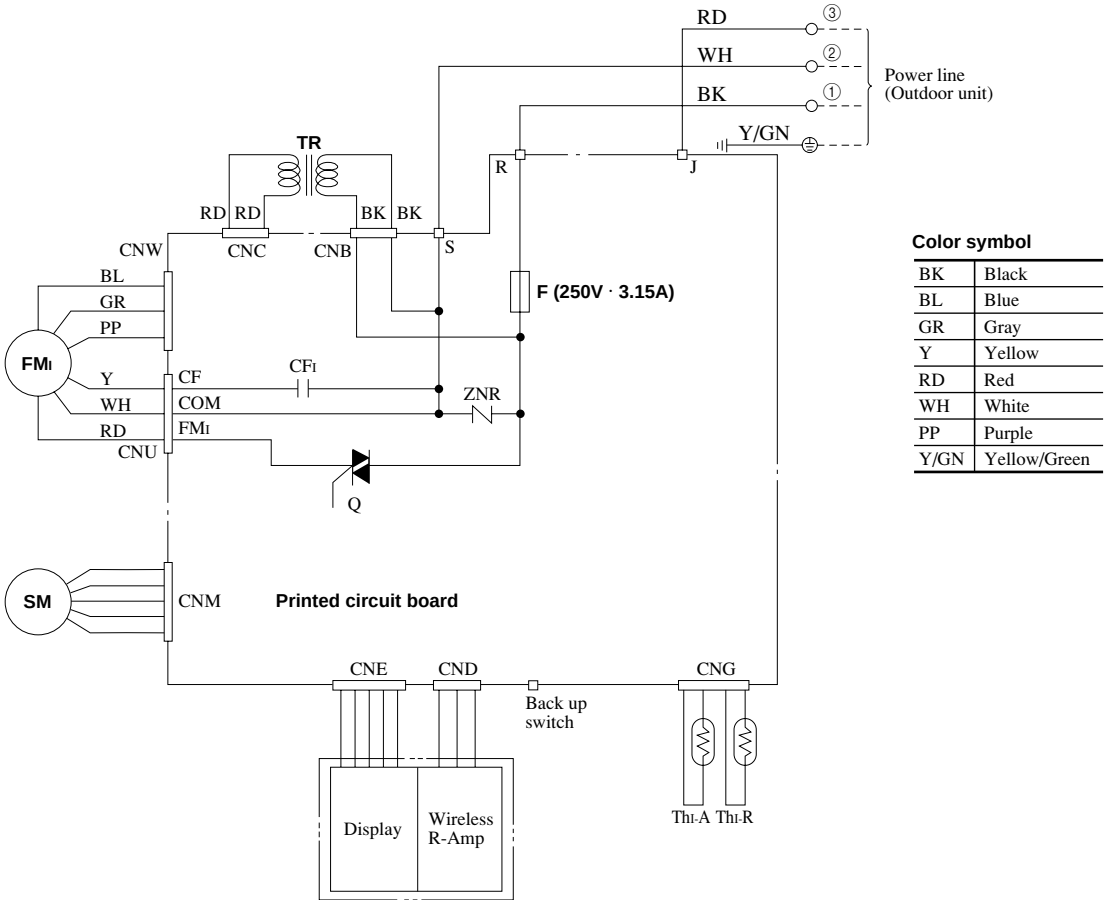
• Indoor Unit

Symbol	Parts name	Symbol	Parts name
FM_I	Fan motor	Q	Fan motor control triac
CF_I	Capacitor (for FM_I)	F	Fuse
SM	Flap motor	Th_I-A	Thermistor (Room temp.)
TR	Transformer	Th_I-R	Thermistor (Indoor H. X temp.)
ZNR	Varistor		

6.3.1 Electrical wiring

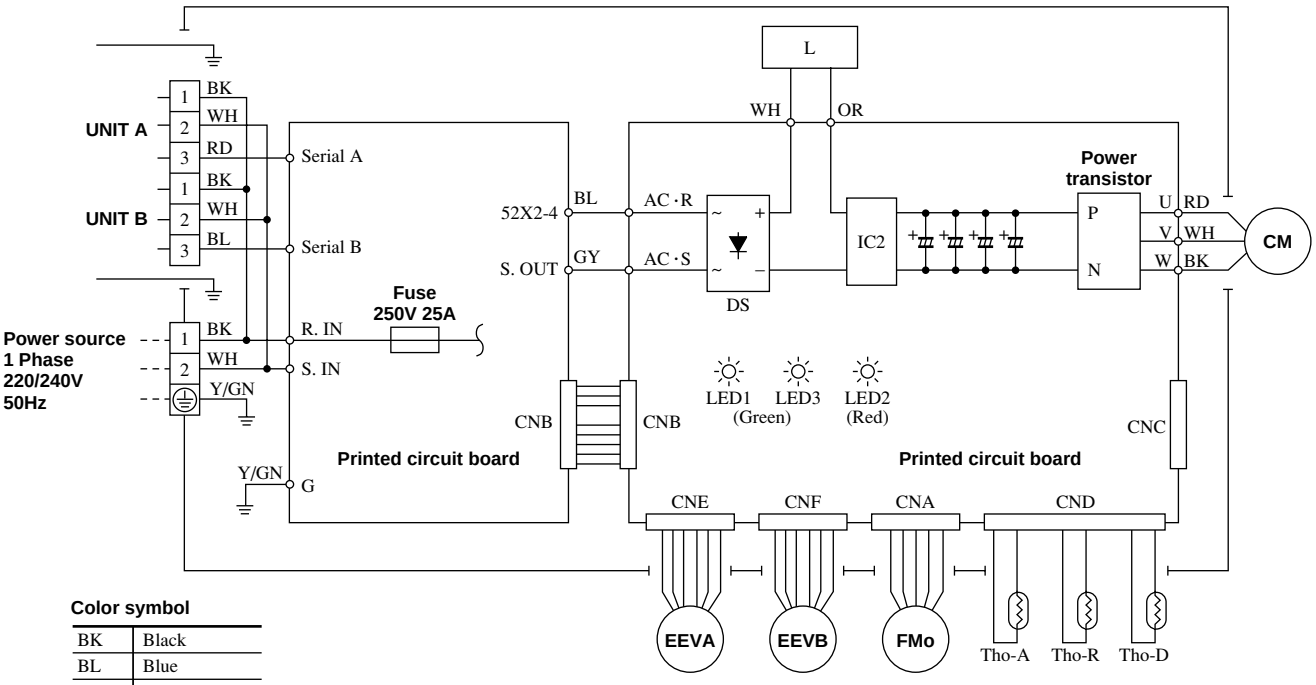
(1) Indoor unit

Models SKM222CENG-L, 252CENG-L, 402CENG-L



(2) Outdoor unit

Model SCM452CENG-L



Color symbol

BK	Black
BL	Blue
GY	Gray
RD	Red
WH	White
OR	Orange
Y/GN	Yellow/Green

6.4 OUTLINE OF OPERATION CONTROL BY MICROCOMPUTER

Except for function relating to heating, same at the for SKM heat pump models. See Page 192.

6.5 APPLICATION DATA

The application data for the cooling only models are similar to those for the heat pump models. See Page 202.

6.6 MAINTENANCE DATA

Some at the cooling/heating equipment SKM heat pump models. See Page 211.

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