SERVICE MANUAL

TECHNICAL INFORMATION
FOR SERVICE PERSONNEL ONLY

HITACHI

air Home Multi Pro

SPLIT UNIT AIR CONDITIONER

OUTDOOR UNIT



RAM-G110N5HAE

MODEL
RAM-G110N5HAE

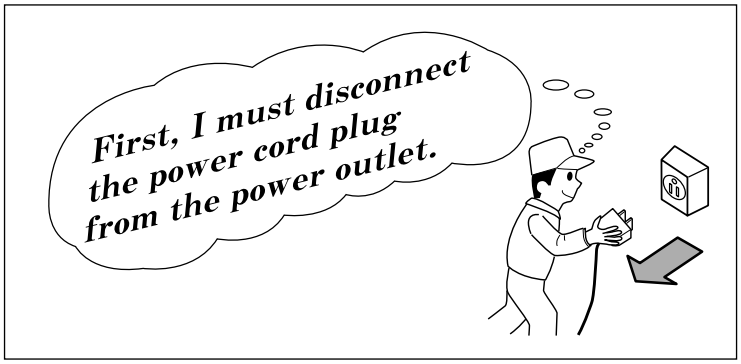
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Cooling & Heating

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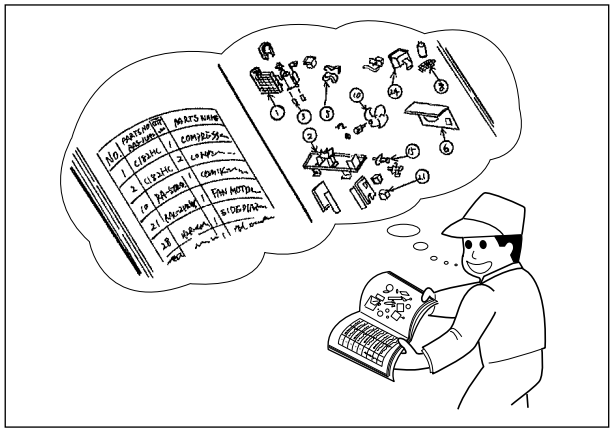
SAFETY DURING REPAIR WORK

1. In order to disassemble and repair the unit in question, be sure to disconnect the power cord plug from the power outlet before starting the work.



2. If it is necessary to replace any parts, they should be replaced with respective genuine parts for the unit, and the replacement must be effected in correct manner according to the instructions in the Service Manual of the unit.

> If the contacts of electrical parts are defective, replace the electrical parts without trying to repair them.



3. After completion of repairs, the initial state should be restored.

4. Lead wires should be connected and laid as in the initial state.

5. Modification of the unit by the user himself should absolutely be prohibited.

6. Tools and measuring instruments for use in repairs or inspection should be accurately calibrated in advance.

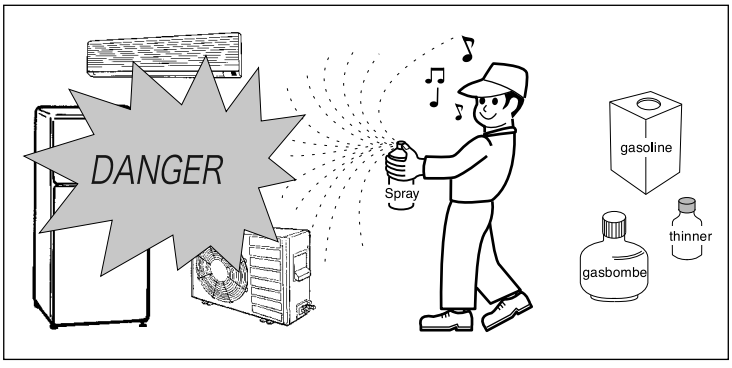
7. In installing the unit having been repaired, be careful to prevent the occurence of any accident such as electrical shock, leak of current, or bodily injury due to the drop of any part.

8. To check the insulation of the unit, measure the insulation resistance between the power cord plug and grounding terminal of the unit. The insulation resistance should be 1MΩ or more as measured by a 500V DC megger.

9. The initial location of installation such as window, floor or the other should be checked for being and safe enough to support the repaired unit again.
   If it is found not so strong and safe, the unit should be installed at the initial location after reinforced or at a new location.

10. Any inflammable object must not be placed about the location of installation.

11. Check the grounding to see whether it is proper or not, and if it is found improper, connect the grounding terminal to the earth.



WORKING STANDARDS FOR PREVENTING BREAKAGE OF SEMICONDUCTORS

1. Scope
   The standards provide for items to be generally observed in carrying and handling semiconductors in relative manufacturers during maintenance and handling thereof. (They apply the same to handling of abnormal goods such as rejected goods being returned).

2. Object parts

   (1) Micro computer
   (2) Integrated circuits (I.C.)
   (3) Field-effective transistor (F.E.T.)
   (4) P.C. boards or the like to which the parts mentioned in (1) and (2) of this paragraph are equipped.

3. Items to be observed in handling

   (1) Use a conductive container for carrying and storing of parts. (Even rejected goods should be handled in the same way).

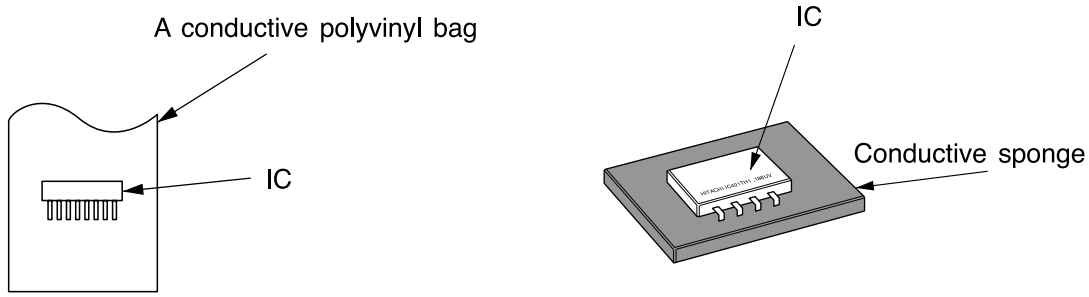


Fig. 1. Conductive container

   (2) When any part is handled uncovered (in counting, packing and the like), the handling person must always use himself as a body earth. (Make yourself a body earth by passing 1MΩ earth resistance through a ring or bracelet).

   (3) Be careful not to touch the parts with your clothing when you hold a part even if a body earth is being taken.

   (4) Be sure to place a part on a metal plate with grounding.

   (5) Be careful not to fail to turn off power when you repair the printed circuit board. At the same time, try to repair the printed circuit board on a grounded metal plate.

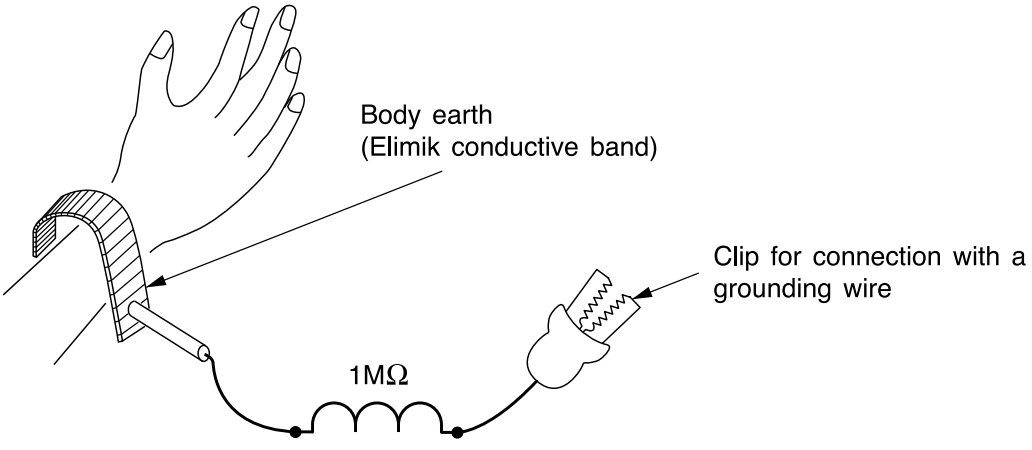


Fig. 2. Body Earth

(6) Use a three wire type soldering iron including a grounding wire.

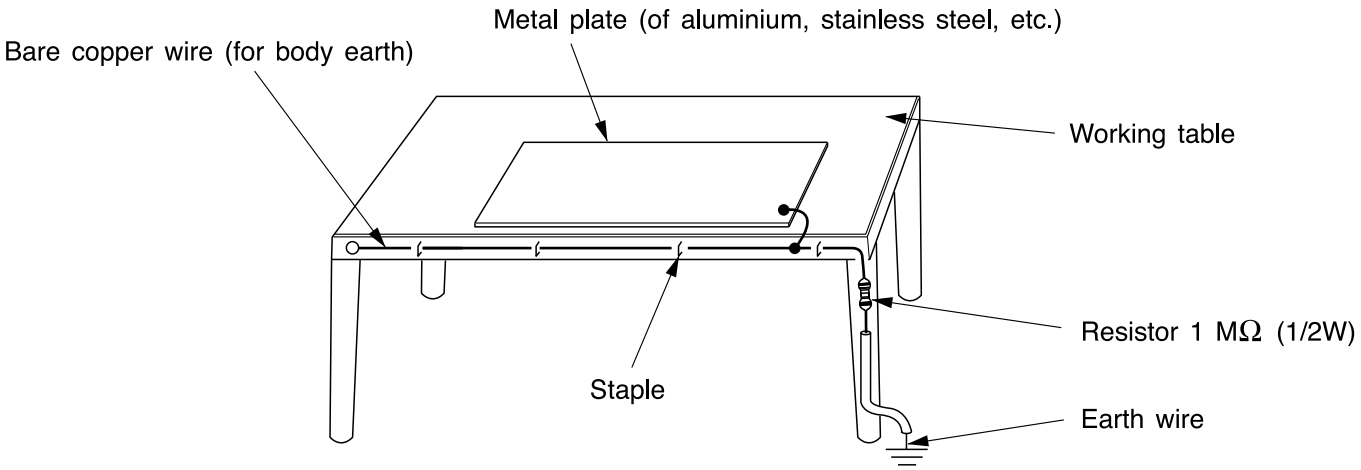


Fig. 3. Grounding of the working table

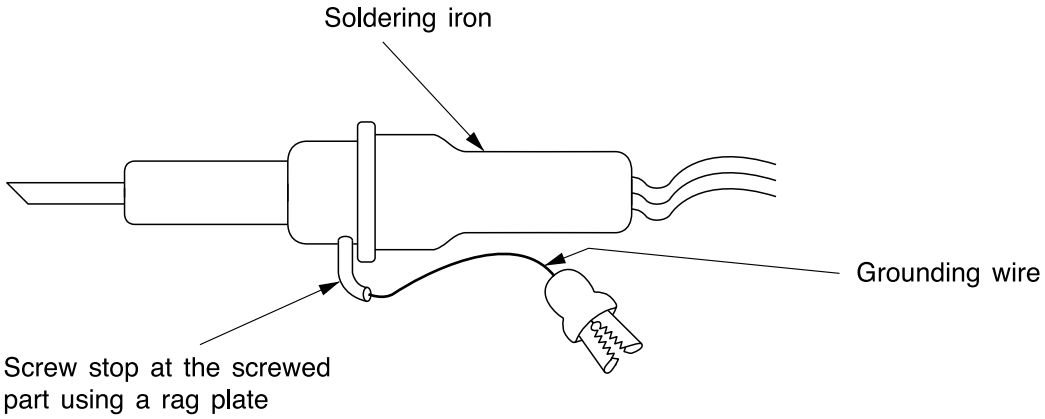


Fig. 4. Grounding a solder iron

Use a high insulation mode (100V, 10MΩ or higher) when ordinary iron is to be used.

(7) In checking circuits for maintenance, inspection or some others, be careful not to have the test probes of the measuring instrument short circuit a load circuit or the like.

⚠ CAUTION

1. In quiet operation or stopping the running, slight flowing noise of refrigerant in the refrigerating cycle is heard occasionally, but this noise is not abnormal for the operation.

2. When it thunders nearby, it is recommend to stop the operation and to disconnect the power cord plug from the power outlet for safety.

3. In the event of power failure, the air conditioner will restart automatically in the previously selected mode once the power is restored. In the event of power failure during TIMER operation, the air conditioner will not start automatically. Re-press ON/OFF button after 3 minutes from when the unit off or power recovery.

4. If the room air conditioner is stopped by adjusting thermostat, or miss operation, and re-start in a moment, there is occasion that the cooling and heating operation does not start for 3 minutes, it is not abnormal and this is the result of the operation of IC delay circuit. This IC delay circuit ensures that there is no danger of blowing fuse or damaging parts even if operation is restarted accidentally.

5. This room air conditioner should not be used at the cooling operation when the outside temperature is below –10°C (14°F).

6. This room air conditioner (the reverse cycle) should not be used when the outside temperature is below –15°C (5°F).
   If the reverse cycle is used under this condition, the outside heat exchanger is frosted and efficiency falls.

7. When the outside heat exchanger is frosted, the frost is melted by operating the hot gas system, it is not trouble that at this time fan stops and the vapour may rise from the outside heat exchanger.

SPECIFICATIONS

MODEL		RAM-G110N5HAE
FAN MOTOR		120 W
FAN MOTOR CAPACITOR		NO
FAN MOTOR PROTECTOR		NO
COMPRESSOR		GTD226UKPA8LT6C
COMPRESSOR MOTOR CAPACITOR		NO
OVERLOAD PROTECTOR		YES
OVERHEAT PROTECTOR		YES
FUSE (for MICROPROCESSOR)		25A, 5.0A, 2.0A
POWER RELAY		G4A
POWER SWITCH		NO
TEMPORARY SWITCH		NO
SERVICE SWITCH (TEST SWITCH)		YES
TRANSFORMER		YES
VARISTOR		S14K320E2G10AS5
NOISE SUPPRESSOR		YES
THERMOSTAT		YES(IC)
REMOTE CONTROL SWITCH (LIQUID CRYSTAL)		NO
REFRIGERANT CHARGING VOLUME (Refrigerant R32)	UNIT	2720g
	PIPES	MAX. 75m

In case the pipe length is more than 30m, add refrigerant R32 at 13gram per every meter exceeds.

SPECIFICATIONS FOR INDOOR UNITS COMBINATION

TYPE		DC INVERTER FIVE SYSTEM MULTI COOLING AND HEATING
MODEL	OUTDOOR UNIT	RAM-G110N5HAE
PHESE/VOLTAGE/FREQUENCY		1ø, 220 - 240V, 50Hz
CIRCUIT AMPERES TO CONNECT (A)		25
COOLING (FIVE UNITS)	CAPACITY (kW) (B.T.U./h)	10.0
		34,120
	TOTAL INPUT (W)	2,967
	EER (B.T.U./hW)	11.50
	TOTAL AMPERES (A)	14.20 - 13.58
	POWER FACTOR (%)	95 - 99
HEATING (FIVE UNITS)	CAPACITY (kW) (B.T.U./h)	12.00
		40,950
	TOTAL INPUT (W)	2,778
	EER (B.T.U./hW)	14.74
	TOTAL AMPERES (A)	13.29 - 12.71
	POWER FACTOR (%)	95 - 99
MAXIMUM LENGTH OF PIPING		MAX. 75m (FIVE UNIT TOTAL)
STANDARD		CE (EMC&LVD)

MODEL		RAM-G110N5HAE
PACKING (mm)	W	1,116
	H	1,100
	D	520
	cu.ft.	22.54
GROSS WEIGHT (kg)		90
FLARE NUT SIZE (SMALL/LARGE)		6.35DX5/9.52DX3&12.7DX2

OPERATION SCOPE

	INDOOR SUCTION TEMPERATURE (˚C)	OUTDOOR SUCTION TEMPERATURE (˚C)	INDOOR SUCTION HUMIDITY (%)
COOLING OPERATION SCOPE	16 - 32	–10 ~ 46	BELOW 80
HEATING OPERATION SCOPE	BELOW 27	–15 ~ 24	–

DC INVERTER SYSTEM MULTI R.A.C. RAM-G110N5HAE
COOL / HEAT CAPACITY SPEC. FOR INDOOR UNITS COMBINATIONS TO BE ABLE TO OPERATE SIMULTANEOUSLY

Whichever indoor units are installed, cooling and heating capacity depends on how many and which indoor units are operating at that time.

5 ROOM MULTI-SPLIT INVERTER TYPE RAC : RAM-G110N5HAE
POSSIBLE COMBINATION TO OPERATE (SAME TIME OPERATION)

(Reference value)

	POSSIBLECOMBINATIONSTO OPERATE		COOLING							HEATING						
			CAPACITY RATING(kW) (RANGE) (kW) (RANGE)	TOTAL	OUTDOOR UNIT POWER CONSUMPTION (W)	OUTDOOR UNIT AMPERE (A) at 220V - 230V - 240V			EER	CAPACITY RATING(kW) (RANGE) (kW) (RANGE)	TOTAL	OUTDOOR UNIT POWER CONSUMPTION (W)	OUTDOOR UNIT AMPERE (A) at 220V - 230V - 240V			COP
ONE UNITS	1.5	1.5	1.50 1.00 ~ 1.60	1.50	460 (320-480)	2.11	2.02	1.94	3.26	2.00 1.50 ~ 2.20	2.00	610 (360-850)	2.80	2.68	2.57	3.28
	1.8	1.8	1.80 1.70 ~ 2.00	1.80	560 (320-610)	2.57	2.46	2.36	3.21	2.50 2.00 ~ 3.00	2.50	1000 (360-1100)	4.59	4.39	4.21	2.50
	2.5	2.5	2.50 1.70 ~ 2.80	2.50	830 (320-860)	3.81	3.65	3.49	3.01	3.40 2.00 ~ 4.00	3.40	1430 (360-1600)	6.57	6.28	6.02	2.38
	3.5	3.5	3.50 1.70 ~ 3.90	3.50	1200 (320-1270)	5.51	5.27	5.05	2.92	4.30 2.00 ~ 5.20	4.30	1620 (360-1820)	7.44	7.11	6.82	2.65
	4.2	4.2	4.20 1.70 ~ 4.60	4.20	1400 (320-1560)	6.43	6.15	5.89	3.00	5.20 2.00 ~ 6.50	5.20	2000 (360-2240)	9.18	8.78	8.42	2.60
	5.0	5.0	5.00 1.70 ~ 5.50	5.00	1600 (320-1860)	7.35	7.03	6.73	3.13	6.50 2.00 ~ 7.30	6.50	2300 (360-2580)	10.56	10.10	9.68	2.83
	6.0	6.0	6.00 1.70 ~ 6.60	6.00	1850 (320-2100)	8.49	8.12	7.79	3.24	7.50 2.00 ~ 8.20	7.50	2350 (360-2950)	10.79	10.32	9.89	3.19
	7.0	7.0	7.00 1.70 ~ 7.70	7.00	1900 (320-2100)	8.72	8.34	8.00	3.68	8.20 2.00 ~ 9.00	8.20	2400 (360-2950)	11.02	10.54	10.10	3.42
TWO UNITS	3.0	1.5 + 1.5	1.50 + 1.50 2.40 ~ 3.50	3.00	900 (500-1020)	4.13	3.95	3.79	3.33	2.00 + 2.00 2.70 ~ 4.70	4.00	1100 (500-1300)	5.05	4.83	4.63	3.64
	3.3	1.5 + 1.8	1.50 + 1.80 2.40 ~ 3.80	3.30	980 (500-1140)	4.50	4.30	4.12	3.37	2.00 ~ 2.50 2.70 ~ 5.20	4.50	1350 (500-1550)	6.20	5.93	5.68	3.33
	4.0	1.5 + 2.5	1.50 + 2.50 2.40 ~ 4.50	4.00	1200 (500-1500)	5.51	5.27	5.05	3.33	2.00 ~ 3.40 2.70 ~ 6.10	5.40	1500 (500-1700)	6.89	6.59	6.31	3.60
	5.0	1.5 + 3.5	1.50 + 3.50 2.40 ~ 5.50	5.00	1600 (500-1860)	7.35	7.03	6.73	3.13	2.00 ~ 4.30 2.70 ~ 7.00	6.30	1750 (500-2060)	8.03	7.69	7.37	3.60
	5.7	1.5 + 4.2	1.50 + 4.20 2.40 ~ 6.20	5.70	1950 (500-2050)	8.95	8.56	8.21	2.92	2.00 ~ 5.20 2.70 ~ 7.90	7.20	2050 (500-2560)	9.41	9.00	8.63	3.51
	6.5	1.5 + 5.0	1.50 + 5.00 2.40 ~ 7.00	6.50	2250 (500-2520)	10.33	9.88	9.47	2.89	2.00 ~ 6.50 2.70 ~ 9.20	8.50	2800 (500-3000)	12.86	12.30	11.78	3.04
	7.5	1.5 + 6.0	1.50 + 6.00 2.40 ~ 8.00	7.50	2400 (500-2520)	11.02	10.54	10.10	3.13	2.00 ~ 7.50 2.70 ~ 10.20	9.50	2800 (500-3000)	12.86	12.30	11.78	3.39
	8.5	1.5 + 7.0	1.50 + 7.00 2.40 ~ 9.00	8.50	2400 (500-2520)	11.02	10.54	10.10	3.54	2.00 ~ 8.20 2.70 ~ 10.90	10.20	2800 (500-3000)	12.86	12.30	11.78	3.64
	3.6	1.8 + 1.8	1.80 + 1.80 2.40 ~ 4.00	3.60	1050 (500-1160)	4.82	4.61	4.42	3.43	2.50 ~ 2.50 2.70 ~ 5.70	5.00	1500 (500-1710)	6.89	6.59	6.31	3.33
	4.3	1.8 + 2.5	1.80 + 2.50 2.40 ~ 4.70	4.30	1290 (500-1590)	5.92	5.67	5.43	3.33	2.50 ~ 3.40 2.70 ~ 6.60	5.90	1615 (500-1990)	7.42	7.09	6.80	3.65
	5.3	1.8 + 3.5	1.80 + 3.50 2.40 ~ 5.80	5.30	1650 (500-1900)	7.58	7.25	6.94	3.21	2.50 ~ 4.30 2.70 ~ 7.50	6.80	1980 (500-2320)	9.09	8.70	8.33	3.43
	6.0	1.8 + 4.2	1.59 + 3.71 2.40 ~ 6.50	6.00	1980 (500-2100)	9.09	8.70	8.33	3.03	2.50 ~ 5.20 2.70 ~ 8.40	7.70	2150 (500-2880)	9.87	9.44	9.05	3.58
	6.8	1.8 + 5.0	1.80 + 5.00 2.40 ~ 7.50	6.80	2350 (500-2970)	10.79	10.32	9.89	2.89	2.50 ~ 6.50 2.70 ~ 9.70	9.00	2500 (500-3400)	11.48	10.98	10.52	3.60
	7.8	1.8 + 6.0	1.80 + 6.00 2.40 ~ 8.20	7.80	2470 (500-3120)	11.34	10.85	10.40	3.16	2.50 ~ 7.50 2.70 ~ 10.70	10.00	2700 (500-3400)	12.40	11.86	11.36	3.70
	8.8	1.8 + 7.0	1.80 + 7.00 2.40 ~ 9.20	8.80	2470 (500-3120)	11.34	10.85	10.40	3.56	2.50 ~ 8.20 2.70 ~ 11.40	10.70	3050 (500-3400)	14.00	13.39	12.84	3.51
	5.0	2.5 + 2.5	2.50 + 2.50 2.40 ~ 5.50	5.00	1440 (500-1640)	6.61	6.32	6.06	3.47	3.40 ~ 3.40 2.70 ~ 7.50	6.80	1900 (500-2250)	8.72	8.34	8.00	3.58
	6.0	2.5 + 3.5	2.50 + 3.50 2.40 ~ 6.60	6.00	1930 (500-2400)	8.86	8.48	8.12	3.11	3.40 ~ 4.30 2.70 ~ 8.40	7.70	2150 (500-2590)	9.87	9.44	9.05	3.58
	6.7	2.5 + 4.2	2.50 + 4.20 2.40 ~ 7.00	6.70	2280 (500-2400)	10.47	10.01	9.60	2.94	3.40 ~ 5.20 2.70 ~ 9.30	8.60	2330 (500-3110)	10.70	10.23	9.81	3.69
	7.5	2.5 + 5.0	2.50 + 5.00 2.40 ~ 8.00	7.50	2580 (500-3270)	11.85	11.33	10.86	2.91	3.40 ~ 6.50 2.70 ~ 10.60	9.90	3180 (500-3400)	14.60	13.97	13.38	3.11
	8.5	2.5 + 6.0	2.50 + 6.00 2.40 ~ 9.00	8.50	2650 (500-3270)	12.17	11.64	11.15	3.21	3.40 ~ 7.50 2.70 ~ 11.60	10.90	3220 (500-3400)	14.78	14.14	13.55	3.39
	9.5	2.5 + 7.0	2.50 + 7.00 2.40 ~ 10.00	9.50	2780 (500-3270)	12.76	12.21	11.70	3.42	3.40 ~ 8.60 2.70 ~ 12.30	11.60	3350 (500-3600)	15.38	14.71	14.10	3.46
	7.0	3.5 + 3.5	3.50 + 3.50 2.40 ~ 7.80	7.00	2300 (450-2990)	10.56	10.10	9.68	3.04	4.30 ~ 4.30 2.70 ~ 9.30	8.60	2400 (500-2860)	11.02	10.54	10.10	3.58
	7.7	3.5 + 4.2	3.50 + 4.20 2.40 ~ 8.10	7.70	2600 (500-2990)	11.94	11.42	10.94	2.96	4.30 ~ 5.20 2.70 ~ 10.20	9.50	2650 (500-3320)	12.17	11.64	11.15	3.58
	8.5	3.5 + 5.0	3.50 + 5.00 2.40 ~ 8.80	8.50	2700 (500-3270)	12.40	11.86	11.36	3.15	4.30 ~ 6.50 2.70 ~ 11.50	10.80	3220 (500-3600)	14.78	14.14	13.55	3.35
	9.5	3.5 + 6.0	3.50 + 6.00 2.40 ~ 10.10	9.50	2850 (500-3270)	13.09	12.52	11.99	3.33	4.30 ~ 7.50 2.70 ~ 12.50	11.80	3280 (500-3600)	15.06	14.40	13.80	3.60
	10.5	3.5 + 7.0	3.33 + 6.67 2.40 ~ 11.00	10.00	2900 (500-3270)	13.31	12.74	12.21	3.45	4.13 ~ 7.87 2.70 ~ 12.70	12.00	3450 (500-3600)	15.84	15.15	14.52	3.48
	8.4	4.2 + 4.2	4.20 + 4.20 2.40 ~ 8.80	8.40	2680 (500-3270)	12.30	11.77	11.28	3.13	5.20 ~ 5.20 2.70 ~ 11.10	10.40	2890 (500-3260)	13.27	12.69	12.16	3.60
	9.2	4.2 + 5.0	4.20 + 5.00 2.40 ~ 9.70	9.20	3100 (500-3470)	14.23	13.61	13.05	2.97	5.20 ~ 6.50 2.70 ~ 12.40	11.70	3170 (500-3800)	14.55	13.92	13.34	3.69
	10.2	4.2 + 6.0	3.99 + 5.70 2.40 ~ 11.00	10.00	3300 (500-3470)	15.15	14.49	13.89	3.03	4.91 ~ 7.09 2.70 ~ 12.70	12.00	3450 (500-3800)	15.84	15.15	14.52	3.48
	11.2	4.2 + 7.0	3.75 + 6.25 2.40 ~ 11.00	10.00	3400 (500-3470)	15.61	14.93	14.31	2.94	4.66 ~ 7.34 2.70 ~ 12.70	12.00	3450 (500-3800)	15.84	15.15	14.52	3.48
	10.0	5.0 + 5.0	5.00 + 5.00 2.40 ~ 11.00	10.00	3300 (500-3670)	15.15	14.49	13.89	3.03	6.00 ~ 6.00 2.70 ~ 12.70	12.00	3450 (500-3800)	15.84	15.15	14.52	3.48
	11.0	5.0 + 6.0	4.55 + 5.45 2.40 ~ 11.00	10.00	3300 (500-3780)	15.15	14.49	13.89	3.03	5.57 ~ 6.43 2.70 ~ 12.70	12.00	3450 (500-3800)	15.84	15.15	14.52	3.48
	12.0	5.0 + 7.0	4.17 + 5.83 2.40 ~ 11.00	10.00	3500 (500-3780)	16.07	15.37	14.73	2.86	5.31 ~ 6.69 2.70 ~ 12.70	12.00	3450 (500-3800)	15.84	15.15	14.52	3.48
	12.0	6.0 + 6.0	5.00 + 5.00 2.40 ~ 11.00	10.00	3500 (500-3870)	16.07	15.37	14.73	2.86	6.00 ~ 6.00 2.70 ~ 12.70	12.00	3450 (500-3800)	15.84	15.15	14.52	3.48
	13.0	6.0 + 7.0	5.00 + 5.00 2.40 ~ 11.00	10.00	3600 (500-3870)	16.53	15.81	15.15	2.78	5.73 ~ 6.27 2.70 ~ 12.70	12.00	3450 (500-3800)	15.84	15.15	14.52	3.48
	14.0	7.0 + 7.0	5.00 + 5.00 2.40 ~ 11.00	10.00	3700 (500-3870)	16.99	16.25	15.57	2.70	5.93 ~ 6.07 2.70 ~ 12.70	12.00	3450 (500-3800)	15.84	15.15	14.52	3.48
	4.5	1.5 + 1.5 + 1.5	1.50 + 1.50 + 1.50 2.70 ~ 5.00	4.50	1300 (510-1500)	5.97	5.71	5.47	3.46	2.00 ~ 2.00 + 2.00 2.90 ~ 6.70	6.00	1500 (520-1850)	6.89	6.59	6.31	4.00
	4.8	1.5 + 1.5 + 1.8	1.50 + 1.50 + 1.80 2.70 ~ 5.30	4.80	1340 (510-1620)	6.15	5.88	5.64	3.58	2.00 ~ 2.00 + 2.50 2.90 ~ 7.20	6.50	1600 (520-2160)	7.35	7.03	6.73	4.06
	5.5	1.5 + 1.5 + 2.5	1.50 + 1.50 + 2.50 2.70 ~ 6.00	5.50	1450 (510-1980)	6.66	6.37	6.10	3.79	2.00 ~ 2.00 + 3.40 2.90 ~ 8.10	7.40	1840 (520-2400)	8.45	8.08	7.74	4.02
	6.5	1.5 + 1.5 + 3.5	1.50 + 1.50 + 3.50 2.70 ~ 7.00	6.50	1700 (510-2670)	7.81	7.47	7.15	3.82	2.00 ~ 2.00 + 4.30 2.90 ~ 9.00	8.30	2230 (520-2900)	10.24	9.79	9.39	3.72
	7.2	1.5 + 1.5 + 4.2	1.50 + 1.50 + 4.20 2.70 ~ 7.80	7.20	1980 (510-2670)	9.09	8.70	8.33	3.64	2.00 ~ 2.00 + 5.20 2.90 ~ 9.90	9.20	2540 (520-2900)	11.66	11.16	10.69	3.62
	8.0	1.5 + 1.5 + 5.0	1.50 + 1.50 + 5.00 2.70 ~ 8.50	8.00	2370 (510-2870)	10.88	10.41	9.97	3.38	2.00 ~ 2.00 + 6.50 2.90 ~ 11.20	10.50	2850 (520-3450)	13.09	12.52	11.99	3.68
	9.0	1.5 + 1.5 + 6.0	1.50 + 1.50 + 6.00 2.70 ~ 9.50	9.00	2900 (510-3470)	13.31	12.74	12.21	3.10	2.00 ~ 2.00 + 7.50 2.90 ~ 12.20	11.50	3170 (520-3450)	14.55	13.92	13.34	3.63
	10.0	1.5 + 1.5 + 7.0	1.50 + 1.50 + 7.00 2.70 ~ 10.50	10.00	3450 (510-3670)	15.84	15.15	14.52	2.90	1.89 ~ 2.36 + 7.75 2.90 ~ 12.70	12.00	3170 (520-3450)	14.55	13.92	13.34	3.79
	5.1	1.5 + 1.8 + 1.8	1.50 + 1.80 + 1.80 2.70 ~ 5.60	5.10	1380 (510-1620)	6.34	6.06	5.81	3.70	2.00 ~ 2.50 + 2.50 2.90 ~ 7.70	7.00	1700 (520-2280)	7.81	7.47	7.15	4.12
	5.8	1.5 + 1.8 + 2.5	1.50 + 1.80 + 2.50 2.70 ~ 6.30	5.80	1470 (510-1820)	6.75	6.46	6.19	3.95	2.00 ~ 2.50 + 3.40 2.90 ~ 8.60	7.90	1930 (520-2600)	8.86	8.48	8.12	4.09
	6.8	1.5 + 1.8 + 3.5	1.50 + 1.80 + 3.50 2.70 ~ 7.30	6.80	1820 (510-2900)	8.36	7.99	7.66	3.74	2.00 ~ 2.50 + 4.30 2.90 ~ 9.50	8.80	2360 (520-3030)	10.84	10.36	9.93	3.73
	7.5	1.5 + 1.8 + 4.2	1.50 + 1.80 + 4.20 2.70 ~ 8.00	7.50	2100 (510-2900)	9.64	9.22	8.84	3.57	2.00 ~ 2.50 + 5.20 2.90 ~ 10.40	9.70	2680 (520-3030)	12.30	11.77	11.28	3.62
	8.3	1.5 + 1.8 + 5.0	1.50 + 1.80 + 5.00 2.70 ~ 9.10	8.30	2500 (510-2900)	11.48	10.98	10.52	3.32	2.00 ~ 2.50 + 6.50 2.90 ~ 11.70	11.00	2940 (520-3690)	13.50	12.91	12.37	3.74
	9.3	1.5 + 1.8 + 6.0	1.50 + 1.80 + 6.00 2.70 ~ 10.20	9.30	3050 (510-3450)	14.00	13.39	12.84	3.05	2.00 ~ 2.50 + 7.50 2.90 ~ 12.70	12.00	3270 (520-3690)	15.01	14.36	13.76	3.67
	10.3	1.5 + 1.8 + 7.0	1.46 + 1.75 + 6.79 2.70 ~ 10.97	10.00	3450 (510-3450)	15.84	15.15	14.52	2.90	1.89 ~ 2.36 + 7.75 2.90 ~ 12.70	12.00	3270 (520-3690)	15.01	14.36	13.76	3.67
	6.5	1.5 + 2.5 + 2.5	1.50 + 2.50 + 2.50 2.70 ~ 7.00	6.50	1700 (510-2520)	7.81	7.47	7.15	3.82	2.00 ~ 3.40 + 3.40 2.90 ~ 9.50	8.80	2230 (520-3030)	10.24	9.79	9.39	3.95
	7.5	1.5 + 2.5 + 3.5	1.50 + 2.50 + 3.50 2.70 ~ 8.30	7.50	2100 (510-3090)	9.64	9.22	8.84	3.57	2.00 ~ 3.40 + 4.30 2.90 ~ 10.40	9.70	2680 (520-3030)	12.30	11.77	11.28	3.62
	8.2	1.5 + 2.5 + 4.2	1.50 + 2.50 + 4.20 2.70 ~ 8.70	8.20	2480 (510-3360)	11.39	10.89	10.44	3.31	2.00 ~ 3.40 + 5.20 2.90 ~ 11.30	10.60	2910 (520-3030)	13.36	12.78	12.25	3.64
	9.0	1.5 + 2.5 + 5.0	1.50 + 2.50 + 5.00 2.70 ~ 9.90	9.00	2900 (510-3360)	13.31	12.74	12.21	3.10	2.00 ~ 3.40 + 6.50 2.90 ~ 12.60	11.90	3170 (520-3690)	14.55	13.92	13.34	3.75
	10.0	1.5 + 2.5 + 6.0	1.50 + 2.50 + 6.00 2.70 ~ 11.00	10.00	3450 (510-3600)	15.84	15.15	14.52	2.90	1.86 ~ 3.16 + 6.98 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07	15.37	14.73	3.43
	11.0	1.5 + 2.5 + 7.0	1.36 + 2.27 + 6.37 2.70 ~ 11.00	10.00	3550 (510-3600)	16.30	15.59	14.94	2.82	1.76 ~ 3.00 + 7.24 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07	15.37	14.73	3.43
	8.5	1.5 + 3.5 + 3.5	1.50 + 3.50 + 3.50 2.70 ~ 9.40	8.50	2640 (510-3600)	12.12	11.59	11.11	3.22	2.00 ~ 4.30 + 4.30 2.90 ~ 11.30	10.60	3000 (520-3360)	13.77	13.18	12.63	3.53
	9.2	1.5 + 3.5 + 4.2	1.50 + 3.50 + 4.20 2.70 ~ 10.10	9.20	3000 (510-3600)	13.77	13.18	12.63	3.07	2.00 ~ 4.30 + 5.20 2.90 ~ 12.20	11.50	3240 (520-3360)	14.88	14.23	13.64	3.55

			COOLING						HEATING					
					OUTDOOR UNIT						OUTDOOR UNIT			
	POSSIBLECOMBINATIONSTO OPERATE		CAPACITY RATING(KW) (RANGE) (kW) (RANGE)	TOTAL	POWER CONSUMPTION (W)	AMPERE (A) at 220V - 230V - 240V	EER	CAPACITY RATING(KW) (RANGE) (kW) (RANGE)	TOTAL	POWER CONSUMPTION (W)	AMPERE (A) at 220V - 230V - 240V	COP
THREE UNITS	10.0	1.5 + 3.5 + 5.0	1.50 + 3.50 + 5.00 2.70 ~ 11.00	10.00	3450 (510-3600)	15.84 - 15.15 - 14.52	2.90	1.88 ~ 4.03 + 6.09 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	11.0	1.5 + 3.5 + 6.0	1.36 + 3.18 + 5.45 2.70 ~ 11.00	10.00	3550 (510-3700)	16.30 - 15.59 - 14.94	2.82	1.74 ~ 3.74 + 6.52 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	12.0	1.5 + 3.5 + 7.0	1.25 + 2.92 + 5.83 2.70 ~ 12.50	10.00	3600 (510-3800)	16.53 - 15.81 - 15.15	2.78	1.66 ~ 3.56 + 6.79 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	9.9	1.5 + 4.2 + 4.2	1.50 + 4.20 + 4.20 2.70 ~ 10.50	9.90	3400 (510-3600)	15.61 - 14.93 - 14.31	2.91	1.94 ~ 5.03 + 5.03 2.90 ~ 12.70	12.00	3470 (520-3690)	15.93 - 15.24 - 14.60	3.46
	10.7	1.5 + 4.2 + 5.0	1.50 + 4.20 + 5.00 2.70 ~ 10.56	10.00	3500 (510-3650)	16.07 - 15.37 - 14.73	2.86	1.75 ~ 4.55 + 5.69 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	11.7	1.5 + 4.2 + 6.0	1.28 + 3.59 + 5.13 2.70 ~ 10.60	10.00	3580 (510-3800)	16.44 - 15.72 - 15.07	2.79	1.63 ~ 4.24 + 6.12 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	12.7	1.5 + 4.2 + 7.0	1.18 + 3.31 + 7.00 2.70 ~ 10.70	10.00	3650 (510-3800)	16.76 - 16.03 - 15.36	2.74	1.56 ~ 4.05 + 6.39 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	11.5	1.5 + 5.0 + 5.0	1.30 + 4.35 + 4.35 2.70 ~ 10.80	10.00	3550 (510-3800)	16.30 - 15.59 - 14.94	2.82	1.60 ~ 5.20 + 5.20 2.90 ~ 12.70	12.00	3500 (520-3890)	16.07 - 15.37 - 14.73	3.43
	12.5	1.5 + 5.0 + 6.0	1.20 + 4.00 + 4.80 2.70 ~ 10.96	10.00	3600 (510-3800)	16.53 - 15.81 - 15.15	2.78	1.50 ~ 4.88 + 5.63 2.90 ~ 12.70	12.00	3500 (520-3890)	16.07 - 15.37 - 14.73	3.43
	13.5	1.5 + 5.0 + 7.0	1.11 + 3.70 + 5.19 2.70 ~ 11.10	10.00	3600 (510-3800)	16.53 - 15.81 - 15.15	2.78	1.44 ~ 4.67 + 5.89 2.90 ~ 12.70	12.00	3500 (520-3890)	16.07 - 15.37 - 14.73	3.43
	13.5	1.5 + 6.0 + 6.0	1.11 + 4.44 + 4.44 2.70 ~ 11.10	10.00	3600 (510-3800)	16.53 - 15.81 - 15.15	2.78	1.41 ~ 5.29 + 5.29 2.90 ~ 12.70	12.00	3500 (520-3890)	16.07 - 15.37 - 14.73	3.43
	14.5	1.5 + 6.0 + 7.0	1.03 + 4.14 + 4.83 2.70 ~ 12.50	10.00	3680 (510-3800)	16.90 - 16.16 - 15.49	2.72	1.36 ~ 5.08 + 5.56 2.90 ~ 12.70	12.00	3500 (520-3890)	16.07 - 15.37 - 14.73	3.43
	15.5	1.5 + 7.0 + 7.0	0.97 + 4.52 + 4.52 2.70 ~ 12.50	10.00	3680 (510-3800)	16.90 - 16.16 - 15.49	2.72	1.30 ~ 5.35 + 5.35 2.90 ~ 12.70	12.00	3500 (520-3890)	16.07 - 15.37 - 14.73	3.43
	5.4	1.8 + 1.8 + 1.8	1.80 + 1.80 + 1.80 2.70 ~ 6.00	5.40	1500 (510-1780)	6.89 - 6.59 - 6.31	3.60	2.50 ~ 2.50 + 2.50 2.90 ~ 8.20	7.50	1800 (520-2860)	8.26 - 7.91 - 7.58	4.17
	6.1	1.8 + 1.8 + 2.5	1.80 + 1.80 + 2.50 2.70 ~ 6.80	6.10	1540 (510-2150)	7.07 - 6.76 - 6.48	3.96	2.50 ~ 2.50 + 3.40 2.90 ~ 9.10	8.40	2050 (520-3060)	9.41 - 9.00 - 8.63	4.10
	7.1	1.8 + 1.8 + 3.5	1.80 + 1.80 + 3.50 2.70 ~ 7.90	7.10	1940 (510-2310)	8.91 - 8.52 - 8.16	3.66	2.50 ~ 2.50 + 4.30 2.90 ~ 10.00	9.30	2500 (520-3060)	11.48 - 10.98 - 10.52	3.72
	7.8	1.8 + 1.8 + 4.2	1.80 + 1.80 + 4.20 2.70 ~ 8.60	7.80	2250 (510-3460)	10.33 - 9.88 - 9.47	3.47	2.50 ~ 2.50 + 5.20 2.90 ~ 10.90	10.20	2815 (520-3060)	12.92 - 12.36 - 11.85	3.62
	8.6	1.8 + 1.8 + 5.0	1.80 + 1.80 + 5.00 2.70 ~ 9.50	8.60	2700 (510-3460)	12.40 - 11.86 - 11.36	3.19	2.50 ~ 2.50 + 6.50 2.90 ~ 12.20	11.50	3040 (520-3690)	13.96 - 13.35 - 12.79	3.78
	9.6	1.8 + 1.8 + 6.0	1.80 + 1.80 + 6.00 2.70 ~ 10.60	9.60	3200 (510-3460)	14.69 - 14.05 - 13.47	3.00	2.40 ~ 2.40 + 7.20 2.90 ~ 12.70	12.00	3370 (520-3690)	15.47 - 14.80 - 14.18	3.56
	10.6	1.8 + 1.8 + 7.0	1.70 + 1.70 + 6.60 2.70 ~ 11.04	10.00	3480 (510-3700)	15.98 - 15.28 - 14.65	2.87	2.27 ~ 2.27 + 7.45 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	6.8	1.8 + 2.5 + 2.5	1.80 + 2.50 + 2.50 2.70 ~ 7.60	6.80	1820 (510-2260)	8.36 - 7.99 - 7.66	3.74	2.50 ~ 3.40 + 3.40 2.90 ~ 10.00	9.30	2370 (520-2760)	10.88 - 10.41 - 9.97	3.92
	7.8	1.8 + 2.5 + 3.5	1.80 + 2.50 + 3.50 2.70 ~ 8.70	7.80	2250 (510-3270)	10.33 - 9.88 - 9.47	3.47	2.50 ~ 3.40 + 4.30 2.90 ~ 10.90	10.20	2780 (520-3080)	12.76 - 12.21 - 11.70	3.67
	8.5	1.8 + 2.5 + 4.2	1.80 + 2.50 + 4.20 2.70 ~ 9.40	8.50	2640 (510-3270)	12.12 - 11.59 - 11.11	3.22	2.50 ~ 3.40 + 5.20 2.90 ~ 11.80	11.10	3000 (520-3220)	13.77 - 13.18 - 12.63	3.70
	9.3	1.8 + 2.5 + 5.0	1.80 + 2.50 + 5.00 2.70 ~ 10.30	9.30	3050 (510-3270)	14.00 - 13.39 - 12.84	3.05	2.42 ~ 3.29 + 6.29 2.90 ~ 12.70	12.00	3270 (520-3690)	15.01 - 14.36 - 13.76	3.67
	10.3	1.8 + 2.5 + 6.0	1.75 + 2.43 + 5.83 2.70 ~ 10.80	10.00	3460 (510-3600)	15.89 - 15.20 - 14.56	2.89	2.24 ~ 3.04 + 6.72 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	11.3	1.8 + 2.5 + 7.0	1.59 + 2.21 + 6.19 2.70 ~ 10.80	10.00	3460 (510-3600)	15.89 - 15.20 - 14.56	2.89	2.13 ~ 2.89 + 6.98 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	8.8	1.8 + 3.5 + 3.5	1.80 + 3.50 + 3.50 2.70 ~ 9.80	8.80	2800 (510-3600)	12.86 - 12.30 - 11.78	3.14	2.50 ~ 4.30 + 4.30 2.90 ~ 11.80	11.10	3100 (520-3330)	14.23 - 13.61 - 13.05	3.58
	9.5	1.8 + 3.5 + 4.2	1.80 + 3.50 + 4.20 2.70 ~ 10.10	9.50	3180 (510-3600)	14.60 - 13.97 - 13.38	2.99	2.50 ~ 4.30 + 5.20 2.90 ~ 12.70	12.00	3340 (520-3430)	15.34 - 14.67 - 14.06	3.59
	10.3	1.8 + 3.5 + 5.0	1.75 + 3.40 + 4.85 2.70 ~ 10.80	10.00	3460 (510-3600)	15.89 - 15.20 - 14.56	2.89	2.26 ~ 3.88 + 5.86 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	11.3	1.8 + 3.5 + 6.0	1.59 + 3.10 + 5.31 2.70 ~ 11.06	10.00	3520 (510-3700)	16.16 - 15.46 - 14.81	2.84	2.10 ~ 3.61 + 6.29 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	12.3	1.8 + 3.5 + 7.0	1.46 + 2.85 + 5.69 2.70 ~ 12.50	10.00	3600 (510-3800)	16.53 - 15.81 - 15.15	2.78	2.00 ~ 3.44 + 6.56 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	10.2	1.8 + 4.2 + 4.2	1.76 + 4.12 + 4.12 2.70 ~ 10.98	10.00	3440 (510-3600)	15.79 - 15.11 - 14.48	2.91	2.33 ~ 4.84 + 4.84 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	11.0	1.8 + 4.2 + 5.0	1.64 + 3.82 + 4.55 2.70 ~ 11.00	10.00	3550 (510-3700)	16.30 - 15.59 - 14.94	2.82	2.11 ~ 4.39 + 5.49 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	12.0	1.8 + 4.2 + 6.0	1.50 + 3.50 + 5.00 2.70 ~ 12.50	10.00	3600 (510-4000)	16.53 - 15.81 - 15.15	2.78	1.97 ~ 4.11 + 5.92 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	13.0	1.8 + 4.2 + 7.0	1.38 + 3.23 + 5.38 2.70 ~ 12.50	10.00	3600 (510-4000)	16.53 - 15.81 - 15.15	2.78	1.89 ~ 3.92 + 6.19 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	11.8	1.8 + 5.0 + 5.0	1.53 + 4.24 + 4.24 2.70 ~ 12.50	10.00	3580 (510-4000)	16.44 - 15.72 - 15.07	2.79	1.94 ~ 5.03 + 5.03 2.90 ~ 12.70	12.00	3500 (520-3890)	16.07 - 15.37 - 14.73	3.43
	12.8	1.8 + 5.0 + 6.0	1.41 + 3.91 + 4.69 2.70 ~ 12.50	10.00	3600 (510-4000)	16.53 - 15.81 - 15.15	2.78	1.82 ~ 4.73 + 5.45 2.90 ~ 12.70	12.00	3500 (520-3890)	16.07 - 15.37 - 14.73	3.43
	13.8	1.8 + 6.0 + 6.0	1.30 + 4.35 + 4.35 2.70 ~ 12.50	10.00	3680 (510-4000)	16.90 - 16.16 - 15.49	2.72	1.71 ~ 5.14 + 5.14 2.90 ~ 12.70	12.00	3500 (520-3890)	16.07 - 15.37 - 14.73	3.43
	14.8	1.8 + 6.0 + 7.0	1.22 + 4.05 + 4.73 2.70 ~ 12.50	10.00	3680 (510-4000)	16.90 - 16.16 - 15.49	2.72	1.65 ~ 4.95 + 5.41 2.90 ~ 12.70	12.00	3500 (520-3890)	16.07 - 15.37 - 14.73	3.43
	15.8	1.8 + 7.0 + 7.0	1.14 + 4.43 + 4.43 2.70 ~ 12.50	10.00	3680 (510-4000)	16.90 - 16.16 - 15.49	2.72	1.59 ~ 5.21 + 5.21 2.90 ~ 12.70	12.00	3500 (520-3890)	16.07 - 15.37 - 14.73	3.43
	7.5	2.5 + 2.5 + 2.5	2.50 + 2.50 + 2.50 2.70 ~ 8.40	7.50	2100 (510-2580)	9.64 - 9.22 - 8.84	3.57	3.40 ~ 3.40 + 3.40 2.90 ~ 10.90	10.20	2680 (520-2920)	12.30 - 11.77 - 11.28	3.81
	8.5	2.5 + 2.5 + 3.5	2.50 + 2.50 + 3.50 2.70 ~ 9.50	8.50	2640 (510-3110)	12.12 - 11.59 - 11.11	3.22	3.40 ~ 3.40 + 4.30 2.90 ~ 11.80	11.10	3000 (520-3250)	13.77 - 13.18 - 12.63	3.70
	9.2	2.5 + 2.5 + 4.2	2.50 + 2.50 + 4.20 2.70 ~ 9.80	9.20	3000 (510-3360)	13.77 - 13.18 - 12.63	3.07	3.40 ~ 3.40 + 5.20 2.90 ~ 12.70	12.00	3220 (520-3330)	14.78 - 14.14 - 13.55	3.73
	10.0	2.5 + 2.5 + 5.0	2.50 + 2.50 + 5.00 2.70 ~ 11.10	10.00	3450 (510-3600)	15.84 - 15.15 - 14.52	2.90	3.07 ~ 3.07 + 5.86 2.90 ~ 12.70	12.00	3500 (520-3560)	16.07 - 15.37 - 14.73	3.43
	11.0	2.5 + 2.5 + 6.0	2.27 + 2.27 + 5.45 2.70 ~ 11.09	10.00	3550 (510-3700)	16.30 - 15.59 - 14.94	2.82	2.85 ~ 2.85 + 6.29 2.90 ~ 12.70	12.00	3500 (520-3560)	16.07 - 15.37 - 14.73	3.43
	12.0	2.5 + 2.5 + 7.0	2.08 + 2.08 + 5.83 2.70 ~ 12.50	10.00	3600 (510-3700)	16.53 - 15.81 - 15.15	2.78	2.72 ~ 2.72 + 6.56 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	9.5	2.5 + 3.5 + 3.5	2.50 + 3.50 + 3.50 2.70 ~ 10.60	9.50	3180 (510-3500)	14.60 - 13.97 - 13.38	2.99	3.40 ~ 4.30 + 4.30 2.90 ~ 12.70	12.00	3320 (520-3690)	15.24 - 14.58 - 13.97	3.61
	10.2	2.5 + 3.5 + 4.2	2.45 + 3.43 + 4.12 2.70 ~ 10.69	10.00	3470 (510-3650)	15.93 - 15.24 - 14.60	2.88	3.16 ~ 4.00 + 4.84 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	11.0	2.5 + 3.5 + 5.0	2.27 + 3.18 + 4.55 2.70 ~ 11.09	10.00	3550 (510-3800)	16.30 - 15.59 - 14.94	2.82	2.87 ~ 3.63 + 5.49 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	12.0	2.5 + 3.5 + 6.0	2.08 + 2.92 + 5.00 2.70 ~ 11.50	10.00	3600 (510-3800)	16.53 - 15.81 - 15.15	2.78	2.68 ~ 3.39 + 5.92 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	13.0	2.5 + 3.5 + 7.0	1.92 + 2.69 + 5.38 2.70 ~ 12.50	10.00	3600 (510-3800)	16.53 - 15.81 - 15.15	2.78	2.57 ~ 3.25 + 6.19 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	10.9	2.5 + 4.2 + 4.2	2.29 + 3.85 + 3.85 2.70 ~ 11.01	10.00	3540 (510-3800)	16.25 - 15.55 - 14.90	2.82	2.96 ~ 4.52 + 4.52 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	11.7	2.5 + 4.2 + 5.0	2.14 + 3.59 + 4.27 2.70 ~ 12.50	10.00	3600 (510-3800)	16.53 - 15.81 - 15.15	2.78	2.70 ~ 4.13 + 5.17 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	12.7	2.5 + 4.2 + 6.0	1.97 + 3.31 + 4.72 2.70 ~ 12.00	10.00	3600 (510-4000)	16.53 - 15.81 - 15.15	2.78	2.53 ~ 3.88 + 5.59 2.90 ~ 12.70	12.00	3500 (520-3890)	16.07 - 15.37 - 14.73	3.43
	13.7	2.5 + 4.2 + 7.0	1.82 + 3.07 + 5.11 2.70 ~ 12.50	10.00	3600 (510-4000)	16.53 - 15.81 - 15.15	2.78	2.43 ~ 3.71 + 5.86 2.90 ~ 12.70	12.00	3500 (520-3890)	16.07 - 15.37 - 14.73	3.43
	12.5	2.5 + 5.0 + 5.0	2.00 + 4.00 + 4.00 2.70 ~ 11.60	10.00	3600 (510-4000)	16.53 - 15.81 - 15.15	2.78	2.49 ~ 4.76 + 4.76 2.90 ~ 12.70	12.00	3500 (520-3890)	16.07 - 15.37 - 14.73	3.43
	13.5	2.5 + 5.0 + 6.0	1.85 + 3.70 + 4.44 2.70 ~ 12.50	10.00	3680 (510-4000)	16.90 - 16.16 - 15.49	2.72	2.34 ~ 4.48 + 5.17 2.90 ~ 12.70	12.00	3500 (520-3890)	16.07 - 15.37 - 14.73	3.43
	14.5	2.5 + 5.0 + 7.0	1.72 + 3.45 + 4.83 2.70 ~ 12.50	10.00	3680 (510-4000)	16.90 - 16.16 - 15.49	2.72	2.25 ~ 4.31 + 5.44 2.90 ~ 12.70	12.00	3500 (520-3890)	16.07 - 15.37 - 14.73	3.43
	14.5	2.5 + 6.0 + 6.0	1.72 + 4.14 + 4.14 2.70 ~ 12.50	10.00	3680 (510-4000)	16.90 - 16.16 - 15.49	2.72	2.22 ~ 4.89 + 4.89 2.90 ~ 12.70	12.00	3500 (520-3890)	16.07 - 15.37 - 14.73	3.43
	15.5	2.5 + 6.0 + 7.0	1.61 + 3.87 + 4.52 2.70 ~ 12.50	10.00	3680 (510-4000)	16.90 - 16.16 - 15.49	2.72	2.14 ~ 4.71 + 5.15 2.90 ~ 12.70	12.00	3500 (520-3890)	16.07 - 15.37 - 14.73	3.43
	16.5	2.5 + 7.0 + 7.0	1.52 + 4.24 + 4.24 2.70 ~ 12.50	10.00	3680 (510-4000)	16.90 - 16.16 - 15.49	2.72	2.06 ~ 4.97 + 4.97 2.90 ~ 12.70	12.00	3500 (520-3890)	16.07 - 15.37 - 14.73	3.43
	10.5	3.5 + 3.5 + 3.5	3.33 + 3.33 + 3.33 2.70 ~ 11.14	10.00	3480 (510-4000)	15.98 - 15.28 - 14.65	2.87	4.00 ~ 4.00 + 4.00 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	11.2	3.5 + 3.5 + 4.2	3.13 + 3.13 + 3.75 2.70 ~ 11.07	10.00	3560 (510-4000)	16.35 - 15.63 - 14.98	2.81	3.74 ~ 3.74 + 4.52 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	12.0	3.5 + 3.5 + 5.0	2.92 + 2.92 + 4.17 2.70 ~ 12.00	10.00	3600 (510-4200)	16.53 - 15.81 - 15.15	2.78	3.42 ~ 3.42 + 5.17 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	13.0	3.5 + 3.5 + 6.0	2.69 + 2.69 + 4.62 2.70 ~ 12.50	10.00	3680 (510-4200)	16.90 - 16.16 - 15.49	2.72	3.20 ~ 3.20 + 5.59 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	14.0	3.5 + 3.5 + 7.0	2.50 + 2.50 + 5.00 2.70 ~ 12.50	10.00	3680 (510-4200)	16.90 - 16.16 - 15.49	2.72	3.07 ~ 3.07 + 5.86 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	11.9	3.5 + 4.2 + 4.2	2.94 + 3.53 + 3.53 2.70 ~ 12.50	10.00	3590 (510-4200)	16.48 - 15.77 - 15.11	2.79	3.51 ~ 4.24 + 4.24 2.90 ~ 12.70	12.00	3500 (520-3690)	16.07 - 15.37 - 14.73	3.43
	12.7	3.5 + 4.2 + 5.0	2.76 + 3.31 + 3.94 2.70 ~ 12.50	10.00	3600 (510-4200)	16.53 - 15.81 - 15.15	2.78	3.23 ~ 3.90 + 4.88 2.90 ~ 12.70	12.00	3500 (520-3890)	16.07 - 15.37 - 14.73	3.43
	13.7	3.5 + 4.2 + 6.0	2.55 + 3.07 + 4.38 2.70 ~ 12.50	10.00	3680 (510-4200)	16.90 - 16.16 - 15.49	2.72	3.04 ~ 3.67 + 5.29 2.90 ~ 12.70	12.00	3500 (520-3890)	16.07 - 15.37 - 14.73	3.43

POSSIBLECOMBINATIONSTO OPERATE		COOLING						HEATING					
		CAPACITY RATING(kW) (RANGE) (kW) (RANGE)	TOTAL	OUTDOOR UNIT POWER CONSUMPTION (W)	OUTDOOR UNIT AMPERE (A) at 220V - 230V - 240V	EER	CAPACITY RATING(kW) (RANGE) (kW) (RANGE)	TOTAL	OUTDOOR UNIT POWER CONSUMPTION (W)	OUTDOOR UNIT AMPERE (A) at 220V - 230V - 240V	COP
14.7	3.5 + 4.2 + 7.0	2.38 + 2.86 + 4.76 2.70 ~ 12.50	10.00	3680 (510-4200)	16.90 - 16.16 - 15.49	2.72	2.92 ~ 3.53 + 5.56 2.90 ~ 12.70	12.00	3500 (520-3890)	16.07 - 15.37 - 14.73	3.43
13.5	3.5 + 5.0 + 5.0	2.59 + 3.70 + 3.70 2.70 ~ 12.50	10.00	3680 (510-4300)	16.90 - 16.16 - 15.49	2.72	2.98 ~ 4.51 + 4.51 2.90 ~ 12.70	12.00	3500 (520-3890)	16.07 - 15.37 - 14.73	3.43
14.5	3.5 + 5.0 + 6.0	2.41 + 3.45 + 4.14 2.70 ~ 12.50	10.00	3680 (510-4300)	16.90 - 16.16 - 15.49	2.72	2.82 ~ 4.26 + 4.92 2.90 ~ 12.70	12.00	3700 (520-4000)	16.99 - 16.25 - 15.57	3.24
15.5	3.5 + 5.0 + 7.0	2.26 + 3.23 + 4.52 2.70 ~ 12.50	10.00	3680 (510-4300)	16.90 - 16.16 - 15.49	2.72	2.72 ~ 4.11 + 5.18 2.90 ~ 12.70	12.00	3700 (520-4000)	16.99 - 16.25 - 15.57	3.24
15.5	3.5 + 6.0 + 6.0	2.26 + 3.87 + 3.87 2.70 ~ 12.50	10.00	3680 (510-4300)	16.90 - 16.16 - 15.49	2.72	2.67 ~ 4.66 + 4.66 2.90 ~ 12.70	12.00	3700 (520-4000)	16.99 - 16.25 - 15.57	3.24
16.5	3.5 + 6.0 + 7.0	2.12 + 3.64 + 4.24 2.70 ~ 12.50	10.00	3680 (510-4300)	16.90 - 16.16 - 15.49	2.72	2.58 ~ 4.50 + 4.92 2.90 ~ 12.70	12.00	3700 (520-4000)	16.99 - 16.25 - 15.57	3.24
12.6	4.2 + 4.2 + 4.2	3.33 + 3.33 + 3.33 2.70 ~ 12.50	10.00	3590 (510-4300)	16.48 - 15.77 - 15.11	2.79	4.00 ~ 4.00 + 4.00 2.90 ~ 12.70	12.00	3700 (520-4000)	16.99 - 16.25 - 15.57	3.24
13.4	4.2 + 4.2 + 5.0	3.13 + 3.13 + 3.73 2.70 ~ 12.50	10.00	3680 (510-4300)	16.90 - 16.16 - 15.49	2.72	3.69 ~ 3.69 + 4.62 2.90 ~ 12.70	12.00	3700 (520-4200)	16.99 - 16.25 - 15.57	3.24
14.4	4.2 + 4.2 + 6.0	2.92 + 2.92 + 4.17 2.70 ~ 12.50	10.00	3680 (510-4300)	16.90 - 16.16 - 15.49	2.72	3.49 ~ 3.49 + 5.03 2.90 ~ 12.70	12.00	3850 (520-4200)	17.68 - 16.91 - 16.20	3.12
15.4	4.2 + 4.2 + 7.0	2.73 + 2.73 + 4.55 2.70 ~ 12.50	10.00	3680 (510-4300)	16.90 - 16.16 - 15.49	2.72	3.35 ~ 3.35 + 5.29 2.90 ~ 12.70	12.00	3850 (520-4200)	17.68 - 16.91 - 16.20	3.12
14.2	4.2 + 5.0 + 5.0	2.96 + 3.52 + 3.52 2.70 ~ 12.50	10.00	3680 (510-4300)	16.90 - 16.16 - 15.49	2.72	3.43 ~ 4.29 + 4.29 2.90 ~ 12.70	12.00	3850 (520-4200)	17.68 - 16.91 - 16.20	3.12
15.2	4.2 + 5.0 + 6.0	2.76 + 3.29 + 3.95 2.70 ~ 12.50	10.00	3680 (510-4300)	16.90 - 16.16 - 15.49	2.72	3.25 ~ 4.06 + 4.69 2.90 ~ 12.70	12.00	3850 (520-4200)	17.68 - 16.91 - 16.20	3.12
16.2	4.2 + 5.0 + 7.0	2.59 + 3.09 + 4.32 2.70 ~ 12.50	10.00	3680 (510-4300)	16.90 - 16.16 - 15.49	2.72	3.14 ~ 3.92 + 4.94 2.90 ~ 12.70	12.00	3850 (520-4200)	17.68 - 16.91 - 16.20	3.12
16.2	4.2 + 6.0 + 6.0	2.59 + 3.70 + 3.70 2.70 ~ 12.50	10.00	3680 (510-4300)	16.90 - 16.16 - 15.49	2.72	2.89 ~ 4.56 + 4.56 2.90 ~ 12.70	12.00	3850 (520-4200)	17.68 - 16.91 - 16.20	3.12
15.0	5.0 + 5.0 + 5.0	3.33 + 3.33 + 3.33 2.70 ~ 12.50	10.00	3680 (510-4300)	16.90 - 16.16 - 15.49	2.72	4.00 ~ 4.00 + 4.00 2.90 ~ 12.70	12.00	3850 (520-4200)	17.68 - 16.91 - 16.20	3.12
16.0	5.0 + 5.0 + 6.0	3.13 + 3.13 + 3.75 2.70 ~ 12.50	10.00	3680 (510-4300)	16.90 - 16.16 - 15.49	2.72	3.80 ~ 3.80 + 4.39 2.90 ~ 12.70	12.00	3850 (520-4200)	17.68 - 16.91 - 16.20	3.12
6.0	1.5 + 1.5 + 1.5 + 1.5	1.50 + 1.50 + 1.50 + 1.50 2.90 ~ 6.40	6.00	1600 (550-2000)	7.35 - 7.03 - 6.73	3.75	2.00 ~ 2.00 + 2.00 + 2.00 3.00 ~ 8.70	8.00	2000 (540-2650)	9.18 - 8.78 - 8.42	4.00
6.3	1.5 + 1.5 + 1.5 + 1.8	1.50 + 1.50 + 1.50 + 1.80 2.90 ~ 6.80	6.30	1700 (550-2000)	7.81 - 7.47 - 7.15	3.71	2.00 ~ 2.00 + 2.00 + 2.50 3.00 ~ 9.20	8.50	2090 (540-2760)	9.60 - 9.18 - 8.80	4.07
7.0	1.5 + 1.5 + 1.5 + 2.5	1.50 + 1.50 + 1.50 + 2.50 2.90 ~ 7.60	7.00	1900 (550-2200)	8.72 - 8.34 - 8.00	3.68	2.00 ~ 2.00 + 2.00 + 3.40 3.00 ~ 10.10	9.40	2290 (540-3030)	10.51 - 10.06 - 9.64	4.10
8.0	1.5 + 1.5 + 1.5 + 3.5	1.50 + 1.50 + 1.50 + 3.50 2.90 ~ 8.70	8.00	2330 (550-3500)	10.70 - 10.23 - 9.81	3.43	2.00 ~ 2.00 + 2.00 + 4.30 3.00 ~ 11.00	10.30	2580 (540-3460)	11.85 - 11.33 - 10.86	3.99
8.7	1.5 + 1.5 + 1.5 + 4.2	1.50 + 1.50 + 1.50 + 4.20 2.90 ~ 9.40	8.70	2650 (550-3700)	12.17 - 11.64 - 11.15	3.28	2.00 ~ 2.00 + 2.00 + 5.20 3.00 ~ 11.90	11.20	2780 (540-3360)	12.76 - 12.21 - 11.70	4.03
9.5	1.5 + 1.5 + 1.5 + 5.0	1.50 + 1.50 + 1.50 + 5.00 2.90 ~ 10.30	9.50	3000 (550-3850)	13.77 - 13.18 - 12.63	3.17	1.92 ~ 1.92 + 1.92 + 6.24 3.00 ~ 12.70	12.00	3000 (540-4000)	13.77 - 13.18 - 12.63	4.00
10.5	1.5 + 1.5 + 1.5 + 6.0	1.43 + 1.43 + 1.43 + 5.71 2.90 ~ 10.86	10.00	3290 (550-4000)	15.11 - 14.45 - 13.85	3.04	1.78 ~ 1.78 + 1.78 + 6.67 3.00 ~ 12.70	12.00	3170 (540-4000)	14.55 - 13.92 - 13.34	3.79
11.5	1.5 + 1.5 + 1.5 + 7.0	1.30 + 1.30 + 1.30 + 6.10 2.90 ~ 10.87	10.00	3360 (550-4000)	15.43 - 14.76 - 14.14	2.98	1.69 ~ 1.69 + 1.69 + 6.93 3.00 ~ 12.70	12.00	3170 (540-4000)	14.55 - 13.92 - 13.34	3.79
6.6	1.5 + 1.5 + 1.8 + 1.8	1.50 + 1.50 + 1.80 + 1.80 2.90 ~ 7.20	6.60	1800 (550-2100)	8.26 - 7.91 - 7.58	3.67	2.00 ~ 2.00 + 2.50 + 2.50 3.00 ~ 9.70	9.00	2170 (540-4000)	9.96 - 9.53 - 9.13	4.15
7.3	1.5 + 1.5 + 1.8 + 2.5	1.50 + 1.50 + 1.80 + 2.50 2.90 ~ 8.00	7.30	2030 (550-2220	9.32 - 8.92 - 8.54	3.60	2.00 ~ 2.00 + 2.50 + 3.40 3.00 ~ 10.60	9.90	2370 (540-4000)	10.88 - 10.41 - 9.97	4.18
8.3	1.5 + 1.5 + 1.8 + 3.5	1.50 + 1.50 + 1.80 + 3.50 2.90 ~ 9.10	8.30	2470 (550-3120)	11.34 - 10.85 - 10.40	3.36	2.00 ~ 2.00 + 2.50 + 4.30 3.00 ~ 11.50	10.80	2660 (540-4000)	12.21 - 11.68 - 11.20	4.06
9.0	1.5 + 1.5 + 1.8 + 4.2	1.50 + 1.50 + 1.80 + 4.20 2.90 ~ 9.80	9.00	2790 (550-3120)	12.81 - 12.25 - 11.74	3.23	2.00 ~ 2.00 + 2.50 + 5.20 3.00 ~ 12.40	11.70	2860 (540-4000)	13.13 - 12.56 - 12.04	4.09
9.8	1.5 + 1.5 + 1.8 + 5.0	1.50 + 1.50 + 1.80 + 5.00 2.90 ~ 10.70	9.80	3150 (550-3510)	14.46 - 13.83 - 13.26	3.11	1.85 ~ 1.85 + 2.31 + 6.00 3.00 ~ 12.70	12.00	3090 (540-4000)	14.19 - 13.57 - 13.01	3.88
10.8	1.5 + 1.5 + 1.8 + 6.0	1.39 + 1.39 + 1.67 + 5.56 2.90 ~ 10.93	10.00	3310 (550-3510)	15.20 - 14.54 - 13.93	3.02	1.71 ~ 1.71 + 2.14 + 6.43 3.00 ~ 12.70	12.00	3180 (540-4000)	14.60 - 13.97 - 13.38	3.77
11.8	1.5 + 1.5 + 1.8 + 7.0	1.27 + 1.27 + 1.53 + 5.93 2.90 ~ 12.50	10.00	3390 (550-3510)	15.56 - 14.89 - 14.27	2.95	1.63 ~ 1.63 + 2.04 + 6.69 3.00 ~ 12.70	12.00	3180 (540-4000)	14.60 - 13.97 - 13.38	3.77
8.0	1.5 + 1.5 + 2.5 + 2.5	1.50 + 1.50 + 2.50 + 2.50 2.90 ~ 8.80	8.00	2330 (550-2580)	10.70 - 10.23 - 9.81	3.43	2.00 ~ 2.00 + 3.40 + 3.40 3.00 ~ 11.50	10.80	2580 (540-4000)	11.85 - 11.33 - 10.86	4.19
9.0	1.5 + 1.5 + 2.5 + 3.5	1.50 + 1.50 + 2.50 + 3.50 2.90 ~ 9.90	9.00	2790 (550-3120)	12.81 - 12.25 - 11.74	3.23	2.00 ~ 2.00 + 3.40 + 4.30 3.00 ~ 12.40	11.70	2860 (540-4000)	13.13 - 12.56 - 12.04	4.09
9.7	1.5 + 1.5 + 2.5 + 4.2	1.50 + 1.50 + 2.50 + 4.20 2.90 ~ 10.60	9.70	3110 (550-3510)	14.28 - 13.66 - 13.09	3.12	1.90 ~ 1.90 + 3.24 + 4.95 3.00 ~ 12.70	12.00	3060 (540-4000)	14.05 - 13.44 - 12.88	3.92
10.5	1.5 + 1.5 + 2.5 + 5.0	1.43 + 1.43 + 2.38 + 4.76 2.90 ~ 10.56	10.00	3290 (550-3510)	15.11 - 14.45 - 13.85	3.04	1.73 ~ 1.73 + 2.94 + 5.61 3.00 ~ 12.70	12.00	3180 (540-4000)	14.60 - 13.97 - 13.38	3.77
11.5	1.5 + 1.5 + 2.5 + 6.0	1.30 + 1.30 + 2.17 + 5.22 2.90 ~ 12.50	10.00	3360 (550-3510)	15.43 - 14.76 - 14.14	2.98	1.61 ~ 1.61 + 2.74 + 6.04 3.00 ~ 12.70	12.00	3180 (540-4000)	14.60 - 13.97 - 13.38	3.77
12.5	1.5 + 1.5 + 2.5 + 7.0	1.20 + 1.20 + 2.00 + 5.60 2.90 ~ 12.50	10.00	3440 (550-3610)	15.79 - 15.11 - 14.48	2.91	1.54 ~ 1.54 + 2.62 + 6.31 3.00 ~ 12.70	12.00	3180 (540-4000)	14.60 - 13.97 - 13.38	3.77
10.0	1.5 + 1.5 + 3.5 + 3.5	1.50 + 1.50 + 3.50 + 3.50 2.90 ~ 10.56	10.00	3250 (550-3510)	14.92 - 14.27 - 13.68	3.08	1.90 ~ 1.90 + 4.10 + 4.10 3.00 ~ 12.70	12.00	3150 (540-4000)	14.46 - 13.83 - 13.26	3.81
10.7	1.5 + 1.5 + 3.5 + 4.2	1.40 + 1.40 + 3.27 + 3.93 2.90 ~ 10.93	10.00	3300 (550-3510)	15.15 - 14.49 - 13.89	3.03	1.78 ~ 1.78 + 3.82 + 4.62 3.00 ~ 12.70	12.00	3200 (540-4000)	14.69 - 14.05 - 13.47	3.75
11.5	1.5 + 1.5 + 3.5 + 5.0	1.30 + 1.30 + 3.04 + 4.35 2.90 ~ 12.50	10.00	3360 (550-3710)	15.43 - 14.76 - 14.14	2.98	1.62 ~ 1.62 + 3.49 + 5.27 3.00 ~ 12.70	12.00	3200 (540-4000)	14.69 - 14.05 - 13.47	3.75
12.5	1.5 + 1.5 + 3.5 + 6.0	1.20 + 1.20 + 2.80 + 4.80 2.90 ~ 12.50	10.00	3440 (550-3710)	15.79 - 15.11 - 14.48	2.91	1.52 ~ 1.52 + 3.27 + 5.70 3.00 ~ 12.70	12.00	3200 (540-4000)	14.69 - 14.05 - 13.47	3.75
13.5	1.5 + 1.5 + 3.5 + 7.0	1.11 + 1.11 + 2.59 + 5.19 2.90 ~ 12.50	10.00	3510 (550-3710)	16.12 - 15.42 - 14.77	2.85	1.45 ~ 1.45 + 3.13 + 5.96 3.00 ~ 12.70	12.00	3200 (540-4000)	14.69 - 14.05 - 13.47	3.75
11.4	1.5 + 1.5 + 4.2 + 4.2	1.32 + 1.32 + 3.68 + 3.68 2.90 ~ 10.96	10.00	3360 (550-4000)	15.43 - 14.76 - 14.14	2.98	1.67 ~ 1.67 + 4.33 + 4.33 3.00 ~ 12.70	12.00	3200 (540-4000)	14.69 - 14.05 - 13.47	3.75
12.2	1.5 + 1.5 + 4.2 + 5.0	1.23 + 1.23 + 3.44 + 4.10 2.90 ~ 11.56	10.00	3420 (550-4000)	15.70 - 15.02 - 14.39	2.92	1.53 ~ 1.53 + 3.97 + 4.97 3.00 ~ 12.70	12.00	3300 (540-4000)	15.15 - 14.49 - 13.89	3.64
13.2	1.5 + 1.5 + 4.2 + 6.0	1.14 + 1.14 + 3.18 + 4.55 2.90 ~ 11.56	10.00	3490 (550-4000)	16.02 - 15.33 - 14.69	2.87	1.44 ~ 1.44 + 3.74 + 5.39 3.00 ~ 12.70	12.00	3300 (540-4000)	15.15 - 14.49 - 13.89	3.64
14.2	1.5 + 1.5 + 4.2 + 7.0	1.06 + 1.06 + 2.96 + 4.93 2.90 ~ 11.56	10.00	3570 (550-4000)	16.39 - 15.68 - 15.03	2.80	1.38 ~ 1.38 + 3.59 + 5.66 3.00 ~ 12.70	12.00	3300 (540-4000)	15.15 - 14.49 - 13.89	3.64
13.0	1.5 + 1.5 + 5.0 + 5.0	1.15 + 1.15 + 3.85 + 3.85 2.90 ~ 12.00	10.00	3475 (550-4000)	15.96 - 15.26 - 14.63	2.88	1.41 ~ 1.41 + 4.59 + 4.59 3.00 ~ 12.70	12.00	3300 (540-4000)	15.15 - 14.49 - 13.89	3.64
14.0	1.5 + 1.5 + 5.0 + 6.0	1.07 + 1.07 + 3.57 + 4.29 2.90 ~ 12.50	10.00	3550 (550-4000)	16.30 - 15.59 - 14.94	2.82	1.33 ~ 1.33 + 4.33 + 5.00 3.00 ~ 12.70	12.00	3300 (540-4000)	15.15 - 14.49 - 13.89	3.64
15.0	1.5 + 1.5 + 5.0 + 7.0	1.00 + 1.00 + 3.33 + 4.67 2.90 ~ 12.50	10.00	3625 (550-4000)	16.64 - 15.92 - 15.26	2.76	1.28 ~ 1.28 + 4.17 + 5.26 3.00 ~ 12.70	12.00	3300 (540-4000)	15.15 - 14.49 - 13.89	3.64
6.9	1.5 + 1.8 + 1.8 + 1.8	1.50 + 1.80 + 1.80 + 1.80 2.90 ~ 7.60	6.90	1900 (550-2560)	8.72 - 8.34 - 8.00	3.63	2.00 ~ 2.50 + 2.50 + 2.50 3.00 ~ 10.20	9.50	2260 (540-4000)	10.38 - 9.93 - 9.51	4.20
7.6	1.5 + 1.8 + 1.8 + 2.5	1.50 + 1.80 + 1.80 + 2.50 2.90 ~ 8.40	7.60	2150 (550-2560)	9.87 - 9.44 - 9.05	3.53	2.00 ~ 2.50 + 2.50 + 3.40 3.00 ~ 11.10	10.40	2460 (540-4000)	11.29 - 10.80 - 10.35	4.23
8.6	1.5 + 1.8 + 1.8 + 3.5	1.50 + 1.80 + 1.80 + 3.50 2.90 ~ 9.50	8.60	2600 (550-3060)	11.94 - 11.42 - 10.94	3.31	2.00 ~ 2.50 + 2.50 + 4.30 3.00 ~ 12.00	11.30	2750 (540-4000)	12.63 - 12.08 - 11.57	4.11
9.3	1.5 + 1.8 + 1.8 + 4.2	1.50 + 1.80 + 1.80 + 4.20 2.90 ~ 10.20	9.30	2930 (550-3120)	13.45 - 12.87 - 12.33	3.17	1.97 ~ 2.46 + 2.46 + 5.11 3.00 ~ 12.70	12.00	2950 (540-4000)	13.54 - 12.96 - 12.42	4.07
10.1	1.5 + 1.8 + 1.8 + 5.0	1.49 + 1.78 + 1.78 + 4.95 2.90 ~ 10.99	10.00	3260 (550-3500)	14.97 - 14.32 - 13.72	3.07	1.78 ~ 2.22 + 2.22 + 5.78 3.00 ~ 12.70	12.00	3150 (540-4000)	14.46 - 13.83 - 13.26	3.81
11.1	1.5 + 1.8 + 1.8 + 6.0	1.35 + 1.62 + 1.62 + 5.41 2.90 ~ 10.99	10.00	3330 (550-3600)	15.29 - 14.62 - 14.02	3.00	1.66 ~ 2.07 + 2.07 + 6.21 3.00 ~ 12.70	12.00	3200 (540-4000)	14.69 - 14.05 - 13.47	3.75
12.1	1.5 + 1.8 + 1.8 + 7.0	1.24 + 1.49 + 1.49 + 5.79 2.90 ~ 12.50	10.00	3410 (550-3700)	15.66 - 14.98 - 14.35	2.93	1.58 ~ 1.97 + 1.97 + 6.47 3.00 ~ 12.70	12.00	3200 (540-4000)	14.69 - 14.05 - 13.47	3.75
8.3	1.5 + 1.8 + 2.5 + 2.5	1.50 + 1.80 + 2.50 + 2.50 2.90 ~ 9.20	8.30	2470 (550-3120)	11.34 - 10.85 - 10.40	3.36	2.00 ~ 2.50 + 3.40 + 3.40 3.00 ~ 12.00	11.30	2660 (540-4000)	12.21 - 11.68 - 11.20	4.25
9.3	1.5 + 1.8 + 2.5 + 3.5	1.50 + 1.80 + 2.50 + 3.50 2.90 ~ 10.30	9.30	2930 (550-3120)	13.45 - 12.87 - 12.33	3.17	1.97 ~ 2.46 + 3.34 + 4.23 3.00 ~ 12.70	12.00	2950 (540-4000)	13.54 - 12.96 - 12.42	4.07
10.0	1.5 + 1.8 + 2.5 + 4.2	1.50 + 1.80 + 2.50 + 4.20 2.90 ~ 11.00	10.00	3250 (550-3500)	14.92 - 14.27 - 13.68	3.08	1.83 ~ 2.29 + 3.11 + 4.76 3.00 ~ 12.70	12.00	3150 (540-4000)	14.46 - 13.83 - 13.26	3.81
10.8	1.5 + 1.8 + 2.5 + 5.0	1.39 + 1.67 + 2.31 + 4.63 2.90 ~ 10.56	10.00	3310 (550-3600)	15.20 - 14.54 - 13.93	3.02	1.67 ~ 2.08 + 2.83 + 5.42 3.00 ~ 12.70	12.00	3300 (540-4000)	15.15 - 14.49 - 13.89	3.64
11.8	1.5 + 1.8 + 2.5 + 6.0	1.27 + 1.53 + 2.12 + 5.08 2.90 ~ 10.80	10.00	3390 (550-3700)	15.56 - 14.89 - 14.27	2.95	1.56 ~ 1.95 + 2.65 + 5.84 3.00 ~ 12.70	12.00	3300 (540-4000)	15.15 - 14.49 - 13.89	3.64
12.8	1.5 + 1.8 + 2.5 + 7.0	1.17 + 1.41 + 1.95 + 5.47 2.90 ~ 10.80	10.00	3460 (550-3700)	15.89 - 15.20 - 14.56	2.89	1.49 ~ 1.86 + 2.53 + 6.11 3.00 ~ 12.70	12.00	3300 (540-4000)	15.15 - 14.49 - 13.89	3.64
10.3	1.5 + 1.8 + 3.5 + 3.5	1.46 + 1.75 + 3.40 + 3.40 2.90 ~ 10.60	10.00	3270 (550-3700)	15.01 - 14.36 - 13.76	3.06	1.83 ~ 2.29 + 3.94 + 3.94 3.00 ~ 12.70	12.00	3180 (540-4000)	14.60 - 13.97 - 13.38	3.77
11.0	1.5 + 1.8 + 3.5 + 4.2	1.36 + 1.64 + 3.18 + 3.82 2.90 ~ 11.00	10.00	3330 (550-3700)	15.29 - 14.62 - 14.02	3.00	1.71 ~ 2.14 + 3.69 + 4.46 3.00 ~ 12.70	12.00	3400 (540-4000)	15.61 - 14.93 - 14.31	3.53
11.8	1.5 + 1.8 + 3.5 + 5.0	1.27 + 1.53 + 2.97 + 4.24 2.90 ~ 10.90	10.00	3390 (550-4000)	15.56 - 14.89 - 14.27	2.95	1.57 ~ 1.96 + 3.37 + 5.10 3.00 ~ 12.70	12.00	3400 (540-4000)	15.61 - 14.93 - 14.31	3.53
12.8	1.5 + 1.8 + 3.5 + 6.0	1.17 + 1.41 + 2.73 + 4.69 2.90 ~ 11.00	10.00	3460 (550-4000)	15.89 - 15.20 - 14.56	2.89	1.47 ~ 1.84 + 3.17 + 5.52 3.00 ~ 12.70	12.00	3400 (540-4000)	15.61 - 14.93 - 14.31	3.53
13.8	1.5 + 1.8 + 3.5 + 7.0	1.09 + 1.30 + 2.54 + 5.07 2.90 ~ 11.00	10.00	3540 (550-4000)	16.25 - 15.55 - 14.90	2.82	1.41 ~ 1.76 + 3.04 + 5.79 3.00 ~ 12.70	12.00	3400 (540-4000)	15.61 - 14.93 - 14.31	3.53
11.7	1.5 + 1.8 + 4.2 + 4.2	1.28 + 1.54 + 3.59 + 3.59 2.90 ~ 10.90	10.00	3380 (550-4000)	15.52 - 14.84 - 14.23	2.96	1.61 ~ 2.01 + 4.19 + 4.19 3.00 ~ 12.70	12.00	3400 (540-4000)	15.61 - 14.93 - 14.31	3.53
12.5	1.5 + 1.8 + 4.2 + 5.0	1.20 + 1.44 + 3.36 + 4.00 2.90 ~ 11.30	10.00	3440 (550-4000)	15.79 - 15.11 - 14.48	2.91	1.48 ~ 1.85 + 3.85 + 4.81 3.00 ~ 12.70	12.00	3400 (540-4000)	15.61 - 14.93 - 14.31	3.53

	POSSIBLECOMBINATIONSTO OPERATE	COOLING							HEATING						
		CAPACITY RATING(kW) (RANGE) (kW) (RANGE)		OUTDOOR UNIT POWER CONSUMPTION (W)	OUTDOOR UNIT AMPERE (A) at 220V - 230V - 240V			EER	CAPACITY RATING(kW) (RANGE) (kW) (RANGE)		OUTDOOR UNIT POWER CONSUMPTION (W)	OUTDOOR UNIT AMPERE (A) at 220V - 230V - 240V			COP
			TOTAL							TOTAL					
FOUR UNITS	13.5	1.5 + 1.8 + 4.2 + 6.0	1.11 + 1.33 + 3.11 + 4.44 2.90 ~ 11.50	10.00	3510 (550-4000)	16.12	15.42	14.77	2.85	1.40 ~ 1.74 + 3.63 + 5.23 3.00 ~ 12.70	12.00	3400 (540-4000)	15.61	14.93	14.31	3.53
	14.5	1.5 + 1.8 + 4.2 + 7.0	1.03 + 1.24 + 2.90 + 4.83 2.90 ~ 11.50	10.00	3590 (550-4000)	16.48	15.77	15.11	2.79	1.34 ~ 1.68 + 3.49 + 5.50 3.00 ~ 12.70	12.00	3400 (540-4000)	15.61	14.93	14.31	3.53
	13.3	1.5 + 1.8 + 5.0 + 5.0	1.13 + 1.35 + 3.76 + 3.76 2.90 ~ 11.30	10.00	3500 (550-4000)	16.07	15.37	14.73	2.86	1.37 ~ 1.71 + 4.46 + 4.46 3.00 ~ 12.70	12.00	3400 (540-4000)	15.61	14.93	14.31	3.53
	14.3	1.5 + 1.8 + 5.0 + 6.0	1.05 + 1.26 + 3.50 + 4.20 2.90 ~ 12.50	10.00	3570 (550-4300)	16.39	15.68	15.03	2.80	1.30 ~ 1.62 + 4.22 + 4.86 3.00 ~ 12.70	12.00	3400 (540-4400)	15.61	14.93	14.31	3.53
	15.3	1.5 + 1.8 + 5.0 + 7.0	0.98 + 1.18 + 3.27 + 4.58 2.90 ~ 12.50	10.00	3650 (550-4300)	16.76	16.03	15.36	2.74	1.25 ~ 1.56 + 4.06 + 5.13 3.00 ~ 12.70	12.00	3400 (540-4400)	15.61	14.93	14.31	3.53
	15.3	1.5 + 1.8 + 6.0 + 6.0	0.98 + 1.18 + 3.92 + 3.92 2.90 ~ 12.50	10.00	3650 (550-4300)	16.76	16.03	15.36	2.74	1.23 ~ 1.54 + 4.62 + 4.62 3.00 ~ 12.70	12.00	3400 (540-4400)	15.61	14.93	14.31	3.53
	16.3	1.5 + 1.8 + 6.0 + 7.0	0.92 + 1.10 + 3.68 + 4.29 2.90 ~ 12.50	10.00	3720 (550-4300)	17.08	16.34	15.66	2.69	1.19 ~ 1.49 + 4.46 + 4.87 3.00 ~ 12.70	12.00	3400 (540-4400)	15.61	14.93	14.31	3.53
	9.0	1.5 + 2.5 + 2.5 + 2.5	1.50 + 2.50 + 2.50 + 2.50 2.90 ~ 10.00	9.00	2790 (550-3130)	12.81	12.25	11.74	3.23	1.97 ~ 3.34 + 3.34 + 3.34 3.00 ~ 12.70	12.00	3400 (540-4000)	15.61	14.93	14.31	3.53
	10.0	1.5 + 2.5 + 2.5 + 3.5	1.50 + 2.50 + 2.50 + 3.50 2.90 ~ 11.10	10.00	3250 (550-3500)	14.92	14.27	13.68	3.08	1.83 ~ 3.11 + 3.11 + 3.94 3.00 ~ 12.70	12.00	3150 (540-4000)	14.46	13.83	13.26	3.81
	10.7	1.5 + 2.5 + 2.5 + 4.2	1.40 + 2.34 + 2.34 + 3.93 2.90 ~ 11.03	10.00	3300 (550-3500)	15.15	14.49	13.89	3.03	1.71 ~ 2.91 + 2.91 + 4.46 3.00 ~ 12.70	12.00	3200 (540-4400)	14.69	14.05	13.47	3.75
	11.5	1.5 + 2.5 + 2.5 + 5.0	1.30 + 2.17 + 2.17 + 4.35 2.90 ~ 10.80	10.00	3360 (550-3500)	15.43	14.76	14.14	2.98	1.57 ~ 2.67 + 2.67 + 5.10 3.00 ~ 12.70	12.00	3400 (540-4400)	15.61	14.93	14.31	3.53
	12.5	1.5 + 2.5 + 2.5 + 6.0	1.20 + 2.00 + 2.00 + 4.80 2.90 ~ 10.90	10.00	3440 (550-3700)	15.79	15.11	14.48	2.91	1.47 ~ 2.50 + 2.50 + 5.52 3.00 ~ 12.70	12.00	3400 (540-4400)	15.61	14.93	14.31	3.53
	13.5	1.5 + 2.5 + 2.5 + 7.0	1.11 + 1.85 + 1.85 + 5.19 2.90 ~ 10.90	10.00	3510 (550-3700)	16.12	15.42	14.77	2.85	1.41 ~ 2.40 + 2.40 + 5.79 3.00 ~ 12.70	12.00	3400 (540-4400)	15.61	14.93	14.31	3.53
	11.0	1.5 + 2.5 + 3.5 + 3.5	1.36 + 2.27 + 3.18 + 3.18 2.90 ~ 10.50	10.00	3330 (550-3700)	15.29	14.62	14.02	3.00	1.71 ~ 2.91 + 3.69 + 3.69 3.00 ~ 12.70	12.00	3150 (540-4000)	14.46	13.83	13.26	3.81
	11.7	1.5 + 2.5 + 3.5 + 4.2	1.28 + 2.14 + 2.99 + 3.59 2.90 ~ 12.50	10.00	3380 (550-3700)	15.52	14.84	14.23	2.96	1.61 ~ 2.74 + 3.46 + 4.19 3.00 ~ 12.70	12.00	3250 (540-4000)	14.92	14.27	13.68	3.69
	12.5	1.5 + 2.5 + 3.5 + 5.0	1.20 + 2.00 + 2.80 + 4.00 2.90 ~ 10.80	10.00	3440 (550-3700)	15.79	15.11	14.48	2.91	1.48 ~ 2.52 + 3.19 + 4.81 3.00 ~ 12.70	12.00	3450 (540-4400)	15.84	15.15	14.52	3.48
	13.5	1.5 + 2.5 + 3.5 + 6.0	1.11 + 1.85 + 2.59 + 4.44 2.90 ~ 10.90	10.00	3510 (550-3700)	16.12	15.42	14.77	2.85	1.40 ~ 2.37 + 3.00 + 5.23 3.00 ~ 12.70	12.00	3450 (540-4400)	15.84	15.15	14.52	3.48
	14.5	1.5 + 2.5 + 3.5 + 7.0	1.03 + 1.72 + 2.41 + 4.83 2.90 ~ 10.90	10.00	3590 (550-3700)	16.48	15.77	15.11	2.79	1.34 ~ 2.28 + 2.88 + 5.50 3.00 ~ 12.70	12.00	3450 (540-4400)	15.84	15.15	14.52	3.48
	12.4	1.5 + 2.5 + 4.2 + 4.2	1.21 + 2.02 + 3.39 + 3.39 2.90 ~ 10.63	10.00	3430 (550-3700)	15.75	15.06	14.44	2.92	1.52 ~ 2.58 + 3.95 + 3.95 3.00 ~ 12.70	12.00	3450 (540-4400)	15.84	15.15	14.52	3.48
	13.2	1.5 + 2.5 + 4.2 + 5.0	1.14 + 1.89 + 3.18 + 3.79 2.90 ~ 10.90	10.00	3490 (550-4000)	16.02	15.33	14.69	2.87	1.40 ~ 2.39 + 3.65 + 4.56 3.00 ~ 12.70	12.00	3450 (540-4400)	15.84	15.15	14.52	3.48
	14.2	1.5 + 2.5 + 4.2 + 6.0	1.06 + 1.76 + 2.96 + 4.23 2.90 ~ 11.20	10.00	3570 (550-4000)	16.39	15.68	15.03	2.80	1.33 ~ 2.25 + 3.45 + 4.97 3.00 ~ 12.70	12.00	3450 (540-4400)	15.84	15.15	14.52	3.48
	15.2	1.5 + 2.5 + 4.2 + 7.0	0.99 + 1.64 + 2.76 + 4.61 2.90 ~ 11.20	10.00	3640 (550-4000)	16.71	15.99	15.32	2.75	1.28 ~ 2.17 + 3.32 + 5.23 3.00 ~ 12.70	12.00	3450 (540-4400)	15.84	15.15	14.52	3.48
	14.0	1.5 + 2.5 + 5.0 + 5.0	1.07 + 1.79 + 3.57 + 3.57 2.90 ~ 11.50	10.00	3550 (550-4000)	16.30	15.59	14.94	2.82	1.30 ~ 2.22 + 4.24 + 4.24 3.00 ~ 12.70	12.00	3450 (540-4400)	15.84	15.15	14.52	3.48
	15.0	1.5 + 2.5 + 5.0 + 6.0	1.00 + 1.67 + 3.33 + 4.00 2.90 ~ 12.50	10.00	3625 (550-4000)	16.64	15.92	15.26	2.76	1.24 ~ 2.10 + 4.02 + 4.64 3.00 ~ 12.70	12.00	3450 (540-4400)	15.84	15.15	14.52	3.48
	16.0	1.5 + 2.5 + 5.0 + 7.0	0.94 + 1.56 + 3.13 + 4.38 2.90 ~ 12.50	10.00	3700 (550-4000)	16.99	16.25	15.57	2.70	1.19 ~ 2.03 + 3.88 + 4.90 3.00 ~ 12.70	12.00	3450 (540-4400)	15.84	15.15	14.52	3.48
	12.0	1.5 + 3.5 + 3.5 + 3.5	1.25 + 2.92 + 2.92 + 2.92 2.90 ~ 12.50	10.00	3400 (550-3700)	15.61	14.93	14.31	2.94	1.61 ~ 3.46 + 3.46 + 3.46 3.00 ~ 12.70	12.00	3220 (540-4000)	14.78	14.14	13.55	3.73
	12.7	1.5 + 3.5 + 3.5 + 4.2	1.18 + 2.76 + 2.76 + 3.31 2.90 ~ 12.50	10.00	3450 (550-3700)	15.84	15.15	14.52	2.90	1.52 ~ 3.27 + 3.27 + 3.95 3.00 ~ 12.70	12.00	3450 (540-4000)	15.84	15.15	14.52	3.48
	13.5	1.5 + 3.5 + 3.5 + 5.0	1.11 + 2.59 + 2.59 + 3.70 2.90 ~ 12.50	10.00	3510 (550-4300)	16.12	15.42	14.77	2.85	1.40 ~ 3.02 + 3.02 + 4.56 3.00 ~ 12.70	12.00	3450 (540-4400)	15.84	15.15	14.52	3.48
	14.5	1.5 + 3.5 + 3.5 + 6.0	1.03 + 2.41 + 2.41 + 4.14 2.90 ~ 12.50	10.00	3590 (550-4300)	16.48	15.77	15.11	2.79	1.33 ~ 2.85 + 2.85 + 4.97 3.00 ~ 12.70	12.00	3450 (540-4400)	15.84	15.15	14.52	3.48
	15.5	1.5 + 3.5 + 3.5 + 7.0	0.97 + 2.26 + 2.26 + 4.52 2.90 ~ 12.50	10.00	3660 (550-4300)	16.80	16.07	15.40	2.73	1.28 ~ 2.74 + 2.74 + 5.23 3.00 ~ 12.70	12.00	3450 (540-4400)	15.84	15.15	14.52	3.48
	13.4	1.5 + 3.5 + 4.2 + 4.2	1.12 + 2.61 + 3.13 + 3.13 2.90 ~ 12.50	10.00	3500 (550-4300)	16.07	15.37	14.73	2.86	1.44 ~ 3.09 + 3.74 + 3.74 3.00 ~ 12.70	12.00	3600 (540-4400)	16.53	15.81	15.15	3.33
	14.2	1.5 + 3.5 + 4.2 + 5.0	1.06 + 2.46 + 2.96 + 3.52 2.90 ~ 12.50	10.00	3570 (550-4300)	16.39	15.68	15.03	2.80	1.33 ~ 2.87 + 3.47 + 4.33 3.00 ~ 12.70	12.00	3600 (540-4400)	16.53	15.81	15.15	3.33
	15.2	1.5 + 3.5 + 4.2 + 6.0	0.99 + 2.30 + 2.76 + 3.95 2.90 ~ 12.50	10.00	3640 (550-4300)	16.71	15.99	15.32	2.75	1.26 ~ 2.72 + 3.28 + 4.74 3.00 ~ 12.70	12.00	3600 (540-4400)	16.53	15.81	15.15	3.33
	16.2	1.5 + 3.5 + 4.2 + 7.0	0.93 + 2.16 + 2.59 + 4.32 2.90 ~ 12.50	10.00	3720 (550-4300)	17.08	16.34	15.66	2.69	1.22 ~ 2.62 + 3.17 + 4.99 3.00 ~ 12.70	12.00	3600 (540-4400)	16.53	15.81	15.15	3.33
	15.0	1.5 + 3.5 + 5.0 + 5.0	1.00 + 2.33 + 3.33 + 3.33 2.90 ~ 12.50	10.00	3630 (550-4300)	16.67	15.94	15.28	2.75	1.24 ~ 2.67 + 4.04 + 4.04 3.00 ~ 12.70	12.00	3600 (540-4400)	16.53	15.81	15.15	3.33
	16.0	1.5 + 3.5 + 5.0 + 6.0	0.94 + 2.19 + 3.13 + 3.75 2.90 ~ 12.50	10.00	3700 (550-4300)	16.99	16.25	15.57	2.70	1.18 ~ 2.54 + 3.84 + 4.43 3.00 ~ 12.70	12.00	3600 (540-4400)	16.53	15.81	15.15	3.33
	14.1	1.5 + 4.2 + 4.2 + 4.2	1.06 + 2.98 + 2.98 + 2.98 2.90 ~ 12.50	10.00	3560 (550-4300)	16.35	15.63	14.98	2.81	1.36 ~ 3.55 + 3.55 + 3.55 3.00 ~ 12.70	12.00	3600 (540-4400)	16.53	15.81	15.15	3.33
	14.9	1.5 + 4.2 + 4.2 + 5.0	1.01 + 2.82 + 2.82 + 3.36 2.90 ~ 12.50	10.00	3620 (550-4300)	16.62	15.90	15.24	2.76	1.27 ~ 3.30 + 3.30 + 4.13 3.00 ~ 12.70	12.00	3600 (540-4400)	16.53	15.81	15.15	3.33
	15.9	1.5 + 4.2 + 4.2 + 6.0	0.94 + 2.64 + 2.64 + 3.77 2.90 ~ 12.50	10.00	3690 (550-4300)	16.94	16.21	15.53	2.71	1.21 ~ 3.14 + 3.14 + 4.52 3.00 ~ 12.70	12.00	3600 (540-4400)	16.53	15.81	15.15	3.33
	15.7	1.5 + 4.2 + 5.0 + 5.0	0.96 + 2.68 + 3.18 + 3.18 2.90 ~ 12.50	10.00	3680 (550-4300)	16.90	16.16	15.49	2.72	1.19 ~ 3.09 + 3.86 + 3.86 3.00 ~ 12.70	12.00	3600 (540-4000)	16.53	15.81	15.15	3.33
	7.2	1.8 + 1.8 + 1.8 + 1.8	1.80 + 1.80 + 1.80 + 1.80 2.90 ~ 8.00	7.20	2000 (550-3120)	9.18	8.78	8.42	3.60	2.50 ~ 2.50 + 2.50 + 2.50 3.00 ~ 10.70	10.00	2350 (540-4000)	10.79	10.32	9.89	4.26
	7.9	1.8 + 1.8 + 1.8 + 2.5	1.80 + 1.80 + 1.80 + 2.50 2.90 ~ 8.80	7.90	2280 (550-3120)	10.47	10.01	9.60	3.46	2.50 ~ 2.50 + 2.50 + 3.40 3.00 ~ 11.60	10.90	2550 (540-4000)	11.71	11.20	10.73	4.27
	8.9	1.8 + 1.8 + 1.8 + 3.5	1.80 + 1.80 + 1.80 + 3.50 2.90 ~ 9.90	8.90	2740 (550-3120)	12.58	12.03	11.53	3.25	2.50 ~ 2.50 + 2.50 + 4.30 3.00 ~ 12.50	11.80	2840 (540-4000)	13.04	12.47	11.95	4.15
	9.6	1.8 + 1.8 + 1.8 + 4.2	1.80 + 1.80 + 1.80 + 4.20 2.90 ~ 10.60	9.60	3070 (550-3460)	14.10	13.48	12.92	3.13	2.36 ~ 2.36 + 2.36 + 4.91 3.00 ~ 12.70	12.00	3040 (540-4000)	13.96	13.35	12.79	3.95
	10.4	1.8 + 1.8 + 1.8 + 5.0	1.73 + 1.73 + 1.73 + 4.81 2.90 ~ 11.06	10.00	3280 (550-3460)	15.06	14.40	13.80	3.05	2.14 ~ 2.14 + 2.14 + 5.57 3.00 ~ 12.70	12.00	3250 (540-4000)	14.92	14.27	13.68	3.69
	11.4	1.8 + 1.8 + 1.8 + 6.0	1.58 + 1.58 + 1.58 + 5.26 2.90 ~ 12.50	10.00	3355 (550-3600)	15.40	14.73	14.12	2.98	2.00 ~ 2.00 + 2.00 + 6.00 3.00 ~ 12.70	12.00	3250 (540-4000)	14.92	14.27	13.68	3.69
	12.4	1.8 + 1.8 + 1.8 + 7.0	1.45 + 1.45 + 1.45 + 5.65 2.90 ~ 4.84	10.00	3430 (550-3700)	15.75	15.06	14.44	2.92	1.91 ~ 1.91 + 1.91 + 6.27 3.00 ~ 12.70	12.00	3250 (540-4000)	14.92	14.27	13.68	3.69
	8.6	1.8 + 1.8 + 2.5 + 2.5	1.80 + 1.80 + 2.50 + 2.50 2.90 ~ 9.60	8.60	2600 (550-3040)	11.94	11.42	10.94	3.31	2.50 ~ 2.50 + 3.40 + 3.40 3.00 ~ 12.50	11.80	2750 (540-4000)	12.63	12.08	11.57	4.29
	9.6	1.8 + 1.8 + 2.5 + 3.5	1.80 + 1.80 + 2.50 + 3.50 2.90 ~ 10.10	9.60	3070 (550-3460)	14.10	13.48	12.92	3.13	2.36 ~ 2.36 + 3.21 + 4.06 3.00 ~ 12.70	12.00	3040 (540-4000)	13.96	13.35	12.79	3.95
	10.3	1.8 + 1.8 + 2.5 + 4.2	1.75 + 1.75 + 2.43 + 4.08 2.90 ~ 10.68	10.00	3270 (550-3460)	15.01	14.36	13.76	3.06	2.21 ~ 2.21 + 3.00 + 4.59 3.00 ~ 12.70	12.00	3170 (540-4000)	14.55	13.92	13.34	3.79
	11.1	1.8 + 1.8 + 2.5 + 5.0	1.62 + 1.62 + 2.25 + 4.50 2.90 ~ 11.15	10.00	3330 (550-3600)	15.29	14.62	14.02	3.00	2.01 ~ 2.01 + 2.74 + 5.23 3.00 ~ 12.70	12.00	3300 (540-4000)	15.15	14.49	13.89	3.64
	12.1	1.8 + 1.8 + 2.5 + 6.0	1.49 + 1.49 + 2.07 + 4.96 2.90 ~ 11.60	10.00	3400 (550-3700)	15.61	14.93	14.31	2.94	1.89 ~ 1.89 + 2.57 + 5.66 3.00 ~ 12.70	12.00	3300 (540-4000)	15.15	14.49	13.89	3.64
	13.1	1.8 + 1.8 + 2.5 + 7.0	1.37 + 1.37 + 1.91 + 5.34 2.90 ~ 11.60	10.00	3480 (550-3700)	15.98	15.28	14.65	2.87	1.81 ~ 1.81 + 2.46 + 5.93 3.00 ~ 12.70	12.00	3300 (540-4000)	15.15	14.49	13.89	3.64
	10.6	1.8 + 1.8 + 3.5 + 3.5	1.70 + 1.70 + 3.30 + 3.30 2.90 ~ 10.60	10.00	3300 (550-3460)	15.15	14.49	13.89	3.03	2.21 ~ 2.21 + 3.79 + 3.79 3.00 ~ 12.70	12.00	3190 (540-4000)	14.65	14.01	13.43	3.76
	11.3	1.8 + 1.8 + 3.5 + 4.2	1.59 + 1.59 + 3.10 + 3.72 2.90 ~ 10.99	10.00	3350 (550-3600)	15.38	14.71	14.10	2.99	2.07 ~ 2.07 + 3.56 + 4.30 3.00 ~ 12.70	12.00	3240 (540-4000)	14.88	14.23	13.64	3.70
	12.1	1.8 + 1.8 + 3.5 + 5.0	1.49 + 1.49 + 2.89 + 4.13 2.90 ~ 11.50	10.00	3400 (550-3700)	15.61	14.93	14.31	2.94	1.90 ~ 1.90 + 3.27 + 4.94 3.00 ~ 12.70	12.00	3450 (540-4400)	15.84	15.15	14.52	3.48
	13.1	1.8 + 1.8 + 3.5 + 6.0	1.37 + 1.37 + 2.67 + 4.58 2.90 ~ 12.00	10.00	3480 (550-3700)	15.98	15.28	14.65	2.87	1.79 ~ 1.79 + 3.07 + 5.36 3.00 ~ 12.70	12.00	3450 (540-4400)	15.84	15.15	14.52	3.48
	14.1	1.8 + 1.8 + 3.5 + 7.0	1.28 + 1.28 + 2.48 + 4.96 2.90 ~ 12.00	10.00	3560 (550-3700)	16.35	15.63	14.98	2.81	1.71 ~ 1.71 + 2.95 + 5.62 3.00 ~ 12.70	12.00	3450 (540-4400)	15.84	15.15	14.52	3.48
	12.0	1.8 + 1.8 + 4.2 + 4.2	1.50 + 1.50 + 3.50 + 3.50 2.90 ~ 12.50	10.00	3400 (550-3700)	15.61	14.93	14.31	2.94	1.95 ~ 1.95 + 4.05 + 4.05 3.00 ~ 12.70	12.00	3450 (540-4400)	15.84	15.15	14.52	3.48
	12.8	1.8 + 1.8 + 4.2 + 5.0	1.41 + 1.41 + 3.28 + 3.91 2.90 ~ 10.80	10.00	3460 (550-4000)	15.89	15.20	14.56	2.89	1.80 ~ 1.80 + 3.74 + 4.67 3.00 ~ 12.70	12.00	3450 (540-4400)	15.84	15.15	14.52	3.48
	13.8	1.8 + 1.8 + 4.2 + 6.0	1.30 + 1.30 + 3.04 + 4.35 2.90 ~ 11.30	10.00	3535 (550-4000)	16.23	15.52	14.88	2.83	1.69 ~ 1.69 + 3.53 + 5.08 3.00 ~ 12.70	12.00	3450 (540-4400)	15.84	15.15	14.52	3.48
	14.8	1.8 + 1.8 + 4.2 + 7.0	1.22 + 1.22 + 2.84 + 4.73 2.90 ~ 11.30	10.00	3610 (550-4000)	16.57	15.85	15.19	2.77	1.63 ~ 1.63 + 3.39 + 5.35 3.00 ~ 12.70	12.00	3450 (540-4400)	15.84	15.15	14.52	3.48
	13.6	1.8 + 1.8 + 5.0 + 5.0	1.32 + 1.32 + 3.68 + 3.68 2.90 ~ 11.20	10.00	3520 (550-4000)	16.16	15.46	14.81	2.84	1.67 ~ 1.67 + 4.33 + 4.33 3.00 ~ 12.70	12.00	3550 (540-4400)	16.30	15.59	14.94	3.38
	14.6	1.8 + 1.8 + 5.0 + 6.0	1.23 + 1.23 + 3.42 + 4.11 2.90 ~ 11.60	10.00	3595 (550-4000)	16.51	15.79	15.13	2.78	1.58 ~ 1.58 + 4.11 + 4.74 3.00 ~ 12.70	12.00	3550 (540-4400)	16.30	15.59	14.94	3.38
	15.6	1.8 + 1.8 + 5.0 + 7.0	1.15 + 1.15 + 3.21 + 4.49 2.90 ~ 11.60	10.00	3670 (550-4000)	16.85	16.12	15.45	2.72	1.52 ~ 1.52 + 3.96 + 4.99 3.00 ~ 12.70	12.00	3550 (540-4400)	16.30	15.59	14.94	3.38
	15.6	1.8 + 1.8 + 6.0 + 6.0	1.15 + 1.15 + 3.85 + 3.85 2.90 ~ 12.00	10.00	3670 (550-4000)	16.85	16.12	15.45	2.72	1.50 ~ 1.50 + 4.50 + 4.50 3.00 ~ 12.70	12.00	3550 (540-4400)	16.30	15.59	14.94	3.38
	16.6	1.8 + 1.8 + 6.0 + 7.0	1.08 + 1.08 + 3.61 + 4.22 2.90 ~ 12.00	10.00	3745 (550-4000)	17.19	16.45	15.76	2.67	1.45 ~ 1.45 + 4.35 + 4.75 3.00 ~ 12.70	12.00	3550 (540-4400)	16.30	15.59	14.94	3.38
	9.3	1.8 + 2.5 + 2.5 + 2.5	1.80 + 2.50 + 2.50 + 2.50 2.90 ~ 10.40	9.30	2930 (550-3460)	13.45	12.87	12.33	3.17	2.36 ~ 3.21 + 3.21 + 3.21 3.00 ~ 12.70	12.00	2950 (540-4000)	13.54	12.96	12.42	4.07
	10.3	1.8 + 2.5 + 2.5 + 3.5	1.75 + 2.43 + 2.43 + 3.40 2.90 ~ 10.99	10.00	3270 (550-3460)	15.01	14.36	13.76	3.06	2.21 ~ 3.00 + 3.00 + 3.79 3.00 ~ 12.70	12.00	3170 (540-4000)	14.55	13.92	13.34	3.79

POSSIBLECOMBINATIONSTO OPERATE		COOLING							HEATING						
			CAPACITY RATING(kW) (RANGE) (kW) (RANGE)	TOTAL	OUTDOOR UNIT POWER CONSUMPTION (W)	OUTDOOR UNIT AMPERE (A) at 220V - 230V - 240V		EER	CAPACITY RATING(kW) (RANGE) (kW) (RANGE)	TOTAL	OUTDOOR UNIT POWER CONSUMPTION (W)	OUTDOOR UNIT AMPERE (A) at 220V - 230V - 240V		COP
	11.0	1.8 + 2.5 + 2.5 + 4.2	1.64 + 2.27 + 2.27 + 3.82 2.90 ~ 11.30	10.00	3325 (550-3600)	15.27 - 14.60 - 13.99		3.01	2.07 ~ 2.81 + 2.81 + 4.30 3.00 ~ 12.70	12.00	3190 (540-4000)	14.65 - 14.01 - 13.43		3.76
	11.8	1.8 + 2.5 + 2.5 + 5.0	1.53 + 2.12 + 2.12 + 4.24 2.90 ~ 11.80	10.00	3385 (550-3700)	15.54 - 14.87 - 14.25		2.95	1.90 ~ 2.58 + 2.58 + 4.94 3.00 ~ 12.70	12.00	3320 (540-4000)	15.24 - 14.58 - 13.97		3.61
	12.8	1.8 + 2.5 + 2.5 + 6.0	1.41 + 1.95 + 1.95 + 4.69 2.90 ~ 12.30	10.00	3460 (550-3700)	15.89 - 15.20 - 14.56		2.89	1.79 ~ 2.43 + 2.43 + 5.36 3.00 ~ 12.70	12.00	3320 (540-4000)	15.24 - 14.58 - 13.97		3.61
	13.8	1.8 + 2.5 + 2.5 + 7.0	1.30 + 1.81 + 1.81 + 5.07 2.90 ~ 12.30	10.00	3100 (550-3700)	14.23 - 13.61 - 13.05		3.23	1.71 ~ 2.33 + 2.33 + 5.62 3.00 ~ 12.70	12.00	3320 (540-4000)	15.24 - 14.58 - 13.97		3.61
	11.3	1.8 + 2.5 + 3.5 + 3.5	1.59 + 2.21 + 3.10 + 3.10 2.90 ~ 10.99	10.00	3350 (550-3600)	15.38 - 14.71 - 14.10		2.99	2.07 ~ 2.81 + 3.56 + 3.56 3.00 ~ 12.70	12.00	3180 (540-4000)	14.60 - 13.97 - 13.38		3.77
	12.0	1.8 + 2.5 + 3.5 + 4.2	1.50 + 2.08 + 2.92 + 3.50 2.90 ~ 11.30	10.00	3400 (550-3700)	15.61 - 14.93 - 14.31		2.94	1.95 ~ 2.65 + 3.35 + 4.05 3.00 ~ 12.70	12.00	3220 (540-4000)	14.78 - 14.14 - 13.55		3.73
	12.8	1.8 + 2.5 + 3.5 + 5.0	1.41 + 1.95 + 2.73 + 3.91 2.90 ~ 11.80	10.00	3460 (550-4000)	15.89 - 15.20 - 14.56		2.89	1.80 ~ 2.44 + 3.09 + 4.67 3.00 ~ 12.70	12.00	3550 (540-4500)	16.30 - 15.59 - 14.94		3.38
	13.8	1.8 + 2.5 + 3.5 + 6.0	1.30 + 1.81 + 2.54 + 4.35 2.90 ~ 12.30	10.00	3535 (550-4000)	16.23 - 15.52 - 14.88		2.83	1.69 ~ 2.31 + 2.92 + 5.08 3.00 ~ 12.70	12.00	3550 (540-4400)	16.30 - 15.59 - 14.94		3.38
	14.8	1.8 + 2.5 + 3.5 + 7.0	1.22 + 1.69 + 2.36 + 4.73 2.90 ~ 12.30	10.00	3610 (550-4000)	16.57 - 15.85 - 15.19		2.77	1.63 ~ 2.22 + 2.80 + 5.35 3.00 ~ 12.70	12.00	3550 (540-4400)	16.30 - 15.59 - 14.94		3.38
	12.7	1.8 + 2.5 + 4.2 + 4.2	1.42 + 1.97 + 3.31 + 3.31 2.90 ~ 11.30	10.00	3450 (550-3860)	15.84 - 15.15 - 14.52		2.90	1.84 ~ 2.50 + 3.83 + 3.83 3.00 ~ 12.70	12.00	3300 (540-4400)	15.15 - 14.49 - 13.89		3.64
	13.5	1.8 + 2.5 + 4.2 + 5.0	1.33 + 1.85 + 3.11 + 3.70 2.90 ~ 11.80	10.00	3510 (550-4000)	16.12 - 15.42 - 14.77		2.85	1.70 ~ 2.32 + 3.55 + 4.43 3.00 ~ 12.70	12.00	3300 (540-4400)	15.15 - 14.49 - 13.89		3.64
	14.5	1.8 + 2.5 + 4.2 + 6.0	1.24 + 1.72 + 2.90 + 4.14 2.90 ~ 12.30	10.00	3590 (550-4300)	16.48 - 15.77 - 15.11		2.79	1.61 ~ 2.19 + 3.35 + 4.84 3.00 ~ 12.70	12.00	3450 (540-4400)	15.84 - 15.15 - 14.52		3.48
	15.5	1.8 + 2.5 + 4.2 + 7.0	1.16 + 1.61 + 2.71 + 4.52 2.90 ~ 12.30	10.00	3660 (550-4300)	16.80 - 16.07 - 15.40		2.73	1.55 ~ 2.11 + 3.23 + 5.10 3.00 ~ 12.70	12.00	3450 (540-4400)	15.84 - 15.15 - 14.52		3.48
	14.3	1.8 + 2.5 + 5.0 + 5.0	1.26 + 1.75 + 3.50 + 3.50 2.90 ~ 12.00	10.00	3570 (550-4300)	16.39 - 15.68 - 15.03		2.80	1.59 ~ 2.16 + 4.13 + 4.13 3.00 ~ 12.70	12.00	3450 (540-4400)	15.84 - 15.15 - 14.52		3.48
	15.3	1.8 + 2.5 + 5.0 + 6.0	1.18 + 1.63 + 3.27 + 3.92 2.90 ~ 12.50	10.00	3650 (550-4300)	16.76 - 16.03 - 15.36		2.74	1.51 ~ 2.05 + 3.92 + 4.52 3.00 ~ 12.70	12.00	3600 (540-4400)	16.53 - 15.81 - 15.15		3.33
	16.3	1.8 + 2.5 + 5.0 + 7.0	1.10 + 1.53 + 3.07 + 4.29 2.90 ~ 12.50	10.00	3720 (550-4300)	17.08 - 16.34 - 15.66		2.69	1.46 ~ 1.98 + 3.79 + 4.78 3.00 ~ 12.70	12.00	3600 (540-4400)	16.53 - 15.81 - 15.15		3.33
	16.3	1.8 + 2.5 + 6.0 + 6.0	1.10 + 1.53 + 3.68 + 3.68 2.90 ~ 12.50	10.00	3720 (550-4300)	17.08 - 16.34 - 15.66		2.69	1.44 ~ 1.95 + 4.31 + 4.31 3.00 ~ 12.70	12.00	3600 (540-4400)	16.53 - 15.81 - 15.15		3.33
	12.3	1.8 + 3.5 + 3.5 + 3.5	1.46 + 2.85 + 2.85 + 2.85 2.90 ~ 10.90	10.00	3420 (550-4000)	15.70 - 15.02 - 14.39		2.92	1.95 ~ 3.35 + 3.35 + 3.35 3.00 ~ 12.70	12.00	3230 (540-4000)	14.83 - 14.19 - 13.59		3.72
	13.0	1.8 + 3.5 + 3.5 + 4.2	1.38 + 2.69 + 2.69 + 3.23 2.90 ~ 11.20	10.00	3475 (550-4300)	15.96 - 15.26 - 14.63		2.88	1.84 ~ 3.17 + 3.17 + 3.83 3.00 ~ 12.70	12.00	3400 (540-4400)	15.61 - 14.93 - 14.31		3.53
	13.8	1.8 + 3.5 + 3.5 + 5.0	1.30 + 2.54 + 2.54 + 3.62 2.90 ~ 11.70	10.00	3535 (550-4300)	16.23 - 15.52 - 14.88		2.83	1.70 ~ 2.93 + 2.93 + 4.43 3.00 ~ 12.70	12.00	3600 (540-4400)	16.53 - 15.81 - 15.15		3.33
	14.8	1.8 + 3.5 + 3.5 + 6.0	1.22 + 2.36 + 2.36 + 4.05 2.90 ~ 12.30	10.00	3610 (550-4300)	16.57 - 15.85 - 15.19		2.77	1.61 ~ 2.77 + 2.77 + 4.84 3.00 ~ 12.70	12.00	3600 (540-4400)	16.53 - 15.81 - 15.15		3.33
	15.8	1.8 + 3.5 + 3.5 + 7.0	1.14 + 2.22 + 2.22 + 4.43 2.90 ~ 12.30	10.00	3685 (550-4300)	16.92 - 16.18 - 15.51		2.71	1.55 ~ 2.67 + 2.67 + 5.10 3.00 ~ 12.70	12.00	3600 (540-4400)	16.53 - 15.81 - 15.15		3.33
	13.7	1.8 + 3.5 + 4.2 + 4.2	1.31 + 2.55 + 3.07 + 3.07 2.90 ~ 11.50	10.00	3530 (550-4300)	16.21 - 15.50 - 14.86		2.83	1.74 ~ 3.00 + 3.63 + 3.63 3.00 ~ 12.70	12.00	3400 (540-4400)	15.61 - 14.93 - 14.31		3.53
	14.5	1.8 + 3.5 + 4.2 + 5.0	1.24 + 2.41 + 2.90 + 3.45 2.90 ~ 12.00	10.00	3590 (550-4300)	16.48 - 15.77 - 15.11		2.79	1.62 ~ 2.79 + 3.37 + 4.22 3.00 ~ 12.70	12.00	3600 (540-4400)	16.53 - 15.81 - 15.15		3.33
	15.5	1.8 + 3.5 + 4.2 + 6.0	1.16 + 2.26 + 2.71 + 3.87 2.90 ~ 12.50	10.00	3660 (550-4300)	16.80 - 16.07 - 15.40		2.73	1.54 ~ 2.65 + 3.20 + 4.62 3.00 ~ 12.70	12.00	3600 (540-4400)	16.53 - 15.81 - 15.15		3.33
	16.5	1.8 + 3.5 + 4.2 + 7.0	1.09 + 2.12 + 2.55 + 4.24 2.90 ~ 12.50	10.00	3740 (550-4300)	17.17 - 16.43 - 15.74		2.67	1.49 ~ 2.55 + 3.09 + 4.87 3.00 ~ 12.70	12.00	3600 (540-4400)	16.53 - 15.81 - 15.15		3.33
	15.3	1.8 + 3.5 + 5.0 + 5.0	1.18 + 2.29 + 3.27 + 3.27 2.90 ~ 12.30	10.00	3650 (550-4300)	16.76 - 16.03 - 15.36		2.74	1.52 ~ 2.61 + 3.94 + 3.94 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	16.3	1.8 + 3.5 + 5.0 + 6.0	1.10 + 2.15 + 3.07 + 3.68 2.90 ~ 12.50	10.00	3720 (550-4300)	17.08 - 16.34 - 15.66		2.69	1.44 ~ 2.48 + 3.75 + 4.33 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	14.4	1.8 + 4.2 + 4.2 + 4.2	1.25 + 2.92 + 2.92 + 2.92 2.90 ~ 12.00	10.00	3580 (550-4300)	16.44 - 15.72 - 15.07		2.79	1.66 ~ 3.45 + 3.45 + 3.45 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	15.2	1.8 + 4.2 + 4.2 + 5.0	1.18 + 2.76 + 2.76 + 3.29 2.90 ~ 12.30	10.00	3640 (550-4300)	16.71 - 15.99 - 15.32		2.75	1.55 ~ 3.22 + 3.22 + 4.02 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	16.2	1.8 + 4.2 + 4.2 + 6.0	1.11 + 2.59 + 2.59 + 3.70 2.90 ~ 12.50	10.00	3715 (550-4300)	17.06 - 16.32 - 15.64		2.69	1.47 ~ 3.06 + 3.06 + 4.41 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	16.2	1.8 + 4.2 + 5.0 + 5.0	1.11 + 2.59 + 3.09 + 3.09 2.90 ~ 12.50	10.00	3715 (550-4300)	17.06 - 16.32 - 15.64		2.69	1.45 ~ 3.01 + 3.77 + 3.77 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	10.0	2.5 + 2.5 + 2.5 + 2.5	2.50 + 2.50 + 2.50 + 2.50 2.90 ~ 11.20	10.00	3150 (550-3460)	14.46 - 13.83 - 13.26		3.17	3.00 ~ 3.00 + 3.00 + 3.00 3.00 ~ 12.70	12.00	3150 (540-4000)	14.46 - 13.83 - 13.26		3.81
	11.0	2.5 + 2.5 + 2.5 + 3.5	2.27 + 2.27 + 2.27 + 3.18 2.90 ~ 11.50	10.00	3325 (550-3700)	15.27 - 14.60 - 13.99		3.01	2.81 ~ 2.81 + 2.81 + 3.56 3.00 ~ 12.70	12.00	3300 (540-4000)	15.15 - 14.49 - 13.89		3.64
	11.7	2.5 + 2.5 + 2.5 + 4.2	2.14 + 2.14 + 2.14 + 3.59 2.90 ~ 11.80	10.00	3380 (550-3700)	15.52 - 14.84 - 14.23		2.96	2.65 ~ 2.65 + 2.65 + 4.05 3.00 ~ 12.70	12.00	3450 (540-4400)	15.84 - 15.15 - 14.52		3.48
	12.5	2.5 + 2.5 + 2.5 + 5.0	2.00 + 2.00 + 2.00 + 4.00 2.90 ~ 12.30	10.00	3440 (550-4000)	15.79 - 15.11 - 14.48		2.91	2.44 ~ 2.44 + 2.44 + 4.67 3.00 ~ 12.70	12.00	3550 (540-4400)	16.30 - 15.59 - 14.94		3.38
	13.5	2.5 + 2.5 + 2.5 + 6.0	1.85 + 1.85 + 1.85 + 4.44 2.90 ~ 12.50	10.00	3510 (550-4000)	16.12 - 15.42 - 14.77		2.85	2.31 ~ 2.31 + 2.31 + 5.08 3.00 ~ 12.70	12.00	3550 (540-4400)	16.30 - 15.59 - 14.94		3.38
	14.5	2.5 + 2.5 + 2.5 + 7.0	1.72 + 1.72 + 1.72 + 4.83 2.90 ~ 12.50	10.00	3590 (550-4000)	16.48 - 15.77 - 15.11		2.79	2.22 ~ 2.22 + 2.22 + 5.35 3.00 ~ 12.70	12.00	3550 (540-4400)	16.30 - 15.59 - 14.94		3.38
	12.0	2.5 + 2.5 + 3.5 + 3.5	2.08 + 2.08 + 2.92 + 2.92 2.90 ~ 11.90	10.00	3400 (550-3700)	15.61 - 14.93 - 14.31		2.94	2.65 ~ 2.65 + 3.35 + 3.35 3.00 ~ 12.70	12.00	3490 (540-4400)	16.02 - 15.33 - 14.69		3.44
	12.7	2.5 + 2.5 + 3.5 + 4.2	1.97 + 1.97 + 2.76 + 3.31 2.90 ~ 12.20	10.00	3450 (550-4000)	15.84 - 15.15 - 14.52		2.90	2.50 ~ 2.50 + 3.17 + 3.83 3.00 ~ 12.70	12.00	3600 (540-4400)	16.53 - 15.81 - 15.15		3.33
	13.5	2.5 + 2.5 + 3.5 + 5.0	1.85 + 1.85 + 2.59 + 3.70 2.90 ~ 12.60	10.00	3500 (550-4500)	16.07 - 15.37 - 14.73		2.86	2.32 ~ 2.32 + 2.93 + 4.43 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	14.5	2.5 + 2.5 + 3.5 + 6.0	1.72 + 1.72 + 2.41 + 4.14 2.90 ~ 12.50	10.00	3590 (550-4300)	16.48 - 15.77 - 15.11		2.79	2.19 ~ 2.19 + 2.77 + 4.84 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	15.5	2.5 + 2.5 + 3.5 + 7.0	1.61 + 1.61 + 2.26 + 4.52 2.90 ~ 12.50	10.00	3660 (550-4300)	16.80 - 16.07 - 15.40		2.73	2.11 ~ 2.11 + 2.67 + 5.10 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	13.4	2.5 + 2.5 + 4.2 + 4.2	1.87 + 1.87 + 3.13 + 3.13 2.90 ~ 12.50	10.00	3550 (550-4300)	16.30 - 15.59 - 14.94		2.82	2.37 ~ 2.37 + 3.63 + 3.63 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	14.2	2.5 + 2.5 + 4.2 + 5.0	1.76 + 1.76 + 2.96 + 3.52 2.90 ~ 12.50	10.00	3565 (550-4300)	16.37 - 15.66 - 15.00		2.81	2.21 ~ 2.21 + 3.37 + 4.22 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	15.2	2.5 + 2.5 + 4.2 + 6.0	1.64 + 1.64 + 2.76 + 3.95 2.90 ~ 12.50	10.00	3640 (550-4300)	16.71 - 15.99 - 15.32		2.75	2.09 ~ 2.09 + 3.20 + 4.62 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	16.2	2.5 + 2.5 + 4.2 + 7.0	1.54 + 1.54 + 2.59 + 4.32 2.90 ~ 12.50	10.00	3715 (550-4300)	17.06 - 16.32 - 15.64		2.69	2.02 ~ 2.02 + 3.09 + 4.87 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	15.0	2.5 + 2.5 + 5.0 + 5.0	1.67 + 1.67 + 3.33 + 3.33 2.90 ~ 12.50	10.00	3625 (550-4300)	16.64 - 15.92 - 15.26		2.76	2.06 ~ 2.06 + 3.94 + 3.94 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	16.0	2.5 + 2.5 + 5.0 + 6.0	1.56 + 1.56 + 3.13 + 3.75 2.90 ~ 12.50	10.00	3700 (550-4300)	16.99 - 16.25 - 15.57		2.70	1.96 ~ 1.96 + 3.75 + 4.33 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	13.0	2.5 + 3.5 + 3.5 + 3.5	1.92 + 2.69 + 2.69 + 2.69 2.90 ~ 12.23	10.00	3475 (550-4300)	15.96 - 15.26 - 14.63		2.88	2.50 ~ 3.17 + 3.17 + 3.17 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	13.7	2.5 + 3.5 + 3.5 + 4.2	1.82 + 2.55 + 2.55 + 3.07 2.90 ~ 12.50	10.00	3530 (550-4300)	16.21 - 15.50 - 14.86		2.83	2.37 ~ 3.00 + 3.00 + 3.63 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	14.5	2.5 + 3.5 + 3.5 + 5.0	1.72 + 2.41 + 2.41 + 3.45 2.90 ~ 12.50	10.00	3590 (550-4300)	16.48 - 15.77 - 15.11		2.79	2.21 ~ 2.79 + 2.79 + 4.22 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	15.5	2.5 + 3.5 + 3.5 + 6.0	1.61 + 2.26 + 2.26 + 3.87 2.90 ~ 12.50	10.00	3660 (550-4300)	16.80 - 16.07 - 15.40		2.73	2.09 ~ 2.65 + 2.65 + 4.62 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	16.5	2.5 + 3.5 + 3.5 + 7.0	1.52 + 2.12 + 2.12 + 4.24 2.90 ~ 12.50	10.00	3740 (550-4300)	17.17 - 16.43 - 15.74		2.67	2.02 ~ 2.55 + 2.55 + 4.87 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	14.4	2.5 + 3.5 + 4.2 + 4.2	1.74 + 2.43 + 2.92 + 2.92 2.90 ~ 12.50	10.00	3580 (550-4300)	16.44 - 15.72 - 15.07		2.79	2.25 ~ 2.85 + 3.45 + 3.45 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	15.2	2.5 + 3.5 + 4.2 + 5.0	1.64 + 2.30 + 2.76 + 3.29 2.90 ~ 12.50	10.00	3640 (550-4300)	16.71 - 15.99 - 15.32		2.75	2.10 ~ 2.66 + 3.22 + 4.02 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	16.2	2.5 + 3.5 + 4.2 + 6.0	1.54 + 2.16 + 2.59 + 3.70 2.90 ~ 12.50	10.00	3715 (550-4300)	17.06 - 16.32 - 15.64		2.69	2.00 ~ 2.53 + 3.06 + 4.41 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	16.0	2.5 + 3.5 + 5.0 + 5.0	1.56 + 2.19 + 3.13 + 3.13 2.90 ~ 12.50	10.00	3700 (550-4300)	16.99 - 16.25 - 15.57		2.70	1.97 ~ 2.49 + 3.77 + 3.77 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	14.0	3.5 + 3.5 + 3.5 + 3.5	2.50 + 2.50 + 2.50 + 2.50 2.90 ~ 12.50	10.00	3550 (550-4300)	16.30 - 15.59 - 14.94		2.82	3.00 ~ 3.00 + 3.00 + 3.00 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	14.7	3.5 + 3.5 + 3.5 + 4.2	2.38 + 2.38 + 2.38 + 2.86 2.90 ~ 12.50	10.00	3600 (550-4300)	16.53 - 15.81 - 15.15		2.78	2.85 ~ 2.85 + 2.85 + 3.45 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	15.5	3.5 + 3.5 + 3.5 + 5.0	2.26 + 2.26 + 2.26 + 3.23 2.90 ~ 12.50	10.00	3660 (550-4300)	16.80 - 16.07 - 15.40		2.73	2.66 ~ 2.66 + 2.66 + 4.02 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	16.5	3.5 + 3.5 + 3.5 + 6.0	2.12 + 2.12 + 2.12 + 3.64 2.90 ~ 12.50	10.00	3740 (550-4300)	17.17 - 16.43 - 15.74		2.67	2.53 ~ 2.53 + 2.53 + 4.41 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	15.4	3.5 + 3.5 + 4.2 + 4.2	2.27 + 2.27 + 2.73 + 2.73 2.90 ~ 12.50	10.00	3655 (550-4300)	16.78 - 16.05 - 15.38		2.74	2.72 ~ 2.72 + 3.28 + 3.28 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	16.2	3.5 + 3.5 + 4.2 + 5.0	2.16 + 2.16 + 2.59 + 3.09 2.90 ~ 12.50	10.00	3715 (550-4300)	17.06 - 16.32 - 15.64		2.69	2.54 ~ 2.54 + 3.07 + 3.84 3.00 ~ 12.70	12.00	3700 (540-4400)	16.99 - 16.25 - 15.57		3.24
	7.5	1.5 + 1.5 + 1.5 + 1.5 + 1.5	1.50 + 1.50 + 1.50 + 1.50 + 1.50 2.40 ~ 8.00	7.50	2100 (550-2800)	9.64 - 9.22 - 8.84		3.57	2.00 ~ 2.00 + 2.00 + 2.00 + 2.00 3.40 ~ 10.70	10.00	2430 (610-2720)	11.16 - 10.67 - 10.23		4.12
	7.8	1.5 + 1.5 + 1.5 + 1.5 + 1.8	1.50 + 1.50 + 1.50 + 1.50 + 1.80 2.70 ~ 8.40	7.80	2238 (550-2800)	10.28 - 9.83 - 9.42		3.49	2.00 ~ 2.00 + 2.00 + 2.00 + 2.50 3.40 ~ 11.20	10.50	2520 (610-2830)	11.57 - 11.07 - 10.61		4.17
	8.5	1.5 + 1.5 + 1.5 + 1.5 + 2.5	1.50 + 1.50 + 1.50 + 1.50 + 2.50 2.90 ~ 9.20	8.50	2560 (550-2800)	11.75 - 11.24 - 10.77		3.32	2.00 ~ 2.00 + 2.00 + 2.00 + 3.40 3.40 ~ 12.10	11.40	2720 (610-2880)	12.49 - 11.95 - 11.45		4.19
	9.5	1.5 + 1.5 + 1.5 + 1.5 + 3.5	1.50 + 1.50 + 1.50 + 1.50 + 3.50 2.90 ~ 10.30	9.50	3020 (550-3460)	13.87 - 13.26 - 12.71		3.15	1.95 ~ 1.95 + 1.95 + 1.95 + 4.20 3.40 ~ 12.70	12.00	3000 (610-4000)	13.77 - 13.18 - 12.63		4.00
	10.2	1.5 + 1.5 + 1.5 + 1.5 + 4.2	1.47 + 1.47 + 1.47 + 1.47 + 4.12 2.90 ~ 10.78	10.00	3268 (550-3460)	15.01 - 14.35 - 13.76		3.06	1.82 ~ 1.82 + 1.82 + 1.82 + 4.73 3.40 ~ 12.70	12.00	3150 (610-4000)	14.46 - 13.83 - 13.26		3.81

POSSIBLECOMBINATIONSTO OPERATE		COOLING							HEATING						
		CAPACITY RATING(kW) (RANGE) (kW) (RANGE)	TOTAL	OUTDOOR UNIT POWER CONSUMPTION (W)	OUTDOOR UNIT AMPERE (A) at 220V - 230V - 240V			EER	CAPACITY RATING(kW) (RANGE) (kW) (RANGE)	TOTAL	OUTDOOR UNIT POWER CONSUMPTION (W)	OUTDOOR UNIT AMPERE (A) at 220V - 230V - 240V			COP
11.0	1.5 + 1.5 + 1.5 + 1.5 + 5.0	1.36 + 1.36 + 1.36 + 1.36 + 4.55 2.90 ~ 10.82	10.00	3342 (550-3460)	15.34	14.68	14.06	2.99	1.66 ~ 1.66 + 1.66 + 1.66 + 5.38 3.40 ~ 12.70	12.00	3300 (610-4000)	15.15	14.49	13.89	3.64
12.0	1.5 + 1.5 + 1.5 + 1.5 + 6.0	1.25 + 1.25 + 1.25 + 1.25 + 5.00 2.90 ~ 11.30	10.00	3433 (550-3600)	15.76	15.08	14.45	2.91	1.55 ~ 1.55 + 1.55 + 1.55 + 5.81 3.40 ~ 12.70	12.00	3300 (610-4000)	15.15	14.49	13.89	3.64
13.0	1.5 + 1.5 + 1.5 + 1.5 + 7.0	1.15 + 1.15 + 1.15 + 1.15 + 5.38 2.90 ~ 11.30	10.00	3525 (550-3700)	16.19	15.48	14.84	2.84	1.48 ~ 1.48 + 1.48 + 1.48 + 6.07 3.40 ~ 12.70	12.00	3300 (610-4000)	15.15	14.49	13.89	3.64
8.1	1.5 + 1.5 + 1.5 + 1.8 + 1.8	1.50 + 1.50 + 1.50 + 1.80 + 1.80 2.90 ~ 8.80	8.10	2376 (550-2500)	10.91	10.43	10.00	3.41	2.00 ~ 2.00 + 2.00 + 2.50 + 2.50 3.40 ~ 11.70	11.00	2600 (610-4000)	11.94	11.42	10.94	4.23
8.8	1.5 + 1.5 + 1.5 + 1.8 + 2.5	1.50 + 1.50 + 1.50 + 1.80 + 2.50 2.90 ~ 9.60	8.80	2698 (550-3460)	12.39	11.85	11.36	3.26	2.00 ~ 2.00 + 2.00 + 2.50 + 3.40 3.40 ~ 12.60	11.90	2800 (610-4000)	12.86	12.30	11.78	4.25
9.8	1.5 + 1.5 + 1.5 + 1.8 + 3.5	1.50 + 1.50 + 1.50 + 1.80 + 3.50 2.90 ~ 10.70	9.80	3158 (550-3460)	14.50	13.87	13.29	3.10	1.88 ~ 1.88 + 1.88 + 2.34 + 4.03 3.40 ~ 12.70	12.00	3090 (610-4000)	14.19	13.57	13.01	3.88
10.5	1.5 + 1.5 + 1.5 + 1.8 + 4.2	1.43 + 1.43 + 1.43 + 1.71 + 4.00 2.90 ~ 11.00	10.00	3296 (550-3600)	15.13	14.47	13.87	3.03	1.75 ~ 1.75 + 1.75 + 2.19 + 4.55 3.40 ~ 12.70	12.00	3180 (610-4000)	14.60	13.97	13.38	3.77
11.3	1.5 + 1.5 + 1.5 + 1.8 + 5.0	1.33 + 1.33 + 1.33 + 1.59 + 4.42 2.90 ~ 11.30	10.00	3369 (550-3700)	15.47	14.80	14.18	2.97	1.60 ~ 1.60 + 1.60 + 2.00 + 5.20 3.40 ~ 12.70	12.00	3350 (610-4000)	15.38	14.71	14.10	3.58
12.3	1.5 + 1.5 + 1.5 + 1.8 + 6.0	1.22 + 1.22 + 1.22 + 1.46 + 4.88 2.90 ~ 11.60	10.00	3461 (550-3700)	15.89	15.20	14.57	2.89	1.50 ~ 1.50 + 1.50 + 1.88 + 5.63 3.40 ~ 12.70	12.00	3400 (610-4000)	15.61	14.93	14.31	3.53
13.3	1.5 + 1.5 + 1.5 + 1.8 + 7.0	1.13 + 1.13 + 1.13 + 1.35 + 5.26 2.90 ~ 11.60	10.00	3553 (550-3700)	16.31	15.60	14.95	2.81	1.44 ~ 1.44 + 1.44 + 1.80 + 5.89 3.40 ~ 12.70	12.00	3400 (610-4000)	15.61	14.93	14.31	3.53
9.5	1.5 + 1.5 + 1.5 + 2.5 + 2.5	1.50 + 1.50 + 1.50 + 2.50 + 2.50 2.90 ~ 9.90	9.50	3020 (550-3460)	13.87	13.26	12.71	3.15	1.88 ~ 1.88 + 1.88 + 3.19 + 3.19 3.40 ~ 12.70	12.00	3000 (610-4000)	13.77	13.18	12.63	4.00
10.5	1.5 + 1.5 + 1.5 + 2.5 + 3.5	1.43 + 1.43 + 1.43 + 2.38 + 3.33 2.90 ~ 10.30	10.00	3296 (550-3460)	15.13	14.47	13.87	3.03	1.75 ~ 1.75 + 1.75 + 2.98 + 3.77 3.40 ~ 12.70	12.00	3180 (610-4000)	14.60	13.97	13.38	3.77
11.2	1.5 + 1.5 + 1.5 + 2.5 + 4.2	1.34 + 1.34 + 1.34 + 2.23 + 3.75 2.90 ~ 10.80	10.00	3360 (550-3700)	15.43	14.76	14.14	2.98	1.64 ~ 1.64 + 1.64 + 2.79 + 4.27 3.40 ~ 12.70	12.00	3320 (610-4000)	15.24	14.58	13.97	3.61
12.0	1.5 + 1.5 + 1.5 + 2.5 + 5.0	1.25 + 1.25 + 1.25 + 2.08 + 4.17 2.90 ~ 11.30	10.00	3433 (550-4000)	15.76	15.08	14.45	2.91	1.51 ~ 1.51 + 1.51 + 2.57 + 4.91 3.40 ~ 12.70	12.00	3450 (610-4000)	15.84	15.15	14.52	3.48
13.0	1.5 + 1.5 + 1.5 + 2.5 + 6.0	1.15 + 1.15 + 1.15 + 1.92 + 4.62 2.90 ~ 11.80	10.00	3525 (550-4000)	16.19	15.48	14.84	2.84	1.42 ~ 1.42 + 1.42 + 2.41 + 5.33 3.40 ~ 12.70	12.00	3450 (610-4000)	15.84	15.15	14.52	3.48
14.0	1.5 + 1.5 + 1.5 + 2.5 + 7.0	1.07 + 1.07 + 1.07 + 1.79 + 5.00 2.90 ~ 11.80	10.00	3617 (550-4000)	16.61	15.88	15.22	2.76	1.36 ~ 1.36 + 1.36 + 2.32 + 5.59 3.40 ~ 12.70	12.00	3450 (610-4000)	15.84	15.15	14.52	3.48
11.5	1.5 + 1.5 + 1.5 + 3.5 + 3.5	1.30 + 1.30 + 1.30 + 3.04 + 3.04 2.90 ~ 12.50	10.00	3388 (550-4000)	15.55	14.88	14.26	2.95	1.64 ~ 1.64 + 1.64 + 3.53 + 3.53 3.40 ~ 12.70	12.00	3350 (610-4000)	15.38	14.71	14.10	3.58
12.2	1.5 + 1.5 + 1.5 + 3.5 + 4.2	1.23 + 1.23 + 1.23 + 2.87 + 3.44 2.90 ~ 11.50	10.00	3452 (550-4000)	15.85	15.16	14.53	2.90	1.55 ~ 1.55 + 1.55 + 3.33 + 4.03 3.40 ~ 12.70	12.00	3480 (610-4000)	15.98	15.28	14.65	3.45
13.0	1.5 + 1.5 + 1.5 + 3.5 + 5.0	1.15 + 1.15 + 1.15 + 2.69 + 3.85 2.90 ~ 12.00	10.00	3525 (550-4300)	16.19	15.48	14.84	2.84	1.43 ~ 1.43 + 1.43 + 3.07 + 4.64 3.40 ~ 12.70	12.00	3600 (610-4400)	16.53	15.81	15.15	3.33
14.0	1.5 + 1.5 + 1.5 + 3.5 + 6.0	1.07 + 1.07 + 1.07 + 2.50 + 4.29 2.90 ~ 12.50	10.00	3617 (550-4300)	16.61	15.88	15.22	2.76	1.35 ~ 1.35 + 1.35 + 2.90 + 5.06 3.40 ~ 12.70	12.00	3600 (610-4400)	16.53	15.81	15.15	3.33
15.0	1.5 + 1.5 + 1.5 + 3.5 + 7.0	1.00 + 1.00 + 1.00 + 2.33 + 4.67 2.90 ~ 12.50	10.00	3709 (550-4300)	17.03	16.29	15.61	2.70	1.30 ~ 1.30 + 1.30 + 2.79 + 5.32 3.40 ~ 12.70	12.00	3600 (610-4400)	16.53	15.81	15.15	3.33
12.9	1.5 + 1.5 + 1.5 + 4.2 + 4.2	1.16 + 1.16 + 1.16 + 3.26 + 3.26 2.90 ~ 11.80	10.00	3516 (550-4300)	16.14	15.44	14.80	2.84	1.46 ~ 1.46 + 1.46 + 3.80 + 3.80 3.40 ~ 12.70	12.00	3550 (610-4400)	16.30	15.59	14.94	3.38
13.7	1.5 + 1.5 + 1.5 + 4.2 + 5.0	1.09 + 1.09 + 1.09 + 3.07 + 3.65 2.90 ~ 12.10	10.00	3589 (550-4300)	16.48	15.76	15.11	2.79	1.36 ~ 1.36 + 1.36 + 3.53 + 4.41 3.40 ~ 12.70	12.00	3680 (610-4400)	16.90	16.16	15.49	3.26
14.7	1.5 + 1.5 + 1.5 + 4.2 + 6.0	1.02 + 1.02 + 1.02 + 2.86 + 4.08 2.90 ~ 12.50	10.00	3681 (550-4300)	16.90	16.17	15.49	2.72	1.28 ~ 1.28 + 1.28 + 3.34 + 4.81 3.40 ~ 12.70	12.00	3680 (610-4400)	16.90	16.16	15.49	3.26
15.7	1.5 + 1.5 + 1.5 + 4.2 + 7.0	0.96 + 0.96 + 0.96 + 2.68 + 4.46 2.90 ~ 12.50	10.00	3773 (550-4300)	17.32	16.57	15.88	2.65	1.24 ~ 1.24 + 1.24 + 3.22 + 5.07 3.40 ~ 12.70	12.00	3680 (610-4400)	16.90	16.16	15.49	3.26
14.5	1.5 + 1.5 + 1.5 + 5.0 + 5.0	1.03 + 1.03 + 1.03 + 3.45 + 3.45 2.90 ~ 12.50	10.00	3663 (550-4300)	16.82	16.09	15.42	2.73	1.26 ~ 1.26 + 1.26 + 4.11 + 4.11 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68	16.91	16.20	3.12
15.5	1.5 + 1.5 + 1.5 + 5.0 + 6.0	0.97 + 0.97 + 0.97 + 3.23 + 3.87 2.90 ~ 12.50	10.00	3754 (550-4300)	17.24	16.49	15.80	2.66	1.20 ~ 1.20 + 1.20 + 3.90 + 4.50 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68	16.91	16.20	3.12
16.5	1.5 + 1.5 + 1.5 + 5.0 + 7.0	0.91 + 0.91 + 0.91 + 3.03 + 4.24 2.90 ~ 12.50	10.00	3846 (550-4300)	17.66	16.89	16.19	2.60	1.16 ~ 1.16 + 1.16 + 3.77 + 4.75 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68	16.91	16.20	3.12
8.4	1.5 + 1.5 + 1.8 + 1.8 + 1.8	1.50 + 1.50 + 1.80 + 1.80 + 1.80 2.90 ~ 9.20	8.40	2514 (550-2700)	11.54	11.04	10.58	3.34	2.00 ~ 2.00 + 2.50 + 2.50 + 2.50 3.40 ~ 12.20	11.50	2690 (610-4000)	12.35	11.81	11.32	4.28
9.1	1.5 + 1.5 + 1.8 + 1.8 + 2.5	1.50 + 1.50 + 1.80 + 1.80 + 2.50 2.90 ~ 9.70	9.10	2836 (550-3460)	13.02	12.45	11.94	3.21	1.94 ~ 1.94 + 2.42 + 2.42 + 3.29 3.40 ~ 12.70	12.00	2890 (610-4000)	13.27	12.69	12.16	4.15
10.1	1.5 + 1.5 + 1.8 + 1.8 + 3.5	1.49 + 1.49 + 1.78 + 1.78 + 3.47 2.90 ~ 10.30	10.00	3259 (550-3460)	14.96	14.31	13.72	3.07	1.80 ~ 1.80 + 2.26 + 2.26 + 3.88 3.40 ~ 12.70	12.00	3160 (610-4000)	14.51	13.88	13.30	3.80
10.8	1.5 + 1.5 + 1.8 + 1.8 + 4.2	1.39 + 1.39 + 1.67 + 1.67 + 3.89 2.90 ~ 10.93	10.00	3323 (550-3700)	15.26	14.60	13.99	3.01	1.69 ~ 1.69 + 2.11 + 2.11 + 4.39 3.40 ~ 12.70	12.00	3300 (610-4000)	15.15	14.49	13.89	3.64
11.6	1.5 + 1.5 + 1.8 + 1.8 + 5.0	1.29 + 1.29 + 1.55 + 1.55 + 4.31 2.90 ~ 12.50	10.00	3397 (550-3700)	15.60	14.92	14.30	2.94	1.55 ~ 1.55 + 1.94 + 1.94 + 5.03 3.40 ~ 12.70	12.00	3450 (610-4000)	15.84	15.15	14.52	3.48
12.6	1.5 + 1.5 + 1.8 + 1.8 + 6.0	1.19 + 1.19 + 1.43 + 1.43 + 4.76 2.90 ~ 11.50	10.00	3488 (550-3700)	16.02	15.32	14.68	2.87	1.45 ~ 1.45 + 1.82 + 1.82 + 5.45 3.40 ~ 12.70	12.00	3450 (610-4000)	15.84	15.15	14.52	3.48
13.6	1.5 + 1.5 + 1.8 + 1.8 + 7.0	1.10 + 1.10 + 1.32 + 1.32 + 5.15 2.90 ~ 11.50	10.00	3580 (550-3700)	16.44	15.72	15.07	2.79	1.40 ~ 1.40 + 1.74 + 1.74 + 5.72 3.40 ~ 12.70	12.00	3450 (610-4000)	15.84	15.15	14.52	3.48
9.8	1.5 + 1.5 + 1.8 + 2.5 + 2.5	1.50 + 1.50 + 1.80 + 2.50 + 2.50 2.90 ~ 10.30	9.80	3235 (550-3460)	14.85	14.21	13.62	3.03	1.80 ~ 1.80 + 2.26 + 3.07 + 3.07 3.40 ~ 12.70	12.00	3100 (610-4000)	14.23	13.61	13.05	3.87
10.8	1.5 + 1.5 + 1.8 + 2.5 + 3.5	1.39 + 1.39 + 1.67 + 2.31 + 3.24 2.90 ~ 10.80	10.00	3323 (550-3700)	15.26	14.60	13.99	3.01	1.69 ~ 1.69 + 2.11 + 2.87 + 3.63 3.40 ~ 12.70	12.00	3300 (610-4000)	15.15	14.49	13.89	3.64
11.5	1.5 + 1.5 + 1.8 + 2.5 + 4.2	1.30 + 1.30 + 1.57 + 2.17 + 3.65 2.90 ~ 11.10	10.00	3388 (550-3700)	15.55	14.88	14.26	2.95	1.59 ~ 1.59 + 1.99 + 2.70 + 4.13 3.40 ~ 12.70	12.00	3380 (610-4000)	15.52	14.84	14.23	3.55
12.3	1.5 + 1.5 + 1.8 + 2.5 + 5.0	1.22 + 1.22 + 1.46 + 2.03 + 4.07 2.90 ~ 11.60	10.00	3461 (550-4000)	15.89	15.20	14.57	2.89	1.46 ~ 1.46 + 1.83 + 2.49 + 4.76 3.40 ~ 12.70	12.00	3550 (610-4000)	16.30	15.59	14.94	3.38
13.3	1.5 + 1.5 + 1.8 + 2.5 + 6.0	1.13 + 1.13 + 1.35 + 1.88 + 4.51 2.90 ~ 12.10	10.00	3553 (550-4000)	16.31	15.60	14.95	2.81	1.38 ~ 1.38 + 1.72 + 2.34 + 5.17 3.40 ~ 12.70	12.00	3550 (610-4000)	16.30	15.59	14.94	3.38
14.3	1.5 + 1.5 + 1.8 + 2.5 + 7.0	1.05 + 1.05 + 1.26 + 1.75 + 4.90 2.90 ~ 12.10	10.00	3644 (550-4000)	16.73	16.00	15.34	2.74	1.33 ~ 1.33 + 1.66 + 2.25 + 5.44 3.40 ~ 12.70	12.00	3550 (610-4000)	16.30	15.59	14.94	3.38
11.8	1.5 + 1.5 + 1.8 + 3.5 + 3.5	1.27 + 1.27 + 1.53 + 2.97 + 2.97 2.90 ~ 12.50	10.00	3415 (550-4000)	15.68	15.00	14.37	2.93	1.59 ~ 1.59 + 1.99 + 3.42 + 3.42 3.40 ~ 12.70	12.00	3200 (610-4000)	14.69	14.05	13.47	3.75
12.5	1.5 + 1.5 + 1.8 + 3.5 + 4.2	1.20 + 1.20 + 1.44 + 2.80 + 3.36 2.90 ~ 12.50	10.00	3479 (550-4000)	15.97	15.28	14.64	2.87	1.50 ~ 1.50 + 1.88 + 3.23 + 3.90 3.40 ~ 12.70	12.00	3350 (610-4000)	15.38	14.71	14.10	3.58
13.3	1.5 + 1.5 + 1.8 + 3.5 + 5.0	1.13 + 1.13 + 1.35 + 2.63 + 3.76 2.90 ~ 12.50	10.00	3553 (550-4300)	16.31	15.60	14.95	2.81	1.39 ~ 1.39 + 1.73 + 2.98 + 4.51 3.40 ~ 12.70	12.00	3650 (610-4400)	16.76	16.03	15.36	3.29
14.3	1.5 + 1.5 + 1.8 + 3.5 + 6.0	1.05 + 1.05 + 1.26 + 2.45 + 4.20 2.90 ~ 12.50	10.00	3644 (550-4300)	16.73	16.00	15.34	2.74	1.31 ~ 1.31 + 1.64 + 2.82 + 4.92 3.40 ~ 12.70	12.00	3650 (610-4400)	16.76	16.03	15.36	3.29
15.3	1.5 + 1.5 + 1.8 + 3.5 + 7.0	0.98 + 0.98 + 1.18 + 2.29 + 4.58 2.90 ~ 12.50	10.00	3736 (550-4300)	17.15	16.41	15.72	2.68	1.26 ~ 1.26 + 1.58 + 2.72 + 5.18 3.40 ~ 12.70	12.00	3650 (610-4400)	16.76	16.03	15.36	3.29
13.2	1.5 + 1.5 + 1.8 + 4.2 + 4.2	1.14 + 1.14 + 1.36 + 3.18 + 3.18 2.90 ~ 11.60	10.00	3543 (550-4300)	16.27	15.56	14.91	2.82	1.42 ~ 1.42 + 1.78 + 3.69 + 3.69 3.40 ~ 12.70	12.00	3650 (610-4400)	16.76	16.03	15.36	3.29
14.0	1.5 + 1.5 + 1.8 + 4.2 + 5.0	1.07 + 1.07 + 1.29 + 3.00 + 3.57 2.90 ~ 12.10	10.00	3617 (550-4300)	16.61	15.88	15.22	2.76	1.32 ~ 1.32 + 1.65 + 3.43 + 4.29 3.40 ~ 12.70	12.00	3650 (610-4400)	16.76	16.03	15.36	3.29
15.0	1.5 + 1.5 + 1.8 + 4.2 + 6.0	1.00 + 1.00 + 1.20 + 2.80 + 4.00 2.90 ~ 12.50	10.00	3709 (550-4300)	17.03	16.29	15.61	2.70	1.25 ~ 1.25 + 1.56 + 3.25 + 4.69 3.40 ~ 12.70	12.00	3650 (610-4400)	16.76	16.03	15.36	3.29
16.0	1.5 + 1.5 + 1.8 + 4.2 + 7.0	0.94 + 0.94 + 1.13 + 2.63 + 4.38 2.90 ~ 12.50	10.00	3800 (550-4300)	17.45	16.69	15.99	2.63	1.21 ~ 1.21 + 1.51 + 3.14 + 4.94 3.40 ~ 12.70	12.00	3650 (610-4400)	16.76	16.03	15.36	3.29
14.8	1.5 + 1.5 + 1.8 + 5.0 + 5.0	1.01 + 1.01 + 1.22 + 3.38 + 3.38 2.90 ~ 12.50	10.00	3690 (550-4300)	16.94	16.21	15.53	2.71	1.23 ~ 1.23 + 1.54 + 4.00 + 4.00 3.40 ~ 12.70	12.00	3700 (610-4400)	16.99	16.25	15.57	3.24
15.8	1.5 + 1.5 + 1.8 + 5.0 + 6.0	0.95 + 0.95 + 1.14 + 3.16 + 3.80 2.90 ~ 12.50	10.00	3782 (550-4300)	17.36	16.61	15.92	2.64	1.17 ~ 1.17 + 1.46 + 3.80 + 4.39 3.40 ~ 12.70	12.00	3700 (610-4400)	16.99	16.25	15.57	3.24
10.5	1.5 + 1.5 + 2.5 + 2.5 + 2.5	1.43 + 1.43 + 2.38 + 2.38 + 2.38 2.90 ~ 11.05	10.00	3296 (550-3600)	15.13	14.47	13.87	3.03	1.69 ~ 1.69 + 2.87 + 2.87 + 2.87 3.40 ~ 12.70	12.00	3180 (610-4000)	14.60	13.97	13.38	3.77
11.5	1.5 + 1.5 + 2.5 + 2.5 + 3.5	1.30 + 1.30 + 2.17 + 2.17 + 3.04 2.90 ~ 11.50	10.00	3388 (550-3700)	15.55	14.88	14.26	2.95	1.59 ~ 1.59 + 2.70 + 2.70 + 3.42 3.40 ~ 12.70	12.00	3270 (610-4000)	15.01	14.36	13.76	3.67
12.2	1.5 + 1.5 + 2.5 + 2.5 + 4.2	1.23 + 1.23 + 2.05 + 2.05 + 3.44 2.90 ~ 11.80	10.00	3452 (550-3800)	15.85	15.16	14.53	2.90	1.50 ~ 1.50 + 2.55 + 2.55 + 3.90 3.40 ~ 12.70	12.00	3350 (610-4000)	15.38	14.71	14.10	3.58
13.0	1.5 + 1.5 + 2.5 + 2.5 + 5.0	1.15 + 1.15 + 1.92 + 1.92 + 3.85 2.90 ~ 12.10	10.00	3525 (550-4000)	16.19	15.48	14.84	2.84	1.39 ~ 1.39 + 2.36 + 2.36 + 4.51 3.40 ~ 12.70	12.00	3600 (610-4000)	16.53	15.81	15.15	3.33
14.0	1.5 + 1.5 + 2.5 + 2.5 + 6.0	1.07 + 1.07 + 1.79 + 1.79 + 4.29 2.90 ~ 12.50	10.00	3617 (550-4000)	16.61	15.88	15.22	2.76	1.31 ~ 1.31 + 2.23 + 2.23 + 4.92 3.40 ~ 12.70	12.00	3600 (610-4000)	16.53	15.81	15.15	3.33
15.0	1.5 + 1.5 + 2.5 + 2.5 + 7.0	1.00 + 1.00 + 1.67 + 1.67 + 4.67 2.90 ~ 12.50	10.00	3709 (550-4000)	17.03	16.29	15.61	2.70	1.26 ~ 1.26 + 2.15 + 2.15 + 5.18 3.40 ~ 12.70	12.00	3600 (610-4000)	16.53	15.81	15.15	3.33
13.2	1.5 + 1.5 + 2.5 + 3.5 + 4.2	1.14 + 1.14 + 1.89 + 2.65 + 3.18 2.90 ~ 12.50	10.00	3543 (550-4000)	16.27	15.56	14.91	2.82	1.42 ~ 1.42 + 2.41 + 3.05 + 3.69 3.40 ~ 12.70	12.00	3350 (610-4000)	15.38	14.71	14.10	3.58
14.0	1.5 + 1.5 + 2.5 + 3.5 + 5.0	1.07 + 1.07 + 1.79 + 2.50 + 3.57 2.90 ~ 12.50	10.00	3617 (550-4000)	16.61	15.88	15.22	2.76	1.32 ~ 1.32 + 2.24 + 2.84 + 4.29 3.40 ~ 12.70	12.00	3800 (610-4400)	17.45	16.69	15.99	3.16
15.0	1.5 + 1.5 + 2.5 + 3.5 + 6.0	1.00 + 1.00 + 1.67 + 2.33 + 4.00 2.90 ~ 12.50	10.00	3709 (550-4000)	17.03	16.29	15.61	2.70	1.25 ~ 1.25 + 2.13 + 2.69 + 4.69 3.40 ~ 12.70	12.00	3800 (610-4400)	17.45	16.69	15.99	3.16
16.0	1.5 + 1.5 + 2.5 + 3.5 + 7.0	0.94 + 0.94 + 1.56 + 2.19 + 4.38 2.90 ~ 12.50	10.00	3800 (550-4000)	17.45	16.69	15.99	2.63	1.21 ~ 1.21 + 2.05 + 2.59 + 4.94 3.40 ~ 12.70	12.00	3800 (610-4400)	17.45	16.69	15.99	3.16
13.9	1.5 + 1.5 + 2.5 + 4.2 + 4.2	1.08 + 1.08 + 1.80 + 3.02 + 3.02 2.90 ~ 12.50	10.00	3608 (550-4000)	16.56	15.84	15.18	2.77	1.35 ~ 1.35 + 2.29 + 3.51 + 3.51 3.40 ~ 12.70	12.00	3800 (610-4400)	17.45	16.69	15.99	3.16
14.7	1.5 + 1.5 + 2.5 + 4.2 + 5.0	1.02 + 1.02 + 1.70 + 2.86 + 3.40 2.90 ~ 12.50	10.00	3681 (550-4300)	16.90	16.17	15.49	2.72	1.26 ~ 1.26 + 2.14 + 3.27 + 4.08 3.40 ~ 12.70	12.00	3800 (610-4400)	17.45	16.69	15.99	3.16
15.5	1.5 + 1.5 + 2.5 + 5.0 + 5.0	0.97 + 0.97 + 1.61 + 3.23 + 3.23 2.90 ~ 12.50	10.00	3754 (550-4300)	17.24	16.49	15.80	2.66	1.18 ~ 1.18 + 2.00 + 3.82 + 3.82 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68	16.91	16.20	3.12
16.5	1.5 + 1.5 + 2.5 + 5.0 + 6.0	0.91 + 0.91 + 1.52 + 3.03 + 3.64 2.90 ~ 12.50	10.00	3846 (550-4300)	17.66	16.89	16.19	2.60	1.12 ~ 1.12 + 1.91 + 3.64 + 4.21 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68	16.91	16.20	3.12
13.5	1.5 + 1.5 + 3.5 + 3.5 + 3.5	1.11 + 1.11 + 2.59 + 2.59 + 2.59 2.90 ~ 12.50	10.00	3571 (550-4000)	16.40	15.68	15.03	2.80	1.42 ~ 1.42 + 3.05 + 3.05 + 3.05 3.40 ~ 12.70	12.00	3500 (610-4000)	16.07	15.37	14.73	3.43
14.2	1.5 + 1.5 + 3.5 + 3.5 + 4.2	1.06 + 1.06 + 2.46 + 2.46 + 2.96 2.90 ~ 12.50	10.00	3635 (550-4000)	16.69	15.96	15.30	2.75	1.35 ~ 1.35 + 2.90 + 2.90 + 3.51 3.40 ~ 12.70	12.00	3650 (610-4000)	16.76	16.03	15.36	3.29
15.0	1.5 + 1.5 + 3.5 + 3.5 + 5.0	1.00 + 1.00 + 2.33 + 2.33 + 3.33 2.90 ~ 12.50	10.00	3709 (550-4300)	17.03	16.29	15.61	2.70	1.26 ~ 1.26 + 2.70 + 2.70 + 4.08 3.40 ~ 12.70	12.00	3800 (610-4400)	17.45	16.69	15.99	3.16

	POSSIBLECOMBINATIONSTO OPERATE		COOLING									HEATING								
			CAPACITY RATING(kW) (RANGE) (kW) (RANGE)					TOTAL	OUTDOOR UNIT POWER CONSUMPTION (W)	OUTDOOR UNIT AMPERE (A) at 220V - 230V - 240V		EER	CAPACITY RATING(kW) (RANGE) (kW) (RANGE)					TOTAL	OUTDOOR UNIT POWER CONSUMPTION (W)	OUTDOOR UNIT AMPERE (A) at 220V - 230V - 240V		COP
FIVE UNITS	16.0	1.5 + 1.5 + 3.5 + 3.5 + 6.0	0.94 + 0.94 + 2.19 + 2.19 + 3.75	2.90 ~ 12.50				10.00	3800 (550-4300)	17.45 - 16.69 - 15.99		2.63	1.19 ~ 1.19 + 2.57 + 2.57 + 4.48	3.40 ~ 12.70				12.00	3800 (610-4400)	17.45 - 16.69 - 15.99		3.16
	8.7	1.5 + 1.8 + 1.8 + 1.8 + 1.8	1.50 + 1.80 + 1.80 + 1.80 + 1.80	2.90 ~ 9.60				8.70	2652 (550-3460)	12.18 - 11.65 - 11.16		3.28	2.00 ~ 2.50 + 2.50 + 2.50 + 2.50	3.40 ~ 12.70				12.00	2780 (610-4000)	12.76 - 12.21 - 11.70		4.32
	9.4	1.5 + 1.8 + 1.8 + 1.8 + 2.5	1.50 + 1.80 + 1.80 + 1.80 + 2.50	2.90 ~ 10.10				9.40	2974 (550-3460)	13.65 - 13.06 - 12.52		3.16	1.86 ~ 2.33 + 2.33 + 2.33 + 3.16	3.40 ~ 12.70				12.00	2980 (610-4000)	13.68 - 13.09 - 12.54		4.03
	10.4	1.5 + 1.8 + 1.8 + 1.8 + 3.5	1.44 + 1.73 + 1.73 + 1.73 + 3.37	2.90 ~ 10.60				10.00	3287 (550-3460)	15.09 - 14.43 - 13.83		3.04	1.74 ~ 2.17 + 2.17 + 2.17 + 3.74	3.40 ~ 12.70				12.00	3170 (610-4000)	14.55 - 13.92 - 13.34		3.79
	11.1	1.5 + 1.8 + 1.8 + 1.8 + 4.2	1.35 + 1.62 + 1.62 + 1.62 + 3.78	2.90 ~ 10.90				10.00	3351 (550-3700)	15.39 - 14.72 - 14.10		2.98	1.63 ~ 2.04 + 2.04 + 2.04 + 4.24	3.40 ~ 12.70				12.00	3350 (610-4000)	15.38 - 14.71 - 14.10		3.58
	11.9	1.5 + 1.8 + 1.8 + 1.8 + 5.0	1.26 + 1.51 + 1.51 + 1.51 + 4.20	2.90 ~ 11.40				10.00	3424 (550-3700)	15.72 - 15.04 - 14.41		2.92	1.50 ~ 1.88 + 1.88 + 1.88 + 4.88	3.40 ~ 12.70				12.00	3550 (610-4000)	16.30 - 15.59 - 14.94		3.38
	12.9	1.5 + 1.8 + 1.8 + 1.8 + 6.0	1.16 + 1.40 + 1.40 + 1.40 + 4.65	2.90 ~ 12.00				10.00	3516 (550-3700)	16.14 - 15.44 - 14.80		2.84	1.41 ~ 1.76 + 1.76 + 1.76 + 5.29	3.40 ~ 12.70				12.00	3600 (610-4000)	16.53 - 15.81 - 15.15		3.33
	13.9	1.5 + 1.8 + 1.8 + 1.8 + 7.0	1.08 + 1.29 + 1.29 + 1.29 + 5.04	2.90 ~ 12.00				10.00	3608 (550-3700)	16.56 - 15.84 - 15.18		2.77	1.36 ~ 1.69 + 1.69 + 1.69 + 5.56	3.40 ~ 12.70				12.00	3600 (610-4000)	16.53 - 15.81 - 15.15		3.33
	10.1	1.5 + 1.8 + 1.8 + 2.5 + 2.5	1.49 + 1.78 + 1.78 + 2.48 + 2.48	2.90 ~ 10.60				10.00	3259 (550-3460)	14.96 - 14.31 - 13.72		3.07	1.74 ~ 2.17 + 2.17 + 2.96 + 2.96	3.40 ~ 12.70				12.00	3150 (610-4000)	14.46 - 13.83 - 13.26		3.81
	11.1	1.5 + 1.8 + 1.8 + 2.5 + 3.5	1.35 + 1.62 + 1.62 + 2.25 + 3.15	2.90 ~ 11.08				10.00	3351 (550-3700)	15.39 - 14.72 - 14.10		2.98	1.63 ~ 2.04 + 2.04 + 2.78 + 3.51	3.40 ~ 12.70				12.00	3250 (610-4000)	14.92 - 14.27 - 13.68		3.69
	11.8	1.5 + 1.8 + 1.8 + 2.5 + 4.2	1.27 + 1.53 + 1.53 + 2.12 + 3.56	2.90 ~ 11.40				10.00	3415 (550-3800)	15.68 - 15.00 - 14.37		2.93	1.54 ~ 1.92 + 1.92 + 2.62 + 4.00	3.40 ~ 12.70				12.00	3340 (610-4000)	15.34 - 14.67 - 14.06		3.59
	12.6	1.5 + 1.8 + 1.8 + 2.5 + 5.0	1.19 + 1.43 + 1.43 + 1.98 + 3.97	2.90 ~ 11.70				10.00	3488 (550-3800)	16.02 - 15.32 - 14.68		2.87	1.42 ~ 1.78 + 1.78 + 2.41 + 4.62	3.40 ~ 12.70				12.00	3650 (610-4400)	16.76 - 16.03 - 15.36		3.29
	13.6	1.5 + 1.8 + 1.8 + 2.5 + 6.0	1.10 + 1.32 + 1.32 + 1.84 + 4.41	2.90 ~ 12.20				10.00	3580 (550-4000)	16.44 - 15.72 - 15.07		2.79	1.34 ~ 1.68 + 1.68 + 2.28 + 5.03	3.40 ~ 12.70				12.00	3650 (610-4400)	16.76 - 16.03 - 15.36		3.29
	14.6	1.5 + 1.8 + 1.8 + 2.5 + 7.0	1.03 + 1.23 + 1.23 + 1.71 + 4.79	2.90 ~ 12.20				10.00	3672 (550-4000)	16.86 - 16.13 - 15.45		2.72	1.29 ~ 1.61 + 1.61 + 2.19 + 5.29	3.40 ~ 12.70				12.00	3650 (610-4400)	16.76 - 16.03 - 15.36		3.29
	12.1	1.5 + 1.8 + 1.8 + 3.5 + 3.5	1.24 + 1.49 + 1.49 + 2.89 + 2.89	2.90 ~ 12.50				10.00	3443 (550-4000)	15.81 - 15.12 - 14.49		2.90	1.54 ~ 1.92 + 1.92 + 3.31 + 3.31	3.40 ~ 12.70				12.00	3270 (610-4000)	15.01 - 14.36 - 13.76		3.67
	12.8	1.5 + 1.8 + 1.8 + 3.5 + 4.2	1.17 + 1.41 + 1.41 + 2.73 + 3.28	2.90 ~ 12.50				10.00	3507 (550-4000)	16.10 - 15.40 - 14.76		2.85	1.45 ~ 1.82 + 1.82 + 3.13 + 3.78	3.40 ~ 12.70				12.00	3380 (610-4000)	15.52 - 14.84 - 14.23		3.55
	13.6	1.5 + 1.8 + 1.8 + 3.5 + 5.0	1.10 + 1.32 + 1.32 + 2.57 + 3.68	2.90 ~ 12.50				10.00	3580 (550-4300)	16.44 - 15.72 - 15.07		2.79	1.35 ~ 1.69 + 1.69 + 2.90 + 4.38	3.40 ~ 12.70				12.00	3800 (610-4400)	17.45 - 16.69 - 15.99		3.16
	14.6	1.5 + 1.8 + 1.8 + 3.5 + 6.0	1.03 + 1.23 + 1.23 + 2.40 + 4.11	2.90 ~ 12.50				10.00	3672 (550-4300)	16.86 - 16.13 - 15.45		2.72	1.28 ~ 1.60 + 1.60 + 2.74 + 4.79	3.40 ~ 12.70				12.00	3800 (610-4400)	17.45 - 16.69 - 15.99		3.16
	15.6	1.5 + 1.8 + 1.8 + 3.5 + 7.0	0.96 + 1.15 + 1.15 + 2.24 + 4.49	2.90 ~ 12.50				10.00	3764 (550-4300)	17.28 - 16.53 - 15.84		2.66	1.23 ~ 1.54 + 1.54 + 2.65 + 5.05	3.40 ~ 12.70				12.00	3800 (610-4400)	17.45 - 16.69 - 15.99		3.16
	13.5	1.5 + 1.8 + 1.8 + 4.2 + 4.2	1.11 + 1.33 + 1.33 + 3.11 + 3.11	2.90 ~ 12.50				10.00	3571 (550-4300)	16.40 - 15.68 - 15.03		2.80	1.38 ~ 1.72 + 1.72 + 3.59 + 3.59	3.40 ~ 12.70				12.00	3800 (610-4400)	17.45 - 16.69 - 15.99		3.16
	14.3	1.5 + 1.8 + 1.8 + 4.2 + 5.0	1.05 + 1.26 + 1.26 + 2.94 + 3.50	2.90 ~ 12.50				10.00	3644 (550-4300)	16.73 - 16.00 - 15.34		2.74	1.28 ~ 1.60 + 1.60 + 3.34 + 4.17	3.40 ~ 12.70				12.00	3800 (610-4400)	17.45 - 16.69 - 15.99		3.16
	15.3	1.5 + 1.8 + 1.8 + 4.2 + 6.0	0.98 + 1.18 + 1.18 + 2.75 + 3.92	2.90 ~ 12.50				10.00	3736 (550-4300)	17.15 - 16.41 - 15.72		2.68	1.22 ~ 1.52 + 1.52 + 3.17 + 4.57	3.40 ~ 12.70				12.00	3800 (610-4400)	17.45 - 16.69 - 15.99		3.16
	16.3	1.5 + 1.8 + 1.8 + 4.2 + 7.0	0.92 + 1.10 + 1.10 + 2.58 + 4.30	2.90 ~ 12.50				10.00	3800 (550-4300)	17.45 - 16.69 - 15.99		2.63	1.18 ~ 1.47 + 1.47 + 3.06 + 4.82	3.40 ~ 12.70				12.00	3800 (610-4400)	17.45 - 16.69 - 15.99		3.16
	15.1	1.5 + 1.8 + 1.8 + 5.0 + 5.0	0.99 + 1.19 + 1.19 + 3.31 + 3.31	2.90 ~ 12.50				10.00	3718 (550-4300)	17.07 - 16.33 - 15.65		2.69	1.20 ~ 1.50 + 1.50 + 3.90 + 3.90	3.40 ~ 12.70				12.00	3850 (610-4400)	17.68 - 16.91 - 16.20		3.12
	16.1	1.5 + 1.8 + 1.8 + 5.0 + 6.0	0.93 + 1.12 + 1.12 + 3.11 + 3.73	2.90 ~ 12.50				10.00	3800 (550-4300)	17.45 - 16.69 - 15.99		2.63	1.14 ~ 1.43 + 1.43 + 3.71 + 4.29	3.40 ~ 12.70				12.00	3850 (610-4400)	17.68 - 16.91 - 16.20		3.12
	10.8	1.5 + 1.8 + 2.5 + 2.5 + 2.5	1.39 + 1.67 + 2.31 + 2.31 + 2.31	2.90 ~ 11.11				10.00	3323 (550-3460)	15.26 - 14.60 - 13.99		3.01	1.63 ~ 2.04 + 2.78 + 2.78 + 2.78	3.40 ~ 12.70				12.00	3160 (610-4000)	14.51 - 13.88 - 13.30		3.80
	11.8	1.5 + 1.8 + 2.5 + 2.5 + 3.5	1.27 + 1.53 + 2.12 + 2.12 + 2.97	2.90 ~ 12.50				10.00	3415 (550-3700)	15.68 - 15.00 - 14.37		2.93	1.54 ~ 1.92 + 2.62 + 2.62 + 3.31	3.40 ~ 12.70				12.00	3400 (610-4000)	15.61 - 14.93 - 14.31		3.53
	12.5	1.5 + 1.8 + 2.5 + 2.5 + 4.2	1.20 + 1.44 + 2.00 + 2.00 + 3.36	2.90 ~ 12.50				10.00	3479 (550-3800)	15.97 - 15.28 - 14.64		2.87	1.45 ~ 1.82 + 2.47 + 2.47 + 3.78	3.40 ~ 12.70				12.00	3580 (610-4000)	16.44 - 15.72 - 15.07		3.35
	13.3	1.5 + 1.8 + 2.5 + 2.5 + 5.0	1.13 + 1.35 + 1.88 + 1.88 + 3.76	2.90 ~ 12.50				10.00	3553 (550-4000)	16.31 - 15.60 - 14.95		2.81	1.35 ~ 1.69 + 2.29 + 2.29 + 4.38	3.40 ~ 12.70				12.00	3800 (610-4400)	17.45 - 16.69 - 15.99		3.16
	14.3	1.5 + 1.8 + 2.5 + 2.5 + 6.0	1.05 + 1.26 + 1.75 + 1.75 + 4.20	2.90 ~ 12.50				10.00	3644 (550-4000)	16.73 - 16.00 - 15.34		2.74	1.28 ~ 1.60 + 2.17 + 2.17 + 4.79	3.40 ~ 12.70				12.00	3800 (610-4400)	17.45 - 16.69 - 15.99		3.16
	15.3	1.5 + 1.8 + 2.5 + 2.5 + 7.0	0.98 + 1.18 + 1.63 + 1.63 + 4.58	2.90 ~ 12.50				10.00	3736 (550-4000)	17.15 - 16.41 - 15.72		2.68	1.23 ~ 1.54 + 2.09 + 2.09 + 5.05	3.40 ~ 12.70				12.00	3800 (610-4400)	17.45 - 16.69 - 15.99		3.16
	12.8	1.5 + 1.8 + 2.5 + 3.5 + 3.5	1.17 + 1.41 + 1.95 + 2.73 + 2.73	2.90 ~ 12.50				10.00	3507 (550-4000)	16.10 - 15.40 - 14.76		2.85	1.45 ~ 1.82 + 2.47 + 3.13 + 3.13	3.40 ~ 12.70				12.00	3450 (610-4000)	15.84 - 15.15 - 14.52		3.48
	13.5	1.5 + 1.8 + 2.5 + 3.5 + 4.2	1.11 + 1.33 + 1.85 + 2.59 + 3.11	2.90 ~ 12.50				10.00	3571 (550-4000)	16.40 - 15.68 - 15.03		2.80	1.38 ~ 1.72 + 2.34 + 2.97 + 3.59	3.40 ~ 12.70				12.00	3650 (610-4000)	16.76 - 16.03 - 15.36		3.29
	14.3	1.5 + 1.8 + 2.5 + 3.5 + 5.0	1.05 + 1.26 + 1.75 + 2.45 + 3.50	2.90 ~ 12.50				10.00	3644 (550-4300)	16.73 - 16.00 - 15.34		2.74	1.28 ~ 1.60 + 2.18 + 2.76 + 4.17	3.40 ~ 12.70				12.00	3850 (610-4400)	17.68 - 16.91 - 16.20		3.12
	15.3	1.5 + 1.8 + 2.5 + 3.5 + 6.0	0.98 + 1.18 + 1.63 + 2.29 + 3.92	2.90 ~ 12.50				10.00	3736 (550-4300)	17.15 - 16.41 - 15.72		2.68	1.22 ~ 1.52 + 2.07 + 2.62 + 4.57	3.40 ~ 12.70				12.00	3850 (610-4400)	17.68 - 16.91 - 16.20		3.12
	16.3	1.5 + 1.8 + 2.5 + 3.5 + 7.0	0.92 + 1.10 + 1.53 + 2.15 + 4.29	2.90 ~ 12.50				10.00	3800 (550-4300)	17.45 - 16.69 - 15.99		2.63	1.18 ~ 1.47 + 2.00 + 2.53 + 4.82	3.40 ~ 12.70				12.00	3850 (610-4400)	17.68 - 16.91 - 16.20		3.12
	14.2	1.5 + 1.8 + 2.5 + 4.2 + 4.2	1.06 + 1.27 + 1.76 + 2.96 + 2.96	2.90 ~ 12.50				10.00	3635 (550-4300)	16.69 - 15.96 - 15.30		2.75	1.31 ~ 1.64 + 2.23 + 3.41 + 3.41	3.40 ~ 12.70				12.00	3850 (610-4400)	17.68 - 16.91 - 16.20		3.12
	15.0	1.5 + 1.8 + 2.5 + 4.2 + 5.0	1.00 + 1.20 + 1.67 + 2.80 + 3.33	2.90 ~ 12.50				10.00	3709 (550-4300)	17.03 - 16.29 - 15.61		2.70	1.22 ~ 1.53 + 2.08 + 3.18 + 3.98	3.40 ~ 12.70				12.00	3900 (610-4400)	17.91 - 17.13 - 16.41		3.08
	16.0	1.5 + 1.8 + 2.5 + 4.2 + 6.0	0.94 + 1.13 + 1.56 + 2.63 + 3.75	2.90 ~ 12.50				10.00	3800 (550-4300)	17.45 - 16.69 - 15.99		2.63	1.17 ~ 1.46 + 1.98 + 3.03 + 4.37	3.40 ~ 12.70				12.00	3900 (610-4400)	17.91 - 17.13 - 16.41		3.08
	13.8	1.5 + 1.8 + 3.5 + 3.5 + 3.5	1.09 + 1.30 + 2.54 + 2.54 + 2.54	2.90 ~ 12.50				10.00	3598 (550-4300)	16.52 - 15.80 - 15.15		2.78	1.38 ~ 1.72 + 2.97 + 2.97 + 2.97	3.40 ~ 12.70				12.00	3500 (610-4000)	16.07 - 15.37 - 14.73		3.43
	14.5	1.5 + 1.8 + 3.5 + 3.5 + 4.2	1.03 + 1.24 + 2.41 + 2.41 + 2.90	2.90 ~ 12.50				10.00	3663 (550-4300)	16.82 - 16.09 - 15.42		2.73	1.31 ~ 1.64 + 2.82 + 2.82 + 3.41	3.40 ~ 12.70				12.00	3680 (610-4000)	16.90 - 16.16 - 15.49		3.26
	15.3	1.5 + 1.8 + 3.5 + 3.5 + 5.0	0.98 + 1.18 + 2.29 + 2.29 + 3.27	2.90 ~ 12.50				10.00	3736 (550-4300)	17.15 - 16.41 - 15.72		2.68	1.22 ~ 1.53 + 2.63 + 2.63 + 3.98	3.40 ~ 12.70				12.00	3850 (610-4400)	17.68 - 16.91 - 16.20		3.12
	16.3	1.5 + 1.8 + 3.5 + 3.5 + 6.0	0.92 + 1.10 + 2.15 + 2.15 + 3.68	2.90 ~ 12.50				10.00	3800 (550-4300)	17.45 - 16.69 - 15.99		2.63	1.13 ~ 1.41 + 2.42 + 2.42 + 4.62	3.40 ~ 12.70				12.00	3850 (610-4400)	17.68 - 16.91 - 16.20		3.12
	11.5	1.5 + 2.5 + 2.5 + 2.5 + 2.5	1.30 + 2.17 + 2.17 + 2.17 + 2.17	2.90 ~ 12.50				10.00	3388 (550-3460)	15.55 - 14.88 - 14.26		2.95	1.54 ~ 2.62 + 2.62 + 2.62 + 2.62	3.40 ~ 12.70				12.00	3320 (610-4000)	15.24 - 14.58 - 13.97		3.61
	12.5	1.5 + 2.5 + 2.5 + 2.5 + 3.5	1.20 + 2.00 + 2.00 + 2.00 + 2.80	2.90 ~ 12.50				10.00	3479 (550-3700)	15.97 - 15.28 - 14.64		2.87	1.45 ~ 2.47 + 2.47 + 2.47 + 3.13	3.40 ~ 12.70				12.00	3540 (610-4000)	16.25 - 15.55 - 14.90		3.39
	13.2	1.5 + 2.5 + 2.5 + 2.5 + 4.2	1.14 + 1.89 + 1.89 + 1.89 + 3.18	2.90 ~ 12.50				10.00	3543 (550-3800)	16.27 - 15.56 - 14.91		2.82	1.38 ~ 2.34 + 2.34 + 2.34 + 3.59	3.40 ~ 12.70				12.00	3660 (610-4000)	16.80 - 16.07 - 15.40		3.28
	14.0	1.5 + 2.5 + 2.5 + 2.5 + 5.0	1.07 + 1.79 + 1.79 + 1.79 + 3.57	2.90 ~ 12.50				10.00	3617 (550-4000)	16.61 - 15.88 - 15.22		2.76	1.28 ~ 2.18 + 2.18 + 2.18 + 4.17	3.40 ~ 12.70				12.00	3850 (610-4000)	17.68 - 16.91 - 16.20		3.12
	15.0	1.5 + 2.5 + 2.5 + 2.5 + 6.0	1.00 + 1.67 + 1.67 + 1.67 + 4.00	2.90 ~ 12.50				10.00	3709 (550-4000)	17.03 - 16.29 - 15.61		2.70	1.22 ~ 2.07 + 2.07 + 2.07 + 4.57	3.40 ~ 12.70				12.00	3850 (610-4000)	17.68 - 16.91 - 16.20		3.12
	16.0	1.5 + 2.5 + 2.5 + 2.5 + 7.0	0.94 + 1.56 + 1.56 + 1.56 + 4.38	2.90 ~ 12.50				10.00	3800 (550-4000)	17.45 - 16.69 - 15.99		2.63	1.18 ~ 2.00 + 2.00 + 2.00 + 4.82	3.40 ~ 12.70				12.00	3850 (610-4000)	17.68 - 16.91 - 16.20		3.12
	13.5	1.5 + 2.5 + 2.5 + 3.5 + 3.5	1.11 + 1.85 + 1.85 + 2.59 + 2.59	2.90 ~ 12.50				10.00	3571 (550-4000)	16.40 - 15.68 - 15.03		2.80	1.38 ~ 2.34 + 2.34 + 2.97 + 2.97	3.40 ~ 12.70				12.00	3450 (610-4000)	15.84 - 15.15 - 14.52		3.48
	14.2	1.5 + 2.5 + 2.5 + 3.5 + 4.2	1.06 + 1.76 + 1.76 + 2.46 + 2.96	2.90 ~ 12.50				10.00	3635 (550-4000)	16.69 - 15.96 - 15.30		2.75	1.31 ~ 2.23 + 2.23 + 2.82 + 3.41	3.40 ~ 12.70				12.00	3700 (610-4000)	16.99 - 16.25 - 15.57		3.24
	15.0	1.5 + 2.5 + 2.5 + 3.5 + 5.0	1.00 + 1.67 + 1.67 + 2.33 + 3.33	2.90 ~ 12.50				10.00	3709 (550-4300)	17.03 - 16.29 - 15.61		2.70	1.22 ~ 2.08 + 2.08 + 2.63 + 3.98	3.40 ~ 12.70				12.00	3850 (610-4400)	17.68 - 16.91 - 16.20		3.12
	16.0	1.5 + 2.5 + 2.5 + 3.5 + 6.0	0.94 + 1.56 + 1.56 + 2.19 + 3.75	2.90 ~ 12.50				10.00	3800 (550-4300)	17.45 - 16.69 - 15.99		2.63	1.17 ~ 1.98 + 1.98 + 2.50 + 4.37	3.40 ~ 12.70				12.00	3850 (610-4000)	17.68 - 16.91 - 16.20		3.12
	14.9	1.5 + 2.5 + 2.5 + 4.2 + 4.2	1.01 + 1.68 + 1.68 + 2.82 + 2.82	2.90 ~ 12.50				10.00	3699 (550-4300)	16.98 - 16.25 - 15.57		2.70	1.25 ~ 2.13 + 2.13 + 3.25 + 3.25	3.40 ~ 12.70				12.00	3850 (610-4000)	17.68 - 16.91 - 16.20		3.12
	15.7	1.5 + 2.5 + 2.5 + 4.2 + 5.0	0.96 + 1.59 + 1.59 + 2.68 + 3.18	2.90 ~ 12.50				10.00	3773 (550-4300)	17.32 - 16.57 - 15.88		2.65	1.17 ~ 1.99 + 1.99 + 3.04 + 3.80	3.40 ~ 12.70				12.00	3850 (610-4000)	17.68 - 16.91 - 16.20		3.12
	16.5	1.5 + 2.5 + 2.5 + 5.0 + 5.0	0.91 + 1.52 + 1.52 + 3.03 + 3.03	2.90 ~ 12.50				10.00	3846 (550-4300)	17.66 - 16.89 - 16.19		2.60	1.10 ~ 1.87 + 1.87 + 3.58 + 3.58	3.40 ~ 12.70				12.00	3850 (610-4000)	17.68 - 16.91 - 16.20		3.12
	14.5	1.5 + 2.5 + 3.5 + 3.5 + 3.5	1.03 + 1.72 + 2.41 + 2.41 + 2.41	2.90 ~ 12.50				10.00	3663 (550-4300)	16.82 - 16.09 - 15.42		2.73	1.31 ~ 2.23 + 2.82 + 2.82 + 2.82	3.40 ~ 12.70				12.00	3540 (610-4000)	16.25 - 15.55 - 14.90		3.39
	15.2	1.5 + 2.5 + 3.5 + 3.5 + 4.2	0.99 + 1.64 + 2.30 + 2.30 + 2.76	2.90 ~ 12.50				10.00	3727 (550-4300)	17.11 - 16.37 - 15.69		2.68	1.25 ~ 2.13 + 2.69 + 2.69 + 3.25	3.40 ~ 12.70				12.00	3750 (610-4000)	17.22 - 16.47 - 15.78		3.20
	16.0	1.5 + 2.5 + 3.5 + 3.5 + 5.0	0.94 + 1.56 + 2.19 + 2.19 + 3.13	2.90 ~ 12.50				10.00	3800 (550-4300)	17.45 - 16.69 - 15.99		2.63	1.17 ~ 1.99 + 2.52 + 2.52 + 3.80	3.40 ~ 12.70				12.00	3850 (610-4000)	17.68 - 16.91 - 16.20		3.12
	15.9	1.5 + 2.5 + 3.5 + 4.2 + 4.2	0.94 + 1.57 + 2.20 + 2.64 + 2.64	2.90 ~ 12.50				10.00	3791 (550-4300)	17.41 - 16.65 - 15.96		2.64	1.19 ~ 2.03 + 2.57 + 3.10 + 3.10	3.40 ~ 12.70				12.00	3850 (610-4000)	17.68 - 16.91 - 16.20		3.12
	9.0	1.8 + 1.8 + 1.8 + 1.8 + 1.8	1.80 + 1.80 + 1.80 + 1.80 + 1.80	2.90 ~ 10.00				9.00	2790 (600-3040)	12.81 - 12.25 - 11.74		3.23	2.40 ~ 2.40 + 2.40 + 2.40 + 2.40	3.40 ~ 12.70				12.00	2860 (610-4000)	13.13 - 12.56 - 12.04		4.20
	9.7	1.8 + 1.8 + 1.8 + 1.8 + 2.5	1.80 + 1.80 + 1.80 + 1.80 + 2.50	2.90 ~ 10.80				9.70	3112 (600-3240)	14.29 - 13.67 - 13.10		3.12	2.24 ~ 2.24 + 2.24 + 2.24 + 3.04	3.40 ~ 12.70				12.00	3130 (610-4000)	14.37 - 13.75 - 13.17		3.83
	10.7	1.8 + 1.8 + 1.8 + 1.8 + 3.5	1.68 + 1.68 + 1.68 + 1.68 + 3.27	2.90 ~ 11.12				10.00	3314 (600-3500)	15.22 - 14.56 - 13.95		3.02	2.10 ~ 2.10 + 2.10 + 2.10 + 3.61	3.40 ~ 12.70				12.00	3350 (610-4000)	15.38 - 14.71 - 14.10		3.58
	11.4	1.8 + 1.8 + 1.8 + 1.8 + 4.2	1.58 + 1.58 + 1.58 + 1.58 + 3.68	2.90 ~ 11.50				10.00	3378 (600-3700)	15.51 - 14.84 - 14.22		2.96	1.97 ~ 1.97 + 1.97 + 1.97 + 4.11	3.40 ~ 12.70				12.00	3560 (610-4000)	16.35 - 15.63 - 14.98		3.37
	12.2	1.8 + 1.8 + 1.8 + 1.8 + 5.0	1.48 + 1.48 + 1.48 + 1.48 + 4.10	2.90 ~ 11.90				10.00	3452 (600-3700)	15.85 - 15.16 - 14.53		2.90	1.82 ~ 1.82 + 1.82 + 1.82 + 4.73	3.40 ~ 12.70				12.00	3800 (610-4400)	17.45 - 16.69 - 15.99		3.16
	13.2	1.8 + 1.8 + 1.8 + 1.8 + 6.0	1.36 + 1.36 + 1.36 + 1.36 + 4.55	2.90 ~ 12.40				10.00	3543 (600-3700)	16.27 - 15.56 - 14.91		2.82	1.71 ~ 1.71 + 1.71 + 1.71 + 5.14	3.40 ~ 12.70				12.00	3800 (610-4400)	17.45 - 16.69 - 15.99		3.16
	14.2	1.8 + 1.8 + 1.8 + 1.8 + 7.0	1.27 + 1.27 + 1.27 + 1.27 + 4.93	2.90 ~ 12.40				10.00	3635 (600-3700)	16.69 - 15.96 - 15.30		2.75	1.65 ~ 1.65 + 1.65 + 1.65 + 5.41	3.40 ~ 12.70				12.00	3800 (610-4400)	17.45 - 16.69 - 15.99		3.16
	10.4	1.8 + 1.8 + 1.8 + 2.5 + 2.5	1.73 + 1.73 + 1.73 + 2.40 + 2.40	2.90 ~ 11.15				10.00	3287 (600-3040)	15.09 - 14.43 - 13.83		3.04	2.10 ~ 2.10 + 2.10 + 2.85 + 2.85	3.40 ~ 12.70				12.00	3160 (610-4000)	14.51 - 13.88 - 13.30		3.80
	11.4	1.8 + 1.8 + 1.8 + 2.5 + 3.5	1.58 + 1.58 + 1.58 + 2.19 + 3.07	2.90 ~ 11.60				10.00	3378 (600-3700)	15.51 - 14.84 - 14.22		2.96	1.97 ~ 1.97 + 1.97 + 2.68 + 3.39	3.40 ~ 12.70				12.00	3360 (610-4000)	15.43 - 14.76 - 14.14		3.57

	POSSIBLECOMBINATIONSTO OPERATE	COOLING CAPACITY RATING(kW) (RANGE) (kW) (RANGE)	TOTAL	OUTDOOR UNIT POWER CONSUMPTION (W)	OUTDOOR UNIT AMPERE (A) at 220V - 230V - 240V	EER	HEATING CAPACITY RATING(kW) (RANGE) (kW) (RANGE)	TOTAL	OUTDOOR UNIT POWER CONSUMPTION (W)	OUTDOOR UNIT AMPERE (A) at 220V - 230V - 240V	COP
12.1	1.8 + 1.8 + 1.8 + 2.5 + 4.2	1.49 + 1.49 + 1.49 + 2.07 + 3.47 2.90 ~ 11.90	10.00	3443 (600-3700)	15.81 - 15.12 - 14.49	2.90	1.86 ~ 1.86 + 1.86 + 2.53 + 3.88 3.40 ~ 12.70	12.00	3540 (610-4000)	16.25 - 15.55 - 14.90	3.39
12.9	1.8 + 1.8 + 1.8 + 2.5 + 5.0	1.40 + 1.40 + 1.40 + 1.94 + 3.88 2.90 ~ 12.30	10.00	3516 (600-3700)	16.14 - 15.44 - 14.80	2.84	1.72 ~ 1.72 + 1.72 + 2.34 + 4.48 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
13.9	1.8 + 1.8 + 1.8 + 2.5 + 6.0	1.29 + 1.29 + 1.29 + 1.80 + 4.32 2.90 ~ 12.50	10.00	3608 (600-3700)	16.56 - 15.84 - 15.18	2.77	1.63 ~ 1.63 + 1.63 + 2.22 + 4.89 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
14.9	1.8 + 1.8 + 1.8 + 2.5 + 7.0	1.21 + 1.21 + 1.21 + 1.68 + 4.70 2.90 ~ 12.50	10.00	3699 (600-3700)	16.98 - 16.25 - 15.57	2.70	1.57 ~ 1.57 + 1.57 + 2.14 + 5.15 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
12.4	1.8 + 1.8 + 1.8 + 3.5 + 3.5	1.45 + 1.45 + 1.45 + 2.82 + 2.82 2.90 ~ 12.50	10.00	3470 (600-3700)	15.93 - 15.24 - 14.60	2.88	1.86 ~ 1.86 + 1.86 + 3.20 + 3.20 3.40 ~ 12.70	12.00	3580 (610-4000)	16.44 - 15.72 - 15.07	3.35
13.1	1.8 + 1.8 + 1.8 + 3.5 + 4.2	1.37 + 1.37 + 1.37 + 2.67 + 3.21 2.90 ~ 12.50	10.00	3534 (600-4000)	16.23 - 15.52 - 14.87	2.83	1.76 ~ 1.76 + 1.76 + 3.04 + 3.67 3.40 ~ 12.70	12.00	3700 (610-4000)	16.99 - 16.25 - 15.57	3.24
13.9	1.8 + 1.8 + 1.8 + 3.5 + 5.0	1.29 + 1.29 + 1.29 + 2.52 + 3.60 2.90 ~ 12.50	10.00	3608 (600-4300)	16.56 - 15.84 - 15.18	2.77	1.64 ~ 1.64 + 1.64 + 2.82 + 4.26 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
14.9	1.8 + 1.8 + 1.8 + 3.5 + 6.0	1.21 + 1.21 + 1.21 + 2.35 + 4.03 2.90 ~ 12.50	10.00	3699 (600-4300)	16.98 - 16.25 - 15.57	2.70	1.55 ~ 1.55 + 1.55 + 2.67 + 4.66 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
15.9	1.8 + 1.8 + 1.8 + 3.5 + 7.0	1.13 + 1.13 + 1.13 + 2.20 + 4.40 2.90 ~ 12.50	10.00	3791 (600-4300)	17.41 - 16.65 - 15.96	2.64	1.50 ~ 1.50 + 1.50 + 2.58 + 4.92 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
13.8	1.8 + 1.8 + 1.8 + 4.2 + 4.2	1.30 + 1.30 + 1.30 + 3.04 + 3.04 2.90 ~ 12.50	10.00	3598 (600-4000)	16.52 - 15.80 - 15.15	2.78	1.68 ~ 1.68 + 1.68 + 3.49 + 3.49 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
14.6	1.8 + 1.8 + 1.8 + 4.2 + 5.0	1.23 + 1.23 + 1.23 + 2.88 + 3.42 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.56 ~ 1.56 + 1.56 + 3.25 + 4.06 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
15.6	1.8 + 1.8 + 1.8 + 4.2 + 6.0	1.15 + 1.15 + 1.15 + 2.69 + 3.85 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.49 ~ 1.49 + 1.49 + 3.09 + 4.46 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
16.6	1.8 + 1.8 + 1.8 + 4.2 + 7.0	1.08 + 1.08 + 1.08 + 2.53 + 4.22 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.44 ~ 1.44 + 1.44 + 2.99 + 4.71 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
15.4	1.8 + 1.8 + 1.8 + 5.0 + 5.0	1.17 + 1.17 + 1.17 + 3.25 + 3.25 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.46 ~ 1.46 + 1.46 + 3.80 + 3.80 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
16.4	1.8 + 1.8 + 1.8 + 5.0 + 6.0	1.10 + 1.10 + 1.10 + 3.05 + 3.66 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.40 ~ 1.40 + 1.40 + 3.63 + 4.19 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
11.1	1.8 + 1.8 + 2.5 + 2.5 + 2.5	1.62 + 1.62 + 2.25 + 2.25 + 2.25 2.90 ~ 11.17	10.00	3351 (600-3600)	15.39 - 14.72 - 14.10	2.98	1.97 ~ 1.97 + 2.68 + 2.68 + 2.68 3.40 ~ 12.70	12.00	3200 (610-4000)	14.69 - 14.05 - 13.47	3.75
12.1	1.8 + 1.8 + 2.5 + 2.5 + 3.5	1.49 + 1.49 + 2.07 + 2.07 + 2.89 2.90 ~ 12.50	10.00	3443 (600-3800)	15.81 - 15.12 - 14.49	2.90	1.86 ~ 1.86 + 2.53 + 2.53 + 3.20 3.40 ~ 12.70	12.00	3420 (610-4000)	15.70 - 15.02 - 14.39	3.51
12.8	1.8 + 1.8 + 2.5 + 2.5 + 4.2	1.41 + 1.41 + 1.95 + 1.95 + 3.28 2.90 ~ 12.50	10.00	3507 (600-4000)	16.10 - 15.40 - 14.76	2.85	1.76 ~ 1.76 + 2.40 + 2.40 + 3.67 3.40 ~ 12.70	12.00	3630 (610-4000)	16.67 - 15.94 - 15.28	3.31
13.6	1.8 + 1.8 + 2.5 + 2.5 + 5.0	1.32 + 1.32 + 1.84 + 1.84 + 3.68 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.64 ~ 1.64 + 2.23 + 2.23 + 4.26 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
14.6	1.8 + 1.8 + 2.5 + 2.5 + 6.0	1.23 + 1.23 + 1.71 + 1.71 + 4.11 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.55 ~ 1.55 + 2.11 + 2.11 + 4.66 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
15.6	1.8 + 1.8 + 2.5 + 2.5 + 7.0	1.15 + 1.15 + 1.60 + 1.60 + 4.49 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.50 ~ 1.50 + 2.04 + 2.04 + 4.92 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
13.1	1.8 + 1.8 + 2.5 + 3.5 + 3.5	1.37 + 1.37 + 1.91 + 2.67 + 2.67 2.90 ~ 12.50	10.00	3534 (600-4000)	16.23 - 15.52 - 14.87	2.83	1.76 ~ 1.76 + 2.40 + 3.04 + 3.04 3.40 ~ 12.70	12.00	3680 (610-4000)	16.90 - 16.16 - 15.49	3.26
13.8	1.8 + 1.8 + 2.5 + 3.5 + 4.2	1.30 + 1.30 + 1.81 + 2.54 + 3.04 2.90 ~ 12.50	10.00	3598 (600-4000)	16.52 - 15.80 - 15.15	2.78	1.68 ~ 1.68 + 2.28 + 2.88 + 3.49 3.40 ~ 12.70	12.00	3850 (610-4000)	17.68 - 16.91 - 16.20	3.12
14.6	1.8 + 1.8 + 2.5 + 3.5 + 5.0	1.23 + 1.23 + 1.71 + 2.40 + 3.42 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.56 ~ 1.56 + 2.13 + 2.69 + 4.06 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
15.6	1.8 + 1.8 + 2.5 + 3.5 + 6.0	1.15 + 1.15 + 1.60 + 2.24 + 3.85 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.49 ~ 1.49 + 2.02 + 2.55 + 4.46 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
16.6	1.8 + 1.8 + 2.5 + 3.5 + 7.0	1.08 + 1.08 + 1.51 + 2.11 + 4.22 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.44 ~ 1.44 + 1.95 + 2.47 + 4.71 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
14.5	1.8 + 1.8 + 2.5 + 4.2 + 4.2	1.24 + 1.24 + 1.72 + 2.90 + 2.90 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.60 ~ 1.60 + 2.17 + 3.32 + 3.32 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
15.3	1.8 + 1.8 + 2.5 + 4.2 + 5.0	1.18 + 1.18 + 1.63 + 2.75 + 3.27 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.49 ~ 1.49 + 2.03 + 3.10 + 3.88 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
16.3	1.8 + 1.8 + 2.5 + 4.2 + 6.0	1.10 + 1.10 + 1.53 + 2.58 + 3.68 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.42 ~ 1.42 + 1.93 + 2.96 + 4.27 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
16.1	1.8 + 1.8 + 2.5 + 5.0 + 5.0	1.12 + 1.12 + 1.55 + 3.11 + 3.11 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.40 ~ 1.40 + 1.91 + 3.64 + 3.64 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
14.1	1.8 + 1.8 + 3.5 + 3.5 + 3.5	1.28 + 1.28 + 2.48 + 2.48 + 2.48 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.68 ~ 1.68 + 2.88 + 2.88 + 2.88 3.40 ~ 12.70	12.00	3850 (610-4000)	17.68 - 16.91 - 16.20	3.12
14.8	1.8 + 1.8 + 3.5 + 3.5 + 4.2	1.22 + 1.22 + 2.36 + 2.36 + 2.84 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.60 ~ 1.60 + 2.74 + 2.74 + 3.32 3.40 ~ 12.70	12.00	3850 (610-4000)	17.68 - 16.91 - 16.20	3.12
15.6	1.8 + 1.8 + 3.5 + 3.5 + 5.0	1.15 + 1.15 + 2.24 + 2.24 + 3.21 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.49 ~ 1.49 + 2.57 + 2.57 + 3.88 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
16.6	1.8 + 1.8 + 3.5 + 3.5 + 6.0	1.08 + 1.08 + 2.11 + 2.11 + 3.61 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.42 ~ 1.42 + 2.45 + 2.45 + 4.27 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
15.5	1.8 + 1.8 + 3.5 + 4.2 + 4.2	1.16 + 1.16 + 2.26 + 2.71 + 2.71 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.52 ~ 1.52 + 2.62 + 3.17 + 3.17 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
16.3	1.8 + 1.8 + 3.5 + 4.2 + 5.0	1.10 + 1.10 + 2.15 + 2.58 + 3.07 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.43 ~ 1.43 + 2.46 + 2.97 + 3.71 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
11.8	1.8 + 2.5 + 2.5 + 2.5 + 2.5	1.53 + 2.12 + 2.12 + 2.12 + 2.12 2.90 ~ 12.50	10.00	3415 (600-3600)	15.68 - 15.00 - 14.37	2.93	1.86 ~ 1.86 + 2.53 + 2.53 + 2.53 + 2.53 3.40 ~ 12.70	12.00	3300 (610-4000)	15.15 - 14.49 - 13.89	3.64
12.8	1.8 + 2.5 + 2.5 + 2.5 + 3.5	1.41 + 1.95 + 1.95 + 1.95 + 2.73 2.90 ~ 12.50	10.00	3507 (600-3600)	16.10 - 15.40 - 14.76	2.85	1.76 ~ 2.40 + 2.40 + 2.40 + 3.04 3.40 ~ 12.70	12.00	3500 (610-4000)	16.07 - 15.37 - 14.73	3.43
13.5	1.8 + 2.5 + 2.5 + 2.5 + 4.2	1.33 + 1.85 + 1.85 + 1.85 + 3.11 2.90 ~ 12.50	10.00	3571 (600-3800)	16.40 - 15.68 - 15.03	2.80	1.68 ~ 2.28 + 2.28 + 2.28 + 3.49 3.40 ~ 12.70	12.00	3850 (610-4000)	17.68 - 16.91 - 16.20	3.12
14.3	1.8 + 2.5 + 2.5 + 2.5 + 5.0	1.26 + 1.75 + 1.75 + 1.75 + 3.50 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.56 ~ 2.13 + 2.13 + 2.13 + 4.06 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
15.3	1.8 + 2.5 + 2.5 + 2.5 + 6.0	1.18 + 1.63 + 1.63 + 1.63 + 3.92 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.49 ~ 2.02 + 2.02 + 2.02 + 4.46 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
16.3	1.8 + 2.5 + 2.5 + 2.5 + 7.0	1.10 + 1.53 + 1.53 + 1.53 + 4.29 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.44 ~ 1.95 + 1.95 + 1.95 + 4.71 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
13.8	1.8 + 2.5 + 2.5 + 3.5 + 3.5	1.30 + 1.81 + 1.81 + 2.54 + 2.54 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.68 ~ 2.28 + 2.28 + 2.88 + 2.88 3.40 ~ 12.70	12.00	3600 (610-4000)	16.53 - 15.81 - 15.15	3.33
14.5	1.8 + 2.5 + 2.5 + 3.5 + 4.2	1.24 + 1.72 + 1.72 + 2.41 + 2.90 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.60 ~ 2.17 + 2.17 + 2.74 + 3.32 3.40 ~ 12.70	12.00	3850 (610-4000)	17.68 - 16.91 - 16.20	3.12
15.3	1.8 + 2.5 + 2.5 + 3.5 + 5.0	1.18 + 1.63 + 1.63 + 2.29 + 3.27 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.49 ~ 2.03 + 2.03 + 2.57 + 3.88 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
16.3	1.8 + 2.5 + 2.5 + 3.5 + 6.0	1.10 + 1.53 + 1.53 + 2.15 + 3.68 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.42 ~ 1.93 + 1.93 + 2.45 + 4.27 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
15.2	1.8 + 2.5 + 2.5 + 4.2 + 4.2	1.18 + 1.64 + 1.64 + 2.76 + 2.76 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.52 ~ 2.07 + 2.07 + 3.17 + 3.17 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
16.0	1.8 + 2.5 + 2.5 + 4.2 + 5.0	1.13 + 1.56 + 1.56 + 2.63 + 3.13 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.43 ~ 1.94 + 1.94 + 2.97 + 3.71 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
14.8	1.8 + 2.5 + 3.5 + 3.5 + 3.5	1.22 + 1.69 + 2.36 + 2.36 + 2.36 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.60 ~ 2.17 + 2.74 + 2.74 + 2.74 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
15.5	1.8 + 2.5 + 3.5 + 3.5 + 4.2	1.16 + 1.61 + 2.26 + 2.26 + 2.71 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.52 ~ 2.07 + 2.62 + 2.62 + 3.17 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
16.3	1.8 + 2.5 + 3.5 + 3.5 + 5.0	1.10 + 1.53 + 2.15 + 2.15 + 3.07 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.43 ~ 1.94 + 2.46 + 2.46 + 3.71 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
16.2	1.8 + 2.5 + 3.5 + 4.2 + 4.2	1.11 + 1.54 + 2.16 + 2.59 + 2.59 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.46 ~ 1.98 + 2.50 + 3.03 + 3.03 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
12.5	2.5 + 2.5 + 2.5 + 2.5 + 2.5	2.00 + 2.00 + 2.00 + 2.00 + 2.00 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	2.40 ~ 2.40 + 2.40 + 2.40 + 2.40 3.40 ~ 12.70	12.00	3450 (610-4000)	15.84 - 15.15 - 14.52	3.48
13.5	2.5 + 2.5 + 2.5 + 2.5 + 3.5	1.85 + 1.85 + 1.85 + 1.85 + 2.59 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	2.28 ~ 2.28 + 2.28 + 2.28 + 2.88 3.40 ~ 12.70	12.00	3760 (610-4000)	17.26 - 16.51 - 15.82	3.19
14.2	2.5 + 2.5 + 2.5 + 2.5 + 4.2	1.76 + 1.76 + 1.76 + 1.76 + 2.96 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	2.17 ~ 2.17 + 2.17 + 2.17 + 3.32 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
15.0	2.5 + 2.5 + 2.5 + 2.5 + 5.0	1.67 + 1.67 + 1.67 + 1.67 + 3.33 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	2.03 ~ 2.03 + 2.03 + 2.03 + 3.88 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
16.0	2.5 + 2.5 + 2.5 + 2.5 + 6.0	1.56 + 1.56 + 1.56 + 1.56 + 3.75 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.93 ~ 1.93 + 1.93 + 1.93 + 4.27 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
14.5	2.5 + 2.5 + 2.5 + 3.5 + 3.5	1.72 + 1.72 + 1.72 + 2.41 + 2.41 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	2.17 ~ 2.17 + 2.17 + 2.74 + 2.74 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
15.2	2.5 + 2.5 + 2.5 + 3.5 + 4.2	1.64 + 1.64 + 1.64 + 2.30 + 2.76 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	2.07 ~ 2.07 + 2.07 + 2.62 + 3.17 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
15.5	2.5 + 2.5 + 3.5 + 3.5 + 3.5	1.61 + 1.61 + 2.26 + 2.26 + 2.26 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	2.07 ~ 2.07 + 2.62 + 2.62 + 2.62 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12
16.3	2.5 + 2.5 + 3.5 + 3.5 + 4.2	1.53 + 1.53 + 2.15 + 2.15 + 2.58 2.90 ~ 12.50	10.00	3800 (600-4300)	17.45 - 16.69 - 15.99	2.63	1.98 ~ 1.98 + 2.50 + 2.50 + 3.03 3.40 ~ 12.70	12.00	3850 (610-4400)	17.68 - 16.91 - 16.20	3.12

* Two indoor units should be connected at least.

* Total nominal cooling capacity should not be more than 16.6kW.

<REMARKS>

* ONE UNIT INDICATED ARE ONLY FOR ONE UNIT OPERATION WHEN TWO OR MORE INDOOR UNITS ARE CONNECTED.
* TWO UNITS INDICATED ARE ONLY FOR TWO UNITS OPERATION WHEN TWO OR MORE INDOOR UNITS ARE CONNECTED.
* THREE UNITS INDICATED ARE ONLY FOR THREE UNITS OPERATION WHEN THREE OR MORE INDOOR UNITS ARE CONNECTED.
* FOUR UNITS INDICATED ARE ONLY FOR FOUR UNITS OPERATION WHEN FOUR OR FIVE INDOOR UNITS ARE CONNECTED.

RATING CONDITON (DRY BLUB / WET BULB)

	INDOOR	OUTDOOR
COOLING	27 / 19 ˚C	35 / 24˚C
HEATING	20 / –˚C	7 / 6˚C

DUAL AND TRIPLE SYSTEM MULTI R.A.C. *RAM*-G110N5HAE
INDOOR UNITS COMBINATIONS TO BE ABLE TO INSTALL

Two, three, four or five indoor units can be installed with one outdoor unit.
And total nominal cooling capacity should not be more than 16.6kW

Normal Cooling Capacity(kw)	Indoor Unit Model	CAPACITY(KW) at one unit operation		SUITABLE ROOM SIZE(m^2) at one unit operation	
		Cooling	Heating	Cooling	Heating
1.5kw	RAK-DJ15QHAE	1.00-1.60	1.50-2.20	8-12	9-11
	RAK-VJ15QHAE	1.00-1.60	1.50-2.20	8-12	9-11
1.8kw	RAK-DJ18RHAE	1.70-2.00	2.00-3.00	8-12	9-11
	RAK-VJ18RHAE	1.70-2.00	2.00-3.00	8-12	9-11
	RAK-XJ18QHAE	1.70-2.00	2.00-3.00	8-12	9-11
	RAD-VJ18QHAE	1.70-2.00	2.00-3.00	8-12	9-11
2.5kw	RAK-DJ25RHAE	1.70-2.80	2.00-4.00	11-17	14-18
	RAK-VJ25RHAE	1.70-2.80	2.00-4.00	11-17	14-18
	RAK-XJ25RHAE	1.70-2.80	2.00-4.00	11-17	14-18
	RAD-VJ25QHAE	1.70-2.80	2.00-4.00	11-17	14-18
	RAI-VJ25QHAE	1.70-2.80	2.00-4.00	11-17	14-18
	RAF-XJ25QHAE	1.70-2.80	2.00-4.00	11-17	14-18
3.5KW	RAK-DJ35RHAE	1.70-3.90	2.00-5.20	16-24	17-22
	RAK-VJ35RHAE	1.70-3.90	2.00-5.20	16-24	17-22
	RAK-XJ35RHAE	1.70-3.90	2.00-5.20	16-24	17-22
	RAD-VJ35QHAE	1.70-3.90	2.00-5.20	16-24	17-22
	RAI-VJ35QHAE	1.70-3.90	2.00-5.20	16-24	17-22
	RAF-XJ35QHAE	1.70-3.90	2.00-5.20	16-24	17-22
4.2KW	RAK-VJ42RHAE	1.70-4.60	2.00-6.50	23-24	23-29
5.0kw	RAK-DJ50RHAE	1.70-5.50	2.00-7.30	23-24	23-29
	RAK-VJ50RHAE	1.70-5.50	2.00-7.30	23-24	23-29
	RAK-XJ50RHAE	1.70-5.50	2.00-7.30	23-24	23-29
	RAD-VJ50QHAE	1.70-5.50	2.00-7.30	23-24	23-29
	RAI-VJ50QHAE	1.70-5.50	2.00-7.30	23-24	23-29
	RAF-XJ50QHAE	1.70-5.50	2.00-7.30	23-24	23-29
6.0kw	RAK-DJ60RHAE	1.70-6.60	2.00-8.20	23-24	23-29
	RAK-VJ60RHAE	1.70-6.60	2.00-8.20	23-24	23-29
	RAD-VJ60QHAE	1.70-6.60	2.00-8.20	23-24	23-29
	RAI-VJ60QHAE	1.70-6.60	2.00-8.20	23-24	23-29
7.0kw	RAK-DJ70RHAE	1.70-7.70	2.00-9.00	23-24	23-29
	RAK-VJ70RHAE	1.70-7.70	2.00-9.00	23-24	23-29
	RAD-VJ70QHAE	1.70-7.70	2.00-9.00	23-24	23-29

Be sure to connect two, three, four or five indoor units to this outdoor unit. If not, condensed water may drop, resulting in trouble.

QUADRUPLE SYSTEM MULTI R.A.C. *RAM*-G110N5HAE
INDOOR UNITS COMBINATIONS TO BE ABLE TO INSTALL

POSSIBLE COMBINATIONS TO OPERATE(KW)			SUITABLE ROOM SIZE TO INSTALL (m2)	CONNECTING POSITION ON OUTDOOR UNIT(VALVE DIAMETER)(mm)				
				NO.1	NO.2	NO.3	NO.4	NO.5
				6.35/9.52D	6.35/9.52D	6.35/9.52D	6.35/12.7D	6.35/12.7D
TWO UNIT	3	1.5+1.5	(8-12)+(8-12)	1.5	1.5			
	3.3	1.5+1.8	(8-12)+(8-12)	1.5	1.8			
	4	1.5+2.5	(8-12)+(11-17)	1.5	2.5			
	5	1.5+3.5	(8-12)+(16-24)	1.5	3.5			
	5.7	1.5+4.2	(8-12)+(23-24)	1.5			4.2	
	6.5	1.5+5.0	(8-12)+(23-24)	1.5			5.0	
	7.6	1.5+6.0	(8-12)+(23-24)	1.5			6.0	
	8.5	1.5+7.0	(8-12)+(23-24)	1.5			7.0	
	3.6	1.8+1.8	(8-12)+(8-12)	1.8	1.8			
	4.3	1.8+2.5	(8-12)+(11-17)	1.8	2.5			
	5.3	1.8+3.5	(8-12)+(16-24)	1.8	3.5			
	6	1.8+4.2	(8-12)+(23-24)	1.8			4.2	
	6.8	1.8+5.0	(8-12)+(23-24)	1.8			5.0	
	7.8	1.8+6.0	(8-12)+(23-24)	1.8			6.0	
	8.8	1.8+7.0	(8-12)+(23-24)	1.8			7.0	
	5	2.5+2.5	(11-17)+(11-17)	2.5	2.5			
	6	2.5+3.5	(11-17)+(16-24)	2.5	3.5			
	6.7	2.5+4.2	(9-15)+(22-31)	2.5			4.2	
	7.5	2.5+5.0	(9-15)+(22-31)	2.5			5	
	8.5	2.5+6.0	(9-15)+(22-31)	1.5			6.0	
	9.5	2.5+7.0	(9-15)+(22-31)	1.5			7.0	
	7	3.5+3.5	(16-24)+(16-24)	3.5	3.5			
	7.7	3.5+4.2	(12-19)+(19-27)	3.5			4.2	
	8.5	3.5+5.0	(12-19)+(19-27)	3.5			5.0	
	9.5	3.5+6.0	(12-19)+(19-27)	3.5			6.0	
	10.5	3.5+7.0	(12-19)+(19-27)	3.5			7.0	
	8.4	4.2+4.2	(16-24)+(16-24)				4.2	4.2
	9.2	4.2+5.0	(16-24)+(16-24)				4.2	5.0
	10.2	4.2+6.0	(16-24)+(16-24)				4.2	6.0
	11.2	4.2+7.0	(16-24)+(16-24)				4.2	7.0
	10	5.0+5.0	(16-24)+(16-24)				5.0	5.0
	11	5.0+6.0	(16-24)+(16-24)				5.0	6.0
	12	5.0+7.0	(16-24)+(16-24)				5.0	7.0
	12	6.0+6.0	(16-24)+(16-24)				6.0	5.0
	13	6.0+7.0	(16-24)+(16-24)				6.0	7.0
	14	7.0+7.0	(16-24)+(16-24)				7.0	7.0
	4.5	1.5+1.5+1.5	(8-12)+(8-12)+(8-12)	1.5	1.5	1.5		
	4.8	1.5+1.5+1.8	(8-12)+(8-12)+(8-12)	1.5	1.5	1.8		
	5.5	1.5+1.5+2.5	(8-12)+(8-12)+(11-17)	1.5	1.5	2.5		
	6.5	1.5+1.5+3.5	(8-12)+(8-12)+(16-24)	1.5	1.5	3.5		
	7.2	1.5+1.5+4.2	(8-12)+(8-12)+(23-24)	1.5	1.5		4.2	
	8	1.5+1.5+5.0	(8-12)+(8-12)+(23-24)	1.5	1.5		5.0	
	9	1.5+1.5+6.0	(8-12)+(8-12)+(23-24)	1.5	1.5		6.0	
	10	1.5+1.5+7.0	(8-12)+(8-12)+(23-24)	1.5	1.5		7.0	
	5.1	1.5+1.8+1.8	(8-12)+(8-12)+(8-12)	1.5	1.8	1.8		
	5.8	1.5+1.8+2.5	(8-12)+(8-12)+(11-17)	1.5	1.8	2.5		
	6.8	1.5+1.8+3.5	(8-12)+(8-12)+(16-24)	1.5	1.8	3.5		
	7.5	1.5+1.8+4.2	(8-12)+(8-12)+(23-24)	1.5	1.8		4.2	
	8.3	1.5+1.8+5.0	(8-12)+(8-12)+(23-24)	1.5	1.8		5.0	
	9.3	1.5+1.8+6.0	(8-12)+(8-12)+(23-24)	1.5	1.8		6.0	
	10.3	1.5+1.8+7.0	(8-12)+(8-12)+(23-24)	1.5	1.8		7.0	
	6.5	1.5+2.5+2.5	(8-12)+(11-17)+(11-17)	1.5	2.5	2.5		
	7.5	1.5+2.5+3.5	(8-12)+(11-17)+(16-24)	1.5	2.5	3.5		
	8.2	1.5+2.5+4.2	(8-12)+(11-17)+(22-33)	1.5	2.5		4.2	
	9	1.5+2.5+5.0	(8-12)+(11-17)+(22-33)	1.5	2.5		5.0	
	10	1.5+2.5+6.0	(8-12)+(11-17)+(22-33)	1.5	2.5		6.0	
	11	1.5+2.5+7.0	(8-12)+(11-17)+(22-33)	1.5	2.5		7.0	
	8.5	1.5+3.5+3.5	(8-12)+(16-24)+(16-24)	1.5	3.5	3.5		

	9.2	1.5+3.5+4.2	(7-11)+(14-21)+(20-30)	1.5	3.5		4.2	
	10	1.5+3.5+5.0	(7-11)+(14-21)+(20-30)	1.5	3.5		5.0	
	11	1.5+3.5+6.0	(7-11)+(14-21)+(20-30)	1.5	3.5		6.0	
	12	1.5+3.5+7.0	(7-11)+(14-21)+(20-30)	1.5	3.5		7.0	
	9.9	1.5+4.2+4.2	(6-10)+(17-26)+(17-26)	1.5			4.2	4.2
	10.7	1.5+4.2+5.0	(6-10)+(17-26)+(17-26)	1.5			4.2	5.0
	11.7	1.5+4.2+6.0	(6-10)+(17-26)+(17-26)	1.5			4.2	6.0
	12.7	1.5+4.2+7.0	(6-10)+(17-26)+(17-26)	1.5			4.2	7.0
	11.5	1.5+5.0+5.0	(6-10)+(17-26)+(17-26)	1.5			5.0	5.0
	12.5	1.5+5.0+6.0	(6-10)+(17-26)+(17-26)	1.5			5.0	6.0
	13.5	1.5+5.0+7.0	(6-10)+(17-26)+(17-26)	1.5			5.0	7.0
	13.5	1.5+6.0+6.0	(6-10)+(17-26)+(17-26)	1.5			6.0	6.0
	14.5	1.5+6.0+7.0	(6-10)+(17-26)+(17-26)	1.5			6.0	7.0
	15.5	1.5+7.0+7.0	(6-10)+(17-26)+(17-26)	1.5			7.0	7.0
	5.4	1.8+1.8+1.8	(8-12)+(8-12)+(8-12)	1.8	1.8	1.8		
	6.1	1.8+1.8+2.5	(8-12)+(8-12)+(11-17)	1.8	1.8	2.5		
	7.1	1.8+1.8+3.5	(8-12)+(8-12)+(16-24)	1.8	1.8	3.5		
	7.8	1.8+1.8+4.2	(8-12)+(8-12)+(23-34)	1.8	1.8		4.2	
	8.6	1.8+1.8+5.0	(8-12)+(8-12)+(23-34)	1.8	1.8		5.0	
	9.6	1.8+1.8+6.0	(8-12)+(8-12)+(23-34)	1.8	1.8		6.0	
	10.6	1.8+1.8+7.0	(8-12)+(8-12)+(23-34)	1.8	1.8		7.0	
	6.8	1.8+2.5+2.5	(8-12)+(11-17)+(11-17)	1.8	2.5	2.5		
	7.8	1.8+2.5+3.5	(8-12)+(11-17)+(16-24)	1.8	2.5	3.5		
	8.5	1.8+2.5+4.2	(8-12)+(11-17)+(22-23)	1.8	2.5		4.2	
	9.3	1.8+2.5+5.0	(8-12)+(11-17)+(22-23)	1.8	2.5		5.0	
	10.3	1.8+2.5+6.0	(8-12)+(11-17)+(22-23)	1.8	2.5		6.0	
	11.3	1.8+2.5+7.0	(8-12)+(11-17)+(22-23)	1.8	2.5		7.0	
	8.8	1.8+3.5+3.5	(8-12)+(16-24)+(16-24)	1.8	3.5	3.5		
	9.5	1.8+3.5+4.2	(7-11)+(14-21)+(20-30)	1.8	3.5		4.2	
	10.3	1.8+3.5+5.0	(7-11)+(14-21)+(20-30)	1.8	3.5		5.0	
	11.3	1.8+3.5+6.0	(7-11)+(14-21)+(20-30)	1.8	3.5		6.0	
	12.3	1.8+3.5+7.0	(7-11)+(14-21)+(20-30)	1.8	3.5		7.0	
THREE UNIT	10.2	1.8+4.2+4.2	(6-10)+(17-26)+(17-26)	1.8			4.2	4.2
	11	1.8+4.2+5.0	(6-10)+(17-26)+(17-26)	1.8			4.2	5.0
	12	1.8+4.2+6.0	(6-10)+(17-26)+(17-26)	1.8			4.2	6.0
	13	1.8+4.2+7.0	(6-10)+(17-26)+(17-26)	1.8			4.2	7.0
	11.8	1.8+5.0+5.0	(6-10)+(17-26)+(17-26)	1.8			5.0	5.0
	12.8	1.8+5.0+6.0	(6-10)+(17-26)+(17-26)	1.8			5.0	6.0
	13.8	1.8+5.0+7.0	(6-10)+(17-26)+(17-26)	1.8			5.0	7.0
	13.8	1.8+6.0+6.0	(6-10)+(17-26)+(17-26)	1.8			6.0	6.0
	14.8	1.8+6.0+7.0	(6-10)+(17-26)+(17-26)	1.8			6.0	7.0
	15.8	1.8+7.0+7.0	(6-10)+(17-26)+(17-26)	1.8			7.0	7.0
	7.5	2.5+2.5+2.5	(11-17)+(11-17)+(11-17)	2.5	2.5	2.5		
	8.5	2.5+2.5+3.5	(11-17)+(11-17)+(16-24)	2.5	2.5	3.5		
	9.2	2.5+2.5+4.2	(10-16)+(10-16)+(20-31)	2.5	2.5		4.2	
	10	2.5+2.5+5.0	(10-16)+(10-16)+(20-31)	2.5	2.5		5.0	
	11	2.5+2.5+6.0	(10-16)+(10-16)+(20-31)	2.5	2.5		6.0	
	12	2.5+2.5+7.0	(10-16)+(10-16)+(20-31)	2.5	2.5		7.0	
	9.5	2.5+3.5+3.5	(11-16)+(15-23)+(15-23)	2.5	3.5	3.5		
	10.2	2.5+3.5+4.2	(9-14)+(13-20)+(19-28)	2.5	3.5		4.2	
	11	2.5+3.5+5.0	(9-14)+(13-20)+(19-28)	2.5	3.5		5.0	
	12	2.5+3.5+6.0	(9-14)+(13-20)+(19-28)	2.5	3.5		6.0	
	13	2.5+3.5+7.0	(16-24)+(16-24)+(23-24)	2.5	3.5		7.0	
	10.9	2.5+4.2+4.2	(8-12)+(16-25)+(16-25)	2.5			4.2	4.2
	11.7	2.5+4.2+5.0	(8-12)+(16-25)+(16-25)	2.5			4.2	5.0
	12.7	2.5+4.2+6.0	(8-12)+(16-25)+(16-25)	2.5			4.2	6.0
	13.7	2.5+4.2+7.0	(8-12)+(16-25)+(16-25)	2.5			4.2	7.0
	12.5	2.5+5.0+5.0	(8-12)+(16-25)+(16-25)	2.5			5.0	5.0
	13.5	2.5+5.0+6.0	(8-12)+(16-25)+(16-25)	2.5			5.0	6.0
	14.5	2.5+5.0+7.0	(8-12)+(16-25)+(16-25)	2.5			5.0	7.0
	14.5	2.5+6.0+6.0	(8-12)+(16-25)+(16-25)	2.5			6.0	7.0
	15.5	2.5+6.0+7.0	(8-12)+(16-25)+(16-25)	2.5			6.0	7.0

16.5	2.5+7.0+7.0	(8-12)+(16-25)+(16-25)	2.5			7.0	7.0
10.5	3.5+3.5+3.5	(14-21)+(14-21)+(14-21)	3.5	3.5	3.5		
11.2	3.5+3.5+4.2	(12-18)+(12-18)+(17-26)	3.5	3.5		4.2	
12	3.5+3.5+5.0	(12-18)+(12-18)+(17-26)	3.5	3.5		5.0	
13	3.5+3.5+6.0	(12-18)+(12-18)+(17-26)	3.5	3.5		6.0	
14	3.5+3.5+7.0	(12-18)+(12-18)+(17-26)	3.5	3.5		7.0	
11.9	3.5+4.2+4.2	(10-16)+(15-23)+(15-23)	3.5			4.2	4.2
12.7	3.5+4.2+5.0	(10-16)+(15-23)+(15-23)	3.5			4.2	5.0
13.7	3.5+4.2+6.0	(10-16)+(15-23)+(15-23)	3.5			4.2	6.0
14.7	3.5+4.2+7.0	(10-16)+(15-23)+(15-23)	3.5			4.2	7.0
13.5	3.5+5.0+5.0	(10-16)+(15-23)+(15-23)	3.5			5.0	5.0
14.5	3.5+5.0+6.0	(10-16)+(15-23)+(15-23)	3.5			5.0	6.0
15.5	3.5+5.0+7.0	(10-16)+(15-23)+(15-23)	3.5			5.0	7.0
15.5	3.5+6.0+6.0	(10-16)+(15-23)+(15-23)	3.5			6.0	6.0
16.5	3.5+6.0+7.0	(10-16)+(15-23)+(15-23)	3.5			6.0	7.0
12.6	4.2+4.2+4.2	(14-21)+(14-21)+(14-21)	○4.2			4.2	4.2
13.4	4.2+4.2+5.0	(14-21)+(14-21)+(14-21)	○4.2			4.2	5.0
14.4	4.2+4.2+6.0	(14-21)+(14-21)+(14-21)	○4.2			4.2	6.0
15.4	4.2+4.2+7.0	(14-21)+(14-21)+(14-21)	○4.2			4.2	7.0
14.2	4.2+5.0+5.0	(14-21)+(14-21)+(14-21)	○4.2			5.0	5.0
15.2	4.2+5.0+6.0	(14-21)+(14-21)+(14-21)	○4.2			5.0	6.0
16.2	4.2+5.0+7.0	(14-21)+(14-21)+(14-21)	○4.2			5.0	7.0
16.2	4.2+6.0+6.0	(14-21)+(14-21)+(14-21)	○4.2			6.0	6.0
15	5.0+5.0+5.0	(14-21)+(14-21)+(14-21)	○5.0			6.0	6.0
16	5.0+5.0+6.0	(14-21)+(14-21)+(14-21)	○5.0			6.0	6.0
6.0	1.5+1.5+1.5+1.5	(8-12)+(8-12)+(8-12)+(8-12)	1.5	1.5	1.5	●1.5	
6.3	1.5+1.5+1.5+1.8	(8-12)+(8-12)+(8-12)+(8-12)	1.5	1.5	1.5	●1.8	
7.0	1.5+1.5+1.5+2.5	(8-12)+(8-12)+(8-12)+(11-17)	1.5	1.5	1.5	●2.5	
8.0	1.5+1.5+1.5+3.5	(8-12)+(8-12)+(8-12)+(16-24)	1.5	1.5	1.5	●3.5	
8.7	1.5+1.5+1.5+4.2	(7-11)+(7-11)+(7-11)+(20-30)	1.5	1.5	1.5	4.2	
9.5	1.5+1.5+1.5+5.0	(7-11)+(7-11)+(7-11)+(20-30)	1.5	1.5	1.5	5.0	
10.5	1.5+1.5+1.5+6.0	(7-11)+(7-11)+(7-11)+(20-30)	1.5	1.5	1.5	6.0	
11.5	1.5+1.5+1.5+7.0	(7-11)+(7-11)+(7-11)+(20-30)	1.5	1.5	1.5	7.0	
6.6	1.5+1.5+1.8+1.8	(8-12)+(8-12)+(8-12)+(8-12)	1.5	1.5	1.8	●1.8	
7.3	1.5+1.5+1.8+2.5	(8-12)+(8-12)+(8-12)+(11-17)	1.5	1.5	1.8	●2.5	
8.3	1.5+1.5+1.8+3.5	(8-12)+(8-12)+(8-12)+(16-24)	1.5	1.5	1.8	●3.5	
9	1.5+1.5+1.8+4.2	(7-11)+(7-11)+(7-11)+(20-30)	1.5	1.5	1.8	4.2	
9.8	1.5+1.5+1.8+5.0	(7-11)+(7-11)+(7-11)+(20-30)	1.5	1.5	1.8	5.0	
10.8	1.5+1.5+1.8+6.0	(7-11)+(7-11)+(7-11)+(20-30)	1.5	1.5	1.8	6.0	
11.8	1.5+1.5+1.8+7.0	(7-11)+(7-11)+(7-11)+(20-30)	1.5	1.5	1.8	7.0	
8	1.5+1.5+2.5+2.5	(8-12)+(8-12)+(11-17)+(11-17)	1.5	1.5	2.5	●2.5	
9	1.5+1.5+2.5+3.5	(8-12)+(8-12)+(11-17)+(15-23)	1.5	1.5	2.5	●3.5	
9.7	1.5+1.5+2.5+4.2	(7-10)+(7-10)+(9-14)+(19-28)	1.5	1.5	2.5	4.2	
10.5	1.5+1.5+2.5+5.0	(7-10)+(7-10)+(9-14)+(19-28)	1.5	1.5	2.5	5.0	
11.5	1.5+1.5+2.5+6.0	(7-10)+(7-10)+(9-14)+(19-28)	1.5	1.5	2.5	6.0	
12.5	1.5+1.5+2.5+7.0	(7-10)+(7-10)+(9-14)+(19-28)	1.5	1.5	2.5	7.0	
10	1.5+1.5+3.5+3.5	(7-11)+(7-11)+(14-20)+(14-20)	1.5	1.5	3.5	●3.5	
10.7	1.5+1.5+3.5+4.2	(6-9)+(6-9)+(12-18)+(17-26)	1.5	1.5	3.5	4.2	
11.5	1.5+1.5+3.5+5.0	(6-9)+(6-9)+(12-18)+(17-26)	1.5	1.5	3.5	5.0	
12.5	1.5+1.5+3.5+6.0	(6-9)+(6-9)+(12-18)+(17-26)	1.5	1.5	3.5	6.0	
13.5	1.5+1.5+3.5+7.0	(6-9)+(6-9)+(12-18)+(17-26)	1.5	1.5	3.5	7.0	
11.4	1.5+1.5+4.2+4.2	(5-8)+(5-8)+(15-23)+(15-23)	1.5	1.5		4.2	4.2
12.2	1.5+1.5+4.2+5.0	(5-8)+(5-8)+(15-23)+(15-23)	1.5	1.5		4.2	5.0
13.2	1.5+1.5+4.2+6.0	(5-8)+(5-8)+(15-23)+(15-23)	1.5	1.5		4.2	6.0
14.2	1.5+1.5+4.2+7.0	(5-8)+(5-8)+(15-23)+(15-23)	1.5	1.5		4.2	7.0
13	1.5+1.5+5.0+5.0	(5-8)+(5-8)+(15-23)+(15-23)	1.5	1.5		5.0	5.0
14	1.5+1.5+5.0+6.0	(5-8)+(5-8)+(15-23)+(15-23)	1.5	1.5		5.0	6.0
15	1.5+1.5+5.0+7.0	(5-8)+(5-8)+(15-23)+(15-23)	1.5	1.5		5.0	7.0
15	1.5+1.5+6.0+6.0	(5-8)+(5-8)+(15-23)+(15-23)	1.5	1.5		6.0	6.0
16	1.5+1.5+6.0+7.0	(5-8)+(5-8)+(15-23)+(15-23)	1.5	1.5		6.0	7.0
5.1	1.5+1.8+1.8+1.8	(8-12)+(8-12)+(8-12)+(8-12)	1.5	1.8	1.8	●1.8	
5.8	1.5+1.8+1.8+2.5	(8-12)+(8-12)+(8-12)+(11-17)	1.5	1.8	1.8	●2.5	

	6.8	1.5+1.8+1.8+3.5	(8-12)+(8-12)+(8-12)+(16-24)	1.5	1.8	1.8	●3.5	
	7.5	1.5+1.8+1.8+4.2	(7-11)+(7-11)+(7-11)+(20-30)	1.5	1.8	1.8	4.2	
	8.3	1.5+1.8+1.8+5.0	(7-11)+(7-11)+(7-11)+(20-30)	1.5	1.8	1.8	5.0	
	9.3	1.5+1.8+1.8+6.0	(7-11)+(7-11)+(7-11)+(20-30)	1.5	1.8	1.8	6.0	
	10.3	1.5+1.8+1.8+7.0	(7-11)+(7-11)+(7-11)+(20-30)	1.5	1.8	1.8	7.0	
	8.3	1.5+1.8+2.5+2.5	(8-12)+(8-12)+(11-17)+(11-17)	1.5	1.8	2.5	●2.5	
	9.3	1.5+1.8+2.5+3.5	(8-12)+(8-12)+(11-16)+(15-23)	1.5	1.8	2.5	●3.5	
	10.0	1.5+1.8+2.5+4.2	(7-10)+(7-10)+(9-14)+(19-28)	1.5	1.8	2.5	4.2	
	10.8	1.5+1.8+2.5+5.0	(7-10)+(7-10)+(9-14)+(19-28)	1.5	1.8	2.5	5.0	
	11.8	1.5+1.8+2.5+6.0	(7-10)+(7-10)+(9-14)+(19-28)	1.5	1.8	2.5	6.0	
	12.8	1.5+1.8+2.5+7.0	(7-10)+(7-10)+(9-14)+(19-28)	1.5	1.8	2.5	7.0	
	10.3	1.5+1.8+3.5+3.5	(7-11)+(7-11)+(14-20)+(14-20)	1.5	1.8	3.5	●3.5	
	11.0	1.5+1.8+3.5+4.2	(6-9)+(6-9)+(12-18)+(17-26)	1.5	1.8	3.5	4.2	
	11.8	1.5+1.8+3.5+5.0	(6-9)+(6-9)+(12-18)+(17-26)	1.5	1.8	3.5	5.0	
	12.8	1.5+1.8+3.5+6.0	(6-9)+(6-9)+(12-18)+(17-26)	1.5	1.8	3.5	6.0	
	13.8	1.5+1.8+3.5+7.0	(6-9)+(6-9)+(12-18)+(17-26)	1.5	1.8	3.5	7.0	
	11.7	1.5+1.8+4.2+4.2	(5-8)+(5-8)+(15-23)+(15-23)	1.5	1.8		4.2	4.2
	12.5	1.5+1.8+4.2+5.0	(5-8)+(5-8)+(15-23)+(15-23)	1.5	1.8		4.2	5.0
	13.5	1.5+1.8+4.2+6.0	(5-8)+(5-8)+(15-23)+(15-23)	1.5	1.8		4.2	6.0
	14.5	1.5+1.8+4.2+7.0	(5-8)+(5-8)+(15-23)+(15-23)	1.5	1.8		4.2	7.0
	13.3	1.5+1.8+5.0+5.0	(5-8)+(5-8)+(15-23)+(15-23)	1.5	1.8		5.0	5.0
	14.3	1.5+1.8+5.0+6.0	(5-8)+(5-8)+(15-23)+(15-23)	1.5	1.8		5.0	6.0
	15.3	1.5+1.8+5.0+7.0	(5-8)+(5-8)+(15-23)+(15-23)	1.5	1.8		5.0	7.0
	15.3	1.5+1.8+6.0+6.0	(5-8)+(5-8)+(15-23)+(15-23)	1.5	1.8		6.0	6.0
	16.3	1.5+1.8+6.0+7.0	(5-8)+(5-8)+(15-23)+(15-23)	1.5	1.8		6.0	7.0
	9	1.5+2.5+2.5+2.5	(8-12)+(11-17)+(11-17)+(11-17)	1.5	2.5	2.5	●2.5	
	10	1.5+2.5+2.5+3.5	(7-11)+(10-15)+(10-15)+(14-21)	1.5	2.5	2.5	●3.5	
	10.7	1.5+2.5+2.5+4.2	(6-10)+(9-13)+(9-13)+(17-26)	1.5	2.5	2.5	4.2	
	11.5	1.5+2.5+2.5+5.0	(6-10)+(9-13)+(9-13)+(17-26)	1.5	2.5	2.5	5	
	12.5	1.5+2.5+2.5+6.0	(6-10)+(9-13)+(9-13)+(17-26)	1.5	2.5	2.5	6	
	13.5	1.5+2.5+2.5+7.0	(6-10)+(9-13)+(9-13)+(17-26)	1.5	2.5	2.5	7	
	11	1.5+2.5+3.5+3.5	(6-10)+(9-14)+(13-19)+(13-19)	1.5	2.5	3.5	●3.5	
	11.7	1.5+2.5+3.5+4.2	(6-9)+(8-12)+(11-17)+(16-24)	1.5	2.5	3.5	4.2	
	12.5	1.5+2.5+3.5+5.0	(6-9)+(8-12)+(11-17)+(16-24)	1.5	2.5	3.5	5	
	13.5	1.5+2.5+3.5+6.0	(6-9)+(8-12)+(11-17)+(16-24)	1.5	2.5	3.5	6	
	14.5	1.5+2.5+3.5+7.0	(6-9)+(8-12)+(11-17)+(16-24)	1.5	2.5	3.5	7	
	12.4	1.5+2.5+4.2+4.2	(5-8)+(7-11)+(14-22)+(14-22)	1.5	2.5		4.2	4.2
	13.2	1.5+2.5+4.2+5.0	(5-8)+(7-11)+(14-22)+(14-22)	1.5	2.5		4.2	5.0
	14.2	1.5+2.5+4.2+6.0	(5-8)+(7-11)+(14-22)+(14-22)	1.5	2.5		4.2	6.0
	15.2	1.5+2.5+4.2+7.0	(5-8)+(7-11)+(14-22)+(14-22)	1.5	2.5		4.2	7.0
	14	1.5+2.5+5.0+5.0	(5-8)+(7-11)+(14-22)+(14-22)	1.5	2.5		5.0	5.0
	15	1.5+2.5+5.0+6.0	(5-8)+(7-11)+(14-22)+(14-22)	1.5	2.5		5.0	6.0
	16	1.5+2.5+5.0+7.0	(5-8)+(7-11)+(14-22)+(14-22)	1.5	2.5		5.0	7.0
	12.0	1.5+3.5+3.5+3.5	(6-9)+(12-18)+(12-18)+(12-18)	1.5	3.5	3.5	●3.5	
	12.7	1.5+3.5+3.5+4.2	(5-8)+(10-16)+(10-16)+(15-22)	1.5	3.5	3.5	4.2	
	13.5	1.5+3.5+3.5+5.0	(5-8)+(10-16)+(10-16)+(15-22)	1.5	3.5	3.5	5	
	14.5	1.5+3.5+3.5+6.0	(5-8)+(10-16)+(10-16)+(15-22)	1.5	3.5	3.5	6	
	15.5	1.5+3.5+3.5+7.0	(5-8)+(10-16)+(10-16)+(15-22)	1.5	3.5	3.5	7	
	13.2	1.5+3.5+4.2+4.2	(5-7)+(9-14)+(13-20)+(13-20)	1.5	3.5		4.2	4.2
	14.0	1.5+3.5+4.2+5.0	(5-7)+(9-14)+(13-20)+(13-20)	1.5	3.5		4.2	5.0
	15.0	1.5+3.5+4.2+6.0	(5-7)+(9-14)+(13-20)+(13-20)	1.5	3.5		4.2	6.0
	16	1.5+3.5+4.2+7.0	(5-7)+(9-14)+(13-20)+(13-20)	1.5	3.5		4.2	7.0
	14	1.5+3.5+5.0+5.0	(5-7)+(9-14)+(13-20)+(13-20)	1.5	3.5		5.0	5.0
	15	1.5+3.5+5.0+6.0	(5-7)+(9-14)+(13-20)+(13-20)	1.5	3.5		5.0	6.0
	16	1.5+3.5+5.0+7.0	(5-7)+(9-14)+(13-20)+(13-20)	1.5	3.5		5.0	7.0
	14.1	1.5+4.2+4.2+4.2	(5-7)+(9-14)+(13-20)+(13-20)	1.5	○4.2		4.2	4.2
FOUR UNIT	14.9	1.5+4.2+4.2+5.0	(5-7)+(9-14)+(13-20)+(13-20)	1.5	○4.2		4.2	5.0
	15.9	1.5+4.2+4.2+6.0	(5-7)+(9-14)+(13-20)+(13-20)	1.5	○4.2		4.2	6.0
	15.7	1.5+4.2+5.0+5.0	(5-7)+(9-14)+(13-20)+(13-20)	1.5	○4.2		5.0	5.0
	7.2	1.8+1.8+1.8+1.8	(8-12)+(8-12)+(8-12)+(8-12)	1.8	1.8	1.8	●1.8	
	7.9	1.8+1.8+1.8+2.5	(8-12)+(8-12)+(8-12)+(11-17)	1.8	1.8	1.8	●2.5	
	8.9	1.8+1.8+1.8+3.5	(8-12)+(8-12)+(8-12)+(16-24)	1.8	1.8	1.8	●3.5	

9.6	1.8+1.8+1.8+4.2	(7-11)+(7-11+(7-11)+(20-30)	1.8	1.8	1.8	4.2	
10.4	1.8+1.8+1.8+5.0	(7-11)+(7-11+(7-11)+(20-30)	1.8	1.8	1.8	5.0	
11.4	1.8+1.8+1.8+6.0	(7-11)+(7-11+(7-11)+(20-30)	1.8	1.8	1.8	6.0	
12.4	1.8+1.8+1.8+7.0	(7-11)+(7-11+(7-11)+(20-30)	1.8	1.8	1.8	7.0	
8.6	1.8+1.8+2.5+2.5	(8-12)+(8-12)+(11-17)+(11-17)	1.8	1.8	2.5	●2.5	
9.6	1.8+1.8+2.5+3.5	(8-12)+(8-12)+(11-16)+(15-23)	1.8	1.8	2.5	●3.5	
10.3	1.8+1.8+2.5+4.2	(7-10)+(7-10)+(9-14)+(19-28)	1.8	1.8	2.5	4.2	
11.1	1.8+1.8+2.5+5.0	(7-10)+(7-10)+(9-14)+(19-28)	1.8	1.8	2.5	5.0	
12.1	1.8+1.8+2.5+6.0	(7-10)+(7-10)+(9-14)+(19-28)	1.8	1.8	2.5	6	
13.1	1.8+1.8+2.5+7.0	(7-10)+(7-10)+(9-14)+(19-28)	1.8	1.8	2.5	7	
10.6	1.8+1.8+3.5+3.5	(7-11)+(7-11)+(14-20)+(14-20)	1.8	1.8	3.5	●3.5	
11.3	1.8+1.8+3.5+4.2	(6-9)+(6-9)+(12-18)+(17-26)	1.8	1.8	3.5	4.2	
12.1	1.8+1.8+3.5+5.0	(6-9)+(6-9)+(12-18)+(17-26)	1.8	1.8	3.5	5.0	
13.1	1.8+1.8+3.5+6.0	(6-9)+(6-9)+(12-18)+(17-26)	1.8	1.8	3.5	6.0	
14.1	1.8+1.8+3.5+7.0	(6-9)+(6-9)+(12-18)+(17-26)	1.8	1.8	3.5	7.0	
12	1.8+1.8+4.2+4.2	(5-8)+(5-8)+(15-23)+(15-23)	1.8	1.8		4.2	4.2
12.8	1.8+1.8+4.2+5.0	(5-8)+(5-8)+(15-23)+(15-23)	1.8	1.8		4.2	5.0
13.8	1.8+1.8+4.2+6.0	(5-8)+(5-8)+(15-23)+(15-23)	1.8	1.8		4.2	6.0
14.8	1.8+1.8+4.2+7.0	(5-8)+(5-8)+(15-23)+(15-23)	1.8	1.8		4.2	7.0
13.6	1.8+1.8+5.0+5.0	(5-8)+(5-8)+(15-23)+(15-23)	1.8	1.8		5.0	5.0
14.6	1.8+1.8+5.0+6.0	(5-8)+(5-8)+(15-23)+(15-23)	1.8	1.8		5.0	6.0
15.6	1.8+1.8+5.0+7.0	(5-8)+(5-8)+(15-23)+(15-23)	1.8	1.8		5.0	7.0
15.6	1.8+1.8+6.0+6.0	(5-8)+(5-8)+(15-23)+(15-23)	1.8	1.8		6.0	6.0
16.6	1.8+1.8+6.0+7.0	(5-8)+(5-8)+(15-23)+(15-23)	1.8	1.8		6.0	7.0
9.3	1.8+2.5+2.5+2.5	(8-12)+(11-17)+(11-17)+(11-17)	1.8	2.5	2.5	●2.5	
10.3	1.8+2.5+2.5+3.5	(7-11)+(10-15)+(10-15)+(14-21)	1.8	2.5	2.5	●3.5	
11.0	1.8+2.5+2.5+4.2	(6-10)+(9-13)+(9-13)+(17-26)	1.8	2.5	2.5	4.2	
11.8	1.8+2.5+2.5+5.0	(6-10)+(9-13)+(9-13)+(17-26)	1.8	2.5	2.5	5.0	
12.8	1.8+2.5+2.5+6.0	(6-10)+(9-13)+(9-13)+(17-26)	1.8	2.5	2.5	6.0	
13.8	1.8+2.5+2.5+7.0	(6-10)+(9-13)+(9-13)+(17-26)	1.8	2.5	2.5	7.0	
11.3	1.8+2.5+3.5+3.5	(6-10)+(9-14)+(13-19)+(13-19)	1.8	2.5	3.5	●3.5	
12	1.8+2.5+3.5+4.2	(6-9)+(8-12)+(11-17)+(16-24)	1.8	2.5	3.5	4.2	
12.8	1.8+2.5+3.5+5.0	(6-9)+(8-12)+(11-17)+(16-24)	1.8	2.5	3.5	5.0	
13.8	1.8+2.5+3.5+6.0	(6-9)+(8-12)+(11-17)+(16-24)	1.8	2.5	3.5	6.0	
14.8	1.8+2.5+3.5+7.0	(6-9)+(8-12)+(11-17)+(16-24)	1.8	2.5	3.5	7.0	
12.7	1.8+2.5+4.2+4.2	(5-8)+(7-11)+(14-22)+(14-22)	1.8	2.5		4.2	4.2
13.5	1.8+2.5+4.2+5.0	(5-8)+(7-11)+(14-22)+(14-22)	1.8	2.5		4.2	5.0
14.5	1.8+2.5+4.2+6.0	(5-8)+(7-11)+(14-22)+(14-22)	1.8	2.5		4.2	6.0
15.5	1.8+2.5+4.2+7.0	(5-8)+(7-11)+(14-22)+(14-22)	1.8	2.5		4.2	7.0
14.3	1.8+2.5+5.0+5.0	(5-8)+(7-11)+(14-22)+(14-22)	1.8	2.5		5.0	5.0
15.3	1.8+2.5+5.0+6.0	(5-8)+(7-11)+(14-22)+(14-22)	1.8	2.5		5.0	6.0
16.3	1.8+2.5+6.0+6.0	(5-8)+(7-11)+(14-22)+(14-22)	1.8	2.5		6.0	6.0
12.3	1.8+3.5+3.5+3.5	(6-9)+(12-18)+(12-18)+(12-18)	1.8	3.5	3.5	●3.5	
13	1.8+3.5+3.5+4.2	(5-8)+(10-16)+(10-16)+(15-22)	1.8	3.5	3.5	4.2	
13.8	1.8+3.5+3.5+5.0	(5-8)+(10-16)+(10-16)+(15-22)	1.8	3.5	3.5	5	
14.8	1.8+3.5+3.5+6.0	(5-8)+(10-16)+(10-16)+(15-22)	1.8	3.5	3.5	6	
15.8	1.8+3.5+3.5+7.0	(5-8)+(10-16)+(10-16)+(15-22)	1.8	3.5	3.5	7	
13.7	1.8+3.5+4.2+4.2	(5-7)+(9-14)+(13-20)+(13-20)	1.8	3.5		4.2	4.2
14.5	1.8+3.5+4.2+5.0	(5-7)+(9-14)+(13-20)+(13-20)	1.8	3.5		4.2	5.0
15.5	1.8+3.5+4.2+6.0	(5-7)+(9-14)+(13-20)+(13-20)	1.8	3.5		4.2	6.0
16.5	1.8+3.5+4.2+7.0	(5-7)+(9-14)+(13-20)+(13-20)	1.8	3.5		4.2	7.0
15.3	1.8+3.5+5.0+5.0	(5-7)+(9-14)+(13-20)+(13-20)	1.8	3.5		5.0	5.0
16.3	1.8+3.5+5.0+6.0	(5-7)+(9-14)+(13-20)+(13-20)	1.8	3.5		5.0	6.0
14.4	1.8+4.2+4.2+4.2	(5-7)+(9-14)+(13-20)+(13-20)	1.8	○4.2		4.2	4.2
15.2	1.8+4.2+4.2+5.0	(5-7)+(9-14)+(13-20)+(13-20)	1.8	○4.2		4.2	5.0
16.2	1.8+4.2+4.2+6.0	(5-7)+(9-14)+(13-20)+(13-20)	1.8	○4.2		4.2	6.0
16.2	1.8+4.2+5.0+5.0	(5-7)+(9-14)+(13-20)+(13-20)	1.8	○4.2		5.0	5.0
10	2.5+2.5+2.5+2.5	(10-16)+(10-16)+(10-16)+(10-16)	2.5	2.5	2.5	●2.5	
11	2.5+2.5+2.5+3.5	(9-14)+(9-14)+(9-14)+(13-20)	2.5	2.5	2.5	●3.5	
11.7	2.5+2.5+2.5+4.2	(8-12)+(8-12)+(8-12)+(16-25)	2.5	2.5	2.5	4.2	
12.5	2.5+2.5+2.5+5.0	(8-12)+(8-12)+(8-12)+(16-25)	2.5	2.5	2.5	5.0	
13.5	2.5+2.5+2.5+6.0	(8-12)+(8-12)+(8-12)+(16-25)	2.5	2.5	2.5	6.0	

	14.5	2.5+2.5+2.5+7.0	(8-12)+(8-12)+(8-12)+(16-25)	2.5	2.5	2.5	7.0	
	12	2.5+2.5+3.5+3.5	(9-13)+(9-13)+(12-18)+(12-18)	2.5	2.5	3.5	●3.5	
	12.7	2.5+2.5+3.5+4.2	(8-12)+(8-12)+(11-16)+(15-23)	2.5	2.5	3.5	4.2	
	13.5	2.5+2.5+3.5+5.0	(8-12)+(8-12)+(11-16)+(15-23)	2.5	2.5	3.5	5.0	
	14.5	2.5+2.5+3.5+6.0	(8-12)+(8-12)+(11-16)+(15-23)	2.5	2.5	3.5	6.0	
	15.5	2.5+2.5+3.5+7.0	(8-12)+(8-12)+(11-16)+(15-23)	2.5	2.5	3.5	7.0	
	13.2	2.5+2.5+4.2+4.2	(7-10)+(7-10)+(14-21)+(14-21)	2.5	2.5		4.2	4.2
	14	2.5+2.5+4.2+5.0	(7-10)+(7-10)+(14-21)+(14-21)	2.5	2.5		4.2	5.0
	15	2.5+2.5+4.2+6.0	(7-10)+(7-10)+(14-21)+(14-21)	2.5	2.5		4.2	6.0
	16	2.5+2.5+4.2+7.0	(7-10)+(7-10)+(14-21)+(14-21)	2.5	2.5		4.2	7.0
	15	2.5+2.5+5.0+5.0	(7-10)+(7-10)+(14-21)+(14-21)	2.5	2.5		5.0	5.0
	16	2.5+2.5+5.0+6.0	(7-10)+(7-10)+(14-21)+(14-21)	2.5	2.5		5.0	6.0
	13	2.5+3.5+3.5+3.5	(8-12)+(11-17)+(11-17)+(11-17)	2.5	3.5	3.5	●3.5	
	13.7	2.5+3.5+3.5+4.2	(7-11)+(10-15)+(10-15)+(14-21)	2.5	3.5	3.5	4.2	
	14.5	2.5+3.5+3.5+5.0	(7-11)+(10-15)+(10-15)+(14-21)	2.5	3.5	3.5	5.0	
	15.5	2.5+3.5+3.5+6.0	(7-11)+(10-15)+(10-15)+(14-21)	2.5	3.5	3.5	6.0	
	16.5	2.5+3.5+3.5+7.0	(7-11)+(10-15)+(10-15)+(14-21)	2.5	3.5	3.5	7.0	
	14.4	2.5+3.5+4.2+4.2	(7-11)+(10-15)+(10-15)+(14-21)	2.5	3.5		4.2	4.2
	15.2	2.5+3.5+4.2+5.0	(7-11)+(10-15)+(10-15)+(14-21)	2.5	3.5		4.2	5.0
	16.2	2.5+3.5+4.2+6.0	(7-11)+(10-15)+(10-15)+(14-21)	2.5	3.5		4.2	6.0
	16	2.5+3.5+5.0+5.0	(7-11)+(10-15)+(10-15)+(14-21)	2.5	3.5		5.0	5.0
	14	3.5+3.5+3.5+3.5	(10-16)+(10-16)+(10-16)+(10-16)	3.5	3.5	3.5	●3.5	
	14.7	3.5+3.5+3.5+4.2	(9-14)+(9-14)+(9-14)+(13-20)	3.5	3.5	3.5	4.2	
	15.5	3.5+3.5+3.5+5.0	(9-14)+(9-14)+(9-14)+(13-20)	3.5	3.5	3.5	5.0	
	16.5	3.5+3.5+3.5+6.0	(9-14)+(9-14)+(9-14)+(13-20)	3.5	3.5	3.5	6.0	
	15.2	3.5+3.5+4.2+4.2	(9-14)+(9-14)+(9-14)+(13-20)	3.5	3.5		4.2	4.2
	16.2	3.5+3.5+4.2+5.0	(9-14)+(9-14)+(9-14)+(13-20)	3.5	3.5		4.2	5.0
	7.5	1.5+1.5+1.5+1.5+1.5	(8-12)+(8-12)+(8-12)+(8-12)+(8-12)	1.5	1.5	1.5	●1.5	●1.5
	7.8	1.5+1.5+1.5+1.5+1.8	(8-12)+(8-12)+(8-12)+(8-12)+(11-17)	1.5	1.5	1.5	●1.5	●1.8
	8.5	1.5+1.5+1.5+1.5+2.5	(8-12)+(8-12)+(8-12)+(8-12)+(11-16)	1.5	1.5	1.5	●1.5	●2.5
	9.5	1.5+1.5+1.5+1.5+3.5	(7-10)+(7-10)+(7-10)+(7-10)+(13-20)	1.5	1.5	1.5	●1.5	●3.5
	10.2	1.5+1.5+1.5+1.5+4.2	(6-9)+(6-9)+(6-9)+(6-9)+(17-25)	1.5	1.5	1.5	●1.5	4.2
	11	1.5+1.5+1.5+1.5+5.0	(6-9)+(6-9)+(6-9)+(6-9)+(17-25)	1.5	1.5	1.5	●1.5	5.0
	12	1.5+1.5+1.5+1.5+6.0	(6-9)+(6-9)+(6-9)+(6-9)+(17-25)	1.5	1.5	1.5	●1.5	6.0
	13	1.5+1.5+1.5+1.5+7.0	(6-9)+(6-9)+(6-9)+(6-9)+(17-25)	1.5	1.5	1.5	●1.5	7.0
	8.1	1.5+1.5+1.5+1.8+1.8	(8-12)+(8-12)+(8-12)+(8-12)+(8-12)	1.5	1.5	1.5	●1.8	●1.8
	8.8	1.5+1.5+1.5+1.8+2.5	(8-12)+(8-12)+(8-12)+(8-12)+(11-16)	1.5	1.5	1.5	●1.8	●2.5
	9.8	1.5+1.5+1.5+1.8+3.5	(7-10)+(7-10)+(7-10)+(7-10)+(13-20)	1.5	1.5	1.5	●1.8	●3.5
	10.5	1.5+1.5+1.5+1.8+4.2	(6-9)+(6-9)+(6-9)+(6-9)+(17-25)	1.5	1.5	1.5	●1.8	4.2
	11.3	1.5+1.5+1.5+1.8+5.0	(6-9)+(6-9)+(6-9)+(6-9)+(17-25)	1.5	1.5	1.5	●1.8	5.0
	12.3	1.5+1.5+1.5+1.8+6.0	(6-9)+(6-9)+(6-9)+(6-9)+(17-25)	1.5	1.5	1.5	●1.8	6.0
	13.3	1.5+1.5+1.5+1.8+7.0	(6-9)+(6-9)+(6-9)+(6-9)+(17-25)	1.5	1.5	1.5	●1.8	7.0
	9.5	1.5+1.5+1.5+2.5+2.5	(7-11)+(7-11)+(7-11)+(10-15)+(10-15)	1.5	1.5	1.5	●2.5	●2.5
	10.5	1.5+1.5+1.5+2.5+3.5	(6-10)+(6-10)+(6-10)+(9-14)+(13-19)	1.5	1.5	1.5	●2.5	●3.5
	11.2	1.5+1.5+1.5+2.5+4.2	(6-9)+(6-9)+(6-9)+(8-12)+(16-24)	1.5	1.5	1.5	●2.5	4.2
	12	1.5+1.5+1.5+2.5+5.0	(6-9)+(6-9)+(6-9)+(8-12)+(16-24)	1.5	1.5	1.5	●2.5	5.0
	13	1.5+1.5+1.5+2.5+6.0	(6-9)+(6-9)+(6-9)+(8-12)+(16-24)	1.5	1.5	1.5	●2.5	6.0
	14	1.5+1.5+1.5+2.5+7.0	(6-9)+(6-9)+(6-9)+(8-12)+(16-24)	1.5	1.5	1.5	●2.5	7.0
	11.5	1.5+1.5+1.5+3.5+3.5	(6-9)+(6-9)+(6-9)+(12-18)+(12-18)	1.5	1.5	1.5	●3.5	●3.5
	12.2	1.5+1.5+1.5+3.5+4.2	(5-8)+(5-8)+(5-8)+(10-16)+(15-22)	1.5	1.5	1.5	●3.5	4.2
	13	1.5+1.5+1.5+3.5+5.0	(5-8)+(5-8)+(5-8)+(10-16)+(15-22)	1.5	1.5	1.5	●3.5	5.0
	14	1.5+1.5+1.5+3.5+6.0	(5-8)+(5-8)+(5-8)+(10-16)+(15-22)	1.5	1.5	1.5	●3.5	6.0
	15	1.5+1.5+1.5+3.5+7.0	(5-8)+(5-8)+(5-8)+(10-16)+(15-22)	1.5	1.5	1.5	●3.5	7.0
	12.9	1.5+1.5+1.5+4.2+4.2	(5-7)+(5-7)+(5-7)+(13-20)+(13-20)	1.5	1.5	1.5	4.2	4.2
	13.7	1.5+1.5+1.5+4.2+5.0	(5-7)+(5-7)+(5-7)+(13-20)+(13-20)	1.5	1.5	1.5	4.2	5.0
	14.7	1.5+1.5+1.5+4.2+6.0	(5-7)+(5-7)+(5-7)+(13-20)+(13-20)	1.5	1.5	1.5	4.2	6.0
	15.7	1.5+1.5+1.5+4.2+7.0	(5-7)+(5-7)+(5-7)+(13-20)+(13-20)	1.5	1.5	1.5	4.2	7.0
	14.5	1.5+1.5+1.5+5.0+5.0	(5-7)+(5-7)+(5-7)+(13-20)+(13-20)	1.5	1.5	1.5	5.0	5.0
	15.5	1.5+1.5+1.5+5.0+6.0	(5-7)+(5-7)+(5-7)+(13-20)+(13-20)	1.5	1.5	1.5	5.0	6.0
	16.5	1.5+1.5+1.5+5.0+7.0	(5-7)+(5-7)+(5-7)+(13-20)+(13-20)	1.5	1.5	1.5	5.0	7.0
	16.5	1.5+1.5+1.5+6.0+6.0	(5-7)+(5-7)+(5-7)+(13-20)+(13-20)	1.5	1.5	1.5	6.0	6.0
	8.4	1.5+1.5+1.8+1.8+1.8	(8-12)+(8-12)+(8-12)+(8-12)+(8-12)	1.5	1.5	1.8	●1.8	●1.8

9.1	1.5+1.5+1.8+1.8+2.5	(8-12)+(8-12)+(8-12)+(8-12)+(11-16)	1.5	1.5	1.8	●1.8	●2.5
10.1	1.5+1.5+1.8+1.8+3.5	(7-10)+(7-10)+(7-10)+(7-10)+(13-20)	1.5	1.5	1.8	●1.8	●3.5
10.8	1.5+1.5+1.8+1.8+4.2	(6-9)+(6-9)+(6-9)+(6-9)+(17-25)	1.5	1.5	1.8	●1.8	4.2
11.6	1.5+1.5+1.8+1.8+5.0	(6-9)+(6-9)+(6-9)+(6-9)+(17-25)	1.5	1.5	1.8	●1.8	5.0
12.6	1.5+1.5+1.8+1.8+6.0	(6-9)+(6-9)+(6-9)+(6-9)+(17-25)	1.5	1.5	1.8	●1.8	6.0
13.6	1.5+1.5+1.8+1.8+7.0	(6-9)+(6-9)+(6-9)+(6-9)+(17-25)	1.5	1.5	1.8	●1.8	7.0
9.8	1.5+1.5+1.8+2.5+2.5	(7-11)+(7-11)+(7-11)+(10-15)+(10-15)	1.5	1.5	1.8	●2.5	●2.5
10.8	1.5+1.5+1.8+2.5+3.5	(6-10)+(6-10)+(6-10)+(9-14)+(13-19)	1.5	1.5	1.8	●2.5	●3.5
11.5	1.5+1.5+1.8+2.5+4.2	(6-9)+(6-9)+(6-9)+(8-12)+(16-24)	1.5	1.5	1.8	●2.5	4.2
12.3	1.5+1.5+1.8+2.5+5.0	(6-9)+(6-9)+(6-9)+(8-12)+(16-24)	1.5	1.5	1.8	●2.5	5.0
13.3	1.5+1.5+1.8+2.5+6.0	(6-9)+(6-9)+(6-9)+(8-12)+(16-24)	1.5	1.5	1.8	●2.5	6.0
14.3	1.5+1.5+1.8+2.5+7.0	(6-9)+(6-9)+(6-9)+(8-12)+(16-24)	1.5	1.5	1.8	●2.5	7.0
11.8	1.5+1.5+1.8+3.5+3.5	(6-9)+(6-9)+(6-9)+(12-18)+(12-18)	1.5	1.5	1.8	●3.5	●3.5
12.5	1.5+1.5+1.8+3.5+4.2	(5-8)+(5-8)+(5-8)+(10-16)+(15-22)	1.5	1.5	1.8	●3.5	4.2
13.3	1.5+1.5+1.8+3.5+5.0	(5-8)+(5-8)+(5-8)+(10-16)+(15-22)	1.5	1.5	1.8	●3.5	5.0
14.3	1.5+1.5+1.8+3.5+6.0	(5-8)+(5-8)+(5-8)+(10-16)+(15-22)	1.5	1.5	1.8	●3.5	6.0
15.3	1.5+1.5+1.8+3.5+7.0	(5-8)+(5-8)+(5-8)+(10-16)+(15-22)	1.5	1.5	1.8	●3.5	7.0
13.2	1.5+1.5+1.8+4.2+4.2	(5-7)+(5-7)+(5-7)+(13-20)+(13-20)	1.5	1.5	1.8	4.2	4.2
14	1.5+1.5+1.8+4.2+5.0	(5-7)+(5-7)+(5-7)+(13-20)+(13-20)	1.5	1.5	1.8	4.2	5.0
15	1.5+1.5+1.8+4.2+6.0	(5-7)+(5-7)+(5-7)+(13-20)+(13-20)	1.5	1.5	1.8	4.2	6.0
16	1.5+1.5+1.8+4.2+7.0	(5-7)+(5-7)+(5-7)+(13-20)+(13-20)	1.5	1.5	1.8	4.2	7.0
14.8	1.5+1.5+1.8+5.0+5.0	(5-7)+(5-7)+(5-7)+(13-20)+(13-20)	1.5	1.5	1.8	5.0	5.0
15.8	1.5+1.5+1.8+5.0+6.0	(5-7)+(5-7)+(5-7)+(13-20)+(13-20)	1.5	1.5	1.8	5.0	6.0
10.5	1.5+1.5+2.5+2.5+2.5	(7-10)+(7-10)+(9-14)+(9-14)+(9-14)	1.5	1.5	2.5	●2.5	●2.5
11.5	1.5+1.5+2.5+2.5+3.5	(6-9)+(6-9)+(8-12)+(8-12)+(11-17)	1.5	1.5	2.5	●2.5	●3.5
12.2	1.5+1.5+2.5+2.5+4.2	(5-8)+(5-8)+(8-11)+(8-11)+(15-23)	1.5	1.5	2.5	●2.5	4.2
13	1.5+1.5+2.5+2.5+5.0	(5-8)+(5-8)+(8-11)+(8-11)+(15-23)	1.5	1.5	2.5	●2.5	5.0
14	1.5+1.5+2.5+2.5+6.0	(5-8)+(5-8)+(8-11)+(8-11)+(15-23)	1.5	1.5	2.5	●2.5	6.0
15	1.5+1.5+2.5+2.5+7.0	(5-8)+(5-8)+(8-11)+(8-11)+(15-23)	1.5	1.5	2.5	●2.5	7.0
12.5	1.5+1.5+2.5+3.5+3.5	(6-9)+(6-9)+(8-12)+(11-17)+(11-17)	1.5	1.5	2.5	●3.5	●3.5
13.2	1.5+1.5+2.5+3.5+4.2	(5-8)+(5-8)+(7-11)+(10-15)+(14-21)	1.5	1.5	2.5	●3.5	4.2
14	1.5+1.5+2.5+3.5+5.0	(5-8)+(5-8)+(7-11)+(10-15)+(14-21)	1.5	1.5	2.5	●3.5	5.0
15	1.5+1.5+2.5+3.5+6.0	(5-8)+(5-8)+(7-11)+(10-15)+(14-21)	1.5	1.5	2.5	●3.5	6.0
16	1.5+1.5+2.5+3.5+7.0	(5-8)+(5-8)+(7-11)+(10-15)+(14-21)	1.5	1.5	2.5	●3.5	7.0
13.9	1.5+1.5+2.5+4.2+4.2	(5-8)+(5-8)+(7-11)+(10-15)+(14-21)	1.5	1.5	2.5	4.2	4.2
14.7	1.5+1.5+2.5+4.2+5.0	(5-8)+(5-8)+(7-11)+(10-15)+(14-21)	1.5	1.5	2.5	4.2	5.0
15.7	1.5+1.5+2.5+4.2+6.0	(5-8)+(5-8)+(7-11)+(10-15)+(14-21)	1.5	1.5	2.5	4.2	6.0
15.5	1.5+1.5+2.5+5.0+5.0	(5-8)+(5-8)+(7-11)+(10-15)+(14-21)	1.5	1.5	2.5	5.0	5.0
16.5	1.5+1.5+2.5+5.0+6.0	(5-8)+(5-8)+(7-11)+(10-15)+(14-21)	1.5	1.5	2.5	5.0	6.0
13.5	1.5+1.5+3.5+3.5+3.5	(5-8)+(5-8)+(10-15)+(10-15)+(10-15)	1.5	1.5	3.5	●3.5	●3.5
14.2	1.5+1.5+3.5+3.5+4.2	(5-8)+(5-8)+(10-15)+(10-15)+(10-15)	1.5	1.5	3.5	●3.5	4.2
15.2	1.5+1.5+3.5+3.5+5.0	(5-8)+(5-8)+(10-15)+(10-15)+(10-15)	1.5	1.5	3.5	●3.5	5.0
16.2	1.5+1.5+3.5+3.5+6.0	(5-8)+(5-8)+(10-15)+(10-15)+(10-15)	1.5	1.5	3.5	●3.5	6.0
15.6	1.5+1.5+4.2+4.2+4.2	(5-8)+(5-8)+(10-15)+(10-15)+(10-15)	1.5	1.5	○4.2	4.2	4.2
16.4	1.5+1.5+4.2+4.2+5.0	(5-8)+(5-8)+(10-15)+(10-15)+(10-15)	1.5	1.5	○4.2	4.2	5.0
8.7	1.5+1.8+1.8+1.8+1.8	(8-12)+(8-12)+(8-12)+(8-12)+(8-12)	1.5	1.8	1.8	●1.8	●1.8
9.4	1.5+1.8+1.8+1.8+2.5	(8-12)+(8-12)+(8-12)+(8-12)+(11-16)	1.5	1.8	1.8	●1.8	●2.5
10.4	1.5+1.8+1.8+1.8+3.5	(7-10)+(7-10)+(7-10)+(7-10)+(13-20)	1.5	1.8	1.8	●1.8	●3.5
11.1	1.5+1.8+1.8+1.8+4.2	(6-9)+(6-9)+(6-9)+(6-9)+(17-25)	1.5	1.8	1.8	●1.8	4.2
11.9	1.5+1.8+1.8+1.8+5.0	(6-9)+(6-9)+(6-9)+(6-9)+(17-25)	1.5	1.8	1.8	●1.8	5.0
12.9	1.5+1.8+1.8+1.8+6.0	(6-9)+(6-9)+(6-9)+(6-9)+(17-25)	1.5	1.8	1.8	●1.8	6.0
13.9	1.5+1.8+1.8+1.8+7.0	(6-9)+(6-9)+(6-9)+(6-9)+(17-25)	1.5	1.8	1.8	●1.8	7.0
10.1	1.5+1.8+1.8+2.5+2.5	(7-11)+(7-11)+(7-11)+(10-15)+(10-15)	1.5	1.8	1.8	●2.5	●2.5
11.1	1.5+1.8+1.8+2.5+3.5	(6-10)+(6-10)+(6-10)+(9-14)+(13-19)	1.5	1.8	1.8	●2.5	●3.5
11.8	1.5+1.8+1.8+2.5+4.2	(6-9)+(6-9)+(6-9)+(8-12)+(16-24)	1.5	1.8	1.8	●2.5	4.2
12.6	1.5+1.8+1.8+2.5+5.0	(6-9)+(6-9)+(6-9)+(8-12)+(16-24)	1.5	1.8	1.8	●2.5	5.0
13.6	1.5+1.8+1.8+2.5+6.0	(6-9)+(6-9)+(6-9)+(8-12)+(16-24)	1.5	1.8	1.8	●2.5	6.0
14.6	1.5+1.8+1.8+2.5+7.0	(6-9)+(6-9)+(6-9)+(8-12)+(16-24)	1.5	1.8	1.8	●2.5	7.0
12.1	1.5+1.8+1.8+3.5+3.5	(6-9)+(6-9)+(6-9)+(12-18)+(12-18)	1.5	1.8	1.8	●3.5	●3.5
12.8	1.5+1.8+1.8+3.5+4.2	(5-8)+(5-8)+(5-8)+(10-16)+(15-22)	1.5	1.8	1.8	●3.5	4.2
13.6	1.5+1.8+1.8+3.5+5.0	(5-8)+(5-8)+(5-8)+(10-16)+(15-22)	1.5	1.8	1.8	●3.5	5.0
14.6	1.5+1.8+1.8+3.5+6.0	(5-8)+(5-8)+(5-8)+(10-16)+(15-22)	1.5	1.8	1.8	●3.5	6.0

FIVE UNIT	15.6	1.5+1.8+1.8+3.5+7.0	(5-8)+(5-8)+(5-8)+(10-16)+(15-22)	1.5	1.8	1.8	●3.5	7.0
	13.5	1.5+1.8+1.8+4.2+4.2	(5-7)+(5-7)+(5-7)+(13-20)+(13-20)	1.5	1.8	1.8	4.2	4.2
	14.3	1.5+1.8+1.8+4.2+5.0	(5-7)+(5-7)+(5-7)+(13-20)+(13-20)	1.5	1.8	1.8	4.2	5.0
	15.3	1.5+1.8+1.8+4.2+6.0	(5-7)+(5-7)+(5-7)+(13-20)+(13-20)	1.5	1.8	1.8	4.2	6.0
	16.3	1.5+1.8+1.8+4.2+7.0	(5-7)+(5-7)+(5-7)+(13-20)+(13-20)	1.5	1.8	1.8	4.2	7.0
	15.1	1.5+1.8+1.8+5.0+5.0	(5-7)+(5-7)+(5-7)+(13-20)+(13-20)	1.5	1.8	1.8	5.0	5.0
	16.1	1.5+1.8+1.8+5.0+6.0	(5-7)+(5-7)+(5-7)+(13-20)+(13-20)	1.5	1.8	1.8	5.0	6.0
	10.8	1.5+1.8+2.5+2.5+2.5	(7-10)+(7-10)+(9-14)+(9-14)+(9-14)	1.5	1.8	2.5	●2.5	●2.5
	11.8	1.5+1.8+2.5+2.5+3.5	(6-9)+(6-9)+(8-13)+(8-13)+(12-18)	1.5	1.8	2.5	●2.5	●3.5
	12.5	1.5+1.8+2.5+2.5+4.2	(5-8)+(5-8)+(8-11)+(8-11)+(15-23)	1.5	1.8	2.5	●2.5	4.2
	13.3	1.5+1.8+2.5+2.5+5.0	(5-8)+(5-8)+(8-11)+(8-11)+(15-23)	1.5	1.8	2.5	●2.5	5.0
	14.3	1.5+1.8+2.5+2.5+6.0	(5-8)+(5-8)+(8-11)+(8-11)+(15-23)	1.5	1.8	2.5	●2.5	6.0
	15.3	1.5+1.8+2.5+2.5+7.0	(5-8)+(5-8)+(8-11)+(8-11)+(15-23)	1.5	1.8	2.5	●2.5	7.0
	12.8	1.5+1.8+2.5+3.5+3.5	(6-9)+(6-9)+(8-12)+(11-17)+(11-17)	1.5	1.8	2.5	●3.5	●3.5
	13.5	1.5+1.8+2.5+3.5+4.2	(5-8)+(5-8)+(7-11)+(10-15)+(14-21)	1.5	1.8	2.5	●3.5	4.2
	14.3	1.5+1.8+2.5+3.5+5.0	(5-8)+(5-8)+(7-11)+(10-15)+(14-21)	1.5	1.8	2.5	●3.5	5.0
	15.3	1.5+1.8+2.5+3.5+6.0	(5-8)+(5-8)+(7-11)+(10-15)+(14-21)	1.5	1.8	2.5	●3.5	6.0
	16.3	1.5+1.8+2.5+3.5+7.0	(5-8)+(5-8)+(7-11)+(10-15)+(14-21)	1.5	1.8	2.5	●3.5	7.0
	14.2	1.5+1.8+2.5+4.2+4.2	(5-8)+(5-8)+(7-11)+(10-15)+(14-21)	1.5	1.8	2.5	4.2	4.2
	15	1.5+1.8+2.5+4.2+5.0	(5-8)+(5-8)+(7-11)+(10-15)+(14-21)	1.5	1.8	2.5	4.2	5.0
	16	1.5+1.8+2.5+4.2+6.0	(5-8)+(5-8)+(7-11)+(10-15)+(14-21)	1.5	1.8	2.5	4.2	6.0
	15.8	1.5+1.8+2.5+5.0+5.0	(5-8)+(5-8)+(7-11)+(10-15)+(14-21)	1.5	1.8	2.5	4.2	7.0
	13.8	1.5+1.8+3.5+3.5+3.5	(5-8)+(5-8)+(10-15)+(10-15)+(10-15)	1.5	1.8	3.5	●3.5	●3.5
	14.5	1.5+1.8+3.5+3.5+4.2	(5-8)+(5-8)+(10-15)+(10-15)+(10-15)	1.5	1.8	3.5	●3.5	4.2
	15.3	1.5+1.8+3.5+3.5+5.0	(5-8)+(5-8)+(10-15)+(10-15)+(10-15)	1.5	1.8	3.5	●3.5	5.0
	16.3	1.5+1.8+3.5+3.5+6.0	(5-8)+(5-8)+(10-15)+(10-15)+(10-15)	1.5	1.8	3.5	●3.5	6.0
	15.2	1.5+1.8+3.5+4.2+4.2	(5-8)+(5-8)+(10-15)+(10-15)+(10-15)	1.5	1.8	3.5	4.2	4.2
	16	1.5+1.8+3.5+4.2+5.0	(5-8)+(5-8)+(10-15)+(10-15)+(10-15)	1.5	1.8	3.5	4.2	5.0
	11.5	1.5+2.5+2.5+2.5+2.5	(7-10)+(9-13)+(9-13)+(9-13)+(9-13)	1.5	2.5	2.5	●2.5	●2.5
	12.5	1.5+2.5+2.5+2.5+3.5	(6-9)+(8-11)+(8-12)+(8-12)+(9-17)	1.5	2.5	2.5	●2.5	●3.5
	13.2	1.5+2.5+2.5+2.5+4.2	(5-8)+(7-11)+(7-11)+(7-11)+(14-22)	1.5	2.5	2.5	●2.5	4.2
	14	1.5+2.5+2.5+2.5+5.0	(5-8)+(7-11)+(7-11)+(7-11)+(14-22)	1.5	2.5	2.5	●2.5	5.0
	15	1.5+2.5+2.5+2.5+6.0	(5-8)+(7-11)+(7-11)+(7-11)+(14-22)	1.5	2.5	2.5	●2.5	6.0
	16	1.5+2.5+2.5+2.5+7.0	(5-8)+(7-11)+(7-11)+(7-11)+(14-22)	1.5	2.5	2.5	●2.5	7.0
	13.5	1.5+2.5+2.5+3.5+3.5	(5-8)+(7-11)+(7-11)+(10-16)+(10-16)	1.5	2.5	2.5	●3.5	●3.5
	14.2	1.5+2.5+2.5+3.5+4.2	(5-7)+(7-10)+(7-10)+(9-14)+(13-20)	1.5	2.5	2.5	●3.5	4.2
	15	1.5+2.5+2.5+3.5+5.0	(5-7)+(7-10)+(7-10)+(9-14)+(13-20)	1.5	2.5	2.5	●3.5	5.0
	16	1.5+2.5+2.5+3.5+6.0	(5-7)+(7-10)+(7-10)+(9-14)+(13-20)	1.5	2.5	2.5	●3.5	6.0
	14.9	1.5+2.5+2.5+4.2+4.2	(5-7)+(7-10)+(7-10)+(9-14)+(13-20)	1.5	2.5	2.5	4.2	4.2
	15.7	1.5+2.5+2.5+4.2+5.0	(5-7)+(7-10)+(7-10)+(9-14)+(13-20)	1.5	2.5	2.5	4.2	5.0
	16.5	1.5+2.5+2.5+5.0+5.0	(5-7)+(7-10)+(7-10)+(9-14)+(13-20)	1.5	2.5	2.5	5.0	5.0
	14.5	1.5+2.5+3.5+3.5+3.5	(5-8)+(7-10)+(10-15)+(10-15)+(10-15)	1.5	2.5	3.5	●3.5	●3.5
	15.2	1.5+2.5+3.5+3.5+4.2	(5-8)+(7-10)+(10-15)+(10-15)+(10-15)	1.5	2.5	3.5	●3.5	4.2
	16	1.5+2.5+3.5+3.5+5.0	(5-8)+(7-10)+(10-15)+(10-15)+(10-15)	1.5	2.5	3.5	●3.5	5.0
	15.9	1.5+2.5+3.5+4.2+4.2	(5-8)+(7-10)+(10-15)+(10-15)+(10-15)	1.5	2.5	3.5	4.2	4.2
	9	1.8+1.8+1.8+1.8+1.8	(8-12)+(8-12)+(8-12)+(8-12)+(8-12)	1.8	1.8	1.8	●1.8	●1.8
	9.7	1.8+1.8+1.8+1.8+2.5	(8-12)+(8-12)+(8-12)+(8-12)+(11-16)	1.8	1.8	1.8	●1.8	●2.5
	10.7	1.8+1.8+1.8+1.8+3.5	(7-10)+(7-10)+(7-10)+(7-10)+(13-20)	1.8	1.8	1.8	●1.8	●3.5
	11.4	1.8+1.8+1.8+1.8+4.2	(6-9)+(6-9)+(6-9)+(6-9)+(17-25)	1.8	1.8	1.8	●1.8	4.2
	12.2	1.8+1.8+1.8+1.8+5.0	(6-9)+(6-9)+(6-9)+(6-9)+(17-25)	1.8	1.8	1.8	●1.8	5.0
	13.2	1.8+1.8+1.8+1.8+6.0	(6-9)+(6-9)+(6-9)+(6-9)+(17-25)	1.8	1.8	1.8	●1.8	6.0
	14.2	1.8+1.8+1.8+1.8+7.0	(6-9)+(6-9)+(6-9)+(6-9)+(17-25)	1.8	1.8	1.8	●1.8	7.0
	10.4	1.8+1.8+1.8+2.5+2.5	(7-11)+(7-11)+(7-11)+(10-15)+(10-15)	1.8	1.8	1.8	●2.5	●2.5
	11.4	1.8+1.8+1.8+2.5+3.5	(6-10)+(6-10)+(6-10)+(9-14)+(13-19)	1.8	1.8	1.8	●2.5	●3.5
	12.1	1.8+1.8+1.8+2.5+4.2	(6-9)+(6-9)+(6-9)+(8-12)+(16-24)	1.8	1.8	1.8	●2.5	4.2
	12.9	1.8+1.8+1.8+2.5+5.0	(6-9)+(6-9)+(6-9)+(8-12)+(16-24)	1.8	1.8	1.8	●2.5	5.0
	13.9	1.8+1.8+1.8+2.5+6.0	(6-9)+(6-9)+(6-9)+(8-12)+(16-24)	1.8	1.8	1.8	●2.5	6.0
	14.9	1.8+1.8+1.8+2.5+7.0	(6-9)+(6-9)+(6-9)+(8-12)+(16-24)	1.8	1.8	1.8	●2.5	7.0
	12.4	1.8+1.8+1.8+3.5+3.5	(6-9)+(6-9)+(6-9)+(12-18)+(12-18)	1.8	1.8	1.8	●3.5	●3.5
	13.1	1.8+1.8+1.8+3.5+4.2	(5-8)+(5-8)+(5-8)+(10-16)+(15-22)	1.8	1.8	1.8	●3.5	4.2
	13.9	1.8+1.8+1.8+3.5+5.0	(5-8)+(5-8)+(5-8)+(10-16)+(15-22)	1.8	1.8	1.8	●3.5	5.0
	14.9	1.8+1.8+1.8+3.5+6.0	(5-8)+(5-8)+(5-8)+(10-16)+(15-22)	1.8	1.8	1.8	●3.5	6.0

15.9	1.8+1.8+1.8+3.5+7.0	(5-8)+(5-8)+(5-8)+(10-16)+(15-22)	1.8	1.8	1.8	●3.5	7.0
13.8	1.8+1.8+1.8+4.2+4.2	(5-7)+(5-7)+(5-7)+(13-20)+(13-20)	1.8	1.8	1.8	4.2	4.2
14.6	1.8+1.8+1.8+4.2+5.0	(5-7)+(5-7)+(5-7)+(13-20)+(13-20)	1.8	1.8	1.8	4.2	5.0
15.6	1.8+1.8+1.8+4.2+6.0	(5-7)+(5-7)+(5-7)+(13-20)+(13-20)	1.8	1.8	1.8	4.2	6.0
16.6	1.8+1.8+1.8+4.2+7.0	(5-7)+(5-7)+(5-7)+(13-20)+(13-20)	1.8	1.8	1.8	4.2	7.0
15.4	1.8+1.8+1.8+5.0+5.0	(5-7)+(5-7)+(5-7)+(13-20)+(13-20)	1.8	1.8	1.8	5.0	5.0
16.4	1.8+1.8+1.8+5.0+6.0	(5-7)+(5-7)+(5-7)+(13-20)+(13-20)	1.8	1.8	1.8	5.0	6.0
11.1	1.8+1.8+2.5+2.5+2.5	(7-10)+(7-10)+(9-14)+(9-14)+(9-14)	1.8	1.8	2.5	●2.5	●2.5
12.1	1.8+1.8+2.5+2.5+3.5	(6-9)+(6-9)+(8-13)+(8-13)+(12-18)	1.8	1.8	2.5	●2.5	●3.5
12.8	1.8+1.8+2.5+2.5+4.2	(5-8)+(5-8)+(8-11)+(8-11)+(15-23)	1.8	1.8	2.5	●2.5	4.2
13.6	1.8+1.8+2.5+2.5+5.0	(5-8)+(5-8)+(8-11)+(8-11)+(15-23)	1.8	1.8	2.5	●2.5	5
14.6	1.8+1.8+2.5+2.5+6.0	(5-8)+(5-8)+(8-11)+(8-11)+(15-23)	1.8	1.8	2.5	●2.5	6
15.6	1.8+1.8+2.5+2.5+7.0	(5-8)+(5-8)+(8-11)+(8-11)+(15-23)	1.8	1.8	2.5	●2.5	7
13.1	1.8+1.8+2.5+3.5+3.5	(6-9)+(6-9)+(8-12)+(11-17)+(11-17)	1.8	1.8	2.5	●3.5	●3.5
13.8	1.8+1.8+2.5+3.5+4.2	(5-8)+(5-8)+(7-11)+(10-15)+(14-21)	1.8	1.8	2.5	●3.5	4.2
14.6	1.8+1.8+2.5+3.5+5.0	(5-8)+(5-8)+(7-11)+(10-15)+(14-21)	1.8	1.8	2.5	●3.5	5
15.6	1.8+1.8+2.5+3.5+6.0	(5-8)+(5-8)+(7-11)+(10-15)+(14-21)	1.8	1.8	2.5	●3.5	6
16.6	1.8+1.8+2.5+3.5+7.0	(5-8)+(5-8)+(7-11)+(10-15)+(14-21)	1.8	1.8	2.5	●3.5	7
14.5	1.8+1.8+2.5+4.2+4.2	(5-8)+(5-8)+(7-11)+(10-15)+(14-21)	1.8	1.8	2.5	4.2	4.2
15.3	1.8+1.8+2.5+4.2+5.0	(5-8)+(5-8)+(7-11)+(10-15)+(14-21)	1.8	1.8	2.5	4.2	5.0
16.3	1.8+1.8+2.5+4.2+6.0	(5-8)+(5-8)+(7-11)+(10-15)+(14-21)	1.8	1.8	2.5	4.2	6.0
16.1	1.8+1.8+2.5+5.0+5.0	(5-8)+(5-8)+(7-11)+(10-15)+(14-21)	1.8	1.8	2.5	5.0	5.0
14.1	1.8+1.8+3.5+3.5+3.5	(5-8)+(5-8)+(10-15)+(10-15)+(10-15)	1.8	1.8	3.5	●3.5	●3.5
14.8	1.8+1.8+3.5+3.5+4.2	(5-8)+(5-8)+(10-15)+(10-15)+(10-15)	1.8	1.8	3.5	●3.5	4.2
15.6	1.8+1.8+3.5+3.5+5.0	(5-8)+(5-8)+(10-15)+(10-15)+(10-15)	1.8	1.8	3.5	●3.5	5.0
16.6	1.8+1.8+3.5+3.5+6.0	(5-8)+(5-8)+(10-15)+(10-15)+(10-15)	1.8	1.8	3.5	●3.5	6.0
15.5	1.8+1.8+3.5+4.2+4.2	(5-8)+(5-8)+(10-15)+(10-15)+(10-15)	1.8	1.8	3.5	4.2	4.2
16.3	1.8+1.8+3.5+4.2+5.0	(5-8)+(5-8)+(10-15)+(10-15)+(10-15)	1.8	1.8	3.5	4.2	5.0
11.8	1.8+2.5+2.5+2.5+2.5	(6-9)+(9-13)+(9-13)+(9-13)+(9-13)	1.8	2.5	2.5	●2.5	●2.5
12.8	1.8+2.5+2.5+2.5+3.5	(6-9)+(8-12)+(8-12)+(8-12)+(11-17)	1.8	2.5	2.5	●2.5	●3.5
13.5	1.8+2.5+2.5+2.5+4.2	(5-8)+(7-11)+(7-11)+(7-11)+(14-22)	1.8	2.5	2.5	●2.5	4.2
14.3	1.8+2.5+2.5+2.5+5.0	(5-8)+(7-11)+(7-11)+(7-11)+(14-22)	1.8	2.5	2.5	●2.5	5.0
15.3	1.8+2.5+2.5+2.5+6.0	(5-8)+(7-11)+(7-11)+(7-11)+(14-22)	1.8	2.5	2.5	●2.5	6.0
16.3	1.8+2.5+2.5+2.5+7.0	(5-8)+(7-11)+(7-11)+(7-11)+(14-22)	1.8	2.5	2.5	●2.5	7.0
13.8	1.8+2.5+2.5+3.5+3.5	(5-8)+(7-11)+(7-11)+(10-16)+(10-16)	1.8	2.5	2.5	●3.5	●3.5
14.5	1.8+2.5+2.5+3.5+4.2	(5-7)+(7-10)+(7-10)+(9-14)+(13-20)	1.8	2.5	2.5	●3.5	4.2
15.3	1.8+2.5+2.5+3.5+5.0	(5-7)+(7-10)+(7-10)+(9-14)+(13-20)	1.8	2.5	2.5	●3.5	5.0
16.3	1.8+2.5+2.5+3.5+6.0	(5-7)+(7-10)+(7-10)+(9-14)+(13-20)	1.8	2.5	2.5	●3.5	6.0
15.2	1.8+2.5+2.5+4.2+4.2	(5-7)+(7-10)+(7-10)+(9-14)+(13-20)	1.8	2.5	2.5	4.2	4.2
16	1.8+2.5+2.5+4.2+5.0	(5-7)+(7-10)+(7-10)+(9-14)+(13-20)	1.8	2.5	2.5	4.2	5.0
14.8	1.8+2.5+3.5+3.5+3.5	(5-8)+(7-10)+(10-15)+(10-15)+(10-15)	1.8	2.5	3.5	●3.5	●3.5
15.5	1.8+2.5+3.5+3.5+4.2	(5-8)+(7-10)+(10-15)+(10-15)+(10-15)	1.8	2.5	3.5	●3.5	4.2
16.3	1.8+2.5+3.5+3.5+5.0	(5-8)+(7-10)+(10-15)+(10-15)+(10-15)	1.8	2.5	3.5	●3.5	5.0
16.2	1.8+2.5+3.5+4.2+4.2	(5-8)+(7-10)+(10-15)+(10-15)+(10-15)	1.8	2.5	3.5	4.2	4.2
12.5	2.5+2.5+2.5+2.5+2.5	(8-12)+(8-12)+(8-12)+(8-12)+(8-12)	2.5	2.5	2.5	●2.5	●2.5
13.5	2.5+2.5+2.5+2.5+3.5	(8-12)+(8-12)+(8-12)+(8-12)+(11-16)	2.5	2.5	2.5	●2.5	●3.5
14.2	2.5+2.5+2.5+2.5+4.2	(7-10)+(7-10)+(7-10)+(7-10)+(14-21)	2.5	2.5	2.5	●2.5	4.2
15	2.5+2.5+2.5+2.5+5.0	(7-10)+(7-10)+(7-10)+(7-10)+(14-21)	2.5	2.5	2.5	●2.5	5.0
16	2.5+2.5+2.5+2.5+6.0	(7-10)+(7-10)+(7-10)+(7-10)+(14-21)	2.5	2.5	2.5	●2.5	6.0
14.5	2.5+2.5+2.5+3.5+3.5	(7-11)+(7-11)+(7-11)+(10-15)+(10-15)	2.5	2.5	2.5	●3.5	●3.5
15.2	2.5+2.5+2.5+3.5+4.2	(7-11)+(7-11)+(7-11)+(10-15)+(10-15)	2.5	2.5	2.5	●3.5	4.2
16	2.5+2.5+2.5+3.5+5.0	(7-11)+(7-11)+(7-11)+(10-15)+(10-15)	2.5	2.5	2.5	●3.5	5.0
15.9	2.5+2.5+2.5+4.2+4.2	(7-11)+(7-11)+(7-11)+(10-15)+(10-15)	2.5	2.5	2.5	4.2	4.2
15.5	2.5+2.5+3.5+3.5+3.5	(7-10)+(7-10)+(9-14)+(9-14)+(9-14)	2.5	2.5	3.5	●3.5	●3.5
16.3	2.5+2.5+3.5+3.5+4.2	(7-10)+(7-10)+(7-10)+(9-14)+(9-14)	2.5	2.5	3.5	●3.5	4.2

1.5kW,1.8kW,2.5kW,3.5kW,4.2kW,5.0kW,6.0kW,7.0kW means indoor units cooling capacity class.

(1) Marking

●: needs flare adapter (9.52 → 12.7D): Part No. TA261D-4 001
○: needs flare adapter (12.7 → 9.52D): Part No. TA261D-6 002
⊙: needs flare adapter (12.7 → 15.88D): Part No. TA261D-7 003

(2) Suitable room size is determined based on the conditions below:

- Climate is in the temperate zone like Tokyo, Japan.
- For usual residential use.
- Smaller figure is for light construction which means light thermally sealed.
- Larger figure is for heavy constructions, which means well thermally sealed.

R32 SAFETY PRECAUTIONS (Additional)

Installation (Space)

- Must ensure the installation of pipe-work shall be kept to a minimum. Avoid use dented pipe and do not allow acute bending.
- Must ensure that pipe-work shall be protected from physical damage.
- Must comply with national gas regulations, state municipal rules and legislation. Notify relevant authorities in accordance with all applicable regulations.
- Must ensure mechanical connections be accessible for maintenance purposes.

Unventilated areas

- Warning: The appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified.
- Warning: The appliance shall be stored in a room without continuously operating open flames (e.g. an operating gas appliance) and ignition sources (e.g. an operating electric heater).

Qualification of workers

- When conducting any repair/servicing works, please ensure it is carried out by competent person only.
- Warning: Every working procedure that affects safety means shall only be carried out by competent persons. Examples for such working procedures are:
  - breaking into the refrigerating circuit.
  - opening of sealed components
  - opening of ventilated enclosures.

Information on servicing

- Prior to beginning work on systems, safety checks are necessary to ensure that the risk of ignition is minimized.
- Work shall be undertaken under a controlled procedure so as to minimized the risk of flammable gas or vapor being present while the work is being performed.
- Work in confined spaces shall be avoided. The area around the workspace shall be sectioned off. Ensure that the conditions within the area have been made safe by control of flammable material.

Checking for presence of refrigerant

- The area shall be checked with an appropriate refrigerant detector prior to and during work. The leak detection equipment should be suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

Presence of fire extinguisher

- If any hot work is to be conducted, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO2 fire extinguisher adjacent to the charging area.

No ignition sources

- All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. “No Smoking” signs shall be displayed.

Ventilated area

- Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

Checks to the refrigeration equipment

- Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer’s maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer’s technical department for assistance.

The following checks shall be applied to installations.

- The charge size is in accordance with the room size within which the refrigerant containing parts are installed;
- The ventilation machinery and outlets are operating adequately and are not obstructed;
- If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;
- Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected;
- Refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

Cautions

Checks to electrical devices

- Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised.
- Initial safety checks shall include:
    - that capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;
    - that no live electrical components and wiring are exposed while charging, recovering or purging the system;
    - that there is continuity of earth bonding.

Repairs to sealed components

- During repairs to sealed components, all electrical supplies shall be disconnected prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.
- Ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected, including damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.
- Ensure that the apparatus is mounted securely.
- Ensure that seals or sealing materials have not degraded to the point that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall be in accordance with the manufacturer's specifications.

Repair to intrinsically safe components

- Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use.
- Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere.
- Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

Cabling

- Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

Detection of flammable refrigerants
Removal and evacuation

- The refrigerant charge shall be recovered into the correct recovery cylinders and the system shall be "flushed" with oxygen free nitrogen (OFN) to render the unit safe. This process may need to be repeated several times.
- Compressed air or oxygen shall not be used for purging refrigerant systems.
- Flushing shall be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final OFN charge is used, the system shall be vented down to atmospheric pressure to enable work to take place.
- The vacuum pump is not near to any ignition sources and that ventilation is available at all times.

Charging procedures

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimise the amount of refrigerant contained in them.
- Cylinders shall be kept upright.
- Ensure that the refrigeration system is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the refrigeration system.
- Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leak-tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

Cautions

Decommissioning

- Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail.
- Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of reclaimed refrigerant.
- Electrical power must be available before the task is commenced.
- Become familiar with the equipment and its operation.
- Isolate system electrically.
- Before attempting the procedure, ensure that:
    - mechanical handling equipment is available, if required, for handling refrigerant cylinders;
    - all personal protective equipment is available and being used correctly;
    - the recovery process is supervised at all times by a competent person;
    - recovery equipment and cylinders conform to the appropriate standards.
- Pump down refrigerant system, if possible.
- If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
- Make sure that cylinder is situated on the scales before recovery takes place.
- Start the recovery machine and operate in accordance with manufacturer's instructions.
- Do not overfill cylinders. (No more than 80 % volume liquid charge).
- Do not exceed the maximum working pressure of the cylinder, even temporarily.
- When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
- Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

Labelling

- Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed.
- Ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

Recovery

- When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed.
- Ensure that the correct number of cylinders for holding the total system charge are available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant).
- Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.
- The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of all appropriate refrigerants.
- A set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release.
- The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant waste transfer note arranged.
- Do not mix refrigerants in recovery units and especially not in cylinders.
- If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant.
- The evacuation process shall be carried out prior to returning the compressor to the suppliers.
- Only electric heating to the compressor body shall be employed to accelerate this process.

1. Refrigerant Piping Materials

(1) Thickness of Refrigerant Piping
Although the thickness is same as that for HCFC-22 model, as R32 model features higher pressure, be sure to confirm the thickness prior to use.

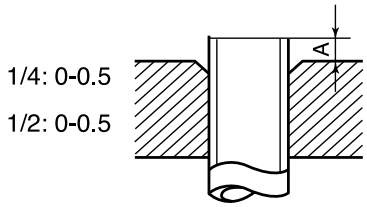
※Do not use thin pipes (thinner than 0.7 mm).

Nominal diameter	Outside diameter (mm)	Thickness (mm)
1/4	6.35	0.8
3/8	9.52	0.8
1/2	12.7	0.8
5/8	15.88	1.0

(2) Flare's Expansion Pipe
The projection when the new flare tool is used, is as follows. When using the conventional flare tool, be sure to secure the following projection by using a gauge for projection adjustment.

※When using the conventional flare tool, use a gauge for projection adjustment.

Projection "A"(mm) for Flare Tool for R32 (Clutch Type)



(3) Flare Nut Dimensions
Along with changes in the expansion pipe dimensions, the opposite side dimensions of flare nuts whose nominal diameter is 1/2 change so that different torque wrenches must be used.

※Figures in ( ) denote those for HCFC-22.

Nominal diameter	Opposite Side Dimensions (mm) of Flare Nuts for R32
1/4	17 (17)
3/8	22 (22)

2. Servicing Tools

(Changes in the Product and Components)

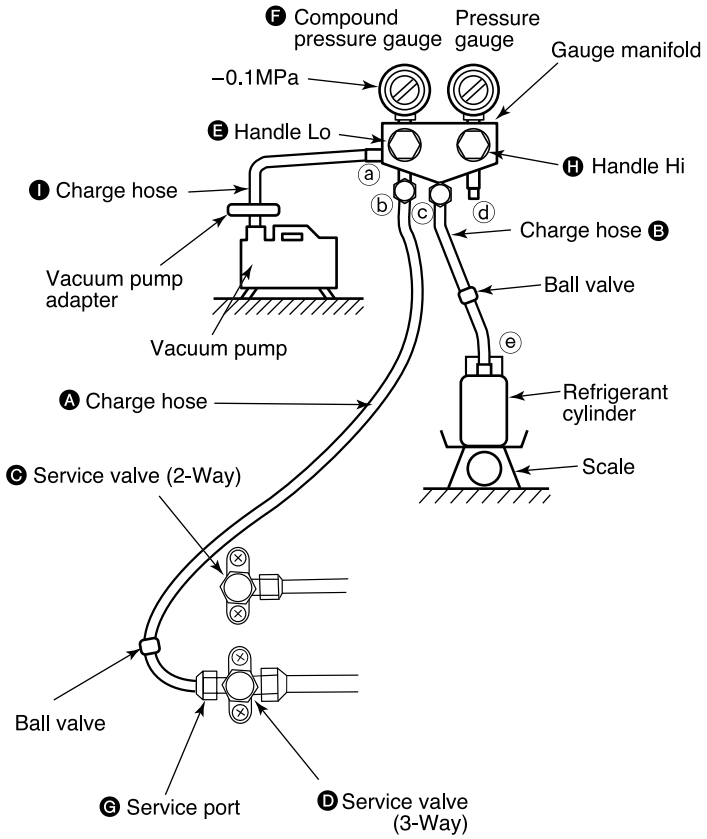
- In order to prevent any other refrigerant from being charged, R32 model is provided with the outdoor unit whose control valve has a different service port diameter (port size: 7/16 UNF 20 threads per inch → 1/2 UNF 20 threads per inch).
- In order to secure larger pressure resisting strength, flare expansion pipe dimensions and flare nut dimensions have been changed.

(New Tools for R32)

New tools for R32	Applicable to HCFC-22 Model	Changes
Gauge manifold	×	As pressure is high, it is impossible to measure by means of conventional gauge. In order to prevent any other refrigerant from being charged, each port diameter has been changed.
Charge hose	×	In order to increase pressure resistance, hose materials and port size have been changed (to 1/2 UNF 20 threads per inch). When purchasing a charge hose, be sure to confirm the port size.
Electronic balance for refrigerant charging	○	As pressure is high and gasification speed is fast, it is difficult to read the indicated value by means of charging cylinder, as air bubbles occur.
Torque wrench	× (nominal diam. 1/2, 5/8)	The opposite side dimensions of flare nuts increase. Incidentally, a common wrench is used for nominal diameters 1/4 and 3/8.
Flare tool (clutch type)	○	By increasing the clamp bar's receiving hole, strengh of spring in the tool has been improved.
Gauge for projection adjustment	–	Used when performing flare processing by means of conventional flare tool.
Vacuum pump adapter	○	Connected to conventional vacuum pump.
Gas leakage detector	×	Exclusive for HFC refrigerant.

- Incidentally, the "refrigerant cylinder" comes with the refrigerant designation (R32) and protector coating in the U.S.'s ARI specified rose color (ARI color code: PMS 507).
- Also, the "charge port and packing for refrigerant cylinder" require 1/2 UNF 20 threads per inch corresponding to the charge hose's port size.

3. Servicing work (Rerfigerant recharging)



Working steps

1. Connect the charge hose Ⓐ to outdoor unit.
2. Connect the vacuum pump adapter to the vacuum pump. Connect the 1/2" conversion adapter to the vacuum pump adapter. Connect the charge hose Ⓘ to the conversion adapter.

Then, service valve Ⓒ & Ⓓ is closed.

3. Connect the charge hose Ⓑ to the refrigerant cylinder.
4. Open the handle Lo Ⓔ.
   Turn ON the power switch of the vacuum pump & adapter.
   Run the vacuum pump in specified time.
5. When the compound pressure gauge's pointer has indicated -0.1MPa, place the handle Lo Ⓔ in the fully closed position.
   Turn OFF the power switch of the vacuum pump & adapter.
6. Remove the charge hose Ⓘ of vacuum pump at portion ⓐ.
7. Air purge of gauge manifold.
   - Open the refrigerant cylinder's valve and push the valve core at portion ⓐ of gauge manifold. Then the refrigerant is discharge in a moment.
8. Calculation of charged refrigerant amount.
9. Charging of refrigeration.
   - Open the handle Lo Ⓔ in a turn and charge the designated amount.
10. Completion of charging.
11. Be closed the valve of charge hose Ⓐ.
12. Run the compressor at cooling operation.
13. Remove the charge hose Ⓐ & Ⓑ.
    - Remove the charge hose Ⓐ rom portion Ⓖ.
    - Remove the charge hose Ⓑ from portion ⓔ.
14. Attach the caps.
15. Gas leakage check.

⚠ CAUTION

1. Be sure to use the vacuum pump, vacuum pump adapter and gauge manifold to refer to their instruction manuals beforehand.

2. Ascertain that the vacuum pump is filled with oil to the level designated on the oil gauge.

3. After closed the ball valve of charge hose, it should be disconnected at service port side and refrigerant cylinder side at first.
   Next, after discharging the remained gas in the charge hose by opening the ball valve a little, disconnect it at gauge manifold side. You can prevent from being released the refrigerant suddenly by connecting the ball valve to service port. And you can work with more safety.

4. Air purging by using vacuum pump

Remove the valve cap from the service valves located at both the large and small pipe rims

↓

Connect the charging hose A to the large service valve.

↓

After connecting the vacuum suction pump adaptor, connect the charging hose B to the adaptor.

↓

During relocation or re-installed, there is a possibility of electric-powered valve to be closed. Should the electric-powered valve be closed, even with air purging being conducted, certain amount of air is still trapped within that area, hence, there is a need to open up the electric-powered valve to do an air purging. Under such circumstances, before using the vacuum-suction pump, the main power supply (LN terminal) should be connected to enable a complete opening up of the valve. After connecting the power supply for approximately 90 seconds, the valve will be fully opened, after which disconnect the power supply and start using the vacuum suction pump.
(Refer to "Power Supply Terminal Connections" in regards to the LN terminal)
CAUTION: Ingress of air during the operating cycle may cause increase in pressure and other breakdowns.

↓

Switch off the outdoor unit's power supply

↓

Shut the manifold valve handle Hi, handle Lo need to be open and operate the vacuum pump for approximately 60 minutes.

↓

Upon a full shut of manifold valve handle Lo, the vacuum pump can be stopped.

↓

Check to ensure that there is no gas leakage.

↓

After removing the charging hose A, rotate the service valve spindles in an anti-clockwise direction to fully open for both valves.

↓

Reinstall the cap nuts to their original positions and tighten them to their specified torque.

↓

Disconnect the charge hose from the service valve.

↓

Tighten the valve cap of valve core.
[Torque 12.3 - 15.7 N·m (125 - 160 kgf·cm)]

↓

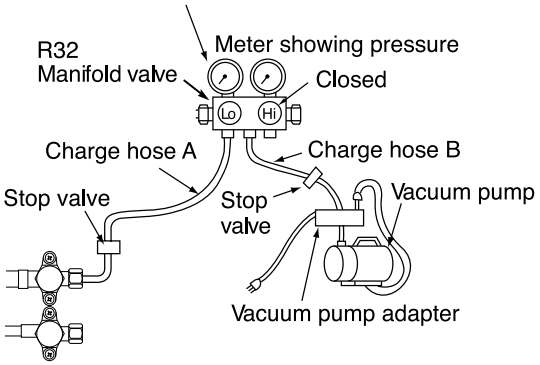
Fix the valve cap to the spindles of each large and small dia. pipe side service valves.

↓

Tighten the valve cap of the spindle.
[Torque 19.6 - 24.5 N·m (200 - 250 kgf·cm)]

Air purging by vacuum pump

When the meter reaches -101KPa (-76cmHg) during pumping, fully tighten the shuttle.



Be sure the stop valve is always fully opened.

Fig. 6-1

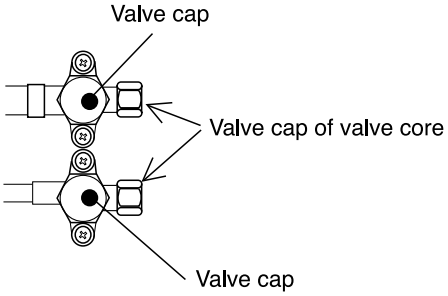


Fig. 6-2

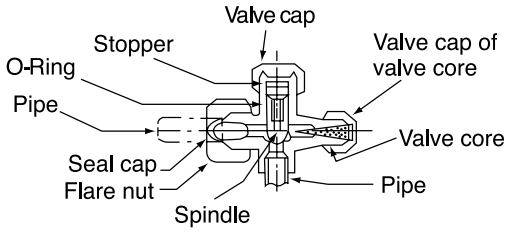


Fig. 6-3

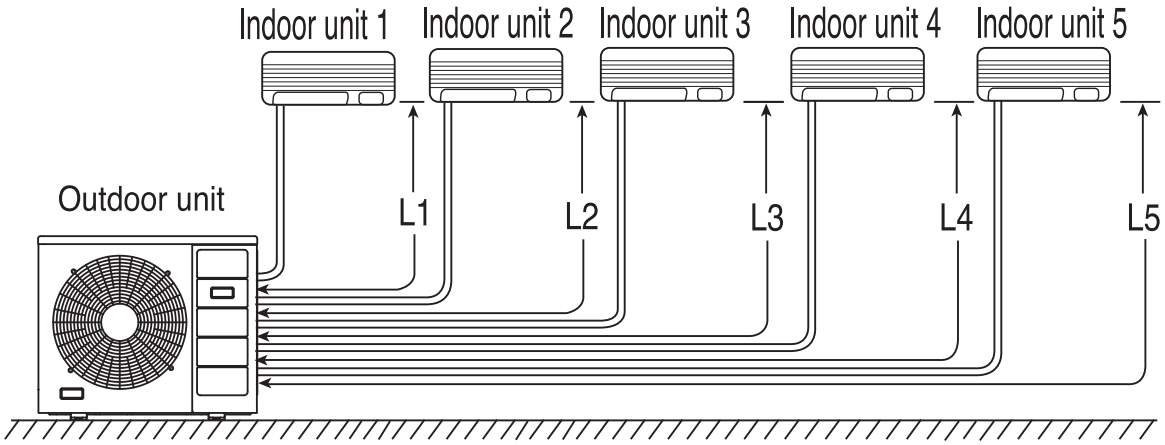
The refrigerant channel is opened so that the refrigerant will flow from the outdoor unit into the indoor unit.

⚠ CAUTION

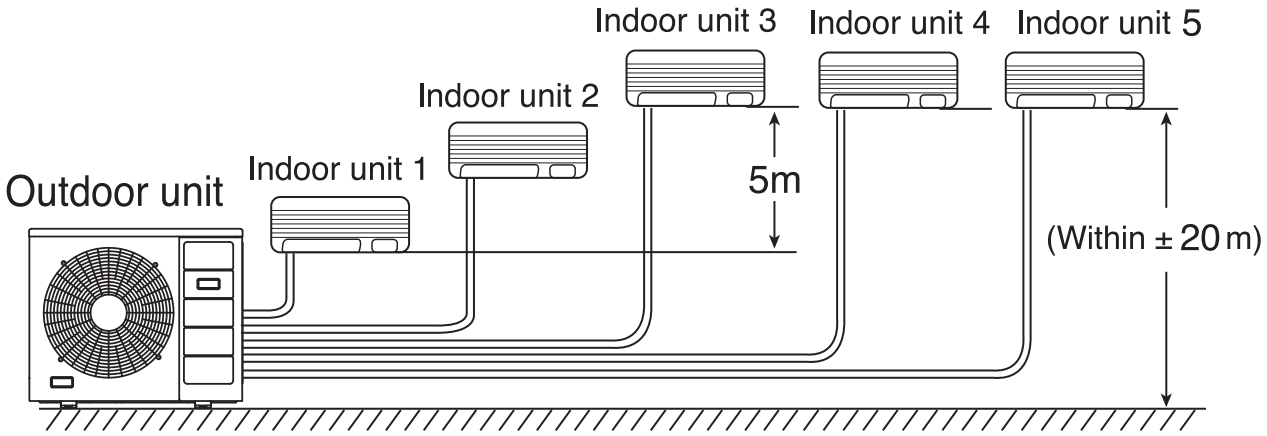
1. Be sure to use the vacuum pump, vacuum pump adapter and manifold gauge and refer to their instruction manuals beforehand.
2. Ascertain that the vacuum pump is filled with oil to the level designated on the oil gauge.
3. After closed the ball valve of charge hose, it should be disconnected at service port side and refrigerant cylinder side at first. Next, after discharging the remained gas in the charge hose by opening the ball valve a little, disconnect it at manifold gauge side. You can prevent sudden release of refrigerant by connecting the ball valve to service port. And you can work more safety.

INSTALLATION

PIPE LENGTH
(1) Total 75m maximum pipe length.
(2) Pipe length for one indoor unit : maximum 25m.
: minimum 3m.

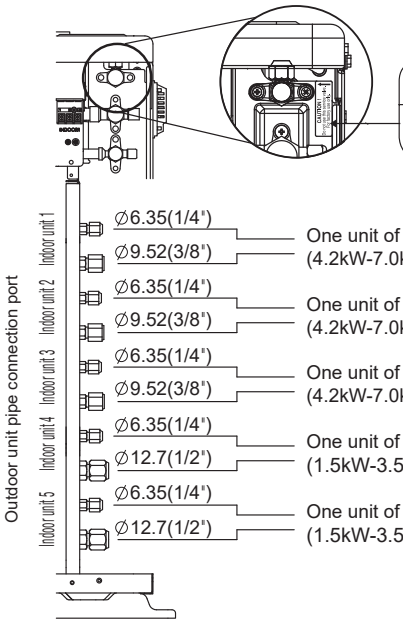


HIGHT DIFFERENCE
(1) Height : maximum ± 20m
(2) Height difference between each indoor unit ≤ 5m.



- To the outdoor unit, up to five indoor units can be connected until the total value of capacity to 16.6kW.
- Make sure to connect two or more indoor units.

MODEL: RAM-G110N5HAE



⚠ CAUTION

Do not use this valve. For factory use only.

One unit of 1.5kW, 1.8kW, 2.5kW, 3.5kW or 4.2kW, 5.0kW, 6.0kW, 7.0kW
(4.2kW-7.0kW unit: Optional flare adaptor for piping is necessary.)

One unit of 1.5kW, 1.8kW, 2.5kW, 3.5kW or 4.2kW, 5.0kW, 6.0kW, 7.0kW
(4.2kW-7.0kW unit: Optional flare adaptor for piping is necessary.)

One unit of 1.5kW, 1.8kW, 2.5kW, 3.5kW or 4.2kW, 5.0kW, 6.0kW, 7.0kW
(4.2kW-7.0kW unit: Optional flare adaptor for piping is necessary.)

One unit of 1.5kW, 1.8kW, 2.5kW, 3.5kW or 4.2kW, 5.0kW, 6.0kW, 7.0kW
(1.5kW-3.5kW unit: Optional flare adaptor for piping is necessary.)

One unit of 1.5kW, 1.8kW, 2.5kW, 3.5kW or 4.2kW, 5.0kW, 6.0kW, 7.0kW
(1.5kW-3.5kW unit: Optional flare adaptor for piping is necessary.)

Flare adaptor for piping

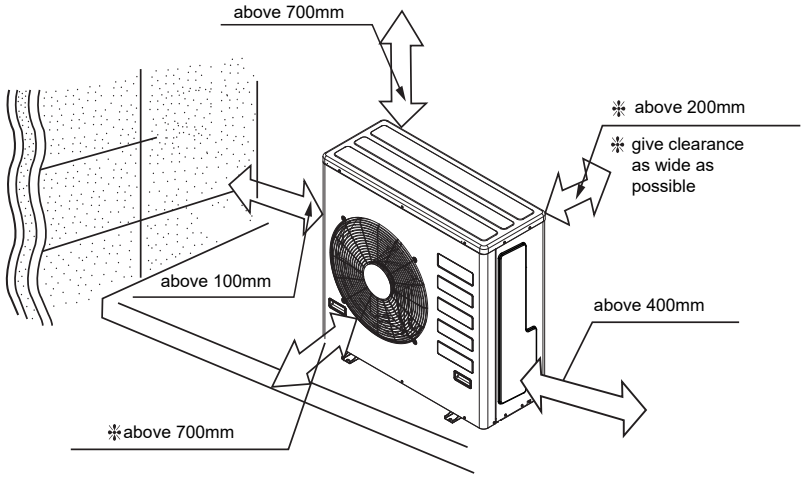
The flare adaptor for piping is required depending on combination of indoor units.

- ø3/8"(ø9.52) → ø1/2"(ø12.7)
  Parts number TA261D-4-001
- ø1/2"(ø12.7) → ø3/8"(ø9.52)
  Parts number TA261D-6-002
- ø1/2"(ø12.7) → ø5/8"(ø15.88)
  Parts number TA261D-7-003

• Remove the side cover.

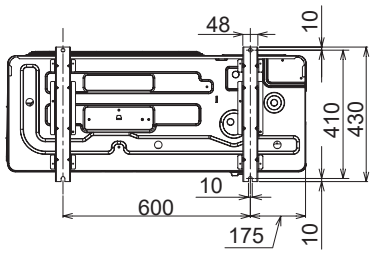
• For installation, refer as shown below.

• The space indicated with a ⇔ mark is required to guarantee the air conditioner's performance. Install the airconditioner in a place big enough to provide ample space for servicing and repairs later on.



Dimension of Mounting Stand of the Outdoor unit

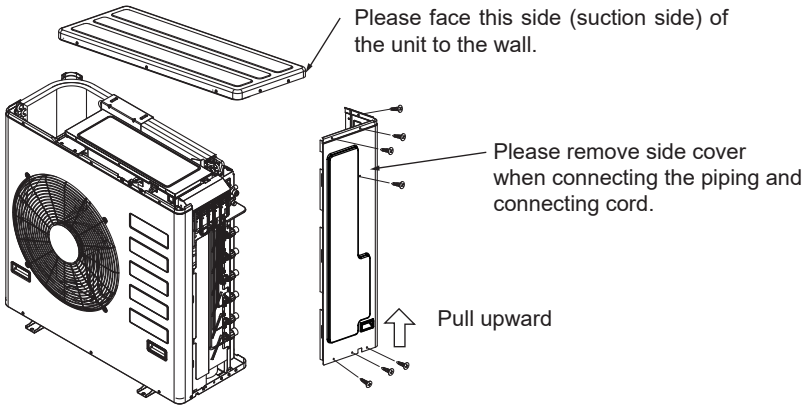
(unit : mm)



Connecting the pipe

• Install the unit in a stable place to minimize vibration or noise.

• After arranging the cord and pipes, secure them inplace.



• Hold the handle of the side cover. Slide down and takeoff the corner hook, then pull. Reverse these steps when installing.

1. Remove flare nut from service valve.
2. Apply refrigerant oil to flare nut sections of servicevalve and pipings.
3. Match center of piping to large diameter side service valve and tank assembly, and tighten flarenut first by hand, then securely tighten using torque wrench.
4. Perform air purge and gas leak inspection.
5. Wrap the provided insulating material around sidepiping using vinyl tape.

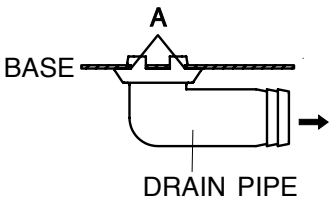
Condensed water disposal of outdoor unit

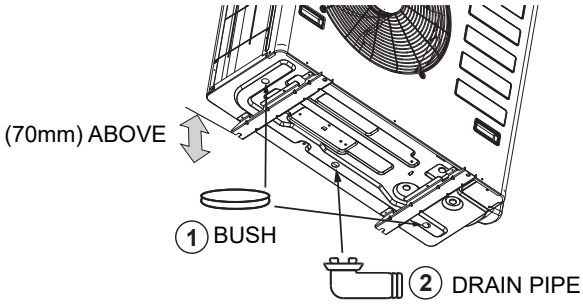
- There is holes on the base of outdoor unit for condensed water to exhaust.
- To lead condensed water to the drain hole, place the outdoor unit on the mounting stand (optional) or on blocks to raise its level more than 100mm from the ground surface. Connect the drain pipe as shown in the figure. Cover two other water drain holes with the bushings included. (To insall a bushing, push in both ends of the bushing so that it aligns with the drain hole.)
- When connecting the drain pipe, make sure that the bushing does not lift off or deviate from the base.
- Install the outdoor unit on a stable, flat surface and check to see that the condensed water drains.

When Using and Installing in Cold Areas

When the air conditioner is used in low temperature and in snowy conditions, water from the heat exchanger may freeze on the base surface to cause poor drainage. When using the air conditioner in such areas, do not install the bushings. Keep a minimum of 250mm between the drain hole and the ground. When using the drain pipe, consult your sales agent.

※ For more details, refer to the Installation Manual for Cold Areas.





Connection of the connecting cords and power cord. (Outdoor unit)

RAM-G110N5HAE

⚠ WARNING

- Connecting cord should be connected according to Fig.1, that the Indoor unit No. shall match with terminal board No. of Outdoor unit.
- Be sure to fix the connecting cord with the band as shown below. Otherwise water leakage causes short circuit or faults.

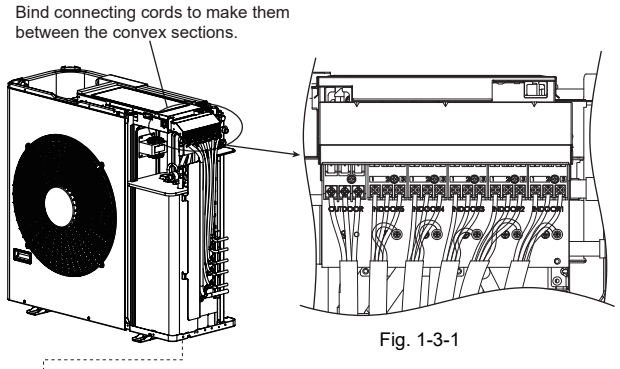


Fig. 1-3-1

Type of grounding rod	Length
SP-EB-2	900mm

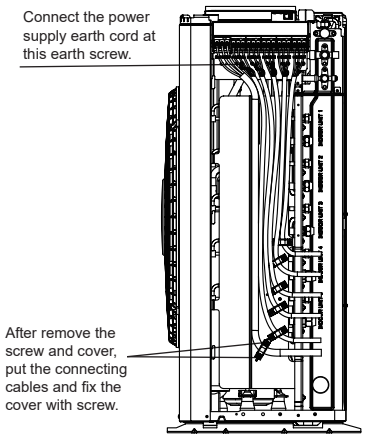


Fig. 1-3-2

⚠ CAUTION

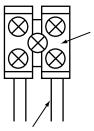
Arrange power cord so they do not touch service valve.

⚠ CAUTION

- To prevent a connection error, connecting cords should be bundled and taped to each respective pipe. If connecting cords are mixed with other indoor units, a refrigeration cycle abnormality may occur, causing dripping.

⚠ WARNING

Connection of the power cord and connecting cord



Securely screw in the power cord and connecting cord so that it will not get loose or disconnect.

Tightening torque reference value: 1.2 to 1.6 N•m (12 to 16 kgf•cm)

Excessive tightening may damage the interior of the cord requiring replacement.

Wiring Pattern

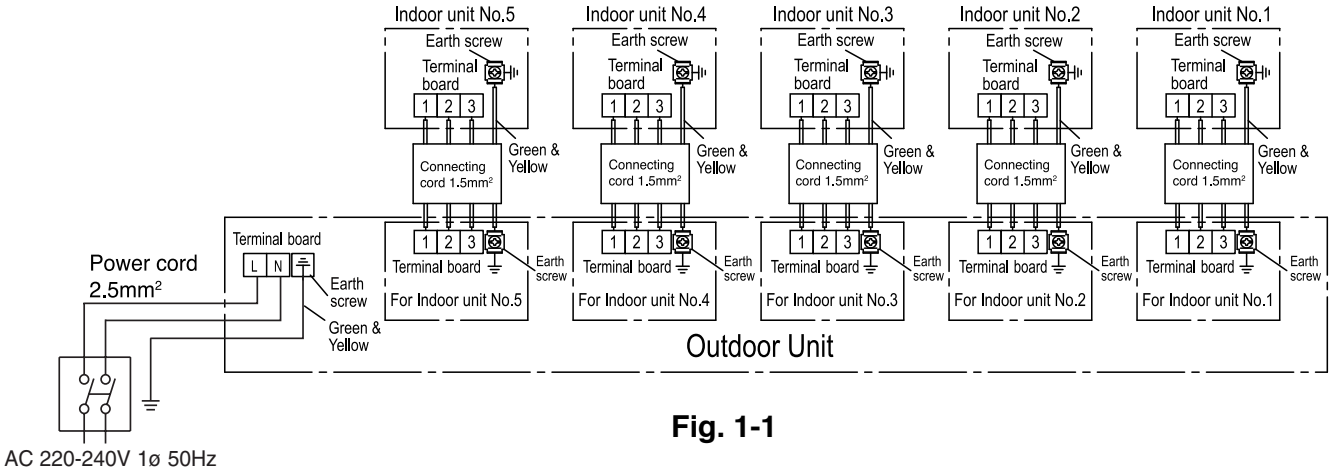
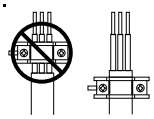


Fig. 1-1

⚠ WARNING

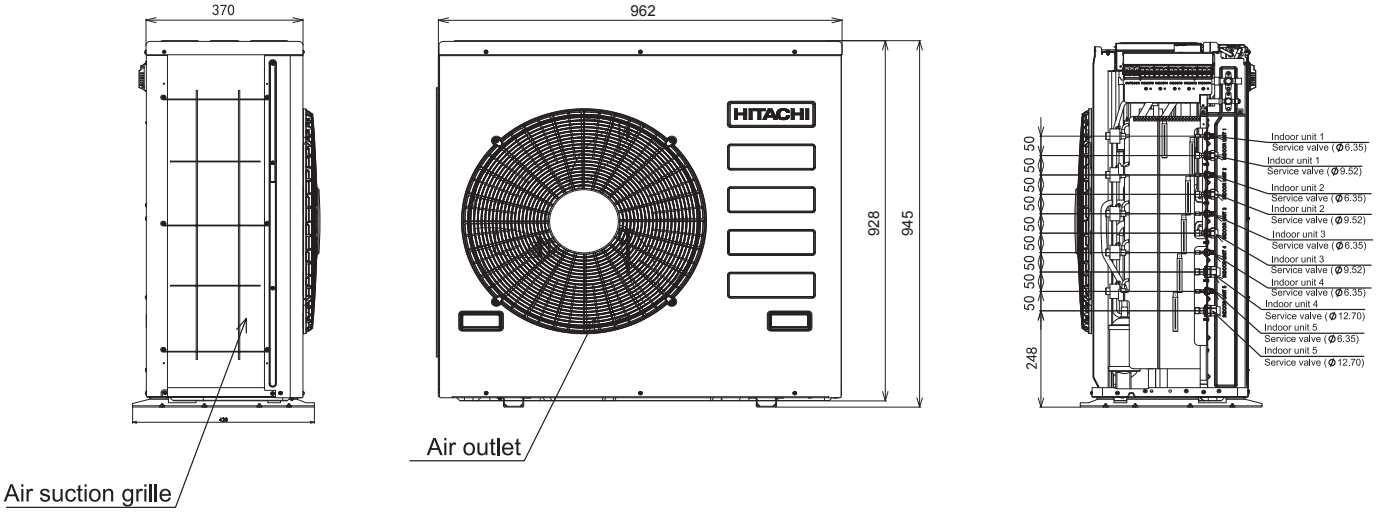
- Leave some space in the connecting cord for maintenance purpose and be sure to secure it with the cord band.
- Secure the connecting cord along the coated part of the wire using the cord band. Do not exert pressure on the wire as this may cause overheating or fire.

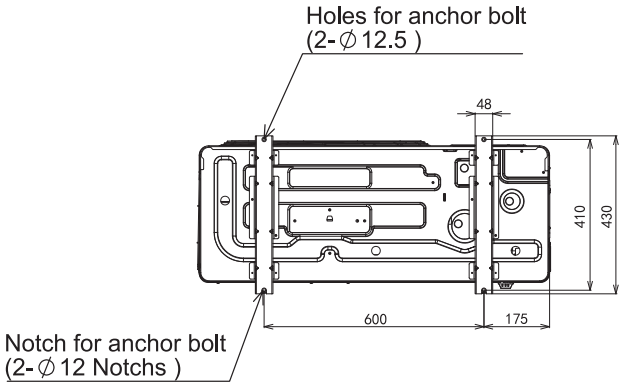


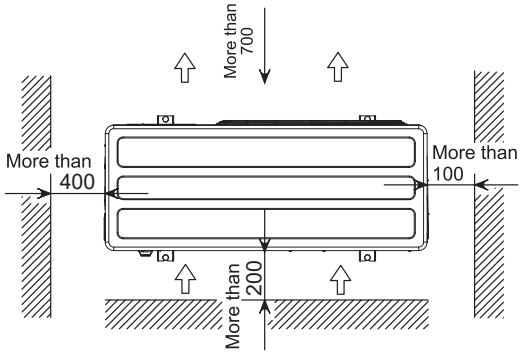
- Hold the handle of the side cover, slide down and take off the corner hook, then pull. Reverse these steps when installing.

CONSTRUCTION AND DIMENSIONAL DIAGRAM

MODEL RAM-G110N5HAE



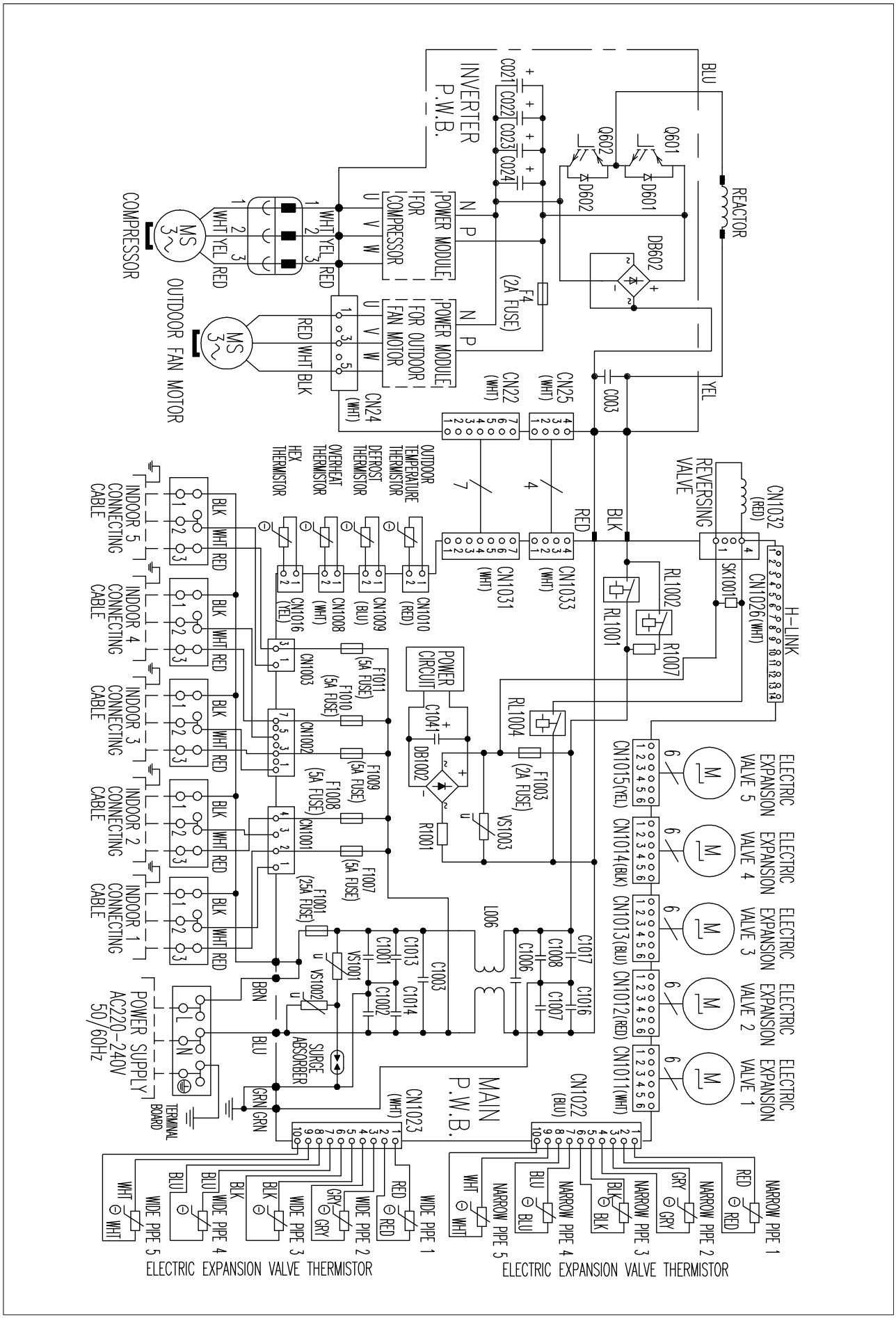




Service space

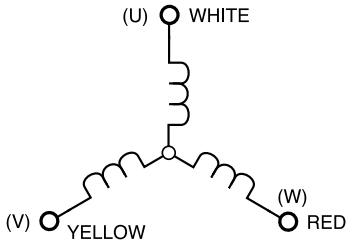
WIRING DIAGRAM

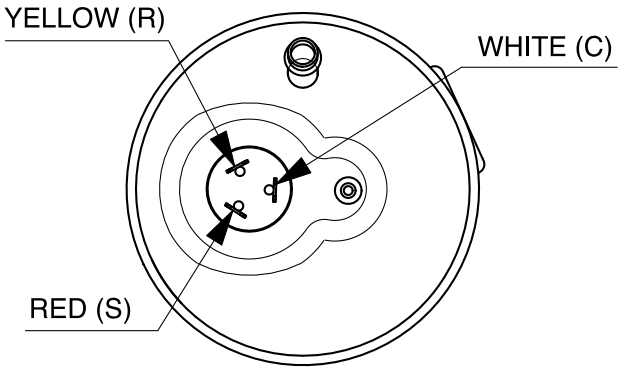
MODEL RAM-G110N5HAE



COMPRESSOR MOTOR

Compressor Motor Specifications

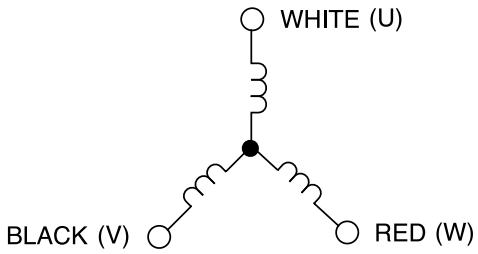
MODEL			RAM-G110N5HAE
COMPRESSOR MODEL			GTD226UKPA8LT6C
PHASE			SINGLE
RATED VOLTAGE			AC 220 ~ 230V
RATED FREQUENCY			50Hz
POLE NUMBER			6
CONNECTION			
RESISTANCE VALUE (Ω)	20°C (68°F)	U-V	0.930
		V-W	0.930
		W-U	0.930
	75°C (167°F)	U-V	1.130
		V-W	1.130
		W-U	1.130



MAIN PARTS COMPONENT

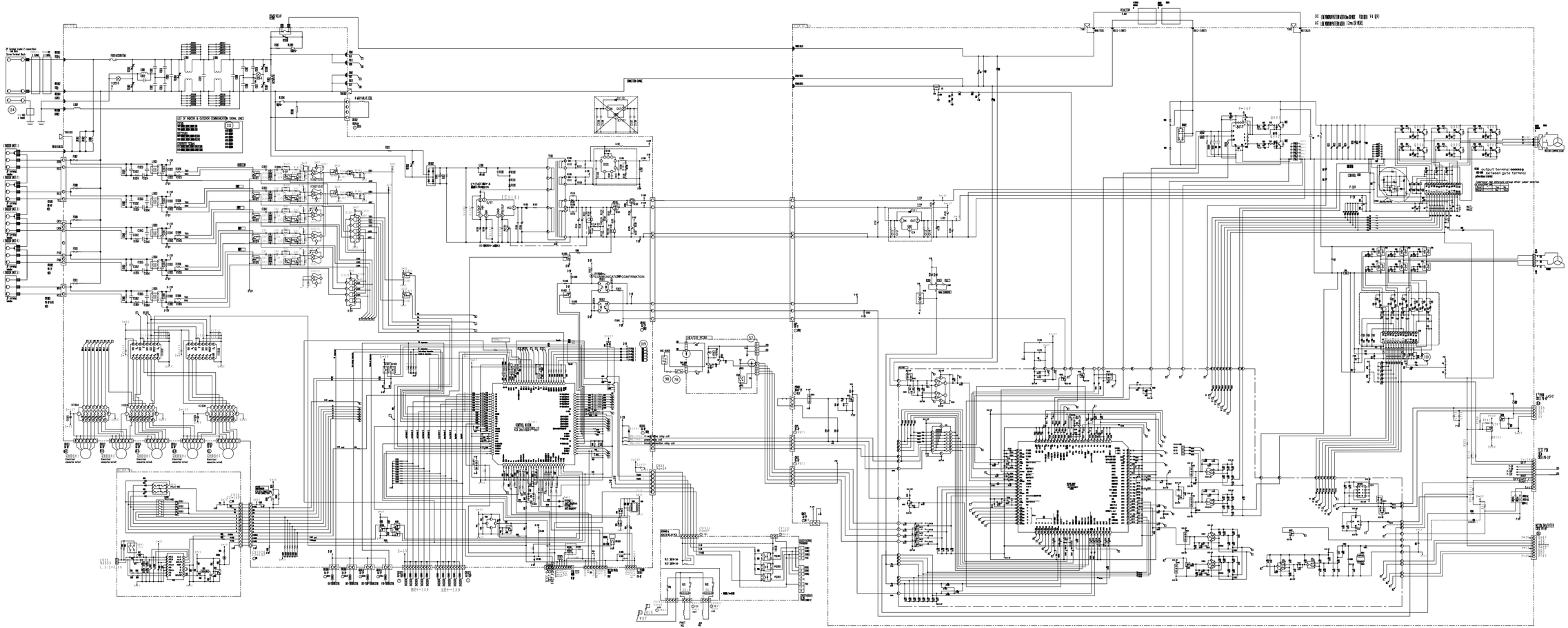
FAN MOTOR

Fan Motor Specifications

MODEL		RAM-G110N5HAE
POWER SOURCE		DC:350V
OUTPUT		120W
CONNECTION		
RESISTANCE VALUE	20˚C (68˚F)	U-V: 22.4 ± 2.2Ω V-W: 22.4 ± 2.2Ω W-U: 22.4 ± 2.2Ω

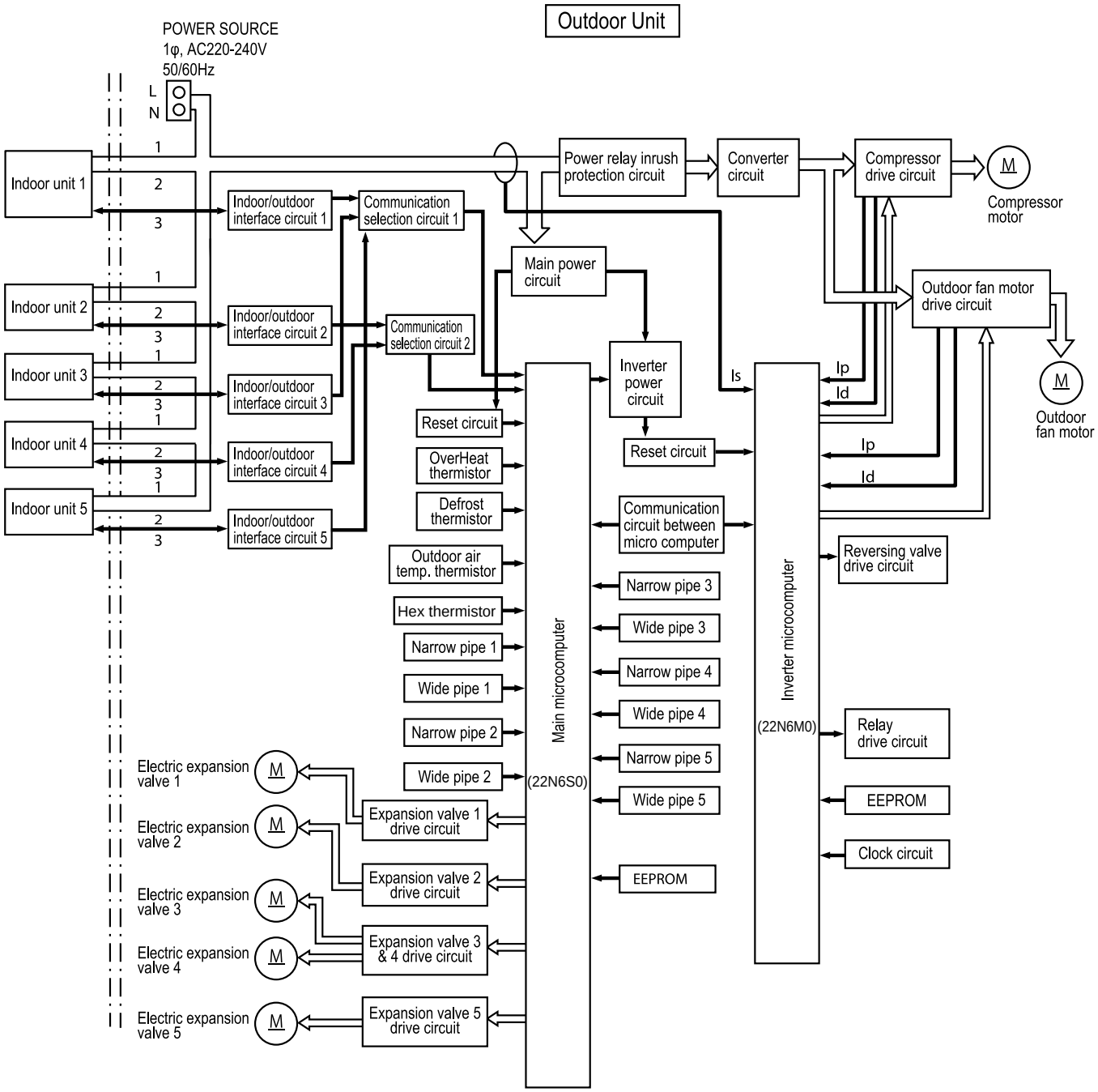
BLU : BLUE	YEL : YELLOW	BRN : BROWN	WHT : WHITE
GRY : GRAY	ORN : ORANGE	GRN : GREEN	RED : RED
BLK : BLACK	PNK : PINK	VIO : VIOLET	

CIRCUIT DIAGRAM
MODEL RAM-G110N5HAE



BLOCK DIAGRAM

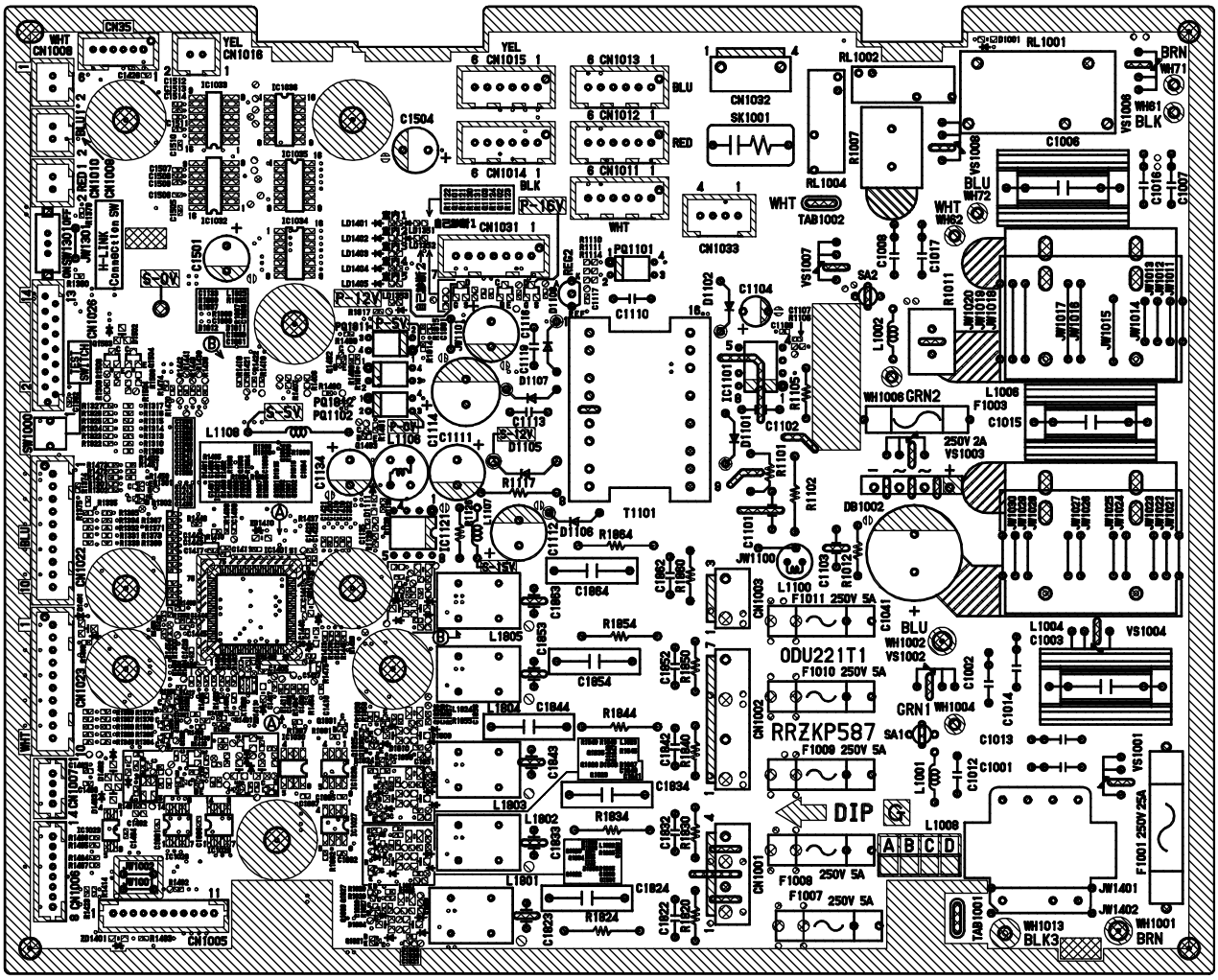
MODEL RAM-G110N5HAE



PRINTED WIRING BOARD LOCATION DIAGRAM

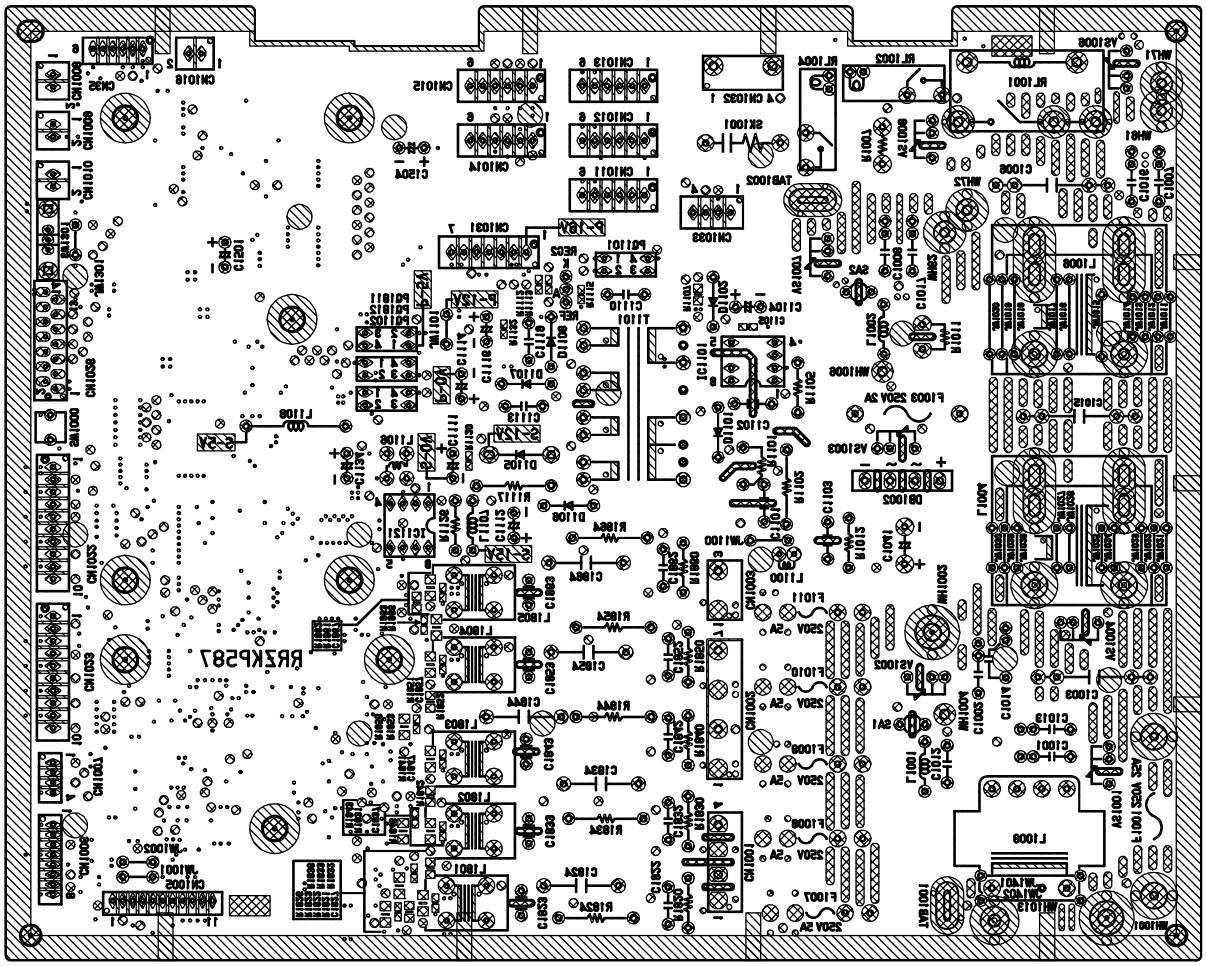
■ RAM-G110N5HAE

Main board [component side]


CN35
CN1009
CN1016
CN1015
CN1013
CN1012
CN1014
CN1011
CN1031
CN1032
SK1001
CN1033
RL1002
RL1001
RL1004
TAB1002
C1504
C1150
C1006
C1016
C1007
C1017
C1008
C1009
C1104
C1110
C1102
C1101
C1111
C1112
C1121
C1134
C1114
C1107
C1108
C1109
C1105
C1103
C1041
C1003
C1002
C1014
C1013
C1001
C1012
C1015
C1852
C1853
C1854
C1844
C1843
C1834
C1833
C1832
C1824
C1823
C1822
C1842
C1964
C1963
C1962
C1124
R1117
R1101
R1102
R1105
R1011
R1007
R1854
R1844
R1834
R1824
R1964
R1960
R1850
R1840
R1830
R1820
R1810
R1124
L1005
L1004
L1003
L1002
L1001
L1006
L1008
L1100
L1101
L1109
L1108
L1107
L1106
L1105
L1104
L1103
L1102
L1901
L1902
L1903
L1904
L1905
L1006
F1003
F1011 250V 5A
F1010 250V 5A
F1009 250V 5A
F1008 250V 5A
F1007 250V 5A
F1001 250V 25A
ODU221T1
RRZKP587
DIP
A B C D
SA1
SA2
VS1003
VS1004
VS1002
VS1001
DB1002
T1101
IC1101
D1102
D1101
D1107
D1113
D1105
D1106
PQ1101
PQ1102
PQ1103
PQ1104
REG1
REG2
JW1100
JW1401
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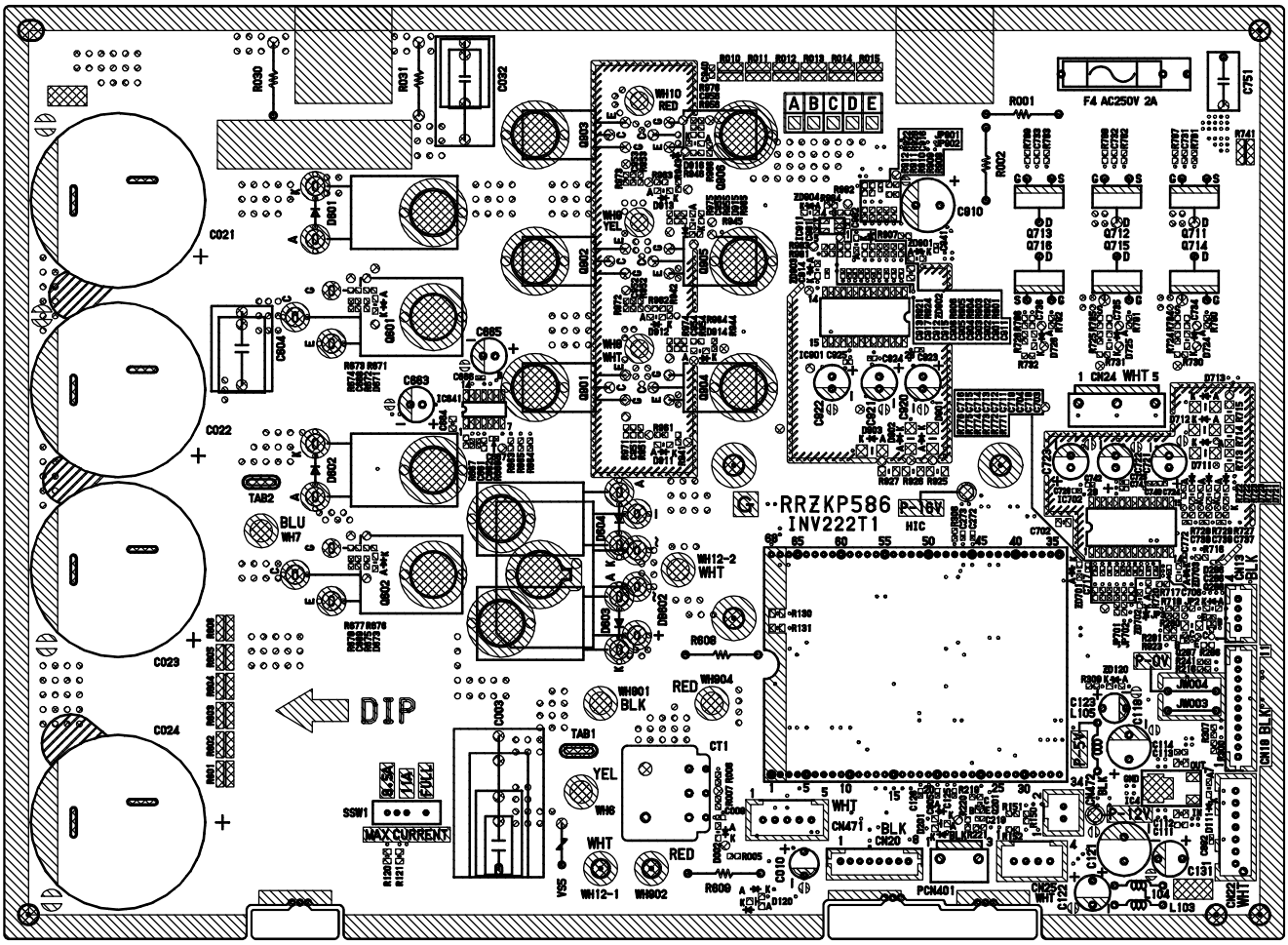
■ RAM-G110N5HAE

Main board [solder side]



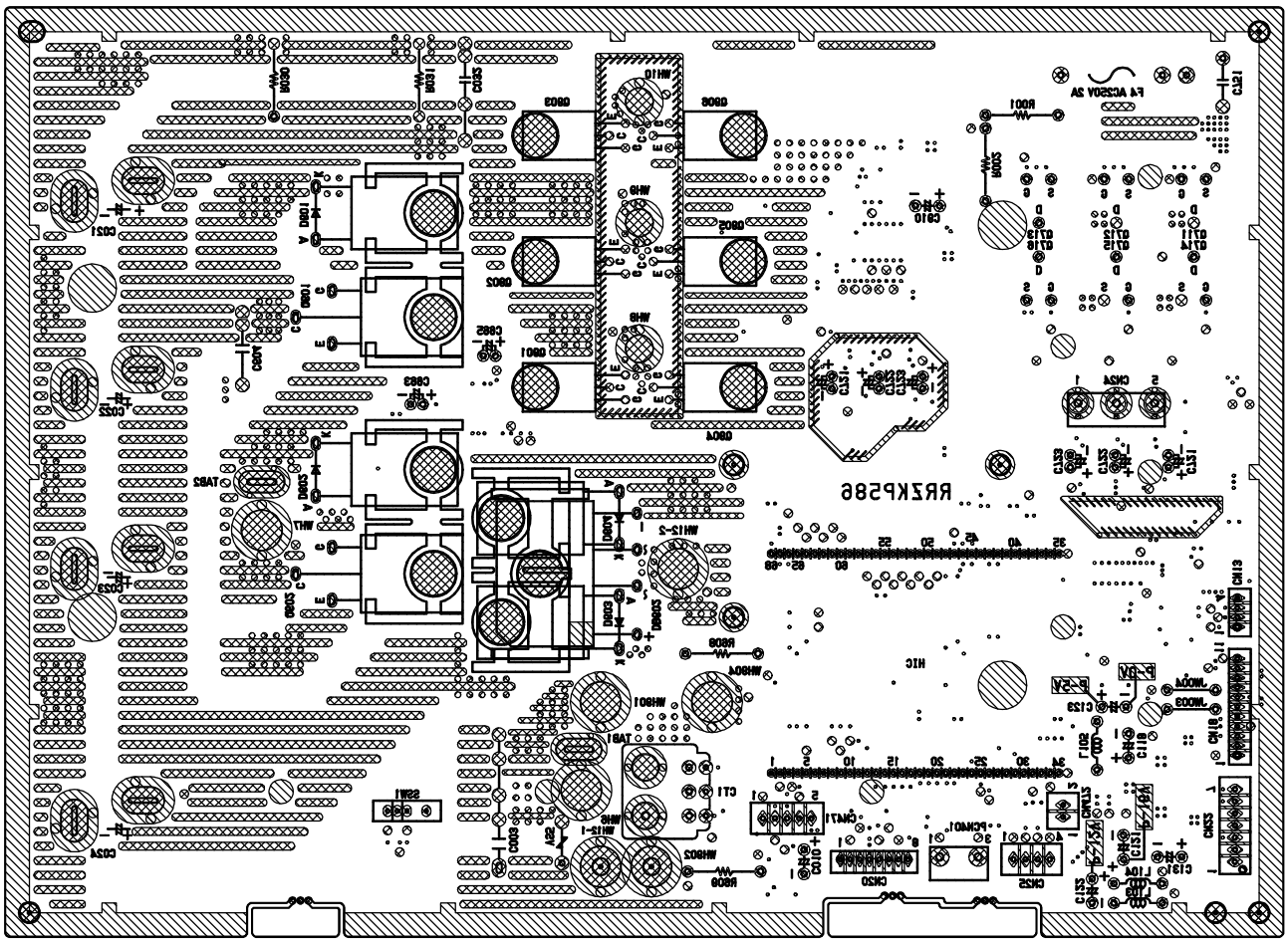
■ RAM-G110N5HAE

Inverter board [component side]



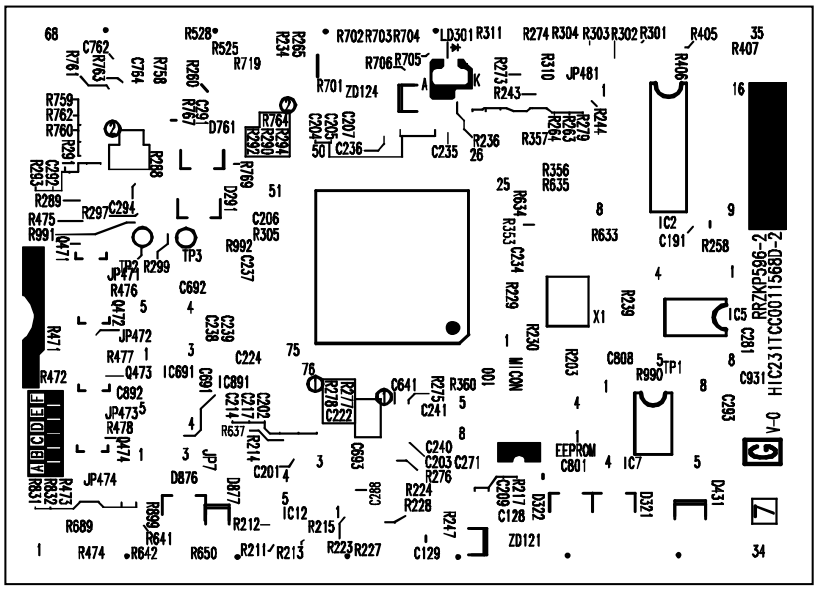
RAM-G110N5HAE

Inverter board [solder side]

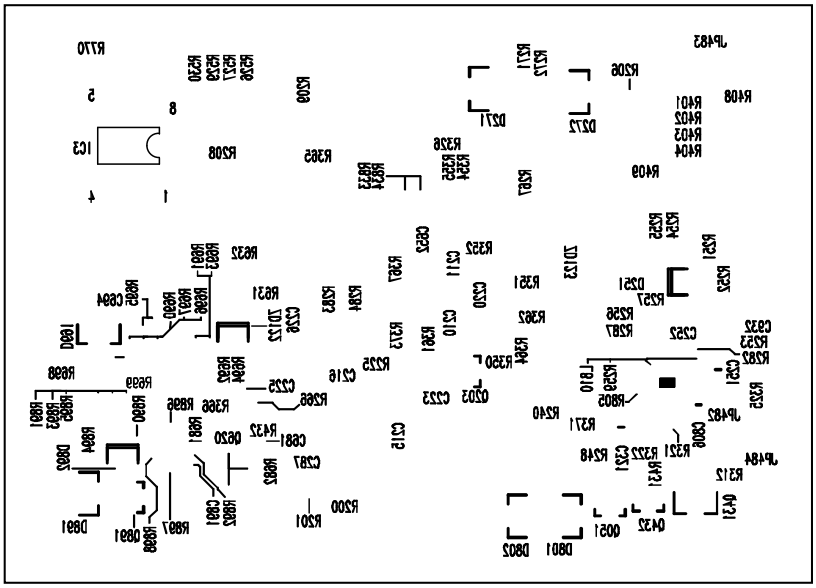


■ RAM-G110N5HAE

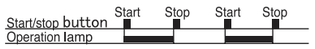
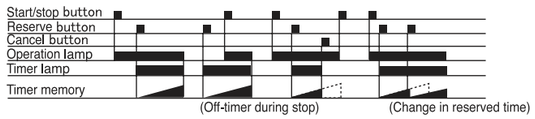
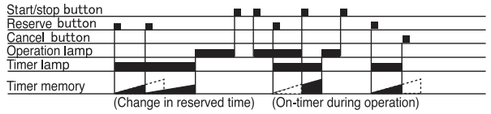
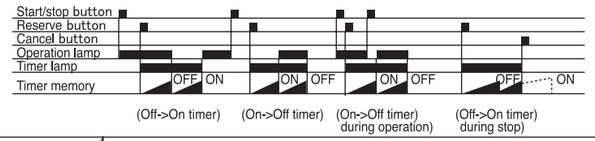
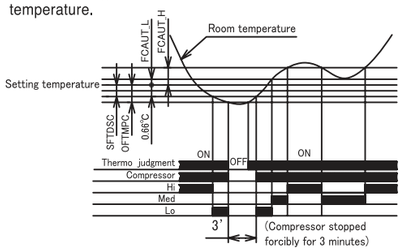
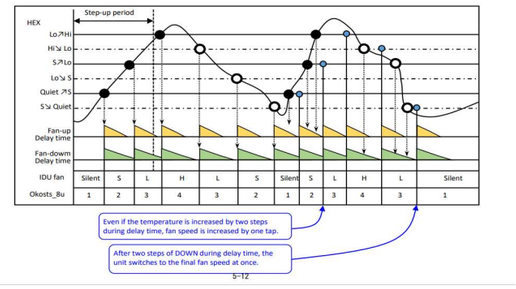
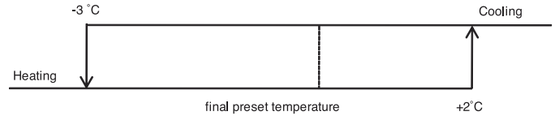
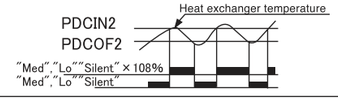
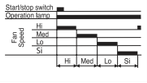
[Inverter HIC board] top side



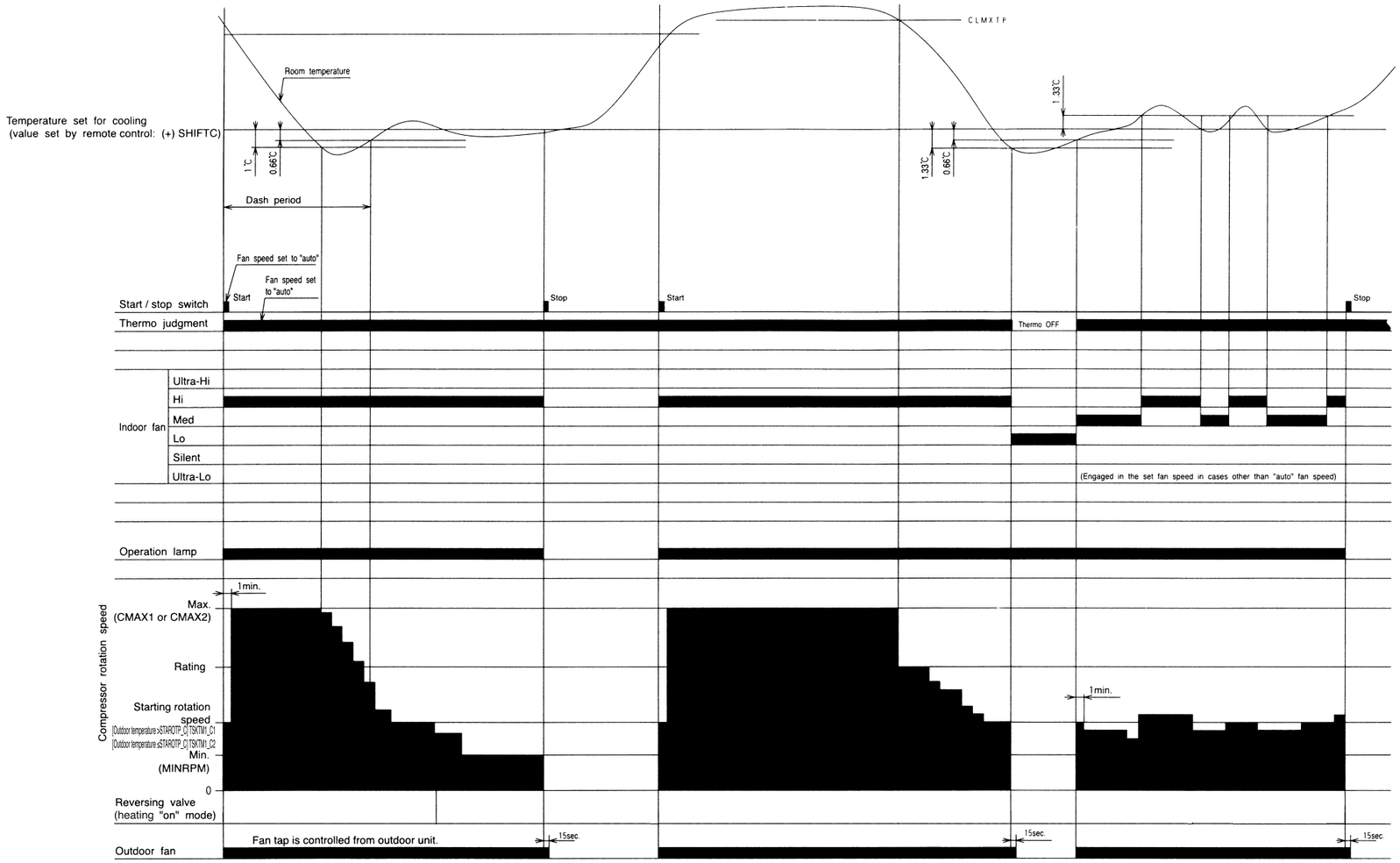
[Inverter HIC board] bottom side



BASIC MODE

Operation mode	Fan	Cooling	Dry	Heating	Auto
Basic operation of start/stop button					
Timer functions — Off-timer					
Timer functions — On-timer					
Timer functions — Off -> On / On -> Off timer					
Fan speed mode (indoor fan) — Auto		Changes from “Hi” to “Med” or “Lo” depending on room temperature.  1. Runs at “Hi” until room temperature reaches to “setting temperature-SFTDSC” after operation is started. 2. Runs at “ultra-Lo” when thermo is off.		Set to ″ultra-Lo″,″Silent″,″Lo″,″Med″,″Hi″,″Super Hi″or″stop″ depending on the room temperature, time and heat exchanger temperature. Set to ″stop″ if the heat exchanger temperature is ″DNZKOF″ during Thermo OFF.(When reach at ″DNZKON″, fan speed set to ″ultra-Lo″ again.) 	Operating mode is judged by room temperature. (1) Judging by room temperature ・ Operating mode at start up is judged (initial judgment). (a) Conditions for judgment (any of the followings). ・ When auto operation is started after the previous auto mode operation. ・ When auto operation is started after the previous manual mode operation. ・ When the operating mode is switched to auto while operating at manual mode. (b) Judging method ・ [Cooling] : Room temperature ≧ Remote controller setting ・ [Heating] : Room temperature < Remote controller setting [Room temperature setting of remote controller] Cooling / Heating (2) Judging operating mode change during operation (Continuous judgment). (a) Conditions for judgment ・ The mode is reviewed at interval time. *Interval time as below ・ The first interval time : 10 minutes ・ The second interval time : 15 minutes ・ On and after the third interval time : 55 minutes (b) Judging method ・ Judge by setting the hysteresis on the final preset temperature. The final preset temperature is the actually targeted preset temperature which is sum of basic preset temperature and each type of shift value. (e.g. preset temperature correction value, powerful shift value, eco shift value, eco sleep shift value, etc.) [Currently cooling] ・ Room temperature ≦ Final preset temperature -3°C Change to heating ・ Room temperature > Final preset temperature -3°C Continue cooling [Currently heating] ・ Room temperature ≧ Final preset temperature 2 °C Change to cooling ・ Room temperature < Final preset temperature 2 °C Continue heating 
Fan speed mode (indoor fan) — Super Hi	Operates at “Super Hi” regardless of the room temperature.	Set to “Super Hi” when the compressor runs at cold dash mode speed, and to “Super Hi” in other modes. Runs at “ultra-Lo” when thermo is off.		Set to ″ultra-Lo″,″Silent″,″Lo″,″Med″,″Hi″,″Super Hi″or″stop″ depending on the room temperature, time and heat exchanger temperature. Set to ″stop″ if the heat exchanger temperature is ″DNZKOF″ during Thermo OFF.(When reach at ″DNZKON″, fan speed set to ″ultra-Lo″ again.)	
Fan speed mode (indoor fan) — Hi	Operates at “Hi” regardless of the room temperature.	Operates at “Hi” regardless of the room temperature. Runs at “ultra-Lo” when thermo is off.			
Fan speed mode (indoor fan) — Med	Operates at “Med” regardless of the room temperature.	Operates at “Med” regardless of the room temperature. Runs at “ultra-Lo” when thermo is off.		Set to ″ultra-Lo″,″Silent″,″Lo″,″Med″,″Hi″,″Super Hi″ or ″stop″ depending on the room temperature, time and heat exchanger temperature. Set to ″stop″ if the heat exchanger temperature is ″DNZKOF″ during Thermo OFF.(When reach at ″DNZKON″, fan speed set to ″ultra-Lo″ again.)	
Fan speed mode (indoor fan) — Lo	Operates at “Lo” regardless of the room temperature.	Operates at “Lo” regardless of the room temperature. Runs at “ultra-Lo” when thermo is off.	Set to “Lo” in modes other than when the compressor stops.	Set to ″ultra-Lo″,″Silent″,″Lo″,″Med″,″Hi″,″Super Hi″ or ″stop″ depending on the room temperature, time and heat exchanger temperature. Set to ″stop″ if the heat exchanger temperature is ″DNZKOF″ during Thermo OFF.(When reach at ″DNZKON″, fan speed set to ″ultra-Lo″ again.) The fan speed is controlled by the heat exchanger temperature; the overload control is executed as in the following diagram: 	
Fan speed mode (indoor fan) — Silent	Operates at “Silent” regardless of the room temperature.	Operates at “Silent” regardless of the room temperature. Runs at “ultra-Lo” when thermo is off.	Set to “Silent” in modes other than when the compressor stops.		
Basic operation of temperature controller	Performs only fan operation at the set speed regardless of the room temperature. 	See page 49.	See page 51.	See page 52.	

Basic Cooling Operation



Notes:

(1) Cool dash is started when the operation is started at fan speed “AUTO” or “HI” or when the fan speed is changed to “AUTO” or “HI” during cooling operation, and when the compressor speed (P item) reaches (CMAX1 ro CMAX2) or higher.

(2) The maximum compressor speed period during cool dash is finished.
   1 When 25 minutes have elapsed after cool dash was started.
   2 When the room temperature reaches the cooling set temperature -1°C (including cooling shift) and then becomes lower than the preset temperature by 0.66°C after the steady speed period
   3 When thermo is OFF.
   (If cool dash finished in the above 1, the compressor does not go through the steady speed period but it starts fuzzy control.)

(3) The thermo OFF temperature during cool dash is cooling set temperature (including cooling shift) -3°C. After thermo OFF, cool dash is finished and fuzzy control starts.

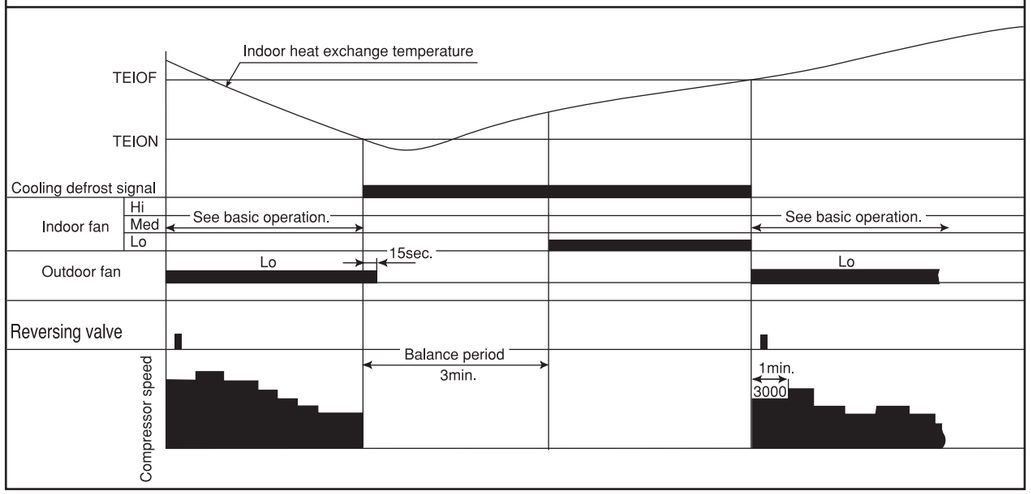
(4) The compressor minimum ON time and minimum OFF time is 3 minutes.

(5) The time limit for which the maximum compressor speed (CMAX1 or CMAX2) during normal cooling can be maintained is less than 60 minutes when the room temperature is less than CLMXTP: it is not provided when the room temperature is CLMXTP or more.

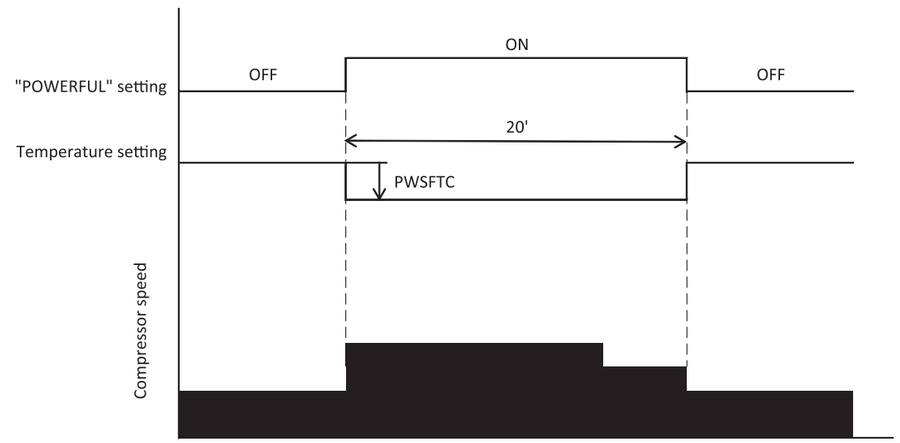
(6) Compressor speed is determined by instruction sent from indoor unit and corrected by outdoor unit according to such factors as capacity, fan speed, number of units being operated, outdoor temperature, etc.

(7) If another indoor unit is doing heating operation, cooling operation cannot be done.

Cooling Defrost



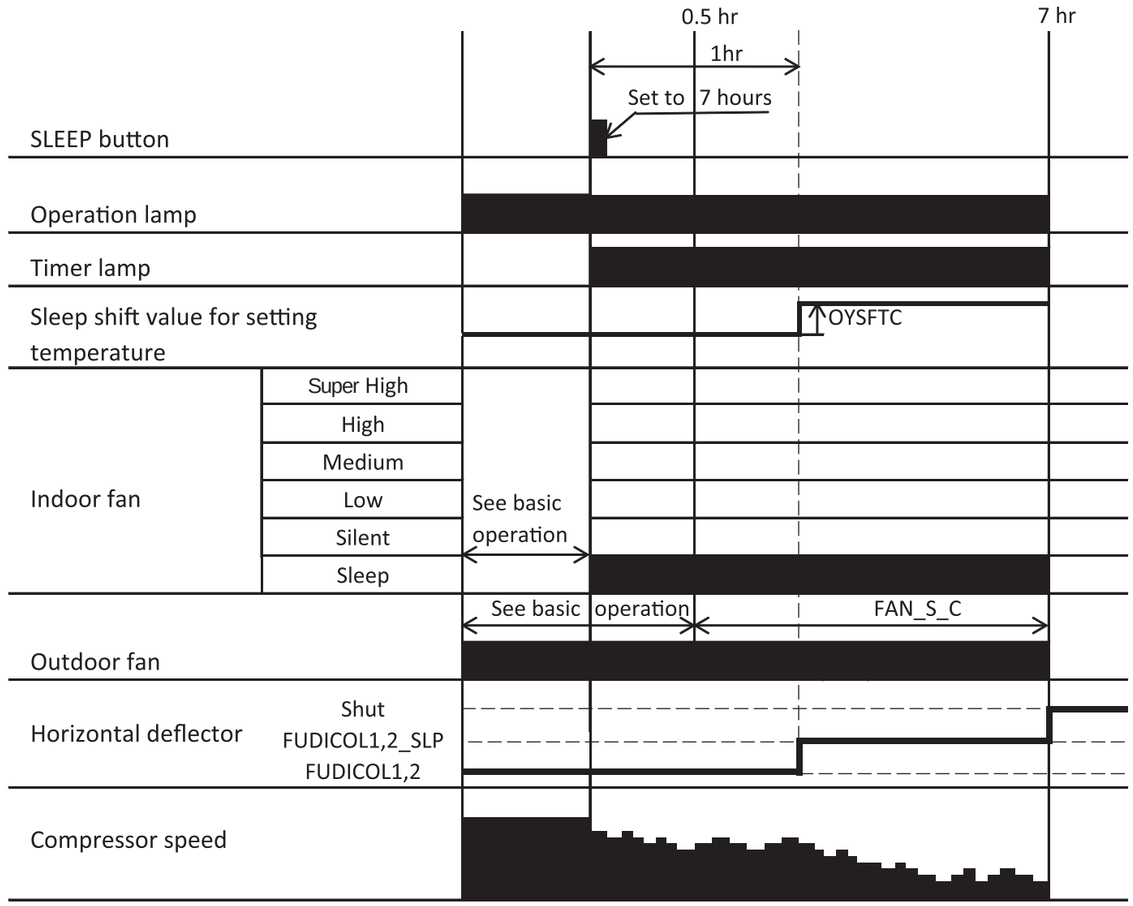
Cooling Powerful Operation



Notes :

(1) Pressing the "POWERFUL" button will reduce the temperature setting by PWSFTC.
(2) The powerful operation is for 20 minutes after setting.
(3) Operation is continued forcibly thermo-ON for 20 minutes after the powerful operation is finished.
(4) Pressing the "START/STOP" button and "POWERFUL"button during powerful operation wil cancel the powerful operation.
(5) If the sleep timer is set during powerful operation, the powerful operation will be canceled.
(6) When the powerful operation is set, the fan speed will be set to "HIGH" and the compressor's maximum speed will be set to CMAX2 during powerful operation. The compressor's lower limit speed is CKYMIN_PW.
(7) The fan speed increases by FNUPPW_C.
(8) After the powerful operation is ended, the system automatically operates with the previous settings used before the powerful operation.

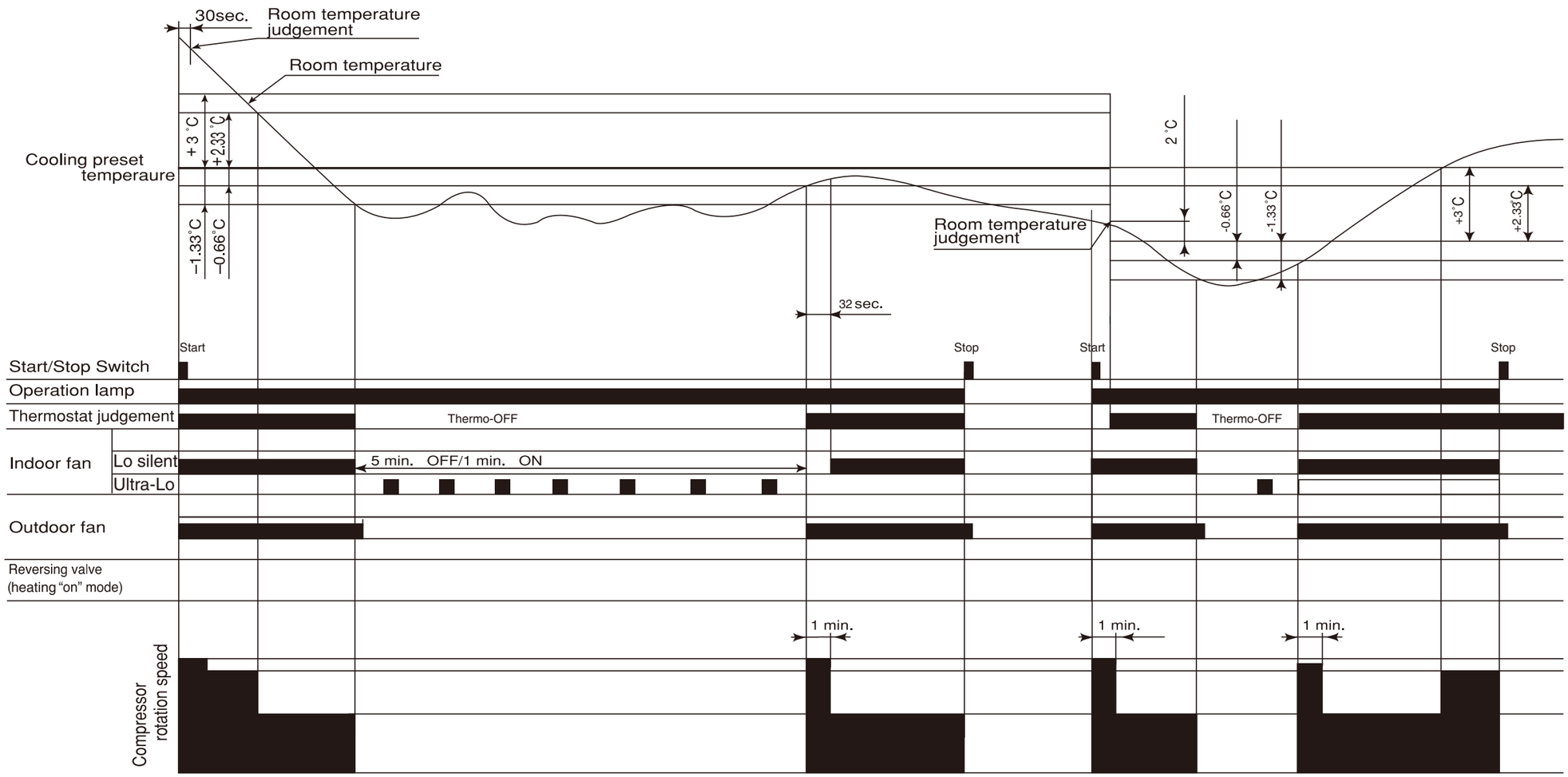
Cooling Sleep Operation



Notes :

(1) The sleep operation starts when the "SLEEP" button is pressed.
(2) When the sleep operation is set, the maximm compressor speed is limited to CSZMAX, and the indoor fan set is "sleep"(FCSOY_P).
(3) The indoor fan speed does not change even when the fan speed mode is changed.
(4) If sleep operation is canceled by the cancel button or sleep button, all data is cleared.
(5) 1 hour after the sleep operation is set, the sleep shift value(OYSFTC) is added.

Dry



Notes:

(1) If the room temperature is (cooling preset temperature) - (1.33°C) or less after 30 seconds from starting the operation, the operation is done assuming as the preset temperature = (room temperature at the time) - (2°C).

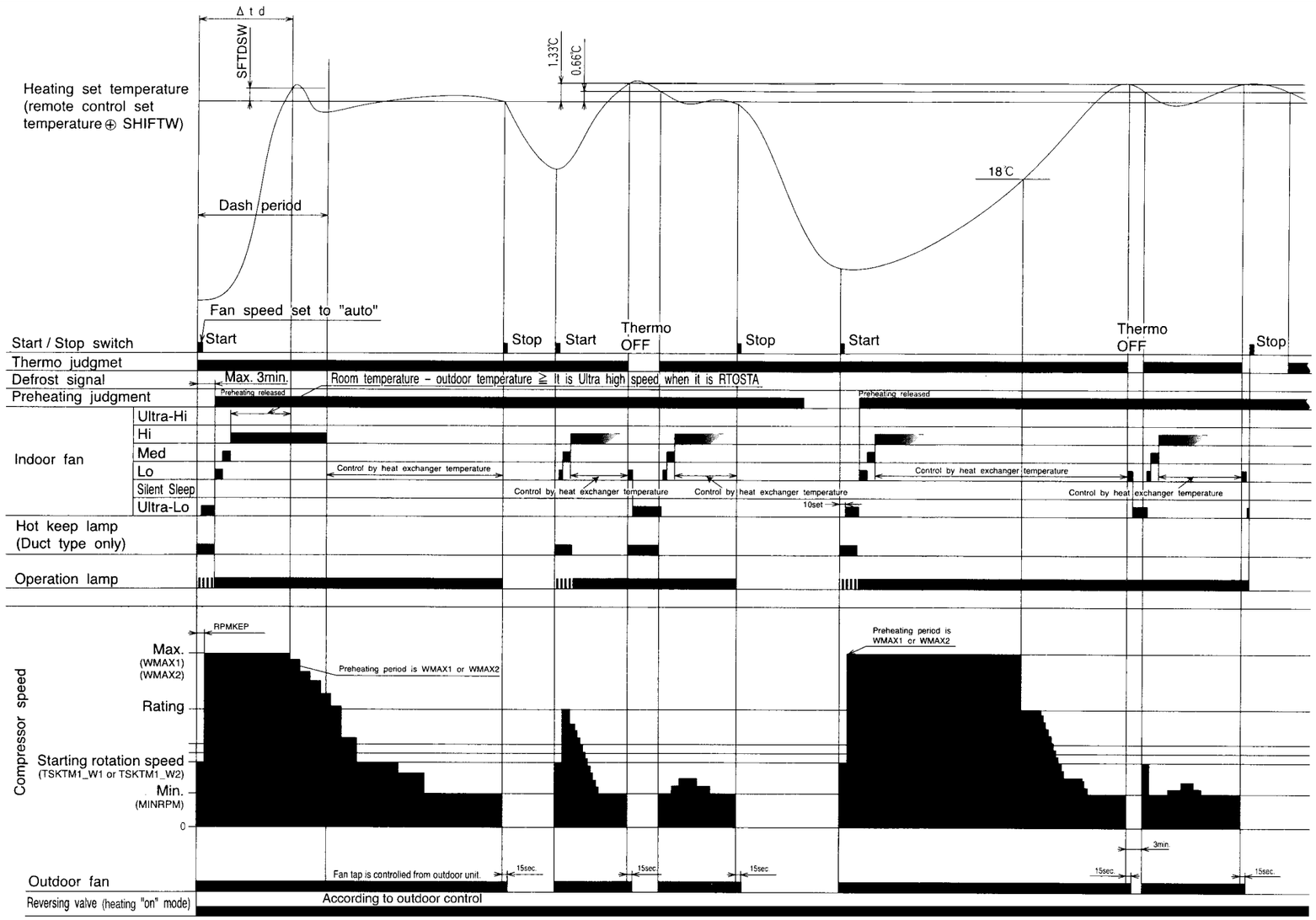
(2) The indoor fan is operated in the “Lo” mode. During thermo OFF indoor fan will be OFF for 5 minutes and ON for 1 minute.

(3) When the operation is started by the themostat turning ON, the start of the indoor fan is delayed 32 seconds after the start of compressor operation.

(4) The compressor is operated forcedly for 3 minutes after operation is started.

(5) The minimum ON time and OFF time of the compressor are 3 minutes.

Heating Basic Operation



Notes:

(1) Hot Dash is started when the operation is started at fan speed “AUTO” or “HI” or when the fan speed is changed to “AUTO” or “HI” during heating operation, and when the compressor speed (P item) reaches (WMAX1 or WMAX2) or higher with the room temperature at 8℃ or less and outdoor temperature at 10℃ or less.

(2) The maximum compressor speed period during hot dash is finished

① when the room temperature reaches the heating set temperature (including heating shift) plus SFTDSW or

② when the thermo is off.

(3) The thermo OFF temperature during hot dash is heating set temperature (including heating shift) plus 3℃. After thermo OFF, hot dash finishes, and PI control starts.

(4) The compressor minimum ON time and minimum OFF time is 3 minutes.

(5) The time limit for which the maximum compressor speed (WMAX1 or WMAX2) during normal heating (except for hot dash) can be maintained is less than 120 minutes when the room temperature is 18℃ or more; it is not provided when the room temperature is less than 18℃ and outdoor temperature is less than 4℃.

(6) The operation indicator will blink every second during initial cycle operation, preheating, defrosting (including balance time after defrost is finished), or auto fresh defrosting. However, with duct type models, operation indicator does not blink, but Hot Keep indicator will light.

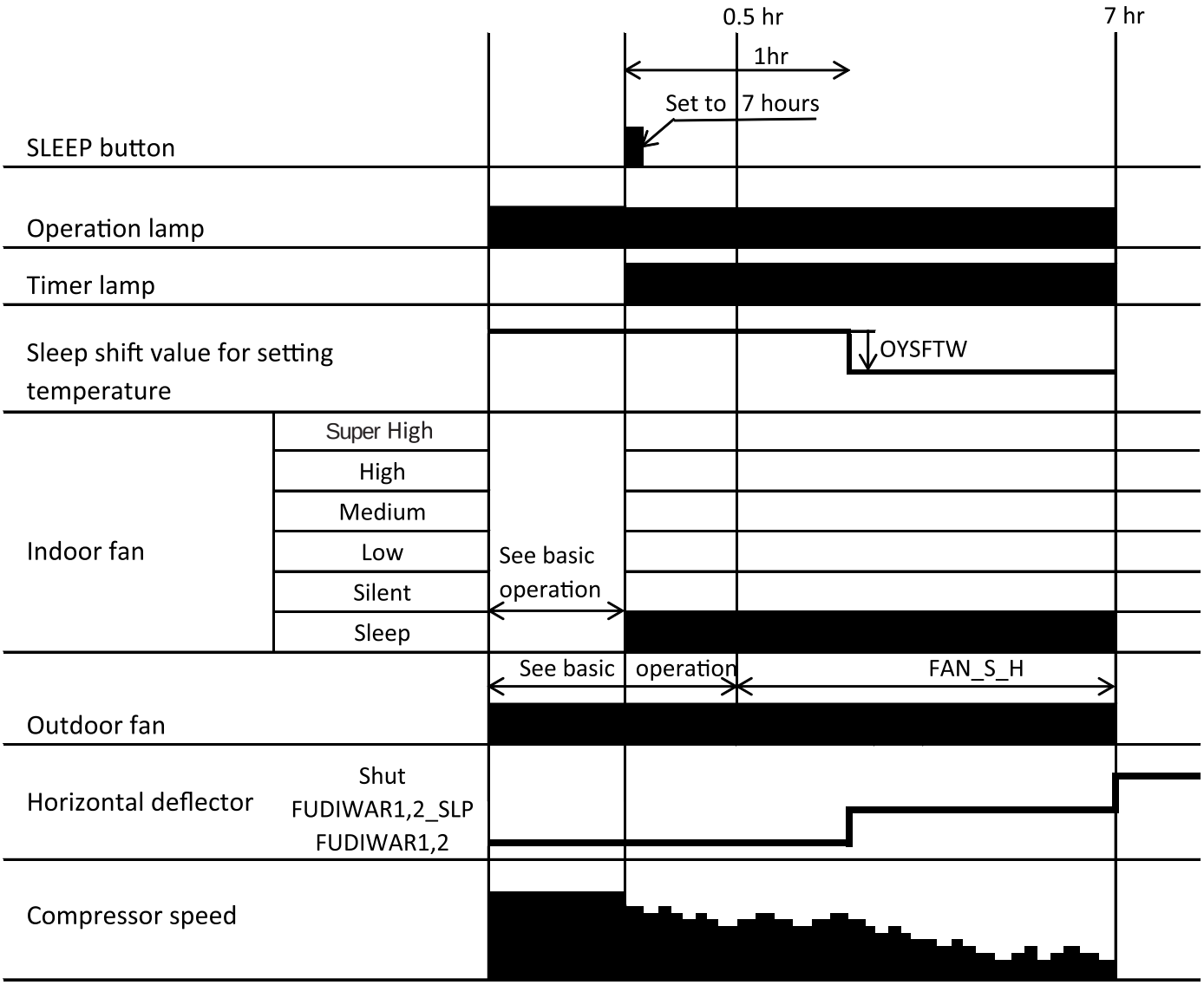
(7) For preheating judgment, preheating starts if the heat exchange temperature is lower than YNEOFC and is cancelled if the heat exchange temperature is YNEOF plus 0.33℃ or higher at the start of operation using the START / STOP button.

(8) If the room temperature falls to less than 18℃ in the "Ultra-Lo" mode, the indoor fan stops. When the room temperature is 18℃+0.33℃ or more, the ultra-Lo operation restarts. However, the ultra-Lo operation during preheating or preheating after defrosting does not stop if the room temperature is less than 18℃.

(9) Compressor speed is determined by instruction sent from indoor unit and corrected by outdoor unit according to such factors as capacity, fan speed, number of units being operated, outdoor temperature, etc.

(10) If another indoor unit is doing cooling operation, dehumidifying operation or fan operation, heating operation cannot be done.

Heating Sleep Operation



Notes :

(1) The sleep operation starts when the "SLEEP" button is pressed.

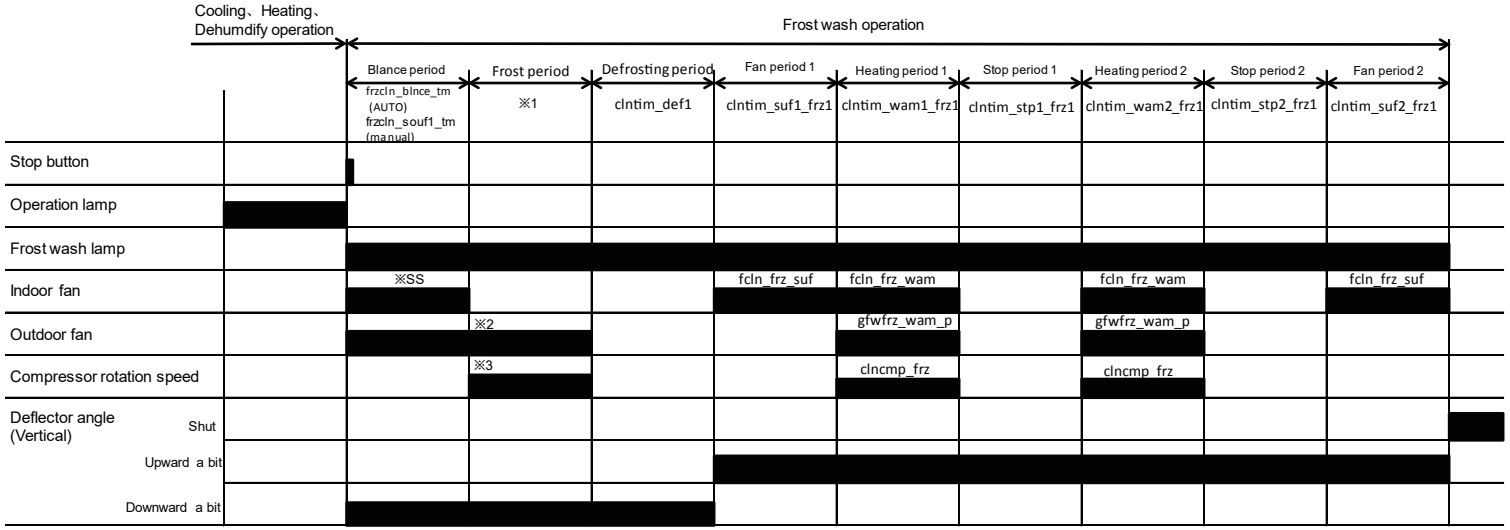
(2) When the sleep operation is set, the maximm compressor speed is limited to WSZMAX, and the indoor fan set is "sleep"(FWSOY_P).

(3) The indoor fan speed does not change even when the fan speed mode is changed.

(4) If sleep operation is canceled by the cancel button or sleep button, all data is cleared.

(5) 1 hour after the sleep operation is set, the sleep shift value(OYSFTW) is reduced.

Frost wash



(1)The total hours of air conditioning operation is more than 42 hours (Adjustable time) (SLEEP、ON TIMER operation will take 84 hours),And air conditioner is operated for more than 30 minutes, Meanwhile, the outdoor temperature and indoor humidity are suitable for the Frost Wash(Area A、B in Fig.3、4),Frost Wash (auto) start;
(2)Within 2 hours before the ON TIMER designated time,Frost wash(auto) cannot be operate;
(3)ONCE TIMER (ON/OFF TIMER) operation cannot be set ,when Frost wash(auto) is running;
(4)When the Frost Wash is stopped during Frost Wash operation, the unit automatically restart Frost Wash at the next operation stop.
(5)Before the Frost period start,the outdoor temperature≥16℃，Or before the defrosting period finish,the heat exchanger temperature ≥0℃，The Heating period will not running. Fan period 1～ Fan period 2 all turn to Fan operation
(6)In frost period ,The maximum time is 10 minutes after the heat exchanger temperature ≤-10℃
(7)Heating period will finish after the heat exchanger temperature ≥35℃,remanent time turn to Fan period 2,the total time unchanged
(8)Fan period 1～ Fan period 2 will not running,when last operation was HEATING;
(9)When device operat Frost wash during ON condition,the device will stop and have blance time(3 minutes)
(10)Before the Frost period start,OH temperature≥60℃,Original blance period time will add 3 minutes
※1 According to room humidity, the Frost period time becomes as it is shown in Fig.1.
※2 According to Compressor rotation speed, the Outdoor fan becomes as it is shown in Fig.2.
※3 The Compressor rotation speed becomes as it is shown in Fig.5.about area A,
The Compressor rotation speed becomes as it is shown in Fig.6.about area B

Fig.1 Frost Period time

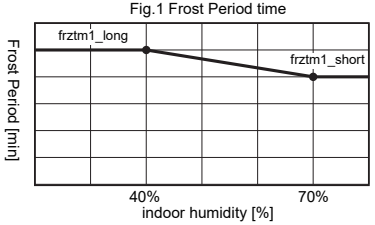


Fig.2 Frost Period outdoor Fan

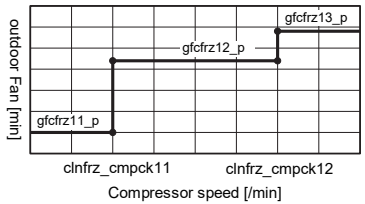


Fig.3 The range of temperature

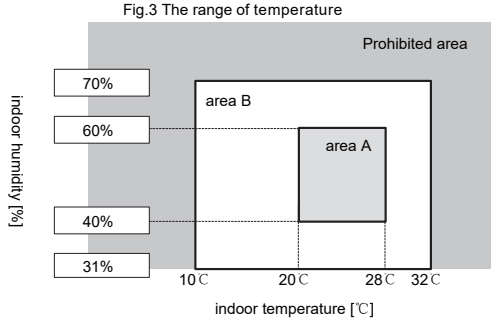


Fig.4 The range of temperature

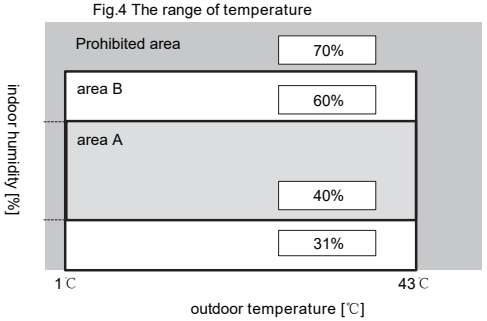


Fig.5 Frost Period Compressor speed (area A)

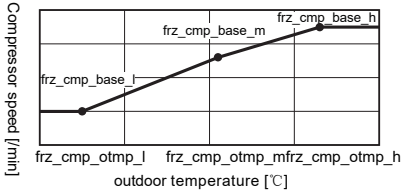
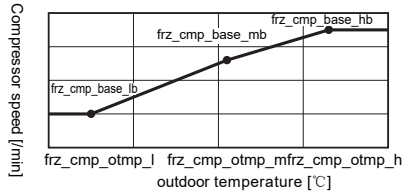


Fig.6 Frost Period Compressor speed (area B)



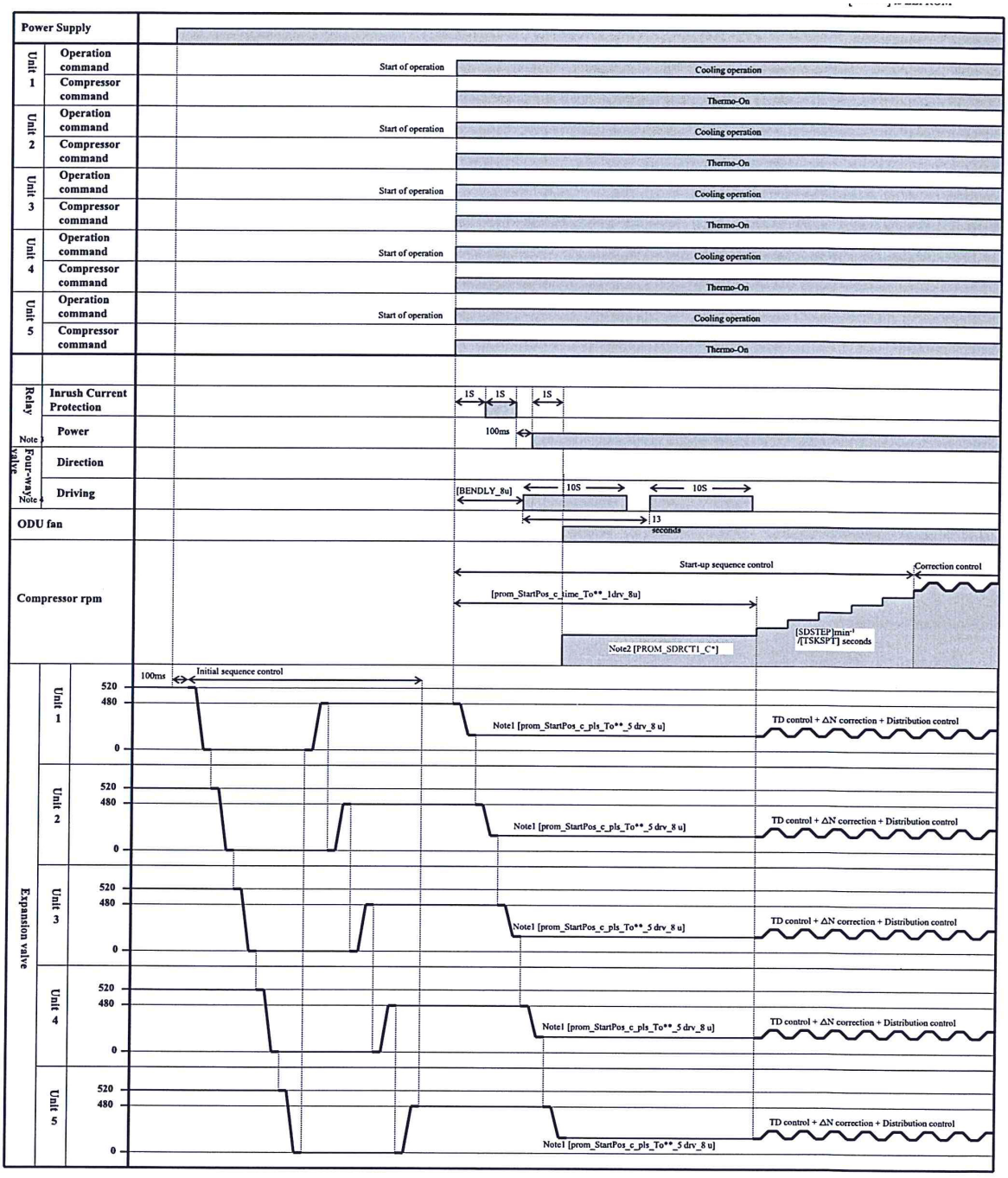
MODEL RAM-G110N5HAE

◇ Expansion valves

- The expansion valves are initialized when power is supplied. The valve for unit 1 is fully closed (–520 pulses), and then that for unit 2 is fully opened (480 pulses). The valve for unit 2 is fully closed (–520 pulses), and then that for unit 3 is fully opened (480 pulses). The valve for unit 3 is fully closed (–520 pulses), and then that for unit 4 is fully opened (480 pulses). The valve for unit 4 is fully closed (–520 pulses), and then that for unit 5 is fully opened (480 pulses). When the valve for unit 1, 2, 3, 4, 5 is fully closed (0 pulse), start-up is possible.
- The start openings are held during the steady speed period when the compressor is started. After the steady speed period is finished, the TD control is entered. The start openings are set to PSTARTH when the outdoor temperature at start 40°C or more, and to PSTART when it is less than 40°C. PSTART C3 is used for 3 rooms and 4 rooms operation.

◇ Compressor rotation speed

- When the compressor is started, the SDRCT1 speed / TSTKTM1 second is held. (Steady speed period) After the steady speed period is finished, the speed increases at the rate of SDSTEP speed / TSKSPT second until the target speed is reached.



*1: Five units shall be cooling at starting opening degree. [**] in EEPROM field contains the name of ambient temp. field. (Low, Mid, HiLow, HiHi)
Note 2: When the outside air temperature > [STAROTP]°C, it is driven by [PROM_SDRCT1_C1]%, and when the outside air temperature ≦ [STAROTP]°C, it is driven by [PROM_SDRCT1_C2]%.
*3: Inrush prevention and power relay indicate output on INV MCU.
Note 4: four-way valve direction and driving indicate MCU control side to INV MCU side transmit command.
The actual four-way valve driving process is performed by INV MCU. Refer to INV software design document for details on four-way valve driving patterns..

DEFROST

・Reversing valve defrost system is employed: it consists of balancing period→ reversing cycle period→ balancing period.

(1) Defrost start condition

- When all the following conditions are established defrost is executed:
  - ① Normal operation
  - ② Heat exchange temperature is within defrost range specified by outdoor temperature and heat exchange temperature. (Defrost signal occured).
  - ③ Defrost inhibit period linked to outdoor temperature has passed.

(2) Defrost release condition

- If any one of the following conditions is established, defrost is released:
  - ① Heat exchange temperature returns (heat exchange temperarure ≥ DEFOFF).
  - ② Defrost max time of 12 minutes has elapsed.
- Released by condition ① during balancing period: When remaining balancing period has elapsed, returned to initial condition (ASTUS=0).
- Released by condition ① or ② during reversing cycle period: [TDF415] Shifted to balancing period.

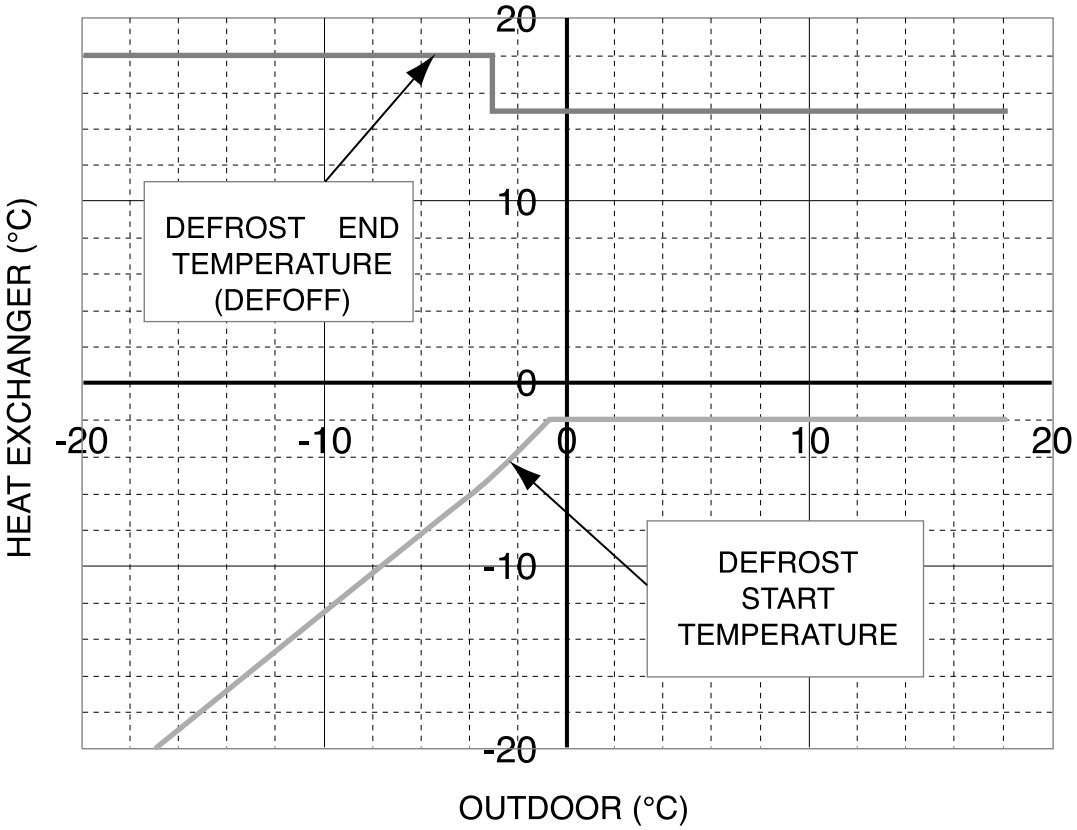
(3) Outputs during defrost

- Indoor defrost request: Transmitted to all units being operated in heating mode.
- Compressor : Balancing period for [TDF414] seconds→ Starting of reversing cycle period by [SDRCT2] min^{-1} for [TSKTM2] seconds→Accelerating by [DFSTEP]min^{-1}/[TDFSPT] seconds in remaining reversing cycle period until defrost MAX speed [DEFMAX] is reached→Balancing period for [TDF415] seconds
- Electric expansion valve

  Unit being stopped : [FULL CLOSE] 30 seconds after balancing period has passed→[FULL CLOSE] during reversing cycle period→ [PCLOSH$] 15 seconds before balancing period is finished

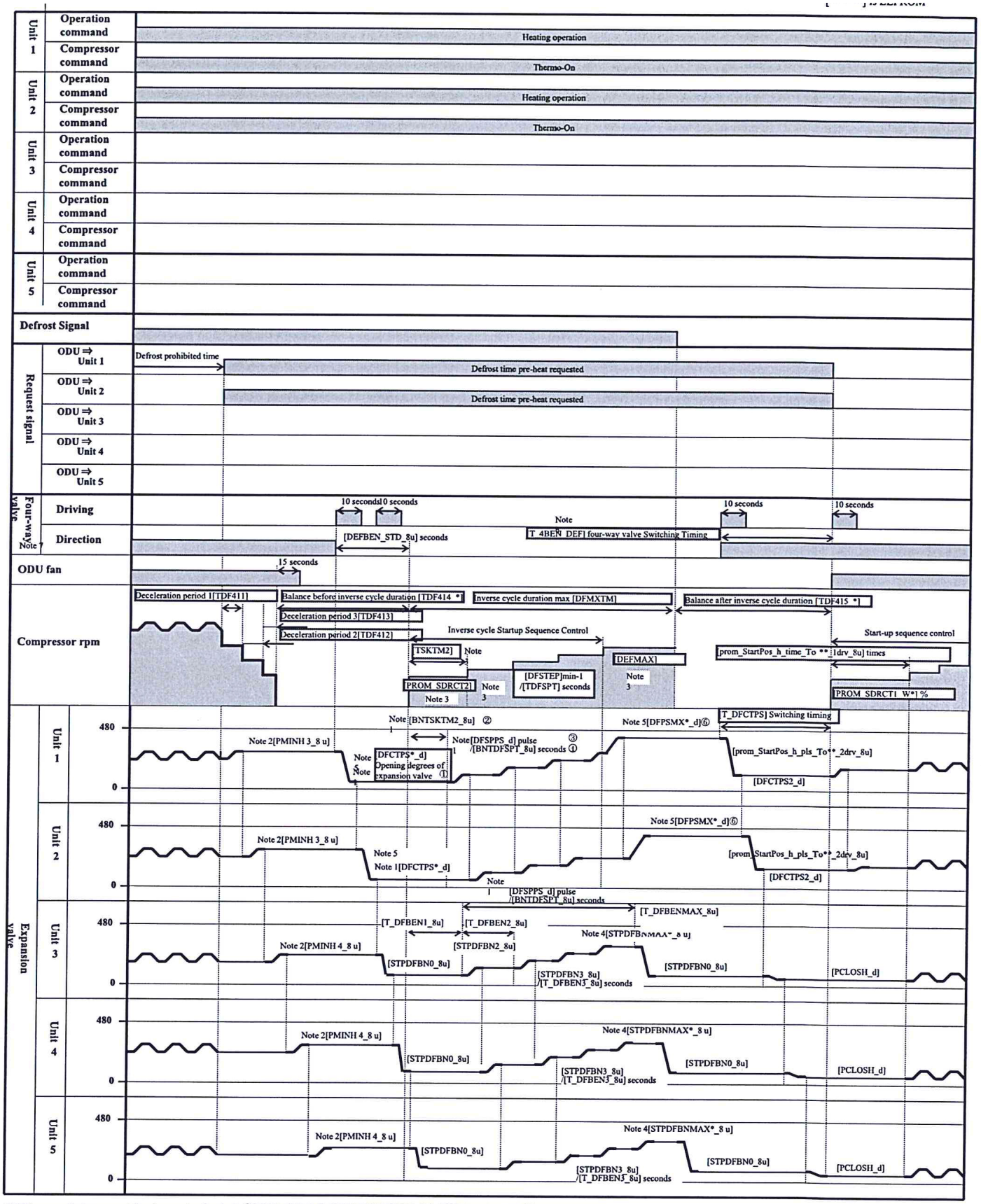
  Unit being operated : [DFCTPS] 30 seconds before balancing period is finished→ Synchronized with step-up of rotation speed of compressor, opened by [DFSPPS] pulses and reaches MAX opening degree [DEFSMX] when rotation speed of compressor reaches [DEFMAX].

RAM-G110N5HAE DEFROST TEMPERATURE



* above graph is showing the ideal value by micon program.
* guaranteed temperature range of this model is –15˚C to +23˚C at heating.

• Time chart when executing defrost (Unit 1 and Unit 2 operated, Unit 3, Unit 4 and Unit 5 stopped)



*1: When capacity is measured (low temperature heating), ① [DFCTPSTEI_d], ② [BNTSKTM2TEI_8u], ③ [DFSPPSTEI_d], ④ [BNTDFSPTTEI_8u].

Note 2: The higher of current opening degree and [PMIN*_8u] opening degree is valid.

*3: Varies depending on the number of operation units. When measuring capacity (low temperature heating), set it separately.

*4 : expansion valve maximum opening degree at standstill varies depending on the number of units connected and the number of units in operation.

*5: ① "DFCTPS1U_d" for one-unit operation, ⑥ "DFPSMX1U_d" for two-unit operation, ① "DFCTPS2U_d" for two-unit operation, and ⑥ "DFPSMX2U_d" For three or more units of operation, ① "DFCTPS_d" and ⑥ "DFPSMX_d".

*6: The values enclosed in parentheses are to be separate data during ErP capacity or capacity measurement.

Note 7: four-way valve direction and driving indicate MCU control side to INV MCU side transmit command.

The actual four-way valve driving process is performed by INV MCU. Refer to INV software design document for details on four-way valve driving patterns..

AUTO-FRESH DEFROST

• During heating operation is stopped, and when auto-fresh condition is established, defrost operation will be performed while operation is stopped.
Auto-fresh consists of balancing period at start of defrost for [TDF414] seconds → Reverse cycle period for MAX 12 minutes.

(1) Start conditions for auto-fresh

• When all the following conditions are established, auto-fresh is executed:
① Defrost request signal is present.
② All indoor units are stopped.
③ 15 minutes of auto-fresh inhibit period has elapsed.
④ Compressor is ON when operation is stopped.
⑤ Compressor delay command is sent from indoor unit when operation is stopped.

(2) Release condition of auto-fresh

• If any one of following conditions is established, auto-fresh is released:
① Heat exchange temperature returns (heat exchange temperature ≥ DEFOFF)
② 12 minutes of defrost MAX time has elapsed.
③ Failure occurred.
④ Either unit 1 or unit 2 or unit 3 or unit 4 started operation.
※ Released during start of balancing period : Stopped or started after remaining balancing period has elapsed.
Released during reverse cycle period : Stopped or started after balancing for 3 minutes.

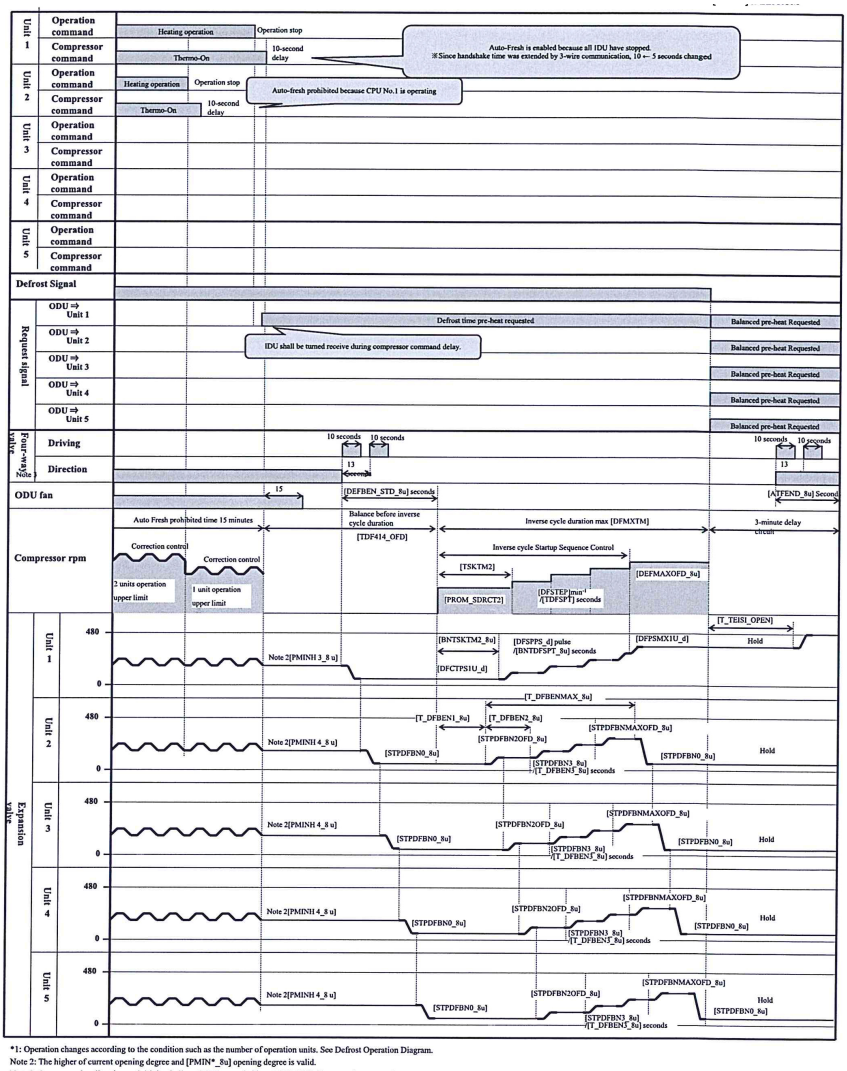
(3) Outputs during auto-fresh

[Indoor unit defrost request]: Transmitted only to unit to which auto-fresh is applied (indoor unit stopped last).
[Compressor]: Accelerated by DFSTEP min^{-1}/TDFSPT seconds and reaches defrost MAX speed [DEFMAX].
[Electric expansion valve]:
Unit auto-fresh not applied: FULL CLOSE when balancing for 30 seconds has elapsed at start of defrost.
Unit auto-fresh applied : Synchronized with step-up of rotation speed of compressor, opened by [DFSPPS] pulses and reaches MAX opening degree [DEFSMX] when rotation speed of compressor reaches [DEFMAX].

(4) Note

• Shifted to auto-fresh in defrost mode when operation is stopped.
• All indoor units must be stopped to fulfill condition for auto-fresh.
If signal is delayed, auto-fresh condition will not be established.

MODEL RAM-G110N5HAE



*1: Operation changes according to the condition such as the number of operation units. See Defrost Operation Diagram.
Note 2: The higher of current opening degree and [PMIN*_8u] opening degree is valid.
Note 3: four-way valve direction and driving indicate MCU control side to INV MCU side transmit command.
The actual four-way valve driving process is performed by INV MCU. Refer to INV software design document for details on four-way valve driving patterns..

FORCED COOLING

- In order to accumulate refrigerant, units operate in cooling cycle.
  Execution condition and operation status are shown below.

[Execution condition]

- With neither indoor unit 1, 2, 3, 4 and 5 not operated, when service switch is turned ON, forced cooling will be performed.
- Always operation status of indoor units are monitored and forced cooling is inhibited when operation of any unit is detected.

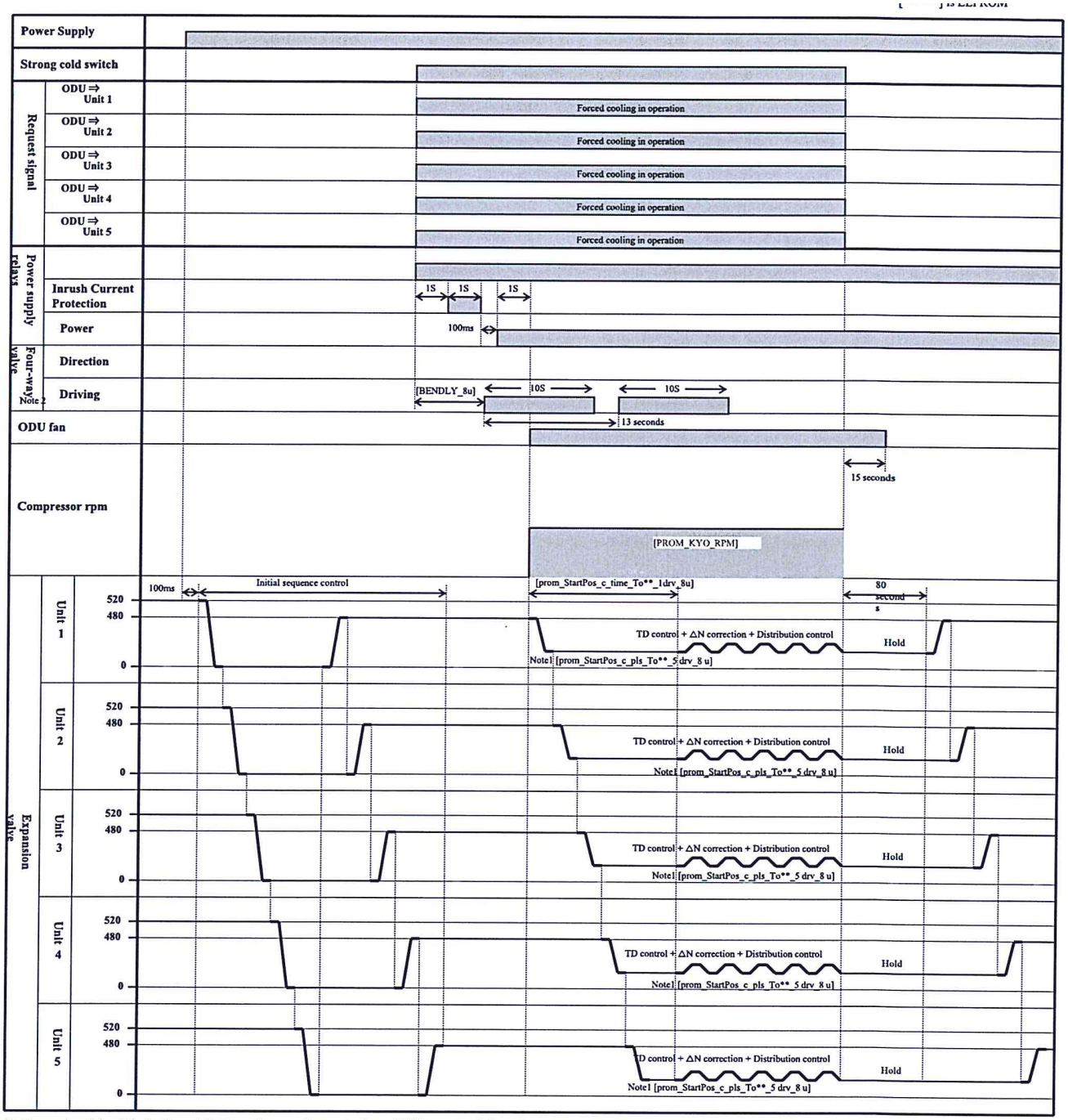
[Operation status]

- Outdoor unit fan: Fixed in LO.
- Compressor rotation speed: Fixed in 3200min^{-1}.
- Expansion valve/reversing valve : Set in normal conditions.

[Note]

- During forced cooling, if failure occurs in outdoor unit, thermostat is turned off. However, it is not counted.
- Since rotation speed of compressor is fixed in 3000min^{-1} during forced cooling, steady speed period of compressor at start is not performed.

- The following shows the operation state of forced cooling.



*1: Max. number of pipes (5 in the diagram) shall be cooling at starting opening degree. [**] in EEPROM field contains the name of ambient temp. field. (Low, Mid, HiLow, HiHi)
Note 2: four-way valve direction and driving indicate MCU side-to-side INV MCU side transmit command.
The actual four-way valve driving process is performed by INV MCU. Refer to INV software design document for details on four-way valve driving patterns..

PROCESSING AT OVERHEAT THERMISTOR (OH) HIGH TEMPERATURE

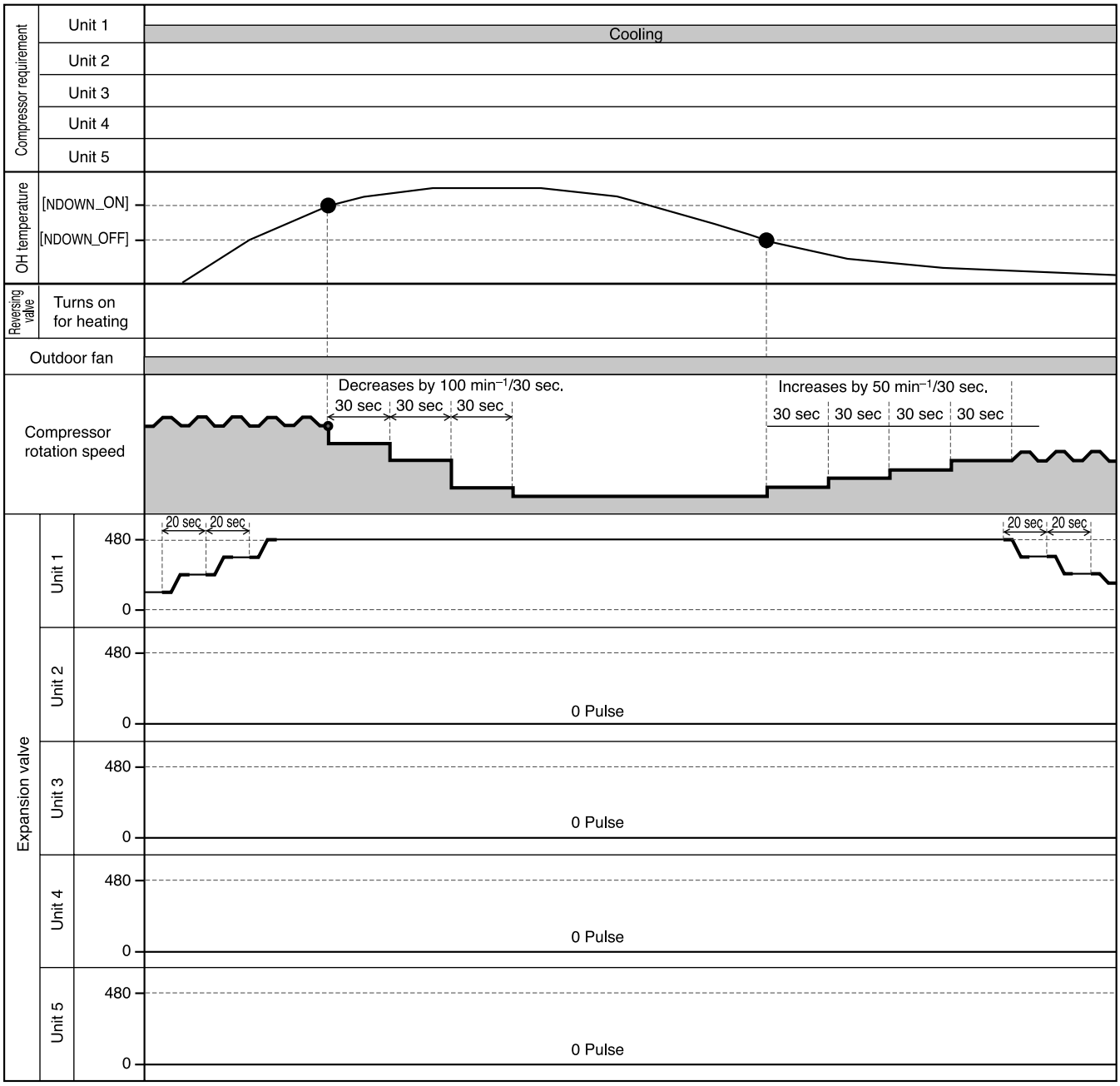
◇ Restriction Start Conditions

- If any expansion valve is operated at 480 pulses and the OH temperature > [NDOWN_ON], the compressor speed will be reduced at a rate of 100 min^{-1}/30 seconds.
- This reduced rotation speed is based on the speed when the reduction started, and will be maintained until the reduction is finished. However, the reference speed will be exchanged only if the target speed is lower than the speed when the reduction started.
- If [NDOWN_OFF] ≤ OH temperature ≤ [NDOWN_ON] and the OH temperature does not rise from that 20 seconds before, the reduction of compressor speed will not occur.

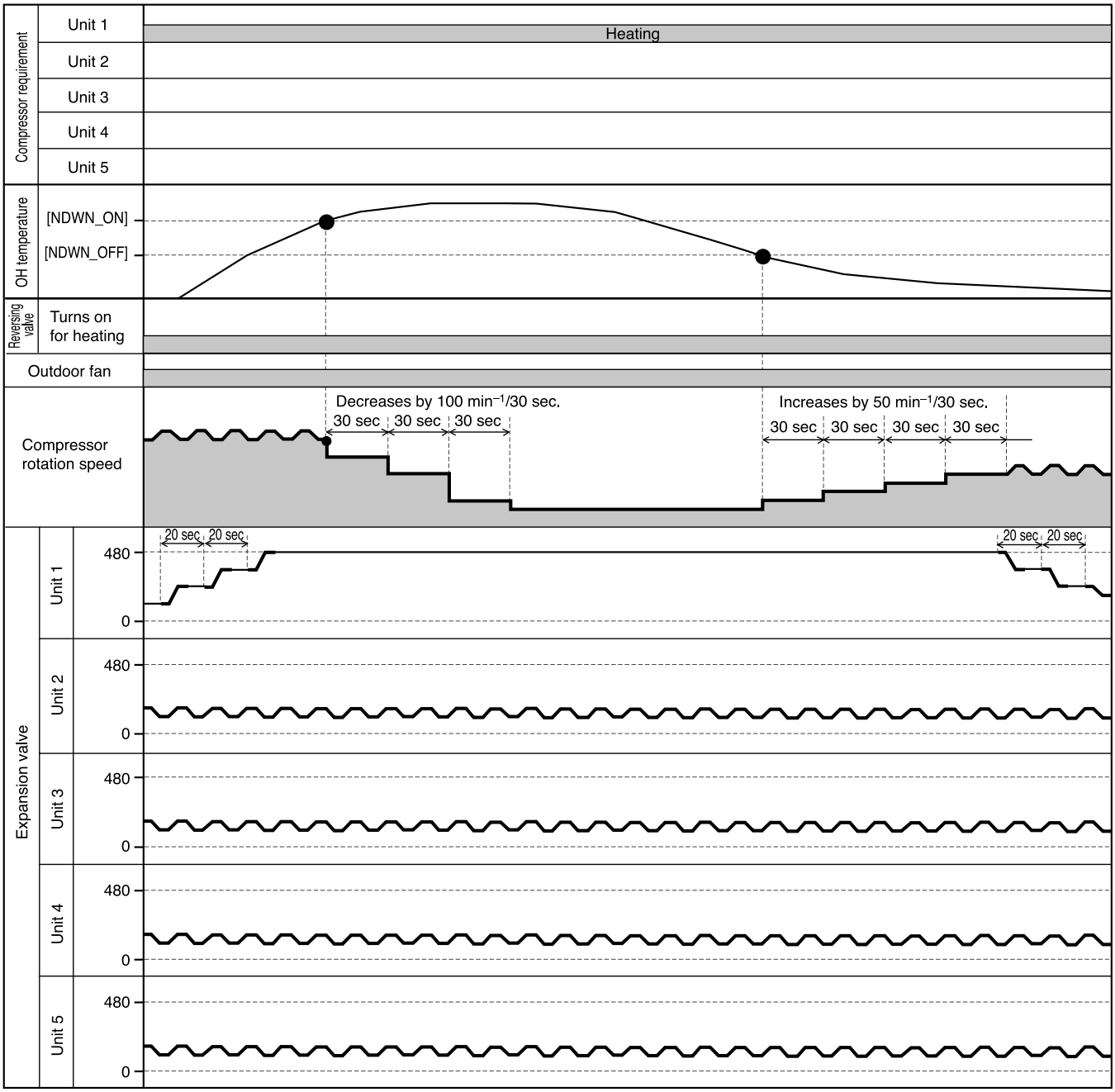
◇ Restriction Release Condition (in common for all)

- The restriction will be released when OH temperature < [NDOWN_OFF], and the compressor speed will be increased at a rate of 50 min^{-1}/30 seconds to restore the target speed.

When one unit is operated for cooling



When one unit is operated for heating



DESCRIPTION OF MAIN OPERATION CIRCUIT

■ RAM-G110N5HAE

1. Main Power Supply Circuit

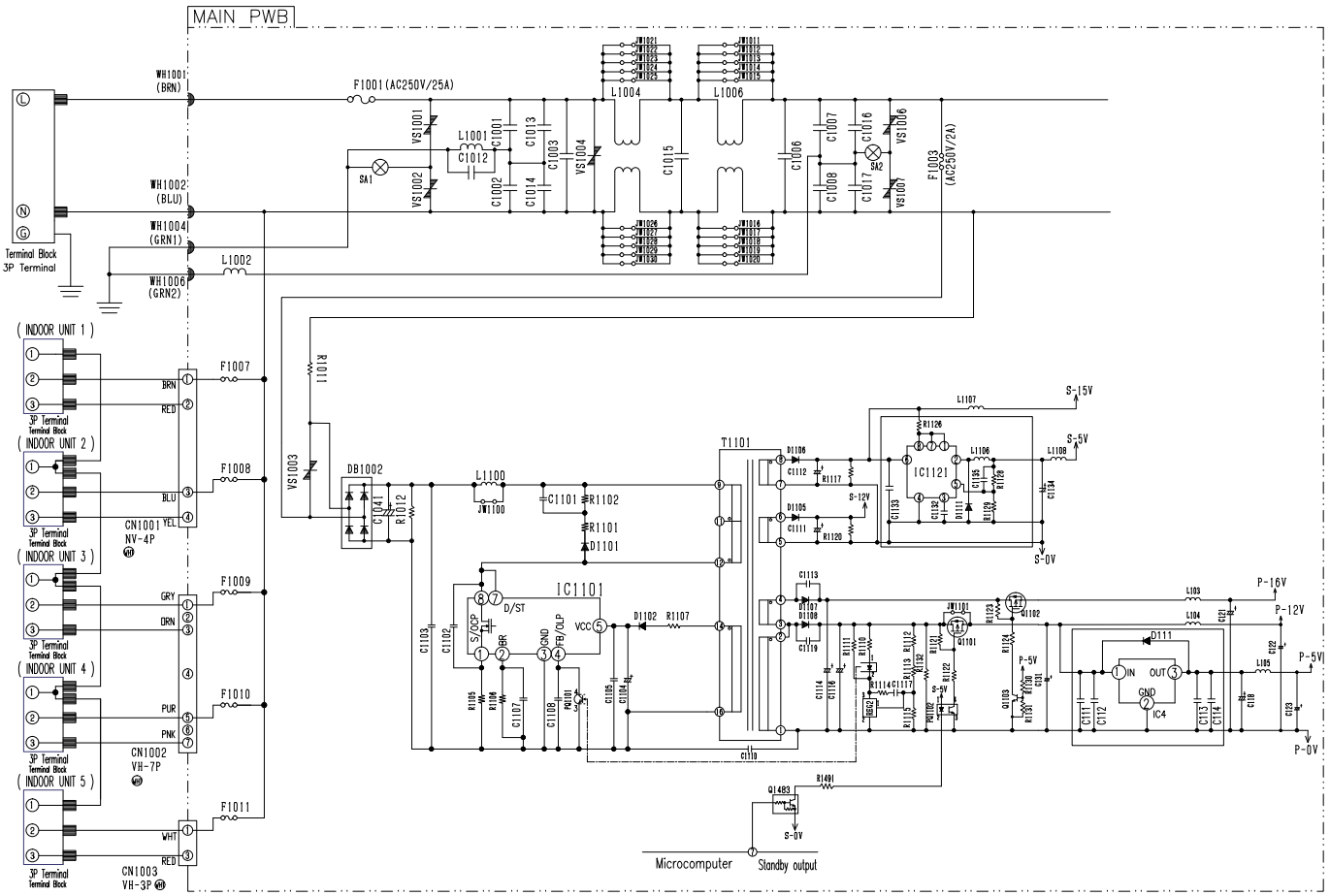


Fig. 1-1

- AC 220 ~ 240V power supplied to the 3P terminal block is supplied to DB1002 via the noise filter circuit, 2A fuse (F1003), and varistor VS1003. High voltage DC smoothed by DB1002 and C1041 is used to create DC voltage on the transformer's secondary side by the switch control IC (IC1101) and switching transformer (T1101).
- Secondary side DC voltage is used in the following six systems:
  (1) S-15V : Power supply for communication circuit between outdoor and indoor
  (2) S-12V : Operating power supply for electric expansion valve
  (3) S-5V : Power supply for main microcomputer and peripheral circuits
  (4) P-16V : Power supply for compressor motor driver circuit and fan motor driver circuit
  (5) P-12V : Power supply for reversing valve relay, power relay, in-rush current relay, and compressor motor operating amplification and fan motor current amplification.
  (6) P-5V : Power supply for inverter microcomputer and peripheral circuits
- Primary Components
  (1) C1001, C1002, C1013, C1014, C1003, C1006, C1007, C1008, C1016, C1017, L1006
  Absorb electrical noise generated during operation of the compressor, and reduce noise level emitted to the power line.
  (2) Surge absorber, VS1001, VS1002, VS1004, VS1003
  Absorb external surges, such as induced lightning.
  (3) IC1101
  IC for control of switching power.
  (4) IC4
  DC/DC converter IC for generating P-12V and P-5V.
  (5) IC1121
  DC/DC converter IC for generating S-15V and S -5V.

- Inverter Microcomputer Power Control
  The power to the inverter microcomputer in turned ON/OFF by commands from the main microcomputer, Q1483, PQ1102, Q1101, and Q1102 are related.

- Specifications and Checkpoints for Main Power Supply Circuits

Output Name	Voltage Specification	Primary Load	± Measurement Location	Examples of Possible Failure Modes for Output Failures (for Reference)
S-15V output	15.5 $^{\pm 1.5}$ V	Indoor/outdoor communication	Tester ⊕ terminal: S-15V indicator (Main PWB : L1107) Tester ⊖ terminal: S-0V indicator (Main PWB : IC1035)	LD1401 ~ LD1402 (green) do not light or blink.
S-12V output	12 $^{+4,-2}$ V	Expansion valve	Tester ⊕ terminal: S-12V indicator (Main PWB : D1105) Tester ⊖ terminal: S-0V indicator (Main PWB : IC1035)	LD1351 (red) blinks 5 or 6 times (related to refrigerant cycle error) and stops.
S-5V output	5 $^{\pm 0.4}$ V	Main microcomputer thermistor	Tester ⊕ terminal: S-5V indicator (Main PWB : L1108) Tester ⊖ terminal: S-0V indicator (Main PWB : IC1035)	LD1353 (green) does not blink. LD1351 (red) does not blink. Outdoor unit does not operate.
P-16V output	15.5 $^{\pm 1.5}$ V	Compressor IPM DC fan drive circuit Converter circuit	Tester ⊕ terminal: P-16V indicator (Main PWB : Q1102), (Inverter PWB : P-16V test point) Tester ⊖ terminal: P-0V indicator (Main PWB : PQ1102), (Inverter PWB : JW004)	LD1351 blinks 3, 4 or 12 times and then stops.
P-12V output	12 $^{\pm 1}$ V	IC2, 3, 4, relay circuits	Tester ⊕ terminal: P-12V indicator (Main PWB : Q1101), (Inverter PWB : P-12V test point) Tester ⊖ terminal: P-0V indicator (Main PWB : PQ1102), (Inverter PWB : JW004)	LD1351 blinks 2, 4, 8 or 14 times and then stops.
P-5V output	5 $^{\pm 0.4}$ V	Inverter microcomputer	Tester ⊕ terminal: P-5V indicator (Main PWB : PQ1811), (Inverter PWB : L105) Tester ⊖ terminal: P-0V indicator (Main PWB : PQ1102), (Inverter PWB : JW004)	LD1351 blinks 8 times.

- Check each voltage. If the above specifications are satisfied, the main power supply circuit can be considered normal.
- Due to high voltage, be particularly careful to avoid electric shock. Further, take care to avoid short-circuit accidents caused by incorrect connection of measuring instruments. Otherwise, the board could be damaged.
- Even after the power is turned off, an electric charge remains in the smoothing capacitor, and a voltage of 260V to 360V is applied between the terminals of the smoothing capacitor.

2. Converter Circuit

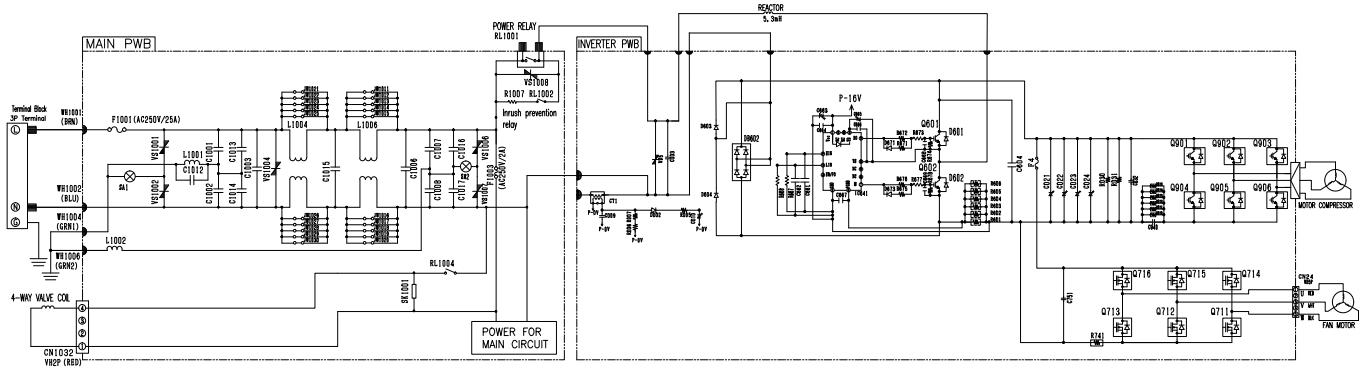


Fig. 2-1

● This circuit rectifies the AC220-240V between L and N on the 3P terminal block, and creates a DC voltage.
During operation of the compressor, the rectified circuit voltage is approximately (DC320V - 360V).

● Primary Components

(1) Q901, Q902, Q903, Q904, Q905, Q906
used for configuration of inverter section.

Reference:

○ In case of Q901, Q902, Q903, Q904, Q905, Q906 failure or broken, immediately after starting the compressor, it might stop due to abnormal speed reduction, switching failure, Ip cut, etc.

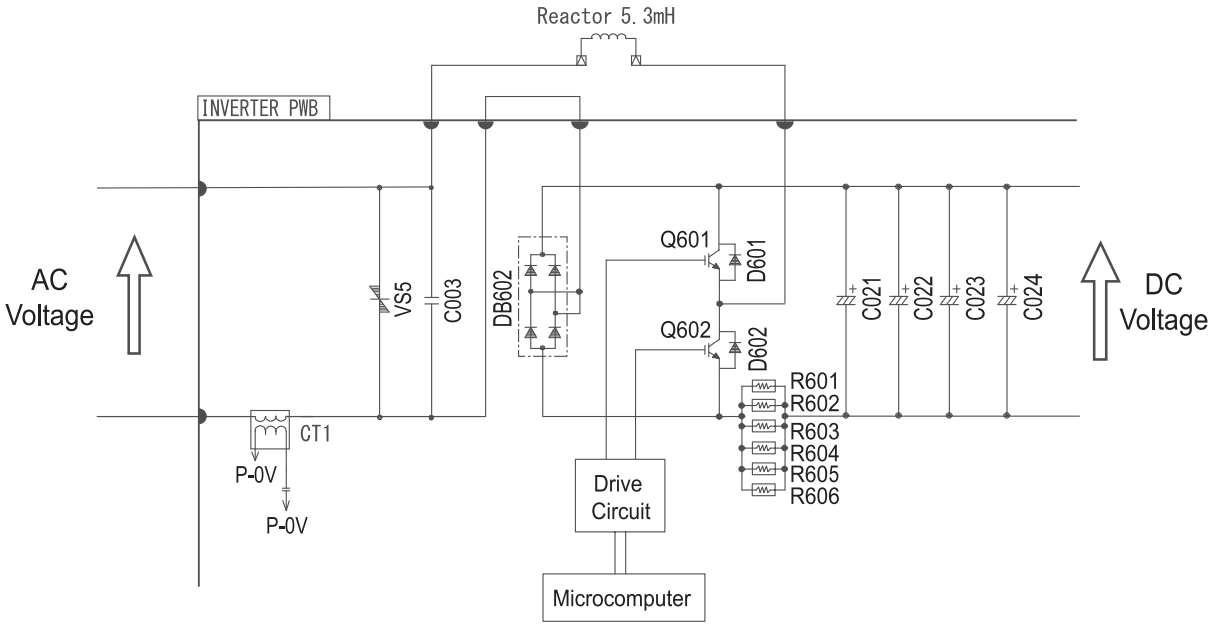


Fig. 2-2

(2) Smoothing Capacitor (C021~C024, 500μF 450V)

Boosts and smoothes (averages) DC voltage rectified by the DB602, Q601, Q602.

(3) Power supply rectification, power factor improvement element (DB602, Q601, Q602)

It works to rectify the AC voltage of 220-240V supplied from the terminal block to DC voltage.
Also, when the load on the compressor is rising, switching Q601 and Q602 performs power factor correction and boost.

3. Reversing Valve Control Circuit

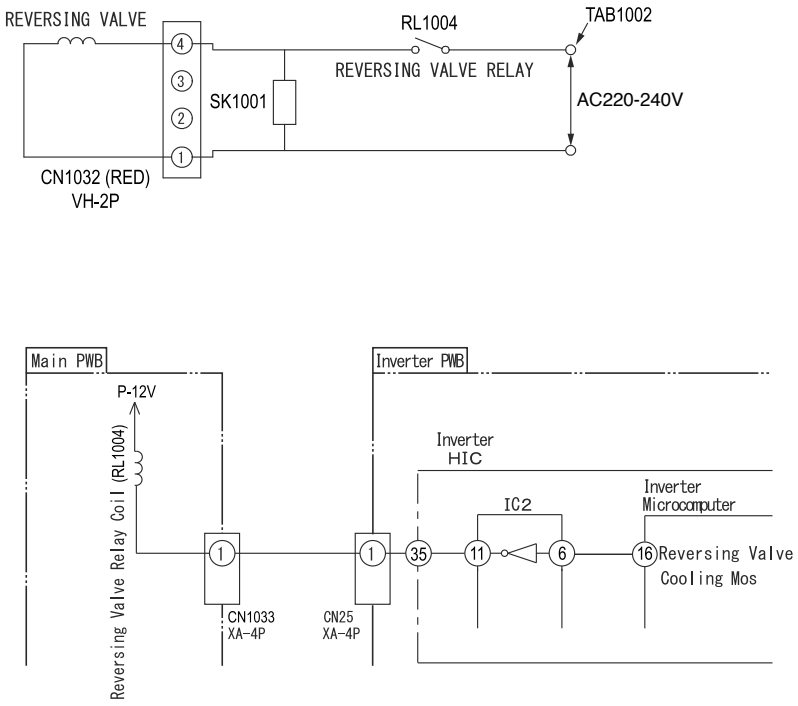


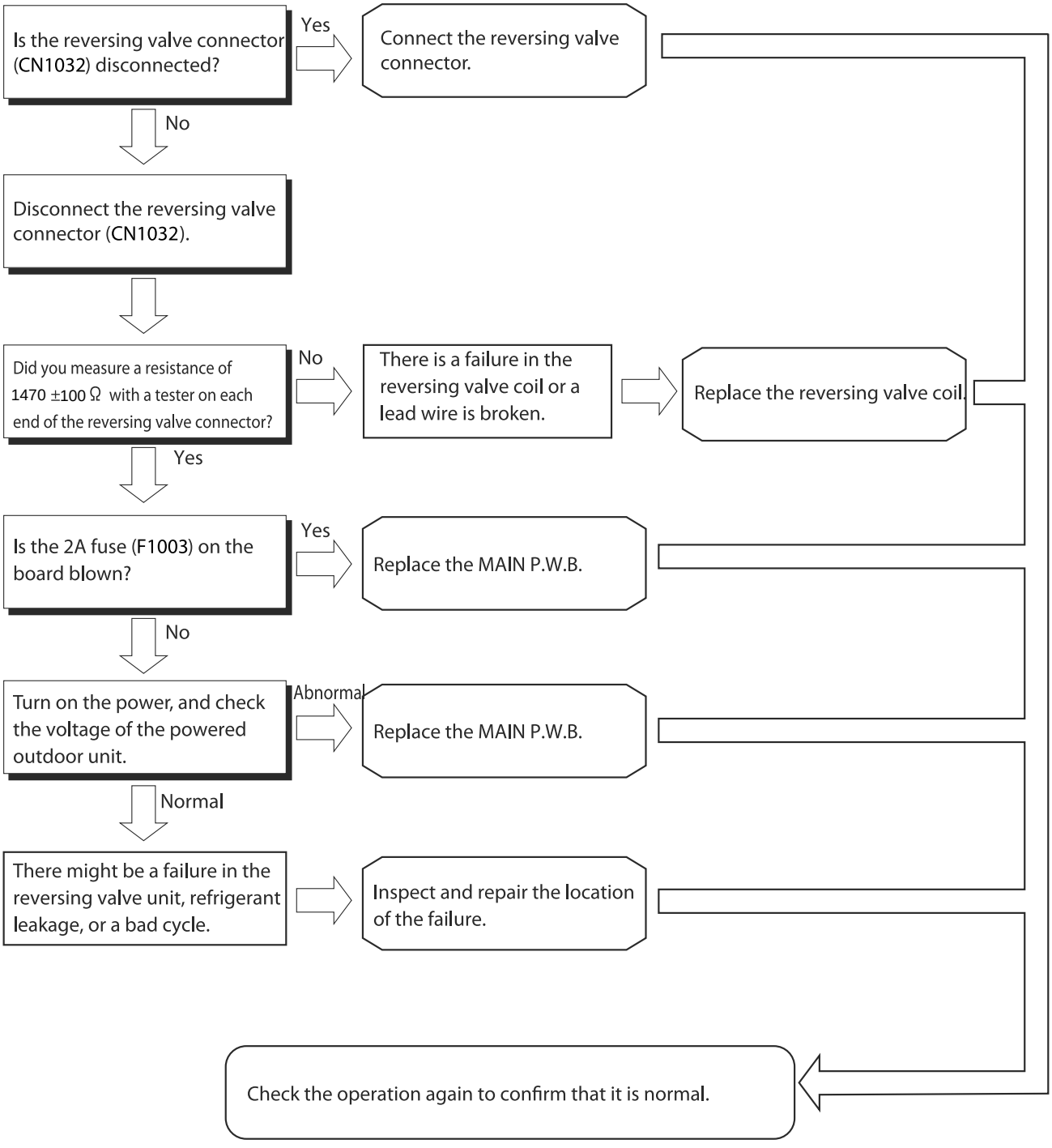
Figure 3-1

- The reversing valve is controlled by operation commands from the indoor microcomputer. Current is applied to the reversing valve coil in the direction designated for each operation mode to slide the valve.
- Before checking the power to the reversing valve, remove the CN1032 connector, measure the resistance at both ends of the connector to see if it is 1470 ±100 Ω. Perform the following power checks only if the result of this check is normal. If this check produces an abnormal result, either a lead wire is broken or there is a failure in the reversing valve.
- Voltage at each point is approximately as shown below table when measure by tester. (When voltage between pin 1 to pin 4 of CN1032 is measured).

Operation Condition		Voltage between pin 1 to pin 4 of CN1032
Cooling	General operation of cooling	About 0V
Heating	In normal heating operation	About AC220-240V
	MAX. rotation speed instructed by indoor microcomputer after defrost is completed.	About AC220-240V
	Defrosting	About 0V

Inspection when Timer Lamp on Indoor Unit Flashes Once

Note: Be sure to turn the power off before performing the following inspection.



4. Temperature Detection Circuit

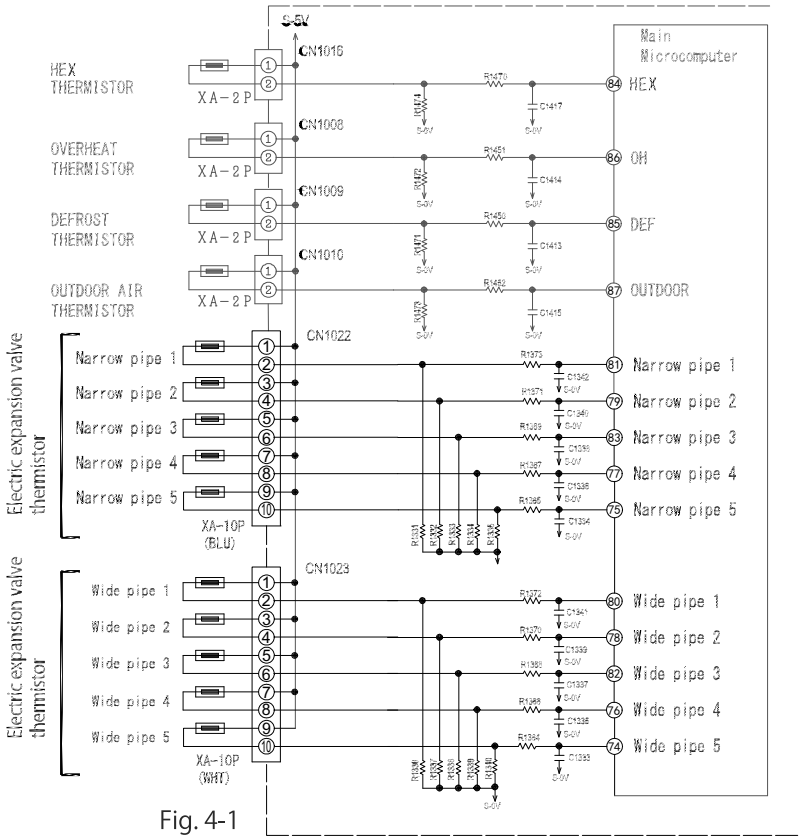


Fig. 4-1

- The OH thermistor circuit detects compressor head surface temperature, the DEF thermistor circuit detects defrost operating temperature, and the outside air temperature thermistor circuit detects the outside air temperature. In addition, the electric expansion valve thermistor (narrow pipe 1) detects the temperature of narrow pipe going to indoor unit 1 and (wide pipe 1) detects the temperature of the wide pipe going to indoor unit 1. (Narrow pipe 2) and (wide pipe 2) are for indoor unit 2.
- Thermistors are negative resistance elements. The resistance value grows smaller as the temperature rises, and grows larger as the temperature falls.
- If the compressor overheats, the resistance value of the OH thermistor grows smaller. S-5V is divided between the OH thermistor and R1472, and therefore the voltage of pin ⑧⑥ on the main microcomputer rises.
- The voltage of pin ⑧⑥ on the main microcomputer is compared with the value set and stored internally. If the set value is exceeded it is determined that the compressor has overheated, and operation is stopped.
- If frost accumulates on the outdoor heat exchanger, the temperature of the heat exchanger will fall rapidly. Therefore, the resistance value for DEF thermistor grows large and the voltage of pin ⑧⑤ on the microcomputer falls. If this voltage drops below the value set and stored internally, defrosting of the main microcomputer will start.
- Outdoor temperature is read by the outdoor temperature thermistor (voltage of pin ⑧⑦ on the microcomputer). Commands from the indoor microcomputer, values read from the outdoor temperature thermistor, and values read from the OH thermistor are taken into account to control the speed of the compressor and the speed of the outdoor fan. Typical values that indicate the relationship between outdoor temperature and voltage are shown below.

Table 4-1

Outdoor temperature (℃)	−10	0	10	20	30	40
Voltage (V) at both ends of R1473	1.19	1.69	2.23	2.75	3.22	3.62

- The Hex thermistor circuit measure the heat exchanger intermediate temperature of the outdoor unit, and micro computer estimate the pressure of compressor according to the temperature data. When the pressure reach the internal set value of the micro computer, the micro computer will adjust the speed of the compressor to protect the pressure of compressor.
- The temperatures at narrow pipe 1 - 5 and wide pipe 1 - 5 are read by thermistors, and the amount that electric expansion valves 1 - 5 are opened is changed to control the distribution of refrigerant.

Reference:
When a thermistor is open and disconnected, pins ⑧⑤ - ⑧⑦, ⑦⑧ - ⑧⓪ and ⑧① on the main microcomputer are approximately 0V. When there is a short-circuit in a thermistor, these pins are approximately 5V, LD1351 will lit and LD1352 blinks during stanby mode or running. Except for overheat thermistor, if there is a short-circuit in a overheat thermistor the LED indication during stanby mode and running will be different as below Table 4-2.
The number of blinks by LD1352 indicates the area/portion in unit that thermistor detect have problem.

Table 4-2

Unit condition	LD1351 indication	LD1352 indication
Stanby Mode	Lit	1 time blinking
Running	6 times blinking	Off

5. Electric Expansion Valve Circuit

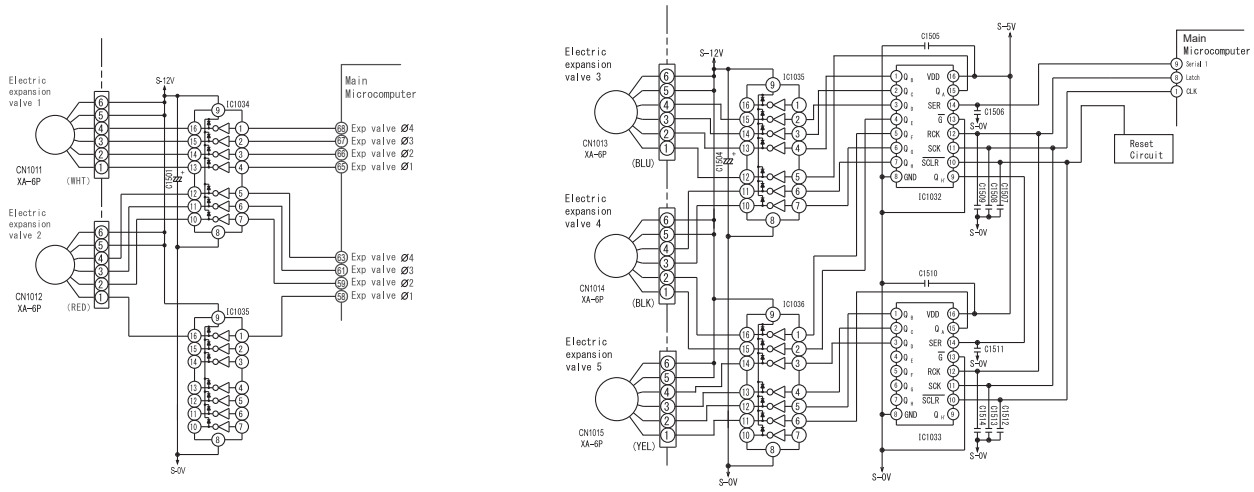


Fig. 5-1

- There are 5 electric expansion valves for indoor units 1-5.
- The electric expansion valves are powered by S-12V for expansion valves. 1- or 2-phase current is applied to 4-phase wound wires, switching the poles of the wound wires to control valve openings.
- The relationship between the switching direction of the current phase and the open/close direction of the valves is shown in the following table. When current is applied, approximately 0.9V passes through pins ①-④ of CN1011,CN1012 CN1013,CN1014 and CN1015 ; when no current is applied, it is approximately 12V. When the power is reset, the expansion valve is initialized for approximately 35 seconds. During initialization, use a tester to measure pins①-④ on CN1011,CN1012, CN1013,CN1014 and CN1015. If there is a pin that does not change at approximately 0.9V or 12V, there is an abnormality in that expansion valve or the Main microcomputer.
- The logic waveform for when an expansion valve operates is shown in Fig. 5-2.

Table 5-1

CN1011, CN1012, CN1013, CN1014, CN1015, Pin No.	Lead wire	Power conditions							
		1	2	3	4	5	6	7	8
④	White	ON	ON	OFF	OFF	OFF	OFF	OFF	ON
③	Yellow	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
②	Orange	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
①	Blue	OFF	OFF	OFF	OFF	OFF	ON	ON	ON
Operation mode 1→2→3→4→5→6→7→8 VALVE CLOSE 8→7→6→5→4→3→2→1 VALVE OPEN									

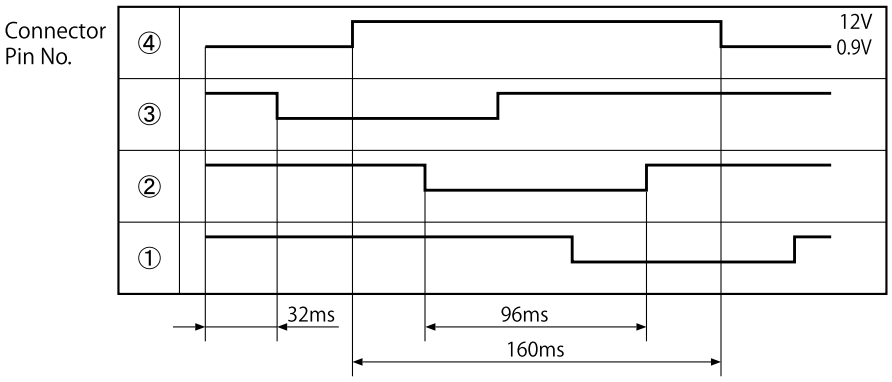


Fig. 5-2

When controlling an expansion valve, the temperature of the compressor head is detected and then the opening is adjusted to stabilize the valve to the target temperature.
This control cycle is performed once every 20 seconds, and a few pulses are output.

6 . Outdoor Fan Motor Control Circuit

● This outdoor unit is equipped with a built-in outdoor fan motor control circuit.

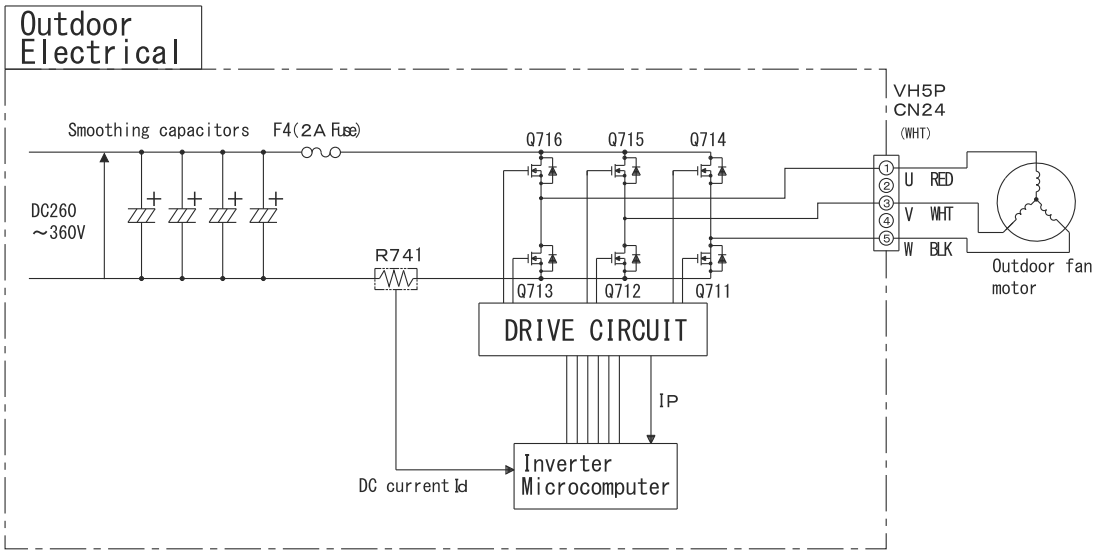


Fig. 6-1

Based on operation commands from the indoor microcomputer, the speed of the outdoor fan motor on this unit is determined by the main microcomputer and controlled by the inverter microcomputer.
Actual speed is estimated based on DC waveforms from R741 to control the speed so that it matches the operational commands.
Overcurrent and other failures in the outdoor fan motor are detected by the magnitude of the direct current.

(1) Control of outdoor fan motor at startup
If the propeller fan is already rotating at the start of operation, due to disturbances such as strong wind, operational behavior will vary according to the direction and speed of such rotation as described below.
Favorable wind is defined as wind that blows outward from the mouth ring.

Strong headwind : Control is not performed, to protect the equipment, and the propeller is blown in the opposite direction by the wind. The unit starts automatically once the wind has weakened.
Headwind : After the speed reduces gradually and finally stops, the speed is controlled in the normal direction.
Favorable wind : The speed of the fan is controlled normally.
Strong favorable wind : Control is not performed, to protect the equipment, and the propeller is blown in the normal direction by the wind. The unit starts automatically once the wind has weakened.

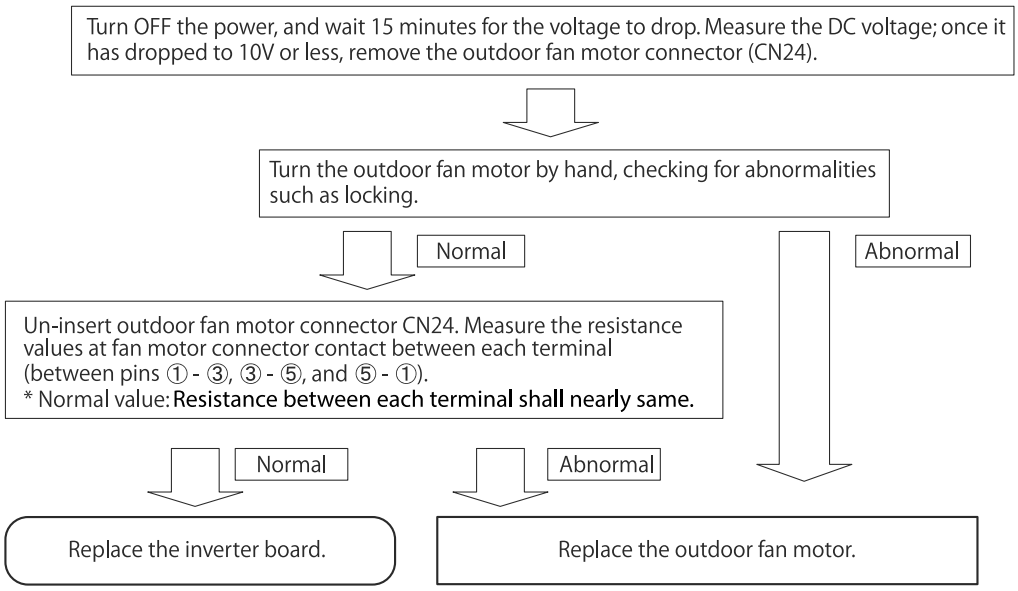
(2) Control of outdoor fan motor during operation
The speed of the propeller fan might drop during operation of the outdoor fan motor due to disturbances such as strong wind.
If such conditions continue for a long period of time, the propeller fan will stop. (Self-diagnosis lamp LD1351: Blinks 11 times)
When the fan is restarted, the operation described in (1) above is used.

(3) Confirmation method when self-diagnosis lamp LD1351 blinks 12 times

If LD1351 on the Main P.W.B. blinks 12 times (fan lock detected) and operation stops, use the following procedure to check the unit.

1. Mechanical locking caused by the insertion of foreign objects such as sticks into the propeller fan or freezing due to the accumulation of snow will cause fan lock to be detected and causing the unit stop it operation. Remove any foreign objects.
2. Check whether CN24 is securely inserted. A poor connection will cause a fan lock detection and causing the unit stop it operation. If CN24 is loose, insert it securely.
3. Strong wind around the outdoor unit might cause a fan lock detection. Check if the unit restarts. (Several minutes might be required for the unit to restart.) If the unit continues to operate after restarting, there is no failure in the outdoor fan motor or electrical components.
4. Perform a check of the outdoor fan motor. The procedure is shown below.

Procedure for Checking the Outdoor Fan Motor



5. Insert the outdoor fan motor connector (CN24).

* Also use the above procedure if F4 (2A fuse) is blown.

Caution

* The power supply for the outdoor fan motor is also used as the power supply for the compressor, and therefore has a high voltage (DC260 to 360V). Use sufficient caution to avoid electric shock when checking operations and performing repairs.

7 . Circuits for Communication between Microcomputers

- This unit uses two microcomputers: a main microcomputer and an inverter microcomputer. The two-way communication circuit shown in Fig. 7-1 is used for communication between these two microcomputers.

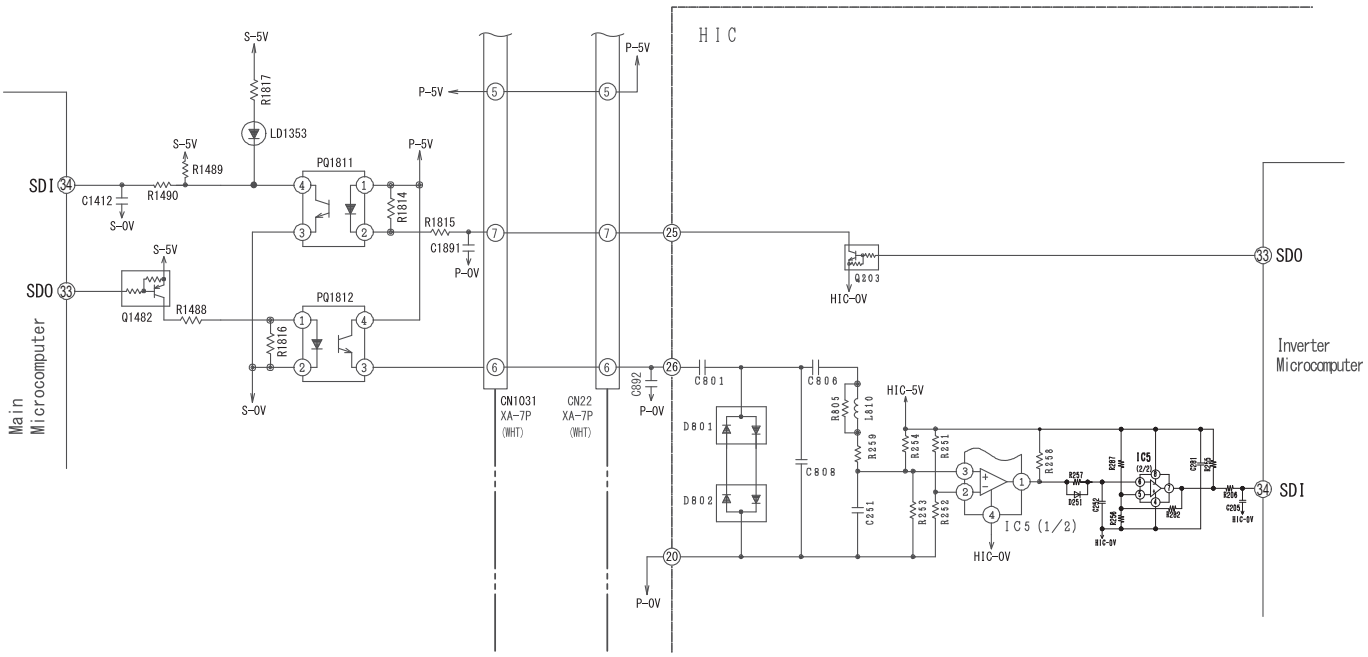


Fig. 7-1

- Signals from the main microcomputer to the inverter microcomputer follow this route: main microcomputer ㉝ → Q1482 → PQ1812 → IC5 → inverter microcomputer ㉞.

- Signals from the inverter microcomputer to the main microcomputer follow this route: inverter microcomputer ㉝ → Q203 → PQ1811 → main microcomputer ㉞.

8. Indoor/outdoor communication circuit

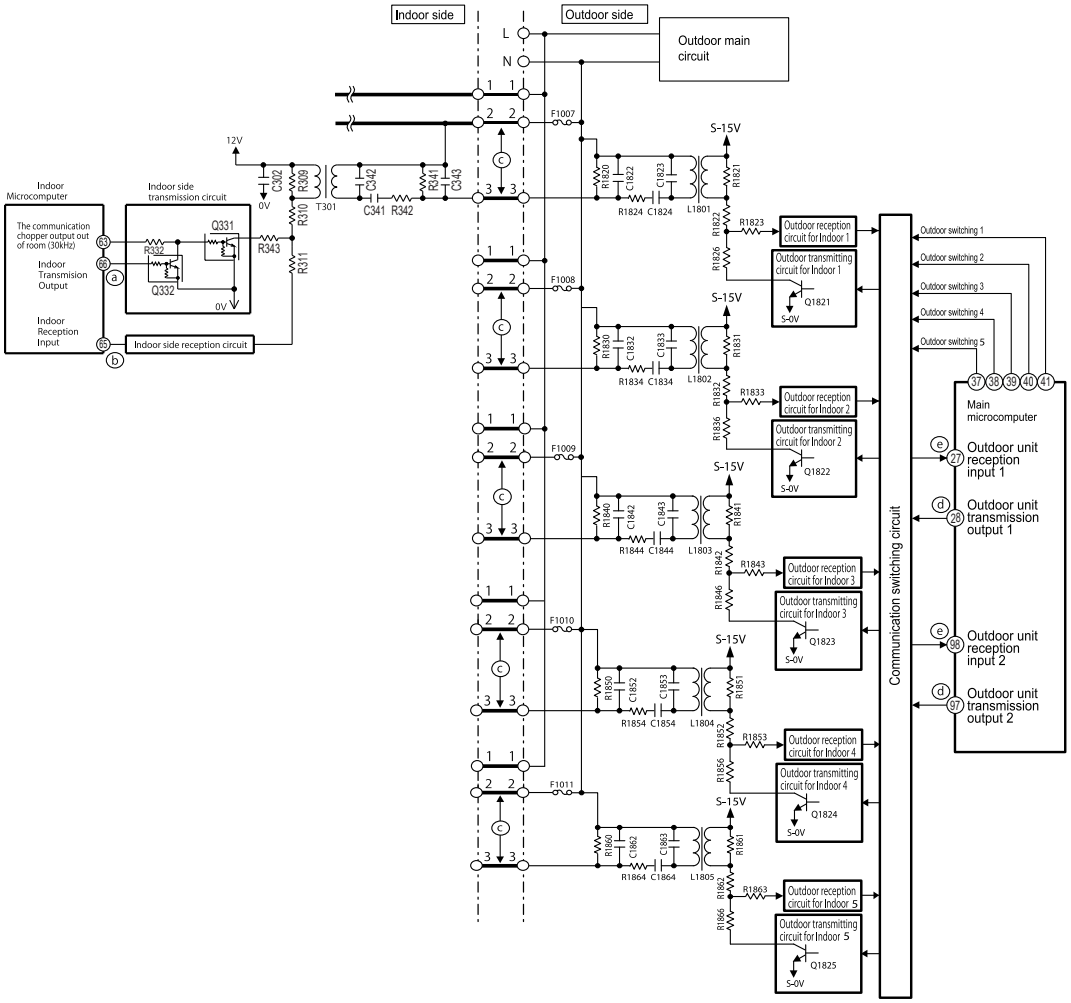


Fig. 5-1

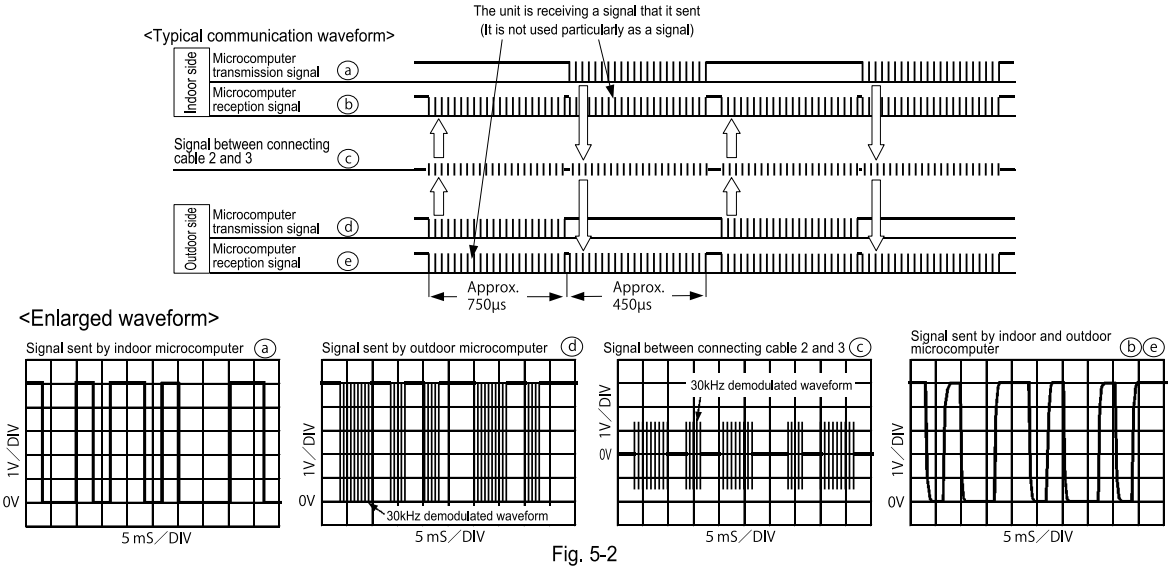


Fig. 5-2

* Indoor and outdoor communications are conducted by using lines 2 and 3 of connecting cable. Line 2 of connecting cable is share with a transmission channel that powers the indoor unit.
* Data communicated between the indoor and outdoor units are outputted from the microcomputer as serial signals and are transmitted as demodulated by a 30kHz carier wave (for indoor) and a 30kHz carier wave (for outdoor).

Check

If the communication fails between the indoor and outdoor units for some reason, the product will give a self-diagnosis display either by “the timer lamp blinking 3 times (indoor failure)” or “the the timer lamp blinking 12 times (outdoor failure)” depending on the cause.

9. Hibernation Mode

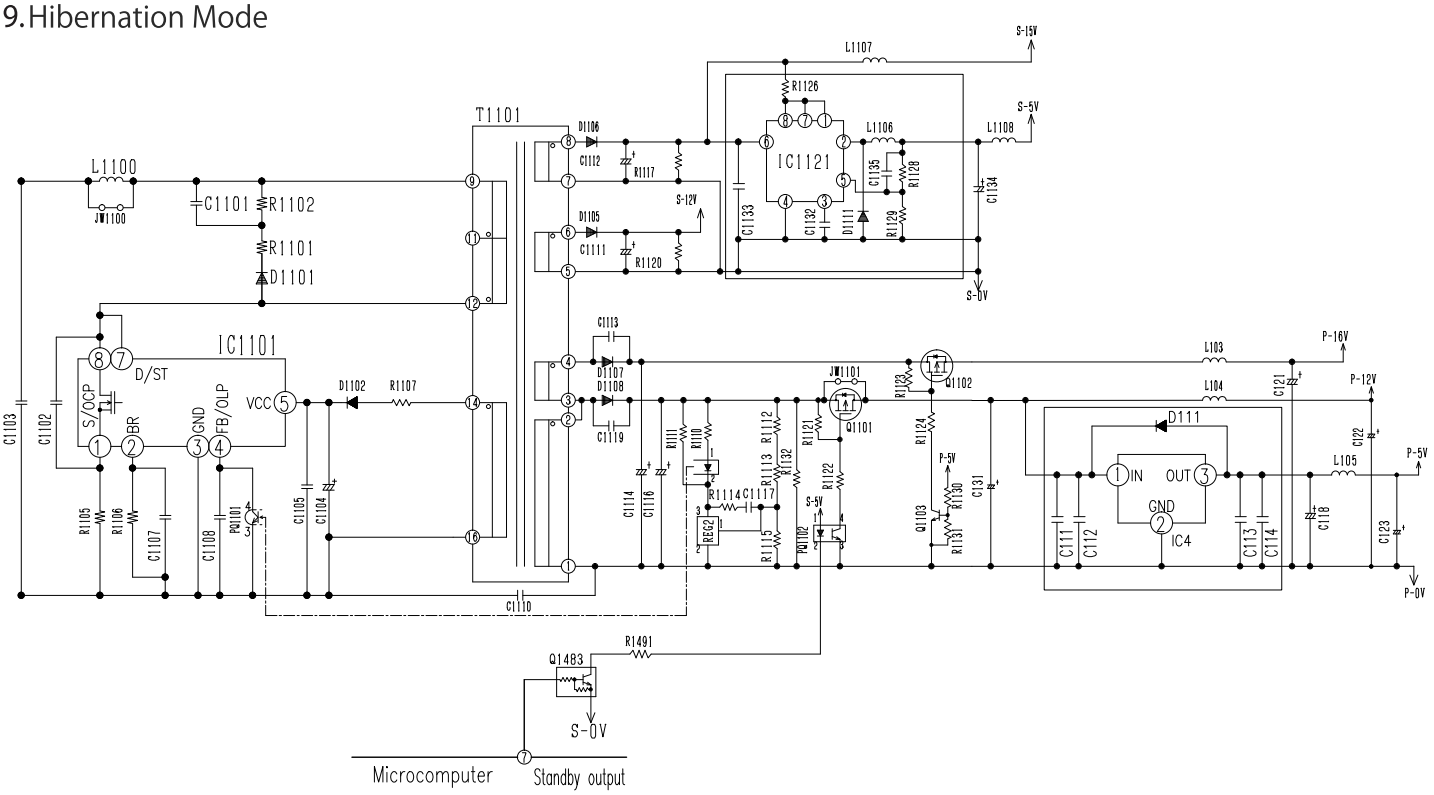


Fig. 8-1

- This model have designed to enter hibernation mode for energy saving and power consumption reduction during stanby.
- Unit will enter hibernation mode during below stanby condition if not received any signal from remote controller and expansion valve already completed initialization .
  1) Stanby continuesly
  2) Unit in running condition, then off the unit by remote controller and leave the unit in stanby condition.
- During hibernation activation, main microcomputer pin ⑦ will change to LOW condition.
  Due to this pin become LOW Q1483, PQ1102 and Q1101 will be OFF. As Q1101 OFF, P-12V and P-5V will drop to 0V. Due to P-5V drop to 0V, Q1103 will be OFF and causing P-16V also drop to 0V.
- During hibernation mode, DC voltage will be as below condition.
  (1) S-15V : Maintain at 15V
  (2) S-12V : Maintain at 12V
  (3) S-5V : Maintain at 5V
  (4) P-16V : Drop to 0V
  (5) P-12V : Drop to 0V
  (6) P-5V : Drop to 0V

  All LED on the Main P.W.B and Inverter P.W.B (LD301, LD1351, LD1352, LD1353, LD1401, LD1402, LD1403, LD1404, LD1405) will be OFF during this mode.
- If outdoor unit have failure/error, all indication including error diagnosis LED will be OFF once the smoothing capacitor (C021 ~ C024) voltage reduce to 29V.
- For inspection during hibernation mode, service person can measure DC voltage S-15V, S-12V and S-5V on Main P.W.B.
  But to measure DC voltage P-16V, P-12V and P-5V on Inverter P.W.B., service person shall on the indoor unit by remote controller first. This will change the unit from hibernation mode to normal.

10. H-LINK (Optional part) (SPX-RAMHLK)

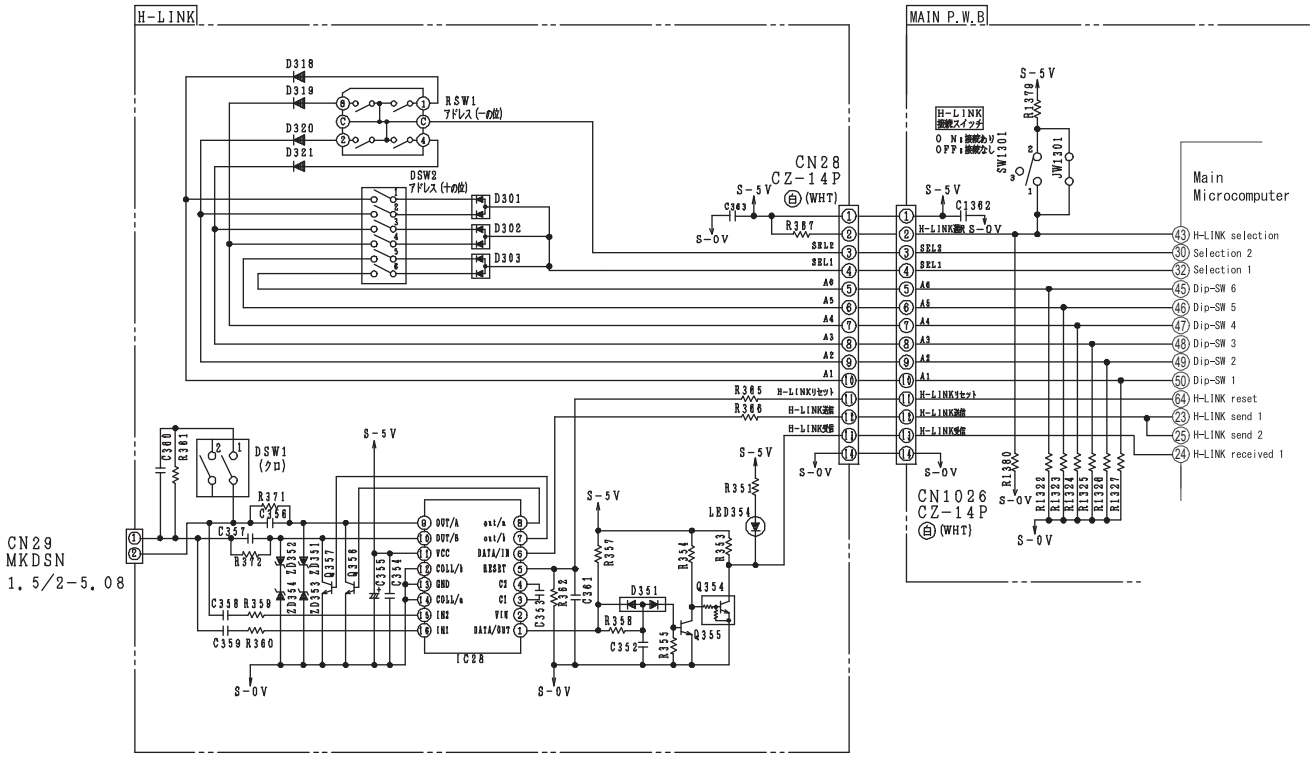


Fig. 9-1

- This model have designed to be connected to Central Control Station through H-LINK board.
- This H-LINK board are sell as optional part and it part number is SPX-RAMHLK.
- H-LINK board CN28 shall be connected to MAIN board CN1026 through 14 pin cord assembly.
- RSW1 and DSW2 shall be set accordingly to the refrigerant cycle number that determine by service personal.
- Central Control station shall be connected to H-LINK board through CN29.
- DSW1 pin 1 shall be switch on only one position in whole H-LINK system.
- SW1301 must be switch on to activate the H-LINK .
- Hibernation mode will be automatically disable if the unit activate the H-LINK system.
- Detail of installation of the H-LINK board shall refer to next page {H-LINK Board (SPX-RAMHLK) Installation Manual}.

10.1 H-LINK Board (SPX-RAMHLK) Installation Manual

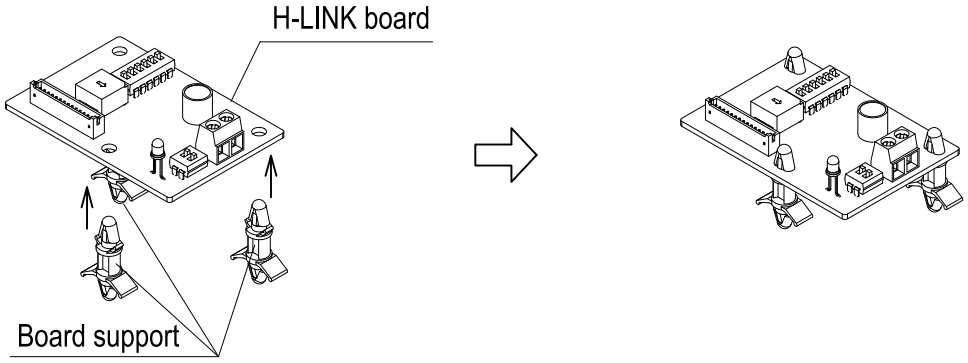
Check through H-LINK board accessories.

Table 1

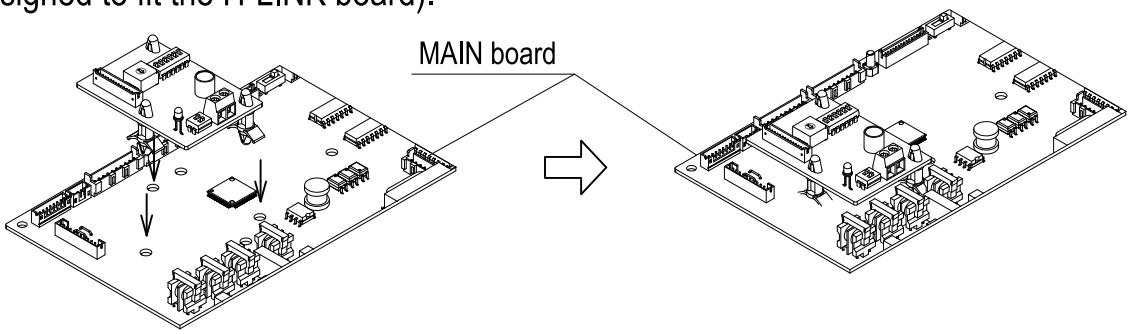
No	Part Name	Quantity
①	H-LINK board	1
②	Board support	3
③	14 pin cord	1
④	Installation manual	1

10.1.2 H-LINK board installation

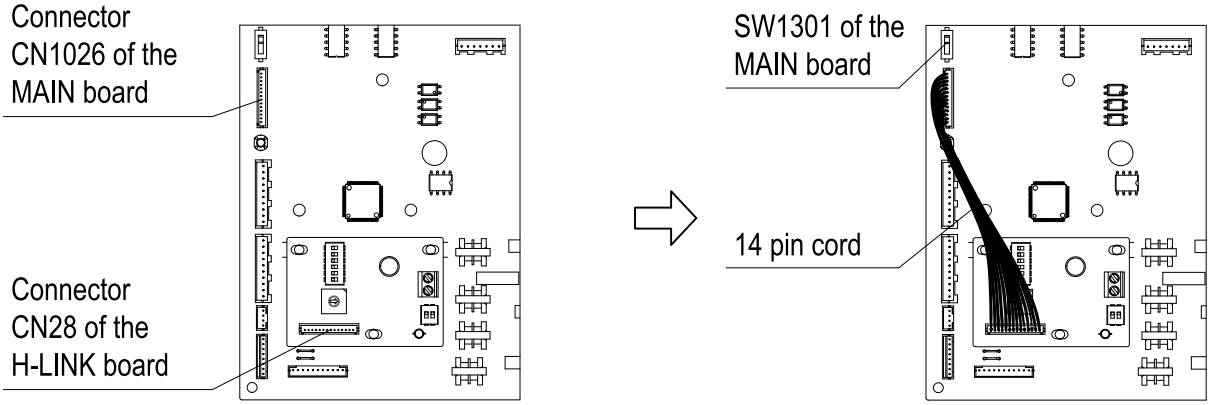
i. Assemble board support (3 pcs) to H-LINK board holes as following picture.



ii. Insert the H-LINK board into the MAIN board (please use 3 holes on MAIN board that designed to fit the H-LINK board).

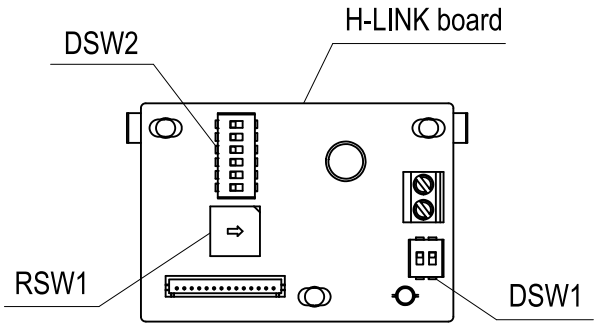


iii. Insert the 14 pin cord to the CN28 of the H-LINK board and CN1026 of the MAIN board.



iv. Set the SW1301 of the MAIN board to ON condition before start the H-LINK operation (default position from factory is OFF condition).

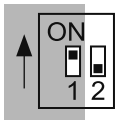
10.1.3 DIP switch setting.



i. DSW1 setting (terminal resistance setting).

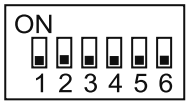
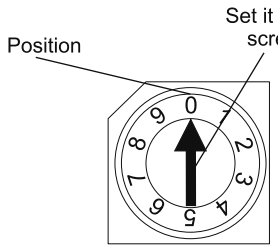
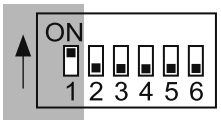
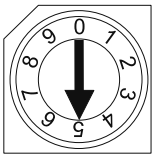
Terminal resistance setting set by pin number 1 of DSW1.
(Default setting from factory is pin number 1 of DSW1 set to OFF condition).

Terminal resistance should be ON in only one position in whole H-LINK.
After checking terminal resistance setting of whole H-LINK, pin number 1 of DSW1 should be set properly.

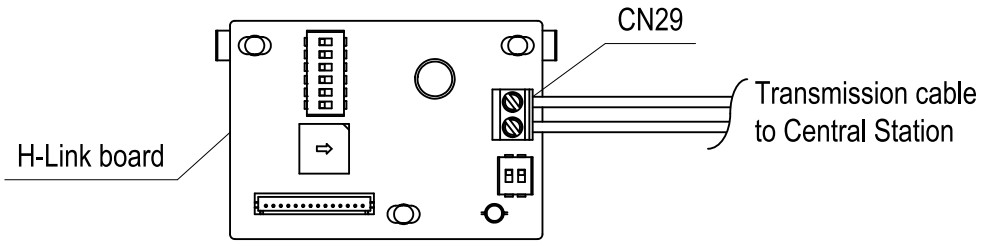
Example: If set pin number 1 to ON condition
DSW1


ii. DSW2 and RSW1 setting.

Refrigerant cycle number is set by DSW2 and RSW1.

DSW2 (tens digit)	RSW1 (ones digit)	Example: Setting cycle number to 15	
		DSW2	RSW1
			
Default setting from factory for DSW2 and RSW1 are set to OFF and 0 respectively.		Pin number 1 is ON	The set position is 5

10.1.4 Connect the H-LINK board to the Central Station by fixing the transmision cable at CN29.



The transmission cable used shall be as below.

i. 2 cores cable (0.75mm^2 to 1.25mm^2). Model : VCTF, VCT, CVV, MVVS, CVVS VVR, VVF.

ii. 2 cores twist pair cable. Model : KPEV, KPEV-S.

Total length of the transmission cable shall be below than 1000m.

10.2 Error code during H-LINK operation.

- If the is any abnomallity to the unit, error code will be display at Central Control Station.
- Error code displayed, its self-diagnosis and it suspected cause of the error shall refer to below table.

Centralized device Alarm display code	RAC (IDU) Alarm display code	Self Diagnosis Display name	Internal and external classification	Display contents (Main cause)	Remarks
1A	0010	Air supply fan failure	IDU	Ventilation fan failure	Reserved ※2
1B	0011	Dirt sensor error	IDU	Ventilation fan failure	Reserved ※2
1C	0012	Cleaning error	IDU	Cleaning error	Reserved ※2
1D	0013	Peltier error	IDU	Peltier error	Reserved ※2
1E	0014	Human sensor error	IDU	-	Reserved ※2
1F	0015	Communication error by other products.	IDU	Communication error by other products.	
71	0001	Four-way valve operation failure	IDU	Four-way valve operation failure	
-※1	0002	Forced cooling in operation	IDU	Forced cooling in operation	Be not a failure
73	0003	IDU communication circuit error	IDU	IDU communication circuit error	
75	0005	Power relay Contact Welding	IDU	Power relay Contact Welding	
76	0006	Error water level	IDU	Error water level	
-※1	0007	Drain-pump test run	IDU	Drain-pump test run	Be not a failure
79	0009	Thermistor failure	IDU	Thermistor failure	
7A	000A	IDU fan failure	IDU	IDU fan failure	
7B	000B	Ionizer generator error	IDU	Ionizer generator error	Reserved ※2
7C	000C	ODU communication circuit error	IDU	ODU communication circuit error	
7D	000D	EEPROM read error	IDU	EEPROM read error	
7E	000E	HEX thermistor wire break short circuit	IDU	HEX thermistor wire break short circuit	Reserved ※2
7F	000F	Indoor temp. thermistor wire break short circuit	IDU	Indoor temp. thermistor wire break short circuit	Reserved ※2
82	0102	Stopping Ip cutting	ODU	Ip Cutting input Signaling detection	
83	0103	Abnormal low speed	ODU	Step-out by axial error condition to detection	Normal operation condition
84	0104	Switching failure	ODU	Step-out by axial error condition to detection	Synchronization, acceleration operation condition
85	0105	Over load shutdown	ODU	Less than min. revolution at over load	
86	0106	OH Stop	ODU	OH has reached the dead temperature.	
87	0107	Thermistor error	ODU	Thermistor burnout/short circuit	
88	0108	Communication between INV	ODU	Communication error between MCU	
89	0109	Incorrect connection	ODU	Connect RAC communication format IDU	Connect single IDU
8A	010A	Power supply VoltageError	ODU	DC voltage is out of limits	
8B	010B	Fan failure detection 1	ODU	Fan OVL stopped	
8C	010C	Fan failure detection 2	ODU	Ip cutting, step-out by axial error, etc.	
8D	010D	EEPROM error	ODU	Read error (ACK, checksum)	
8E	010E	Overvoltage error	ODU	DC voltage is out of limits	Starting
8F	010F	Circuit error	ODU	ACT circuitry, Is/Vs error, etc.	
A0	0128	Valve error	ODU	Yutampo multi valves error	
A1	0029	Leakage of gas (generated IDU)	IDU	Gas-leak Fix	
A2	002A	Gas sensor failure (IDU generated)	IDU	Communication error with gas sensor, etc.	
A4	0129	Gas leak (notification receiving equipment)	ODU	When an A1～A2 occurs, returned to except of the leak generating unit by notifying the ODU.	
A5	012A	Gas sensor failure (notification receiving equipment)	ODU		

・For more information on alarms, see IDU/ODU self diagnosis.

・When an alarm is sent from RAC IDU, the alarm is cleared by RAC IDU.

The alarm cannot be cleared from the central device. (Fit to the operating specs of IDU ≠ RAC adapter)

※1:An alarm code is sent from IDU, but it is not notified to the central device. (Fit to the operating specs of IDU ≠ RAC adapter)

※2:It is not sent from IDU.

SELF CHECK

When it is difficult to judge whether the compressor or the electrical part is faulty resulting self diagnosis lamp LD1351 blink 2,3,4 or 5 times, please confirm first the compressor terminal insulation by using mega ohm checker. If the insulation is normal, proceed to below self-check method.

■Self-check diagnosis method

1. Switch OFF main power supply. (Wait until DC voltage fully discharged :15 minutes or more)
2. Short circuit between JW1001 & JW1002.
3. Switch ON main power supply. (LD1352 will blink 1 time)
4. Press and hold TEST SWITCH for more than 1 second.
5. Self-check diagnosis result will appear.
   - The content of diagnosis result shall refer to below table.
6. SWITCH OFF MAIN POWER SUPPLY. THEN RELEASE BACK JW1001 & JW1002 TO ORIGINAL CONDITION (NO SHORT CIRCUIT CONDITION).

* IF STEP 6 NOT CARRIED OUT, THE SYSTEM WILL NOT OPERATE UNTIL 3 MINUTES HAS LAPSED AFTER RESTORE THE POWER SUPPLY.

■Self-check diagnosis result

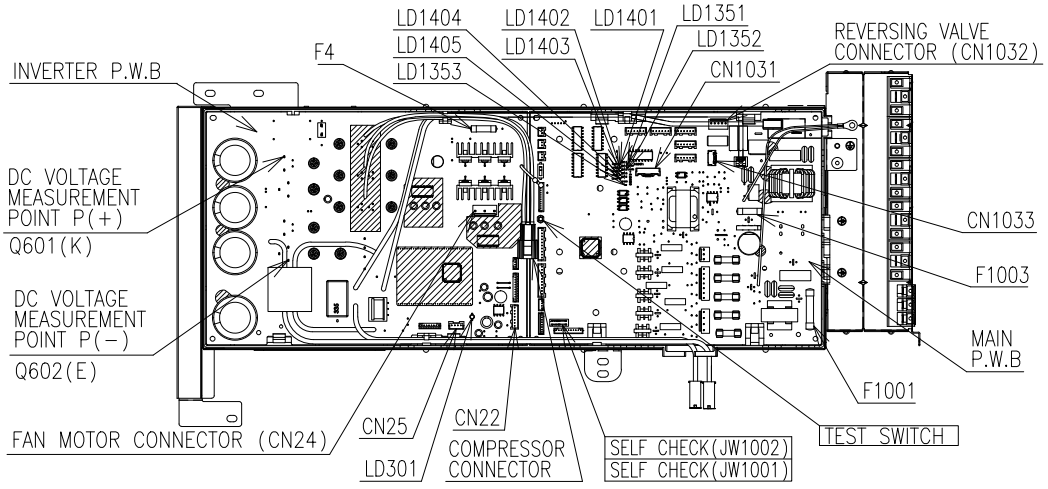
[SELF-CHECK] DIAGNOSIS RESULT		
LD301	DIAGNOSIS CONTENT	REPAIR METHOD
1 TIME BLINK	ELECTRICAL OK	CHANGE COMPRESSOR
2 TIMES BLINK	PEAK CURRENT CUT OFF SIGNAL DETECTED	CHANGE INVERTER P.W.B
7 TIMES BLINK	COMPRESSOR CURRENT ABNORMAL	COMPRESSOR CONNECTOR LOOSE → CHECK CONNECTOR AFTER CHECK COMPRESSOR CHANGE INVERTER P.W.B
10 TIMES BLINK	DC VOLTAGE ABNORMAL	AC VOLTAGE ABNORMAL (BEYOND RATED ± 10%) ↳ CONNECT WITH CORRECT AC VOLTAGE AC VOLTAGE NORMAL (WITHIN RATED ± 10%) ↳ CONNECTOR (CN1033,CN25) BAD INSERTION → CHECK CONNECTOR OTHER → CHANGE BOTH MAIN & INVERTER P.W.B
13 TIMES BLINK	EEPROM READING ERROR	CHANGE INVERTER P.W.B

In case abnormality found at the checking result, please confirm the connecting cord having problem or not before replace the defect part according to the table of self-check diagnosis result.

In case no abnomality found at electrical part, release back JW1001 & JW1002 to original condition (no short circuit condition) before it can be use.

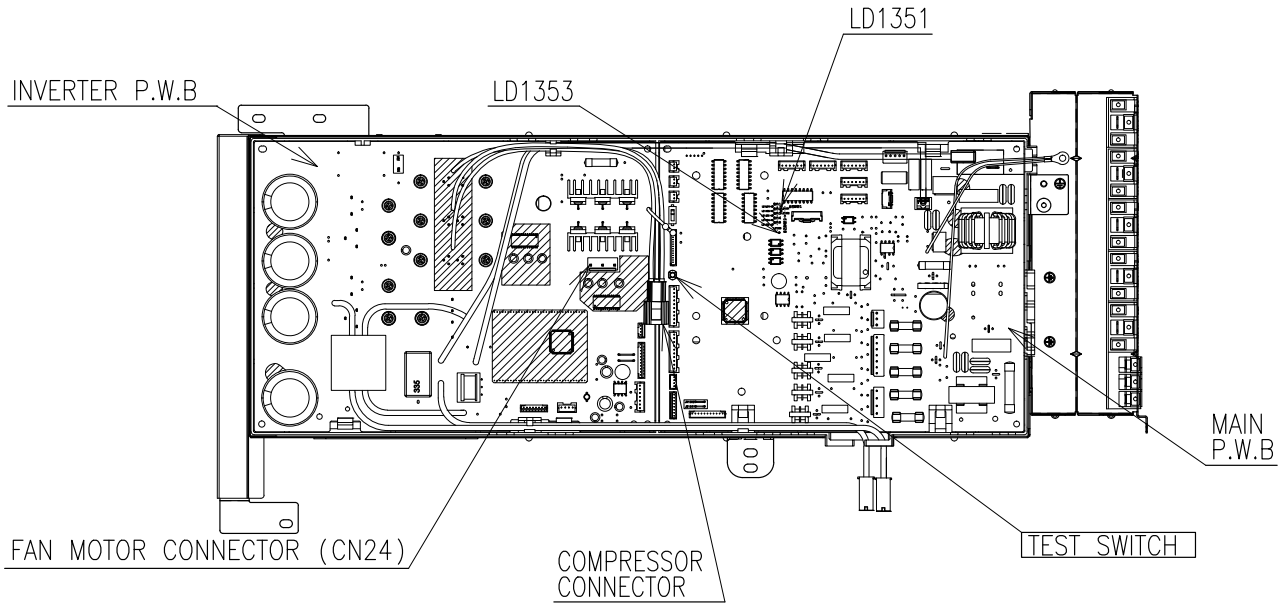
※If forgot to release back JW1001 & JW1002 to original condition, the system will operate as below condition after power supply restored.

Time after power restored	Unit condition
Below than 3 minutes	Indoor timer lamp will 12 times blinking (show error - outdoor communication circuit failure).
3 ~ 6 minutes	Can run as normal.
After 6 minutes	Unit enter hibernation mode. Can run as normal.



Collect refrigerant using test switch operation

1. Turn OFF the breaker and wait for 1 minute or more before turn ON back the breaker.
2. Detach the electrical cover of outdoor unit and ensure LD1353 is blinking once.
3. Wait 20 seconds or more before pressing the test switch for 1 second or more to start the forced cooling operation.
4. Pressing the test switch again for 1 second or more will stop the operation.



■ Cautions

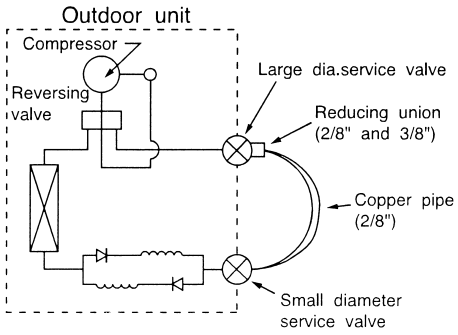
1. Do not any circumstances operate the outdoor unit for more than 5 minutes.
2. Doing work with the compressor connector removed will cause the LD1351 to blink 4 times. It will not start the operation.
3. For another test run, turn OFF the breaker and turn it back ON to reset the power supply. (The test switch is accepted only once after power ON. After operation by remote controller, it is not accepted.)
4. When the operation with the test switch is done, turn OFF the breaker.

How to operate the outdoor unit indipendently

1. Connect the large dia. pipe side and small dia. pipe side service valves using a pipe.

Connect the small diameter service valve and the large diameter service valve using the reducing union and copper pipe as shown on the right.

Charge refrigerant of 300g after vacuuming (※1)



Parts to be prepared

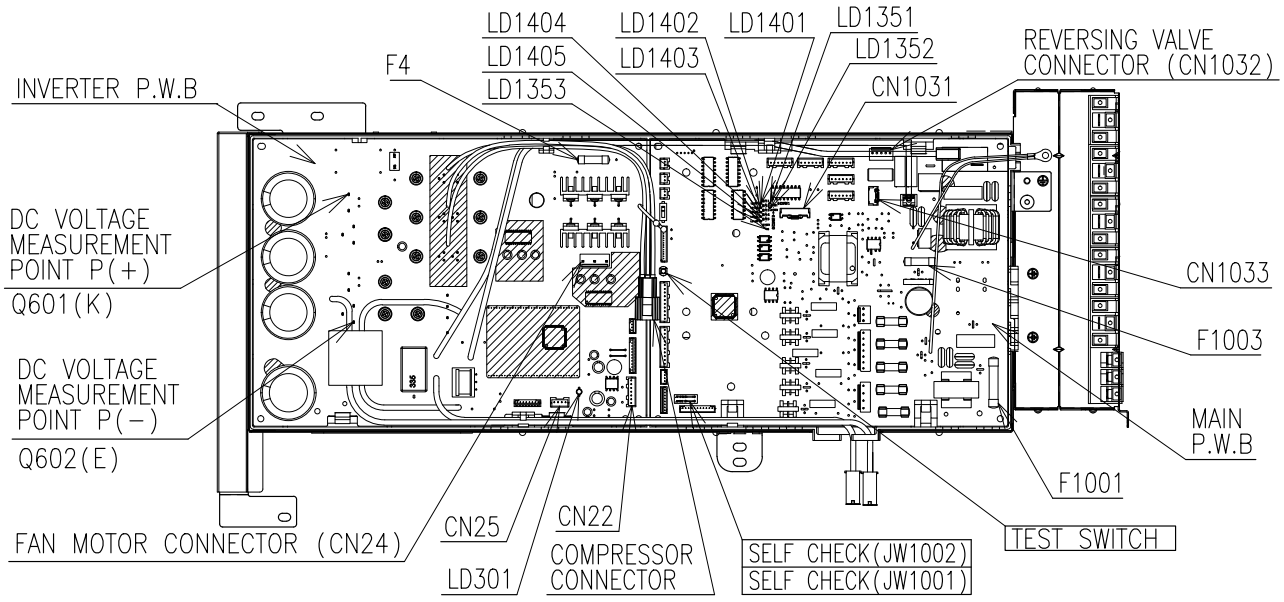
(1) Reducing union
2/8" (6.35mm)
3/8" (9.52mm)
(2) Copper pipe (2/8" and 3/8")

Do not operate more than 5 minutes

The operation method is the same as "Collect refrigerant using test switch".
※1 The charging amount of 300g is equivalent to the load in normal operation.

Lighting mode of the self-diagnosis lamp

1 Mounting location of the self-diagnosis lamp



Lighting mode of the self-diagnosis lamp

2 Lighting mode of the self-diagnosis lamp

SELF-DIAGNOSIS DISPLAY FUNCTION (OUTDOOR SIDE DISPLAY)

LED INDICATION DURING OPERATION

LED	STATUS		SELF-DIAGNOSE CONTENT	CHECKING POINT	REPAIR METHOD
LD1353	BLINK		NORMAL	NORMAL (BLINKING TIMING IS NOT MALFUNCTION).	
	OFF	STANDBY MODE	NORMAL	LED WILL OFF DURING STANDBY MODE.	
	OFF	OTHER THAN STANDBY MODE	ABNORMAL	NO POWER SUPPLY AT TERMINAL "L - N". →	CHECK POWER CABLE.
				CIRCUIT DEFECT. →	CHANGE BOTH MAIN & INVERTER P.W.B.
	LIT		ABNORMAL	CIRCUIT DEFECT. →	CHANGE BOTH MAIN & INVERTER P.W.B.
LD1401 (INDOOR 1) LD1402 (INDOOR 2) LD1403 (INDOOR3) LD1404 (INDOOR4) LD1405 (INDOOR 5)	LIT		CONNECTING	CONNECTED NORMALLY WITH INDOOR UNIT.	
	1 TIME BLINK		COMMUNICATION ERROR BETWEEN INDOOR/OUTDOOR	CONNECTING CABLE DISCONNECTED. →	CHANGE CONNECTING CABLE.
				CONNECTING CABLE MISCONNECTION. →	ADJUST CONNECTING CABLE.
				F1007 ~ F1011 (5A FUSE) BLOWN. →	CHANGE FUSE AFTER CHECK CABLE.
				COMMUNICATION CIRCUIT DEFECT. →	CHANGE BOTH MAIN & INVERTER P.W.B.
	OFF	STANDBY MODE	NORMAL	LED WILL OFF DURING STANDBY MODE.	
	OFF	OTHER THAN STANDBY MODE	ABNORMAL	INDOOR UNIT IS NOT CONNECTED. IF ALREADY CONNECTED, CONFIRM ABOVE 1 TIME BLINK CHECKING POINT.	

LED INDICATION DURING COMPRESSOR OPERATE

LD301	OPERATION STATUS
LIT	NORMAL
BLINK REPEATINGLY WITH 2 SEC LIT - 0.3 SEC OFF	OVERLOAD (NORMAL)

[THE CONTENT OF ※1]
- ACCORDING TO THE INDOOR UNIT THAT BE INSTALLED THE GAS SENSOR.

LED INDICATION DURING STOP

LD1351	LD1352	SELF-DIAGNOSE CONTENT	CHECKING POINT	REPAIR METHOD
OFF	OFF	NO POWER SUPPLY	NO POWER SUPPLY AT TERMINAL "L - N". →	CHECK POWER CABLE.
			CONNECTING CABLE MISCONNECTION. →	CHECK CONNECTION CABLE.
			F1003 (2A FUSE) BLOWN. →	CHANGE BOTH MAIN & INVERTER P.W.B.
			CIRCUIT DEFECT. →	CHANGE BOTH MAIN & INVERTER P.W.B.
		NORMAL STOP	NOT MALFUNCTION	
LIT	BLINK	THERMISTOR ABNORMAL	(see below)	
			THERMISTOR CONNECTOR HALF INSERT. →	INSERT CONNECTOR SECURELY.
			THERMISTOR WIRE SHORTED OR CUT. →	CHANGE THERMISTOR.
			CIRCUIT DEFECT. →	CHANGE INVERTER P.W.B.
1 TIME BLINK	OFF	RESET STOP	WAITING COMPRESSOR TO START. →	NORMAL.
			OTHER. →	IF STILL NOT SOLVE AFTER CHECK THE CONNECTING CABLE, CHANGE MAIN P.W.B.
2 TIMES BLINK		PEAK CURRENT CUT	SERVICE VALVE NOT OPEN. →	CHECK THE SERVICE VALVE.
3 TIMES BLINK		ABNORMAL LOW SPEED ROTATION	COMPRESSOR CONNECTOR NOT CONNECTED. →	CHECK CONNECTOR.
4 TIMES BLINK		SWITCHING FAILURE	IF NO ISSUE WITH ABOVE CHECKING POINT AND AFTER CHECK THE COMPRESSOR INSULATION, PROCEED TO [SELF-CHECK]. →	MAKE ADJUSTMENT BASED ON THE RESULT OF [SELF-CHECK] DIAGNOSIS.
5 TIMES BLINK		OVERLOAD LOWER LIMIT CUT	OUTDOOR UNIT SURROUNDING IS BLOCKED. →	REMOVE THE CAUSE OF BLOCKING.
			OTHER. →	CHECK REFRIGERANT CYCLE.
6 TIMES BLINK		COMPRESSOR TEMPERATURE RISE	SERVICE VALVE NOT OPEN. →	CHECK THE SERVICE VALVE.
			REFRIGERANT LEAK. →	CHECK REFRIGERANT CYCLE AND RE-CHARGE IT.
			BAD COMPRESSOR CONNECTOR INSERTION. →	CHECK CONNECTOR.
			CIRCUIT DEFECT. →	CHANGE MAIN P.W.B.

THERMISTOR ABNORMAL LOCATION

BLINK	ABNORMAL LOCATION
1 TIME	OH THERMISTOR
2 TIMES	DEF THERMISTOR
3 TIMES	OUTDOOR THERMISTOR
20 TIMES	HEX THERMISTOR

BLINK	ABNORMAL LOCATION	
4 TIMES	ELECTRIC EXPANSION VALVE THERMISTOR	NARROW PIPE 1
5 TIMES		WIDE PIPE 1
6 TIMES		NARROW PIPE 2
7 TIMES		WIDE PIPE 2
8 TIMES		NARROW PIPE 3

BLINK	ABNORMAL LOCATION	
9 TIMES	ELECTRIC EXPANSION VALVE THERMISTOR	WIDE PIPE 3
10 TIMES		NARROW PIPE 4
11 TIMES		WIDE PIPE 4
12 TIMES		NARROW PIPE 5
13 TIMES		WIDE PIPE 5

8 TIMES BLINK	OFF	COMMUNICATION ERROR BETWEEN MICON	BAD CONNECTOR INSERTION (CN1031, CN22). →	CHECK CONNECTOR INSERTION.
			OTHER. →	CHANGE BOTH MAIN & INVERTER P.W.B.
9 TIMES BLINK		INDOOR TYPE MISMATCH (SINGLE/MULTI)	REFER LD1401 ~ LD1405. CHECK INDOOR TYPE.	REPLACE INDOOR P.W.B./UNIT
	LIT	GAS SENSOR ERROR	GAS SENSOR (INDOOR).	CHECK INDOOR UNIT. PLEASE REFER TO ※1.
10 TIMES BLINK	OFF	POWER SUPPLY VOLTAGE ERROR	ABNORMAL (BEYOND RATED VOLTAGE ±10%). →	SUPPLY CORRECT VOLTAGE.
			NORMAL (WITHIN RATED VOLTAGE ±10%).	
			→ BAD CONNECTOR INSERTION (CN1033,CN25). →	CHECK CONNECTOR INSERTION.
			→ OTHER. →	CHANGE BOTH MAIN & INVERTER P.W.B.
11 TIMES BLINK		FAN STOP BY STRONG WIND	TEMPORARY STOP DUE TO STRONG WIND.	FAN WILL ROTATE AGAIN AFTER WIND BECOME WEAK.
12 TIMES BLINK		FAN LOCK STOP	TEMPORARY STOP DUE TO STRONG WIND. →	FAN WILL RESTART MOVING LATER.
			PROPELLAR FAN LOCK. →	REMOVE THE THING THAT BLOCKING FAN.
			CONDUCT OUTDOOR FAN MOTOR CHECK. →	REPLACE THE DEFECT PART.
13 TIMES BLINK		EEPROM READING ERROR	LD301 ALSO BLINK 13 TIMES. →	CHANGE INVERTER P.W.B. IF STILL NOT SOLVE, CHANGE MAIN P.W.B.
			OTHER. →	CHANGE MAIN P.W.B.
14 TIMES BLINK		DC VOLTAGE ABNORMAL	CONFIRM AC POWER SUPPLY & DC VOLTAGE IS NORMAL. →	CHANGE INVERTER P.W.B.
			COMPRESSOR LOAD ABNORMAL. →	INSPECT THE COMPRESSOR.
15 TIMES BLINK		CIRCUIT ABNORMAL	CHANGE INVERTER P.W.B.	
16 TIMES BLINK		HIGH LOAD STOP	SERVICE VALVE NOT OPEN. →	CHECK SERVICE VALVE.
			OUTDOOR UNIT SURROUNDING IS BLOCKED. →	REMOVE THE CAUSE OF BLOCKING.
			CLOGGED FILTER IN INDOOR UNIT. →	CHECK THE INDOOR UNIT FILTER.

DURING UNIT STOP, TO DETERMINE WHETHER THE COMPRESSOR OR THE ELECTRICAL IS FAULTY WHEN SELF-DIAGNOSIS BLINK 2,3,4 OR 5 TIMES HAPPEN, CONFIRM THE COMPRESSOR TERMINAL INSULATION BY USING MEGA OHM CHECKER. IF THE INSULATION IS NORMAL, PROCEED TO BELOW [SELF-CHECK] METHOD. TAKE NOTE THAT DURING [SELF-CHECK], THERE ARE POSSIBILITY LOUD SOUND FROM IPM CAN BE HEARD IN THE CASE OF IPM IS BROKEN.

[SELF-CHECK] DIAGNOSIS METHOD

1. SWITCH OFF MAIN POWER SUPPLY.
2. SHORT CIRCUIT BETWEEN JW1001 & JW1002.
3. SWITCH ON MAIN POWER SUPPLY - LD1352 WILL BLINK 1 TIME.
4. PRESS [TEST SWITCH] FOR ORE THAN 1 SECOND.
5. SELF-CHECK DIAGNOSIS RESULT WILL APPEAR (REFER BELOW TABLE).
6. SWITCH OFF MAIN POWER SUPPLY. THEN RELEASE BACK JW1001 & JW1002 TO ORIGINAL CONDITION (NO SHORT CIRCUIT CONDITION).

* IF STEP 6 NOT CARRIED OUT, THE SYSTEM WILL NOT OPERATE UNTIL 3 MINUTES HAS LAPSED AFTER RESTORE THE POWER SUPPLY.

[SELF-CHECK] DIAGNOSIS RESULT

LD301	DIAGNOSIS CONTENT	REPAIR METHOD
1 TIME BLINK	ELECTRICAL OK.	CHANGE COMPRESSOR.
2 TIMES BLINK	PEAK CURRENT CUT OFF SIGNAL DETECTED.	CHANGE INVERTER P.W.B.
7 TIMES BLINK	COMPRESSOR CURRENT ABNORMAL.	COMPRESSOR CONNECTOR LOOSE ⟹ CHECK CONNECTOR. AFTER CHECK COMPRESSOR CHANGE INVERTER P.W.B.
10 TIMES BLINK	DC VOLTAGE ABNORMAL.	AC VOLTAGE ABNORMAL (BEYOND RATED ± 10%). ■▶ CONNECT WITH CORRECT AC VOLTAGE. AC VOLTAGE NORMAL (WITHIN RATED ± 10%). ■▶ CONNECTOR (CN1033,CN25) BAD INSERTION ⟹ CHECK CONNECTOR. OTHER ⟹ CHANGE BOTH MAIN & INVERTER P.W.B.
13 TIMES BLINK	EEPROM READING ERROR.	CHANGE INVERTER P.W.B.

[OUTDOOR FAN MOTOR CHECK] DIAGNOSIS METHOD

1. SWITCH OFF MAIN POWER SUPPLY.
2. UN-INSERT OUTDOOR FAN MOTOR CONNECTOR CN24.
3. MAKE SURE NO ABNORMALITIES AT THE FAN SHAFT.
4. MEASURE RESISTANCE AT FAN MOTOR CONNECTOR CONTACT.
   ⟹ NORMAL RESISTANCE BETWEEN EACH TERMINAL SHALL BE NEARLY SAME.
   MOTOR NORMAL : CHANGE INVERTER P.W.B.
   MOTOR ABNORMAL : CHANGE FAN MOTOR AND INVERTER P.W.B. (IF REQUIRED).

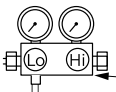
OTHERS CHECKING POINT

1. REVERSING VALVE NOT OPERATE.
   ⟹ UN-INSERT THE CONNECTOR AND CHECK THE LEAD WIRE.
   ⟹ IF OK, CHECK REVERSING VALVE COIL.
2. COMMUNICATION ERROR OR OUTDOOR UNIT NO OPERATION.
   ⟹ CHECK CONNECTING CABLE BETWEEN INDOOR AND OUTDOOR UNIT.

Refrigerant cycle check (gas leak or compressor failure)



Operate the unit after re-connect the connector for compressor.

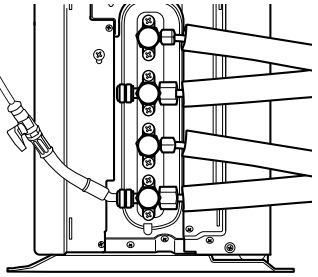


Manifold guage for R32



Is the self-diagnosis lamp shown as per this table?

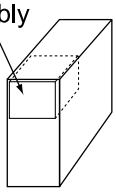
LD1351	2 times blink	3 times blink	4 times blink	5 times blink	ON
LD1352	OFF	OFF	OFF	OFF	1 time blink
Time to blink	2~3sec			About 10sec	Within 30min
Suspect failure item	Compressor				Gas leak





Refer to cycle inspection mode.

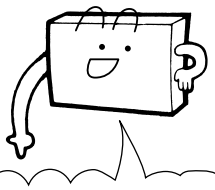
Outdoor electrical assembly



Normal

Abnormal (gas leak)

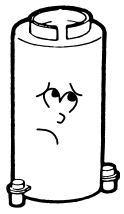




Outdoor electrical assembly
■ Check drive signal using PRD checker

It is a gas leak.
Please repair and re-charge the gas.

Re-charge gas



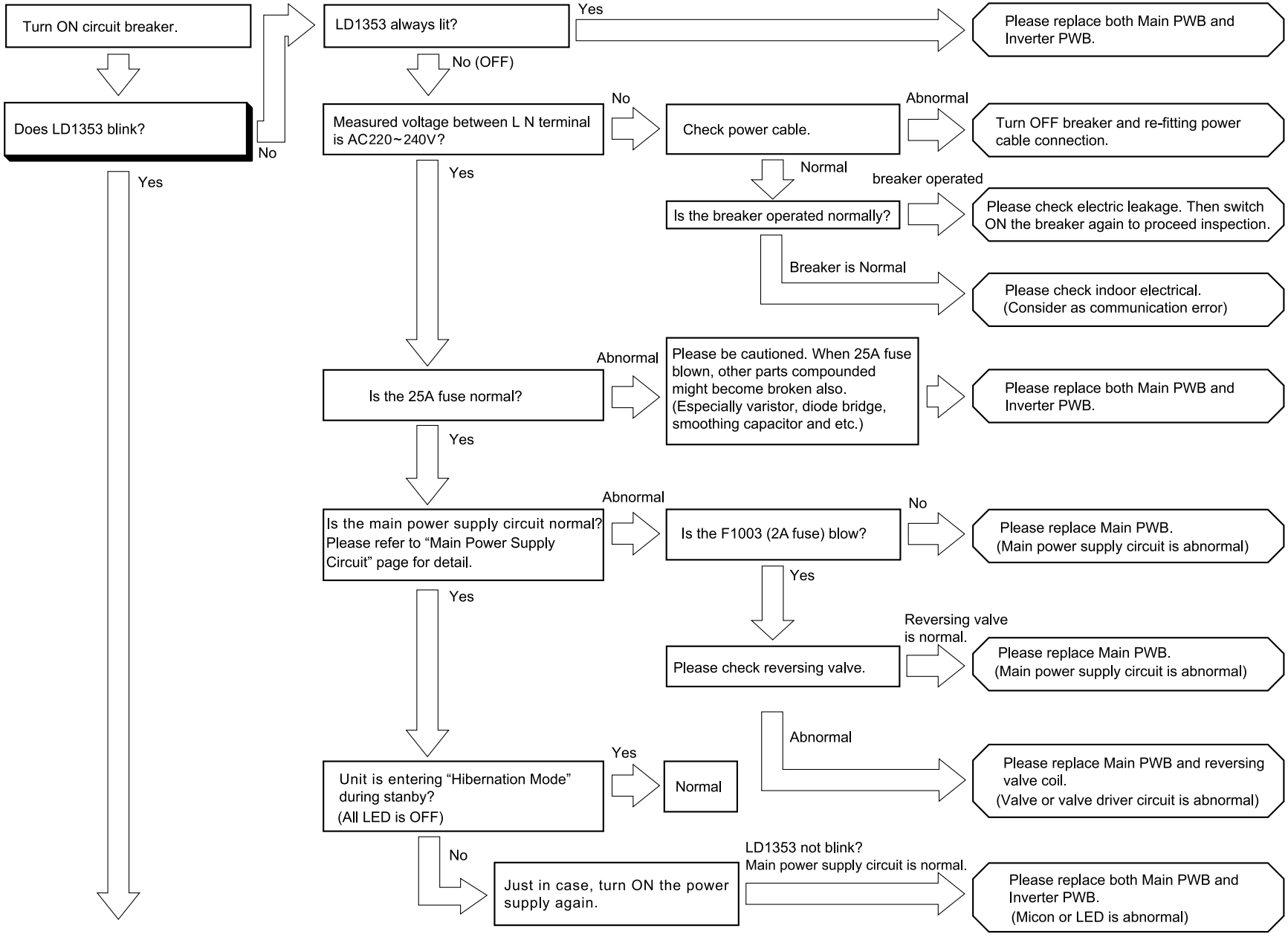
Normal
(When the self-diagnosis lamp is the same to above figure lighting mode)

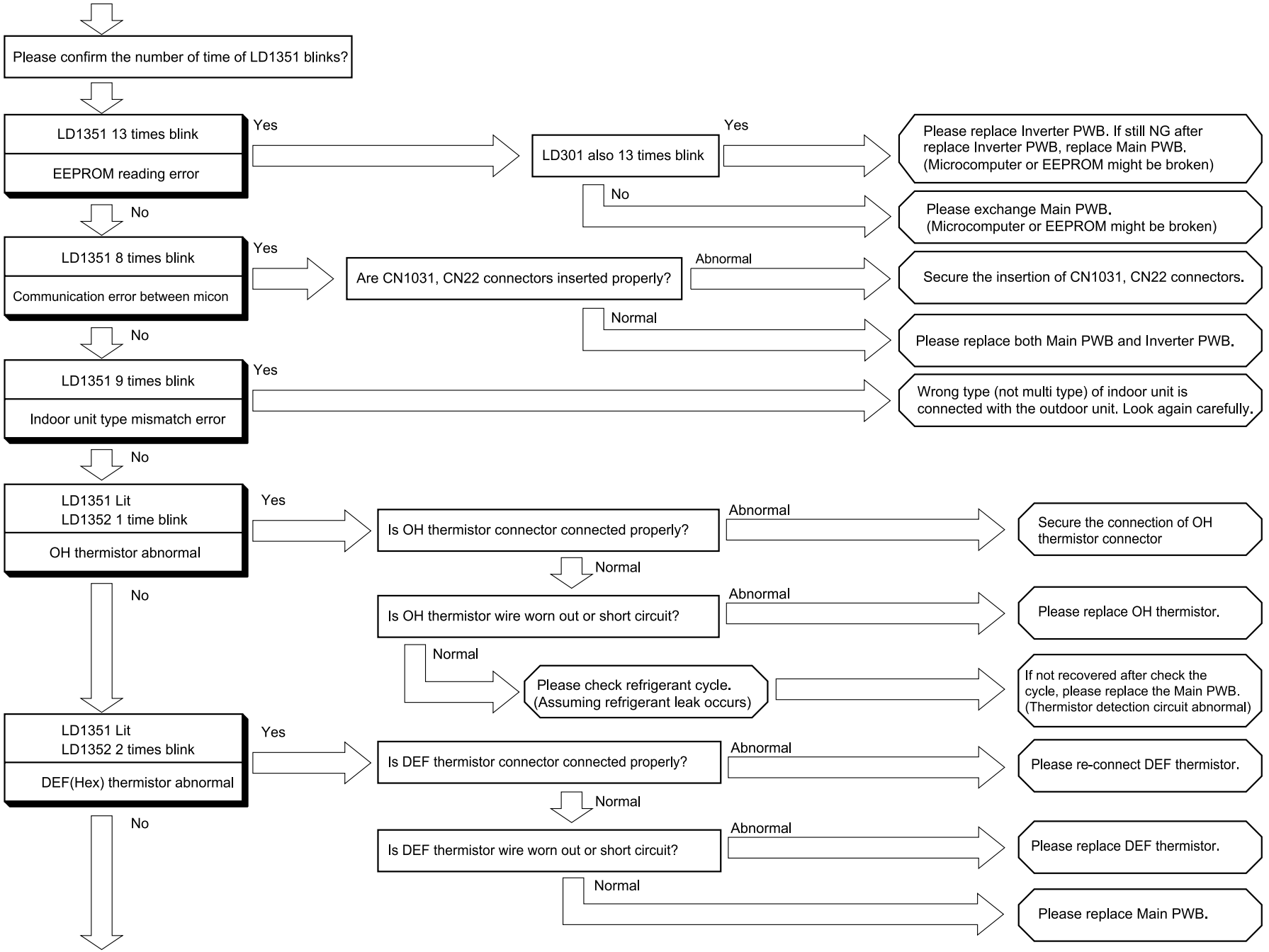
Compressor is abnormal.
Please change it and re-charge gas.

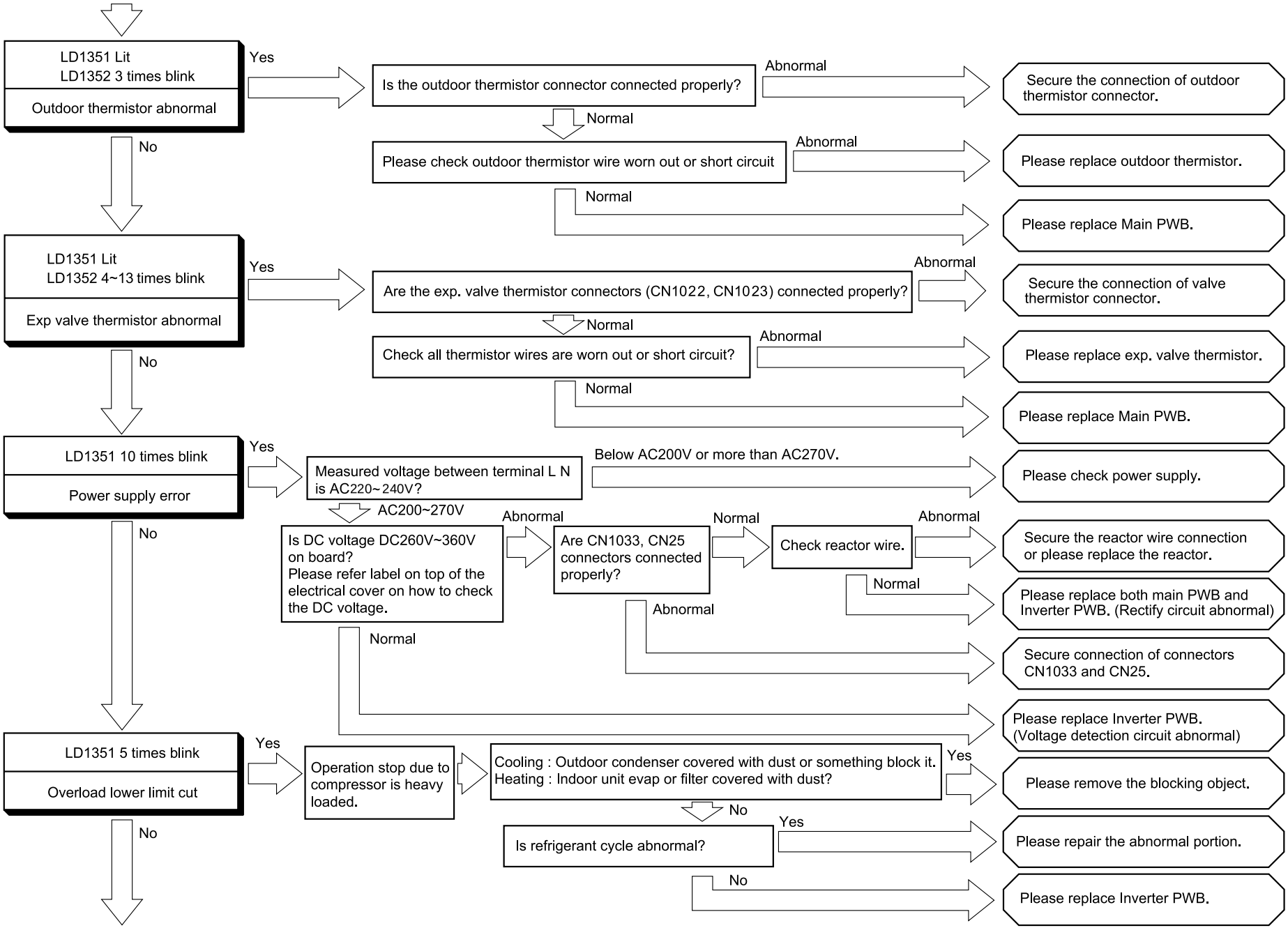
Change compressor

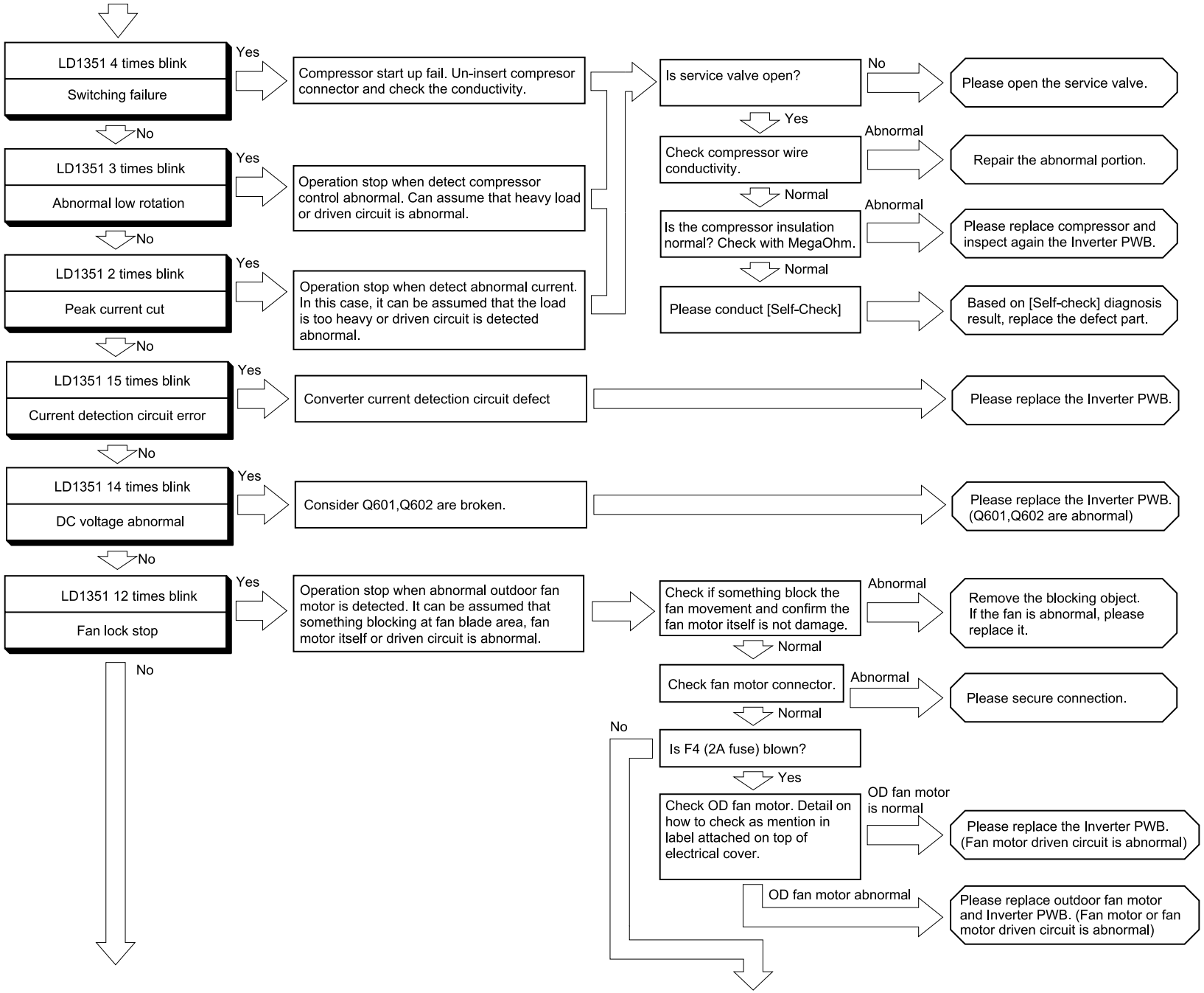
Perform final basic operation check

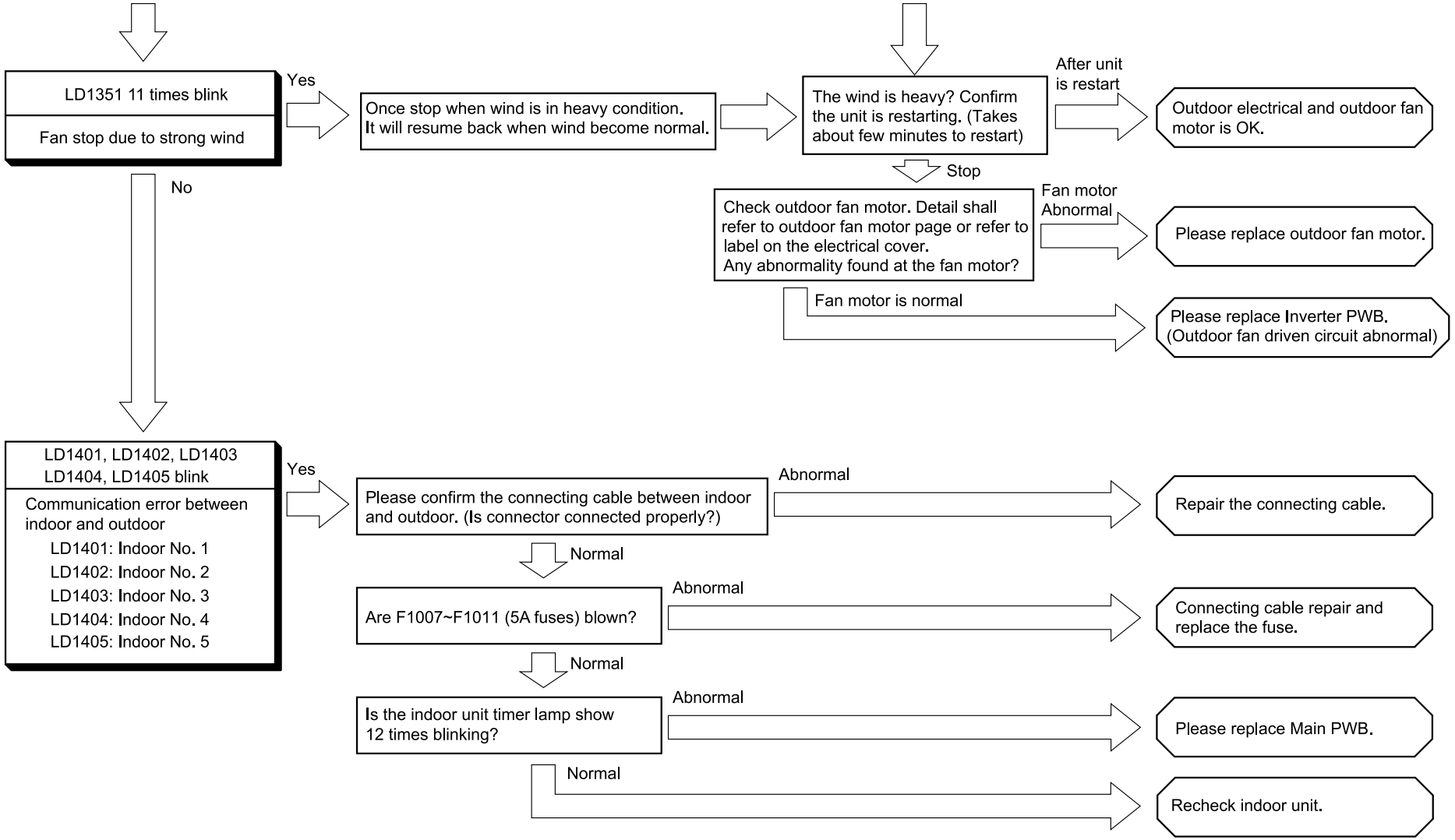
Checking Electrical Parts of Outdoor Unit




Please confirm the number of time of LD1351 blinks?
LD1351 13 times blink
EEPROM reading error
Yes
LD301 also 13 times blink
Yes
Please replace Inverter PWB. If still NG after replace Inverter PWB, replace Main PWB. (Microcomputer or EEPROM might be broken)
No
Please exchange Main PWB. (Microcomputer or EEPROM might be broken)
No
LD1351 8 times blink
Communication error between micon
Yes
Are CN1031, CN22 connectors inserted properly?
Abnormal
Secure the insertion of CN1031, CN22 connectors.
Normal
Please replace both Main PWB and Inverter PWB.
No
LD1351 9 times blink
Indoor unit type mismatch error
Yes
Wrong type (not multi type) of indoor unit is connected with the outdoor unit. Look again carefully.
No
LD1351 Lit
LD1352 1 time blink
OH thermistor abnormal
Yes
Is OH thermistor connector connected properly?
Abnormal
Secure the connection of OH thermistor connector
Normal
Is OH thermistor wire worn out or short circuit?
Abnormal
Please replace OH thermistor.
Normal
Please check refrigerant cycle. (Assuming refrigerant leak occurs)
If not recovered after check the cycle, please replace the Main PWB. (Thermistor detection circuit abnormal)
No
LD1351 Lit
LD1352 2 times blink
DEF(Hex) thermistor abnormal
Yes
Is DEF thermistor connector connected properly?
Abnormal
Please re-connect DEF thermistor.
Normal
Is DEF thermistor wire worn out or short circuit?
Abnormal
Please replace DEF thermistor.
Normal
Please replace Main PWB.
No

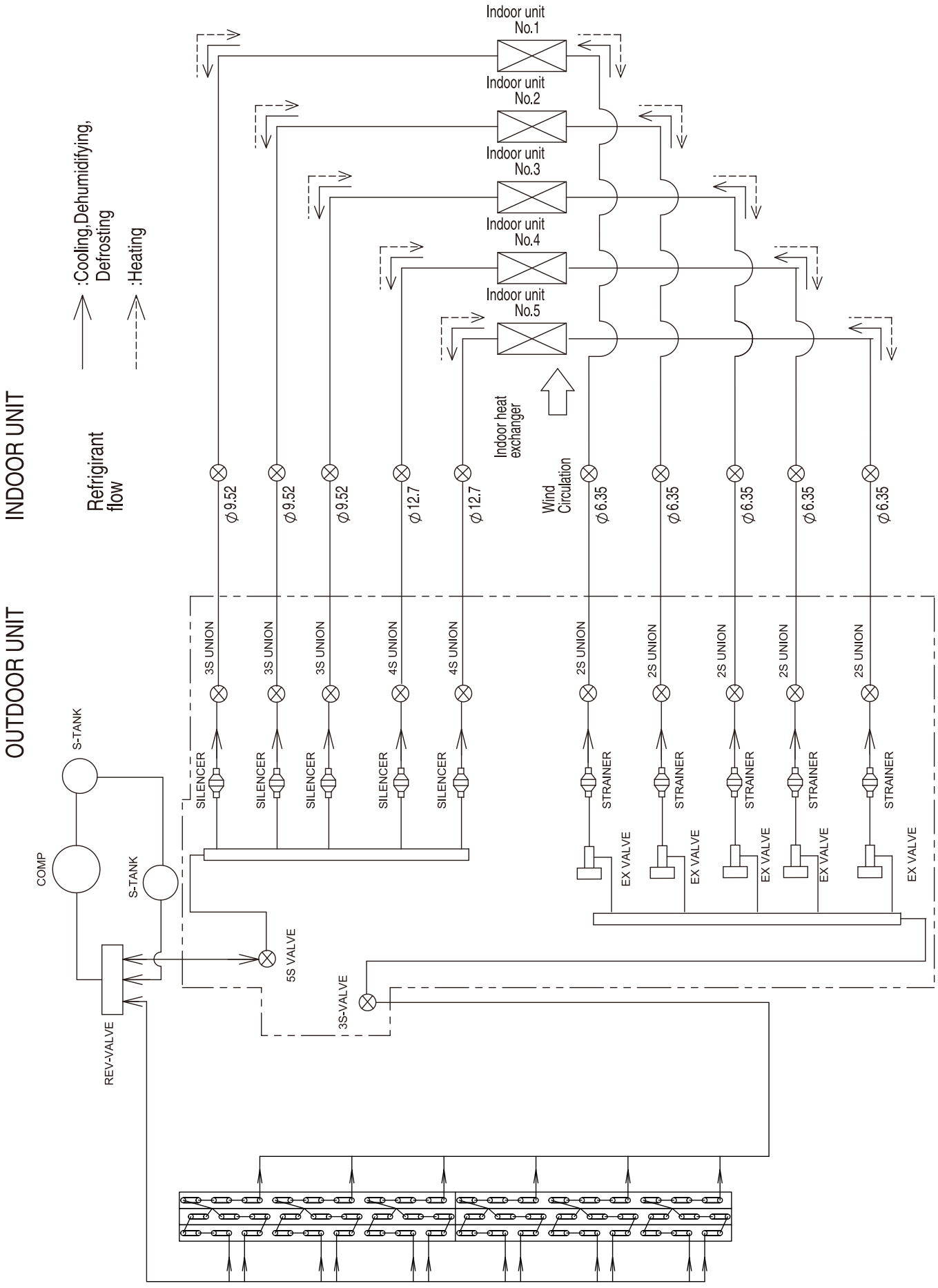

LD1351 Lit
LD1352 3 times blink
Outdoor thermistor abnormal
Yes
Is the outdoor thermistor connector connected properly?
Abnormal
Secure the connection of outdoor thermistor connector.
Normal
Please check outdoor thermistor wire worn out or short circuit
Abnormal
Please replace outdoor thermistor.
Normal
Please replace Main PWB.
No
LD1351 Lit
LD1352 4~13 times blink
Exp valve thermistor abnormal
Yes
Are the exp. valve thermistor connectors (CN1022, CN1023) connected properly?
Abnormal
Secure the connection of valve thermistor connector.
Normal
Check all thermistor wires are worn out or short circuit?
Abnormal
Please replace exp. valve thermistor.
Normal
Please replace Main PWB.
No
LD1351 10 times blink
Power supply error
Yes
Measured voltage between terminal L N is AC220~240V?
Below AC200V or more than AC270V.
Please check power supply.
AC200~270V
Is DC voltage DC260V~360V on board?
Please refer label on top of the electrical cover on how to check the DC voltage.
Abnormal
Are CN1033, CN25 connectors connected properly?
Normal
Check reactor wire.
Abnormal
Secure the reactor wire connection or please replace the reactor.
Normal
Please replace both main PWB and Inverter PWB. (Rectify circuit abnormal)
Abnormal
Secure connection of connectors CN1033 and CN25.
Normal
Please replace Inverter PWB. (Voltage detection circuit abnormal)
No
LD1351 5 times blink
Overload lower limit cut
Yes
Operation stop due to compressor is heavy loaded.
Cooling : Outdoor condenser covered with dust or something block it.
Heating : Indoor unit evap or filter covered with dust?
Yes
Please remove the blocking object.
No
Is refrigerant cycle abnormal?
Yes
Please repair the abnormal portion.
No
Please replace Inverter PWB.
No


LD1351 4 times blink
Switching failure
Yes
Compressor start up fail. Un-insert compresor connector and check the conductivity.
Is service valve open?
No
Please open the service valve.
Yes
Check compressor wire conductivity.
Abnormal
Repair the abnormal portion.
Normal
Is the compressor insulation normal? Check with MegaOhm.
Abnormal
Please replace compressor and inspect again the Inverter PWB.
Normal
Please conduct [Self-Check]
Based on [Self-check] diagnosis result, replace the defect part.
No
LD1351 3 times blink
Abnormal low rotation
Yes
Operation stop when detect compressor control abnormal. Can assume that heavy load or driven circuit is abnormal.
No
LD1351 2 times blink
Peak current cut
Yes
Operation stop when detect abnormal current. In this case, it can be assumed that the load is too heavy or driven circuit is detected abnormal.
No
LD1351 15 times blink
Current detection circuit error
Yes
Converter current detection circuit defect
Please replace the Inverter PWB.
No
LD1351 14 times blink
DC voltage abnormal
Yes
Consider Q601,Q602 are broken.
Please replace the Inverter PWB. (Q601,Q602 are abnormal)
No
LD1351 12 times blink
Fan lock stop
Yes
Operation stop when abnormal outdoor fan motor is detected. It can be assumed that something blocking at fan blade area, fan motor itself or driven circuit is abnormal.
Check if something block the fan movement and confirm the fan motor itself is not damage.
Abnormal
Remove the blocking object. If the fan is abnormal, please replace it.
Normal
Check fan motor connector.
Abnormal
Please secure connection.
Normal
No
Is F4 (2A fuse) blown?
Yes
Check OD fan motor. Detail on how to check as mention in label attached on top of electrical cover.
OD fan motor is normal
Please replace the Inverter PWB. (Fan motor driven circuit is abnormal)
OD fan motor abnormal
Please replace outdoor fan motor and Inverter PWB. (Fan motor or fan motor driven circuit is abnormal)
No


LD1351 11 times blink
Fan stop due to strong wind
Yes
Once stop when wind is in heavy condition.
It will resume back when wind become normal.
The wind is heavy? Confirm the unit is restarting. (Takes about few minutes to restart)
After unit is restart
Outdoor electrical and outdoor fan motor is OK.
Stop
Check outdoor fan motor. Detail shall refer to outdoor fan motor page or refer to label on the electrical cover.
Any abnormality found at the fan motor?
Fan motor Abnormal
Please replace outdoor fan motor.
Fan motor is normal
Please replace Inverter PWB.
(Outdoor fan driven circuit abnormal)
No
LD1401, LD1402, LD1403
LD1404, LD1405 blink
Communication error between indoor and outdoor
LD1401: Indoor No. 1
LD1402: Indoor No. 2
LD1403: Indoor No. 3
LD1404: Indoor No. 4
LD1405: Indoor No. 5
Yes
Please confirm the connecting cable between indoor and outdoor. (Is connector connected properly?)
Abnormal
Repair the connecting cable.
Normal
Are F1007~F1011 (5A fuses) blown?
Abnormal
Connecting cable repair and replace the fuse.
Normal
Is the indoor unit timer lamp show 12 times blinking?
Abnormal
Please replace Main PWB.
Normal
Recheck indoor unit.

REFRIGERATING CYCLE DIAGRAM

MODEL RAM-G110N5HAE



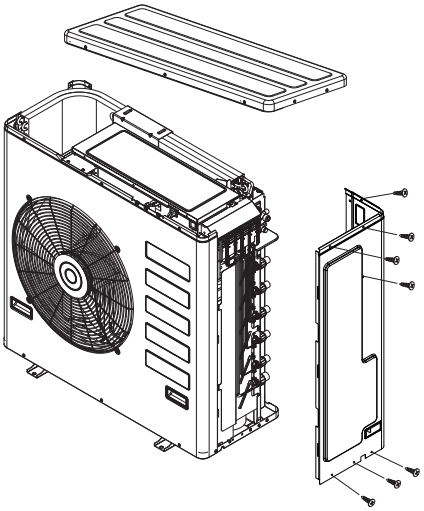
DISMANTLE AND ASSEMBLY PROCEDURE

■ RAM-G110N5HAE

1. Electrical parts (preparation to remove board)

(1) Remove screw that fix the service valve cover and push it down to take it out.

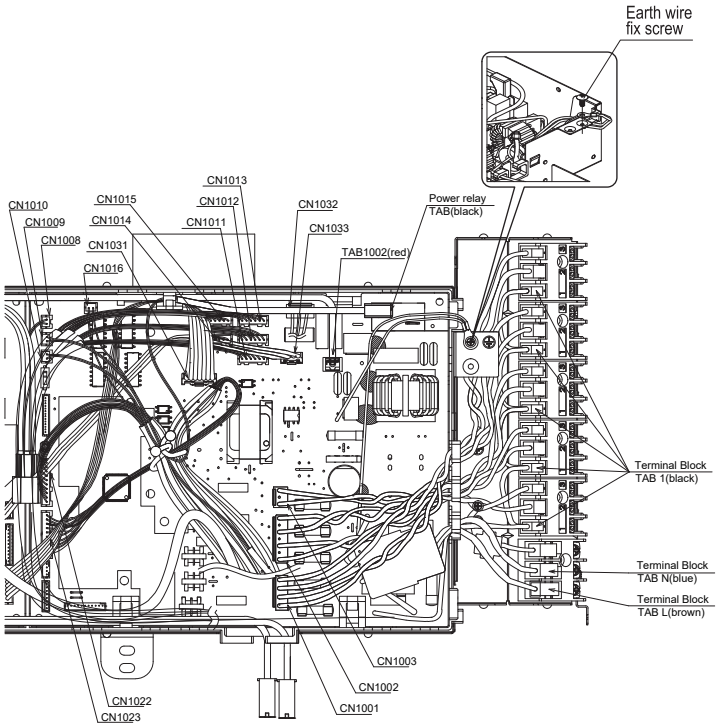
(2) Remove the screws on both sides of top cover and then remove the top cover.



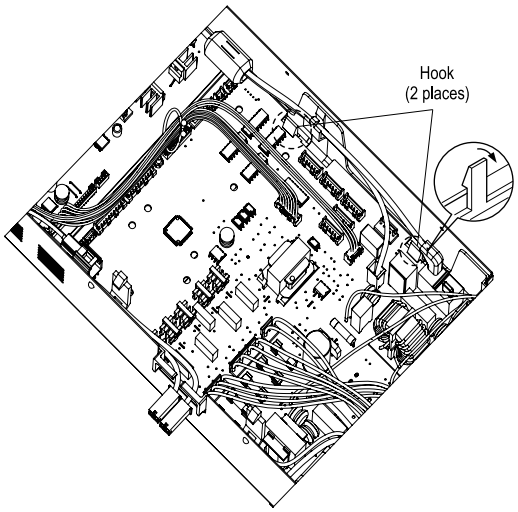
(3) Remove the screws that holding the electrical cover and then remove the cover.

2. Dismantle procedure of main board

(1) Un-insert connector (17 places), TAB terminal (9 places) and un-screw 1 piece earth screw.

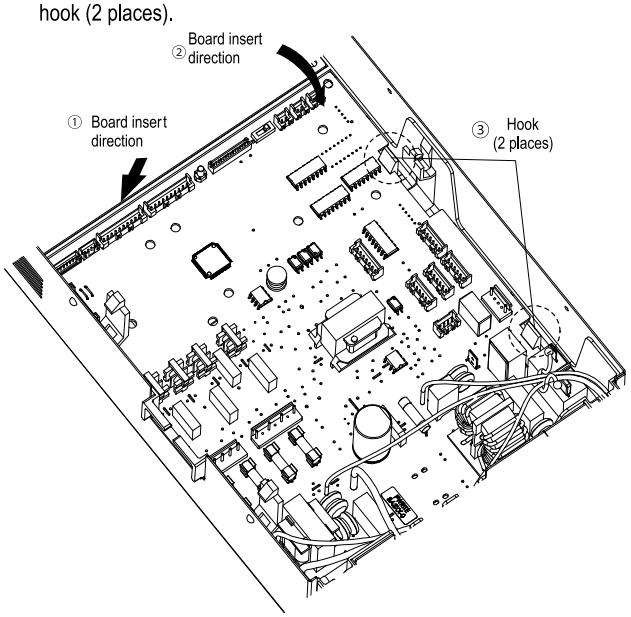


(2) Release the hooks (2 places) that locking the board and lift up the board to take it out.



3. Assembly procedure of main board

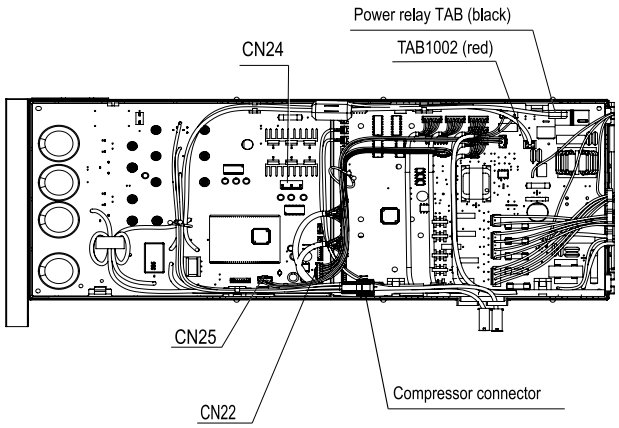
(1) Insert back the board into pcb support and lock it with hook (2 places).



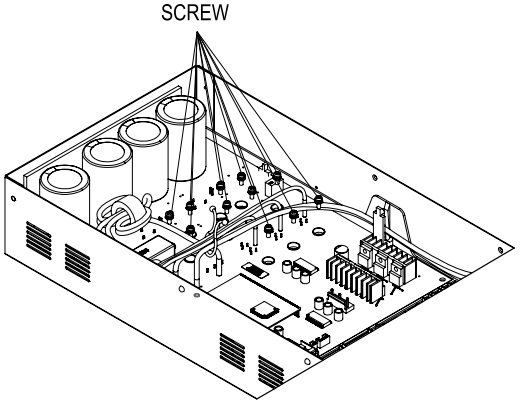
(2) Insert back the connectors (17 places), TAB terminals (9 places) and 1 piece of earth screw.

4. Dismantle procedure of inverter board

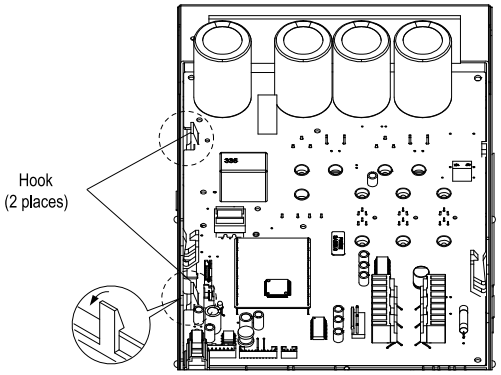
(1) Un-insert connectors (4 places) and TAB terminal (2 places).



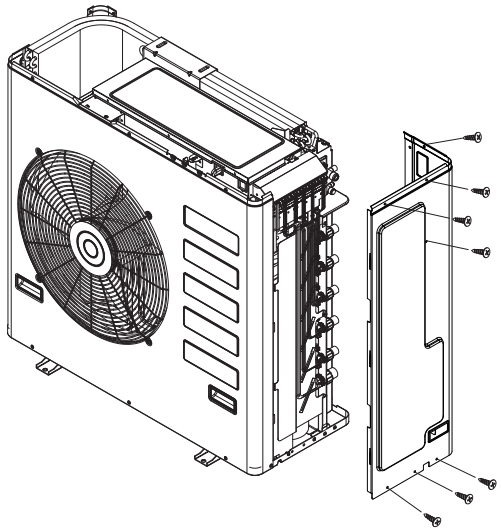
(2) Remove screw (11 pieces) that fixed the board.



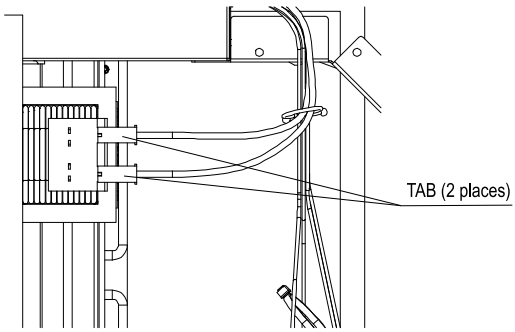
(3) Take out the board by lift up after release the hook that hold the board in its place.



(4) Remove the screw (7 places) that fixed the cabinet then remove the cabinet.



(5) Un-insert the TAB terminal (2 places) that fixed to the reactor.

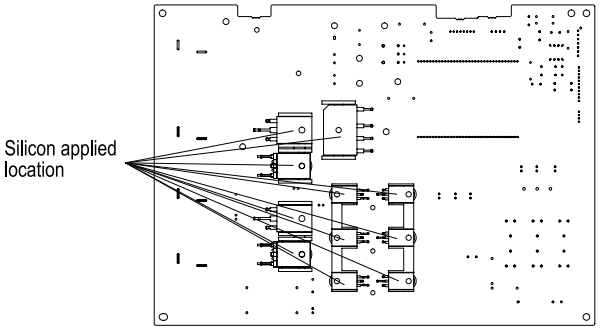


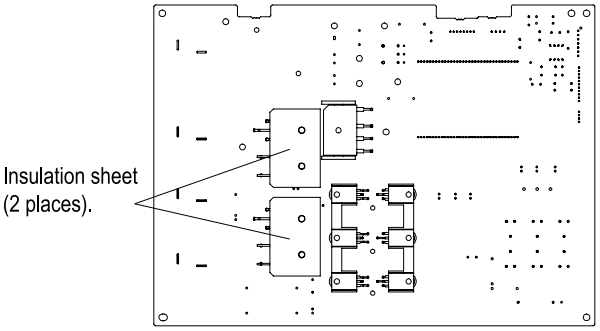
5. Assembly procedure of inverter board

(1) Preparation before insert back the board.

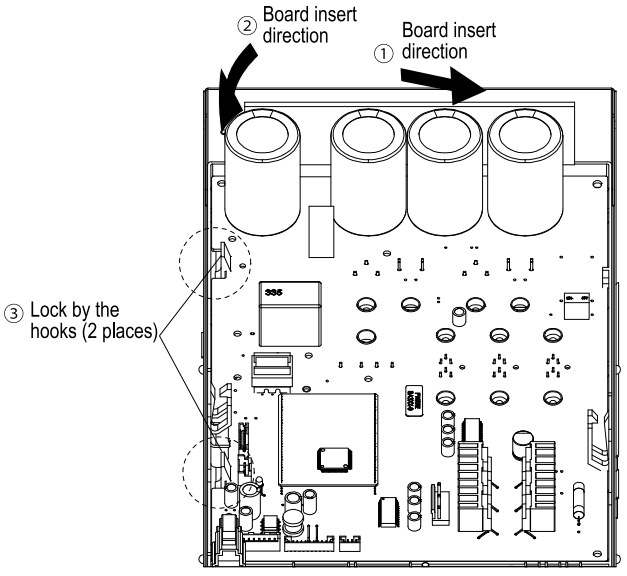
Applied silicon uniformly with small amount to 11 places of electronic part at back side of board.

Then fix back the insulation sheet (2 places).

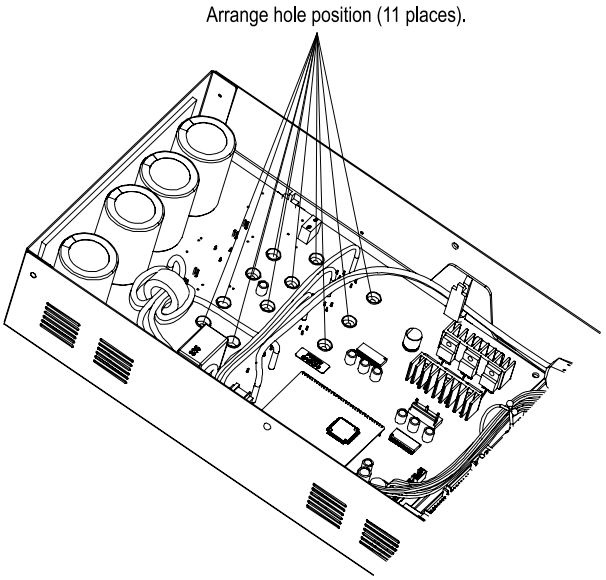




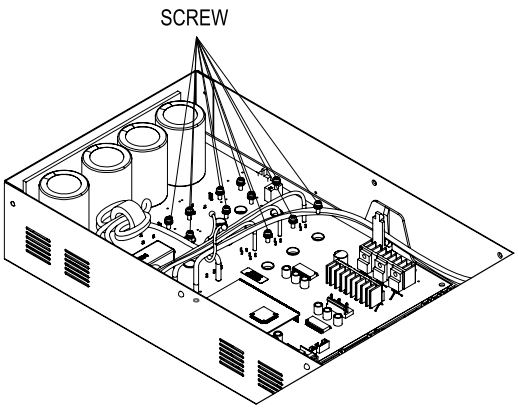
(2) Insert the board into the pcb support and fix it with hooks (2 places).



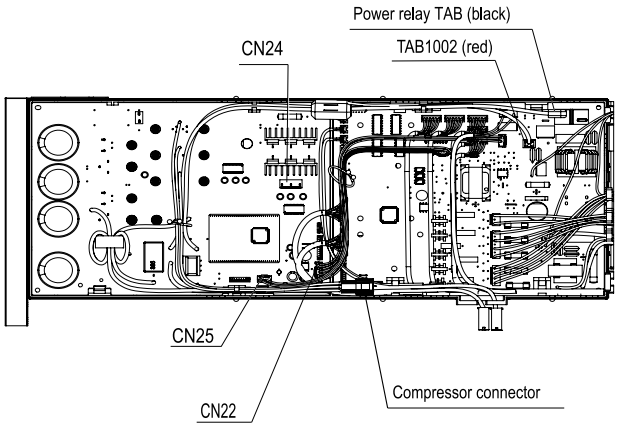
(3) Arrange the board position so that hole for fixing screw and holes at heat sink are concentric.



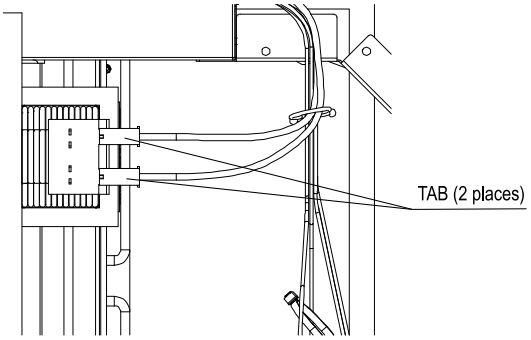
(4) Fix the board with screw (11 pieces).



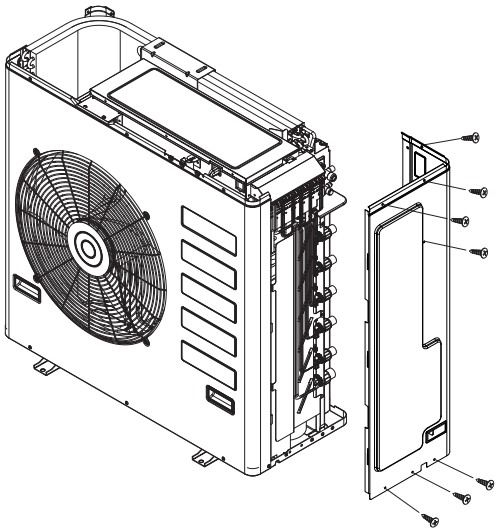
(5) Insert back connector (4 places) and 2 TAB terminal



(6) Insert back TAB (2 places) to the reactor.

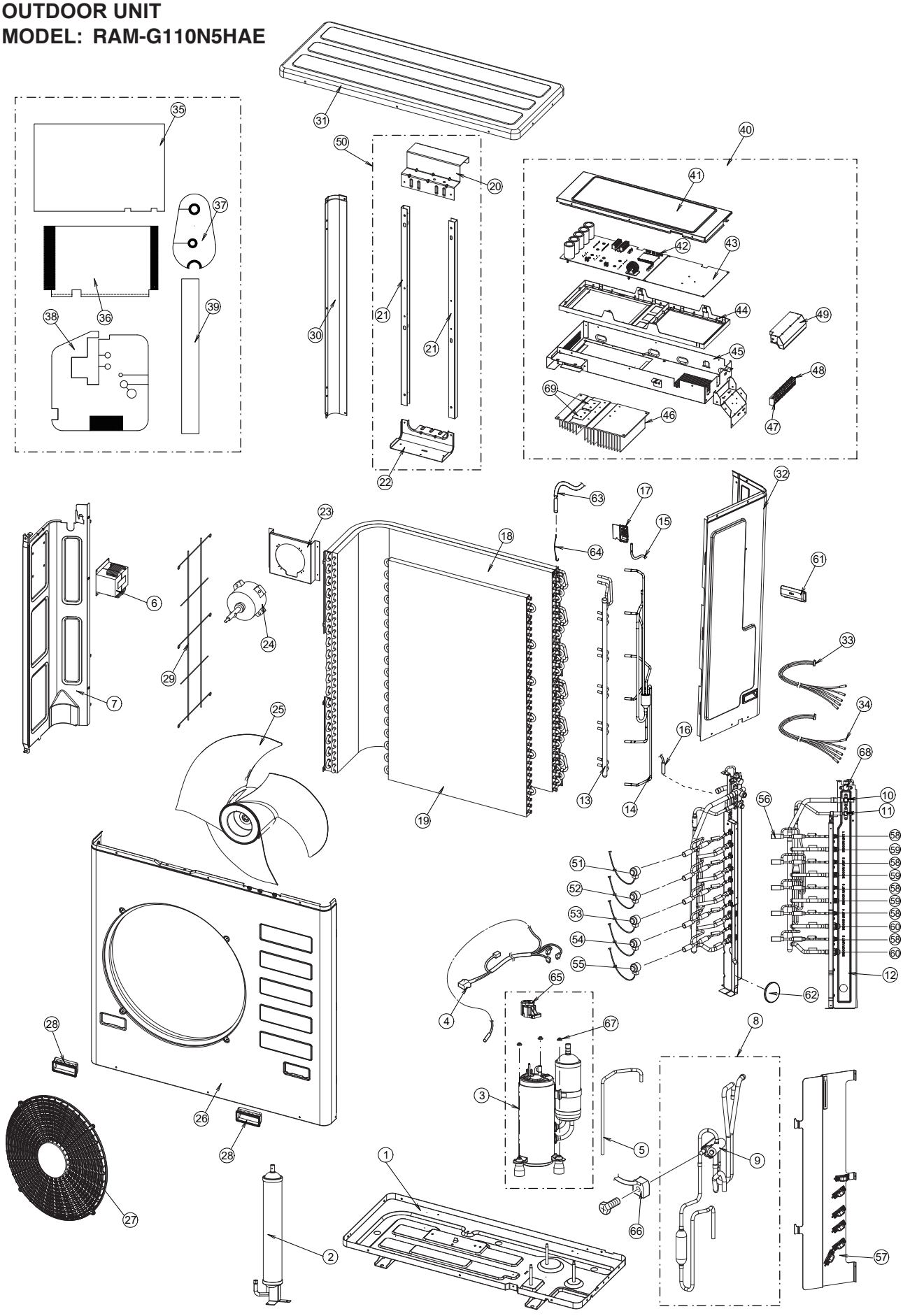


(7) Fix back the cabinet with screw (7 places).



PARTS LIST AND DIAGRAM

OUTDOOR UNIT
MODEL: RAM-G110N5HAE



NO.	PARTS NO.	Q'TY/UNIT	PARTS NAME
1	HWRAM-G110N5HAE A01	1	BASE
2	HWRAM-G110N5HAE A02	1	TANK AS-ADDITITIONAL
3	HWRAM-G110N5HAE A03	1	COMPRESSOR
4	HWRAC-F86KVX 042	1	CONNECT CORD(COMP)
5	HWRAM-G110N5HAE A04	1	PIPE
6	HWRAC-50WED A09	1	REACTOR
7	HWRAM-G110N5HAE A05	1	PARTITION
8	HWRAM-G110N5HAE A06	1	4-REVERSING VALVE ASSEMBLY
9	HWRAM-110NP5E A06	1	REVERING VALVE
10	HWRAM-110NP5E A08	1	VALVE (3S)
11	HWRAM-110NP5E A07	1	VALVE (5S)
12	HWRAM-G110N5HAE A07	1	PLATE AS-VALVE
13	HWRAC-F160MVX 012	1	STRAINER (EI-PIPE-AS)
14	HWRAM-S42U5HLAE A05	1	STRAINER (EO-PIPE-AS)
15	RAS-2.0WNP	1	THERMI-C
16	HWRAM-110NP5E A22	1	THERMI
17	HWRAC-50WXDN A06	1	COVER
18	HWRAM-G110N5HAE A08	1	CONDENSER
19	HWRAM-G110N5HAE A09	1	CONDENSER-3
20	HWRAC-F160MVX 018	1	FAN MOTOR SUPPORT
21	HWRAC-F160MVX 019	2	FAN MOTOR SUPPORT
22	HWRAC-F160MVX 020	1	FAN MOTOR SUPPORT
23	HWRAC-F86KVX 013	1	FAN MOTOR SUPPORT PLATE
24	HWRAC-F86KVX 018	1	FAN MOTOR
25	HWRAC-F86KVX 006	1	PROPELLER FAN
26	HWRAM-G110N5HAE A10	1	FRONT COVER
27	HWRAM-110NP5E A36	1	DISCHARGE GRILL
28	HWRAC-X10CSK A03	2	HANDLE
29	HWRAC-L72GVX 004	1	NET LEFT
30	HWRAC-F160MVX 022	1	LEFT PLATE
31	HWRAM-S42U5HLAE A08	1	TOP COVER
32	HWRAM-SX42H5NK A02	1	SIDE COVER(R)
33	HWRAM-110NP5E A24	1	THERNISTOR-PIPE(W)
34	HWRAM-110NP5E A25	1	THERNISTOR-PIPE(N)
35	HWRAM-G110N5HAE A11	1	SOUND PROOF
36	HWRAM-G110N5HAE A12	1	SOUND PROOF
37	HWRAM-G110N5HAE A13	2	SOUND PROOF
38	HWRAM-G110N5HAE A14	1	SOUND PROOF
39	HWRAM-S42U5HLAE A14	1	SOUND PROOF
40	HWRAM-G110N5HAE A15	1	ELECTRICAL BOX
41	HWRAM-G110N5HAE A16	1	ELECTRICAL PARTS COVER-AS
* 42	HWRAM-G110N5HAE A17	1	P.W.B(INVERTER)
43	HWRAM-G110N5HAE A18	1	P.W.B(MAIN)
44	HWRAM-G110N5HAE A19	1	SUPPORT(P.W.B)
45	HWRAM-G110N5HAE A20	1	ELECTRICAL PLATE ASSEMBLY
46	HWRAM-110NP5E A55	1	HEAT SINK
47	HWRAM-110NP5E A56	1	TERMINAL BOARD (3P-POWER SUPPLY)
48	HWRAM-110NP5E A57	5	TERMINAL BOARD (3P-IDU SUPPLY)
49	HWRAM-S42U5HLAE A20	1	TERMINAL COVER
50	HWRAC-F160MVX 041	1	BRACKET GP-MOTOR
51	HWRAM-110NP5E A12	1	COIL
52	HWRAM-110NP5E A13	1	COIL
53	HWRAM-110NP5E A14	1	COIL
54	HWRAM-110NP5E A15	1	COIL
55	HWRAM-110NP5E A16	1	COIL
56	HWRAM-110NP5E A11	5	ELECTRIC EXPANSION VALVE
57	HWRAM-SX42H5NK A05	1	WIRING COVER
58	HWRAM-G110N5HAE A21	5	VALVE (2S)
59	HWRAM-110NP5E A48	3	VALVE (3S)
60	HWRAM-110NP5E A49	2	VALVE (4S)
61	HWRAM-S42U5HLAE A22	1	HANDLE
62	HWRAM-G110N5HAE A22	1	RUBBER
63	HWRAC-DJ18PHAE A13	1	THERMISTOR
64	HWRAC-DJ18PHAE A14	1	THERMISTOR SUPPORT
65	HWRAC-25WXD A08	1	O.L.R COVER
66	HWRAC-EH36WHLAE A21	1	COIL (REVERSING VALVE)
67	HWRAM-110NP5E A04	1	PUSH NUT
68	HWRAM-G110N5HAE A23	1	COIL (REVERSING VALVE)
69	HWRAM-G110N5HAE A24	2	INSULATION SHEET

The PWB(*42#) sold does not have radiator, so it is necessary to add thermal paste.

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