

AIRSTAGETM

Variable Refrigerant Flow System

Multi Air Conditioning System for Buildings



HEATPUMP & COOLING ONLY TYPE

SERVICE MANUAL

FUJITSU GENERAL LIMITED

Multi Air Conditioning System for Buildings

Variable Refrigerant Flow System

SERVICE MANUAL

Refrigerant

R22

CONTENTS

1. TEST RUN

1-1	CHECK ITEMS BEFORE TEST RUN.....	01-01
1-2	CHECK ITEM DURING TEST RUN.....	01-02
1-3	TEST RUN METHOD.....	01-03
1-3-1	TEST RUN FROM OUTDOOR PC BOARD.....	01-03
1-3-2	TEST RUN FROM REMOTE CONTROLLER.....	01-03
1-4	TEST RUN CONTROL.....	01-05

2. FUNCTION OF PRINTED CIRCUIT BOARD

2-1	PCB LAYOUTS.....	02-01
2-1-1	INDOOR UNIT CONTROL CIRCUIT BOARD.....	02-01
2-1-2	INDOOR UNIT CONTROL CIRCUIT BOARD (COMPACT WALL MOUNTED TYPE).....	02-02
2-1-3	OUTDOOR UNIT CONTROL CIRCUIT BOARD.....	02-03
2-1-4	WIRED REMOTE CONTROLLER, SIMPLE REMOTE CONTROLLER CIRCUIT BOARD.....	02-04
2-1-5	CENTRAL REMOTE CONTROLLER CIRCUIT BOARD.....	02-05
2-1-6	NETWORK CONVERTORS' CIRCUIT BOARD.....	02-06
2-1-7	SIGNAL AMPLIFIER CIRCUIT BOARD.....	02-08
2-1-8	GROUP REMOTE CONTROLLER CIRCUIT BOARD.....	02-09
2-1-9	EXTERNAL SWITCH CONTROLLER CIRCUIT BOARD.....	02-10
2-2	MICROPROCESSOR FUNCTION LIST.....	02-11
2-2-1	INDOOR UNIT.....	02-11
2-2-2	OUTDOOR UNIT.....	02-14
2-3	FUNCTION AND SETTING OF EACH SWITCH.....	02-15
2-3-1	INDOOR UNIT(EXCEPT FOR COMPACT WALL MOUNTED TYPE).....	02-15
2-3-2	INDOOR UNIT(COMPACT WALL MOUNTED TYPE).....	02-19
2-3-3	OUTDOOR UNIT.....	02-22
2-3-4	WIRED, SIMPLE REMOTE CONTROLLER.....	02-26
2-3-5	CENTRAL REMOTE CONTROLLER.....	02-28
2-3-6	NETWORK CONVERTOR.....	02-30
2-3-7	SIGNAL AMPLIFIER.....	02-33
2-3-8	GROUP REMOTE CONTROLLER.....	02-34
2-3-9	EXTERNAL SWITCH CONTROLLER.....	02-35
2-4	EXTERNAL INPUT & OUTPUT.....	02-38
2-4-1	INDOOR UNIT(EXCEPT FOR COMPACT WALL MOUNTED TYPE).....	02-38
2-4-2	INDOOR UNIT(COMPACT WALL MOUNTED).....	02-40
2-4-3	OUTDOOR UNIT.....	02-41
2-4-4	CENTRAL REMOTE CONTROLLER / PC CONTROLLER.....	02-42
2-4-5	NETWORK CONVERTOR.....	02-44

3. OUTDOOR UNIT OPERATION CONTROL

3-1 COMPRESSOR OPERATION CONTROL.....	03-01
3-1-1 OPERATION / STOP CONDITION.....	03-01
3-1-2 COMPRESSOR OUTPUT PATTERN	03-01
3-1-3 COMPRESSOR OPERATION CONTROL.....	03-01
3-1-4 COMPRESSOR RECOVERY OPERATION.....	03-02
3-2 EXPANSION VALVE CONTROL.....	03-03
3-3 4-WAY VALVE 1 , 2 CONTROL.....	03-03
3-4 HEAT EXCHANGER CHANGE OVER CONTROL.....	03-03
3-5 FAN CONTROL.....	03-03
3-6 PRESSURE BALANCE CONTROL.....	03-03
3-7 OIL RETURN CONTROL.....	03-04
3-8 SPECIAL OPERATION MODE.....	03-04
3-8-1 OIL RECOVERY OPERATION.....	03-04
3-8-2 OIL LEVEL BALANCE OPERATION.....	03-04
3-8-3 DEFROSTING CONTROL.....	03-05
3-9 PROTECTIVE FUNCTION.....	03-05
3-10 OUTPUT CONTROL OF BASE HEATER AND CRANK CASE HEATER.....	03-06

4. INDOOR UNIT OPERATION

4-1 TIMER CONTROL.....	04-01
4-1-1 WIRELESS REMOTE CONTROLLER.....	04-01
4-1-2 WIRED REMOTE CONTROLLER.....	04-03
4-1-3 GROUO REMOTE CONTROLLER.....	04-06
4-2 FAN CONTROL.....	04-08
4-2-1 "AUTO" POSITION.....	04-08
4-2-2 "LOW", "MED" AND "HIGH" POSITION.....	04-08
4-3 MASTER CONTROL.....	04-09
4-3-1 OPERATION MODE CONTROL.....	04-09
4-3-2 AUTO CHANGEOVER.....	04-09
4-3-3 "COOL" POSITION.....	04-10
4-3-4 "HEAT" POSITION.....	04-10
4-3-5 "FAN" POSITION.....	04-10
4-4 LOUVER CONTROL.....	04-11
4-5 ENERGY SAVE OPERATION.....	04-14
4-6 ANTI FREEZE CONTROL.....	04-15
4-7 ELECTRONIC EXPANSION VALVE CONTROL.....	04-15
4-8 AUTO RESTART.....	04-15
4-9 DRAIN PUMP OPERATION.....	04-15

5. TROUBLESHOOTING

5-1	INDOOR UNIT.....	05-01
5-1-1	NORMAL OPERATION DISPLAY.....	05-01
5-1-2	ABNORMAL OPERATION DISPLAY.....	05-02
5-2	OUTDOOR UNIT.....	05-03
5-2-1	NORMAL OPERATING DISPLAY.....	05-03
5-2-2	ABNORMAL OPERATION DISPLAY.....	05-04
5-3	REMOTE CONTROLLER.....	05-05
5-3-1	WIRED REMOTE CONTROLLER.....	05-05
5-3-2	SIMPLE REMOTE CONTROLLER.....	05-06
5-3-3	CENTRAL REMOTE CONTROLLER.....	05-07
5-3-4	GROUP REMOTE CONTROLLER.....	05-10
5-4	NETWORK CONVERTOR.....	05-12
5-5	ERROR CODE & TROUBLESHOOTING.....	05-13
5-5-1	TROUBLE SHOOTING WITH ERROR CODE.....	05-13
5-5-2	TROUBLE SHOOTING WITH NO ERROR CODE.....	05-49
5-6	CASE SUCH AS THESE ARE NORMAL.....	05-59

6. APPENDING DATA 1 (INSTALLATION)

6-1	ADDITIONAL CHARGE.....	06-01
6-2	ADDRESS SETTING.....	06-03
6-2-1	KINDS OF ADDRESS AND SETTING RANGE.....	06-03
6-2-2	ADDRESS SETTING FOR COMPACT WALL MOUNTED TYPE.....	06-05
6-2-3	EXAMPLES OF SYSTEM SETTING.....	06-06
6-3	PUMP DOWN METHOD.....	06-10
6-3-1	PROCEDURE OF THE PUMP DOWN.....	06-10
6-3-2	A FLOW CHART OF PUMP DOWN.....	06-10
6-4	TOOLS.....	06-11
6-5	PRECAUTIONS FOR INSTALLATION.....	06-12

7. APPENDING DATA 1 (UNIT)

7-1	REFRIGERANT PIPE SYSTEM DIAGRAM.....	07-01
7-2	CHARACTERISTICS OF SENSORS.....	07-04
7-2-1	THRMISTOR.....	07-04
7-2-2	PRESSURE SENSOR.....	07-06
7-3	WIRING DIAGRAM.....	07-07
7-3-1	INDOOR UNIT.....	07-07
7-3-2	OUTDOOR UNIT.....	07-19
7-4	OUTDOOR INTERNAL LAYOUT.....	07-21
7-5	MODEL DESIGNATION	07-22

Refrigerant

R22

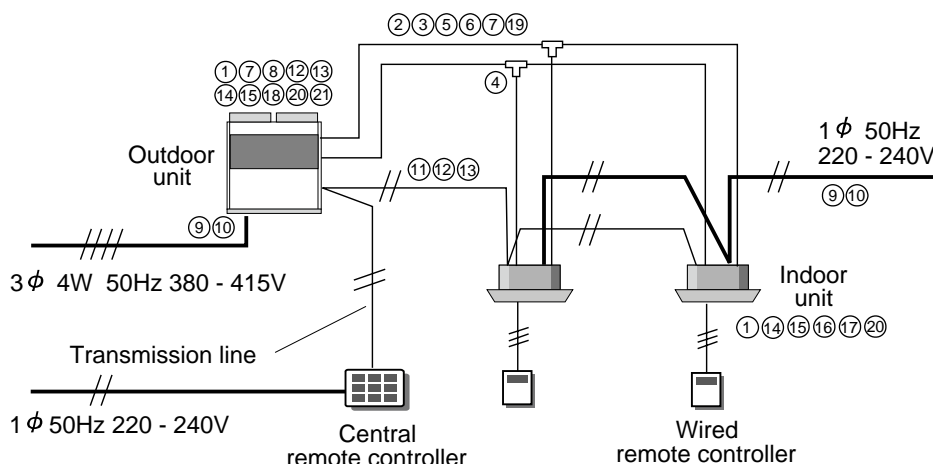


1 . TEST RUN

1. TEST RUN

1-1 CHECK ITEMS BEFORE TEST RUN

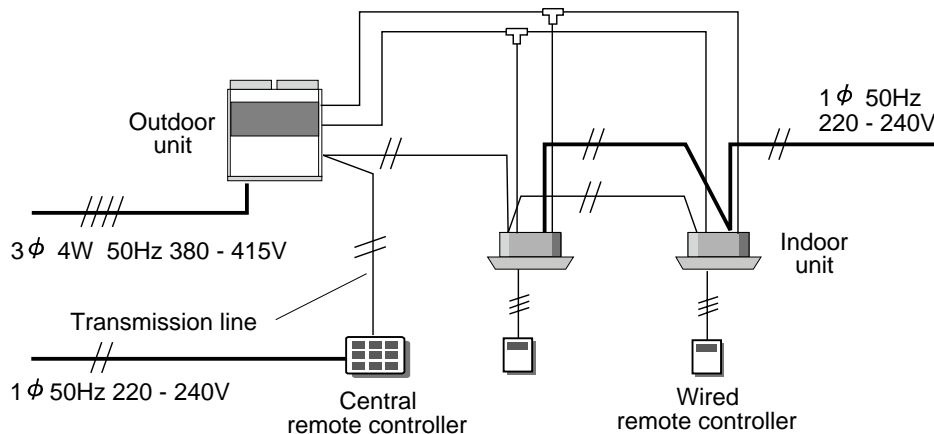
Before test run, check the following items.



- ① Is the selection of the outdoor unit and the indoor units correct?
(Check the number of connected indoor units, total capacity of the indoor units.)
- ② Is the piping length correct?
(Ex. Maximum piping length : 100m)
- ③ Is the diameter of the selected pipe correct?
- ④ Is the diameter selected separation kit correct?
- ⑤ Doesn't gas leak?
- ⑥ Have the vacuum process done enough time?
- ⑦ Is the refrigerant flow correct?
- ⑧ Is the additional refrigerant charge amount correct?
(Note the charge amount to control box cover)
- ⑨ Are the power supply cables connected?
(Power supply for the indoor unit and outdoor unit is separated.)
- ⑩ Is the spec. for the power supply cable correct?
- ⑪ Is the length of the transmission line under the limit?
- ⑫ Is the spec. for the transmission cable correct?
(non-polar 2-core, 0.75-1.25mm²)
- ⑬ Is the transmission cable connected to all units?
- ⑭ Is the remote controller cable connected to units?
- ⑮ Is not the power supply cable connected to transmission and remote controller terminal?
- ⑯ Are the addresses set? (Ex. Refrigerant circuit address, indoor unit address, remote controller address, etc.)
- ⑰ Have the all settings done on the PCB?
- ⑱ Is the ball valve opened?
- ⑲ Is the pipe heat-insulated which have the enough thickness?
- ⑳ Is the drain water-flow correct?
- ㉑ Is the power supplied to crank case heater for more than 12 hours before the start of test run at outdoor temperature of 20°C or below?

1-2 CHECK ITEM DURING TEST RUN

During the test run operation, check the following items.



- ① When the power supply turn on, check the following items.

Outdoor unit : LED 1 lights continuously.

if LED flashing, it means error occurs, check the error and solve the problem.

Indoor unit : LED RED (operation lamp) & GREEN (timer lamp) lights flash alternately.

RC : Timer display indicates

When errors occur, don't advance towards the following step before a complete settlement of all these errors.

- ② Start the Indoor unit test run from remote controller one by one (Refer to 1-3-2)

Check the following item.

Indoor unit

LED (red&green) light flash at the same time slowly.

Louver operates to open.

Fan rotates

Air flow comes

(Drain pump operation)

RC signal receive

Outdoor unit

Corresponds from indoor unit signal

Compressor start to operates

Fan rotates

Measure the following item.

Indoor unit

Air intake temp.

Air flow temp.

Outdoor unit

Outdoor temp.

Discharge pipe temp.

Suction pipe temp.

High pressure

Low pressure

Continue the operation about 10 minutes.

- ③ When there is no problem, check the next indoor unit.

- ④ After every indoor unit is checked by test run, please do test run using all of the indoor units and check them.

1-3 TEST RUN METHOD

Supply power to the crankcase heater for 12 hours prior to the start of operation if the outdoor temperature is lower than 20 °C. The following is the procedure for the test run operation.

1-3-1 TEST RUN FROM OUTDOOR PC BOARD

By setting DIP SW1-1 and SW1-2 on control PC board of outdoor unit, cooling test run or heating test run for all the indoor units in the same refrigerant system can be performed.

SW1-1	SW1-2	Operation Mode	Select position of [SW1-1, SW1-2]
OFF	OFF	Normal Operation	[OFF,ON] or [ON,OFF] → [OFF,OFF]
ON	ON	Normal Operation	[OFF,ON] or [ON,OFF] → [ON,ON]
OFF	ON	Heating Test Run	[OFF,OFF] or [ON,ON] → [OFF,ON]
ON	OFF	Cooling Test Run	[OFF,OFF] or [ON,ON] → [ON,OFF]

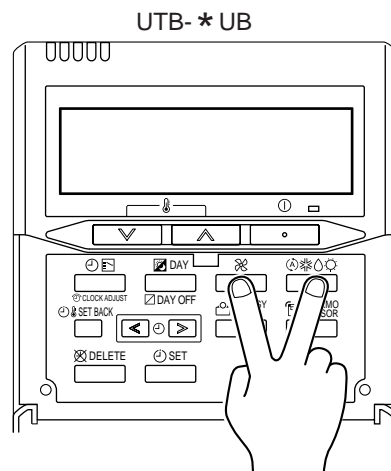
1-3-2 TEST RUN FROM REMOTE CONTROLLER

1) Standard wired remote controller

Stop the indoor unit. Push the FAN CONTROL button and MASTER CONTROL button simultaneously for more than two seconds. The air conditioner will start to conduct a test run and "a!" will display on the remote controller display.

However, the SET TEMP./DAY setting button does not have function, but all other buttons, displays, and protection functions will operate.

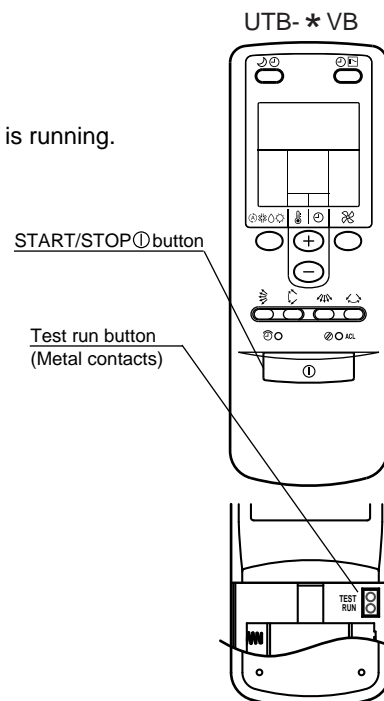
- Perform the test operation for 60 minutes.
- To stop test run, push the START/STOP button of the standard wired remote controller.
- For the operation method, refer to the operating manual and perform operation check.
- Check that there are no abnormal sounds or vibration sounds during test run operation.



2) Standard wireless remote controller

- Short two metal contacts under the battery compartment lid, while the air conditioner is running.
- To stop test run operation, push START/STOP button of the wireless remote controller.

When the air conditioner is being test run, the OPERATION and TIMER lamps of indoor unit flash slowly at the same time.



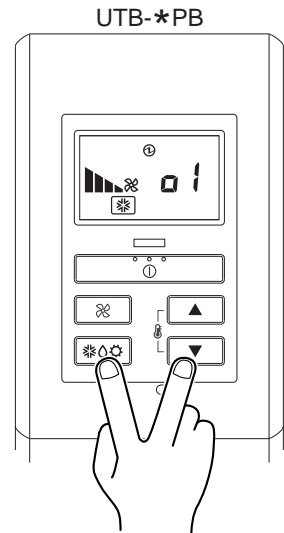
3) Simple remote controller

Stop the indoor and outdoor units. Push the remote controller button and button simultaneously for more than two seconds. The air conditioner will start to conduct a test run and will display on the temperature display.

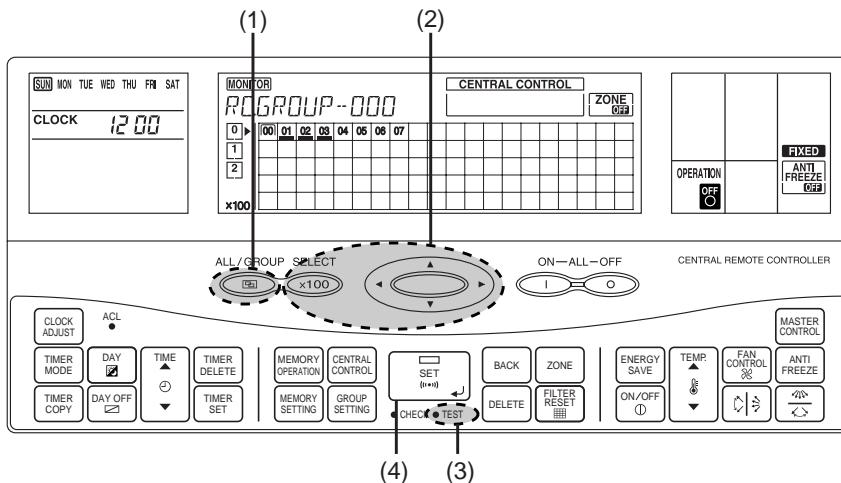
- Perform the test operation for 60 minutes.

The setting button does not have function. However, the other can be used to change the setting.

- To stop test running press the button of the simple remote controller.
- For the operation method refer to the operating manual and perform operation check.
- Check that there are no abnormal sounds or vibration sounds during test run operation.

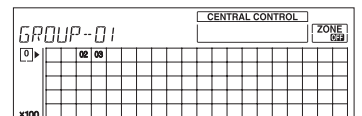
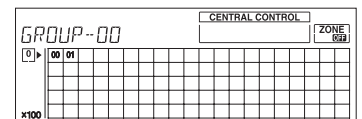


4) Central remote controller

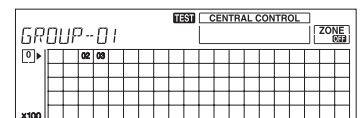


Remote control group operation settings are performed in the control mode. The following procedure for the setting is the same for any of the control modes: Individual mode / Group control mode / All control group.

- (1) Push to select control mode from among Individual control mode / Group control mode / All control.
- (2) When Individual control mode is selected, use and to select the desired central control number, then go to (3).
When Group control mode is selected use to select the desired group number, then go to (3).
When All control mode is selected, go directly to (3).

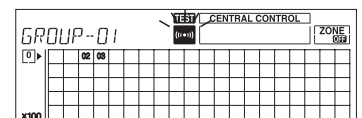


- (3) Press and **TEST** will light up. The operation setting is applied to the selected units.



- (4) Press to send the signal and test run setting is sent to the indoor unit.

will flash as the signal is being transmitted.

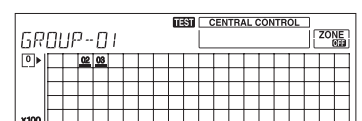


60 minutes' test run starts.

To stop the test run, do the same procedure as those for stop a normal operation.

It is possible to change the settings for the operation mode (heating / cooling) and fan setting.

- (5) Once the signal has been transmitted, the segment and LED will go out. The indoor unit will start test run operation.



NOTE : If the test run is stopped midway, do the operation shown in (3) above and press .

OPERATION

will come on, then do the operation shown in (4). Test run will stop.

1-4 TEST RUN CONTROL

- 1) When the test run signal is transmitted from standard wired, wireless remote controller, simple remote controller and central remote controller.
 - (1) The test runn operation starts and the electric expansion valve is controlled to a maximum flow, regardless of the temperature condition.
 - (2) De-frosting and frost prevention operation has priority over item(1).
 - (3) After 60 minutes passes, the test run stops. However, the operation continues in same operating mode.
- 2) When the test run signal is transmitted from the outdoor unit.
 - (1) Whether state of the indoor unit operates or stops, All units in the same refrigerant system will start to conduct a test run in accordance with the operation mode set by DIP SW 1-1 and SW 1-2 of outdoor unit (see 1 - 3 - 1).
 - (2) Test running initialization is shown below.

Operating Mode	Cooling	Heating
Fan speed	Hi	Hi
Room Temperature Indication	18	30
Vertical Air Direction Panel	Position ①	Position ④
Horizontal Air Direction Panel	Position ③	Position ③
Swing	OFF	OFF

※ Please refer to '4-4 LOUVER CONTROL' in this manual and find the definition for air direction panel position.

Refrigerant

R22



2 . FUNCTION OF PRINTED CIRCUIT BOARD

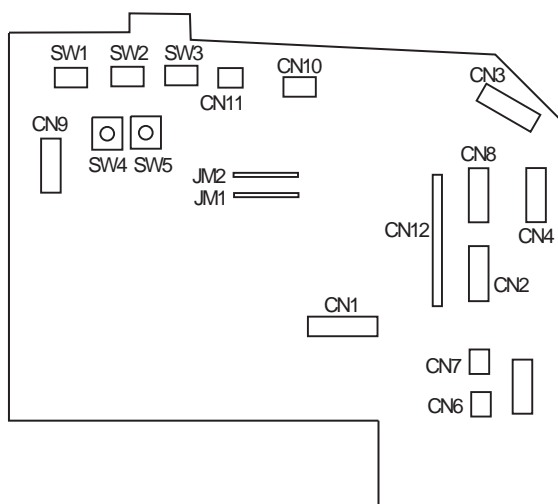
2-1-2 INDOOR UNIT CONTROL CIRCUIT BOARD (COMPACT WALL MOUNTED TYPE)

Indoor unit		
DIP SW	SW 1	1 Forbidden(Indoor unit fan speed switch 1)
		2 Forbidden(Indoor unit fan speed switch 2)
		3 Forbidden(Indoor unit model code)
		4 Forbidden(Indoor unit model code)
	SW 2	1 Indoor unit address switch
		2 Indoor unit address switch
		3 Auto restart validity / invalidity
		4 Forbidden
	SW 3	1 Refrigerant circuit address switch
		2 Refrigerant circuit address switch
		3 Refrigerant circuit address switch
		4 Forbidden
Rotary SW	SW 4	Indoor unit address switch
	SW 5	Refrigerant circuit address switch
Jumper wire	JM 1	Wireless remote controller custom code
	JM 2	Wireless remote controller custom code

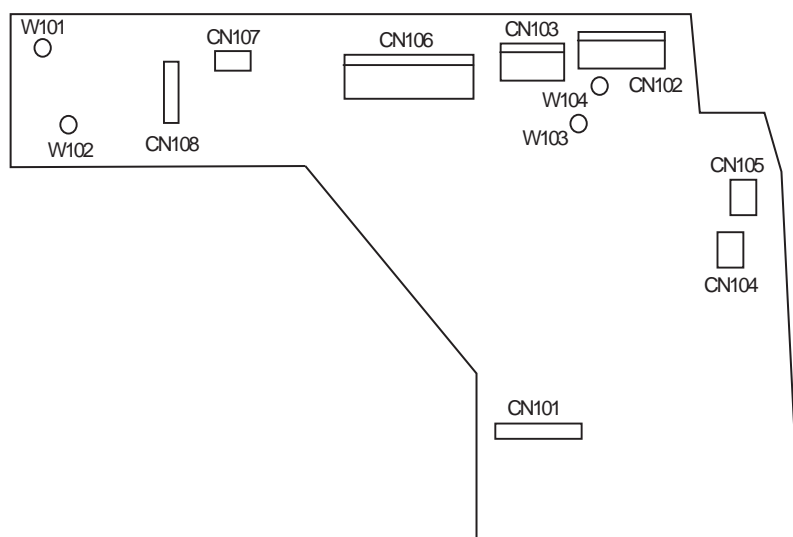
■ SWITCH POSITION

- Compact wall mounted type indoor unit control circuit board

Controller PCB



Power supply PCB

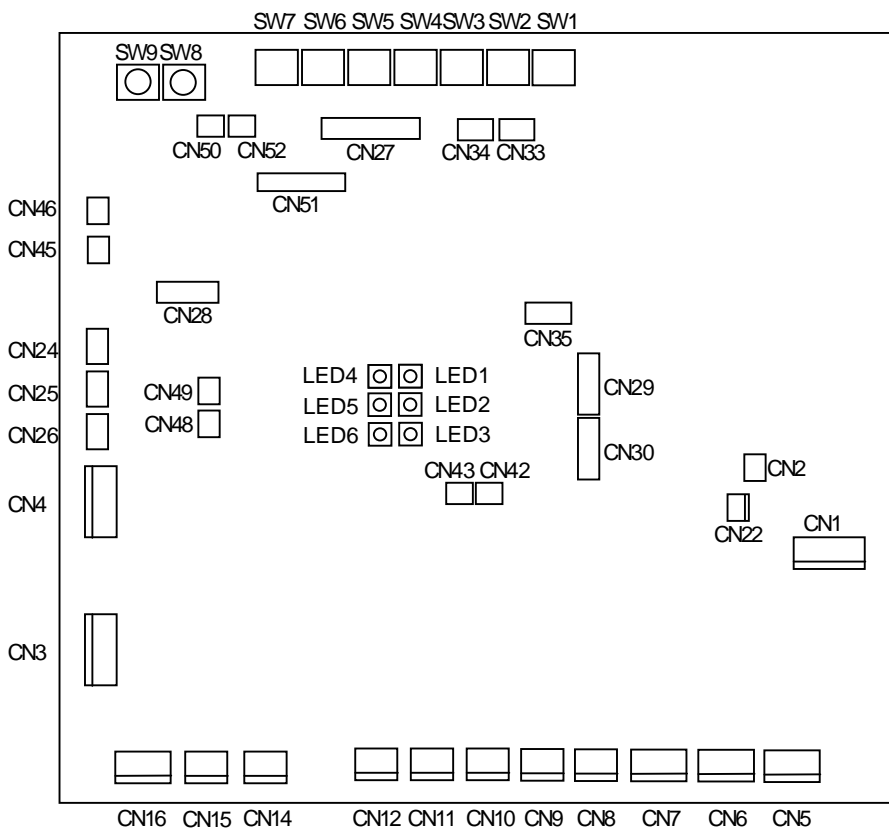


2-1-3 OUTDOOR UNIT CONTROL CIRCUIT BOARD

Outdoor unit			
DIP SW	SW 1	1	Test run (Cooling)
		2	Test run (Heating)
		3	Pump down operation
		4	Forced oil recovery operation
	SW 2	1	Silent operation mode
		2	Snow falling protection fan mode
		3	Sequential start shift switch 1
		4	Sequential start shift switch 2
	SW 3	1	Forbidden
		2	Forbidden
		3	Forbidden
		4	Forbidden
	SW 4	1	Forbidden
		2	Forbidden
		3	Forbidden
		4	Forbidden
	SW 5	1	Cooling capacity shift switch 1
		2	Cooling capacity shift switch 2
		3	Heating capacity shift switch 1
		4	Heating capacity shift switch 2
	SW 6	1	Pipe length switch 1
		2	Pipe length switch 2
		3	Defrost temperature setting switch
		4	Forbidden
	SW 7	1	Forbidden(System type switch 1)
		2	Forbidden(System type switch 2)
		3	Forbidden(Refrigerant type switch)
		4	Forbidden(MODEL CODE switch)
ROTARY SW	SW 8	Refrigerant circuit address 1	
	SW 9	Refrigerant circuit address 2	

■ SWITCH POSITION

● Outdoor unit control circuit board



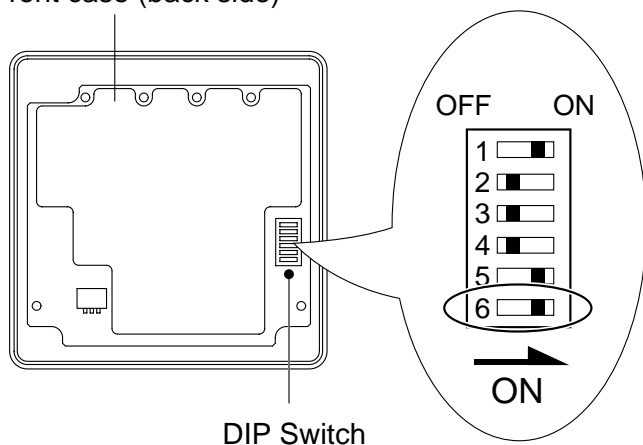
2-1-4 WIRED REMOTE CONTROLLER, SIMPLE REMOTE CONTROLLER CIRCUIT BOARD

Wired, simple remote controller		
DIP SW	1	Dual remote controller setting
	2	
	3	Group control setting
	4	Model setting
	5	Auto changeover setting
	6	Memory backup setting (Wired remote controller only)

■ SWITCH POSITION

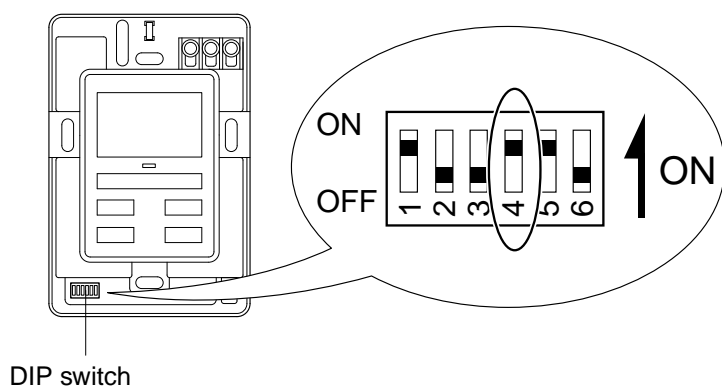
● Wired remote controller

Front case (back side)

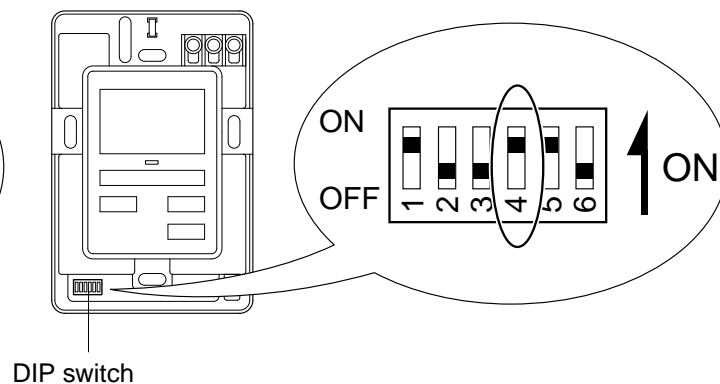


● Simple remote controller

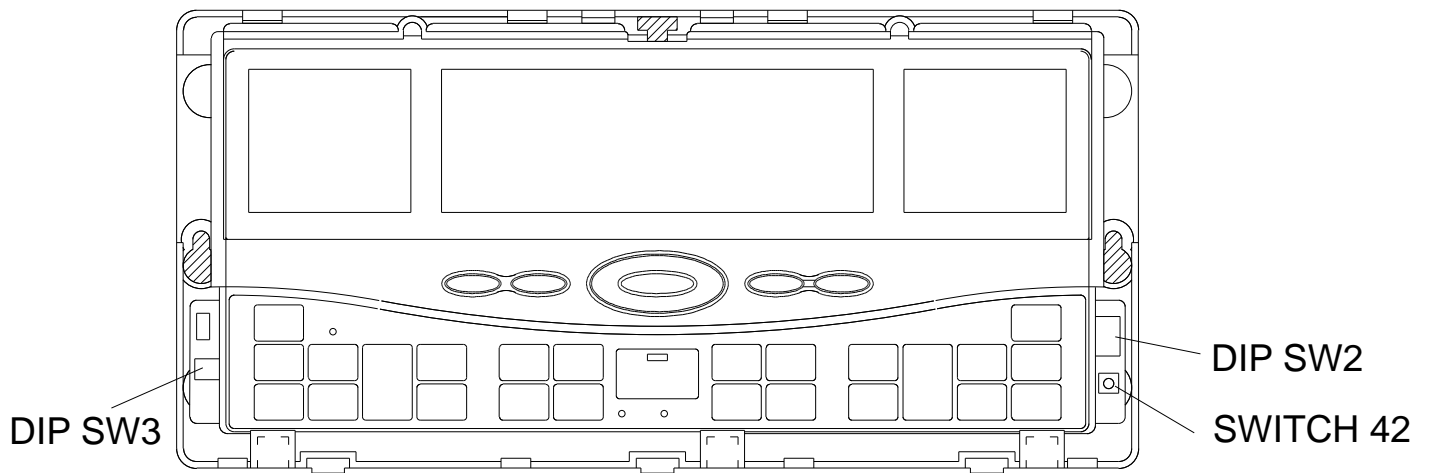
(UTB-YPB / UTB-GPB / UTB-TPB)



(UTB-YRA / UTB-GRA / UTB-TRA)



2-1-5 CENTRAL REMOTE CONTROLLER CIRCUIT BOARD



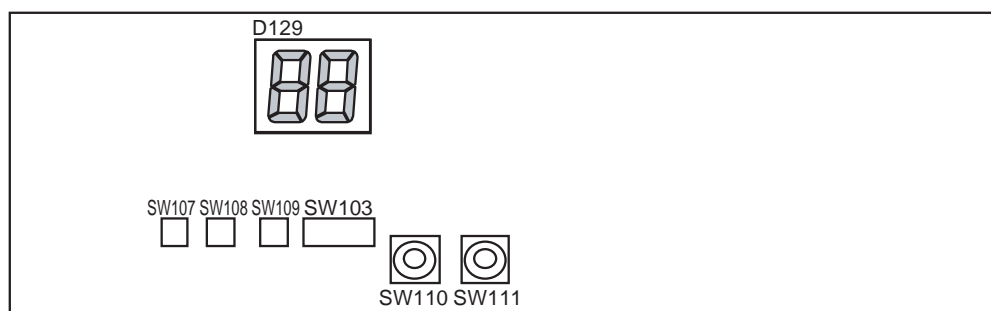
Central remote controller			
DIP-SW	SW 2	1	External input validity / invalidity
		2	External input select edge / pulse
		3	Filter sign indication ON / OFF
		4	°C / °F switch
		5	RC operation prohibit function validity/invalidity
		6	Forbidden
		7	Forbidden
		8	SRAM battery ON / OFF
	SW 3	1	Forbidden
		2	Forbidden
		3	Forbidden
		4	Forbidden
	SW 42		Initial setting

2-1-6 NETWORK CONVERTORS' CIRCUIT BOARD

(1) NETWORK CONVERTOR (UTR-YSSA)

Network Convertor (UTR-YSSA)			
DIP SW	SW 103	1	Remote controller type
		2	
		3	
		4	
		5	Number of connected indoor units
		6	
		7	
		8	
	SW 107	1	Forbidden(Fixed at OFF)
		2	Wired remote controller validity / invalidity
	SW 108	1	External input validity / invalidity
		2	External input select edge / pulse
ROTARY SW	SW 109	1	Auto changeover validity / invalidity * Set to OFF for duct type indoor unit
		2	Auto restart validity / invalidity
	SW 110		Refrigerant circuit address 1
	SW 111		Refrigerant circuit address 2

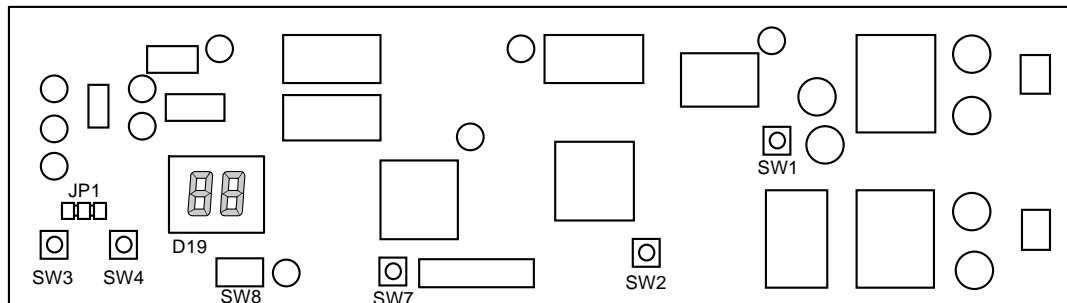
■ SWITCH POSITION



(2) NETWORK CONVERTOR (UTR-YLLA)

Item	Type	Details	
SW1	Push switch	Forbidden	
SW2	Push switch	Service pin	It is used for the commissioning.
SW3	Push switch	Forbidden	
SW4	Push switch	Set button	It is used for the initial setting.
SW7	Push switch	CPU reset	It is used for the initial setting. The CPU will be reset.
SW8	Push switch	Forbidden	
JP1	Jumper switch	Back up battery	It is used for the back up battery setting.
D19	LED	Forbidden	It is used to display the mode of the network convertor mode.

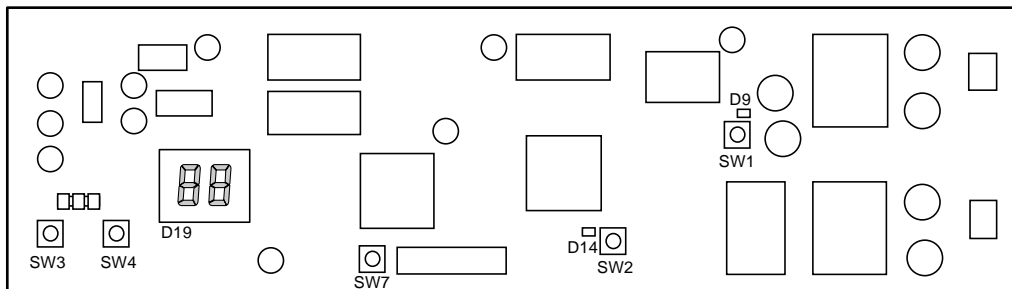
■ SWITCH POSITION



2-1-7 SIGNAL AMPLIFIER CIRCUIT BOARD

SIGNAL AMPLIFIER (UTR-YRPC)

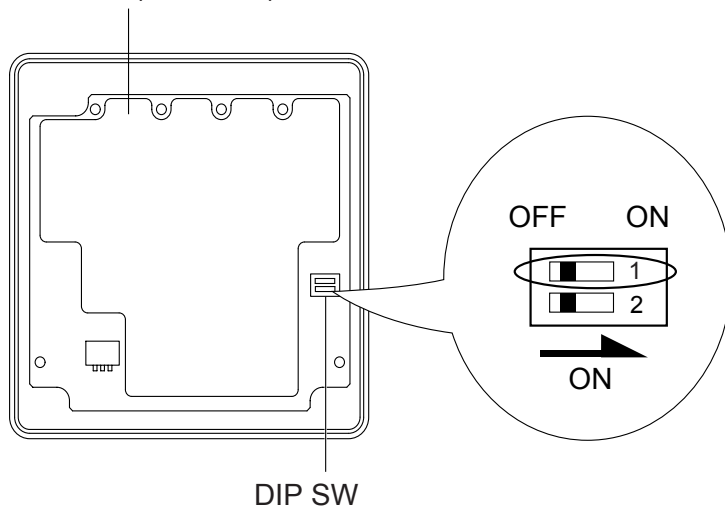
■ SWITCH POSITION



2-1-8 GROUP REMOTE CONTROLLER CIRCUIT BOARD

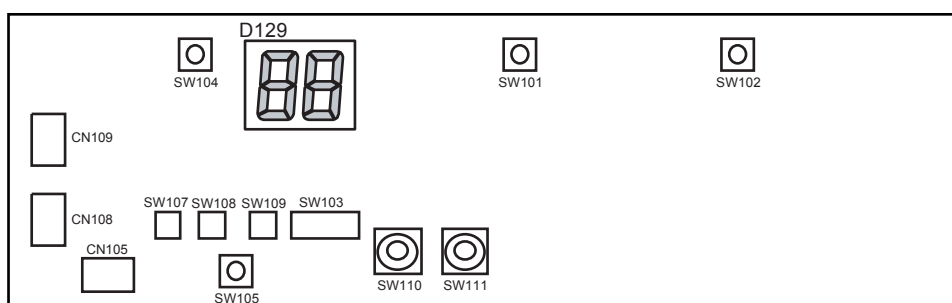
● Group remote controller (UTB-YDA / GDA)

Front case (back side)



Group remote controller		
DIP SW	1	Memory backup setting
	2	Forbidden

● Network convertor for group remote controller (UTR-YRDA)

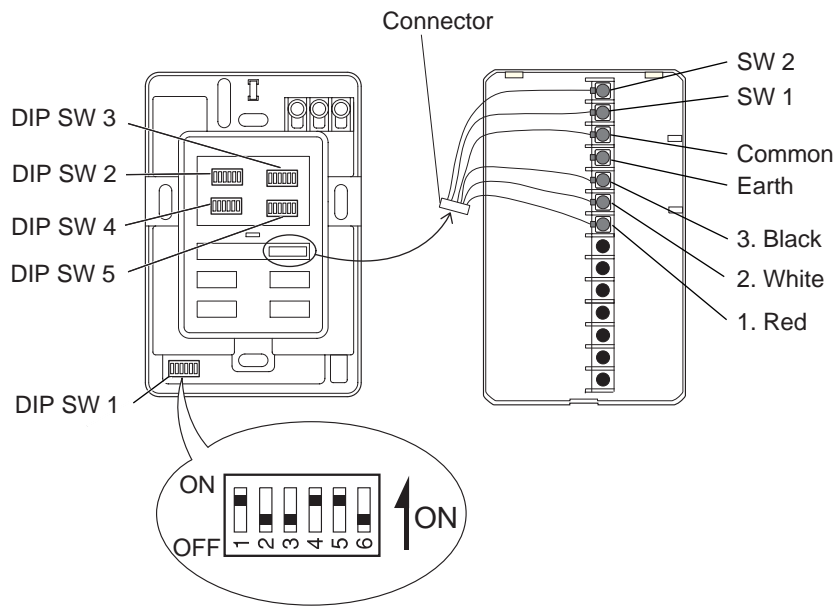


Network convertor (UTR-YRDA)																	
Convertor address		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Rotary SW	SW110	★0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SW111	★0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

(★ : Factory setting)

2-1-9 External Switch Controller Circuit Board

External switch controller (UTR-YESA)



External switch controller			
DIP SW	SW 1	1	MODE setting
		2	
		3	Delay-time setting : Set to ON for switching operation mode in 1 minute after contact.
		4	
		5	Special installation methods
		6	
	SW 2	1	Operation mode setting of parameter setting 1 (P1)
		2	
		3	
		4	
		5	
		6	
	SW 3	1	Setting contact input of SW1 at MODE 0 Operation conditions : Set to ON when switched to P1 or P2 setting by contact input only during indoor unit is in operation.
		2	
		3	
		4	
		5	
		6	
	SW 4	1	Operation mode setting of parameter setting 2 (P2)
		2	
		3	
		4	
		5	
		6	
	SW 5	1	Setting contact input of SW2 at MODE 0 Cannot be used
		2	
		3	
		4	
		5	
		6	

2-2 MICROPROCESSOR FUNCTION LIST

2-2-1 INDOOR UNIT

INDOOR UNIT TYPE		Large Ceiling	Universal	Compact Cassette	Thin Cassette	Large Cassette	Compact Duct	Low Static Pressure Duct	High Static Pressure Duct
CAPACITY (BTU/h)	60,000								○
	54,000	○				○			
	45,000	○				○		○	○
	36,000	○				○		○	○
	30,000	○			○			○	
	24,000 (25,000)		○ 24		○ 25			○ 25	
	20,000				○				
	18,000		○	○			○		
	14,000		○	○			○		
	12,000		○	○			○		
	9,000			○			○		
	7,000			○			○		
CN1	AC IN	○	○	○	○	○	○	○	○
CN2	TH. FUSE	○	○	○	○	○	○	○	○
CN3	FAN CAPA	○	○	○	○	○	○	○	○
CN4	FAN MOTOR	○	○	○	○	○	○	○	○
CN5	D. PUMP	○	○	○	○	○	○	○	○
CN6	S. VALVE	○	○	○	○	○	○	○	○
CN10	SP-M (U,D)	○	○	○	○	○	—	—	—
CN11	SP-M (R,L)	—	—	—	—	—	—	—	—
CN12	HEATER	○	○	○	○	○	○	○	○
CN13	DISPLAY	○	○	○	○	○	○	○	○
CN14	E.E.VALVE	○	○	○	○	○	○	○	○
CN15	FLOAT SW	○	○	○	○	○	○	○	○
CN16	MOTOR F. BACK	○	—	—	○	—	—	—	—
CN17	REMOCON	○	○	○	○	○	○	○	○
CN18	TEST	○	○	○	○	○	○	○	○
CN19	R. TH	○	○	○	○	○	○	○	○
CN20	P. TH	○	○	○	○	○	○	○	○
CN21	S. TH	○	○	○	○	○	○	○	○
CN22	EX. OUT1	○	○	○	○	○	○	○	○
CN23	EX. OUT2	○	○	○	○	○	○	○	○
CN24	EX. OUT3	○	○	○	○	○	○	○	○
CN25	FLASH	○	○	○	○	○	○	○	○
CN26	COMMUNICATION-PWB	○	○	○	○	○	○	○	○
CN27	EX. IN	○	○	○	○	○	○	○	○
CN101	NETWORK	○	○	○	○	○	○	○	○
CN201	COMMUNICATION	○	○	○	○	○	○	○	○
SW1	FUNCTION 1	○	○	○	○	○	○	○	○
SW2	FUNCTION 2	○	○	○	○	○	○	○	○
SW3	FUNCTION 3	○	○	○	○	○	○	○	○
SW4	FUNCTION 4	○	○	○	○	○	○	○	○
SW5	FUNCTION 5	○	○	○	○	○	○	○	○
SW6	INDOOR UNIT ADDRESS 1	○	○	○	○	○	○	○	○
SW7	FORBIDDEN	○	○	○	○	○	○	○	○
SW8	REFRIGERANT ADDRESS 1	○	○	○	○	○	○	○	○
SW9	REFRIGERANT ADDRESS 2	○	○	○	○	○	○	○	○
SW10	REMOTE CONTROLLER ADDRESS	○	○	○	○	○	○	○	○

INDOOR UNIT TYPE			Wall Mounted	Ceiling Wall
CAPACITY (BTU/h)		30,000	○	○
		24,000	○	○
		18,000	○	○
		14,000		○
	CN1	TH. FUSE	○	○
	CN2	FAN MOTOR	○	—
	CN3	FAN MOTOR	—	○
	CN4	D. PUMP	○	○
	CN5	S. VALVE	○	○
	CN6	DIFFUSER/SP-M(U,D)	○	○
	CN7	SP-M(L/R)	○	○
	CN8	DISPLAY-1	○	○
	CN9	DISPLAY-2	○	○
	CN10	F. BACK	—	—
	CN11	TEST	○	○
	CN12	E.E.VALVE	○	○
	CN13	REMOCON	○	○
	CN14	FLOAT	○	○
	CN15	NETWORK	○	○
	CN16	R.-TH	○	○
	CN17	P-TH	○	○
	CN18	S-TH	○	○
	CN19	FLASH	○	○
	CN20	HEATER	○	○
	CN21	EX. IN	○	○
	CN22	EX. OUT1	○	○
	CN23	EX. OUT2	○	○
	CN24	EX. OUT3	○	○
	CN25	COMMUNICATION-PWB	○	○
	CN26	COMMUNICATION	○	○
	SW1	FUNCTION 1	○	○
	SW2	FUNCTION 2	○	○
	SW3	FUNCTION 3	○	○
	SW4	FUNCTION 4	○	○
	SW5	FUNCTION 5	○	○
	SW6	INDOOR UNIT ADDRESS 1	○	○
	SW7	FORBIDDEN	○	○
	SW8	REFRIGERANT ADDRESS 1	○	○
	SW9	REFRIGERANT ADDRESS 2	○	○
	SW10	REMOTE CONTROLLER ADDRESS	○	○

INDOOR UNIT TYPE		Compact Wall Mounted
CAPACITY (BTU/h)	14,000	<input type="radio"/>
	12,000	<input type="radio"/>
	9,000	<input type="radio"/>
	7,000	<input type="radio"/>
CN1	POWER-PWB	<input type="radio"/>
CN2	FAN F. BACK	<input type="radio"/>
CN3	E. E. VALVE	<input type="radio"/>
CN4	SP MOTOT(U,D)	<input type="radio"/>
CN5	DISPLAY	<input type="radio"/>
CN6	ROOM TH.	<input type="radio"/>
CN7	PIPE TH.	<input type="radio"/>
CN8	TEST	<input type="radio"/>
CN9	FLASH	<input type="radio"/>
CN10	EX. IN	<input type="radio"/>
CN11	EX. OUT	<input type="radio"/>
CN12	COMMUNICATION-PWB	<input type="radio"/>
CN101	MAIN-PWB	<input type="radio"/>
CN102	FAN MOTOR	<input type="radio"/>
CN103	TRANS-P	<input type="radio"/>
CN104	TRANS-S	<input type="radio"/>
CN105	TH. FUSE	<input type="radio"/>
CN106	S. VALVE	<input type="radio"/>
CN107	NETWORK	<input type="radio"/>
CN108	COMMUNICATION	<input type="radio"/>
W101-102	POWER SUPPLY	<input type="radio"/>
W103-104	FAN CAPACITOR	<input type="radio"/>
SW1	FUNCTION	<input type="radio"/>
SW2	FUNCTION & INDOOR UNIT ADDRESS	<input type="radio"/>
SW3	REFRIGERANT CIRCUIT ADDRESS	<input type="radio"/>
SW4	INDOOR UNIT ADDRESS	<input type="radio"/>
SW5	REFRIGERANT CIRCUIT ADDRESS	<input type="radio"/>
JM1	WIRELESS REMOTE CONTROLLER CUSTOM	<input type="radio"/>
JM2	WIRELESS REMOTE CONTROLLER CUSTOM	<input type="radio"/>

2-2-2 OUTDOOR UNIT

OUTDOOR UNIT TYPE			AO90R	AO72R	AO90A	AO72A
CN1	AC IN		○	○	○	○
CN2	NET		○	○	○	○
CN3	FAN.1		○	○	○	○
CN4	FAN.2		○	○	○	○
CN5	CRANK CASE HEATER 1		○	○	—	—
CN6	CRANK CASE HEATER 2		○	○	—	—
CN7	CRANK CASE HEATER 3		○	○	—	—
CN8	S.V.1		○	○	○	○
CN9	S.V.2		○	○	○	○
CN10	S.V.3		○	○	○	○
CN11	S.V.4		○	○	○	○
CN12	S.V.5		○	○	○	○
CN14	4WV.1		○	○	—	—
CN15	4WV.2		○	○	—	—
CN16	BASE HEATER		○	○	—	—
CN22	TERMINATOR		○	○	○	○
CN24	COMP.1		○	○	○	○
CN25	COMP.2		○	○	○	○
CN26	COMP.3		○	○	○	○
CN27	TH.1		○	○	○	○
CN28	FLASH W/R		○	○	○	○
CN29	E.E.V1		○	○	—	—
CN30	E.E.V2		○	○	—	—
CN33	P.SEN-L		○	○	○	○
CN34	P.SEN-H		○	○	○	○
CN35	TEST		○	○	○	○
CN45	TH.2		○	○	—	—
CN46	TH.3		○	○	—	—
CN48	EXT.OUTPUT 2		○	○	○	○
CN49	EXT.OUTPUT 1		○	○	○	○
CN50	EXT.INPUT 1		○	○	—	—
CN51	COMMUNICATION PWB		○	○	○	○
CN52	EXT.INPUT 2		○	○	—	—
SW 1	FUNCTION 1		○	○	○	○
SW 2	FUNCTION 2		○	○	○	○
SW 3	FUNCTION 3		○	○	○	○
SW 4	FUNCTION 4		○	○	○	○
SW 5	FUNCTION 5		○	○	○	○
SW 6	FUNCTION 6		○	○	○	○
SW 7	FUNCTION 7		○	○	○	○
SW 8	REFRIGERANT ADDRESS 1		○	○	○	○
SW 9	REFRIGERANT ADDRESS 2		○	○	○	○

2-3 FUNCTION AND SETTING OF EACH SWITCH

2-3-1 INDOOR UNIT (EXCEPT FOR COMPACT WALL MOUNTED TYPE)

■ DIP SWITCH SETTING

1. SW1 setting

1-1 DIP SW 1-1 and SW 1-2 setting forbidden

(◆ ■ ■ Factory setting)

◆	SW1-1	OFF
◆	SW1-2	OFF

1-2 Room temperature correct coefficient of heating.

Decide the heating temperature correct coefficient value for room temperature thermistor. The overall temperature increases when a larger coefficient value is used.

HEATING TEMPERATURE CORRECTION (◆ ■ ■ Factory setting)

	SW1-3	SW1-4	Coefficient value
◆	OFF	OFF	+ 4 deg
	ON	OFF	+ 8 deg
	OFF	ON	0 deg
	ON	ON	+ 12 deg

2. SW2 setting

2-1 Room temperature correct coefficient of cooling.

Decide the cooling temperature correct coefficient value for room temperature thermistor. The overall temperature decreases when a larger coefficient value is used.

COOLING TEMPERATURE CORRECTION (◆ ■ ■ Factory setting)

	SW2-1	Coefficient value
◆	OFF	0 deg
	ON	+ 2 deg

2-2 Dip SW 2-2 setting forbidden

(◆ ■ ■ Factory setting)

◆	SW2-2	OFF
---	-------	-----

2-3 Filter check validity / invalidity.

Filter check is set with Dip SW 2-3

FILTER CLEANING FUNCTION (◆ ■ ■ Factory setting)

	SW2-3	Filter check
◆	OFF	Invalidity
	ON	Validity

2-4 Auto restart validity / invalidity.

Control the auto restart function by turning this switch ON/OFF.

AUTO RESTART SETTING (◆ ■ ■ Factory setting)

	SW2-4	Auto restart
◆	OFF	Invalidity
	ON	Validity

3. SW3 setting (Never change at the site)

3-1 Indoor unit fan speed switch

This switch can select fan speed corresponding to each model.

* Large ceiling type

	AB30	AB36	AB45	AB54
SW3-1	OFF	OFF	OFF	OFF
SW3-2	OFF	ON	OFF	ON
SW3-3	OFF	OFF	ON	ON

* Cassette type

	AU54	AU45	AU36	AU30	AU25	AU20
SW3-1	OFF	ON	OFF	OFF	OFF	ON
SW3-2	OFF	OFF	ON	OFF	ON	ON
SW3-3	OFF	OFF	OFF	ON	ON	ON

* Wall mounted type

	AS18	AS24	AS30
SW3-1	OFF	OFF	ON
SW3-2	OFF	ON	ON
SW3-3	ON	ON	ON

* Ceiling wall type

	AW7	AW9	AW12	AW14	AW18	AW24	AW30
SW3-1	OFF	ON	OFF	ON	OFF	OFF	ON
SW3-2	OFF	OFF	ON	ON	OFF	ON	ON
SW3-3	OFF	OFF	OFF	OFF	ON	ON	ON

* Other model (Default)

SW3-1	OFF
SW3-2	OFF
SW3-3	OFF

3-2 DIP SW 3-4 setting

This switch is used to select the format of external input command as shown in the table below.

(◆ . . . Factory setting)

	SW3-4	External input select
◆	OFF	Edge
	ON	Pulse

4. SW4 setting (Never change at the site)

Indoor unit model code.

This switch for changing the model code information of indoor unit PCB.

INDOOR UNIT MODEL CODE

Capacity Type	60	54	45	36	30	25(24)	20	18	14	12	9	7
SW4-1	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
SW4-2	ON	ON	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF
SW4-3	OFF	OFF	OFF	OFF	ON	ON	ON	ON	OFF	OFF	OFF	OFF
SW4-4	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

5. SW5 setting

5-1 Wireless remote controller custom code switch

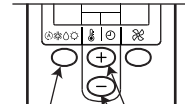
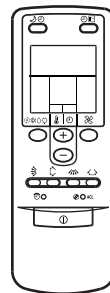
Decid the custom code and restrict the type of infrared control signal, in order to prevent mixing of multiple indoor unit signals.

Remote controller custom code switch

(◆ . . . Factory setting)

SW5-1	SW5-2	Custom code
◆ OFF	OFF	Type A
ON	OFF	Type B
OFF	ON	Type C
ON	ON	Type D

Remote controller



MASTER CONTROLL button

SET TEMP button

1. Press the MASTER CONTROL  for more than five seconds to start the code change.

2. Press the SET TEMP  (+) or (-) button to select the desired code.

→ A → B → C → D

3. Press the MASTER CONTROL  again to end the code change.

5-2 Frost prevention temperature shift switch

Set the frost prevention temperature for indoor unit.

Frost prevention temperature shift switch

(◆ . . . Factory setting)

SW5-3	Frost prevention temperature
◆ OFF	Normal
ON	High

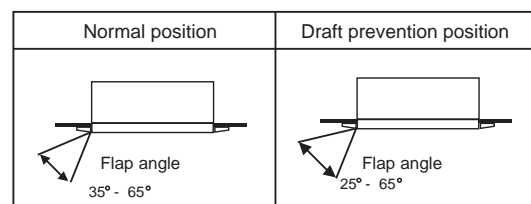
5-3 Draft prevention setting switch (only for cassette type)

Set the flap angle of cassette type unit.

Draft prevention switch

(◆ . . . Factory setting)

SW5-4	flap angle
◆ OFF	Normal position
ON	Draft prevention position



An air flow direction, by moving the flap angle horizontally, It can prevent that a cold wind directly hits.

*If air conditioning cooling operation is performed in long time and a humid place, there is a possibility that waterdrop may hang down from a blow-off mouth.

■ ROTARY SWITCH SETTING

1.SW6 setting

Indoor unit address switch

Sets the indoor unit addresses.

INDOOR UNIT ADDRESS SWITCH (Factory setting : 0)

Rotary SW	Description	Remarks
6	Indoor unit address SW	Indoor unit address (0~15)

2.SW7 setting forbidden

Rotary SW7	0
------------	---

3.SW8,9 setting

Refrigerant circuit address switch

Sets the refrigerant circuit.

REFRIGERANT CIRCUIT ADDRESS SWITCH (Factory setting SW 8: 0 SW 9: 0)

Rotary SW	Description	Remarks
8	Refrigerant circuit address 1	Refrigerant circuit address (the first digit)
9	Refrigerant circuit address 2	Refrigerant circuit address (the second digit)

4.SW10 setting

Remote controller address switch

When the indoor unit is wired by remote controller group, to identify the indoor unit in the remote controller group, the number (remote controller address) in the remote controller group is set. Set the remote controller address in the 0.1.2,~,15 order (Blank is not allowed)

REMOTE CONTROLLER ADDRESS SWITCH (Factory setting : 0)

Rotary SW	Description	Remarks
10	Remote controller address SW	Remote controller address

■ EXTERNAL INPUT AND OUTPUT

Connector	Indoor unit type	Input	Output	Remarks
CN21	Wall mounted / Ceiling wall types	CONTROL INPUT (OPERATION / STOP)	—	See 2-4-1 for details
CN27	Other types			
CN22	All types	—	OPERATION DISPLAY (DC12V)	
CN23			ERROR DISPLAY (DC12V)	
CN24			INDOOR UNIT FAN STATUS DISPLY(DC12V)	

2-3-2 INDOOR UNIT (COMPACT WALL MOUNTED TYPE)

■ DIP SWITCH SETTING

1. SW1 setting (Never change at the site)

1-1 Fan speed setting switch

The fan speed corresponding to each model is set with the switch.

	AS7	AS9	AS12	AS14
SW1-1	OFF	ON	OFF	ON
SW1-2	OFF	OFF	ON	ON

1-2 Model code setting switch

The model code information corresponding to each model is provided with the switch.

	AS7	AS9	AS12	AS14
SW1-3	OFF	ON	OFF	ON
SW1-4	OFF	OFF	ON	ON

2. SW2 setting

2-1 Dip SW 2-1,2-2 setting forbidden

(◆ ■ ■ ■ Factory setting)

◆	SW2-1	OFF
◆	SW2-2	OFF

2-2 Auto restart validity / invalidity.

The auto restart function becomes validity by changing the switch position from OFF to ON.

AUTO RESTART SETTING (◆ ■ ■ ■ Factory setting)

◆	SW2-3	Auto restart
	OFF	Invalidity
	ON	Validity

2-3 DIP SW 2-4 setting forbidden.

(◆ ■ ■ ■ Factory setting)

◆	SW2-4	OFF
---	-------	-----

3. SW3 setting

3-1 Refrigerant circuit address switch

By combined with Rotary SW5 , the refrigerant circuit address (0-99) can be set.
Please see "6-2 ADDRESS SETTING" for refrigerant address conversion table.

(◆ ■ ■ ■ Factory setting)

	Refrigerant circuit address	SW3-1	SW3-2	SW3-3	Remarks
◆	0 - 15	OFF	OFF	OFF	About Rotary SW5, see next page
	16 - 31	ON	OFF	OFF	
	32 - 47	OFF	ON	OFF	
	48 - 63	ON	ON	OFF	
	64 - 79	OFF	OFF	ON	
	80 - 95	ON	OFF	ON	
	96 - 99	OFF	ON	ON	

3-2 DIP SW 3-4 setting forbidden.

(◆ ■ ■ ■ Factory setting)

◆	SW3-4	OFF
---	-------	-----

■ ROTARY SWITCH SETTING

1.SW4 setting

Indoor unit address switch

Set the indoor unit addresses.

INDOOR UNIT ADDRESS SWITCH (Factory setting : 0)

Rotary SW	Description	Remarks
4	Indoor unit address SW	Indoor unit address (0~15)

2.SW5 setting

Refrigerant circuit address switch

By combined with DIP switch 3-1,3-2 and 3-3,the refrigerant circuit address(0 - 99)can be set. Please see "6-2 ADDRESS SETTING" for the refrigerant address conversion table.

REFRIGERANT CIRCUIT ADDRESS SWITCH (Factory setting SW 5: 0)

Rotary SW	Description	Remarks
5	Refrigerant circuit address SW	About DIP switch 3-1,3-2 and 3-3 see previous page

■ JUMPER WIRE

Wireless remote controller custom code switch

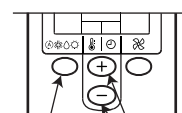
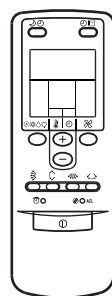
Limit the type of infrared control signal which the indoor unit is controlled,in order to prevent misoperation of the unit due to the signal from other wireless remote controller.

Remote controller custom code switch

(◆ . . . Factory setting)

	JM 1	JM 2	Custom code
◆	Connect	Connect	Type A
	Disconnect	Connect	Type B
	Connect	Disconnect	Type C
	Disconnect	Disconnect	Type D

Remote controller



MASTER CONTROLL button

SET TEMP button

1. Press the MASTER CONTROL (A) for more than five seconds to start the code change.

2. Press the SET TEMP (+) or (-) button to select the desired code.

→ A → B → C → D →

3. Press the MASTER CONTROL (A) again to end the code change.

■ EXTERNAL INPUT AND OUTPUT

Connector	Input or Output	Remarks
CN10	Control Input (Operation / Stop)	See 2-4-2 for details.
CN11	Operation Display (DC12V)	

2-3-3 OUTDOOR UNIT

• DIP SWITCH SETTING

1. SW1 setting

1-1 Test run (cooling & Heating)

All the indoor units connected to the outdoor unit can be test-operated by DIP switch setting.

SELECTOR SWITCH FOR TEST RUN AND NORMAL OPERATION (◆ . . . Factory setting)

	SW1-1	SW1-2	Test Run	Remarks
◆	OFF	OFF	Normal operation	
	ON	OFF	Cooling test run	SW1-1/SW1-2: OFF/OFF or ON/ON → ON/OFF and be kept at ON/OFF position for more than 1min.
	OFF	ON	Heating test run	SW1-1/SW1-2: OFF/OFF or ON/ON → OFF/ON and be kept at OFF/ON position for more than 1min.
	ON	ON	Normal operation	

1-2 Pump down operation

Pump down operation is set with SW1-3

PUMP DOWN OPERATION (◆ . . . Factory setting)

	SW1-3	Pump down operation	Remarks
◆	OFF	Release	
	ON	Operate	OFF → ON and be kept at ON position for more than 40 sec

1-3 Forced oil recovery operation

FORCED OIL RECOVERY OPERATION (◆ . . . Factory setting)

	SW1-4	Forced defrost	Remarks
◆	OFF	Release	
	ON	Operate	OFF → ON and be kept at ON position for more than 10 sec

2. SW2 setting

2-1 Silent operation mode (Cooling mode only)

Noise level can be reduced using silent operation mode when the outdoor temperature falls to 29°C, and the discharge pressure decreases to 2.0MPa or below.

SILENT OPERATION MODE (◆ . . . Factory setting)

	DIP SW 2-1	Silent operation mode
◆	OFF	Release
	ON	Operate

2-2 Snow falling protection fan mode

When the outdoor temperature falls to 5°C, to prevent the unit from being covered with snow, the outdoor fan is periodically operated by this switch even when the compressor is stopped.

SNOW FALLING PROTECTION FAN MODE (◆ . . . Factory setting)

	SW2-2	Snow falling protection fan mode
◆	OFF	Release
	ON	Operate

2-3 Sequential start shift

The start-up timing of outdoor unit can be set up so that it can delay several seconds.

(◆ . . . Factory setting)

	SW2-3	SW2-4	Sequential start shift timing
◆	OFF	OFF	Normal
	OFF	ON	2 sec. delay
	ON	OFF	4 sec. delay
	ON	ON	6 sec. delay

*This feature is useful when multiple number of outdoor units are installed and turned on at the same time to limit the starting current.

3. SW3 setting

Dip SW3-1,3-2,3-3,3-4 setting forbidden.

SW3-1	OFF
SW3-2	OFF
SW3-3	OFF
SW3-4	OFF

4. SW4 setting

Dip SW4-1,4-2,4-3,4-4 setting forbidden.

SW4-1	OFF
SW4-2	OFF
SW4-3	OFF
SW4-4	OFF

5. SW5 setting

5-1 Cooling Capacity shift SW

This setting makes it possible to vary the outflow air temperature within the range of about 2 degrees, by which 15% capacity increase and energy saving operation are realized.

COOLING CAPACITY SHIFT SW (◆ ■ ■ ■ Factory setting)

	SW 5-1	SW 5-2	Capacity shift
◆	OFF	OFF	Normal mode
	OFF	ON	Save energy mode
	ON	OFF	High power mode 1
	ON	ON	High power mode 2

5-2 Heating Capacity Shift SW

HEATING CAPACITY SHIFT SW (◆ ■ ■ ■ Factory setting)

	SW 5-3	SW 5-4	Capacity shift
◆	OFF	OFF	Normal mode
	OFF	ON	Save energy mode
	ON	OFF	High power mode 1
	ON	ON	High power mode 2

6. SW6 setting

6-1 Pipe Length Setting SW

Set up SW6-1 and SW6-2 to match up with the pipe length as follows.

PIPING LENGTH SETTING SW (◆ . . . Factory setting)

SW6-1	SW6-2	Applicable piping length	Remarks: Pipe Length(m)
◆ OFF	OFF	Standard	40<Pipe Length=<60
OFF	ON	Short	Pipe Length=<40
ON	OFF	Medium	60<Pipe Length=<80
ON	ON	Long	80<Pipe Length=<100

6-2 Defrost Temperature Setting SW

The defrosting capacity can be selected by setting up SW6-3

DEFROST TEMPERATURE SETTING SW (◆ . . . Factory setting)

SW6-3	Defrost Capacity
◆ OFF	Standard
ON	Large

6-3 SW 6-4

DIP SW6-4 setting forbidden.

DIP SW6-4	OFF
-----------	-----

7. SW7 setting

7-1 System type of the outdoor unit

The system type of the outdoor unit can be selected by setting up SW7-1 and SW7-2 as follows.

OUTDOOR UNIT SYSTEM TYPE SELECTION (◆ . . . Factory setting)

DIP SW7-1	DIP SW7-2	System type
◆ OFF	OFF	Heat pump
◆ ON	OFF	Cooling only
OFF	ON	Forbidden
ON	ON	Forbidden

7-2 Refrigerant type switch

REFRIGERANT TYPE SWITCH

SW7-3	Refrigerant type
OFF	R22
ON	R407C

◆ R22 model

◆ R407C model

※ AO90TPAMF must be off.

7-3 Model code switch

MODEL CODE SWITCH

SW7-4	Model code
OFF	90
ON	72

◆ 90 model

◆ 72 model

※ SW7 has been set up at factory.
There is no need to set it up at the installation.

• ROTARY SWITCH SETTING

SW8,9 setting

Rotary SW	Description	Remarks
8	Refrigerant circuit address 1	Refrigerant circuit address (the first digit)
9	Refrigerant circuit address 2	Refrigerant circuit address (the second digit)

• EXTERNAL INPUT AND OUTPUT

Connector	Input	Output	
CN48	_____	Compressor ON Compressor OFF	DC12V 0V
CN49	_____	Normal Error	0V DC12V
CN50	OFF:Remote controller priority ON:External Input priority	_____	
CN52	Cool or Heat Select switch	_____	

2-3-4 WIRED , SIMPLE REMOTE CONTROLLER

• DIP SWITCH SETTING

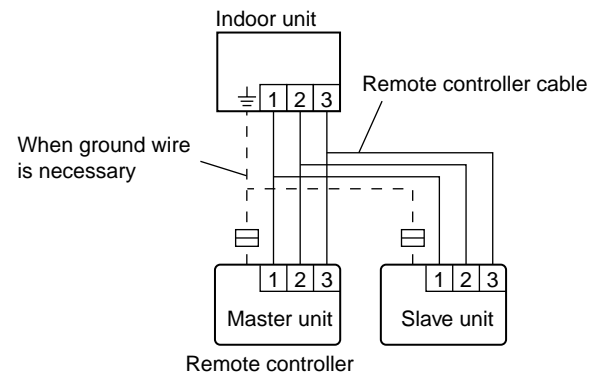
1. SW1 setting

1-1 Dual remote controller setting

Set the remote controller DIP switch No.1 and 2 according to the following table.

(◆ . . . Factory setting)

Number of remote controller	Master unit		Slave unit	
	DIP-SW No.1	DIP-SW No.2	DIP-SW No.1	DIP-SW No.2
◆ 1 (Normal)	ON	OFF	—	—
2 (Dual)	OFF	OFF	ON	ON

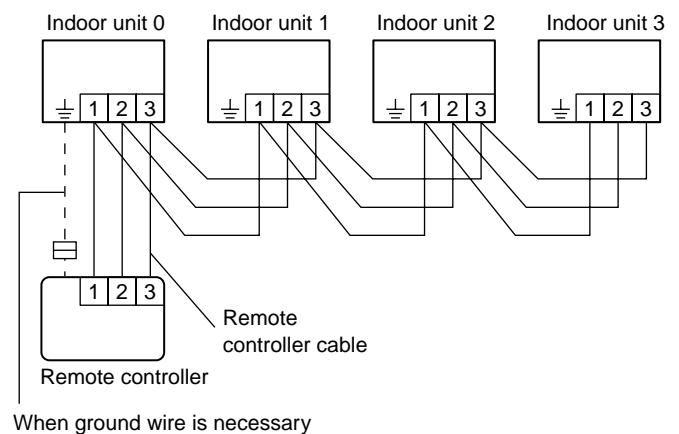


1-2 Group control setting

Number of indoor unit connection (One/Multiple)
This is switched according to the number of connected indoor units.

(◆ . . . Factory setting)

DIP-SW No.3	Number of indoor unit
◆ OFF	One unit connection
ON	Multiple unit connection



1-3 Model setting

The system type of the outdoor unit can be selected by setting up DIP switch No.4 as follows.

(◆ . . . Factory setting)

DIP-SW No.4	Model
◆ OFF	Heat Pump model or Heat Recovery model
ON	Cooling only model

1-4 Auto changeover setting

Selecting auto changeover validity / invalidity.

Set to OFF for AIRSTAGE™ (VRF system) Heat Pump models.

(◆ ■ ■ ■ Factory setting)

	DIP-SW No.5	Auto changeover
◆	OFF	Invalidity
	ON	Validity

1-5 Memory backup setting(Wired remote controller only)

Set to ON to use batteries for thr memory backup.

If batteries are not used, all of the settings stored in memory will be deleted if there is a power failure.

(◆ ■ ■ ■ Factory setting)

	DIP-SW No.6	Memory backup
◆	OFF	Invalidity
	ON	Validity

Never turn it ON in the case of simple remote controller.

2-3-5 CENTRAL REMOTE CONTROLLER

1. DIP-SW2 SETTING

1-1 DIP SW2-1 setting .

For validity / invalidity the external input function.

(◆ . . . Factory setting)

◆	SW 2-1	External input function
	OFF	Invalidity
	ON	Validity

1-2 DIP SW2-2 setting .

Select the external input command function.

(◆ . . . Factory setting)

◆	SW 2-2	External input select
	OFF	Edge
	ON	Pulse

(Refer to 2-4-4 about external input & output)

1-3 DIP SW2-3 setting.

Filter check sign indication or not when filter check come from indoor unit.

(◆ . . . Factory setting)

◆	SW2-3	Filter check sign indication
	OFF	Non-Display
	ON	Display

1-4 DIP SW2-4 setting.

°C / °F switch

Temperature display is centigrate(°C) / Fahrenheit(°F)

(◆ . . . Factory setting)

◆	SW2-4	°C / °F
	OFF	°C
	ON	°F

1-5 DIP SW2-5 setting

For validity / invalidity the wired and wireless remote controller operation prohibit function.

(◆ . . . Factory setting)

◆	SW2-5	RC operation prohibit function
	OFF	Validity
	ON	Invalidity

1-6 DIP SW2-6 and 2-7 setting forbidden.

SW 2-6	OFF
SW 2-7	OFF

1-7 DIP SW2-8 setting.

SRAM Battery ON / OFF

When installing the control remote controller, this switch must be set to ON.
(factory setting:OFF)

(◆ . . . Factory setting)

	SW2-8	SRAM Battery
◆	OFF	OFF
	ON	ON

At the time of shipment,the battery is turned off to avoid electricity consumption.
Be sure to set this switch to ON.

1-8 SW42 Initial setting button

This switch is used when initializing the central remote controller.

2-3-6 Network Convertor

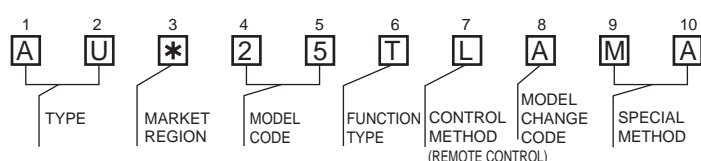
■ Network convertor (UTR-YSSA)

Table 1. Compatible indoor units

J SERIES		○
Big multi	Simultaneous model	○
	Individual model	○
Single type	Wired RC model	○
	Wireless RC model	×
Window type		×

Indoor units which may be controlled from a network convertor are denoted by "L", "U", or "F" as the control method (remote controller). (Fig. 1)

Fig. 1



- When connecting an indoor unit that has an "L" control method, connect the remote controller for VRF (UTB-□□□, UTB-□□□, UTB-□□□ and UTB-□□□) to control from a wired remote controller. Do not connect the wired remote controller included with the indoor unit.
- As the network convertor is not compatible with "Flow direction setting (except for wired remote controller)", "Anti-freeze", "Filter sign", "Set temperature 10-15°C", "Room temperature detection location", "Model name display", and "Electricity charge calculation", control and display are not possible with the controller units.

1. DIP-SW103 (1, 2, 3, 4) RC model or system type setting

① "L" indoor unit control method

- Refer to Fig.1 for information about the control method.
- Set the remote controller model compatible with the number on the back of the wired remote controller packaged with the single model or big multi model as shown in the following Table 2. (Fig. 2)

Fig. 2

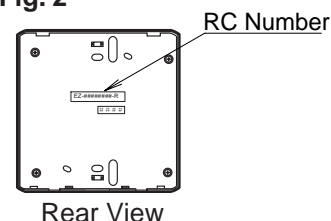


Table 2. RC model setting

RC number	RC model	DIP-SW103			
		1	2	3	4
EZ-099DHSE-R ,EZ-000DHSE-R ,EZ-0001HSE-R EZ-000GHSE-R ,EZ-00004HSE-R EZ-00005HSE-R,EZ-0015HSE-R ,EZ-0019HSE-R	Weekly timer and heat pump model	OFF	OFF	OFF	OFF
EZ-0994HSE-R ,EZ-000EHSE-R	Big multi and heat pump model	OFF	OFF	OFF	ON
EZ-09907WSE-R,EZ-000KHSE-R ,EZ-09503HSE-R EZ-0950DHSE-R	Program timer and heat pump model	OFF	OFF	ON	OFF
EZ-099CWSE-R ,EZ-000AWSE-R ,EZ-0001WSE-R EZ-0012WSE-R	Weekly timer and cooling only model	ON	OFF	OFF	OFF
EZ-09906WSE-R,EZ-000BWSE-R	Big multi and cooling only model	ON	OFF	OFF	ON
EZ-09907WSE-R,EZ-095YWSE-R	Program timer and cooling only model	ON	OFF	ON	OFF
EZ-098VWSE-R		ON	ON	OFF	OFF

② "U" or "F" indoor unit control method

- Refer to Fig.1 for information about the control method.
- Set the system type in accordance with Table 3.

Table 3. System type setting

Outdoor unit System type	DIP-SW103			
	1	2	3	4
Heat pump model	OFF	ON	OFF	OFF
Cooling only model	ON	ON	OFF	ON

2. DIP- SW103 (5, 6, 7, 8) Setting the number of connected indoor units

Set the number of connected indoor units as shown in Table 4.

Table 4 Connected indoor units setting

(◆ . . . Factory setting)

Number of connected Indoor unit	DIP-SW 103				Number of connected Indoor unit	DIP-SW 103				Number of connected Indoor unit	DIP-SW 103			
	5	6	7	8		5	6	7	8		5	6	7	8
◆ 1	OFF	OFF	OFF	OFF	7	OFF	ON	ON	OFF	13	ON	ON	OFF	OFF
2	OFF	OFF	OFF	ON	8	OFF	ON	ON	ON	14	ON	ON	OFF	ON
3	OFF	OFF	ON	OFF	9	ON	OFF	OFF	OFF	15	ON	ON	ON	OFF
4	OFF	OFF	ON	ON	10	ON	OFF	OFF	ON	16	ON	ON	ON	ON
5	OFF	ON	OFF	OFF	11	ON	OFF	ON	OFF					
6	OFF	ON	OFF	ON	12	ON	OFF	ON	ON					

3. DIP-SW 107 Setting

(1) DIP SW 107-1 setting forbidden

(◆ . . . Factory setting)

◆	SW 107-1	OFF
---	----------	-----

(2) Wired RC validity / invalidity setting

Select the wired RC validity / invalidity

(◆ . . . Factory setting)

◆	SW 107-2	Wired RC
	OFF	Invalidity
	ON	validity

4. DIP-SW 108 setting

(1) External input validity / invalidity setting

Select the external input function validity / invalidity

(◆ . . . Factory setting)

◆	SW 108-1	External input function
	OFF	Invalidity
	ON	validity

(2) External input

Select the external input command type

(◆ . . . Factory setting)

◆	SW 108-2	External input
	OFF	Edge
	ON	Pulse

5. DIP-SW109 setting

(1) Auto changeover validity / invalidity setting

Select auto changeover function validity / invalidity

Set to OFF when connecting the duct model.

(◆ . . . Factory setting)

◆	SW 109-1	Auto changeover function
	OFF	Invalidity
	ON	validity

(2) Auto restart validity / invalidity setting

Select auto restart function validity / invalidity

(◆ . . . Factory setting)

◆	SW 109-2	Auto restart function
	OFF	Invalidity
	ON	validity

6. Rotary-SW 110 , 111 Setting

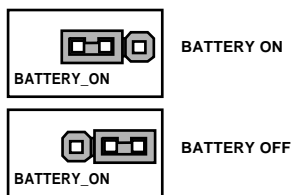
Set the refrigeration circuit address.

Rotary SW	Description	Remarks
SW 110	Refrigeration circuit address 1	Refrigeration circuit address (The second digit)
SW 111	Refrigeration circuit address 1	Refrigeration circuit address (The first digit)

■ Network convertor (UTR-YLLA)

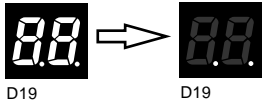






JP1 setting

Set the Jumper switch 1 (JP1) in order to set "Back up battery ON"
(This is necessary in order to save the initial setting data and commissioning data to SRAM.)



2-3-7 Signal Amplifier

■ Signal Amplifier (UTR-YRPC)

<p>1. Turn on the power for the signal amplifier.</p>  <p>D19 D19</p>	<p>2. While holding down the set button (SW4), press and release the reset button (SW7) to enter the address setting mode. The address setting mode is activated only if the set button is held down when the reset button is released.</p>  <p>D19 Address setting mode</p>	<p>3. Press the set button (SW4) to display the current address. The address is set to A1 at the factory.</p>  <p>D19</p>
<p>4. Press the mode button (SW3) to select the address*. The displayed address changes as follows each time the mode button is pressed.</p> <p style="text-align: center;"> A1 → A2 → A3 → A4 → A5 ← A8 ← A7 ← A6 ← </p> <p>* If connecting multiple signal amplifiers, be sure to select a different address for each amplifier. If the same address is used for different signal amplifiers, communication cannot occur.</p>	 <p>D19 Ex.) Address No. 5 is selected.</p>	
<p>5. Press the set button (SW4) to set the selected address.</p>  <p>D19 Ex.) Address No. 5 is set.</p>	<p>6. Turn the power off and on or press the reset button (SW7) to exit the address setting mode and return to the normal mode. If an address setting error occurs ("f" is displayed on the right side of the D19 LED display), the address will not be set. Perform address setting again.</p> <div style="display: flex; justify-content: space-around;"> <div data-bbox="746 1115 829 1216">  <p>D19 Normal mode</p> </div> <div data-bbox="1114 1115 1200 1216">  <p>D19 Address setting error</p> </div> </div>	

2-3-8 Group Remote Controller

■ Group Remote Controller (UTB-YDA / GDA)

DIP-SW setting

(1) Memory backup setting

Set to ON to use batteries for the memory backup.
If batteries are not used, all of the settings stored in memory will be deleted if there is a power failure.

(◆ ■ ■ ■ Factory setting)

	SW1	Memory backup
◆	OFF	Invalidity
	ON	validity

(2) DIP SW2 setting forbidden

(◆ ■ ■ ■ Factory setting)

◆	SW2	OFF
---	-----	-----

■ Network convertor for Group Remote Controller (UTR-YRDA)

Rotary-SW 110, 111 setting

Set rotary SW 110, 111 in accordance with the following table.

- Be sure to set the convertor address different from the central remote controller address(refer to the setting manual for the central remote controller).
- Each convertor address can be selected freely but the same address cannot be used more, than once.

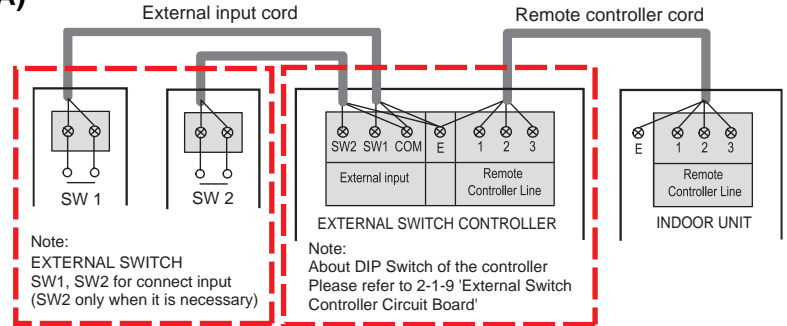
Convertor address		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Rotary switch	SW110	★ 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SW111	★ 0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

(★ : Factory setting)

2-3-9 External Switch Controller

■ External Switch Controller (UTR-YESA)

Wiring diagram



1. DIP SW SETTING

(1) MODE setting.

Sets the mode.

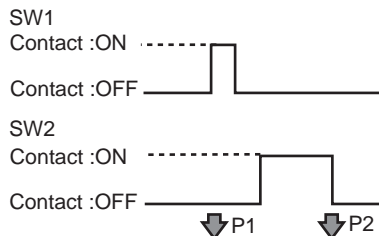
(◆ . . . Factory setting)

SW1-1	SW1-2	MODE setting	Detail
OFF	OFF	MODE 0	This MODE sets to P1 operation mode if SW1 has a contact input of DIP-SW3-5. This MODE sets to P2 operation mode if SW2 has a contact input of DIP-SW5-5.
OFF	ON	MODE 1	This MODE sets to P1 operation mode if a contact of SW1 is switched ON ⇒ OFF. This MODE sets to P2 operation mode if a contact of SW1 is switched OFF ⇒ ON.
ON	OFF	MODE 2	This MODE sets to P1 operation mode in 1 minute after stop operation if a contact of SW1 is switched ON ⇒ OFF. This MODE sets to P2 operation mode in 1 minute after stop operation if a contact of SW1 is switched OFF ⇒ ON.
ON	ON	No setting	

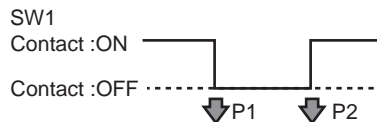
Example :

① MODE 0

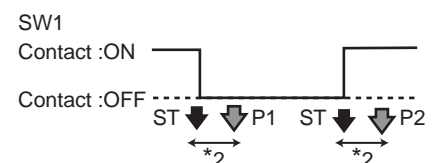
DIP-SW3-5 : ON
DIP-SW5-5 : OFF



② MODE 1



③ MODE 2



*1 : ST means "Stop operation".

*2 : If the indoor unit is operated between ST and P1 or ST and P2, it may not be set at the operational status of P1 or P2.

(2) Delay-time setting

Set to ON for switching operation mode in 1 minute after contact.

(◆ . . . Factory setting)

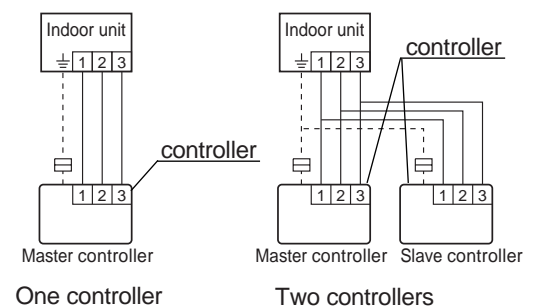
SW1-3	Delay-time setting
OFF	Instant (200msec)
ON	Delay (1 min)

(3) External switch controller and remote controller, or dual external switch controllers setting

Set the external switch controller DIP switch No.1-4,1-5 according to the following table.

(◆ . . . Factory setting)

Number of remote controllers	Master controller		Slave controller	
	DIP-SW1 No.4	DIP-SW1 No.5	DIP-SW1 No.4	DIP-SW1 No.5
One controller	ON	OFF	—	—
Two controllers	OFF	OFF	ON	ON



(◆ . . . Factory setting)

DIP-SW1 No.6	Number of indoor unit
OFF	One unit connection
ON	Multiple unit connection

(4) Group control setting

Number of indoor unit connection (One/Multiple)

This is switched according to the number of connected indoor units.

(5) Operation mode setting

Operation mode setting of parameter setting 1(P1)

SW2-1	SW2-2	Operation
OFF	OFF	invalidity
OFF	ON	OFF
ON	OFF	ON
ON	ON	SET BACK *1

SW3-1	SW3-2	Operation mode
OFF	OFF	invalidity
OFF	ON	COOL
ON	OFF	HEAT *2*3
ON	ON	Not setting

SW3-3	SW3-4	Fan speed
OFF	OFF	invalidity
OFF	ON	HIGH
ON	OFF	MID
ON	ON	LOW

SW2-3	SW2-4	SW2-5	SW2-6	Set temperature
OFF	OFF	OFF	OFF	invalidity
OFF	OFF	OFF	ON	16°C *2*3
OFF	OFF	ON	OFF	17°C
OFF	OFF	ON	ON	18°C
OFF	ON	OFF	OFF	19°C
OFF	ON	OFF	ON	20°C
OFF	ON	ON	OFF	21°C
OFF	ON	ON	ON	22°C
ON	OFF	OFF	OFF	23°C
ON	OFF	OFF	ON	24°C
ON	OFF	ON	OFF	25°C
ON	OFF	ON	ON	26°C
ON	ON	OFF	OFF	27°C
ON	ON	OFF	ON	28°C
ON	ON	ON	OFF	29°C
ON	ON	ON	ON	30°C

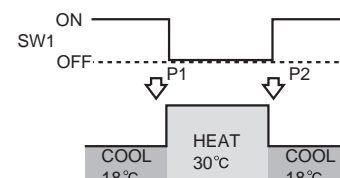
*1 Setting of SETBACK turns back the operation state to that of before switching parameter setting. (Example on the right shows that the operation state is set back to before switching to P1 setting.)

*2 Do not set the operation mode "HEAT", or the setting temperature "16°C" or "17°C" for COOLING ONLY MODEL. These settings do not function.

*3 Units cannot operate correctly under the settings shown below:

- Set the operation mode to "HEAT" and temperature to "16°C" or "17°C" during operation in Cooling priority.
- Set the operation mode to "COOL" during operation in Heating priority.
- Set the Fan speed during the operation mode "DRY".

Ex. MODE 1, P2 is SETBACK.



(6) Contact input

Setting contact input of SW1 at MODE 0.

(◆ . . . Factory setting)

SW3-5	Contact input of SW1
◆ OFF	ON ⇒ OFF
ON	OFF ⇒ ON

(7) Operation conditions

Set to ON when switched to P1 or P2 setting by contact input only during indoor unit is in operation.

(◆ . . . Factory setting)

SW3-6	Operation conditions
◆ OFF	No condition
ON	Unit in operation only

(8) Operation mode setting

Operation mode setting of parameter setting 2(P2)

SW4-1	SW4-2	Operation
OFF	OFF	invalidity
OFF	ON	OFF
ON	OFF	ON
ON	ON	SET BACK *1

SW5-1	SW5-2	Operation mode
OFF	OFF	invalidity
OFF	ON	COOL
ON	OFF	HEAT *2*3
ON	ON	Not setting

SW5-3	SW5-4	Fan speed
OFF	OFF	invalidity
OFF	ON	HIGH
ON	OFF	MID
ON	ON	LOW

SW4-3	SW4-4	SW4-5	SW4-6	Set temperature
OFF	OFF	OFF	OFF	invalidity
OFF	OFF	OFF	ON	16°C *2*3
OFF	OFF	ON	OFF	17°C
OFF	OFF	ON	ON	18°C
OFF	ON	OFF	OFF	19°C
OFF	ON	OFF	ON	20°C
OFF	ON	ON	OFF	21°C
OFF	ON	ON	ON	22°C
ON	OFF	OFF	OFF	23°C
ON	OFF	OFF	ON	24°C
ON	OFF	ON	OFF	25°C
ON	OFF	ON	ON	26°C
ON	ON	OFF	OFF	27°C
ON	ON	OFF	ON	28°C
ON	ON	ON	OFF	29°C
ON	ON	ON	ON	30°C

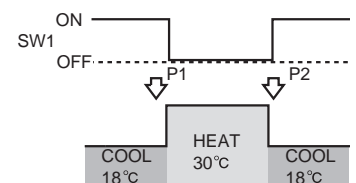
*1 Setting of SETBACK turns back the operation state to that of before switching parameter setting. (Example on the right shows that the operation state is set back to before switching to P1 setting.)

*2 Do not set the operation mode "HEAT", or the setting temperature "16°C" or "17°C" for COOLING ONLY MODEL. These settings do not function.

*3 Units cannot operate correctly under the settings shown below:

- Set the operation mode to "HEAT" and temperature to "16°C" or "17°C" during operation in Cooling priority.
- Set the operation mode to "COOL" during operation in Heating priority.
- Set the Fan speed during the operation mode "DRY".

Ex. MODE 1, P2 is SETBACK.



(9) Contact input

Setting contact input of SW2 at MODE 0.

(◆ . . . Factory setting)

SW5-5	Contact input of SW2
OFF	ON ⇒ OFF
ON	OFF ⇒ ON

(10) DIP SW5-6 setting forbidden

(◆ . . . Factory setting)

SW5-6	ON
-------	----

2-4 EXTERNAL INPUT & OUTPUT

2-4-1 INDOOR UNIT (EXCEPT FOR COMPACT WALL MOUNTED TYPE)

(1) Control input (Operation/Stop)

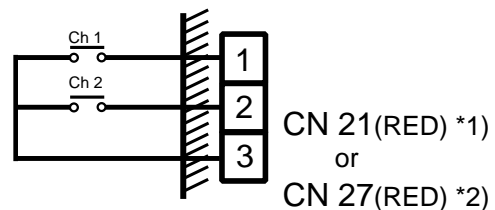
Indoor unit can be operated or stopped by using indoor unit PCB
CN 21 (Wall mounted type / ceiling wall type) or CN27 (other types)

① Input select

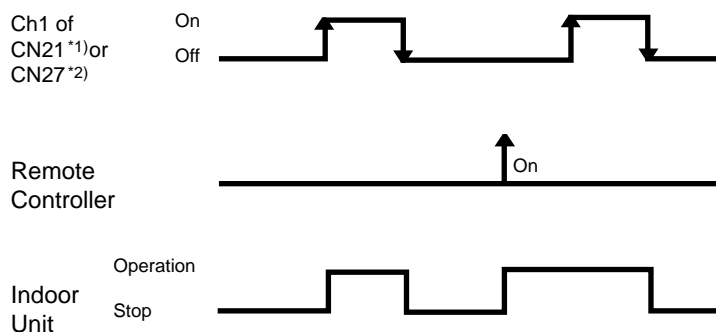
Dip SW3-4	Input select
OFF	Edge
ON	Pulse

② In the case of "Edge" input

CONNECTOR	INPUT SIGNAL	COMMAND
Ch1 of CN21 ^{*1)} (RED) or CN27 ^{*2)} (RED)	OFF → ON	Operation
	ON → OFF	Stop



*1) For Wall mounted type / Ceiling wall type.
*2) For other types

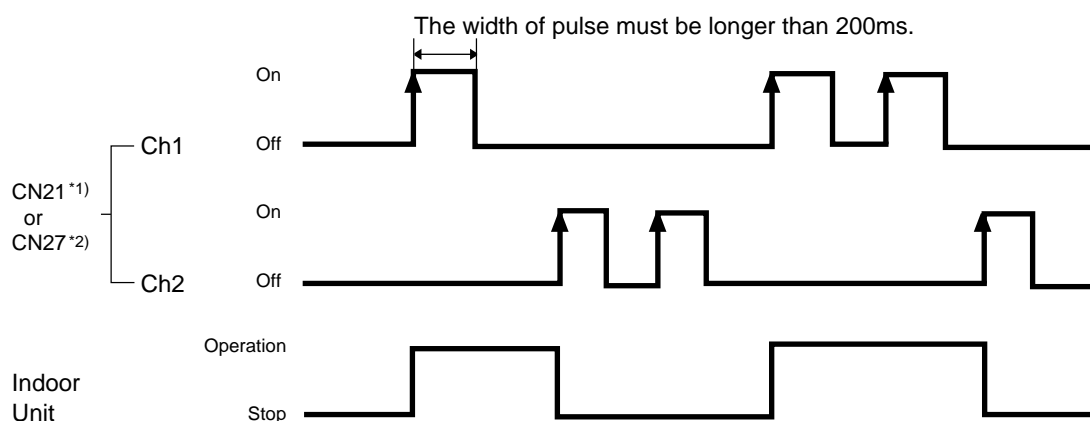


NOTE

1. The last command has priority.
2. The indoor units within the same remote controller group operates in the same mode.
3. The wire connection shall be separate from the power cable line.

③ In the case of "pulse" input

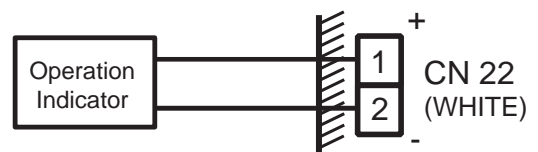
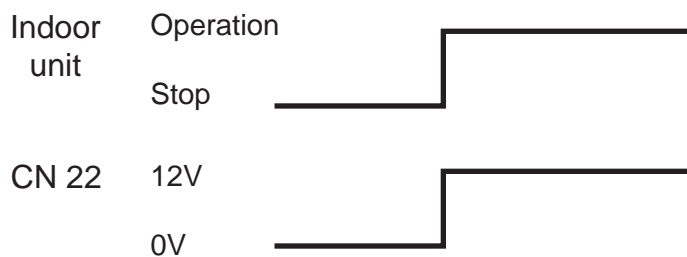
CONNECTOR		INPUT SIGNAL	COMMAND
CN21* ¹⁾ (RED) or CN27* ²⁾ (RED)	Ch1	OFF → ON	Operation
	Ch2	OFF → ON	Stop



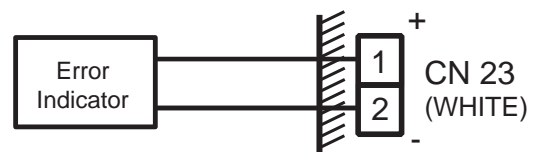
(2) Output

CONNECTOR	OUT VOLTAGE	STATUS
CN22	12V	Operation
	0V	Stop
CN23	12V	Error
	0V	Normal
CN24	12V	Fan run
	0V	Fan stop

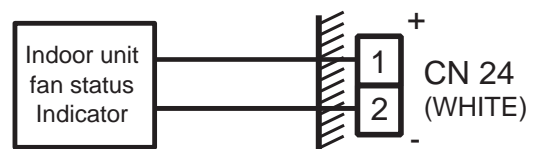
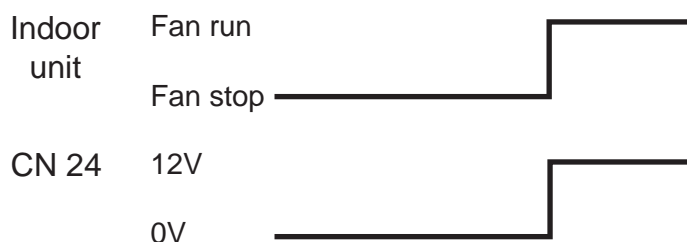
① Operation display



② Error display



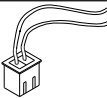
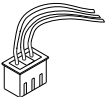
③ Inter locking output with indoor unit fan



EX) Used for inter lock energize for exhaust fan.

(3) Parts

Following cord (service parts) is required. Please use the parts number shown below to order the cord from your sales representative.

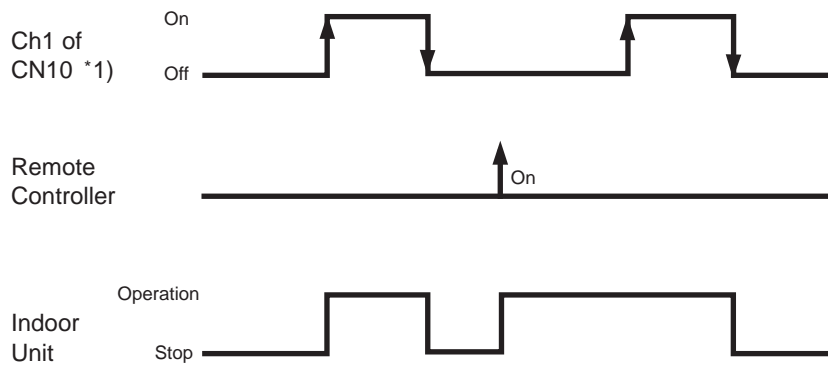
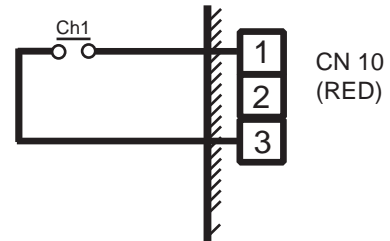
Usage	Name and shapes	Q'ty	Parts No.
For output port	EXTERNAL INPUT WIRE 	1	9368778002
For control input port	EXTERNAL INPUT WIRE 	1	9368779009

2-4-2 INDOOR UNIT (COMPACT WALL MOUNTED)

(1) Control input (Operation / Stop)

Indoor unit can be operated or stopped by using the connector CN10(RED) ON indoor unit PCB.

CONNECTOR	INPUT SIGNAL	COMMAND
CN10 (RED)	OFF → ON	Operation
	ON → OFF	Stop



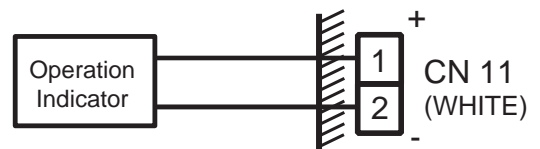
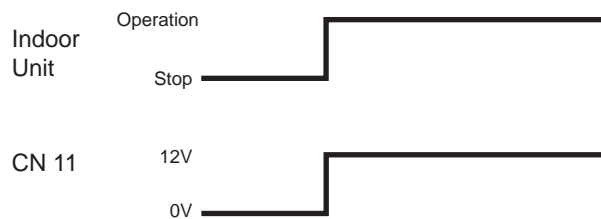
NOTE

1. The last command has priority.
2. The wire connection shall be separate from the power cable line.

(2) Output

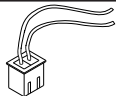
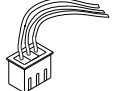
CONNECTOR	OUT VOLTAGE	STATUS
CN11 (WHITE)	12V	Operation
	0V	Stop

Operation display



(3) Parts

Following cord (service parts) is required. Please use the parts number shown below to order the cord from your sales representative.

Usage	Name and shapes	Q'ty	Parts No.
For output port	EXTERNAL INPUT WIRE 	1	9368778002
For control input port	EXTERNAL INPUT WIRE 	1	9368779009

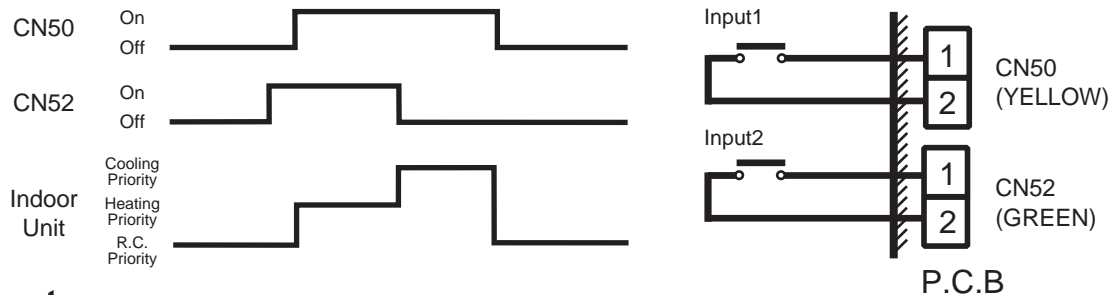
2-4-3 OUTDOOR UNIT

(1) Input

Heat and Cool switch (Heat pump type only)

"Cooling priority" or "Heating priority" can be selected by this input.

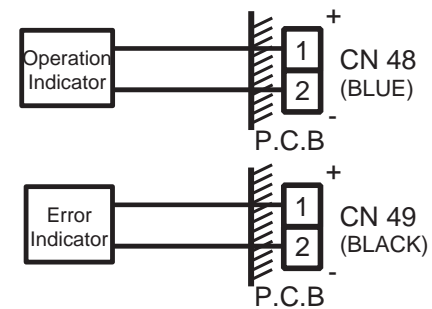
CONNECTOR	INPUT SIGNAL	STATUS	REMARKS
CN50 (YELLOW)	OFF	Remote Controller priority	
	ON	External input priority	
CN52 (GREEN)	OFF	Cooling priority	CN50 need to be "ON".
	ON	Heating priority	



(2) Output

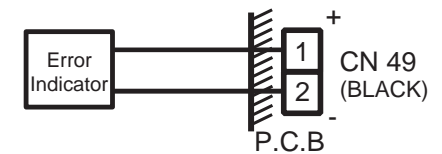
① Operation display

This output indicates the outdoor unit's "Operation" status.

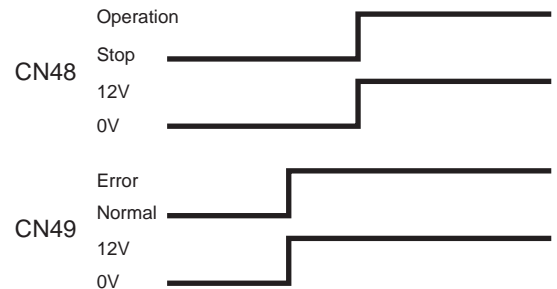


② Error display

This output indicates the outdoor unit and connected indoor unit's "Normal" or "Error" status.

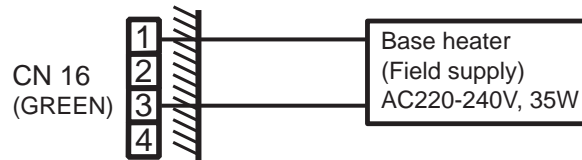


CONNECTOR	OUTPUT VOLTAGE	STATUS
CN48 (BLUE)	0V	Stop
	12V	Operation
CN49 (BLACK)	0V	Normal
	12V	Error



③ Base heater output

Turn ON when the ambient temperature is low in heating mode.(2 °C or less)



(3) Parts

Following cord (service parts) is required. Please use the parts number shown below to order the cord from your sales representative.

Usage	Name and shapes	Q'ty	Parts No.
For base heater output port	BASE HEATER WIRE	1	9368776008
For input and output port	EXTERNAL INPUT WIRE	1	9368777005

2-4-4 CENTRAL REMOTE CONTROLLER / PC CONTROLLER

(1) Input

① Control input (All on / All off)

Indoor units which stored into Central R.C. or PC controller can be operated or stopped by this input.

a) Input select

• Central remote controller

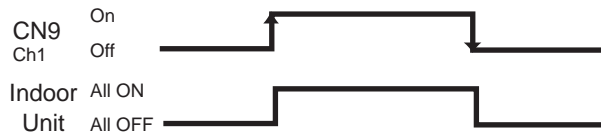
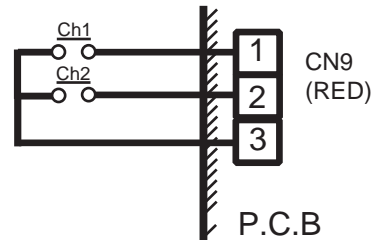
DipSW2-1	DipSW2-2	Input select
ON	OFF	"Edge"
ON	ON	"Pulse"

• PC controller

Input select can be set in environmental set up.
(Please refer to PC Controller's setting manual.)

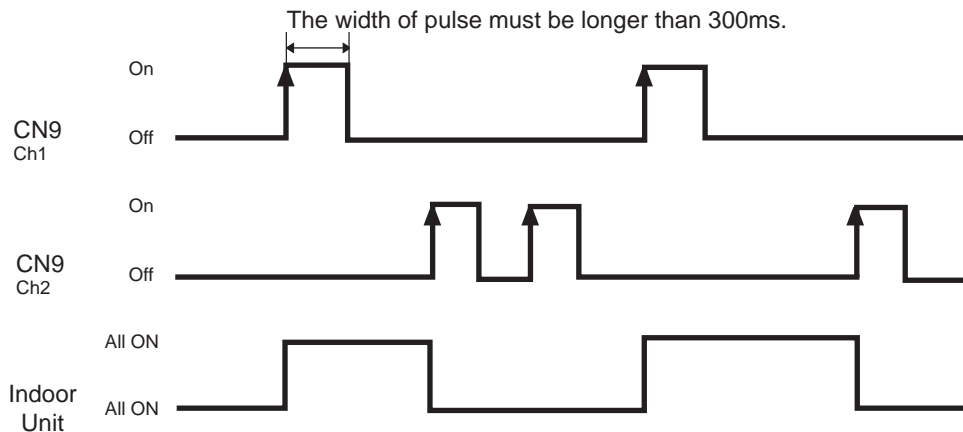
b) In the case of "Edge" input

CONNECTOR		INPUT SIGNAL	COMMAND
CN9 (RED)	Ch1	OFF → ON	All ON
		ON → OFF	All OFF



c) In the case of "Pulse" input

CONNECTOR		INPUT SIGNAL	COMMAND
CN9 (RED)	Ch1	OFF → ON	All ON
	Ch2	OFF → ON	All OFF

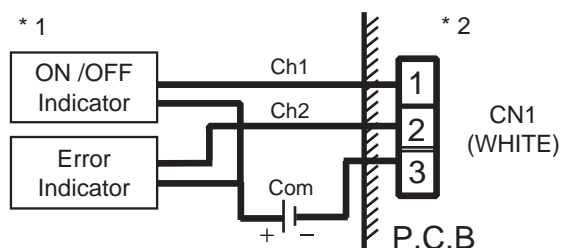
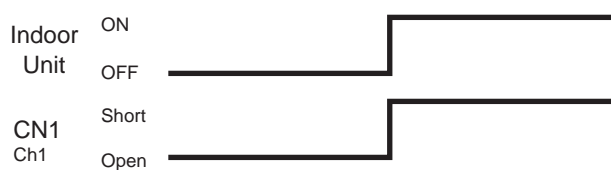


(2) Output

① Operation display

This output indicates the indoor unit's "Operate" or "Stop" status.

CONNECTOR		OUTPUT SIGNAL	STATUS
CN1 (WHITE)	Ch1	Open	All of indoor units "OFF"
		Short	At least one more indoor units "ON"



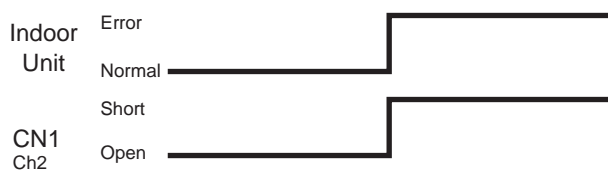
* 1 Always insert a diode on both ends of relay coil.

* 2 Pin 1 - Pin 3 } Max 15V
Pin 2 - Pin 3 } 70mA

② Error display


This output indicates the indoor unit's "Normal" or "Error" status.

CONNECTOR		OUTPUT SIGNAL	STATUS
CN1 (WHITE)	Ch2	Open	All of indoor units "Normal"
		Short	At least one more indoor units "Error"



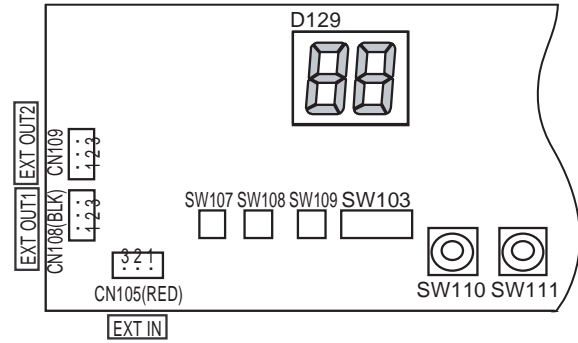
(3) Parts

Following cord (service parts) is required. Please use the parts number shown below to order the cord from your sales representative.

Usage	Name and shapes	Q'ty	Parts No.
For input and output port	EXTERNAL INPUT WIRE 	1	9368779009

2-4-5 NETWORK CONVERTOR

The connector positions and pin number of network convertor (UTR-YSSA) for external input and output are shown in the right figure.



(1) Control input (Operation / Stop)

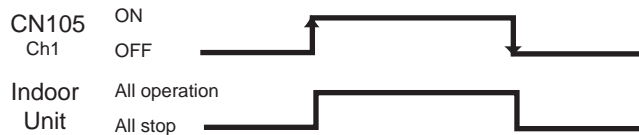
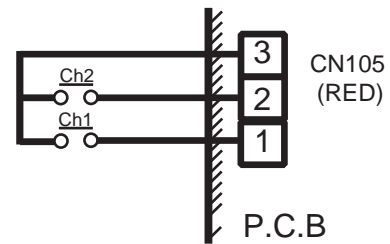
Indoor units that connected to network convertor can be controlled (all operation / all stop) by this input.

a) Input select

DipSW108-1	DipSW108-2	Input select
ON	OFF	"Edge"
ON	ON	"Pulse"

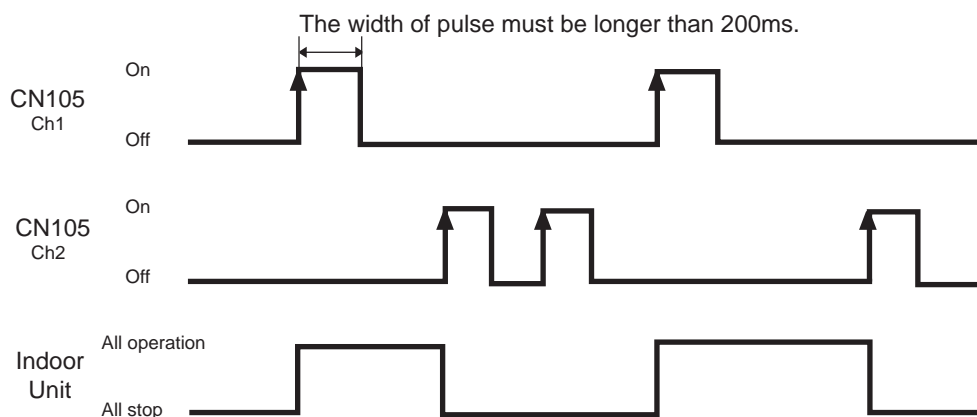
b) In the case of "Edge" input

CONNECTOR	INPUT SIGNAL	COMMAND
CN105 (RED)	Ch1	OFF → ON
	Ch1	ON → OFF



c) In the case of "Pulse" input

CONNECTOR	INPUT SIGNAL	COMMAND
CN105 (RED)	Ch1	OFF → ON
	Ch2	OFF → ON

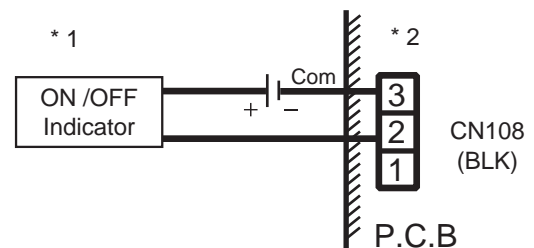
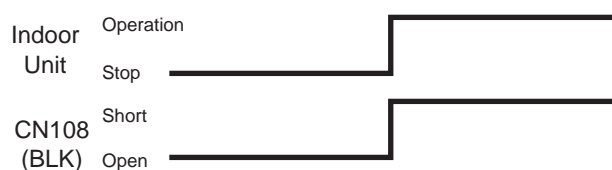


(2) Output

① Operation display (EXT OUT1)

This output indicates the indoor unit's "Operation" or "Stop" status.

CONNECTOR	OUTPUT SIGNAL	STATUS
CN108 (BLACK)	Open	Indoor units "Stop"
	Short	Indoor units "Operation"



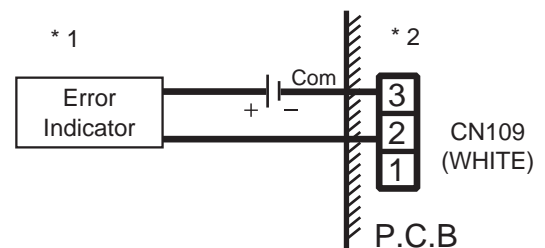
* 1 Always insert a diode on both ends of relay coil.

* 2 Pin 2 - Pin 3 Max 15V, 50mA

② Error display (EXT OUT2)

This output indicates the indoor unit's "Normal" or "Error" status.

CONNECTOR	OUTPUT SIGNAL	STATUS
CN109 (WHITE)	Open	All of the indoor units "Normal"
	Short	At least one more indoor units "Error"

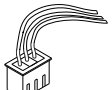


* 1 Always insert a diode on both ends of relay coil.

* 2 Pin 2 - Pin 3 Max 15V, 50mA

(3) Parts

Following cord (service parts) is required. Please use the parts number shown below to order the cord from your sales representative.

Usage	Name and shapes	Q'ty	Parts No.
For control input and output port	EXTERNAL INPUT WIRE 	1	9368779009

Refrigerant

R22



3 . OUTDOOR UNIT OPERATION CONTROL

3. OUTDOOR UNIT OPERATION CONTROL

3-1 COMPRESSOR OPERATION CONTROL

3-1-1 OPERATION / STOP CONDITION

① Compressor operation condition

When cooling requirement capacity or heating requirement capacity from any indoor units in the same refrigerant system is input, compressor will start operation automatically.

The compressor does not start to operate if heating requirement capacity is input to cooling only model. But in the following cases, the compressor operates in accordance with each operation mode.

- During compressor recovery operation
- During frost prevention operation
- Failure (except for some)
- Defrosting
- Oil recovery
- During pressure balance operation
- Under expansion valve initialization
- At protective operation
 - * discharge temperature protection
 - * High pressure protection
 - * Low pressure protection

② Compressor stop condition

When the requirement capacity from all indoor units in the refrigerant system become zero, all compressors will stop operating in 10 seconds.

But, in the following cases, the compressor operates in accordance with operation of each mode.

- Defrosting
- Oil recovery

3-1-2 COMPRESSOR OUTPUT PATTERN

The output pattern of compressors is shown below.

① In the cases of AO90R and AO90A

OUTPUT PATTERN	COMPRESSOR 1	COMPRESSOR 2	COMPRESSOR 3
STEP 0	OFF	OFF	OFF
STEP 1	ON	OFF	OFF
STEP 2R	OFF	ON	OFF
STEP 2	OFF	ON	OFF
STEP 3	OFF	OFF	ON
STEP 4	ON	ON	OFF
STEP 5	ON	OFF	ON
STEP 6	OFF	ON	ON
STEP 7	ON	ON	ON

SV4 turns ON for the STEP 2R.

② In the cases of AO72R and AO72A

OUTPUT PATTERN	COMPRESSOR 1	COMPRESSOR 2	COMPRESSOR 3
STEP 0	OFF	OFF	OFF
STEP 1	ON	OFF	OFF
STEP 2R	OFF	ON	OFF
STEP 2	OFF	ON	OFF
STEP 3	ON	ON	OFF
STEP 4	OFF	OFF	ON
STEP 5	ON	OFF	ON
STEP 6	OFF	ON	ON
STEP 7	ON	ON	ON

SV4 turns ON for the STEP 2R.

3-1-3 COMPRESSOR OPERATION CONTROL

Compressor steps is automatically controlled in order to provide an optimum refrigerant flow for air conditioning, i.e. to achieve an ideal evaporating temperature for cooling operation and an ideal condensing temperature for heating operation.

3-1-4 COMPRESSOR RECOVERY OPERATION

If one or even if two of the three compressors damaged, the remaining compressor(s) will automatically perform temporary operation, namely, recovery operation, to avoid a full interruption of air conditioning. When compressor 1, 2, or 3 is judged to be faulty, the system is operated by switching the compressor output pattern as shown in the following tables.

Compressor failure is displayed by LED on the PCB of the outdoor unit and an ERROR information is also sent to the communication bus line (wired remote controller, central remote controller, PC controller).

① In the cases of AO90R and AO90A

ORDINARY OPERATION	RECOVERY OPERATION					
	(a)X-4-6	(b)2-X-6	(c)2-4-X	(d)X-X-6	(e)2-X-X	(f)X-4-X
STEP 0	STEP 0	STEP 0	STEP 0	STEP 0	STEP 0	STEP 0
STEP 1	STEP 2R	STEP 1	STEP 1	STEP 3	STEP 1	STEP 2
STEP 2R	STEP 2R	STEP 1	STEP 2R	STEP 3	STEP 1	STEP 2
STEP 2	STEP 2	STEP 1	STEP 2	STEP 3	STEP 1	STEP 2
STEP 3	STEP 3	STEP 3	STEP 4	STEP 3	STEP 1	STEP 2
STEP 4	STEP 3	STEP 3	STEP 4	STEP 3	STEP 1	STEP 2
STEP 5	STEP 3	STEP 5	STEP 4	STEP 3	STEP 1	STEP 2
STEP 6	STEP 6	STEP 5	STEP 4	STEP 3	STEP 1	STEP 2
STEP 7	STEP 6	STEP 5	STEP 4	STEP 3	STEP 1	STEP 2

x : The compressor is stopped by a protection function or abnormal operation.

② In the cases of AO72R and AO72A

ORDINARY OPERATION	RECOVERY OPERATION					
	(a)X-4-6	(b)2-X-6	(c)2-4-X	(d)X-X-6	(e)2-X-X	(f)X-4-X
STEP 0	STEP 0	STEP 0	STEP 0	STEP 0	STEP 0	STEP 0
STEP 1	STEP 2R	STEP 1	STEP 1	STEP 4	STEP 1	STEP 2R
STEP 2R	STEP 2R	STEP 1	STEP 2R	STEP 4	STEP 1	STEP 2R
STEP 2	STEP 2	STEP 1	STEP 2	STEP 4	STEP 1	STEP 2
STEP 3	STEP 4	STEP 4	STEP 3	STEP 4	STEP 1	STEP 2
STEP 4	STEP 4	STEP 4	STEP 3	STEP 4	STEP 1	STEP 2
STEP 5	STEP 4	STEP 5	STEP 3	STEP 4	STEP 1	STEP 2
STEP 6	STEP 6	STEP 5	STEP 3	STEP 4	STEP 1	STEP 2
STEP 7	STEP 6	STEP 5	STEP 3	STEP 4	STEP 1	STEP 2

x : The compressor is stopped by a protection function or abnormal operation.

3-2 EXPANSION VALVE CONTROL

The expansion valve control is only applied to the outdoor unit of heat pump type.

- 1) The expansion valve of the outdoor unit initializes when resetting the power of the outdoor unit, or when the compressor becomes Step 0 by stopping all the indoor units.
- 2) While the compressor is operating, the expansion valve is automatically controlled by the feed back data such as discharge gas temperature, discharge pressure, suction pressure, etc.
The expansion valve at the unused side of the heat exchanger is closed.

3-3 4-WAY VALVE 1 , 2 CONTROL

4 - way valve control is only applied to the outdoor unit of heat pump type.

The 4-way valve 1,2 turn ON when the outdoor unit is operated in heating mode. They keep at ON position even though the refrigerant flow is stopped in following cases, (1) a protection is operated, (2) the room temperature reach the set temperature. Other than that, the 4-way valve 1,2 keep the position at OFF, but only the 4-way valve 2 may turns ON if the discharge pressure is low while in cooling mode.

3-4 HEAT EXCHANGER CHANGE OVER CONTROL

Heat exchanger changeover control is not applied to the outdoor unit of cooling only type.

The change over of the heat exchanger is performed by controlling the 4-way valves and expansion valves.

Operation mode	Heat exchanger 1	Heat exchanger 2	4WV 1	4WV 2	EEV 1	EEV 2	Remark
Cooling Mode	○ —	○	OFF	OFF ON	Control pulse Closed	Control pulse	In the case of low discharge pressure
Heating Mode	○	○ —	ON	ON	Control pulse	Control pulse Closed	Compressor step is larger than or equal to Step 2R Compressor step 1

3-5 FAN CONTROL

- 1) Heating mode

The outdoor fan 1,2 rotates in High-High.

- 2) Cooling mode

The rotation speed of the outdoor fan 1,2 is automatically controlled by the discharge pressure.

The fan speed has 4 steps, High-High, Low-Low, Low-Stop, and Stop-Stop.

In the case of the silent operation mode, the fan speed has only 3 steps, Low-Low, Low-Stop, and Stop-Stop.

3-6 PRESSURE BALANCE CONTROL

The pressure balance control is performed when the outdoor operation mode is changed over from cooling to heating mode or from heating to cooling mode.

During the pressure balance control operation, the compressor shut off approximate 1 minute, then the solenoidal valves SV4, SV5 and electric expansion valve (EEV1, EEV2) open fully, so that the pressure inside the refrigerant system is balanced out.

3-7 OIL RETURN CONTROL

When the integrated operation time of a compressor in operation becomes over 20minutes, the solenoidal valve which corresponds to the compressor turns ON for about 10 to 20 seconds in order to return the accumulated oil in the oil separator back to the compressor.

Compressor	Corresponding solenoidal valve	Opening time of solenoidal valve (sec)
COMP 1	SV1	20
COMP 2	SV2	15
COMP 3	SV3	10

3-8 SPECIAL OPERATION MODE

3-8-1 OIL RECOVERY OPERATION

1) Purpose of the operation

The amount of refrigerant machinery oil which has been transported to the indoor units and the connection pipe with the refrigerant will become large as the operation time of compressor increase. It is necessary to recover the oil back into the outdoor unit for a certain time interval in order to prevent compressors from damaging due to lack of lubrication oil.

2) About the oil recovery operation

When "oil recovery integrated time", which is the integrated operating time of any compressor in operation, reaches to the certain time, the oil recovery operation starts.

The "oil recovery integrated time" to start the oil recovery is as follows.

- The first time of oil recovery after the power is turned on : 1 hour
- The second time and afterwards : Approx. every 12 hours

Please note that "oil recovery integrated time" is reset to zero at the end of defrosting operation if the compressor operating time exceeds 4 minutes in defrosting operation.

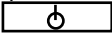
Also, the starting time of the oil recovery operation may delay up to one hour if the oil balance operation is performed.

The oil recovery operation can be performed by setting the forced oil recovery DIP SW1-4 from OFF to ON and keeping it at ON position for more than 10 seconds.

3) Compressor operation time for oil recovery operation

The compressor operation time for oil recovery operation is 5 minutes.

4) Others

During the oil recovery operation the fans of the indoor units stop. **DEFROST** appears on the display of wired and central remote controller, and  appears on the simple remote controller.

The operation indicators (LED) of the indoor units flash slowly.

3-8-2 OIL LEVEL BALANCE OPERATION

1) Purpose of the operation

When one or two of the three compressors operated for long term, the distribution of compressor oil in compressors will become unbalanced. In order to resolve this problem, oil level balance operation control is adopted for the system. The oil which has been accumulated to a large amount in a compressor will be driven out and re-distributed evenly among the three compressors by this operation.

2) About the oil level balance operation

When "oil level balance integrated time", which is the integrated operating time of any compressor in operation, reaches to 3 hours, the oil level balance operation starts.

The behavior of the oil level balance operation depends on the numbers of compressors which were in operation just before the start of oil level balance operation. (see the tables below)

The case of one compressor was in operation just before the start of oil level balance operation

Compressor in operation during the oil level balance operation	Time(sec)	Solenoidal valve which opens
COMP 1	40	SV2
COMP 2	40	SV3
COMP 3	40	SV1
		SV2

The case of multiple compressors were in operation just before the start of oil level balance operation.

Compressor in operation during the oil level balance operation	Time(sec)	Solenoidal valve which opens
COMP 1+2	30	SV3
COMP 2+3	30	SV1
COMP 1+3	30	SV2

The air conditioning is not interrupted during the oil level balance operation.

After completion of the oil level balance operation, the compressor steps will switch to the same step which the oil level balance operation begins from.

3) Others

- When the outdoor unit is operating in recovery mode, the oil level balance operation will never be performed.
- Every time the oil recovery operation is performed, "oil level balance integrated time" is reset to zero.

3-8-3 DEFROSTING CONTROL

1) Purpose of operation

By removing the frost that was formed on the surface of the outdoor unit heat exchanger, the defrosting operation prevents a decline in heat transfer efficiency and realizes an efficient heating operation.

2) About the defrosting operation

(a) Starting condition of the defrosting operation

The defrosting operation starts when all the following conditions are satisfied.


- Outdoor unit operation mode is "heating".
- Integrated time which any of the compressors is operating has reached 40 minutes or longer.
- The temperature of any outlet of heat exchanger in operation has become less than -10°C.

(b) End condition of the defrosting operation

When any of the following conditions is satisfied, defrosting operation ends.

- The temperature of the heat exchanger in operation exceeds a certain temperature preset with DIP switch 6-3.
- 10 minutes or longer have elapsed since defrosting started.
- When the operation mode is changed from heating to cooling.

3) Others

During the defrosting operation the fans of indoor units stop, **DEFROST** appears on the display of wired and central remote controller, and  appears on the simple remote controller.

The operation indicators (LED) of the indoor units flash slowly.

3-9 PROTECTIVE FUNCTION

1. Discharge temperature protection

When the discharge temperature of the compressors becomes higher than or equal to 110°C, the solenoidal valve SV5 opens to perform liquid injection. The opened solenoidal valve closes when the discharge temperature decreases to 95°C or below. When the discharge temperature of any compressor reaches 130°C or above, the corresponding compressor stops owing to the discharge temperature protection. In order to release the discharge temperature protection, the discharge temperature of the stopped compressor should become lower than 95°C

2. High pressure protection

When the discharge pressure increases to a high pressure (Cooling: 3.0MPa, Heating: 2.8MPa), the solenoidal valve SV4 opens to perform hot gas bypass. The opened solenoidal valve closes when the discharge pressure decreases to 2.7MPa for cooling operation and 2.3MPa for heating operation.

When the discharge pressure increases to 3.3MPa or above, All the compressors are stopped owing to the high pressure protection. In order to re-start the compressor, the discharge pressure should become low than 2.3MPa.

3. Low pressure protection

When the suction pressure falls to 0.0MPa or below for several minutes, All the compressor are stopped owing to low pressure protection. In order to re-start the compressor, the suction pressure should become higher than a certain pressure.

3-10 OUTPUT CONTROL OF BASE HEATER AND CRANK CASE HEATER

The function for output of the base heater is valid only for heat pump type outdoor unit.

1) Output of the base heater

The base heater output turns ON when the outdoor unit is operated in heating mode under the outdoor temperature lower than 2°C.

When the outdoor temperature becomes higher than 4°C, the crank case heater turns OFF.

The base heater shall be locally procured and the specification for base heater is AC220-240V, 35W.

2) Output control of the crank case heaters

The crank case heaters turn ON except for the following conditions.

- All compressors operate.
- All temperature of outdoor temperature thermistor is higher than or equal to 58°C.

Refrigerant

R22



4 . INDOOR UNIT OPERATION

4-1 TIMER CONTROL

4-1-1 Wireless Remote Controller

UTB - * VB

There are following 4 kinds of timer modes are available.

- ON Timer :
- OFF Timer :
- PROGRAM Timer :
- SLEEP Timer :
- Timer reset :

1. ON / OFF TIMER

Instructions relating to heating are applicable to "HEAT PUMP MODELS".

The timer functions cannot be used when this controller is used together with the remote controller (Wired type).

A beeping sound is made when a signal is received.

To set the ON / OFF timer

Press the START/ STOP button to start the air conditioner, and then proceed as follows.

1 Select "OFF TIMER" or "ON TIMER"

RESET → OFF TIMER → ON TIMER
PROGRAM TIMER (OFF ← ON, OFF → ON)

2 Adjust the OFF or ON time.
(About 5 seconds later, the entire display will reappear.)

2. PROGRAM TIMER

To set the PROGRAM timer

Press the START/ STOP button to start the air conditioner, and then proceed as follows.

1 Select "OFF TIMER"

2 Adjust the OFF time.

3 Select "ON TIMER"

4 Adjust the ON time.
(About 5 seconds later, the entire display will reappear.)

5 Select "PROGRAM TIMER"
(Either OFF ON or OFF ON will display.)
(If the ON timer has been selected to operate first, the unit will stop operating at this point.)

To cancel the TIMER

Select "TIMER RESET".
The air conditioner will return to normal operation.

To change operating conditions

If you wish to change the operating conditions (ON/OFF, Mode, Fan Speed, Temperature Setting), after making the time setting, wait until the entire display reappears, then press the appropriate buttons to change to the desired operating condition.

3. SLEEP TIMER

To set the SLEEP timer

The SLEEP timer can be set regardless of whether the indoor unit is operating or stopped.

1 (Both the indoor unit's OPERATION indicator lamp (red) and the TIMER indicator lamp (green) will light.)

2 Adjust the OFF time.
(About 5 seconds later, the entire display will reappear.)

To change the timer settings

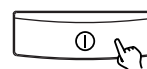
1

2 The OFF time is displayed when the "▼" mark is flashing.

To cancel the TIMER

Select "TIMER RESET".
The air conditioner will return to normal operation.

To stop air conditioner operation during timer operating

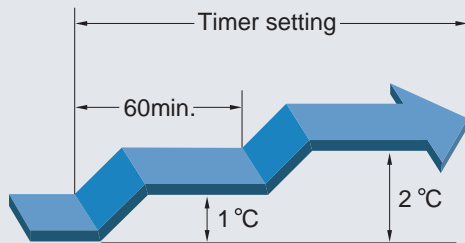


- Sleep timer

The sleep timer function automatically corrects the temperature thermostat setting according to the time setting to prevent excessive cooling and heating while sleeping.

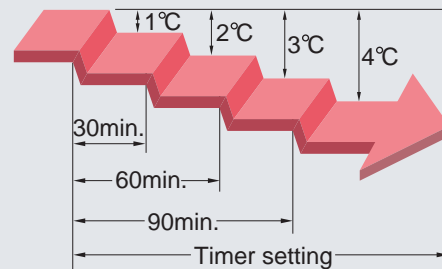
Cooling operation / dry operation

When the sleep timer is set, the set temperature automatically rises 1°C every hour. The set temperature can rise up to a maximum of 2°C



Heating operation

When the sleep timer is set, the set temperature automatically drops 1°C every 30 minutes. The set temperature can drop to a maximum of 4°C



4-1-2 Wired Remote Controller

UTB - * UB


- ON / TIMER
- OFF / TIMER
- WEEKLY TIMER
- TEMPERATURE SET BACK TIMER




1. ON / OFF TIMER

Instructions related to heating are applicable to "HEAT PUMP MODELS".

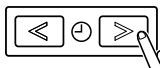
The timer function may not be available because of initial setting.

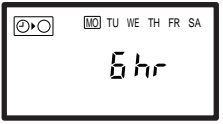
To set the ON / OFF timer

1  Press the TIMER MODE button to select the ON TIMER or OFF TIMER.

→ No display →  →  → 


NON STOP OFF TIMER ON TIMER WEEKLY TIMER

2  From 1 to 24 hours

 ex. OFF timer set for 6 hours

Press the SET TIME buttons to set time.
After the time is set, the timer will start automatically.
The amount of time until the OFF timer operates that is displayed on the timer display decreases as time passes.

To cancel the timer mode

 **DELETE**


- Press the DELETE button to cancel the timer mode.
- The timer mode can also be canceled by changing the timer mode using the TIMER MODE button.


2. WEEKLY TIMER

Instructions related to heating are applicable to "HEAT PUMP MODELS".




The timer function may not be available because of initial setting.

To set the WEEKLY timer


1  Press the TIMER MODE button to select the weekly timer.

2  Press the SET button for 2 seconds or more.

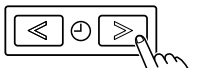

3 **Day of the week setting**

   1 2





*ALL → SU → MO → TU → WE → TH → FR → SA


Press the DAY button to select the day of the week, and then press the SET button to confirm the setting.
* For ALL, all of the days can be set together when a  appears around each day.

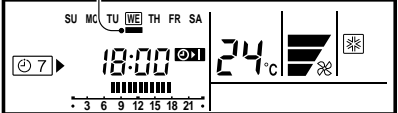
4 **Time setting**

 1  2

→ ON-1 → OFF-1 → ON-2 → OFF-2


When the operating time is set, the  mark appears.

 ex. The timer is set for 7:00-18:00.

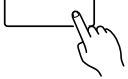
Press the SET TIME buttons to set the ON time in 30-minute increments, then press the SET button to proceed to the OFF time setting. Set the OFF time in the same way. If necessary, set the second weekly timer settings in the same way.

5

Repeat steps **3** and **4** to set the weekly timer for another day of the week.

6  Press the SET button for 2 seconds or more to complete the weekly timer settings.

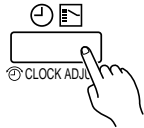
To delete the operating time

 **DELETE**

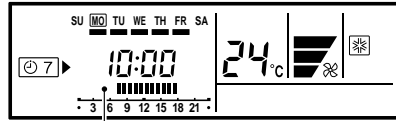
If the DELETE button is pressed during steps **3** or **4**, the operating time for the selected day will be deleted.
If all the days are selected, the operating times for all of the days will be deleted.

To start/cancel the WEEKLY timer operation

To start



When the weekly timer is selected, the timer starts automatically.



• 3 6 9 12 15 18 21 •
ex. Operating time 7:00-18:00

The operating time for the current day is displayed.

To cancel



- Press the DELETE button to cancel the timer mode.
- The timer mode can also be canceled by changing the timer mode using the TIMER MODE button.

NOTES

(1) PRECAUTIONS DURING WEEKLY TIMER SET UP
Setup is not possible in the following cases, so amend the time.

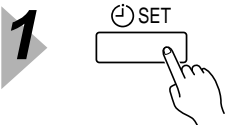
- Be sure to set the ON time first, then the OFF time. If either the ON time or the OFF time is not set correctly, the timer will not operate properly.
- The WEEKLY 2 settings cannot be set earlier than the WEEKLY 1 settings.
- The WEEKLY 1 and WEEKLY 2 time spans cannot overlap.

(2) The earliest OFF time you can set is 30 minutes after the ON time.

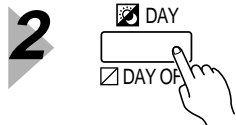
(3) The OFF time can be carried over to the next day.

(4) Even if the timer operation is set, the timer indicator lamp of the indoor unit does not light up. (The timer indicator lamp is used for wireless remote controllers only.)

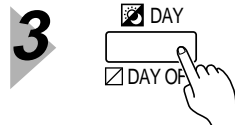
To set the DAY OFF (for a holiday)



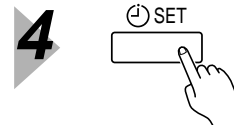
During the weekly timer, press the SET button for 2 seconds or more to set the day.



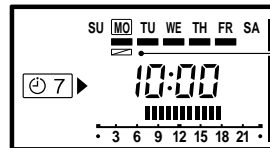
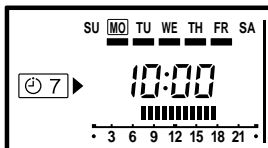
Select the day to set the DAY OFF.



Press the DAY(DAY OFF) button for 2 seconds or more to set the DAY OFF.



Press the SET button for 2 seconds or more to complete the DAY OFF setting.



mark: Indicates the DAY OFF.

ex. The DAY OFF is set for Monday.

To cancel

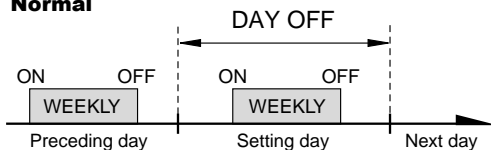
Follow the same procedures as those for setup.

NOTES

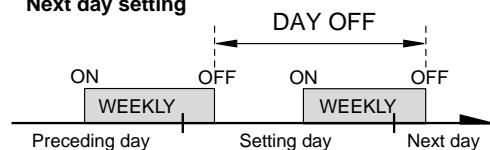
(1) The DAY OFF setting is only available for days for which weekly settings already exist.

(2) If the operating time carries over to the next day (during a next day setting), the effective DAY OFF range will be set as shown below.

Normal



Next day setting



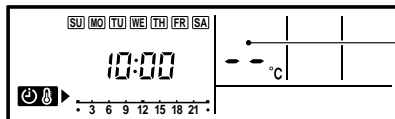
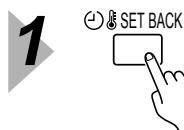
(3) The DAY OFF setting can only be set one time. The DAY OFF setting is cancelled automatically after the set day has passed.

3. TEMPERATURE SET BACK TIMER

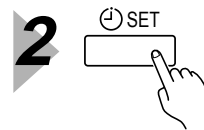
Instructions related to heating are applicable to "HEAT PUMP MODELS".

The timer function may not be available because of initial setting.

To set the temperature SET BACK timer



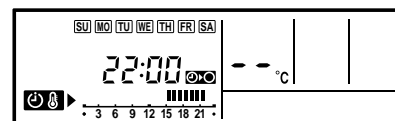
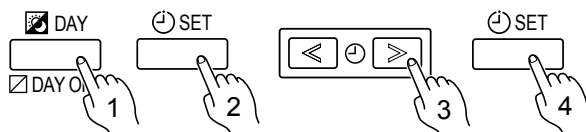
If there is no existing SET BACK temperature setting, "-" will be displayed for the temperature.



Press the SET BACK button to change to the SET BACK confirmation display. The SET BACK operating time and the set temperature will be displayed.

Press the SET button for 2 seconds or more.

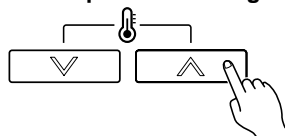
3 Day setting ☐ Operating time setting



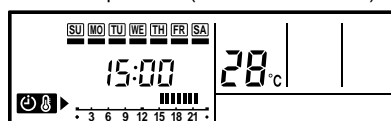
ex. When setting all days together

Follow steps **3** and **4** in "To set the WEEKLY timer" (the previous page). The DELETE button is also used as described in the procedures for the weekly timer.

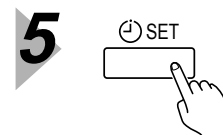
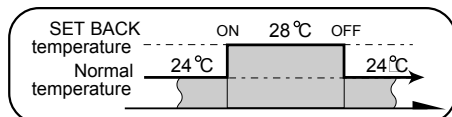
4 Temperature setting



Press the SET TEMPERATURE button to set the temperature (from 10 °C to 30 °C).



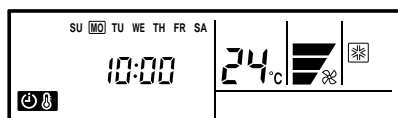
ex. Operating time 15:00 - 22:00



Repeat steps **3** and **4**. Press the SET button for 2 seconds or more to complete the temperature SET BACK timer settings.

To start/ cancel the temperature SET BACK timer operation

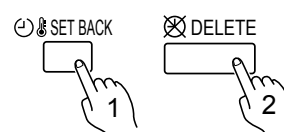
To start



ex. Display during SET BACK timer operation (The operating time will not be displayed.)

Press the SET BACK button. The SET BACK confirmation display appears for 5 seconds, and then the timer starts automatically.

To cancel



Press the SET BACK button, and then press the DELETE button while the SET BACK confirmation display is displayed. Even if the SET BACK button is pressed again, the SET BACK timer will be cancelled.

i NOTES

- (1) The SET BACK timer only changes the set temperature, it cannot be used to start or stop air conditioner operation.
- (2) The SET BACK timer can be set to operate up to two times per day but only one temperature setting can be used.
- (3) The SET BACK timer can be used together with the ON, OFF, and weekly timer functions.
- (4) During the COOL/DRY mode, the air conditioner will operate at a minimum of 18°C even if the SET BACK temperature is set to 17°C or lower.
- (5) The SET BACK operating time is displayed only in the SET BACK confirmation display. (Refer to step 1 for the SET BACK confirmation display.)
- (6) Room temperatures as low as 10, 12, and 14°C cannot be set depending on the model.

4-1-3 Group Remote Controller

UTB - YDA

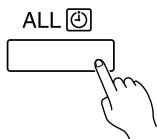
- WEEKLY TIMER

1. WEEKLY TIMER

Instructions related to heating are applicable to "HEAT PUMP MODELS".
The timer function is not available depending on the initial setting.

- Different schedules can be set for each day of the week.
- Four timers can be set for each day.
- Operation on/off time, operation mode, and temperature can be specified for each timer.

To start / cancel the WEEKLY timer operation



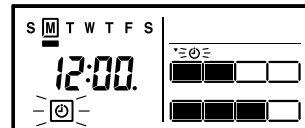
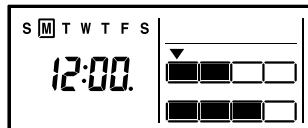
Press the ALL TIMER button to start or cancel the WEEKLY timers for all indoor units.



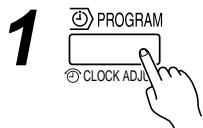
- If any of the indoor units are in the timer mode, pressing this button cancels the timers for all indoor units.
- If none of the indoor units are in the timer mode, pressing this button starts the timers for all indoor units.



Press the Timer Mode (DELETE) button to start or cancel the WEEKLY timers for the indoor units selected by the Select button.

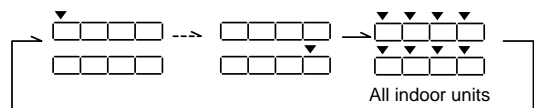
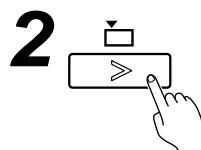


To set the WEEKLY timer



Press the PROGRAM (CLOCK ADJUST) button.

* Do not press this button for two seconds or more, otherwise you will enter the time setting mode.



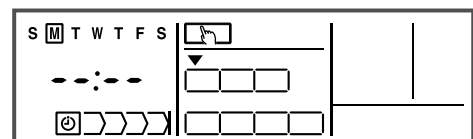
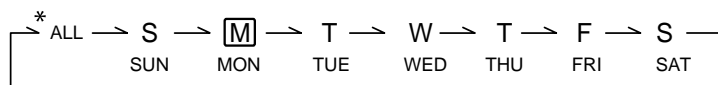
Press the Select button to select the indoor unit.

* If all indoor units are selected, the times for all of the registered indoor unit timers are set at once.



Press the DAY button to select the day of the week.

* For ALL, all of the days can be set together when a ☐ appears around each day



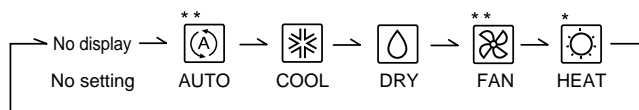
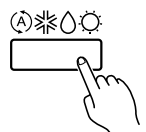
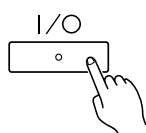
Reverse Advance



ex. 24-hour display

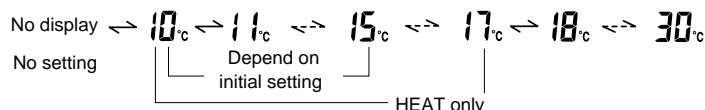
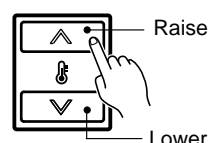
Press the Set Time buttons to set the time in 10-minute increments.

5 ● Operating setting



* If all of the selected indoor units are COOLING ONLY MODELS, there is a possibility that HEAT cannot be selected.

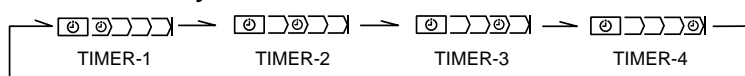
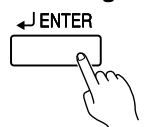
** If all of the selected indoor units are HEAT PUMP MODELS or if HEAT PUMP MODELS are selected with COOLING ONLY MODELS, there is a possibility that AUTO or FAN cannot be selected.



* The temperature setting ranges vary according to the operation mode and initial setting. In addition, the temperature range from 10 to 15 °C is invalid depending on the model even if it can be set.

Press the Start/Stop button or the Master Control button or the Set Temperature button to set the operation.

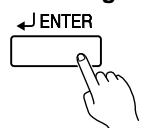
6 ● Setting the next timer for the same day:



Then press the ENTER button to proceed to the time setting, and repeat steps from **4** to **5**.

● Repeat steps **3** to **5** to set the timer for another day of the week.

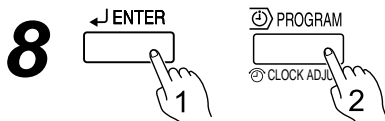
7 ● Setting the timer for the other indoor units:



Before setting the timer for other indoor units, press the ENTER button to confirm the settings.

* The display switches to the next timer.

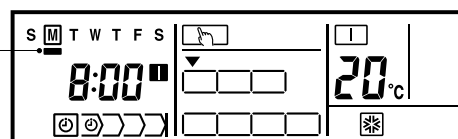
● Repeat steps **2** to **6** to set the timer for other indoor units.



1. Press the ENTER button to confirm the set timer.
2. Press again the PROGRAM (CLOCK ADJUST) button to complete the weekly timer setting.

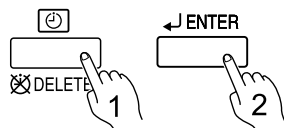
* flashes for two seconds.

When the operating time is set, the mark appears.



ex. TIMER-1 will start operation at 8:00 on COOL with a setting of 20 °C.

● To delete the operating time



1. If the Timer Mode (DELETE) button is pressed during steps **3** to **7**, the operating time for the selected day will be deleted.

* If all the days are selected, the operating times for all of the days of the selected timer will be deleted.

2. Press the ENTER button to confirm the deletion.

1 NOTES

(1) For HEAT PUMP MODEL, Does not operate according to the settings for the HEAT timer during the cooling mode and for the COOL or DRY timer during the heating mode.

(2) Even if the timer operation is set, the timer lamp of the indoor unit does not light up. (The timer lamp is used for wireless remote controller only.)

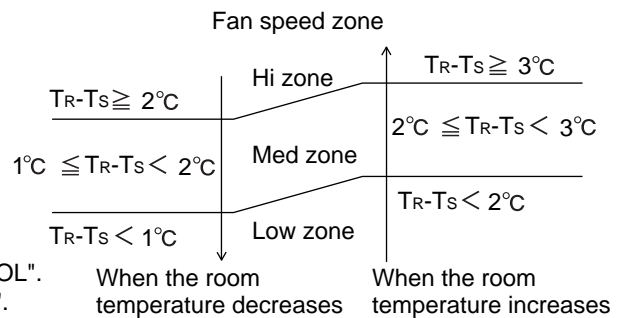
4-2 FAN CONTROL

4-2-1 "AUTO" POSITION

1) COOLING OPERATION

The fan speed is determined automatically in accordance with the condition " T_R (corrected room temperature) - T_s (corrected set temperature)" as shown on the right. However, the fan speed zone is determined in the manner as the room temperature increases for the following cases.

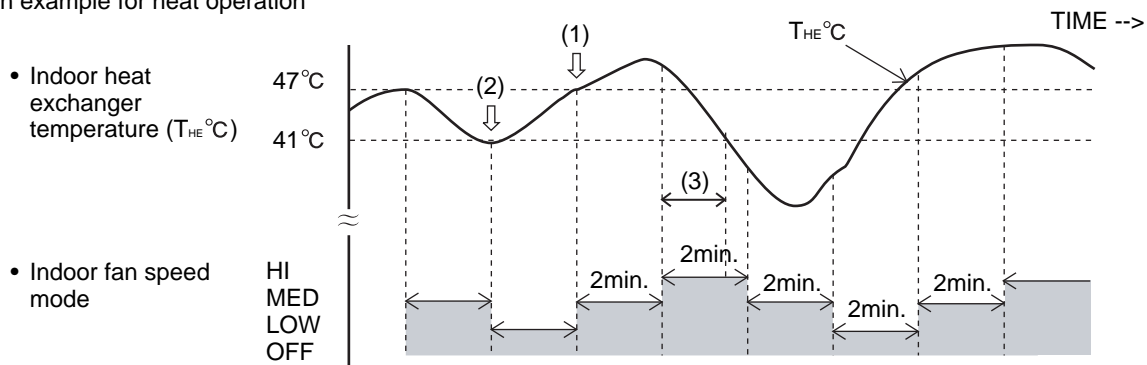
- (1) When the T_s is changed.
- (2) When the operation mode is changed from other mode to "COOL".
- (3) When the fan control is changed from other position to "AUTO".



2) HEATING OPERATION

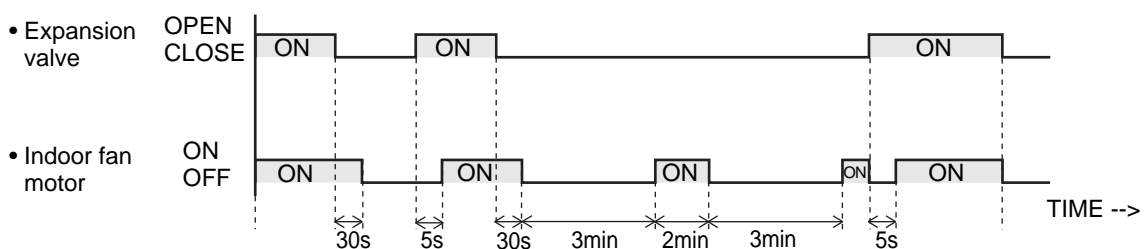
- (1) When the indoor heat exchanger temperature reaches 47°C or more, the fan speed switches to the next higher position. ("LOW" --> "MED", "MED" --> "HIGH").
- (2) When the indoor heat exchanger temperature drops below 41°C while the refrigerant circulation of the indoor unit is ON, the fan speed switches to the next lower position ("HIGH" --> "MED", "MED" --> "LOW").
- (3) After switching the fan speed, it does not switch again within 2 minutes.
- (4) When "FAN CONTROL" is switched from a set fan speed to "AUTO" after the cold air prevention is released, the fan of indoor unit will start at "MED" speed for $T_{HE} \geq 41^\circ\text{C}$ or at "LOW" speed for $T_{HE} < 41^\circ\text{C}$.

An example for heat operation



3) DRY OPERATION

The indoor fan always rotates at "Lo" speed.



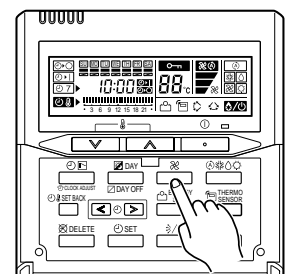
- (1) The indoor fan starts operation 5 seconds after the electric expansion valve opens. However, when the indoor unit just starts its operation or the operation mode is changed from other to "DRY" and the refrigerant circulation is not stopped, the fan will rotate immediately without a delay time of 5 seconds.
- (2) The indoor fan will stop in 30 seconds when the refrigerant circulation stops.
- (3) The indoor fan will stop immediately when the indoor unit is stopped by pushing the stop button or by a setting of ON timer.
- (4) When the refrigerant circulation is stopped due to a lower room temperature for more than 3 minutes, the fan will rotate 2 minutes at intervals of 3 minutes.
- (5) When the indoor unit just starts its operation or the operation mode is changed from other to "DRY" and the refrigerant circulation is stopped, the fan will rotate for 1 minute and then it will operate according to the statement (4).

4) FAN OPERATION

The indoor fan rotates continuously at "Lo" speed.

4-2-2 "LOW", "MED" AND "HIGH" POSITION

The indoor fan operates at the fan speed set with the FAN CONTROL mode button.



4-3 MASTER CONTROL

4-3-1 OPERATION MODE CONTROL

Each operation mode is controlled as below.

(1) Stop mode

Indoor fan motor : OFF
 Electric expansion valve : Stop pulse
 Drain pump : Turns ON-OFF by the drain pump control function

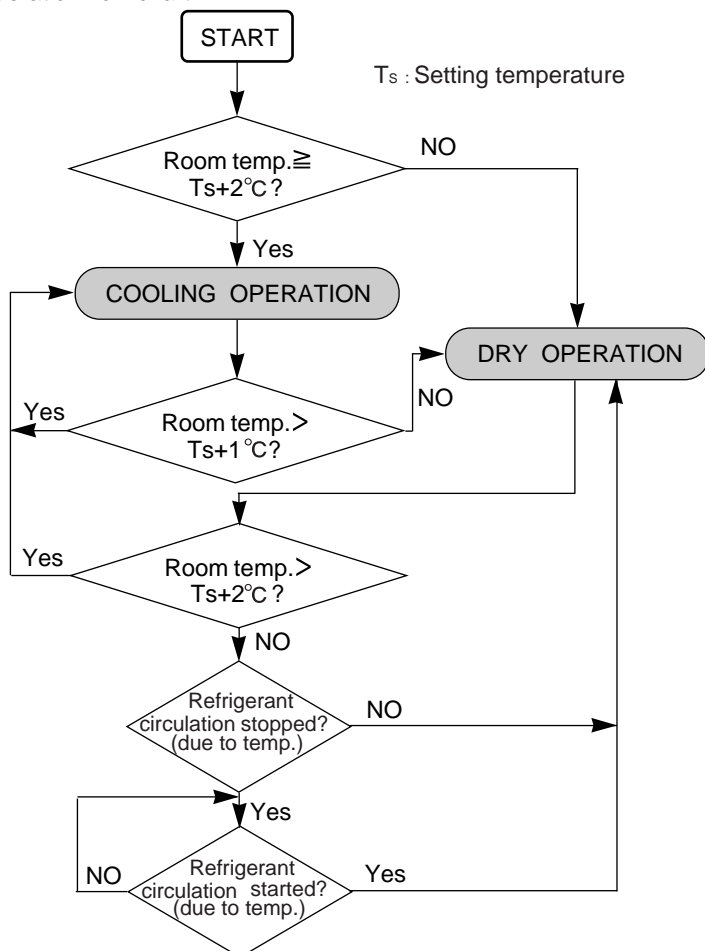
(2) Cool, Fan, Heat and Dry Mode

	Cool	Fan	Heat	Dry
Indoor fan motor	Operates according to the AIR FLOW-MODE setting, and besides frost prevention operation	Operates according to the AIR FLOW-MODE setting.	Operates according to the AIR FLOW-MODE setting, and besides <ul style="list-style-type: none"> • Cold air prevention • Defrost operation 	See the fan control page.
Drain pump	Turns ON-OFF by the drain pump control function			
Electrical expansion valve	Pulse controlled by the temperature difference calculation and frost prevent fuction	Stop pulse	Pulse controlled by the temperature difference caculation and the defrosting function	Pulse controlled by the temperature difference calculation and frost prevent function

4-3-2 AUTO CHANGEOVER

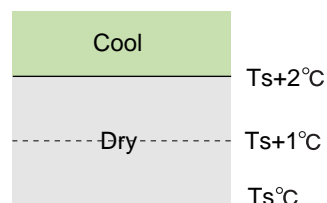
■ AUTO CHANGEOVER operation (COOLING ONLY TYPE)

Operation flow chart

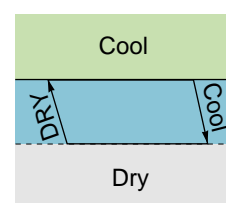


- (1) When the indoor unit starts the operation at "AUTO" or it is switched to "AUTO" from other modes, if the room temperature is higher than the set temperature + 2°C (Room temp. \geq Set temp.(Ts) + 2°C), "COOL" operation will start automatically.
- (2) When the room temperature decreases under the set temp. (Ts) + 1°C during the "COOL" operation, the indoor unit will switch to "DRY" operation automatically.
- (3) When the room temperature increases up to the set temp. (Ts) + 2°C during the "DRY" operation, the indoor unit will switch to "COOL" operation automatically.
- (4) When the indoor unit starts the operation at "AUTO" or it is switched to "AUTO" from other modes, if the room temperature is lower than the set temperature + 2°C (Room temp. < Set temp.(Ts) + 2°C), "DRY" operation will start automatically.

The cases of (1) and (4)



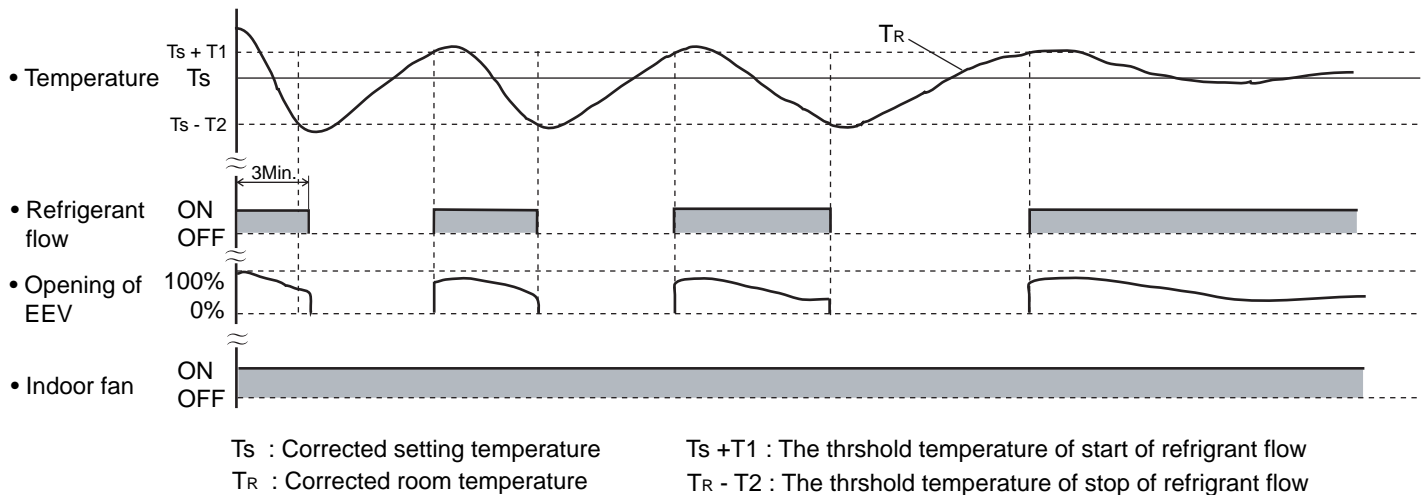
The cases of (2) and (3)



4-3-3 "COOL" POSITION

When using the cooling mode, set the temperature to a value lower than the current room temperature, otherwise the indoor unit will not start the cooling operation and only the fan will rotate.

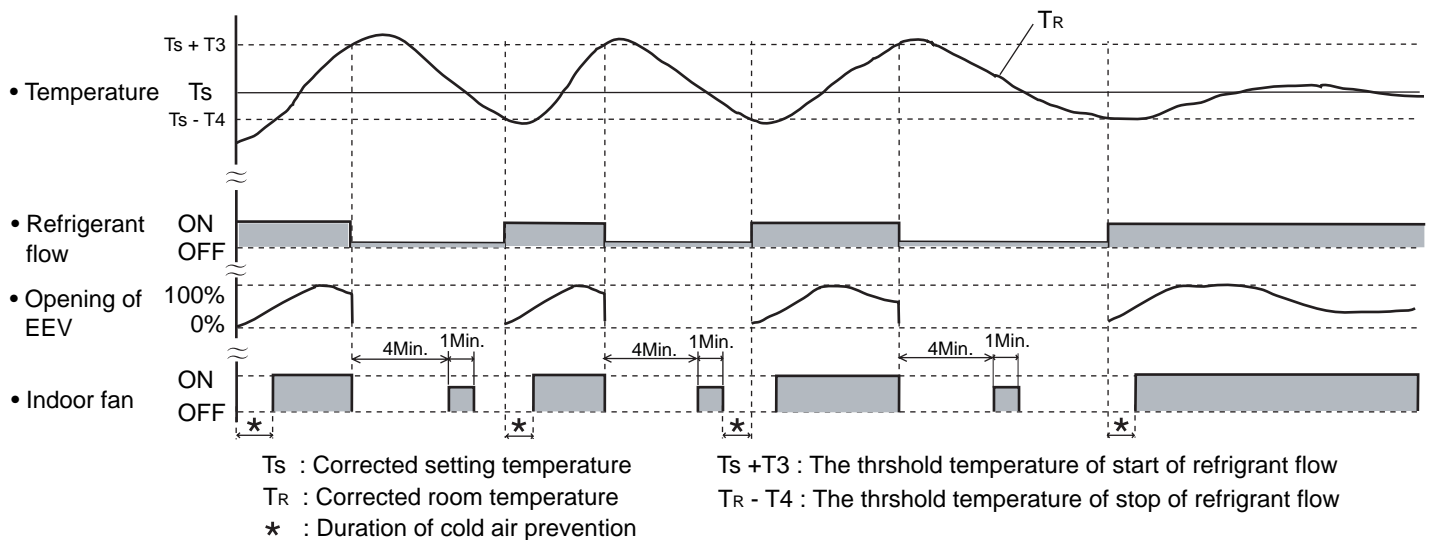
An example for COOLING TEMPERATURE CONTROL time chart (Manual setting)



4-3-4 "HEAT" POSITION

- (1) When using the heating mode, set the temperature to a value higher than the current room temperature, otherwise the indoor unit will not start the heating operation.
- (2) After the start of heating operation, the fan of indoor unit will not rotate until the heater exchange is warmed up to blow out warm air.
- (3) During defrosting, the OPERATION indicator lamp flashes 3 sec. ON and 1 sec. OFF, and repeat. The heating operation will be temporarily interrupted.

An example for HEATING TEMPERATURE CONTROL time chart (Manual setting)



4-3-5 "FAN" POSITION

- (1) In this position, the fan merely rotates to circulate air, so the room temperature will not change.
- (2) The fan will rotate at a fan speed set with the FAN CONTROL button.
- (3) When only the "FAN" mode is being used, setting the fan speed at "AUTO" is equivalent to setting it at "Low".

4-4 LOUVER CONTROL

(1) ADJUSTING THE DIRECTION OF AIR CIRCULATION

Instructions relating to heating (*) are applicable only to heat pump type outdoor unit.

Begin air conditioner operation before performing this procedure.

Vertical Air Direction Adjustment

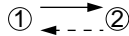
This instructions are applicable to "LARGE CEILING TYPE", "UNIVERSAL FLOOR/CEILING TYPE", "CASSETTE TYPE", "WALL MOUNTED TYPE", "COMPACT WALL MOUNTED TYPE" and "CEILING WALL TYPE".

Press the **VERTICAL AIR FLOW DIRECTION SET** button.

Each time the button is pressed, the air direction will change as follows, except for compact wall mounted type indoor units operating under cooling mode.

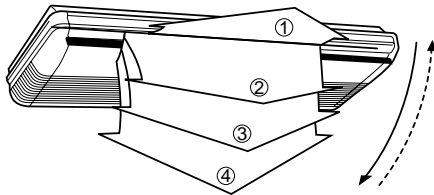


For compact wall mounted type indoor units operating under cooling mode.

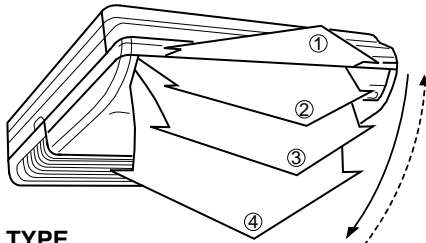


The remote controller's display does not change.

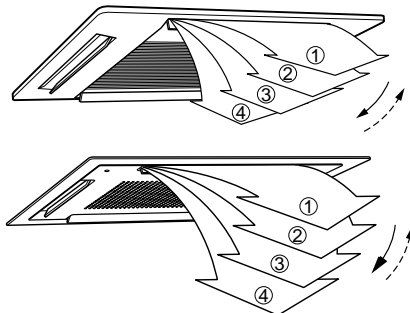
■ LARGE CEILING TYPE



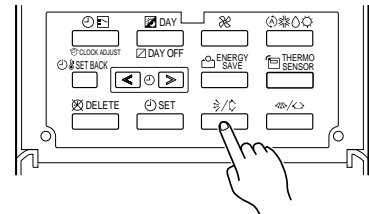
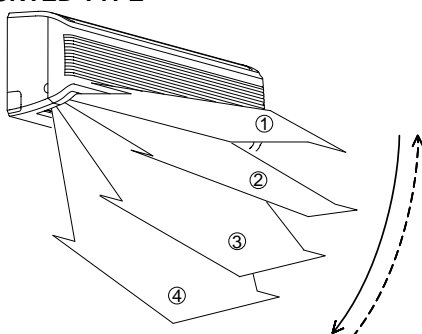
■ UNIVERSAL FLOOR/CEILING TYPE



■ CASSETTE TYPE



■ WALL MOUNTED TYPE



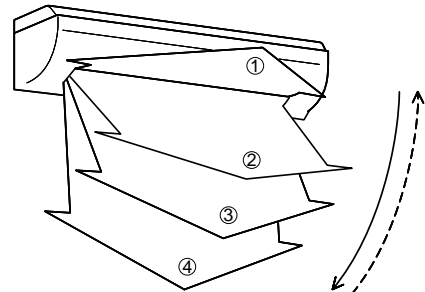
Example : When set to vertical air direction.

⚠ DANGER!

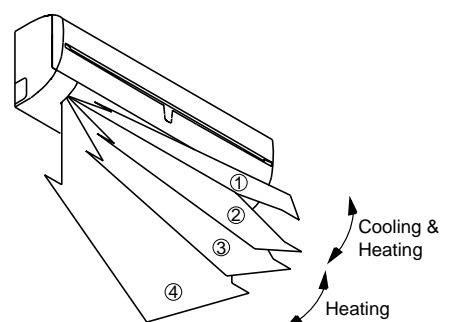
Never place fingers or foreign objects inside the outlet ports, since the internal fan operates at high speed and could cause personal injury.

- Always use the remote control unit's **AIR FLOW DIRECTION** button to adjust the UP/DOWN air direction flaps or RIGHT/LEFT air direction louvers. Attempting to move them manually could result in improper operation; in this case, stop operation and restart. The louvers should begin to operate properly again.
- During use of the Cooling and Dry modes, do not set the UP/DOWN air direction flaps in the position of ④ (Compact wall mounted type ③&④ for long periods of time, since water vapor may condense near the outlet port and drops of water may drip from the air conditioner.
- When used in a room with infants, children, elderly or sick persons, the air direction and room temperature should be considered carefully when making settings.

■ CEILING WALL TYPE



■ COMPACT WALL MOUNTED TYPE



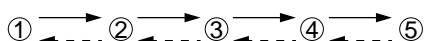
- Use the air direction adjustments within the ranges shown above.
- The vertical airflow direction is set automatically as shown, in accordance with the type of operation selected.
During Cooling mode : Horizontal flow ①
* During Heating mode : Downward flow ④
- During AUTO mode operation, for the first minute after beginning operation, airflow will be horizontal ①, the air direction cannot be adjusted during this period.

Horizontal Air Direction Adjustment

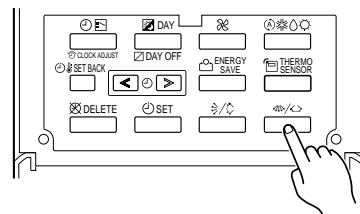
This instructions are applicable to "LARGE CEILING TYPE", "UNIVERSAL FLOOR/CEILING TYPE", "WALL MOUNTED TYPE" and "CEILING WALL TYPE".

Press the HORIZONTAL AIR FLOW DIRECTION SET button.

Each time the button is pressed, the air direction range will change as follows:

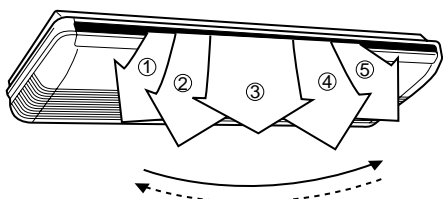


The remote controller's display does not change.

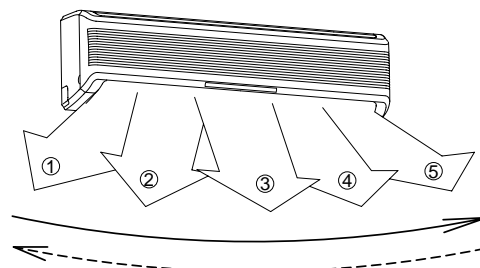


Example : When set to horizontal air direction.

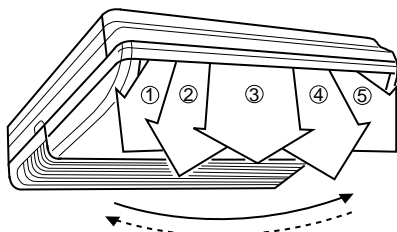
■ LARGE CEILING TYPE



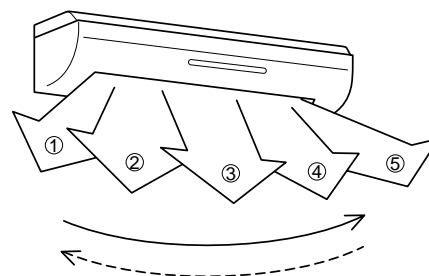
■ WALL MOUNTED TYPE



■ UNIVERSAL FLOOR/CEILING TYPE



■ CEILING WALL TYPE



(2) SWING OPERATION

Instructions relating to "the indoor unit's indicator lamp" (**) are applicable to "LARGE CEILING TYPE", "UNIVERSAL FLOOR / CEILING TYPE", "CASSETTE TYPE", "WALL MOUNTED TYPE", "COMPACT WALL MOUNTED TYPE" and "CEILING WALL TYPE".

Begin air conditioner operation before performing this procedure.

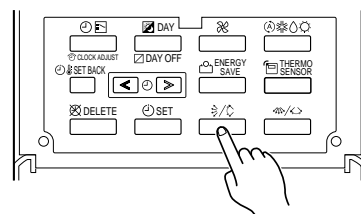
To select Vertical airflow SWING Operation

This instructions are applicable to "LARGE CEILING TYPE", "UNIVERSAL FLOOR/CEILING TYPE", "CASSETTE TYPE", "WALL MOUNTED TYPE", "COMPACT WALL MOUNTED TYPE" and "CEILING WALL TYPE".

Press the VERTICAL SWING button for more than two seconds.

The remote controller's VERTICAL SWING lamp (orange) ** and indoor unit's SWING indicator lamp (VERTICAL SWING) (orange) will light up.

In this mode, the UP/DOWN air direction flaps will swing automatically to direct the air flow both up and down.



Example : When set to vertical swing.

To Stop Vertical airflow SWING Operation

Press the VERTICAL SWING button for more than two seconds once and again.

The remote controller's VERTICAL SWING lamp **and indoor unit's SWING indicator lamp (VERTICAL SWING) will go out.
Airflow direction will return to the setting before swing was begun.

Instructions relating to "the indoor unit's indicator lamp" (**) are applicable to "LARGE CEILING TYPE", "UNIVERSAL FLOOR / CEILING TYPE", "CASSETTE TYPE", "WALL MOUNTED TYPE", "COMPACT WALL MOUNTED TYPE" and "CEILING WALL TYPE".

About Vertical Airflow SWING Operation

- The range of swing is relative to the currently set airflow direction.
- If the swing range is not as desired, use the remote controller's VERTICAL AIR FLOW DIRECTION SET button to change the range of swing.
- The SWING operation may stop temporarily when the air conditioner's fan is not operating, or when operating at very low speeds.

Air swing range (Expect for compact wall mounted type indoor unit)

Air flow direction set	Range of swing
①	① to ③
②	② to ④
③	② to ④
④	① to ④ (All range)

Air swing range (Compact wall mounted type indoor unit)

Air flow direction set	Range of swing
① or ②	① to ②
③ or ④	③ to ④

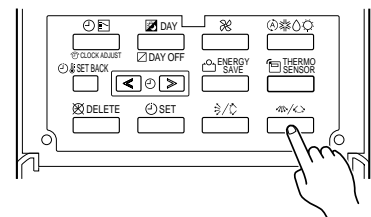
To select Horizontal Airflow SWING Operation

This instructions are applicable to "LARGE CEILING TYPE", "UNIVERSAL FLOOR / CEILING TYPE", "WALL MOUNTED TYPE" and "CEILING WALL TYPE".

Press the HORIZONTAL SWING button for more than two seconds.

The remote controller's HORIZONTAL SWING lamp (orange) **and indoor unit's SWING indicator lamp (HORIZONTAL SWING) (orange) will light up.

In this mode, the RIGHT/LEFT air direction louvers will swing automatically to direct the airflow both right and left.



Example : When set to horizontal swing.

To stop Horizontal airflow SWING Operation

Press the HORIZONTAL SWING button for more than two seconds once and again.

The remote controller's HORIZONTAL SWING lamp **and indoor unit's SWING indicator lamp (HORIZONTAL SWING) will go out.
Airflow direction will return to the setting before swing was begun.

About Horizontal Airflow Swing Operation

- The range of swing is relative to the currently set airflow direction.
- If the swing range is not as desired, use the remote controller's HORIZONTAL AIR FLOW DIRECTION SET button to change the range of swing.
- The SWING operation may stop temporarily when the air conditioner's fan is not operating, or when operating at very low speed.

Air swing range

Air flow direction set	Range of swing
①	① to ⑤ (All range)
②	① to ③
③	② to ④
④	③ to ⑤
⑤	① to ⑤ (All range)

Air direction range

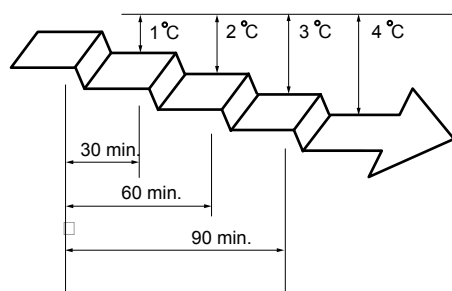
4-5 ENERGY SAVE OPERATION

(1) About the ENERGY SAVE

- The energy conservation mode (ENERGY SAVE) raises the set temperature slightly in the cooling mode and lowers the set temperature in the heating mode, using a computer program to economically control the operation of the unit.
- If you press the ENERGY SAVE button while the air conditioner is on, it will change to the conservation mode. If you press the ENERGY SAVE button while the unit is in the timer mode (ON timer or WEEKLY timer), the unit will go into the conservation mode when the unit starts with the timer.
- If you turn off the air conditioner while in the conservation mode, the mode will be shut off.

▪ When Heating

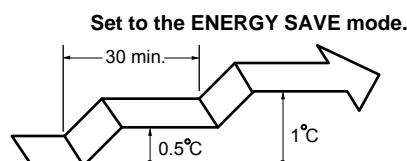
After the ENERGY SAVE button is pressed, the set temperature will be lowered about 1°C every 30 minutes. When it has lowered a total of 4°C, then it will hold that temperature.



Set to the ENERGY SAVE mode.

▪ When Cooling

After the ENERGY SAVE button is pressed, the set temperature will be raised about 0.5°C every 30 minutes. When it has gone up a total of 1°C, then it will hold that temperature.



Set to the ENERGY SAVE mode.

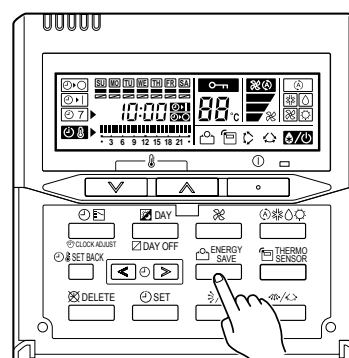
(2) To Use the ENERGY SAVE

Press the ENERGY SAVE button.
The unit will run in the ENERGY SAVE mode.

(3) To Stop the ENERGY SAVE

Press the ENERGY SAVE button one more time.
The ENERGY SAVE mode will be turned off.

The ENERGY SAVE light goes off, and the unit will return to the former operating conditions.



4-6 ANTI FREEZE CONTROL

(1) About the ANTI FREEZE

The freeze prevention function operates when the START/STOP button is pressed and the remote controller is in stop mode (indoor unit is in stop mode). Whenever the room temperature falls to 5 °C, it automatically sets the fan to low speed and starts the heating operation. This operation stops when the temperature in the room rises reaches 8 °C.

(2) To Use the ANTI FREEZE

Anti freeze operation can be set with central remote controller or PC controller.
Please refer to operating manual for the details.

4-7 ELECTRONIC EXPANSION VALVE CONTROL

After the power is turned on, the following operation is controlled automatically to control the most suitable refrigerant charge according to the operation mode and operation conditions of each unit.

Electronic expansion valve control process.

The electronic expansion valve adjusts the opening by selecting the number of pulses from the rated capacity, operation mode (cool / heat) and set temperature of each indoor unit.

4-8 AUTO RESTART

- (1) The air conditioner restarts with the previous setting operation.
- (2) When the air conditioner restarts for heating operation, the "COLD AIR DISCHARGE PREVENTION FUNCTION" operates.

4-9 DRAIN PUMP OPERATION

- (1) When cooling and refrigerant circulation starts, the drain pump starts simultaneously.
 - (2) The drain pump operates continuously for 3 minutes after the refrigerant circulation stopped.
 - (3) When the refrigerant circulation is stopped by a start of indoor heat exchanger frost prevention operation, the drain pump will turn off in 1 hour after the end of indoor heat exchanger frost prevention operation.
 - (4) When the water level in the drain pan rises up and then the float switch functions:
 - ① Microcomputer stops the refrigerant circulation and indoor fan motor operation.
 - ② Drain pump operates continuously for 3 minutes after the float switch is turned off.
- (Almost condensing water may be drained)
- (5) When the float switch turns ON continuously for 3 minutes, 'FAILURE INDICATION' operates.
 - (6) When the float switch turns OFF within 3 minutes, the unit starts cooling operation.

Refrigerant

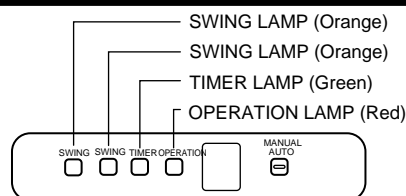
R22



5 . TROUBLE SHOOTING

5. TROUBLESHOOTING

5-1 INDOOR UNIT



Operation can be checked by lighting and flashing of the LED (OPERATION, TIMER, SWING) of the grille display section. Perform judgment in accordance with the following.


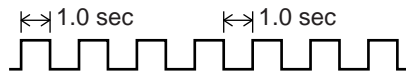

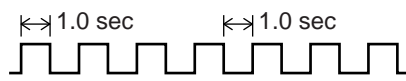

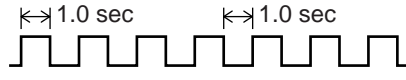



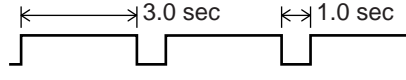
- Test run

When the air conditioner is operating in test run mode, the OPERATION and TIMER lamps flash slowly at the same time.

- Error

The OPERATION, TIMER and SWING lamps operate as follows (refer to 5-1-2) according to the error contents.

5-1-1 NORMAL OPERATION DISPLAY

OPERATING CONDITION	INDICATOR LAMP	FLASHING PATTERN
Test run	Operation lamp (red) 	ON OFF 
	Timer lamp (green) 	ON OFF 
*1 Stop (Auto-restart disable) DIP SW 2-4 : OFF	Operation lamp (red) 	ON OFF 
	Timer lamp (green) 	ON OFF 
*2 (Defrosting operation (Heating operation) or Oil recovery operation	Operation lamp (red) 	ON OFF 

Note: Indicator lamps are on the front panel of the indoor unit.

*1: If a power failure occurred, the lamps of operation and timer flash on and off alternately when the power returns.

*2: While the indoor fan motor stops, the operation lamp flashes on and off.

5-1-2 ABNORMAL OPERATION DISPLAY

Error display				Error contents
OPERATION lamp	TIMER lamp	VERTICAL SWING lamp	HORIZONTAL SWING lamp	
0.1sec ON/OFF	0.1 sec ON/OFF	Goes off	Goes off	Model information abnormal
0.1sec ON/OFF	0.1 sec ON/OFF	0.1 sec ON/OFF	0.1 sec ON/OFF	Power supply frequency abnormal
2 times flashing	0.1 sec ON/OFF	Goes off	Goes off	Room temperature thermistor error
3 times flashing	0.1 sec ON/OFF	1 times flashing	Goes off	Indoor unit heat exchanger thermistor (inlet) error
3 times flashing	0.1 sec ON/OFF	2 times flashing	Goes off	Indoor unit heat exchanger thermistor (middle) error
3 times flashing	0.1 sec ON/OFF	3 times flashing	Goes off	Indoor unit heat exchanger thermistor (outlet) error
4 times flashing	0.1 sec ON/OFF	Goes off	Goes off	Drain abnormal
5 times flashing	0.1 sec ON/OFF	1 times flashing	Goes off	Communication error 1 (indoor unit ↔ Wired/Simple remote controller)
5 times flashing	0.1 sec ON/OFF	2 times flashing	Goes off	Microcomputer error
5 times flashing	0.1 sec ON/OFF	4 times flashing	Goes off	Communication error 2 (indoor unit ↔ Wired/Simple remote controller)
6 times flashing	0.1 sec ON/OFF	Goes off	Goes off	Indoor unit fan error
7 times flashing	0.1 sec ON/OFF	Goes off	Goes off	Blower temperature thermistor error
0.1 sec ON/OFF	3 times flashing	3 times flashing	Goes off	Outdoor unit error
0.1 sec ON/OFF	4 times flashing	1 times flashing	Goes off	EEPROM access error
0.1 sec ON/OFF	4 times flashing	2 times flashing	Goes off	EEPROM deletion error
0.1 sec ON/OFF	5 times flashing	1 times flashing	Goes off	Transmission error
0.1 sec ON/OFF	5 times flashing	2 times flashing	Goes off	Node setting error
0.1 sec ON/OFF	6 times flashing	Goes off	Goes off	Parallel communication error
0.1 sec ON/OFF	7 times flashing	Goes off	Goes off	Room temperature abnormal

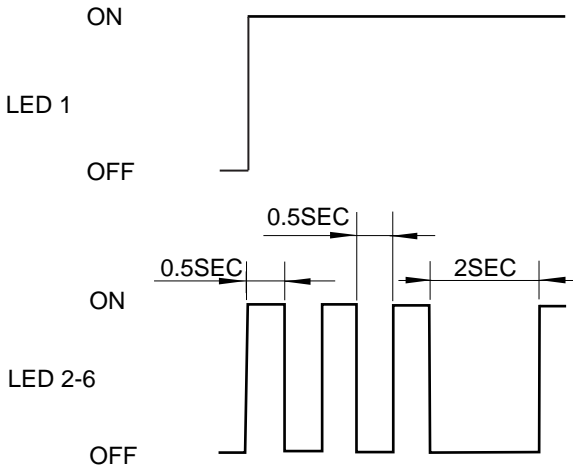
5-2 OUTDOOR UNIT

5-2-1 NORMAL OPERATING DISPLAY

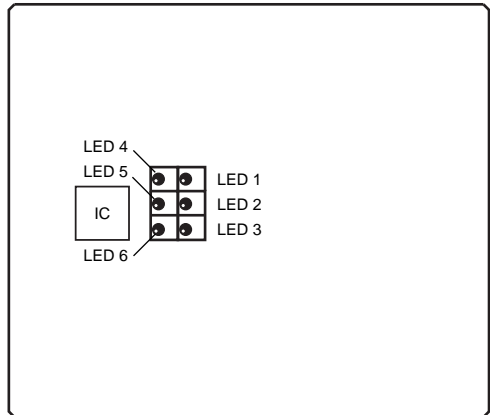
Display Type	LED 1	LED 2	LED 3	LED 4	LED 5	LED 6
Idling (stop)	⊙					
Cooling operation	⊙	○ (1)				
Heating operation	⊙	○ (2)				
Compressor 1 output	⊙		○ (1)			
Compressor 2 output	⊙		○ (2)			
Compressor 3 output	⊙		○ (3)			
Compressor 1, 2 output	⊙		○ (4)			
Compressor 1, 3 output	⊙		○ (5)			
Compressor 2, 3 output	⊙		○ (6)			
Compressor 1, 2, 3 output	⊙		○ (7)			
Heat exchanger usage capacity STEP 1	⊙			○ (2)		
Heat exchanger usage capacity STEP 2	⊙			○ (3)		
Heat exchanger usage capacity STEP 3	⊙			○ (5)		
Pressure balance operation	⊙			⊙		
Oil recovery operation	⊙				○ (1)	
Defrosting operation	⊙				○ (2)	
Test run	⊙				○ (3)	
Oil Level balance operation	⊙				○ (4)	
Pump down completed	⊙	○ (2)	○ (2)	○ (2)	○ (2)	○ (2)
Liquid injection	⊙					○ (1)
Hot gas bypass	⊙					○ (2)
Recovery mode	⊙					○ (4)

Display Method ◎ : Lighted continuously
 ○ : 0.5sec ON/0.5sec OFF flashing
 () : Flashing times

- Operation display



● OUTDOOR PRINTED CIRCUIT BOARD LAYOUTS



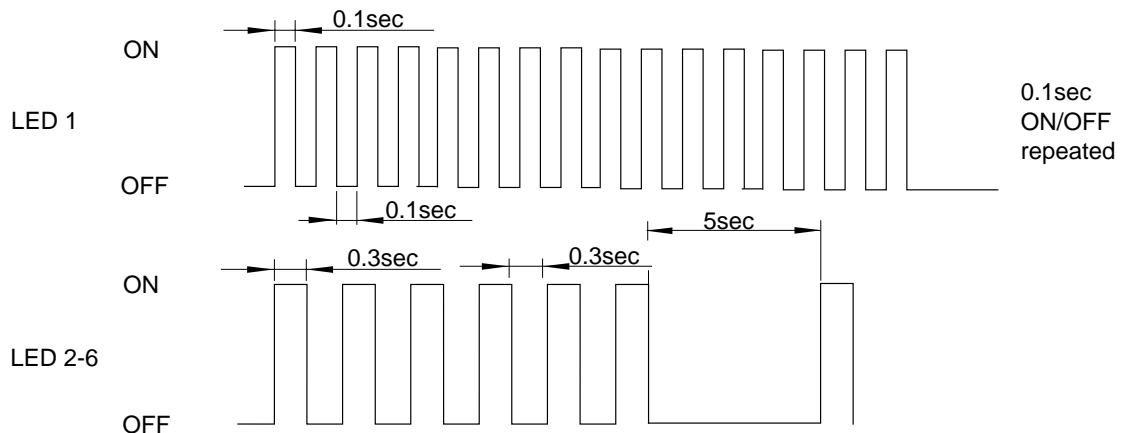
5-2-2 ABNORMAL OPERATION DISPLAY

Display type	LED 1	LED 2	LED 3	LED 4	LED 5	LED 6
Compressor 1 error	◇	● (1)				
Compressor 2 error	◇	● (2)				
Compressor 3 error	◇	● (3)				
Discharge temperature 1 error	◇	● (4)				
Discharge temperature 2 error	◇	● (5)				
Discharge temperature 3 error	◇	● (6)				
High-pressure error	◇	● (7)				
Low-pressure error	◇	● (8)				
Pump down error	◇	● (9)				
Discharge temperature thermistor 1 error	◇		● (1)			
Discharge temperature thermistor 2 error	◇		● (2)			
Discharge temperature thermistor 3 error	◇		● (3)			
Heat exchanger thermistor 1 error	◇		● (4)			
Heat exchanger thermistor 2 error	◇		● (5)			
Suction temperature thermistor error	◇		● (10)			
Outdoor temperature thermistor error	◇		● (11)			
Discharge pressure sensor error	◇			● (1)		
Suction pressure sensor error	◇			● (3)		
Reverse phase blocker error	◇				● (1)	
Power supply frequency abnormal	◇				● (2)	
EEPROM access error	◇				● (3)	
Outdoor unit circuit board error 1	◇				● (6)	
Transmission error	◇				● (8)	
Node setting error	◇				● (9)	
Indoor unit error	◇					● (1)

Display method {

- ◇ : 0.1 sec ON / 0.1 sec OFF flashing
- : 0.3 sec ON / 0.3 sec OFF flashing
- () : Flashing times

•Error display



5-3 REMOTE CONTROLLER

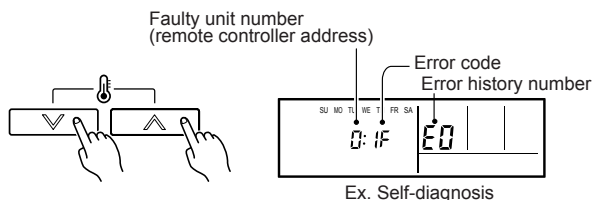
5-3-1 WIRED REMOTE CONTROLLER

When the error indication "E:EE" is displayed, inspection of the air conditioning system is necessary. Please consult authorized service personnel.

Run [Self-Diagnosis] if [E:EE] flashes on the clock display of the remote controller.

SELF-DIAGNOSIS

- (1) Stop the air conditioner operation.
- (2) Press the Set Temperature buttons Δ and ∇ at the same time for more than 5 seconds to start the self-diagnosis.
- (3) Press the Set Temperature buttons Δ and ∇ at the same time for more than 5 seconds to stop the self-diagnosis.



Error code displayed on wired or simple remote controller

Error Code	Error contents
:00	No error
:02	Model information abnormal
:04	Power supply frequency abnormal
:05	EEPROM access error
:07	EEPROM deletion error
:09	Room temperature thermistor error
:0A	Indoor unit heat exchanger thermistor (middle) error
:0B	Indoor unit heat exchanger thermistor (inlet) error
:0C	Indoor unit heat exchanger thermistor (outlet) error
:0d	Blower temperature thermistor error
:11	Drain abnormal
:12	Room temperature abnormal
:13	Indoor unit fan error
:1F	Transmission error
:20	Node setting error
:21	Parallel communication error
:32	Outdoor unit error

HOW TO DISPLAY INDOOR UNIT ADDRESS AND ERROR CODE HISTORY

1. INDOOR UNIT ADDRESS DISPLAY

Displays the indoor unit refrigerant circuit address and indoor unit address of the indoor unit connected to the remote controller.

- (1) Stop the air conditioner operation.
- (2)

ex. Error display

Press the set temperature buttons Δ/∇ and start/stop button simultaneously for 3 seconds or more
- (3)

Lower Raise

Press the set temperature Δ/∇ button to select the indoor unit (remote controller address).

00 ↔ 01 ↔ 02 ↔ 03 ↔ 04 ↔ 05 ↔ 06 ↔ 07
15 ↔ 14 ↔ 13 ↔ 12 ↔ 11 ↔ 10 ↔ 09 ↔ 08
- (4) Press the SET TEMPERATURE buttons simultaneously for 3 seconds or more to stop the display.

2. ERROR CODE HISTORY DISPLAY

Up to 16 memorized error codes may be displayed for the indoor unit connected to the remote controller.

- (1) Stop the air conditioner operation.
- (2)

Press the set temperature buttons Δ/∇ and start/stop button simultaneously for 3 seconds or more.
- (3)

Press the start/stop button.

Faulty unit number (remote controller address) Error code Error history number

0:1F E0
- (4)

Lower Raise

Press the SET TEMPERATURE button to select the error history number.

00 ↔ 01 ↔ 02 ↔ 03 ↔ 04 ↔ 05 ↔ 06 ↔ 07
15 ↔ 14 ↔ 13 ↔ 12 ↔ 11 ↔ 10 ↔ 09 ↔ 08
- (5) Press the SET TEMPERATURE buttons simultaneously for 3 seconds or more to stop the display.

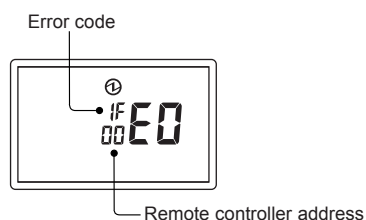
5-3-2 SIMPLE REMOTE CONTROLLER

When the error indication " \overline{EE} " is displayed, inspection of the air conditioning system is necessary. Please consult authorized service personnel.

Run [Self-Diagnosis] if \overline{EE} flashes on the clock display of the remote controller.

SELF-DIAGNOSIS

- (1) Stop the air conditioner operation.
- (2) Press the Fan control button and the Set Temperature buttons at the same time for more than 5 seconds to start the self-diagnosis.
- (3) Press the Fan control button and the Set Temperature buttons at the same time for more than 5 seconds to stop the self-diagnosis.



Error code displayed on wired or simple remote controller

Error Code	Error contents
:00	No error
:02	Model information abnormal
:04	Power supply frequency abnormal
:05	EEPROM access error
:07	EEPROM deletion error
:09	Room temperature thermistor error
:0A	Indoor unit heat exchanger thermistor (middle) error
:0B	Indoor unit heat exchanger thermistor (inlet) error
:0C	Indoor unit heat exchanger thermistor (outlet) error
:0d	Blower temperature thermistor error
:11	Drain abnormal
:12	Room temperature abnormal
:13	Indoor unit fan error
:1F	Transmission error
:20	Node setting error
:21	Parallel communication error
:32	Outdoor unit error

HOW TO DISPLAY INDOOR UNIT ADDRESS AND ERROR CODE HISTORY

1. INDOOR UNIT ADDRESS DISPLAY

Displays the indoor unit refrigerant circuit address and indoor unit address of the indoor unit connected to the remote controller.

- (1) Stop the air conditioner operation.
- (2)
 ex. Error display \overline{EE}
 Press the set temperature \blacktriangle / \blacktriangledown and start/stop button simultaneously for 3 seconds or more
- (3)
 Raise \blacktriangle / Lower \blacktriangledown
 00 ↔ 01 ↔ 02 ↔ 03 ↔ 04 ↔ 05 ↔ 06 ↔ 07
 15 ↔ 14 ↔ 13 ↔ 12 ↔ 11 ↔ 10 ↔ 09 ↔ 08
 Press the set temperature \blacktriangle / \blacktriangledown button to select the indoor unit (remote controller address).
- (4) Press the SET TEMPERATURE buttons simultaneously for 3 seconds or more to stop the display.

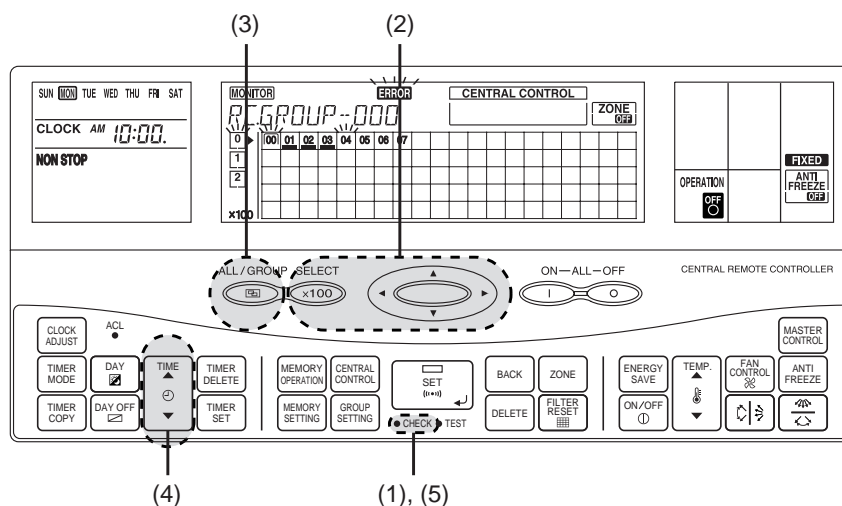
2. ERROR CODE HISTORY DISPLAY

Up to 16 memorized error codes may be displayed for the indoor unit connected to the remote controller.

- (1) Stop the air conditioner operation.
- (2)
 Press the set temperature \blacktriangle / \blacktriangledown and start/stop button simultaneously for 3 seconds or more.
- (3)
 Press the start/stop button.
 Error code history number
 Error code \overline{IF}
 Faulty unit number (remote controller address) 00
- (4)
 Raise \blacktriangle / Lower \blacktriangledown
 00 ↔ 01 ↔ 02 ↔ 03 ↔ 04 ↔ 05 ↔ 06 ↔ 07
 15 ↔ 14 ↔ 13 ↔ 12 ↔ 11 ↔ 10 ↔ 09 ↔ 08
 Press the SET TEMPERATURE button to select the error history number.
- (5) Press the SET TEMPERATURE buttons simultaneously for 3 seconds or more to stop the display.

5-3-3 CENTRAL REMOTE CONTROLLER

If the **ERROR** and the number for the central control number **00** flash during operation, there is an error at the relevant remote control group. Start the error monitor, identify the error and remove the cause.



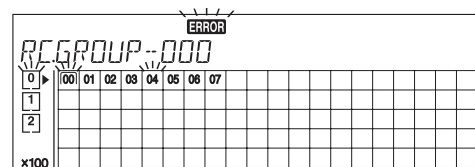
When the error monitor is started, the following can be performed.

The error code for each remote control group (indoor units) is displayed.

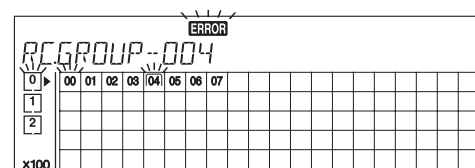
Up to two of the past error codes are displayed for each of the indoor units, the outdoor units and the central remote controller group.

- (1) Press **● CHECK** to start the error monitor.

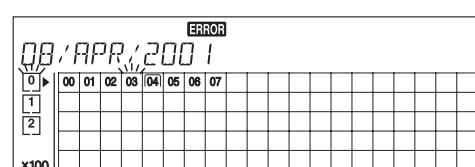
The LCD changes to the error monitor screen.



- (2) Press **SELECT** to select the central control number for which its details of the error contents are to be confirmed. (The number of the **00** causing the error is flashing.)




- (3) Press **ALL / GROUP** to select the display mode for the error code. Each press of **ALL / GROUP** will switch the display as shown below.



► Current error code → First previous error code → Second previous error code

(4) Press  to select the indoor units in the remote control group selected in 3.

Continue pressing , the error codes for the outdoor unit and the central re-

remote controller are displayed. Each of the displays is shown below.

Indoor unit error display

SUN	MON	TUE	WED	THU	FRI	SAT
ADDRESS 00:01						
09:E						
--:E						

"The refrigerant system address and indoor unit address are displayed."



Outdoor unit error display

SUN	MON	TUE	WED	THU	FRI	SAT
ADDRESS 00:-0						
21:E						
--:E						

"Refrigerant system address" and "-0" are displayed.



Central remote control error display

SUN	MON	TUE	WED	THU	FRI	SAT
ADDRESS C:00						
01:E						
--:E						

The "C" code and the central remote controller address are displayed.



- If there have been multiple errors for one unit, continually

pressing will  display the

error codes in sequence. When all the error codes have been displayed, the display will switch to the next unit.

- If there is no error in the central control number selected in 3, the display will not change

when  is pressed. "00"

displayed means "no errors".

(5) Press ● CHECK again to end the error monitor.

MONITOR										ERROR										CENTRAL CONTROL										ZONE									
PCGROUP-000																														000									
0	1	2	3	4	5	6	7	8	9	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0
2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1
x100																																							

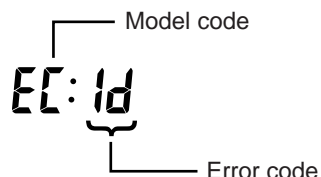
Error code displayed on central remote controller

Error Code	Indoor unit error	Outdoor unit error	Central remote controller
00	No error	No error	No error
01	–	–	–
02	Model information error	Model information error	Printed circuit board error (Control panel)
03	Microcomputer communication error	Microcomputer communication error	Printed circuit board error (Transmission adaptor)
04	Power supply frequency abnormal	Power supply frequency abnormal	Memory error
05	–	Reverse phase blocker error	Node setting error
06	EEPROM access error	EEPROM access error	Parallel communication error
07	EEPROM deletion error	–	–
08	–	–	–
09	Room temperature thermistor error	Compressor 1 error	–
0A	Heat exchanger thermistor (middle) error	Compressor 2 error	–
0B	Heat exchanger thermistor (inlet) error	Compressor 3 error	–
0C	Heat exchanger thermistor (outlet) error	–	–
0D	Blower temperature thermistor error	Discharge temperature thermistor 1 error	–
0E	–	Discharge temperature thermistor 2 error	–
0F	–	Discharge temperature thermistor 3 error	–
10	–	Outdoor temperature thermistor error	–
11	Drain abnormal	Heat exchanger inlet thermistor 1 error	–
12	Room temperature abnormal	Heat exchanger inlet thermistor 2 error	–
13	Indoor unit fan error	Heat exchanger inlet thermistor 3 error	–
14	–	Heat exchanger outlet thermistor 1 error	–
15	–	Heat exchanger outlet thermistor 2 error	–
16	–	Heat exchanger outlet thermistor 3 error	–
17	–	Suction thermistor error	–
18	Standard wired remote control communication error	–	–
19	–	Discharge pressure sensor error	–
1A	–	Liquid pressure sensor error	–
1B	–	Suction pressure sensor error	–
1C	–	–	Connection error
1D	–	–	Initial setting error
1E	–	–	Manual storing 2 error
1F	Transmission error	Transmission error	Transmission error
20	–	–	–
21	–	Discharge temperature 1 error	Software error (Output)
22	–	Discharge temperature 2 error	Software error (Input)
23	–	Discharge temperature 3 error	–
24	–	High-pressure error	–
25	–	Low-pressure error	–
26	–	–	–
27	–	–	–
28	–	Pump down error	–

5-3-4 GROUP REMOTE CONTROLLER

■ Error display


- (1) The air conditioning system must be inspected if "E*: **" (error code) appears on the Timer and Clock Display, or the operation lamp is flashing.
The following explains the meaning of each of the error codes.








Model code **0** : Outdoor unit
1 : Indoor unit
E : Group remote controller
A : Converter

Error Code	0 Outdoor unit error	1 Indoor unit error	E A Group remote controller error Converter error
00	No error	No error	No error
01	-	-	-
02	Model information abnormal	Model information abnormal	-
03	Microcomputer communication error	Microcomputer communication error	Microcomputer communication error
04	Power supply frequency abnormal	Power supply frequency abnormal	-
05	-	-	Parallel communication error
06	EEPROM access error	EEPROM access error	EEPROM access error
07	EEPROM deletion error	EEPROM deletion error	-
08	-	-	-
09	Compressor 1 error	Room temperature thermistor error	-
0A	Compressor 2 error	Heat exchanger thermistor (middle) error	-
0b	Compressor 3 error	Heat exchanger thermistor (inlet) error	-
0C	-	Heat exchanger thermistor (outlet) error	-
0d	Discharge temperature thermistor 1 error	Blower temperature thermistor error	-
0E	Discharge temperature thermistor 2 error	-	-
0F	Discharge temperature thermistor 3 error	-	-
10	Outdoor temperature thermistor error	-	-
11	Heat exchanger inlet thermistor 1 error	Drain abnormal	-
12	Heat exchanger inlet thermistor 2 error	Room temperature abnormal	-
13	Heat exchanger inlet thermistor 3 error	Indoor unit fan error	-
14	Heat exchanger outlet thermistor 1 error	-	-
15	Heat exchanger outlet thermistor 2 error	-	-
16	Heat exchanger outlet thermistor 3 error	-	-
17	Suction temperature thermistor error	-	-
18	-	Standard wired remote control communication error	Standard wired remote control communication error
19	Discharge pressure sensor error	-	-
1A	Liquid pressure sensor error	-	Address setting error
1b	Suction pressure sensor error	-	-
1C	Oil sensor error	-	Connection error
1d	-	-	System error
1E	-	-	-
1F	Transmission error	Transmission error	Transmission error
20	-	-	-
21	Discharge temperature 1 error	-	-
22	Discharge temperature 2 error	-	-
23	Discharge temperature 3 error	-	-
24	High-pressure error	-	-
25	Low-pressure error	-	-
26	-	-	-
27	Oil recovery error	-	-
28	Pump down error	-	-

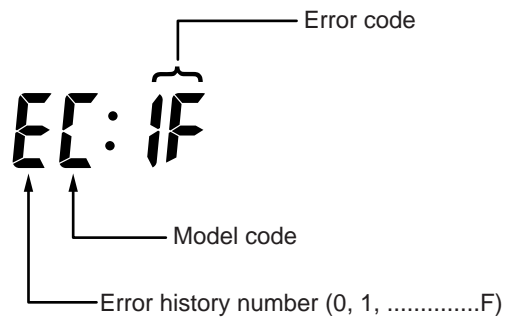
- (2) When an indoor unit operation indicator is flashing, it means that error occurs at the indoor unit.




- (3) Press SELECT button  to move cursor ▼ to the corresponding indoor unit.
Error code "E1:*" will appear.

■ Error code history display function.

- (1) Stop the air conditioner operation.
- (2) Press SET TIME button  and  simultaneously for more than 3 seconds.
- (3) Press SET TEMPERATURE button  or  several times until "E5" appears on the temperature display.
- (4) Press DAY button  to select the error history number.

Example












- (5) Press TIME MODE (DELETE) button  for more than 3 seconds to clear the error histories if necessary.
- (6) Press SET TIME button  and  simultaneously for more than 3 seconds to stop the function.

5-4 NETWORK CONVERTOR

If there is a problem with the network convertor(UTR-YSSA), an error code will appear on D129 of print circuit board.

Error code displayed on network convertor

Error code	Error contents
	No error (operation mode)
	Initial setting
	Circuit board error 1
	Circuit board error 2
	Transmission error with wired RC
	Transmission error with indoor unit
	Transmission error with VRF system
	Software error
	Indoor or outdoor unit error

5-5 ERROR CODE & TROUBLESHOOTING

5-5-1 TROUBLE SHOOTING WITH ERROR CODE

■ INDOOR UNIT TROUBLESHOOTING

ERROR CODE	ERROR	ERROR CONTENTS	CAUSE	COUNTERMEASURE
00	No errors			
02	Model information abnormal	<ol style="list-style-type: none"> 1. Error occurrence condition When power is turned on. Error for the model information, which is memorized in EEPROM, occurs. 2. Relevant operation <ol style="list-style-type: none"> 1) Relevant indoor unit is stopped (Not started). 2) Error is displayed on LED of indoor unit or output to communication bus line. 3. Clearance □ □ Model information, which is memorized in EEPROM is recovered normally. 	Model information is not memorized or erased because of some reason.	Replace control printed circuit board of indoor unit.
03	Microcomputer communication error	<ol style="list-style-type: none"> 1. Error occurrence condition Communication between two microcomputers on indoor unit control printed circuit board is not performed correctly. 2. Relevant operation <ol style="list-style-type: none"> 1) Relevant indoor unit is stopped (not started). 2) Error is displayed on LED of indoor unit or output to communication bus line. 3. Clearance The communication between microcomputers is performed correctly. 	<ol style="list-style-type: none"> 1. Effect of extraneous noise 2. Control printed circuit board of Indoor unit is faulty. 	<ol style="list-style-type: none"> 1. When power is turned off, and then turned on again: <ol style="list-style-type: none"> 1) If error doesn't occur, printed circuit board is normal. Then, remove noise sources near indoor unit. 2) If error occurs again, remove noise sources and take measure with the following countermeasure No.2. 2. Replace indoor unit control printed circuit board.
04	Power supply frequency abnormal	<ol style="list-style-type: none"> 1. Error occurrence condition When control printed circuit board of Indoor unit detects frequency, which is not specified. 2. Relevant operation <ol style="list-style-type: none"> 1) Relevant indoor unit is stopped (not started). 2) Error is displayed on LED of indoor unit or output to communication bus line. 3. Clearance Control printed circuit board of Indoor unit detects the specified frequency. 	Power supply frequency is in the following range. Lower than 45Hz or Higher than 65Hz.	Check power supply frequency and apply the power whose frequency is within the specified frequency.
06	EEPROM access error	<ol style="list-style-type: none"> 1. Error occurrence condition After indoor unit operation is started, EEPROM cannot be accessed because of disturbance or device error. 2. Relevant operation Error is displayed on LED of indoor unit. 3. Clearance Access to EEPROM is performed correctly. 	EEPROM cannot be accessed because of disturbance, device error, etc.	<ol style="list-style-type: none"> 1. Remove noise sources near indoor unit. 2. Replace control printed circuit board of indoor unit.

ERROR CODE	ERROR	ERROR CONTENTS	CAUSE	COUNTERMEASURE
07	EEPROM deletion error	<ol style="list-style-type: none"> 1. Error occurrence condition After indoor unit operation is started, error for model information, which is memorized on EEPROM, occurs. 2. Relevant operation 1) Relevant indoor unit is stopped. 2) Error is displayed on LED of indoor unit. 3. Clearance Model information, which is memorized on EEPROM is recovered. 	Model information is not memorized, or erased because of some reasons.	Replace control printed circuit board of indoor unit.
09	Room temperature thermistor error	<ol style="list-style-type: none"> 1. Error occurrence condition The condition of thermistor, which is short or open, is detected. 2. Relevant operation Indoor unit stopped. Error is displayed on LED of indoor unit and output to communication bus line. 3. Clearance Thermistor detection is other than short or open. 	<ol style="list-style-type: none"> 1. Connector connection is faulty. 	<ol style="list-style-type: none"> 1. Check if the connector of Room temperature thermistor loosens or comes off.
			<ol style="list-style-type: none"> 2. Room Temperature thermistor is faulty. 	<ol style="list-style-type: none"> 2. Check the resistance of Room temperature thermistor. If it's not normal, replace the thermistor.
0A	Heat exchanger thermistor (middle) error	<ol style="list-style-type: none"> 1. Error occurrence condition The condition of thermistor, which is short or open, is detected. 2. Relevant operation Indoor unit is stopped. Error is displayed on LED of indoor unit and output to communication bus line. 3. Clearance Thermistor detection is other than short or open. 	<ol style="list-style-type: none"> 1. Connector connection is faulty. 	<ol style="list-style-type: none"> 1. Check if the connector of Heat exchanger thermistor (middle) loosens or comes off.
			<ol style="list-style-type: none"> 2. Heat exchanger thermistor (middle) is faulty. 	<ol style="list-style-type: none"> 2. Check the resistance of heat exchanger thermistor (middle). If it's not normal, replace thermistor.
0B	Heat exchanger thermistor (inlet) error	<ol style="list-style-type: none"> 1. Error occurrence condition The condition of thermistor, which is short or open, is detected. 2. Relevant operation Error is displayed on LED of indoor unit. 3. Clearance Thermistor detection is other than short or open. 	<ol style="list-style-type: none"> 1. Connector connection is faulty. 	<ol style="list-style-type: none"> 1. Check if the connector of heat exchanger thermistor (inlet) loosens or comes off.
			<ol style="list-style-type: none"> 2. Heat exchanger thermistor (inlet) is faulty. 	<ol style="list-style-type: none"> 2. Check the resistance of heat exchanger thermistor (inlet). If it's not normal, replace thermistor.
0C	Heat exchanger thermistor (outlet) error	<ol style="list-style-type: none"> 1. Error occurrence condition The condition of thermistor, which is short or open, is detected. 2. Relevant operation Error is displayed on LED of indoor unit. 3. Clearance Thermistor detection is other than short or open. 	<ol style="list-style-type: none"> 1. Connector connection is faulty. 	<ol style="list-style-type: none"> 1. Check if the connector of heat exchanger thermistor (outlet) loosens or comes off.
			<ol style="list-style-type: none"> 2. Heat exchanger thermistor (outlet) is faulty. 	<ol style="list-style-type: none"> 2. Check the resistance of heat exchanger thermistor (outlet). If it's not normal, replace thermistor.

ERROR CODE	ERROR	CONTENTS	CAUSE	COUNTERMEASURE
0D	Blower temperature thermistor error	<ol style="list-style-type: none"> 1. Error occurrence condition The condition of thermistor, which is short or open, is detected. 2. Relevant operation Indoor unit is stopped. Error is displayed on LED of indoor unit and output to communication bus line. 3. Clearance Thermistor detection is other than short or open. 	<ol style="list-style-type: none"> 1. Connector connection is faulty. 2. Blower temperature thermistor is faulty. 	<ol style="list-style-type: none"> 1. Check if the connector of blower temperature thermistor loosens or comes off. 2. Check resistance of blower temperature thermistor. If it's not normal, replace thermistor.
11	Drain abnormal	<ol style="list-style-type: none"> 1. Error occurrence condition Float SW is ON continuously for 3 minutes. 2. Relevant operation Indoor unit is stopped. Error is displayed on LED of indoor unit and output to communication bus line. 3. Clearance Float SW is OFF. 	<ol style="list-style-type: none"> 1. Drain hose is clogged. 2. Drain outlet is clogged. 3. Drain pump is faulty. 4. Float SW operation is faulty (short) 	<ol style="list-style-type: none"> 1. Clean drain hose. 2. Clean drain outlet. 3. Check drain pump operation. If it's faulty, replace pump. 4. If float SW is shorted, replace SW.
12	Room temperature abnormal	<ol style="list-style-type: none"> 1. Error occurrence condition Room temperature thermistor detects higher than 60°C continuously for 30 minutes or longer during indoor unit operation. 2. Relevant operation Indoor unit is stopped. Error is displayed on LED of indoor unit and output to communication bus line. 3. Clearance It's cleared by turning off the power . 	<ol style="list-style-type: none"> 1. Connector connection is faulty. 2. Room temperature thermistor is faulty. 	<ol style="list-style-type: none"> 1. Check if the connector of room temperature thermistor loosens or comes off. 2. Check resistance of room temperature thermistor. If it's normal, replace thermistor.
13	Indoor unit fan error	<ol style="list-style-type: none"> 1. Error occur condition Fan speed feedback of large ceiling type, slim body cassette type and ceiling wall type is lower than 1/3 of target speed. 2. Relevant operation Indoor fan is stopped, error is displayed on LED of indoor unit and out put to communication bus line. 3. Clearance It's cleared by turning off the power. 	<ol style="list-style-type: none"> 1. Indoor fan motor lead wire connection is faulty. 2. Power supply voltage abnormal. 	<ol style="list-style-type: none"> 1. Check the wiring of indoor fan motor lead wire . 2. Check if rated power supply voltage is applied.
18	Standard wired R.C. communication error	<ol style="list-style-type: none"> 1. Error occurrence condition Communication can not be performed between standard wired remote controller and indoor unit or between indoor units in same remote controller group for a certain time. 2. Relevant operation Error is displayed on LED of indoor unit. 3. Clearance Standard wired remote controller communication is recovered. 	<ol style="list-style-type: none"> 1. Communication line is not connected, connection fault, or disconnection. 2. Indoor unit control printed circuit board is faulty. 3. Standard wired remote controller printed circuit board is faulty. 	<ol style="list-style-type: none"> 1. Check if communication line is connected to each indoor unit. Check if communication line is disconnected or loosen. 2. Replace control printed circuit board of indoor unit. 3. Replace standard wired remote controller printed circuit board.

ERROR COCE	ERROR	ERROR CONTENTS	CAUSE	COUNTERMEASURE
1F	Transmission error	<p>1. Error occurrence condition Communication between indoor unit and outdoor unit cannot be performed for a certain time.</p> <p>2. Relevant operation Current operation is continued. Error is displayed on standard wired remote controller, and displayed on indoor unit LED.</p> <p>3. Clearance Communication between indoor unit and outdoor unit is recovered.</p>	<p>1. Effect of extraneous noise.</p> <p>2. Communication line is not connected, connection fault, or disconnection.</p> <p>3. Insertion for communication printed circuit board of indoor unit or outdoor unit is faulty.</p> <p>4. Printed circuit board is faulty.</p>	<p>1. When power is turned OFF and turned ON again:</p> <p>1) If error doesn't occur, printed circuit board is normal. Then, remove noise sources near outdoor unit.</p> <p>2) If error occurs again, remove noise sources and take measure with the following countermeasure No.2-4.</p> <p>2. Check if communication line is connected to all indoor unit. Check if communication line is disconnected.</p> <p>3. Check the insertion of indoor unit communication printed circuit board and outdoor unit communication printed circuit board.</p> <p>4. 1) If communication of some indoor units in same refrigerant system is abnormal and the compressor operates, replace printed circuit boards with following procedures and check the operation:</p> <p>① Replace Indoor unit communication printed circuit board.</p> <p>② Replace Indoor unit control printed circuit board.</p> <p>2) If communication of all indoor units in same refrigerant system is abnormal and the compressor does not operate, replace printed circuit boards with following procedures and check the operation:</p> <p>① Replace Outdoor unit communication printed circuit board.</p> <p>② Replace Outdoor unit control printed circuit board.</p> <p>③ Replace Indoor unit communication printed circuit board.</p> <p>④ Replace Indoor unit control printed circuit board.</p>
20	Node setting error	<p>1. Error occurrence condition Indoor unit communication printed circuit board is not initialized normally.</p> <p>2. Relevant operation Error is displayed on standard wired remote controller and displayed on LED of indoor unit.</p> <p>3. Clearance Indoor unit communication printed circuit board is initialized correctly.</p>	<p>1. Effect of extraneous noise.</p> <p>2. Printed circuit board is faulty.</p>	<p>1. When power turned OFF and turned ON again:</p> <p>1) If error doesn't occur, printed circuit board is normal. Then, remove noise sources near indoor unit.</p> <p>2) If error occurs again, remove noise sources and take measure with the following countermeasure No.2-3.</p> <p>2. Replace printed circuit boards with following procedures, and check the operation.</p> <p>① Replace Indoor unit communication printed circuit board.</p> <p>② Replace Indoor unit control printed circuit board.</p>

ERROR CODE	ERROR	ERROR CONTENTS	CAUSE	COUNTERMEASURE
21	Parallel communication error	<p>1. Error occurrence condition Communication between indoor unit control printed circuit board and indoor unit communication printed circuit board is not performed normally.</p> <p>2. Relevant operation</p> <p>1) Current operation is continued. Error is displayed on standard wired remote controller, and displayed on LED of indoor unit.</p> <p>2) If error continues for 90 seconds after it's occurrence, a new transmission error (1F) is output.</p> <p>3. Clearance Communication is performed correctly between indoor unit control printed circuit board and indoor unit communication printed circuit board.</p>	<p>1. Effect of extraneous noise.</p> <hr/> <p>2. Indoor unit communication board insertion is faulty.</p> <hr/> <p>3. Printed circuit board is faulty.</p>	<p>1. When power is turned OFF and turned ON again:</p> <p>1) If error doesn't occur, printed circuit board is normal. Then, remove noise sources near indoor unit.</p> <p>2) If error occurs again, remove noise sources and take measure with the following countermeasure No.2-3.</p> <hr/> <p>2. Check the insertion of indoor unit communication printed circuit board.</p> <hr/> <p>3. Replace printed circuit boards with following procedure, and check the operation.</p> <p>(1) Replace Indoor unit communication printed circuit board.</p> <p>(2) Replace Indoor unit control printed circuit board.</p>
32	Outdoor unit error	Error occurs on outdoor unit in same refrigerant system.	Outdoor unit is faulty.	See "Outdoor unit troubleshooting".

■ OUTDOOR UNIT TROUBLESHOOTING

ERROR CODE	ERROR	ERROR CONTENTS	CAUSE	COUNTERMEASURE
00	No errors			
04	Power supply frequency abnormal	1. Error occurrence condition Outdoor unit control printed circuit board detects frequency outside of rating. 2. Relevant operation 1) All compressors are stopped (not started). 2) Error is displayed on LED of outdoor unit and output to communication bus line. 3. Clearance Outdoor unit control printed circuit board detects the specified frequency.	Power supply frequency is in the following range. Lower than 45Hz or higher than 65Hz.	Check power supply frequency and apply the power whose frequency is within the specified frequency.
05	Reverse phase blocker error	1. Error occurrence condition Reverse phase prevention circuit detects the wrong phase of power supply or the correct power supply input is not detected. 2. Relevant operation 1) All compressors are stopped (not started). 2) Error is displayed on LED of outdoor unit and output to communication bus line. 3. Clearance Reverse phase prevention circuit doesn't detect reverse phase input.	1. Reverse phase wiring. ----- 2. Reverse phase prevention circuit is faulty.	1. Check power supply wiring. ----- 2. Check power supply wiring. If there are no mistakes, replace outdoor unit control printed circuit board.

ERROR CODE	ERROR	ERROR CONTENTS	CAUSE	COUNTERMEASURE
06	EEPROM access error	<p>1. Error occurrence condition After outdoor unit operation is started, EEPROM cannot be accessed because of disturbance or device error.</p> <p>2. Relevant operation Error is displayed on LED of outdoor unit. *Outdoor unit operation is not controlled.</p> <p>3. Clearance EEPROM can be accessed correctly.</p>	EEPROM cannot be accessed because of disturbance, device error, etc.	<p>1. Remove noise sources near outdoor unit.</p> <p>2. Replace outdoor unit control printed circuit board.</p>
09	Compressor 1 error	<p>1. Error occurrence condition After 2 minutes has elapsed since compressor 1 starts to work, the discharge temperature 1 does not reach to outdoor temperature plus 10 °C, and the discharge pressure does not reach to suction pressure plus 0.2MPa. However, the error occurrent condition is not applied to defrosting operating, oil recovery operating, oil level balance operating.</p> <p>2. Relevant operation 1) After compressor error occurs, compressor recovery operation is performed. 2) Error is displayed on LED of outdoor unit and output to communication bus line.</p> <p>3. Clearance Error is cleared by turning power off.</p>	<p>1. Discharge temperature sensor TH_{D1} is faulty.</p> <p>2. Compressor power relay 1 is faulty.</p> <p>3. Outdoor unit control printed circuit board is faulty.</p> <p>4. Magnetic contactor 1 is faulty.</p> <p>5. Lack of refrigerant.</p> <p>6. Compressor motor protector is operated.</p> <p>7. Compressor is faulty.</p>	<p>1. Check if the wiring of discharge temperature sensor TH_{D1} loosens or comes off. And check the resistance of sensor. If it's abnormal, replace sensor.</p> <p>2. Check compressor power relay 1. If it's abnormal, replace power relay.</p> <p>3. Check CN24 (compressor 1) 12V voltage output on outdoor unit control printed circuit board. If it's abnormal, replace printed circuit board.</p> <p>4. Check magnetic contactor 1. If it's abnormal, replace contactor.</p> <p>5. Check additional refrigerant amount and recharge suitable refrigerant.</p> <p>6. Compressor overload operation check "High-pressure error". Motor protector is reset at 69°C</p> <p>7. Check compressor. If it's faulty, replace compressor.</p>

ERROR CODE	ERROR	CONTENTS	CAUSE	COUNTERMEASURE
0A	Compressor 2 error	<p>1. Error occurrence condition After 2 minutes have elapsed since compressor 2 starts to work, the discharge temperature 2 does not reach to outdoor temperature plus 10 °C, and the discharge pressure does not reach to suction pressure plus 0.2MPa. However, the error occurrent condition is not applied to defrosting operating, oil recovery operating, oil level balance operating.</p> <p>2. Relevant operation 1) After compressor error occurs, compressor recovery operation is performed. 2) Error is displayed on LED of outdoor unit and output to communication bus line. 3. Clearance Error is cleared by turning power off.</p>	<p>1. Discharge temperature sensor TH_{D2} is faulty.</p> <p>2. Compressor power relay 2 is faulty.</p> <p>3. Outdoor unit control printed circuit board is faulty.</p> <p>4. Magnetic contactor 2 is faulty.</p> <p>5. Lack of refrigerant.</p> <p>6. Compressor motor protector is operated.</p> <p>7. Compressor is faulty.</p>	<p>1. Check if the wiring of discharge temperature sensor TH_{D2} loosens or comes off. And check the resistance of sensor. If it's abnormal, replace sensor.</p> <p>2. Check compressor power relay 2. If it's abnormal, replace power relay.</p> <p>3. Check CN25 (compressor 2) 12V voltage output on outdoor unit control printed circuit board. If it's abnormal, replace printed circuit board.</p> <p>4. Check magnetic contactor 2. If it's abnormal, replace contactor.</p> <p>5. Check additional refrigerant amount and recharge suitable refrigerant.</p> <p>6. Compressor overload operation check "High-pressure error". Motor protector is reset at 61°C.</p> <p>7. Check compressor. If it's faulty, replace compressor.</p>
0B	Compressor 3 error	<p>1. Error occurrence condition After 2 minutes have elapsed since compressor 3 starts to work, the discharge temperature 3 does not reach to outdoor temperature plus 10 °C, and the discharge pressure does not reach to suction pressure plus 0.2MPa. However, the error occurrent condition is not applied to defrosting operating, oil recovery operating, oil level balance operating.</p> <p>2. Relevant operation 1) After compressor error occurs, compressor recovery operation is performed. 2) Error is displayed on LED of outdoor unit and output to communication bus line. 3. Clearance Error is cleared by turning power off.</p>	<p>1. Discharge temperature sensor TH_{D3} is faulty.</p> <p>2. Compressor power relay 3 is faulty.</p> <p>3. Outdoor unit control printed circuit board is faulty.</p> <p>4. Magnetic contactor 3 is faulty.</p> <p>5. Lack of refrigerant.</p> <p>6. Compressor motor protector is operated.</p> <p>7. Compressor is faulty.</p>	<p>1. Check if the wiring of discharge temperature sensor TH_{D3} loosens or comes off. And check the resistance of sensor. If it's abnormal, replace sensor.</p> <p>2. Check compressor power relay 3. If it's abnormal, replace power relay.</p> <p>3. Check CN26 (compressor 3) 12V voltage output on outdoor unit control printed circuit board. If it's abnormal, replace printed circuit board.</p> <p>4. Check magnetic contactor 3. If it's abnormal, replace contactor.</p> <p>5. Check additional refrigerant amount and recharge suitable refrigerant.</p> <p>6. Compressor overload operation check "High-pressure error". Motor protector is reset at 61°C.</p> <p>7. Check compressor. If it's faulty, replace compressor.</p>

ERROR CODE	ERROR	CONTENTS	CAUSE	COUNTERMEASURE
0D	Discharge temperature thermistor 1 error	1. Error occurrence condition Thermistor condition, which is short or open, is detected. 2. Relevant operation 1) Compressor 1 is stopped. 2) Error is displayed on LED of outdoor unit and output to communication bus line. 3. Clearance 1) Thermistor detection is other than short or open. *Error can be detected when Compressor continues to operate for 5 minutes or longer. 2) Main power is reset.	1. Connector contact is faulty. ----- 2. Discharge temperature thermistor TH _{D1} is faulty.	1. Check if the connector of discharge temperature thermistor TH _{D1} loosens or comes off. ----- 2. Check the resistance of discharge temperature thermistor TH _{D1} . If it's abnormal, replace thermistor.
0E	Discharge temperature thermistor 2 error	1. Error occurrence condition Thermistor condition, which is short or open, is detected. 2. Relevant operation 1) Compressor 2 is stopped. 2) Error is displayed on LED of outdoor unit and output to communication bus line. 3. Clearance 1) Thermistor detection is other than short or open. *Error can be detected when Compressor continues to operate for 5 minutes or longer. 2) Main power is reset.	1. Connector contact is faulty. ----- 2. Discharge temperature thermistor TH _{D2} is faulty.	1. Check if the connector of discharge temperature thermistor TH _{D2} loosens or comes off. ----- 2. Check the resistance of discharge temperature thermistor TH _{D2} . If it's abnormal, replace thermistor.
0F	Discharge temperature thermistor 3 error	1. Error occurrence condition Thermistor condition, which is short or open, is detected. 2. Relevant operation 1) Compressor 3 is stopped. 2) Error is displayed on LED of outdoor unit and output to communication bus line. 3. Clearance 1) Thermistor detection is other than short or open. *Error can be detected when Compressor continues to operate for 5 minutes or longer. 2) Main power is reset.	1. Connector contact is faulty. ----- 2. Discharge temperature thermistor TH _{D3} is faulty.	1. Check if the connector of discharge temperature thermistor TH _{D3} loosens or comes off. ----- 2. Check the resistance of discharge temperature thermistor TH _{D1} . If it's abnormal, replace thermistor.

ERROR CODE	ERROR	CONTENTS	CAUSE	COUNTERMEASURE
10	Outdoor temperature thermistor error	1. Error occurrence condition Each thermistor condition, which is short or open, is detected. 2. Relevant operation 1) All Compressors are stopped.	1. Connector contact is faulty. 2. Outdoor temperature thermistor TH ₀ is faulty.	1. Check if the connector of outdoor temperature thermistor TH ₀ loosens or comes off. 2. Check the resistance of outdoor temperature thermistor TH ₀ . If it's abnormal, replace thermistor.
14	Heat exchanger thermistor 1 error	2) Error is displayed on LED of outdoor unit and output to communication bus line. 3. Clearance 1) Thermistor detection is other than short or open.	1. Connector contact is faulty. 2. Heat exchanger thermistor TH _{HO1} is faulty.	1. Check if the connector of heat exchanger outlet thermistor TH _{HO1} loosens or comes off. 2. Check the resistance of heat exchanger thermistor TH _{HO1} . If it's abnormal, replace thermistor.
15	Heat exchanger thermistor 2 error	2) Main power is reset.	1. Connector contact is faulty. 2. Heat exchanger thermistor TH _{HO2} is faulty.	1. Check if the connector of heat exchanger outlet thermistor TH _{HO2} loosens or comes off. 2. Check the resistance of heat exchanger outlet thermistor TH _{HO2} . If it's abnormal, replace thermistor.
17	Suction temperature thermistor error		1. Connector contact is faulty. 2. Suction temperature thermistor TH _s is faulty.	1. Check if the connector of suction temperature thermistor TH _s loosens or comes off. 2. Check the resistance of suction temperature thermistor TH _s . If it's abnormal, replace thermistor.

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	COUNTERMEASURE
19	Discharge pressure sensor error	1. Error occurrence condition 1) Output voltage of the pressure sensor remains under 0.8V for 3 minutes or longer. However, detection isn't performed for 3 minutes after power is applied to outdoor unit.	Discharge pressure sensor P _H is faulty.	Replace discharge pressure sensor P _H .
1B	Suction pressure sensor error	2) Output voltage of the pressure sensor is greater than or equal to 5V. However, detection isn't performed for 3 minutes after power is applied to outdoor unit. 2. Relevant operation 1) All compressors and fan motors are stopped. 2) Error is displayed on LED of outdoor unit and output to communication bus line. 3. Clearance 1) Output voltage of pressure sensor increases to 0.8V or higher for the case of 1-1) or decreases to 3.75V or lower for the case of 1-2) 2) Main Power is reset.	Suction pressure sensor P _L is faulty.	Replace suction pressure sensor P _L .

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	COUNTERMEASURE
1F	Transmission error	1. Error occurrence condition Communication from each indoor units are cut off for a certain time. 2. Relevant operation 1) If transmission error occurs after 90 seconds since outdoor unit circuit board error 1 occurs, all compressors are stopped and error is displayed on LED of outdoor unit. 2) If communication from all indoor units are cuts of for a certain time, all compressors are stopped and error is displayed on LED of outdoor unit. 3) Except a-fore mentioned operations, only indoor units that completes the communications are operated. Error is displayed on LED of outdoor unit. 3. Clearance 1) Communication with indoor units is recovered. 2) Main power is reset.	1. Effect of extraneous noise	1. When power is turned off, and turned on again: (1) If error doesn't occur, printed circuit board is normal. Then, remove noise sources near outdoor unit. (2) If error occurs again, remove noise sources and take measures with the following countermeasure No.2 to 5.
			2. Communication line is not connected, contact is faulty, or disconnection.	2. Check if communication line is connected to all indoor units. Check if communication line is disconnected.
			3. Indoor unit power is OFF	3. Check indoor units power supply.
			4. Insertion fault for communication printed circuit board of indoor unit or outdoor unit.	4. Check the insertion of indoor unit communication PC board and outdoor unit communication PC board.
			5. PC board is faulty.	5. 1) If transmission error occurs after Parallel communication error replace PC boards with following procedures and check the operation. (1) Replace outdoor unit communication printed circuit board. (2) Replace outdoor unit control printed circuit board. 2) when some indoor units in same refrigerant system are operated, replace printed circuit boards with following procedures and make sure the operation. (1) Replace communication printed circuit board of indoor unit that occurs transmission error (2) Replace control printed circuit board of indoor unit that occurs transmission error. 3) When an error occurs on all indoor units of the same refrigerant system and compressor does not operate, replace PC boards with following procedures and make sure the operation. (1) Replace outdoor unit communication PC board. (2) Replace outdoor unit control PC board. (3) Replace indoor unit communication PC board. (4) Replace indoor unit control PC board.

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	COUNTERMEASURE
21	Discharge temperature 1 error	<p>1. Error occurrence condition Compressor 1 is stopped 3 or more times due to a high discharge temperature 1 (130°C or higher) in 40 minutes.</p> <p>2. Relevant operation</p> <p>1) Error is displayed on LED of outdoor unit and output to communication bus line.</p> <p>2) When the condition of 3-2) is satisfied recovery operation start up.</p> <p>3. Clearance When all the following conditions are satisfied:</p> <p>1) Discharge temperature protector 1 reset.</p> <p>2) Discharge temperature protector is not operated for 10 minutes or longer and the discharge temperature 1 decreases to 95°C or lower.</p> <p>3) Main power is reset.</p>	<p>1. Gas leak or lack of refrigerant.</p> <p>-----</p> <p>2. Outdoor unit fan motors are faulty.</p> <p>-----</p> <p>3. Discharge temperature sensor TH_{D1} is faulty.</p> <p>-----</p> <p>4. Electronic expansion valve operation is faulty.</p> <p>-----</p> <p>5. Solenoid valve operation is faulty.</p>	<p>1. Check the gas leak and additional refrigerant amount, and recharge suitable refrigerant.</p> <p>-----</p> <p>2. Check outdoor unit fan motors operation. Remove the obstruction in wind path. If the fan motors are faulty, replace the motors.</p> <p>-----</p> <p>3. Check if the wiring of discharge temperature sensor TH_{D1} loosens or comes off and check the resistance TH_{D1}. If it's abnormal, replace sensor.</p> <p>-----</p> <p>4. Check operation and coil resistance of following electronic expansion valve. If it's abnormal, replace electronic expansion valve. Coil resistance measurement points. Red-white, red-orange, brown-yellow, brown-blue.</p> <p>(1) Outdoor unit electronic expansion valve EEV1 and EEV2 Coil resistance: 192 +/-19 ohms.</p> <p>(2) Indoor units electronic expansion valve EEV Coil resistance: 150 +/-50 ohms.</p> <p>-----</p> <p>5. Check operation of following solenoid valves. If operation is faulty, replace solenoid valve.</p> <p>Cooling operation. Outdoor unit solenoid valve SV5.</p> <p>Heating operation. Outdoor units solenoid valves SV4 and SV5.</p>

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	COUNTERMEASURE
22	Discharge temperature 2 error	<p>1. Error occurrence condition Compressor 2 is stopped 3 or more times due to a high discharge temperature 2 (130°C or higher) in 40 minutes.</p> <p>2. Relevant operation</p> <p>1) Error is displayed on LED of outdoor unit and output to communication bus line.</p> <p>2) When the condition of 3-2) is satisfied recovery operation starts up.</p> <p>3. Clearance When all the following conditions are satisfied:</p> <p>1) Discharge temperature protector 2 is reset.</p> <p>2) Discharge temperature protector is not operated for 10 minutes or longer and the discharge temperature 2 decreases to 95°C or lower.</p> <p>3) Main power is reset.</p>	<p>1. Gas leak or lack of refrigerant.</p> <p>-----</p> <p>2. Outdoor unit fan motors are faulty.</p> <p>-----</p> <p>3. Discharge temperature sensor TH_{D2} is faulty.</p> <p>-----</p> <p>4. Electronic expansion valve operation is faulty.</p> <p>-----</p> <p>5. Solenoid valve operation is faulty.</p>	<p>1. Check the gas leak and check additional refrigerant amount and recharge suitable refrigerant.</p> <p>-----</p> <p>2. Check outdoor unit fan motors operation. Remove the obstruction in wind path. If the fan motors are faulty, replace the motors.</p> <p>-----</p> <p>3. Check if the wiring of discharge temperature sensor TH_{D2} loosens or comes off and check the resistance of TH_{D2}. If it's abnormal, replace sensor.</p> <p>-----</p> <p>4. Check operation and coil resistance of following electronic expansion valve. If it's abnormal, replace electronic expansion valve. Coil resistance measurement points. Red-white, red-orange, brown-yellow, brown-blue. (1) Outdoor unit electronic expansion valve EEV1 and EEV2 Coil resistance: 192 +/-19 ohms. (2) Indoor units electronic expansion valve EEV Coil resistance: 150 +/-50 ohms.</p> <p>-----</p> <p>5. Check operation of following solenoid valves. If operation is faulty, replace solenoid valve. Cooling operation Outdoor unit solenoid valve SV5. Heating operation Outdoor units solenoid valves SV4 and SV5.</p>

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	COUNTERMEASURE
23	Discharge temperature 3 error	<p>1. Error occurrence condition Compressor 3 is stopped 3 or more times due to a high discharge temperature 3 (130°C or higher) in 40 minutes.</p> <p>2. Relevant operation</p> <p>1) Error is displayed on LED of outdoor unit and output to communication bus line.</p> <p>2) When the condition of 3-2) is satisfied recovery operation starts up.</p> <p>3. Clearance When all the following conditions are satisfied:</p> <p>1) Discharge temperature protector 3 is reset.</p> <p>2) Discharge temperature protector is not operated for 10 minutes or longer and the discharge temperature 3 decreases to 95°C or lower.</p> <p>3) Main power is reset.</p>	<p>1. Gas leak or lack of refrigerant.</p> <p>-----</p> <p>2. Outdoor unit fan motors are faulty.</p> <p>-----</p> <p>3. Discharge temperature sensor TH_{D3} is faulty.</p> <p>-----</p> <p>4. Electronic expansion valve operation is faulty.</p> <p>-----</p> <p>5. Solenoid valve operation is faulty.</p>	<p>1. Check the gas leak and check additional refrigerant amount and recharge suitable refrigerant.</p> <p>-----</p> <p>2. Check outdoor unit fan motors operation. Remove the obstruction in wind path. If the fan motors are faulty, replace the motors.</p> <p>-----</p> <p>3. Check if the wiring of discharge temperature sensor TH_{D3} loosens or comes off and check the resistance of TH_{D3}. If it's abnormal, replace sensor.</p> <p>-----</p> <p>4. Check operation and coil resistance of following electronic expansion valve. If it's abnormal, replace electronic expansion valve. Coil resistance measurement points. Red-white, red-orange, brown-yellow, brown-blue.</p> <p>(1) Outdoor unit electronic expansion valve EEV1 and EEV2 Coil resistance: 192 +/-19 ohms.</p> <p>(2) Indoor units electronic expansion valve EEV Coil resistance: 150 +/-50 ohms.</p> <p>-----</p> <p>5. Check operation of following solenoid valves. If operation faulty, replace solenoid valve.</p> <p>Cooling operation Outdoor unit solenoid valve SV5.</p> <p>Heating operation Outdoor units solenoid valves SV4 and SV5.</p>

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	COUNTERMEASURE
24	High pressure error	<p>1. Error occurrence condition When any of following conditions is satisfied: Compressor is stopped twice or more due to high pressure protection within in 20 minutes.</p> <p>2. Relevant operation 1) All compressor are stoped. 2) Error is displayed on LED of outdoor unit and output to communication bus line.</p> <p>3. Clearance When all of following conditions satisfied: 1) 10 minutes have passed since compressor is stopped due to high pressure protection and the high pressure to 2.3MPa or lower. 2) High pressure protection is not operated for 20 minutes or longer. 3) Main power is reset.</p>	<p>1. The ball valve and the 3-way valve aren't opened completely.</p> <p>2. Short cycle of air passage of inlet and outlet of outdoor unit.</p> <p>3. Outdoor heat exchanger is dirty or clogged with foreign matter.</p> <p>4. Outdoor fan motor is faulty.</p> <p>5. Indoor unit filter is clogged.</p> <p>6. Indoor fan motor is faulty.</p> <p>7. Electronic expansion valve operation is faulty.</p> <p>8. Solenoid valve operation is faulty.</p> <p>9. Overload</p>	<p>1. Open the ball valve and the 3-way valve fully.</p> <p>2. Check required installation dimensions.</p> <p>3. Clean heat exchanger or remove foreign matter.</p> <p>4. Check outdoor fan motor operation. Remove the obstruction in wind path. If fan motor faulty, replace motor.</p> <p>5. Clean the filter.</p> <p>6. Check indoor fan motor operation. If fan motor is faulty, replace motor.</p> <p>7. Check operation and coil resistance of following electronic expansion valve. If it's faulty, replace electronic expansion valve. Coil resistance measurement points Red-white, red-orange, brown-yellow, brown-blue (1) Outdoor unit electronic expansion valve EEV1 and EEV2 Coil resistance: 192 +/-19 ohms. (2) Indoor units electronic expansion valve EEV Coil resistance: 150 +/-15 ohms.</p> <p>8. Check operation of following solenoid valves. If operation faulty, replace solenoid valve. Cooling operation Outdoor unit solenoid valve SV4. Heating operation Outdoor units solenoid valves SV4.</p> <p>9. Clear the cause of overload (e.g. Caused by indoor unit or outdoor unit installation)</p>

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	COUNTERMEASURE
25	Low pressure error	<p>1. Error occurrence condition When any of following conditions satisfied: Compressor is stopped twice or more due to low pressure protection in 20 minutes.</p> <p>2. Relevant operation 1) All compressors are stoped. 2) Error is displayed on LED of outdoor unit and output to communication bus line.</p> <p>3. Clearance When all of following conditions is satisfied: 1) 10 minutes have passed since compressor is stopped due to low pressure protection and the low pressure increases to 0.12MPa or higher. 2) Low pressure protection is not operated for 20 minutes or longer. 3) Main power is reset.</p>	<p>1. The ball valve and the 3-way valve aren't completely.</p> <p>2. Gas leak</p> <p>3. Is the resistance value of outdoor temperature thermistor correct.</p> <p>4. Indoor unit filter is clogged.</p> <p>5. Outdoor unit fan motors are faulty.</p> <p>6. Indoor unit fan motor is faulty.</p> <p>7. Electronic expansion valve operation is faulty.</p>	<p>1. Open the ball valve and the 3-way valve fully.</p> <p>2. Repair gas leak, and charge suitable refrigerant.</p> <p>3. Check the resistance value of outdoor temperature thermistor and replace it if it isn't the right value.</p> <p>4. Clean the filter.</p> <p>5. Check outdoor unit fan motors operation. If the fan motors are faulty replaced the motors.</p> <p>6. Check indoor unit fan motor operation. If the fan motor is faulty, replace motor.</p> <p>7. Check operation and coil resistance of following electronic expansion valve. If it's faulty, replace electronic expansion valve. Coil resistance measurement points. Red-white, red-orange, brown-yellow, brown-blue.</p> <p>(1) Outdoor unit electronic expansion valve EEV1 and EEV2. Coil resistance: 192 +/-19 ohms.</p> <p>(2) Indoor units electronic expansion valve EEV.Coil resistance: 150 +/-15 ohms.</p>

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	COUNTERMEASURE
28	Pump down error	1. Error occurrence condition 8 minutes have elapsed since pump down is performed, or discharge pressure sensor P _H is 3MPa or higher. 2. Relevant operation 1) All compressors and outdoor fans are stopped. 2) Error is displayed on LED of outdoor unit and output to communication bus line. 3. Clearance Pump down DIP SW1-3 is switched from ON to OFF.	Pump down SW remains ON.	Switch pump down DIP SW1-3 in control printed circuit board of outdoor unit from ON to OFF.
			Outdoor unit fan motors are faulty.	Check outdoor unit fan motors operation. Remove the obstruction in wind path. If the fan motors are faulty replace the motors.
—	Node setting error	1. Error occurrence condition Communication printed circuit board of outdoor unit isn't initialized correctly. 2. Relevant operation Error is displayed on LED of outdoor unit. 3. Clearance Communication printed circuit board of outdoor unit is initialized correctly.	1. Effect of extraneous noise	1. When power turned off, then turned back on: 1) If error doesn't occur, PC board is normal. Then, remove noise sources near outdoor unit. 2) If error occurs again, remove noise sources and take measure with the following countermeasure No.2.
			2. Printed circuit board is faulty.	2. Replace printed circuit boards with following procedure, and check the operation. (1) Replace Outdoor unit communication PC board (2) Replace Outdoor unit control PC board
—	Outdoor unit circuit board error 1	1. Error occurrence condition Communication between control printed circuit board and communication printed circuit board of outdoor unit isn't performed correctly. 2. Relevant operation 1) Current operation is continued. Error is displayed on LED of outdoor unit. 2) If error is kept for 90 seconds since error occurs, new communication error (1F) occurs. 3. Clearance The communication between control printed circuit board and communication printed circuit board of outdoor unit is performed correctly.	1. Effect of extraneous noise	1. When power is turned off, and turned on again: 1) If error doesn't occur, printed circuit board is normal. Then, remove noise sources near outdoor unit. 2) If error occurs again, remove noise sources and take measure with the following countermeasure No.2.
			2. Outdoor unit communication PC board insertion is faulty.	2. Check the insertion of outdoor unit communication printed circuit board.
			3. Printed circuit board is faulty.	3. Replace printed circuit boards with the following procedure, and check the operation. (1) Replace outdoor unit communication printed circuit board (2) Replace outdoor unit control printed circuit board
—	Indoor unit error	Error occurs on indoor unit in same refrigerant system.	Indoor unit is faulty.	See indoor unit troubleshooting.

■CENTRAL REMOTE CONTROLLER TROUBLESHOOTING

ERROR CODE	ERROR	CONTENTS	CAUSE	COUNTERMEASURE
00	No errors			
02	Printed circuit board error (Control panel)	1. Error occurrence condition Error occurs at control panel printed circuit board and central remote controller cannot be operated.	1. Effect of extraneous noise.	1. After ACL key is pressed, or power is turned on again: 1) If error doesn't occur, printed circuit board is normal. Then, remove noise sources near operation panel. 2) If error occurs again, remove noise sources and take measure with the following countermeasure No.2.
		2. Relevant operation Error display.Only error code display is operated. Other operations are ineffective. 3. Clearance□ □ Error is cleared and central remote controller bcomes operable again.	2. Conrol panel printed circuit board is faulty.	2. Replace operation panel printed circuit board.
03	PC board error (Transmission adaptor)	1. Error occurrence condition Error occurs at transmission adaptor control printed circuit board and central remote controller cannot be operated.	1. Effect of extraneous noise	1. After reset key on transmission adaptor control printed circuit board is pressed, or power is turned on again: 1) If error doesn't occur,printed circuit board is normal. Then, remove noise sources near transmission adaptor. 2) If error occurs again, remove noise sources and take measure with the following countermeasure No.2.
		2. Relevant operation Error display.Only error code display operation can be paformed.Other operations are ineffective. 3. Clearance□ □ Error is cleared and central controller bcomes operable again.	2. Transmission adaptor conrol printed circuit board is faulty.	2. Replace transmission adaptor control printed circuit board.
04	Memory error	1. Error occurrence condition Control panel memory is failed, or model infomation and remote controller group registration, which are stored in memory is failed	1. Effect of extraneous noise	1. Initialize the setting again, after initial setting. 1) If error doesn't occur, printed circuit board is normal. Then, remove noise sources near operation panel. 2) If error occurs again, remove noise sources and take measurre with the following countermeasure NO.2.
		2. Relevant operation 1) Error occurs in normal state. Error and error code are displayed . Only pressing key SW42 on control panel printed circuit boad is effective. Other operations are ineffective. 2) When error occurs in initialize menu mode. Error and error code display. Only pressing SET key is effective. Other operations are ineffective.	2. Control panel PC board is faulty.	2. Replace control panel printed circuit board. 3. Clearances 1) If error occurs in normal condition, Key SW42 on control panel printed circuit board is pressed and the memory is cleared. 2) If error occurs on the initial setting menu mode. Set key is pressed and the memory is cleared.

ERROR CODE	ERROR	CONTENTS	CAUSE	COUNTERMEASURE
05	Node setting error	<p>1. Error occurrence condition Control panel printed circuit board isn't initialized normally.</p> <p>2. Relevant operation Error display. Only error display operation can be performed. Other operations are ineffective.</p> <p>3. Clearance Operation panel printed circuit board initialization operation is performed normally.</p>	<p>1. Effect of extraneous noise</p> <p>2. Printed circuit board is faulty.</p>	<p>1. After ACL key is pressed or power is turned on again :</p> <p>1) If error doesn't occur, printed circuit board is normal. Then, remove noise sources near operation panel.</p> <p>2) If error occurs again, remove noise sources and take measure with the following countermeasure No.2.</p> <p>2. Replace printed circuit boards with following procedure and confirm the operation.</p> <p>① Replace Transmission adapter control printed circuit board.</p> <p>② Replace Transmission adapter communication printed circuit board.</p> <p>③ Operation panel printed circuit board.</p>
06	Parallel communication error	<p>1. Error occurrence condition Communication between transmission adapter control printed circuit board and transmission adapter communication printed circuit board is not performed normally.</p> <p>2. Relevant operation</p> <p>1) Error indication. Central Remote operation is available.</p> <p>2) If error is kept to detect for a while after error occurs, transmission error (1F) is output.</p> <p>3. Clearance The communication between the control printed circuit board and communication printed circuit board of transmission adaptor is performed correctly.</p>	<p>1. Effect of extraneous noise</p> <p>2. Transmission adapter communication printed circuit board insertion is faulty.</p> <p>3. Printed circuit board is faulty.</p>	<p>1. After RESET key on control printed circuit board of transmission adapter is pressed, or power is turned on again :</p> <p>1) If error doesn't occur, printed circuit board is normal. Then, remove noise sources near transmission adaptor.</p> <p>2) If error occurs again, remove noise sources and take measure with the following countermeasure No.2,3.</p> <p>2. Check insertion for the communication printed circuit board of transmission adaptor.</p> <p>3. Replace printed circuit boards with following procedure and confirm the operation.</p> <p>① Replace Transmission adapter communication board.</p> <p>② Replace Transmission adapter control board.</p>

ERROR CODE	ERROR	ERROR CONTENTS	CAUSE	COUNTERMEASURE
1C	Connection error	1. Error occurrence condition Communication between transmission adapter and control panel is not performed correctly. 2. Relevant operation Error display. Only error code display operation can be performed. Other operations are ineffective. 3. Clearance The communication between transmission adapter and operation panel is performed correctly.	1. Effect of extraneous noise	1-1. Check error continuity. 1) If error is cleared automatically, printed circuit board is normal. Then, remove noise sources near central remote controller. 2) If error isn't cleared automatically, check following. 1-2. After ACL key is pressed, RESET key on control board of transmission adaptor is pressed, or power is turned on again : 1) If error doesn't occur, printed circuit board is normal. Then, remove noise sources near central remote controller. 2) If error occurs again, remove noise sources and take measure with the following countermeasure No.2,3,4.
			2. Communication line between transmission adapter and control panel connection is faulty or disconnecting.	2. Check if communication line between transmission adapter and control panel is disconnected or the other problem for connection occurs.
			3. Communication parameter setting error.	3. Check setting of DIP-SW1-1~7 on control panel and DIP-SW2-1~4 and DIP-SW3-1~3 on transmission adapter printed circuit board.
			4. Printed circuit board is faulty.	4. Replace printed circuit boards with following procedure and confirm the operation. ① Replace Transmission adaptor control board. ② Replace Control panel printed circuit board.

ERROR CODE	ERROR	ERROR CONTENTS	CAUSE	COUNTERMEASURE
1D	Initial setting error	1. Error occurrence condition Initialization is not performed normally. When recognized as only indoor or outdoor unit in the same refrigerant system, or when not recognizing In / Out at all. 2. Relevant operation Error display. Central remote controller operation can be performed. 3. Clearance Initialization is performed again from key operation.	1. Effect of extraneous noise	1. Initialize the setting again. 1) If error doesn't occur, printed circuit board is normal. Then, remove noise sources near control panel. If error occurs again, remove noise sources and take measure with the following countermeasure No.2,3.
			2. Other remote controller (Standard wired remote controller, wireless remote controller, Central remote controller) is operated.	2. Stop operation of other remote controller, and initialize again.
			3. Printed circuit board is faulty.	3. Check the power supply, wiring, address set-up of Indoor / Outdoor unit. ① Replace Transmission adaptor communication printed circuit board. ② Replace Transmission adaptor control printed circuit board ③ Replace Control panel printed circuit board
1E	Manual storing 2 error	1. Error occurrence condition Manual store 2 is not performed normally. 2. Relevant operation Error display. Central remote controller operation can be performed. 3. Clearance Storing (automatic allocation, manual storing 1, manual storing 2) is performed from key operation, or initial setting menu mode is cancelled.	1. Effect of extraneous noise	1. Perform allocation again. After manual storing 2 setting: 1) If error doesn't occur, printed circuit board is normal. Then, remove noise sources near control panel. If error occurs again, remove noise sources and take measure with the following countermeasure No.2.
			2. Printed circuit board is faulty.	2. Replace printed circuit boards with following procedures, and confirm the operation. ① Replace Transmission adaptor commutation board. ② Replace Transmission adaptor control board. ③ Replace Control panel printed circuit board.
1F	Transmission error	1. Error occurrence condition Communication between indoor unit and central remote controller is cut off for a certain time. 2. Relevant operation 1) Error Indication. Central Remote can be operated. 2) If parallel communication error occurs and communication error occurs after a certain time, error is displayed. Central remote control can be operated.	1. Effect of extraneous noise	1-1. After indoor unit power is turned on again: 1) If error doesn't occur, printed circuit board is normal. Then, remove noise sources near indoor unit. If error occurs again, remove noise sources and take measure with the following countermeasure 1-2. 1-2. After ACL key is pressed, or power is turned on again: 1) If error doesn't occur, printed circuit board is normal. Then, remove noise sources near control panel. If error occurs again, remove noise sources and take measure with the following countermeasure No.2-6.
			2. Communication line is not connected, connection fault, or disconnection.	2. Check if communication line is wired to each indoor unit.
			3. Indoor unit power off.	3. Check power supply for indoor unit.

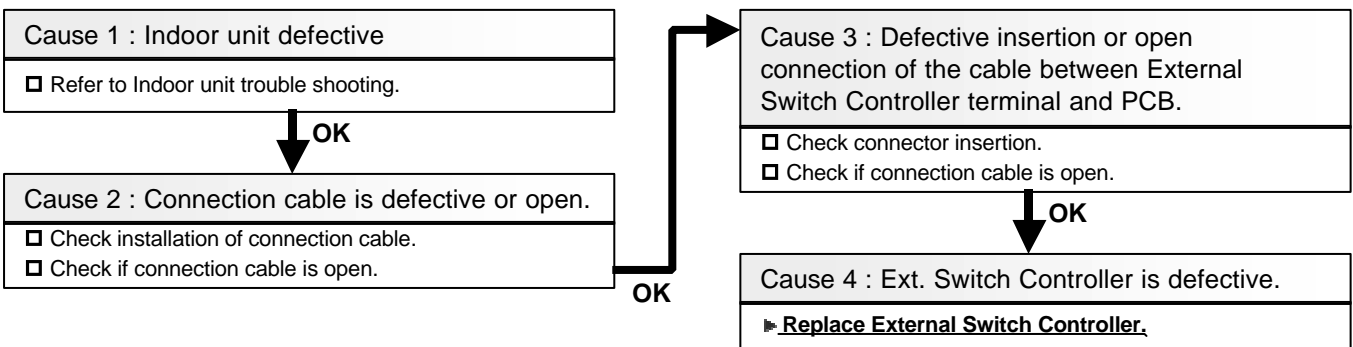
ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	COUNTERMEASURE
1F	Transmission error	3. Clearance For 2-1), the communication with indoor unit is restored. For 2-2), the communication between control printed circuit board and communication printed circuit board of transmission adaptor is performed.	4. Transmission adapter communication printed circuit board or indoor unit communication printed circuit board insertion is faulty. 5. Initialing setting after indoor unit address is changed, is forgotten. 6. Printed circuit board faulty.	4. Check insertion of the communication printed circuit board of transmission adaptor and the communication printed circuit board of indoor unit. 5. Perform initialization. 6. 1) If communication error occurs after parallel communication error occurs, replace printed circuit boards with the following procedure, and make sure the operation. ① Replace Transmission adapter communication printed circuit board. ② Replace Transmission adapter control printed circuit board. 2) For other cases, replace printed circuit boards with following procedure and make sure the operation ① Replace Indoor unit communication printed circuit board. ② Replace Indoor unit control printed circuit board.
21	Software error (OUTPUT)	1. Error occurrence condition If CPU of central remote controller is initialized by momentary power interruption during the operation setting or changing, the setting is reset. 2. Relevant operation Error display. Only error code display can be operated. Other operations are ineffective.	1. Effect of extraneous noise 2. The power supply is shut down or power supply voltage is abnormal. 3. Printed circuit board is faulty.	1-1 Check continuity error. 1) If error is cleared automatically, printed circuit board is normal. Then, remove noise sources near central remote controller. 2) If error isn't cleared automatically, check following. 1-2 After ACL key is pressed, or power is turned on again: 1) If error doesn't occur, printed circuit board is normal. Then, remove noise sources near control panel. 2) If error occurs again, remove noise sources and take measure with the following countermeasure No.2,3. 2. Check power supply voltage and operate after turning on power. 3. Replace printed circuit boards with following procedures and check the operation. ① Replace Transmission adapter control printed circuit board. ② Replace Operation panel printed circuit board.
22	Software error (INPUT)	1. Error occurrence condition Operation condition of indoor units, which is memorized in transmission adapter is abnormal. 2. Relevant operation Error display. Central remote controller can be operated. 3. Clearance When contents of memory, which is memorized in transmission adapter is normal.	1. Effect of extraneous noise 2. Transmission adapter control printed circuit board is faulty.	1-1 Check error continuity. 1) If error is cleared automatically, printed circuit board is normal. Then, remove noise sources near central remote controller. 2) If error isn't cleared automatically, check following. 1-2 After RESET key on control printed circuit board of transmission adapter is pressed, or power is turned on again: 1) If error doesn't occur, printed circuit board is normal. Then, remove noise sources near operation panel. 2) If error occurs again, remove noise sources and take measure with the following countermeasure No.2. 2. Replace transmission adapter control printed circuit board.

1. External Switch Controller (UTR-YESA)

Error Contents : Power Supply Error	Symptom : No operation & LED does not light up.
------------------------------------------------------	----------------------------------------------------------------------

Condition :

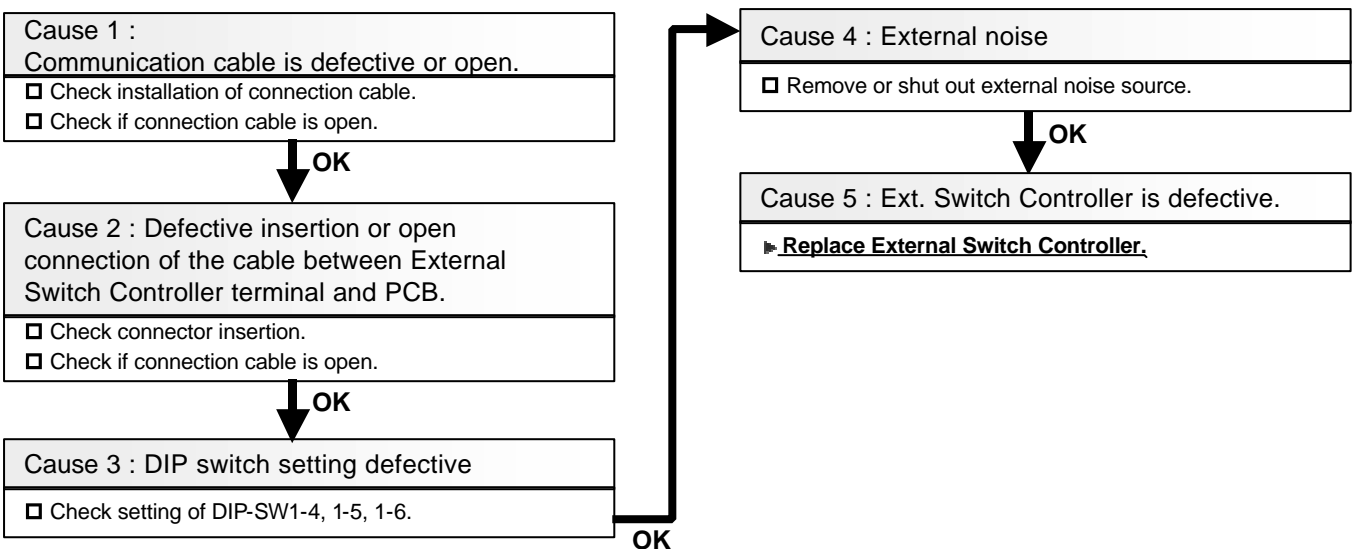
1. No power supply.
Voltage error between red and black terminals of External Switch Controller. (Normal voltage: 12V plus minus 10%)
2. Electric circuit error.
Voltage is normal between red and black terminals of External Switch Controller (Normal voltage: 12V plus minus 10%)



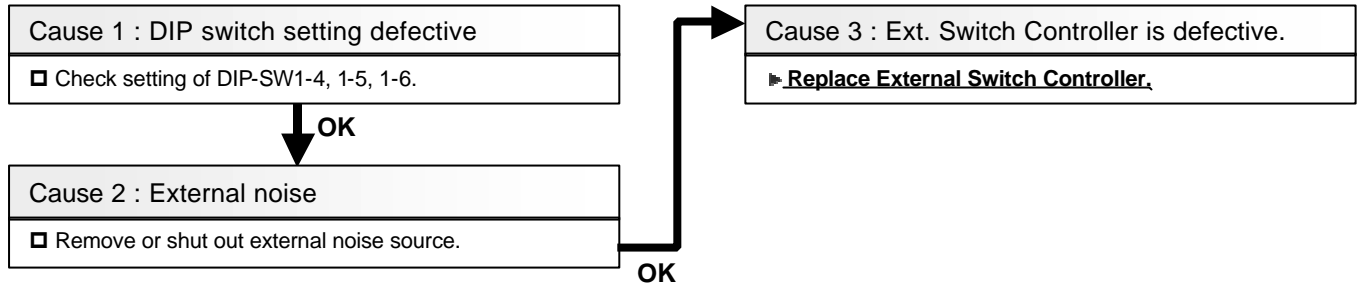
Error Contents : The abnormality in connection of remote controller cable	Symptom : LED repeats flashing 0.5sec ON & 0.5sec OFF.
--------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------

Condition :

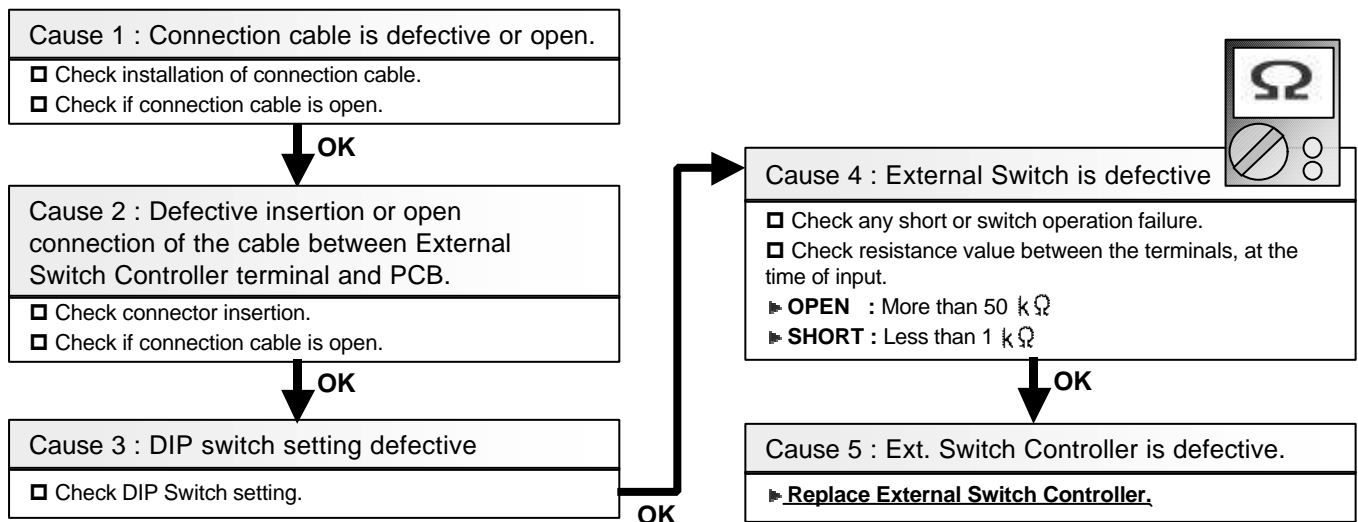
Communication with Indoor unit has been cut off for longer than 1 minute.



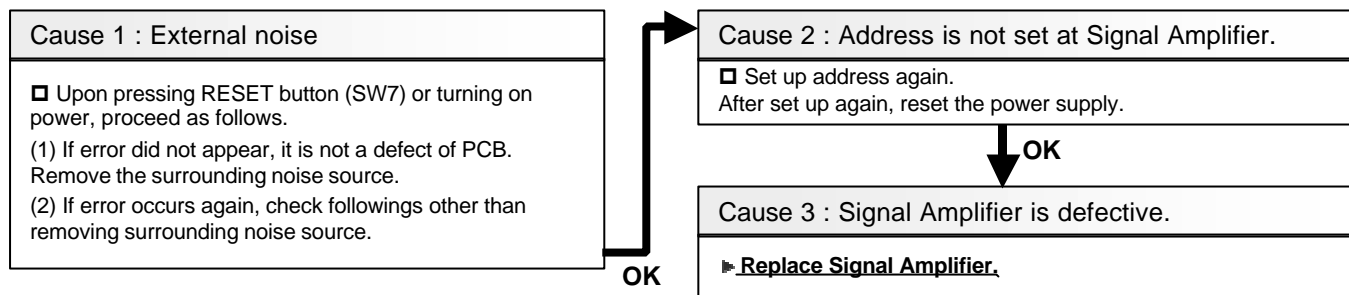
Error Contents : Transmission Error	Symptom : LED repeats flashing 0.5sec ON & 1.0sec OFF.
Condition : Normal communication with Indoor unit has been suspended for longer than 1 minute.	



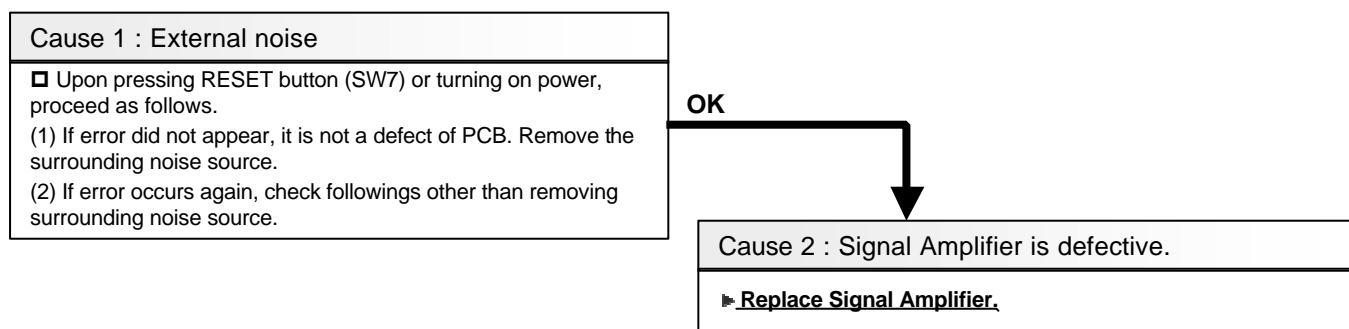
Error Contents : Switch Operation Error	Symptom : LED is lighting but Switch (SW1 or SW2) does not operate.
Condition : Switch input can not be detected.	



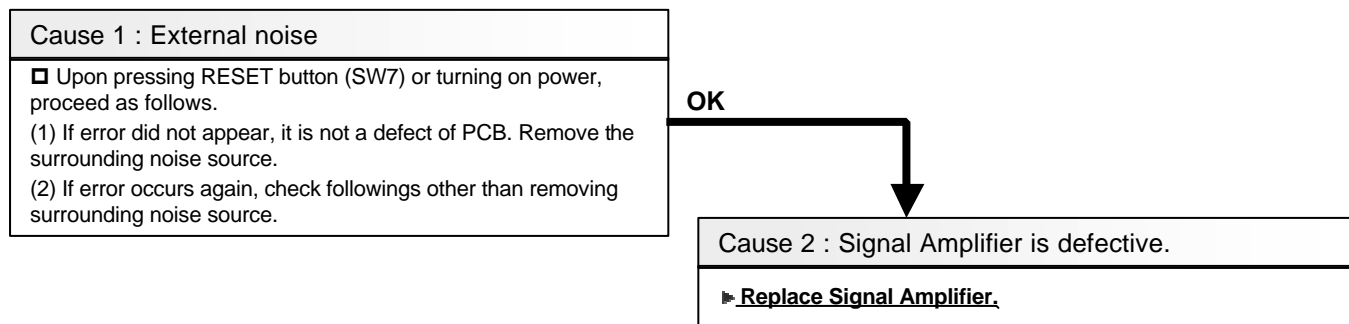
Error Contents : Address Setting Error	Symptom : Error display [_1] No operation.
Details : Condition of occurrence : Address is not set at Signal Amplifier. Release condition : Address setting mode is started up, and desired address has been set up.	



Error Contents : Parallel Communication Error B	Symptom : Error display [_8] No operation.
Details : Condition of occurrence : Communication error between CPU and Network Driver IC (CH_B side) Release condition : Communication is normal between CPU and Network Driver IC (CH_B side)	



Error Contents : Parallel Communication Error A	Symptom : Error display [_9] No operation.
Details : Condition of occurrence : Communication error between CPU and Network Driver IC (CH_A side) Release condition : Communication is normal between CPU and Network Driver IC (CH_A side)	



3. Network Converter (UTR-YSSA)

Error Contents : **PCB Error 1**

Symptom :
Error Code display [05]
All the control items do not operate.

Details :

Condition of occurrence : Synchronization of Network Device was not normally done.

Release condition : When the synchronization of the device is normally done.

Cause 1 : External noise

☐ After pressing SW104 of Network Converter PCB for 5 seconds or turning on power.
Does error code display reappear?

YES

➡ Remove the surrounding noise source.

NO

➡ It is not a defect of PCB. Remove the surrounding noise source.

OK

Cause 2 : Network Converter is defective.

➡ **Replace Network Converter.**

Error Contents : **PCB Error 2**

Symptom :
Error Code display [06]
Other controls are left as they are.

Details :

Condition of occurrence : Error of inside information of EEPROM.

Initial setting of Network Converter PCB was not normally performed.

Release condition : When error disappeared and Network Converter becomes available to control.

Cause 1 : External noise

☐ After pressing SW104 of Network Converter PCB for 5 seconds or turning on power.
Does error code display reappear?

YES

➡ Remove the surrounding noise source.

NO

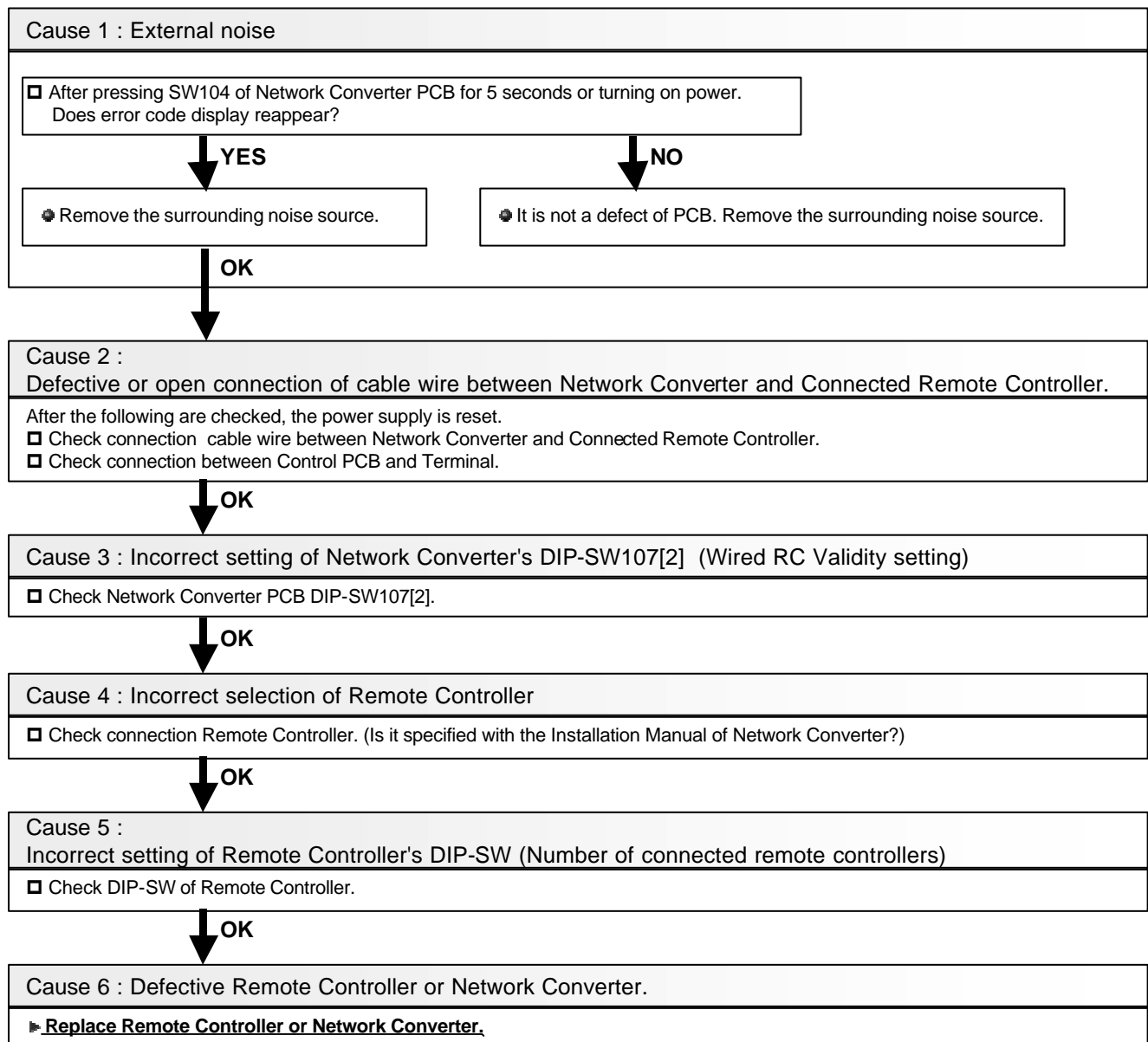
➡ It is not a defect of PCB. Remove the surrounding noise source.

OK

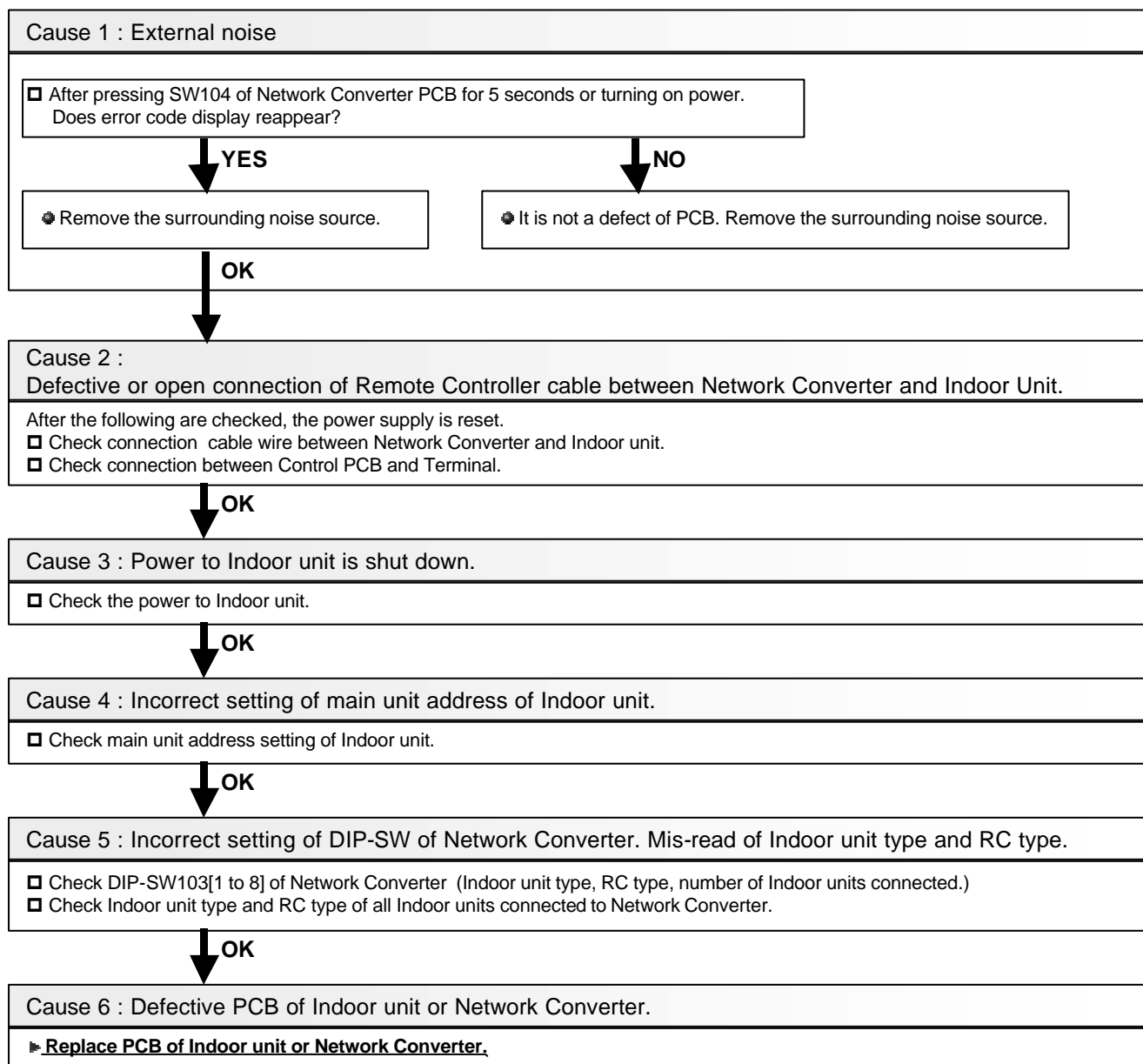
Cause 2 : Network Converter is defective.

➡ **Replace Network Converter.**

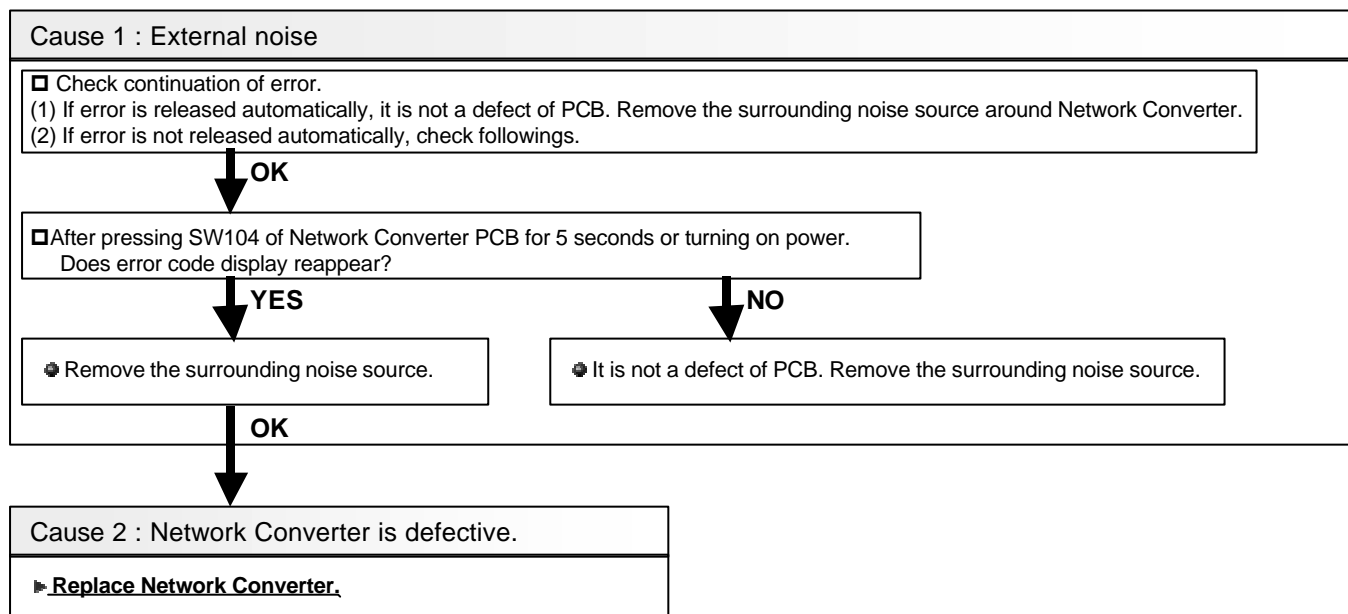
Error Contents : Communication Error with Standard Remote Controller	Symptom : Error Code display [18] Control/Display from Standard Remote is not available. Other controls are left as they are.
Details : Condition of occurrence : The communication between Standard Remote and Network Converter was not normally performed. Release condition : When the communication between Standard Remote and Network Converter resumes normal operation.	



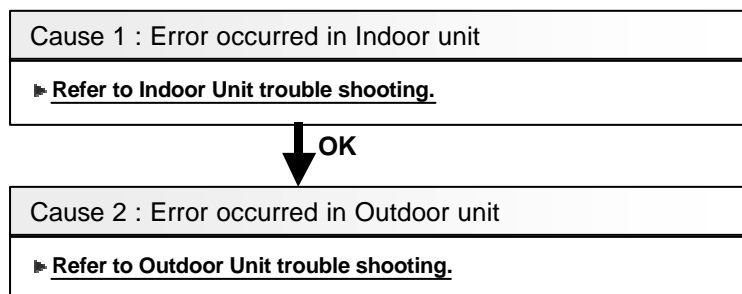
Error Contents : Communication Error with Indoor Unit	Symptom : Error Code display [1C] All the control items do not operate.
Details : Condition of occurrence : The communication between Indoor unit and Network Converter was not performed normally. Release condition : When the communication with Indoor unit is resumed normally.	



Error Contents : Software Error	Symptom : Error Code display [21] All the control items do not operate.
Details : Condition of occurrence : Micon program performed an abnormal control. Release condition : Micon has been reset, and the control of Network Converter became normal.	



Error Contents : Indoor / Outdoor Unit Error	Symptom : Error Code display [32] Other controls are left as they are.
Details : Condition of occurrence : When error occurred on Indoor/Outdoor unit that is connected to Network Converter. Release condition : When the error of Indoor/Outdoor unit that is connected to Network Converter is released.	



4. Group Remote Controller (UTB-YDA / GDA)

Error Contents : Communication Error	Symptom : Error Code display [1F] OPERATION LED is flashing.
Details : Condition of occurrence : When the signal is cut off for more than 90 seconds from the registered Indoor unit (including Slave unit) and Outdoor unit. Release condition : 1. The signal has been received from the Indoor & Outdoor units that was creating the error. 2. MPU has been booted up. (Release from the reset operation, the power failure stand-by operation.	

Cause 1 : Connection failure

- ☐ Check transmission cable
- ☐ Check disconnected power line for Indoor and Outdoor unit.
- ☐ Check if converter power line is disconnected.



Cause 2 : Check outside cause (Voltage drop or noise, etc.)

- ◆ Instant drop ----- Check if there is a large load electric apparatus in the same circuit.
- ◆ Momentary power failure ----- Check if there is a defective contact or leak current in the power supply circuit.
- ◆ Noise ----- Check if there is any equipment causing harmonic wave near electric line (Neon bulb or electric equipment that may cause harmonic wave).



Cause 3 : Remote Controller is defective.

- ▶ **Replace Group Remote Controller.**

Error Contents : PCB Error	Symptom : Error Code display [03] OPERATION LED is flashing.
Details : Condition of occurrence : When EEPROM can not be written, or the control port does not operate. Release condition : Power is reset.	

Cause 1 : Remote Controller is defective.

- ▶ **Replace Group Remote Controller.**

Error Contents : Connection Error	Symptom : Error Code display [1C] OPERATION LED is flashing.
Details : Condition of occurrence : The valid signal has not been received from the converter more than 90 seconds after the communication line became valid. Release condition : Valid signal is received from Converter.	

Cause 1 : Connection failure
<input type="checkbox"/> Check power to the converter. <input type="checkbox"/> Check connection of remote control line between controller and converter.



Cause 2 : Check outside cause (Voltage drop or noise, etc.)
<ul style="list-style-type: none"> ● Instant drop ----- Check if there is a large load electric apparatus in the same circuit. ● Momentary power failure ----- Check if there is a defective contact or leak current in the power supply circuit. ● Noise ----- Check if there is any equipment causing harmonic wave near electric line (Neon bulb or electric equipment that may cause harmonic wave).



Cause 3 : Remote Controller is defective.
▶ Replace Group Remote Controller.

Error Contents : Address Setting Error	Symptom : Error Code display [1A] OPERATION LED is flashing.
Details : Condition of occurrence : 1. No Indoor unit is registered. 2. Refrigerant system, System type value, etc. of the registered Indoor units are outside the setting range. (Ex. Refrigerant system address is bigger than 100. Etc.) Release condition : 1. The key to enter the function selection process is pressed. DAY key and PROGRAM key (CLOCK ADJUST key) are simultaneously kept pressed. 2. It automatically initializes by itself. After that, it is released by pressing the key to enter the function selection process.	

Cause 1 : Setting failure
<input type="checkbox"/> Register Indoor units again by entering to the function selection mode. (Keep pressing DAY key and PROGRAM key (CLOCK ADJUST key). (Refer to the installation manual for the remote controller.)

Error Contents : System Error	Symptom : Error Code display [1d] OPERATION LED is flashing.
Details : Condition of occurrence : 1. Only the slave unit is registered. (Main unit is not registered.) 2. Indoor unit which is not existing was registered. Release condition : Registered contents have been changed by SELECT key, DAY key, Timer Mode key (DELETE key).	

Cause 1 : Setting failure

- ☐ Recheck the registered contents. (Register the main unit.)
- ☐ Check Indoor unit DIP-SW, R-SW.



Cause 2 : Connection failure

- ☐ Check transmission cable
- ☐ Check if Indoor or Outdoor unit power line is disconnected.
- ☐ Check if the converter power line is disconnected.
- ☐ Check connection between controller and the converter.



Cause 3 : Check outside cause (Voltage drop or noise, etc.)

- ⚙ Instant drop ----- Check if there is a large load electric apparatus in the same circuit.
- ⚙ Momentary power failure ----- Check if there is a defective contact or leak current in the power supply circuit.
- ⚙ Noise ----- Check if there is any equipment causing harmonic wave near electric line (Neon bulb or electric equipment that may cause harmonic wave).



Cause 4 : Remote Controller is defective.

- ▶ **Replace Group Remote Controller.**

5-5-2 TROUBLE SHOOTING WITH NO ERROR CODE

How to read the tables

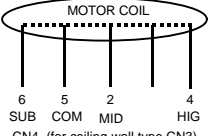
1. Select the relevant item of errors from 1 to 5 below, and decide the table to be used.
2. Deduce "Cause" from "LED display" and "Symptoms that can occur other than title".
3. Check if the deduced "Cause" is correct by means of "Check method" and "Remarks".

When there is no error code display at the indoor unit, outdoor unit or central remote controller, but there is one of the following operation errors, check the cause in the following order:

1. Indoor fan does not operate normally.
2. System does not cool or heat.
3. Abnormal sound is heard from indoor unit.
4. Water leaking from indoor unit.
5. Others.

1. Indoor unit fan does not operate normally

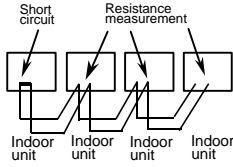
LED display			Symptoms that can occur other than title	Cause	Check method (Error state check method)	Remarks
Indoor unit	Outdoor unit	Remote controller				
Body LED	PCB LED 1 to 6	LCD	—	Power is not supplied to indoor unit. Circuit breaker is at OFF position. Power line is faulty.	Check the voltage between power supply terminals 1 and 2 of each indoor units.	Voltage between terminals 1 and 2: 220~240V
No display	Error display (Transmission line error) ※	No display		Indoor unit is short circuiting. (The circuit to which voltage is applied when operation is short circuiting (leakage of electricity).)	The breaker falls immediately after turning on the breaker of the indoor units. The resistance between the power terminal block and the metal parts of any indoor units is almost zero.	When short circuit occurred,the resistance between power supply terminals 1 and 2 of indoor unit approaches to zero.
				Indoor unit is short circuiting. (The circuit to which voltage is applied when operation is short circuiting (leakage of electricity).)	When the indoor unit circuit breaker trips during operation, locate the faulty indoor unit by disconnecting the PCBs one by one (disconnect CN1). Then check the individual electric parts to distinguish the parts which cause the leakage of electricity.	If short circuited,there is a electric part whose resistance between two electrodes will indicate a value near zero.
※ Become normal after the power is reset.			—	Communication line is faulty between indoor unit and wired remote controller or simple remote controller. Open circuit.	When any of 1-2, 2-3, and 3-1 at the indoor unit terminal board for remote controller are shorted, however, the resistances between red and white or white and black or black and red do not indicate a value near zero.	
Error display (Remote controller communication system error) ※	Error display (Indoor unit error) ※	Normal display or no display		Communication line between indoor units for remote controller group control is faulty. Open circuit.	Check the wiring color and the wiring connection of indoor unit terminal board for remote controller.	
			※ Become normal after the power is reset.			—
Normal display	Normal display	Normal display or no display	Communication line between indoor units for remote controller group control is faulty. Erroneous connection. (polarity incorrect)	Check the wiring color and the wiring connection of indoor unit terminal board for remote controller.	The combinations of wiring color and indoor unit terminal board for remote controller are as following: red to 1, white to 2 and black to 3.	
			—	The setting of master/slave setting switch (DIP SW 1-4) of the remote controller is not correct.	When indoor unit operated for each remote control group, operation is abnormal.	Do not start to operate when there is no master unit (SW 1-4 set to OFF) in one remote controller group.
Capacity of the indoor fan capacitor is faulty.	Check the indoor unit Model No. and capacity of the capacitor.					
Thermo-control	The set temperature is very close to the room temperature and a sent louver operation signal is not accepted by indoor unit.	Indoor fan operates 1-2 minutes for every five minutes during thermo-control.				
Cold air prevention control is in progress (heating operation).	The area (heat exchanger) near outlet of the indoor unit is not warm and up/down louvers are set to a horizontal position.	Wait several minutes, then restart the heating operation.				

LED display			Symptom that can occur other than title	Cause	Check method (Error state check method)	Remarks
Indoor unit	Outdoor unit	Remote controller				
Body LED	PCB LED 1 to 6	LCD				
Normal display	Normal display	Filter sign display※	—	The meshes of the filter were clogged up.	Check if the filter is dirty.	When the operating time of fan motor of any indoor unit exceeds 150 hours, the filter cleaning sign appears at the wired remote controller. The operating time of fan motor can be reset by pushing the ZONE/SET button for more than 3 seconds. ※ The filter cleaning sign is informed by flashing of the set temperature display(1 sec. ON, 1 sec. OFF and repeat).
Controlling display (Operation display LED flashes) ※	Controlling display (Oil recovery operation)	Normal display	Abnormal sound is heard from indoor unit.	Oil recovery operation control is in progress.	All indoor unit fans stop and the signal sent from remote controller is not accepted by indoor unit.	1st oil recovery operation: 1 hour (operation time) after the power turned on. 2nd oil recovery operation and afterwards: every 12 hours (operation time). ※ Operation LED flashes (3 sec. ON, 1 sec. OFF and repeats).
Error display (Indoor unit fan error) ※	Normal display	Error display (Indoor unit fan error) ※	—	Indoor fan capacitor is faulty.	Check the resistance value of the capacitor. (If normal, the resistance will show a value of several hundred kilohms.)	Large ceiling type, slim body cassette type and ceiling wall type will inform the error. (Others don't) 
				Indoor fan motor is faulty.	Check the fan motor resistance values (4-5, 5-6).	
Error display (Thermistor error) ※	Error display (Indoor unit error)	Error display (Thermistor error) ※	System does not cool/heat.	Indoor unit thermistor is faulty.	Measure the thermistor resistance and compare it to the ambient temperature(refer to 7-2-1).	Refer to the service manual (section 8-5-1) for the temperature and thermistor resistance relationship. ※ When thermistor shorted or open.
Normal display	Normal display or Error display (Discharge temperature error)	Normal display	System does not cool/heat.	Indoor unit short circuit.	Air flow out from an indoor unit is sucked directly into the same indoor unit or into another indoor unit.	
No display or Error display (Cannot be specified.)	Cannot be specified	No display or Error display (Cannot be specified.)	System does not cool/heat. Abnormal sound is heard from indoor unit.	Indoor control PCB is faulty.	Symptom has many branches, depending on the error contents, and there is no effective check method.	If the problem is caused by PCB or connection wire the trouble is often sloved by a change of PCB or connection wire.
Cannot be specified.	No display or Error display (Cannot be specified.)	Cannot be specified.	System does not cool/heat. Abnormal sound is heard from indoor unit.	Outdoor control PCB is faulty.	Symptom has many branches, depending on the error contents, and there is no effective check method.	If the problem is caused by PCB or connection wire the trouble is often sloved by a change of PCB or connection wire.

2. System does not cool or heat

LED display			Symptom that can occur other than title	Cause	Check method (Error state check method)	Remarks
Indoor unit	Outdoor unit	Remote controller				
Body LED	PCB LED 1 to 6	LCD				
Error display (Communication error) ※	No display	Error display (Communication error) ※	—	Power is not supplied to outdoor unit. Circuit breaker is at OFF position. Power line is faulty.	Check the voltage of power supply terminal board of outdoor unit.	Voltages between R-S, S-T, and T-R are 380~415V Voltages between R-N, S-N, and T-N are 220~ 240V.
				Outdoor unit is short circuiting. (The circuit to which voltage is applied when operation is short circuiting (leakage of electricity).)	The breaker falls immediately after turning on the breaker of the outdoor units. The resistance between the power terminal block and the metal parts of outdoor units is almost zero.	When short circuit occurred,the resistances between power supply terminals (R-S, S-T, T-R, R-N, S-N, T-N) of outdoor unit approach to zero.
				Outdoor unit is short circuiting. (The circuit to which voltage is applied when operation is short circuiting (leakage of electricity).)	The outdoor unit circuit breaker trips during operation. The resistance value of the outdoor unit electric parts and outdoor unit metal part approaches zero.	If short circuited,there is a electric part whose resistance between two electrodes will indicate a value near zero.
※ Become normal after the power is reset.						
Normal display	Normal display	Normal display	—	Indoor unit refrigerant system address (SW 8,9) setting is incorrect.	When the indoor units are operated one by one,there is an indoor unit whose outdoor unit does not operate.	Set the address to the same refrigerant system address of the outdoor unit to which the refrigerant piping is connected.
				Indoor unit address (SW 6) setting is incorrect. (address duplicated)	Operate each indoor unit for 5 minutes or more. The relevant outdoor unit stops and operates unsteadily. (Compressor capacity and heat exchange capacity is incorrect by observing the LED of PCB of outdoor unit.)	Multiple indoor units in one refrigerant system must not be set to the same indoor unit address.
				Installed piping is unsuitable. pipe length is too long. (Actual length exceeds 100m)	Check the position of outdoor and indoor units and estimate the piping length.	When the pipe length is too long, the cooling and heating capacity may be insufficient.
				Installed piping is unsuitable. Gas pipe diameter is incorrect.	Check the indoor unit capacity and pipe diameter.	When the gas pipe diameter is large,cooling and heating capacity will be insufficient.
				Refrigerant leakage.	Check refrigerant leakage using a gas detector.(Refrigerant charged state)	Regarding air tightness test after installation or repair,pressurize the system with nitrogen(2.94MPa) and test for leaks with soapy water and allow the system to stand for 24 hours,and then check that there is no drop in pressure.(Note: When the outdoor temperature changes 5℃,the test pressure changes 0.05MPa.)
				Insufficient gas (slightly)	During the cooling operation,the air flow temperature does not become low when all the indoor units are operating. During the heating operation, the air flow temperature does not become high when only one indoor unit is operating.	For slightly gas insufficiency, capacity drops only in a specific operation state.(Note that this symptom resembles faulty caused by a bad opening of indoor unit's electronic expansion valve.)

LED display			Symptom that can occur other than title	Cause	Check method (Error state check method)	Remarks
Indoor unit	Outdoor unit	Remote controller				
Body LED	PCB LED 1 to 6	LCD				
Normal display	Normal display	Normal display	—	Indoor unit electronic expansion valve is faulty. Full closed state (Not open)	When the relevant indoor unit performs the cooling operation, the compressor operates, but the air flow temperature of the indoor unit is not cool. When the relevant indoor unit performs the heating operation, the compressor operates, but the air flow temperature of the indoor unit is not warm. (Heat pump model only) When the heating operation is stopped, the liquid pipe of the relevant indoor unit is not warm. (At fully closed opening, the liquid pipe is cold.)	Coil resistance (red-white, red-orange, brown-blue, brown-yellow): 100~200Ω (Cooling/heating pump type only.) When the electronic expansion valve of an indoor unit is fully closed after stopping heat operation, the liquid refrigerant will gather in the stopped indoor unit and the insufficient gas symptom will appear.
				Outdoor unit electronic expansion valve (EEV1, EEV2) opening is faulty. 1. Fully closed state (Not opened) Heating operation.	The electronic expansion valve inlet pipe does not become cold.	During the heating operation, when EEV1 and 2 are fully closed, the low pressure and high pressure both drop. Coil resistance (red-white, red-orange, brown-blue, brown-yellow): 170~210Ω
				Outdoor unit electronic expansion valve (EEV1, EEV2) opening is faulty. 2. Open excessively (fully open)	There is no effective check method.	At low outdoor temperatures, cooling may become poor when EEV1 or EEV2 is open excessively. If the outdoor power supply is reset 3~5 times, the electronic expansion valve may return to normal opening. Coil resistance (red-white, red-orange, brown-blue, brown-yellow): 170~210Ω

LED display			Symptom that can occur other than title	Cause	Check method (Error state check method)	Remarks
Indoor unit	Outdoor unit	Remote controller				
Body LED	PCB LED 1 to 6	LCD				
Normal display	Normal display	Normal display	Abnormal sound is heard from indoor unit.	Installed piping is not suitable. Liquid piping diameter is incorrect.	Check the capacity of indoor unit and the pipe diameter.	When the diameter is large, a refrigerant rushing sound is generated and when the diameter is small, capacity will be insufficient.
				4-way valve (4WV1) is faulty. (heat pump type only)	The temperature of the pipe (28mm in diameter) which connect to 4WV1 is abnormal. (normal state; cooling : cold, heating : hot). Operating state (cooling : turning off; heating : turning on (AC220V)).	Four-way valve coil resistance : 1200~1500 Ω
			High pressure rises or falls abnormally.	4-way valve (4WV2) is faulty.	Check the capacity of heat exchanger by LED. When the 4WV2 is at OFF position, the temperature of pipe which connect to heat exchanger is normally warm.	When a 4-way valve 2 is faulty, the high pressure become abnormal. The resistance of 4-way valve coil : 1200~1500 Ω
				Refrigerant additional charge is unsuitable.	Check the Model No., liquid piping diameter, length of the connected indoor unit, and the additional charge amount.	When gas is insufficient, the capacity drops and when gas is excessive, the high pressure rises abnormally.
Error display (Outdoor unit error) ※	Error display (Communication error) ※	Error display (Outdoor unit error) ※	—	Indoor-outdoor unit communication line faulty.	When one of communication terminal board (Transmission) terminals 1-2 of the indoor units is shorted, the resistance between 1 and 2 of communication terminal board (Transmission) of all the indoor units become zero.	
※ Become normal after the power is reset.						
Normal display	Normal display	Normal display	—	The pipe length setting switch of outdoor unit (DIP SW6-1, 6-2) is incorrect.	The air flow is not cool or warm during operation.	When the setting of DIP switches (SW6-1 SW6-2) is incorrect, the cooling and heating capacity may be insufficient.
Normal display	Normal display or error display (Compressor error)	Normal display	—	Insufficient gas (serious)	When the number of operating indoor units was changed, the discharge temperature of the indoor units does not become low or high.	When the gas insufficiency become seriously, the high pressure drops and the discharge temperature increases abnormally.
Error display (Thermistor error) ※	Error display (Indoor unit error)	Error display (Thermistor error) ※	The fan of the indoor unit does not rotate.	Indoor thermistor is faulty.	Measure the thermistor resistance and compare it to the ambient temperature.	Refer to the service manual (section 7-2-1) to find the correlation between the temperature and thermistor resistance. ※ When short or open circuit of thermistor occurred.

LED display			Symptom that can occur other than title	Cause	Check method (Error state check method)	Remarks
Indoor unit	Outdoor unit	Remote controller				
Body LED	PCB LED 1 to 6	LCD				
Error display (Outdoor unit error)	Error display (Thermistor error) ※	Error display (Outdoor unit error)	—	Outdoor thermistor is faulty.	Check by measuring the thermistor resistance and comparing it to the ambient temperature.	Refer to the service manual (section 7-2-1) to find the correlation between the temperature and thermistor resistance. ※ When short or open circuit of thermistor occurred.
Normal display	Normal display or error display (High pressure error)	Normal display	—	Outdoor fan capacitor is faulty.	Check the capacity (11uF) and resistance of the capacitor.	Resistance between fan motor wires: Blue-white : 60 ohms, white-red : 40 ohms, red-blue : 20 ohms
				Outdoor fan motor is faulty.	Voltage (AC 220-240V) is applied to motor, but motor does not rotate.	
				Outdoor unit electronic expansion valve (EEV1, EEV2) opening is faulty. Fully closed state (not open) during cooling operation □	When the electronic expansion valves (EEV1, EEV2) are working correctly the temperature difference of pipes which are before and after the electronic expansion valve is clearly different.	When EEV1 and 2 are fully closed during the cooling operation, the high pressure may rise abnormally and the gas may become insufficient and the low pressure may drop. Coil resistance (red-white, red-orange, brown-blue, brown-yellow) : 170~210 Ω
			Abnormal sound is heard from indoor unit.	Ball valve and 3 way-valve are not fully opened.	Check the positions of spindle (handel) of the 3-way valve and ball valve.	Open the 3-way valve and ball valves fully.
Normal display	Normal display or error display (Discharge temperature error)	Normal display	—	Short-circuit of air circulation of outdoor units occurred.	Air discharged from an outdoor unit is directly sucked into the same outdoor unit or into another outdoor unit.	
				Outdoor unit heat exchanger is blocked with foreign objects.	Not enough space around outdoor unit. The surface of heat exchanger of outdoor unit was covered with dirty or other foreign objects.	Refer to the 'Design and Technical Data' manual for the service space. Remove the obstacle which is covering the surface of heat exchanger.

LED display			Symptom that can occur other than title	Cause	Check method (Error state check method)	Remarks												
Indoor unit	Outdoor unit	Remote controller																
Body LED	PCB LED 1 to 6	LCD																
Controlling display (Operation display LED flashing) ※ 1	Controlling display (Defrosting operation)	Normal display ※ 2	—	Defrosting operation in progress.	Outdoor unit heat exchanger extremely cold. (-10°C or less)	※1 Operation display LED flashes (3 seconds ON, 1 second OFF) and repeats. ※2 DEFROST message appears on the display of the remote controller.												
Error display (Outdoor unit error display)	Error display (Compressor error)	Error display (Outdoor unit error)	—	Compressor is faulty.	Voltage (AC380-415V) is applied to secondary side of magnetic relay, but compressor does not operate. → Compressor lock → Compressor motor burned	When one or two of three compressors damaged, recovery operation will start automatically. Resistance of compressor at 25°C (line-to-line) <table border="1"><tr><td></td><td>AO90R AO90A</td><td>AO72R AO72A</td></tr><tr><td>Comp 1</td><td colspan="2">8.64</td></tr><tr><td>Comp 2</td><td>2.9</td><td>4.83</td></tr><tr><td>Comp 3</td><td colspan="2">2.27</td></tr></table>		AO90R AO90A	AO72R AO72A	Comp 1	8.64		Comp 2	2.9	4.83	Comp 3	2.27	
					AO90R AO90A	AO72R AO72A												
				Comp 1	8.64													
Comp 2	2.9	4.83																
Comp 3	2.27																	
Compressor is faulty. Compressor lock	When the compressor does not operate, measure the line-to-line and line-to-ground resistance of the compressor. (When the compressor is locked, the resistance will show a normal value.)	When this trouble occurs, the oil in the compressor has deteriorated (with black color). Therefore, long-term operation should avoid because it will cause another compressor lock.																
Compressor is faulty. Compressor motor burned	When the compressor does not operate, measure the line-to-line and line-to-ground resistance of the compressor. (When the motor is burned, the line-to-line resistance increases (open circuit) and line-to-ground resistance decreases.)	When this trouble occurs, the oil does not deteriorate. Therefore, operation can be continued, the power line of the damaged compressor must be disconnected.																
Error display (Outdoor unit error)	Error display (Reverse phase error)	Error display (Outdoor unit error)	—	Compressor is faulty. Reverse phase	The compressor operates, but the high pressure does not rise.	The compressor wiring is red-R, white-S, and black-T.												
Error display (Communication error) ※	Error display (Communication error) ※	Error display (Communication error) ※	—	Outdoor unit communication PCB is faulty.	When power reset for the outdoor or indoor unit is repeated, a communication error is generated.	If the display returns to normal by reset during no communicating period, the communication PCB or communication line may be abnormal.												
							※ Become normal after the power is reset.											
No display or error display (cannot be specified)	Cannot be specified.	No display or error display (cannot be specified)	The fan of the indoor unit does not rotate. Abnormal sound is heard from indoor unit.□	Indoor unit control PCB is faulty.	The symptom has many branches, depending on the error contents, and there is no effective check method.	When the PCB or the connection wiring is faulty, problem can often be solved by replacing the PCB.												
Cannot be specified.	No display or error display (cannot be specified)	Cannot be specified.	The fan of the indoor unit does not rotate. Abnormal sound is heard from indoor unit.□	Outdoor unit control PCB is faulty.	The symptom has many branches, depending on the error contents, and there is no effective check method.	When the PCB or the connection wiring is faulty, problem can often be solved by replacing the PCB.												

3. Abnormal sound is heard from the indoor unit.

LED display			Symptom that can occur other than title	Cause	Check method (Error state check method)	Remarks
Indoor unit	Outdoor unit	Remote controller				
Body LED	PCB LED 1 to 6	LCD				
Normal display	Normal display	Normal display		Indoor electronic expansion valve opening is faulty.	—	Coil resistance (red-white, red-orange, brown-blue, brown-yellow) : 100~200 Ω
			Indoor units except for the relevant indoor unit do not perform cooling.	Electronic expansion valve opening of the relevant indoor unit is faulty (open excessively) during cooling operation.	The area (heat exchanger) near the outlet is cool even after several minutes have elapsed since the relevant indoor unit was stopped. (the gas pipe of the relevant indoor unit remains cold)	When the electronic expansion valve is open excessively, other indoor units may not operate at full capacity or a loud refrigerant rushing sound may be generated.
			Indoor units except for the relevant indoor unit do not perform cooling. Frost form on the surface of the heat exchanger of the relevant indoor unit. □	Electronic expansion valve opening of the relevant indoor unit is faulty (open excessively) after stopping cooling operation.	The area (heat exchanger) near the outlet is cool. (the gas pipe of the relevant indoor unit remains cold)	If the electronic expansion valve of the stopping indoor unit remains open, frost may form on the surface of the heat exchanger of the indoor unit.
			Indoor units except for the relevant indoor unit do not perform heating.	Electronic expansion valve opening of the relevant indoor unit is faulty (open excessively) during heating operation.	The temperature of air flow as well as inlet pipe of the electronic expansion valve of the relevant indoor unit is higher than those of other indoor units.	
				Electronic expansion valve opening of the relevant indoor unit is faulty (open excessively) when the indoor unit stop heating operation.	The temperature of inlet pipe of the electronic expansion valve do not become low.	
			System does not cool / heat	Outdoor cool/heat switching 4-way valve (4WV1) is faulty. (heat pump type only)	The temperature of the pipe (28mm in diameter) which connect to 4WV1 is abnormal. (normal state; cooling : cold, heating : hot). Operating state (cooling : turning off; heating : turning on (AC220V)).	The resistance of 4-way valve coil : 1200~1500 Ω
				Outdoor heat exchanger switching 4-way valve (4WV2) is faulty.	Check the capacity of heat exchanger by LED. When the 4WV2 is at OFF position, the temperature of pipe which connect to heat exchanger is normally warm.	When a 4-way 2 is faulty, the high pressure become abnormal. The resistance of 4-way valve coil : 1200~1500 Ω
				Installed piping is unsuitable. Liquid piping diameter is incorrect.	Check the indoor unit capacity and pipe diameter.	When the diameter is large, a refrigerant rushing sound will be generated and when the diameter is small, capacity will be insufficient.

LED display			Symptom that can occur other than title	Cause	Check method (Error state check method)	Remarks
Indoor unit	Outdoor unit	Remote controller				
Body LED	PCB LED 1 to 6	LCD				
Normal display	Normal display or error display (High pressure error)	Normal display	System does not cool / heat.	Ball valve and 3 way-valve are not fully opened.	Check the positions of spindle (handel) of the 3-way valve and ball valve.	Open the 3-way valve and ball valves fully.
Controlling display (Operation display LED flashes) ※	Controlling display (Oil recovery operation)	Normal display	Indoor unit not operating.	Oil recovery operation control is in progress.	All indoor unit fans stop and the signal sent from remote controller is not accepted by indoor unit.	1st oil recovery operation: 1 hour (operation time) after the power turned on. 2nd oil recovery operation and afterwards: every 12 hours (operation time). ※Operation LED flashes (3 sec. ON, 1 sec. OFF and repeat).
No display or error display (Cannot be specified.)	Cannot be specified.	No display or error display (Cannot be specified.)	The fan of the indoor unit does not rotate. System does not cool / heat.	Indoor control PCB is faulty.	The symptom has many branches, depending on the error contents, and there is no effective check method.	When the PCB or the connection wiring is faulty, problem can often be solved by replacing the PCB.
Cannot be specified.	No display or error display (Cannot be specified.)	Cannot be specified.	The fan of the indoor unit does not rotate. System does not cool / heat.	Outdoor control PCB is faulty.	The symptom has many branches, depending on the error contents, and there is no effective check method.	When the PCB or the connection wiring is faulty, problem can often be solved by replacing the PCB.

4. Water leaks from the indoor unit.

LED display			Symptom that can occur other than title	Cause	Check method (Error state check method)	Remarks
Indoor unit	Outdoor unit	Remote controller				
Body LED	PCB LED 1 to 6	LCD				
Normal display	Normal display	Normal display	—	Drain hose is faulty.	Tilt the drain hose from the indoor unit to the drain outlet.	The same symptom will also appear when the drain hose is clogged.
Error display (Drain error) ※	Error display (Indoor unit error)	Error display (Drain error) ※	—	Drain pump is faulty (Cassette type only)	During cooling operation, drain pump is not effective even though a voltage (DC5V) is applied to the terminal of CN5 (for wall mounted and ceiling wall type: CN4).	※ Generated when the float switch does not return even though 3 minutes have elapsed after the operation signal was sent from the float switch.
				Float switch is faulty.	Remove the float switch and move the float up and down and check the resistance.	When the float is lowered, the circuit is open (high resistance) and when the float is raised, the circuit is closed (low resistance). ※ Occur when the float switch does not return even though 3 minutes have elapsed after the operation signal was sent from the float switch.

5. Others

LED display			Symptom that can occur other than title	Cause	Check method (Error state check method)	Remarks
Indoor unit	Outdoor unit	Remote controller				
Body LED	PCB LED 1 to 6	LCD				
Normal display	Normal display	Normal display		The electronic expansion valve opening of indoor unit is faulty.		When the indoor unit power is reset 5~10 times at a 2~3 minutes interval, the expansion valve may close. Coil resistance (red-white, red-orange, brown-blue, brown-yellow) : 100~200Ω
			Indoor units except for the relevant indoor unit do not perform cooling. Abnormal sound is heard from indoor unit.	Electronic expansion valve opening of the relevant indoor unit is faulty (open excessively) during cooling operation.	The area (heat exchanger) near the outlet is cool even after several minutes have elapsed since the relevant indoor unit was stopped. (the gas pipe of the relevant indoor unit remains cold)	When the electronic expansion valve is open excessively, other indoor units may not operate at full capacity or a loud refrigerant rushing sound may be generated.
			Indoor units except for the relevant indoor unit do not perform cooling. Abnormal sound is heard from indoor unit. Frost form on the surface of the heat exchanger of the relevant indoor unit. □	Electronic expansion valve opening of the relevant indoor unit is faulty (open excessively) after stopping cooling operation.	The area (heat exchanger) near the outlet is cool. (the gas pipe of the relevant indoor unit remains cold)	If the electronic expansion valve of the stopping indoor unit remains open, frost may form on the surface of the heat exchanger of the indoor unit and water leakage or other trouble may occur.
			Indoor units except for the relevant indoor unit do not perform heating. Abnormal sound is heard from the relevant indoor unit. sound.	Electronic expansion valve opening of the relevant indoor unit is faulty (open excessively) during heating operation.	The temperature of air flow as well as inlet pipe of the electronic expansion valve of the relevant indoor unit is higher than those of other indoor units.	
				Electronic expansion valve opening of the relevant indoor unit is faulty (open excessively) when the indoor unit stop heating operation.	The temperature of inlet pipe of the electronic expansion valve do not become low.	
			Discharge temperature is high.	Up - down (left - right) swing switching motor is faulty.	Louver does not move even when a voltage (DC12V) is applied to the terminal of CN10. (for wall mounted and ceiling wall type: CN6).	For the left - right swing switching motor, check the voltage across the terminal of CN11. (for wall mounted and ceiling wall type: CN7).
			Discharge temperature is high. ※Remakes	Liquid injection solenoid valve (SV5) is faulty.	When a voltage (AC220V) is applied to CN12, the temperature of liquid injection solenoid valve outlet pipe is not changed.	When SV5 is faulty, the discharge gas temperature may rise and a discharge temperature error may be generated. Coil resistance : 1200~1500Ω
				High pressure gas bypass solenoid valve (SV4) is faulty.	When a voltage (AC220V) is applied to CN11, the high pressure gas bypass solenoid outlet pipe is not warm.	When SV4 is faulty, the high pressure may rise and a high pressure error may be generated. Coil resistance : 1200~1500Ω
			Compressor error occur ※Remakes	Oil return solenoid valve (SV1, SV2, SV3) is faulty.	When a voltage (AC220V) is applied to CN8, CN9 and CN10, the outlet pipe of the relevant solenoidal valves (SV1, SV2, SV3) do not become hot.	When SV1, SV2, and SV3 do not operate normally, the oil may not return to the compressor properly and compressor trouble may occur. Coil resistance : 1200~1500Ω
Error display (Outdoor unit error)	Error display (Discharge sensor error)	Error display (Outdoor unit error)	The operation of the outdoor unit is abnormal. ※Remakes	Pressure sensor (HP, LP) are faulty.	Measure the pressure sensors output voltage (between terminals 2 and 3 of CN33 and CN34) and compare the result with the pressure gauge indication.	When the pressure sensors are faulty, compressor steps and protection control will not be conducted properly. Refer to 7-2-2 to find the correlation between pressure and output voltage of the sensor.

5-6 CASES SUCH AS THESE ARE NORMAL

■ Operation not trouble

From the stand point of control, the following operations are incorporated for air conditioner operation and protection. They do not indicate trouble.

Operation		Description	Indoor unit	Remote indication
Red and green lamps flash alternately, or simultaneously.		Indicates that the power came on normally when power was applied (at power failure recovery). Indication is cleared by RUN command.	The red and green lamps flash alternately in the operation stop state.	
		When test run is performed, the unit operates without regard to the temperature setting. Stopped by remote controller stop, or reset after 60 minutes maximum.	The red and green lamps flash simultaneously in the operation state.	TEST
Red lamp flashes.		Operation is stopped and refrigerant is passed through the indoor unit to remove the outdoor unit frost (defrosting operation) or to recover the refrigerant oil (oil recovery operation). The indoor unit stops in about 5-10 minutes.	The fan stops and the refrigerant passes through. The red lamp flashes slowly.	DEFROST
Indoor unit fan does not operate even through the RUN signal has entered.		The fan is stopped to prevent blowing out of cold air when the machine is still not warm at the start of heating operation. About 3 minutes are necessary.	The fan stops and the red lamp lights steadily.	
Fan turns on/off periodically.		When the room temperature at heating operation reaches the set temperature, the FAN is stopped and room temperature rise is prevented. At this time, the fan is operated periodically to detect the room temperature. (4 minutes stop, 1minute operate)	The fan continues to operate and the red lamp lights steadily.	
Remote controller airflow indication flashes.		This is the filter cleaning time. After cleaning the filter, press the ZONE/SET key for a few seconds to be released .	Same as normal.	Airflow indication flashes
Heating operation is performed when stopped.		Anti-freeze operation is set so that the water pipe and electronic devices do not freeze. Operation starts at room temperature 5°C or less and continues until the room temperature reaches 8°C or more.	At standby, the red lamp flashes and the fan continues to operate. At operation, the heating operation is performed.	ANTIFREEZE
RUN signal is input, but is not accepted. Buzzer sounds.		When operation is inhibited during central control by central remote controller, the buzzer that denies the wireless remote controller signals sounds.	Buzzer buzzes 5 times and setting is not received. Operation before setting continues.	CENTRAL
		When an [AUTO], [FAN] and an operation other than the operation another indoor unit is already performing at cooling/heating selection type or [HEAT] operation at a cooling only unit is commanded, operation cannot be performed at that setting.	Buzzer buzzes 5 times and setting is not received. Operation before setting continues.	
		Timer setting cannot be performed by wireless remote controller at an indoor unit with wired remote controller connected. Set the timer from the wired remote controller.	Buzzer buzzes 5 times and setting is not received. Operation before setting continues.	
Makes a sound even after operation stops.		The valve opens to return the refrigerant collected inside the indoor unit to the outdoor unit even after operation stops. Remains for about 4 minutes maximum.		
		After cooling operation stops, the drain pump is operated. Remains for 3 minutes.		
Makes a sound while operating.	Flowing liquid sound during operation	A sound changed by the refrigerant flow may be made by operation of another indoor unit connected to the same outdoor unit. A switching sound may be made at the start and after the end of defrosting operation and oil recovery operation.		
	Squeaking sound	This is due to expansion and contraction of resin parts by the temperature change during heating operation and oil recovery operation.		
	Switching sound	A sound is generated when the internal valve is switched at operation switching and at the start of defrosting operation and oil recovery operation.		

When operation and indication other than the above occurs, call the manager.

Refrigerant

R22



6 . APPENDING DATA 1 (INSTALLATION)

6. APPENDING DATA1 (INSTALLATION)

6-1 ADDITIONAL CHARGE

■ Applicable models

AO*90RPCMF
AO*72RPCMF

For AO*90RPBMF, AO*72RPBMF refer to page (06-02)
AO*90APBMF, AO*72APBMF

Additional charge for pipe length

Liquid pipe outside diameter (mm)	φ 12.7	φ 9.52	φ 6.35
Additional amount Pipe length (kg/m)	0.094	0.048	0.017

The amount of additional charge C (kg)

$$\begin{array}{|c|c|} \hline \text{Total length} & \text{x 0.094} \\ \hline \text{of } \phi 12.7\text{mm} & \text{kg/m} \\ \hline \text{liquid pipe} & \\ \hline \text{m} & \\ \hline \text{kg} & \\ \hline \end{array} + \begin{array}{|c|c|} \hline \text{Total length} & \text{x 0.048} \\ \hline \text{of } \phi 9.52\text{mm} & \text{kg/m} \\ \hline \text{liquid pipe} & \\ \hline \text{m} & \\ \hline \text{kg} & \\ \hline \end{array} + \begin{array}{|c|c|} \hline \text{Total length} & \text{x 0.017} \\ \hline \text{of } \phi 6.35\text{mm} & \text{kg/m} \\ \hline \text{liquid pipe} & \\ \hline \text{m} & \\ \hline \text{kg} & \\ \hline \end{array} + 4 = \begin{array}{|c|} \hline \text{Total} \\ \hline \text{kg} \\ \hline \end{array}$$

Round up C to 2 decimal place.

Example : When the outdoor unit model is AO*90RPCMF and liquid pipe length are 20m (φ12.7mm), 15m (φ 9.52mm) and 20m (φ 6.35mm), respectively.

The amount of additional charge:

$$C = 20(\text{m}) \times 0.094 (\text{kg/m}) + 15(\text{m}) \times 0.048(\text{kg/m}) + 20(\text{m}) \times 0.017(\text{kg/m}) + 4 = 6.94 (\text{kg})$$

■ Applicable models

AO*90RPBMF, AO*72RPBMF
AO*90APBMF, AO*72APBMF

For **AO*90RPCMF, AO*72RPCMF**
refer to page (06-01).

Use the following formula to calculate C1 and C2. After calculating the refrigerant amounts, use the larger value for the additional charge.

AO*90*PBMF

$$\begin{array}{l}
 \text{C1} = \left[\begin{array}{|c|c|} \hline \text{Total length} & \text{x 0.136} \\ \hline \text{of } \varnothing 12.7 \text{ mm} & \text{kg/m} \\ \hline \text{liquid pipe} & \\ \hline \text{m} & \\ \hline \text{kg} & \\ \hline \end{array} \right] + \left[\begin{array}{|c|c|} \hline \text{Total length} & \text{x 0.063} \\ \hline \text{of } \varnothing 9.52 \text{ mm} & \text{kg/m} \\ \hline \text{liquid pipe} & \\ \hline \text{m} & \\ \hline \text{kg} & \\ \hline \end{array} \right] + \left[\begin{array}{|c|c|} \hline \text{Total length} & \text{x 0.025} \\ \hline \text{of } \varnothing 6.35 \text{ mm} & \text{kg/m} \\ \hline \text{liquid pipe} & \\ \hline \text{m} & \\ \hline \text{kg} & \\ \hline \end{array} \right] - 4 = \begin{array}{|c|} \hline \text{Total} \\ \hline \text{kg} \\ \hline \end{array} \\
 \\
 \text{C2} = \left[\begin{array}{|c|c|} \hline \text{Total length} & \text{x 0.094} \\ \hline \text{of } \varnothing 12.7 \text{ mm} & \text{kg/m} \\ \hline \text{liquid pipe} & \\ \hline \text{m} & \\ \hline \text{kg} & \\ \hline \end{array} \right] + \left[\begin{array}{|c|c|} \hline \text{Total length} & \text{x 0.048} \\ \hline \text{of } \varnothing 9.52 \text{ mm} & \text{kg/m} \\ \hline \text{liquid pipe} & \\ \hline \text{m} & \\ \hline \text{kg} & \\ \hline \end{array} \right] + \left[\begin{array}{|c|c|} \hline \text{Total length} & \text{x 0.017} \\ \hline \text{of } \varnothing 6.35 \text{ mm} & \text{kg/m} \\ \hline \text{liquid pipe} & \\ \hline \text{m} & \\ \hline \text{kg} & \\ \hline \end{array} \right] + 0 = \begin{array}{|c|} \hline \text{Total} \\ \hline \text{kg} \\ \hline \end{array}
 \end{array}$$

Round up C1 and C2 to 2 decimal place.

AO*72*PBMF

$$\begin{array}{l}
 \text{C1} = \left[\begin{array}{|c|c|} \hline \text{Total length} & \text{x 0.136} \\ \hline \text{of } \varnothing 12.7 \text{ mm} & \text{kg/m} \\ \hline \text{liquid pipe} & \\ \hline \text{m} & \\ \hline \text{kg} & \\ \hline \end{array} \right] + \left[\begin{array}{|c|c|} \hline \text{Total length} & \text{x 0.063} \\ \hline \text{of } \varnothing 9.52 \text{ mm} & \text{kg/m} \\ \hline \text{liquid pipe} & \\ \hline \text{m} & \\ \hline \text{kg} & \\ \hline \end{array} \right] + \left[\begin{array}{|c|c|} \hline \text{Total length} & \text{x 0.025} \\ \hline \text{of } \varnothing 6.35 \text{ mm} & \text{kg/m} \\ \hline \text{liquid pipe} & \\ \hline \text{m} & \\ \hline \text{kg} & \\ \hline \end{array} \right] - 3 = \begin{array}{|c|} \hline \text{Total} \\ \hline \text{kg} \\ \hline \end{array} \\
 \\
 \text{C2} = \left[\begin{array}{|c|c|} \hline \text{Total length} & \text{x 0.094} \\ \hline \text{of } \varnothing 12.7 \text{ mm} & \text{kg/m} \\ \hline \text{liquid pipe} & \\ \hline \text{m} & \\ \hline \text{kg} & \\ \hline \end{array} \right] + \left[\begin{array}{|c|c|} \hline \text{Total length} & \text{x 0.048} \\ \hline \text{of } \varnothing 9.52 \text{ mm} & \text{kg/m} \\ \hline \text{liquid pipe} & \\ \hline \text{m} & \\ \hline \text{kg} & \\ \hline \end{array} \right] + \left[\begin{array}{|c|c|} \hline \text{Total length} & \text{x 0.017} \\ \hline \text{of } \varnothing 6.35 \text{ mm} & \text{kg/m} \\ \hline \text{liquid pipe} & \\ \hline \text{m} & \\ \hline \text{kg} & \\ \hline \end{array} \right] + 1 = \begin{array}{|c|} \hline \text{Total} \\ \hline \text{kg} \\ \hline \end{array}
 \end{array}$$

Round up C1 and C2 to 2 decimal place.

Example : When the outdoor unit model is AO*90*PBMF and liquid pipe length are 20m (Ø12.70mm), 15m (Ø9.52mm), and 20m (Ø6.35mm), respectively.

$$\begin{array}{l}
 \text{C1} = 20 \text{ (m)} \times 0.136 \text{ (kg/m)} + 15 \text{ (m)} \times 0.063 \text{ (kg/m)} + 20 \text{ (m)} \times 0.025 \text{ (kg/m)} - 4 = 0.17 \text{ (kg)} \\
 \text{C2} = 20 \text{ (m)} \times 0.094 \text{ (kg/m)} + 15 \text{ (m)} \times 0.048 \text{ (kg/m)} + 20 \text{ (m)} \times 0.017 \text{ (kg/m)} + 0 = 2.94 \text{ (kg)}
 \end{array}$$

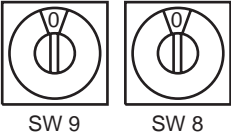
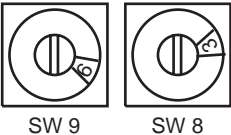
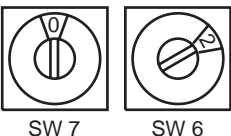

Since $\text{C1} < \text{C2}$,

The amount of additional charge : 2.94 (kg)

6-2 ADDRESS SETTING

- With this system, an address must be set for the indoor unit, outdoor unit and remote controller and central remote controller.

6-2-1 KINDS OF ADDRESS AND SETTING RANGE

UNIT	SETTING	SETTING RANGE	TYPE OF SWITCH	REMARKS
Outdoor unit	Refrigerant circuit address	0~99	Setting example 0  SW 9 SW 8	Shown in the next page
Indoor unit ¹⁾	Refrigerant circuit address	0~99	Setting example 63  SW 9 SW 8	
	Indoor unit address	0~15	Setting example 2  SW 7 SW 6	Always SW 7 set "0"
	Remote controller address	0~ 3	Setting example 0  SW 10	
Remote controller (wired,simple)	Dual remote controller switch 1	ON/OFF	DIP SW1	OFF : Not terminated ON : Terminated
	Dual remote controller switch 2	ON/OFF	DIP SW2	OFF : Master ON : Slave
	Group control setting	ON/OFF	DIP SW3	Number of indoor unit OFF : 1 unit ON : multiple unit
Central remote controller	Central remote controller address	0 ~ 15	Initial setting	

1) For compact wall mounted type indoor unit, refer to 6-2-2.

●Refrigerant circuit address conversion table

Outdoor unit

Rotary switch (SW 8)- - - Factory setting "0"

Rotary switch (SW 9)- - - Factory setting "0"

Indoor Unit

Rotary switch (SW 8)- - - Factory setting "0"

Rotary switch (SW 9)- - - Factory setting "0"

In the case of a multiple refrigerant system, each refrigerant system (outdoor unit and indoor unit) must be set an exclusive refrigerant circuit address.

Please use the rotary switches(SW8,SW9) to set the address.A conversion table of refrigerant circuit address and rotary switch setting is shown in the table below.

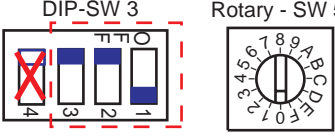
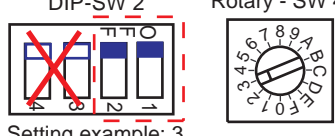
Do not use a nonexistent switch setting combination.

Example : When SW 9 is set to "1" and SW 8 is set to "14" the refrigerant circuit address will be "30".

Refrigerant circuit address	Rotary Switch setting		Refrigerant circuit address	Rotary Switch setting		Refrigerant circuit address	Rotary Switch setting		Refrigerant circuit address	Rotary Switch setting		Refrigerant circuit address	Rotary Switch setting	
	SW9	SW8		SW9	SW8		SW9	SW8		SW9	SW8		SW9	SW8
0	0	0	20	1	4	40	2	8	60	3	12	80	5	0
1	0	1	21	1	5	41	2	9	61	3	13	81	5	1
2	0	2	22	1	6	42	2	10(A)	62	3	14	82	5	2
3	0	3	23	1	7	43	2	11(B)	63	3	15	83	5	3
4	0	4	24	1	8	44	2	12(C)	64	4	0	84	5	4
5	0	5	25	1	9	45	2	13(D)	65	4	1	85	5	5
6	0	6	26	1	10(A)	46	2	14(E)	66	4	2	86	5	6
7	0	7	27	1	11(B)	47	2	15(F)	67	4	3	87	5	7
8	0	8	28	1	12(C)	48	3	0	68	4	4	88	5	8
9	0	9	29	1	13(D)	49	3	1	69	4	5	89	5	9
10	0	10(A)	30	1	14(E)	50	3	2	70	4	6	90	5	10(A)
11	0	11(B)	31	1	15(F)	51	3	3	71	4	7	91	5	11(B)
12	0	12(C)	32	2	0	52	3	4	72	4	8	92	5	12(C)
13	0	13(D)	33	2	1	53	3	5	73	4	9	93	5	13(D)
14	0	14(E)	34	2	2	54	3	6	74	4	10(A)	94	5	14(E)
15	0	15(F)	35	2	3	55	3	7	75	4	11(B)	95	5	15(F)
16	1	0	36	2	4	56	3	8	76	4	12(C)	96	6	0
17	1	1	37	2	5	57	3	9	77	4	13(D)	97	6	1
18	1	2	38	2	6	58	3	10	78	4	14(E)	98	6	2
19	1	3	39	2	7	59	3	11	79	4	15(F)	99	6	3

6-2-2 ADDRESS SETTING (COMPACT WALL MOUNTED TYPE)

KINDS OF ADDRESS AND SETTING RANGE

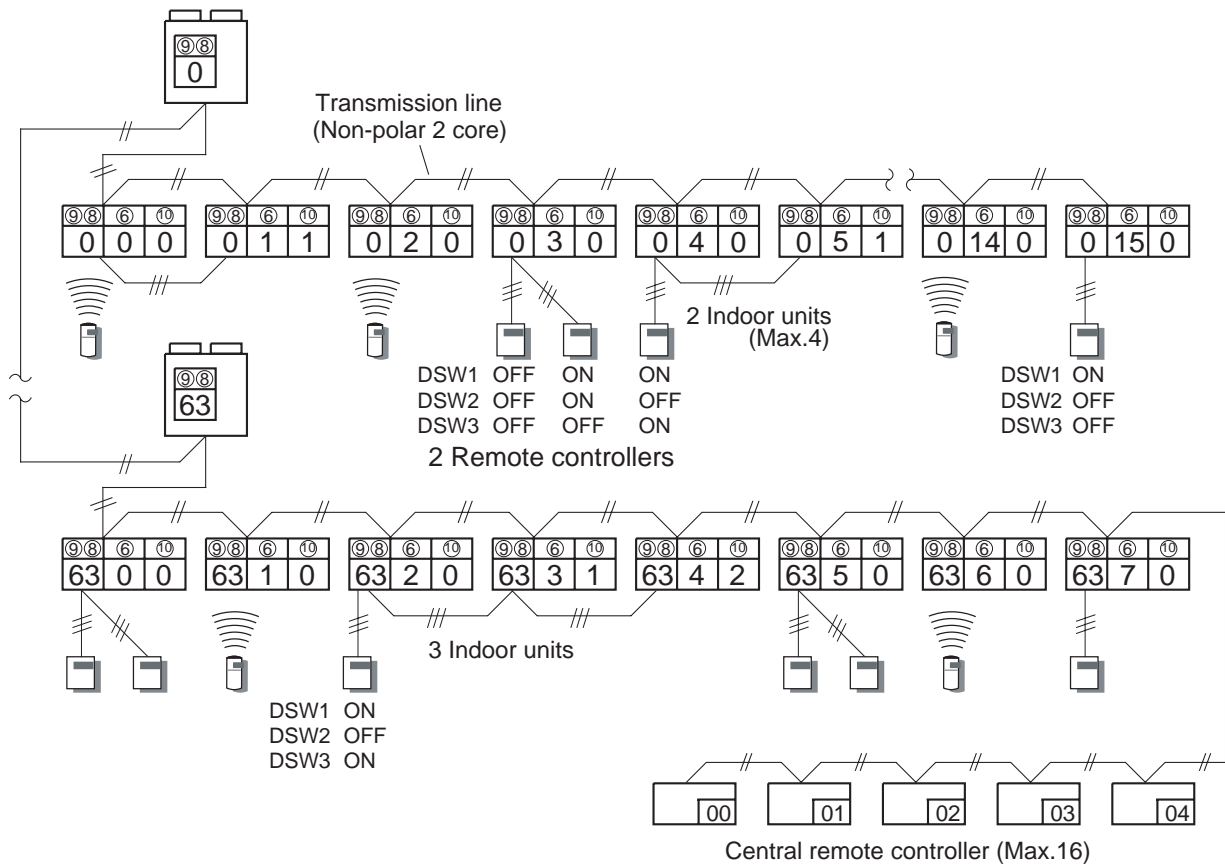
SETTING	SETTING RANGE	TYPE OF SWITCH	REMARKS
Refrigerant circuit address	0~99	 <p>Setting example: 16</p>	See refrigerant address conversion table below
Indoor unit address	0~15(F)	 <p>Setting example: 3</p>	Always set DIP SW 2-1 and 2-2 to "OFF"
Remote controller address	—	No such a switch	A setup is impossible.

● Refrigerant address conversion table

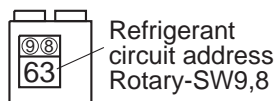
Refrigerant circuit address	DIP-SW			Rotary -sw sw5	Refrigerant circuit address	DIP-SW			Rotary -sw sw5	Refrigerant circuit address	DIP-SW			Rotary -sw sw5	Refrigerant circuit address	DIP-SW			Rotary -sw sw5
	3-1	3-2	3-3			3-1	3-2	3-3			3-1	3-2	3-3			3-1	3-2	3-3	
0	OFF	OFF	OFF	0	25	ON	OFF	OFF	9	50	ON	ON	OFF	2	75	OFF	OFF	ON	11(B)
1	OFF	OFF	OFF	1	26	ON	OFF	OFF	10(A)	51	ON	ON	OFF	3	76	OFF	OFF	ON	12(C)
2	OFF	OFF	OFF	2	27	ON	OFF	OFF	11(B)	52	ON	ON	OFF	4	77	OFF	OFF	ON	13(D)
3	OFF	OFF	OFF	3	28	ON	OFF	OFF	12(C)	53	ON	ON	OFF	5	78	OFF	OFF	ON	14(E)
4	OFF	OFF	OFF	4	29	ON	OFF	OFF	13(D)	54	ON	ON	OFF	6	79	OFF	OFF	ON	15(F)
5	OFF	OFF	OFF	5	30	ON	OFF	OFF	14(E)	55	ON	ON	OFF	7	80	ON	OFF	ON	0
6	OFF	OFF	OFF	6	31	ON	OFF	OFF	15(F)	56	ON	ON	OFF	8	81	ON	OFF	ON	1
7	OFF	OFF	OFF	7	32	OFF	ON	OFF	0	57	ON	ON	OFF	9	82	ON	OFF	ON	2
8	OFF	OFF	OFF	8	33	OFF	ON	OFF	1	58	ON	ON	OFF	10(A)	83	ON	OFF	ON	3
9	OFF	OFF	OFF	9	34	OFF	ON	OFF	2	59	ON	ON	OFF	11(B)	84	ON	OFF	ON	4
10	OFF	OFF	OFF	10(A)	35	OFF	ON	OFF	3	60	ON	ON	OFF	12(C)	85	ON	OFF	ON	5
11	OFF	OFF	OFF	11(B)	36	OFF	ON	OFF	4	61	ON	ON	OFF	13(D)	86	ON	OFF	ON	6
12	OFF	OFF	OFF	12(C)	37	OFF	ON	OFF	5	62	ON	ON	OFF	14(E)	87	ON	OFF	ON	7
13	OFF	OFF	OFF	13(D)	38	OFF	ON	OFF	6	63	ON	ON	OFF	15(F)	88	ON	OFF	ON	8
14	OFF	OFF	OFF	14(E)	39	OFF	ON	OFF	7	64	OFF	OFF	ON	0	89	ON	OFF	ON	9
15	OFF	OFF	OFF	15(F)	40	OFF	ON	OFF	8	65	OFF	OFF	ON	1	90	ON	OFF	ON	10(A)
16	ON	OFF	OFF	0	41	OFF	ON	OFF	9	66	OFF	OFF	ON	2	91	ON	OFF	ON	11(B)
17	ON	OFF	OFF	1	42	OFF	ON	OFF	10(A)	67	OFF	OFF	ON	3	92	ON	OFF	ON	12(C)
18	ON	OFF	OFF	2	43	OFF	ON	OFF	11(B)	68	OFF	OFF	ON	4	93	ON	OFF	ON	13(D)
19	ON	OFF	OFF	3	44	OFF	ON	OFF	12(C)	69	OFF	OFF	ON	5	94	ON	OFF	ON	14(E)
20	ON	OFF	OFF	4	45	OFF	ON	OFF	13(D)	70	OFF	OFF	ON	6	95	ON	OFF	ON	15(F)
21	ON	OFF	OFF	5	46	OFF	ON	OFF	14(E)	71	OFF	OFF	ON	7	96	OFF	ON	ON	0
22	ON	OFF	OFF	6	47	OFF	ON	OFF	15(F)	72	OFF	OFF	ON	8	97	OFF	ON	ON	1
23	ON	OFF	OFF	7	48	ON	ON	OFF	0	73	OFF	OFF	ON	9	98	OFF	ON	ON	2
24	ON	OFF	OFF	8	49	ON	ON	OFF	1	74	OFF	OFF	ON	10(A)	99	OFF	ON	ON	3

6-2-3 EXAMPLES OF SYSTEM SETTING

The following examples apply to all indoor units except for compact wall mounted type indoor unit.



• Outdoor unit



• Indoor unit ¹⁾

Refrigerant circuit address Rotary-SW9,8

Indoor unit address Rotary-SW6
Remote controller address Rotary-SW10

• Remote controller

DSW1 OFF ON
DSW2 OFF ON
DSW3 OFF OFF

Dual remote controller switch1
Dual remote controller switch2
Group control setting

• Central remote controller

00 — Central remote controller address

1) For compact wall mounted type indoor unit, refer to 6-2-2.

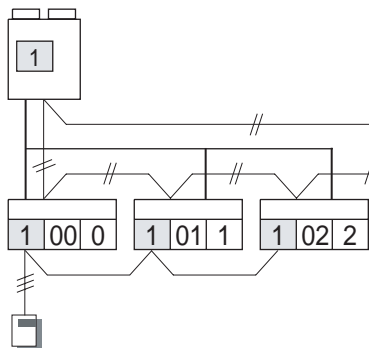
※ Instructions for setting up the address

- 1 The Refrigerant circuit address of the indoor and outdoor units can be set to optional numbers in the range of 0 to 99.
- 2 The Indoor unit address can be set to optional numbers in the range of 0 to 15.
- 3 Set the Remote controller address in the order of 0,1,2,3.(Blank is impossible)
- 4 The Central remote controller address can be set to optional numbers in the range of 0 to 15.

① Refrigerant circuit address (Outdoor unit)

② Refrigerant circuit address (Indoor unit)

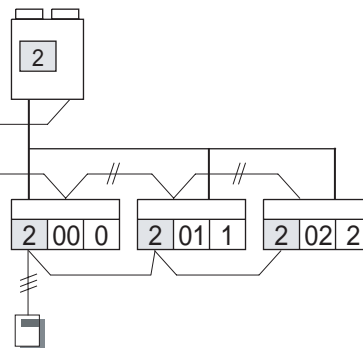
Refrigerant circuit 1



Outdoor unit PCB (Address setting No.0~99)

Setting by rotary SW8,9

Refrigerant circuit 2

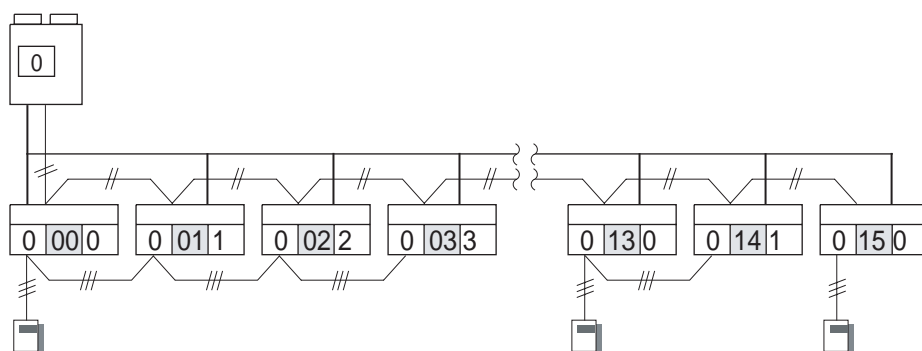


Indoor unit PCB (Address setting No.0~99)

Setting by rotary SW8,9

For compact wall mounted type indoor unit, refer to 6-2-2.

③ Indoor unit address



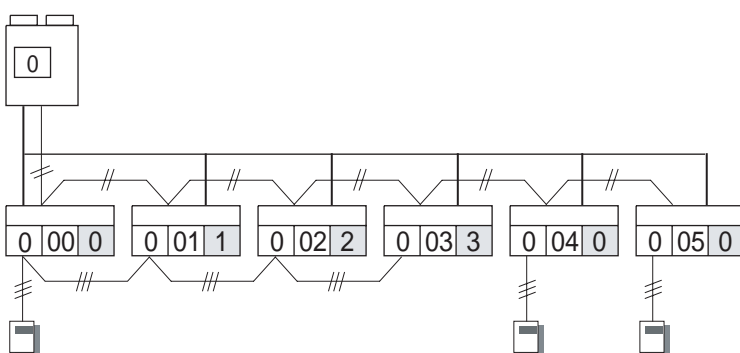
Indoor unit PCB (Address setting No. 0~15)

Setting by rotary SW6, SW7

(Always set Rotary SW7 at 0)

For compact wall mounted type indoor unit, refer to 6-2-2.

④ Remote controller address (Indoor unit)

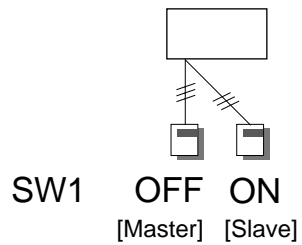


Indoor unit PCB (Address setting No.0~3)

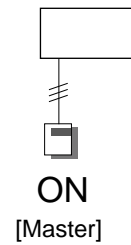
Setting by rotary SW10

⑤ Dual remote controller switch 1

If 2 sets of wired remote controllers are connected to the remote control group, turn the DIP SW 1 of Master Remote Controller off.

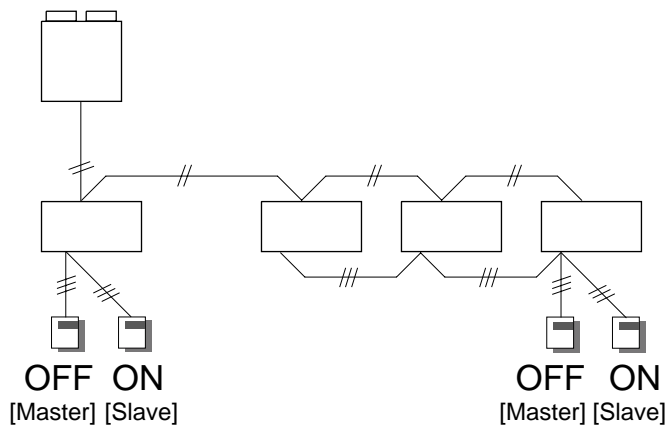


Remote controller unit PCB
Setting by DIP SW 1



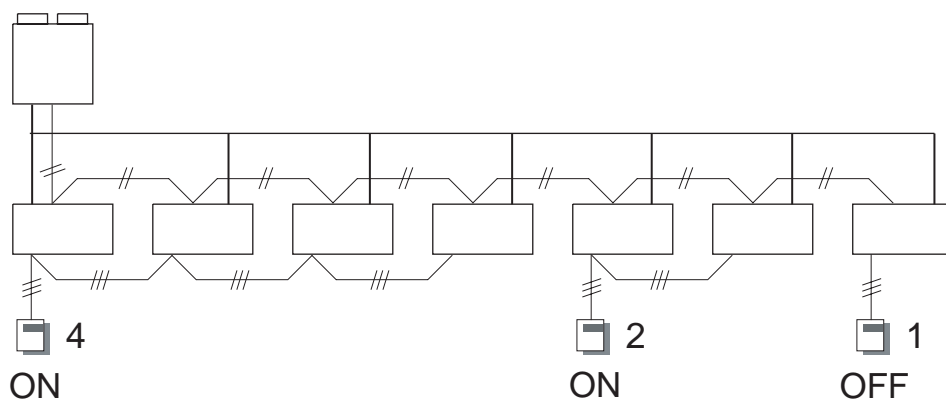
When only 1 remote controller will connect,
this switch must be set ON.

⑥ Dual remote controller switch 2 (Remote controller)



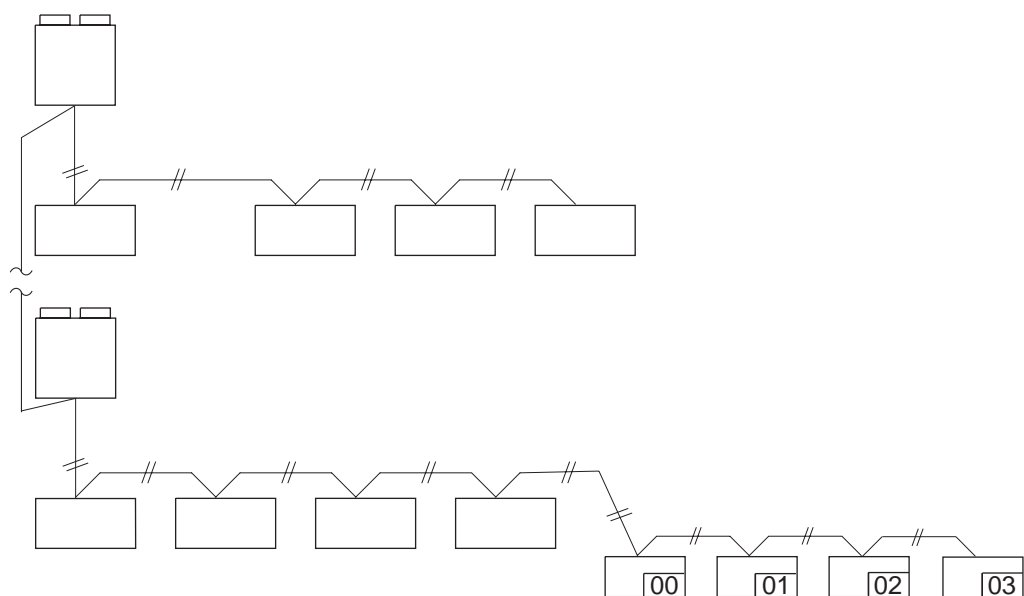
Remote controller unit PCB
Setting by DIP SW 2

⑦ Group control setting



Remote controller PCB
Setting by DIP SW 3

⑧ Central remote controller address



Central remote controller (Max. 16)

* Set central remote controller address first, to conduct the initial setting of it.

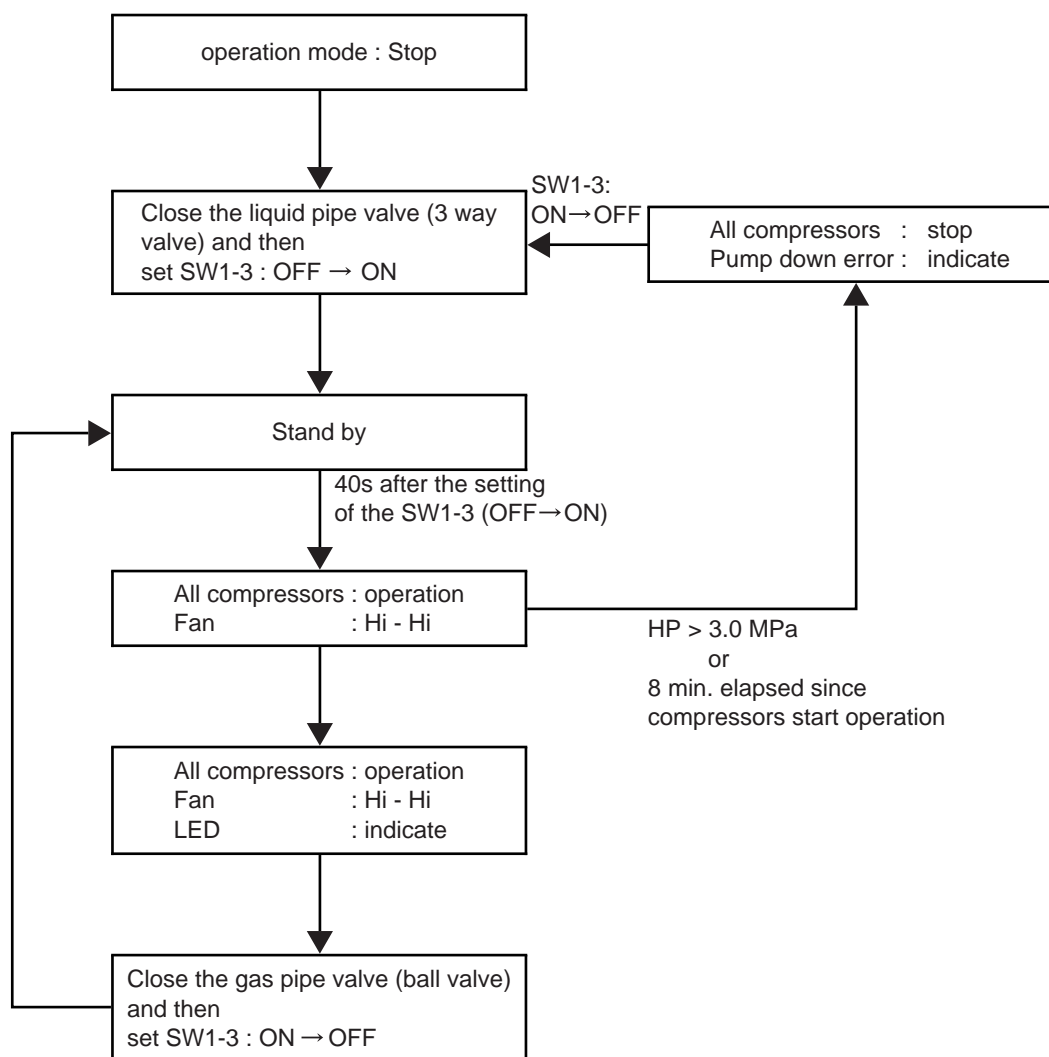
6-3 PUMP DOWN METHOD

6-3-1 PROCEDURE OF THE PUMP DOWN

Refer to the following pump down procedure.

- (1) Stop the indoor and outdoor units.
- (2) Close the liquid pipe valve using Hexagon wrench.
- (3) Select Dip SW 1-3 in the outdoor unit PC board from OFF to ON, so that the pump down operation starts automatically in 40 seconds.
- (4) If the pump down operation normally complete, the LED on PCB of outdoor unit will light and flash to inform you the completion of the pump down operation.
- (5) After you confirm the display type of the LED, please close the gas pipe valve and then set the DIP SW1-3 from ON to OFF immediately.

6-3-2 A FLOW CHART OF PUMP DOWN



Gauge manifold (Fig.4-1)
Pressure gauge changed.

Charge hose (Fig.4-2)
Changed to HCFC resistant material.

Charging cylinder (Fig.4-3)
Confirm the refrigerant type before charging.

Electronic balance for refrigerant charging (Fig.4-4)
Electronic balance is recommended.

Vacuum pump with adapter to prevent reverse flow (Fig.4-5)
Conventional pump can be used.

Vacuum holder (Fig.4-6)
Conventional pump can be used if adapter for preventing vacuum pump oil from flowing back is used.

Gas leakage tester (Fig.4-7)
For R22 type.

Refrigerant cleaner (Fig.4-8)
Brown paint as designated by the ARI, USA

Flare tool (Fig.4-9)
Conventional tool can be used.

Torque wrench (Fig.4-10)
Conventional wrench can be used.

Refrigerant recovering equipment (Collector) (Fig.4-11)
The type which can be used for any refrigerant is available

Nitrogen cylinder (Fig.4-12)
This prevents an oxide film from forming in the pipe silver-alloy brazing work by turning the air out of the pipe and preventing the inside combustion.

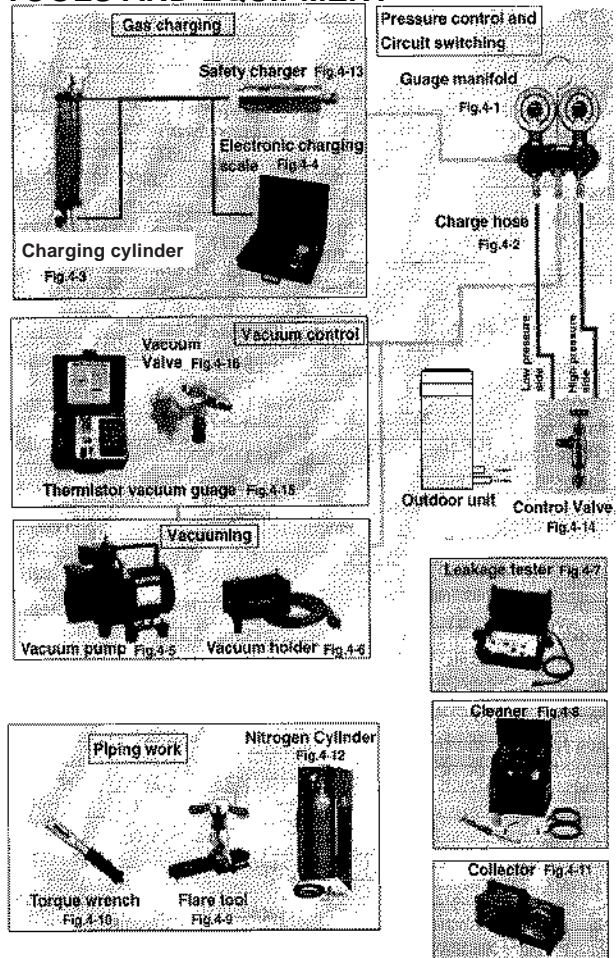
Safety charger (Fig.4-13)
In order to avoid the refrigerant from returning to the compressor in a liquid state, the refrigerant can be charged instead of giving a load to the compressor with a safety charger.

Control valve (Fig.4-14)
The control valve prevents the refrigerant from spouting when it is removed, as the charging hose side and the service port side are possible to open and close at the same time.

Thermistor vacuum gauge (Fig.4-15)
To remove moisture from the refrigerating cycle completely, it is necessary to perform appropriate vacuum drying. For that reason, vacuum conditions can be confirmed certainly.

Vacuum valve (Fig.4-16)
This valve builds in a check valve, and it is easily possible to vacuum a refrigerating cycle or check for degree of vacuum with it.

TOOLS AND EQUIPMENT



6-5 PRECAUTIONS FOR INSTALLATION

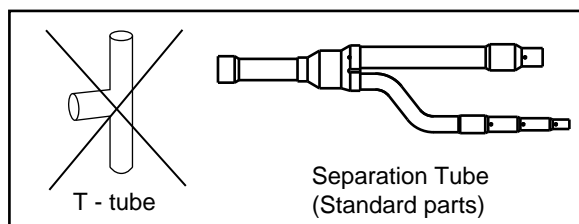
1. Preparing pipes

- (1) Use the designated size (diameter & thickness) of refrigerant pipes.
- (2) Those pipes purchased locally may contain dust inside. Please blow out the dust by dried inert gas when using.
- (3) Be careful to avoid the dust or water falling into the pipe when performing piping process and piping installation.
- (4) When processing the pipe, make the number of bending portion as few as possible, and the bending radius as large as possible.

Diameter and thickness of copper pipes is shown below.

Nominal diameter (inch)	Outer diameter (mm)	Thickness (mm)
1/4	ø 6.35	0.8
3/8	ø 9.52	0.8
1/2	ø 12.70	0.8
5/8	ø 15.88	1.0
3/4	ø 19.05	1.0
1 1/8	ø 28.58	1.2

- (5) To process the branch, do not use T-shaped pipe, which causes an uneven refrigerant flow. Use the optionally available standard branch kit.
- (6) If the diameter of the required pipe is different from the branch unit, either cut it out or use the reducer.



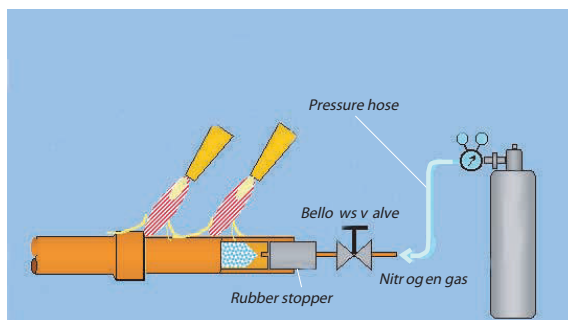
- (7) Keep the permissible length of every piping limitation to prevent a defect or cooling/heating failure.
- (8) When replacing the unit, never use piping which has been used for previous installations. Only use the new piping.

2. Flare connection

- (1) Confirm that there are not scratches or waster, etc., on the flare and union surface.
- (2) When using lubrication oil on the inside and outside of flare, always use small amount and must the same lubrication oil as used in the refrigerant circuit. Use of different oil will cause the lubrication oil to deteriorate and a compressor failure. Also too much oil may introduce water inside refrigerant circuit.

3. Brazing work

Brazing work must be carried out while blowing dry nitrogen gas through the pipes, so that an oxidized layer does not form on the inner surface of the pipes.



Example) Inside state of welded pipe section

Nitrogen Gas is used



Nitrogen Gas is used but not sufficient (Oxygen gas still exists inside the pipe)



Nitrogen Gas is not used



4. Tightness test

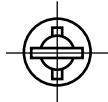
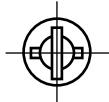
- (1) After completing all piping connection, always carry out an air tight test to check and confirm that there is no gas leakage. Charge the piping with nitrogen to within the sealing test pressure (2.94 MPa). After 24 hours, check that the pressure has not fallen. Make sure to add the pressure to both gas pipe and liquid pipe. Perform the leak test on all flared and brazed parts.
Note: When the ambient temperature changes 5 deg. , the test pressure changes 0.05MPa.
- (2) After tightness test, please insulate the connecting portion, apply the enough insulation to avoid any gap.

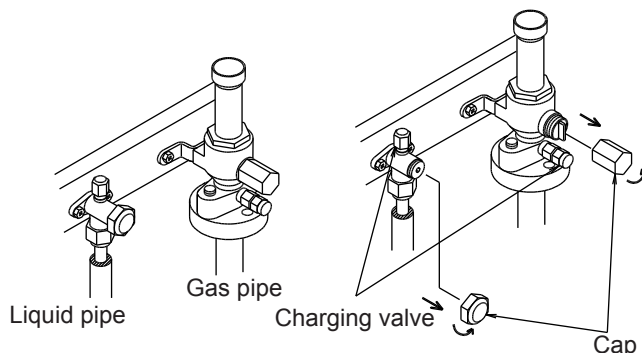
5. Vacuum process

- (1) Do not purge the air with refrigerant but use a vacuum pump to remove air from the indoor units and connection pipes!
- (2) Remove the cap, and connect the gauge manifold and the vacuum pump to the charging valve by the service hoses.
- (3) Vacuum the indoor unit and the connecting pipes until the pressure gauge indicates -76 cmHg.
- (4) When -76 cmHg is reached, operate the vacuum pump for at least 1 hour.
- (5) After vacuuming inside the indoor unit and connecting pipes,remove the cap of the two valves.
- (6) Open the handle (spindle) of the Large valves (Ball valve). Open the spindle of the Small valve (3 - way valve) with a hexagon wrench.
- (7) Tighten the cap of the two valves to the specified torque.

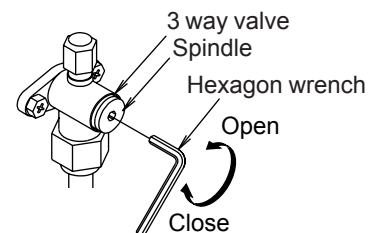
	Tightening torque	
	Ball valve	3 way valve
Spindle (handle)	15 kgf•cm (1.47 N•m) or less	100 to 120 kgf•cm (9.8 to 11.7 N•m)
Cap	150 to 200 kgf•cm (14.7 to 19.6 N•m)	200 to 250 kgf•cm (19.6 to 24.5 N•m)

Ball valve

Open valve state	Closed valve state
	



3 way valve



- If the spindle (handle) is not fully open, performance will degrade and an abnormal sound will be generated.

6. Additional charge

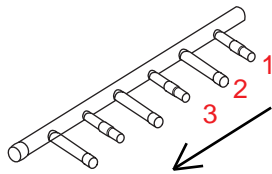
- (1) Be careful, don't charge with wrong refrigerant!
- (2) When moving and installing the air conditioner, do not mix gas other than the specified refrigerant inside the refrigerant circuit.
- (3) When charging the refrigerant, always use an electronic balance for refrigerant charging. (to measure the refrigerant by weight)
- (4) Always add the refrigerant for the appropriate amount. (For the calculation method, please refer to 6-1"ADDITIONAL CHARGE")
- (5) Either larger or smaller refrigerant charge amount leads to the cause of trouble.
- (6) For after service purpose, the added refrigerant charge amount and the calculation shall be indicated firmly on the service label over the control box cover.

7. Precautions on Header installation

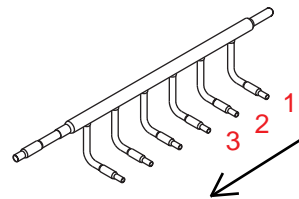
Since necessary performance may not be obtained due to the mounting angle, header installation is specified as follows.

- (1) Connection pipe to each indoor unit shall be connected from the edge of header.
(Connect the pipe in order of 1, 2, 3, as shown in the figure below.)

Gas pipe

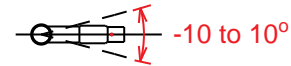
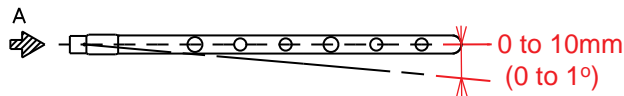


Liquid pipe



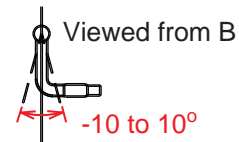
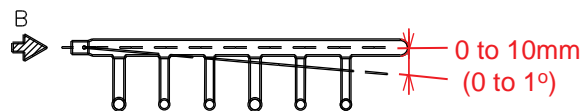
- (2) Header shall be mounted horizontally.
Permissible tolerance is 10mm (1°) between inlet and edge of the header.
(Always check with a level so that the header shall be positioned as shown below.)

Gas pipe



Viewed from A

Liquid pipe



- (3) Take a level
After the pipe welding and insulation, use a level again to make sure that the header is positioned as shown in the figure above, and then secure it in place.

8. Other installation information

Please refer to (DESIGN & TECHNICAL DATA) to find more detailed installation information on installation the outdoor unit, on installation space, on electrical wiring and drain processing.

Refrigerant

R22



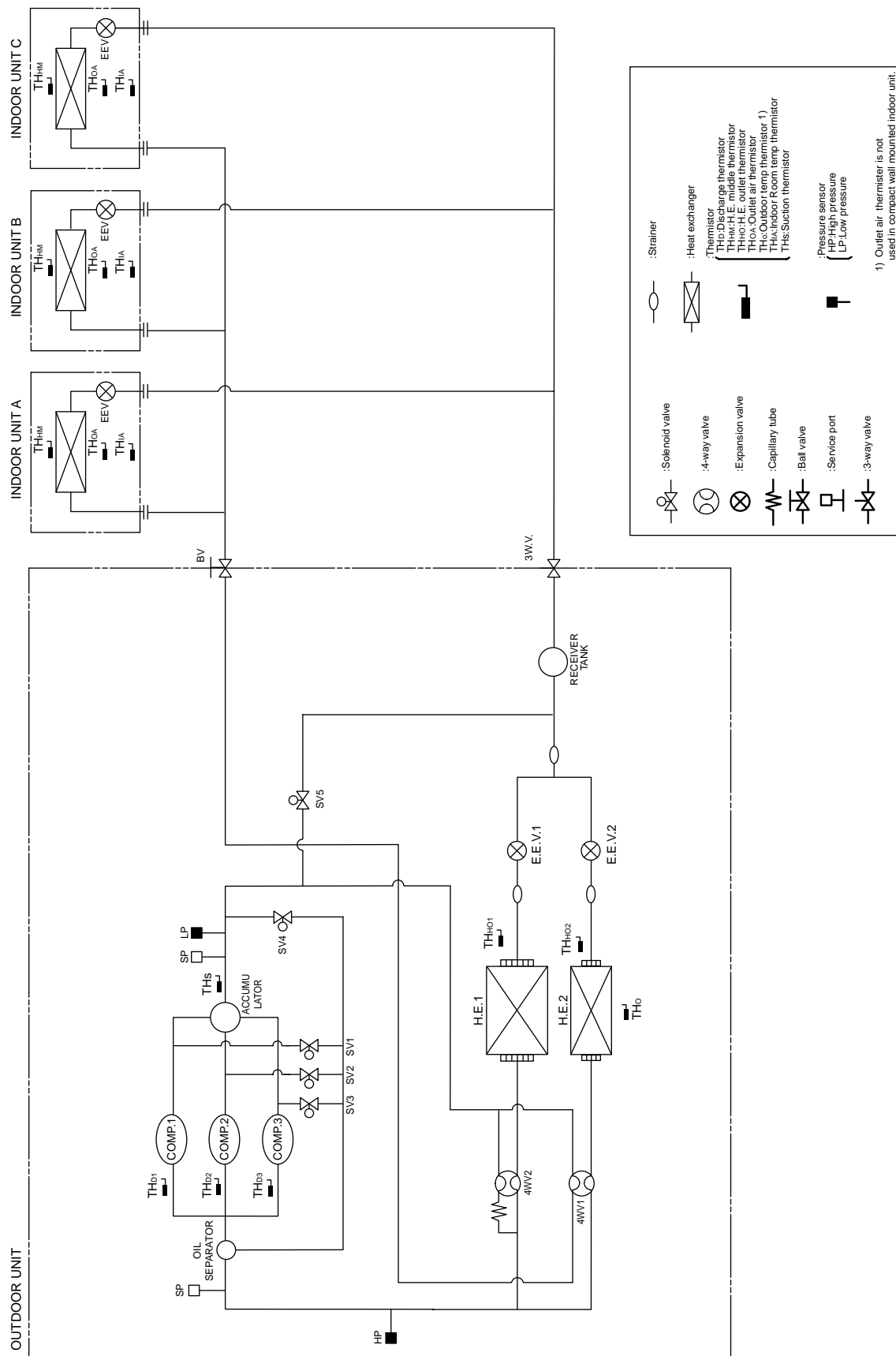
7 . APPENDING DATA 1 (UNIT)

7. APPENDING DATA1 (UNIT)

7-1 REFRIGERANT PIPE SYSTEM DIAGRAM

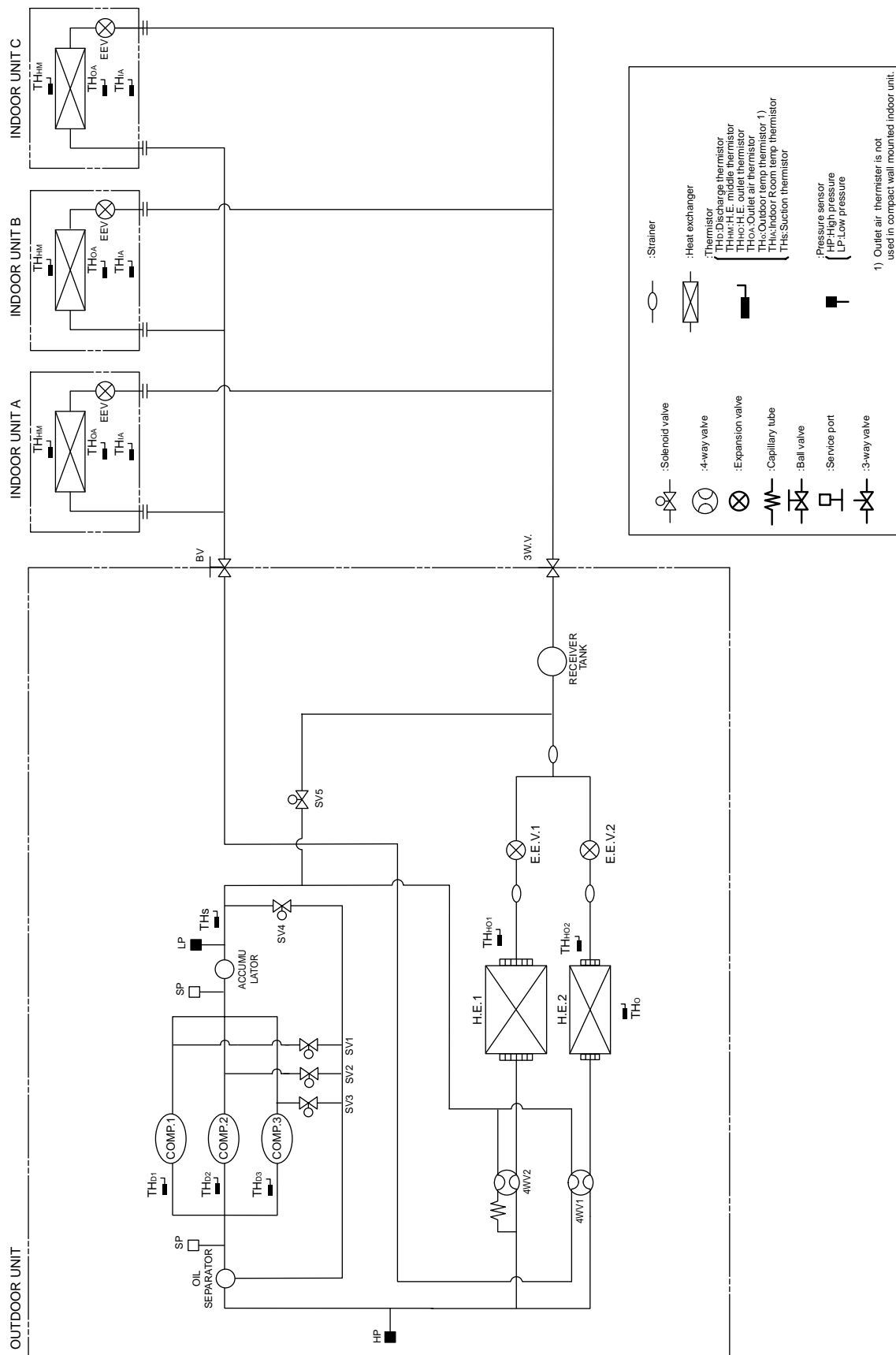
■ HEAT PUMP TYPE

- MODEL : AO90RPCMF , AO72RPCMF



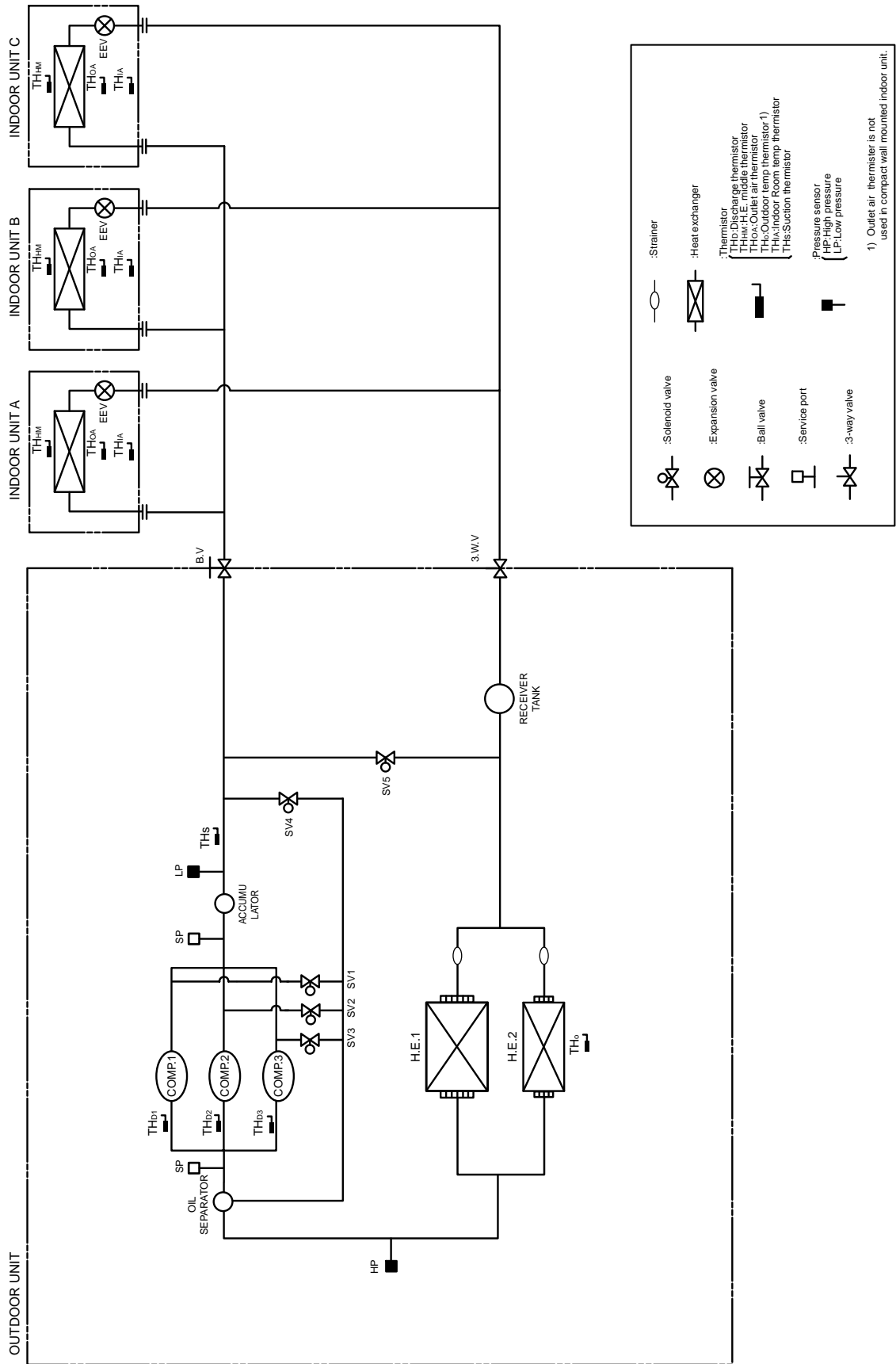
■ HEAT PUMP TYPE

- MODEL : AO90RPBMF , AO72RPBMF



■ COOLING ONLY TYPE

• MODEL : AO90APBMF , AO72APBMF



7-2 CHARACTERISTICS OF SENSORS

7-2-1 THERMISTOR

Thermistor resistance values <Indoor unit side>

1) Room temperature thermistor (TH_{0A}, TH_{ZA})

Room temperature (°C)	0	2.5	5	7.5	10	12.5	15	17.5	20	22.5	25	27.5	30
Resistance value (kΩ)	33.6	29.5	25.9	22.8	20.2	17.9	15.8	14.1	12.5	11.2	10.0	9.0	8.0

Room temperature (°C)	32.5	35	37.5	40	42.5	45	47.5	50
Resistance value (kΩ)	7.2	6.5	5.9	5.3	4.8	4.3	3.9	3.6

2) Indoor heat exchanger temperature thermistor (TH_{HM})

Heat exchanger temperature (°C)	0	2.5	5	7.5	10	12.5	15	17.5	20	22.5	25	27.5	30
Resistance value (kΩ)	176.0	153.5	134.2	117.6	103.3	91.0	80.3	71.0	62.9	55.9	49.7	44.3	39.6

Heat exchanger temperature (°C)	32.5	35	37.5	40	42.5	45	47.5	50	52.5	55	57.5	60
Resistance value (kΩ)	35.4	31.7	28.5	25.6	23.1	20.8	18.8	17.1	15.5	14.1	12.8	11.6

Thermistor resistance values <Outdoor unit side>

1) Outdoor heat exchanger temperature thermistor (TH_{HO1}, TH_{HO2})

Pipe temperature (°C)	-50	-40	-30	-20	-10	-7.5	-5.0	-2.5	0	2.5	5.0	7.5	10
Resistance value (kΩ)	384.8	182.8	92.3	49.2	27.5	24.0	20.9	18.3	16.1	14.1	12.4	11.0	9.7

Pipe temperature (°C)	12.5	15.0	17.5	20	22.5	25.0	27.5	30	32.5	35	37.5	40	50
Resistance value (kΩ)	8.6	7.7	6.8	6.1	5.5	4.9	4.4	3.9	3.6	3.2	2.9	2.6	1.8

Pipe temperature (°C)	60	70	80	90	100
Resistance value (kΩ)	1.2	0.9	0.6	0.5	0.4

2) Discharge pipe temperature thermistor (TH_{D1}, TH_{D2}, TH_{D3})

Pipe temperature (°C)	-40	-30	-20	-10	0	5.0	10	12.5	15	17.5	20	22.5	25
Resistance value (kΩ)	2183	1076	561	307	176	135	105	92.4	81.8	72.6	64.5	57.5	51.3

Pipe temperature (°C)	27.5	30	32.5	35	37.5	40	50	60	70	80	90	100	120
Resistance value (kΩ)	45.8	41.1	36.9	33.1	29.8	26.9	18.1	12.5	8.8	6.3	4.6	3.4	2.0

Pipe temperature (°C)	140	160	180
Resistance value (kΩ)	1.2	0.8	0.5

3) Outdoor temperature thermistor (TH_O)

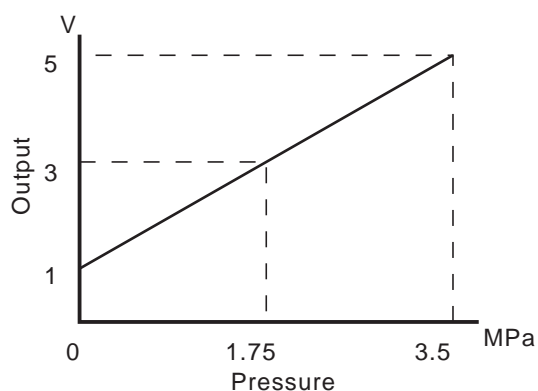
Outdoor temperature (°C)	-50	-40	-30	-20	-10	-7.5	-5.0	-2.5	0	2.5	5.0	8.0	10
Resistance value (kΩ)	859	402	200	105	58.2	50.6	44.0	38.4	33.6	29.5	25.9	22.3	20.2

Outdoor temperature (°C)	12.5	15	17.5	20	22.5	25	27.5	30	32.5	35	37.5	40	50
Resistance value (kΩ)	17.9	15.8	14.1	12.5	11.2	10.0	9.0	8.0	7.2	6.5	5.9	5.3	3.6

Outdoor temperature (°C)	60	70	80
Resistance value (kΩ)	2.5	1.8	1.3

7-2-2 PRESSURE SENSOR

1) Characteristics of pressure sensor

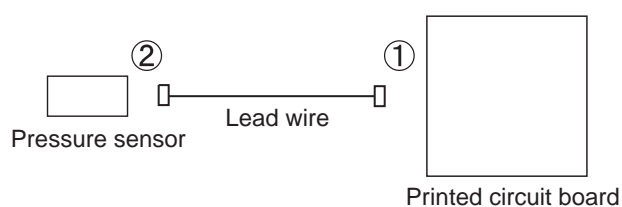


OUTPUT VOLTAGE OF THE PRESSURE SENSORS (HP,LP)

Pressure (MPa)	0.00	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00	1.20	1.40
Output (V)	0.00	1.11	1.21	1.33	1.45	1.56	1.68	1.80	1.91	2.01	2.13	2.36	2.60

Pressure (MPa)	1.60	1.80	2.00	2.20	2.40	2.60	2.80	3.00	3.20	3.40	3.50
Output (V)	2.81	3.05	3.28	3.50	3.73	3.96	4.20	4.41	4.65	4.88	4.98

2) Check point of replacing pressure sensor



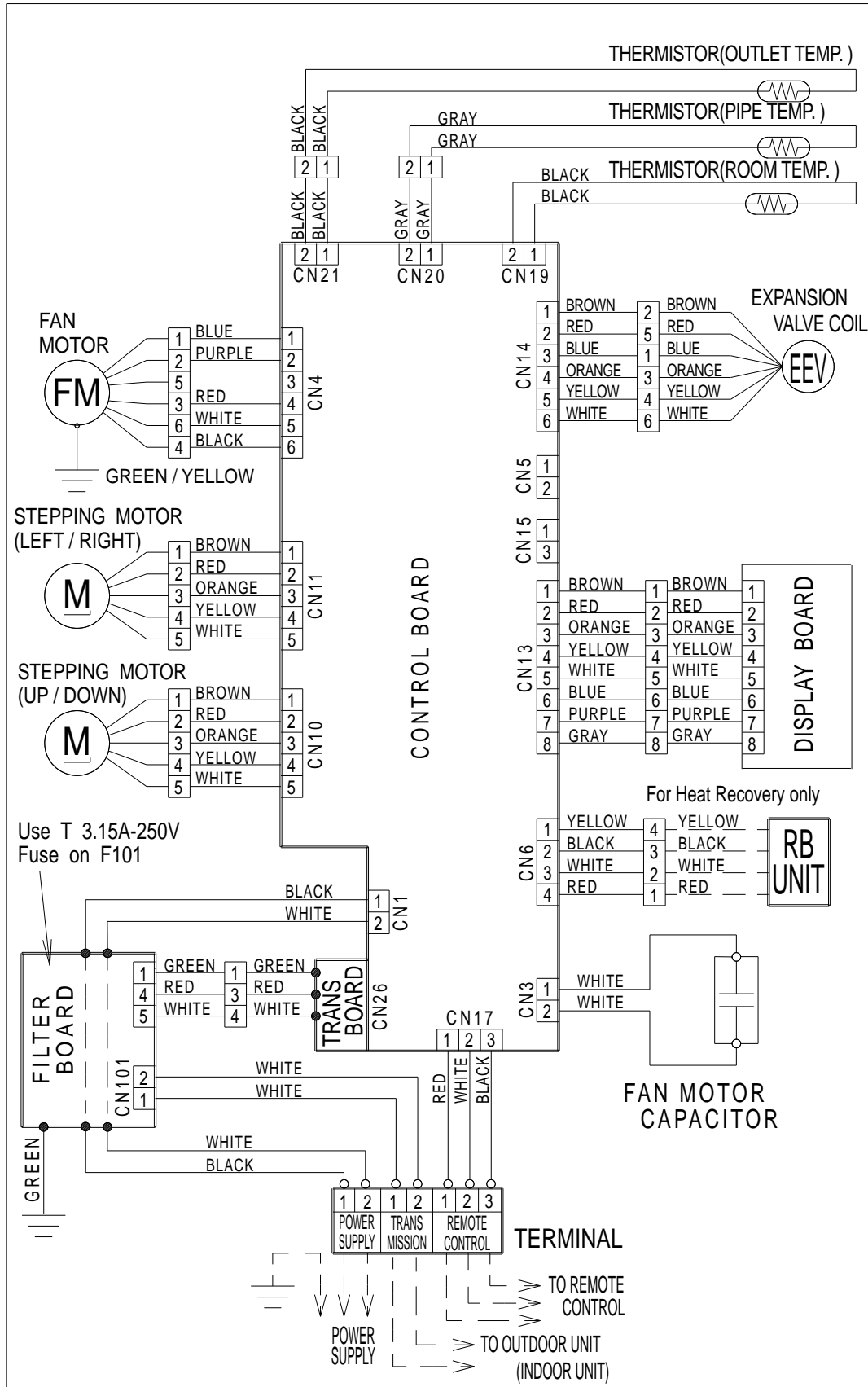
When installing the pressure sensor, connect a lead wire to the PCB (①), thereafter connect the other end of a lead wire to the pressure sensor (②). When disconnecting, do the opposite procedure. Be careful not to install other than above procedure, otherwise the pressure sensor can be failed.

7-3 WIRING DIAGRAM

7-3-1 INDOOR UNIT

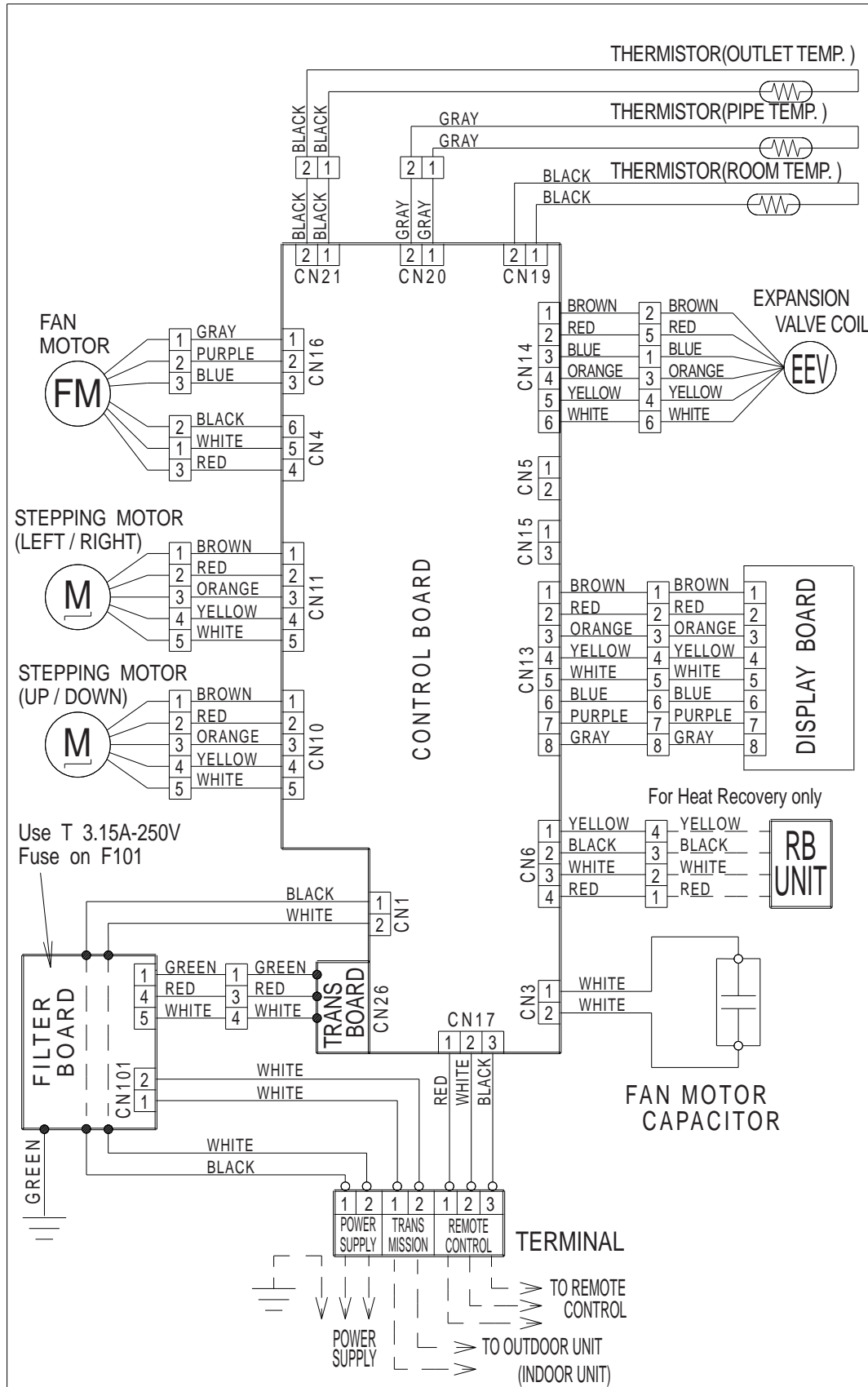
UNIVERSAL FLOOR / CEILING TYPE

■ MODELS : AB12, AB14, AB18, AB24



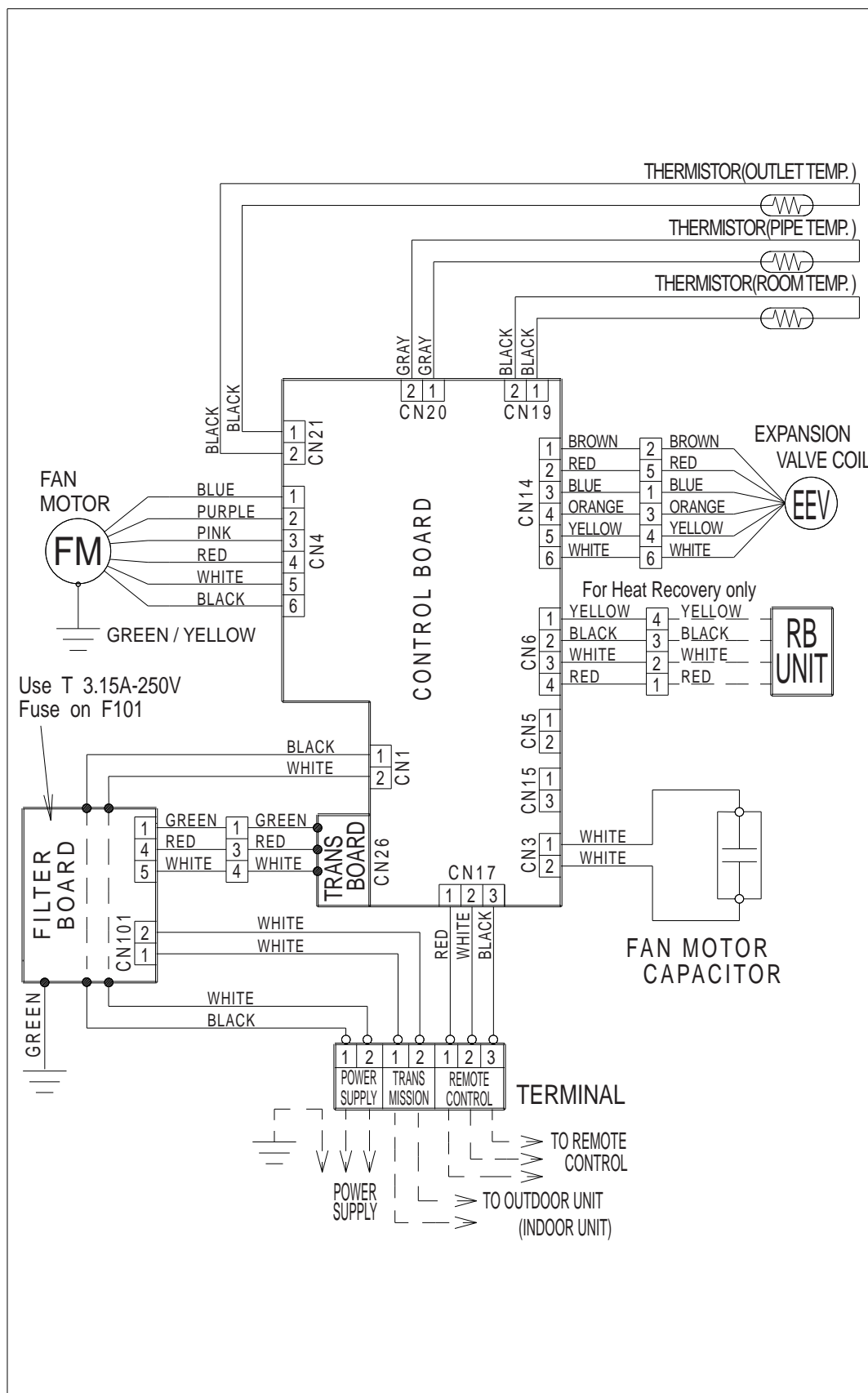
LARGE CEILING TYPE

■ MODELS : AB30, AB36, AB45, AB54



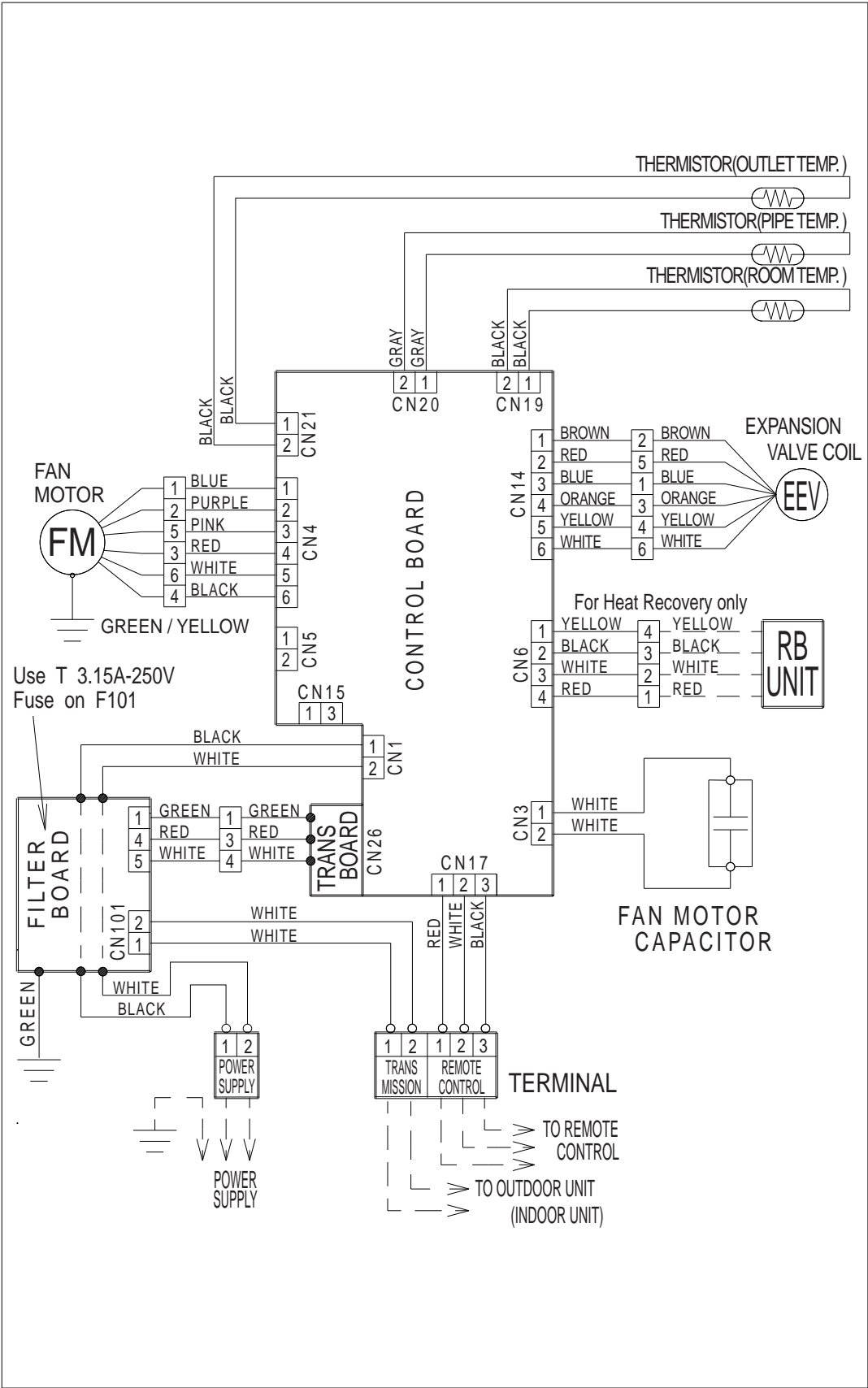
COMPACT DUCT TYPE

■ MODELS : AR7, AR9, AR12, AR14, AR18



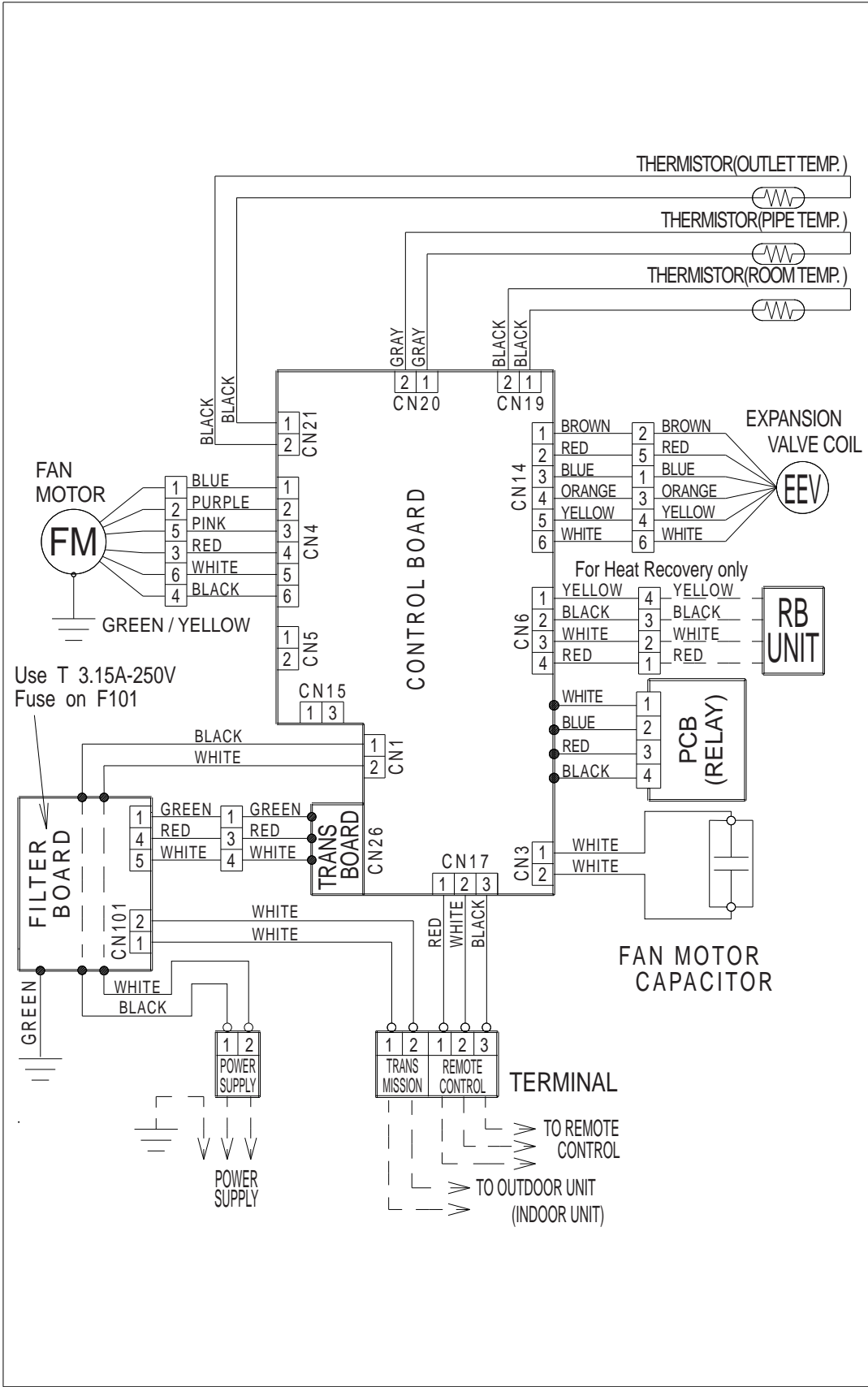
LOW STATIC PRESSURE DUCT TYPE

■ MODELS : AR25



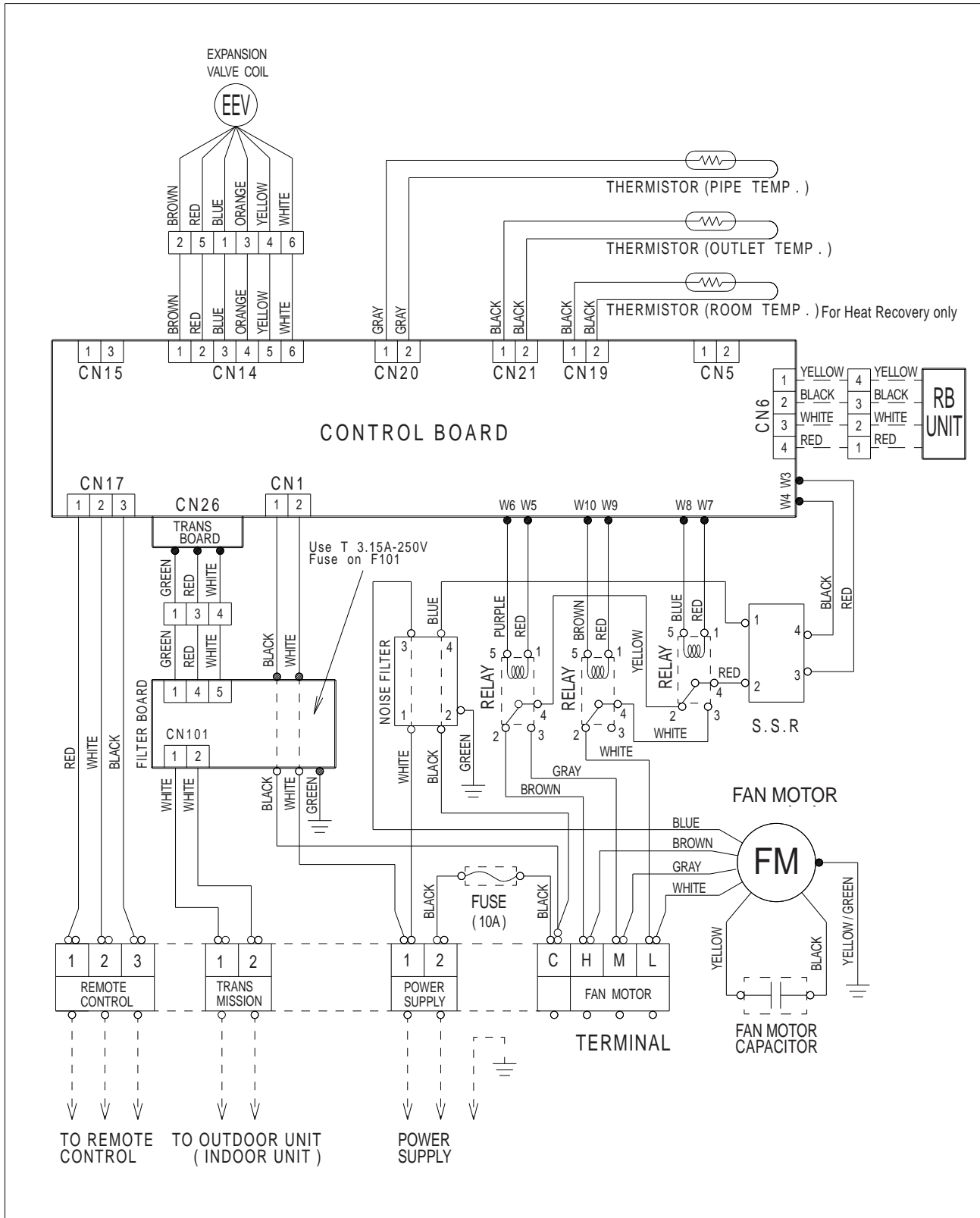
LOW STATIC PRESSURE DUCT TYPE

■ MODELS : AR30, AR36, AR45



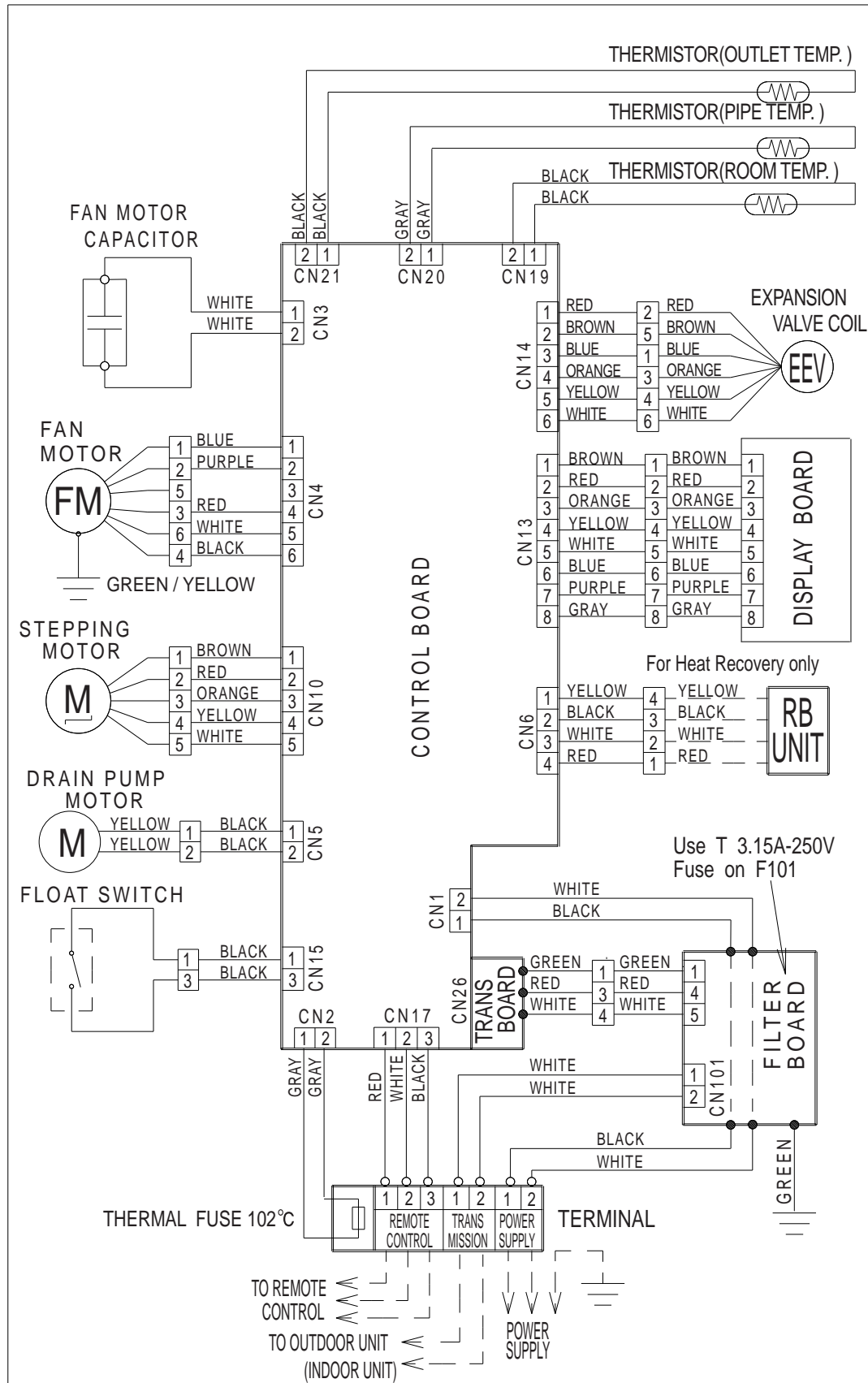
HIGH STATIC PRESSURE DUCT TYPE

■ MODELS : AR36H, AR45H, AR60H



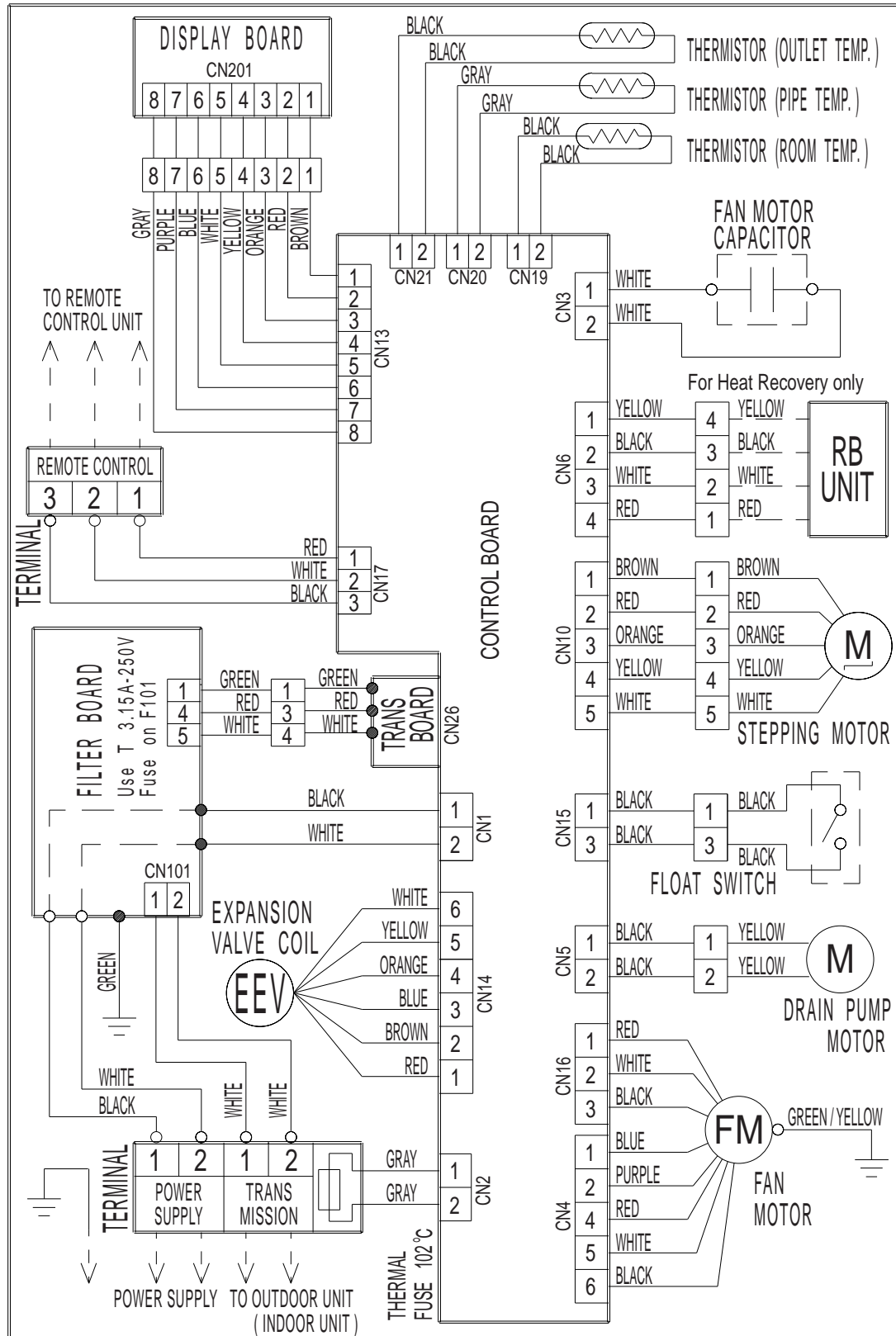
COMPACT CASSETTE TYPE

■ MODELS : AU7, AU9, AU12, AU14, AU18

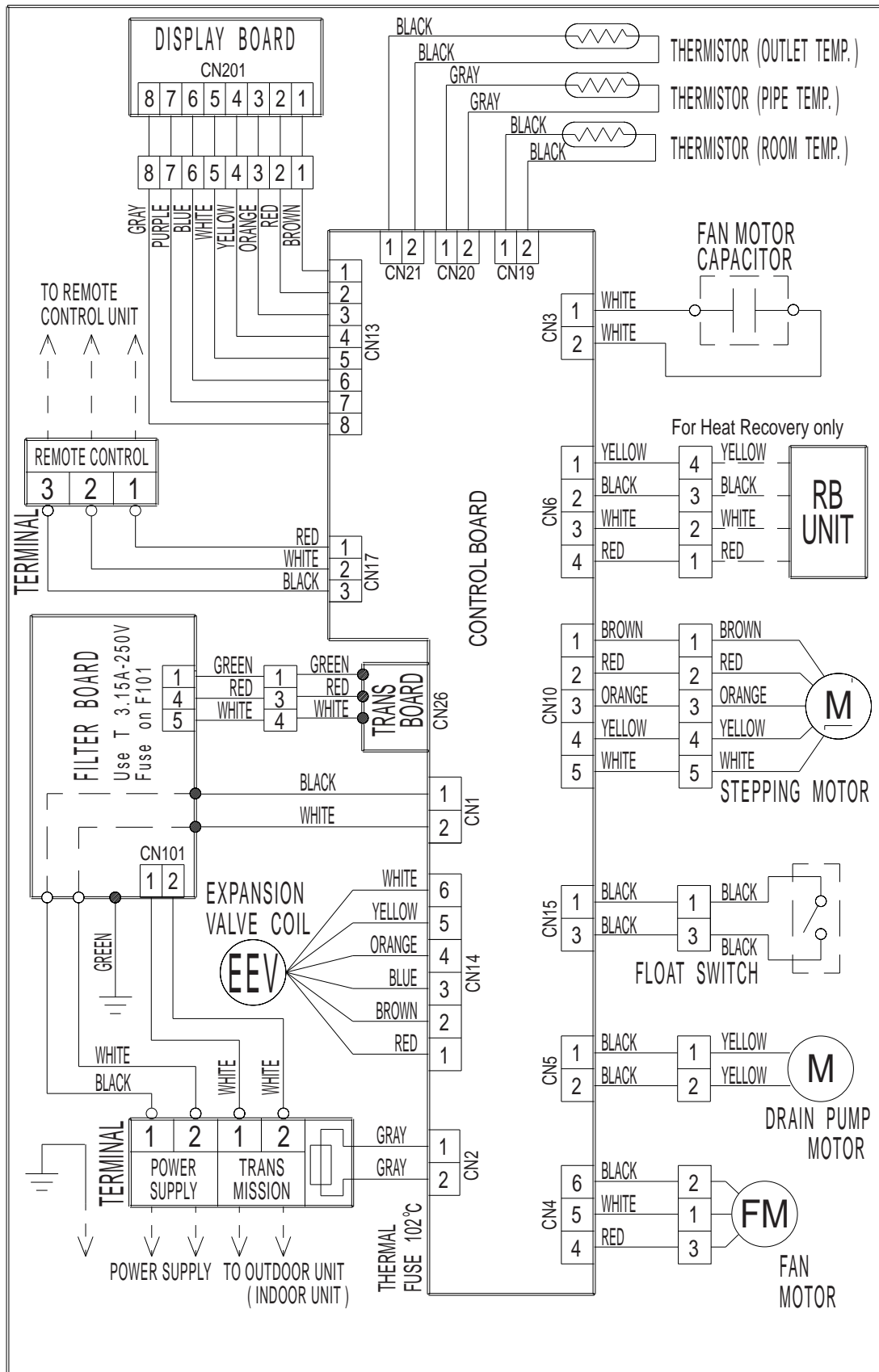


CASSETTE TYPE

■ MODELS : AU20, AU25, AU30

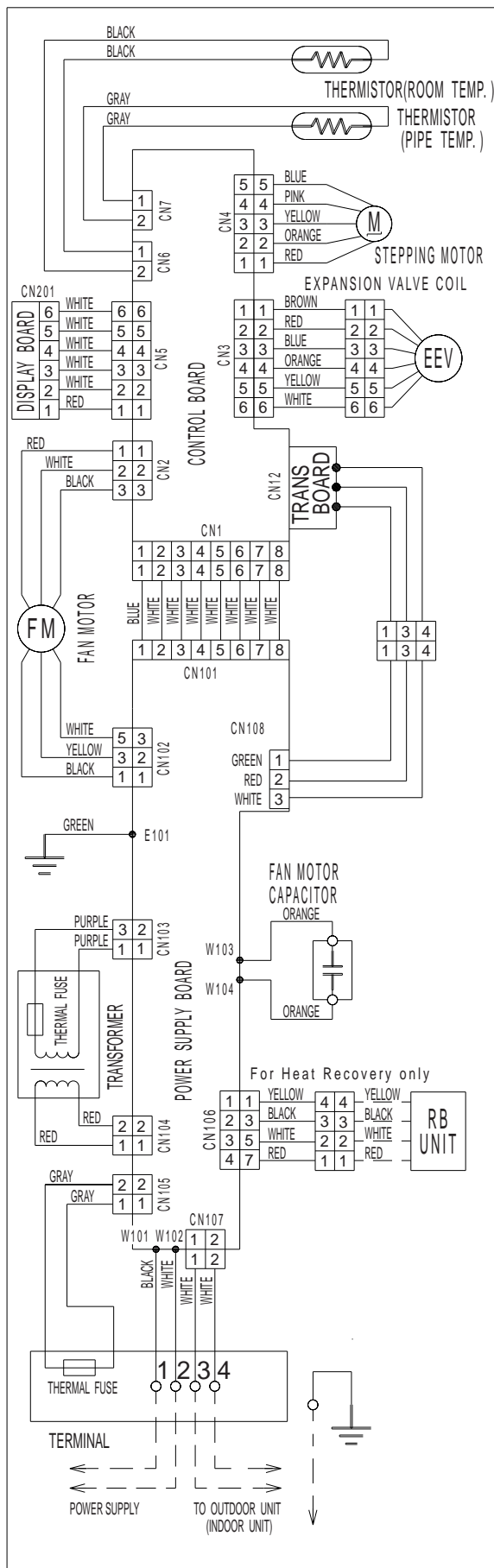


■ **MODELS : AU36, AU45, AU54**



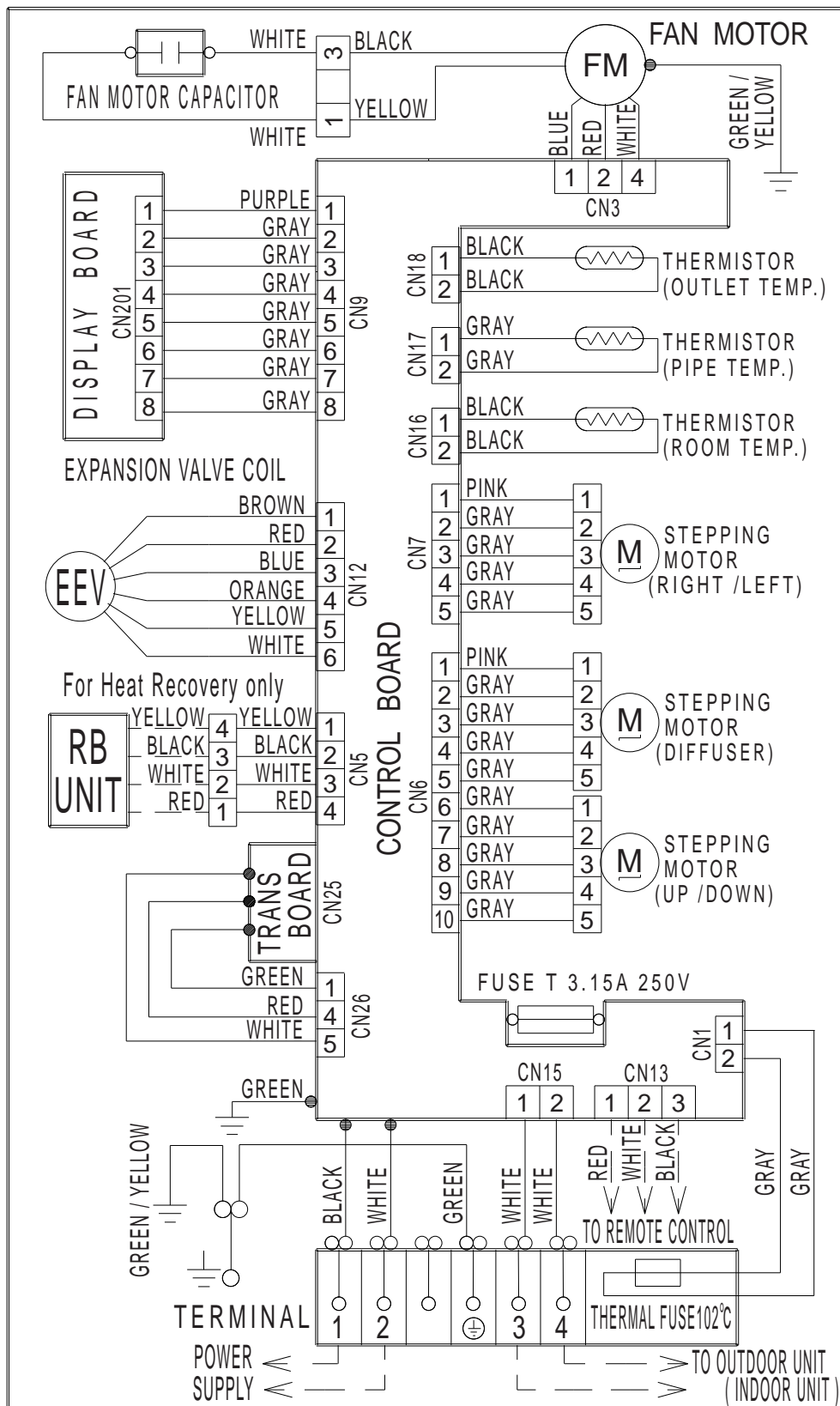
COMPACT WALL MOUNTED TYPE

■ MODELS : AS7,AS9,AS12,AS14



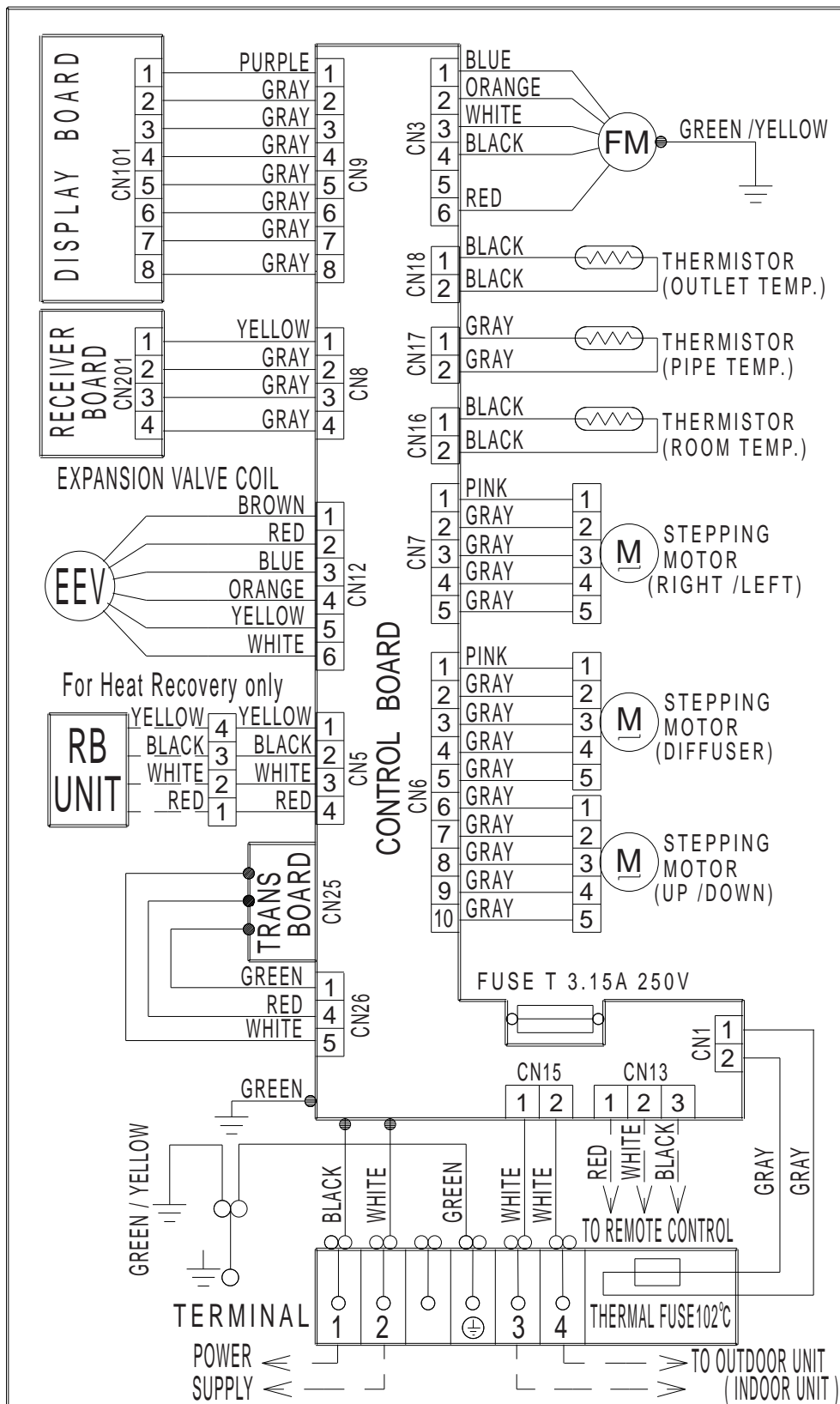
WALL MOUNTED TYPE

■ MODELS : AS18, AS24, AS30



CEILING WALL TYPE

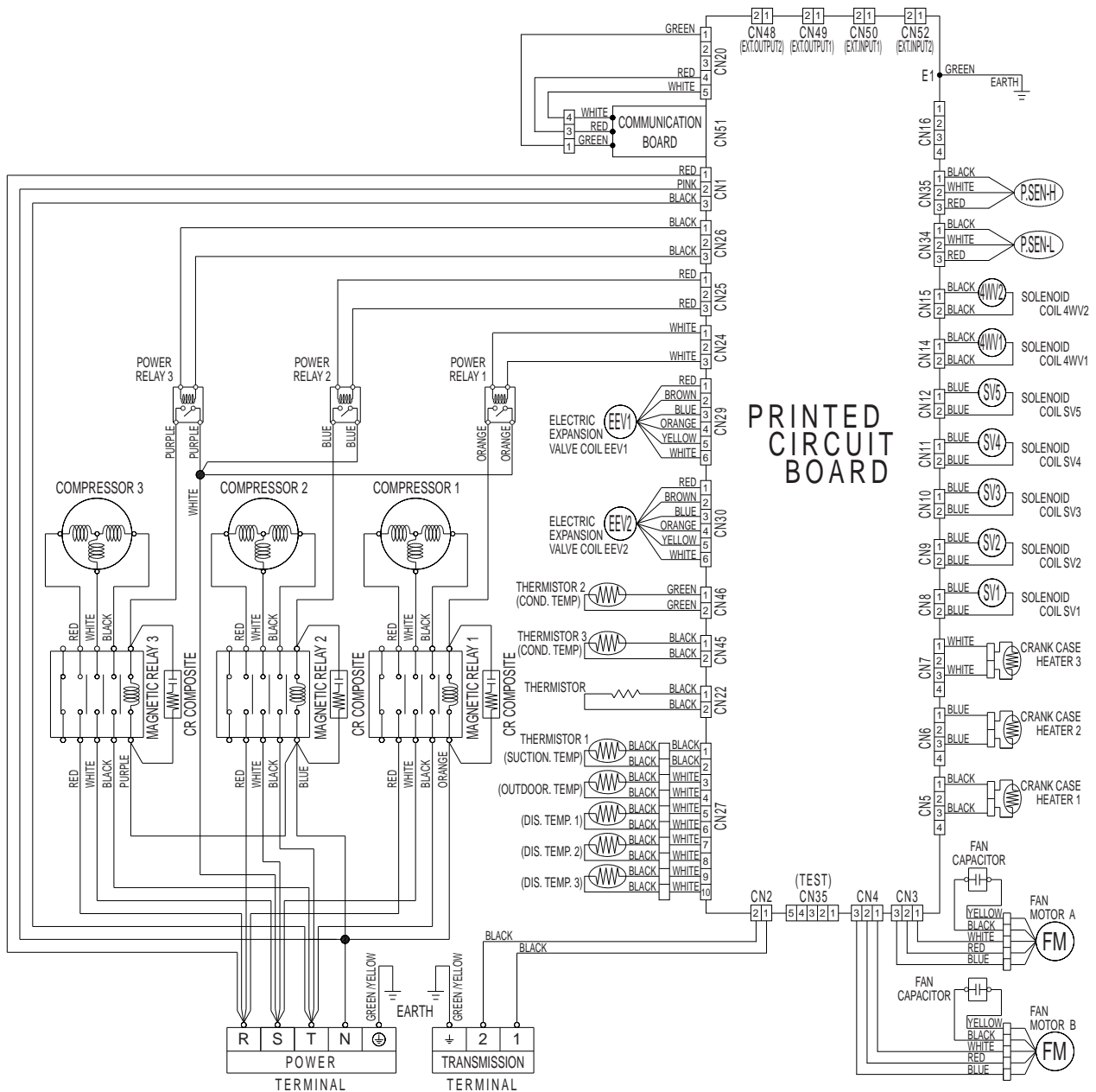
■ MODELS : AW7, AW9, AW14, AW18, AW24, AW30



7-3-2 OUTDOOR UNIT

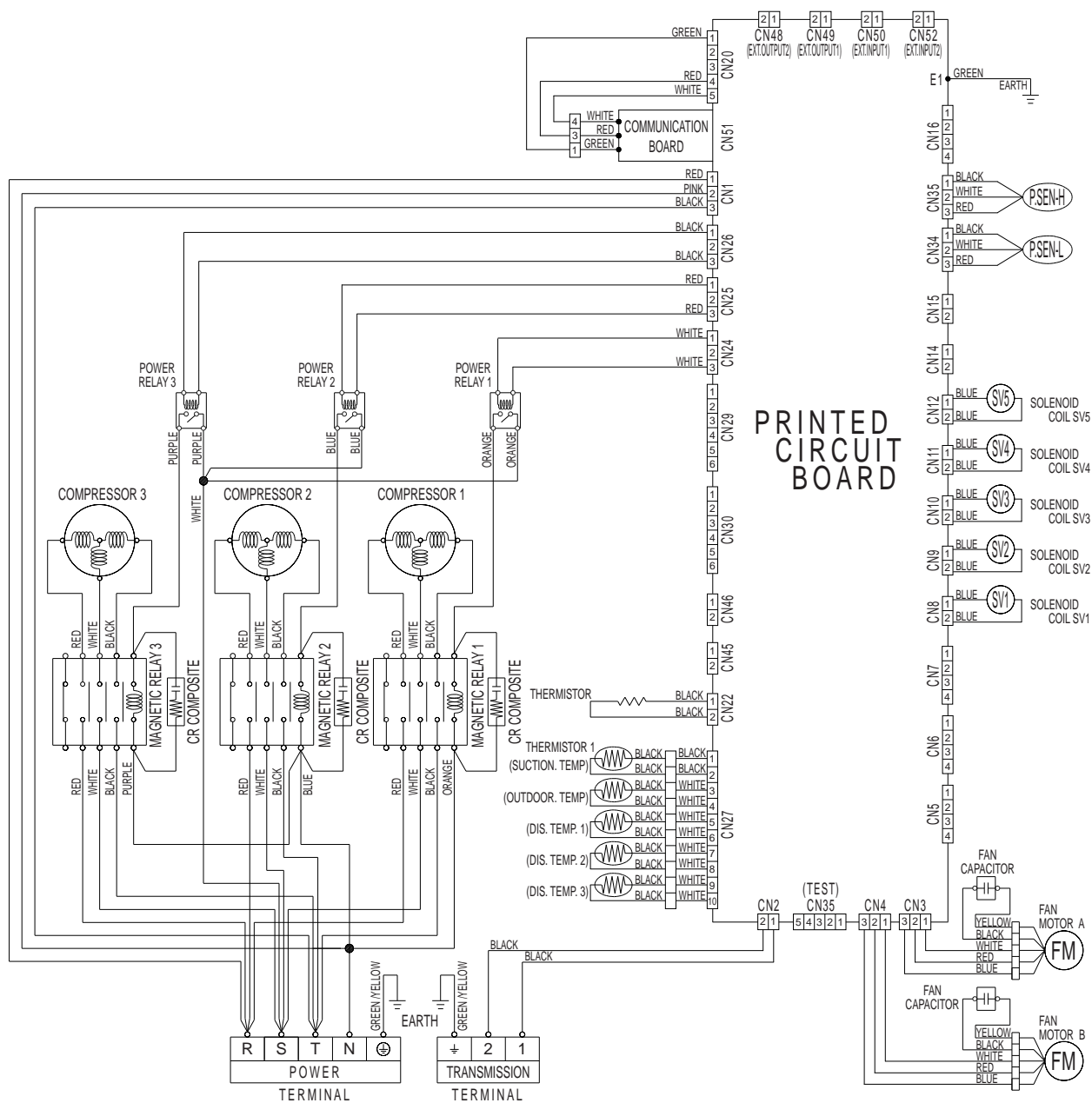
■ HEAT PUMP TYPE

MODEL : AO90RPBMF , AO72RPBMF
AO90RPCMF , AO72RPCMF



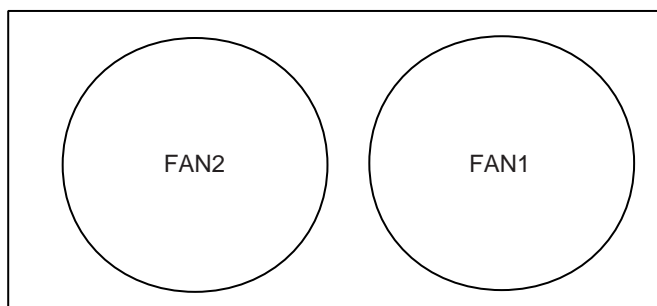
■ COOLING ONLY TYPE

MODEL : AO90APBMF , AO72APBMF

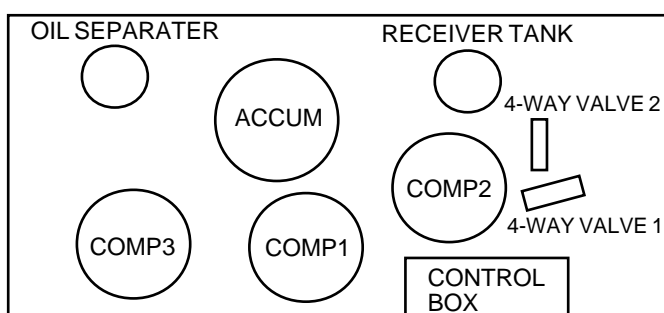


7-4 OUTDOOR INTERNAL LAYOUT

OUTDOOR UNIT INTERNAL LAYOUT



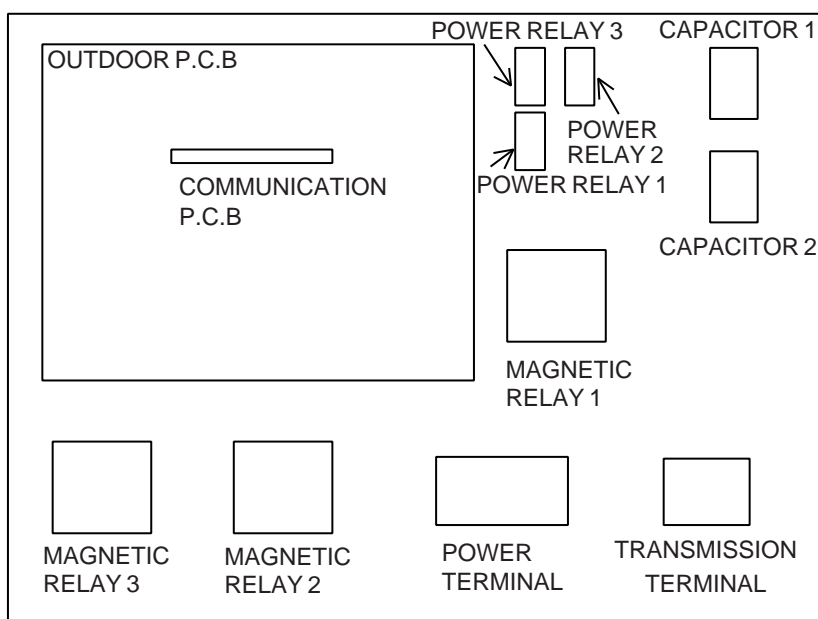
(FRONT)



(FRONT)

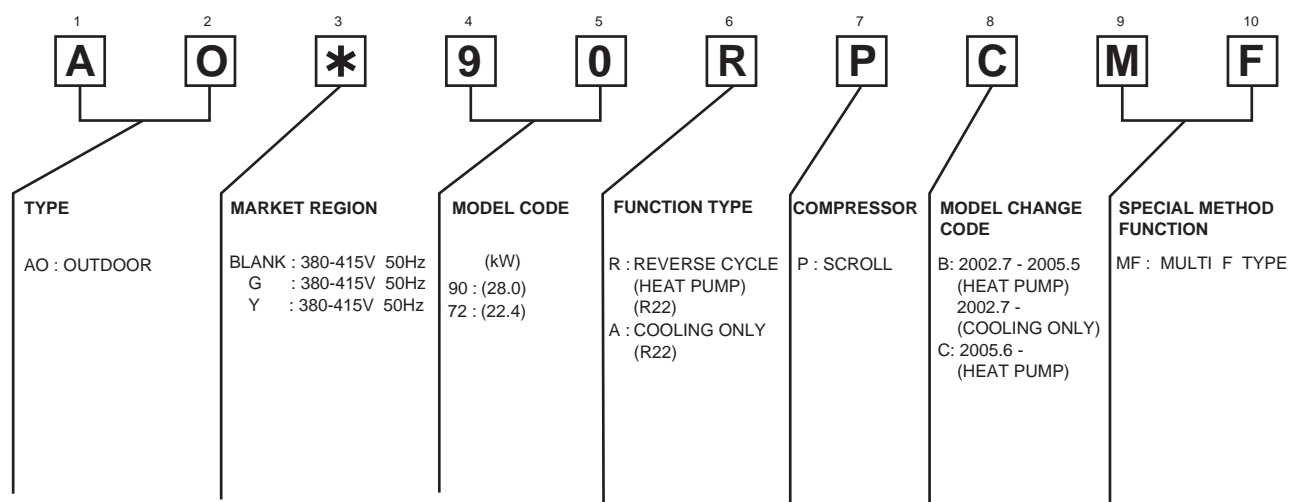
Note: 4-way valve1,2 are not used in cooling only type outdoor unit.

**OUTDOOR UNIT CONTROL BOX
INTERNAL LAYOUT**

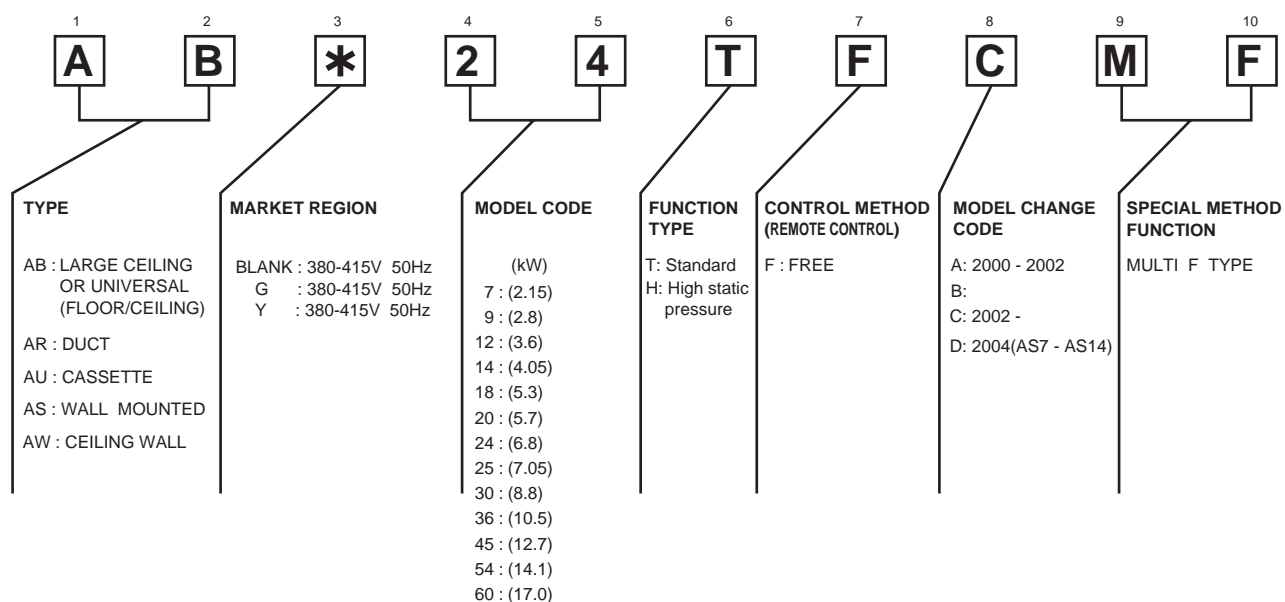


7-5 MODEL DESIGNATION

● OUTDOOR UNIT



● INDOOR UNIT



● REMARK

This manual corresponds to the model with following model change code.

	MODEL CHANGE CODE	
OUTDOOR UNIT	HEAT PUMP or COOLING ONLY	B
	HEAT PUMP	C
INDOOR UNIT	C, D	



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Product specifications are subject to change without notice.

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