

TECHNICAL CATALOGUE

HITACHI

Cooling & Heating



MULTIZONE

OUTDOOR UNIT

RAM-33NP2E
RAM-40NP2E
RAM-53NP2E
RAM-53NP3E
RAM-68NP3E
RAM-70NP4E
RAM-90NP5E

INDOOR

RAK-18QXE
RAK-(25-50)RXE
RAK-15QPE
RAK-(18-50)RPE
RAK-50RPE1
RAK-60RPE
RAF-(25-50)RXE
RAI-(25-60)RPE
RAD-18QPE
RAD-(25-60)RPE

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1 SPECIFICATIONS

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1.2. MULTIZONE OUTDOOR

1.2.1. RAM-33NP2E / 40NP2E / 53NP2E / 53NP3E

OUTDOOR		UNIT	RAM-33NP2E	RAM-40NP2E	RAM-53NP2E	RAM-53NP3E
Minimum / Maximum indoor units connectable			2	2	2	2 / 3
Minimum / Maximum connected capacity			3.0kW / 5.0kW	3.0kW / 6.0kW	3.0kW / 8.5kW	3.0kW / 8.8kW
Nominal Cooling capacity (min - max)		kW	3.3 (1.5-3.8)	4.0 (1.5-4.2)	5.3 (1.5-6.6)	5.3 (1.5-6.6)
Nominal Heating capacity (min - max)		kW	4.0 (1.5-4.6)	5.2 (1.5-5.5)	6.8 (1.5-7.2)	6.8 (1.5-7.2)
Nominal cooling power input (min - max)		kW	0.73 (0.25-1.05)	0.95 (0.25-1.15)	1.26 (0.35-1.66)	1.29 (0.46-1.68)
Nominal heating power input (min - max)		kW	0.90 (0.25-1.50)	1.18 (0.25-1.50)	1.61 (0.35-2.01)	1.61 (0.43-2.01)
EER / COP			4.50/4.40	4.20/4.40	4.20/4.20	4.10/4.20
SEER / SCOP			8.50/4.60	8.50/4.60	8.50/4.60	8.50/4.60
Energy class (SEER/SCOP)			A+++/A++	A+++/A++	A+++/A++	A+++/A++
Noise level cooling (sound pressure)		dB(A)	48	49	50	50
Noise level heating (sound pressure)		dB(A)	50	51	51	51
Noise level (sound power)		dB(A)	50/60	50/60	56/61	56/61
Air flow (Cooling / Heating)		m ³ /h	1620/1620	1620/1620	2160/2160	2160/2160
Dimensions (H x W x D)		mm	570x750x280	570x750x280	750x850x298	800x850x298
Weight		kg	38	41	53	54
Colour			Beige (5Y7/2)	Beige (5Y7/2)	Beige (5Y7/2)	Beige (5Y7/2)
Power supply			220-240V/1ph/ 50/60Hz	220-240V/1ph/ 50/60Hz	220-240V/1ph/ 50/60Hz	220-240V/1ph/ 50/60Hz
Recommended fuse size		A	16	16	16	20
Starting current (C/H)		A	6	6	8	8
Running current (C/H)		A	3.35-3.07 / 4.13- 3.79	4.36-3.99 / 5.42- 4.97	5.79-5.31/7.39- 6.78	5.92-5.43/7.39- 6.78
Cable section (Power)		mm ²	2.50 x 2 + EARTH	2.50 x 2 + EARTH	2.50 x 2 + EARTH	2.50 x 2 + EARTH
Cable section (Interconnection)		mm ²	1.50 x 3 + EARTH	1.50 x 3 + EARTH	1.50 x 3 + EARTH	1.50 x 3 + EARTH
Piping diameter (Liq / Gas)		Inch	1/4" x 2 / 3/8" x 2	1/4" x 2 / 3/8" x 2	1/4" x 2 / 3/8" x 2	1/4" x 3 / 3/8" x 3
Minimum piping length		m	3	3	3	3
Maximum piping length / height difference		m	35 / 10	35 / 10	35 / 20	60 / 20
Current quantity of refrigerant		kg / TeqCO ₂	1.02 / 0.689	1.02 / 0.689	1.80 / 1.215	2.05 / 1.384
Chargeless / Additional refrigerant charge		m / g/m	35/-	35/-	35/-	35/20
Working range (cooling / heating)		°C	-10 ~ 46 / -15 ~ 24	-10 ~ 46 / -15 ~ 24	-10 ~ 46 / -15 ~ 24	-10 ~ 46 / -15 ~ 24
Refrigerant / GWP			R32 / 675	R32 / 675	R32 / 675	R32 / 675
Condenser Fan			Propeller Fan			
Compressor	Type		Rotary	Rotary	2 Cylinder Rotary	2 Cylinder Rotary
	Oil Type					
	Oil Charge	ml	330ml±5	330ml±5	580ml±5	840ml±5
	Coil Resistance	Ω	2.089Ω ±7% at 75°C	2.149Ω ±7% at 75°C	1.579Ω ±7% at 75°C	U-V 1.265Ω ±7% at 75°C V-W 1.248Ω ±7% at 75°C W-U 1.282Ω ±7% at 75°C
	Quantity		1	1	1	1

NOTE:

1. The Sound Pressure Level is based on the following conditions:

- Half height of the unit
- 1 meter from Discharge grille

The above data was measured in an anechoic chamber. Please take into consideration reflected sound of your specific site

1.2.2. RAM-68NP3E / 70NP4E / 90NP5E

OUTDOOR		UNIT	RAM-68NP3E	RAM-70NP4E	RAM-90NP5E
Minimum / Maximum indoor units connectable			2 / 3	2 / 4	2 / 5
Minimum / Maximum connected capacity			3.0kW / 11.0kW	3.0kW / 11.0kW	3.0kW / 15.5kW
Nominal Cooling capacity (min - max)		kW	6.8 (2.40-8.00)	7.0 (2.4-8.8)	8.5 (1.52-9.5)
Nominal Heating capacity (min - max)		kW	8.5 (2.4-9.5)	8.5 (2.6-9.5)	10.0 (1.5-11.5)
Nominal cooling power input (min - max)		kW	1.83 (0.46-2.96)	1.89 (0.46-3.20)	2.50 (0.50-3.85)
Nominal heating power input (min - max)		kW	2.12 (0.43-2.60)	2.02 (0.48-3.12)	2.56 (0.50-3.85)
EER / COP			3.70/4.0	3.70/4.20	3.40/3.90
SEER / SCOP			8.10/4.60	8.10/4.60	7.90/4.30
Energy class (SEER/SCOP)			A++/A++	A++/A++	A++/A+
Noise level cooling (sound pressure)		dB(A)	50	50	53
Noise level heating (sound pressure)		dB(A)	53	53	56
Noise level (sound power)		dB(A)	56/63	60/63	60/66
Air flow (Cooling / Heating)		m ³ /h	2700/2700	2700/2700	3900/3900
Dimensions (H x W x D)		mm	800x850x298	800x850x298	800x950x370
Weight		kg	58	58	71
Colour			Beige (5Y7/2)	Beige (5Y7/2)	Beige (5Y7/2)
Power supply			220-240V/1ph/ 50/60Hz	220-240V/1ph/ 50/60Hz	220-240V/1ph/ 50/60Hz
Recommended fuse size		A	20	20	25
Starting current (C/H)		A	8	8	8
Running current (C/H)		A	8.40-7.70/9.73-8.92	8.68-7.95/9.27-8.50	11.48-10.52/11.75-10.77
Cable section (Power)		mm ²	2.50 x 2 + EARTH	2.50 x 2 + EARTH	2.50 x 2 + EARTH
Cable section (Interconnection)		mm ²	1.50 x 3 + EARTH	1.50 x 3 + EARTH	1.50 x 3 + EARTH
Piping diameter (Liq / Gas)		Inch	1/4" x 3 / 3/8" x 3	1/4" x 4 / (3/8" x 3) + (1/2" x 1)	1/4" x 5 / (3/8" x 3) + (1/2" x 2)
Minimum piping length		m	3	3	3
Maximum piping length / height difference		m	60 / 20	60 / 20	75 / 20
Current quantity of refrigerant / Chargeless		kg / T _{eq} CO ₂	2.05 / 1.384	2.05 / 1.384	2.40 / 1.620
Chargeless / Additional refrigerant charge		m / g/m	30/20	30/20	35/15
Working range (cooling / heating)		°C	-10 ~ 46 / -15 ~ 24	-10 ~ 46 / -15 ~ 24	-10 ~ 46 / -15 ~ 24
Refrigerant / GWP			R32 / 675	R32 / 675	R32 / 675
Condenser Fan			Propeller Fan		
Compressor	Type		2 Cylinder Rotary	2 Cylinder Rotary	2 Cylinder Rotary
	Oil Type				
	Oil Charge	ml	840ml±5	840ml±5	1000ml±5
	Coil Resistance	Ω	U-V 1.265Ω ±7% at 75°C V-W 1.248Ω ±7% at 75°C W-U 1.282Ω ±7% at 75°C	U-V 1.265Ω ±7% at 75°C V-W 1.248Ω ±7% at 75°C W-U 1.282Ω ±7% at 75°C	0.448Ω at 75°C
	Quantity		1	1	1

NOTE:

1. The Sound Pressure Level is based on the following conditions:

- Half height of the unit
- 1 meter from Discharge grille

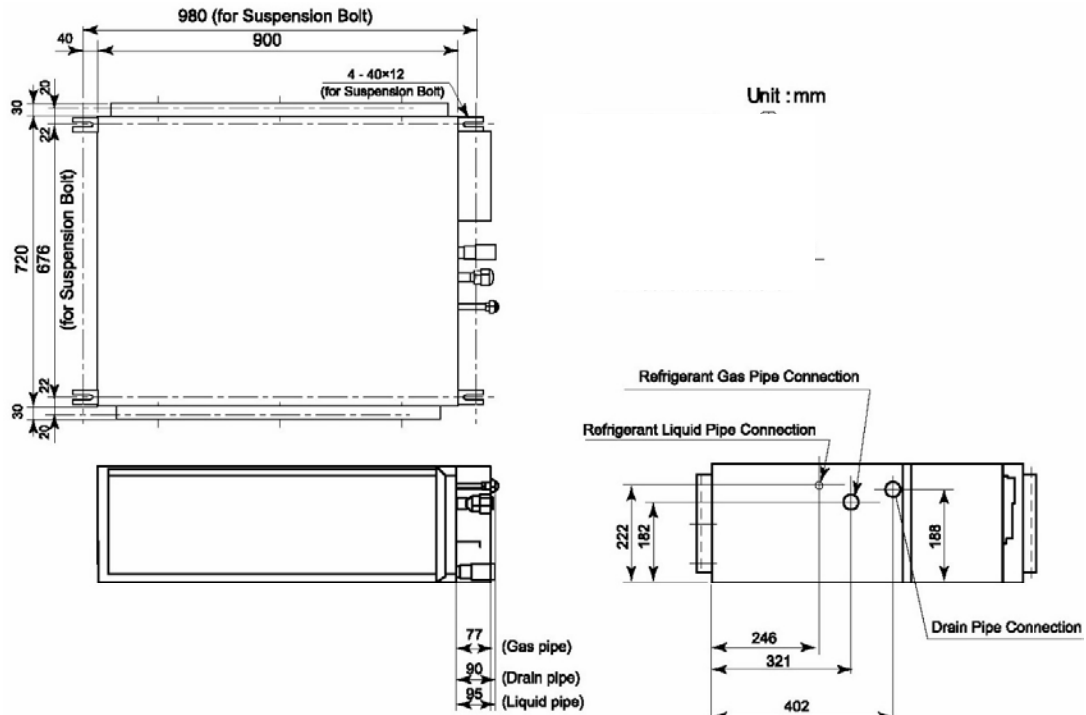
The above data was measured in an anechoic chamber. Please take into consideration reflected sound of your specific site

2 DIMENSIONAL DATA

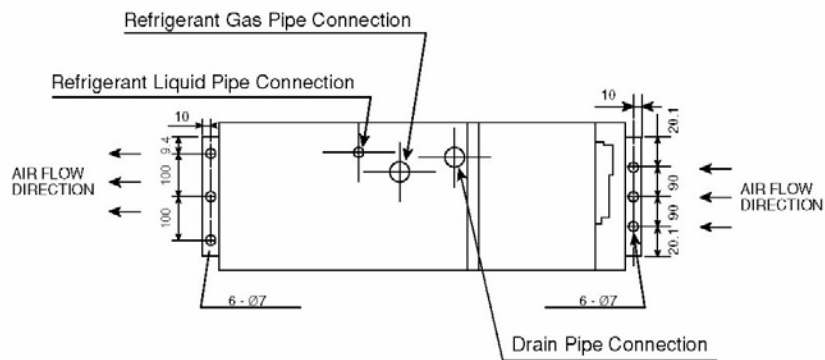
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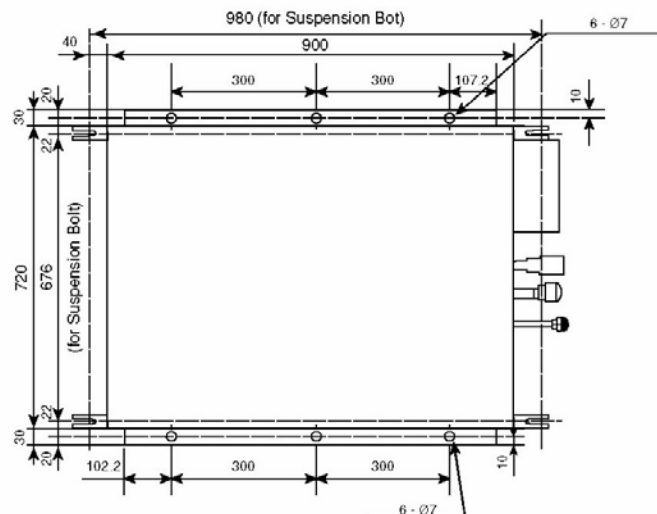
2.1.7. DUCT TYPE: RAD-50RPE / 60RPE



SIDE VIEW

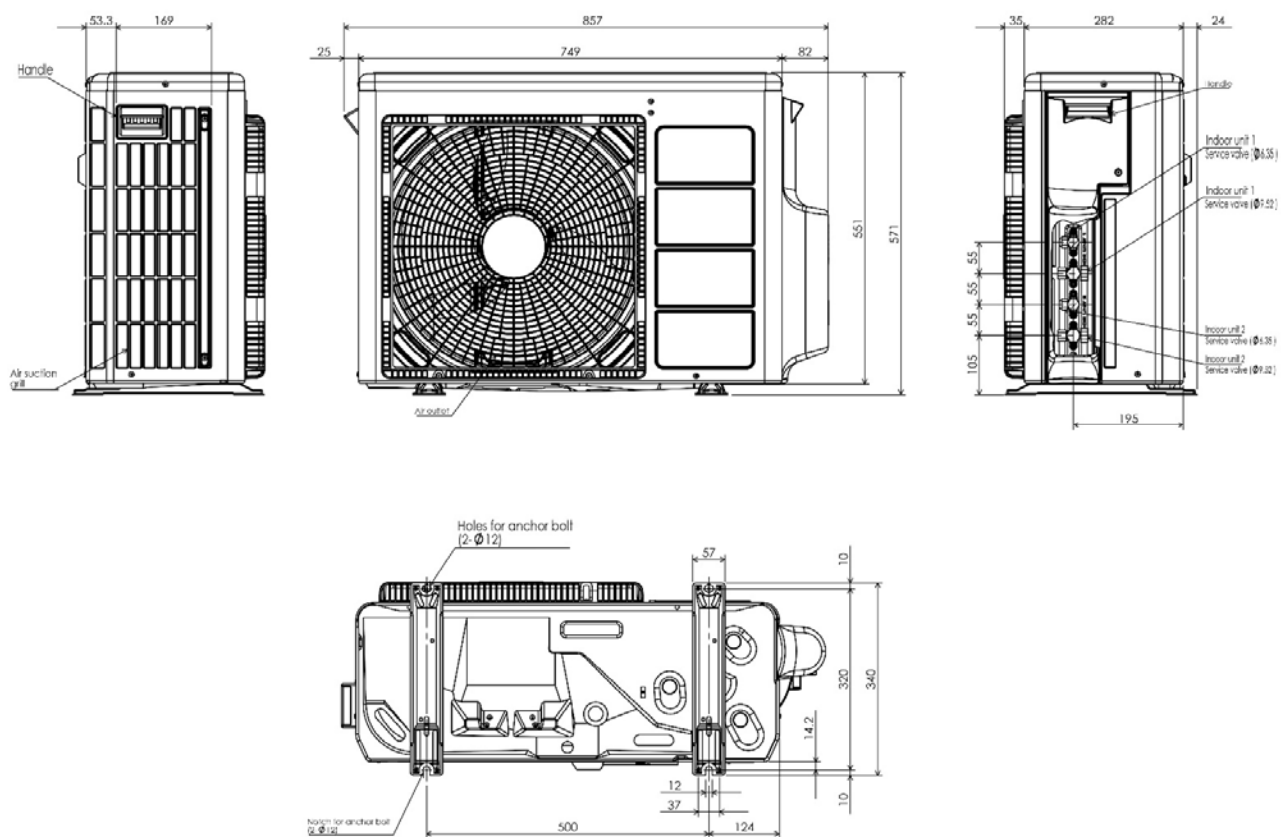


TOP VIEW



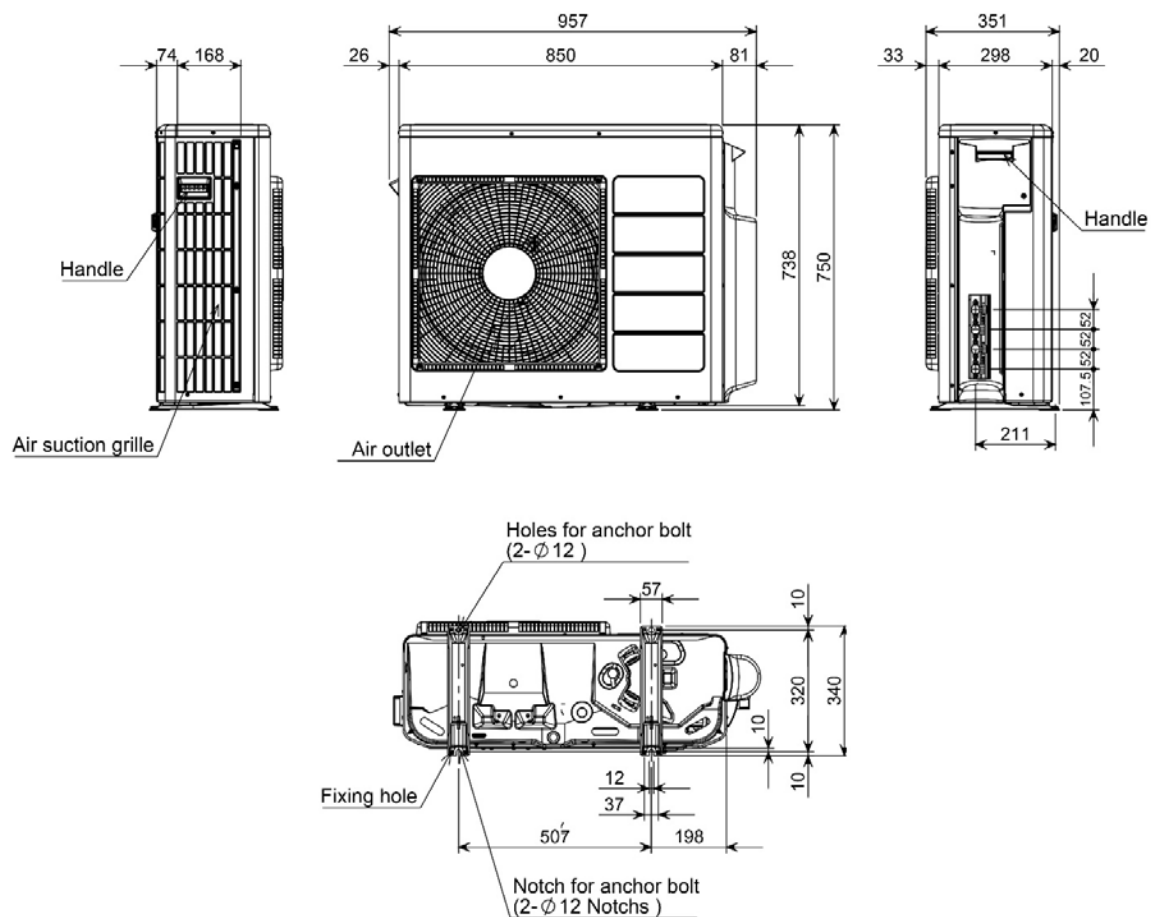
2.2. MULTIZONE OUTDOOR UNITS

2.2.1. 2 ROOMS MULTIZONE: RAM-33NP2E / RAM-40NP2E



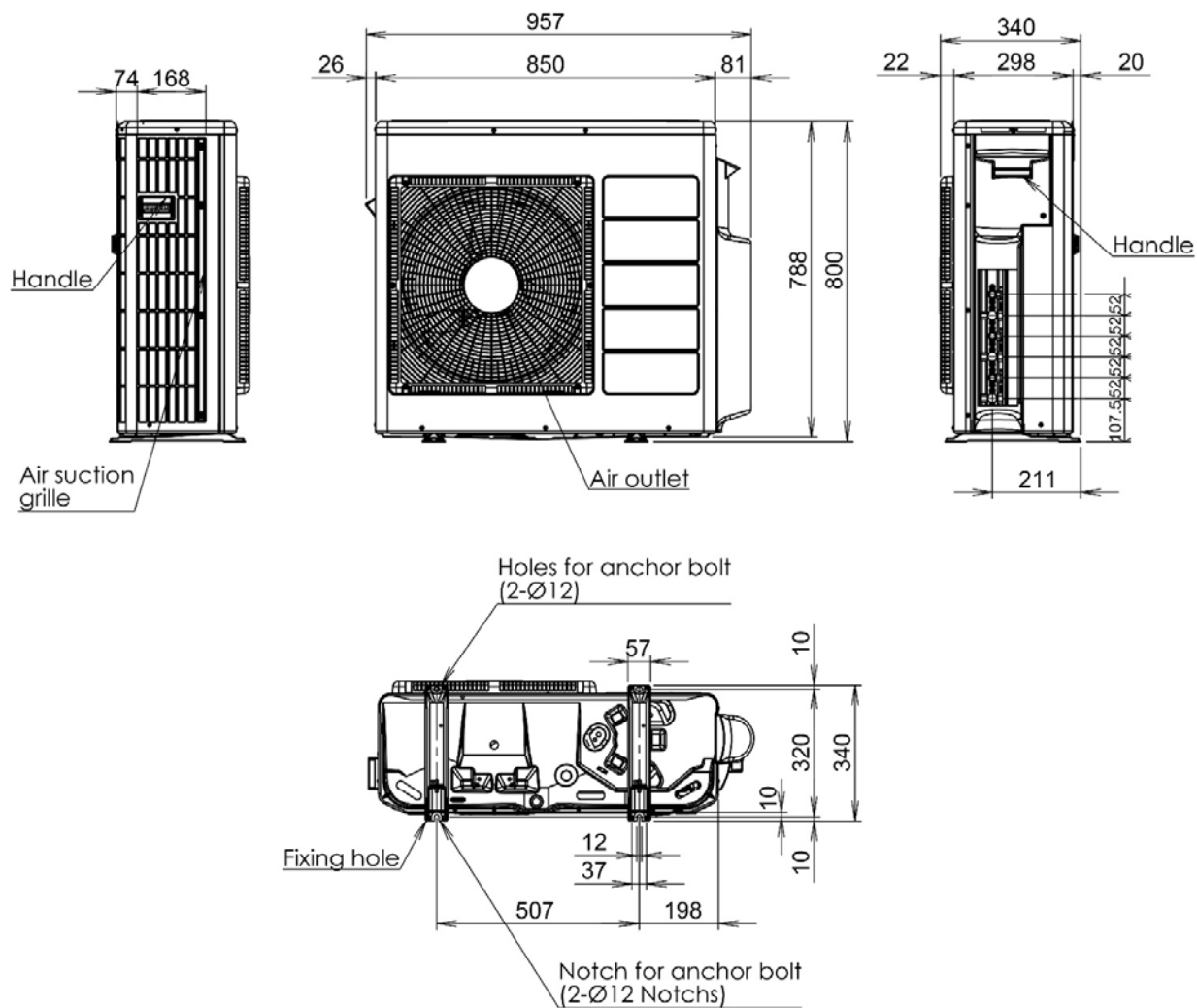
2.2.2. 2 ROOMS MULTIZONE: RAM-53NP2E

Unit: mm



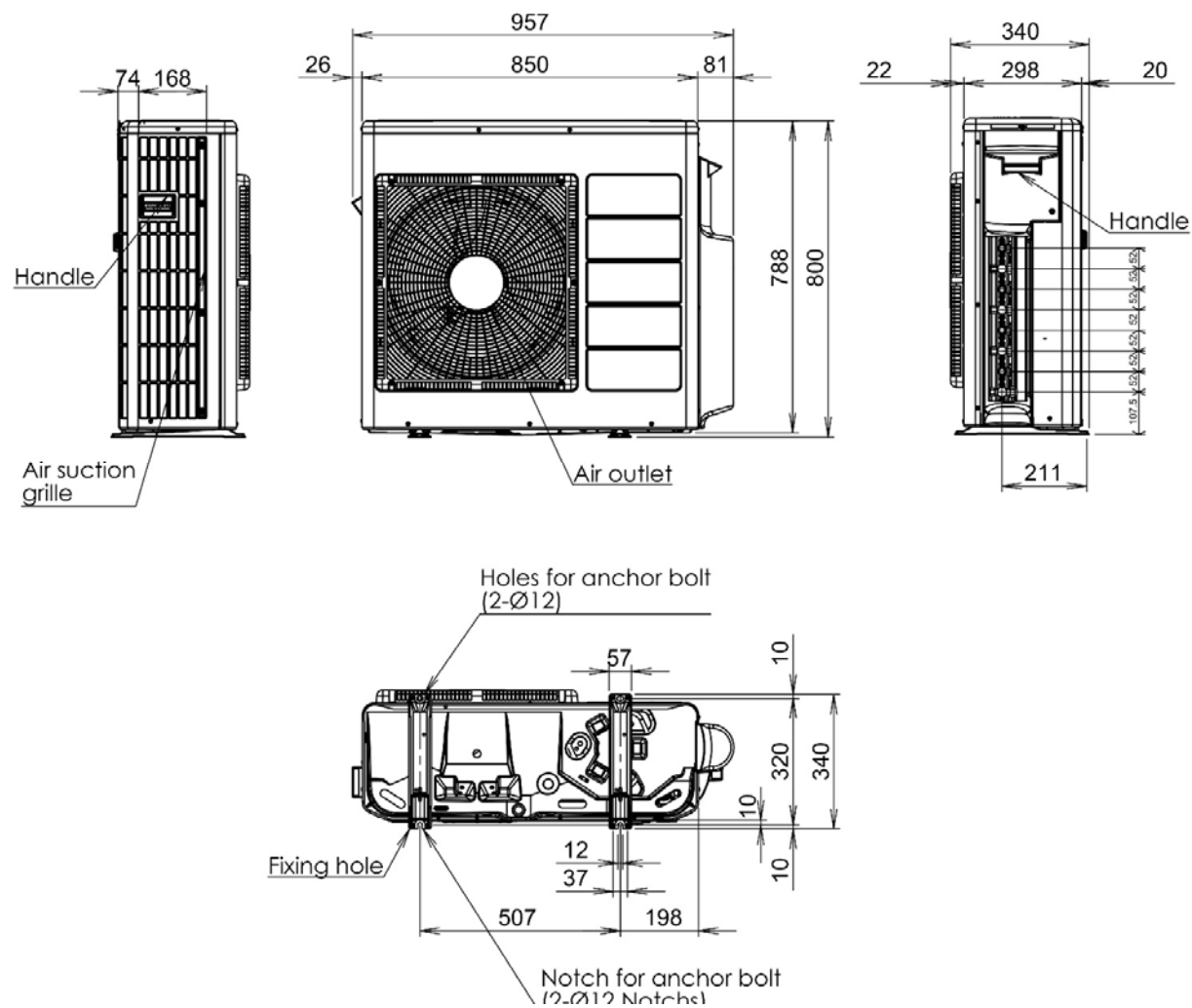
2.2.3. 3 ROOMS MULTIZONE: RAM-53NP3E / RAM-63NP3E

Unit: mm

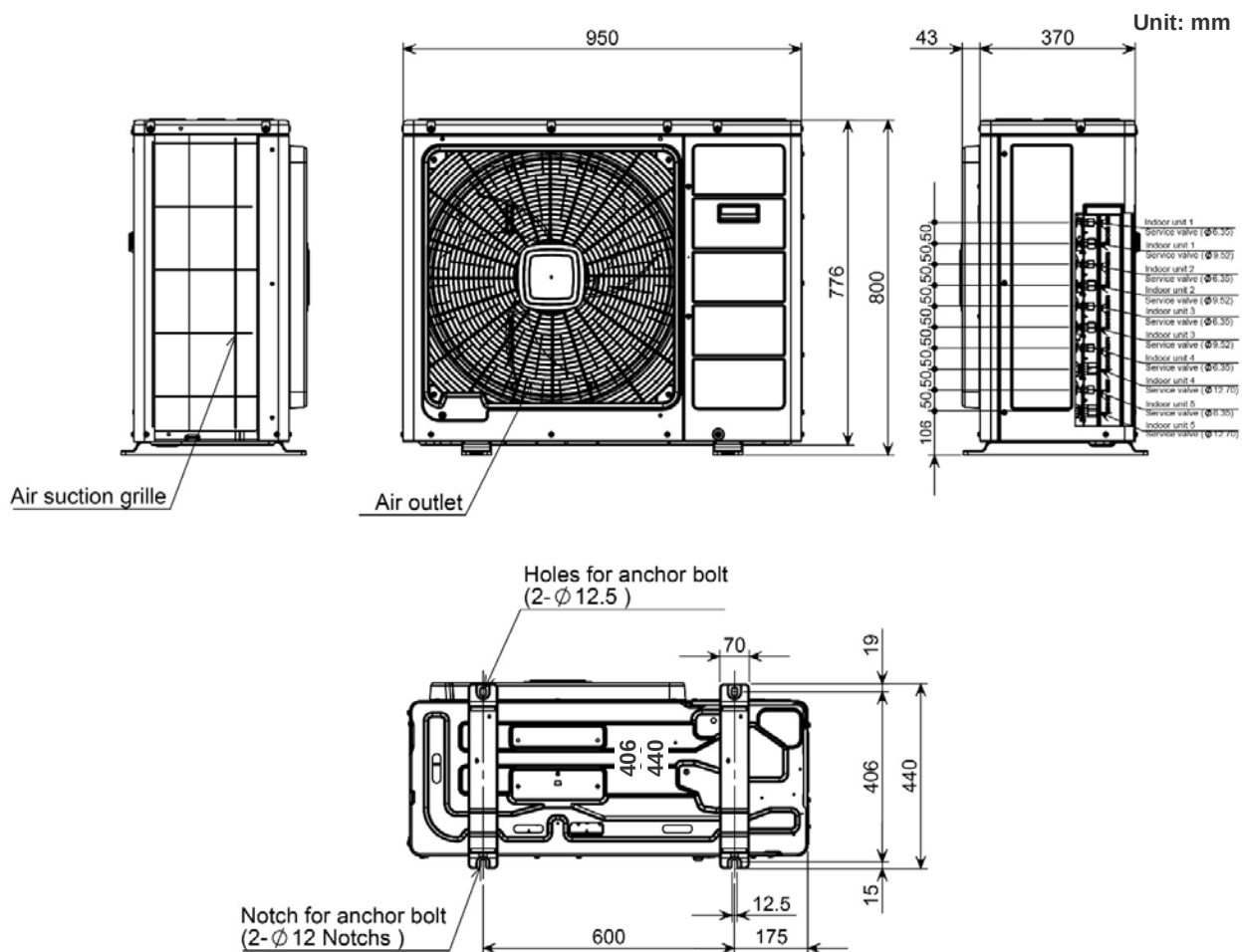


2.2.4. 4 ROOMS MULTIZONE: RAM-70NP4E

Unit: mm



2.2.5. 5 ROOMS MULTIZONE: RAM-90NP5E



3 CAPACITIES AND SELECTION DATA

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3.1. SYSTEM SELECTION PROCEDURE

The following system procedure is giving a sample regarding unit selection system, indicating how to use all parameters showed in this chapter.

3.1.1. SELECTION UNIT FEATURES

Considering the building distribution, the possible indoor unit position and the available air flow distribution, select the unit features that are giving the best efficiency and comfort to each room.

Decide the Outdoor Unit position getting easy service maintenance and easy refrigerant pipe installation.

Therefore, the maximum indoor unit capacity combined with outdoor unit should be carefully considered for correct indoor unit distribution at each building

3.1.2. SELECTION GUIDE

The following guide giving the method for indoor and outdoor unit selection.

* Step 1: Determine the system requirements

Calculate the cooling capacity and heating capacity of each indoor unit according to the following conditions:

Total Load for each room

		Room			
Item		1	2	3	1+2+3
Estimated Cooling Load	kW	2.75	4.24	5.35	12.34
Estimated Heating Load	kW	2.90	4.60	6.00	13.50

*Example

Temperature Condition

Cooling	Heating
Outdoor Air Inlet • Dry Bulb: 35.0°C	Outdoor Air Inlet • Dry Bulb: 7°C • Wet Bulb: 0°C
Indoor Air Inlet • Dry Bulb: 27.0°C • Wet Bulb: 19.0°C	Indoor Air Inlet • Dry Bulb: 20°C

*Example

* Step 2: Select Unit Capacity Performance

The unit kW is selected following the Cooling capacity and Heating capacity showed in the combination table.

* Step 3: Read Selected Capacity Performance

The unit performance should be calculated considering the following correction factors:

1. Cooling and Heating piping length
2. Outdoor unit performance capacity
3. Indoor unit performance capacity for each room cooling load

Kindly refer to the unit selection combination table for correct capacity performance.

3.1.3. MULTIZONE COMBINATION SELECTION

Type							Dual	Dual	Dual	Triple	Triple	Quad	Pentad
Model Name							RAM-33NP2E	RAM-40NP2E	RAM-53NP2E	RAM-53NP3E	RAM-68NP3E	RAM-70NP4E	RAM-90NP5E
Product Image													
Combination						Total							
ONE UNIT	1.5					1.5							
	1.8					1.8							
	2.5					2.5							
	4.2					4.2							
	3.5					3.5							
	5.0					5.0							
	6.0					6.0							
TWO UNITS	1.5	1.5				3.0	★	★	★	★	★	★	★
	1.5	1.8				3.3	★	★	★	★	★	★	★
	1.5	2.5				4.0	★	★	★	★	★	★	★
	1.5	3.5				5.0	★	★	★	★	★	★	★
	1.5	4.2				5.7		★	★	★	★	★	★
	1.5	5.0				6.5			★	★	★	★	★
	1.5	6.0				7.5			★	★	★	★	★
	1.8	1.8				3.6	★	★	★	★	★	★	★
	1.8	2.5				4.3	★	★	★	★	★	★	★
	1.8	3.5				5.3		★	★	★	★	★	★
	1.8	4.2				6.0		★	★	★	★	★	★
	1.8	5.0				6.8			★	★	★	★	★
	1.8	6.0				7.8			★	★	★	★	★
	2.5	2.5				5.0		★	★	★	★	★	★
	2.5	3.5				6.0		★	★	★	★	★	★
	2.5	4.2				6.7			★	★	★	★	★
	2.5	5.0				7.5			★	★	★	★	★
	2.5	6.0				8.5			★	★	★	★	★
	3.5	3.5				7.0			★	★	★	★	★
	3.5	4.2				7.7			★	★	★	★	★
	3.5	5.0				8.5			★	★	★	★	★
	3.5	6.0				9.5					★	★	★
	4.2	4.2				8.4			★	★	★	★	★
	4.2	5.0				9.2					★	★	★
	4.2	6.0				10.2					★	★	★
	5.0	5.0				10.0					★	★	★
	5.0	6.0				11.0					★	★	★
	6.0	6.0				12.0							★

Type							Triple	Triple	Quad	Pentad
Model Name							RAM-53NP3E	RAM-68NP3E	RAM-70NP4E	RAM-90NP5E
Product Image										
Combination						Total				
THREE UNITS	1.5	1.5	1.5			4.5	★	★	★	★
	1.5	1.5	1.8			4.8	★	★	★	★
	1.5	1.5	2.5			5.5	★	★	★	★
	1.5	1.5	3.5			6.5	★	★	★	★
	1.5	1.5	4.2			7.2	★	★	★	★
	1.5	1.5	5.0			8.0	★	★	★	★
	1.5	1.5	6.0			9.0		★	★	★
	1.5	1.8	1.8			5.1	★	★	★	★
	1.5	1.8	2.5			5.8	★	★	★	★
	1.5	1.8	3.5			6.8	★	★	★	★
	1.5	1.8	4.2			7.5	★	★	★	★
	1.5	1.8	5.0			8.3	★	★	★	★
	1.5	1.8	6.0			9.3		★	★	★
	1.5	2.5	2.5			6.5	★	★	★	★
	1.5	2.5	3.5			7.5	★	★	★	★
	1.5	2.5	4.2			8.2	★	★	★	★
	1.5	2.5	5.0			9.0		★	★	★
	1.5	2.5	6.0			10.0		★	★	★
	1.5	3.5	3.5			8.5	★	★	★	★
	1.5	3.5	4.2			9.2		★	★	★
	1.5	3.5	5.0			10.0		★	★	★
	1.5	3.5	6.0			11.0		★	★	★
	1.5	4.2	4.2			9.9		★	★	★
	1.5	4.2	5.0			10.7			★	★
	1.5	4.2	6.0			11.7				★
	1.5	5.0	5.0			11.5				★
	1.5	5.0	6.0			12.5				★
	1.5	6.0	6.0			13.5				★
	1.8	1.8	1.8			5.4	★	★	★	★
	1.8	1.8	2.5			6.1	★	★	★	★
	1.8	1.8	3.5			7.1	★	★	★	★
	1.8	1.8	4.2			7.8	★	★	★	★
	1.8	1.8	5.0			8.6	★	★	★	★
	1.8	1.8	6.0			9.6		★	★	★
	1.8	2.5	2.5			6.8	★	★	★	★
	1.8	2.5	3.5			7.8	★	★	★	★
	1.8	2.5	4.2			8.5	★	★	★	★
	1.8	2.5	5.0			9.3		★	★	★
	1.8	2.5	6.0			10.3		★	★	★
	1.8	3.5	3.5			8.8	★	★	★	★
	1.8	3.5	4.2			9.5		★	★	★
	1.8	3.5	5.0			10.3			★	★
	1.8	3.5	6.0			11.3				★

6.1. INDOOR UNIT

Model	Unit Main Power		Applicable Current		Indoor Fan Motor	
	VOL, PH, Hz	Fuse Rating (A)	STC	RNC	RNC	IPT
RAK-18QXE	230, 1, 50	3.15	-	-	0.67	30
RAK-25RXE	230, 1, 50	3.15	(C) 2.92 (H) 2.73	(C) 4.35 (H) 5.22	0.67	30
RAK-35RXE	230, 1, 50	3.15	(C) 3.86 (H) 3.67	(C) 6.09 (H) 6.96	0.67	30
RAK-50RXE	230, 1, 50	3.15	(C) 6.36 (H) 6.44	(C) 9.13 (H) 11.74	0.67	30
RAK-15QPE	230, 1, 50	3.15	-	-	0.67	30
RAK-18RPE	230, 1, 50	3.15	(C) 2.46 (H) 2.93	(C) 4.39 (H) 4.22	0.67	30
RAK-25RPE	230, 1, 50	3.15	(C) 3.08 (H) 3.87	(C) 5.61 (H) 6.52	0.67	30
RAK-35RPE	230, 1, 50	3.15	(C) 4.81 (H) 5.11	(C) 6.35 (H) 7.39	0.67	30
RAK-42RPE	230, 1, 50	3.15	(C) 5.10 (H) 5.99	(C) 7.39 (H) 8.70	0.67	30
RAK-50RPE	230, 1, 50	3.15	(C) 6.69 (H) 7.09	(C) 8.70 (H) 11.96	0.67	30
RAF-25RXE	230, 1, 50	3.15	(C) 2.87 (H) 3.50	(C) 5.13 (H) 4.87	0.75	38
RAF-35RXE	230, 1, 50	3.15	(C) 4.27 (H) 5.26	(C) 6.0 (H) 5.87	0.75	38
RAF-50RXE	230, 1, 50	3.15	(C) 6.33 (H) 7.19	(C) 9.13 (H) 11.74	0.75	38
RAI-25RPE	230, 1, 50	3.15	-	-	0.25	57
RAI-35RPE	230, 1, 50	3.15	-	-	0.25	57
RAI-50RPE	230, 1, 50	3.15	-	-	0.25	57
RAI-60RPE	230, 1, 50	3.15	-	-	0.25	57
RAD-18QPE	230, 1, 50	3.15	-	-	0.11	30
RAD-25RPE	230, 1, 50	3.15	-	-	0.11	30
RAD-35RPE	230, 1, 50	3.15	-	-	0.11	30
RAD-50RPE	230, 1, 50	3.15	-	-	0.75	180
RAD-60RPE	230, 1, 50	3.15	-	-	0.75	180

VOL: Rated Unit Power Supply Voltage (V)

Hz: Frequency (Hz)

STC: Starting Current (A)

RNC: Running Current (A)

PH: Phase (φ)

IPT: Input (W)

6.2. OUTDOOR UNIT

Model	Unit Main Power				Compressor Motor					
	VOL, PH, Hz	Fuse Rating (A)	Min (V)	Max (V)	Locked Rotor Ampere (A)	STC	Cooling Operation		Heating Operation	
							RNC	IPT	RNC	IPT
RAM-33NP2E	220 ~ 240, 1, 50/60	16	198	264	N/A	6	3.5	1320	N/A	N/A
RAM-40NP2E	220 ~ 240, 1, 50/60	16	198	264	N/A	6	7.3	1440	7.5	1810
RAM-53NP2E	220 ~ 240, 1, 50/60	16	198	264	N/A	8	7.4	1470	7.7	1850
RAM-53NP3E	220 ~ 240, 1, 50/60	20	198	264	N/A	8	7.4	1470	7.7	1850
RAM-68NP3E	220 ~ 240, 1, 50/60	20	198	264	N/A	8	7.4	1470	7.7	1850
RAM-70NP4E	220 ~ 240, 1, 50/60	20	198	264	N/A	8	7.4	1470	7.7	1850
RAM-90NP5E	220 ~ 240, 1, 50/60	25	198	264	N/A	8	10.3	2676	9.9	28.5

VOL: Rated Unit Power Supply Voltage (V)

HZ: Frequency (Hz)

STC: Starting Current (A)

RNC: Running Current (A)

PH: Phase (φ)

IPT: Input (W)

NOTE:

1. The above compressor data is based on 100% capacity combination of indoor units at the rated operating frequency
2. This data is based on the same conditions as the nominal heating and cooling capacities.
3. The compressor started by an inverter, resulting in extremely low starting current.

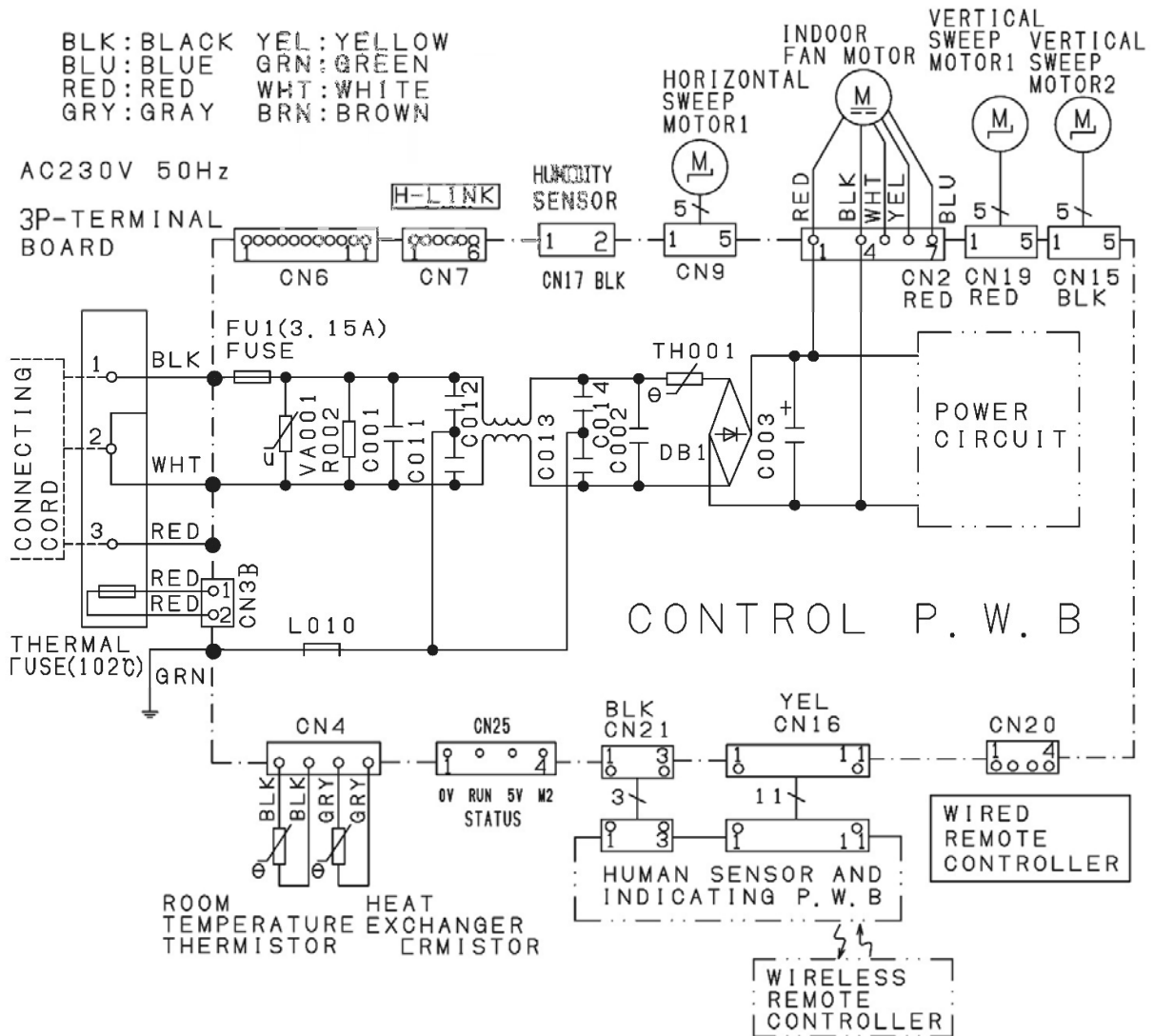
7 WIRING DIAGRAM

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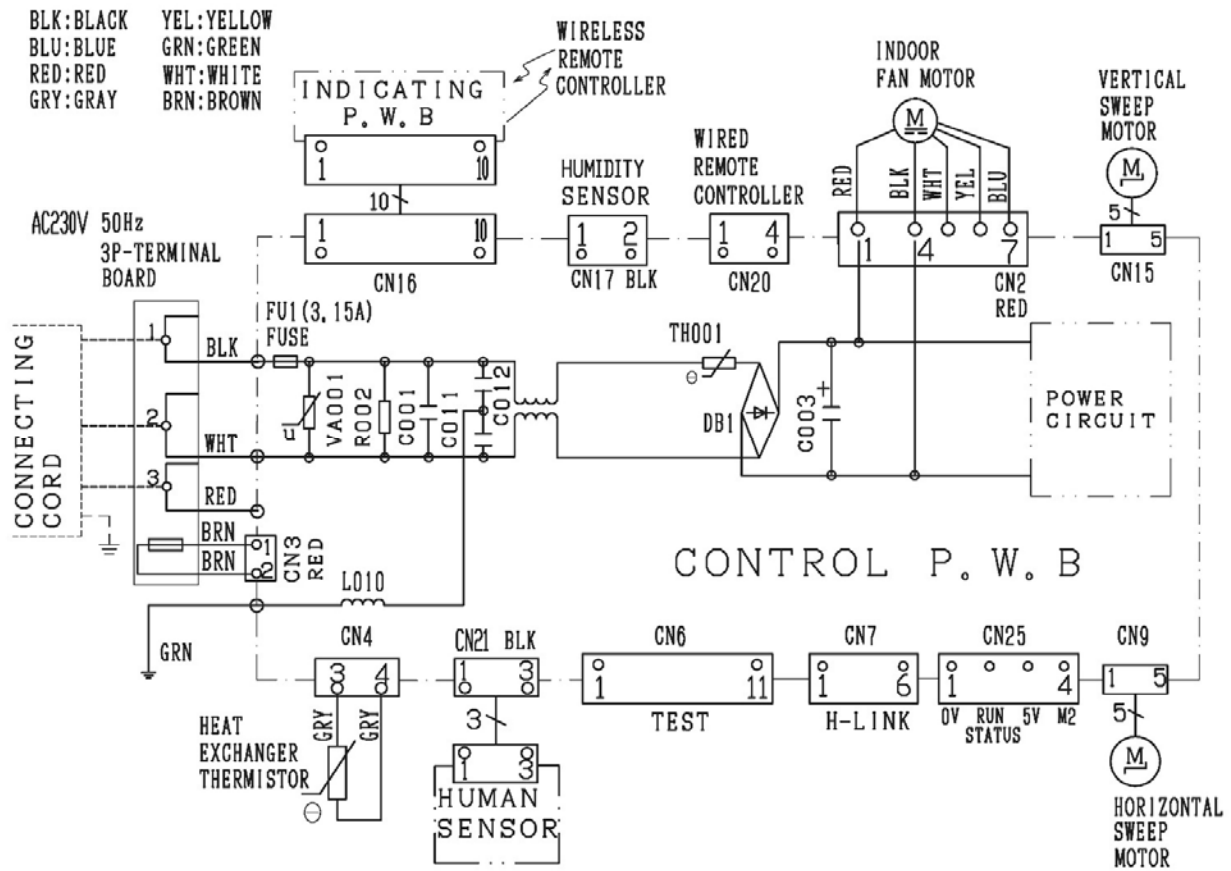
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7.1. MULTIZONE

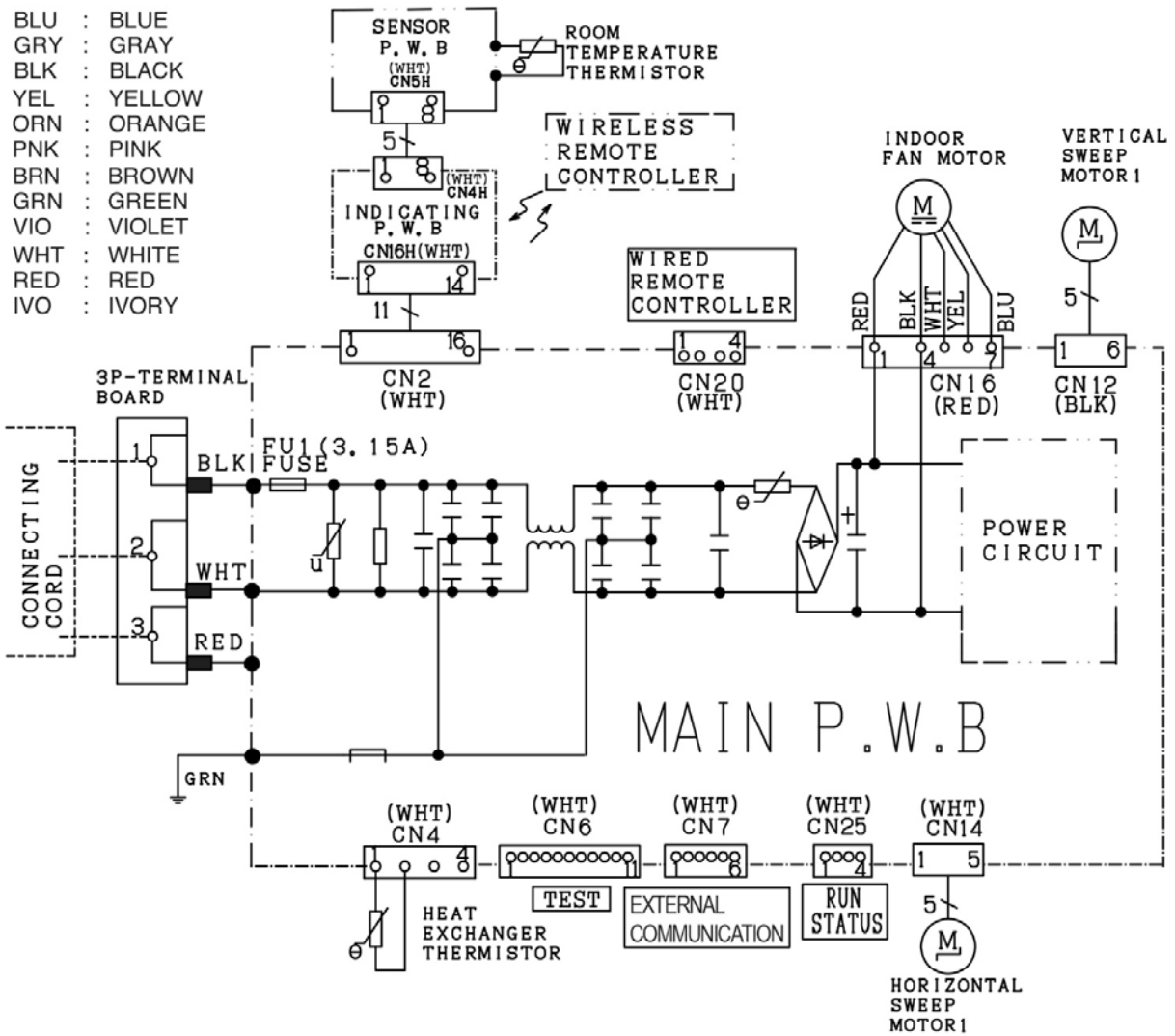
7.1.1. RAK-18QXE, RAK-25RXE, RAK-35RXE, RAK-50RXE



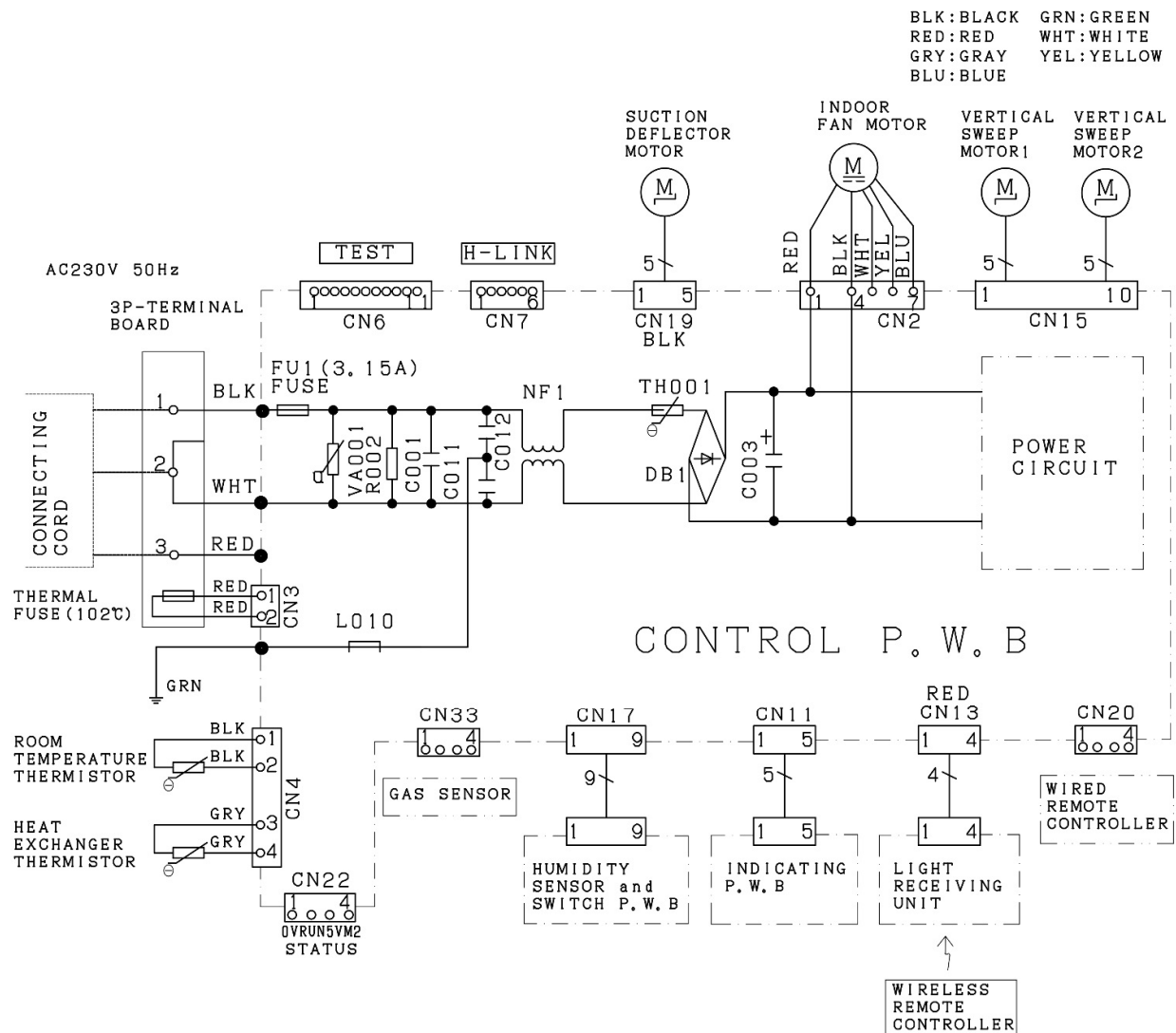
7.1.2. RAK-15QPE, RAK-18RPE, RAK-25RPE, RAK-35RPE, RAK-42RPE, RAK-50RPE



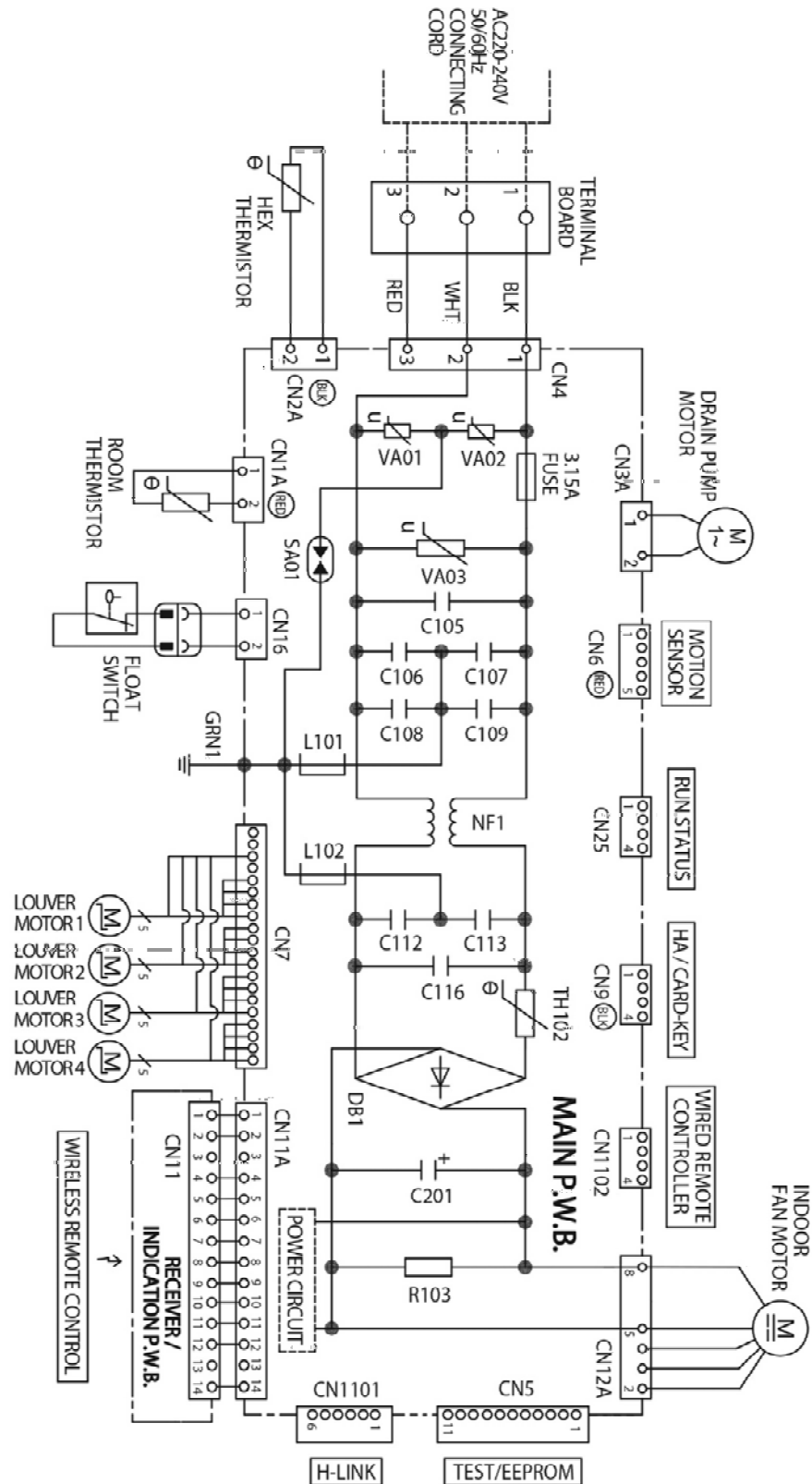
7.1.3. RAK-50RPE1, RAK-60RPE



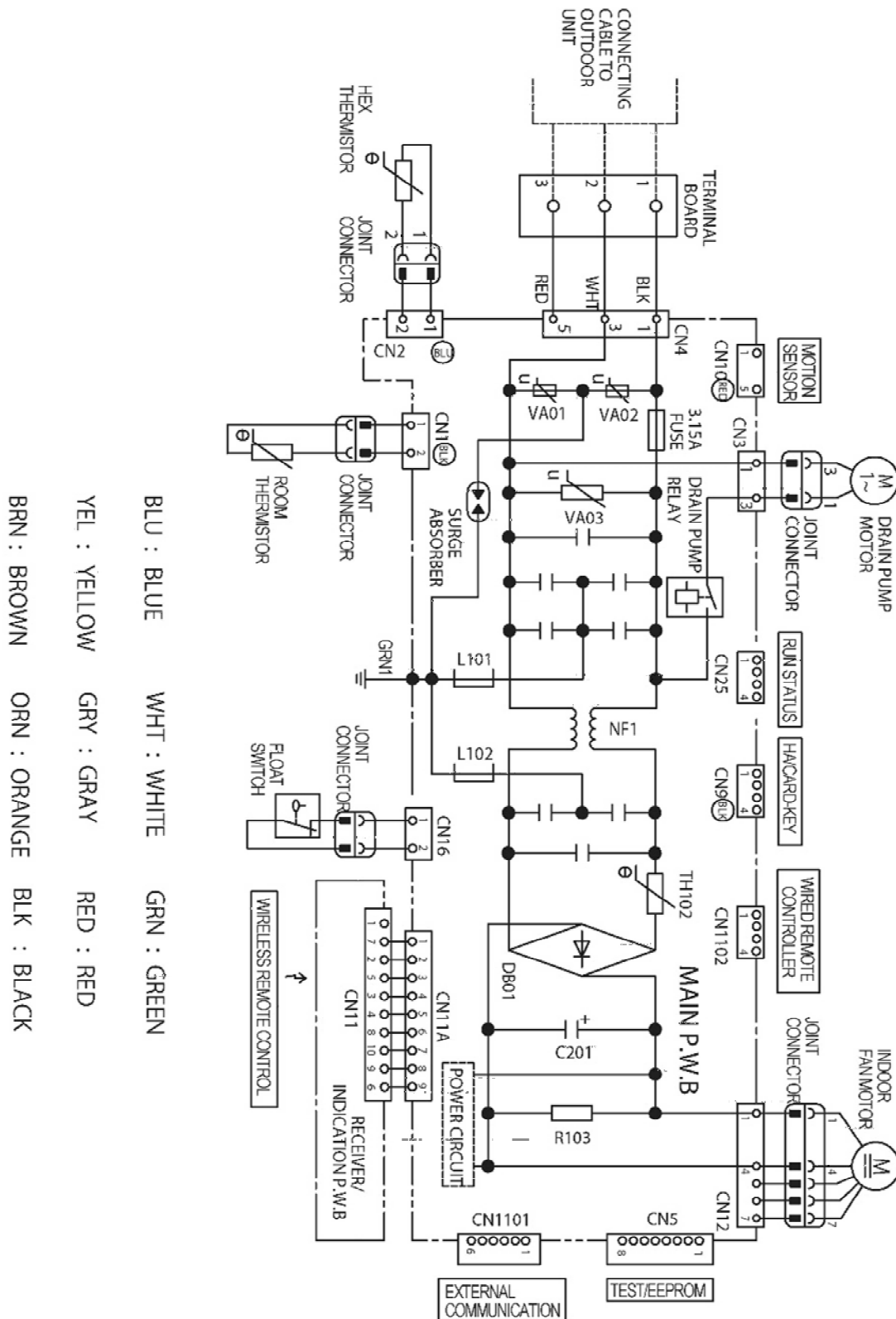
7.1.4. RAF-25RXE, RAF-35RXE, RAF-50RXE



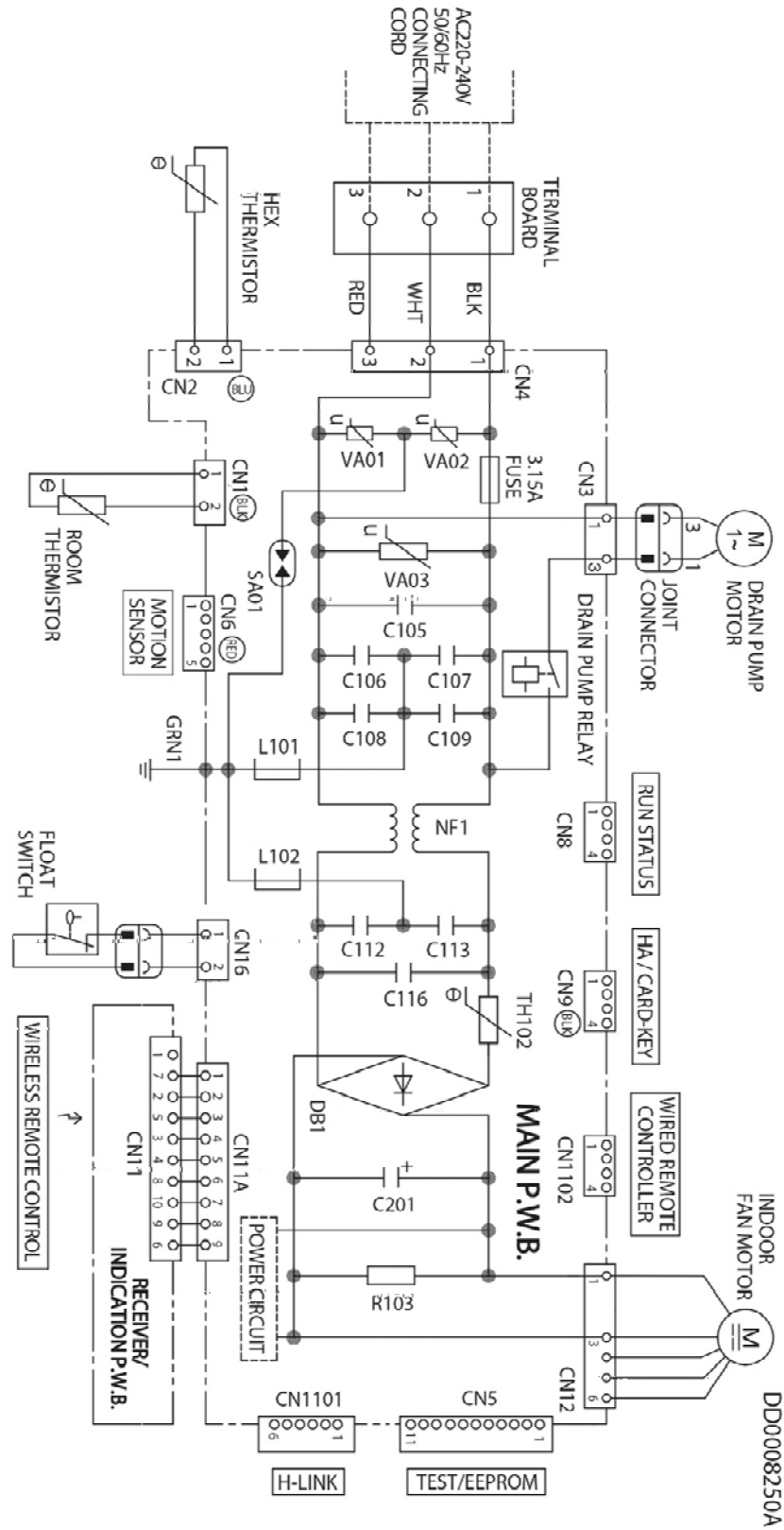
7.1.5. RAI-25RPE, RAI-35RPE, RAI-50RPE, RAI-60RPE



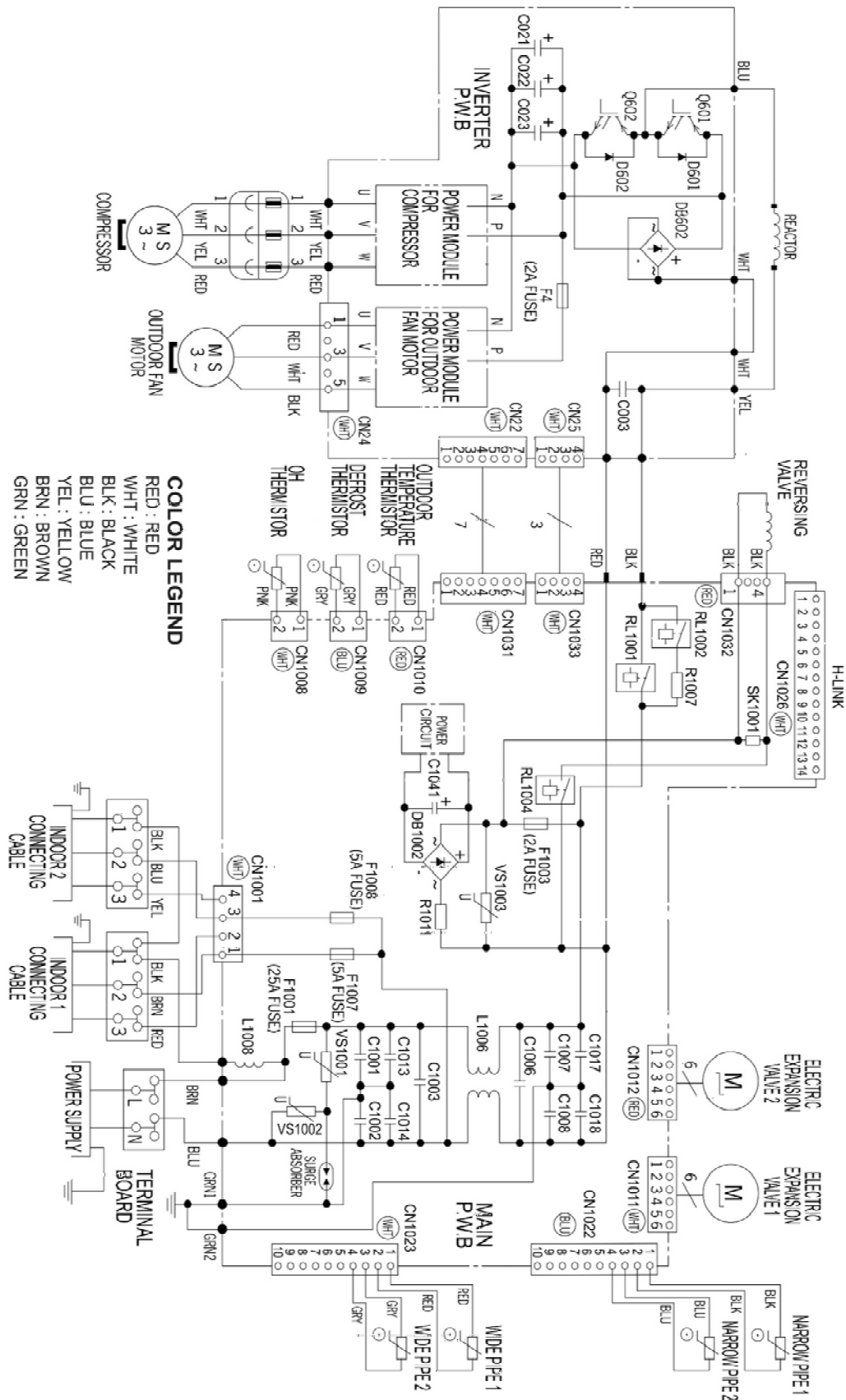
7.1.6. RAD-18QPE, RAD-25RPE, RAD-35RPE



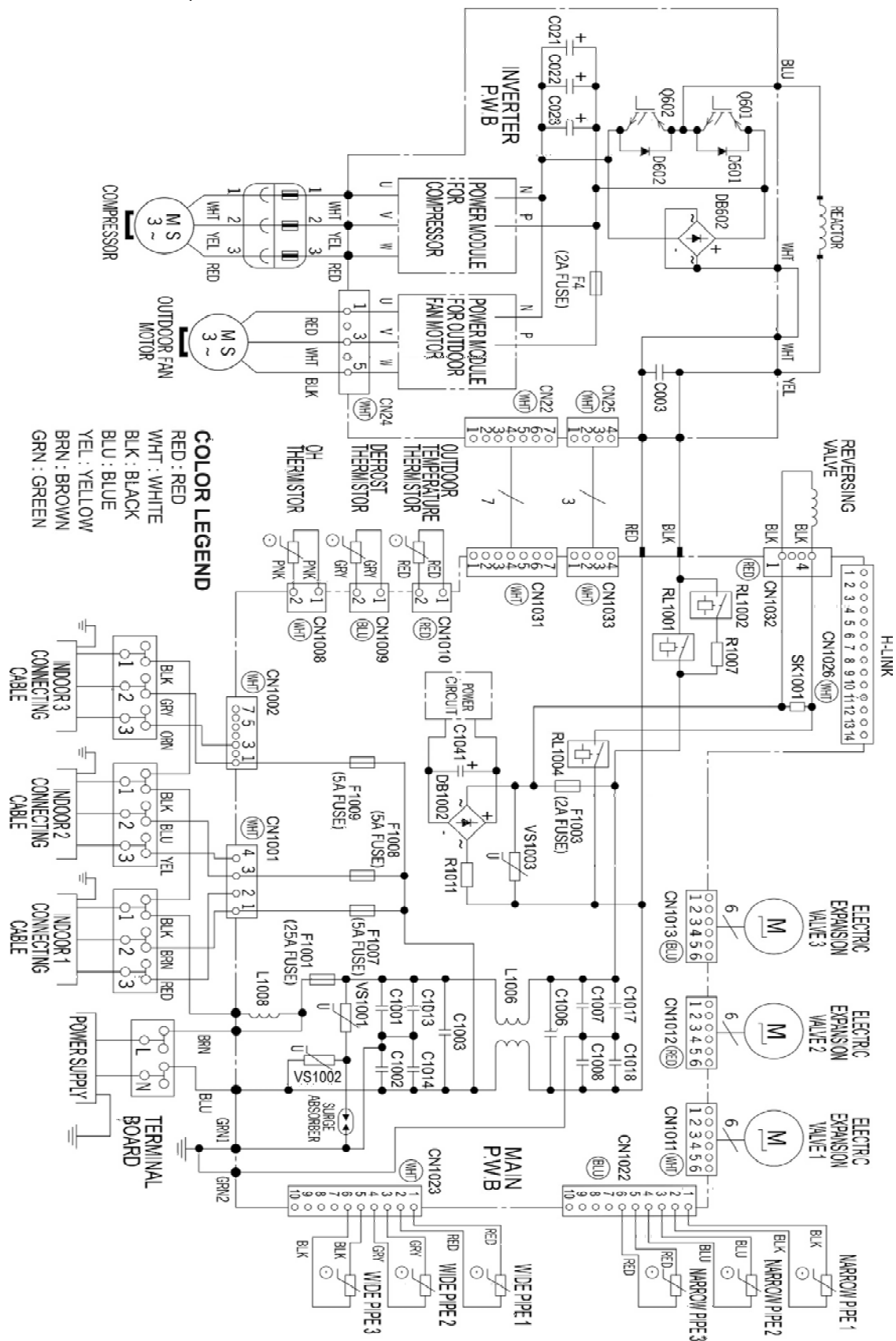
7.1.8. RAD-50RPE, RAD-60RPE



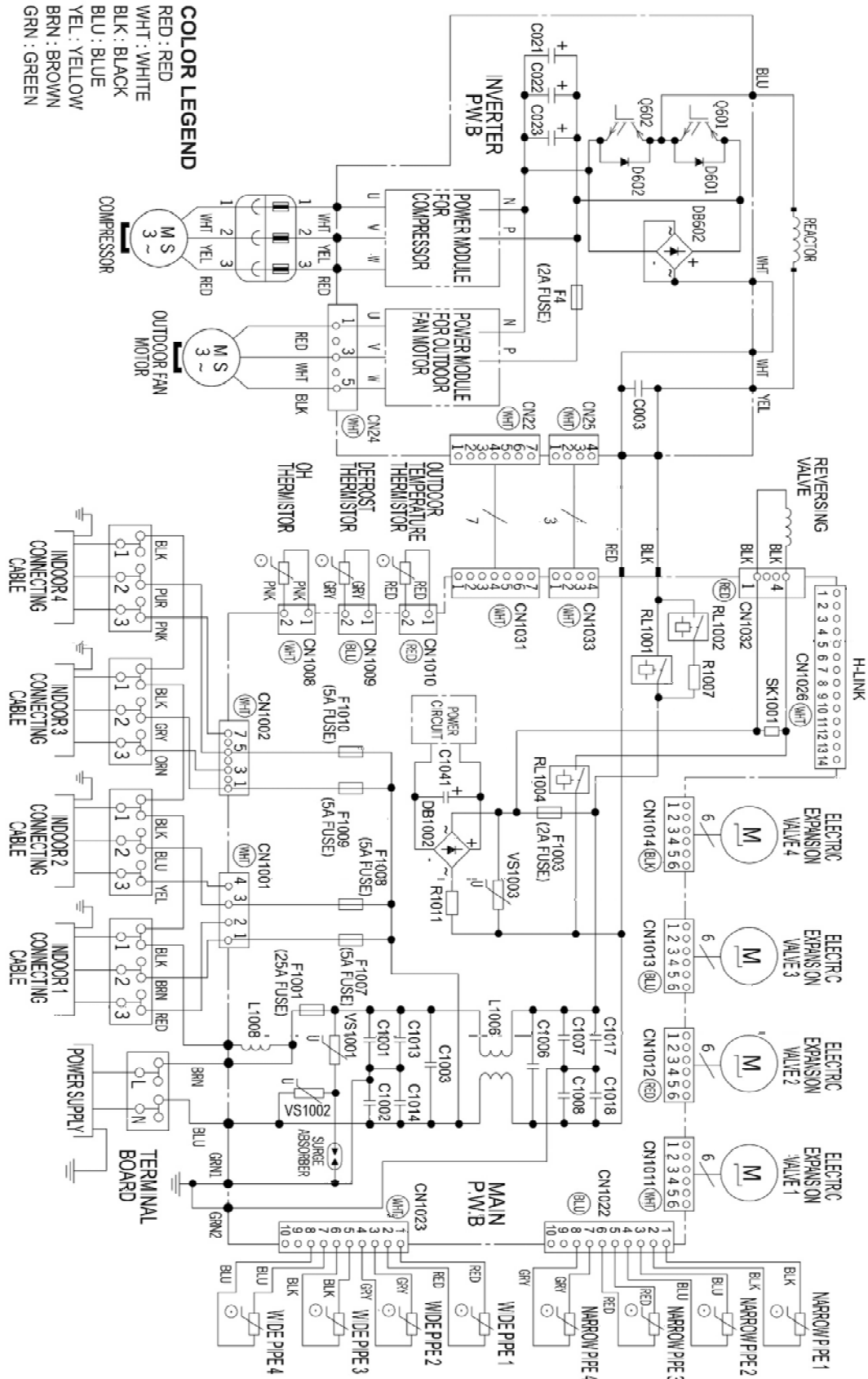
7.1.6. RAM-33NP2E, RAM-40NP2E, RAM-53NP2E



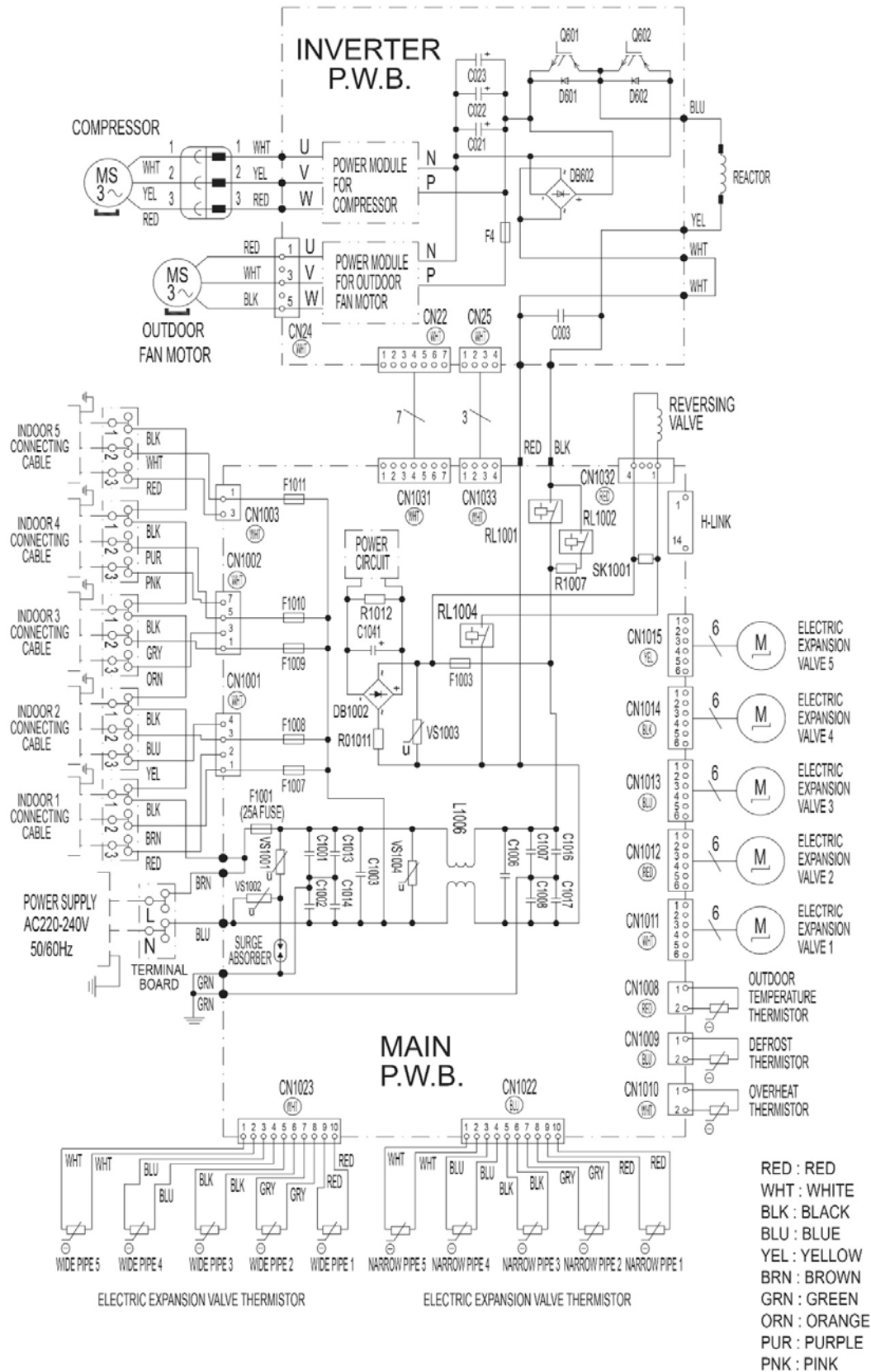
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7.1.8. RAM-70NP4E



7.1.10. RAM-90NP5E



8 REFRIGERANT CYCLE

CONTENT

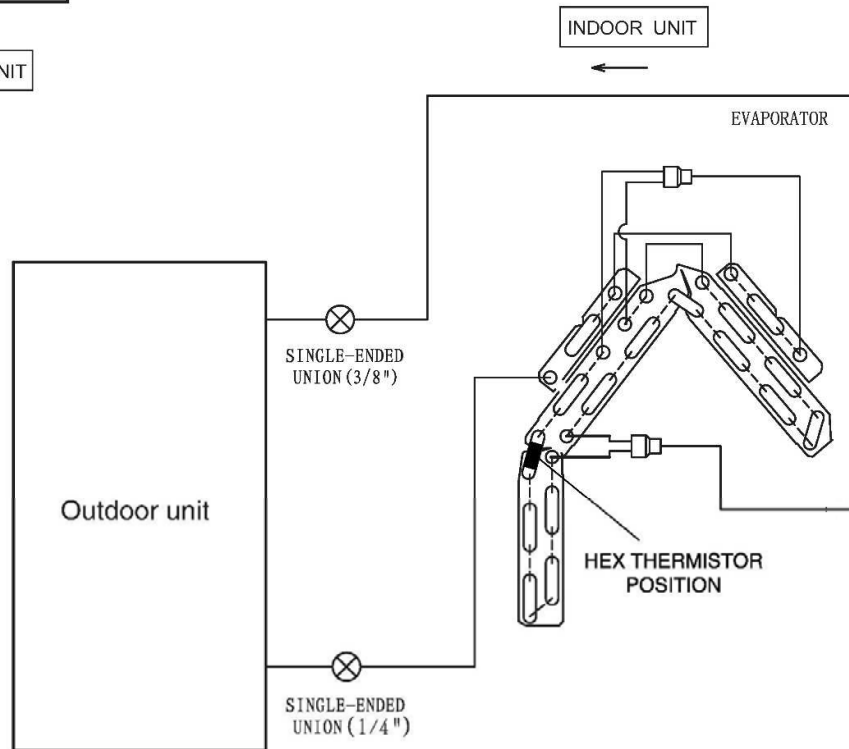
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8.1. MULTIZONE INDOOR UNITS

8.1.1. WALL TYPE: RAK-18QXE, RAK-25RXE, RAK-35RXE

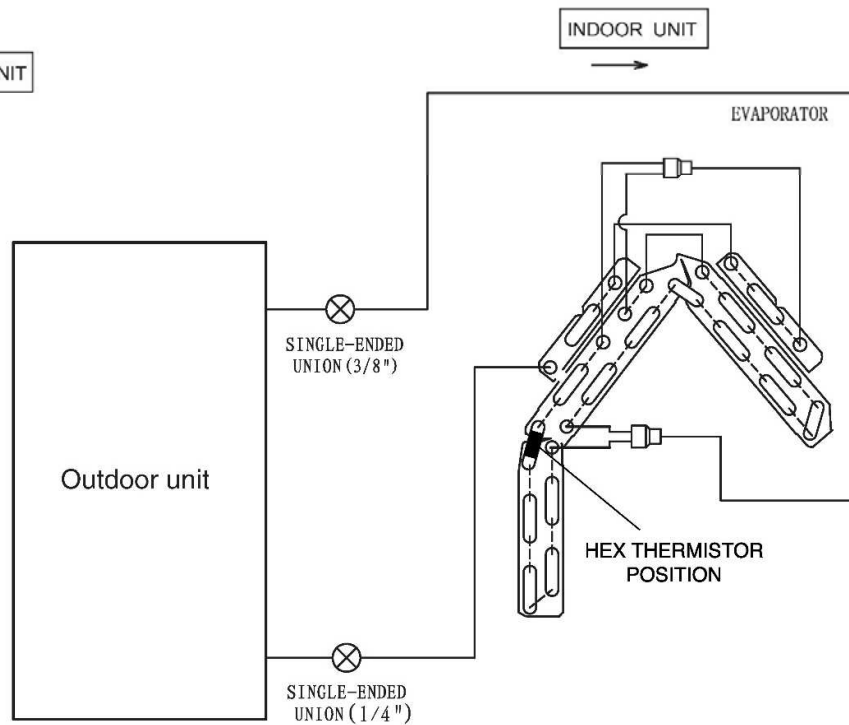
COOLING CYCLE

OUTDOOR UNIT



HEATING CYCLE

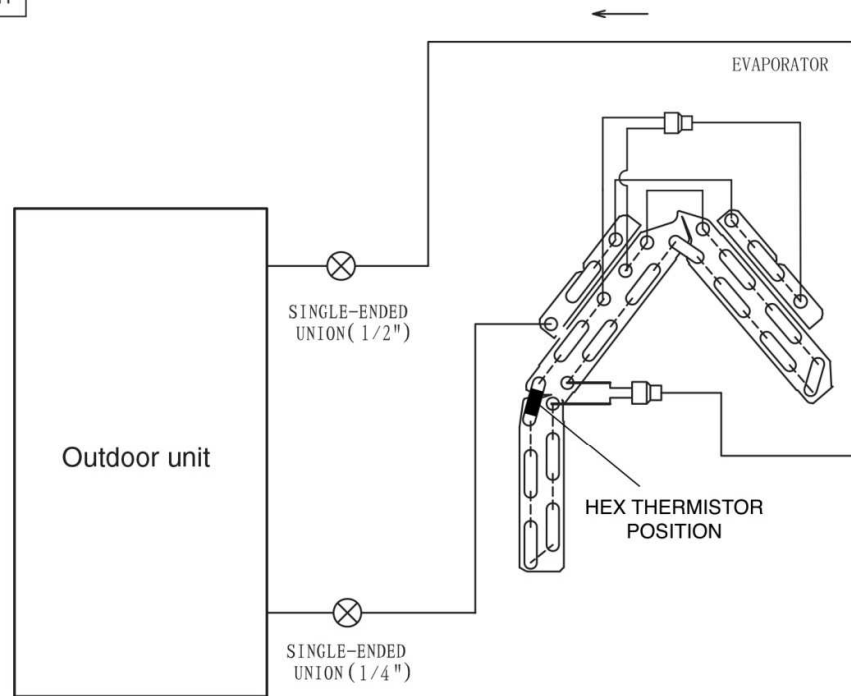
OUTDOOR UNIT



8.1.2. WALL TYPE: RAK-50RXE

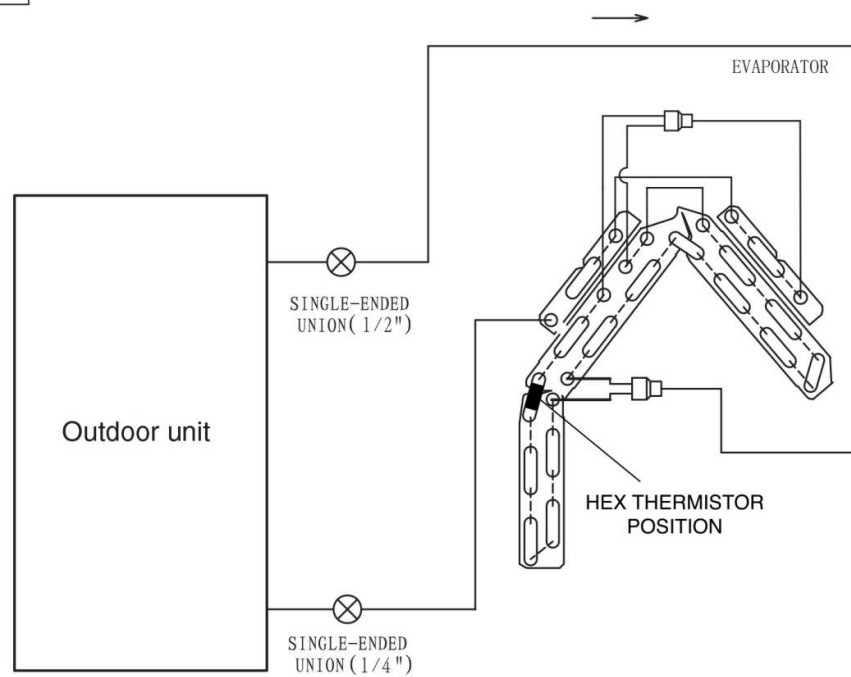
COOLING CYCLE

INDOOR UNIT



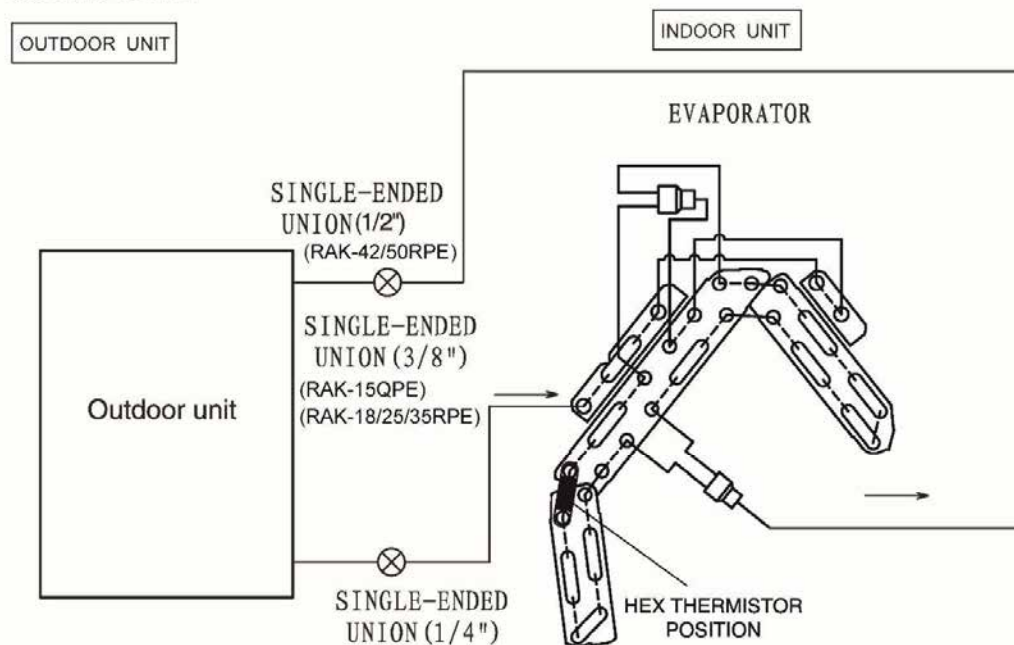
HEATING CYCLE

INDOOR UNIT

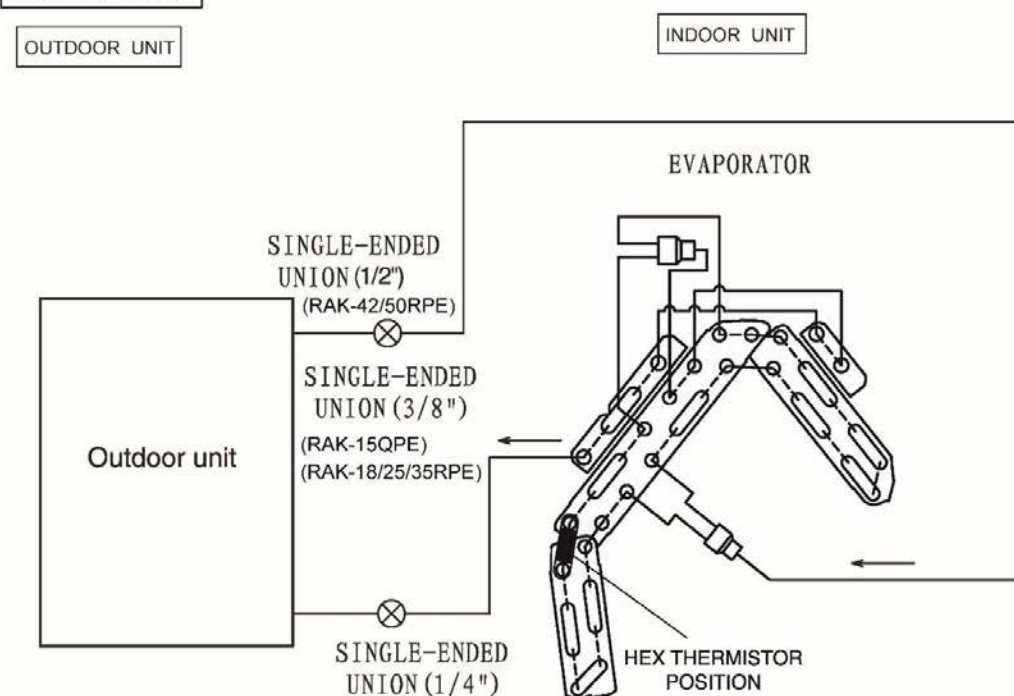


8.1.3. WALL TYPE: RAK-15QPE, RAK-18RPE, RAK-25RPE, RAK-35RPE, RAK-42RPE, RAK-50RPE

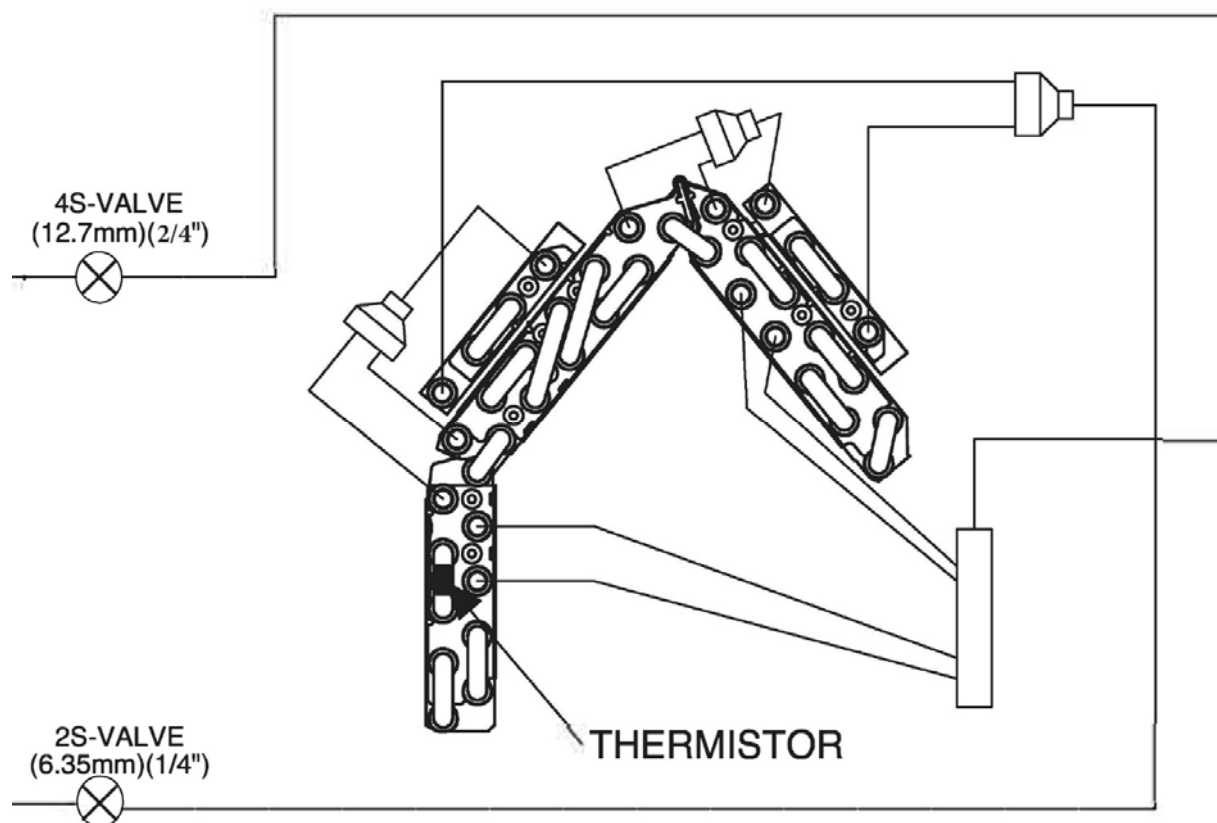
COOLING CYCLE



HEATING CYCLE

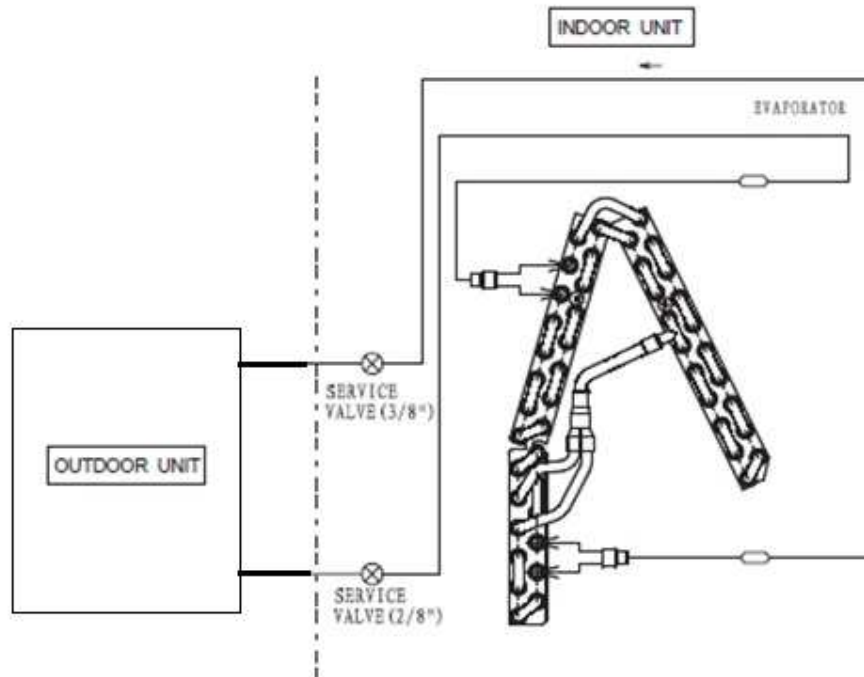


8.1.4. WALL TYPE: RAK-50NPE1, RAK-60NPE

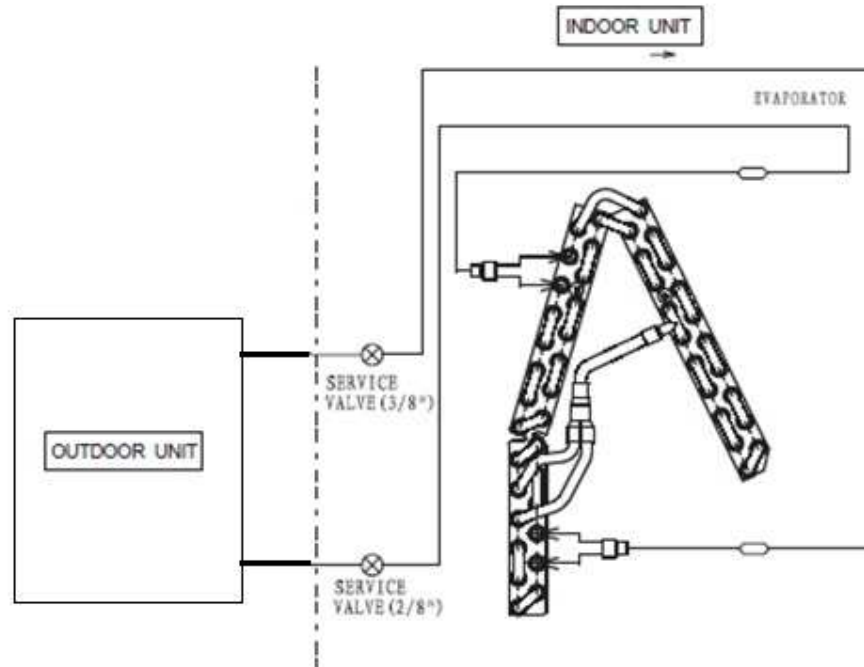


8.1.5. FLOOR TYPE: RAF-25RXE, RAF-35RXE

COOLING CYCLE

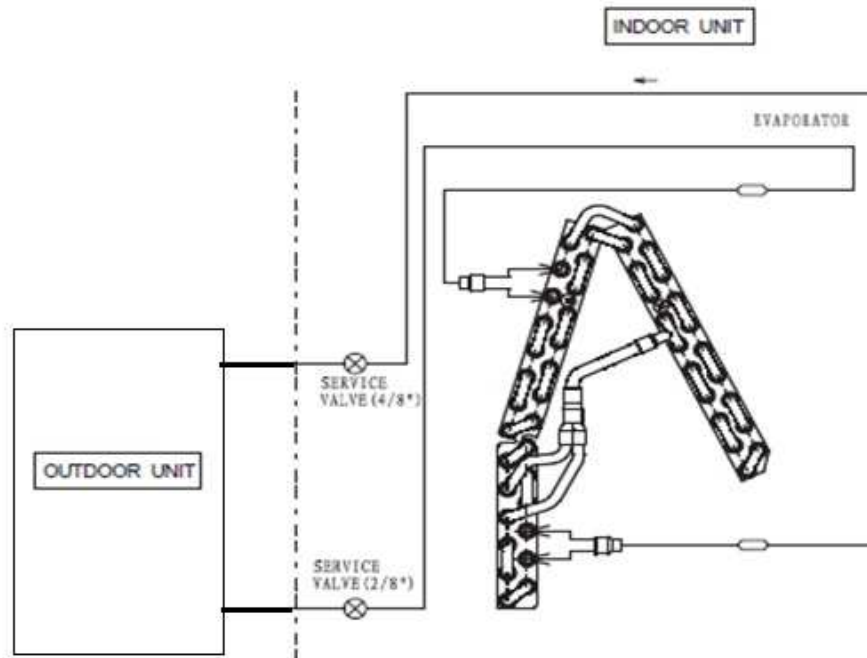


HEATING CYCLE

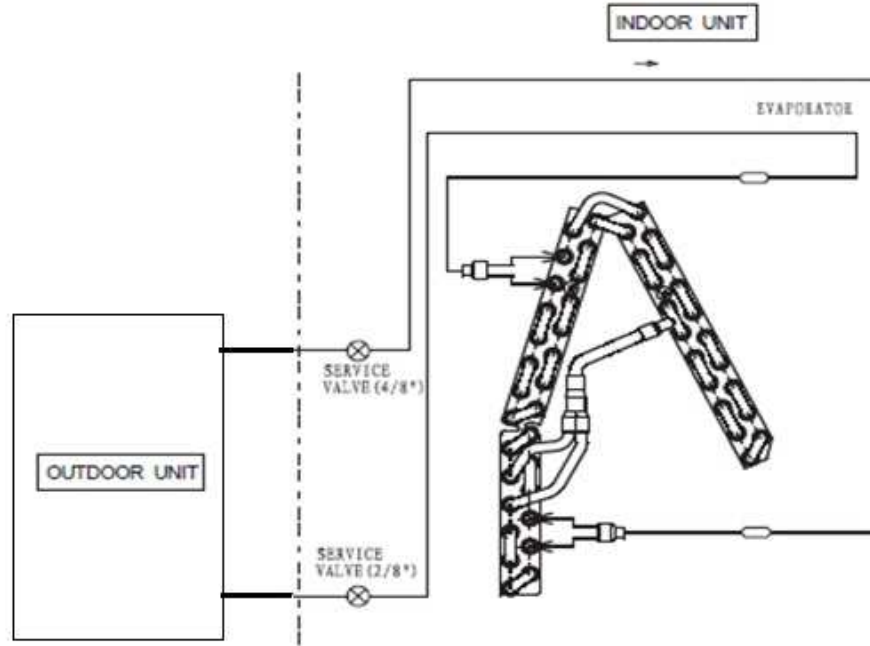


8.1.6. FLOOR TYPE: RAF-50RXE

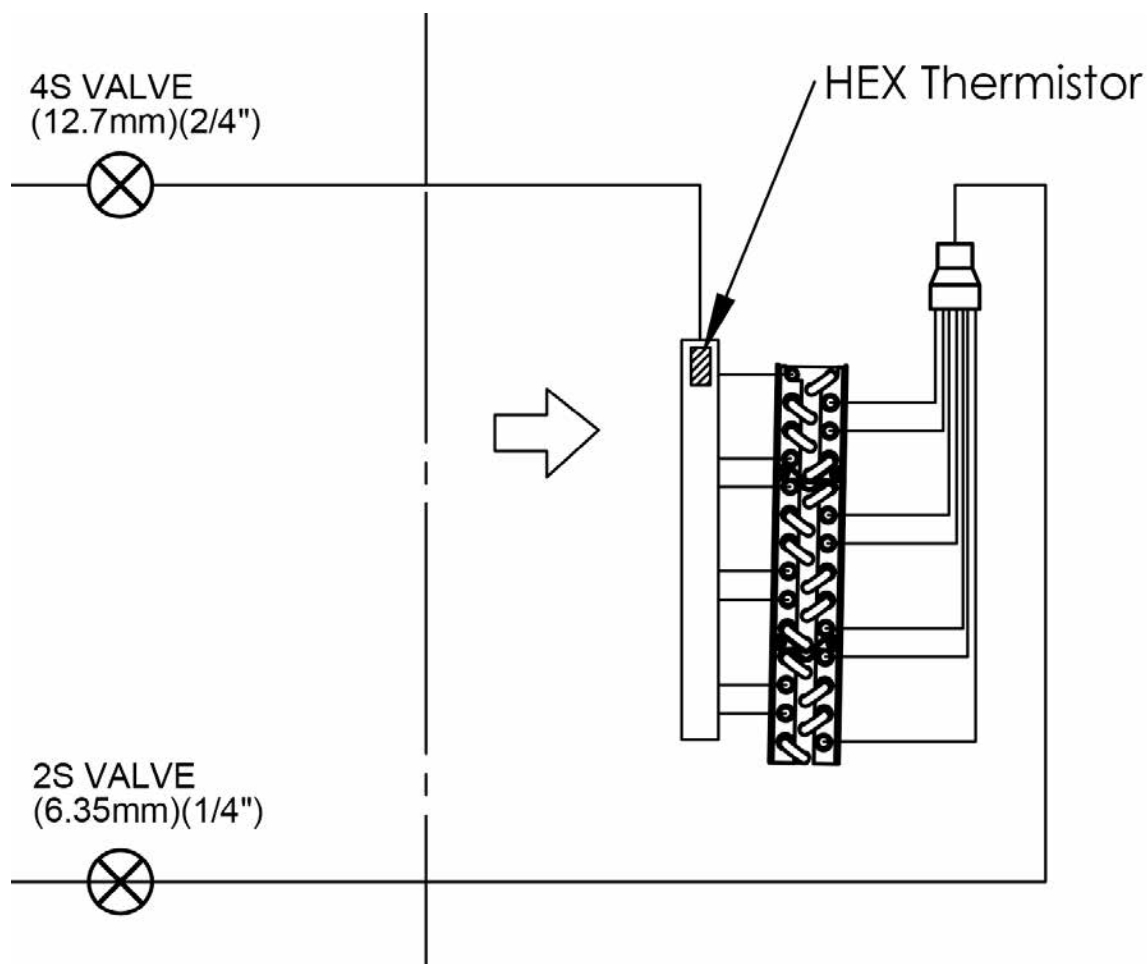
COOLING CYCLE



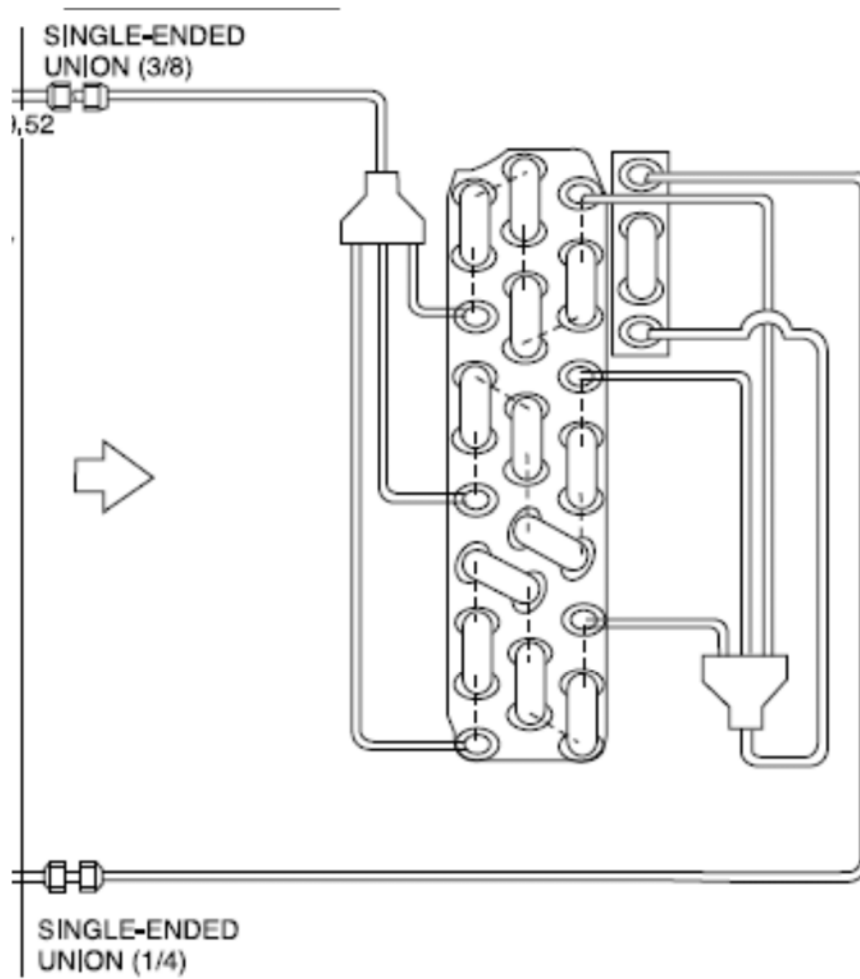
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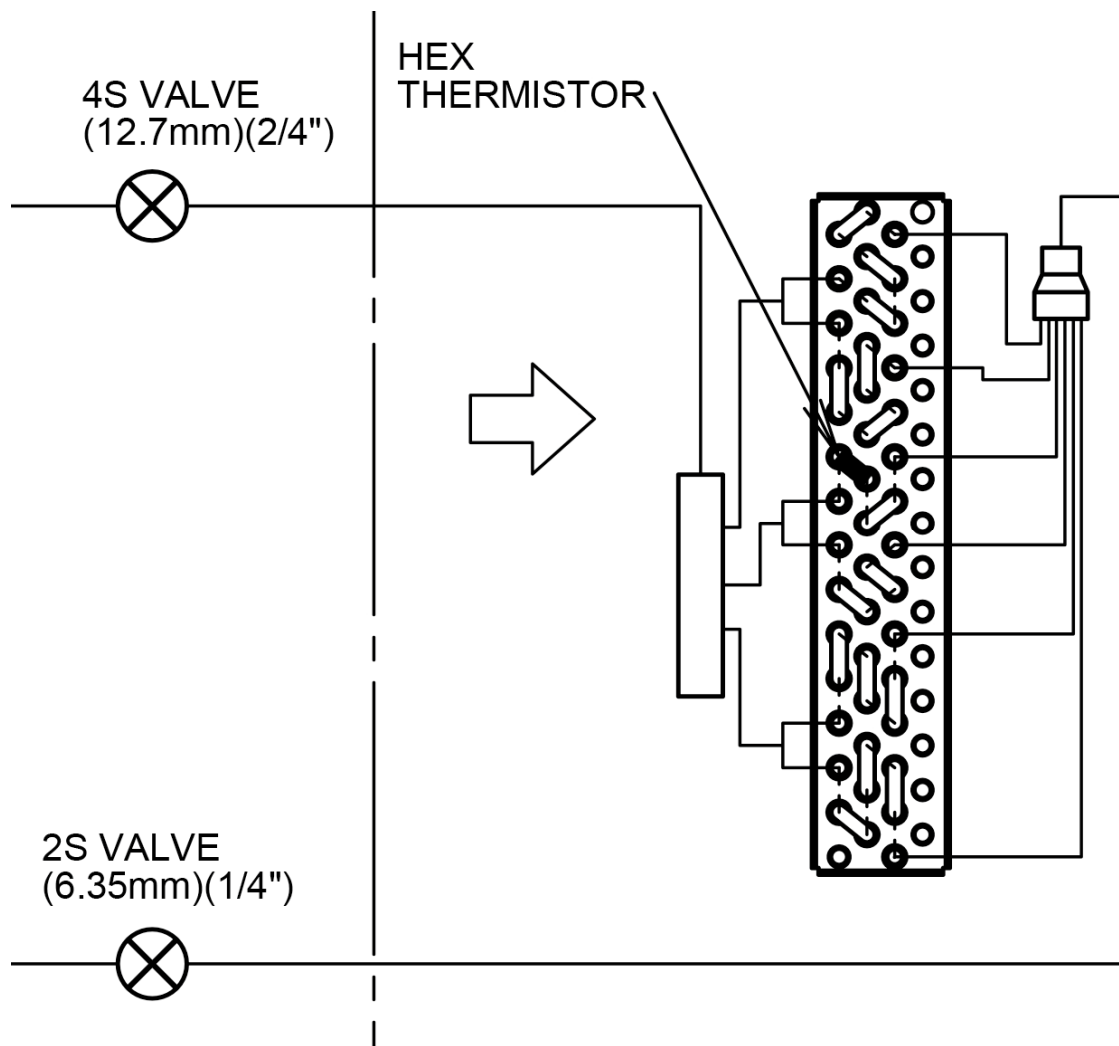
8.1.7. CEILING CASSETTE: RAI-25RPE, RAI-35RPE,RAI-50RPE, RAI-60RPE



8.1.8. DUCT TYPE: RAD-18QPE, RAD-25RPE, RAD-35RPE

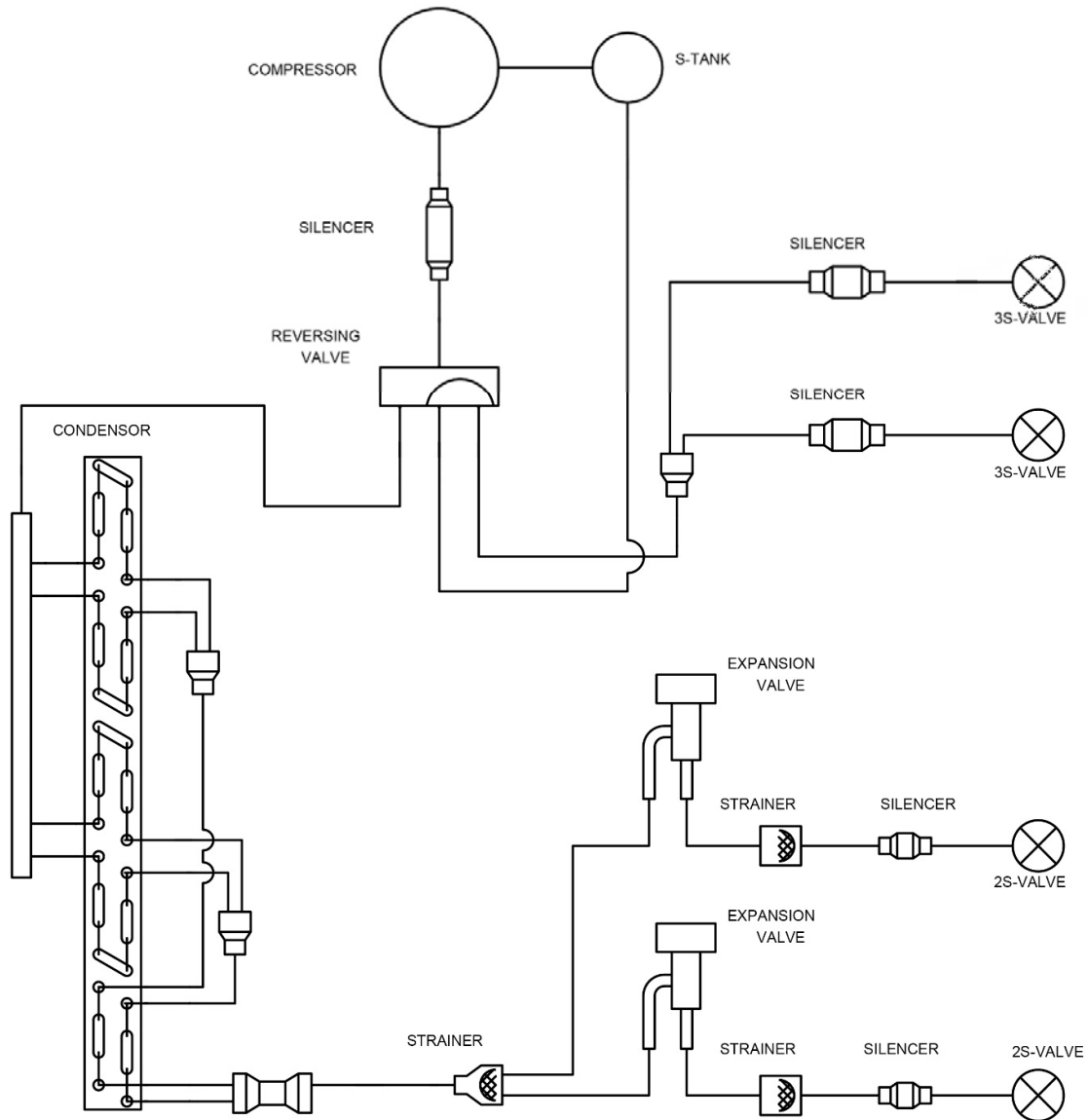


8.1.9. DUCT TYPE: RAD-50RPE, RAD-60RPE

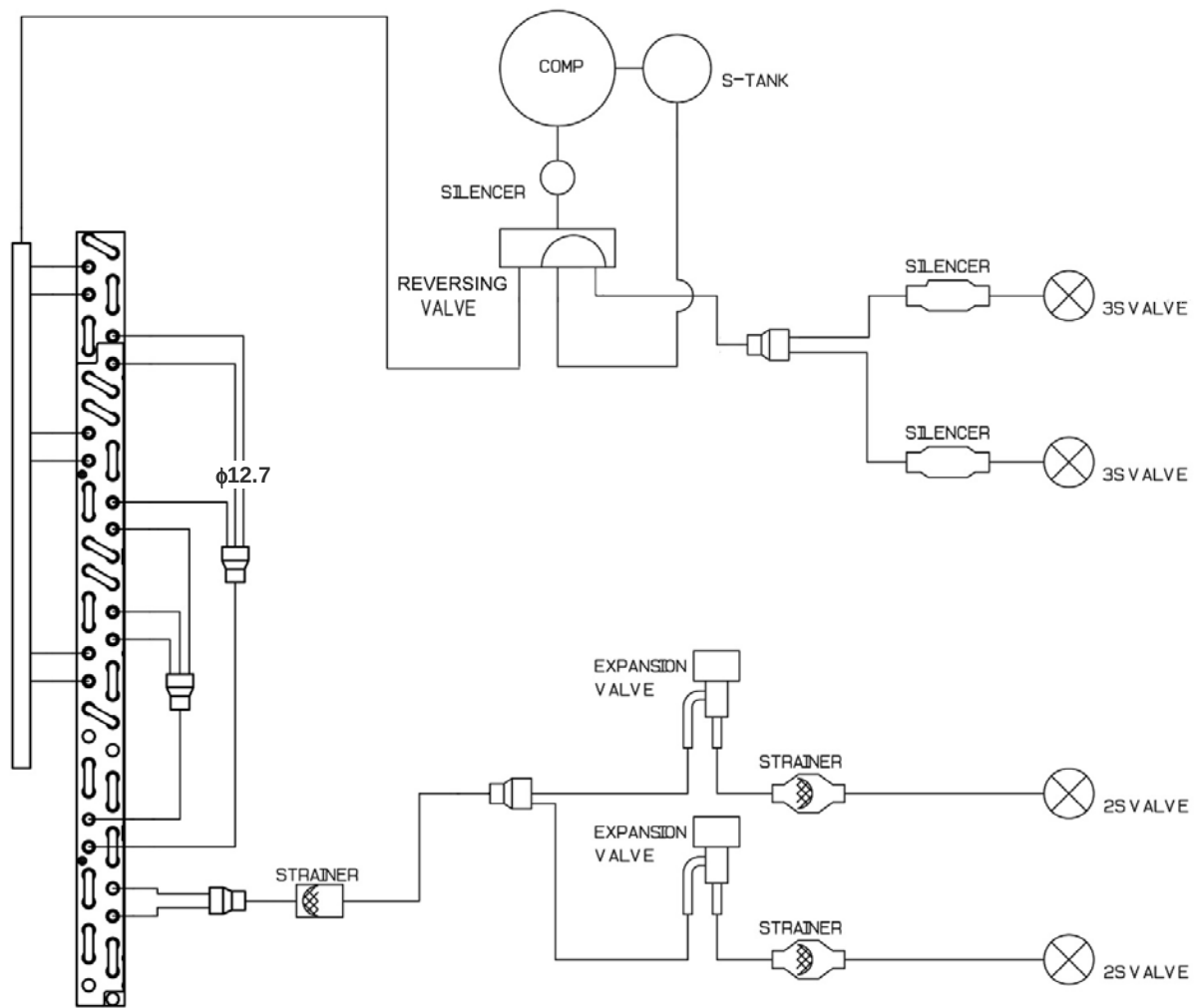


8.2. MULTIZONE OUTDOOR UNITS

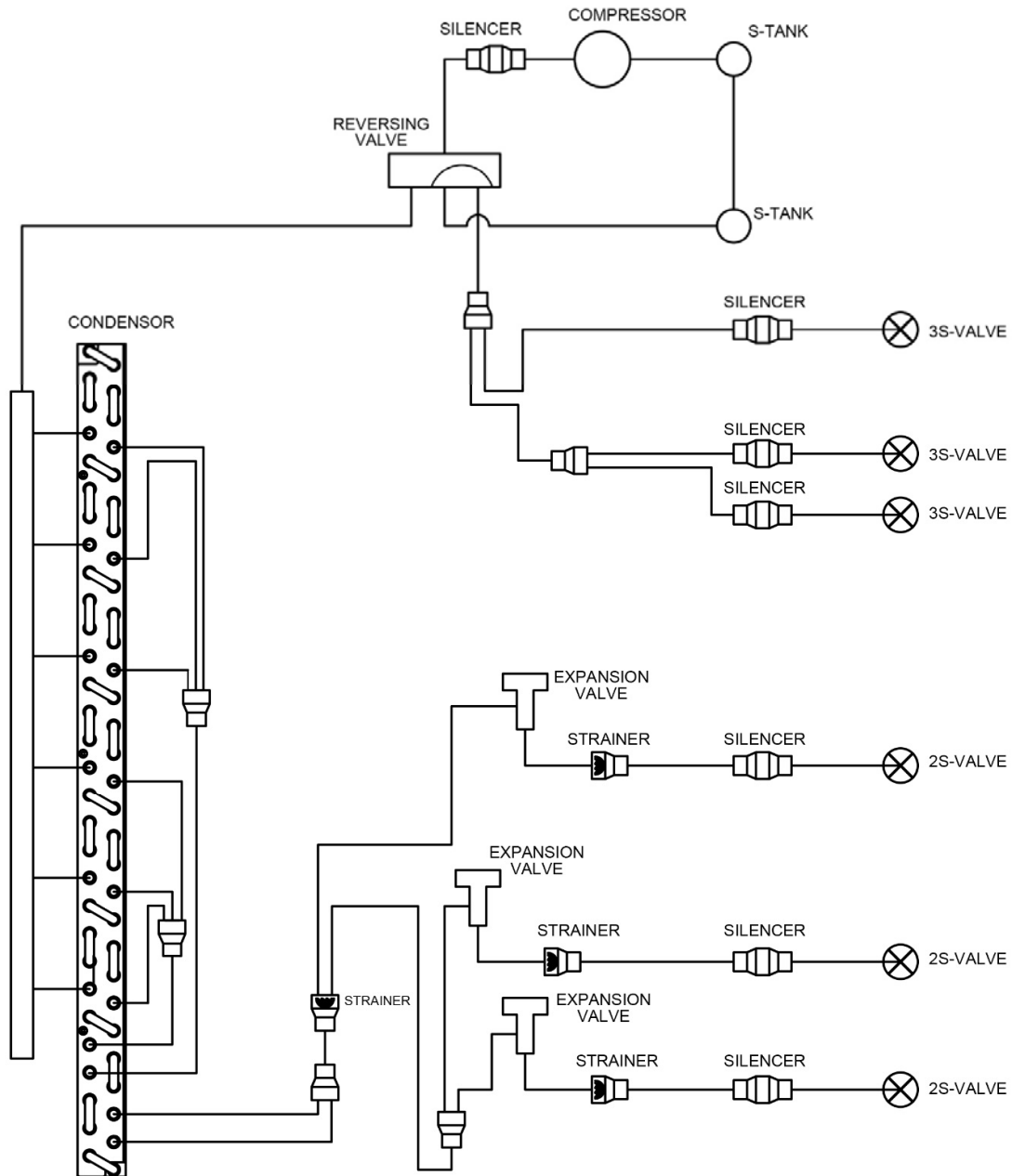
8.2.1. 2 ROOMS MULTIZONE: RAM-33NP2E, RAM-40NP2E



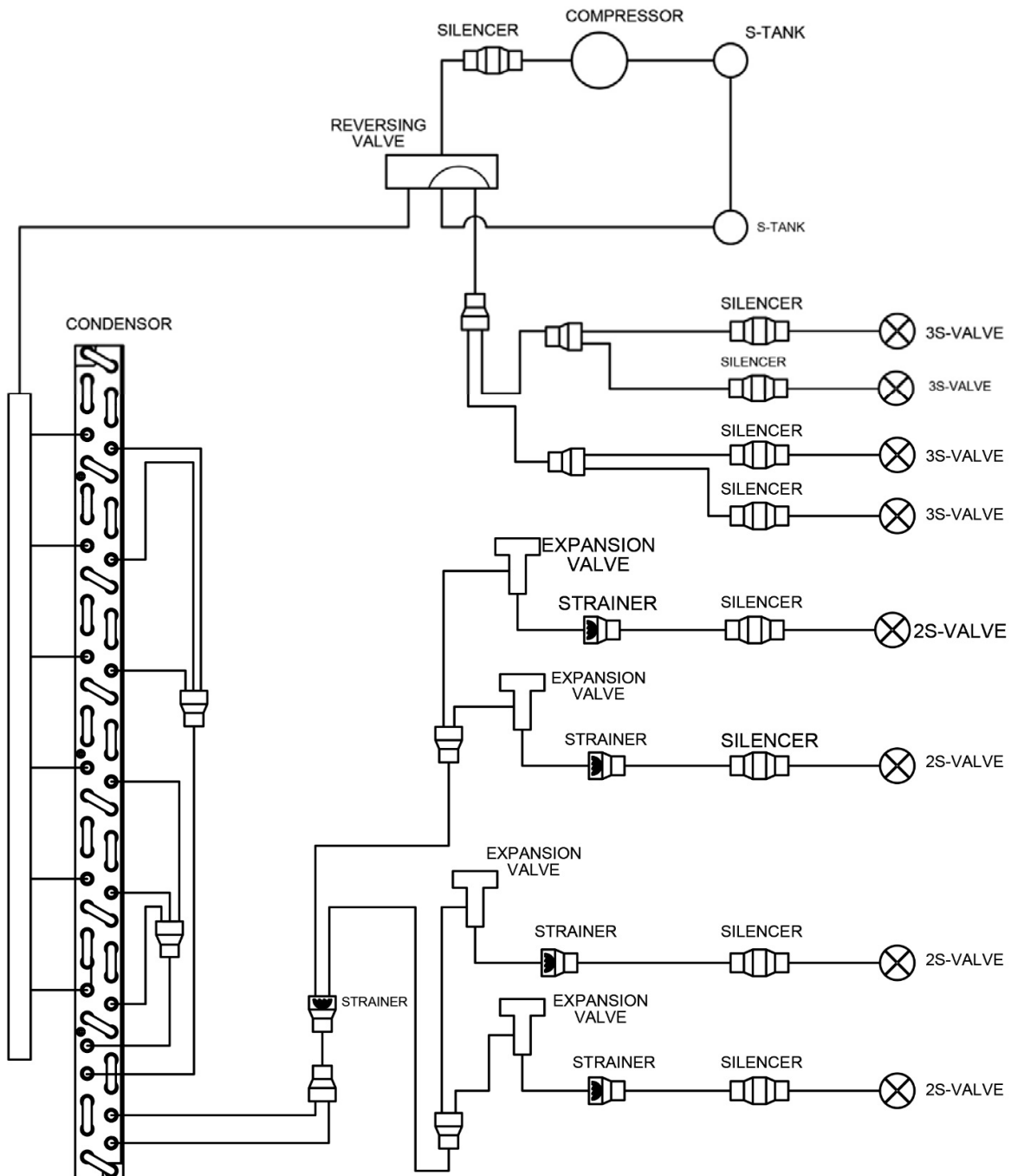
8.2.3. 2 ROOMS MULTIZONE: RAM-53NP2E



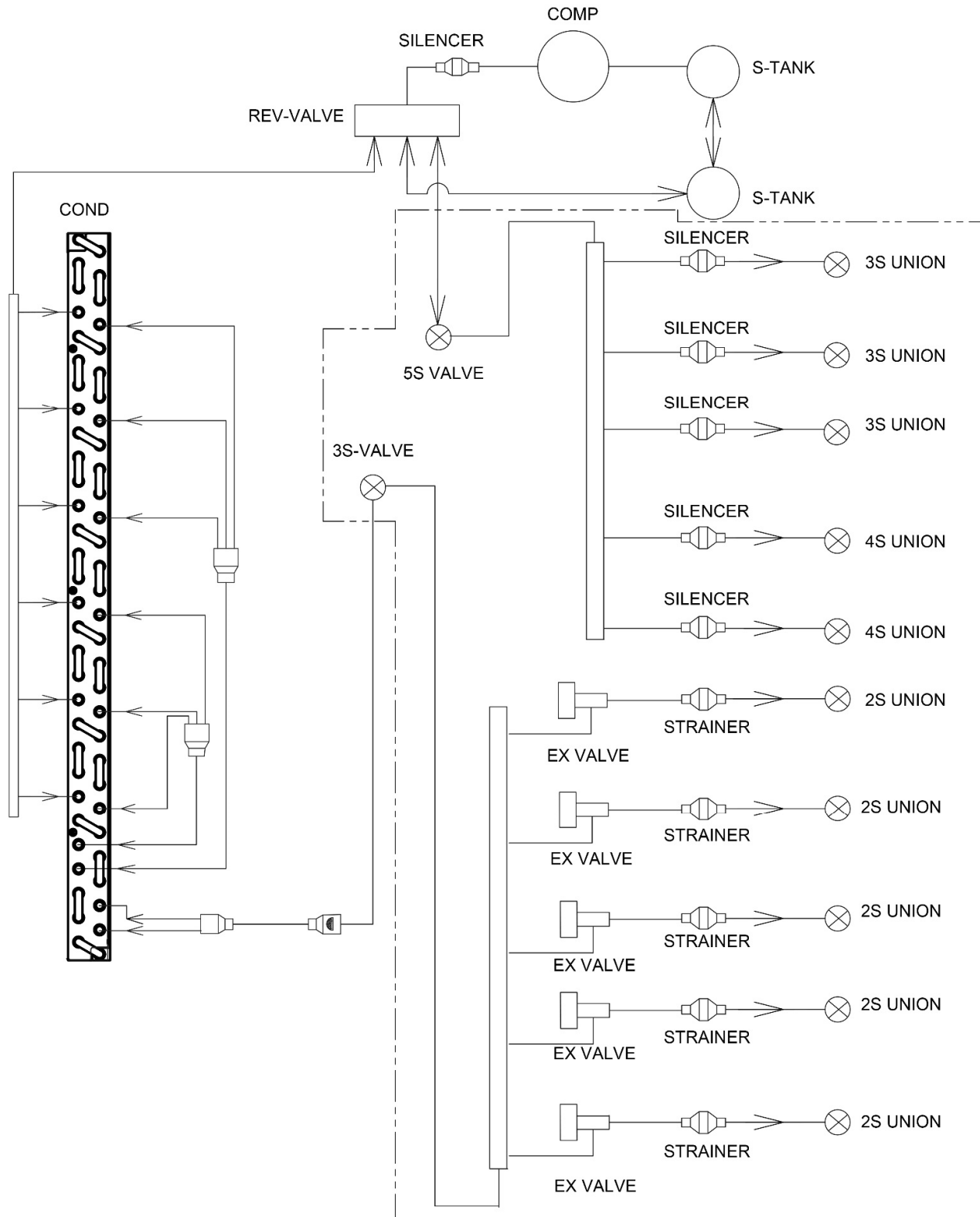
8.2.4. 3 ROOMS MULTIZONE: RAM-53NP3E, RAM-68NP3E



8.2.5. 4 ROOMS MULTIZONE: RAM-70NP4E



8.2.6. 5 ROOMS MULTIZONE: RAM-90NP5E



9 CONTROL AND FUNCTION

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9.1 WIRELESS REMOTE CONTROL FUNCTION

9.1.1. RAR-6N1, RAR-6N2, RAR-6NE4, RAR-6N5 AND RAR-6NE1

RAR-6N1	RAR-6N2	RAR-6NE4	RAR-6N5	RAR-6NE1
				
(Optional) RAK-50RPE1 RAK-60RPE	(Optional) RAI-25RPE RAI-35RPE RAI-50RPE RAI-60RPE	(Standard) RAF-25RXE RAF-35RXE RAF-50RXE	(Optional) RAD-18QPE RAD-25RPE RAD-35RPE RAD-50RPE RAD-60RPE	(Standard) RAK-18QXE RAK-25RXE RAK-35RXE RAK-50RXE RAK-15QPE RAK-18RPE RAK-25RPE RAK-35RPE RAK-42RPE RAK-50RPE

BUTTONS	FUNCTION
	MODE Selector Use this button to select the operating mode. Every time you press this button, the mode will change from  (HEAT) →  (DEHUMIDIFY) →  (COOL) and →  (FAN) cyclically.
	FAN SPEED Selector Button This determines the fan speed. Every time you press this button, the airflow rate will change from  (AUTO) →  (HIGH) →  (MED) →  (LOW) →  (SILENT). (This button allows selection of optimal or preferred fan speed for each operation mode).
	START/STOP button Press this button to start operation. Press it again to stop operation.
	ECO button Use this button to set the ECO mode.
	POWERFUL button Use this button to set the POWERFUL mode.
	SILENT button Use this button to set the SILENT mode.
	INFO button 1) Press this button to display temperature for 10 seconds. 2) Press this button to check monthly power consumption. 3) Press this button to receive the current calendar and clock.
	ECO SLEEP TIMER button Use this button to set the ECO sleep timer.
	AUTO SWING (Vertical) button Controls the angle of the horizontal air deflector.

	AUTO SWING (Horizontal) button Controls the angle of the vertical air deflector.
	LEAVE HOME button Prevent the room temperature from falling too much by setting temperature 10°C~16°C when no one is at home.
	ONE TOUCH CLEAN button Drying indoor heat exchanger after cooling operation to prevent mildew.
	EXTENDED AIR FLOW button Press this button during operation to start extended airflow operation.
WEEKLY TIMER buttons	
	ON/OFF TIMER button The device will turn on (off) and off (on) at the designated time.
	TIME button Press the button to set starting time of the program
	OK button Press the button to save the program. The button shall be pressed everytime after finishing a program setting.
	DELETE button 1) Press the button to delete the selected program. 2) Press the button for about 10 seconds by directing the remote controller towards the indoor unit while Mode A or B display blinks, programs for Mode A or B will be deleted both from the indoor unit and the remote controller after the beep sound from the indoor unit.
	DAY button Select the desired day of the week.
	PROGRAM NO. button Press this button to select a program number.
	CANCEL 1) Press the button to cancel the current setting process on the screen. 2) Press the button by directing the remote controller towards the indoor unit, then weekly timer setting will be canceled from indoor unit after the beep sound from the indoor unit. The program setting remains in the remote controller.
	SEND button Press the button for about 3 seconds by directing the remote controller towards the indoor unit after finishing the program setting. Timer lamp on the indoor unit will blink rapidly and after the beep sound from indoor unit, TIMER lamp will light up.
	CLOCK button Press the button to set calendar and clock.
	WEEKLY TIMER MODE button 1) Select Mode A or Mode B. 2 modes can be set and stored as a weekly timer. 2) By pressing the button longer than 3 seconds, program setting screen will appear.

9.2 SHIFT VALUE

- Press and hold (START/STOP) button and (ON) button.
- Press [RESET] button on the same time. Release [RESET] button only, then release (START/STOP) and (ON) button once Screen 1 appears.

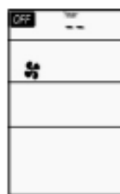


Screen 1



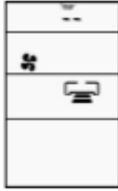
Screen 2

- Press the (MODE) button to display fan mode (Screen 3).



Screen 3

4. Press  (START/STOP) and Screen 4 appear.

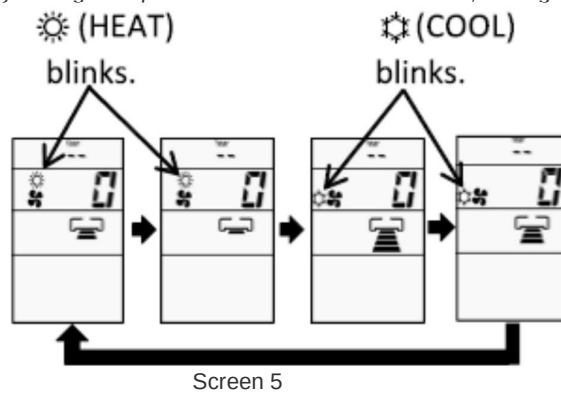


Screen 4

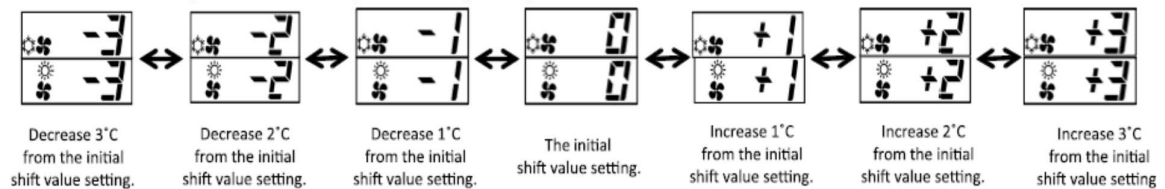
5. Select  (FAN SPEED) button to choose Heating Shift or Cooling Shift Mode (Screen 5).

By setting fan speed to HIGH  or MED  , it will go to Cooling Shift mode.

By setting fan speed to LOW  or SILENT  , it will go to Heating Shift mode.



6. Press the Temperature button () to adjust the shift value.



NOTE:

1. There are total of 7 shift values ranging from -3 to 3.
2. The displayed shift value,  (HEAT) and  (COOL) symbol on the remote controller display will be disappear after 10 seconds
3. The changed shift value will remain unchanged after turned off the power.
4. If "0" is displayed on the remote controller display, it indicates the shift value is now at the initial setting.

9.3 OPERATION LOCK

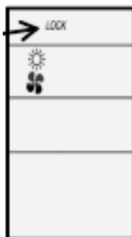
1. HEATING MODE

- a) Press and hold  (ECO) and  (POWERFUL) buttons, press  (RESET) button on the same time. Release  (RESET) button only when Screen 1 appear, then release  (ECO) button and  (POWERFUL) button.



Screen 1

- b) Wait until only Screen 2 appear.



Screen 2

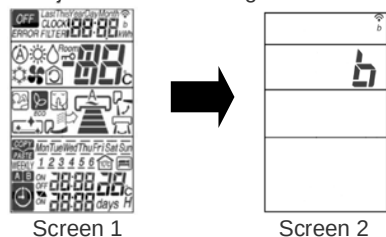
- c) The heating mode operation is locked.
 d) To unlock HEATING mode, repeat step (a). After all operations mode symbols displayed for 10 seconds, the operation mode symbol before cancellation will be display. The heating mode operation is unlocked.

2. COOLING AND DEHUMIDIFYING MODE

- a) Press and hold  (ECO) and  (SILENT) buttons for at least 5 seconds when the remote controller is OFF.
 b) Wait until only  and  displayed on the screen. The cooling and dehumidifying modes operation is locked.
 c) To unlock HEATING mode, repeat step (a). After all operations mode symbols displayed for 10 seconds, the operation mode symbol before cancellation will be display. The cooling and dehumidifying mode operation is unlocked.

9.4 SETTING THE PREVENTION OF MUTUAL INTERFERENCE

1. Please ensure the other indoor unit is OFF.
2. Press **1-6** (PROGRAM NO.) button, **ON TIMER** button and **RESET** (RESET) button simultaneously. The remote controller will display Screen 1 and followed by Screen 2. The indoor unit beeps to indicate that it has just received the signal from remote controller.



NOTE:

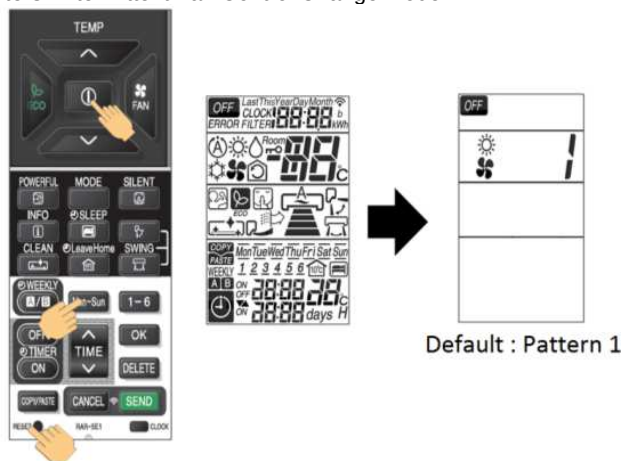
If indoor unit still not receive the correct signal from the correct remote controller, setting shall be made again. By setting again for the 2nd time, the signal address will change from B to A, then repeat again for the 3rd time.

9.5 INTERMITTENT FAN SPEED SETTING

The intermittent fan control during thermo off in Heating Mode can be changed by the remote controller. (This procedure should be done only by service personnel.) It is possible to select from 3 patterns.

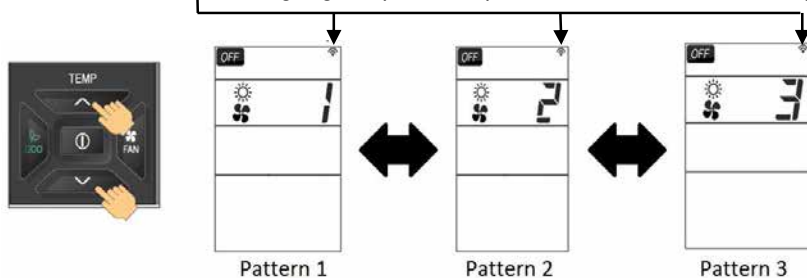
PROCEDURE

1. Press **1** [START/STOP] button, **Mon-Sun** [Mon-Sun] button and press **RESET** (RESET) button simultaneously. Release **RESET** (RESET) button only and make sure that all marks on the remote controller display are indicated, then release **1** [START/STOP] button and **Mon-Sun** [Mon-Sun] button. Remote controller now enters "Intermittent Fan Control Change Mode".



2. Press [ROOM TEMPERATURE setting] [^ (UP)]/[v (DOWN)] buttons. (The intermittent pattern changed with indoor unit beep sound.)

Transmission sign lights up with beep from indoor unit simultaneously.



	Pattern 1	Pattern 2	Pattern 3
Single Model	Continuous	30sec ON / 210sec OFF repeatedly	50sec ON / 190sec OFF repeatedly
Multi Model	30sec ON / 210sec OFF repeatedly	50sec ON / 190sec OFF repeatedly	Continuous

NOTE :

- (1) The indication of the selected intermittent pattern will disappear after 10 seconds.
- (2) The selected intermittent pattern will remain unchanged after the unit is turned off.

9.6 FAN SPEED SETTING IN THERMO OFF IN COOLING

The fan speed in Cooling Mode during thermo off can be changed by the remote controller.

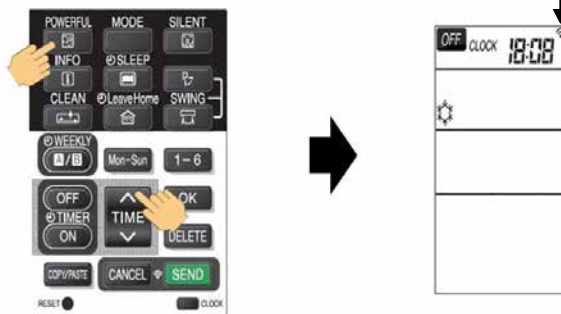
(This procedure shall be implemented strictly by service personnel only.)

It is possible to return it to the default setting.

PROCEDURE

Press  [POWERFUL] button and  [TIME ^ (UP)] button simultaneously for about 5 seconds when the remote controller is OFF.

Transmission sign lights up with beep from indoor unit simultaneously.



Beep sound pattern : 1) Default setting : Short beep
 2) Changed setting : Double beep

	Fan speed during thermo off
Default Setting	Ultra low
Changed Setting	Set fan speed (When auto fan speed is set, the fan speed is low)

NOTE :

- (1) The selected fan speed will remain unchanged after the unit is turned off.
- (2) If Timer reservation has been set, it will be canceled.
- (3) During time setting and timer setting, this operation cannot be set.

9.7 ERROR CODE INFORMATION

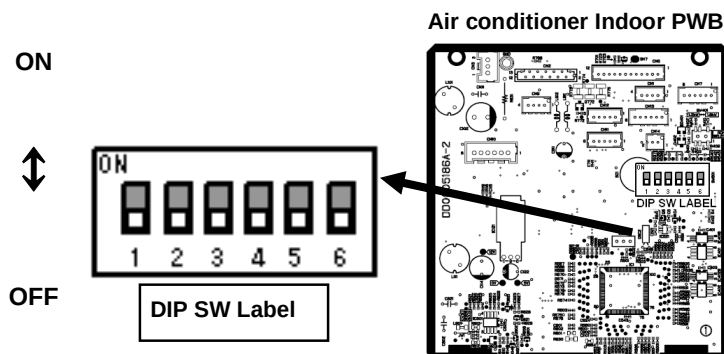
1. In case failure occurs to the air conditioner, by pressing  (INFO) button, an error code will be displayed.
2. Direct the remote controller towards the receiver of indoor unit (within 2 meters in front of indoor unit) and press  (INFO) button.
3. Wait for 2 seconds for signal transmission and the error code will be displayed.

	TIMER LAMP BLINKING	LED301 BLINKING	CODE	MEANING
INDOOR	-	-	000 00	Normal
	1 time		001 00	Refrigerant cycle fault
	2 times	-	-	Outdoor unit is under forced operation
	3 times	9 times	003 00	Communication error between indoor and outdoor units
	9 times	-	009 00	Indoor thermistor
	10 times	-	010 00	Abnormal rotating numbers
	13 times	-	013 00	IC401 data reading error
OUTDOOR	4 times	2 times	002 01	Peak current cut
	4 times	3 times	003 01	Compressor abnormal low speed rotation
	4 times	4 times	004 01	Compressor switching failure
	4 times	5 times	005 01	Overload lower limit cut
	4 times	6 times	006 01	OH thermistor temperature rise
	4 times	7 times	007 01	Abnormal outdoor thermistor
	4 times	8 times	008 01	Acceleration defective
	4 times	9 times	009 01	Communication error
	4 times	10 times	010 01	Abnormal power source
	4 times	11 times	011 01	Fan stop for strong wind
	4 times	12 times	012 01	Fan motor fault
	4 times	13 times	013 01	EEPROM reading error
	4 times	14 times	014 01	Active converter defective
	4 times	15 times	015 01	Abnormal PWB circuit

	TIMER LAMP BLINKING	LD301 Lit LD302 BLINKING	CODE	MEANING
OUTDOOR	4 times	1 times	071 01	Overheat thermostat
	4 times	2 times	072 01	Defrost thermostat
	4 times	3 times	073 01	Outdoor temperature thermostat
	4 times	4 times	074 01	Narrow pipe thermostat (indoor 1)
	4 times	5 times	075 01	Wide pipe thermostat (indoor 1)
	4 times	6 times	076 01	Narrow pipe thermostat (indoor 2)
	4 times	7 times	077 01	Wide pipe thermostat (indoor 2)
	4 times	8 times	078 01	Narrow pipe thermostat (indoor 3)
	4 times	9 times	079 01	Wide pipe thermostat (indoor 3)
	4 times	10 times	080 01	Narrow pipe thermostat (indoor 4)
	4 times	11 times	081 01	Wide pipe thermostat (indoor 4)
	4 times	12 times	082 01	Narrow pipe thermostat (indoor 5)
	4 times	13 times	083 01	Wide pipe thermostat (indoor 5)

9.8 ADDITIONAL FUNCTION VIA DIP-SWITCH SETTINGS

A new DIP Switch is available on the PWBs of the indoor unit that provide additional functions via the settings on the switches.



Pin No.	Function	Switch Position / Setting					
		OFF	Enable	ON	Disable		
1	AUTO RESTART function	OFF	Enable	ON	Disable		
2	DRY CONTACT function	OFF	Disable	ON	Enable		
3	DRY CONTACT Logic Select	OFF	HI Input Active	ON	LO Input Active		
4	HEATING / COOLING ONLY MODE SELECT	OFF	NORMAL (HEAT AND COOL)	OFF	HEATING ONLY	ON	COOLING ONLY
5		OFF		ON		OFF	
6	REMOCON ID SELECT ❖1	OFF	SELECT ID A	ON	SELECT ID B		

NOTE:

- ❖1 The setting of pin no. 6 is disabled for this model. Please refer to **9.4 SETTING THE PREVENTION OF MUTUAL INTERFERENCE**.

9.8.1 AUTO RESTART FUNCTION

The AUTO RESTART function can be enabled or disabled by setting Pin No. 1 on the DIP SWITCH above to the ON or OFF position accordingly.

9.8.2 HEATING/COOLING ONLY MODE SELECTION

When this function is enabled, the operation mode could be locked to either Heating Only (Heating or Fan) or Cooling Only (Cooling, Fan or Dehumidifying) by setting the Pin No. 4 and 5 accordingly.

LOCKED MODE	REMARKS
HEATING ONLY	Unit will not enter into Cooling mode although cooling mode is selected using the remote controller.
COOLING ONLY	Unit will not enter into Heating mode although heating mode is selected using the remote controller.

10 OPTION LIST

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10.1 WIRED REMOTE CONTROL SPX-RCDA AND SPX-RCDB

This controls the operation function and timer setting of the room air conditioner.

RAR-5G1 (SPX-RCDA) 	RAR-5G2 (SPX-RCDB) 		
RAD-18QPE RAD-25RPE RAD-35RPE RAD-50RPE RAD-60RPE	<table border="1"> <tr> <td data-bbox="813 853 1145 1211"> RAK-18QXE RAK-25RXE RAK-35RXE RAK-50RXE RAK-15QPE RAK-18RPE RAK-25RPE RAK-35RPE RAK-42RPE RAK-50RPE RAK-50RPE1 RAK-60RPE </td><td data-bbox="1145 853 1473 1211"> RAF-25RXE RAF-35RXE RAF-50RXE RAI-25RPE RAI-35RPE RAI-50RPE RAI-60RPE </td></tr> </table>	RAK-18QXE RAK-25RXE RAK-35RXE RAK-50RXE RAK-15QPE RAK-18RPE RAK-25RPE RAK-35RPE RAK-42RPE RAK-50RPE RAK-50RPE1 RAK-60RPE	RAF-25RXE RAF-35RXE RAF-50RXE RAI-25RPE RAI-35RPE RAI-50RPE RAI-60RPE
RAK-18QXE RAK-25RXE RAK-35RXE RAK-50RXE RAK-15QPE RAK-18RPE RAK-25RPE RAK-35RPE RAK-42RPE RAK-50RPE RAK-50RPE1 RAK-60RPE	RAF-25RXE RAF-35RXE RAF-50RXE RAI-25RPE RAI-35RPE RAI-50RPE RAI-60RPE		

BUTTONS	FUNCTION
	MODE Selector Use this button to select the operation mode. Every time you press this button, the mode will change from (AUTO) → (HEAT) → (DEHUMIDIFY) → (COOL) and → (FAN) cyclically.
 FAN	FAN SPEED Selector Button This determines the fan speed. Every time you press this button, the airflow rate will change from (AUTO) → (HIGH) → (MED) → (LOW) → (SILENT) (This button allows selection of optimal or preferred fan speed for each operation mode).
	ON/OFF button Press this button to start operation. Press it again to stop operation.
	SLEEP button Use this button to set the SLEEP timer.
	SET button Timer setting reservation.
	OFF button Select the turn OFF timer.
	ON button Select the turn ON timer.
	CANCEL button Cancel timer reservation.
	AUTO SWING (Vertical) button Controls the angle of the horizontal air deflector.
	ROOM TEMPERATURE setting button Value will change quicke when keep pressing.

10.1.1 SHIFT VALUE

1. Press and hold  (ON/OFF) button and  (ON TIMER) button at the same time while giving a single press on the RESET button until remote controller now enter 'Shift value change mode'.
2. Press  (ON/OFF) button so that the display indicates  (FAN) speed.
3. Select  (FAN SPEED) button to choose Heating Shift or Cooling Shift Mode.

By setting fan speed to HIGH  or MED  , it will go to Cooling Shift mode.

By setting fan speed to LOW  or SILENT  , it will go to Heating Shift mode.

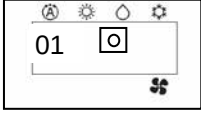
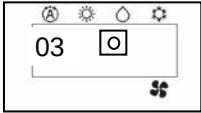
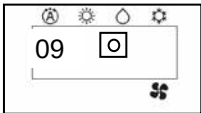
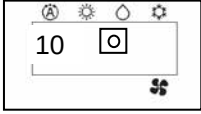
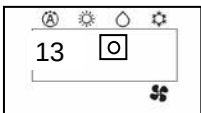
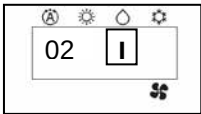
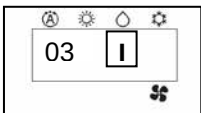
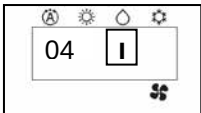
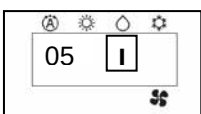
4. Press  (ROOM TEMPERATURE) button to change the shift value (-3°C ~ 0 ~ 3°C).
5. Press  (ON/OFF) button to end 'Shift value setting mode'.

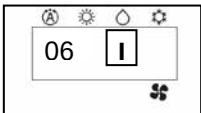
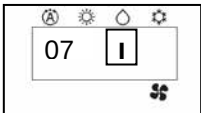
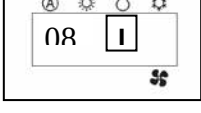
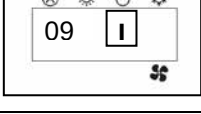
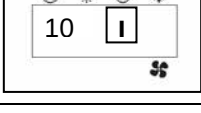
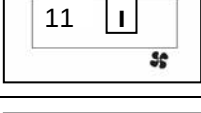
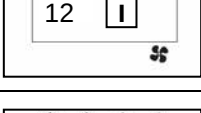
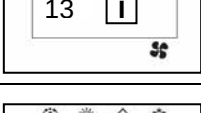
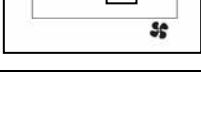
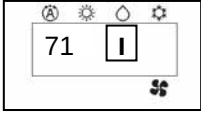
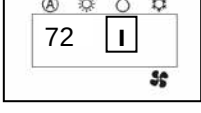
NOTE:

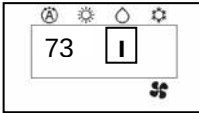
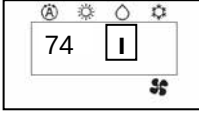
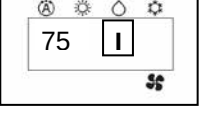
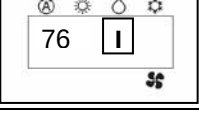
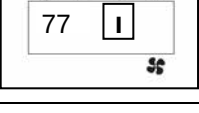
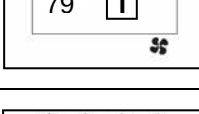
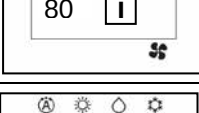
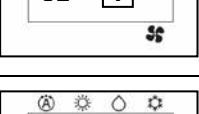
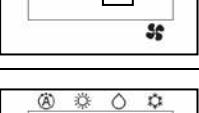
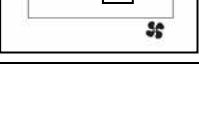
1. There are total of 7 shift values ranging from -3 to 3.
2. The changed shift value will remain unchanged after turned off the power.

10.1.2 ERROR CODE INFORMATION

1. In case failure occurs to the air conditioner, the error code will constantly appear on the wired remote controller display.

	TIMER LAMP BLINKING	LD301 BLINKING	CODE	MEANING
INDOOR	-	-	-	Normal
	1 time	-		Refrigerant cycle fault
	2 times	-	-	Outdoor unit is under forced operation
	3 times	9 times		Communication error between indoor and outdoor units
	9 times	-		Indoor thermistor
	10 times	-		Abnormal rotating numbers
	13 times	-		IC401 data reading error
OUTDOOR	4 times	2 times		Peak current cut
	4 times	3 times		Compressor abnormal low speed rotation
	4 times	4 times		Compressor switching failure
	4 times	5 times		Overload lower limit cut

	TIMER LAMP BLINKING	LD301 BLINKING	CODE	MEANING
OUTDOOR	4 times	6 times		OH thermistor temperature rise
	4 times	7 times		Abnormal outdoor thermistor
	4 times	8 times		Acceleration defective
	4 times	9 times		Communication error
	4 times	10 times		Abnormal power source
	4 times	11 times		Fan stop for strong wind
	4 times	12 times		Fan motor fault
	4 times	13 times		EEPROM reading error
	4 times	14 times		Active converter defective
	4 times	15 times		Abnormal PWB circuit
		LD301 Lit LD302 BLINKING		
	4 times	1 times		Overheat thermostat
	4 times	2 times		Defrost thermostat

	TIMER LAMP BLINKING	LD301 Lit LD302 BLINKING	CODE	MEANING
OUTDOOR	4 times	3 times		Outdoor temperature thermostat
	4 times	4 times		Narrow pipe thermostat (indoor 1)
	4 times	5 times		Wide pipe thermostat (indoor 1)
	4 times	6 times		Narrow pipe thermostat (indoor 2)
	4 times	7 times		Wide pipe thermostat (indoor 2)
	4 times	8 times		Narrow pipe thermostat (indoor 3)
	4 times	9 times		Wide pipe thermostat (indoor 3)
	4 times	10 times		Narrow pipe thermostat (indoor 4)
	4 times	11 times		Wide pipe thermostat (indoor 4)
	4 times	12 times		Narrow pipe thermostat (indoor 5)
	4 times	13 times		Wide pipe thermostat (indoor 5)

10.2 H-LINK ADAPTOR – PSC 6RAD

10.2.1 SAFETY SUMMARY

DANGER:

- DO NOT pour water into the remote control switch (hereafter called “controller”). This product is equipped with electrical parts. This will cause serious electrical shock.

WARNING:

- DO NOT perform installation work and electrical wiring connection by yourself. Contact your distributor or dealer of HITACHI and ask then for installation work and electrical wiring by service person. The specified cable should be used to connect (i) room air conditioner and adaptor, and (ii) controller and adaptor.

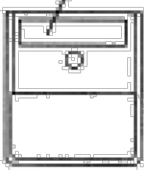
CAUTION:

- DO NOT install the indoor unit, outdoor unit, controller and cable as such places as:
 - where there is oil vapor and dispersion of oil
 - where there is sulfuric environment (near the hot springs)
 - where there is a flammable gas
 - where there is salty environment (near the sea)
- DO NOT install the indoor unit, outdoor unit, controller and cable within approximately 3 meters from strong electromagnetic wave radiators, such as medical equipment. In case that the controller is installed in a place where there is electromagnetic wave direct-radiation, shield the controller and cables by covering with the steel box and running the cable through the metal conduit tube.
- In case that there is electric noise at the power source for the indoor unit, provide a noise filter.

10.2.2 INSTALLATION WORK

■ Before installation

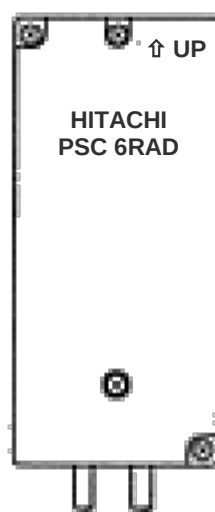
Check the contents and the number of the accessories in the packing.

Adaptor	 With two 1.8m cables
1 piece of cover for hiding the covering	 Attached 2 sided tapes
Two-sided tape for attaching to Adaptor	 110x40x3mm

2 connectors for H-Link connection		
2 tapping screws for attaching to wall		φ3.0 x 10mm
2 screws for attaching to wooden wall		φ3.1 x 16mm

- 1) RAC adaptor can be installed to the wall as well as on the air conditioner itself
- 2) Install RAC adaptor in the vertical surface as shown below.

Upper side

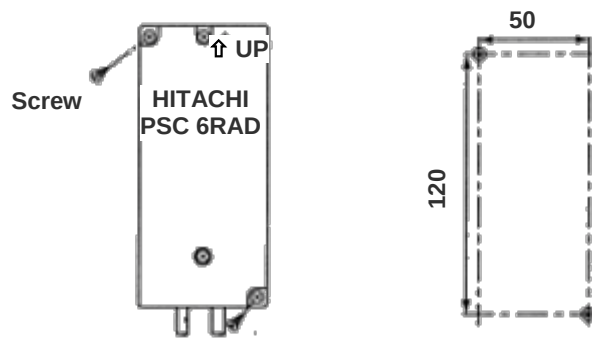


Mark “↑ UP”

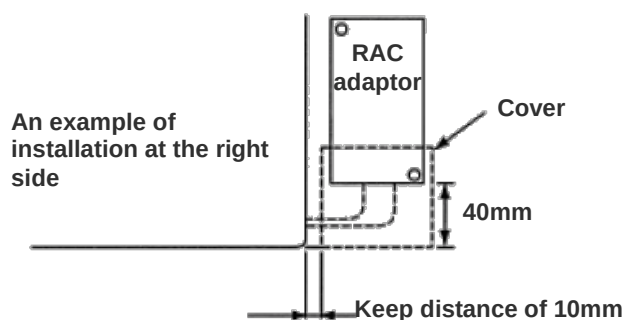
Wiring outlet

Bottom side

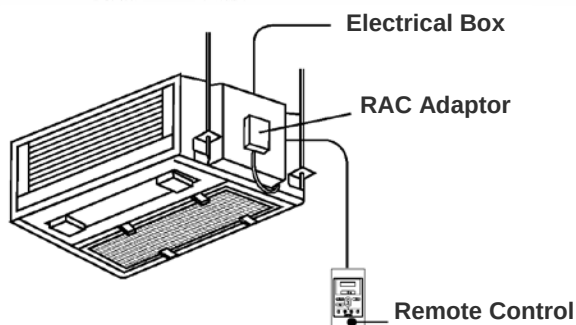
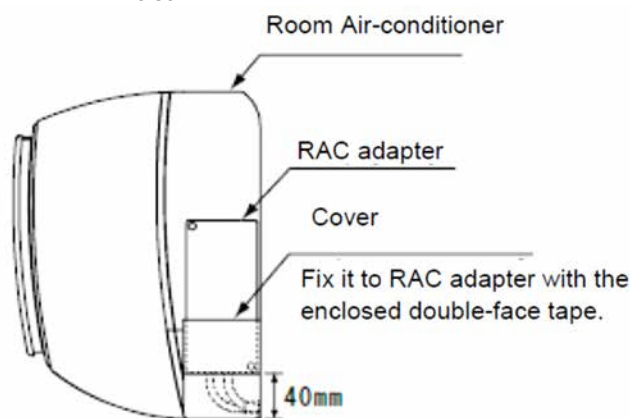
- 3) Installation procedure
 - a) When installing to the wall.
 - i) Fix the adaptor with 2 screws. Tapping screw is for metal surface, and other screw is for wooden surface.



- ii) When using the cover
It can be installed at the right and left side of room air conditioner. Fix the cover and RAC adaptor with the two-sided tape (accessory).



- b) When installing on the room air-conditioner
In case that it cannot be installed to the wall due to the space or material problem, install the RAC adaptor with the two-sided tape (accessory) on the room air-conditioner.
- Confirm if the piping cover of the unit can be removed when performing the service maintenance, and then fix the RAC adaptor in the side of room air-conditioner with two-sided tape. (Available at the right as well as left side)
 - Clean the surface to be installed with a dry cloth.

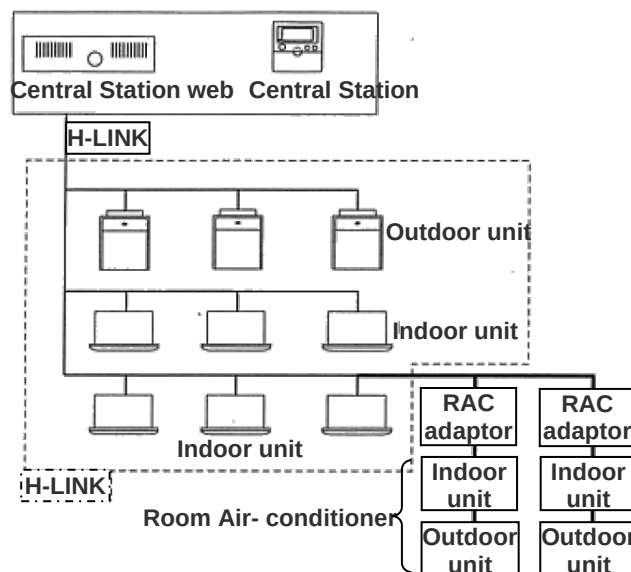


NOTE:

- Consider the following points since the adhesiveness changes according to the environmental conditions (temperature, humidity etc)
- The adhesiveness is decreased when there is humidity or oil.
- Warm the adhesive part and installation place of the two-sided tape to avoid the decrease of the adhesiveness in case the ambient temperature is low.
- DO NOT touch the adhesive part by fingers nor re-attach it many times. The adhesiveness has decreased and the RAC adaptor may fall off.
- DO NOT apply any force within 24 hours after installation.

10.2.3 ELECTRICAL WIRING

■ System configuration



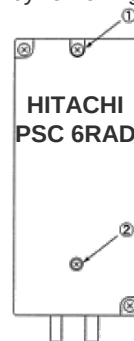
CAUTION:

- Turn OFF the power supply of the room air-conditioner of the central control device when performing the wiring work
- DO NOT run all the H-LINK cable or power supply cable along the other signal cable, or malfunction may occur due to the noise, etc. If it is required to run along the other transmission cable, separate the cable more than 30cm, or run the cable through the metal tube and earth the tube.
- Follow local codes and regulations when performing electrical wiring and earth wiring.
- Transmissions cable used in H-LINK shall be 2 cores cable (0.7mm² to 1.25mm² for model: VCTF, VCT, CVV, MVVX, CVVX, VVR, VVF) or 2 cores twisted pair cable (model: KPEV, KPEV-Spec). Total length of cable shall be below 1000mm.
- DO NOT use wire with more than 3 cores.

■ Internal components and Wiring connections

Check the contents and the number of the accessories in the packing.

- Access
Open the cover by removing the ① and ② screws.



- Wiring Connection
Connection with Room Air-Conditioner
 - Remove the front cover of the room air-conditioner and the cover of electrical box.
 - The cable attached with the connector of the RAC adaptor shall be connected with the connector of indoor PCB

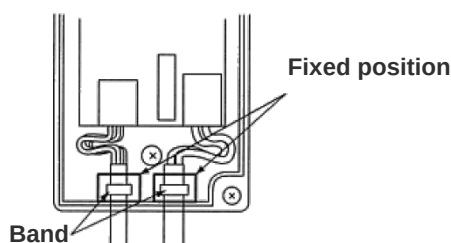
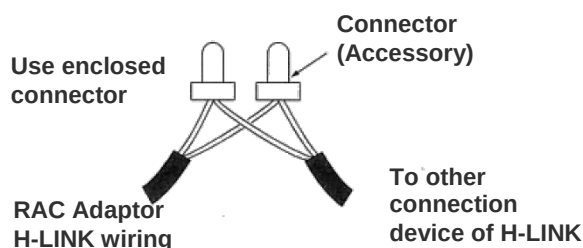
- iii) Install the electrical box cover paying attention not to clamp the cable. Read the installation manual of each room air-conditioner for confirming how to connect and how to assemble the cable of the RAC adaptor.

CAUTION:

- Disconnect the power plug before performing this work
- Turn OFF the break power source in case the power is supplied from the outdoor unit.

- Connection of Transmission Cable

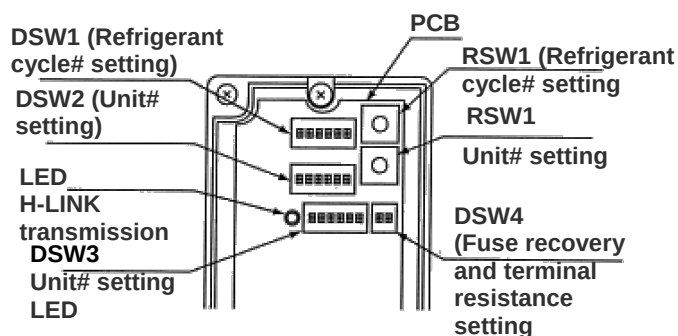
H-LINK transmission cable connecting to RAC adaptor shall be connected to H-LINK.

**CAUTION:**

- DO NOT connect incorrect wiring. It may cause the failure of the RAC Adaptor. Especially pay attention not to apply high voltage e.g. AC400/230V.
- DO NOT perform the wiring work while power to the central station or the RAC Adaptor is still being supplied. It may cause malfunction. Turn OFF devices when performing the wiring work.
- The RAC Adaptor side cable should not overload to the connector.
- DO NOT clamp the cable when attaching the RAC adaptor cover.
- Band should not be loose and in fixed position.

10.2.4 DIP SWITCH SETTING

- 1) Switch OFF the power of room air conditioner before setting the DIP switch. If the power is ON, the settings are INVALID.
- 2) The position of the DIP switch is shown below.

**CAUTION:**

- DO NOT turn ON various pins of DSW1 and DSW2

3) Set the refrigerant cycle# by RSW1 and DSW1

DSW1 (Ten digit)	RSW1 (Last digit)
DSW1 and RSW1 are set "0" before shipment. Up to 15 cycles can be set. E.g. Setting in Ref No. 5	
No. 1 pin is OFF	The position is Set 5

4) Set the unit No. by RSW2 and DSW2

DSW2 (Ten digit)	RSW2 (Last digit)
DSW2 and RSW3 are set "0" before shipment. Up to 15 cycles can be set. E.g. Setting in Unit No. 15	
No. 1 pin is OFF	The position is Set 5

5) Slave unit.

In case of setting various RAC adaptors in the same refrigerant cycle, set the RAC adaptor with smallest Unit# as a master unit. In case of setting only one RAC adaptor in a refrigerant system, this adaptor should be a master unit. Set this procedure by DSW3.

Master Unit setting	Setting before shipping (slave unit setting)

●: Master Unit setting

○: Setting before Shipping (Slave Unit setting)

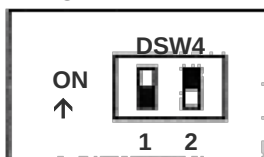
Refrigerant Unit#	Indoor Unit#									
	0	1	2	3	4	5	6	7		
0	●	○	○	○	○					
1			●	○	○					
2				●	○	○	○	○		
3		●								
4										

CAUTION:

- DO NOT set various main adaptors in the same refrigerant cycle.

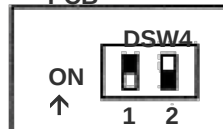
- 6) Procedure when applying 200V voltage to H-LINK wiring incorrectly.

In case of applying 200V voltage to H-LINK wiring incorrectly, the fuse installed in a transmission circuit on PCB will blow out. In this case, reconnect the wiring correctly and turn ON No. 2 pin of DSW4 on PCB. The transmission circuit can be recovered. (If applying this error again, the transmission circuit can not be recovered)

PCB

Turn ON No.2 pin of DSW4

- 7) Terminating resistance is set in whole H-LINK system.
- If H-LINK connecting devices like package air-conditioner are connected besides the RAC Adaptor, set the terminating resistance by those connecting devices. The terminating resistance should be set ON in only one position in whole H-LINK system.
 - In case that H-LINK is connected only by the RAC adaptor, set the terminating resistance by the RAC adaptor. The terminating resistance should be set ON in only one position in whole H-LINK system.

PCB

Turn ON No.1 pin of DSW4

10.2.5 TEST RUN

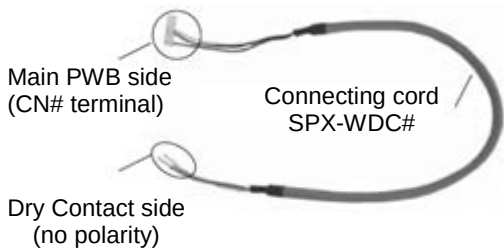
Test run should be performed in the following after finishing the installation, wiring and setting. Refer to the installation manuals enclosed with the control system equipment.

- Confirmation of RAC Adaptor Connection**
Confirm if the RAC adaptor connection is recognized in the control system equipments. In case that it is not confirmed, check the transmission cable, refrigerant cycle #, indoor unit #, terminal resistance setting etc.
- Registration**
Confirm if the RAC adaptor connection is recognized.
- Confirmation of RUN/STOP Operation.**
Confirm if the room air-conditioner operate correctly by RUN/STOP from the central control system equipments. Check also if the room air-conditioner operation changes correctly by each setting.

10.3 DRY CONTACT (SPX-WDC2 AND SPX-WDC3) APPLICATION (USING DIP SWITCH)

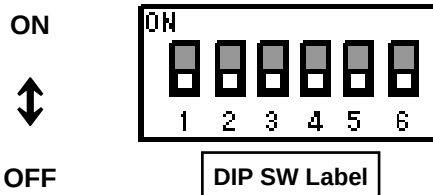
The dry contact system enables the operation of the air conditioner indoor unit to be controlled by using external dry contacts (with non voltage) such as card-key controller or window for facilities such as hotels.

Table 1 (Applicable models and related information)

Optional Connecting cord Accessory SPX-WDC#		Model	DIP SW Label	CN#
 Main PWB side (CN# terminal) Connecting cord SPX-WDC# Dry Contact side (no polarity)	SPX-WDC2	RAI-25/35/50/60RPE	SW501	CN9
		RAD-18QPE RAD-25/35/50/60RPE	SW501	CN9
	SPX-WDC3	RAK-18QXE RAK-25/35/50RXE	DSW1	CN6
		RAK-15QPE RAK-18/25/35/42/50RPE	DSW1	CN6
		RAK-50RPE1 RAK-60RPE	DSW1	CN6
		RAF-25/35/50RXE	DSW1	CN6

Note:

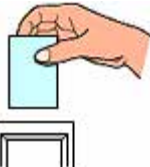
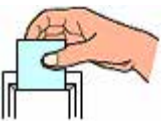
- 1) DRY CONTACT function is "Enable" by set pin No. 2 of the DIP SWITCH (refer to table 1 for the label) to ON position.
- 2) Select the proper setting for DRY CONTACT LOGIC INPUT pin No. 3 on DIP SWITCH (refer to Table 1 for the label)
 - i) Set to OFF position (Hi Input) if the type of Dry Contact switch to be used (for the CARD KEY UNIT or Window) is of contact type a (Normally Open Type) as shown in below diagram.
 - ii) Set to ON position (Lo Input) if the type of Dry contact switch to be used (for the CARD KEY UNIT or Window) is of contact type b (Normally Close Type) as shown in below diagram.



Pin No.	Function	Switch Position / Setting			
		OFF	Disable	ON	Enable
2	DRY CONTACT function				
3	DRY CONTACT Input Logic		HI Input Active		LO Input Active

- Please decide the type of dry contact you will be using and set the position of the DIP Switch No. 2 and 3 accordingly

[1] CHECK DRY CONTACT OF CARD KEY UNIT

	AIR CONDITIONER Standby	AIR CONDITIONER Operating
CARD KEY (Door Switch)	REMOVE 	INSERT 
Contact type a	OPEN 	CLOSE 
Contact type b	CLOSE 	OPEN 

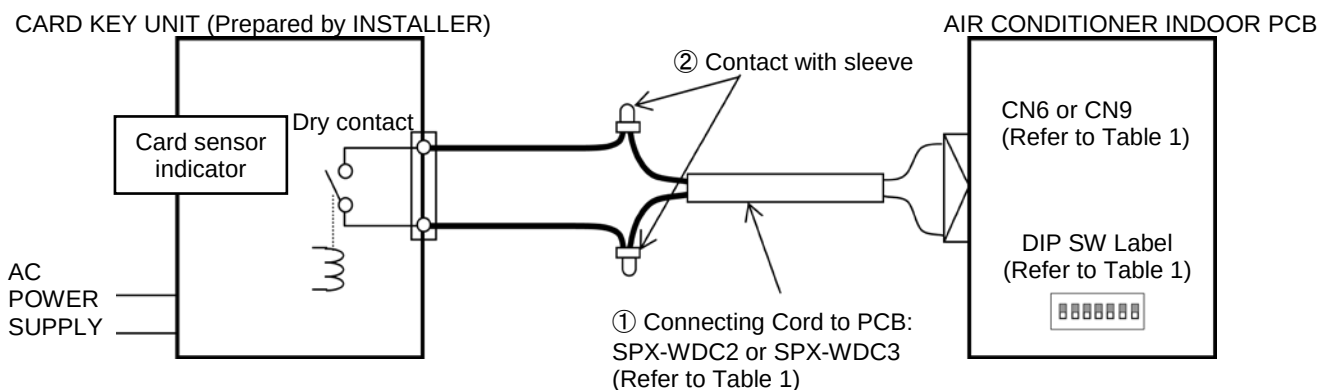
[2] SET THE POSITION OF DIP SWITCH

POSITION CONDITION OF DIP SWITCH	
INITIAL CONDITION (CARD KEY NO USE)  No.2 : OFF No.3 : OFF	
 No.2 : ON No.3 : OFF	HI Input Active
 No.2 : ON No.3 : ON	LO Input Active

After all connection has been done as below diagram, ON the breaker and push ON button of wireless remote controller or wired remote controller to operate the air conditioner unit.

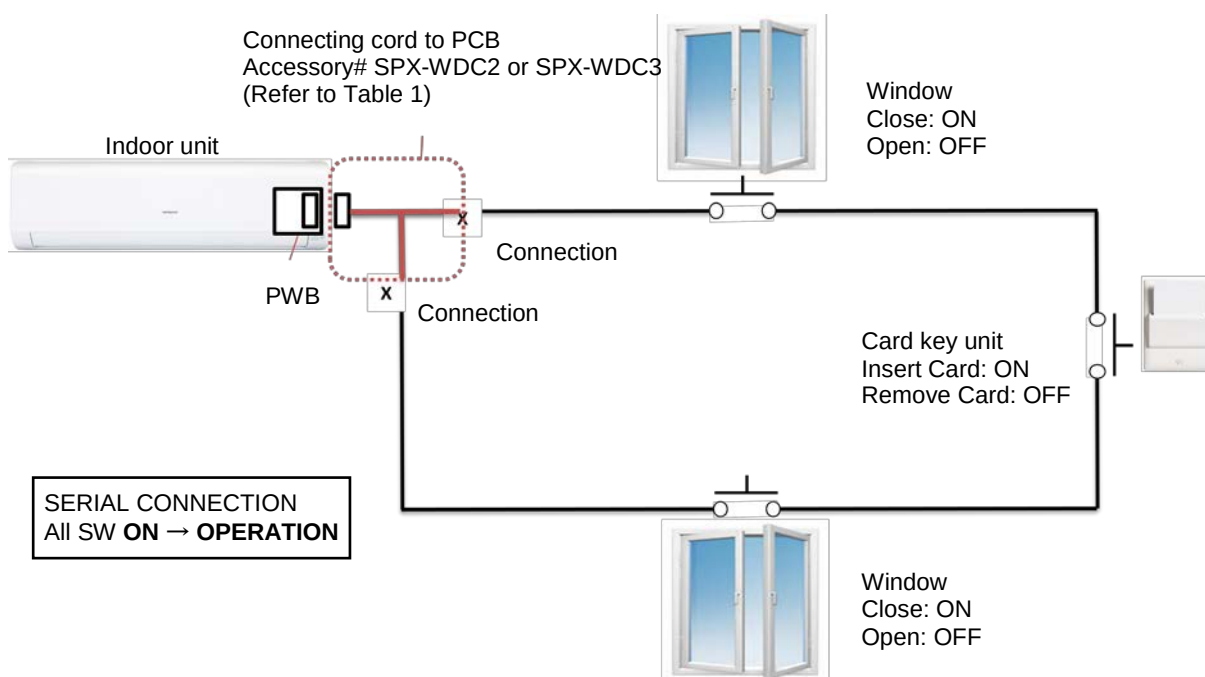
- When the CARD KEY is in insert condition, the air conditioner operation is allowable by remote controller.
- When the dry contact switch on the Card Key Unit is open (refer to diagram below for contact type a), the unit stops to operate (it takes 10 seconds to stop the unit operation after the dry contact switch on the card key turns off) and vice versa.
- When the card key is removed from the Card Key Unit, the wireless remote controller cannot be used.
- When the card key is removed from the Card Key Unit, the wired remote controller LCD display is activated; however it has no control over the unit.
- The suitable accessory Connecting Cord (accessory code#: SPX-WDC2 or SPX-WDC3) need to be used to connect the Card Key Unit's dry contact switch to the connector on the control board of the indoor unit. Please refer to Table 1 to select suitable accessory code# for the concerning indoor model.

Example of wiring connection to Card Key Unit will be as below (reference only)

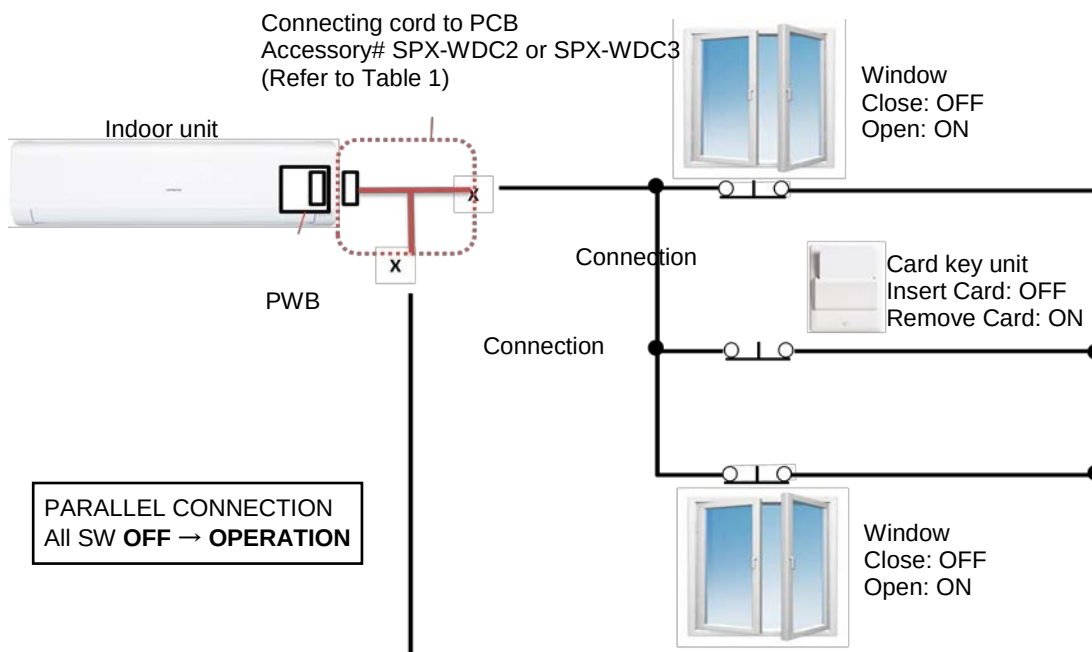


• CONNECTION EXAMPLE

i. Pin No. 3 of DIP SWITCH is set to OFF position (HI Input Active) for Dry Contact Type a



ii. Pin No. 3 of DIP SWITCH is set to ON position (LO Input Active) for Dry Contact Type b

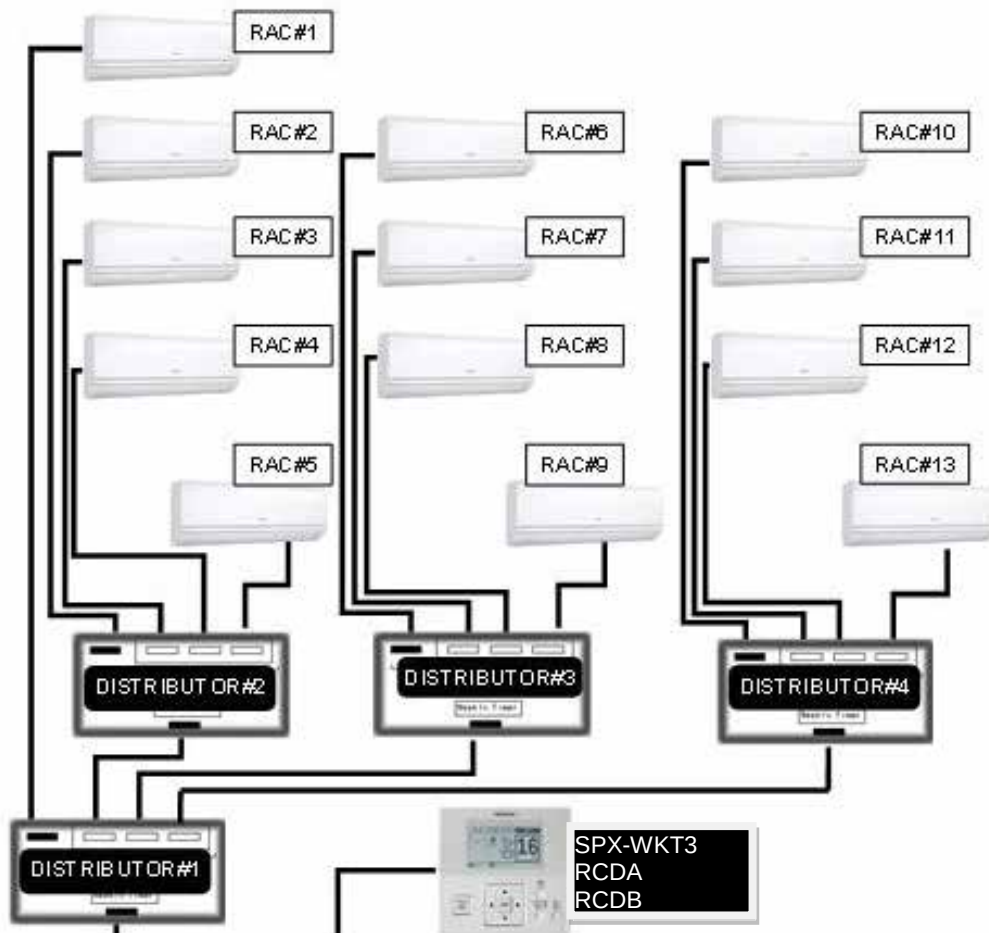
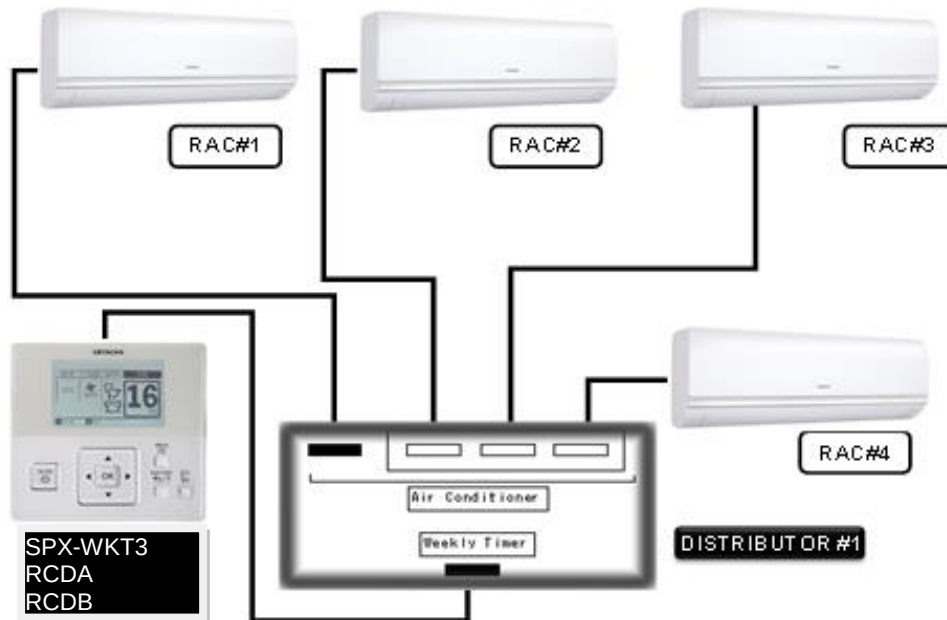


Please refer to the actual manual supplied with the optional connecting cords SPX-WDC2/WDC3 for more details.

10.4 DISTRIBUTOR – SPX-DST1

The optional distributor is to be used together with the wired remote controller when there is a need to centralize the control of multiple indoor units using only a single wired remote controller.

A single distributor could be connected further to 3 separate distributors so that up to 13 units of indoor could be controlled by a single wired remote controller.



10.5 REMOTE SENSOR - SPX-RTH1

This remote sensor is applicable to Duct type indoor unit for Hitachi split system air conditioner.

10.5.1 SELECTION OF INSTALLATION POSITION

The thermistor for detecting room temperature is installed inside the remote sensor

The installation position of the remote sensor should be determined in consideration with the following conditions.

- Where the average room temperature can be detected.
- Where is not exposed to the sun
- Where the heat source is not located near the remote sensor.
- Where the discharge air from the air conditioner does not blow directly.
- Where is not affected by the outdoor air when opening / closing the door, etc

10.5.2 INSTALLATION PROCEDURE

▪ In case of mounting onto the wall (Fig.1)

- Make the wiring on the sensor box, and let the wires for sensor through the box slot.
- Fix the sensor box onto the wall with 2 screws (B)
- In case that the sensor box can not be fixed onto the wall with screws, fix it onto the wall by using the double sided adhesive tapes, etc.

▪ In case of mounting onto Electrical Switch box (Fig. 2 and 3)

- Make the holes for fixing sensor box on the Switch Box Cover (A) (field-supplied) as shown on the Fig. 3 and fix the sensor box to the plate with screws (B)
- Pay attention that the hole for air intake on the sensor box (C) may not be shut.

Fig. 1

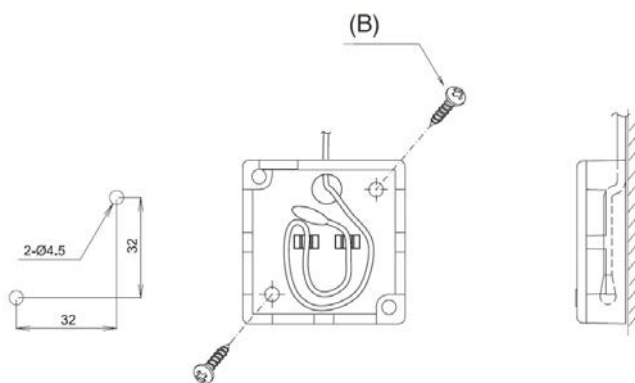


Fig. 2

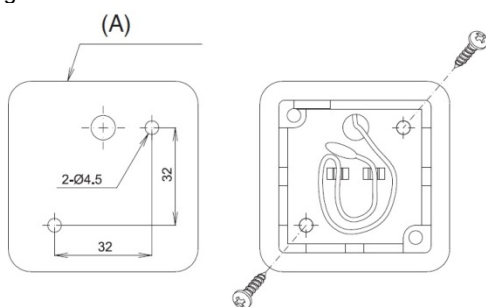
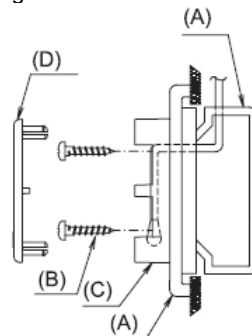


Fig. 3



10.5.3 WIRING PROCEDURES

- Remove the original room thermistor from CN1 at the indoor printed circuit board.
- Connect the cord (15m) of the remote sensor to CN1 (Black) of the indoor printed circuit board.

Please refer to the actual manual supplied with the SPX- RTH1 for more details.

Specification in this document are subject to change without notice, in order that Johnson Controls Hitachi Air Conditioning Malaysia Sdn. Bhd. may bring the latest innovations to their customers.

Johnson Controls Hitachi Air Conditioning Malaysia Sdn. Bhd.

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