

Multi Air Conditioning System for Buildings

VRF (FREELY SELECTABLE MULTI TYPE SYSTEM)

SERVICE MANUAL



FUJITSU GENERAL LIMITED

Multi Air Conditioning System for Buildings

VRF (FREELY SELECTABLE MULTI TYPE SYSTEM)

SERVICE MANUAL

CONTENTS

1. OUTLINE OF SYSTEM

1-1 MODEL CONSTRUCTION	5
1-2 SYSTEM CONSTRUCTION CONDITIONS	7
1-2-1 REFRIGERANT PIPING	7
1-2-2 SYSTEM WIRING	12
1-3 ADDRESS SETTING	13
(1) KINDS OF ADDRESS AND SETTING RANGE	13
(2) EXAMPLES OF SYSTEM SETTING	15

2. TEST RUN ADJUSTMENT

2-1 CHECK ITEMS BEFORE TEST RUN	19
2-2 TEST RUN METHOD	20
2-2-1 OUTDOOR PC BOARD	20
2-2-2 TEST OPERATION USING REMOTE CONTROLLER	20
2-3 TEST RUN CONTROL	22

3. REFRIGERANT PIPE SYSTEM DIAGRAM

3-1 COOLING ONLY / HEAT PUMP TYPE	23
3-2 HEAT RECOVERY TYPE	24

4. FUNCTION OF PRINTED CIRCUIT BOARD

4-1 PCB LAYOUTS	25
4-2 MICROPROCESSOR BLOCK DIAGRAM	26
4-3 MICROPROCESSOR FUNCTION LIST	28
4-4 FUNCTION AND SETTING OF EACH SWITCH	30
▪ INDOOR UNIT	30
▪ OUTDOOR UNIT	34
▪ REMOTE CONTROLLER	36

5. OUTDOOR UNIT OPERATION CONTROL

5-1 COMPRESSOR OPERATION CONTROL	43
5-1-1 OPERATION STOP CONDITION	43
5-1-2 COMPRESSOR OUTPUT PATTERN	43
5-1-3 3 MINUTES RESTART PREVENTION (3 MIN ST)	43
5-1-4 COMPRESSOR RECOVERY OPERATION	44
5-2 HEAT EXCHANGER CAPACITY CONTROL	45
5-3 OUTDOOR FAN MOTOR CONTROL	46
5-4 EXPANSION VALVE 1/2 CONTROL	48
5-5 FOUR-WAY VALVE 1 CONTROL	49
5-6 CIRCULATING SAVE AMOUNT CONTROL	50
5-7 SOLENOID VALVE 2 CONTROL	51
5-8 FOUR-WAY VALVE 5 CONTROL	52
5-9 DEFROSTING CONTROL	53
5-10 OIL RETURN CONTROL	54
5-11 OIL RECOVERY CONTROL	55
5-12 PROTECTION FUNCTION	56
5-13 PUMP DOWN CONTROL	57

6. INDOOR UNIT OPERATION	
6-1 TIMER CONTROL	59
6-2 FAN CONTROL	64
6-2-1 "AUTO" POSITION	64
6-2-2 "LOW" "MED" AND "HIGH" POSITION	64
6-3 MASTER CONTROL	65
6-3-1 OPERATION MODE CONTROL	65
6-3-2 "AUTO" POSITION	65
6-3-3 "COOL" POSITION	69
6-3-4 "HEAT" POSITION	69
6-3-5 "FAN" POSITION	70
6-4 LOUVER CONTROL	71
6-5 ELECTRONIC EXPANSION VALVE CONTROL	74
6-6 AUTO RESTART	74
6-7 DRAIN PUMP OPERATION	74
7. WIRING DIAGRAM	
▪ INDOOR UNIT	75
▪ OUTDOOR UNIT	83
8. TROUBLESHOOTING	
8-1 INDOOR UNIT	84
8-1-1 NORMAL OPERATION DISPLAY	84
8-1-2 ABNORMAL OPERATION DISPLAY	85
8-2 OUTDOOR UNIT	88
8-2-1 NORMAL OPERATING DISPLAY	88
8-2-2 ABNORMAL OPERATION DISPLAY	89
8-3 REMOTE CONTROL UNIT	90
8-4 ERROR CODE & TROUBLESHOOTING	91
INDOOR UNIT TROUBLESHOOTING	91
OUTDOOR UNIT TROUBLESHOOTING	96
CENTRAL REMOTE CONTROLLER TROUBLESHOOTING	109
8-4-1 TROUBLESHOOTING (NO ERROR CODE)	114
8-5 OTHERS	124
8-5-1 CHARACTERISTICS OF THERMISTOR	124
8-5-2 PRESSURE SENSOR	126
8-5-3 ELECTRIC EXPANSION VALVE	126
8-5-4 RB UNIT (HEAT RECOVERY TYPE ONLY)	126
8-5-5 OTHERS	126
9. IN USE OF THE NEW REFRIGERANT R407C	129
10. DISASSEMBLY ILLUSTRATION	134
11. PARTS LIST	173

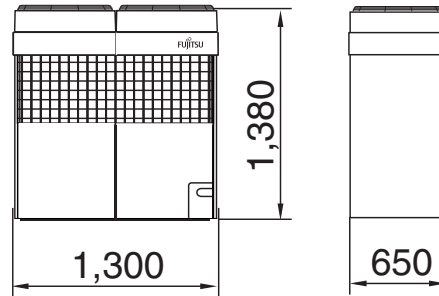
1. OUTLINE OF SYSTEM

1-1 MODEL CONSTRUCTION

OUTDOOR UNITS

TYPE	POWER SOURCE 3 PHASE 4 LINE	CAPACITY RANGE
COOLING ONLY	380~415V 50Hz	28.0 kW
HEAT PUMP	380~415V 50Hz	28.0 kW
HEAT RECOVERY	380~415V 50Hz	28.0 kW

- Compact size












- Serial installation possible



INDOOR UNITS

10 types, 39 models ranging from 2.15kW to 17.0kW.

○ : 2002~

Capacity		Type	Ceiling/ Floor	Ceiling	Duct	Duct	Duct	Duct (High Static Pressure)	Cassette (compact)	Cassette	Wall mounted	Wall mounted
		kw	Model code									
14.1 (17.0)	54 (60)			●				●		●		
12.7	45			●				●		●		
10.5	36			●				●		●		
8.8	30			●				●		●	●	
6.8 (7.05)	24 (25)	●						●		●	●	
5.3 (5.7)	18 (20)	●							●	●	●	
4.05	14	●							●		●	○
3.6	12	●							●			○
2.8	9				●				●			○
2.15	7				●				●			○

■ RB (REFRIGERANT BRANCH) UNIT

Model	Max. connectable indoor units
UTF-Y90A4A	4
UTF-Y54A1A	1

※ Above units are required during heat recovery operation.

■ SEPARATION TUBE

Type	Model	Total model code of connectable indoor unit
Cooling only Heat pump	UTR-BP54A	Less than 60
	UTR-BP90A	More than 61 or more
Heat recovery	UTR-BP54R	Less than 60
	UTR-BP90R	More than 61 or more

■ HEADER

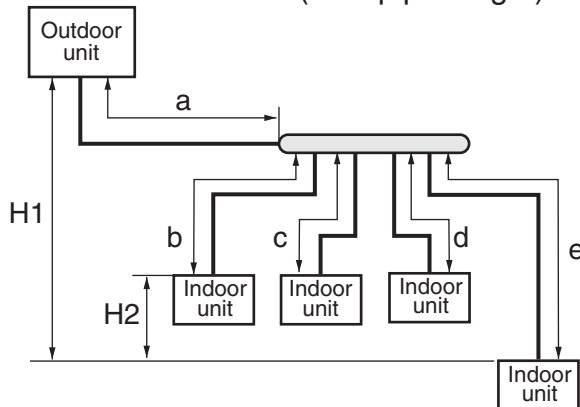
Type	Model	Connectable indoor units
Cooling only Heat pump	UTR-HD906A	3 ~ 6
	UTR-HD908A	7 ~ 8
Heat recovery	UTR-HD906R	3 ~ 6
	UTR-HD908R	7 ~ 8

1-2 SYSTEM CONSTRUCTION CONDITIONS

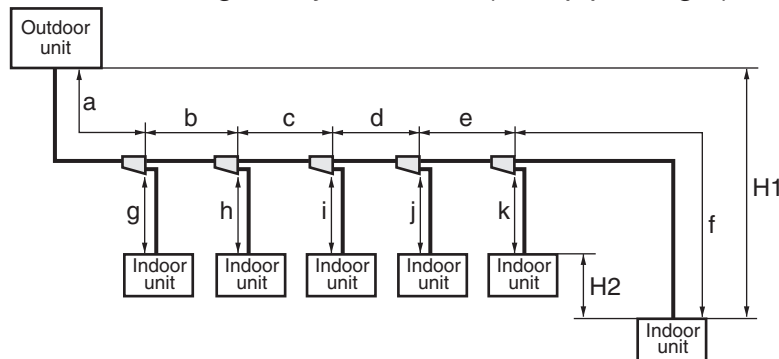
1-2-1 REFRIGERANT PIPING

■ COOLING ONLY / HEAT PUMP MODEL

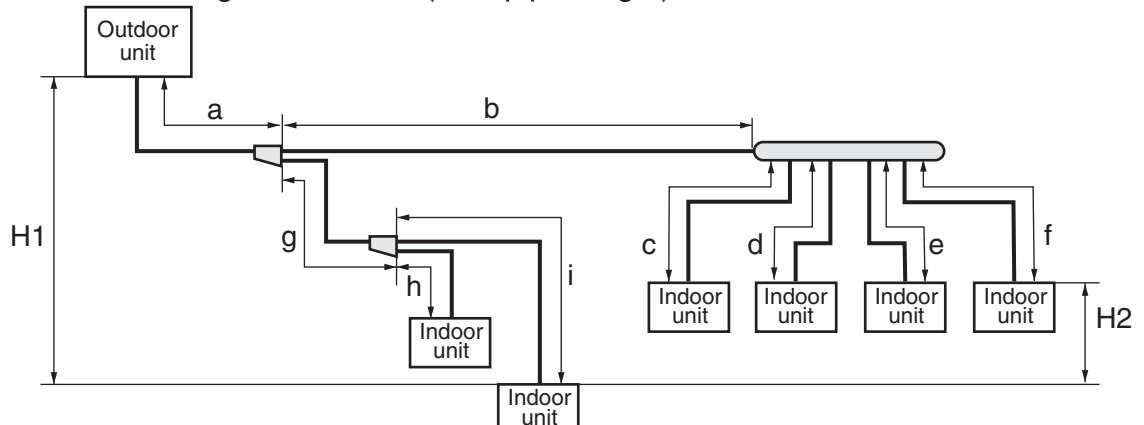
- $a+e \leq 100\text{m}$ (actual pipe length)
- Difference in height between outdoor unit and indoor units ($H1$) maximum 50m.
(For the outdoor unit stated below: maximum 40m)
- Difference in height between adjacent indoor units ($H2$) maximum 15m.
- $e \leq 40\text{m}$ (actual pipe length)
- $a \leq 70\text{m}$ (actual pipe length)
- $a+b+c+d+e \leq 200\text{m}$ (total pipe length)



- $a+b+c+d+e+f \leq 100\text{m}$ (actual pipe length)
- Difference in height between outdoor unit and indoor units ($H1$) maximum 50m.
- Difference in height between adjacent indoor units ($H2$) maximum 15m.
- From outdoor unit to first separation tube $a \leq 70\text{m}$ (actual pipe length)
- $b+c+d+e+f \leq 40\text{m}$ (actual pipe length)
- $a+b+c+d+e+f+g+h+i+j+k \leq 200\text{m}$ (total pipe length)



- $a+g+i \leq 100\text{m}$ $a+b+f \leq 100\text{m}$ (actual pipe length)
- Difference in height between outdoor unit and indoor units ($H1$) maximum 50m.
- Difference in height between adjacent indoor units ($H2$) maximum 15m.
- $a \leq 70\text{m}$ (actual pipe length)
- $g+i \leq 40\text{m}$ $b+f \leq 40\text{m}$ (actual pipe length)
- $a+b+c+d+e+f+g+h+i \leq 200\text{m}$ (total pipe length)



PIPE SIZE

COOLING ONLY / HEAT PUMP MODEL

- Pipe size connected to outdoor unit.

(unit : mm)

Model	Gas Pipe	Liquid Pipe
AO 90	φ 28.58	φ 12.7

- Between two adjacent refrigerant branch kits.

(unit : mm)

Total model code of indoor unit	Gas Pipe	Liquid Pipe	Separation Kit
Less than 30	φ 15.88	φ 9.53	UTR-BP54A
31 or more to 60	φ 19.05	φ 9.53	
61 or more	φ 28.58	φ 12.7	UTR-BP90A

- Connection pipe size of indoor unit.

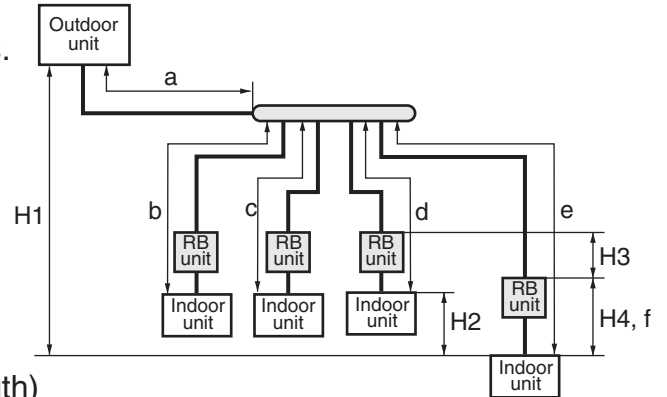
(unit : mm)

Model code of indoor unit	Gas Pipe	Liquid Pipe
7, 9	φ 9.53	φ 6.35
12, 14 ※(18)	φ 12.7	φ 6.35
18, 20, 24, 25	φ 15.88	φ 6.35
30	φ 15.88	φ 9.53
36, 45, 54, 60	φ 19.05	φ 9.53

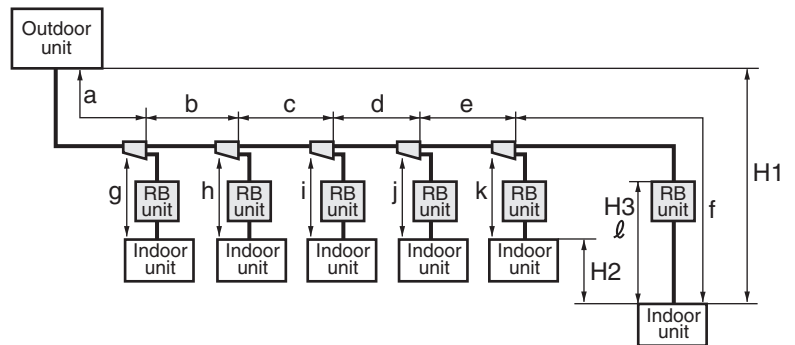
※ Cassette(compact) only

HEAT RECOVERY MODEL

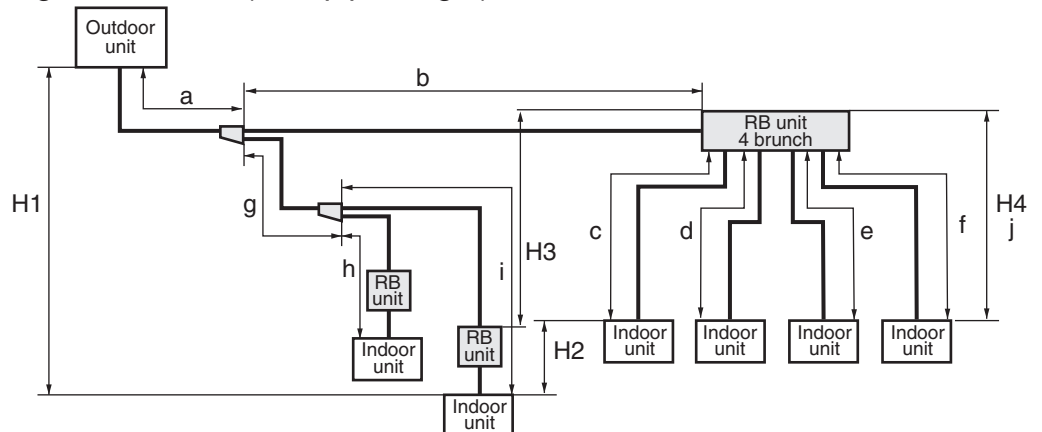
- $a+e \leq 100\text{m}$ (actual pipe length)
- Difference in height between outdoor unit and indoor units ($H1$) maximum 50m. (For the outdoor unit stated below : maximum 40m)
- Difference in height between adjacent indoor units ($H2$) maximum 15m.
- Difference in height between RB unit and RB unit ($H3$) 15m or less.
- Difference in height between RB unit and indoor unit ($H4$) 5m or less.
- $e \leq 40\text{m}$ (actual pipe length)
- $f \leq 10\text{m}$ (actual pipe length)
- $a+b+c+d+e \leq 200\text{m}$ (total pipe length)



- $a+b+c+d+e+f \leq 100\text{m}$ (actual pipe length)
- Difference in height between outdoor unit and indoor units ($H1$) maximum 50m.
- Difference in height between adjacent indoor units ($H2$) maximum 15m.
- Difference in height between RB unit and indoor unit ($H3$) 5m or less.
- From outdoor unit to first separation tube $a \leq 70\text{m}$ (actual pipe length)
- $b+c+d+e+f \leq 40\text{m}$ (actual pipe length)
- $l \leq 10\text{m}$ (actual pipe length)
- $a+b+c+d+e+f+g+h+i+j+k \leq 200\text{m}$ (total pipe length)



- $a+g+i \leq 100\text{m}$ $a+b+f \leq 100\text{m}$ (actual pipe length)
- Difference in height between outdoor unit and indoor units ($H1$) maximum 50m.
- Difference in height between adjacent indoor units ($H2$) maximum 15m.
- Difference in height between RB unit and RB unit ($H3$) 15m or less.
- Difference in height between RB unit and indoor unit ($H4$) 5m or less.
- $g+i \leq 40\text{m}$ $b+f \leq 40\text{m}$ (actual pipe length)
- $j \leq 10\text{m}$ (actual pipe length)
- $a+b+c+d+e+f+g+h+i \leq 200\text{m}$ (total pipe length)



HEAT RECOVERY MODEL

- Pipe size connected to outdoor unit.

(unit : mm)

Model	Suction Gas Pipe	Discharge Gas Pipe	Liquid Pipe
AO 90	φ 28.58	φ 19.05	φ 12.7

- Between two adjacent refrigerant branch kits.

(unit : mm)

Total model code of indoor unit	Suction Gas Pipe	Discharge Gas Pipe	Liquid Pipe	Separation Kit
Less than 30	φ 15.88	φ 12.7	φ 9.53	UTR-BP54R
31 or more to 60	φ 19.05	φ 15.88	φ 9.53	
61 or more	φ 28.58	φ 19.05	φ 12.7	UTR-BP90R

- Connection pipe size of indoor unit.

(unit : mm)

Model code of indoor unit	Gas Pipe	Liquid Pipe
7, 9	φ 9.53	φ 6.35
12, 14	φ 12.7	φ 6.35
18, 20, 24, 25	φ 15.88	φ 6.35
30	φ 15.88	φ 9.53
36, 45, 54, 60	φ 19.05	φ 9.53

ADDITIONAL CHARGE

- Up to a pipe length of 7.5 m, charging with additional refrigerant is not necessary.
- If the pipe length exceeds 7.5 m, charging with refrigerant is necessary.
- Charge with additional refrigerant in the amounts shown in the table below.

(1) Pipe length

Liquid pipe (mm)	φ 12.7	φ 9.53	φ 6.35
Additional refrigerant (R407C) (kg/m)	0.1	0.05	0.03

(2) System type

It is necessary to add refrigerant to all connected Indoor unit.

Add refrigerant to the corresponding type as shown in the Table for every connected Indoor unit to the refrigerant system.

Example : When AR30 x2 and AU18 x2 are connected to the refrigerant system.

" Additional charge of system type" is $1.0(\text{kg}) \times 2 + 0.65(\text{kg}) \times 2 = 3.3(\text{kg})$

Model / Model code	7	9	12	14	18	20	24/25	30	36	45	54	60
AS	—	—	—	0.9	—	0.9	0.9	0.9	—	—	—	—
AU	0.65	0.65	0.65	0.65	0.65	0.8	0.8	0.8	1.5	1.5	1.5	—
AB	—	—	0.65	0.65	0.65	—	1.0	1.0	1.0	1.0	1.0	—
AR	0.4	0.4	0.45	0.45	0.7	—	1.0	1.0	2.0	2.0	—	2.0

amount of refrigerant (kg)

ADDITIONAL CHARGE = (1) + (2)

1-2-2 SYSTEM WIRING

Use		Size		Wire type	Remarks	
Power supply cable (mm ²)	Outdoor unit	Maximum	8.0	H07RN-F or equivalent	3 ϕ 4 wire 50Hz 380-415V	※1
		Minimum	6.0			
	Indoor unit	Maximum	2.5	H07RN-F or equivalent	1 ϕ 2 wire 50Hz 220-240V	※2
		Minimum	1.5			
Transmission cable (mm ²)		Maximum	1.25	Shield cord (LONWORKS compatible part)	Non-polar 2-core	※3
		Minimum	0.75			
Wired remote control cable (mm ²)		Maximum	1.25	Sheathed vinyl cord cable	Polar 3-core	※4
		Minimum	0.75			

※1,2 The grounding wire is not included in this cable.

Always ground the unit.

※3 Do not bundle the transmission cable with other wires.

Transmission cable between each unit : 200m max

※ Each unit means indoor unit, outdoor unit, central remote controller, and signal amplifier.

Total wiring length: maximum 2000m.

However, when wiring exceeds 500m in length,

a signal amplifier (option) is required.

Use the shielded wire specified and always ground (however, one side only).

If not, transmit-receive with a transmission line is not only impossible normally, but malfunction may occur.

※4 10m cable attached.

Use the shielded cable in accordance with standards in the country.

Wiring length of a remote controller group shall be within 500m.

Fuse capacity	Model	Field fuse	Leakage breaker
	Outdoor unit	40A ※5	40A 100mA 0.1sec or less
	Indoor unit	20A ※6	20A 40mA 0.1sec or less

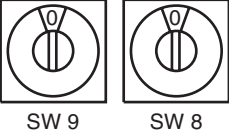
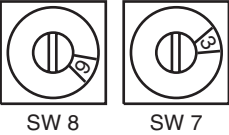


※5 per one outdoor unit

※6 per one refrigerant system.

1-3 ADDRESS SETTING

This system is needed to set the address for the indoor unit, outdoor unit and remote controller and central remote controller.

(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	Show next page
Indoor unit	Refrigerant circuit address	0~99	Setting example 63  SW 8 SW 7	
	Indoor unit address	0~15	Setting example 2  SW 5	
	Remote controller address	0~15	Setting example 0  SW 9	
Remote controller	Remote controller switch 1	ON/OFF	DIP SW1-1	Terminator
	Number of indoor unit connection	ON/OFF	DIP SW1-2	Number of indoor unit OFF : 1 unit ON : multiple unit
	Remote controller switch 2	ON/OFF combination	DIP SW1-4	Shown below
Central remote controller	Central remote controller address	0 ~15	Initial setting	

INDOOR UNIT CONTROL METHOD

DSW1-4	METHOD	REMARKS
OFF	Master	Allocate remote control addresses by order from the master unit
ON	Slave	

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 7) - - Factory setting "0"

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

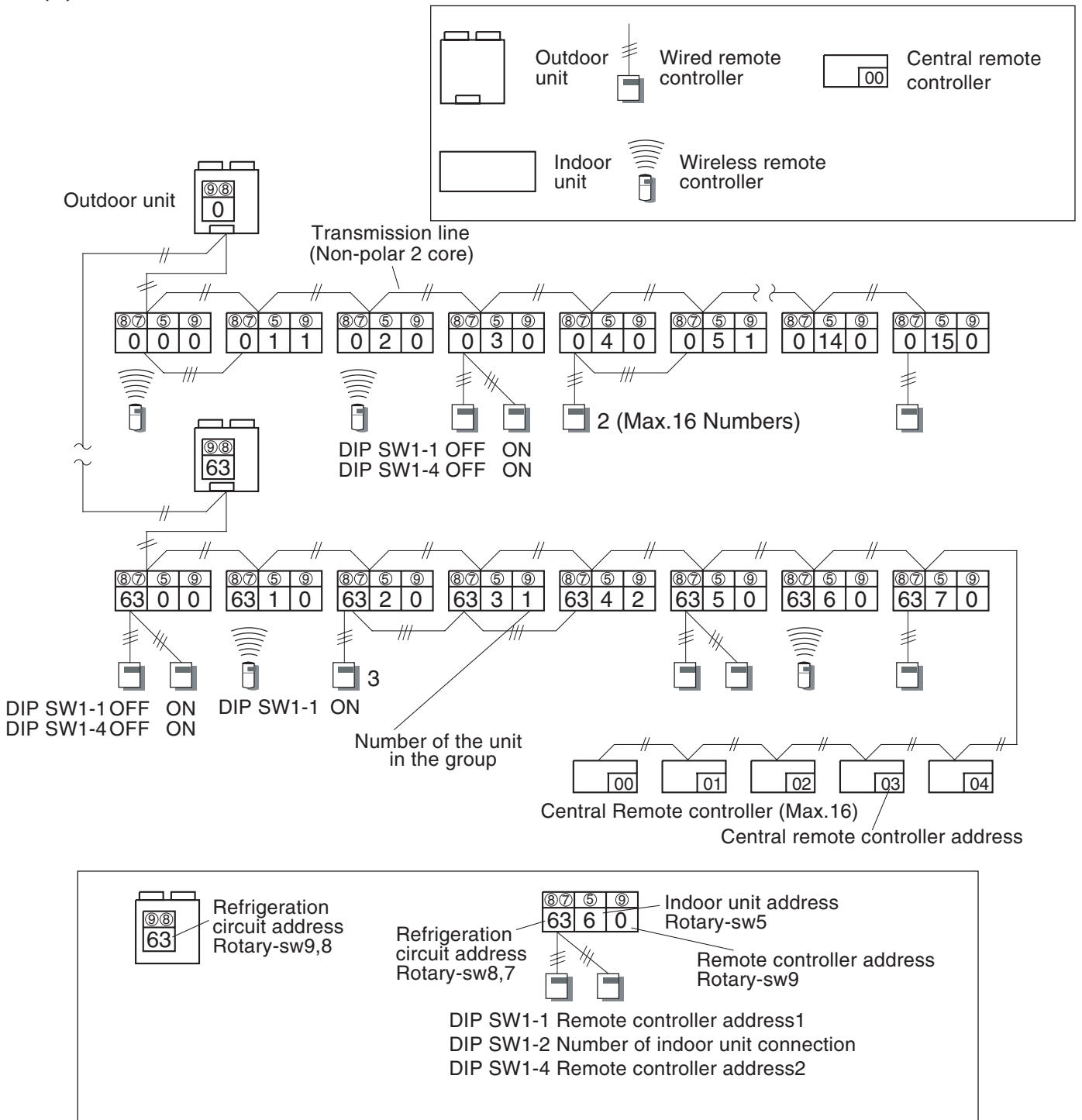
In case of multiple refrigerant system, set SW 8 and SW 9 Indoor unit SW7 and SW8 as shown in the table for each refrigerant system.

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	
	OUTDOOR UNIT			OUTDOOR UNIT			OUTDOOR UNIT			OUTDOOR UNIT			OUTDOOR UNIT	
	SW9	SW8		SW9	SW8		SW9	SW8		SW9	SW8		SW9	SW8
	INDOOR UNIT			INDOOR UNIT			INDOOR UNIT			INDOOR UNIT			INDOOR UNIT	
	SW8	SW7		SW8	SW7		SW8	SW7		SW8	SW7		SW8	SW7
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	62	3	14	82	5	2
3	0	3	23	1	7	43	2	11	63	3	15	83	5	3
4	0	4	24	1	8	44	2	12	64	4	0	84	5	4
5	0	5	25	1	9	45	2	13	65	4	1	85	5	5
6	0	6	26	1	10	46	2	14	66	4	2	86	5	6
7	0	7	27	1	11	47	2	15	67	4	3	87	5	7
8	0	8	28	1	12	48	3	0	68	4	4	88	5	8
9	0	9	29	1	13	49	3	1	69	4	5	89	5	9
10	0	10	30	1	14	50	3	2	70	4	6	90	5	10
11	0	11	31	1	15	51	3	3	71	4	7	91	5	11
12	0	12	32	2	0	52	3	4	72	4	8	92	5	12
13	0	13	33	2	1	53	3	5	73	4	9	93	5	13
14	0	14	34	2	2	54	3	6	74	4	10	94	5	14
15	0	15	35	2	3	55	3	7	75	4	11	95	5	15
16	1	0	36	2	4	56	3	8	76	4	12	96	6	0
17	1	1	37	2	5	57	3	9	77	4	13	97	6	1
18	1	2	38	2	6	58	3	10	78	4	14	98	6	2
19	1	3	39	2	7	59	3	11	79	4	15	99	6	3

(2) SETTING EXAMPLE

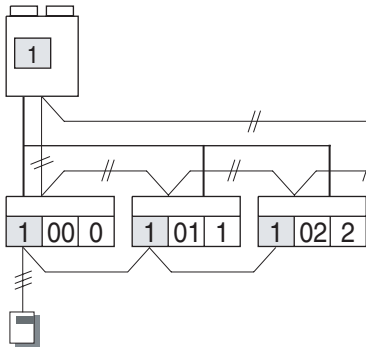


※ Instructions for setting up the address

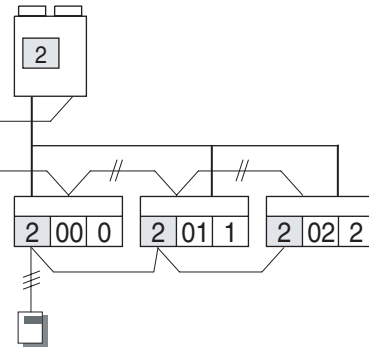
- 1 The refrigerant system address of the indoor and outdoor units can be set to optional numbers in the range of 0 and 99.
- 2 Address of the indoor unit can be set to optional numbers in the range of 0 to 15.
- 3 Set address of the remote controller in the order of 0,1,2,...15.(Blank is impossible)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



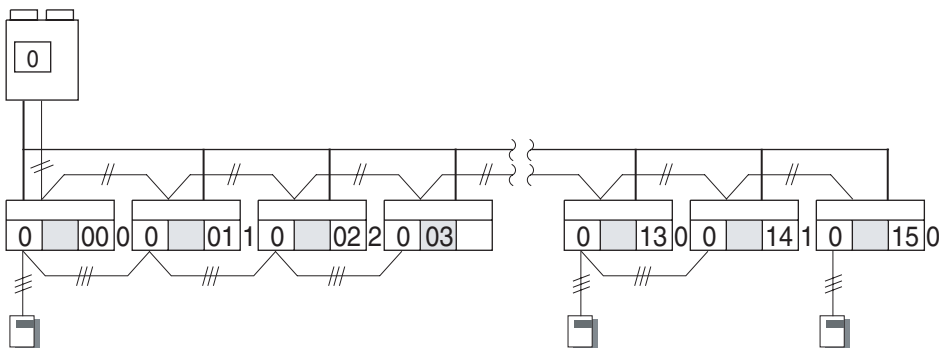
Refrigerant circuit 2



Outdoor unit PCB (Address setting No.0 ~ 99)
Setting by rotary SW8,9

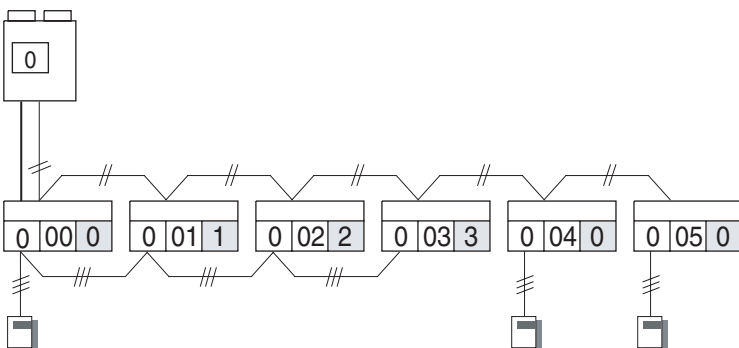
Indoor unit PCB (Address setting No.0 ~ 99)
Setting by rotary SW7,8

- ③ Indoor unit address



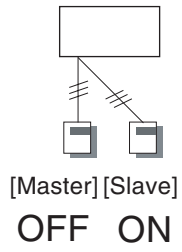
Indoor unit PCB (Address setting No. 0 ~ 15)
Setting by rotary SW5

- ④ Remote controller address (Indoor unit)



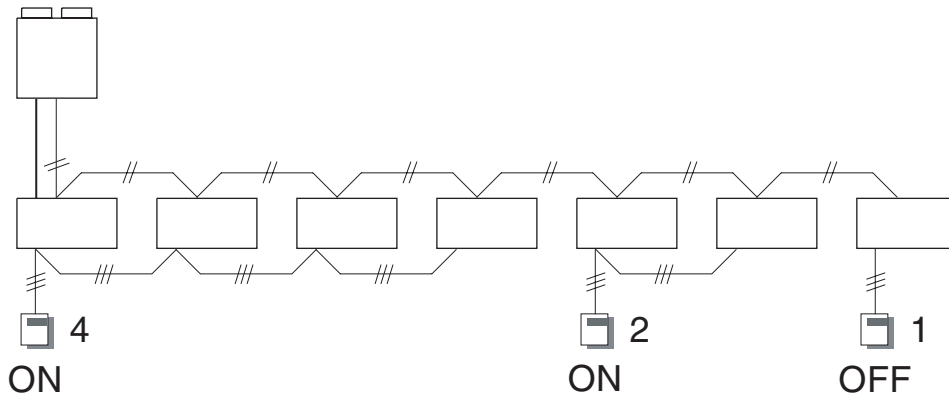
Indoor unit PCB (Address setting No.0 ~ 15)
Setting by rotary SW9

⑤ Remote controller switch 1



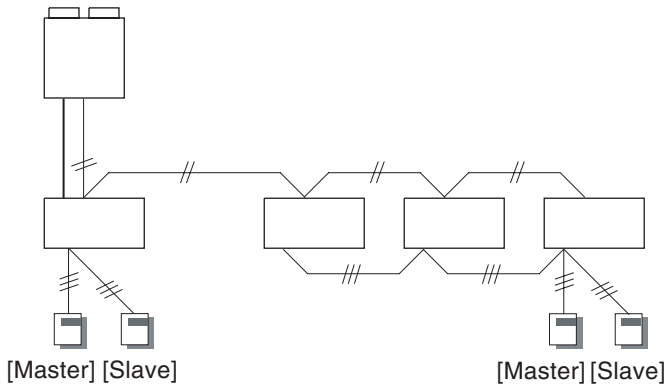
Remote controller unit PCB
Setting by DIP SW 1-1

⑥ No. indoor unit connection



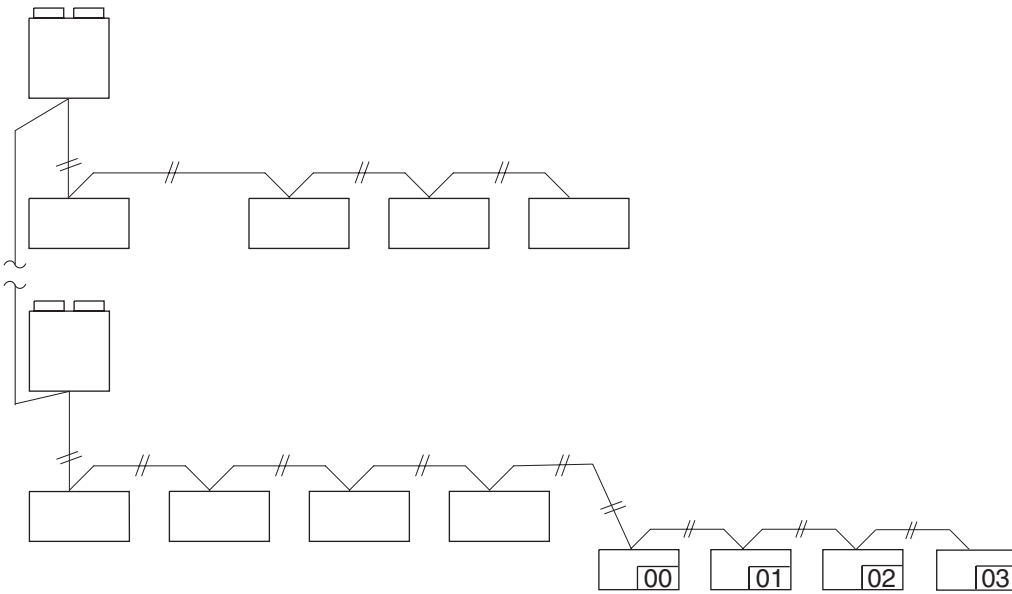
Remote controller PCB
Setting by DIP SW 1-2

⑦ Remote controller switch 2
(Remote controller)



Remote controller unit PCB
Setting by DIP SW 1-4

⑧ Central remote controller address



Central remote controller (Max.16)

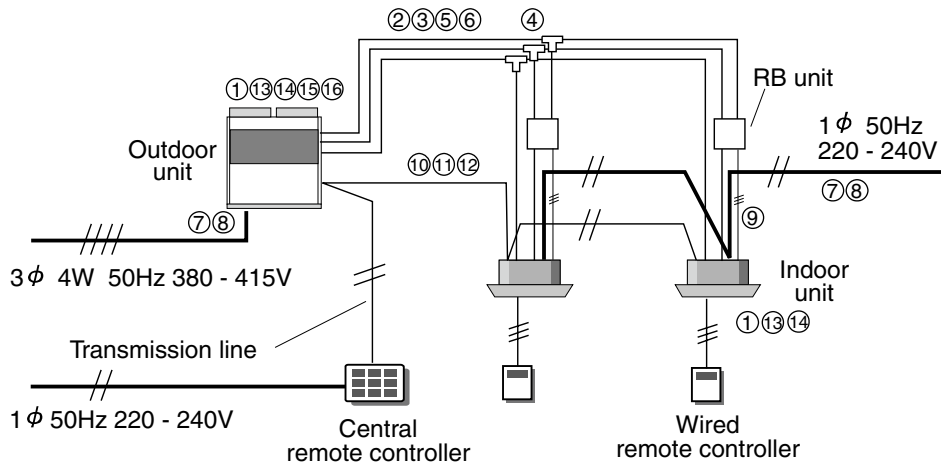
- Set central remote controller address first, to conduct the initial setting of it.

2. TEST RUN

2-1 CHECK ITEMS BEFORE TEST RUNNING

Before test running, check the following items.

Note: RB unit (⑨) is for the heat recovery type.



- ① Is the selection of the outdoor unit and the indoor unit correct?
(Maximum operating indoor unit, total capacity of the indoor unit)
- ② Is the piping length correct?
(Ex. Maximum piping length : 100m)
- ③ Is the diameter of the pipe selected correct?
- ④ Is the separate selected correct?
- ⑤ Doesn't gas leak?
- ⑥ Is the refrigerant flow correct?
- ⑦ Are the power supplies connected?
(Power supply for the indoor unit and outdoor unit is separated.)
- ⑧ Is the spec. for the power supply cable correct?
- ⑨ Is the RB unit cable connected?
- ⑩ Is the length of the transmission line under the limit?
- ⑪ Is the spec. for the transmission cable correct?
(non-polar 2-core, 0.75-1.25mm²)
- ⑫ Is the transmission cable connected to all units?
- ⑬ Are the addresses set? (Ex. Refrigerant circuit address, indoor unit address, remote controller address, etc.)
- ⑭ Have the all settings done on the PCB?
- ⑮ Is the refrigerant valve opened?
- ⑯ Is the power supplied to crank case heater for 12 hours before winter operation?

2-2 TEST RUNNING METHOD

Supply power to the crankcase heater for 12 hours prior to the start of operation in the winter.
The following is the procedure for the test operation.

2-2-1 OUTDOOR PC BOARD

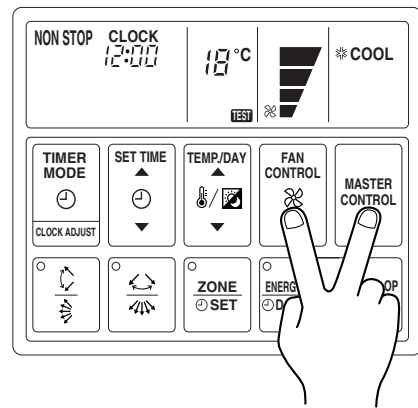
If the test operation is to be done for cooling operation, set DIP switch (SW-1-1) to on. If the test operation is to be done for heating, set DIP switch (SW1-2) to on.

2-2-2 TEST OPERATION USING REMOTE CONTROLLER

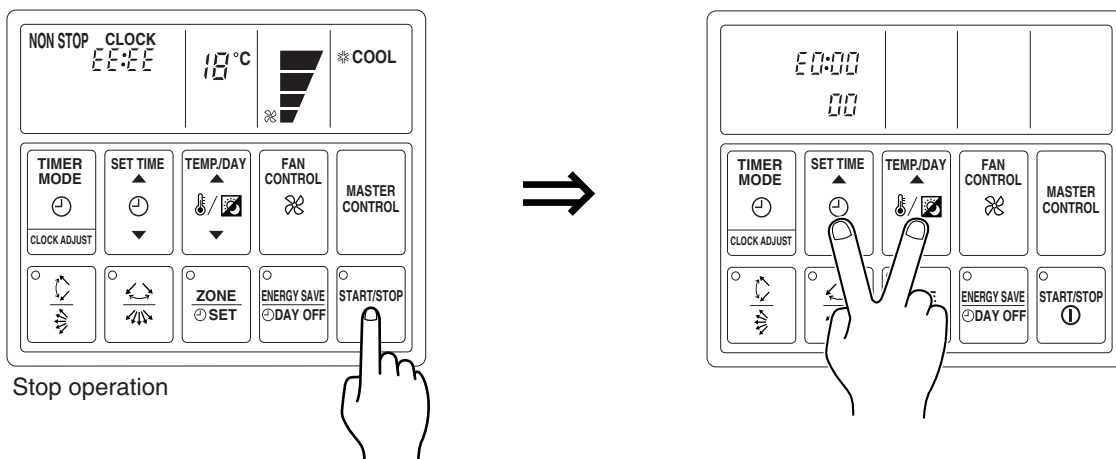
(1) Standard wired remote controller

For test running, when the remote controller FAN CONTROL button and MASTER CONTROL button are pressed simultaneously for more than three seconds when the air conditioner is not running, the air conditioner starts and TEST is displayed on the remote controller display.

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



•When EE : EE blinks at the current time display, there is an error inside the air conditioner. If the SET TIME button (▼) and SET TEMP. DAY button (▼) are pressed simultaneously for more than three seconds, the self diagnosis check will start and the error contents will be displayed at the current time display. In addition, the remote controller address will be displayed below. When the operation lamp lights, press the START/STOP button and after operation lamp goes off, perform the same operation.



Error Code	Error contents
E:00	No error
E:02	Model information abnormal
E:04	Power supply frequency abnormal
E:05	EEPROM access error
E:07	EEPROM elimination error
E:09	Room temperature thermistor error
E:0A	Indoor unit heat exchange thermistor (middle) error
E:0b	Indoor unit heat exchange thermistor (inlet) error
E:0c	Indoor unit heat exchange thermistor (exit) error

Error Code	Error contents
E:0d	Blower temperature thermistor error
E:11	Drain abnormal
E:12	Room temperature abnormal
E:13	Indoor unit fan error
E:1F	Communication error
E:20	Node setting error
E:21	Parallel communication error
E:32	Outdoor unit error

- To stop test running, press the START/STOP button.
- 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 running.

(2) Standard wireless remote controller

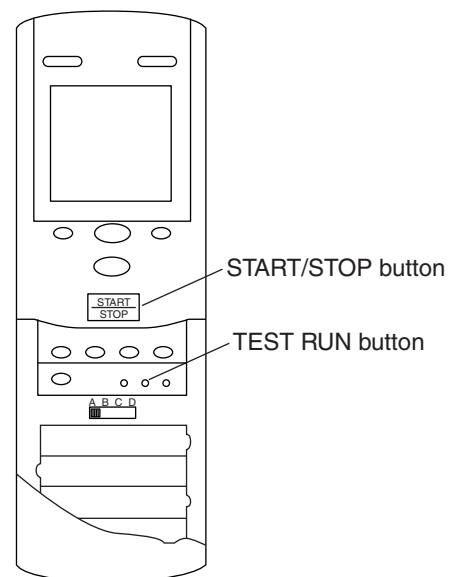
- Press the remote control unit test run button while the air conditioner is running.
- At the end of test running, press the remote control unit start-stop button.

Operation can be checked by lighting and flashing of the display section OPERATION and TIMER lamps.
Perform judgment in accordance with the following.

- Test running

When the air conditioner is run by pressing the remote control unit test run button, the OPERATION and TIMER lamps flash slowly at the same time.

Remote control unit



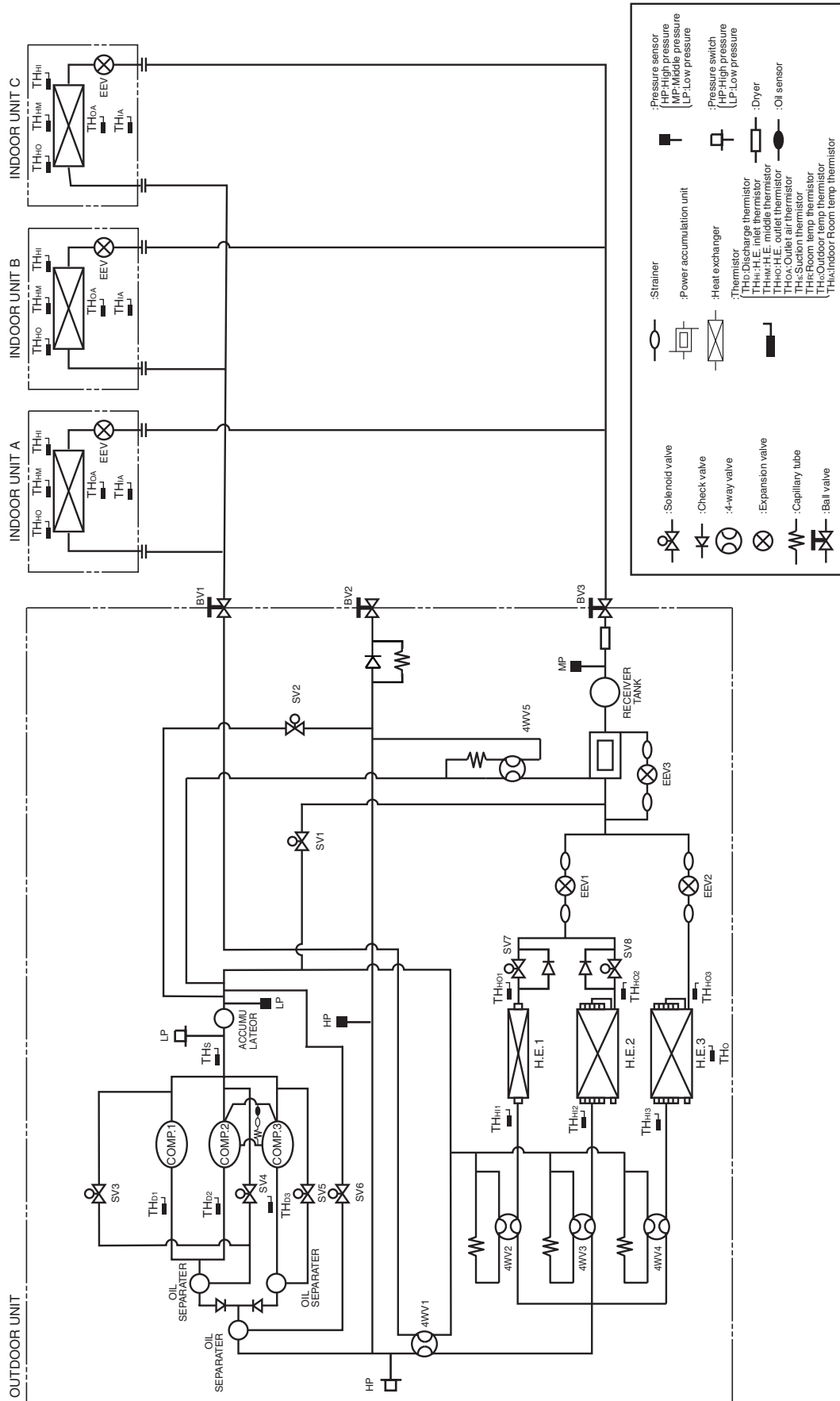
2-3 TEST RUN CONTROL

- 1) When the test run signal is transmitted from the standard wired remote controller, the wireless remote controller and the central remote controller.
 - (1) In the test running status, operated in accordance with the setting of each switch besides the room temperature switch. The room temperature adjustment does not function, and then the electric expansion valve is controlled with maximum flow.
 - (2) De-frosting and de-icing prevention has priority over item(1).
 - (3) After 60 minutes passes, the test run stops.
- 2) When the test run signal is transmitted from the outdoor unit.
 - (1) Whether state of the indoor unit operates or stops, test run will be made in accordance with the operation mode of the indoor unit, which belongs to the same refrigerant system.
 - (2) Test running initialization is shown below.

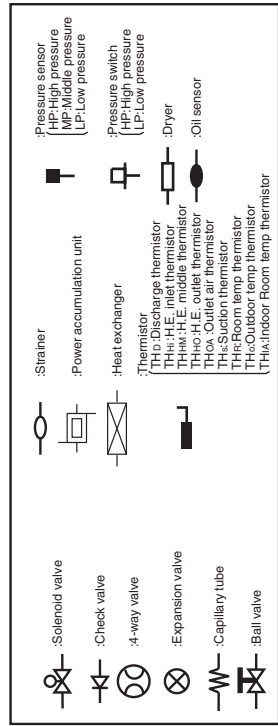
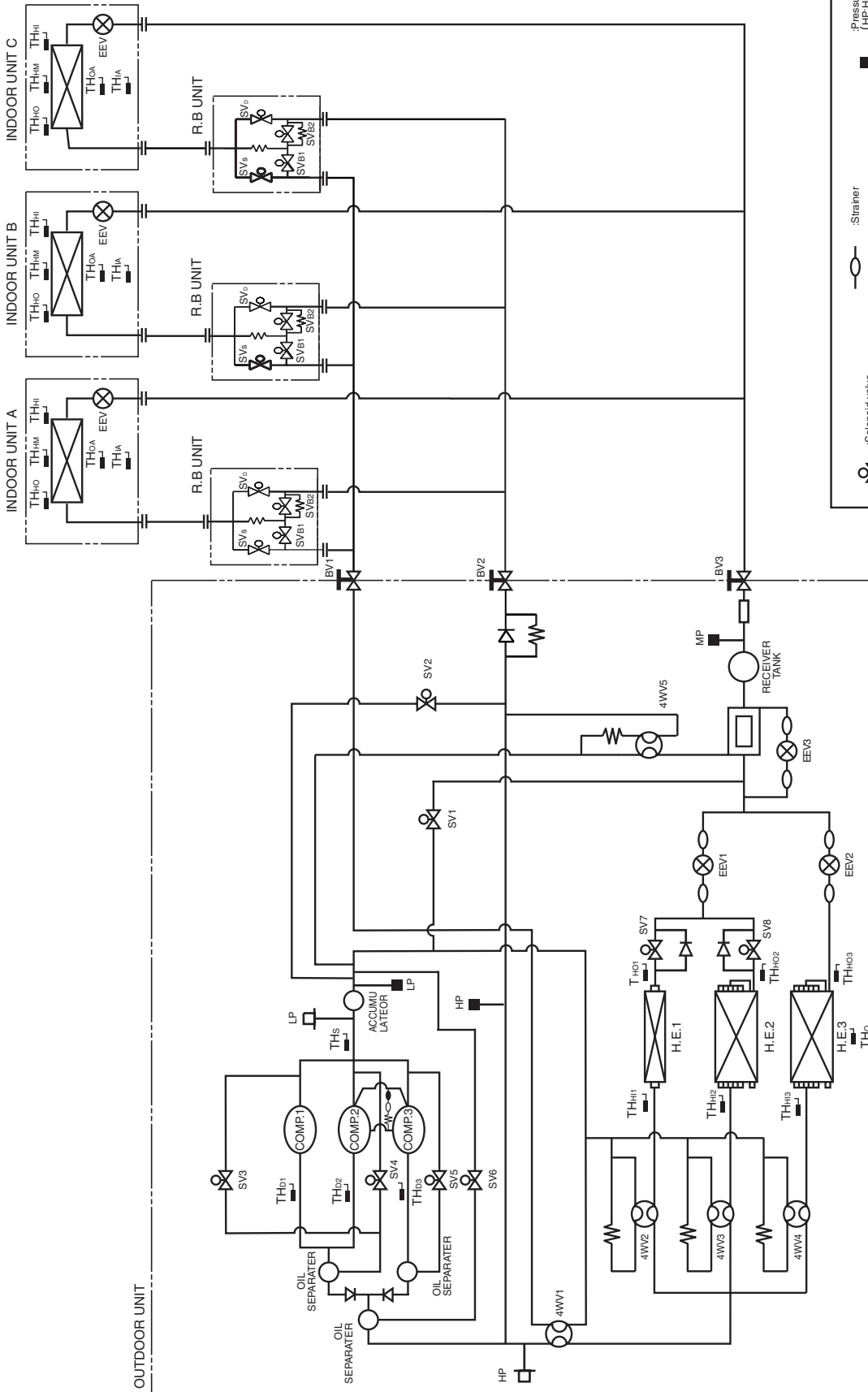
Operating Mode	Cooling	Heating
Air Flow	Hi	Hi
Room Temperature Indication	18	30
Vertical Air Direction Panel	Initialized position	Initialized position
Horizontal Air Direction Panel	Front	Front
Swing	OFF	OFF

3. REFRIGERANT PIPE SYSTEM DIAGRAM

3-1 COOLING ONLY / HEAT PUMP TYPE



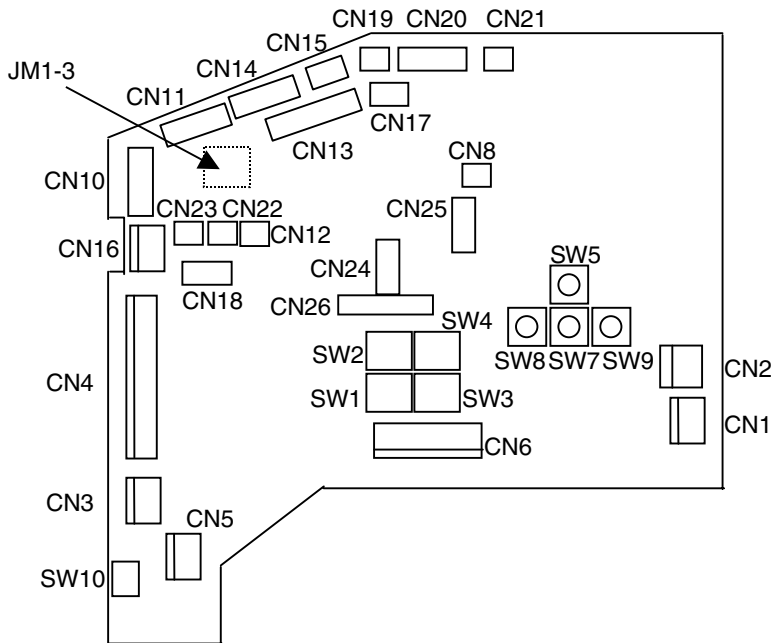
3-2 HEAT RECOVERY TYPE



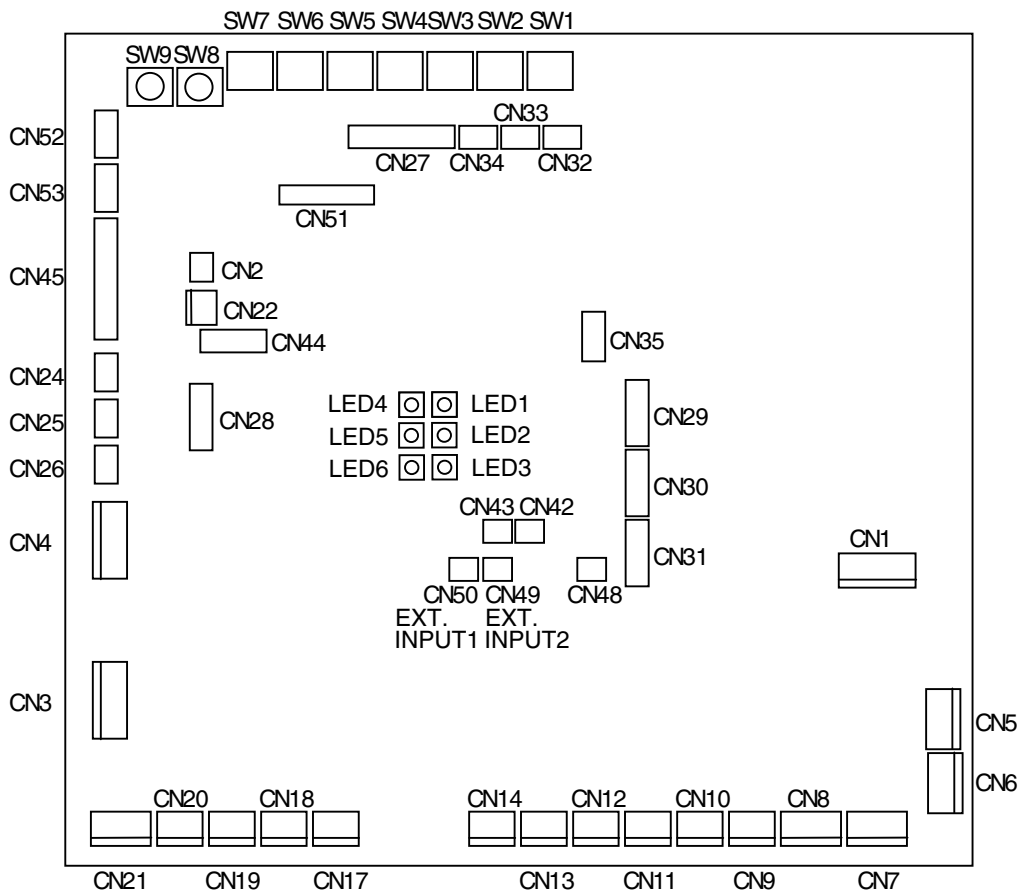
4. FUNCTION OF PRINTED CIRCUIT BOARD

4-1 PCB LAYOUTS

INDOOR UNIT CONTROL CIRCUIT BOARD

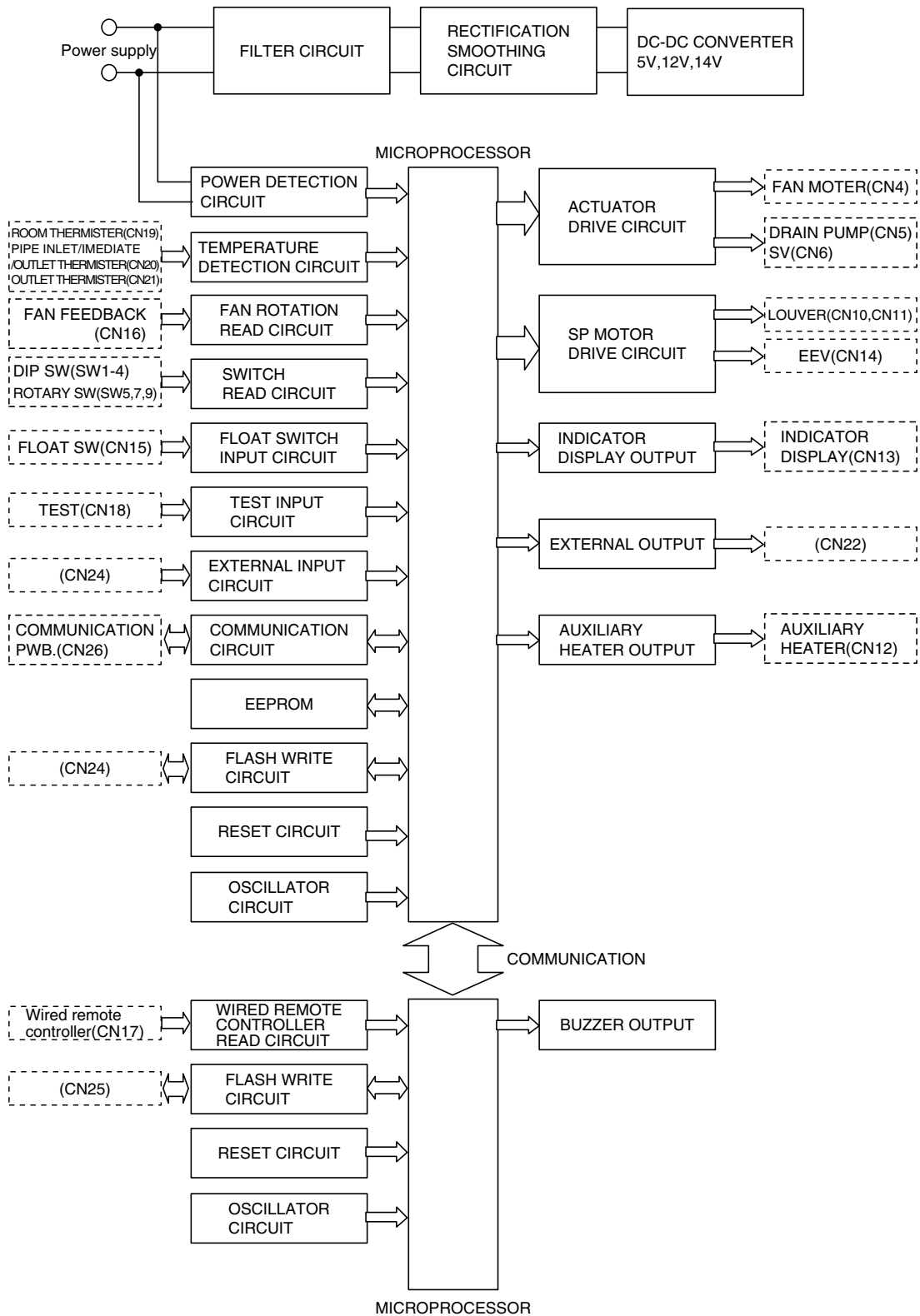


OUTDOOR UNIT CONTROL CIRCUIT BOARD

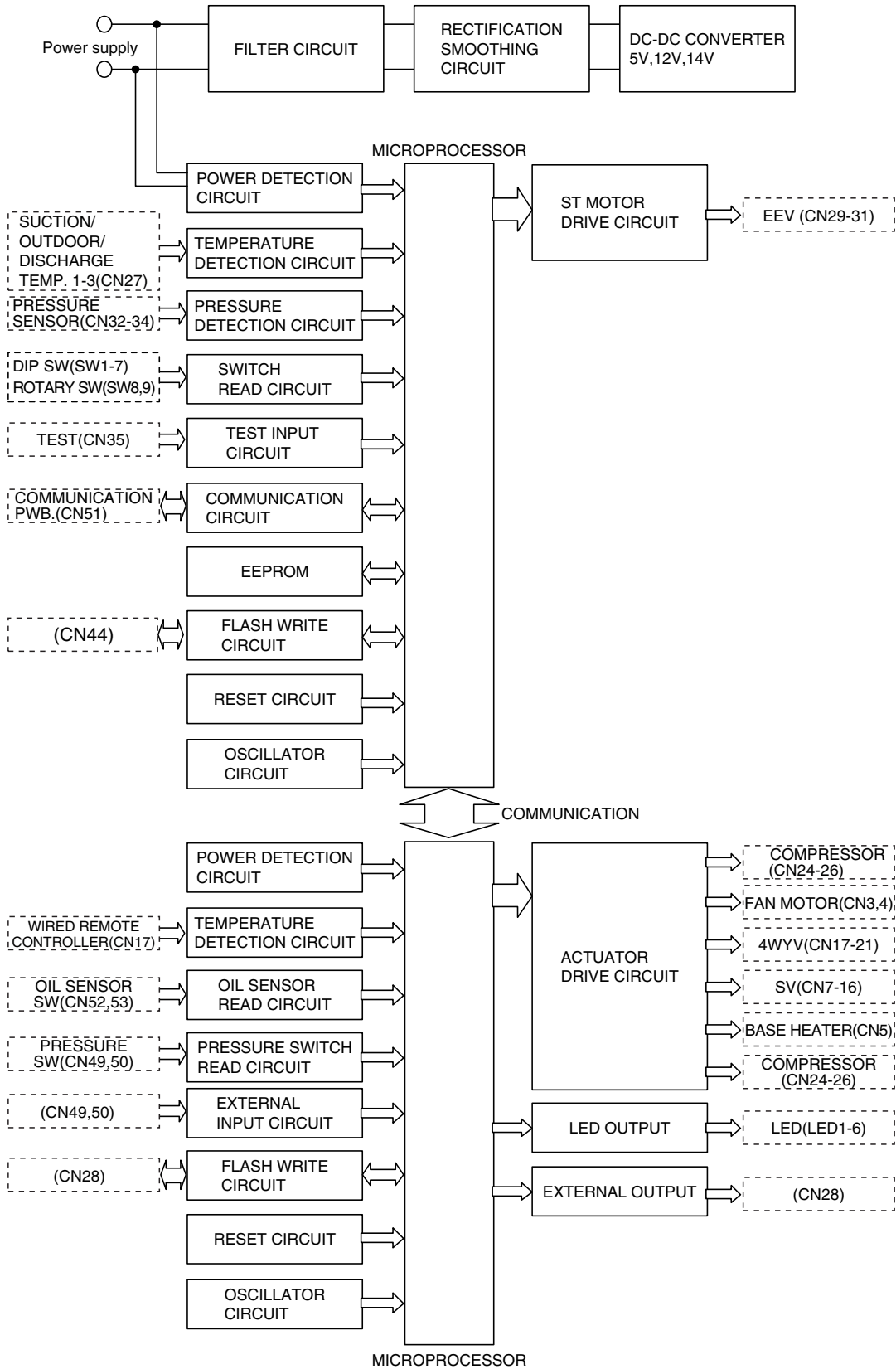


4-2 MICROPROCESSOR BLOCK DIAGRAM

INDOOR UNIT



■ OUTDOOR UNIT



4-3 MICROPROCESSOR FUNCTION LIST

■ INDOOR UNIT

INDOOR UNIT TYPE		Large Ceiling	Universal	Compact Cassette	Large Cassette	Compact Duct	Low Static Pressure Duct	High Static Pressure Duct	Wall Mounted
CAPACITY (BTU/h)	60,000							○	
	54,000	○		○					
	45,000	○		○			○		
	36,000	○		○			○		
	30,000	○		○			○		○
	24,000(25,000)		○		○		○25		○25
	20,000								○
	18,000		○	○		○			
	14,000		○	○		○			
	12,000		○	○		○			
	9,000					○			
	7,000					○			
	CN1	ACIN	○	○	○	○	○	○	○
CN2	TH FUSE				○				○
CN3	FAN CAPA	○	○	○	○	○	○		○
CN4	FAN MOTOR	○	○	○	○	○	○		○
CN5	DRAIN PUMP			○	○	○	○	○	
CN6	S. VALVE	○	○	○	○	○	○	○	○
CN8	NETWORK	○	○	○	○	○	○	○	○
CN10	SP-M(U.D)	○	○	○	○				○
CN11	SP-M(R,L)	○	○						○
CN12	HEATER	○	○	○	○	○	○	○	○
CN13	DISPLAY	○	○	○	○				○
CN14	E.E.VALVE	○	○	○	○	○	○	○	○
CN15	FLOAT SW			○	○	○	○	○	
CN16	FAN FEEDBACK	○							
CN17	WIRED REMOTE CONTROLLER	○	○	○	○	○	○	○	○
CN18	TEST								
CN19	R.TH	○	○	○	○	○	○	○	○
CN20	P.TH	○	○	○	○	○	○	○	○
CN21	S.TH	○	○	○	○	○	○	○	○
CN22	EXT.OUTPUT								
CN23	EXT.INPUT								
CN24	FLASH(MAIN)								
CN25	FLASH(SUB)								
CN26	COMMUNICATE	○	○	○	○	○	○	○	○
SW1	FUNCTION 1	○	○	○	○	○	○	○	○
SW2	FUNCTION 2	○	○	○	○	○	○	○	○
SW3	FUNCTION 3	○	○	○	○	○	○	○	○
SW4	FUNCTION 4	○	○	○	○	○	○	○	○
SW5	INDOOR UNIT ADDRESS 1	○	○	○	○	○	○	○	○
SW6	INDOOR UNIT ADDRESS 2	○	○	○	○	○	○	○	○
SW7	REFRIGERANT ADDRESS 1	○	○	○	○	○	○	○	○
SW8	REFRIGERANT ADDRESS 2	○	○	○	○	○	○	○	○
SW9	REMOTE CONTROLLER ADDRESS	○	○	○	○	○	○	○	○
SW10	MANUAL AUTO	○	○	○					○

■ OUTDOOR UNIT

OUTDOOR UNIT TYPE		AOY90TPAMF
CN1	AC IN	○
CN2	NET	○
CN3	FAN.1	○
CN4	FAN.2	○
CN5	BASE HEATER	
CN6	CRANK CASE HEATER	○
CN7	S.V.1	○
CN8	S.V.2	○
CN9	S.V.3	○
CN10	S.V.4	○
CN11	S.V.5	○
CN12	S.V.6	○
CN13	S.V.7	○
CN14	S.V.8	○
CN17	4WV.1	○
CN18	4WV.2	○
CN19	4WV.3	○
CN20	4WV.4	○
CN21	4WV.5	○
CN22	TERMINATOR	○
CN24	COMP.1	○
CN25	COMP.2	○
CN26	COMP.3	○
CN27	TH.1	○
CN28	FLASH W/R S	
CN29	E.E.V.1	○
CN30	E.E.V.2	○
CN31	E.E.V.3	○
CN32	P.SEN-L	○
CN33	P.SEN-M	○
CN34	P.SEN-H	○
CN35	TEST	
CN42	P.SW-H	○
CN43	P.SW-L	○
CN44	FLASH W/R M	
CN45	TH.2	○
CN48	EXT.OUTPUT	
CN49	EXT.INPUT2	
CN50	EXT.INPUT1	
CN51	COMMUNICATION PWB.	○
CN52	OIL LV-HI	○
CN53	OIL LV-LO	○
SW1	FUNCTION 1	○
SW2	FUNCTION 1	○
SW3	FUNCTION 1	○
SW4	FUNCTION 1	○
SW5	FUNCTION 1	○
SW6	FUNCTION 1	○
SW7	FUNCTION 1	○
SW8	REFRIGERANT ADDRESS 1	○
SW9	REFRIGERANT ADDRESS 2	○

4-4 FUNCTION AND SETTING OF EACH SWITCH

INDOOR UNIT

1. DIP SWITCH 1

① Ceiling height setting.

Changeover the fan speed of the indoor fan phase control according to ceiling height (cassette type).
Details of rotation is according to DIP SW3 setting.

CEILING HEIGHT SETTING 1,2

		Standard	High ceiling 1	High ceiling 2	Low ceiling
SW1-1		OFF	ON	OFF	ON
SW1-2		OFF	OFF	ON	ON
NOTCH	(1)	HIGH	HIGH	HIGH	—
	(2)	—	MED	MED	—
	(3)	MED	—	LOW	HIGH
	(4)	—	LOW	—	MED
	(5)	LOW	—	—	LOW
	(6)	S-LOW	S-LOW	S-LOW	S-LOW
Ceiling height		2.5~3.0m	3.0~3.5m	more than 3.5m	less than 2.5m

② Room temp correct coefficient of heating.

Decide room temp correct coefficient value of heating.

ROOM TEMP. CORRECT COEFFICIENT OF HEATING

SW1-3	SW1-4	Coefficient value
OFF	OFF	+ 2 deg
ON	OFF	- 2 deg
OFF	ON	0 deg
ON	ON	+ 4 deg

2. DIP SWITCH 2

① Room temp. correct coefficient of cooling.

Decide room temp correct coefficient value of cooling.

ROOM TEMP CORRECT COEFFICIENT OF COOLING

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

② Zone control switch.

Decide the indoor unit for zone control use and not for zone control.

ZONE CONTROL SWITCH

SW2-2	Switch control
OFF	Validity
ON	Invalidity

- ③ Filter check validity/invalidity.
Filter check is set with Dip SW 2-3.

FILTER CLEANING FUNCTION

SW2-3	Filter check
OFF	Invalidity
ON	Validity

- ④ Auto restart validity/invalidity.
Auto restart is set with Dip SW2-4. But,when a LCD wired remote controller is connected, auto restart is set to "validity" regardless of the indoor unit setting.

AUTO RESTART SETTING

SW2-4	Auto restart
OFF	Invalidity
ON	Validity

3. DIP SWITCH 3

- ① Indoor unit for speed switch.
This switch has eight kinds of rotation table, and can select fan speed corresponding to each model.

INDOOR UNIT FAN SPEED TABLE

Table No.	0	1	2	3	4	5	6	7
SW3-1	OFF	ON	OFF	ON	OFF	ON	OFF	ON
SW3-2	OFF	OFF	ON	ON	OFF	OFF	ON	ON
SW3-3	OFF	OFF	OFF	OFF	ON	ON	ON	ON

INDOOR FAN MOTOR SPEED (LARGE CEILING)

Table No.	0	1	2	3	4	5	6	7
Models	AB30	Not used	AB36	Not used	AB45	Not used	AB54	Not used
Hi	850	—	1000	—	1100	—	1250	—
Me	750	—	900	—	1000	—	1150	—
Lo	600	—	750	—	850	—	1000	—
S-Lo	500	—	500	—	500	—	500	—

※ Rotating speed of the indoor fan motor is the same for Cooling / Fan / Heating.

INDOOR FAN MOTOR SPEED (CASSETTE)

Table No.	0	1	2	3	
Models	AU54	AU45	AU36	Not used	
(1)	680	620	580	—	—
(2)	630	580	550	—	—
(3)	580	550	500	—	—
(4)	550	500	470	—	—
(5)	500	470	420	—	—
(6)	300	300	300	—	—

Table No.	4	5	6	7
Models	AU30	Not used	AU25	AU20
(1)	500	—	460	420
(2)	470	—	430	390
(3)	430	—	390	350
(4)	390	—	350	310
(5)	360	—	320	280
(6)	300	—	300	250

* Rotating speed of the indoor fan motor is the same for Cooling/Fan/Heating.

② Not used (SW3-4).

4. DIP SWITCH 4

① Indoor unit model switch.

Indoor unit model (capacity data) is set with SW4-1~4.

INDOOR UNIT MODEL SWITCH

Capacity Type	90	60	54	45	36	30	25	20	18	14	12	9	7
SW4-1	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
SW4-2	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF
SW4-3	ON	OFF	OFF	OFF	OFF	ON	ON	ON	ON	OFF	OFF	OFF	OFF
SW4-4	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

5. JUMPER

① Custom code selection of the remote controller.

Custom code of the infrared signal is set with jumper lead combinations which are shown below. Once set, other infrared signal is not accepted.

REMOTE CONTROLLER CUSTOM CODE SELECTION

JP1	JP2	Custom code
Connect	Connect	Type A (Primary setting)
Disconnect	Connect	Type B
Connect	Disconnect	Type C
Disconnect	Disconnect	Type D

② Not used (JP3)

■ OUTDOOR UNIT

1. DIP SWITCH 1

① Test run.

Test run(forced operation) and normal operation are set with SW1-1.2 on the PCB.
The cooling/heating operation mode on the test run is set.

TEST RUN SW

(◆ . . . Initial setting)

SW1-2	SW1-1	Test Run	Remarks
◆ OFF	OFF	Normal operation	
OFF	ON	Cooling test run	(OFF-ON)and (operated continuously more than 1 min. with ON state)
ON	OFF	Heating test run	(OFF-ON)and (operated continuously more than 1 min. with ON state)
ON	ON	Normal operation	

② Pump down operation.

Pump down operation is set with SW1-3 on the PCB.

PUMP DOWN SW

(◆ . . . Initial setting)

SW1-3	Pump down operation	Remarks
◆ OFF	Release	
ON	Operate	(OFF-ON)and (operated continuously more than 1 min. with ON state)

③ Forced defrost operation.

Defrosting is started forcedly with SW1-4 on the PCB.

FORCED DEFROST SW

(◆ . . . Initial setting)

SW1-4	Forced defrost	Remarks
◆ OFF	Release	
ON	Operate	(OFF-ON)and (operated continuously more than 1 min. with ON state)

2. DIP SWITCH 2

① Night operation fan mode.

The night operation fan mode ON/OFF is set with SW2-1 thermistor detects the temperature less than 30°C and the outdoor unit operation mode is cooling.

NIGHT OPERATION FAN MODE SW (◆ . . . Initial setting)

SW2-1	Night operation fan mode
◆ OFF	Release
ON	Operate

② Snow falling protection fan mode SW.

When the compressor is stopped,snow falling protection fan mode is set with SW2-2.

SNOW FALLING PROTECTION FAN MODE SW(◆ . . . Initial setting)

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

- ③ Expansion valve initialize.
The pulse of the expansion valve is initialized with SW2-3.

EXPANSION VALVE INITIALIZATION SW (◆ ...Initial setting)

SW2-3	Expansion Valve Initialization Operation	Remarks
OFF	Release	
ON	Operate	

- ④ Forced oil recovery operation.
Forced oil recovery operation started with SW2-4.

FORCED OIL RECOVERY SW (◆ ...Initial setting)

SW2-4	Forced Oil Recovery	Remarks
OFF	Release	
ON	Operate	(OFF-ON)+(ON continues for 1 minute)

3. DIP SWITCH3 SETTING IS FORBIDDEN

4. DIP SETTING IS FORBIDDEN

5. DIP SWITCH5

- ① SW5-1 and SW5-2 setting are forbidden.
- ② Base heater validity/invalidity.
The base heater setting is performed with SW5-3.

BASE HEATER SETTING SW (◆ ...Initial setting)

SW5-3	Base Heater Setting SW	Remarks
OFF	Validity	
ON	Invalidity	

6. DIP SWITCH6 SETTING IS FORBIDDEN

7. DIP SWITCH7

- ① System type switch 1,2.
Model change in Heat recovery / Heat pump type / Cooling only type are made with SW7-1,2.

SYSTEM TYPE SWITCH 1/2 (◆ ...Initial setting)

SW7-2	SW7-1	Model selection	Remarks
OFF	OFF	Heat Pump	
OFF	ON	Cooling Only	
ON	OFF	Heat Recovery	
ON	ON	Cannot Set	

8. External input terminal 1/2

When the cooling or heating mode is selected, the priority circuit is set.
With CN49 and CN50.

EXTERNAL INPUT TERMINAL 1/2

Terminal	Conditions	Setting	Remarks
External input terminal 1CN50	R.C.	OPEN	
	External input	SHORT	
External input terminal 2CN49	Cool	OPEN	
	Heat	SHORT	

■ WIRED REMOTE CONTROLLER

1. DIP SWITCH 1

- ① Remote controller address 1

FINAL REMOTE CONTROLLER SWITCH

SW1-1	Terminator
OFF	NO
ON	YES

- ② Indoor unit connection.

This is switched according to No. of connected indoor unit.

No. INDOOR UNIT CONNECTION SWITCH

SW1-2	Number of indoor unit
OFF	One unit connection
ON	Multiple unit connection

- ③ Remote controller address1,2.

Used for setting of the remote controller address. Set the addresses by ordering MASTER → SLAVE without any space.

REMOTE CONTROLLER ADDRESS 1,2 SWITCH

SW1-3	SW1-4	Method
OFF	OFF	Master
OFF	ON	Slave

- ④ SW1-5 and SW1-6 setting are forbidden.

2. DIP SWITCH 2

- ① Cooling only / heat pump.

Switching cooling only / heat pump is set with SW2-1.

COOLING ONLY / HEAT PUMP SWITCH

SW2-1	Operation system
OFF	Heat pump
ON	Cooling only

- ② Auto change over validity / invalidity.

Auto change over validity / invalidity is set with SW2-2.

AUTO CHANGEOVER SWITCHING

SW2-2	Auto restart
OFF	Invalidity
ON	Validity

③ SW2-3 setting is forbidden.

④ Maintenance.

Used for indication of the refrigerant system, indoor unit address and error history.

MAINTENANCE SWITCH

SW2-4	Mode
OFF	Normal mode
ON	Maintenance mode

⑤ SW2-5 setting is forbidden.

⑥ Battery backup switch.

When installing, turn the SW2-6 ON.

■ CENTRAL REMOTE CONTROLLER

1. DIP-SW2

- ① DIP SW2-1 2-2 setting forbidden.

DIP SW 2-1	OFF
DIP SW 2-2	OFF

- ② DIP SW2-3 setting.

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

(◆ . . . Factory setting)

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

- ③ DIP SW2-4 setting.

°C / °F switch
Temperature display is centigrade(°C) / Fahrenheit(°F)

(◆ . . . Factory setting)

SW2-4	°C / °F
◆ OFF	°C
ON	°F

- ④ 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

- ⑤ DIP SW2-6 2-7 setting forbidden.

DIP SW 2-6	OFF
DIP SW 2-7	OFF

- ⑥ 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

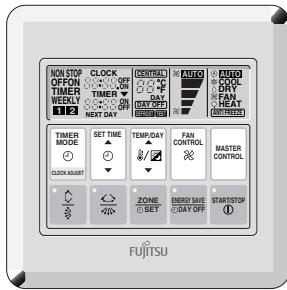
At the time of shipment, the battery is turned off to avoid electricity consumption.
Be sure to set this switch to ON.

- ⑦ SW42 Initial setting button

This switch is used when initializing the central remote controller.

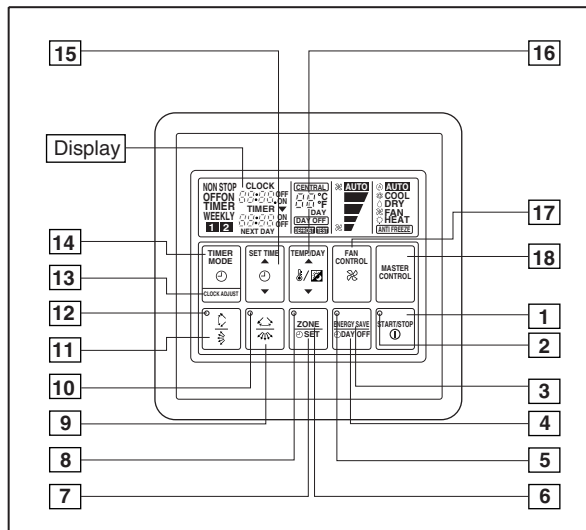
WIRED REMOTE CONTROLLER

■ FEATURE OF CONTROLLER



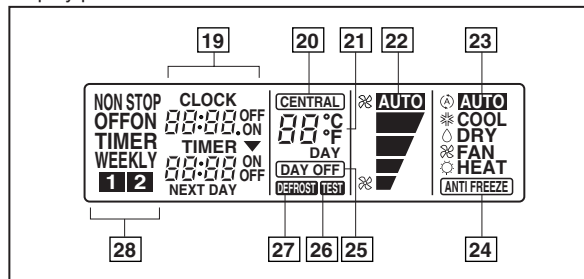
- Four kinds of timer setup (OFF/ ON1/ ON2/ WEEKLY) are possible.
- Equipped with weekly timer as standard function. (2 times Start/Stop per day for a week)
- By failure, the error code is displayed. The error history can be displayed, which is convenient for maintenance.
- 2 remote controllers can be connected.
- Up to 16 indoor units can be simultaneously controlled.
- Anti freeze, saving operation and zone control are possible.
- Favorite timer (ON 2)

■ FUNCTIONS



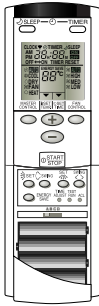
- 1 START/STOP button
Pressed to start and stop operation
- 2 Operation lamp
Lights during operation and when the timer is on.
- 3 Energy save button
Turns the energy efficient mode on and off.
- 4 Day off button
Temporary cancellation of one day timer.
- 5 Energy save lamp
Lights up when the unit is in the energy save mode.
- 6 Zone button
Use to turn the zone control on and off.
- 7 Set button
Sets the date, hour, minute and on-off time.
- 8 Zone lamp
Lights up when the unit is in the zone control mode.
- 9 Horizontal air flow direction and swing button
Push for two seconds and change swing mode.
- 10 Horizontal swing lamp
Push for two seconds and change swing mode.
- 11 Vertical air flow direction and swing button
Push for two seconds and change swing mode.
- 12 Vertical swing lamp
- 13 Clock adjust button
- 14 Timer mode button
Changes the timer mode (NON STOP, OFF TIMER, ON TIMER, WEEKLY TIMER).
- 15 Set time button
Sets the current time and on-off time.
- 16 Temp./Day button
Sets the indoor temperature / days.
- 17 Fan control button
Selects the fan speed (AUTO, LOW, MED, HIGH).
- 18 Master control button
Selects the operating mode(AUTO, HEAT, FAN, COOL, DRY).
- 19 Clock display
- 20 Central control display
- 21 Set temperature / Day display
- 22 Fan speed display
- 23 Master control display
- 24 Anti freeze display
- 25 Day off display
- 26 Test display
- 27 Defrost display
- 28 Timer mode display

Display panel



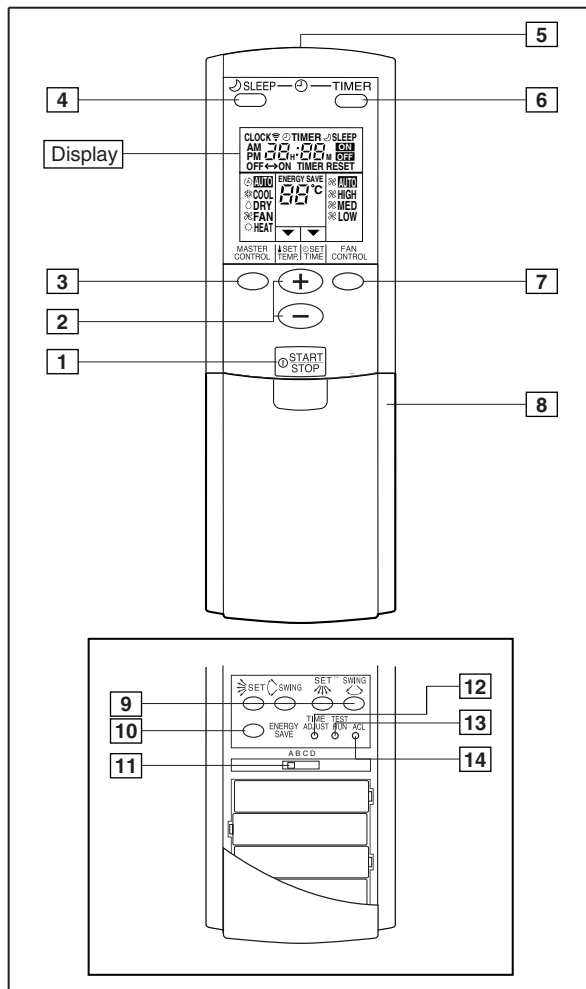
WIRELESS REMOTE CONTROLLER

■ FEATURE OF CONTROLLER



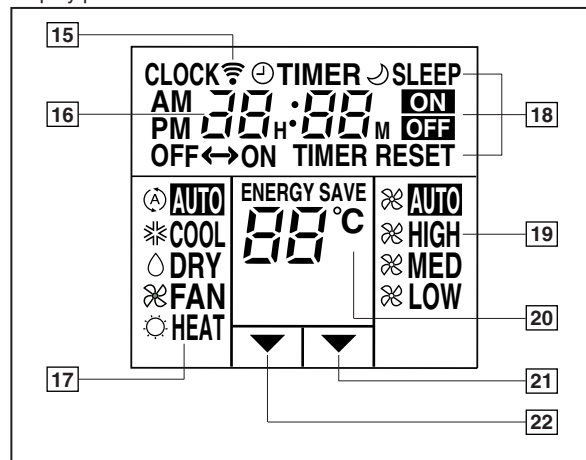
- Four kinds of timer setup (ON/OFF/PROGRAM/SLEEP) are possible.
- Up to 16 indoor units can be simultaneously controlled.
- Both wired and wireless remote controller can be used jointly.

■ FUNCTIONS

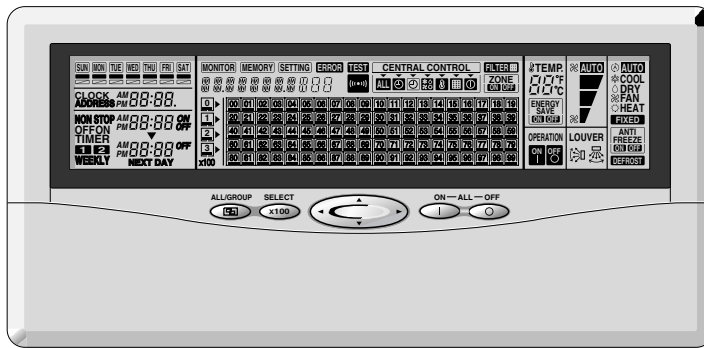


- 1 START/STOP button
Pressed to start and stop operation
- 2 Set temp./Set time buttons
Sets the indoor temp./Sets the current time and on-off time
- 3 Master control button
Selects the operating mode(AUTO, HEAT, FAN, COOL, DRY).
- 4 Sleep timer button
Press to select sleep timer.
- 5 Signal transmitter
- 6 Timer button
Press to select the timer mode.(OFF TIMER,ON TIMER, PROGRAM TIMER,TIMER RESET)
- 7 Fan control button
Selects the fan speed (AUTO, LOW, MED, HIGH).
- 8 Battery compartment lid
- 9 Air flow direction button
Use to set the desired air flow direction & SWING function.
- 10 Energy save button
Turns the energy efficient mode on and off.
- 11 Code change (Slide Switch)
Switching the remote control unit code.(Max.4 units)
- 12 Time adjust button
Set the current time.
- 13 Test run button
This button is used when testing the air conditioner after installation.
- 14 ACL button
This button is used when replacing batteries.
- 15 Transmit indicator
- 16 Clock display
- 17 Master control display
- 18 Timer mode display
- 19 Fan speed display
- 20 Set temperature display
- 21 Timer set indicator
- 22 Temperature set indicator

Display panel



CENTRAL REMOTE CONTROLLER



■ FEATURE OF CONTROLLER

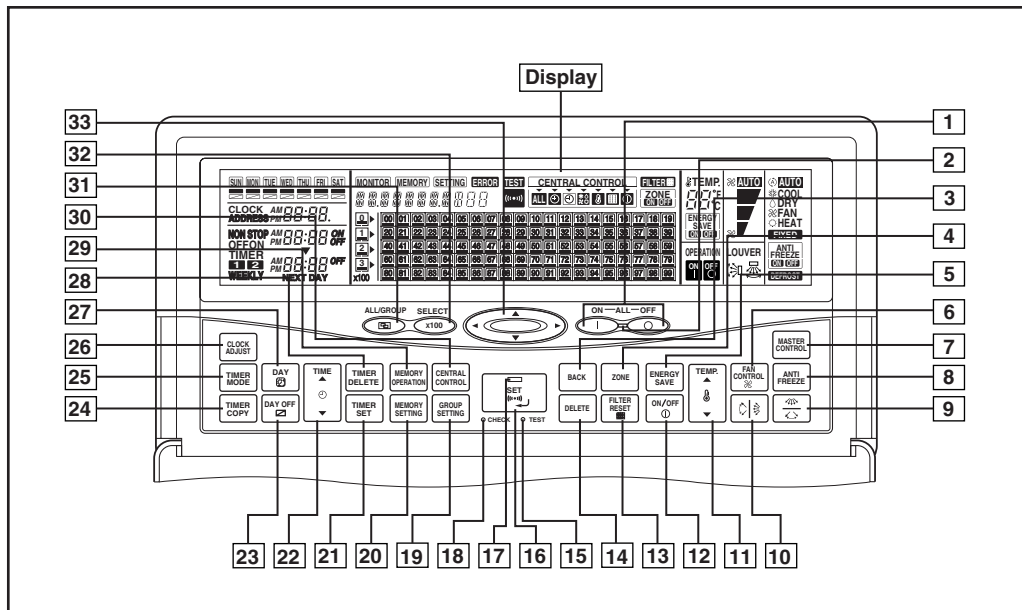
- Up to 400 indoor units/64 groups can be controlled with one central remote controller.
- Up to 16 central remote controllers can be connected in one system.
- Central remote controller can control by all/group/individual.
- By setting the central remote controller, it is possible to lock the function of the standard controllers. Items of selections are all functions, timer mode, disabling all functions for certain hour, operating mode, temperature setting, reset filter, and On/Off.
- Weekly timer is equipped as standard function. (2 times On/Off per day for one week).
- Setting contents of central remote controller are all memorized, so that each indoor unit can be operated in the memorized condition even if the operating conditions are changed later on.
- Error code is displayed when it occurs.

The history of failure can also be displayed, which is convenient for maintenance.

Examples of error:

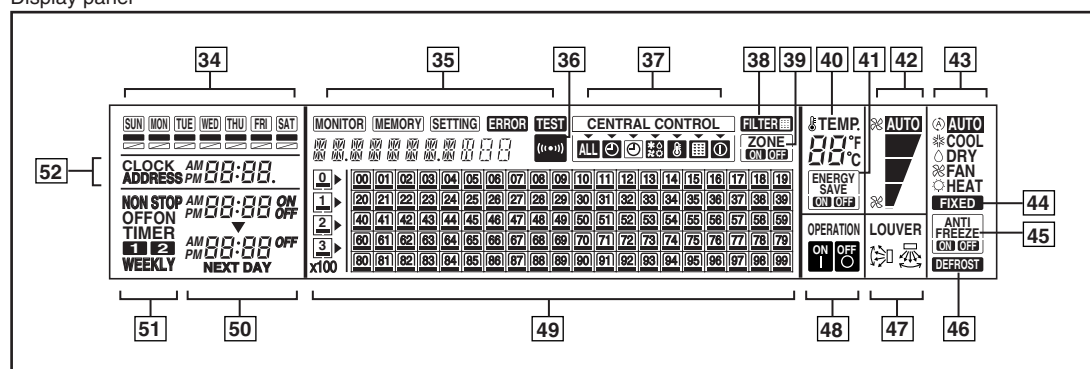
- | | |
|---------------------------------------|--|
| 1. Communication/micro computer error | 9. Abnormal room temperature thermistor |
| 2. Abnormal heat exchanger thermistor | 10. Abnormal air blow temperature thermistor |
| 3. Float switch operating | 11. 3 phase reverse polarity connection |
| 4. Abnormal outdoor unit thermistor | 12. Abnormal pressure |
| 5. Abnormal discharge temperature | 13. Abnormal refrigerant pressure sensor |
| 6. Abnormal oil sensor | 14. Duplicated indoor unit address |
| 7. Excessive indoor units connected | 15. Duplicated outdoor unit address |
| 8. Abnormal indoor fan | |

■ FUNCTION



- 1** All ON/OFF button
- 2** All ON/OFF LED
- 3** Back button
- 4** Zone button Change over the zone.
- 5** Energy save button Starting energy save operation.
- 6** Fan control button
- 7** Master control button
- 8** Anti freeze button
- 9** Horizontal Air flow direction and swing button
- 10** Vertical Air flow direction and swing button
- 11** Temp button Setting of indoor temperature.
- 12** ON/OFF button ON/OFF setting by groups.
- 13** Filter reset button
- 14** Delete button Delete of setting.
- 15** Test button
- 16** Set button Transmission of all changed setting details.
- 17** Set LED Blinks when transmission is necessary.
- 18** Check button Confirmation of address setting and error code.
- 19** Group setting button Setting of group of some remote controller group connected to the central remote controller.
- 20** Memory setting button Memory the setting contents of all.
- 21** Timer set button Setting of dates, hours, minutes and on-off time.
- 22** Time button Setting of on-off time.
- 23** Day off button Temporary cancellation of one day timer.
- 24** Timer copy button Copying the timer condition (the day before).
- 25** Timer mode button Changeover the timer mode (NON STOP, OFF, ON1, ON2, WEEKLY).
- 26** Clock adjust button
- 27** Day button
- 28** Timer delete button
- 29** Memory operation button Operating the memorized condition.
- 30** Central button Forbid some operation of the individual remote controller.
- 31** All/Group button Changeover of control unit (ALL→GROUP → R.C.GROUP).
- 32** Select × 100 button Remote controller group indication by hundreds.
- 33** Select button Change to remote controller and group number.

Display panel



- | | | | |
|--------------------------------------|--|--------------------------------------|-------------------------------------|
| 34 Day of the week display | 40 Temperature display | 45 Anti freeze display | 51 Timer mode display |
| 35 Status display | 41 Energy save display | 46 Defrost display | 52 Clock and address display |
| 36 Transmit indicator display | 42 Fan control display | 47 Air flow direction display | |
| 37 Central control display | 43 Master control display | 48 ON/OFF display | |
| 38 Filter reset display | 44 Fixed cooling or heating operation display | 49 Group control display | |
| 39 Zone display | | 50 ON/OFF time display | |

5. OUTDOOR UNIT OPERATION CONTROL

5-1 COMPRESSOR OPERATION CONTROL

5-1-1 OPERATION STOP CONDITION

① Compressor operation condition
 When cooling requirement capacity or heating requirement capacity from either of the indoor units in the same refrigerant system is input, the compressor operates.
 But in the following case, the compressor operates in accordance with operation of each mode.

- During 3 minute restart prevention operation
- During compressor recovery operation
- During deicing operation
- Failure (except for a part)
- Defrosting
- 4-way valve 1 restart switching
- Oil recovery
- Under expansion valve initialization
- At protective operation
 - * Central discharge temperature protection
 - * High pressure protection

② Compressor stop condition
 When all the indoor units in no "cooling requirement capacity" or "heating requirement capacity ", all the compressors are stopped.
 But, in the following case, the compressor operates in accordance with operation of each mode.

- Defrosting
- Oil recovery

5-1-2 COMPRESSOR OUTPUT PATTERN

The output pattern of a compressor is defined as shown below.

Compressor output pattern

OUTPUT PATTERN	COMPRESSOR 1 (2HP)	COMPRESSOR 2 (4HP)	COMPRESSOR 3 (6HP)
Step 0	OFF	OFF	OFF
Step 1	ON	OFF	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

5-1-3 3 MINUTES RESTART PREVENTION (3 MIN ST)

When the compressor is stopped, the compressor does not start on any condition for 3 minutes afterwards.
 But, this function is excluded when defrosting, oil recovery is performed and the power is turned on.

5-1-4 COMPRESSOR RECOVERY OPERATION

If compressor 1, 2, or 3 fails, or if two or more compressors fail at the same time, the remaining compressor(s) perform temporary operation to prevent interruption of air conditioning system operation by a failure.

When compressor 1, 2, or 3 is judged to be faulty, the system is operated by switching the compressor output pattern (compressors 0 to 7) as shown in the following table.

Compressor failure is displayed by LEDs on the PCB of the outdoor unit and by output ERROR to the communication bus line (standard wired remote controller, central remote controller, PC controller).

- (a) When compressor 1 (2 HP) fails (compressor 2 is substituted for compressor 1).
- (b) When compressor 2 (4 HP) fails (compressor 3 is substituted for compressor 2)
- (c) When compressor 3 (6 HP) fails (compressor 1 and 2 are substituted for compressor 3)

COMPRESSOR RECOVERY OPERATION

ORDINARY OPERATION	RECOVERY OPERATION				
	(a)X-4-6	(b)2-X-6	(c)2-4-X	(d)X-X-6	(e)X-4-X
Step 0	Step 0	Step 0	Step 0	Step 0	Step 0
Step 1	Step 2	Step 1	Step 1	Step 4	Step 2
Step 2	Step 2	Step 4	Step 2	Step 4	Step 2
Step 3	Step 4	Step 4	Step 3	Step 4	Step 2
Step 4	Step 6	Step 5	Step 3	Step 4	Step 2
Step 5	Step 6	Step 5	Step 3	Step 4	Step 2
Step 6	Step 6	Step 5	Step 3	Step 4	Step 2

x : The compressor is stopped by a protection function or abnormal operation.
(The figures show the compressor capacity (HP) that permits system operation.)

5-2 HEAT EXCHANGE CAPACITY CONTROL

The heat exchanger capacity and four-way valve, solenoid valve, and electronic expansion valve operation states are shown below.

1. Cooling, mainly cooling

Pattern	4-way valve (4WV)			Solenoid valve (SV)		Electronic expansion valve (EEV)		Used heat exchange (HP)			Remarks
	4WV2	4WV3	4WV4	SV7	SV8	EEV1	EEV2	2	4	6	
1	OFF	ON	ON	ON	OFF	Control pulse	0 pulse	○	×	×	Cooling 2HP
2	ON	OFF	ON	OFF	ON	Control pulse	0 pulse	×	○	×	Cooling 4HP
3	ON	ON	OFF	OFF	OFF	0 pulse	Control pulse	×	×	○	Cooling 6HP
4	OFF	ON	OFF	ON	OFF	Control pulse	Control pulse	○	×	○	Cooling 8HP
5	ON	OFF	OFF	OFF	ON	Control pulse	Control pulse	×	○	○	Cooling 10HP
6	OFF	OFF	OFF	ON	ON	Control pulse	Control pulse	○	○	○	Cooling 12HP

2. Heating, mainly heating

Pattern	4-way valve (4WV)			Solenoid valve (SV)		Electronic expansion valve (EEV)		Used heat exchange (HP)			Remarks
	4WV2	4WV3	4WV4	SV7	SV8	EEV1	EEV2	2	4	6	
1	ON	ON	ON	ON	OFF	Control pulse	0 pulse	○	×	×	Cooling 2HP
2	ON	ON	ON	OFF	ON	Control pulse	0 pulse	×	○	×	Cooling 4HP
3	ON	ON	ON	OFF	OFF	0 pulse	Control pulse	×	×	○	Cooling 6HP
4	ON	ON	ON	ON	OFF	Control pulse	Control pulse	○	×	○	Cooling 8HP
5	ON	ON	ON	OFF	ON	Control pulse	Control pulse	×	○	○	Cooling 10HP
6	ON	ON	ON	ON	ON	Control pulse	Control pulse	○	○	○	Cooling 12HP

3. Stop and same capacity operation

Pattern	4-way valve (4WV)			Solenoid valve (SV)		Electronic expansion valve (EEV)		Used heat exchange (HP)			Remarks
	4WV2	4WV3	4WV4	SV7	SV8	EEV1	EEV2	2	4	6	
1	OFF	OFF	OFF	OFF	OFF	Control pulse	Control pulse	×	×	×	Stop
2	ON	ON	ON	OFF	OFF	0 pulse	0 pulse	×	×	×	Same capacity

5-3 OUTDOOR FAN MOTOR CONTROL

ON /OFF

The outdoor fan motor is turned on with the compressor start and turned off with the compressor stop except for the following cases.

Also, the operating mode of the outdoor unit is changed, fan speed at each operating mode after changing is controlled.

When the defrosting operation is performed

When the deicing operation is performed

When the same capacity cooling or heating mixed operation is performed

When the overload protection operation during heating operation is performed

Fan Speed

The outdoor fan motor has the following five steps of speed in addition to Stop.

FAN SPEED	FAN 1	FAN 2
1	Hi	Hi
2	Hi	Stop
3	Lo	Lo
4	Lo	Stop
5	Intermittent	
6	Stop	Stop

*Intermittent output

1. Stop (FAN 1)-Stop (FAN 2) for 50 sec.
2. Lo-Stop is repeated for 20 sec.
3. The intermittent output is always started from Stop-Stop of 50 sec.
4. The Stop-Stop of 50 sec at the intermittent output is not a Stop of the outdoor fan.
5. But the outdoor fan shall operate at a cycle of Stop-Stop for 50 sec and Lo-Stop for 20 sec.

Fan Speed Switching

- (a) Fan Control of cooling mode and cooling principal mode.

The fan motor is operated at fan speed shown in Table 1 from the outside temperature.

Table 1 Fan speed switching from the outside temperature

OUTSIDE TEMPERATURE (TH _o)	USUAL	NIGHT OPERATING MODE
TH _o > 29°C	1	3
29°C ≥ TH _o > 18°C	2	3
18°C ≥ TH _o > 6°C	4	4
6°C ≥ TH _o	5	5

- (b) Fan control Heating mode and Heating principal mode.

The fan motor is operated at fan speed shown in Table 2 from the outside temperature.

Table 2 Fan speed switching from the outside temperature

OUTSIDE TEMPERATURE (TH _o)	USUAL
TH _o > 18°C	1
18°C ≥ TH _o > 15°C	1
15°C ≥ TH _o > 10°C	1
10°C ≥ TH _o	1

- (c) Same capacity fan control

When the operating mode of the outdoor unit is the same capacity mode, the fan 1/2 are turned off.

When the operating mode of the outdoor unit is changed from the same capacity operating mode to another operating mode, the fan operates in accordance with fan speed at the start of that mode.

- (d) Oil recovery fan control

The fan control in the cooling mode is performed at the time of oil recovery.

5-4 EXPANSION VALVE 1/2 CONTROL

The expansion valves have the following four states:

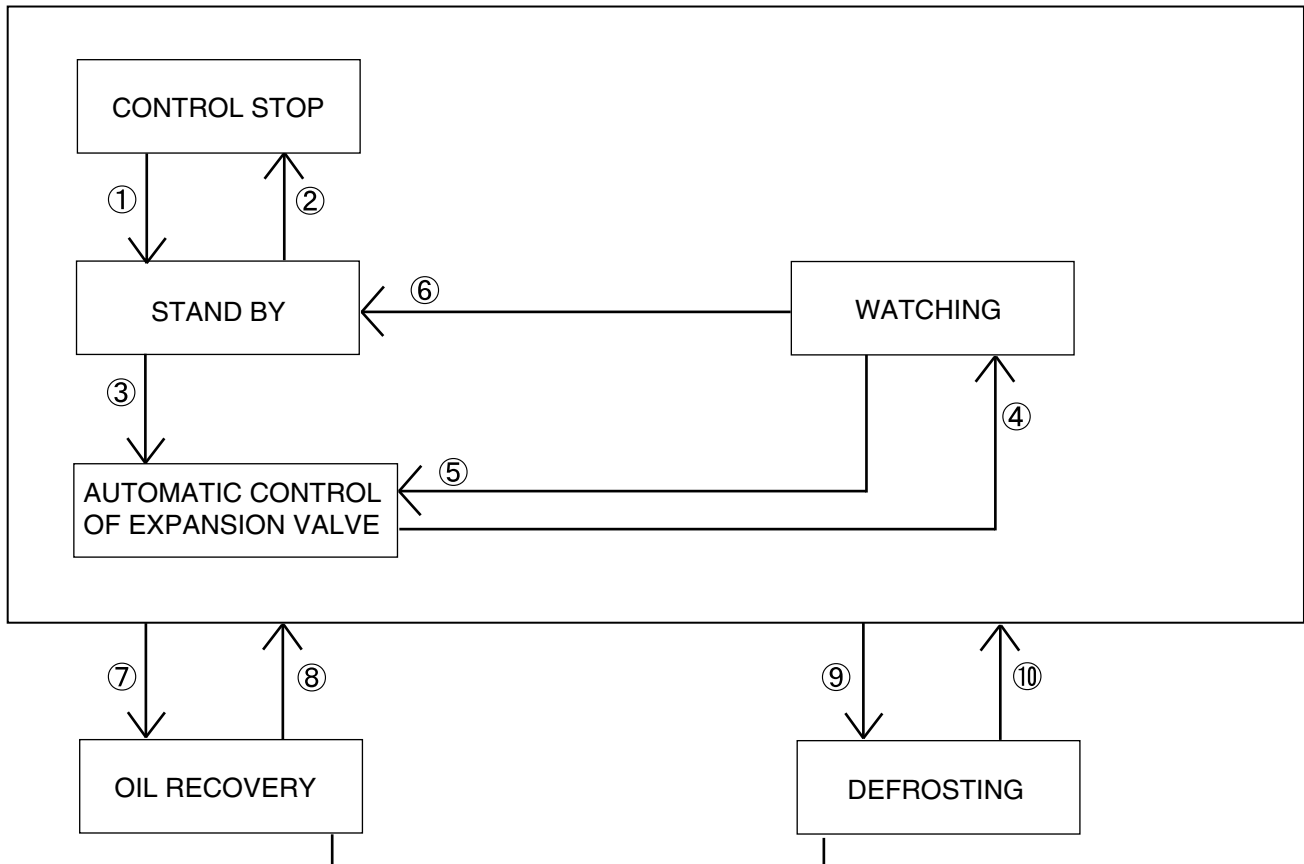
CONTROL STOP : Power is not yet supplied to the outdoor unit so the expansion valve does not operate.

STAND BY : Power is supplied to the outdoor unit and the expansion valve is initialized, but automatic control of the expansion valve has not been performed.

WATCHING : The compressor is turned off while the expansion valve is controlled automatically and the turn-on and initialization of the next compressor's expansion valve have not been performed.

CONTROLLING : The expansion valve is controlled automatically.

EXPANSION VALVE CONTROL



* Only one side of them is controlled.

- ① Power ON
- ② Power OFF
- ③ Compressor ON condition EEV initialization condition interval under 4hours
- ④ Compressor OFF
- ⑤ Compressor ON condition
- ⑥ Expansion valve initialization condition interval more than 4 hours
- ⑦ Oil recovery condition
- ⑧ Oil recovery finish
- ⑨ Defrosting condition
- ⑩ Defrosting finish

5-5 FOUR-WAY VALVE 1 CONTROL

Four-way valve 1 (4WV1) operates for "Cooling/heating selection" type only.

1. 4-way valve delayed switching

When the outdoor operation mode is Stop, 4-way valve 1 maintains its state and turns off 2 minutes 35 seconds later. However, when the outdoor unit operation mode is switched from "Heating" to "Cooling", this function does not operate and the 4-way valve turns off at that point.

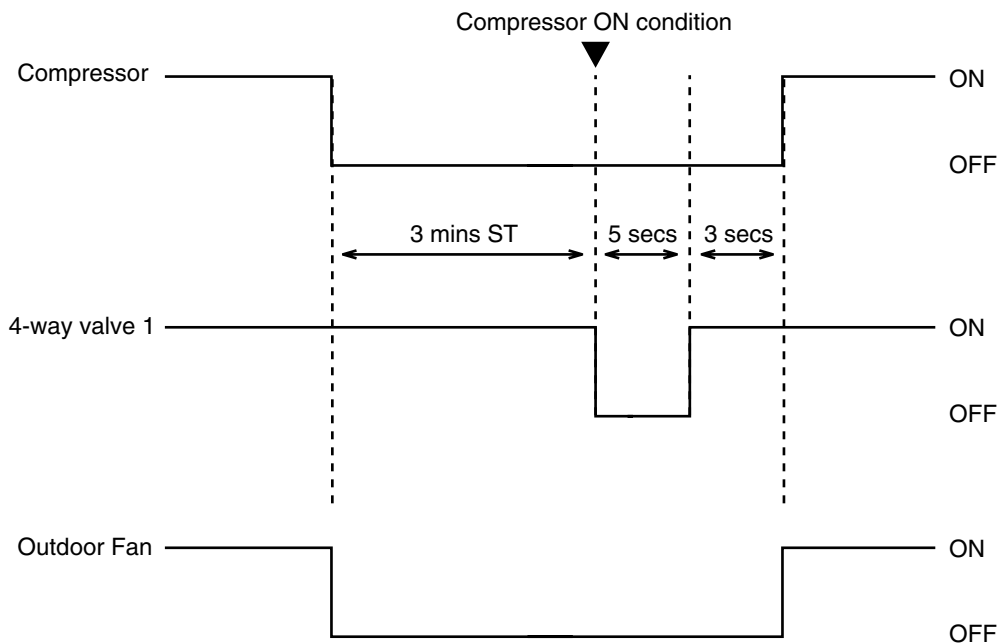
2. Restarting 4-way valve switching

When the compressor satisfies the OFF → ON condition when the operation mode is "Heating" (including immediately after the power is turned on), 4-way valve 1 turns off for 5 seconds. Thereafter, 4-way valve 1 turns on and 3 seconds later, the compressor starts.

However, except in the following cases:

- Defrosting, defrosting end
- Oil recovery in progress, oil recovery end

Operation example (Restarting 4-way valve switching)



3. 4-way valve 1 setting by operation mode

Four-way valve 1 is set according to the operation modes as shown below.

4-way valve 1 control by operation mode

System type	Operation mode	4WV1
Cooling / Heating selection type	Cooling	OFF
	Heating	ON
	Stop	OFF*

*1) 4-way valve 1 delayed switching control compatible

5-6 CIRCULATING SAVE AMOUNT CONTROL

* Expansion Valve Control

As there is the difference between compressor's actual capacity and compressor's requirement capacity practically, capacity by the difference is bypassed as a circulating save amount.

(Compressor's actual capacity – Compressor's requirement capacity)

① Start condition

- In case of other than that the compressor 1 (2 HP compressor) is operated by only one compressor.
- In case of the operating mode of " Cooling " or " Heating "

② End condition

- In case of only one compressor (2 HP compressor) operation.
- In case of the operating mode other than " Cooling " or " Heating "

5-7 SOLENOID VALVE 2 CONTROL

- The outdoor unit operates at the time of the same capacity operation.
When the difference between compressor's actual capacity fixed by a compressor and compressor's requirement capacity obtained by cooling (or heating) requirement capacity from the indoor unit is saved (bypassed) as a circulating save amount, the electromagnetic valve 2 is controlled.

5-8 FOUR-WAY VALVE 5 CONTROL

1) System type switching

The 4-way valve 5 is used properly depending on the model as shown below.

	HEAT RECOVERY TYPE	HEAT PUMP TYPE	COOLING ONLY TYPE
4-WAY VALVE 5	○	○	X

○ : Used (ON/OFF operation under condition)

X : Not used (always OFF)

2) 4-Way valve 5 setting by the operating mode

(a) 4-Way valve 5 setting by the operating mode

4-Way valve 5 control

OPERATING MODE	4-WAY VALVE 5 CONDITIONS
Stop	OFF
Cooling	OFF
Heating	ON
Same performance	OFF

(b) Delay switching

When the operating mode is changed to Stop, the 4-way valve 5 maintains a start of the operating mode before changing, and when the operating mode is other than Stop before three minutes pass it follows the above 1) immediately.

5-9 DEFROSTING CONTROL

1. Defrosting start conditions

1) Defrosting start conditions

When the forced defrosting SW was operated, or all of the following conditions are satisfied, defrosting starts.

- Operation mode is "Heating" and the integrated operating time in the state in which any of the compressors is operating has reached 40 minutes or longer
- When the operating time of any compressor is the specified time (A minutes) or longer. Where, A is defined as follows:
When the "all compressors stopped" state has continued for 20 minutes or longer before any compressor operates A=10
Other than the above A= 6
- When the outlet temperature of each heat exchanger is -5 °C or less

2) Integrated time

The time the operation mode is "Heating" and the time any compressor has operated are integrated. However, the integrated value is cleared in the following cases:

- Operation mode is switched to other than "Heating"
- Defrosting has ended
- Oil recovery operation is in progress and the heat exchange outlet temperature satisfies the defrosting end condition

2. Defrosting start restrictions

In the following cases, defrosting is not performed even if the previously mentioned defrosting start conditions are satisfied.

- Oil recovery operation is in progress
- Error that prohibits defrosting operating was generated
Error other than compressor 1, 2, or 3 error, suction thermistor error, oil sensor error, oil recovery error, or EEPROM access error.
- Following protection function has operated (Compressor OFF)
Compressor OFF by discharge temperature protector 1, 2, and 3 and high pressure protector, low voltage protector, defrosting operation

3. Defrosting end condition

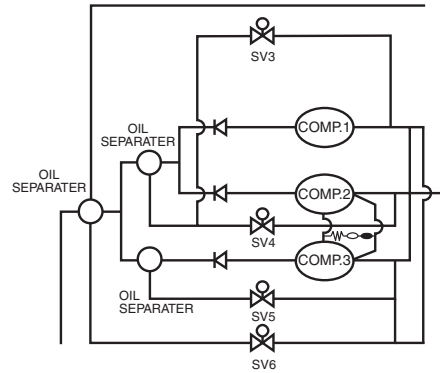
When any of the following conditions is satisfied, defrosting ends.

- Outdoor unit operation mode was switched to other than "Heating"
- 20 minutes or longer have elapsed since defrosting stopped
- Integration of compressor operation time after start of defrosting has exceeded 15 minutes
- The following error was generated
Errors except compressor 1, 2, and 3 error suction thermistor error, oil sensor error, oil recovery error, or EEPROM access error
- Each heat exchanger outlet temperature has reached defrosting end heat exchanger temperature 10 °C or higher.

5-10 OIL RETURN CONTROL

There are two oil return controls, one is the individual oil return and the other one is centralized oil return.

- (1) When each solenoid valve is turned ON, the oil return is performed
- (2) Oil level status is defined in accordance with performance of the oil level sensor.



1. Oil return solenoid valves

	Solenoid valve	Application
Individual oil return	Solenoid valve SV3	Compressor 1
	SV4	Compressor 2
	SV5	Compressor 3
Central oil return	SV6	Compressor 1/2/3

2. Oil sensors

The oil sensors determine the oil level.

Definition of state	Oil sensor		Contents of state	Sketch
	U	L		
State 0	OFF	ON	The oil is filled up to oil sensor U (upper limit).	
State 1	ON	ON	The oil level is between oil sensor U (upper limit) and oil sensor L (lower limit).	
State 2	ON	OFF	Oil sensor L (lower limit) cuts the oil level.	
State 3	OFF	OFF	Abnormal state ("Oil level error")	

Oil sensor U Compressor upper limit oil level sensor
 Oil sensor L Compressor lower limit oil level sensor

Definition of oil sensor operation (oil sensor U/L)

	Operation	Oil sensor circuit output judgment standard
Oil sensor U/L	OFF	Oil sensor LED (Voltage detected before output) - (voltage detected after output) < 0.3V max.
	ON	Oil sensor LED (Voltage detected before output) - (voltage detected after output) ≥ 0.3V max.

3. Individual oil return control

When a compressor operates continuously for 1 minute or longer and the oil sensor satisfies any of the following conditions in "State 1" or "State 2", the solenoid valve corresponding to the compressor turns on and controls oil return.

- (1) The integrated operating time of each compressor has reached 15 minutes or greater
- (2) Each compressor is stopped.

* When oil return starts, the integrated operating time for each compressor is reset.

4. Central oil return control

When any of the following conditions is satisfied, the central oil return solenoid valve SV6 turns on and central oil return control begins.

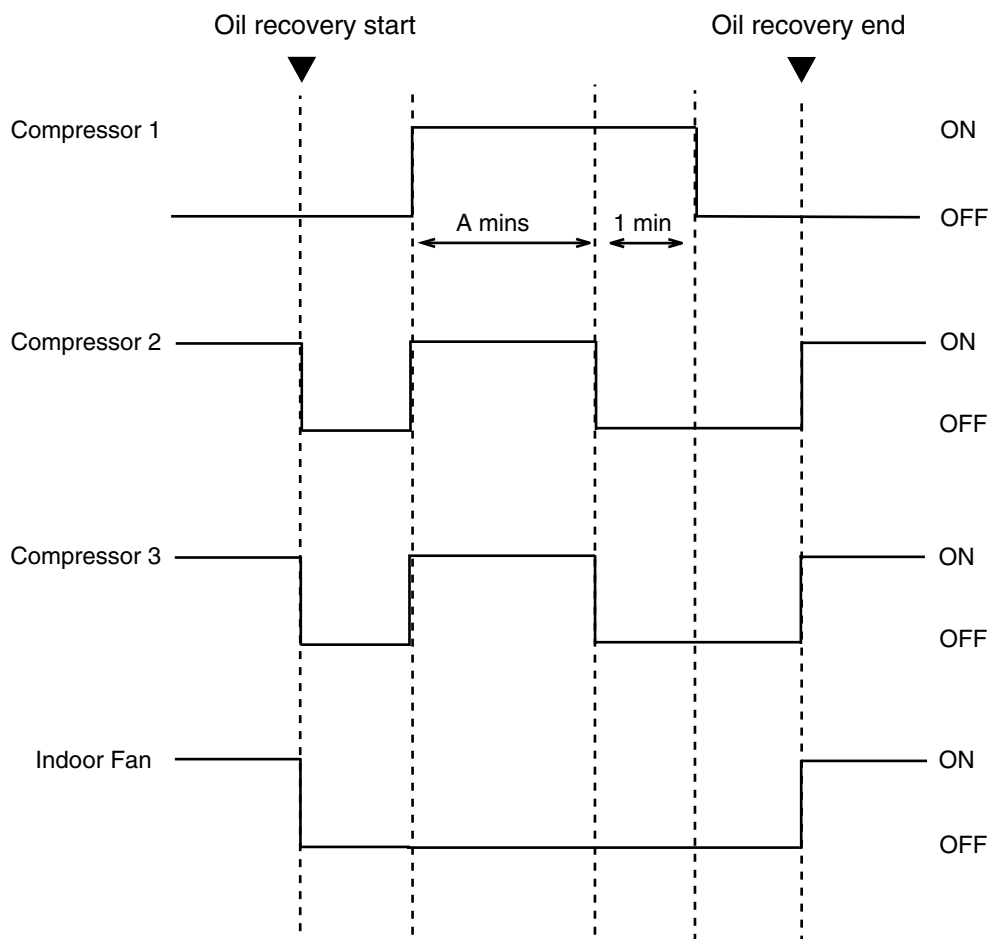
- (1) One or more compressors are operating and the integrated time in the "1 or more compressors operating" state exceeds 15 minutes
- (2) All the compressors were stopped from the "1 or more compressors operating" state.

5-11 OIL RECOVERY CONTROL

When any the following conditions is satisfied, the indoor fan stops and " Oil recovery operation " starts.

- (1) One or more compressor are operating.
- (2) The integrated operating time in the " 1 or more compressors operating state " has exceeded 4-6 hours.
- (3) Defrosting is not performed.

*However the first oil recovery operation after the power is turned on is performed when the integrated operating time in the " 1 or more compressors operating " state has exceeded 1 hour.



* When oil recovery error not generated A= 4-6 mins
 When oil recovery error generated A= 7-9 mins

5-12 PROTECTION FUNCTIONS

1. Central discharge temperature protection

- 1) When the discharge temperature of any compressor reaches 110 °C or higher, solenoid valve 1 (SV1) is turned on and bypass is performed. SV1 is turned off and central discharge temperature protection operation is ended by any of the following conditions:
 - (1) Discharge temperature of all compressors reaches 95 °C or lower
 - (2) Oil recovery operation starts
- 2) When solenoid valve 1 (SV1) is on and the outdoor fan speed is "5", solenoid valve 2 (SV2) is simultaneously turned on and bypass is performed. SV2 is turned off by any of the following conditions:
 - (1) Outdoor fan speed is set to other than "5"
 - (2) Oil recovery operation starts
 - (3) Discharge temperature of all compressors reaches 95 °C or lower.

2. Discharge temperature protection

When the discharge temperature of any compressor reaches 130 °C or higher, the corresponding compressor stops. Compressor stop is reset and discharge temperature protection operation is ended by any of the following conditions:

- (1) Discharge temperature of all compressors reaches 95 °C or lower.
- (2) Oil recovery operation starts

However, during oil recovery operation, discharge temperature protection is not performed.

3. High-pressure protection

- 1) When the high-pressure SW (HP) is turned off except during oil recovery operation or defrosting, solenoid 1 (SV1) and solenoid 2 (SV2) are turned on and bypass is performed. SV1 and SV2 are turned off by any of the following conditions:
 - (1) High-pressure pressure SW turned on
 - (2) Oil recovery control starts
 - (3) Defrosting control starts
- 2) When 1 minute has elapsed after SV1 and SV2 were turned on and the discharge pressure sensor (PH) detected value is 3.34MPa or greater, compressors 1, 2, and 3 are stopped. SV1 and SV2 ON and compressors 1, 2, and 3 stop are reset and high-pressure protection operation is ended by any of the following conditions:
 - (1) High-pressure SW (HP) turned on
 - (2) Oil recovery control starts
 - (3) Defrosting control starts

4. Heating overload protection

When the operating mode is " Heating " and the high-pressure SW (HP) was turned off except during oil recovery or defrosting in the "Heat mode", the outdoor fan is stopped. Outdoor fan stop is reset and heat overload protection operation is ended by any of the following conditions:

- (1) High-pressure SW (HP) turned on
- (2) Oil recovery control starts
- (3) Defrosting control starts
- (4) Mode is switched to other than "Heat"

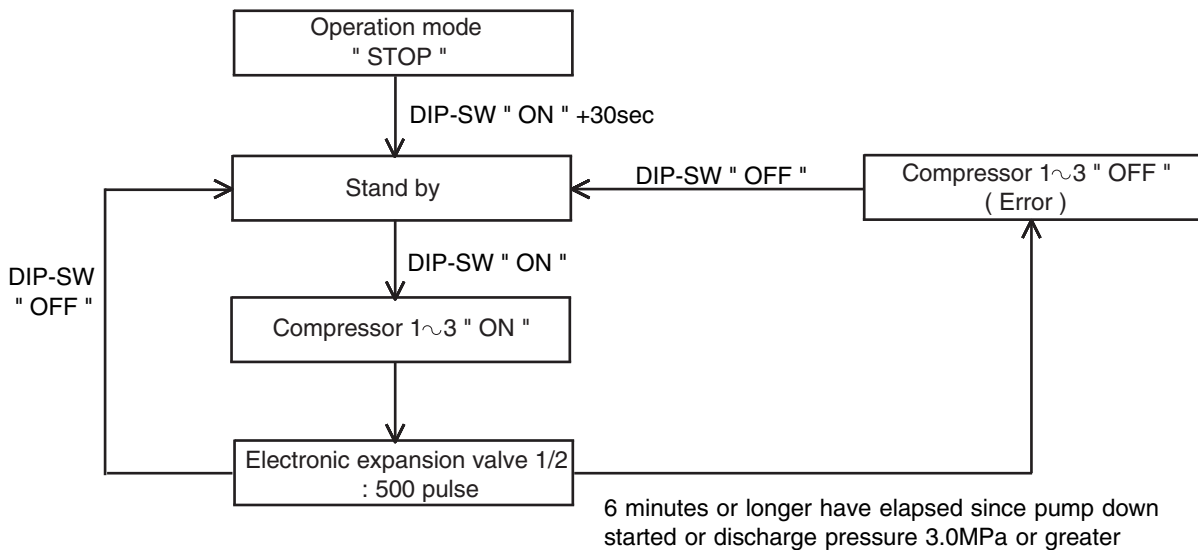
5-13 PUMP DOWN CONTROL

(1) If the following condition was satisfied, the pump down control starts.

When the operation mode is stopped and pump down DIP-SW turns OFF → ON.

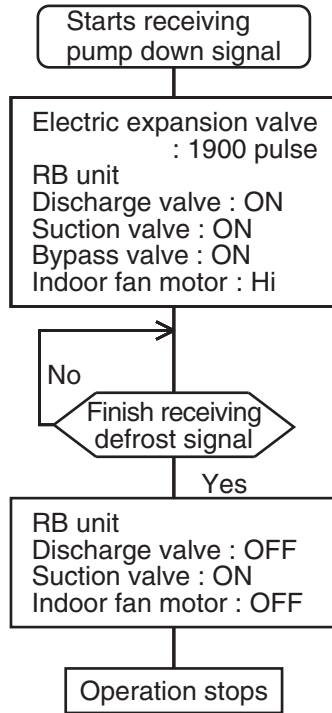
(2) Pump down flow-chart.

■ OUTDOOR UNIT



■ INDOOR UNIT

When the indoor unit receives the "Pump down signal" from the outdoor unit, the indoor unit is performed following operation.



(3) Pump down is completed in following cases.

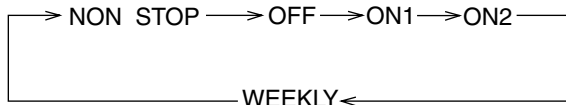
- When pump down DIP-SW is turned ON → OFF
- When the discharge pressure sensor detects more than 3Mpa.

6. INDOOR UNIT OPERATION CONTROL

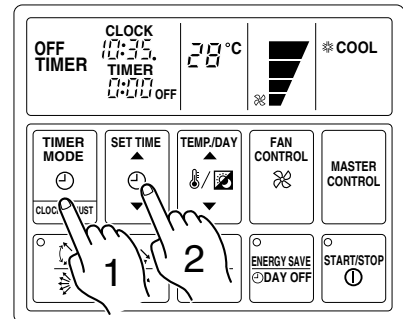
6-1 TIMER CONTROL

There are three timer modes: "OFF TIMER", "ON TIMER" and "WEEKLY TIMER" .

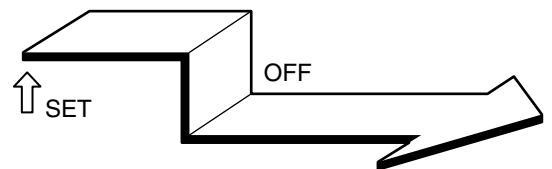
- (1) Set the clock time when the unit is in the stop mode (only the current time will be shown on the remote control unit display).
- (2) While adjusting the current clock time, do not use other remote control functions.
- (3) Each time the TIMER button is pressed, the remote control unit display will change in the order shown below:



Remote control button selected



OFF timer setting



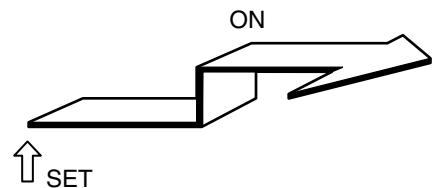
1) OFF timer

Use when going to bed or otherwise to stop operation. When the clock reaches the set time, the air conditioner will be turned off.

2) ON timer 1

When the timer mode is set to "ON TIMER" , operation automatically starts when the set time has elapsed.

ON timer setting



3) ON timer 2

- The timer function is designed to bring your room to a comfortable temperature by the set time ; as a result, the unit automatically begins operation before the set time so that the room reaches the desired temperature by the time set on the timer ("Favorite temperature timer")
- The hotter it is in summer, or the colder it is in winter, the earlier that operation will begin.
 - During Heating Operation..... from 45 to 10 minutes before set time.
 - During Cooling/Dry Operation..... from 20 to 10 minutes before set time.
 - During Fan Operation..... at the set time.

4) WEEKLY timer

Use the weekly timer to set operating times for each day of the week.

Weekly Timer Features

- Set different operating times for each day of the week.
- Set one or two operating spans (one or two ON times and one or two OFF times) per day.
- Set time to a resolution of 5 minutes.
- OFF time can be carried over to the subsequent day.
- Use the "DAY OFF" setting to cancel operation for any day of the coming week (one-time cancellation).

Setting Up the Weekly Timer Operation

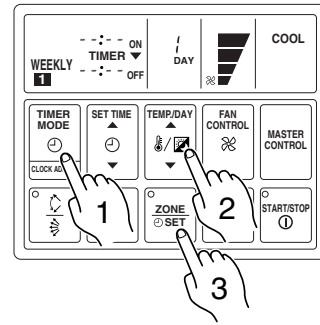
Press the START/STOP button to stop the air conditioner, and then proceed as follows.

1. Press the **TIMER MODE** button so that **"WEEKLY"** appears on the display.

The display now shows the current day (by DAY CODE), the first ON and OFF times for the day (the "WEEKLY 1" times), the fan speed, and the operating mode.

The top time value gives the ON time, and the bottom value gives the OFF time.

If either time is not set, the corresponding time display is blank "----".



2. Press the **SET TEMP./DAY** button to select the day that you want to set up.

▲ : Use to advance the day forward.

▼ : Use to turn the day back.

DAY CODE	1	2	3	4	5	6	7
DAY OF THE WEEK	MON	TUE	WED	THU	FRI	SAT	SUN

3. Hold the **SET** button down for 3 seconds.

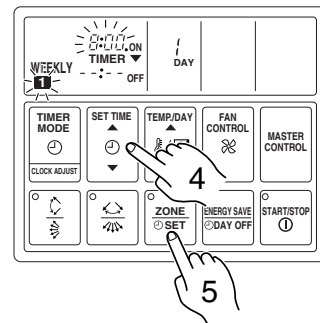
The "WEEKLY 1" ON time starts flashing, and the fan speed and operating mode displays go off.

4. Press the **SET TIME** button to set the day's first ON time.

▲ : Use to advance the day forward.

▼ : Use to turn the day back.

(Press once to move the time 5 minutes; hold down and the time will move 10 minutes at a time.)



5. Press the **SET** button.

This registers the first ON time setting for the selected day.

The ON time display stops flashing, and the "WEEKLY 1" OFF time starts flashing.

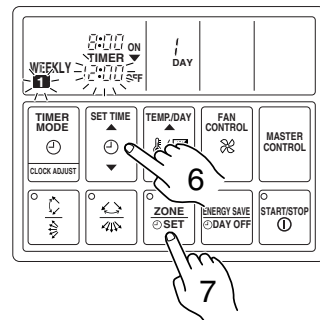
6. Press the **SET TIME** button to set the day's first OFF time.

The earliest OFF time you can set is 5 minutes after the ON time. The latest OFF time is 23:55 on the subsequent day.

7. Press the **SET** button.

This registers the first OFF time for the day, completing the "WEEKLY 1" settings for that day.

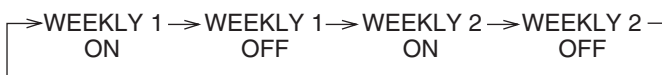
The display switches to "WEEKLY 2", and the day's second ON time begins flashing.



8. Repeat the operations described in Steps 4 to 7 to set the second ON and OFF times for the day (the "WEEKLY 2" times).

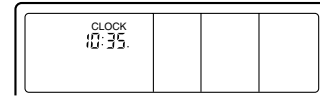
When you press the SET button after setting the "WEEKLY 2" OFF time, the system registers the "WEEKLY 2" settings for the day and returns you to the "WEEKLY 1" ON time setup process. (The first ON setting reappears and begins flashing.)

You can review your settings by pressing the SET button. Each press moves you to the next setting, as follows.



If the timer is not set, press the SET button with the time display blank "----", and perform next operation.

9. Press the SET TEMP./DAY button to select another day for setup. The repeat steps 4 to 8 above to set the ON and OFF times for that day.



10. When you have finished setting all of the times, hold down the SET button for 3 seconds.

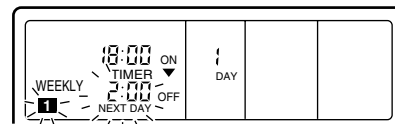
The WEEKLY display flashes for 3 seconds while the new WEEKLY TIMER settings are registered, and then the clock display reappears.

NOTES:

- (1) If no time values are flashing, the clock display will automatically reappear after 15 seconds if no buttons are pressed.
- (2) A flashing time value indicates that the system is in time-setting mode. To return to the clock display you must hold down the SET button for 3 seconds.
- (3) You do not need to set values for both WEEKLY 1 and WEEKLY 2. If you wish, you can set values only for WEEKLY 1 or only for WEEKLY 2.
- (4) The allowable range for the day as time settings is shown below.



(5) If you set the OFF time to occur on the day following the ON time, the NEXT DAY caption appears on the display.

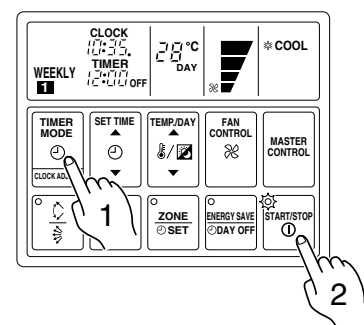


Starting Weekly Timer Operation

1. Press the TIMER MODE button so that "WEEKLY" appears on the display.
2. Press the START/STOP button to start operation.
(This step is not necessary if the air conditioner is already running.)

Weekly timer operation starts, and the operation lamp comes on. (If the current time is between the first or second ON and OFF time settings for the current day, the air conditioner will start. Otherwise the air conditioner will remain off.)

The day display is replaced by the temperature display. The upper time display now shows the current time, and the lower time display shows the next scheduled ON or OFF time.



To Stop Weekly Timer Operation

- To stop weekly timer while leaving the air conditioner running:
Press the TIMER MODE button to select NONSTOP, OFF TIMER, or ON TIMER.
To stop weekly timer operation and the air conditioner also:
Press the START/STOP button.

Reviewing the Time Settings

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

- 1 Press the TIMER MODE button so that "WEEKLY" appears on the display.
- 2 Press the SET TEMP./DAY button to select the day that you want check.
- 3 Press the SET TIME button (▲ or ▼) to switch between the "WEEKLY 1" or "WEEKLY 2" time displays.

About the DAY OFF

- Use the DAY OFF setting to switch off timed operation for a selected day in the coming week.
- This is a temporary, one-time setting. The DAY OFF setting is automatically cleared as soon as the specified day passes.

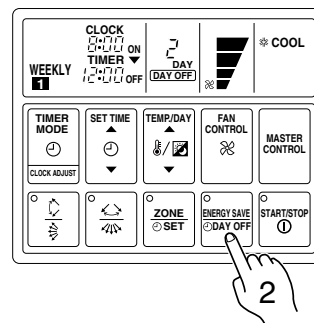
Using the DAY OFF Setting

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

1. Carry out steps 1 to 2 of the "Setting Up the Weekly Timer Operation" procedure to select the day that you want to set as the DAY OFF.
2. Press the DAY OFF button.

The DAY OFF setting is registered, and the DAY OFF caption appears on the display.

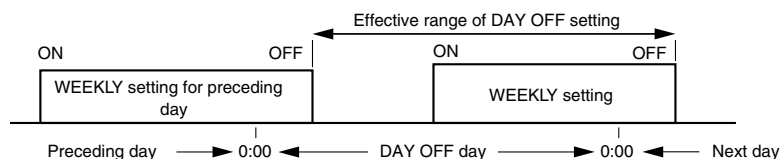
- To cancel the DAY OFF setting:
You can cancel the setting by pressing the DAY OFF button again.



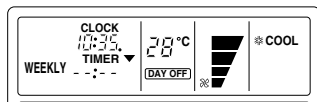
Example : To switch off timed operation for day 2 (Tuesday).

NOTES:

- (1) The DAY OFF setting is only available for days for which weekly time settings already exist.
- (2) You can make this setting for any of the next seven days (counting from the current day).
- (3) The DAY OFF setting is effective over the range illustrated below. The Weekly setting for which an ON time has been set is eligible for the day in which the DAY OFF has been set.



- (4) The display on the clock's lower line will usually be " - " for the DAY OFF set day during Weekly operations.



Precautions during setup

Setup is not possible in the following cases, so amend the time.

- If you set an ON time while leaving the OFF time setting blank:
Nothing will happen when you press the SET button.
To proceed, press the SET TIME button and enter an appropriate setting.
- When an attempt is made to set only the OFF time.
Nothing will happen when you press the SET TIME button.
Press the SET button and amend the entry for the ON time.
- ON and OFF times cannot be set to the same value.
- The OFF time cannot be set earlier than the ON time.
- The WEEKLY 2 settings cannot be set earlier than the WEEKLY 1 settings.
- The WEEKLY 1 and WEEKLY 2 time spans cannot overlap.

Canceling Selected Time Settings

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

1. Carry out steps 1 to 3 of the "Setting Up the Weekly Timer Operation" procedure to select the day you want to edit.
2. Press the SET button to select the ON time that you want to cancel.

Be sure to select an ON time (the upper time display).

3. Hold down the ▼ side of the SET TIME button until the time display becomes blank "----".
4. Press the SET button.

The first OFF time setting ("WEEKLY 1" OFF time) is deleted and replaced by a flashing blank pattern "----".

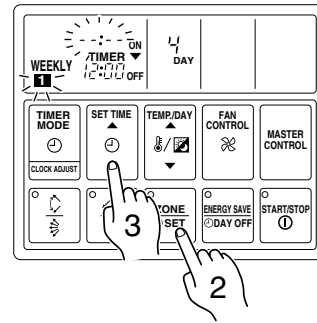
5. Press the SET button again.

This completes deletion of the "WEEKLY 1" ON/OFF settings. The second ON time setting ("WEEKLY 2" ON time) appears and flashes.

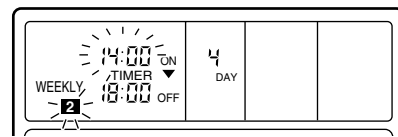
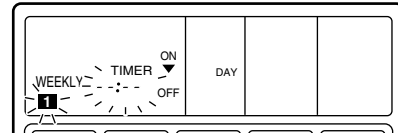
If you wish to delete other time settings, repeat steps 2 through 5.

6. Once the setting has been canceled, hold down the SET button for 3 seconds.

The WEEKLY display flashes briefly, and then the clock display appears.



Example : Clearing the "WEEKLY 1" ON/OFF times for day 4 (Thursday).

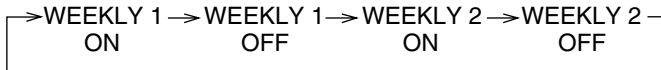


To Change Selected Time Settings

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

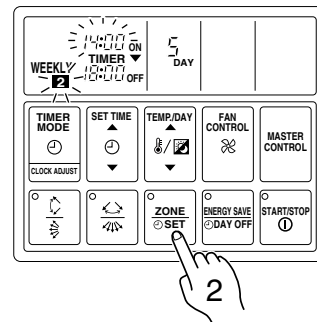
1. Carry out steps 1 to 3 of the "Setting Up the Weekly Timer Operation" procedure to select the day you want to edit.
2. Press the SET button to select the time that you want to change.

The selected setting flashes on the display. Each press moves you to the next setting for the selected day, as follows.

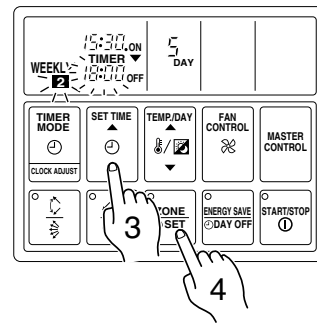


3. Press the SET TIME button to change the time setting.
 4. Press the SET button.
- The new setting overwrites the previous setting.
5. Once the setting has been canceled, hold down the SET button for 3 seconds.

The WEEKLY display flashes briefly, and then the clock display appears.



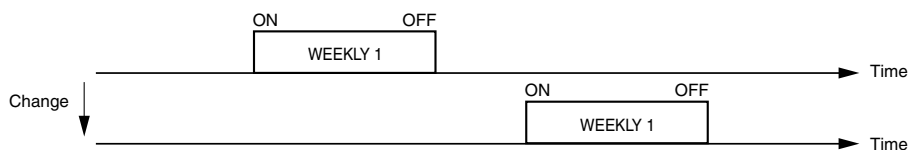
Example : Changing the "WEEKLY 2" ON setting for day 5 (Friday) from 14:00 to 15:30.



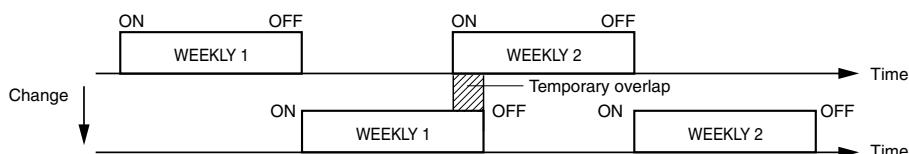
NOTES:

In the following cases, cancel the set time prior to making the required amendments.

- (1) If you want to change the ON time to a time that is later than the currently set OFF time.



- (2) If the change would cause a temporary overlap between the first and second ON/OFF time spans.

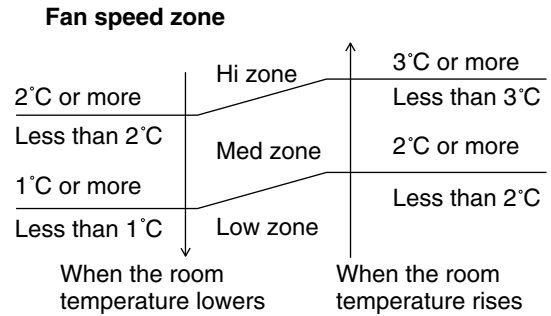


6.2 FAN CONTROL

6-2-1 "AUTO" POSITION

1) COOLING OPERATION

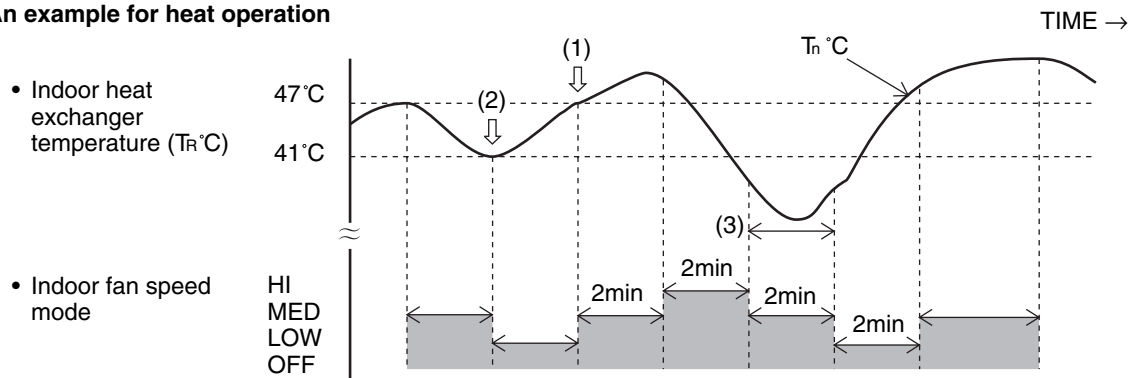
Air flow mode is set automatically in accordance with the condition "(Room temp. - Set temp.)" as shown at the right.



2) HEATING OPERATION

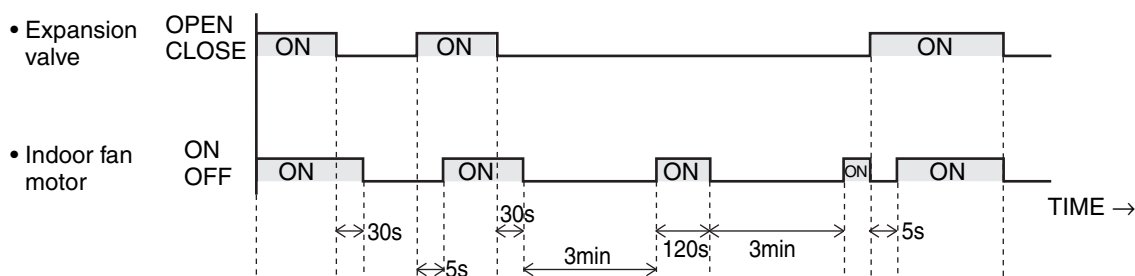
- When the indoor heat exchanger temperature reaches 47°C or more, the fan mode switches to the next higher position ("LOW" → "MED", "MED" → "HIGH").
- When the indoor heat exchanger temperature drops below 41°C while the compressor operates, the fan mode switches to the next lower position ("HIGH" → "MED", "MED" → "LOW").
- After switching the fan mode, it does not switch again within 2 minutes.
- When "FAN CONTROL" is switched to "AUTO" while the unit is operated at the "FAN CONTROL" position of "HIGH", "MED" or "LOW", the unit operation is performed in the "MED" fan mode.

An example for heat operation



3) DRY OPERATION

"Indoor fan motor" operates with "Lo" fan speed despite of "FAN CONTROL" mode.



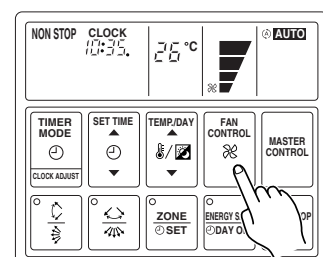
- The indoor fan motor starts operation after 5 seconds when the air condition starts operation or the refrigerant circulation is activating when the operation mode is changed from other OPERATION MODE to "DRY".
- The indoor fan motor stops after 30 seconds from the refrigerant circulation stops.
- During the indoor unit operation, the indoor fan motor will be operated for 120 seconds when the refrigerant circulation continuously stops over 3 minutes.

4) FAN OPERATION

The fan operates continuously with Lo mode.

6-2-2 "LOW", "MED" AND "HIGH" POSITION

The indoor fan operates at the air flow set in the FAN CONTROL mode.



6-3 MASTER CONTROL

6-3-1 OPERATION MODE CONTROL

Each operation mode is controlled as below.

(1) Stop motion

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

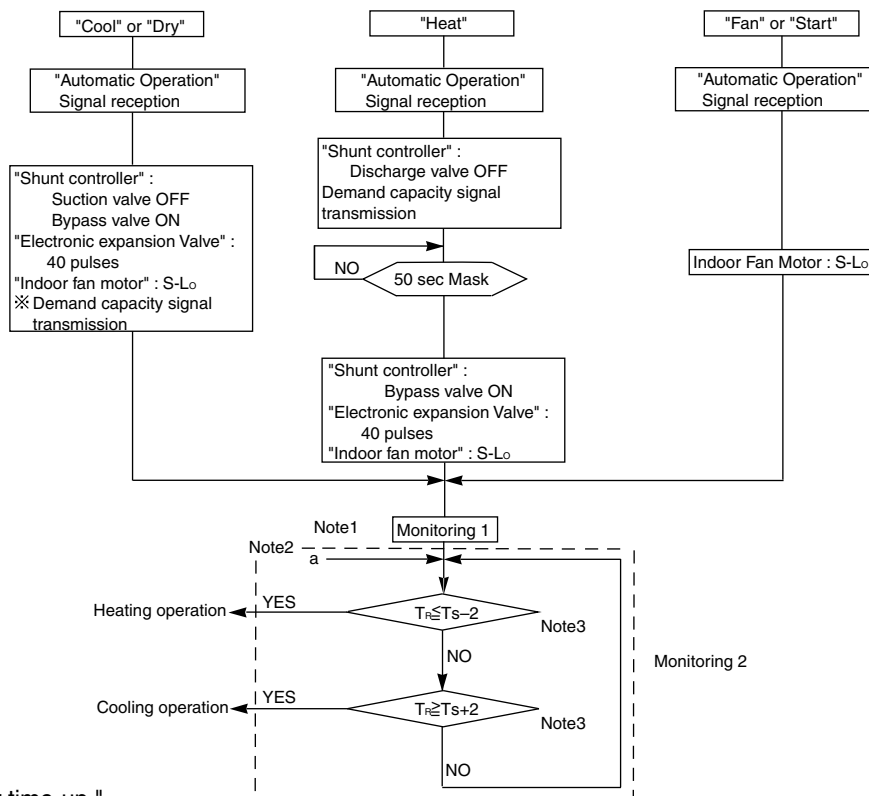
(2) Cool, Fan, Heat and Dry Mode

	Cool	Fan	Heat	Dry	Remarks
Indoor fan motor	Operates according to the AIR FLOW-MODE setting. (Except Monitoring)	Operates according to the AIR FLOW-MODE setting.	Operates according to the AIR FLOW-MODE setting besides followings. <ul style="list-style-type: none"> • Cold air prevention • Defrost operation • Monitoring 	See the fan control page.	
RB unit discharge valve	OFF	OFF	ON	OFF	Heat recovery type Only
RB unit suction valve	ON	OFF	OFF	ON	
RB unit by-pass valve	OFF	OFF	ON	OFF	
Drain pump	Turns ON-OFF by the drain pump control function				
Electrical expansion valve	Pulse controlled by the temperature compensation and the de-icing function	Stop pulse	Pulse controlled by the temperature compensation and the defrosting function	Pulse controlled by the temperature compensation and the de-icing function	

6-3-2 "AUTO"(AUTO CHANOVER) POSITION

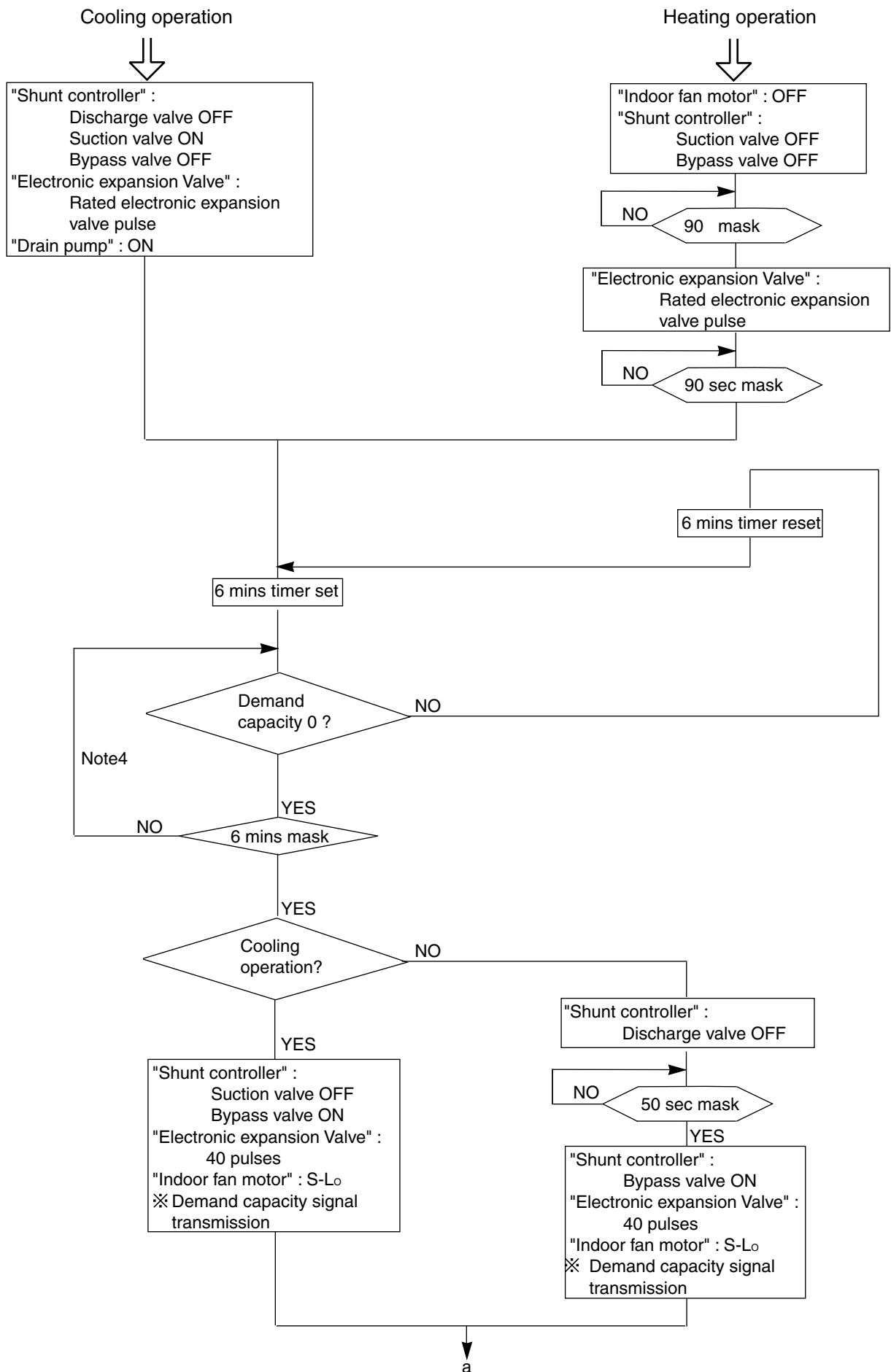
If the autochangeover is selected, the following control is performed.

■ AUTO CHANGEOVER operation (HEAT RECOVERY TYPE)



※ "Mask" means "Timer time-up".

<After automatic operation decided>



Note 1. Monitoring 1 performs the following for 60 seconds and detects the " Room temperature " from the point that
 " Operation started "
 " Indoor unit fan motor " : S-Lo
 " Shunt controller discharge valve " : OFF
 " Shunt controller suction valve " : OFF
 " Shunt controller bypass valve " : ON

Note 2. Room temperature monitoring state.
 If " Room temperature " (T_R) is 2°C lower than the " Set temperature " (T_S) , " Heating " is decided and if it is higher than 2°C , " Cooling " is decided.
 The system operates at S-Lo until the operation mode is decided as " Heating " or " Cool " .
 This state is made monitoring 2.

Note 3. 2: [deg].

Note 4. When the system is in the " Refrigerant circulation stop " state continuously for 6 minutes after " Heating " or " cooling " was decided, returns to a.
 However ,this 6 minutes do not include " Refrigerant circulation stopped " by a protection function.

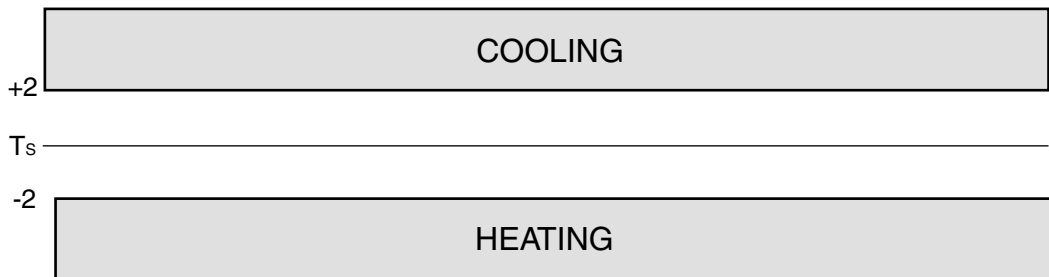
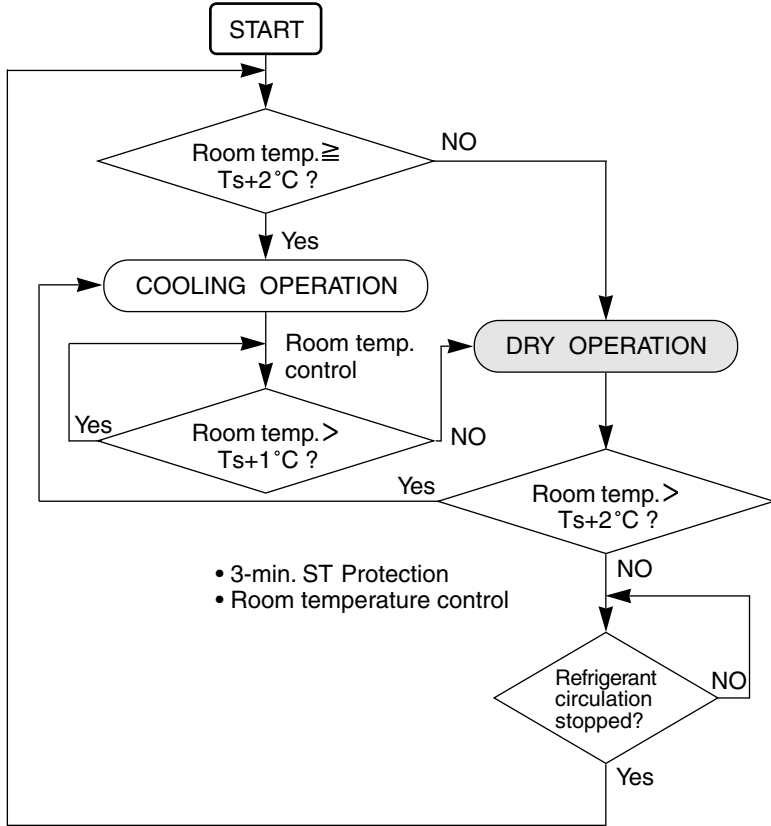


Fig.7-10 Operation mode at " Automatic operation "

- ① Previous Note 2. " Monitoring 1 " measures the room temperature (T_R) and if it is " Set temperature $T_S + 2^\circ\text{C}$ " or less, " Heating " is decided and " Refrigerant circulation " is started.
- ② When $T_S - 2 < T_R < T_S + 2$ at ①, " Monitoring 2 " " Room fan motor " continues and monitoring of the room temperature continues until " Cooling " or " Heating " operation is decided.
- ③ When " Heating " or " Cooling " is decided, the respective operation is performed in accordance with " Room temperature control " to be described later.
- ④ When " Refrigerant circulation stopped " by " Cooling " or " Heating " "Room temperature adjustment " continues for 6 minutes or more, the room temperature monitoring of ② above is performed.
- ⑤ In the state of room temperature watching stated in the above ④, the indoor unit fan motor shall be S-Lo.
- ⑥ When " Set temperature " was changed.
 - A) When changed during " Monitoring 1 ", judgment if performed by means of the " Set temperature " newly input after the end of " Monitoring 1 " .
 - B) When changed with in the previously mentioned Note 3 monitoring range, the newly input " Set temperature " is made T_S .
 - C) When changed during " Cooling operation in progress " (including " Refrigerant circulation stopped " for under 6 minutes by " Room temperature adjustment ") after " Cooling operation " decision, " Cooling operation " is continued with the newly input " Set temperature " as T_S .
 - D) When changed during " Heating operation in progress " (including " Refrigerant circulation stopped " for under 6 minutes by " Room temperature adjustment ") after " Heating operation " decision, " Heating operation " is continued with the newly input " Set temperature " as T_S .
- ⑦ After entering the room temperature monitoring state after the " Refrigerant circulation state " by " Room temperature adjustment " has continued for 6 minutes, " Cooling \leftrightarrow Heating switching is performed even when in a temperature state which switches " Cooling \leftrightarrow Heating " by "Set temperature " change.

■ AUTO CHANGEOVER operation (COOLING ONLY TYPE)

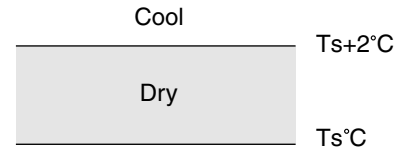
Operation flow chart



(1) When starting the operation at "AUTO" or when 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" mode is set automatically and an air conditioner operates until the room temperature reaches the condition "Room temp. \leq Set temp. (Ts) +1°C".

(2) When the room temperature is less than the set temperature (Ts) +2°C at the start of operation or changing into "AUTO", or after the room temperature reaches the condition "Room temp. < Set temp. (Ts) +2°C", the unit is changed into the "DRY" mode.

"Room Temp. \leq Set Temp. (Ts) +2°C"

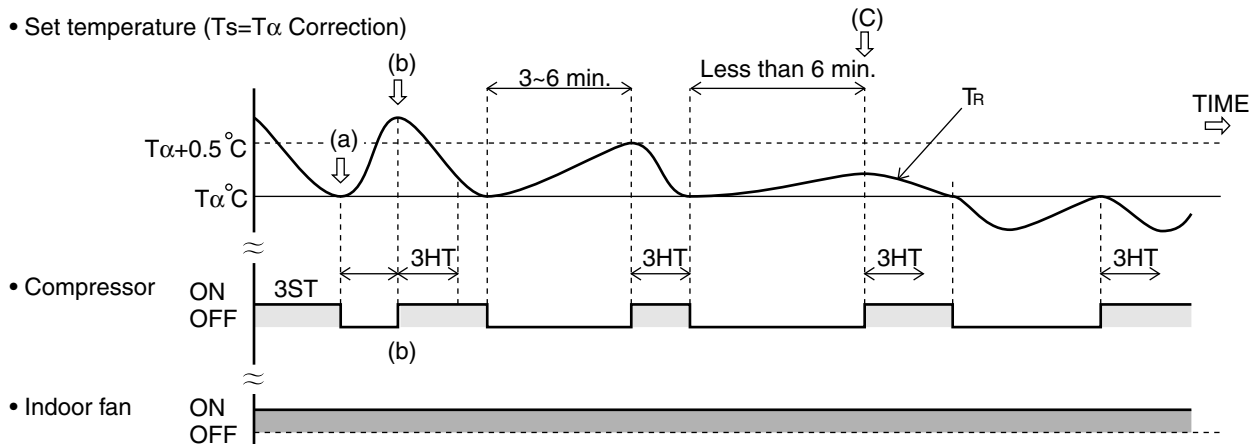


6-3-3 "COOL" POSITION

- (1) When using the cooling mode, set the temperature to a value lower than the current room temperature.
- (2) If it is set higher than the current room temperature the unit will not enter the cooling mode and only the fan will operate.

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

- Set temperature ($T_s = T_\alpha$ Correction)



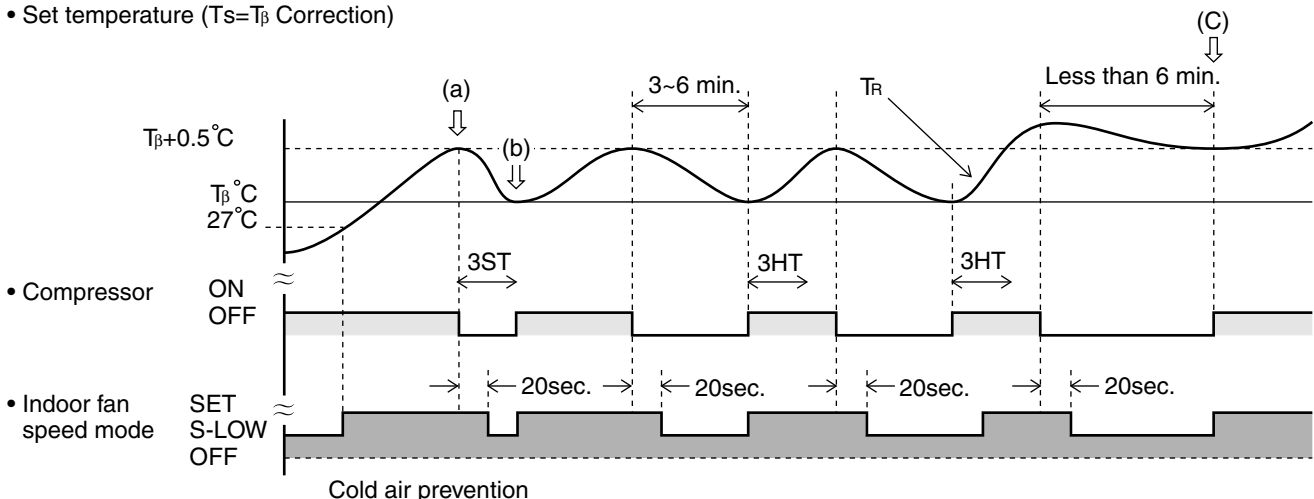
- Compressor turned OFF : $T_R < T_\alpha$
- Compressor turned ON : $T_R \geq T_\alpha + 0.5^\circ\text{C}$ (In case of 3 to 6 minutes)
- Compressor turned ON : $T_R \leq T_\alpha$ (In case that the compressor stops more than 6 minutes)

6-3-4 "HEAT" POSITION

- (1) Set the temperature higher than the current room temperature. If it is set to a lower temperature, heating will not start.
- (2) For about 3 ~ 5 minutes after the start of heating, the fan will operate very slowly, and then switch to the selected fan setting. This period allows the indoor unit's heat exchanger to warm-up before emitting warm air.
- (3) During defrosting, the OPERATION indicator lamp flashes 3 sec. ON and 1 sec. OFF, and the heating mode will be temporarily interrupted.

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

- Set temperature ($T_s = T_\beta$ Correction)



- Compressor OFF : $T_R \geq T_\beta + 0.5^\circ\text{C}$
- Compressor ON : $T_R < T_\beta$
- Compressor ON : $T_R < T_\beta + 0.5^\circ\text{C}$ (When the compressor stops after less than 6min.)

6-3-5 “FAN” POSITION

- (1) In this position, the fan operates alone to circulate air. The room temperature will not be changed.
- (2) Operates at the air flow set in the FAN CONTROL mode.
- (3) When only the “FAN” mode is being used, setting to “AUTO” is equivalent to set it at “MED”.

6-4 LOUVER CONTROL

(1) ADJUSTING THE DIRECTION OF AIR CIRCULATION

Instructions relating to heating (*) are applicable only to "HEAT & COOL MODEL" (Reverse Cycle).

Begin air conditioner operation before performing this procedure.

Vertical Air Direction Adjustment

This instructions are applicable to "CEILING SUSPENSION TYPE", "FLOOR CONSOLE/UNDER CEILING DUAL TYPE", "CASSETTE TYPE", and "WALL MOUNTED TYPE".

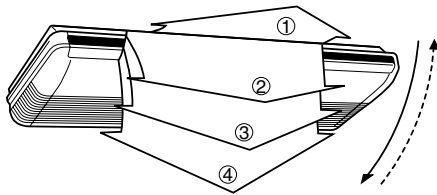
Press the VERTICAL AIR FLOW DIRECTION SET button.

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

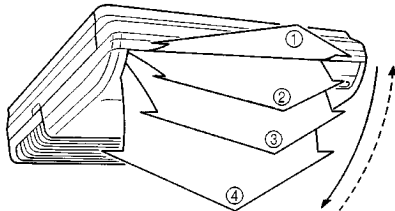


The remote controller's display does not change.

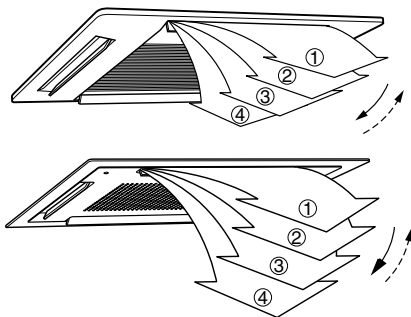
■ CEILING SUSPENSION TYPE



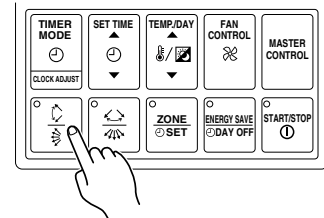
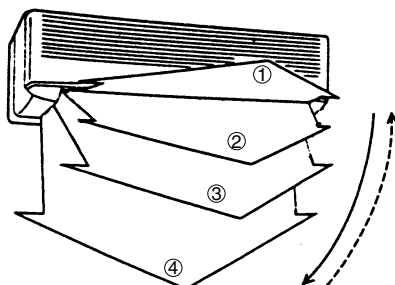
■ FLOOR CONSOLE/UNDER CEILING DUAL TYPE



■ CASSETTE TYPE



■ WALL MOUNTED TYPE



Example : When set to vertical air direction.

⚠ DANGER!

Never place fingers or foreign objects inside the outlet port could cause personal injury.

- Always use the remote controller's AIR FLOW DIRECTION button to adjust the UP/DOWN air direction flap or RIGHT/LEFT air direction louvers. Attempting to move them manually could result in improper operation; in this case, stop operation and restart. The flaps should begin to operate properly again.
- During use of the Cooling mode, do not set the UP/DOWN air direction flap in the ④ position 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.

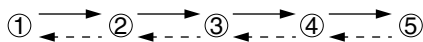
- Use the air direction adjustments within the ranges shown above.
- The vertical airflow direction is set automatically as shown, in accordance with the type of operation selected.
 - During Cooling mode : Horizontal flow ①
 - * During Heating mode : Downward flow ④
- During AUTO mode operation, for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

Horizontal Air Direction Adjustment

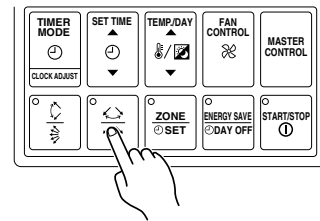
This instructions are applicable to "CEILING SUSPENSION TYPE", "FLOOR CONSOLE/UNDER CEILING DUAL TYPE" and "WALL MOUNTED TYPE".

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

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

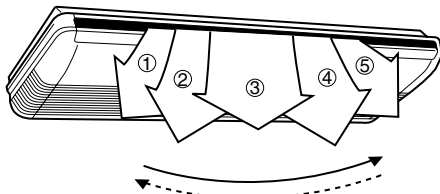


The remote controller's display does not change.

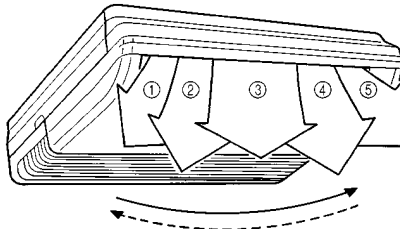


Example : When set to horizontal air direction.

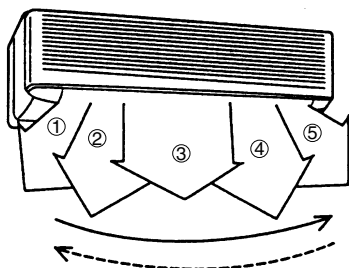
■ CEILING SUSPENSION TYPE



■ FLOOR CONSOLE/UNDER CEILING DUAL TYPE



■ WALL MOUNTED TYPE



(2) SWING OPERATION

Instructions relating to "the indoor unit's indicator lamp" (**) are applicable to "CEILING SUSPENSION TYPE", "FLOOR CONSOLE /UNDER CEILING DUAL TYPE", "CASSETTE TYPE", "WALL MOUNTED TYPE".

Begin air conditioner operation before performing this procedure.

To select Vertical airflow SWING Operation

This instructions are applicable to "CEILING SUSPENSION TYPE", "FLOOR CONSOLE/UNDER CEILING DUAL TYPE", "CASSETTE TYPE" and "WALL MOUNTED 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.

To Stop Vertical airflow SWING Operation

Press the VERTICAL SWING button for more than two seconds once 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 "CEILING SUSPENSION TYPE", "FLOOR CONSOLE /UNDER CEILING DUAL TYPE", "CASSETTE TYPE" and "WALL MOUNTED 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.
- During use of the Cooling mode, do not set the air UP/ DOWN direction flap, in the ④ position for long periods of time, since water vapor may condense near the outlet port and drops of water may drip from the air conditioner.

To select Horizontal Airflow SWING Operation

This instructions are applicable to "CEILING SUSPENSION TYPE", "FLOOR CONSOLE/UNDER CEILING DUAL TYPE" and "WALL MOUNTED 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.

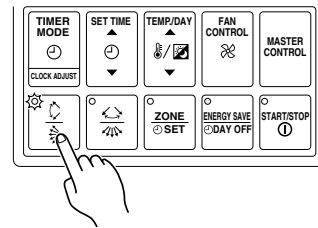
To Stop Horizontal airflow SWING Operation

Press the HORIZONTAL SWING button for more than two seconds once 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

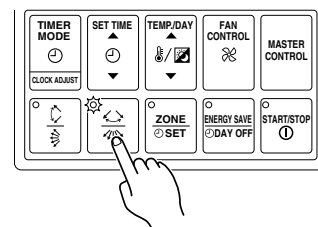
- The range of swing is relative to the currently set airflow direction.
- If the swing range is not as desired, use the remote controller's HORIZONTAL AIR FLOW DIRECTION SET button to change the range of swing.
- The SWING operation may stop temporarily when the air conditioner's fan is not operating,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



Example : When set to vertical swing.

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 direction range (See page 22)



Example : When set to horizontal swing.

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

Air direction range (See page 23)

6-5 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.

6-6 AUTO RESTART

- (1) The air conditioner restarts with the previous setting operation.
- (2) When the air conditioner restarts, the " THREE MINUTE DELAY FUNCTION " operates.
- (3) When the air conditioner restarts for heating operation, the " COLD AIR DISCHARGE PREVENTION FUNCTION " operates.
- (4) When the timer power is interrupted during operation and is reset later, the timer display flashes (on 3 sec. / off 1 sec.).

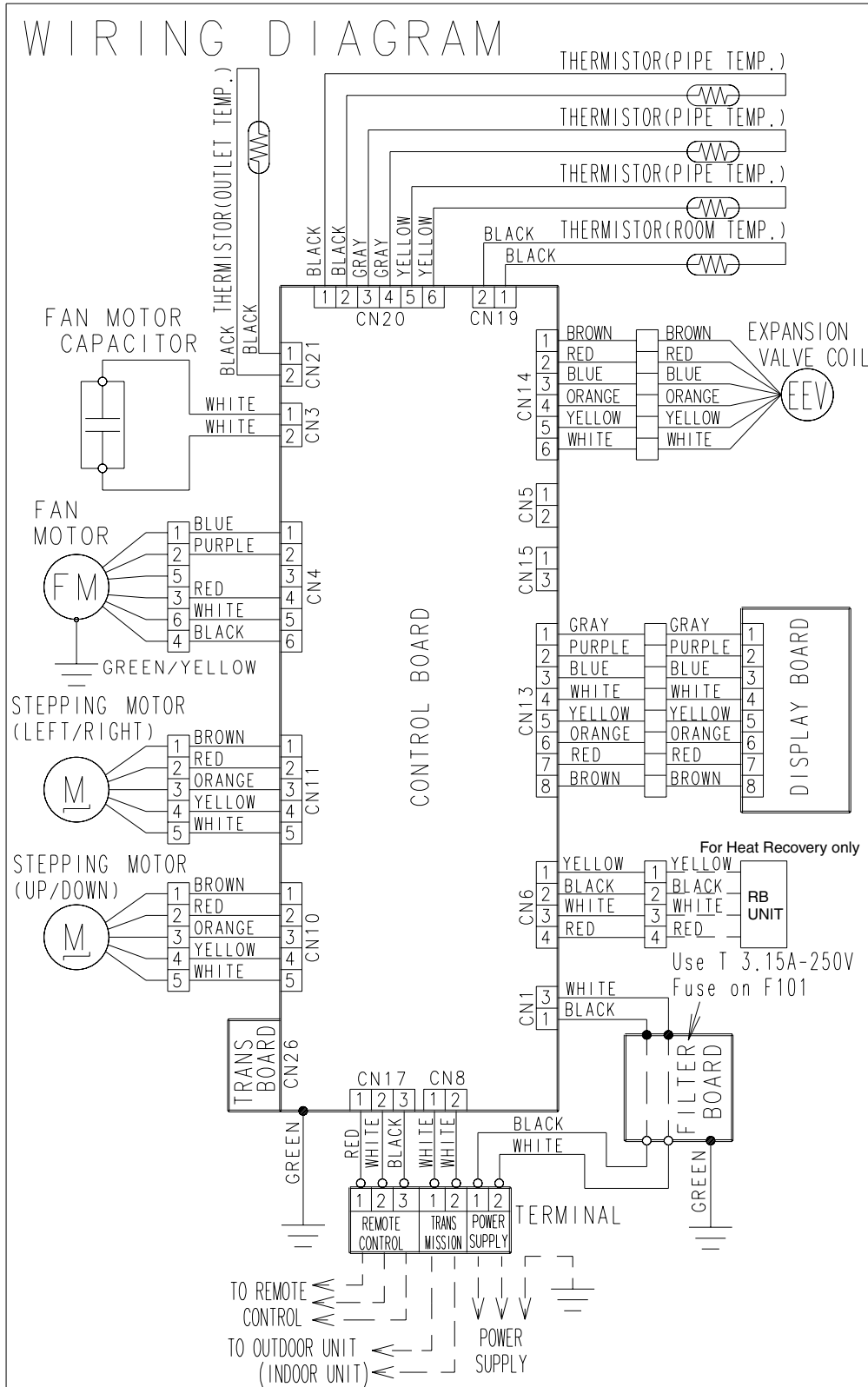
6-7 DRAIN PUMP OPERATION

- (1) When 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 stops by the 'Indoor heat exchanger de-icing function', the drain pump is turned off in 1 hour after the compressor stops.
- (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 and outdoor 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 min., 'FAILURE INDICATION' operates.
- (6) When the float switch turns OFF within 3 min., the unit starts cooling operation.

7. WIRING DIAGRAMS

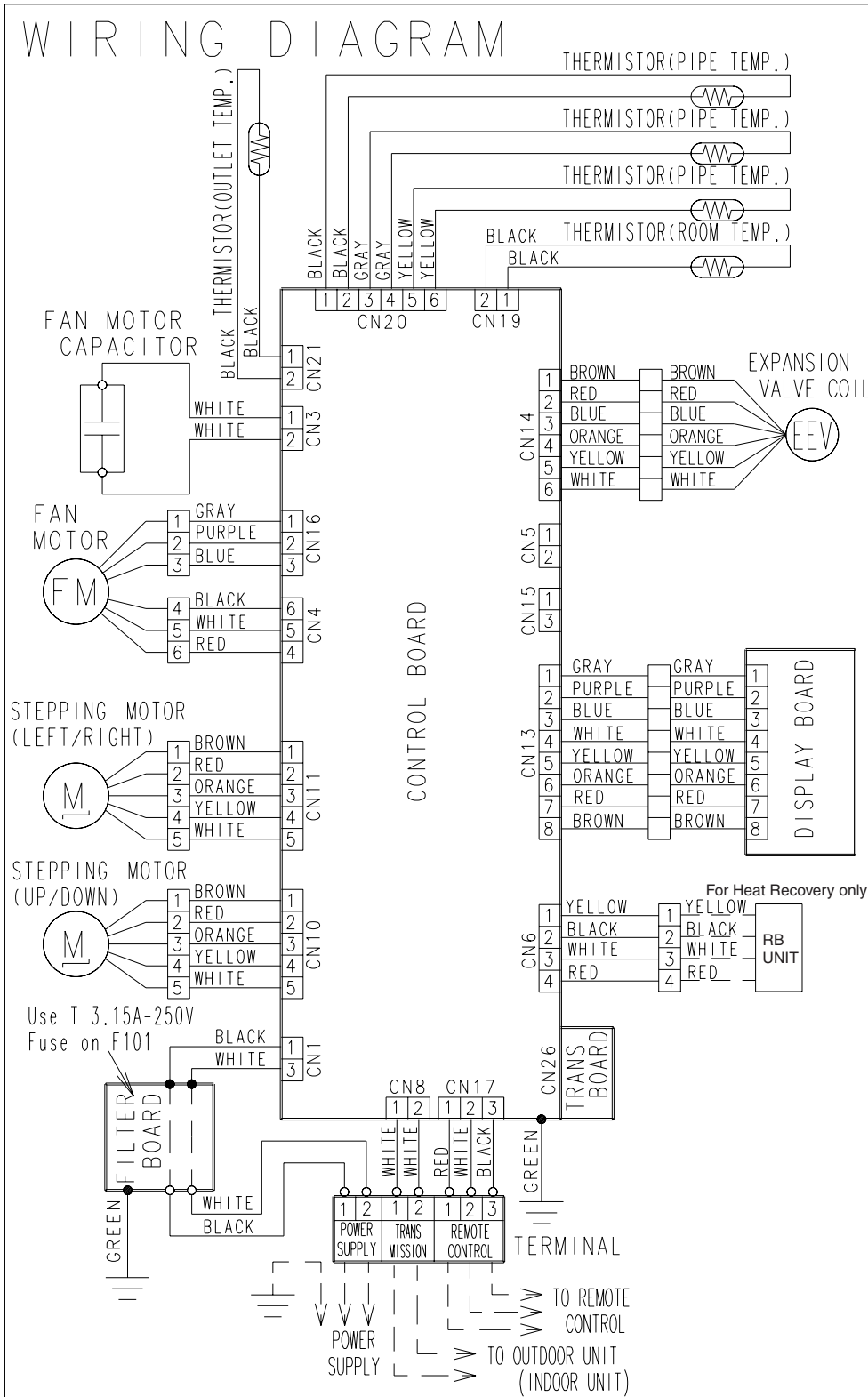
7-1 UNIVERSAL FLOOR / CEILING TYPE

■ MODELS : AB12, AB14, AB18, AB24



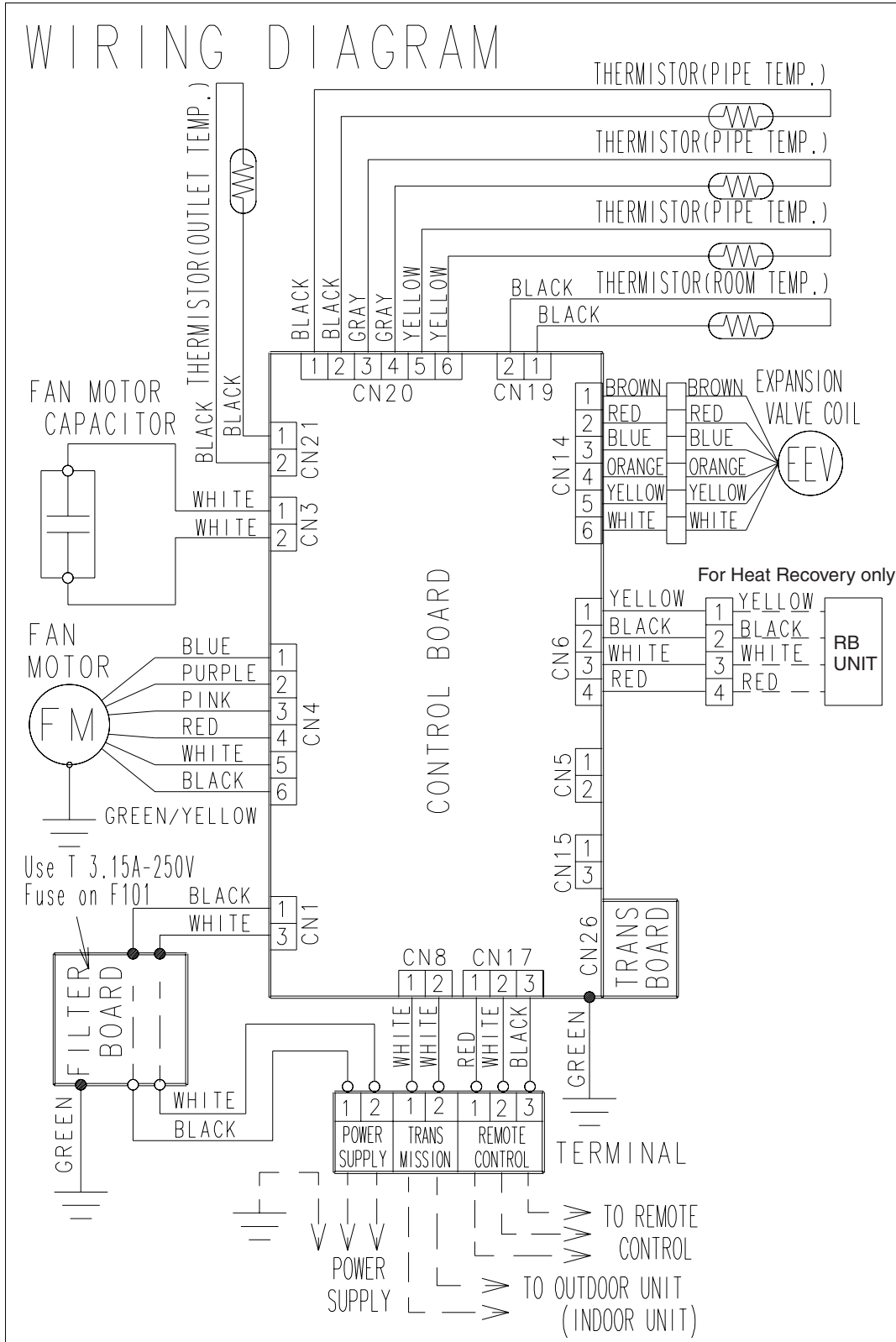
7-2 LARGE CEILING TYPE

■ MODELS : AB30, AB36, AB45, AB54



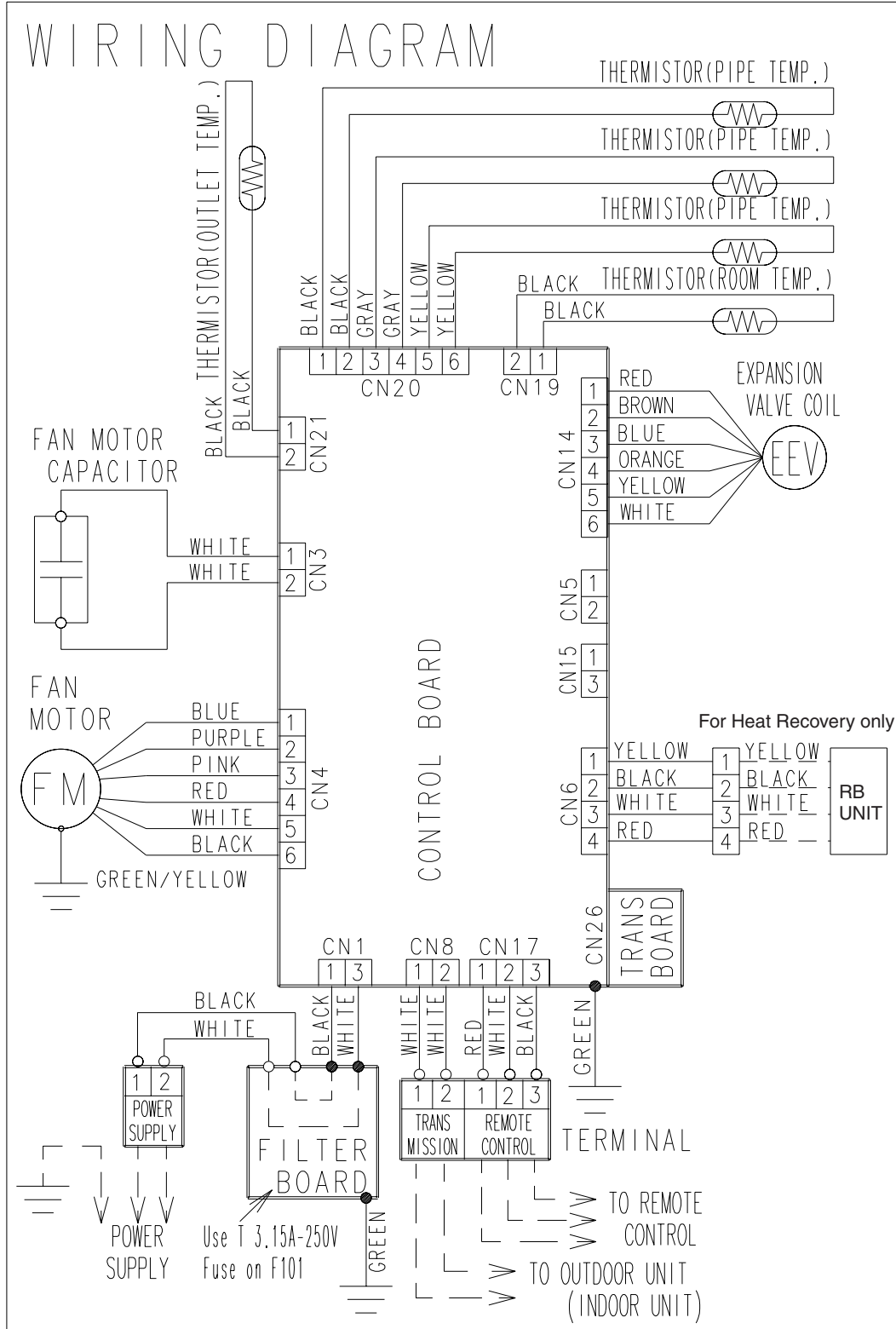
7-3 COMPACT DUCT TYPE

■ MODELS : AR7, AR9, AR12, AR14, AR18



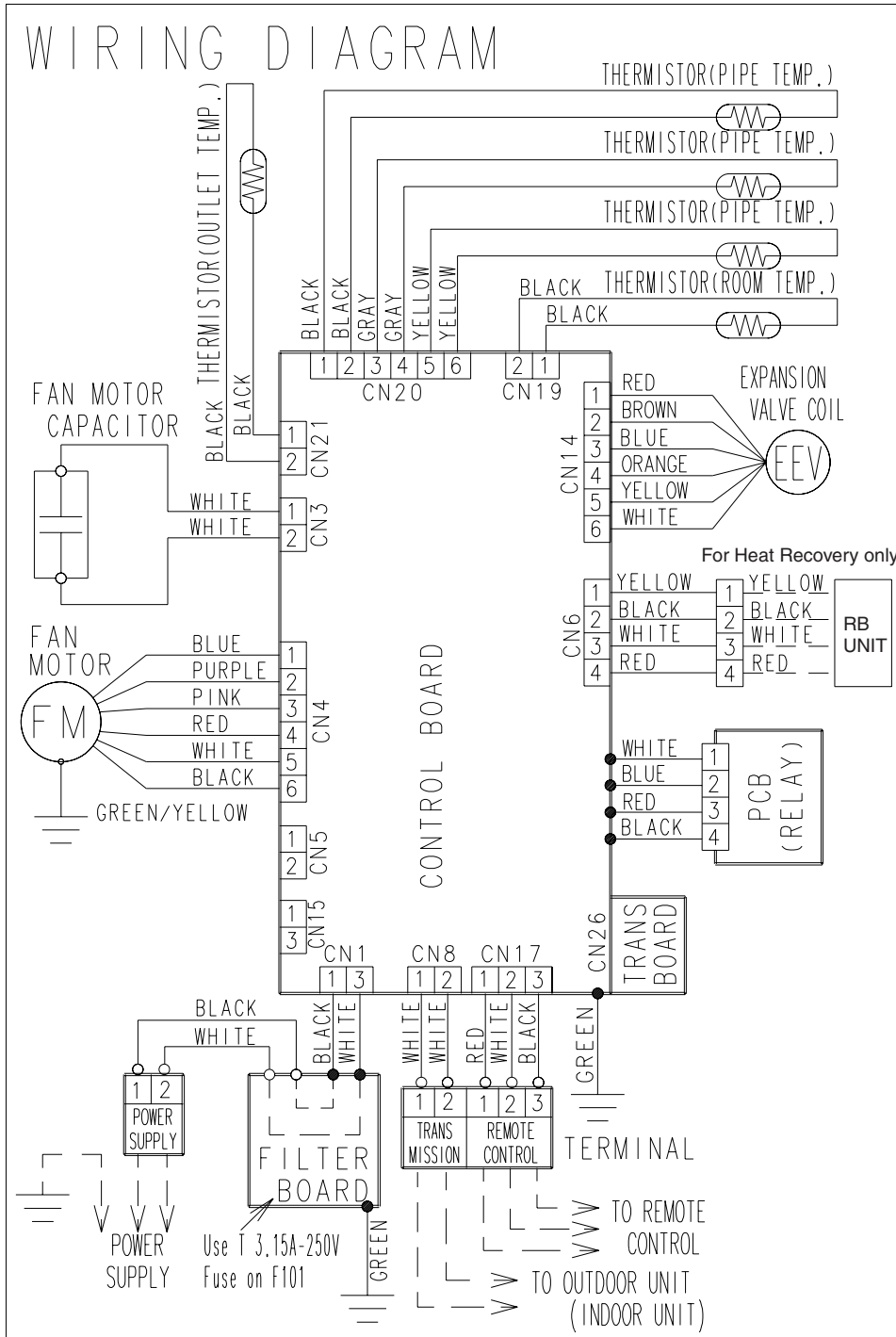
7-4 LOW STATIC PRESSURE DUCT TYPE

■ MODELS : AR25, AR30, AR36, AR45



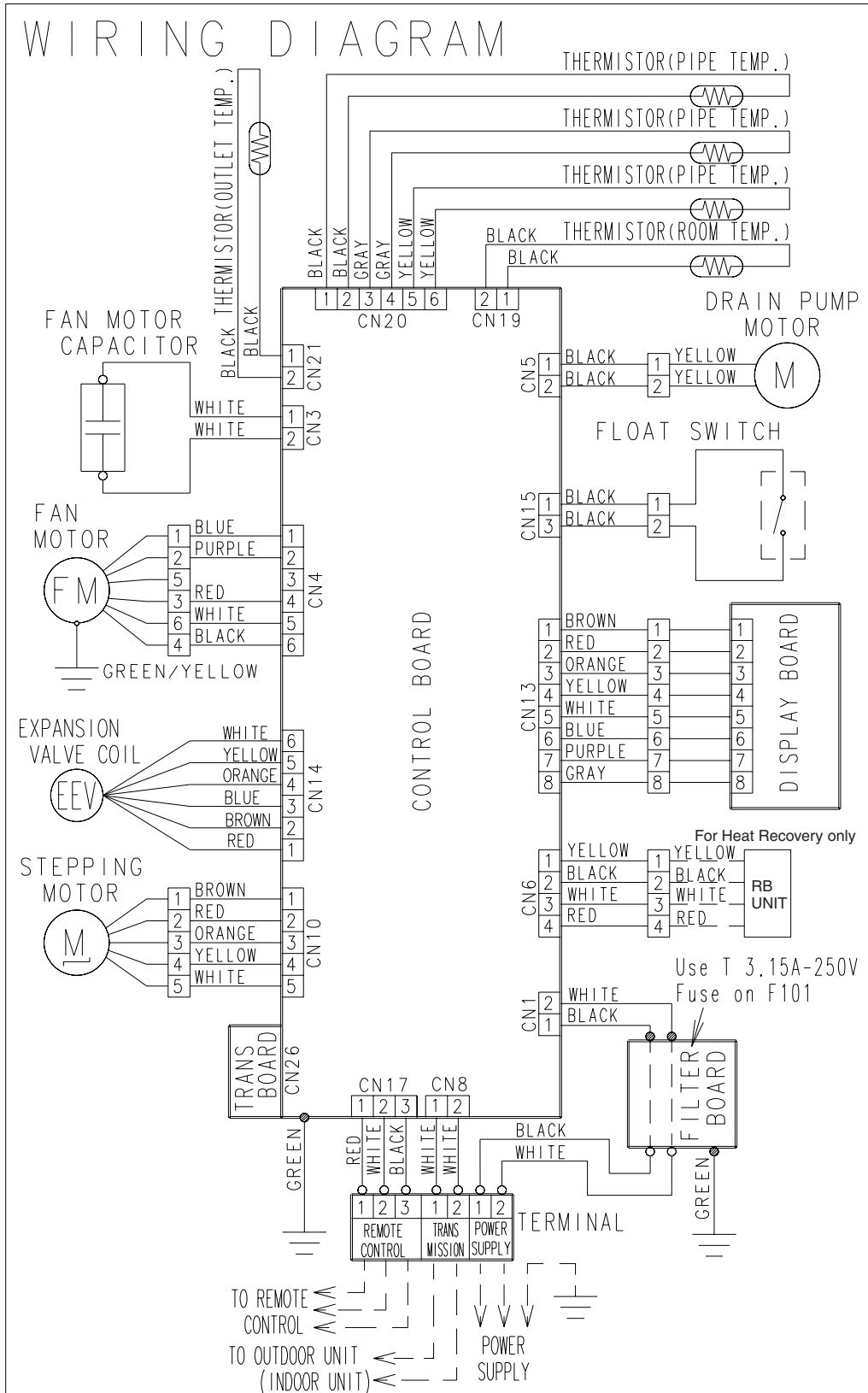
7-5 HIGH STATIC PRESSURE DUCT TYPE

■ MODELS : AR36H, AR45H, AR60H



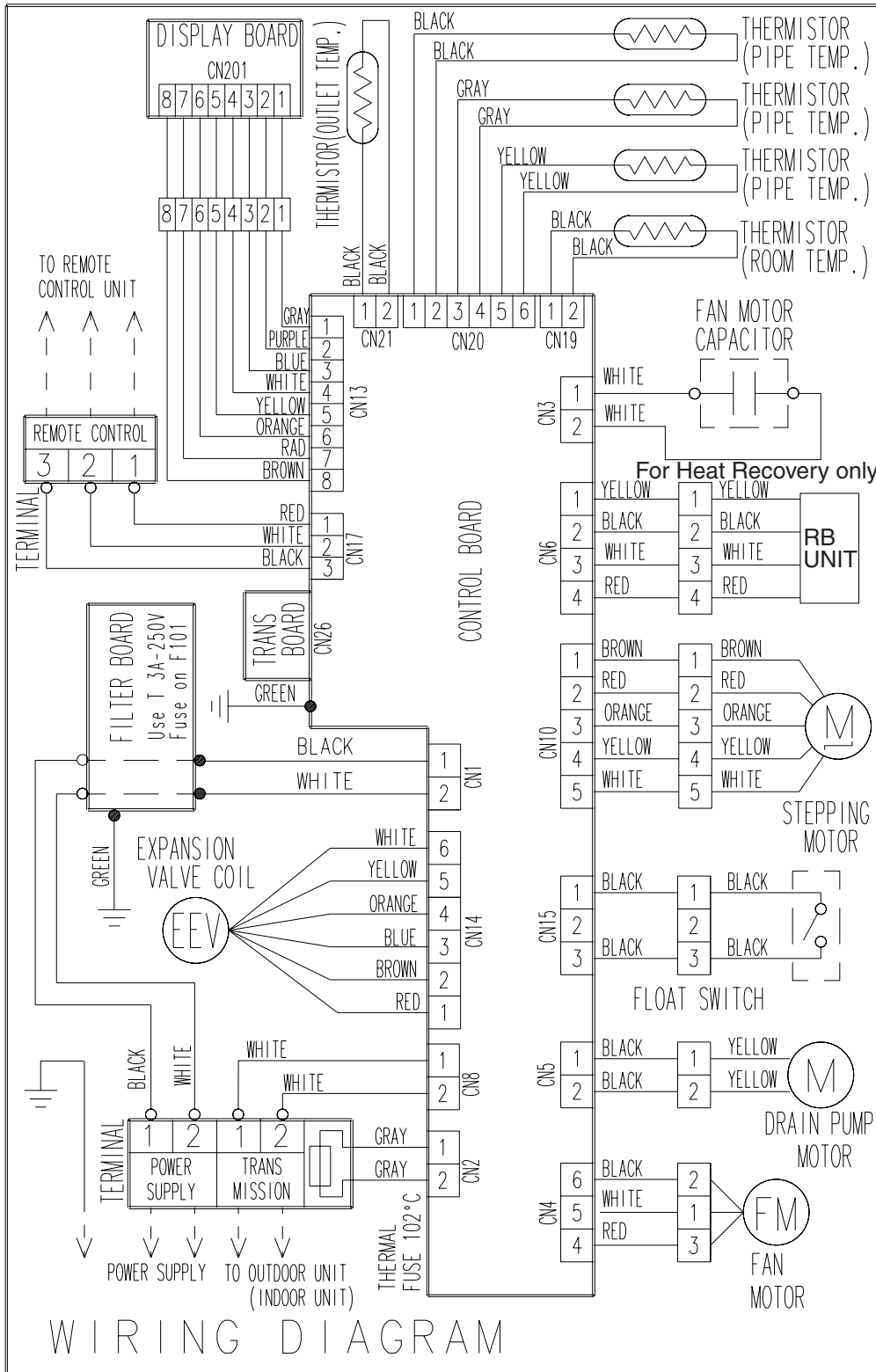
7-6 COMPACT CASSETTE TYPE

MODELS : AU7, AU9, AU12,AU14,AU18



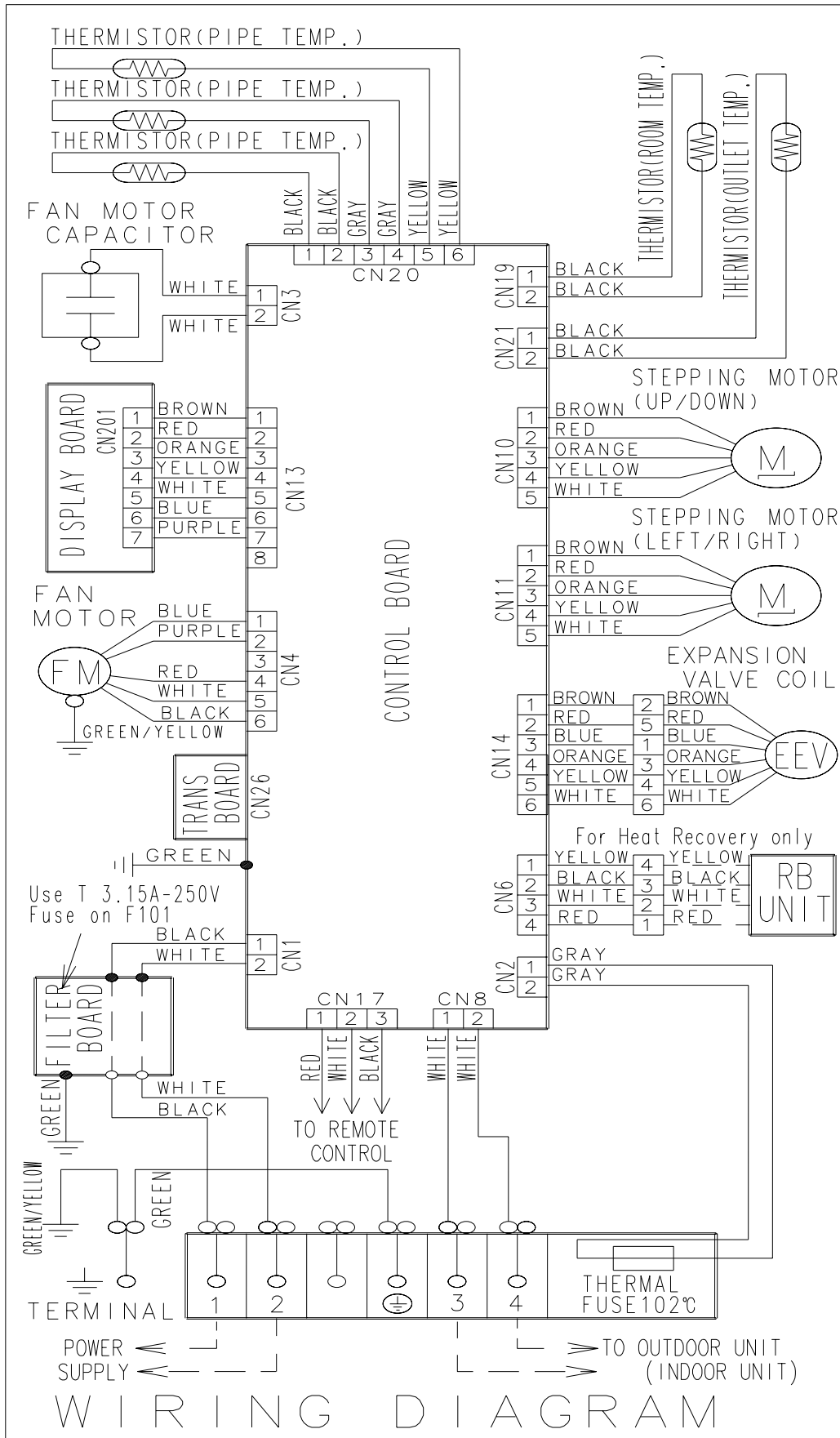
7-7 NEW CASSETTE TYPE

■ MODELS : AU20, AU25, AU30,AU36,AU45,AU54



7-8 WALL MOUNTED TYPE

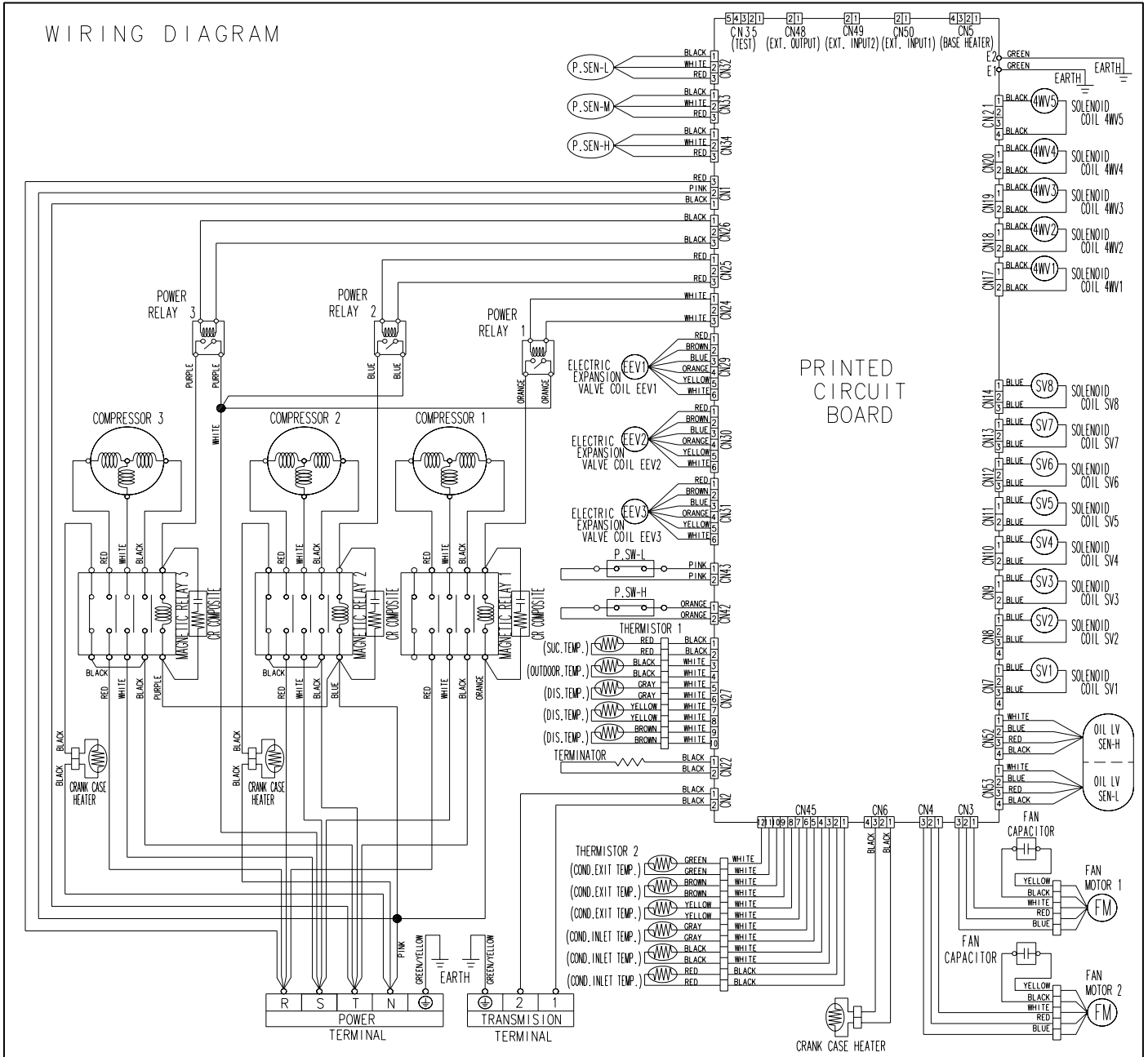
■ MODELS : AS14 , 20 , 24 , 30



7-9 OUTDOOR UNIT

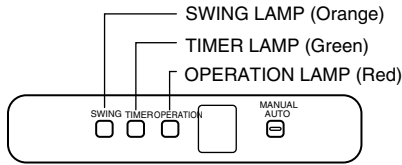
MODEL : AOY90

WIRING DIAGRAM



8. TROUBLESHOOTING

8-1 INDOOR UNIT



Operation can be checked by lighting and flashing of the grille display section OPERATION and TIMER lamps. perform judgment in accordance with the following.


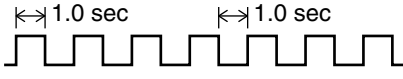

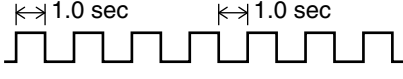

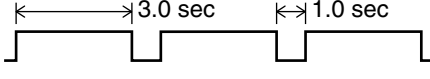



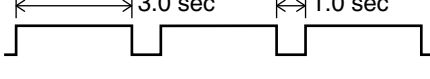
- Test running

When the air conditioner is run by pressing the remote controller test run button, the OPERATION and TIMER lamps flash slowly at the same time.

- Error

The OPERATION and TIMER lamps operate as follows (Table 11) according to the error contents.

8-1-1 NORMAL OPERATION DISPLAY

OPERATION FACTOR	INDICATOR LAMP	FLASH / TIME (SEC)
① Test operation	Operation lamp (red) 	ON OFF 
	Timer lamp (green) 	ON OFF 
② Power failure *1 Auto-restart enable (DIP SW 2-4 : OFF)	Timer lamp (green) 	ON OFF 
	*2 Auto-restart disable (DIP SW 2-4 : ON)	Operation lamp (red)  Timer lamp (green) 
③ Defrost operation *3 (Heating operation)	Operation lamp (red) 	ON OFF 

Note: Display lamps light on the front panel of the indoor unit.

*1: The power is failed during timer operation, then the timer lamp flashes on and off when the power returns.

*2: The power is failed during operation, then both lamps flash on and off when the power returns.

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

8-1-2 ABNORMAL OPERATION DISPLAY

	Operation Lamp	Timer Lamp	Swing Lamp	Error contents
①	0.1 sec. ON / OFF flashing	0.1 sec. ON / OFF flashing	—	Model data error
②	0.5 sec. / 0.5 sec. flashing 2 times	0.1 sec. ON / OFF flashing	—	Room temperature thermistor error
③	0.5 sec. / 0.5 sec. flashing 3 times	0.1 sec. ON / OFF flashing	0.5 sec. / 0.5 sec. flashing once	Heat exchanger inlet temperature thermistor error
④	0.5 sec. / 0.5 sec. flashing 3 times	0.1 sec. ON / OFF flashing	0.5 sec. / 0.5 sec. flashing 2 times	Heat exchanger intermediate temperature thermistor error
⑤	0.5 sec. / 0.5 sec. flashing 3 times	0.1 sec. ON / OFF flashing	0.5 sec. / 0.5 sec. flashing 3 times	Heat exchanger outlet temperature thermistor error
⑥	0.5 sec. / 0.5 sec. flashing 4 times	0.1 sec. ON / OFF flashing		Drain error(Float switch operation)
⑦	0.5 sec. / 0.5 sec. flashing 5 times	0.1 sec. ON / OFF flashing		Serial communication error
⑧	0.5 sec. / 0.5 sec. flashing 6 times	0.1 sec. ON / OFF flashing		Indoor fan error
⑨	0.1 sec. ON / OFF flashing 7 times	0.1 sec. ON / OFF flashing		Discharge temperature thermistor error
⑩	0.1 sec.ON/ OFF	0.5 sec. ON / OFF flashing 2 times	0.5 sec. ON / OFF flashing 2 times	Duplicate indoor unit numbers, Number of indoor units exceeds limit
⑪	0.1 sec. ON / OFF flashing	0.5 sec. ON / OFF flashing 3 times	0.5 sec. ON / OFF flashing 3 times	Outdoor unit error

- ① Model data error
PCB fault.
- ② Room temperature thermistor error.
Thermistor(CN19) open or short-circuited.
- ③ Indoor heat exchanger inlet temperature thermistor error.
Heat exchanger inlet thermistor(CN20 1,2PIN) open or short-circuited.
- ④ Indoor heat exchanger intermediate temperature thermistor error.
Heat exchanger inlet thermistor(CN20 3,4PIN) open or short-circuited.
- ⑤ Indoor heat exchanger outlet temperature thermistor error.
Heat exchanger outlet thermistor(CN20 5,6PIN) open or short-circuited
- ⑥ Drain error (Float switch operation) The float switch operates and if there is no recovery within 3 minutes.
Inside of the hose stuffed, drain pump/float switch and PCB fault.
(When float switch is turned to ON, the compressor and the indoor fan stopped)
- ⑦ Serial communication error (between air conditioner unit and wired remote controller)
PCB fault.
- ⑧ Indoor fan error.
AB30-54: Indoor fan motor line(CN 4) or feedback line (CN 16) is disconnected/bad connected, PCB and indoor fan motor fault.
* When the indoor fan motor rotation is differ from the required rotation on the indoor fan phase control model(AB30-54), the indoor fan becomes faulty due to the rotation does not feedback.
- ⑨ Discharge temperature thermistor error.
Discharge thermistor (CN 21) open or short-circuited.
- ⑩ Doubled indoor address and excessive connecting units.
Indoor unit address is doubled or units to be connected are excessive.
- ⑪ Outdoor unit error.
Outdoor unit faulty.

Table 11

Error display		Error contents	Error display		Error contents						
①	<p>OPERATION LAMP: 0.1 sec ON, 0.1 sec OFF repeated</p> <p>TIMER LAMP: 0.1 sec ON, 0.1 sec OFF repeated</p> <p>SWING LAMP: 0.1 sec ON, 0.1 sec OFF repeated</p>	Model data error	⑥	<p>OPERATION LAMP: Four quick flashes repeated (0.5 sec ON, 0.5 sec OFF)</p> <p>TIMER LAMP: 0.1 sec ON, 0.1 sec OFF repeated</p> <p>SWING LAMP: 0.1 sec ON, 0.1 sec OFF repeated</p>	Drain error (Float switch operation) The float switch operates and if there is no recovery within 3 minutes.						
	②			<p>OPERATION LAMP: Two quick flashes repeated (0.5 sec ON, 5 sec OFF)</p> <p>TIMER LAMP: 0.1 sec ON, 0.1 sec OFF repeated</p> <p>SWING LAMP: 0.1 sec ON, 0.1 sec OFF repeated</p>		Room temperature thermistor error	⑦	<p>OPERATION LAMP: Five quick flashes repeated (0.5 sec ON, 0.5 sec OFF)</p> <p>TIMER LAMP: 0.1 sec ON, 0.1 sec OFF repeated</p> <p>SWING LAMP: 0.1 sec ON, 0.1 sec OFF repeated</p>	Serial communication error (between air conditioner unit and wired remote controller)		
										③	<p>OPERATION LAMP: Three quick flashes repeated (0.5 sec ON, 5 sec OFF)</p> <p>TIMER LAMP: 0.1 sec ON, 0.1 sec OFF repeated</p> <p>SWING LAMP: One quick flash repeated (0.5 sec ON, 5 sec OFF)</p>
④	<p>OPERATION LAMP: Three quick flashes repeated (0.5 sec ON, 5 sec OFF)</p> <p>TIMER LAMP: 0.1 sec ON, 0.1 sec OFF repeated</p> <p>SWING LAMP: Two quick flashes repeated (0.5 sec ON, 5 sec OFF)</p>	Indoor heat exchanger intermediate temperature thermistor error	⑨	<p>OPERATION LAMP: Seven quick flashes repeated (0.5 sec ON, 0.5 sec OFF)</p> <p>TIMER LAMP: 0.1 sec ON, 0.1 sec OFF repeated</p> <p>SWING LAMP: 0.1 sec ON, 0.1 sec OFF repeated</p>	Discharge temperature thermistor error						
						⑤	<p>OPERATION LAMP: Three quick flashes repeated (0.5 sec ON, 5 sec OFF)</p> <p>TIMER LAMP: 0.1 sec ON, 0.1 sec OFF repeated</p> <p>SWING LAMP: Three quick flashes repeated (0.5 sec ON, 5 sec OFF)</p>	Indoor heat exchanger outlet temperature thermistor error	⑩		

Error display		Error contents
①	<p>OPERATION LAMP</p> <p>ON</p> <p>OFF</p> <p>0.1 sec</p> <p>0.1 sec ON/OFF repeated</p>	Outdoor unit error
	<p>TIMER LAMP</p> <p>ON</p> <p>OFF</p> <p>0.5 sec</p> <p>0.5 sec</p> <p>Three quick flashes repeated</p>	
	<p>SWING LAMP</p> <p>ON</p> <p>OFF</p> <p>5 sec</p> <p>Three quick flashes repeated</p>	

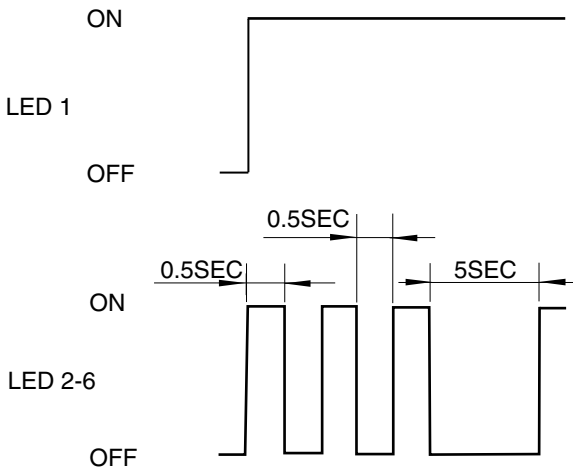
8-2 OUTDOOR UNIT

8-2-1 NORMAL OPERATING DISPLAY

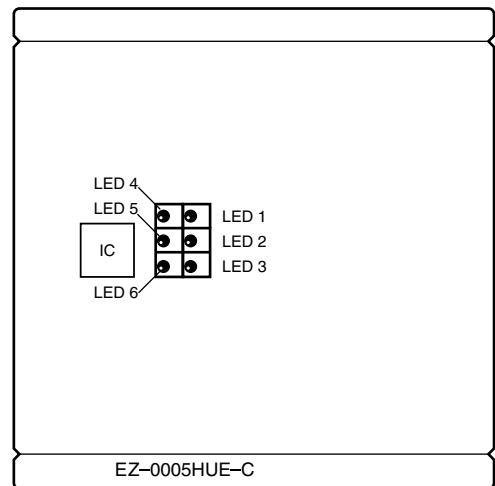
Display Type	LED 1	LED 2	LED 3	LED 4	LED 5	LED 6
Cooling operation	◎	○ (1)				
Heating operation	◎	○ (2)				
Cooling main operation	◎	○ (3)				
Heating main operation	◎	○ (4)				
Same performance operation	◎	○ (5)				
Compressor output STEP1	◎		○ (1)			
Compressor output STEP2	◎		○ (2)			
Compressor output STEP3	◎		○ (3)			
Compressor output STEP4	◎		○ (4)			
Compressor output STEP5	◎		○ (5)			
Compressor output STEP6	◎		○ (6)			
Heat exchanger usage capacity STEP1	◎			○ (1)		
Heat exchanger usage capacity STEP2	◎			○ (2)		
Heat exchanger usage capacity STEP3	◎			○ (3)		
Heat exchanger usage capacity STEP4	◎			○ (4)		
Heat exchanger usage capacity STEP5	◎			○ (5)		
Heat exchanger usage capacity STEP6	◎			○ (6)		
Oil recovery	◎				○ (1)	
Defrosting	◎				○ (2)	
Test operation	◎				○ (3)	
High pressure → Medium pressure by-pass	◎					○ (1)
High pressure → Low pressure by-pass	◎					○ (2)
Under initialization of expansion valve	◎					◎

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

Error display



OUTDOOR P.C.B. BOARD LAYOUTS



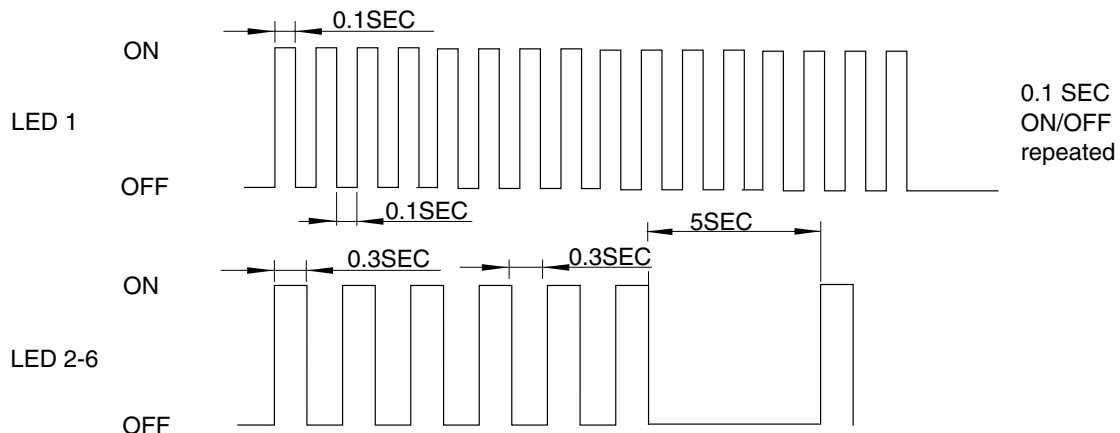
8-2-2 ABNORMAL OPERATION DISPLAY

Display type	LED 1	LED 2	LED 3	LED 4	LED 5	LED 6
Compressor1 error	◇	● (1)				
Compressor2 error	◇	● (2)				
Compressor3 error	◇	● (3)				
Discharge temprature1 error	◇	● (4)				
Discharge temprature2 error	◇	● (5)				
Discharge temprature3 error	◇	● (6)				
High-pressure error	◇	● (7)				
Low-pressure error	◇	● (8)				
Pump down error	◇	● (9)				
Discharge temperature thermistor1 error	◇		● (1)			
Discharge temperature thermistor2 error	◇		● (2)			
Discharge temperature thermistor3 error	◇		● (3)			
Heat exchange inlet thermistor1 error	◇		● (4)			
Heat exchange inlet thermistor2 error	◇		● (5)			
Heat exchange inlet thermistor3 error	◇		● (6)			
Heat exchange outlet thermistor1 error	◇		● (7)			
Heat exchange outlet thermistor2 error	◇		● (8)			
Heat exchange outlet thermistor3 error	◇		● (9)			
Suction thermistor error	◇		● (10)			
Outdoor thermistor error	◇		● (11)			
Discharge pressure sensor error	◇			● (1)		
Liquid line pressure sensor error	◇			● (2)		
Suction pressure sensor error	◇			● (3)		
Oil sensor error	◇			● (4)		
Oil recovery error	◇			● (7)		
Reverse phase blocker error	◇		●	◇	● (1)	
Reverse phase blocker error	◇				● (2)	
Power frequency faulty	◇				◇	◇
Model data error	◇	◇	◇	◇	◇	◇
EEPROM access error	◇				● (3)	
EEPROM deletion error	◇				● (4)	
Outdoor unit circuit bord error 1	◇				● (6)	
Outdoor unit circuit bord error 2	◇				● (7)	
Outdoor unit circuit bord error 2	◇	●		◇		
Communication error	◇				● (8)	
Node setting error	◇				● (9)	
Indoor unit error	◇					● (1)

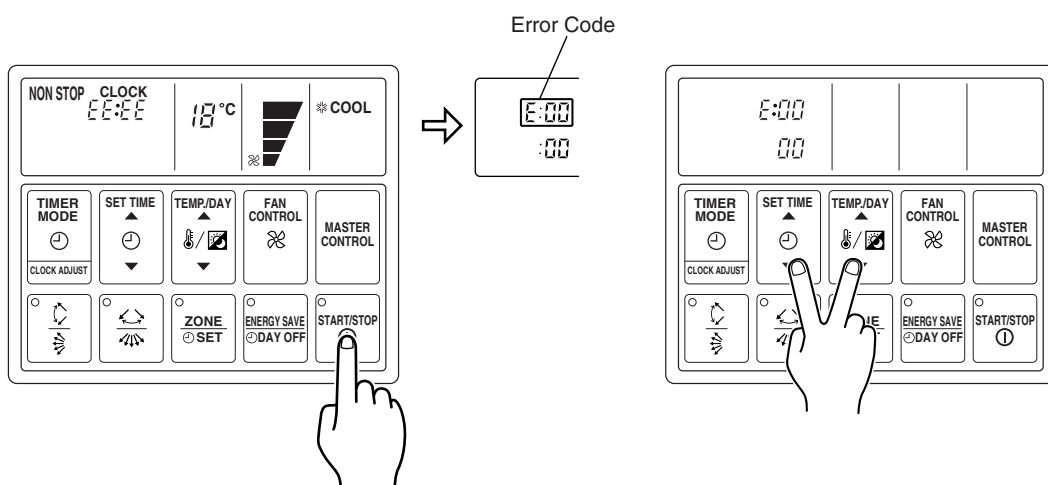
Display method {

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

Error display



8-3 REMOTE CONTROL UNIT



When EE : EE blinks at the current time display, there is an error inside the air conditioner. If the SET TIME button (▼) and SET TEMP/DAY button (▼) are pressed simultaneously for more than three seconds, the self diagnosis check will start and the error contents will be displayed at the current time display. In addition, the remote controller address will be displayed at the current time display. In addition, the remote controller address will be displayed below. When the operation lamp lights, press the START/STOP button and after operation lamp goes off, perform the same operation.

Error Code	Error contents
E:00	No error
E:02	Model data abnormal
E:04	Power supply frequency error
E:06	EEPROM access error
E:07	EEPROM deletion error
E:09	Room temperature themistor error
E:0A	Indoor unit heat exchanger themistor (middle) error
E:0B	Indoor unit heat exchanger themistor (inlet) error
E:0C	Indoor unit heat exchanger themistor (outlet) error
E:0D	Blower tempearture themistor error
E:11	Drain abnormal
E:12	Room tempearture abnormal
E:13	Indoor unit fan error
E:1F	Transmission error
E:20	Node setting error
E:21	Parallel communication error
E:32	Outdoor unit error

8-4 ERROR CODE & TROUBLESHOOTING

■ INDOOR UNIT TROUBLESHOOTING

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	REMEDY
00	No errors			
02	Model data error	<ol style="list-style-type: none"> 1. Generation condition Error in model information memorized in EEPROM when power turned on. 2. Corresponding operation. <ol style="list-style-type: none"> 1) Relevant indoor unit stopped (not started). 2) Error display to indoor unit LED and error output to communication bus line. 3. Reset condition. Model information memorized in EEPROM restored to normal. 	Model information not memorized or erased for some reason.	Replace indoor unit control PC board.
03	Microcomputer error	<ol style="list-style-type: none"> 1. Generation condition. Communication between two microcomputers on indoor unit control PC board not performed normally. 2. Corresponding operation. <ol style="list-style-type: none"> 1) Relevant indoor unit stopped (not started). 2) Error display to indoor unit LED and error output to communication bus line. 3. Reset condition Normal microcomputers communication restored. 	1. Effect of extraneous noise.	<ol style="list-style-type: none"> 1. When power turned off, and then turned on again: <ol style="list-style-type: none"> 1) If error not generated again, PC board is normal. Therefore, remove noise sources near indoor unit. 2) If error generated again, perform the following, in addition to removing noise sources.
			2. Indoor unit control PC board faulty.	2. Replace indoor unit control PC board.
04	Power line frequency abnormal	<ol style="list-style-type: none"> 1. Generation condition Indoor unit control PC board detected frequency outside operating. 2. Corresponding operation. <ol style="list-style-type: none"> 1) Relevant indoor unit stopped (not started). 2) Error display to indoor unit LED and error output to communication bus line 3. Reset operation. Indoor unit control PC board detects rated frequency. 	Power line frequency is below 45Hz or above 65Hz.	Check power line frequency and supply rated frequency.
06	EEPROM access error	<ol style="list-style-type: none"> 1. Generation condition After indoor unit started, EEPROM cannot be accessed because of disturbance or element error. 2. Corresponding operation Error display to indoor unit LED. 3. Reset operation Normal access to EEPROM restored. 	EEPROM cannot be accessed because of disturbance, element error, etc.	<ol style="list-style-type: none"> 1. Remove noise sources near indoor unit. 2. Replace indoor unit control PC board.

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	REMEDY
07	EEPROM deletion error	<ol style="list-style-type: none"> 1. Generation condition. Error in model information memorized at EEPROM after indoor unit started. 2. Corresponding operation. 1) Relevant indoor unit stopped 2) Error display to indoor unit LED. 3. Reset condition Model information memorized at EEPROM restored to normal. 	Model information not memorized, or erased for some reason.	Replace indoor unit control PC board.
09	Room temperature thermistor error	<ol style="list-style-type: none"> 1. Generation condition. Thermistor short or open detected. 2. Corresponding operation. Indoor unit stopped, error display to indoor unit LED, and error output to communication bus line. 3. Reset condition. Thermistor detection value other than short or open. 	<ol style="list-style-type: none"> 1. Connector connection faulty. 2. Temperature thermistor faulty. 	<ol style="list-style-type: none"> 1. Check for loose or dislodged thermistor connector. 2. Check temperature thermistor resistance. If abnormal, replace thermistor.
0A	Indoor unit heat exchanger thermistor error (middle)error	<ol style="list-style-type: none"> 1. Generation condition. Thermistor short or open detected. 2. Corresponding operation. Indoor unit stopped, error display to indoor unit LED, and error output to communication bus line. 3. Reset condition. Thermistor detection value other than short or open. 	<ol style="list-style-type: none"> 1. Connector connection faulty. 2. Heat exchanger thermistor (middle) faulty. 	<ol style="list-style-type: none"> 1. Check for loose or dislodged heat exchanger thermistor(middle) connector. 2. Check resistance of heat exchanger thermistor(middle). If abnormal, replace thermistor.
0B	Indoor unit heat exchanger thermistor(inlet)error	<ol style="list-style-type: none"> 1. Generation condition. Thermistor short or open detected. 2. Corresponding operation. Error display to indoor unit LED. 3. Reset condition. Thermistor detection value other than short or open. 	<ol style="list-style-type: none"> 1. Connector connection faulty. 2. Heat exchanger thermistor (inlet)faulty. 	<ol style="list-style-type: none"> 1. Check for loose or dislodged heat exchanger thermistor(inlet) connector. 2. Check resistance of heat exchanger thermistor(inlet). If abnormal, replace thermistor.
0C	Indoor unit heat exchanger thermistor(outlet) error	<ol style="list-style-type: none"> 1. Generation condition. Thermistor short or open detected. 2. Corresponding operation. Error display to indoor unit LED. 3. Reset condition. Thermistor detection value other than short or open. 	<ol style="list-style-type: none"> 1. Connector connection faulty. 2. Heat exchanger thermistor (outlet)faulty. 	<ol style="list-style-type: none"> 1. Check for loose or dislodged heat exchanger thermistor(outlet) connector. 2. Check resistance of heat exchanger thermistor(outlet). If abnormal, replace thermistor.

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	REMEDY
0D	Blower temperature thermistor error	<ol style="list-style-type: none"> 1. Generation condition Thermistor short or open detected. 2. Corresponding operation Indoor unit stopped, error display to indoor unit LED, and error output to communication bus line. 3. Reset condition Thermistor detection value other than short or open. 	<ol style="list-style-type: none"> 1. Connector connection faulty. 2. Blower temperature thermistor faulty. 	<ol style="list-style-type: none"> 1. Check for loose or dislodged blower temperature thermistor connector. 2. Check resistance of blower temperature thermistor. If abnormal, replace thermistor.
11	Drain abnormal	<ol style="list-style-type: none"> 1. Generation condition Float SW ON continuously for 3 minutes. 2. Corresponding operation Indoor unit stopped, error display to indoor unit LED, and error output to communication bus line. 3. Reset condition Float SW turned OFF. 	<ol style="list-style-type: none"> 1. Drain hose clogged. 2. Drain outlet clogged. 3. Drain pump faulty. 4. Float SW operation faulty (short) 	<ol style="list-style-type: none"> 1. Clean drain hose. 2. Clean drain outlet. 3. Check drain pump operation. If faulty, replace pump. 4. When float SW shorted, replace SW.
12	Room temperature thermistor error	<ol style="list-style-type: none"> 1. Generation condition Room temperature thermistor detected temperature exceeds 60 C continuously for 30 minutes or longer during indoor unit operation. 2. Corresponding operation Indoor unit stopped, error display to indoor unit LED, and error output to communication bus line. 3. Reset condition Reset by turning power off and on again. 	<ol style="list-style-type: none"> 1. Connector connection faulty. 2. Room temperature thermistor faulty. 	<ol style="list-style-type: none"> 1. Check for loose or dislodged room temperature connector. 2. Check resistance of room temperature thermistor. If abnormal, replace thermistor.
13	Indoor unit fan error	<ol style="list-style-type: none"> 1. Generation condition Fan speed feedback by large type ceiling model (AB30 or above) +/-400rpm or greater relative to target speed. 2. Corresponding operation Indoor fan stopped, error display to indoor unit LED, error output to communication bus line. 3. Reset condition Reset by turning power off. 	<ol style="list-style-type: none"> 1. Indoor fan motor lead wire connection faulty. 2. Power line voltage abnormal. 	<ol style="list-style-type: none"> 1. Check indoor fan motor lead wire wiring. 2. Check if rated power line voltage supplied.
18	Communication error (indoor unit-remote controller)	<ol style="list-style-type: none"> 1. Generation condition Communication impossible between standard wired remote controller and indoor unit. 2. Corresponding operation Error display to indoor unit LED 3. Reset condition Standard wired remote controller communication restored. 	<ol style="list-style-type: none"> 1. Communication line not connected, connector faulty, or line open. 2. Indoor unit control PC board faulty. 3. Standard wired remote controller PC board faulty. 	<ol style="list-style-type: none"> 1. Check if communication line connected to each indoor unit. Check for communication line open and loose connection. 2. Replace indoor unit control PC board. 3. Replace standard wired remote controller PC board.

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	REMEDY
1F	Transmission error	<p>1. Generation condition. Communication between indoor unit and outdoor unit exceeds certain time.</p> <p>2. Corresponding operation. Current operation continued, error display to standard wired remote controller, and display to indoor unit LED.</p> <p>3. Reset condition. Communication between indoor unit and outdoor unit restored.</p>	<p>1. Effect of extraneous noise.</p> <p>-----</p> <p>2. Communication line not connected, connection faulty, or line open.</p> <p>-----</p> <p>3. Indoor unit communication PC board or outdoor unit communication PC board insertion faulty.</p> <p>-----</p> <p>4. PC board faulty.</p>	<p>1. When power turned OFF, then turned back ON: (1) If error not generated again, PC board is normal. Therefore, remove noise sources near outdoor unit. (2) If error generated again, check following, in addition to removing noise sources.</p> <p>-----</p> <p>2. Check if communication line connected to each indoor unit. Check for open communication line and loose wiring.</p> <p>-----</p> <p>3. Check insertion of indoor unit communication PC board and outdoor unit communication PC board.</p> <p>-----</p> <p>4. (1) If communication with some indoor units in same refrigerant system is abnormal and compressor operates, replace PC boards in following order and check operation: ① Indoor unit communication PC board ② Indoor unit control PC board (2) If communication with all indoor units in same refrigerant system is abnormal and compressor does not operate, replace PC boards in following order and check operation: ① Outdoor unit communication PC board. ② Outdoor unit control PC board. ③ Indoor unit communication PC board. ④ Indoor unit control PC board.</p>
20	Node setting error	<p>1. Generation condition. Indoor unit communication PC board not initialized normally.</p> <p>2. Corresponding operation. Error display to standard wired remote controller and display to indoor unit LED.</p> <p>3. Reset condition. Indoor unit communication PC board initialized normally.</p>	<p>1. Effect of extraneous noise.</p> <p>-----</p> <p>2. PC board faulty.</p>	<p>1. When power turned off, then turned back on: (1) If error not generated again, PC board is normal. Therefore, remove noise sources near indoor unit. (2) If error generated again, check following, in addition to removing noise sources.</p> <p>-----</p> <p>1. Replace PC boards in following order, and check operation. (1) Indoor unit communication PC board. (2) Indoor unit control PC board.</p>

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	REMEDY
21	Parallel communication error	<p>1. Generation condition. Communication between indoor unit control PC board and indoor unit communication PC board not performed normally.</p> <p>2. Corresponding operation.</p> <p>1) Current operation continued, error display to standard wired remote controller, and display to indoor unit LED.</p> <p>2) If error continues for 90 seconds after generation, a new transmission error (1F) is output.</p> <p>3. Reset condition. Normal communication restored between indoor unit control PC and indoor unit communication PC board.</p>	<p>1. Effect of extraneous noise.</p> <hr/> <p>2. Indoor unit communication board insertion faulty.</p> <hr/> <p>3. PC board faulty.</p>	<p>1. When power turned off, then turned back on:</p> <p>1) If error not generated again, PC board is normal. Therefore, remove noise sources near indoor unit.</p> <p>2) If error generated again, check following, in addition to removing noise sources.</p> <hr/> <p>2. Check indoor communication PC board insertion.</p> <hr/> <p>3. Replace PC boards in following order, and check operation.</p> <p>(1) Indoor unit communication PC board.</p> <p>(2) Indoor unit control PC board.</p>
32	Outdoor unit error	Error generated at outdoor unit in same refrigerant system.	Outdoor unit faulty.	See "Outdoor unit troubleshooting".

■ OUTDOOR UNIT TROUBLESHOOTING

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	REMEDY
00	No errors			
02	Model data error	<ol style="list-style-type: none"> 1. Generation condition. When power turned on, there was an error in model information memorized in EEPROM. 2. Corresponding operation. <ol style="list-style-type: none"> 1) All compressors stopped (not started). 2) Error display to outdoor unit LED and error output to communication bus line. 3. Reset condition. Model information memorized in EEPROM restored to normal. 	Model information not memorized, or erased for some reason.	Replace outdoor unit control PC board.
03	Communication error	<ol style="list-style-type: none"> 1. Generation condition. Communication between two microcomputers on outdoor unit control PC board not performed normally. <ol style="list-style-type: none"> 1) All compressors stopped (not started). 2) Error display to outdoor unit LED and error output to communication bus line. 3. Reset condition. Normal microcomputers communication restored. 	<ol style="list-style-type: none"> 1. Effect of extraneous noise. 2. Outdoor unit control PC board faulty. 	<ol style="list-style-type: none"> 1. When power turned off, then turned back on: <ol style="list-style-type: none"> 1) If error not generated again, PC board is normal. Therefore, remove noise sources near outdoor unit. 2) If error generated again, perform following, in addition to removing noise sources. 2. Replace outdoor unit control PC board.
04	Power frequency faulty	<ol style="list-style-type: none"> 1. Generation condition. Outdoor unit control PC board detected frequency outside of rating. 2. Corresponding operation. <ol style="list-style-type: none"> 1) All compressors stopped (not started). 2) Error display to outdoor unit LED and error output to communication bus line. 3. Reset condition. Outdoor unit control PC board detects rated frequency. 	Power line frequency below 45Hz or above 65Hz.	Check power line frequency and supply correct frequency.
05	Reverse phase blocker error	<ol style="list-style-type: none"> 1. Generation condition. Reverse phase prevention circuit detected reverse phase input or when the normal input was not detected. 2. Corresponding operation. <ol style="list-style-type: none"> 1) All compressors stopped. 2) Error display to outdoor unit LED and error output to communication bus line. 3. Reset condition. Reverse phase prevention circuit no longer detects reverse phase input. 	<ol style="list-style-type: none"> 1. Reverse phase wiring. 2. Reverse phase prevention circuit faulty. 	<ol style="list-style-type: none"> 1. Check power supply wiring. 2. Check power supply wiring. If there are no mistakes, replace outdoor unit control PC board.

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	REMEDY
06	EEPROM access error	<p>1. Generation condition. After outdoor unit started, EEPROM cannot be accessed because of disturbance or element error.</p> <p>2. Corresponding operation. Error display to outdoor unit LED.*Restriction on outdoor unit not performed.</p> <p>3. Reset condition. EEPROM accessed normally.</p>	EEPROM cannot be accessed because of disturbance, element error, etc.	<p>1. Remove noise sources near outdoor unit.</p> <p>2. Replace outdoor unit control PC board.</p>
07	EEPROM deletion error	<p>1. Generation condition. After outdoor unit started, there was an error in model information memorized in EEPROM.</p> <p>2. Corresponding operation. 1) All compressors stopped. 2) Error display to outdoor unit LED.</p> <p>3. Reset condition. Model information memorized in EEPROM restored to normal.</p>	Model information not memorized, or erased for some reason.	Replace outdoor unit control PC board.
09	Compressor 1 error	<p>1. Generation condition. Thirty minutes after compressor 1 started, discharge temperature 1 does not reach outdoor temperature plus 10°C.</p> <p>2. Corresponding operation. 1) After compressor error, compressor recovery operation performed. However, for defrosting control and oil recovery operation, compressor recovery operation is not performed.</p> <p>2) Error display to outdoor unit LED and error output to communication bus line.</p> <p>3. Reset condition. When 2 hours have elapsed after error generation. *Counting of 2-hour counter begins from state in which error occurred at one or more of three compressors. Error reset by turning power off.</p>	<p>1. Discharge temperature sensor TH_{D1} faulty.</p> <p>2. Compressor power relay 1 faulty.</p> <p>3. Outdoor unit control PC board faulty.</p> <p>4. Magnetic contactor 1 faulty.</p> <p>5. Refrigerant level low.</p> <p>6. After 2 hours 30 minutes have elapsed since error was displayed, error detection is performed again and error is not displayed.</p> <p>7. Compressor motor protector operated.</p> <p>8. Compressor faulty.</p>	<p>1. Check for loose or dislodged discharge temperature sensor TH_{D1} sensor wiring and check sensor resistance. If abnormal, replace sensor.</p> <p>2. Check compressor power relay 1. If abnormal, replace power relay.</p> <p>3. Check CN32 (compressor 1) 12V voltage output on outdoor unit control PC board. If abnormal, replace PC board.</p> <p>4. Check magnetic contactor 1. If abnormal, replace contactor.</p> <p>5. Check additional refrigerant amount and recharge suitable refrigerant.</p> <p>6. Temporary data transmission trouble due to affect of noise, etc. Operation is not affected.</p> <p>7. Compressor overload operation. Check "High-pressure error". Motor protector reset at 61°C +/-9°C.</p> <p>8. Check compressor. If faulty, replace compressor.</p>

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	REMEDY
0A	Compressor 2 error	<p>1. Generation condition. Thirty minutes after compressor 2 started, discharge temperature 2 does not reach outdoor temperature plus 10°C.</p> <p>2. Corresponding operation.</p> <p>1) After compressor error, compressor recovery operation performed. However, for defrosting control and oil recovery operation, compressor recovery operation is not performed.</p> <p>2) Error display to outdoor unit LED and error output to communication bus line.</p> <p>3. Reset condition. When 2 hours have elapsed after error generation. *Counting of 2-hour counter begins from state in which error occurred at one or more of three compressors. Error reset by turning power off.</p>	1. Discharge temperature sensor TH _{D2} faulty.	1. Check for loose or dislodged discharge temperature sensor TH _{D2} sensor wiring and check sensor resistance. If abnormal, replace sensor.
			2. Compressor power relay 2 faulty.	2. Check compressor power relay 2. If abnormal, replace power relay.
			3. Outdoor unit control PC board faulty.	3. Check CN33 (compressor 2) 12V voltage output on outdoor unit control PC board. If abnormal, replace PC board.
			4. Magnetic contactor 2 faulty.	4. Check magnetic contactor 2. If abnormal, replace contactor.
			5. Refrigerant level low.	5. Check additional refrigerant amount and recharge suitable refrigerant.
			6. After 2 hours 30 minutes have elapsed since error was displayed, error detection is performed again and error is not displayed.	6. Temporary data transmission trouble due to affect of noise, etc. Operation is not affected.
			7. Compressor motor protector operated.	7. Compressor overload operation. Check "High-pressure error". Motor protector reset at 61 °C +/-9 °C.
			8. Compressor faulty.	8. Check compressor. If faulty, replace compressor.
0B	Compressor 3 error	<p>1. Generation condition. Thirty minutes after compressor 3 started, discharge temperature 3 does not reach outdoor temperature plus 10°C.</p> <p>2. Corresponding operation.</p> <p>1) After compressor error, compressor recovery operation performed. However, for defrosting control and oil recovery operation, compressor recovery operation is not performed.</p> <p>2) Error display to outdoor unit LED and error output to communication bus line.</p> <p>3. Reset condition. When 2 hours have elapsed after error generation. *Counting of 2-hour counter begins from state in which error occurred at one or more of three compressors. Error reset by turning power off.</p>	1. Discharge temperature sensor TH _{D3} faulty.	1. Check for loose or dislodged discharge temperature sensor TH _{D3} sensor wiring and check sensor resistance. If abnormal, replace sensor.
			2. Compressor power relay 3 faulty.	2. Check compressor power relay 3. If abnormal, replace power relay.
			3. Outdoor unit control PC board faulty.	3. Check CN34 (compressor 3) 12V voltage output on outdoor unit control PC board. If abnormal, replace PC board.
			4. Magnetic contactor 3 faulty.	4. Check magnetic contactor 3. If abnormal, replace contactor.
			5. Refrigerant level low.	5. Check additional refrigerant amount and recharge suitable refrigerant.
			6. After 2 hours 30 minutes have elapsed since error was displayed, error detection is performed again and error is not displayed.	6. Temporary data transmission trouble due to affect of noise, etc. Operation is not affected.
			7. Compressor motor protector operated.	7. Compressor overload operation. Check "High-pressure error". Motor protector reset at 61 °C +/-9 °C.
			8. Compressor faulty.	8. Check compressor. If faulty, replace compressor.

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	REMEDY
0D	Discharge temperature thermistor 1 error	<ol style="list-style-type: none"> 1. Generation condition. Thermistor short or open detected. 2. Corresponding operation. <ol style="list-style-type: none"> 1) Compressor 1 stop. 2) Error display to outdoor unit LED and error output to communication bus line. 3. Reset condition. Thermistor detection value other than short or open. <p>* Compressor continues to operate for 5 minutes or longer and detection is performed during operation.</p>	<ol style="list-style-type: none"> 1. Connector contact faulty. 2. Discharge temperature thermistor TH_{D1} faulty. 	<ol style="list-style-type: none"> 1. Check for loose or dislodged discharge temperature thermistor TH_{D1} connector. 2. Check discharge temperature thermistor TH_{D1} resistance. If abnormal, replace thermistor.
0E	Discharge temperature thermistor 2 error	<ol style="list-style-type: none"> 1. Generation condition. Thermistor short or open detected. 2. Corresponding operation. <ol style="list-style-type: none"> 1) Compressor 2 stop. 2) Error display to outdoor unit LED and error output to communication bus line. 3. Reset condition. Thermistor detection value other than short or open. <p>* Compressor continues to operate for 5 minutes or longer and detection is performed during operation.</p>	<ol style="list-style-type: none"> 1. Connector contact faulty. 2. Discharge temperature thermistor TH_{D2} faulty. 	<ol style="list-style-type: none"> 1. Check for loose or dislodged discharge temperature thermistor TH_{D2} connector. 2. Check discharge temperature thermistor TH_{D2} resistance. If abnormal, replace thermistor.
0F	Discharge temperature thermistor 3 error	<ol style="list-style-type: none"> 1. Generation condition. Thermistor short or open detected. 2. Corresponding operation. <ol style="list-style-type: none"> 1) Compressor 3 stop. 2) Error display to outdoor unit LED and error output to communication bus line. 3. Reset condition. Thermistor detection value other than short or open. <p>* Compressor continues to operate for 5 minutes or longer and detection is performed during operation.</p>	<ol style="list-style-type: none"> 1. Connector contact faulty. 2. Discharge temperature thermistor TH_{D3} faulty. 	<ol style="list-style-type: none"> 1. Check for loose or dislodged discharge temperature thermistor TH_{D3} connector. 2. Check discharge temperature thermistor TH_{D3} resistance. If abnormal, replace thermistor.

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	REMEDY
10	Outdoor thermistor error	1. Generation condition. Thermistor short or open detected. 2. Corresponding operation. 1) All Compressors stopped. * For suction temperature thermistor error, compressors not stopped.	1. Connector contact faulty. ----- 2. Outdoor thermistor TH _{H0} faulty.	1. Check for loose or dislodged outdoor thermistor TH _{H0} connector. ----- 2. Check outdoor thermistor TH _{H0} resistance. If abnormal, replace thermistor.
11	Heat exchange outlet thermistor 1 error	2) Error display to outdoor unit LED and error output to communication bus line. * For suction temperature thermistor error, error display to outdoor unit LED only.	1. Connector contact faulty. ----- 2. Heat exchange outlet thermistor TH _{H01} faulty.	1. Check for loose or dislodged heat exchange thermistor TH _{H01} connector. ----- 2. Check heat exchange outlet thermistor TH _{H01} resistance. If abnormal, replace thermistor.
12	Heat exchange outlet thermistor 2 error	3. Reset condition. Thermistor detection value other than short or open.	1. Connector contact faulty. ----- 2. Heat exchange outlet thermistor TH _{H02} faulty.	1. Check for loose or dislodged heat exchange thermistor TH _{H02} connector. ----- 2. Check heat exchange outlet thermistor TH _{H02} resistance. If abnormal, replace thermistor.
13	Heat exchange outlet thermistor 3 error		1. Connector contact faulty. ----- 2. Heat exchange outlet thermistor TH _{H03} faulty.	1. Check for loose or dislodged heat exchange thermistor TH _{H03} connector. ----- 2. Check heat exchange outlet thermistor TH _{H03} resistance. If abnormal, replace thermistor.
14	Heat exchange inlet thermistor 1 error		1. Connector contact faulty. ----- 2. Heat exchange inlet thermistor TH _{H11} faulty.	1. Check for loose or dislodged heat exchange inlet thermistor TH _{H11} connector. ----- 2. Check heat exchange thermistor TH _{H11} resistance. If abnormal, replace thermistor.
15	Heat exchange inlet thermistor 2 error		1. Connector contact faulty. ----- 2. Heat exchange inlet thermistor TH _{H12} faulty.	1. Check for loose or dislodged heat exchange inlet thermistor TH _{H12} connector. ----- 2. Check heat exchange thermistor TH _{H12} resistance. If abnormal, replace thermistor.
16	Heat exchange inlet thermistor 3 error		1. Connector contact faulty. ----- 2. Heat exchange inlet thermistor TH _{H13} faulty.	1. Check for loose or dislodged heat exchange inlet thermistor TH _{H13} connector. ----- 2. Check heat exchange thermistor TH _{H13} resistance. If abnormal, replace thermistor.
17	Suction thermistor error		1. Connector contact faulty. ----- 2. Suction thermistor TH _S faulty.	1. Check for loose or dislodged suction thermistor TH _S connector. ----- 2. Check suction thermistor TH _S resistance. If abnormal, replace thermistor.

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	REMEDY
19	Discharge pressure sensor error	1. Generation condition. 1) Voltage output from output remains under 0.8V for 3 minutes or longer. However, not detected for 3 minutes after power to outdoor unit turned on.	Discharge pressure sensor P _H faulty.	Replace discharge pressure sensor P _H .
1A	Liquid line pressure sensor error		Liquid line pressure sensor P _M faulty.	Replace liquid line pressure sensor P _M .
1B	Suction pressure sensor error	2) Output sensor detection value is 3.46MPa or greater. 2. Corresponding operation. 1) All compressors stop. * Discharge pressure and liquid line pressure sensor error only. 2) Error display to outdoor unit LED and error output to communication bus line. * For suction pressure sensor error, only error display to outdoor unit LED. 3. Reset condition. Output voltage from pressure sensor returns to 1- 5V.	Suction pressure sensor P _M faulty.	Replace suction pressure sensor P _M .
1C	Oil sensor error	1. Generation condition. At the same time "Oil below oil sensor L level" and "Oil over oil sensor H level" states output by oil sensor. 2. Corresponding operation. Error display to outdoor unit LED. 3. Reset condition. "Oil below oil sensor L level" and "Oil over oil sensor H level" states no longer output by oil sensor.	1. Connector contact faulty. ----- 2. Output unit control PC power supply voltage output abnormal. ----- 3. Oil sensor LED faulty.	1. Check contact of outdoor unit control board connectors CN52 and CN53. ----- 2. Check outdoor unit control PC board voltage output. 1) Oscilloscope. (1) Check if 5+/-0.05V voltage output is present between pins 1 and 2 of CN52 and CN53. (2) Check if 12V +/-10% voltage output is present between pins 3 and 4 of CN52 and CN53. 2) Tester. Check if output voltage is present between pins 3 and 4 of CN52 and CN53. (1 time in 10 secs.Needle deflects.) * Voltage output 1 time in 10 seconds 250msec ----- 3. Check output voltage 1.0 +/-0.1V between connectors 3 and 4 of OIL LV SEN-H (connected to CN52) and OIL LV SEN-L (connected to CN53) in tester diode mode. If output voltage is abnormal, replace oil sensor. * Connect tester plus terminal to 3 and minus terminal to 4.

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	REMEDY
1F	Communication error	<p>1. Generation condition. Communication from indoor units cuts off certain time.</p> <p>2. Corresponding operation.</p> <p>1) When communication error generated 90 seconds after outdoor unit circuit board error 1 generated, all compressors stopped.</p> <p>2) When communication from all indoor units cuts off certain time, all compressors stopped and error display to outdoor unit LED.</p> <p>3) For other than the above, only indoor units that completed communications are operation target. Error display to outdoor unit LED.</p> <p>3. Reset condition. Communication with indoor units restored.</p>	1. Affect of extraneous noise.	<p>1. When power turned off, then turned on again:</p> <p>1) If error not generated again, PC board is normal. Therefore, remove noise sources near outdoor unit.</p> <p>2) If error generated again, perform following, in addition to removing noise sources.</p>
			2. Communication line not connected, contact faulty, or line open.	2. Check if communication line connected to all indoor units.
			3. Indoor unit power OFF.	3. Check indoor units power supply.
			4. Indoor unit communication PC board or outdoor unit communication PC board insertion faulty.	4. Check insertion of indoor unit communication PC board and outdoor unit communication PC board.
			5. PC board faulty.	<p>5. 1) If communication error generated after outdoor unit circuit board error generated, replace PC boards in following order and check operation.</p> <p>(1) Outdoor unit communication PC board.</p> <p>(2) Outdoor unit control PC board.</p> <p>2) If some indoor units in same refrigerant operated, replace PC boards in following order and check operation:</p> <p>(1) Communication PC board of indoor unit that generated communication error.</p> <p>(2) Control PC board of indoor unit that generated communication error.</p> <p>3) When all indoor units in same refrigerant system generate an error and compressor does not operate, replace PC boards in following order and check operation.</p> <p>(1) Outdoor unit communication PC board.</p> <p>(2) Outdoor unit control PC board.</p> <p>(3) Indoor unit communication PC board.</p> <p>(4) Indoor unit control PC board.</p>

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	REMEDY
21	Discharge temperature 1 error	<p>1. Generation condition. Discharge temperature 1 remains 130°C or greater for 40 minutes and compressor 1 stopped 2 times or more.</p> <p>2. Corresponding operation. Error display to outdoor unit LED and error output to communication bus line.</p> <p>3. Reset condition. When all the following conditions are satisfied:</p> <p>1) Discharge temperature protector 1 reset.</p> <p>2) Discharge temperature protector not operated for 40 minutes or longer.</p>	<p>1. Gas leak or refrigerant level low.</p> <p>2. Outdoor fan motor faulty.</p> <p>3. Discharge temperature sensor TH_{D1} faulty.</p> <p>4. Electronic expansion valve operation faulty.</p> <p>5. Solenoid valve operation faulty.</p>	<p>1. Check for leak and check additional refrigerant amount and recharge suitable refrigerant.</p> <p>2. Check outdoor fan motor operation. Remove wind path obstruction. If fan motor faulty, replace motor.</p> <p>3. Check for loose or dislodged discharge temperature sensor TH_{D1} wiring and check TH_{D1} resistance. If abnormal, replace sensor.</p> <p>4. Check operation and coil resistance of following electronic expansion valve. If 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>5. Check operation of following solenoid valves. If operation faulty, replace solenoid valve. Cooling operation. (1) Outdoor unit solenoid valve SV1. (2) RB unit solenoid valves SV_s Heating operation. (3) Outdoor units solenoid valves SV1, SV7, and SV8. (4) RB unit solenoid valve SV_D. Heat recovery operation (1), (2), (3), (4).</p>

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	REMEDY
22	Discharge temperature 2 error	<p>1. Generation condition. Discharge temperature 2 remains 130°C or greater for 40 minutes and compressor 2 stopped 2 times or more.</p> <p>2. Corresponding operation. Error display to outdoor unit LED and error output to communication bus line.</p> <p>3. Reset condition. When all the following conditions are satisfied:</p> <p>1) Discharge temperature protector 2 reset. 2) Discharge temperature protector not operated for 40 minutes or longer.</p>	<p>1. Gas leak or refrigerant level low.</p> <p>2. Outdoor fan motor faulty.</p> <p>3. Discharge temperature sensor TH_{D2} faulty.</p> <p>4. Electronic expansion valve operation faulty.</p> <p>5. Solenoid valve operation faulty.</p>	<p>1. Check for leak and check additional refrigerant amount and recharge suitable refrigerant.</p> <p>2. Check outdoor fan motor operation. Remove wind path obstruction. If fan motor faulty, replace motor.</p> <p>3. Check for loose or dislodged discharge temperature sensor TH_{D2} wiring and check TH_{D2} resistance. If abnormal, replace sensor.</p> <p>4. Check operation and coil resistance of following electronic expansion valve. If 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>5. Check operation of following solenoid valves. If operation faulty, replace solenoid valve. Cooling operation. (1) Outdoor unit solenoid valve SV1. (2) RB unit solenoid valves SVs Heating operation. (3) Outdoor units solenoid valves SV1, SV7, and SV8. (4) RB unit solenoid valve SV_D. Heat recovery operation (1), (2), (3), (4).</p>

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	REMEDY
23	Discharge temperature 3 error	<p>1. Generation condition. Discharge temperature 3 remains 130°C or greater for 40 minutes and compressor 3 stopped 2 times or more.</p> <p>2. Corresponding operation. Error display to outdoor unit LED and error output to communication bus line.</p> <p>3. Reset condition. When all the following conditions are satisfied:</p> <p>1) Discharge temperature protector 3 reset.</p> <p>2) Discharge temperature protector not operated for 40 minutes or longer.</p>	<p>1. Gas leak or refrigerant level low.</p> <p>2. Outdoor fan motor faulty.</p> <p>3. Discharge temperature sensor TH_{D3} faulty.</p> <p>4. Electronic expansion valve operation faulty.</p> <p>5. Solenoid valve operation faulty.</p>	<p>1. Check for leak and check additional refrigerant amount and recharge suitable refrigerant.</p> <p>2. Check outdoor fan motor operation. Remove wind path obstruction. If fan motor faulty, replace motor.</p> <p>3. Check for loose or dislodged discharge temperature sensor TH_{D3} wiring and check TH_{D3} resistance. If abnormal, replace sensor.</p> <p>4. Check operation and coil resistance of following electronic expansion valve. If 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>5. Check operation of following solenoid valves. If operation faulty, replace solenoid valve. Cooling operation. (1) Outdoor unit solenoid valve SV1. (2) RB unit solenoid valves SVs Heating operation. (3) Outdoor units solenoid valves SV1, SV7, and SV8. (4) RB unit solenoid valve SV_D. Heat recovery operation (1), (2), (3), (4).</p>

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	REMEDY
24	High-pressure error	<p>1. Generation condition. When any of following conditions satisfied:</p> <p>1) High-pressure protection stops compressor 2 times or more in 40 minutes.</p> <p>2) High-pressure SW operated after restarted 3 minutes after compressor stopped by high-pressure protection.</p> <p>2. Corresponding operation. Error display to outdoor unit LED and error output to communication bus line.</p> <p>3. Reset condition. When all of following conditions satisfied:</p> <p>1) High pressure SW reset after restarting 3 minutes after compressor stopped by high-pressure protection.</p> <p>2) High pressure protection not operated for 40 minutes or longer.</p> <p>* High pressure SW set value 3MPa OFF , 2.4MPa ON</p>	<p>1. Ball valve not open completely.</p> <p>2. Outdoor unit short cycle.</p> <p>3. Outdoor heat exchanger dirty or clogged with foreign matter.</p> <p>4. Outdoor fan motor faulty.</p> <p>5. Pressure SW faulty.</p> <p>6. Indoor unit short cycle.</p> <p>7. Filter clogged.</p> <p>8. Indoor fan motor faulty.</p> <p>9. Electronic expansion valve operation faulty.</p> <p>10. Solenoid valve operation faulty.</p> <p>11. Overload</p>	<p>1. Open ball 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 wind path obstruction. If fan motor faulty, replace motor.</p> <p>5. Check pressure using pressure gauge. If pressure SW faulty, replace SW.</p> <p>6. Remove obstruction.</p> <p>7. Clean filter.</p> <p>8. Check indoor fan motor operation. If fan motor faulty, replace motor.</p> <p>9. Check operation and coil resistance of following electronic expansion valve. If 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>10. Check operation of following solenoid valves.If operation faulty, replace solenoid valve. Cooling operation (1) Outdoor unit solenoid valve SVs (2) RB unit solenoid valve SVs Heating operation (3) Outdoor units solenoid valves SV2, SV7, and SV8 (4) RB unit solenoid valve SVb Heat recovery operation (1), (2), (3), (4)</p> <p>11. Remove indoor and outdoor installation conditions and other overload causes.</p>

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	REMEDY
25	Low pressure error	<p>1. Generation condition. When any of following conditions satisfied:</p> <p>1) Low-pressure protection stops compressor 2 or more times within 40 minutes.</p> <p>2) Low pressure SW operates after restarting 3 minutes after compressor stopped by low-pressure protector.</p> <p>2. Corresponding operation. Error display to outdoor unit LED and error output to communication bus line.</p> <p>3. Reset condition. When all of following conditions satisfied:</p> <p>1) Low pressure SW reset after restarting 3 minutes after compressor stopped by low-pressure protection.</p> <p>2) Low pressure protection not operated for 40 minutes or longer.</p> <p>* Low pressure SW set value 0.2MPa OFF , 0.3MPa ON</p>	<p>1. Ball valve not open completely.</p> <p>2. Pressure SW faulty.</p> <p>3. Gas leak.</p> <p>4. Indoor unit short cycle.</p> <p>5. Indoor unit filter clogged.</p> <p>6. Indoor unit fan motor faulty.</p> <p>7. Electronic expansion valve operation faulty.</p> <p>8. Solenoid valve operation faulty.</p>	<p>1. Open ball valve fully.</p> <p>2. Check pressure using pressure gauge. If pressure SW faulty, replace SW.</p> <p>3. Repair gas leak, and charge suitable refrigerant.</p> <p>4. Remove obstruction.</p> <p>5. Clean filter.</p> <p>6. Check indoor fan motor operation. If fan motor faulty, replace motor.</p> <p>7. Check operation and coil resistance of following electronic expansion valve. If 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. (1) Outdoor unit solenoid SV2. (2) RB unit solenoid valve SVs. Heating operation. (3) Outdoor unit solenoid valves SV2, SV7, and SV8 (4) RB unit solenoid valve SVb. Heat recovery operation (1), (2), (3), (4).</p>
27	Oil recovery error	<p>1. Generation condition. Oil judged to be below oil sensor L level. Oil recovery operation performed consecutively 3 times or more.</p> <p>2. Corresponding operation. Error display to outdoor unit LED.</p> <p>3. Reset condition. Oil rises above oil sensor L level.</p>	<p>1. Oil recovery solenoid valve faulty.</p> <p>2. Connector connection faulty.</p>	<p>1. Check operation of following solenoid valves. If operation faulty, replace solenoid valve. Compressor 1 solenoid valve SV3. Compressor 2 solenoid valve SV4. Compressor 3 solenoid valve SV5. Central oil return solenoid valve SV6.</p> <p>2. Check for loose or dislodged solenoid valves wiring connector.</p>

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	REMEDY
28	Pump down error	<p>1. Generation condition. Six minutes have elapsed since pump down performed, or discharge pressure sensor PH is 3MPa or higher.</p> <p>2. Corresponding operation. 1) All compressors and outdoor fans stop. 2) Error display to outdoor unit LED and error output to communication bus line.</p> <p>3. Reset condition. Pump down DIP SW1-3 switched from ON to OFF.</p>	Pump down SW remains ON.	Switch outdoor unit control PC board pump down DIP SW1-3 from ON to OFF.
—	Node setting error	<p>1. Generation condition. Outdoor unit communication PC board initialization not performed normally.</p> <p>2. Corresponding operation. Error display to outdoor unit LED.</p> <p>3. Reset condition. Outdoor unit communication PC board initialization performed normally.</p>	<p>1. Affect of extraneous noise.</p> <p>-----</p> <p>2. PC board faulty.</p>	<p>1. When power turned off, then turned back on: 1) If error not generated again, PC board is normal. Therefore, remove noise sources near outdoor unit. 2) If error generated again, check following, in addition to removing noise sources.</p> <p>-----</p> <p>2. Replace PC boards in following order, and check operation. (1) Outdoor unit communication PC board (2) Outdoor unit control PC board</p>
—	Outdoor unit circuit board error 1	<p>1. Generation condition. Communication between outdoor unit control PC board and outdoor unit communication PC board not performed normally.</p> <p>2. Corresponding operation. 1) Current operation continued. Error display to outdoor unit LED. 2) When error continues for 90 seconds after error generation, new communication error (1F) output.</p> <p>3. Reset condition. Normal communication restored between outdoor unit control PC board and outdoor unit communication PC board.</p>	<p>1. Affect of extraneous noise.</p> <p>-----</p> <p>2. Outdoor unit communication PC board insertion faulty.</p> <p>-----</p> <p>3. PC board faulty.</p>	<p>1. When power turned off, then turned back on: 1) If error not generated again, PC board is normal. Therefore, remove noise sources near outdoor unit. 2) If error generated again, check following, in addition to removing noise sources.</p> <p>-----</p> <p>2. Check outdoor unit communication PC board insertion.</p> <p>-----</p> <p>3. Replace PC boards in following order, and check operation. (1) Outdoor unit communication PC board (2) Outdoor unit control PC board</p>
—	Indoor unit error	Error generated at indoor unit in same refrigerant system.	Indoor unit faulty.	See indoor unit troubleshooting.

■CENTRAL REMOTE CONTROLLER TROUBLESHOOTING

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	REMEDY
00	No errors			
02	PC board error (Control panel)	<p>1, Generation condition Error generated at control panel PC board and central remote controller cannot be operated.</p> <p>2, Corresponding operation Error display. Only error code display operation is possible. Other operations are ineffective.</p> <p>3, Reset condition Error removed and central remote controller becomes operable again.</p>	1, Effect of extraneous noise.	<p>1, After ACL key pressed, or power turned on again :</p> <p>1) If error not generated again, PC board is normal. Therefore, remove noise sources near operation panel.</p> <p>2) If error generated again, perform following, in addition to removing noise sources.</p>
			2, Control panel PC board faulty.	2, Replace operation panel PC board.
03	PC board error (Transmission adapter)	<p>1, Generation condition Error generated at transmission adapter control PC board and central remote controller cannot be operated.</p> <p>2, Corresponding operation Error display. Only error code display operation is possible. Other operations are ineffective.</p> <p>3, Reset condition Error removed and central controller becomes operable again.</p>	1, Effect of extraneous noise	<p>1, After reset key on transmission adapter control PC board pressed, or power turned on again :</p> <p>1) If error not generated again, PC board is normal. Therefore, remove noise sources near communication adapter.</p> <p>2) If error generated again, perform following, in addition to removing noise sources.</p>
			2, Transmission adapter control PC board faulty.	2, Replace transmission adapter control PC board.
04	Memory error	<p>1, Generation condition. Control panel memory failed, or error in model information and remote controller group registration stored in memory.</p> <p>2, Corresponding operation.</p> <p>1) Error generated in normal state. Error and error code display. Only pressing of key SW42 on control panel PC board is effective. Other operations are ineffective.</p> <p>2) When error generated in initialize menu mode. Error and error code display. Only pressing of SET key is effective. Other operations are ineffective.</p>	1, Effect of noise	<p>1, Initial setting again. After initial setting:</p> <p>1) If error not generated again, PC board is normal. Therefore, remove noise sources near operation panel.</p> <p>2) If error generated again, perform following, in addition to removing noise sources.</p>
			2, Control panel PC board faulty.	2, Replace control panel PC board.

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	REMEDY
04	Memory error	<p>3, Reset conditions.</p> <p>1) When error generated in normal state Key SW42 on control panel PC board pressed and memory cleared.</p> <p>2) When error generated in initial setting menu mode. Set key pressed and memory cleared.</p>		
05	Node setting error	<p>1, Generation condition. Control panel PC board be initialized normally.</p> <p>2, Corresponding operation. Error display. Only error display operation is possible. Other operations are ineffective.</p> <p>3, Reset condition. Operation panel PC board initialization operation performed normally.</p>	1, Effect of noise	<p>1, After ACL key pressed or power turned on again :</p> <p>1) If error not generated again, PC board is normal. Therefore, remove noise sources near operation panel.</p> <p>2) If error generated again, check following, in addition to removing noise sources.</p>
			2, PC board faulty.	<p>2, Replace PC boards in following order, and check operation.</p> <p>① Transmission adapter control PC board.</p> <p>② Transmission adapter communication PC board.</p> <p>③ Operation panel PC board.</p>
06	Parallel communication error	<p>1, Generation condition. Communication between transmission adapter control PC board and transmission adapter communication PC board not performed normally.</p> <p>2, Corresponding operation.</p> <p>1) Error display. Only error code display operation is possible. Other operations are ineffective.</p> <p>2) If error continues for a certain time after generation, a new communication error(1F) is output.</p> <p>3, Reset condition Normal communication restored between communication adaptor control PC board and communication adapter communication PC board.</p>	1, Effect of extraneous noise.	<p>1, After RESET key on transmission adapter control PC board pressed, or power turned on again :</p> <p>1) If error not generated again, PC board is normal. Therefore, remove noise sources near communication adapter.</p> <p>2) If error generated again, check following, in addition to removing noise sources.</p>
			2, Transmission adapter communication PC board insertion faulty.	2, Check insertion of communication adapter communication PC board.
			3, PC board faulty.	<p>3, Replace PC boards in following order and check operation.</p> <p>① Transmission adapter communication board.</p> <p>② Transmission adapter control board.</p>

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	REMEDY
1C	Connection error	<p>1, Generation condition. Communication between transmission adapter and control panel not performed normally.</p> <p>2, Corresponding operation. Error display. Only error code display operation is possible. Other operations are ineffective.</p> <p>3, Reset condition. Normal communication restored between transmission adapter and control panel.</p>	1, Effect of extraneous noise.	<p>1-1, Check error continuity.</p> <p>1) If error reset automatically, PC board is normal. Therefore, remove noise sources near central remote controller.</p> <p>2) If error not reset automatically, check following.</p> <p>1-2, After ACL key pressed, RESET key on transmission adapter control board pressed, or power turned on again :</p> <p>1) If error not generated again, PC board is normal. Therefore, remove noise sources near central remote controller.</p> <p>2) If error generated again, check following, in addition to removing noise sources.</p>
			2, Communication line between transmission adapter and control panel connection faulty or line open.	2, Check if communication line between transmission adapter and control panel is open or connection is faulty.
			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 PC board.
			4, PC board faulty.	<p>4, Replace PC boards in following order and check operation.</p> <p>① Transmission adapter control board.</p> <p>② Control panel PC board.</p>

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	REMEDY
1D	Initial setting error	<p>1, Generation condition. Initialization not performed normally.</p> <p>2, Corresponding operation Error display. Central remote-controller operation is possible.</p> <p>3, Reset condition Initialization repeated from key operation.</p>	1, Effect of extraneous noise.	<p>1, Repeat initialization. After initialization:</p> <p>1) If error not generated again, PC-board is normal. Therefore, remove noise sources near control panel.</p> <p>2) If error generated again, check following, in addition to removing noise sources.</p>
			2, Other remote controller (Standard wired remote controller, wireless remote controller, Central remote controller) Operated.	2, Stop operation of other remote controller, and initialize again.
			3, PC board faulty	<p>3, Replace PC boards in following order, and check operation.</p> <p>① Transmission adapter communication PC board.</p> <p>② Transmission adapter control PC board</p> <p>③ Control panel PC board</p>
1E	Manual storing 2 error	<p>1, Generation condition Manual store 2 not performed normally.</p> <p>2, Corresponding operation Error display. Central remote controller operation is possible.</p> <p>3, Reset condition Storing (automatic allocation, manual storing1, manual storing2) repeated from key operation, or initial setting menu mode reset.</p>	1, Effect of extraneous noise.	<p>1, Perform allocation again. After manual storing 2 setting:</p> <p>1) If error not generated again, PC board is normal. Therefore, remove noise sources near control panel.</p> <p>2) If error generated again, check following, in addition to removing noise sources.</p>
			2, PC board faulty.	<p>2, Replace PC boards in following order, and check operation.</p> <p>① Transmission adapter communication board.</p> <p>② Transmission adapter control board</p> <p>③ Control panel PC board</p>
1F	Transmission error	<p>1, Generation condition Communication between indoor unit and central remote controller cut off certain time.</p> <p>2, Corresponding operation</p> <p>1) Indoor unit (remote controller grouping) that cut off communicating error display. Central remote controller operation is possible.</p> <p>2) If parallel-parallel communication error generated and communication error generated after a certain time, error is displayed. Central remote control operation is possible.</p>	1, Effect of extraneous noise	<p>1-1, After indoor unit power turned on again:</p> <p>1) If error not generated again, PC board is normal. therefore, remove noise sources near indoor unit.</p> <p>2) If error generated again, check following, in addition to removing noise sources.</p> <p>1-2, After ACL key pressed, or power turned on again:</p> <p>1) If error not generated again, PC board is normal. Therefore, remove noise sources near control panel.</p> <p>2) If error generated again, check following, in addition to removing noise sources.</p>
			2, Communication line not connected, connection faulty, or line open.	2, Check if communication line is wired to each indoor unit.
			3, Indoor unit power off.	3, Check indoor unit power supply.

ERROR CODE	ERROR	CONTENTS	ERROR CAUSE	REMEDY
1F	Transmission error	3, Reset condition For 2-1), communication with indoor unit restored. For 2-2), normal communication restored between transmission adapter control PC board and transmission adapter communication PC board.	4, Transmission adapter communication PC board or indoor unit communication PC board insertion faulty. 5, Initialization not performed after indoor unit address changed.	4, Check insertion of communication adapter communication PC board and indoor unit communication PC board. 5, Perform initialization.
			6, PC board faulty	6, 1)If communication error generated after parallel-parallel communication error generated, replace PC boards in following order, and check operation. ① Transmission adapter communication PC board. ② Transmission adapter control PC board. 2)For other cases, replace PC boards in following order, and check operation. ① Indoor unit communication PC board ② Indoor unit control PC board
21	Software error (OUTPUT)	1, Generation condition PC initialized by momentary power interruption, etc. When operation setting, modification, etc. performed from central remote controller and setting contents reset. 2, Corresponding operation Error display. Only error code display operation is possible. Other operations are ineffective.	1, Affect of extraneous noise	1-1 Check error continuity. 1) If error reset automatically, PC board is normal. therefore, remove noise sources near central remote controller. 2)If error not reset automatically, check following. 1-2 After ACL key pressed, or power turned on again: 1)If error not generated again, PC board is normal. Therefore, remove noise sources near control panel. 2)If error generated again, check following, in addition to removing noise sources.
			2, Power off or power supply voltage abnormal.	2, Check power supply voltage and check operation after turning on power.
			3, PC board faulty.	3, Replace PC boards in following order, and check operation. ① Transmission adapter control PC board. ② Operation panel PC board.
22	Software error (INPUT)	1, Generation condition Operation state of indoor units memorized in transmission adapter memory abnormal. 2, Corresponding operation Error display. Central remote controller operation is possible. 3, Reset condition When contents of memory memorized in transmission adapter memory restored to normal.	1, Affect of extraneous noise	1-1 Check error continuity. 1) If error reset automatically, PC board is normal. Therefore, remove noise sources near central remote controller. 2)If error not reset automatically, check following. 1-2 After RESET key on transmission adapter control PC board pressed, or power turned on again: 1) If error not generated again, PC board is normal. Therefore, remove noise sources near operation panel. 2)If error generated again, check following, in addition to removing noise sources.
			2, Transmission adapter control PC board faulty.	2, Replace transmission adapter control PC board.

8-4-1 Troubleshooting (No error code)

How to read the tables

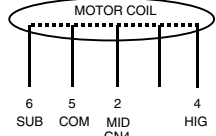
1. Select the relevant item errors 1 to 5 below, and decide the table to be used.
2. Deduce "Cause" from "LED display" and "Symptom that can occur other than title".
3. Check if the deduced "Cause" is correct by means of "Check" and "Remarks".

When there is no error code display at the indoor unit, outdoor unit or centralized 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. Indoor unit makes an abnormal sound
4. Water leaking from indoor unit
5. Others

1. Indoor unit fan does not operate normally

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				
No display	Error display (Transmission line error) ※	No display	—	Power not supplied to indoor unit Circuit breaker OFF Power line faulty	Check the voltage across indoor unit power supply terminal board (Power Supply) terminals 1-2.	Voltage across 1-2: 220~240V
				Indoor unit leakage (short circuit). (Circuit to which voltage is applied when energized is leaking electricity.)	Drop the indoor unit power supply terminal board (Power Supply 1, 2) and indoor unit metal part resistance value to near zero by opening the circuit breaker immediately after setting the indoor unit circuit breaker to ON.	When shorted, the resistance across indoor unit power supply terminal board (Power Supply) terminals 1-2 approaches zero.
				Indoor unit leaking (short circuit). (Circuit to which voltage is applied only during operation is leaking 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 for leakage.	If short-circuited, the resistance across the electric parts will indicate a value near zero.
※ Normal after the power reset.						
Error display (Remote controller communication system error) ※	Error display (Indoor-unit error) ※	Normal display or no display	—	Communication faulty between indoor unit and remote controller (wired). Open circuit.	When 1-2, 2-3, and 3-1 at the indoor unit terminal board (Remote Control) are shorted, the resistance across red-white, white-black, and black-red does not indicate a value near zero.	
				Remote control group control interior communication line faulty. Open circuit	Check the wiring color and wiring connection of indoor unit terminal board (Remote Control) terminals 1, 2, and 3.	Wiring color and indoor unit terminal board (Remote Control) combinations are red-1, white-2, and black-3.
※ Normal after the power reset.						
Normal display	Normal display	Normal display or no display	—	Communication line faulty between indoor unit and remote controller (wired). Erroneous connection (polarity incorrect)	When terminals 1-2, 2-3, and 3-1 at the indoor unit terminal board (Remote Control) are shorted, the resistance across red-white, white-black, and black-red at the remote control terminals does not indicate a value near zero.	
				Remote control group control interior communication line faulty. Erroneous connection (Polarity incorrect)	Check the wiring color and wiring connection of indoor unit terminal board (Remote Control) terminals 1, 2, and 3.	Wiring color and indoor unit terminal board (Remote Control) combinations are red-1, white-2, and black-3.
Normal display	Normal display	Normal display	—	Remote controller master/slave setting switch (DIP SW 1-4) setting incorrect.	When indoor unit operated for each remote control group, operation is abnormal.	Does not operate when there is no master unit (SW 1-4 set to OFF) in one remote control group.
				Capacity of indoor fan capacitor faulty.	Check the indoor unit Model No. and capacity of the capacitor.	
				Thermo-control	Set temperature is set to near room temperature and louver operation signal is not received.	Indoor fan operates a little every five minutes during thermo-control.
				Cold air blow prevention control in progress (heating operation)	Area (heat exchanger) near indoor unit outlet is not warm and up-down louvers are set to horizontal position.	Wait several minutes, then restart the heating operation.
				Cool/heat switching control in progress (heat recovery type)	At least 3 minutes did not elapse after switching from cooling to heating or from heating to cooling.	When the operating state was switched from cool to heat, heat to cool, or stop to heat, it takes 3 minutes to balance the refrigerant pressure in the RB 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	Filter display ※	—	Filter clogged	Check if the filter is dirty.	When the indoor unit fan motor starting time exceeds 150 hours, the filter cleaning display appears at the wired remote controller. The starting time is reset by pressing the ZONE/SET button of the wired remote controller for 3 seconds or more and is performed side-by-side with ZONE setting. ※ At filter change display, the set temperature display flashes at a 1 second ON, 1 second OFF cycle.
Controlling display (Operation display LED flashes) ※	Controlling display (Oil recovery operation)	Normal display	Indoor unit makes an abnormal sound.	Oil recovery operation being controlled.	All indoor unit fans stop and signal not received during operation.	After the initial hour after the outdoor unit power was turned on, the oil recovery operation is performed every 6 hours without regard to the operating state of the indoor unit. ※ Operation display LED flashes at a 3 seconds ON, 1 second OFF cycle.
Error display (Indoor unit fan error) ※	Normal display	Error display (Indoor unit fan error) ※	—	Indoor fan capacitor faulty.	Check the resistance value of the capacitor. (If normal, the resistance will show a value of several hundred kilohms.)	AB30-54 (large ceiling suspended type) are error display. (Others are normal display.) 
				Indoor fan motor 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 faulty.	Measure the thermistor resistance and compare it to the ambient temperature.	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 discharged 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. Indoor unit makes an abnormal sound.	Indoor control PCB faulty.	Symptom has many branches, depending on the error contents, and there is no effective check method.	When a PCB or connection wire is faulty, the trouble is often corrected by changing the PCB.
Cannot be specified.	No display or error display (Cannot be specified.)	Cannot be specified.	System does not cool/heat. Abnormal noise coming from indoor unit.	Outdoor control PCB faulty.	Symptom has many branches, depending on the error contents, and there is no effective check method.	When a PCB or connection wire is faulty, the trouble is often corrected by changing the PCB.

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 not supplied to outdoor unit. Circuit breaker OFF. Power line faulty.	Check each outdoor unit power supply terminal board(Power) voltage.	Voltage across R-S, S-T, and T-R: 380~415V Voltage across R-N,S-N, and T-N: 220~ 240V.
※ Normal after the power reset.				Outdoor unit is leaking(shorted). (Circuit to which a voltage is applied when energized is leaking electricity.)	Trip the outdoor unit circuit breaker immediately after setting the circuit breaker to ON. The resistance across each outdoor unit power supply terminal board(Power) terminal and outdoor unit metal part approaches zero.	When shorted,there is a combination that shows an outdoor unit power supply wires(R-S,S-T,T-R,R-N,S-N,T-N) correlative resistance of nearly zero.
				Outdoor unit is leaking(shorted). (Circuit to which a voltage is applied only when operating is leaking electricity.)	Trip the outdoor unit circuit breaker during operation. The resistance value of the outdoor unit electric parts and outdoor unit metal part approaches zero.	When shorted,there is a combination,which indicates an electric parts correlative resistance near zero.
Normal display	Normal display	Normal display	—	Outdoor unit system type selector switch (DIP SW7-1,7-2) setting error. Set to heat recovery type/cooling only type with cooling/heating pump type piping.	Cold air is blown from the indoor unit during the cooling operation, but warm air is not blown from the indoor unit during the heating operation.	
				Indoor unit refrigerant system address setting (SW 7,8) error.	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 indoor unit address (SW 5) setting error. (address duplicated)	Operate each indoor unit for 5 minutes or more. The relevant outdoor unit stops and starts midway. (Compressor capacity and heat exchange capacity at outdoor unit LED is not correct.)	Multiple indoor units in one refrigerant system must not be set to the same indoor unit address.
				Installed piping is unsuitable. piping is too long. (Real length 100m or more)	Check the outdoor unit and indoor unit installation site and estimate the piping length.	When the piping is too long, the cooling capacity may be insufficient. Heating capacity may also be insufficient,but cooling capacity is made insufficient.
				Installed piping is unsuitable. Gas piping diameter is incorrect.	Check the indoor unit capacity and piping diameter.	When the gas piping diameter is large,cooling capacity will be insufficient. Heating capacity may also be insufficient at heating,but cooling capacity is made insufficient.
				Refrigerant leakage.	Check for leaks using a gas detector.(Refrigerant charged state)	Regarding air tightness test after installation or repair,pressurize the system with nitrogen(3.5MPa) 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 pressure changes 0.06MPa.)
				Insufficient gas (light)	During the cooling operation,the discharge temperature does not become low when all the indoor units are operated. During the heating operation, the discharge temperature does not become high when only one indoor unit is operated.	For light gas insufficiency, capacity drops only in a specific operation state.(Note that this symptom resembles faulty indoor unit electronic expansion valve opening.)

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 faulty. Full closed state (Not open)	When the relevant indoor unit performs the cooling operation, the compressor operates, but the indoor unit discharge temperature is not cool. When the relevant indoor unit performs the heating operation, the compressor operates, but the indoor unit discharge temperature is not warm. (cooling/heating pump type system 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 heating stops, and the electronic expansion valve is fully closed, the liquid refrigerant collects at the stopped indoor unit and the insufficient gas symptom appears.
				RB unit solenoid valve faulty. SVd solenoid valve faulty.	During heating operation, a voltage (AC 220V) is applied to indoor control PCB CN6 (across terminals 1-4), but the indoor unit discharge temperature does not become warm.	During the cooling operation with a faulty SVd, the gas pipe is cold. Coil resistance : 1,200 ~ 1,500 Ω
				RB unit solenoid valve faulty. SVs solenoid valve faulty.	During cooling operation, a voltage (AC 220V) is applied to indoor unit control PCB CN6 (across terminals 2-4), but the indoor unit discharge temperature does not become cool.	
				Outdoor unit electronic expansion valve (EEV1, EEV2) opening faulty. 1. Fully closed state (Not opened) Heating operation.	When a voltage (AC 220V) is applied to the coil of the heat exchange 4-way valve (4WV2, 4WV3, 4WV4) and to the heat exchange solenoid valve (SV7, SV8) corresponding to the electronic expansion valve, the electronic expansion valve outlet 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 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	Indoor unit makes an abnormal sound.	Installed piping not suitable. Liquid piping diameter incorrect.	Check the indoor unit capacity and piping diameter.	When the diameter is large, a refrigerant rushing sound is generated and when the diameter is small, capacity will be insufficient.
				Outdoor unit refrigerant switching 4-way valve (4WV1) faulty. (Cooling/heating pump type only)	28 dia. pipe temperature corresponding to 4WV1 energized state (cooling : de-energized, heating : energized (AC220V)) is abnormal (cooling : cold, heating : hot).	Four-way valve coil resistance : 1200~1500 Ω
				Outdoor heat exchange switching 4-way valve (4WV2, 4WV3, 4WV4) or solenoid valve (SV7, SV8) faulty.	Check the heat exchange operation capacity at the LED on the outdoor control PCB. Corresponding heat exchange 4-way valve and solenoid valve energized state (AC220V) is abnormal. (Refer to section 5-2 of the service manual for the energized states.)	When a 4-way valve or solenoid valve is faulty, the high pressure will rise during the cooling operation and the low pressure will fall during the heating operation. Coil resistance : 1200~1500 Ω
			Overall refrigerant pressure rises (in particular, high pressure rises abnormally) or falls.	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 communication terminal board (Trans Mission) terminals 1-2 of one indoor unit was shorted, the resistance across communication terminal board (Trans Mission) terminals 1-2 of all the indoor units does not indicate a value near zero.	<p>Short circuit Resistance measurement Resistance measurement</p> <p>Indoor unit Indoor unit Indoor unit 3</p>
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> ※ Normal after power reset. </div>						
Normal display	Error display (High pressure error)	Normal display	—	Indoor unit system type selector switch (DIP SW7-1, 7-2) setting error. Set to cooling/heating pump type/cooling only type with heat recovery type piping.	Cool air or warm air not discharged from indoor unit during both the cooling and heating operations.	Refer to the service manual (section 4-4 "Outdoor Unit") for the switches.
Normal display	Normal display or error display (Compressor error)	Normal display	—	Insufficient gas (serious)	When the number of operating indoor units was changed, the indoor unit discharge temperature does not become low (does not become high).	For serious gas insufficiency, the high pressure always drops and the low pressure always rises during all operations.
Error display (Thermistor error) ※	Error display (Indoor unit error)	Error display (Thermistor error) ※	Indoor fan unit not operating.	Indoor thermistor faulty.	Measure the thermistor resistance and compare it to the ambient temperature.	Refer to the service manual (section 8-5-1) for the temperature and thermistor resistance relationship. ※ When a thermistor is shorted or open.
Normal display	Error display (High pressure error)	Normal display	—	RB unit solenoid valve wiring faulty.	When a relevant indoor unit performs the heating operation, the high pressure becomes high and warm air is not discharged from the indoor unit.	Solenoid valve wiring corresponding to the connection piping must not be connected to the same indoor unit. (Trouble occurs especially easily with the UTF-Y90A1A.)

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 faulty.	Check by measuring the thermistor resistance and comparing it to the ambient temperature.	Refer to the service manual (section 8-5-1) for the temperature and thermistor resistance relationship. ※When thermistor is shorted or open.
Normal display	Normal display or error display (High pressure error)	Normal display	—	Outdoor fan capacitor faulty.	Check the capacity (11uF) and resistance of the capacitor. (When normal, the resistance is several hundred kilohms or more.)	Resistance value across fan motor wires: Blue-white : 60 ohms, white-red : 40 ohms, red-blue : 20 ohms
				Outdoor fan motor faulty.	Voltage (AC 30V) is applied to motor, but motor does not rotate.	
				Outdoor unit electronic expansion valve (EEV1, EEV2) opening faulty. Fully closed state (not open) Cooling operation	When the heat exchange 4-way valve (4WV2, 4WV3, 4WV4) corresponding to the electronic expansion valve is not energized, the temperature (warm) of the piping before and after the electronic expansion valve is clearly different.	
			Indoor unit makes an abnormal sound.	Ball valve opening faulty.	Turn the knob of the liquid pipe, discharge pipe, and suction pipe clockwise.	When the ball valve is fully open, the knob of the liquid pipe and discharge pipe is vertical and the knob of the suction pipe is horizontal.
Normal display	Normal display or error display (Discharge temperature error)	Normal display	—	Outdoor unit short circuit	Air discharged from an outdoor unit is sucked directly into the same outdoor unit or into another outdoor unit.	
				Outdoor unit heat exchanger block	Not enough space around outdoor unit. Dirt or other foreign matter stuck to outdoor unit heat exchanger.	Refer to the design technical manual for the service space.

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 (-5°C or less)	※ 1 Operation display LED repeats 3 seconds ON, 1 second OFF cycle. ※ 2 DEFROST is displayed at bottom of set temperature display position.
Error display (Outdoor unit error display)	Error display (Compressor error)	Error display (Outdoor unit error)	—	Compressor faulty	Voltage (AC380-415V) is applied to secondary side of power line, but compressor does not operate. → Compressor lock → Compressor motor burned	While checking for a compressor error, the other compressors perform the backup operation. Resistance across compressor wires : 5 Ω each.
				Compressor faulty Compressor lock	When the compressor does not operate, measure the resistance across the compressor wires and the ground resistance. (When the compressor is locked, the resistance across the wires and the ground resistance will be the normal value, the same as when the compressor is stopped.)	When this trouble occurs, the oil in the compressor has deteriorated (changed to black color). Therefore, long-term operation is impossible. (Another compressor locks.)
				Compressor faulty Compressor motor burned	When the compressor does not operate, measure the resistance across the compressor wires and the ground resistance. (When the motor is burned, the resistance across wires increases / open and the ground resistance drops.)	When this trouble occurs, the oil does not deteriorate. Therefore, operation can be continued, but since the possibility of electric leakage is high, the compressor power line must always be disconnected.
Error display (Outdoor unit error)	Error display (Reverse phase error)	Error display (Outdoor unit error)	—	Compressor faulty Reverse phase	The compressor operates normally, 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 faulty.	When outdoor unit power reset is repeated, a communication error is generated.	When the display returns to normal (not communicating) after reset, the communication PCB or communication line is abnormal.
※ Normal after power reset.						
No display or error display (Cannot be specified)	Cannot be specified.	No display or error display (Cannot be specified)	Indoor unit fan not operating. Indoor unit makes an abnormal sound.	Indoor unit control PCB 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, operation can often be restored by replacing the PCB.
Cannot be specified.	No display or error display (Cannot be specified)	Cannot be specified.	Indoor unit fan not operating. Indoor unit makes an abnormal sound.	Outdoor unit control PCB 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, operation can often be restored 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	—	RB unit solenoid valve faulty. SVb1, 2 solenoid valve faulty.	When heating operation starts, a voltage (AC220V) is applied to indoor unit control PCB CN6 (across terminals 3-4), but 3 minutes later a loud refrigerant rushing sound is generated from the RB unit.	Coil resistance : 1200~1500 Ω
				Indoor electronic expansion valve opening faulty.	—	Coil resistance (red-white, red-orange, brown-blue, brown-yellow) : 100~200 Ω
			Indoor unit other than the relevant indoor unit does not perform cooling.	Indoor electronic expansion valve opening faulty. Fully open (open excessively) Cooling operations performed.	The area (heat exchanger) near the air diffuser is not cooled even after several minutes have elapsed since the relevant indoor unit was stopped. (Gas pipe is 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 unit other than the relevant indoor unit does not perform cooling. Indoor unit heat exchanger icing.	Indoor unit electronic expansion valve opening faulty. Fully open (open excessively) Cooling stopped	The area (heat exchanger) near the air diffuser of the stopped relevant indoor unit is cold. (Gas pipe is cold.)	When the electronic expansion valve opens, the indoor heat exchanger may ice while stopped and water leakage or other trouble may occur.
			Indoor unit other than relevant indoor unit does not perform heating.	Indoor unit electronic expansion valve opening faulty. Full open (open excessively) Heating operation	When the relevant indoor unit performs the heating operation or another indoor unit performs the heating operation, the indoor unit discharge temperature does not become high and the high pressure becomes low.	
				Indoor unit electronic expansion valve opening faulty. Full open (open excessively) Heating stopped.	When the relevant indoor unit or another indoor unit performs the heating operation, the indoor unit discharge temperature does not become high and the high pressure become low.	
			System does not cool/heat	Outdoor cool/heat switching 4-way valve (4WV1) faulty. (Cooling/heating pump type only)	28 dia. gas piping temperature corresponding to 4WV1 energized state(cooling, de-energized, heating, energized(AC220V) is abnormal (cooling : cold, heating : hot).	4-way valve coil resistance : 1200~1500 Ω
				Outdoor heat exchanger switching 4-way valve (4WV2, 4WV3, 4WV4) or solenoid valve (SV7, SV8) faulty.	Check the heat exchange operation capacity at the outdoor control PCB LED. The energized state (AC220V) of the heat exchange 4-way valve and solenoid valve corresponding to it is abnormal. (Separate sheet 1)	When a 4-way valve or solenoid valve is faulty, the high pressure rises during the cooling operation and the low pressure drops during the heating operation. Coil resistance : 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 opening faulty.	Turn the knob of the liquid pipe, discharge pipe, and suction pipe ball valve counter-clockwise.	When the ball valve is fully open, the knob of the liquid pipe and discharge pipe is vertical and the knob of the suction pipe is horizontal.
Controlling display (Operation display LED flash) ※	Controlling display (Oil recovery operation)	Normal display	Indoor unit not operating.	Oil recovery operation control in progress.	All the operating indoor unit fans are stopped and signals are not received.	Oil recovery operation is performed even though the indoor unit operation state is entered every 6 hours after the initial hour after the outdoor unit power is turned on. ※Operation display LED repeats 3 seconds ON, 1 second OFF cycle.
No display or error display (Cannot be specified.)	Cannot be specified.	No display or error display (Cannot be specified.)	Indoor unit fan is not operating. System does not cool/heat.	Indoor control PCB faulty.	The symptom has many branches, depending on the error contents, and there is no effective check method.	When the PCB or connection wiring is faulty, operation can often be restored by replacing the PCB.
Cannot be specified.	No display or error display (Cannot be specified.)	Cannot be specified.	Indoor unit fan is not operating. System does not cool/heat.	Outdoor control PCB faulty.	The symptom has many branches, depending on the error contents, and there is no effective check method.	When the PCB or connection wiring is faulty, operation can often be restored 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 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 faulty (Cassette type only)	During cooling operation, drain pump is not effective even though a voltage (DC5V) is applied across CN5 terminals 1-2.	※ 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 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). ※ Generated 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		Indoor unit electronic expansion valve opening 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 unit other than relevant indoor unit does not perform cooling. Indoor unit makes an abnormal sound.	Indoor unit electronic expansion valve opening faulty. Fully open (open excessively) Cooling operation.	Area (heat exchanger) near the air diffuser is not cooled even after several minutes have elapsed after the relevant indoor unit was stopped. (Gas pipe is 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 unit other than relevant indoor unit does not perform cooling. Indoor unit makes an abnormal sound Icing at indoor unit heat exchanger.	Indoor unit electronic expansion valve opening faulty. Fully open (open excessively) Cooling stopped.	The area (heat exchanger) near the air diffuser of the stopped relevant indoor unit is cold. (Gas pipe is cold.)	When the electronic expansion valve opens, the stopped indoor heat exchanger may ice and water leakage or other trouble may occur.
			Indoor unit other than relevant indoor unit does not perform heating. Relevant indoor unit is making an abnormal sound.	Indoor unit electronic expansion valve opening faulty. Fully open (open excessively) Heating operation.	When a relevant indoor unit or another indoor unit performs the heating operation, the indoor unit discharge temperature does not become high and the high pressure becomes low.	When the electronic expansion valve is open excessively, a loud refrigerant rushing sound may be generated.
				Indoor unit electronic expansion valve opening faulty. Fully open (open excessively) Heating stopped.		
			Discharge temperature is high.	Up - down (left - right) swing switching motor faulty.	Louver does not move even when a voltage (DC12V) is applied to the CN10 terminals (across 1-2) at swing input.	For the left - right swing switching motor, check the voltage across the CN11 terminals (1-2).
			Discharge temperature is high. ※ Remakes	Liquid injection solenoid valve (SV1) faulty.	When a voltage (AC220V) is applied to CN7, the liquid injection solenoid valve outlet pipe is not cold.	When SV1 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 (SV2) faulty.	When a voltage (AC220V) is applied to CN8, the high pressure gas bypass solenoid outlet pipe is not warm.	When SV2 is faulty, the high pressure error may be generated. Coil resistance : 1200~1500Ω
			Compressor error ※ Remakes	Oil return solenoid valve (SV3, SV4, SV5, SV6) faulty.	When a voltage (AC220V) is applied to CN9, CN10, CN11, and CN12, the outlet pipe of the respective solenoid valve (SV3, SV4, SV5, SV6) does not become hot.	When SV3, SV4, SV5, and SV6 do not operate normally, the oil may not return to the compressor and compressor trouble may occur. Coil resistance : 1200~1500Ω
			High pressure is high. ※ Remakes	High pressure switch faulty.	There is a voltage difference across terminals 1-2 of CN42 even though the high pressure exceeds 3.0MPa.	When the pressure switch is faulty, protection control will not be entered even if the high pressure rises and a high pressure error may be generated.
Error display (Outdoor unit error)	Error display (Discharge, liquid pipe pressure sensor error)	Error display (Outdoor unit error)	High pressure is high. ※ Remakes	Pressure sensor (HP, MP) faulty.	Measure the pressure sensor output voltage (across terminals 2-3 of CN33 and CN34) and compare the result to the pressure gauge indication.	When the pressure sensor is faulty, protection control is not entered even if the high pressure rises and a high pressure error may be generated. Refer to the service manual (section 8-5-2) for the pressure and pressure sensor output voltage relationship.

8-5 OTHERS

8-5-1 CHARACTERISTICS OF THERMISTOR

Thermistor resistance values <Indoor unit side>

1) Room temperature thermistor

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

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)	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

Room 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

3) Indoor heat exchanger outlet temperature thermistor

Room temperature (°C)	-50	-40	-30	-20	-10	-5	0	2.5	5	7.5	10	12.5	15
Resistance value (kΩ)	384.8	182.8	92.3	49.2	27.5	20.9	16.1	14.1	12.4	11.0	9.7	8.6	7.7

Room temperature (°C)	17.5	20	22.5	25	27.5	30	32.5	35	37.5	40	42.5	45	50
Resistance value (kΩ)	6.8	6.1	5.5	4.9	4.4	3.9	3.6	3.2	2.9	2.6	2.4	2.2	1.8

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

Thermistor resistance values <Outdoor unit side>

1) Outdoor heat exchanger temperature thermistor

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

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	161	180
Resistance value (kΩ)	1.2	0.8	0.5

3) Outdoor temperature thermistor

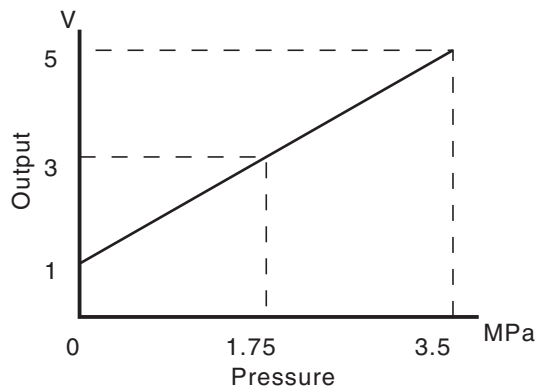
Pipe temperature (°C)	-50	-40	-30	-20	-10	-7.5	-5.0	-2.5	0	2.5	5.0	8.0	10
Resistance value (kΩ)	859	402	200	105	58.2	50.6	44.0	38.4	33.6	29.5	25.9	22.3	20.2

Pipe 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

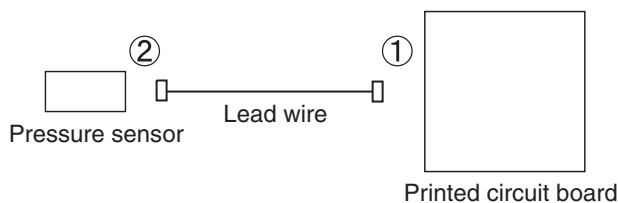
Pipe temperature (°C)	60	70	80
Resistance value (kΩ)	2.5	1.8	1.3

8-5-2 PRESSURE SENSOR

1) Characteristics of pressure sensor



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.

8-5-3 ELECTRIC EXPANSION VALVE

When the electric expansion valve is locked cause by failure, it emits click noise. Confirming the noise emission is done by touching any implement like a screw driver.

8-5-4 RB UNIT (HEAT RECOVERY TYPE ONLY)

When the RB unit is failed, it can be concerned one of the valve such as discharge valve, suction valve and bypass is locked. The discharge valve will be ON during heating operation, the suction valve will be ON during cooling operation and the bypass valve will be ON during stopping.

8-5-5 OTHERS

1) Solving the problem is necessary since following can be occurred.

- ① Gas leakage, capacity declining cause by gas shortage.
- ② Dirt from the filter and the EEV.
- ③ Capacity declining by mis-setting of the indoor unit capacity.
- ④ Unfit of the refrigerant pipe.
- ⑤ Increasing the indoor unit by mis-piping.
- ⑥ Increasing the indoor unit by mis-setting the refrigerant system address.
- ⑦ Disconnection of the transmission line.

2) The air conditioner operates intermittently or an error message appears.

- ① Wiring method of the transmission line.
- ② Loose contact of the transmission line
- ③ Mis-selecting the transmission line.
- ④ Over the limit of the transmission line length.
- ⑤ Noise influences the transmission line.
- ⑥ In case of the specified indoor unit, the indoor unit PCB is defected.
- ⑦ In case of all units or the specified unit, the outdoor unit PCB is defected.

8-5-6 OUTDOOR HEAT EXCHANGER CAPACITY AND THE STATE OF 4-WAY VALVE, ELECTROMAGNETIC VALVE, AND ELECTRONIC EXPANSION VALVE

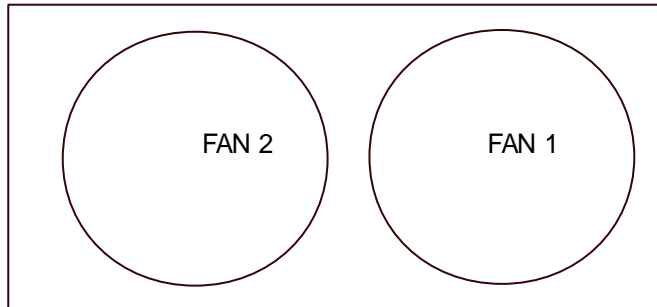
1. Cooling operation

Heat exchange capacity(HP)	4-way valve in the energized mode			Electromagnetic valve in the energized mode		Electronic expansion valve opening	
	4WV2	4WV3	4WV4	SV7	SV8	EEV1	EEV2
	CN18	CN19	CN20	CN13	CN14	CN29	CN30
2	OFF	ON	ON	ON	OFF	open	enclosed
4	ON	OFF	ON	OFF	ON	open	enclosed
6	ON	ON	OFF	OFF	OFF	enclosed	open
8	OFF	ON	OFF	ON	OFF	open	open
10	ON	OFF	OFF	OFF	ON	open	open
12	OFF	OFF	OFF	ON	ON	open	open

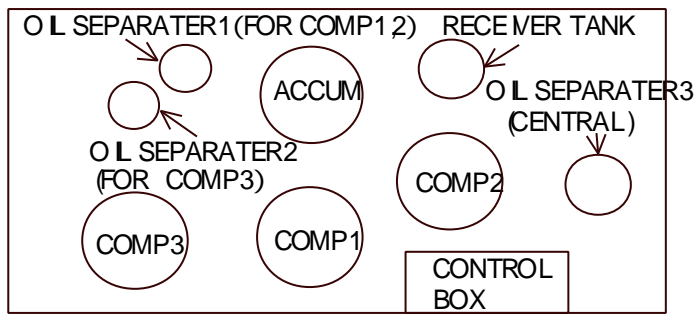
2. Heating operation

Heat exchange capacity(HP)	4-way valve in the energized mode			Electromagnetic valve in the energized mode		Electronic expansion valve opening	
	4WV2	4WV3	4WV4	SV7	SV8	EEV1	EEV2
	CN18	CN19	CN20	CN13	CN14	CN29	CN30
2	ON	ON	ON	ON	OFF	open	enclosed
4	ON	ON	ON	OFF	ON	open	enclosed
6	ON	ON	ON	OFF	OFF	enclosed	open
8	ON	ON	ON	ON	OFF	open	open
10	ON	ON	ON	OFF	ON	open	open
12	ON	ON	ON	ON	ON	open	open

OUTDOOR UNIT INTERNAL LAYOUT

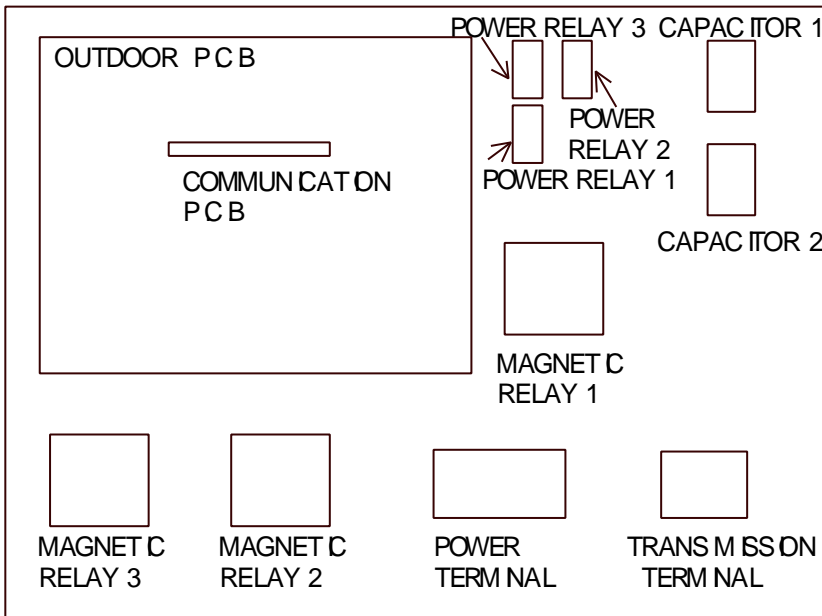


(FRONT)



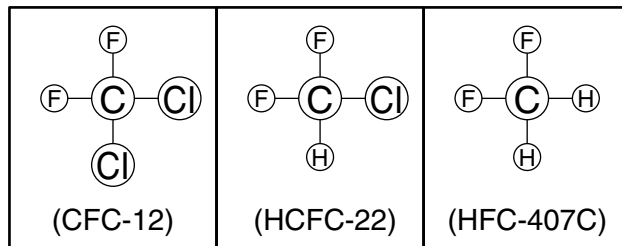
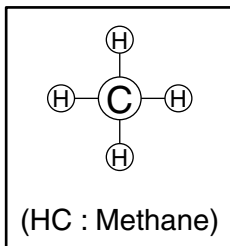
(FRONT)

OUTDOOR UNIT CONTROL BOX
INTERNAL LAYOUT



9. IN USE OF THE NEW REFRIGERANT R407C

9-1 What is CFC/HCFC/HFC ?



CFC : Chloro-Fluoro-Carbon
 = high ODP (ozone depletion potential) chemical compound containing chlorine (ODP: 0.6 - 1.0)
 HCFC : Hydro-Chloro-Fluoro-Carbon (R22)
 = low ODP chemical compound containing chlorine and hydrogen (ODP: 1/10 - 1/150 of CFC)
 HFC : Hydro-Fluoro-Carbon (R407C)
 = zero ODP new chemical compound in which is not containing chlorine (ODP: 0)

9-2 Characteristics of R22 and R407C

HANDLING

As in the case of R22, the specific gravity of its vapor is larger than that of air and should it leak in an airtight room it may stay at a low level and cause oxygen starvation accident.

cause a poisonous gas to occur, so be sure to handle it only in a well ventilated area.

SELECTION OF REFRIGERANT

As there is no appropriate mono-constituent refrigerant to replace R22 which has been used for conventional air conditioners, the mixed refrigerant of HFC series was developed.

	R22	R407C
Composition (wt%)	R22 (100)	R32/R125/R134a (23/25/52)
Boiling point	-40.8	-43.6
Ozone depletion potential ODP	0.055	0
Global warming potential GWP	1,700	1,530
Inflammability	Nonflammable (A1)	Nonflammable (A1/A1)
Toxicity	less	less
Azeotropic or Zeotropic	————	Zeotropic
Features	————	Necessary to handle carefully because of zeotropic. Working pressure is nearly equal to that of R22 (about 1.1 times).

R407C

Merits

As working pressure is nearly equal to R22 (about 1.1 times), pressure resistance design is easy.

- Discharge compressor
 Max. 30.0 bar for reciprocating compressor
 Max. 28.5 bar for rotary compressor

Demerits

Composition control is necessary for charging refrigerant as it is zeotropic refrigerant.

- When leaked, it will become composition of more R134a constituent with high boiling point.
 Also, charging refrigerant must be done from the liquid phase side.
 Review of control system is required as there is temperature glide.
- R407C is used for large air conditioners.
 Pressure resistance design is easy and safe.

9-3 Difference from conventional model (R22) and precautions

OIL

- Use new synthetic oils such as ester because HFC series refrigerant has less solubility with mineral oils conventionally used for R22.
- As these new synthetic oils are easily influenced by moisture and dusts, they must be treated more carefully than the conventional lubricating oils.

CAUTION

For installation/servicing, take more precautions than before to avoid moisture and dusts. Also, for storing parts, same precautions must be taken.

COMPRESSOR

- Use better grade of material for sliding parts for securing good lubrication of sliding part as HFC refrigerant does not contain chloride.
- Review insulating materials
- Increase pressure resistance strength

CAUTION

Check if the compressor is suitable for the refrigerant (model) when replacing. Complete welding within 15 minutes after opening the cap when replacing.

HEAT EXCHANGER

- Review the water, contaminants controlling level
- Use thinner tube to increase pressure resistance strength (only outdoor unit) improving performance

CAUTION

During storage, due care must be taken so that foreign matters such as dust and water do not enter.

4-WAY VALVE

- Review materials

CAUTION

Check if the valve is suitable for the refrigerant (model) when replacing.

CHECK VALVE

- Review materials
- Change shape of pipe ends to increase pressure resistance strength

CAUTION

Check if the valve is suitable for the refrigerant (model) when replacing.

2, 3-WAY VALVE

- Review material O-ring, valve core seal for securing suitability with oil.

CAUTION

Check if the valve is suitable for the refrigerant (model) when replacing.

BALL VALVE

- Review material O-ring, valve core seal for securing suitability with oil.

CAUTION

Check if the valve is suitable for the refrigerant (model) when replacing.

DRYER

- Change desiccant (XH-6 → XH-10) Volume of desiccant is increased.

CAUTION

Complete welding within one hour after the package of dryer is opened.

PRESSURE SWITCH

- Adopt for some models for better reliability.

CAUTION

Check if the valve is suitable for the refrigerant (model) when replacing.

OTHER PIPING

- Review the water, contaminants controlling level.
- Review thickness of pipes.

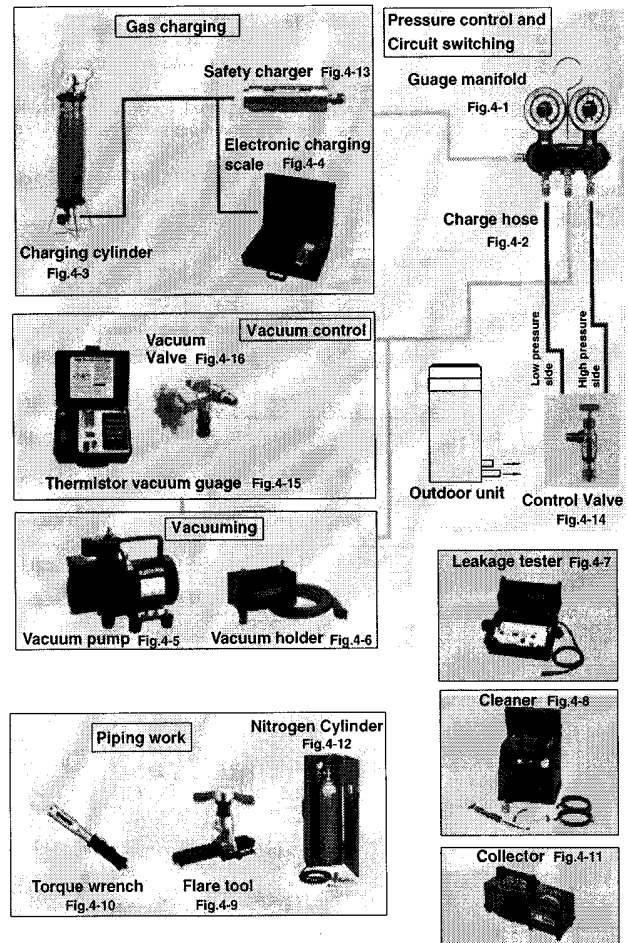
CAUTION

During storage, due care must be taken so that foreign matters such as dust and water do not enter.

9-4 Tools

- Gauge manifold** (Fig.4-1)
Pressure gauge changed.
- Charge hose** (Fig.4-2)
Changed to HFC resistant material.
- Charging cylinder** (Fig.4-3)
Gauge changed
- Electronic balance for refrigerant charging** (Fig.4-4)
Electronic balance is recommended as in the case of R410A.
- 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)
Exclusive for HFC
- 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)
It is always compulsory to change the liquid, because R407C is a mixed refrigerant and there is some fear that a mixing ratio changes. 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 (R407C)



9-5 Precautions for installation

COPPER PIPES

- (1) It is necessary to choose adequate materials.
If new synthetic oil is mixed with residual oil(ex : mineral type) ,they may deteriorate, and block the capillary tubes, or cause the compressor to fail.
So it is desirable that the amount of residual oil in connection pipes is less than 40 mg/10 m.
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

- (2) Control contaminants
Since new synthetic oil is easily influenced by contaminants (water, residual oil, etc.), it must be handled with care more than the conventional lubricating oil.
- (3) Refrigerant charge
When charging refrigerant, take into account the slight change in the composition of the gas and liquid phases, and always charge from the liquid phase side whose composition is stable.
- (4) Correct refrigerant charge
As there are air conditioner models using different refrigerant such as R22, R407C, make sure to check and not to use wrong refrigerant when installing and servicing.
- (5) Air purge
Always use a vacuum pump to purge the air.
In the case of Fujitsu General's new refrigerant model, refrigerant for purging the air is not charged in the outdoor unit at the factory.

9-6 Precautions for Servicing

1. Countermeasure when the refrigerant leaks

As R407C is geotropic refrigerant, the composition of the remaining refrigerant changes when the refrigerant leaks.

Therefore, recharging refrigerant cannot be done.

Recover the remaining refrigerant and charge the specified amount of new refrigerant.

2. Never use the existing refrigerant piping

The existing piping used for R22 cannot be used for the cycle of HFC series refrigerant as the conventional mineral oils are adhering to the piping.

Due to the deteriorated mineral oils, compressor may be damaged.

Therefore, basically use a brand new piping.
However, in case of the existing piping buried in the wall and replacement with new piping is difficult, wash the piping fully with detergent.

3. Replacement of refrigeration cycle parts

As refrigeration cycle parts are basically different from conventional parts, be sure to use the parts suitable for the refrigerant when replacing.

For R407C, the materials are being reviewed.

4. Charging wrong refrigerant

As there are air conditioner models using different refrigerant such as R22, R407C, make sure to check and not to use wrong refrigerant when installing and servicing.

5. Storage of parts

When storing parts, make such treatment as packing the parts in bags so as to avoid dusts, water, etc.

6. Replacing parts

When replacing parts, be sure to check if the parts are suitable for the refrigerant(model).

For most refrigeration cycle parts which have same appearance, the inside material is changed.

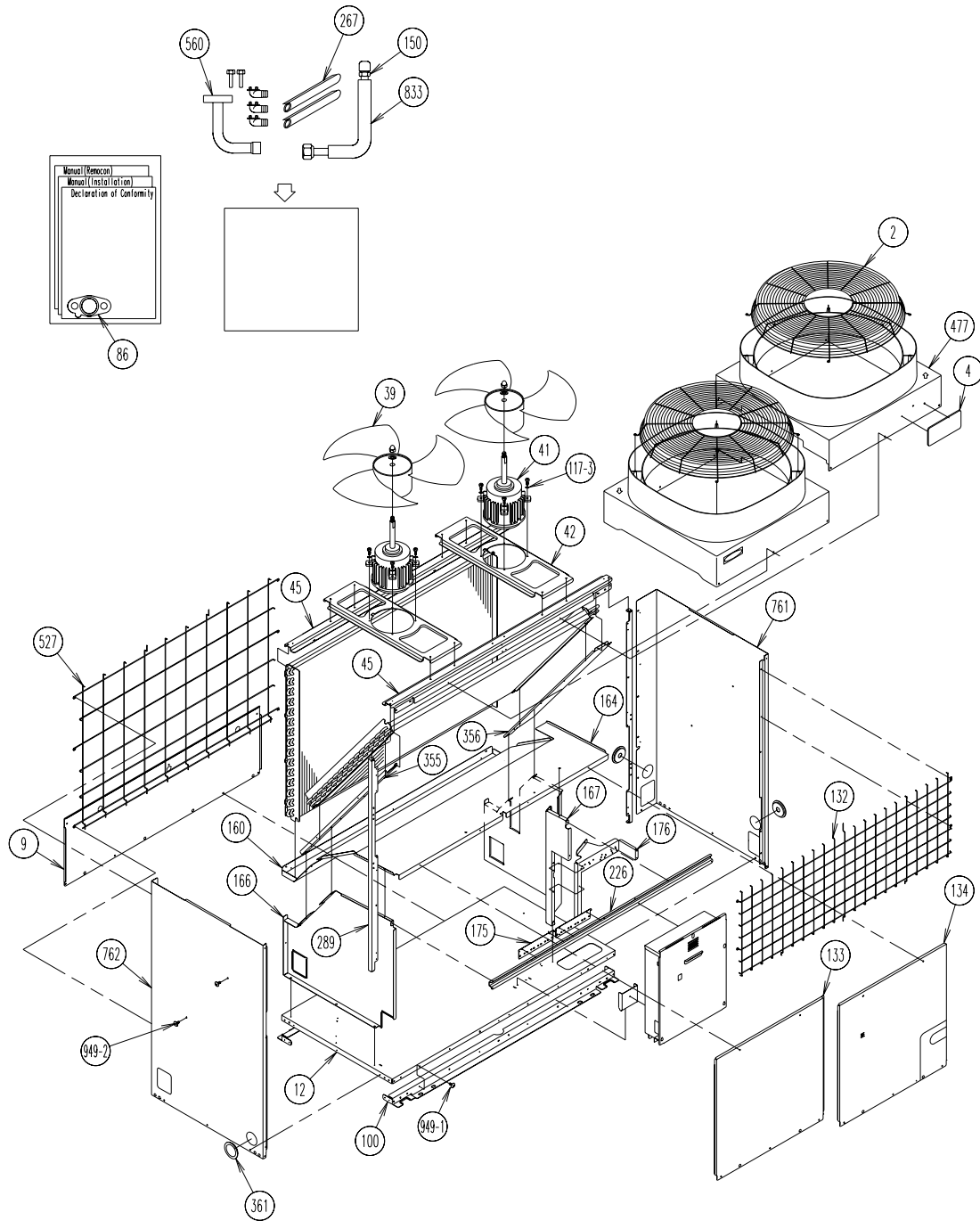
When changing compressor, complete brazing within 15 minutes after opening the cap. After opening the cap, the moist air enters the compressor, and oil absorbs the moisture causing sludge. When changing dryer, complete brazing within one hour after the package of dryer is opened.

The desiccant starts to absorb the water content as soon as the package of dryer is opened.

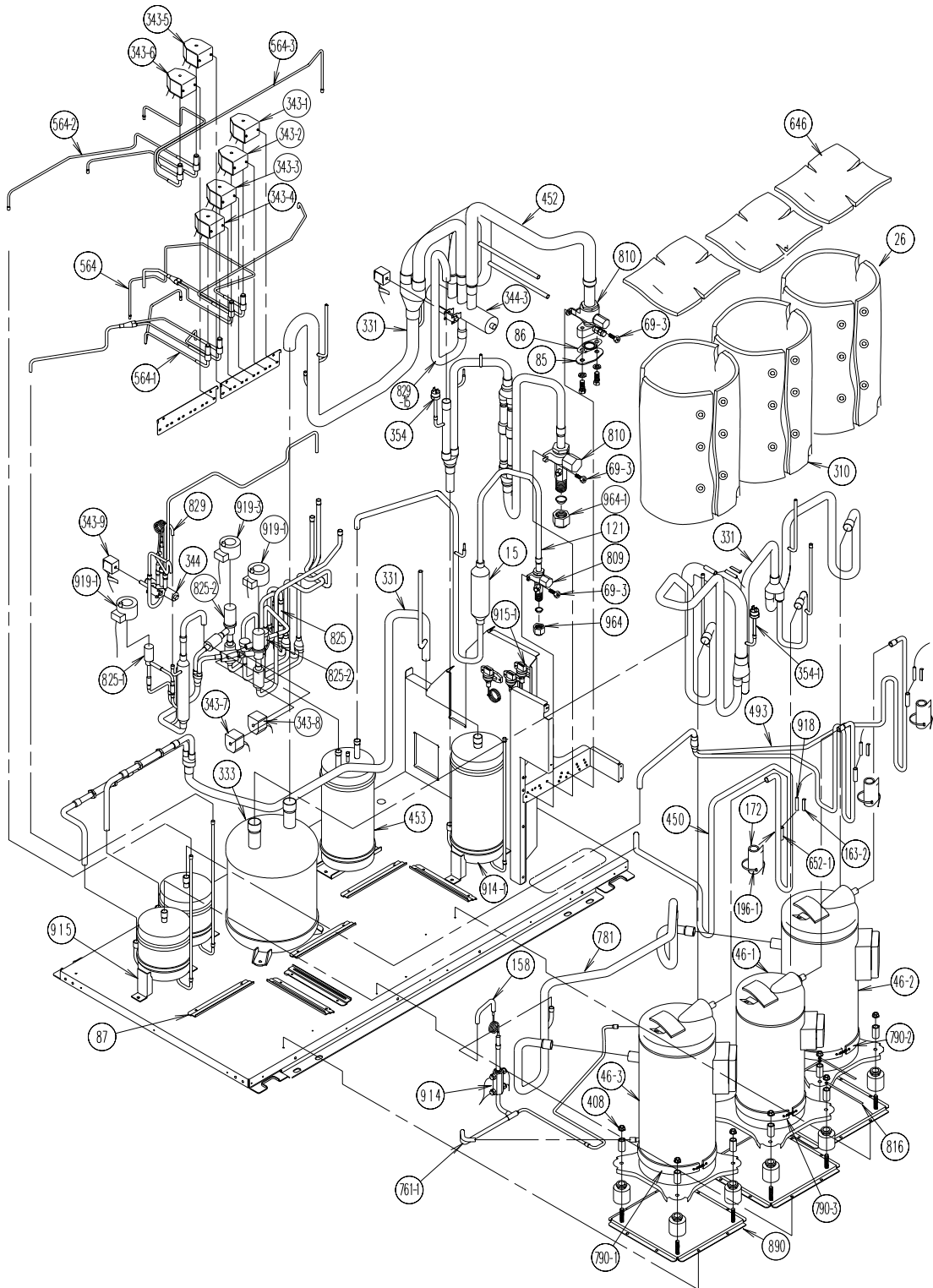
If it absorbs too much water content when replacing, it cannot absorb fully the water content in the refrigerating cycle.

10. DISASSEMBLY ILLUSTRATION

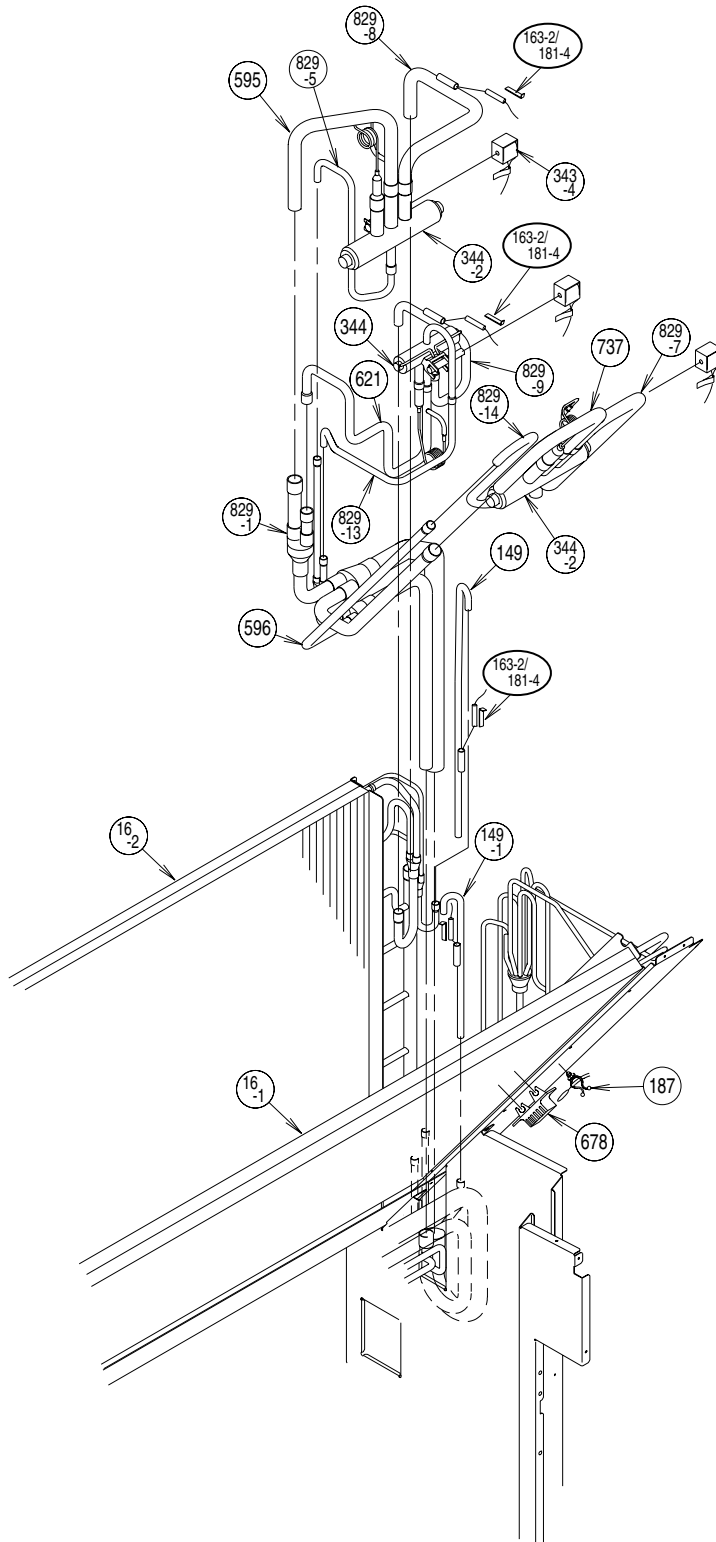
Models : AOY90TPAMF



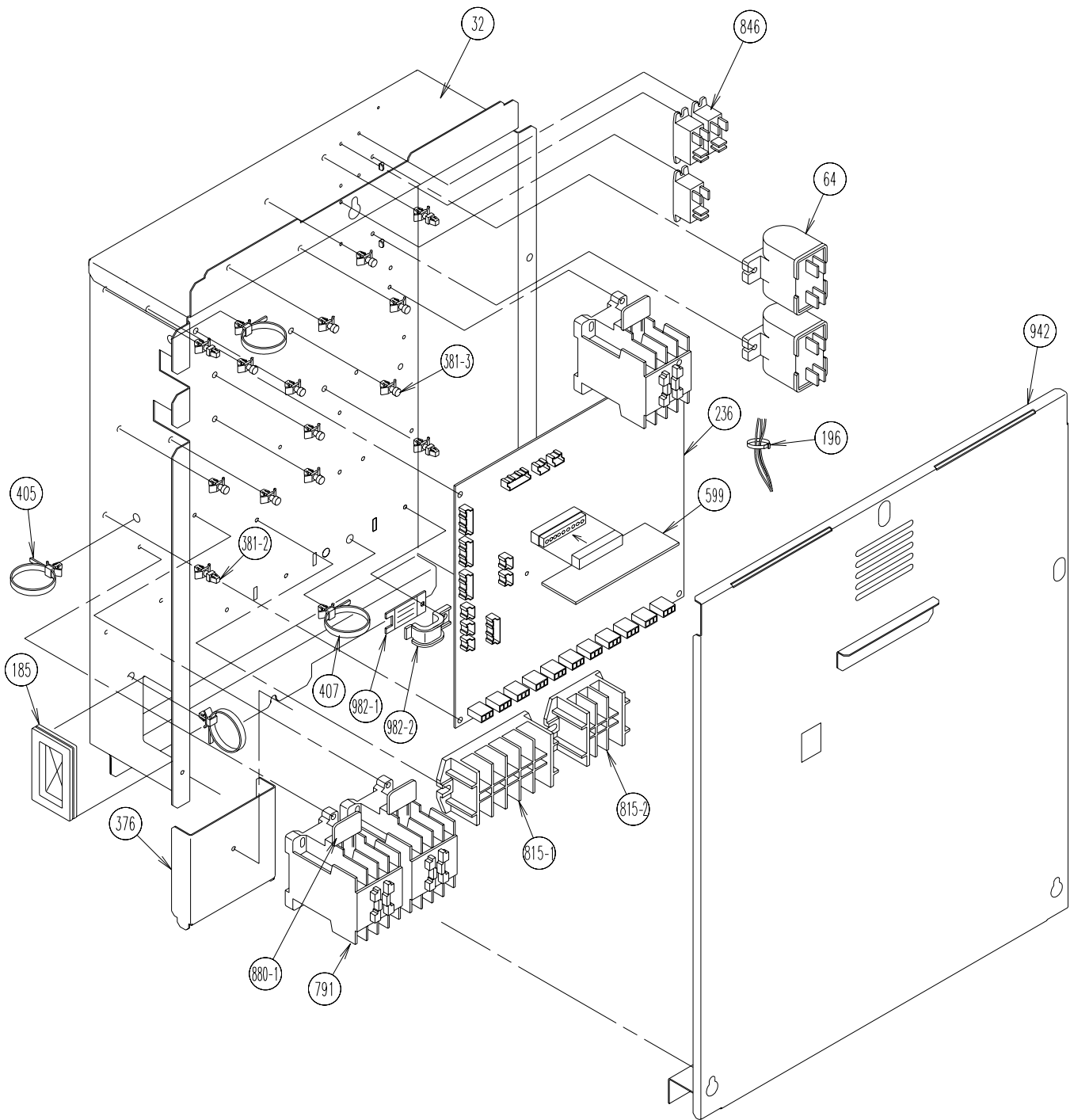
Models : AOY90TPAMF



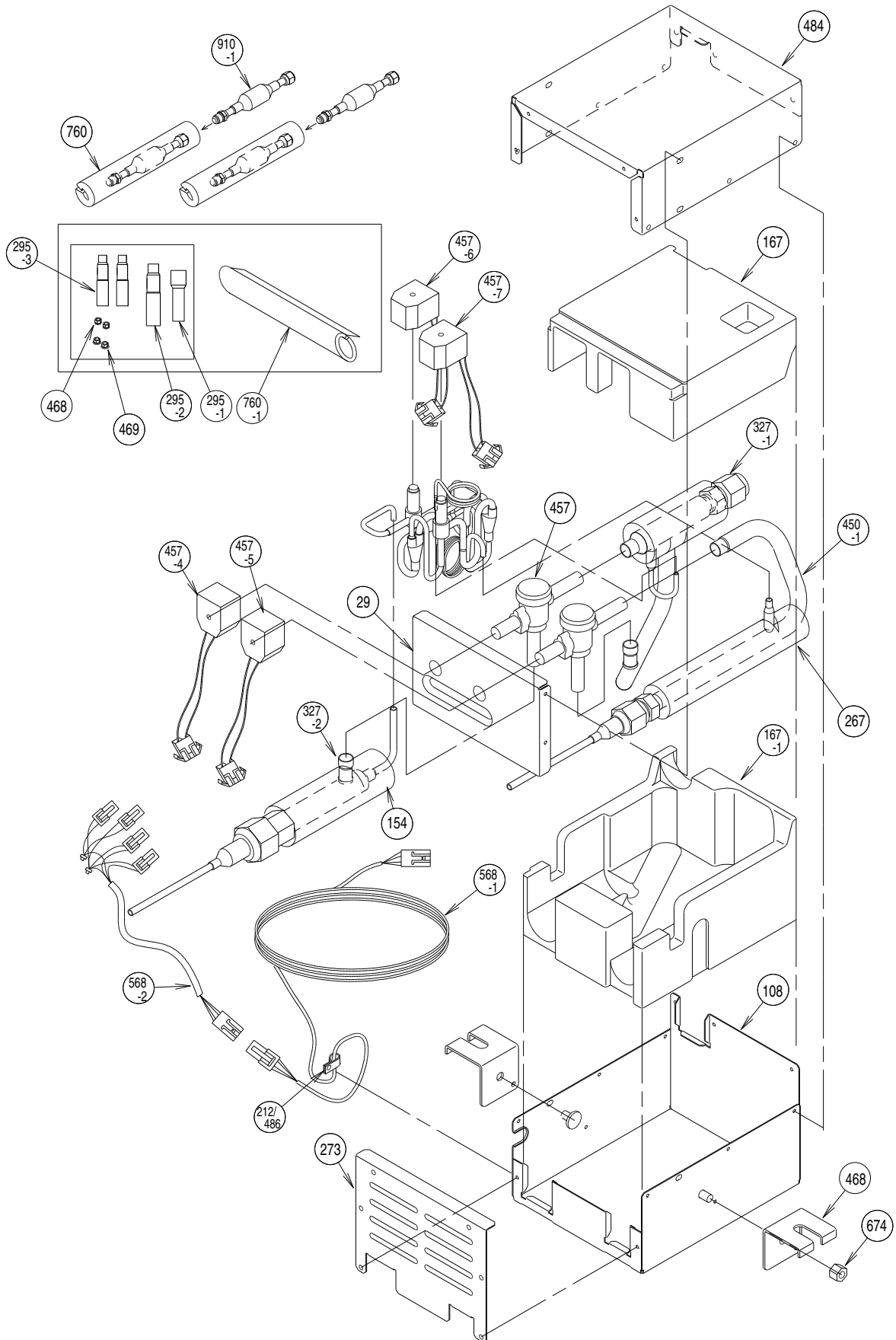
Models : AOY90TPAMF



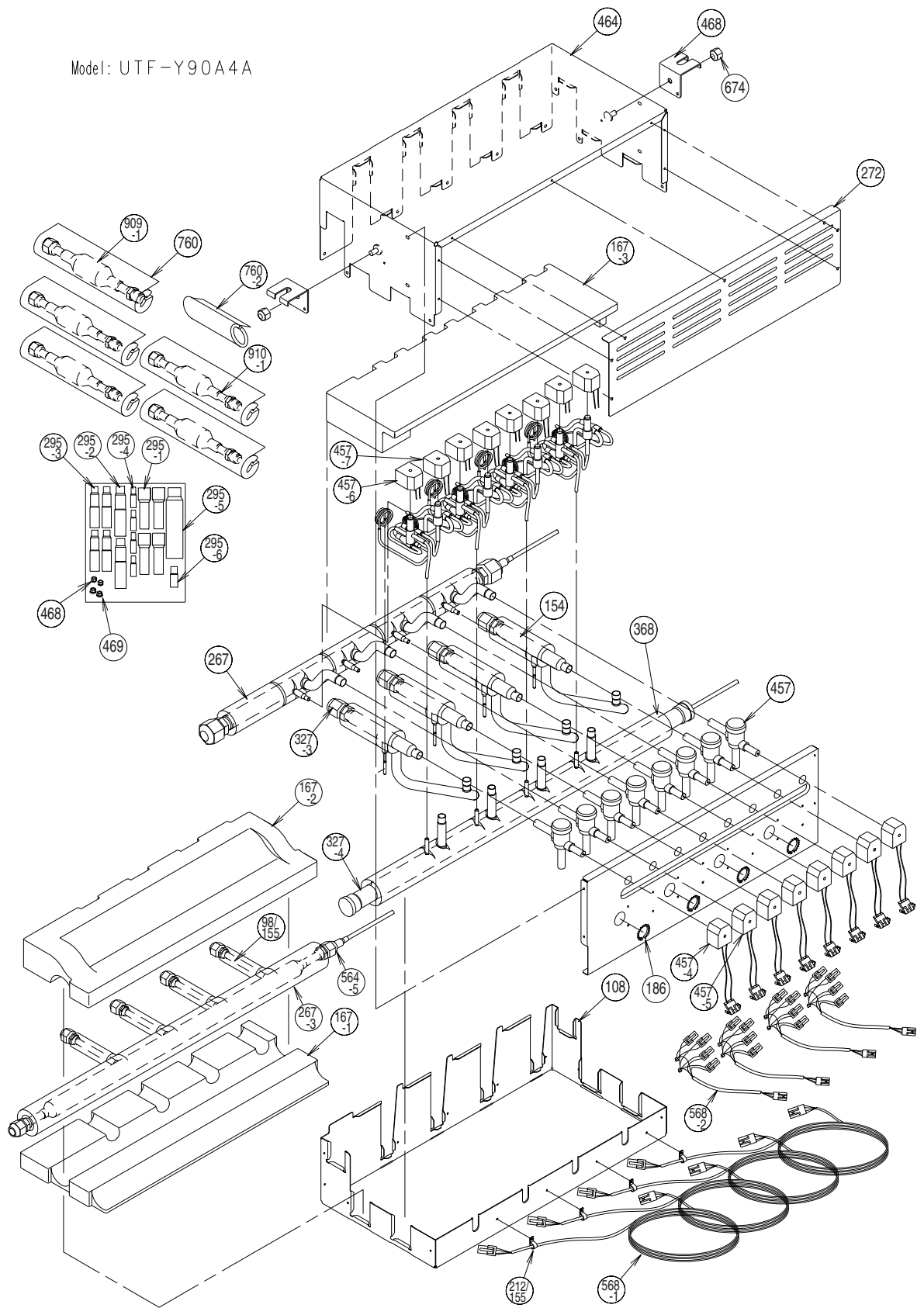
Models : AOY90TPAMF



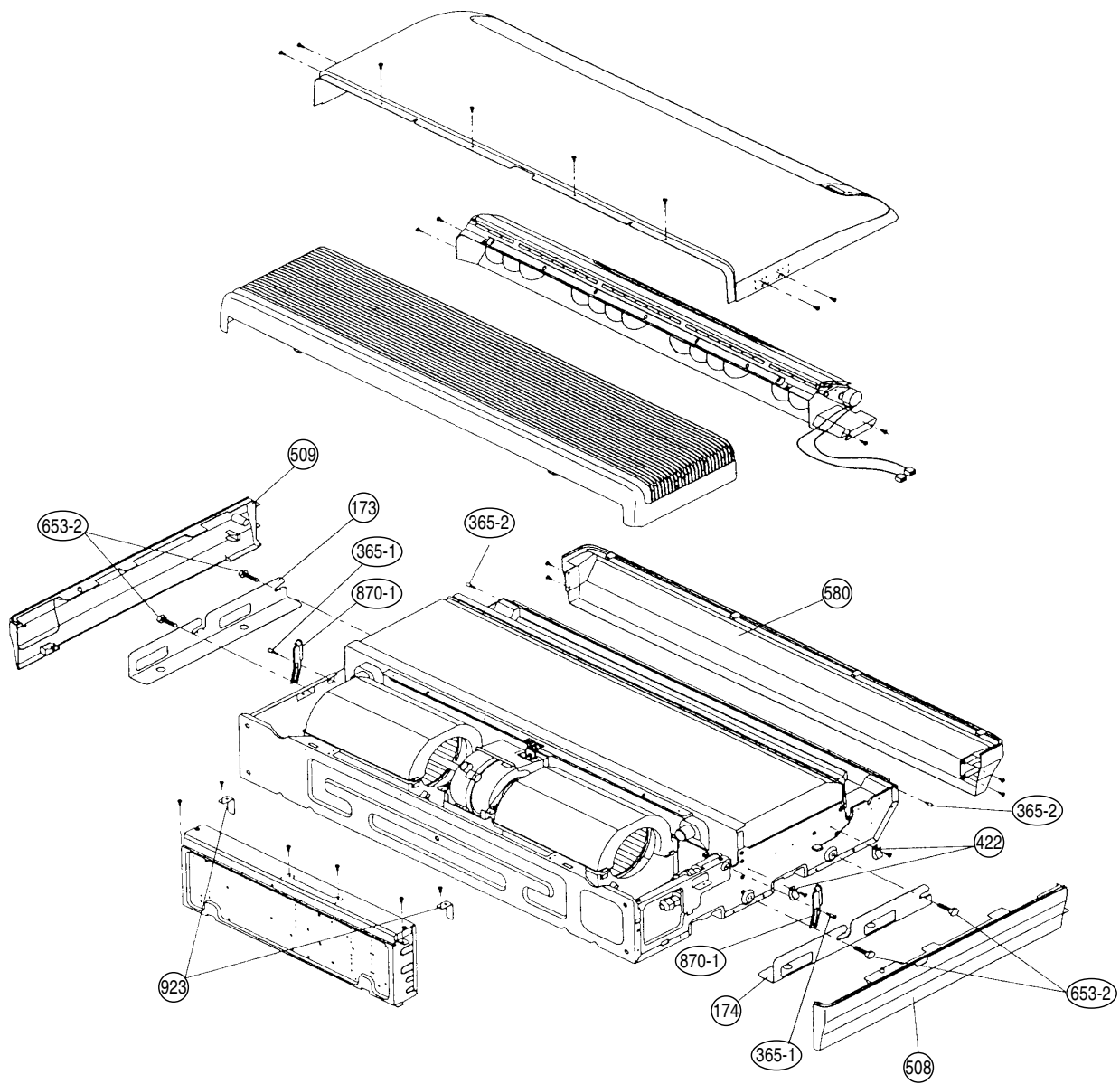
Model: UTF-Y54A1A



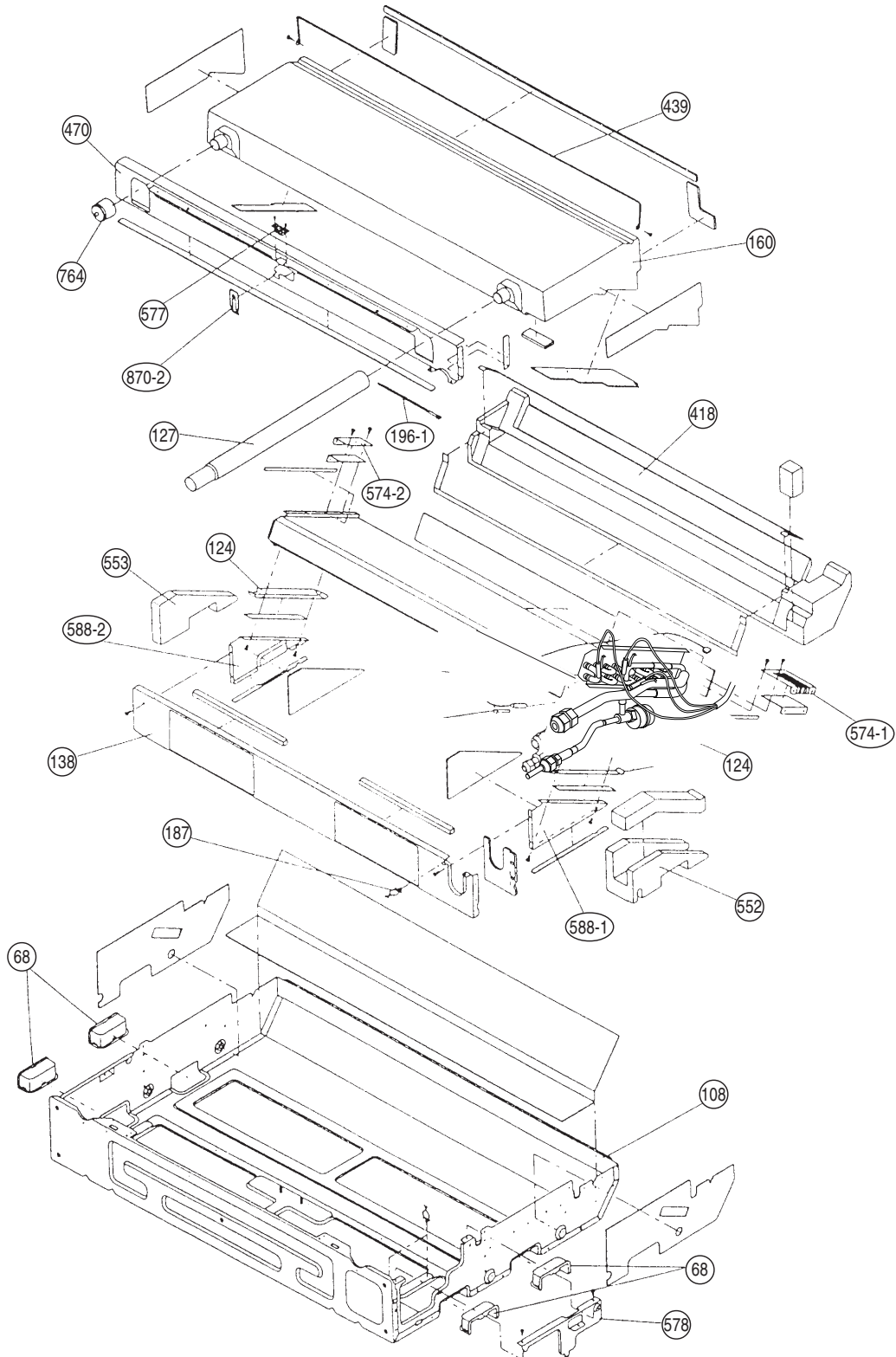
Model: UTF-Y90A4A



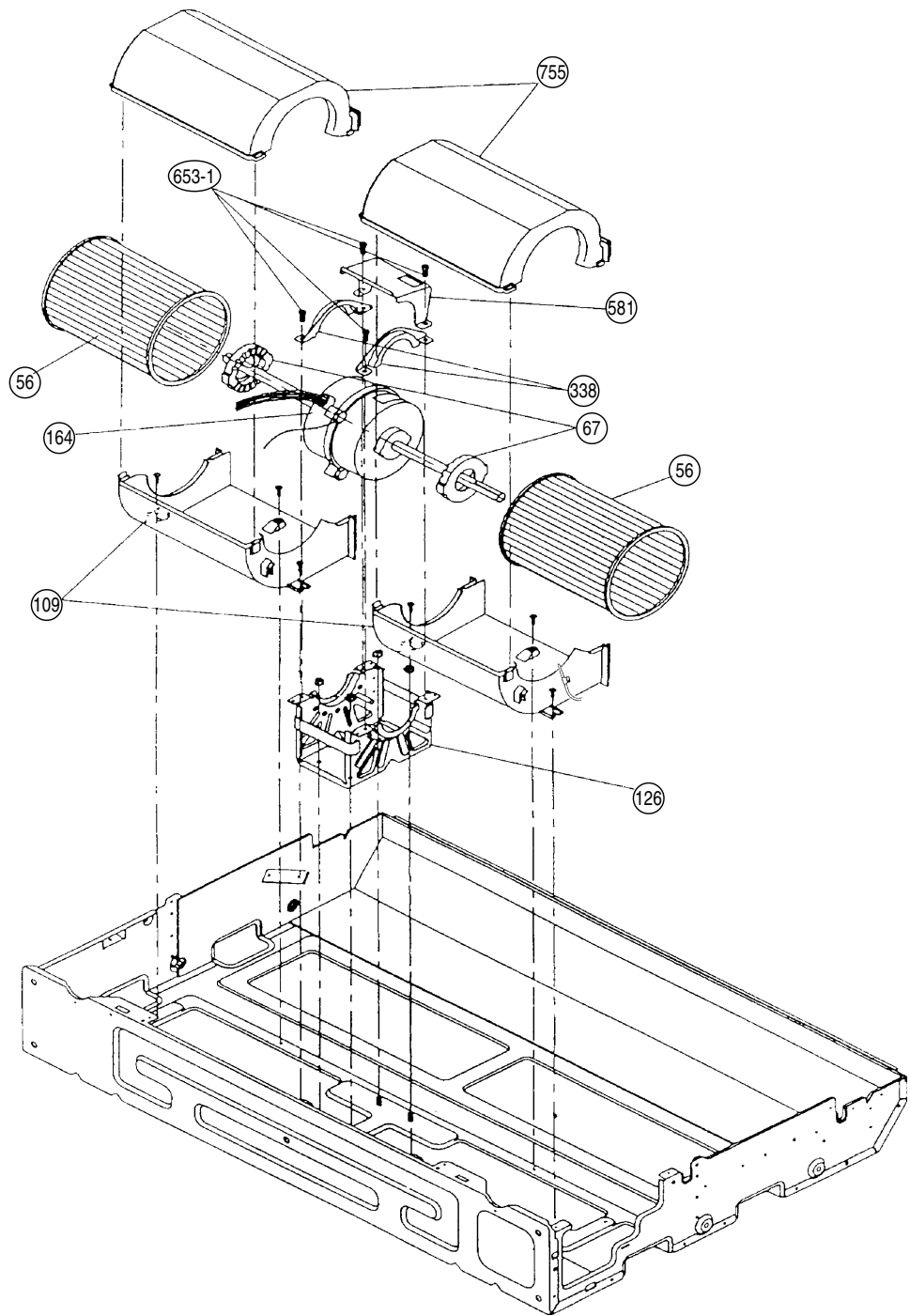
Models : ABY12TFAMF
ABY14TFAMF
ABY18TFAMF
ABY24TFAMF



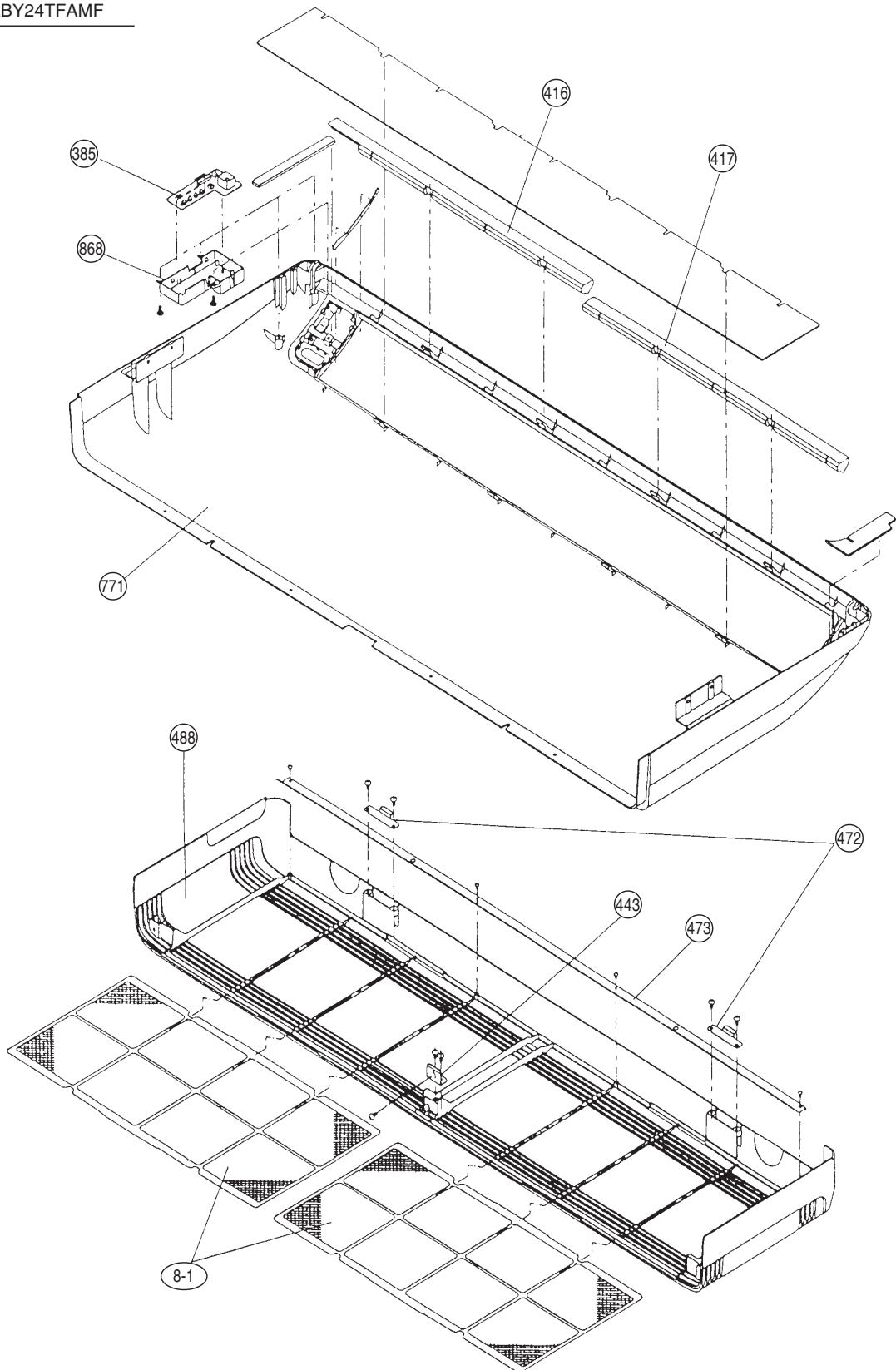
Models : ABY12TFAMF
ABY14TFAMF
ABY18TFAMF
ABY24TFAMF



Models : ABY12TFAMF
ABY14TFAMF
ABY18TFAMF
ABY24TFAMF

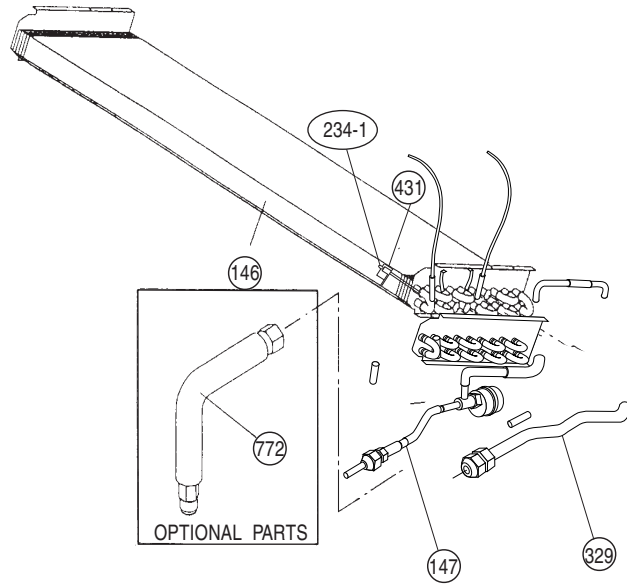


Models : ABY12TFAMF
ABY14TFAMF
ABY18TFAMF
ABY24TFAMF

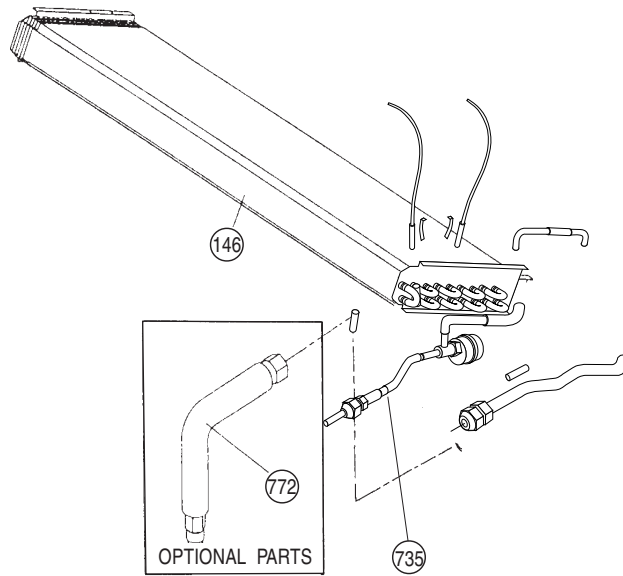


Models : ABY12TFAMF
ABY14TFAMF
ABY18TFAMF
ABY24TFAMF

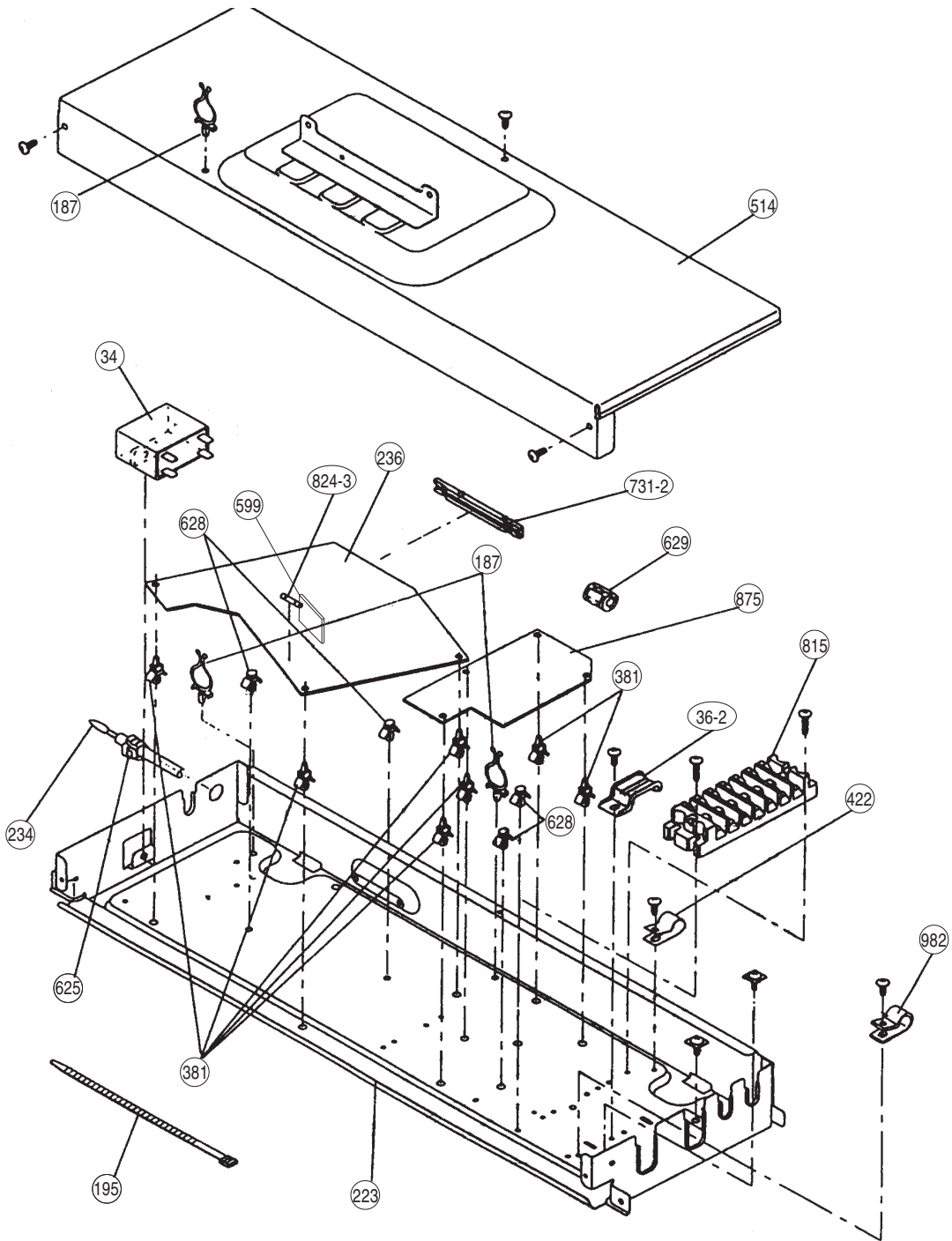
ABY18TFAMF



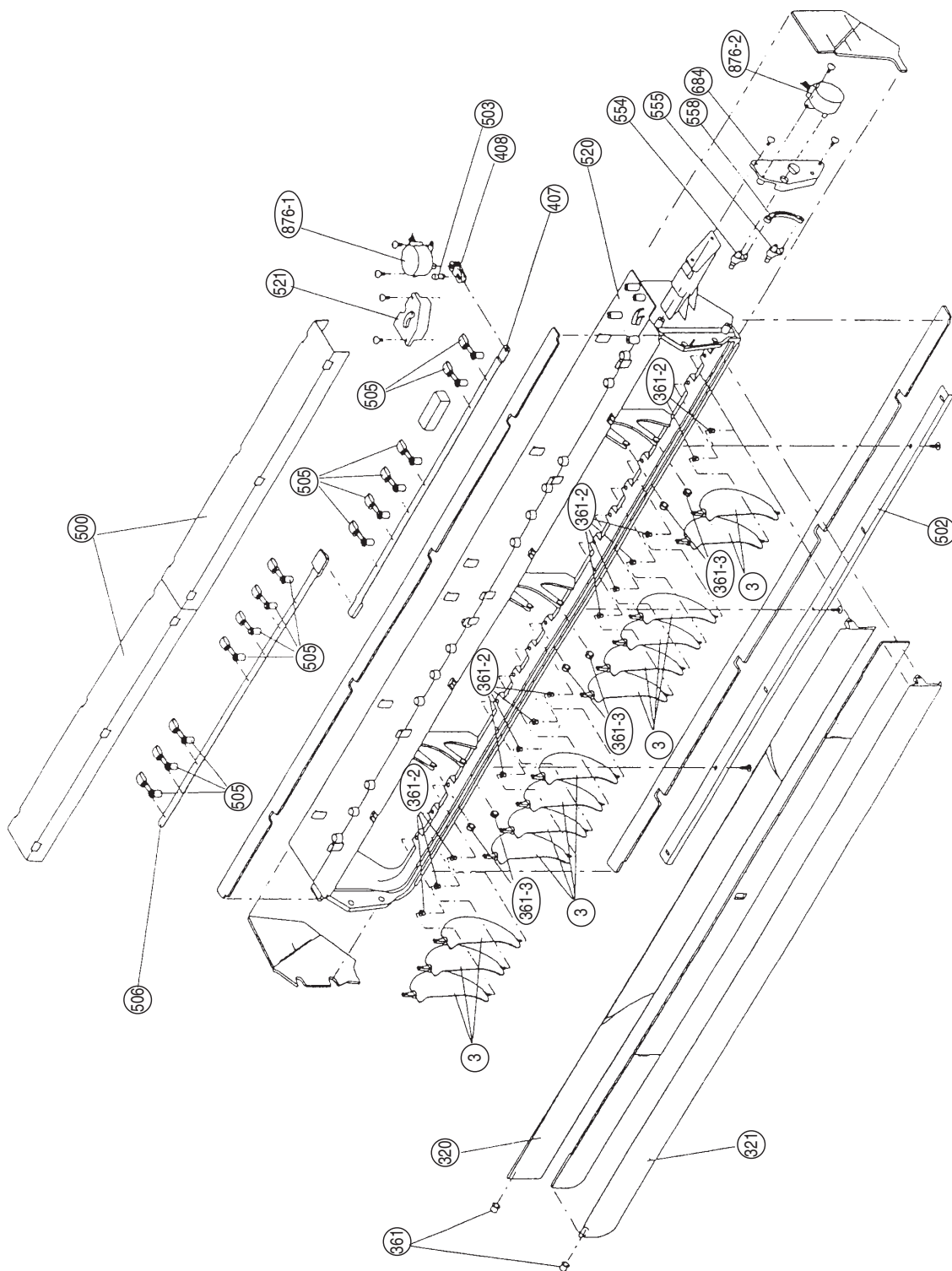
ABY24TFAMF



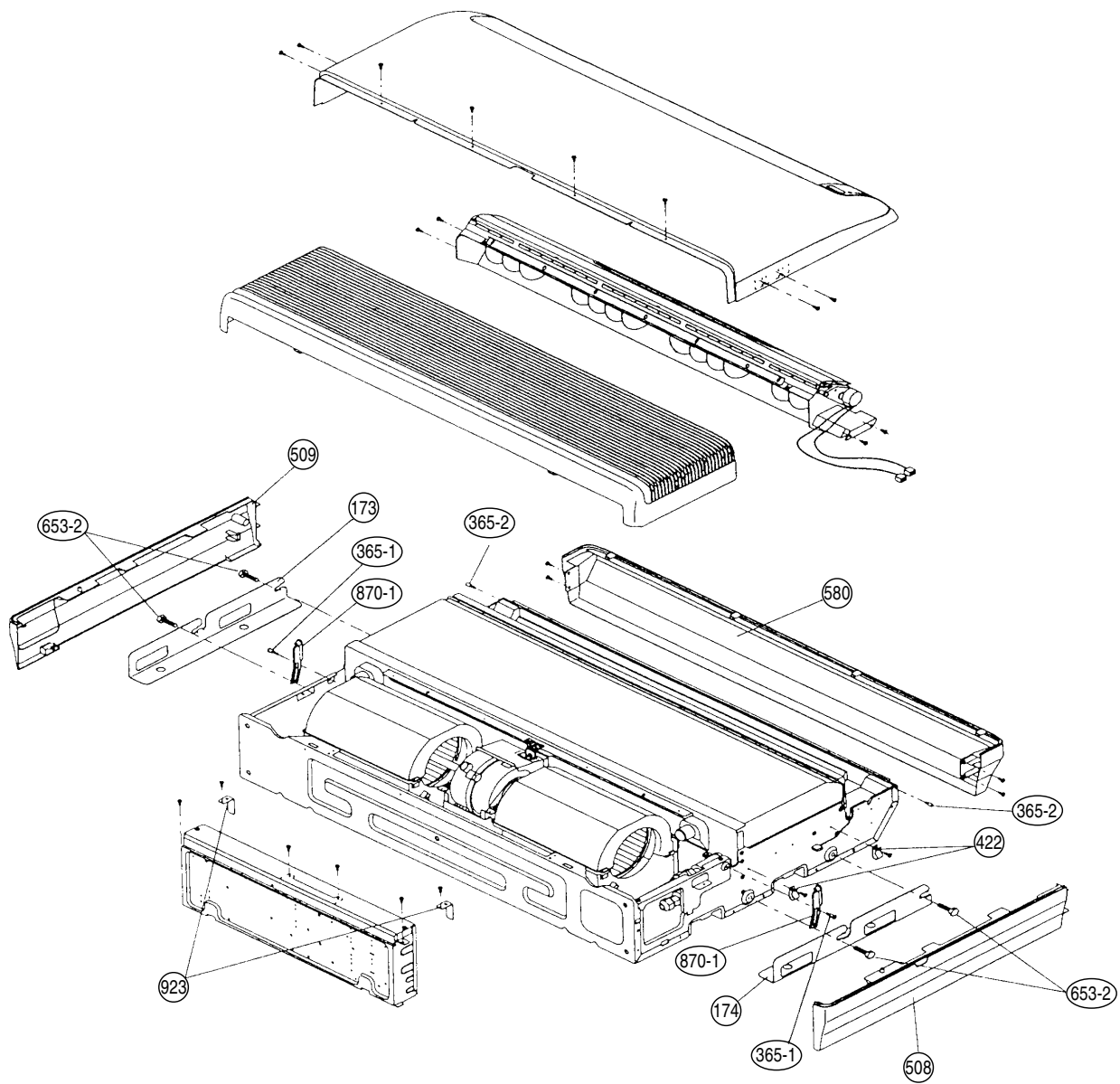
Models : ABY12TFAMF
ABY14TFAMF
ABY18TFAMF
ABY24TFAMF



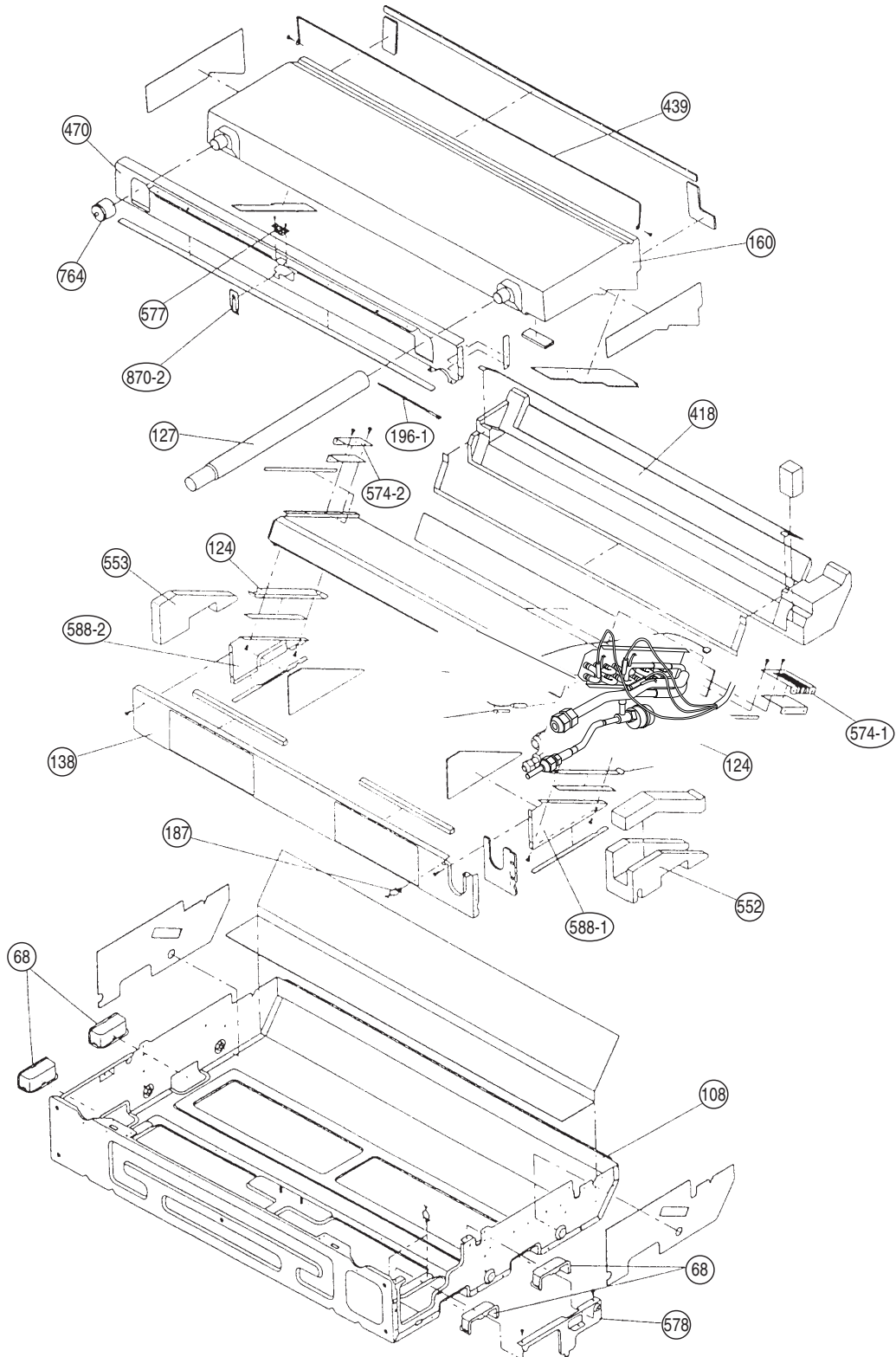
Models : ABY12TFAMF
ABY14TFAMF
ABY18TFAMF
ABY24TFAMF



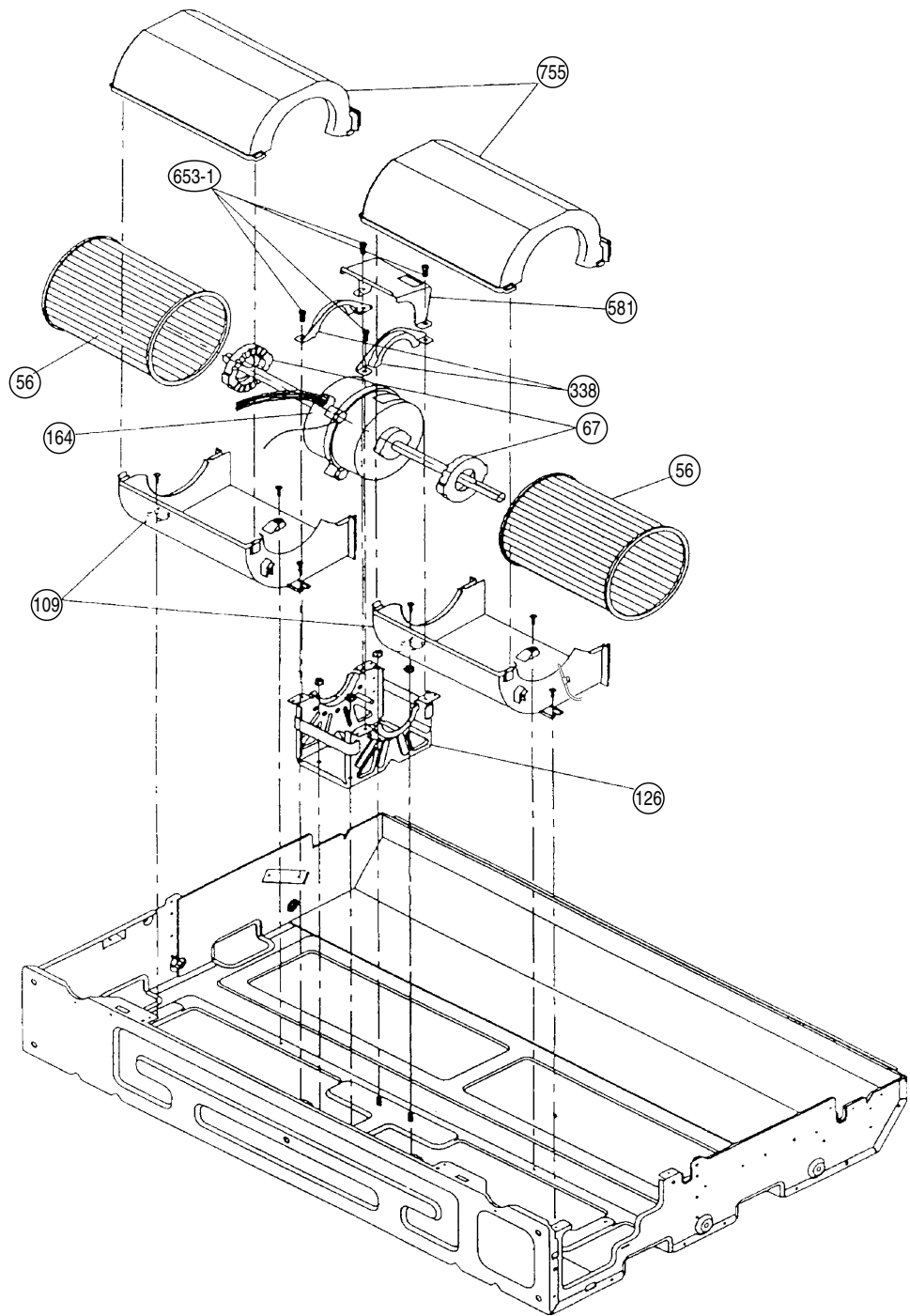
Models : ABY12TFAMF
ABY14TFAMF
ABY18TFAMF
ABY24TFAMF



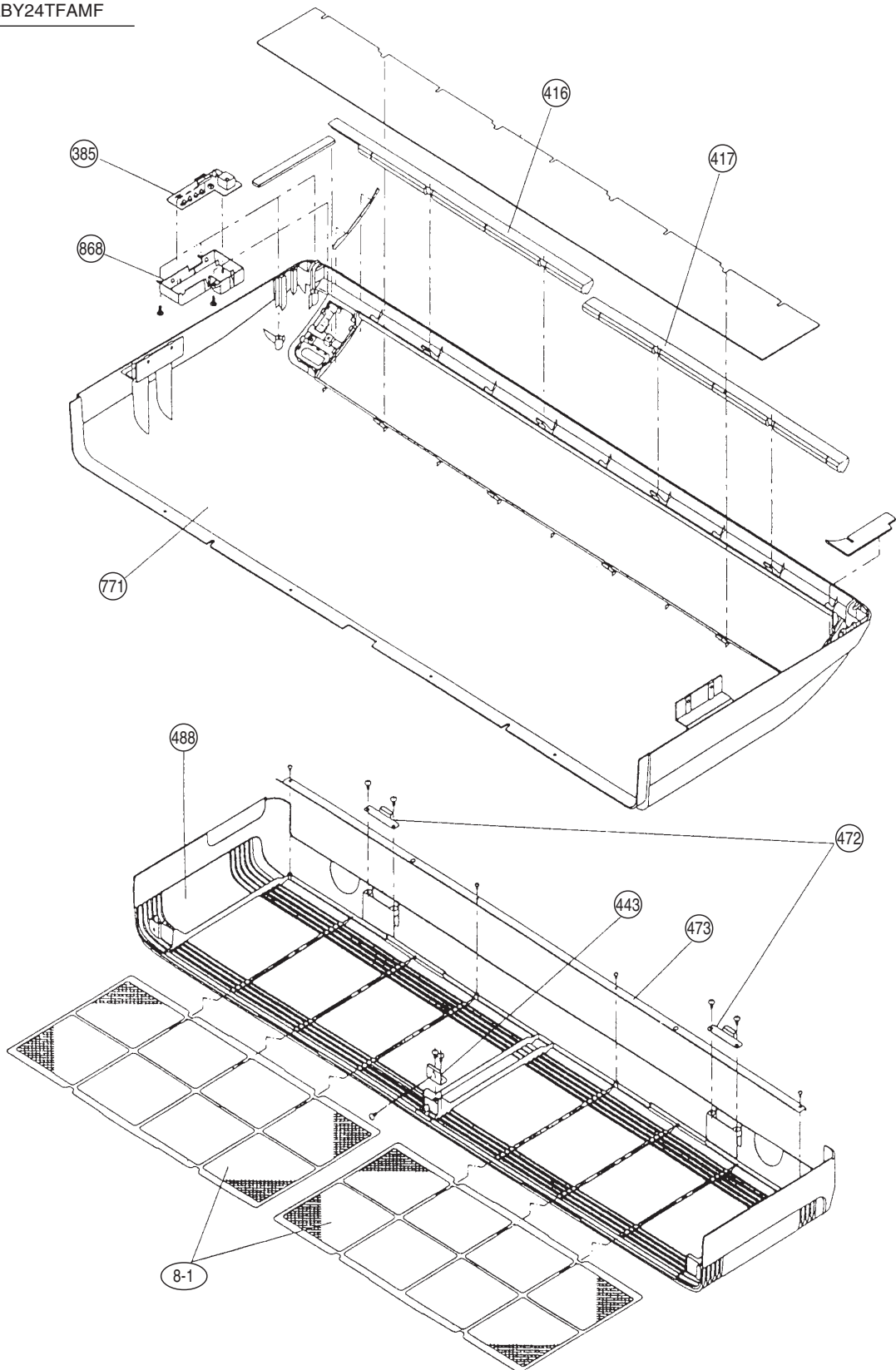
Models : ABY12TFAMF
ABY14TFAMF
ABY18TFAMF
ABY24TFAMF



Models : ABY12TFAMF
ABY14TFAMF
ABY18TFAMF
ABY24TFAMF

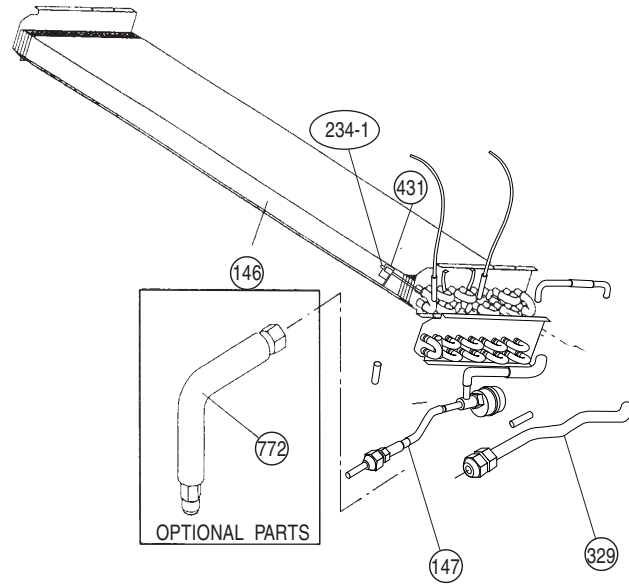


Models : ABY12TFAMF
ABY14TFAMF
ABY18TFAMF
ABY24TFAMF

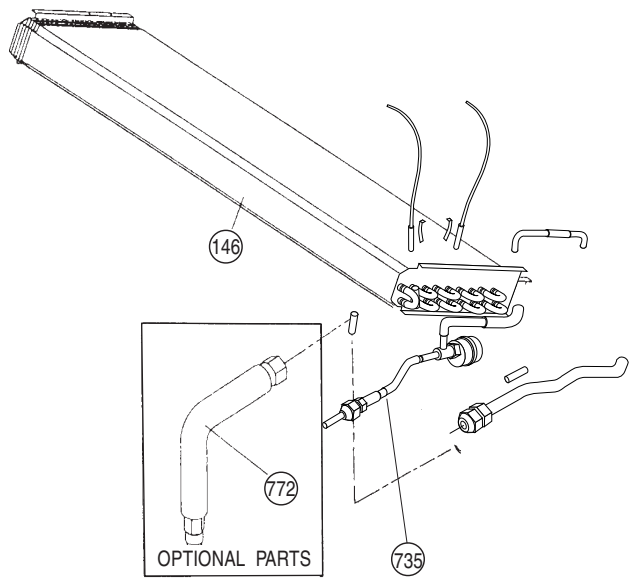


Models : ABY12TFAMF
ABY14TFAMF
ABY18TFAMF
ABY24TFAMF

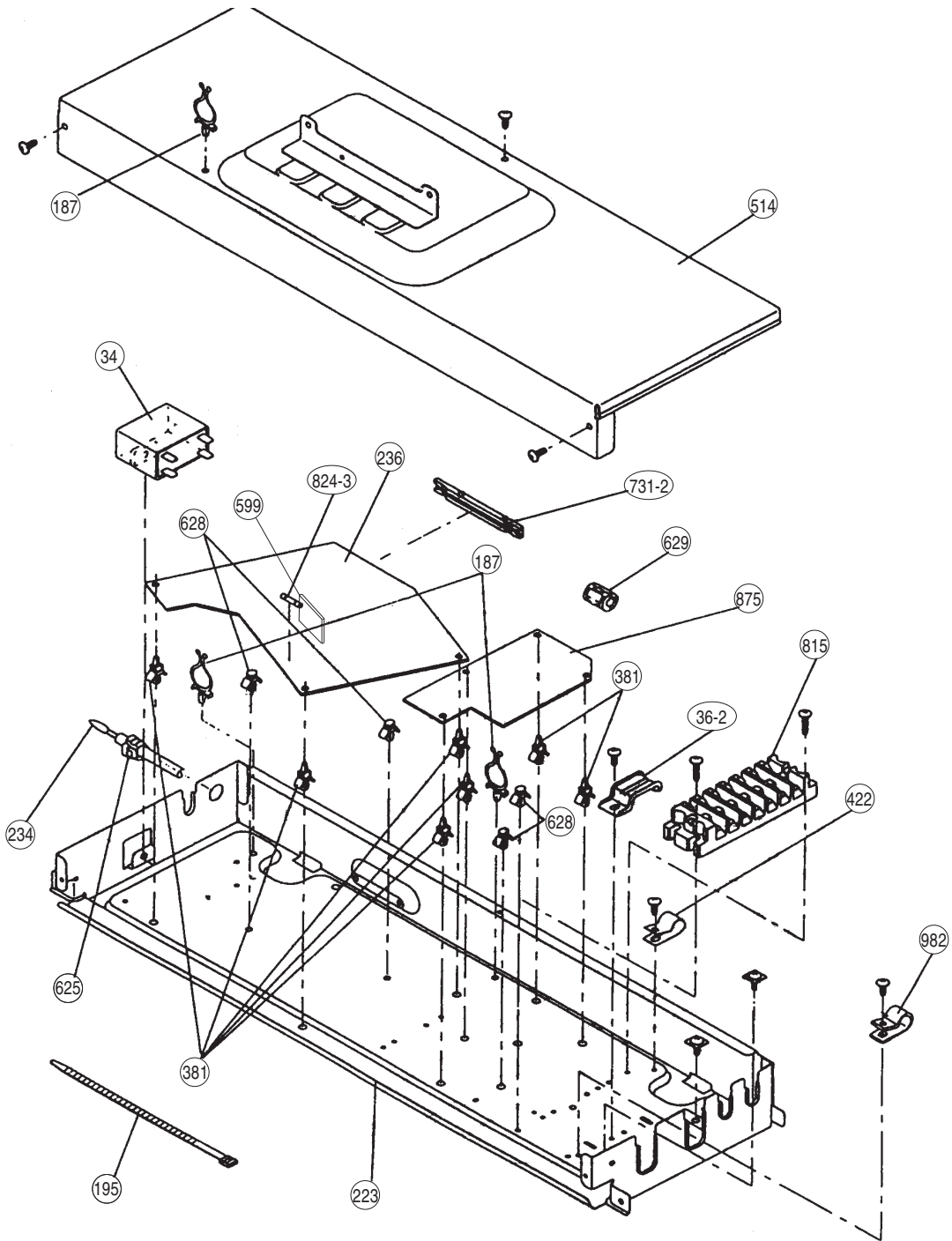
ABY18TFAMF



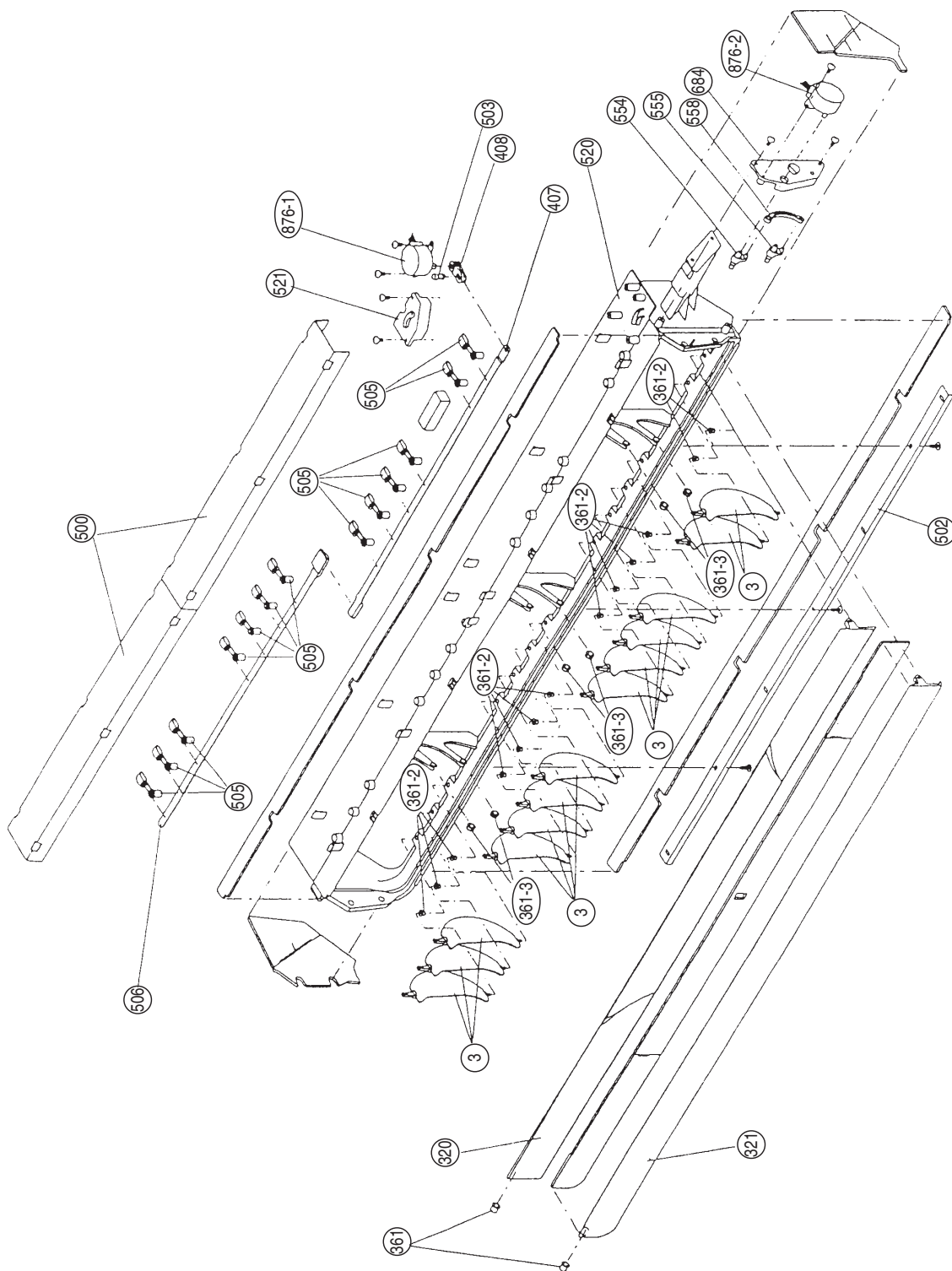
ABY24TFAMF



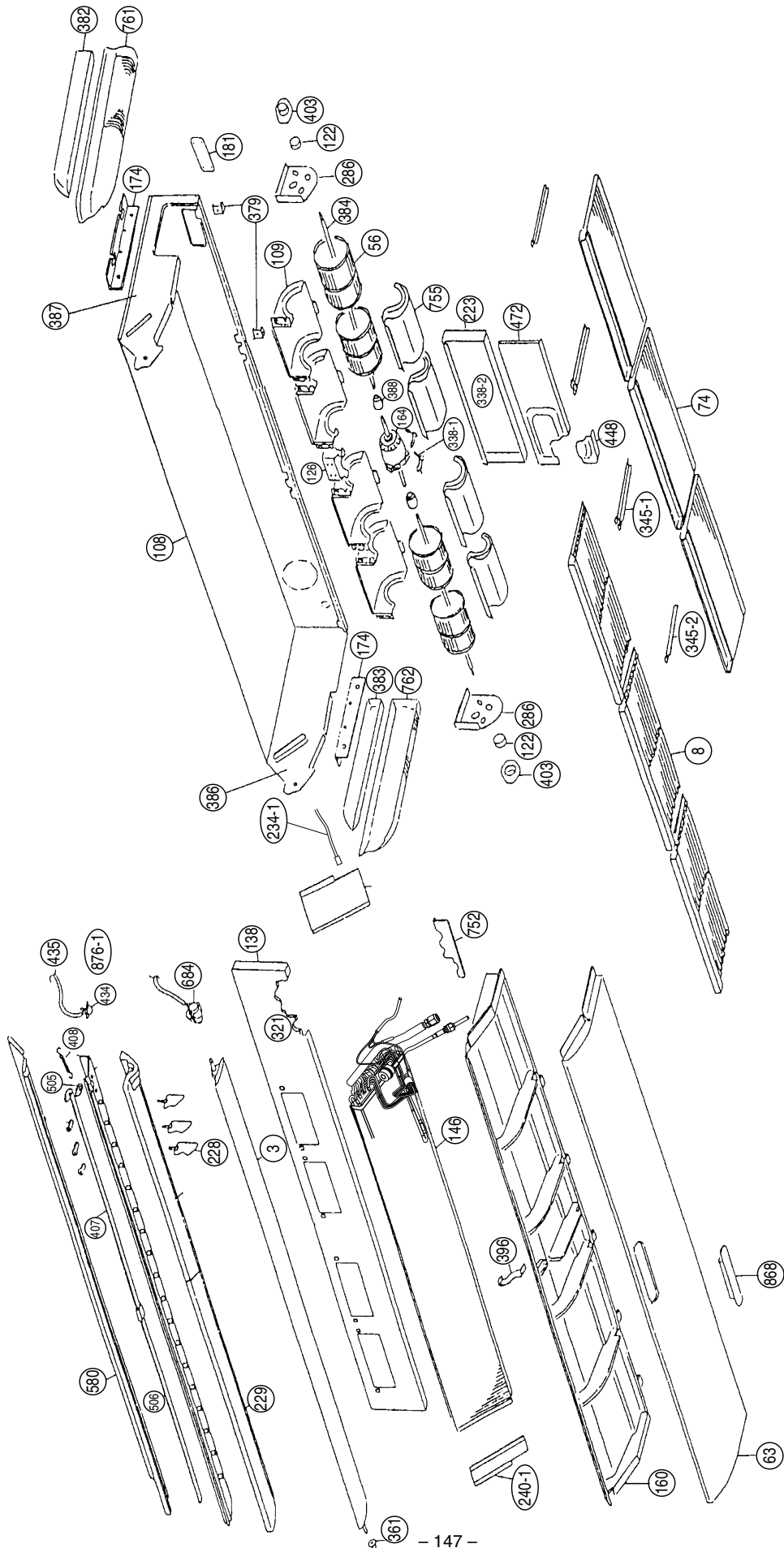
Models : ABY12TFAMF
ABY14TFAMF
ABY18TFAMF
ABY24TFAMF



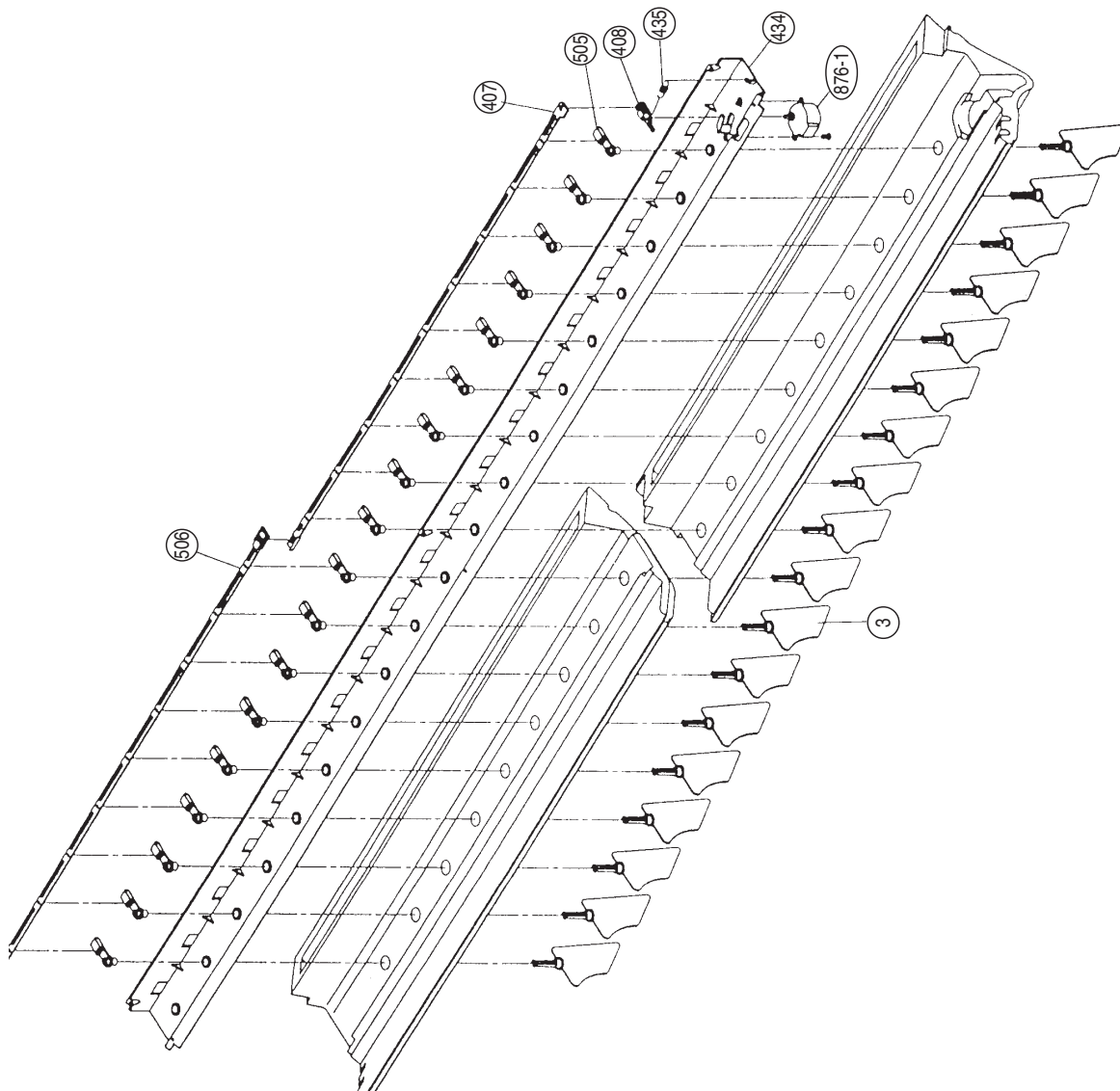
Models : ABY12TFAMF
ABY14TFAMF
ABY18TFAMF
ABY24TFAMF



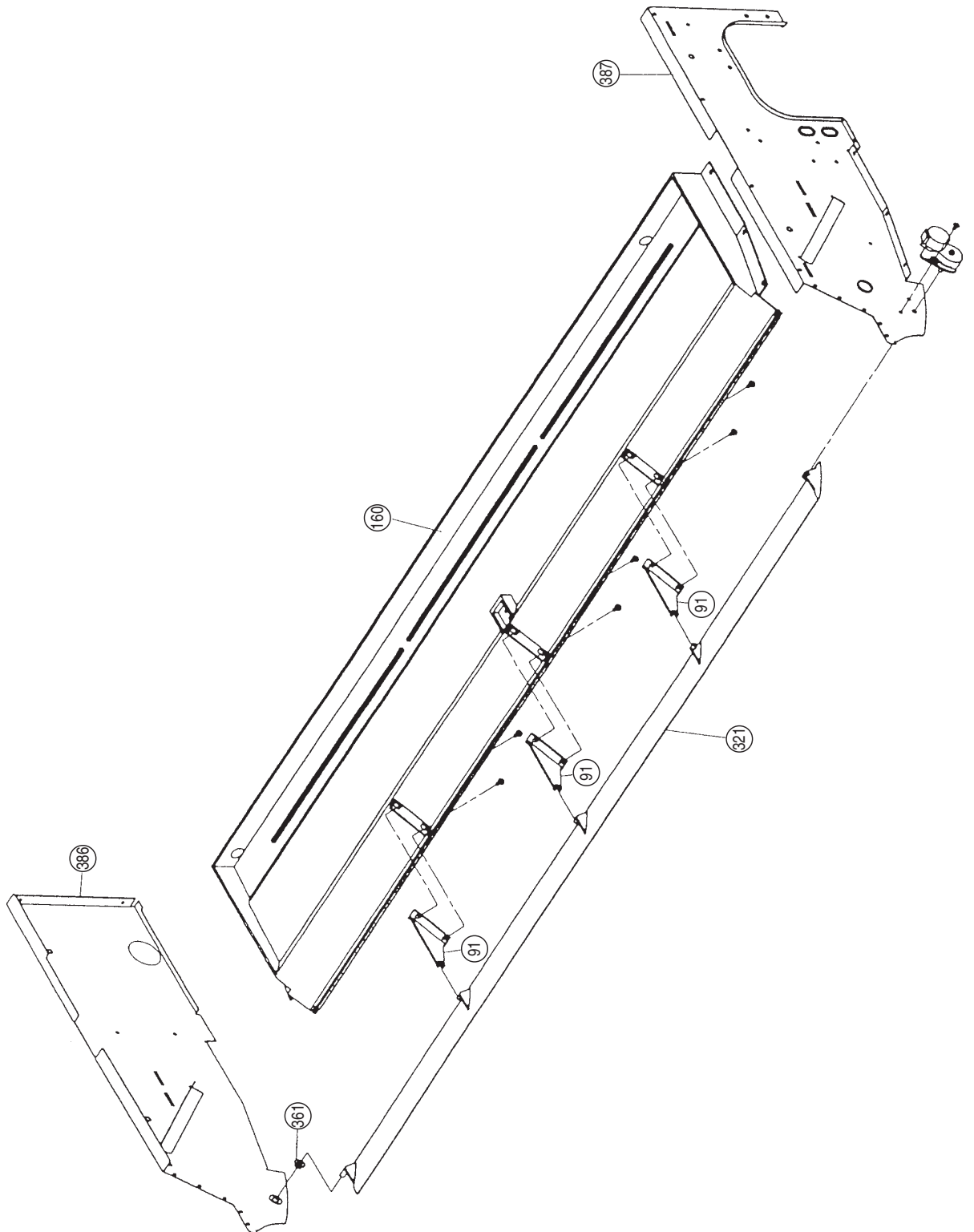
Models : ABY30TFAMF
ABY36TFAMF
ABY45TFAMF
ABY54TFAMF



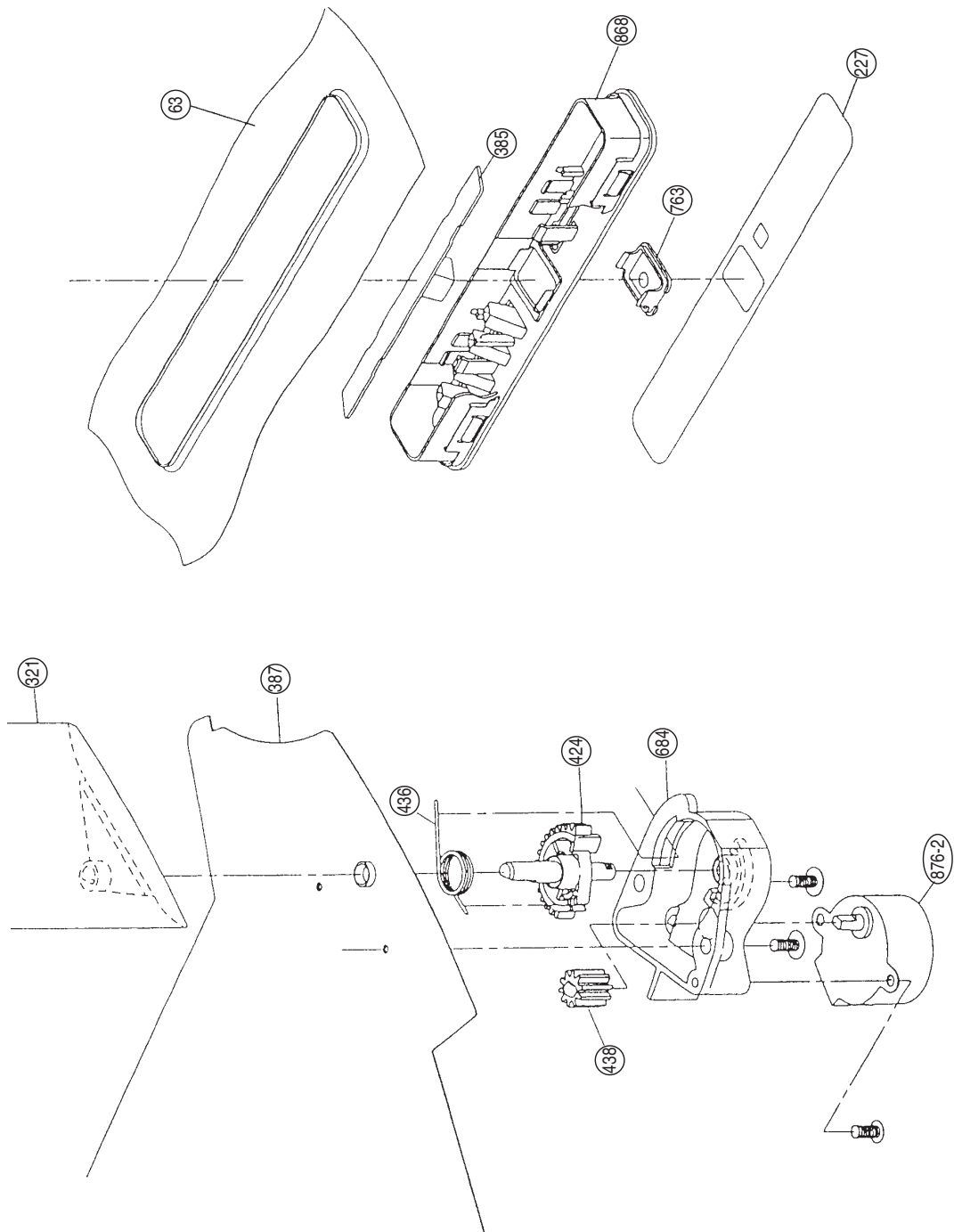
Models : ABY30TFAMF
ABY36TFAMF
ABY45TFAMF
ABY54TFAMF



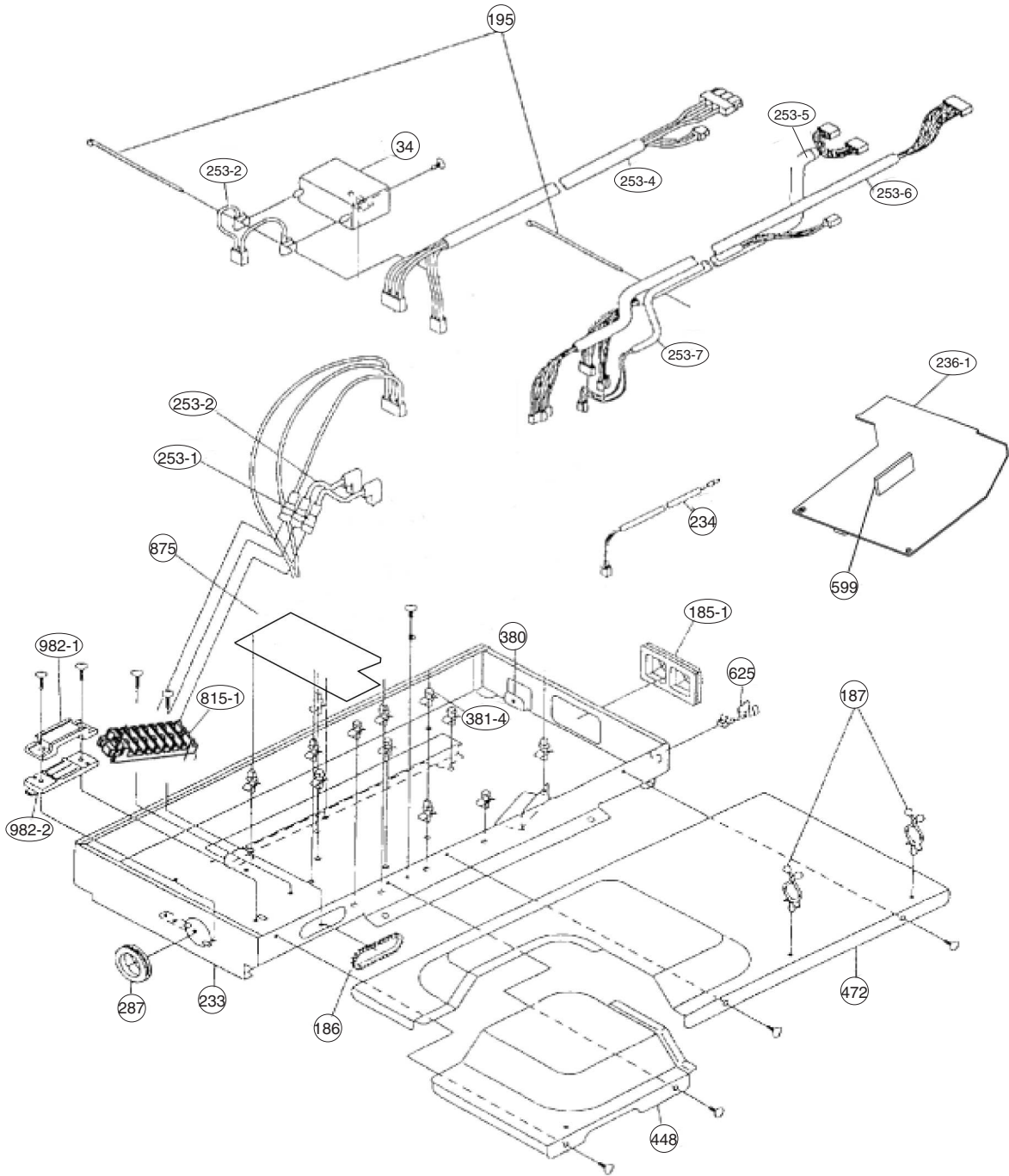
Models : ABY30TFAMF
ABY36TFAMF
ABY45TFAMF
ABY54TFAMF



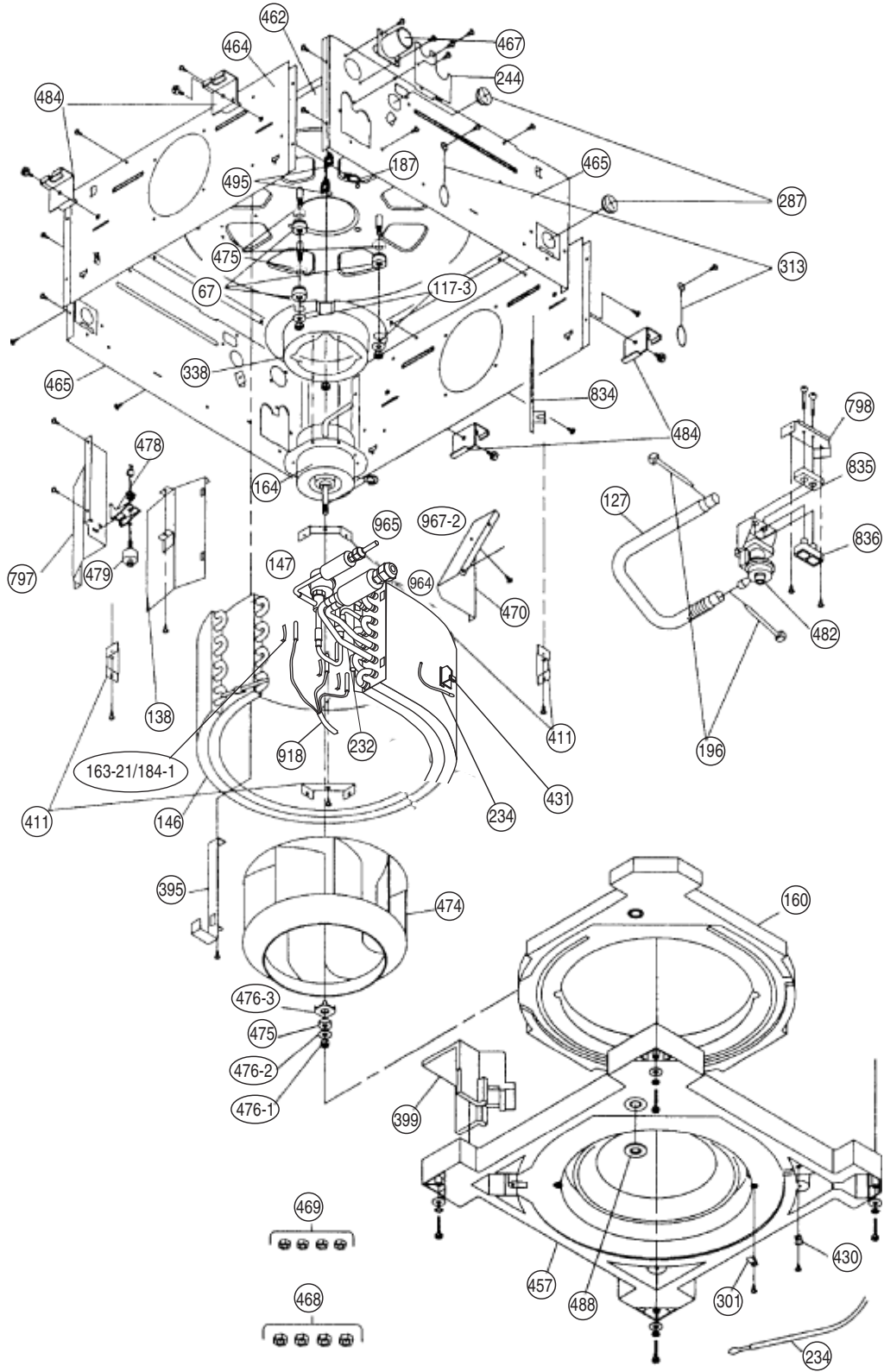
Models : ABY30TFAMF
ABY36TFAMF
ABY45TFAMF
ABY54TFAMF



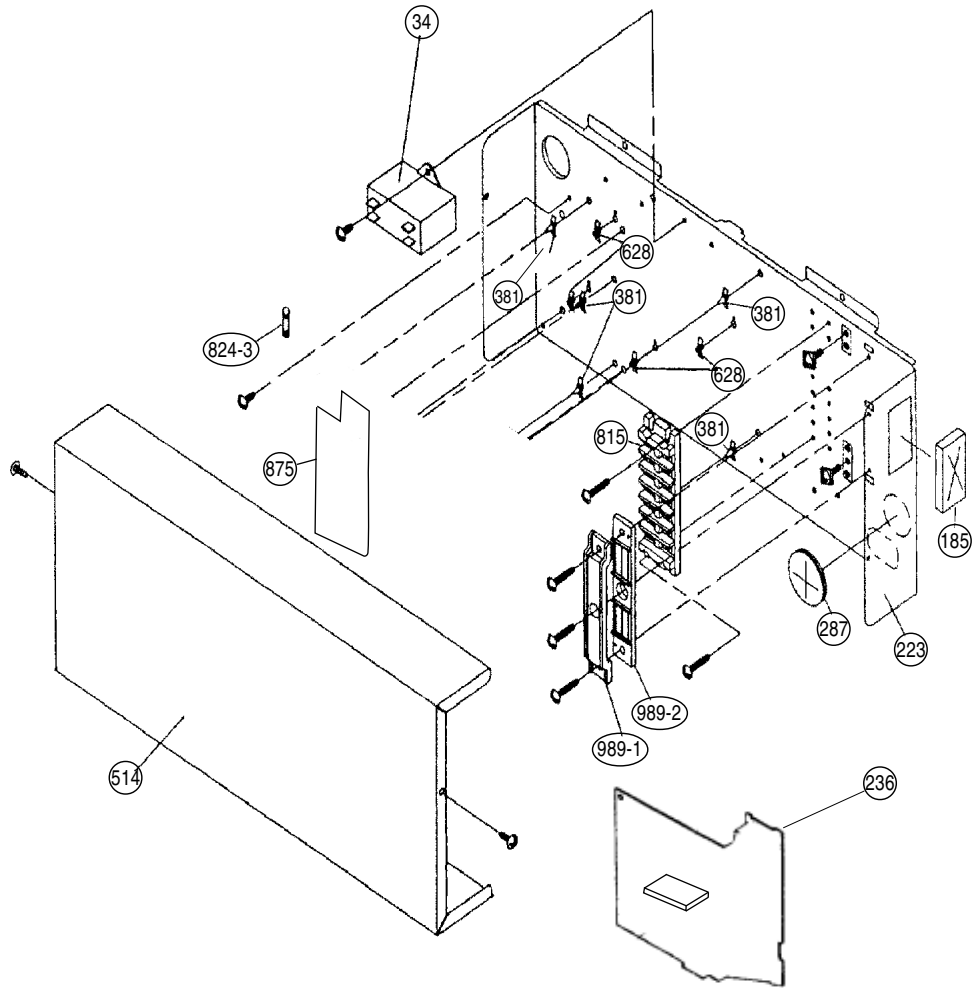
Models : ABY30TFAMF
ABY36TFAMF
ABY45TFAMF
ABY54TFAMF



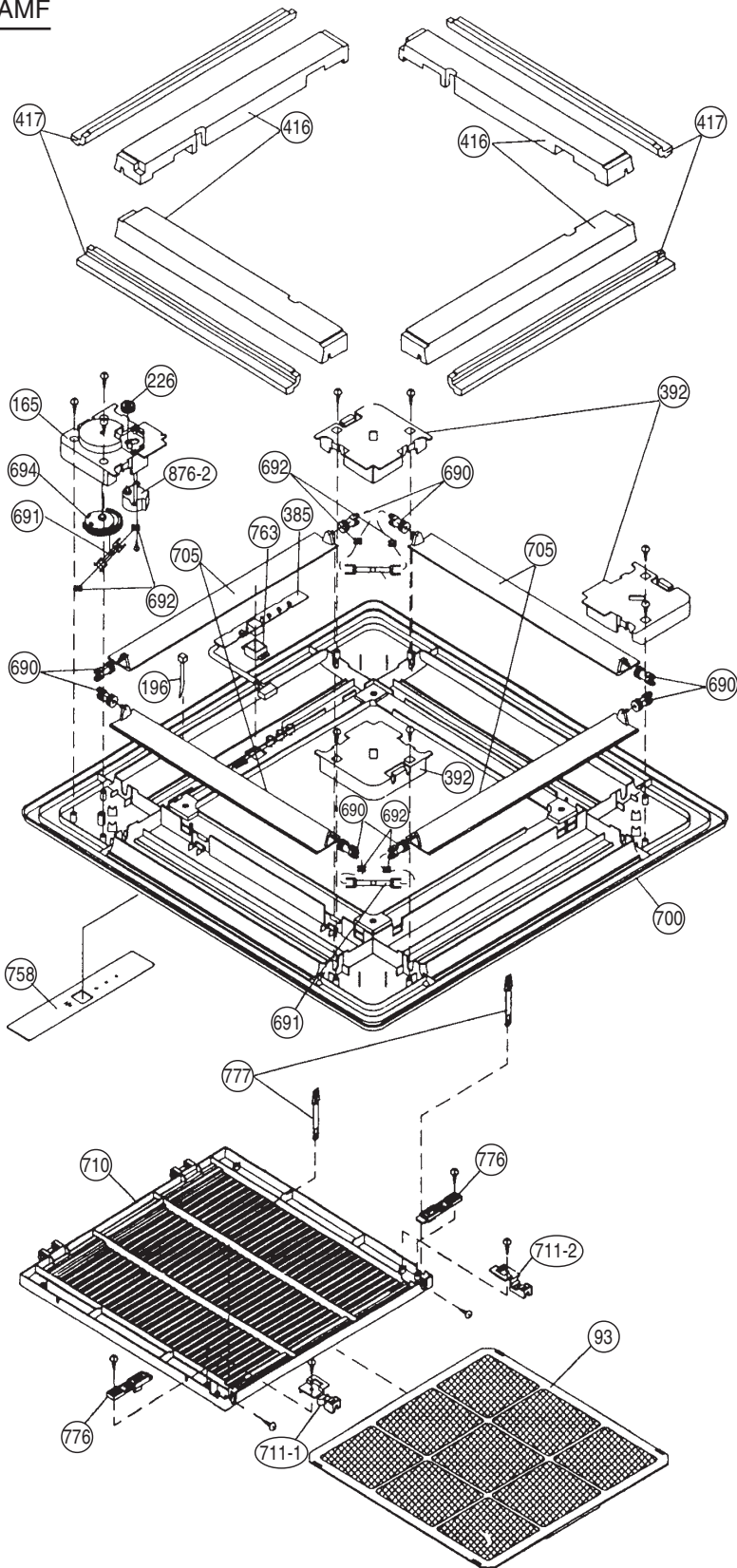
Models : AUY 7TFAMF
 AUY 9TFAMF
 AUY12TFAMF
 AUY14TFAMF
 AUY18TFAMF



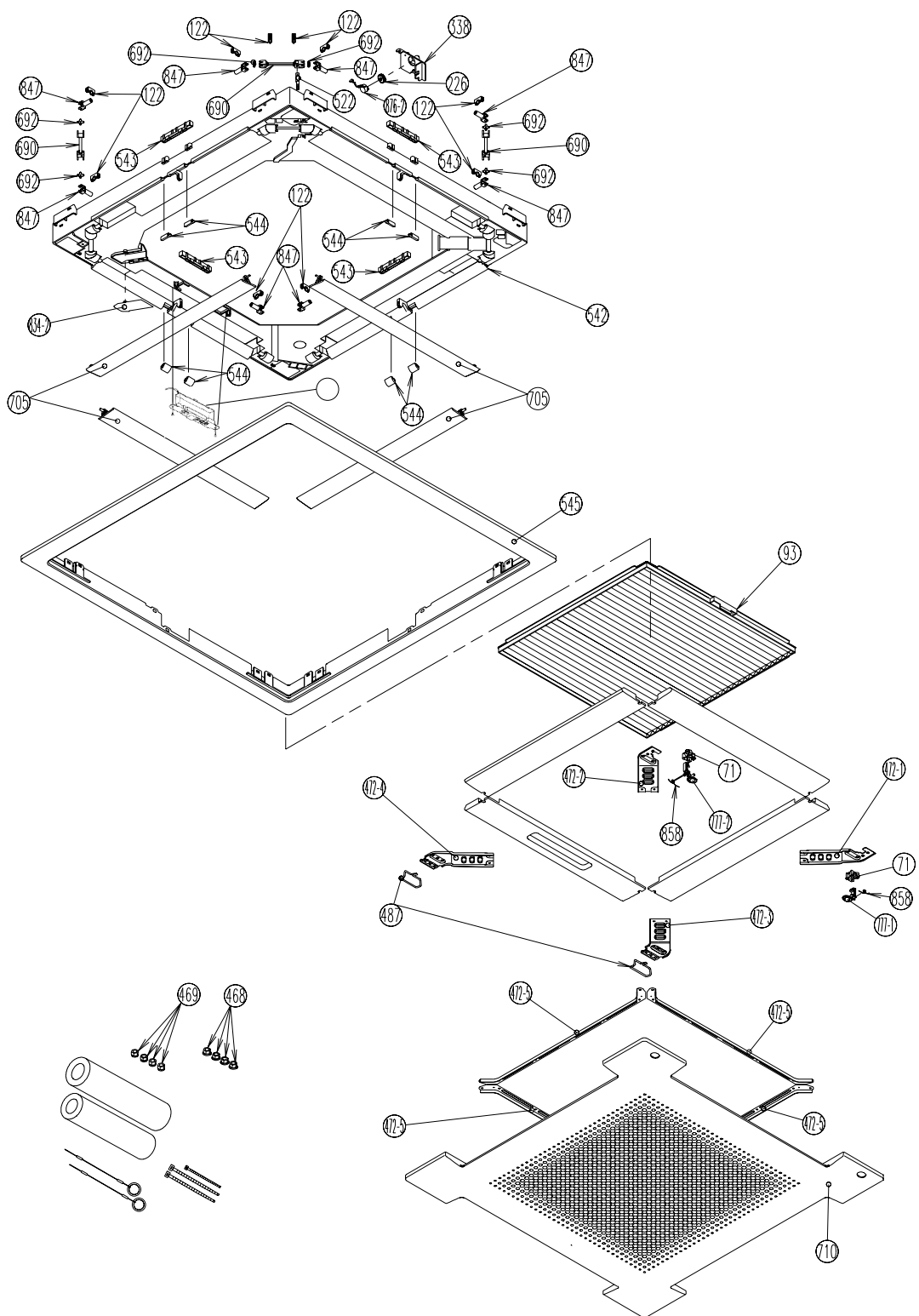
Model : AUY 7 TFAMF
AUY 9 TFAMF
AUY 12 TFAMF
AUY 14 TFAMF
AUY 18 TFAMF



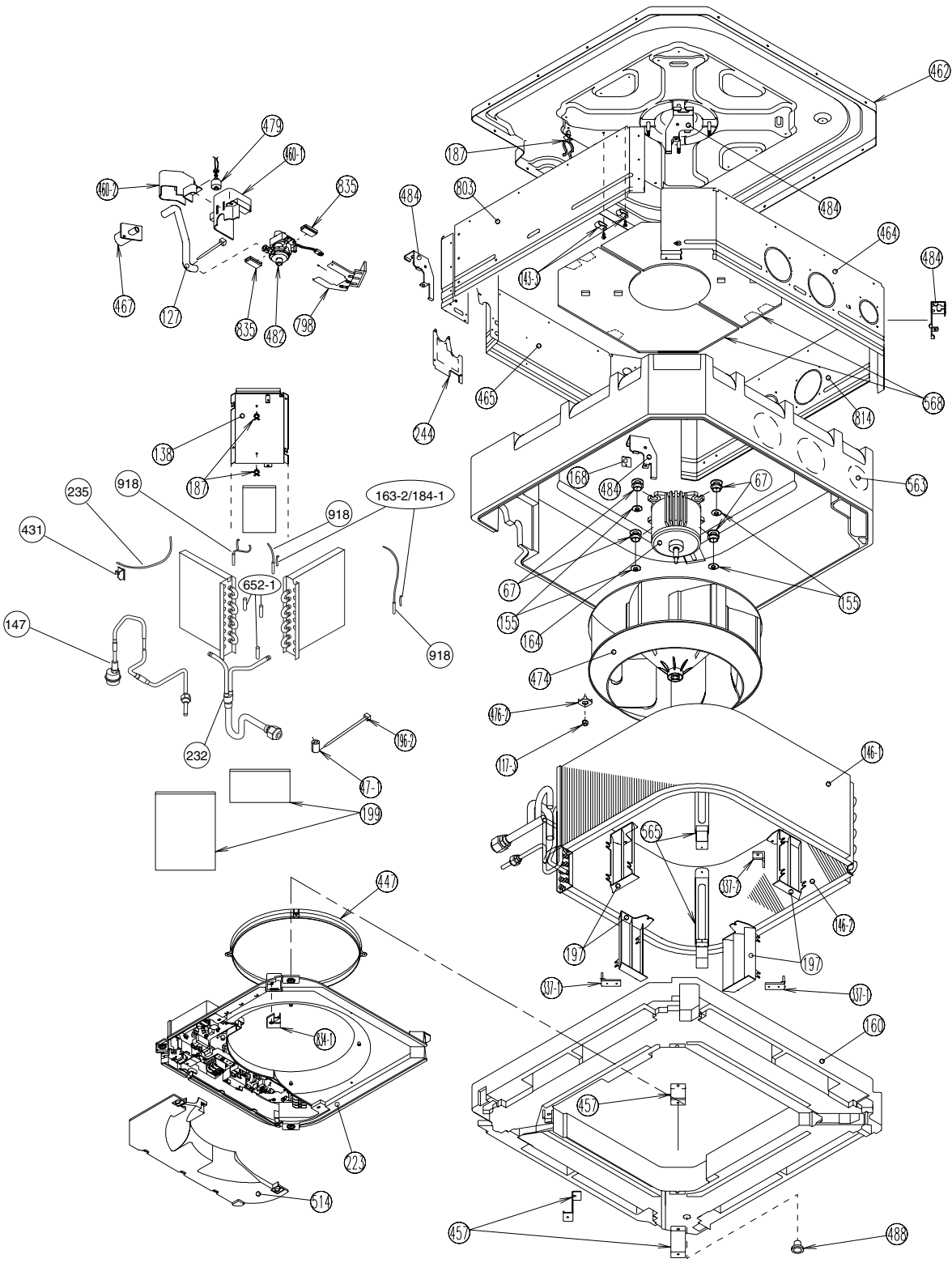
Models : AUY 7TFAMF
AUY 9TFAMF
AUY12TFAMF
AUY14TFAMF
AUY18TFAMF



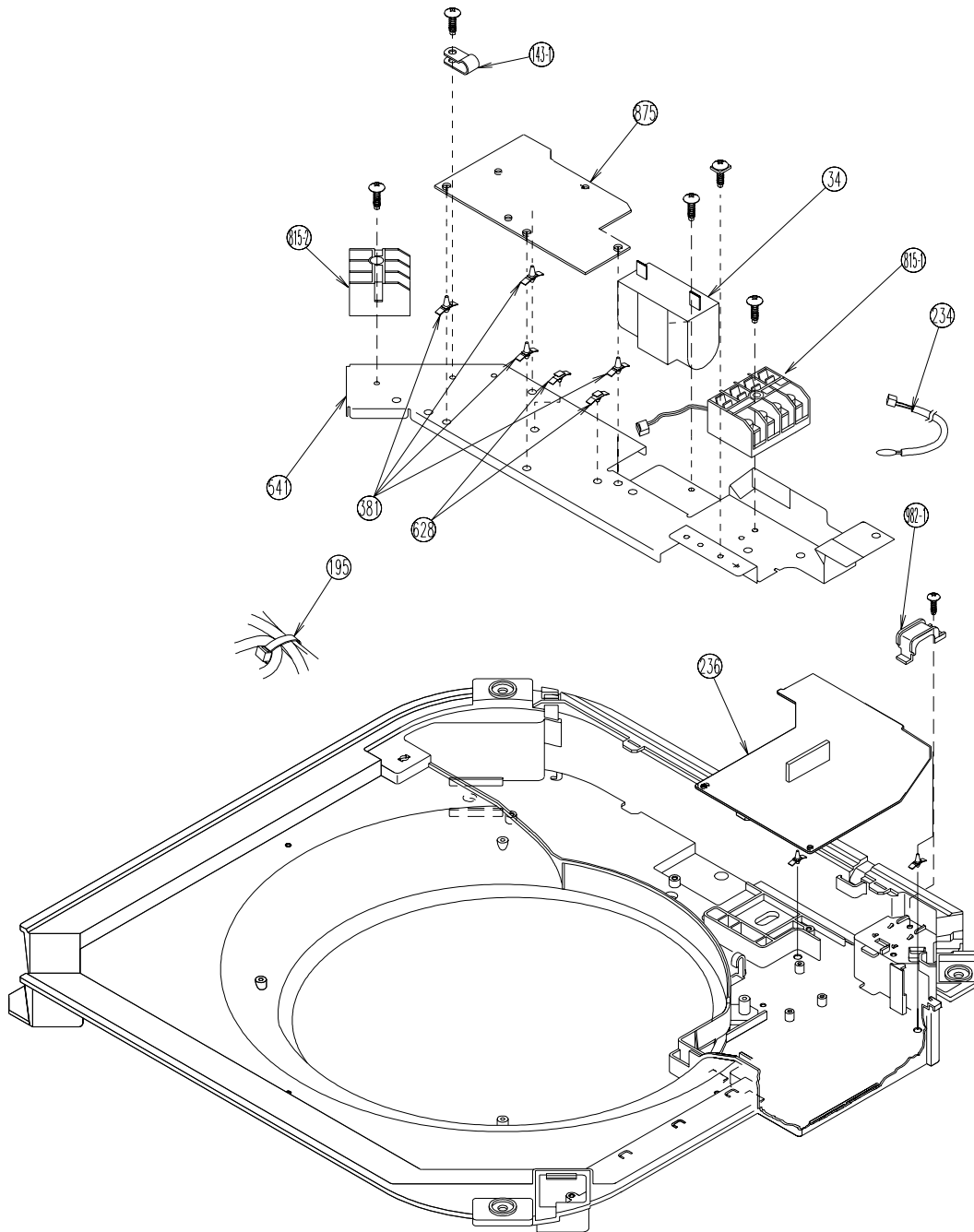
Models : AUY20TFAMF
AUY25TFAMF
AUY30TFAMF
AUY36TFAMF
AUY45TFAMF
AUY54TFAMF



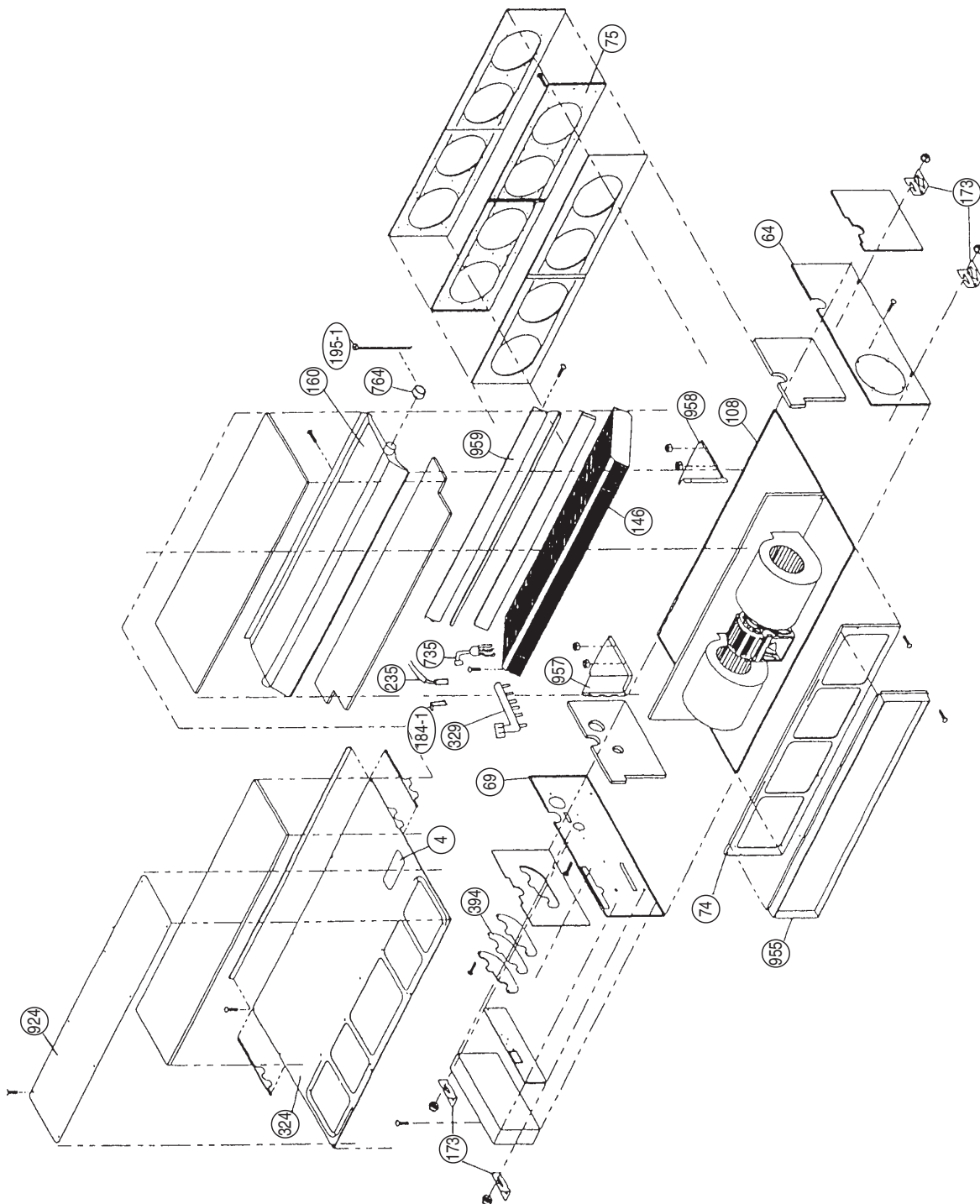
Models : AUJ20TFAMF
 AUJ25TFAMF
 AUJ30TFAMF
 AUJ36TFAMF
 AUJ45TFAMF
 AUJ54TFAMF



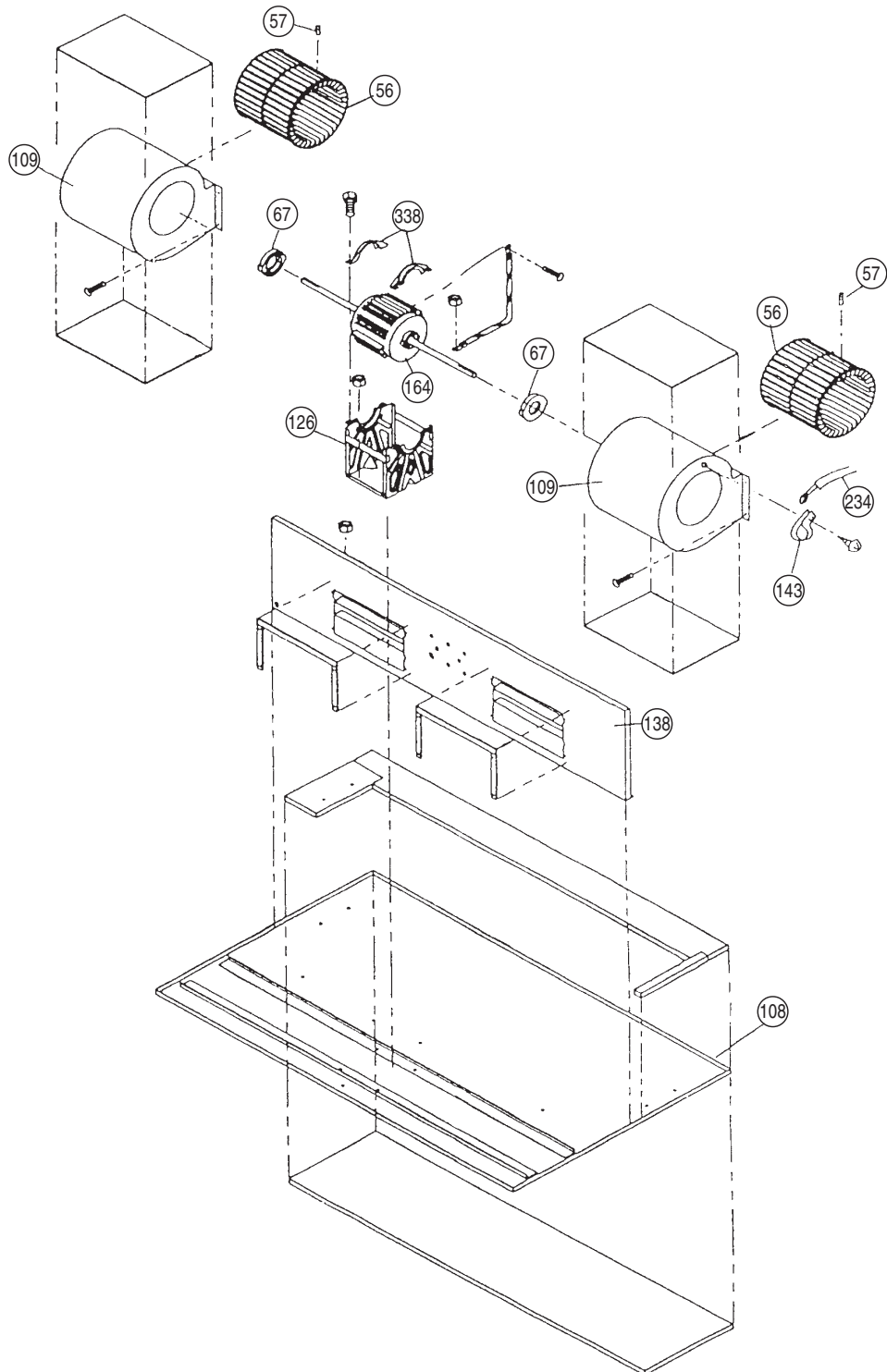
Models : AUY25TLAMA, AUY30TLAMA
AUY36TLAMA, AUY45TLAMA



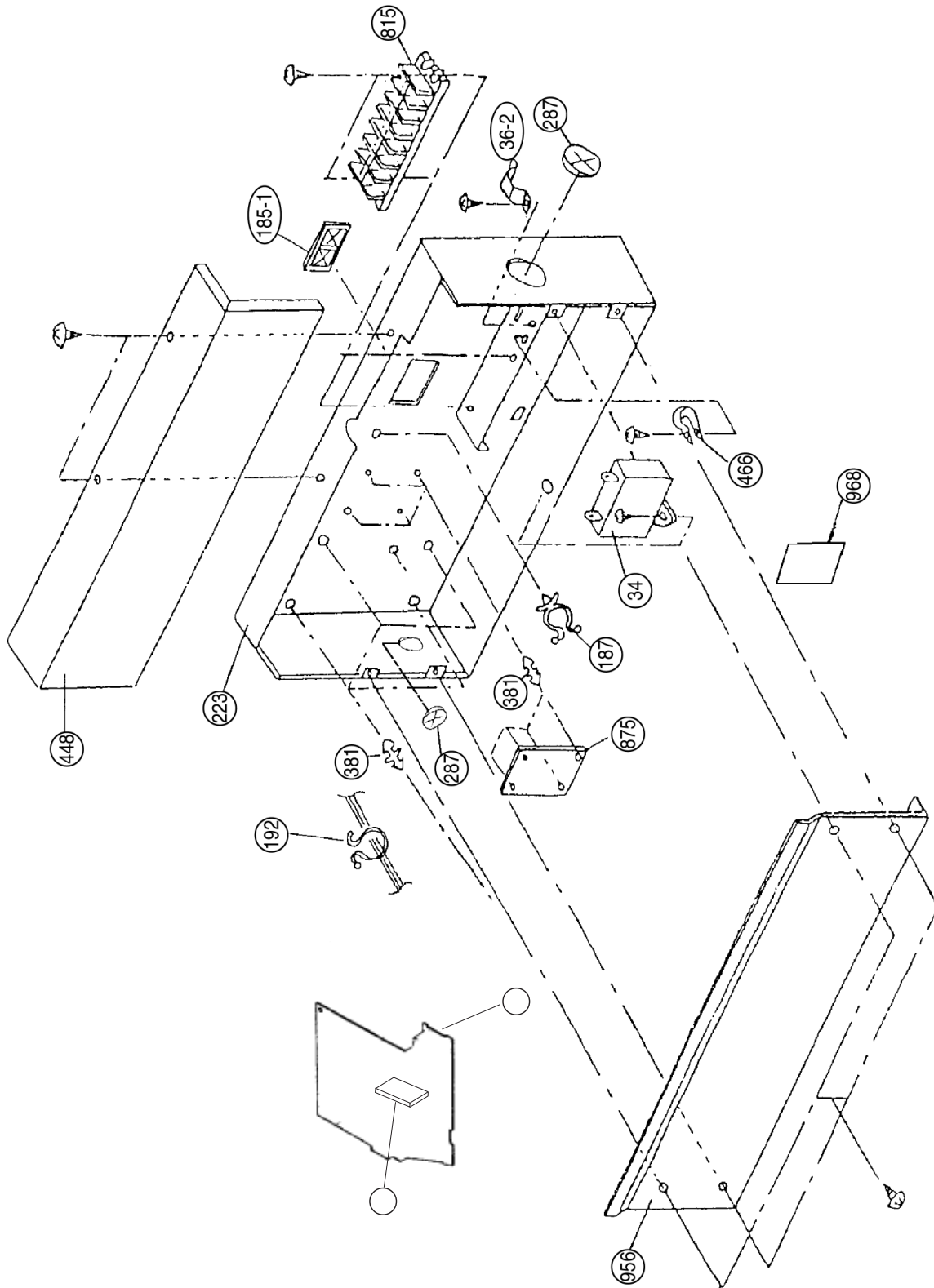
Models : ARY25TLAMA, ARY30TLAMA
ARY36TLAMA, ARY45TLAMA



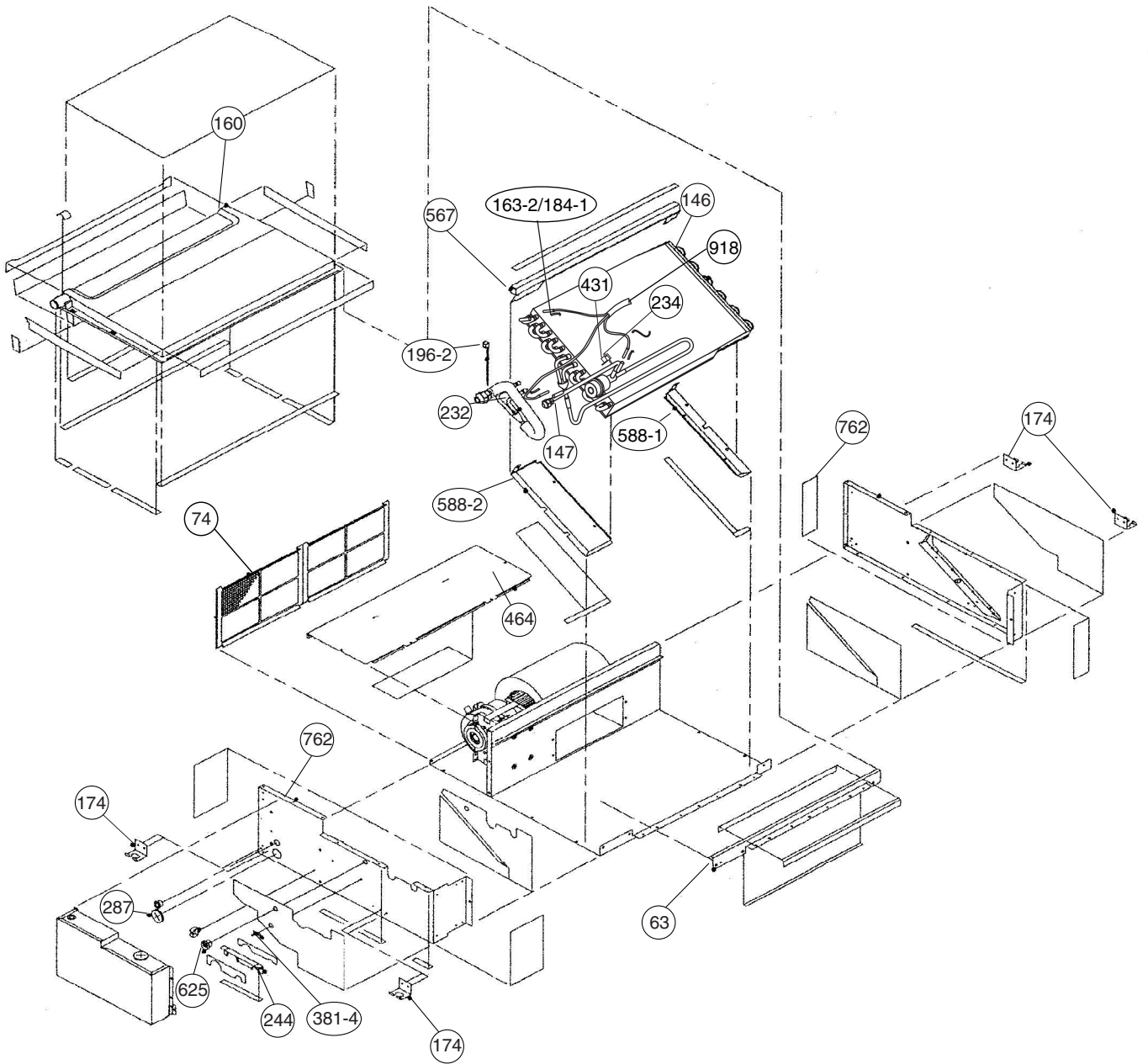
Models : ARY25TLAMA, ARY30TLAMA
ARY36TLAMA, ARY45TLAMA



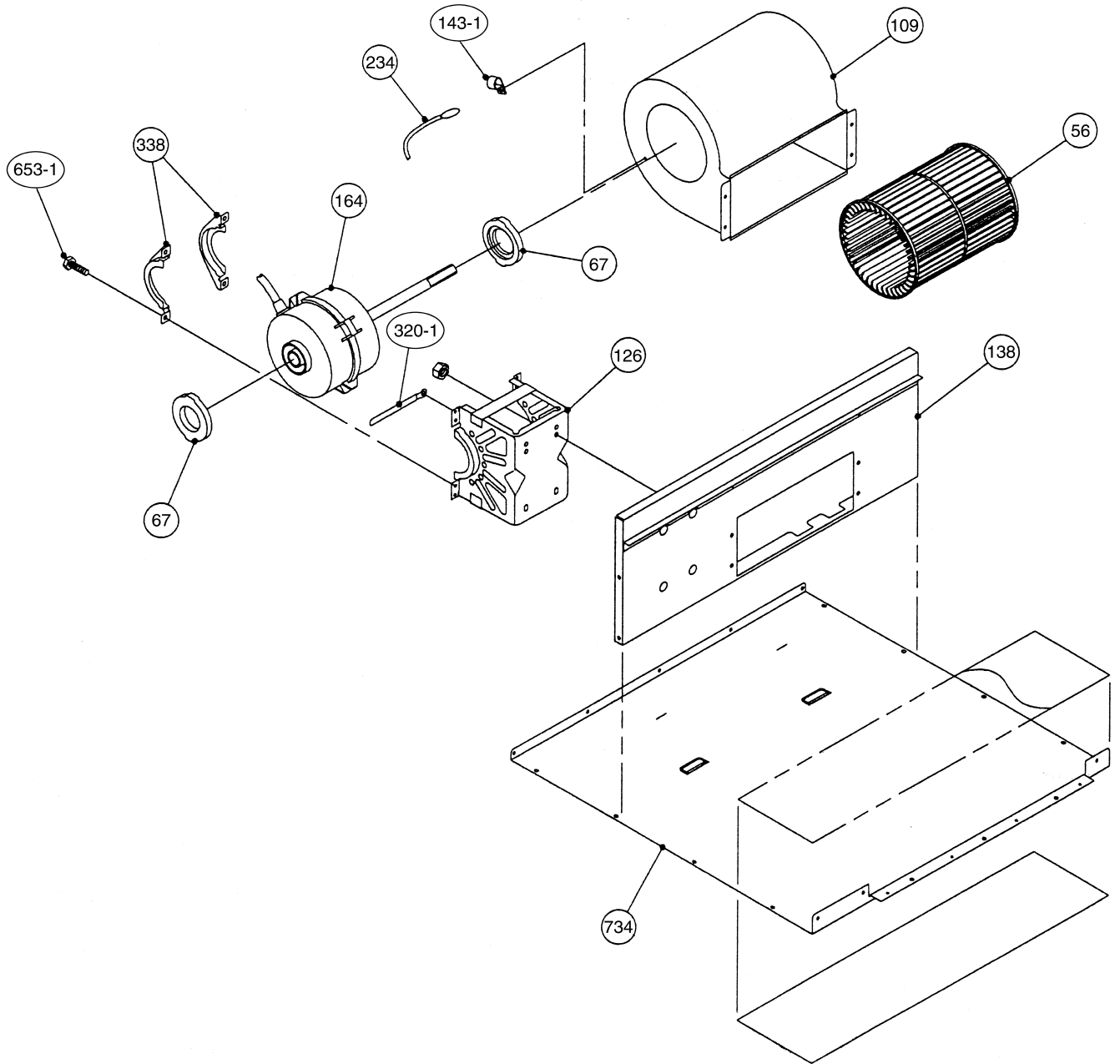
Models : ARY25TFAMF
ARY30TFAMF
ARY36TFAMF
ARY45TFAMF



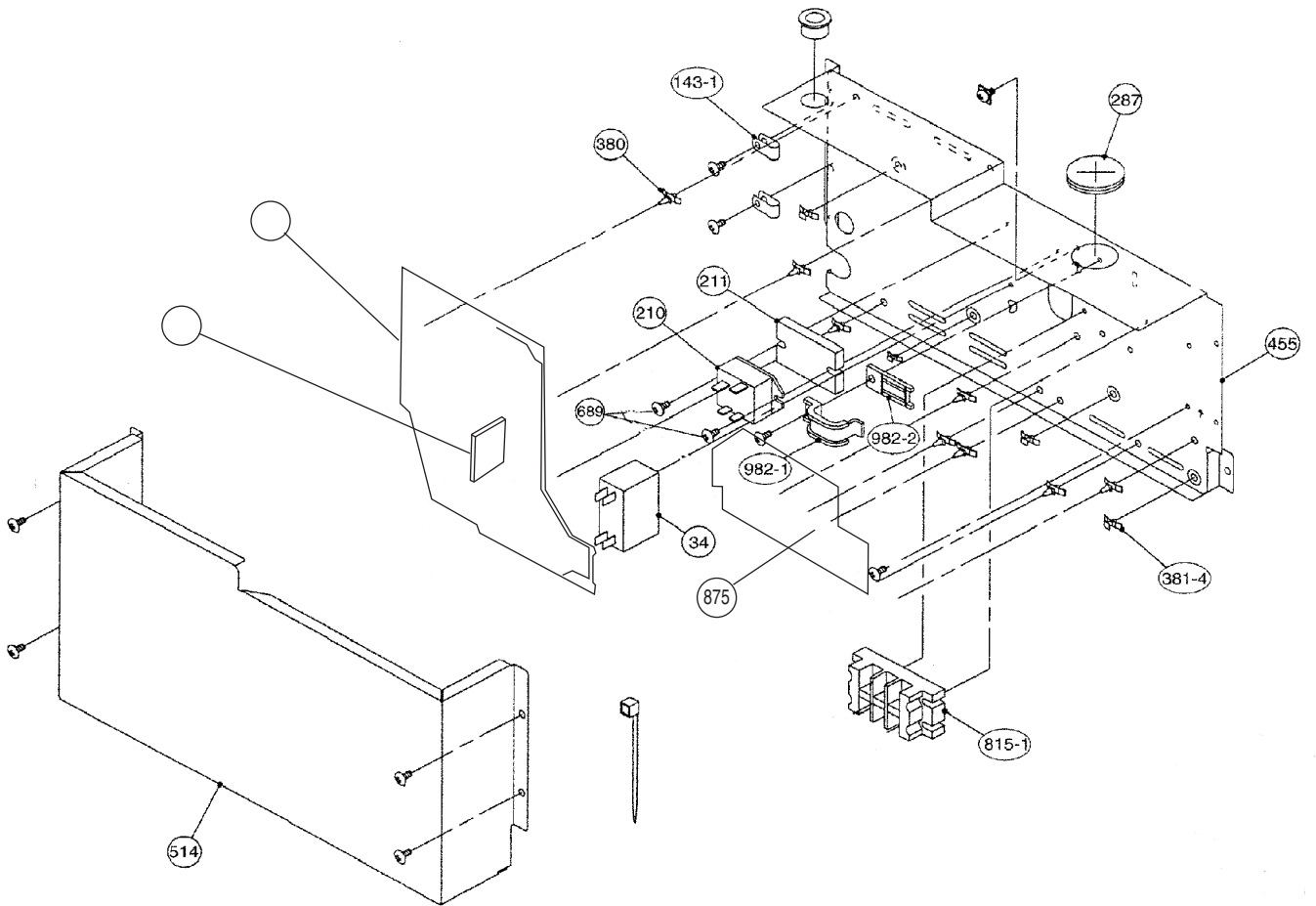
Model : ARY7TFAMF
ARY9TFAMF



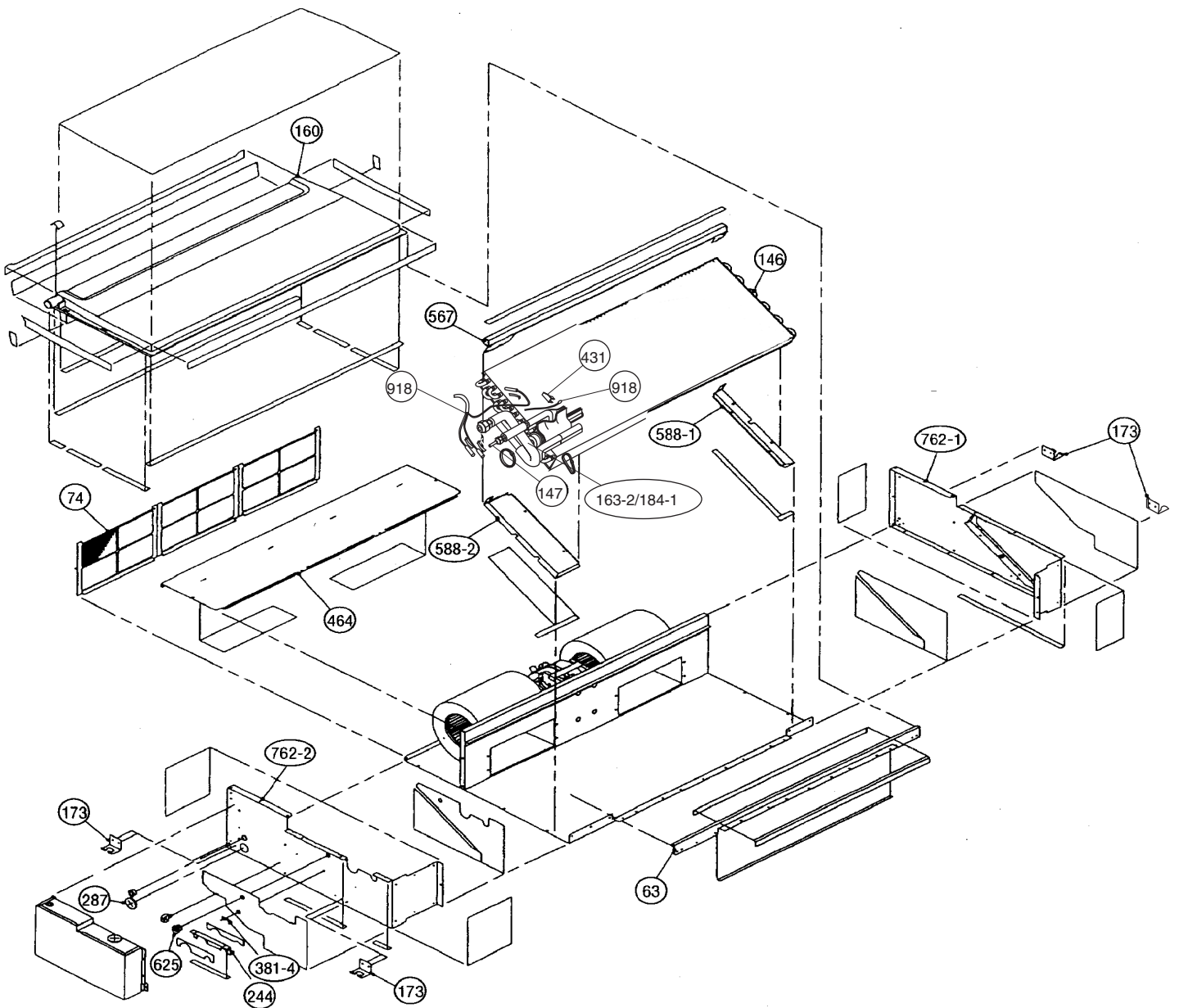
Model : ARY7TFAMF
ARY9TFAMF



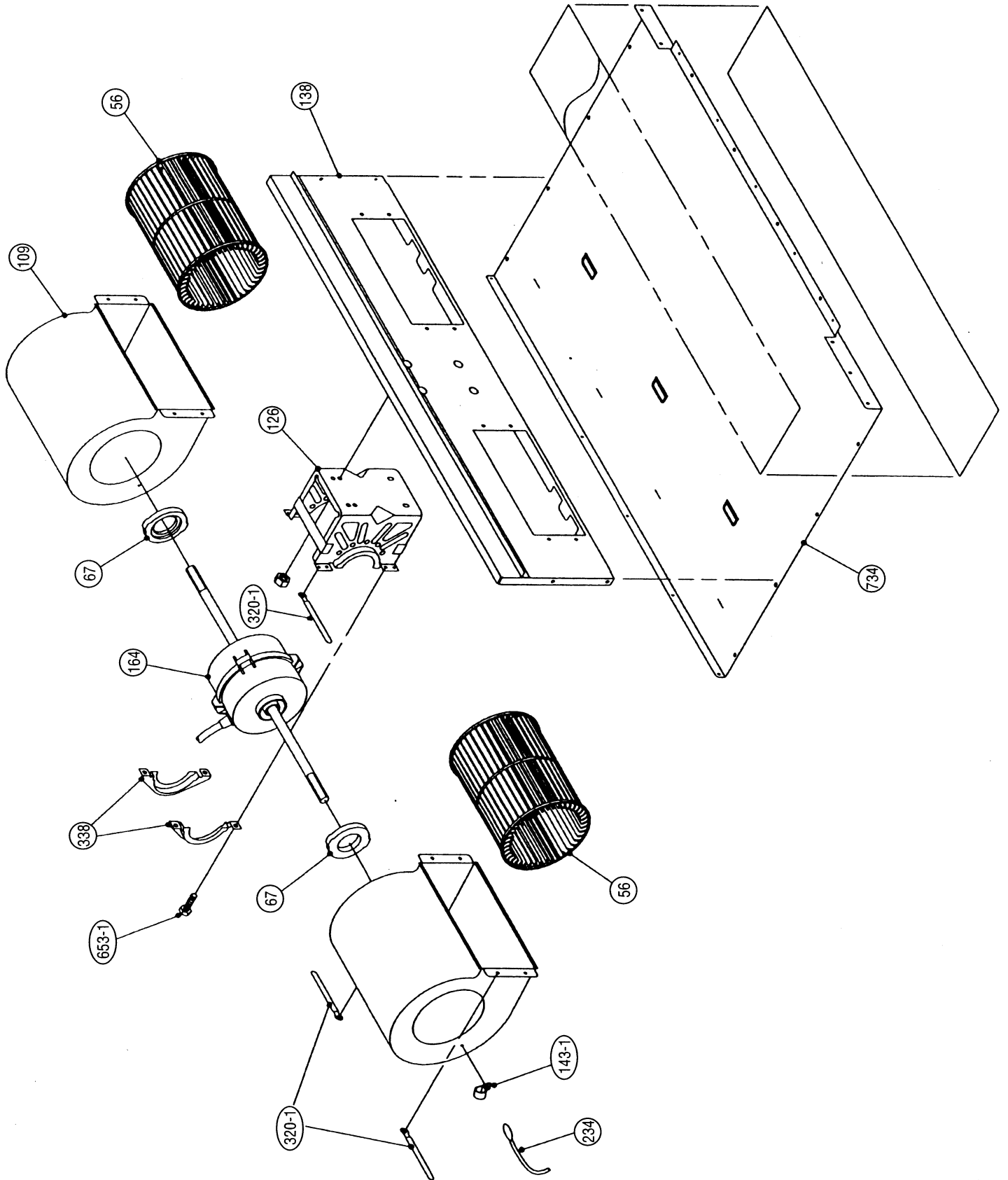
Model : ARY7TFAMF
ARY9TFAMF



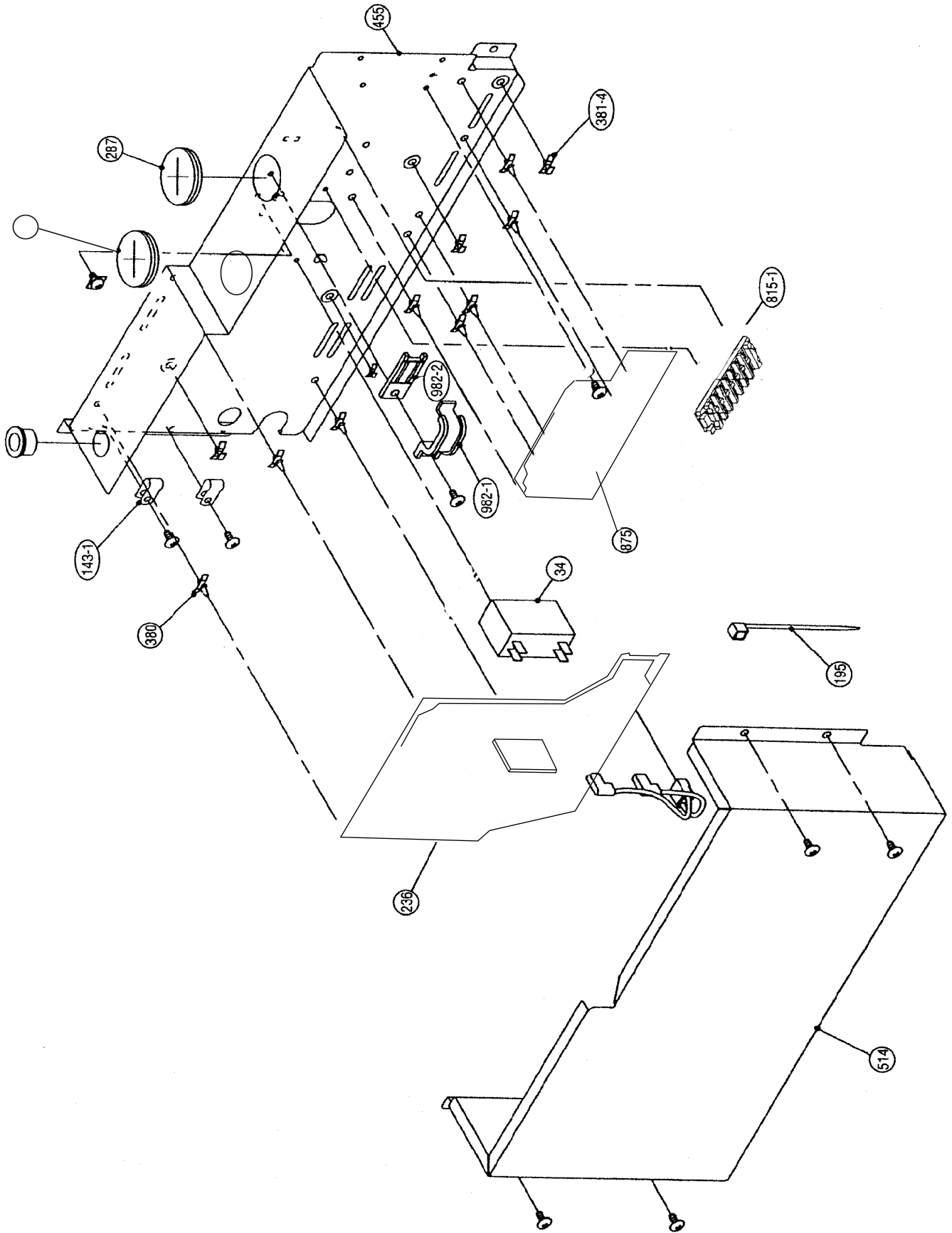
Model : ARY12TFAMF
ARY14TFAMF
ARY18TFAMF



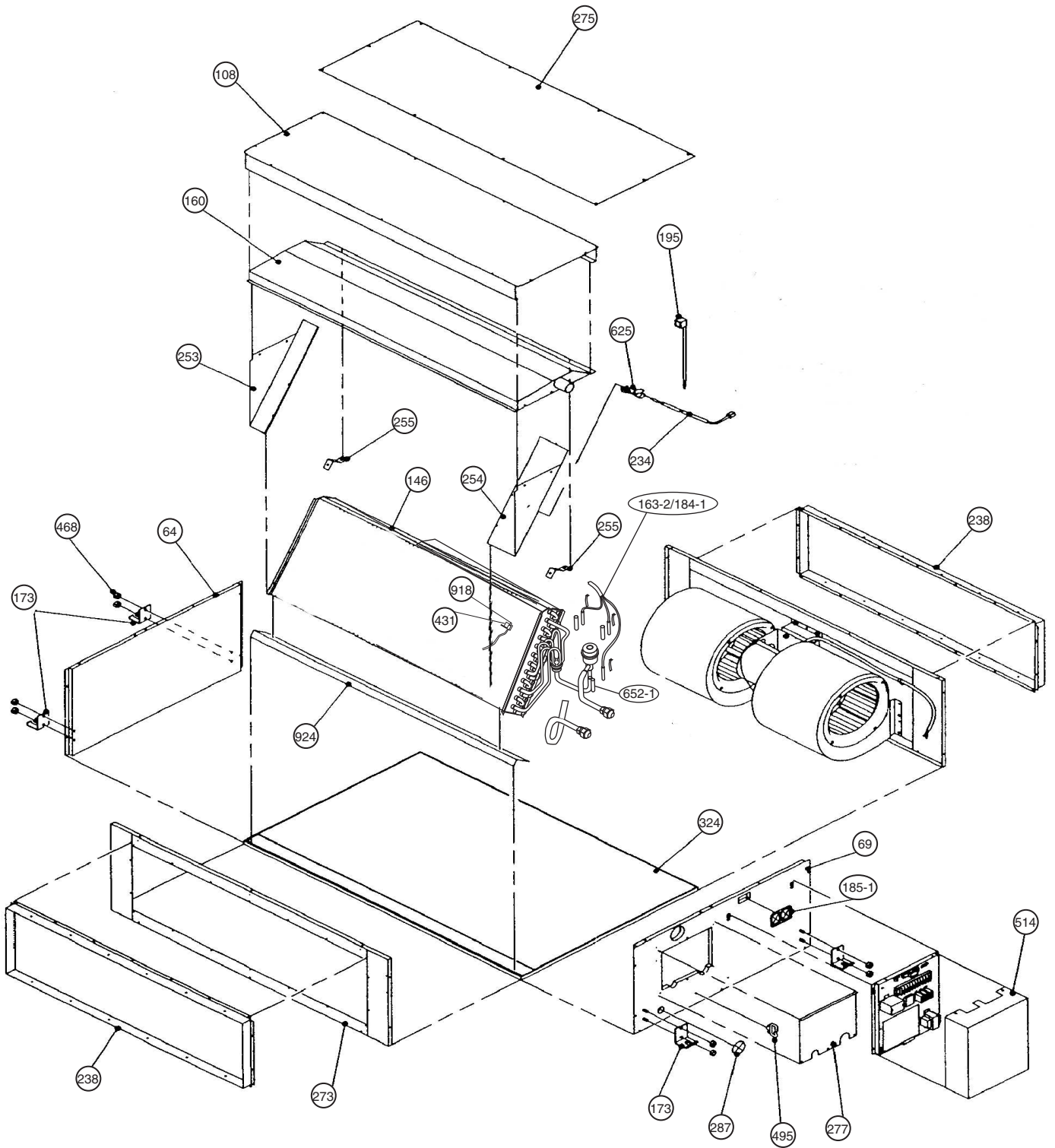
Model : ARY12TFAMF
ARY14TFAMF
ARY18TFAMF



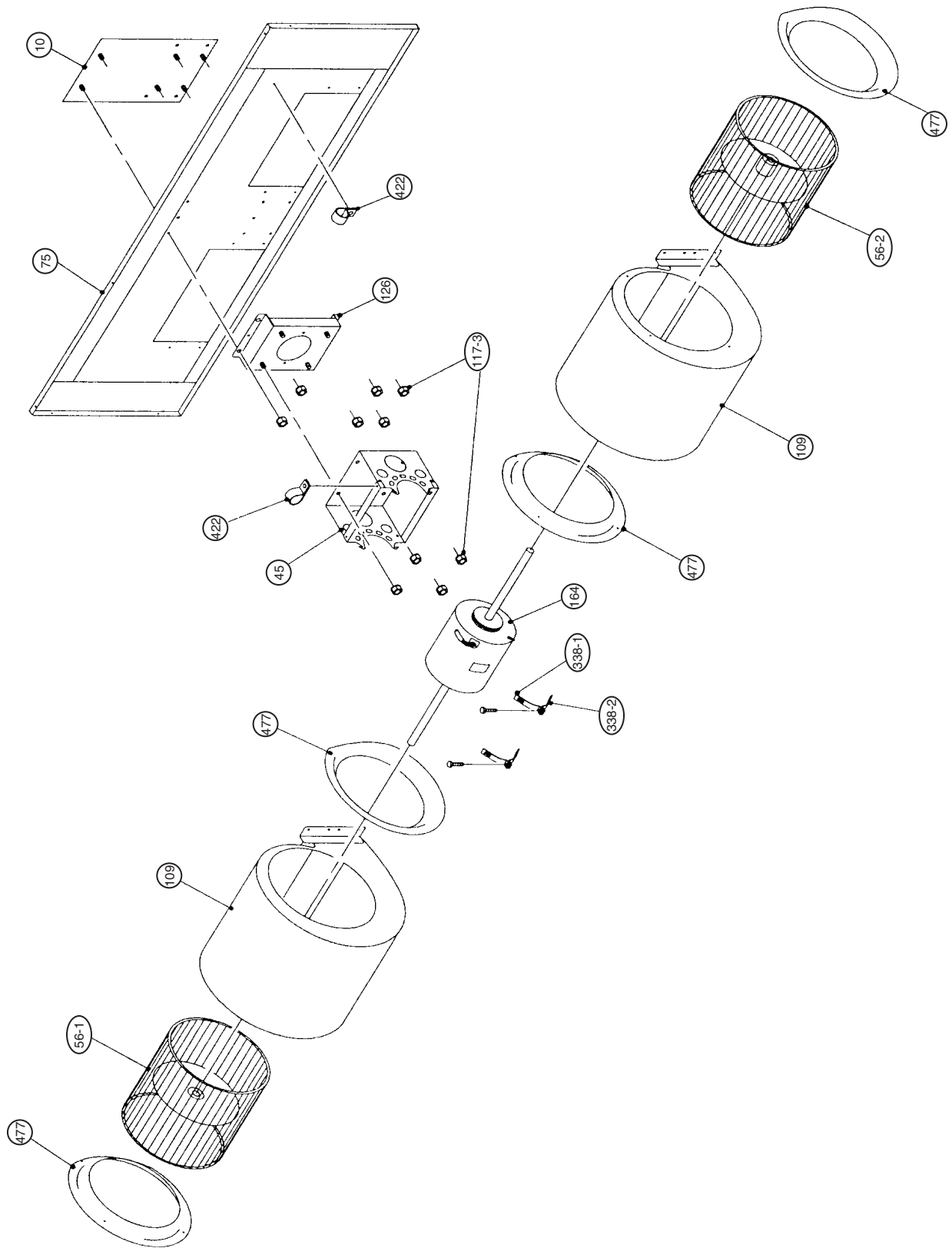
Model : ARY12TFAMF
ARY14TFAMF
ARY18TFAMF



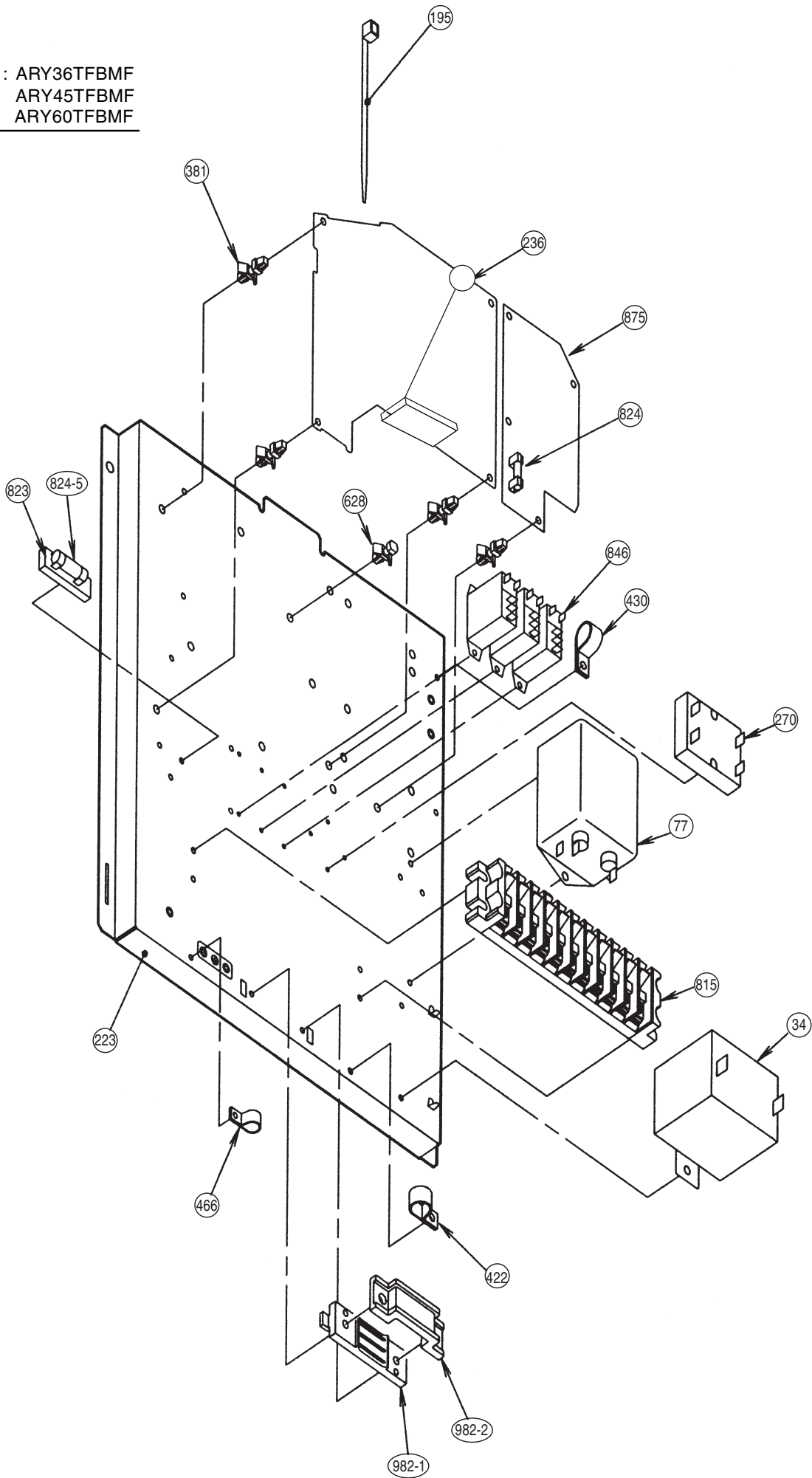
Model : ARY36TFAMF
ARY45TFAMF
ARY60TFAMF



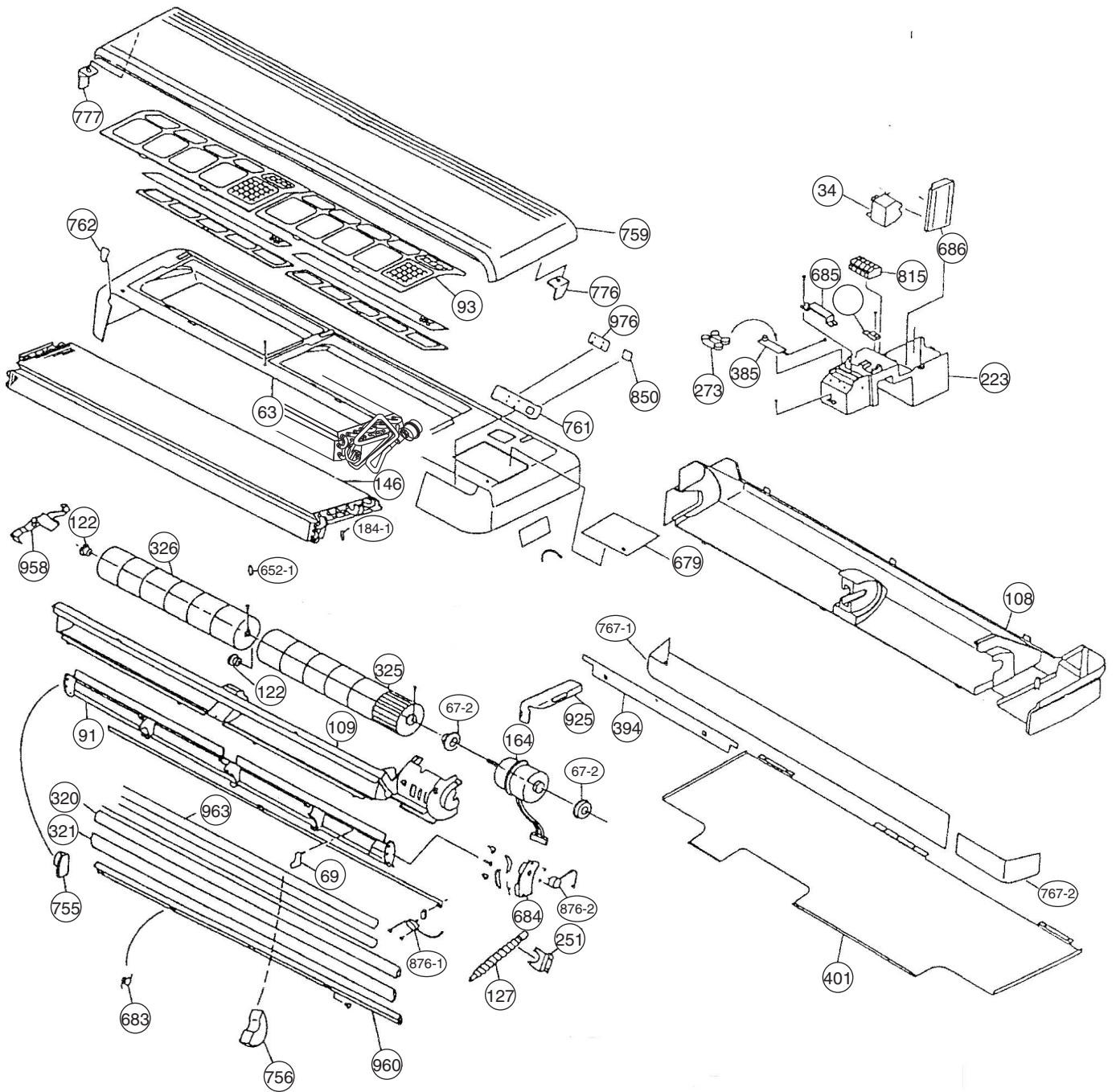
Model : ARY36TFAMF
ARY45TFAMF
ARY60TFAMF



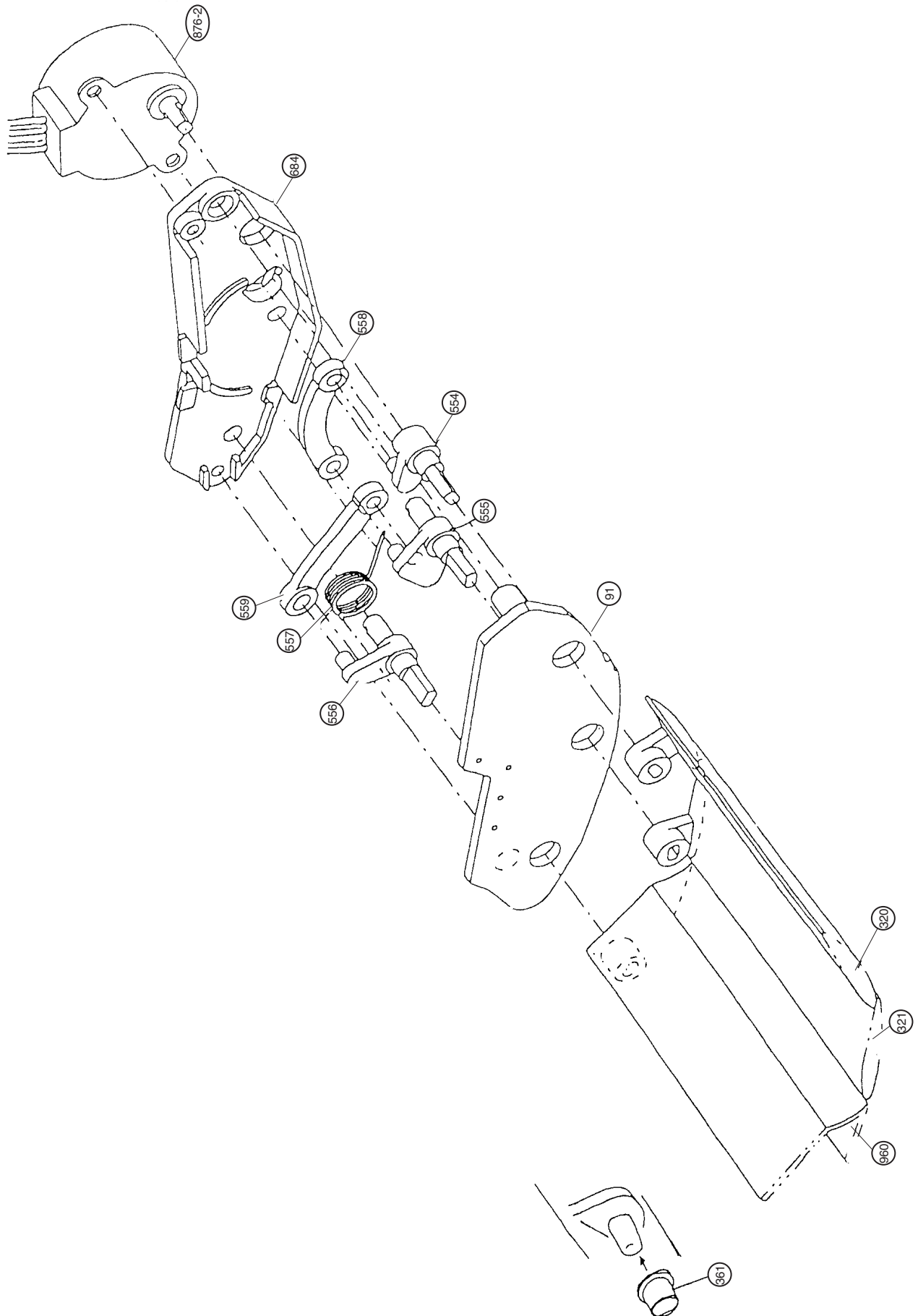
Model : ARY36TFBMF
ARY45TFBMF
ARY60TFBMF



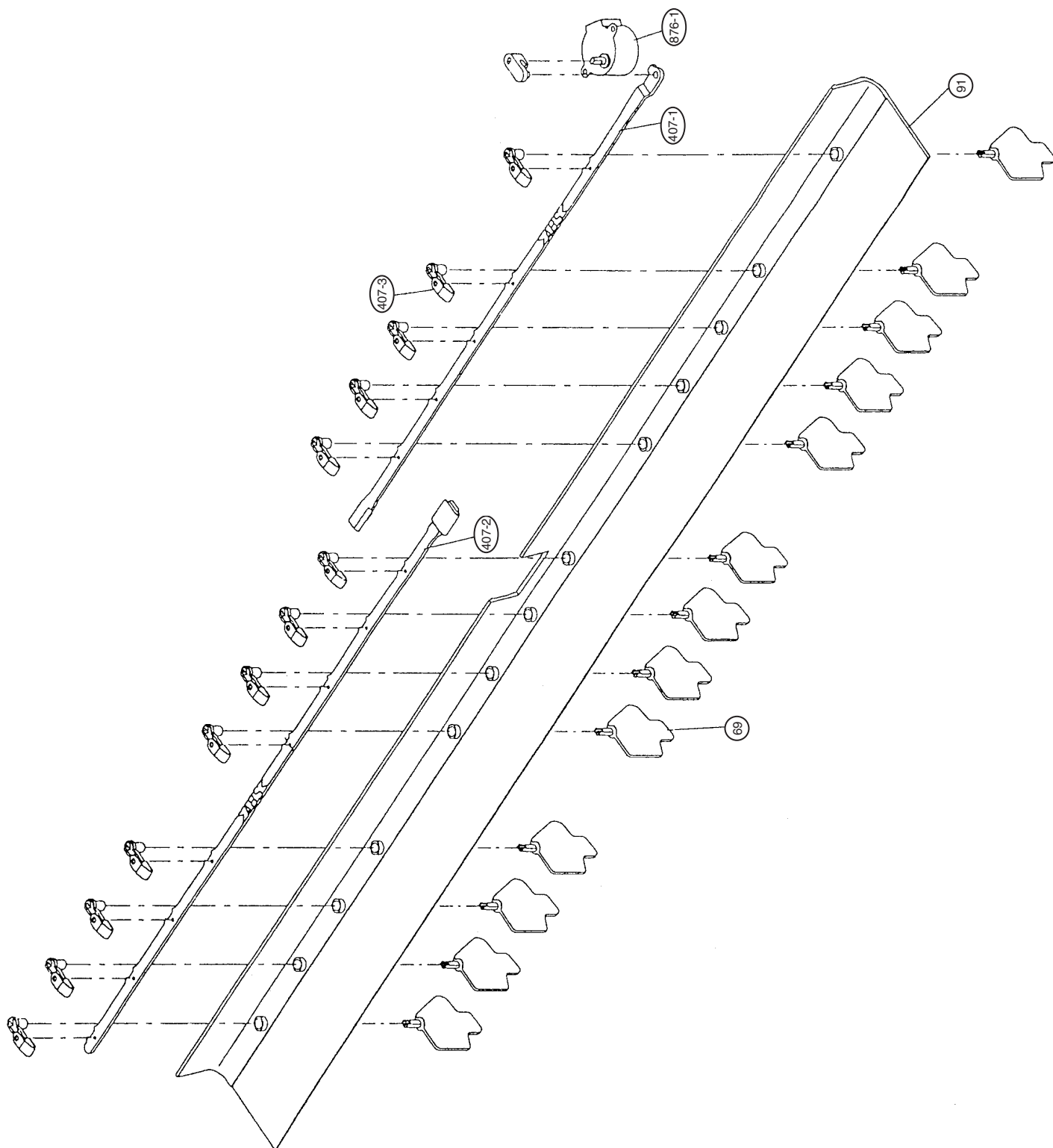
Model : ASY20TFAMF
ASY24TFAMF
ARY30TFAMF



Model : ASY20TFAMF
ASY24TFAMF
ARY30TFAMF



Model : ASY20TFAMF
ASY24TFAMF
ARY30TFAMF



11. PARTS LIST

Models : AOY90TPAMF

OUTDOOR UNIT

Ref No.	Description	Parts No.	Ord Q'ty	Ref No.	Description	Parts No.	Ord Q'ty
		AOY90TPAMF				AOY90TPAMF	
333	ACCUMULATOR ASSY	9366351009		765	DRAIN PIPE.(I-TYPE)	9301102000	
867	ACCUMULTR HLD.RUBBER	9354022027		15	DRYER	9361926004	
833	AUXILIARY PIPE ASSY	9363891003		829-16	DRYER JNT PP ASSY	9363893007	
196-1	BAINDER XL	9366156000		4	EMBLEM-REAR	9359836018	
452	BAL VLV JNT PIPE C	9363900002		629	EMI FILTER	0400056133	
121	BALL VALVE JOINT B	9365533000		629	EMI FILTER	0400056140	
809	BALL VALVE-A	9361937000			EMI FILTER	0400165040	
810	BALL VALVE-B	9361938007		825-1	EXPANSION VALVE	9361929005	
810-1	BALL VALVE-B	9362579001		825-2	EXPANSION VALVE	9363294002	
12	BASE ASSY	9361684003		825	EXPANSION VALVE ASSY	9366067009	
100	BASE FOOT	9361688025		2	FAN COVER	9366142010	
477	BELL-MOUTH	9361721005		41	FAN MOTOR ASSY-OUTER	9601271017	
790-3	BELT HEATER	9361140073		560	FLANGE ASSY	9363035001	
790-1	BELT HEATER-A	9361140042		964	FLARE NYT	9363273007	
790-2	BELT HEATER-B	9361140059		133	FRONT PANEL-L	9361709027	
674	BOLT	0700145100		63-1	FRONT PANEL-L	9361709010	
653	BOLT, FOR FAN MOTOR	0700145087		134	FRONT PANEL-R	9361710047	
69-3	BOLT, HEX. SOCKET	301210060360		63-2	FRONT PANEL-R	9361710030	
966	BONNET	9363274004		132	FRONT PROTECTION NET	9366144014	
199	BR SHEET	9363708028		824-3	FUSE	0600222574	
220-1	BR SHEET-B	9351990022			FUSE HOLDER	0500158072	
42	BRACKET PANEL (MOTOR)	9361703001		761	GAS FQUALIZATION ASY	9365721001	
87	BRACKET (COMPRESSOR)	9361694002		86	GASKET	9363272000	
355	BRACKET (COMPRESSOR)-L	9361698000		150	HALF UNION-B	9357351018	
356	BRACKET (COMPRESSOR)-R	9361699007			HEAT SINK	9703347016	
376	BRACKET (CONTROL BOX)	9361727007			HYBRID IC	0100335019	
45	BRACKET (MOTOR)	9361701007			IC	0101461120	
678	BRACKET (THERMISTOR)	313557406106			IC	0101547039	
176	BRACKET (VALVE)-A	9361719002			IC LIN	0100462098	
890	BRKT PNL (COMP) ASSY	9364208008			IC (TRANSISTOR ASSY)	0100028041	
175	BRKT PNL (S VLV)	9364230009		285	INSU (ACCUMULATOR)	9366131007	
361	BUSHING	9361725003		267	INSULATION (PIPE)-C	313005074759	
564	BYPASS A ASSY	9366164005		829-1	JOINT PIPE A ASSY	9363994001	
564-1	BYPASS B ASSY	9366165002		829-7	JOINT PIPE F ASSY	9363912005	
564-2	BYPASS C ASSY	9366166009		829-8	JOINT PIPE G ASSY	9364022000	
654-3	BYPASS D ASSY	9366928003		829-9	JOINT PIPE H ASSY	9364017006	
64/34	CAPACITOR (FAN MOTOR)	9703306037		829-15	JOINT PIPE K	9364959009	
	CAPACITOR . ELEC	0301192558		829-14	JOINT PIPE I	9365016008	
	CAPACITOR . ELEC	0300256060		829-13	JOINT PIPE M	9365017005	
	CAPACITOR . ELEC	0301192589		829-2	JOINT PIPE (SUB COOL)	9365858004	
	CAPACITOR . ELEC	0301196822			LABEL."R407C"	9362389006	
	CAPACITOR.PLASTIC	0300304099			LED	0000813259	
	CAPACITOR.PLASTIC	0301052098		381-2	LOCKING SPACER	0600035020	
178-2	CAPILLARY HLD.RUBBER	313394274808		381-3	LOCKING SPACER	0600118051	
	CERAMIC RESONATOR	9701261031		791	MAGNETIC RELAY	9363277005	
519-2	CHECK VALVE	9353020000			MANUAL (INSULATION)	9367724017	
187	CLAMP	313361271706		880-1	NETWORK (C-R)	9700987017	
182	CLAMP	313361271505			NETWORK (CR)	9701125012	
195	CLAMP	313361275805		347	NOISE INSULATION-D	313712304109	
196-2	CLAMP	313035356905		761-1	OIL EQUALZATION	9366275008	
196-1	CLAMP	312300787605		914	OIL SENSOR ASSY	9365712009	
407	CLAMP	313739340109		331	OIL SEPA JNT PP A AS	9363944006	
919-3	COIL (EXPANSION VALVE)	9361930001		914-1	OIL SEPARATOR A ASSY	9366359005	
919-1	COIL (EXPANSION VALVE)	9366344001		915	OIL SEPARATOR B ASSY	9366368007	
919-2	COIL (EXPANSION VALVE)	9366345008			PACK ING BOTTOM PAPER	9363888003	
46-1	COMPRESSOR ASSY	9367379002			PACKING CASE-CARTON	9301094015	
46-2	COMPRESSOR ASSY	9367380008			PACKING WOOD-BOTTOM	9362978019	
46-3	COMPRESSOR ASSY	9367381005			PACKING WOOD-FRONT	9362979016	
310	COMPRESSOR COVER	9366132004			PACKING WOOD-PROTECT	9363301014	
26	COMPRESSOR COVER-A	9361935006			PACKING WOOD-SIDE	9362980012	
646	COMPRESSOR COVER-B	9361936003			PACKING WOOD-TOP	9362981019	
149-1	CONDENCING PIPE F AS	9365439005			PHOTO COUPLER	0000117074	
149	CONDENCING PIPE P AS	9364952000		172	PIPE COVER	9363470000	
16-1	CONDENSER A ASSY	9365462003		172-1	PIPE COVER B	9366129004	
16-2	CONDENSER B ASSY	9365463000			PLUG.PWB	0500005338	
527	CONDENSER GUARD	9366143017			PLUG.PWB	0500006069	
158	CONNECTING PIPE ASSY	9366491002			PLUG.PWB	0500011131	
32	CONTROL BOX	9361713000			PLUG.PWB	0500011155	
942	CONTROL BOX COVER	9361716001			PLUG.PWB	0500011520	
236	CONTROLLER PCB ASSY	9703739019			PLUG.PWB	0500011766	
982-1	CORD CLAMP	9356857009			PLUG.PWB	0500011773	
982-2	CORD CLAMP-B	9356858006			PLUG.PWB	0500011803	
193	CUSHION RUBBER	313376149201			PLUG.PWB	0500011810	
450	DICHARG PIPE A ASSY	9363996005			PLUG.PWB	0500011827	
493	DICHARG PIPE C ASSY	9363909005			PLUG.PWB	0501045012	
	DIODE	0000353120			PLUG.PWB	0501045029	
	DIODE	0000625036			PLUG.PWB	0501045050	
	DIODE	0000746519			PLUG.PWB	0501045098	
	DIODE	0000906500			PLUG.PWB	0501045210	
	DIODE.MINIMOLD	0000684019			PLUG.PWB	0501045227	
	DIODE.POWER	0000208024			PLUG.PWB	0501045319	
	DIODE.POWER	0000689045			PLUG.PWB	0501045357	
160	DRAIN PAN	9361700000			PLUG.PWB	0501045418	

Models : AOY90TPAMF

Ref No.	Description	Parts No.	Ord Q'ty	Ref No.	Description	Parts No.	Ord Q'ty
		AOY90TPAMF				AOY90TPAMF	
354	PRESSURE SWITCH (HIGH)	9355094009			WIRE ASSY (HEATER)	9363255003	
354-1	PRESSURE SWITCH (LOW)	9703269004		253-1	WIRE ASSY	9702313036	
39	PROPELLER FAN	9361726000		816	WIRE CLAMP METAL	313584219902	
9	REAR PANEL.PAINTED	9361712027		253	WIRE WITH CONNECTOR	9703878015	
453	RECEIVER TANK ASSY	9366371007		253	WIRE WITH CONNECTOR	9703879012	
226	REINFORCEMENT	9361697003			XTAL.RESONATOR	9703542015	
289	REINFORCEMENT	9361704008		326	3-WAY JOINT	9354901001	
846	RELAY	9304375005		344	4-WAY VALVE	313943302804	
	RELAY	9701566013		344-1	4-WAY VALVE	313947302811	
	RESISTOR.CHIP	0200306667		344-2	4-WAY VALVE	9353532008	
	RESISTOR.CHIP	0201010662		344-3	4-WAY VALVE	9703884009	
	RESISTOR.CHIP	0200230269					
	RESISTOR.CHIP	0200230740					
	RESISTOR.CHIP	0200231013					
	RESISTOR.CHIP	0201010013					
	RESISTOR.CHIP	0201010747					
	RESISTOR.CHIP	0201010907					
	RESISTOR.CHIP	0201011010					
	RESISTOR.METAL OXIDE	0201107997					
	RESISTOR.WIRING	0200244372					
185	RUBBER BUSHING	313005066051					
107	RUBBER SEAT-A	9364084008					
128-1	RUBBER (DISCHA.PIPE)	313155086308					
47-2	RUBBER (DISCHA.PIPE)	313185159802					
47-1	RUBBER (DISCHA.PIPE)	313194159807					
	SCREW	0700008023					
949-2	SCREW.PAINTED	9302348001					
949-1	SCREW.PAINTED	9305648009					
	SEMICON ACCESSORY	0000393010					
915-1	SENSOR(PRESSURE)	9703890000					
166	SEPARATE WALL-L	9361695009					
167	SEPARATE WALL-R	9361696006					
164	SEPARATE WALL-UPPER	9361693005					
762	SIDE PANEL-L.PAINTED	9361705029					
761	SIDE PANEL-R.PAINTED	9361706026					
599	SIGNAL PCB ASSY	9703728013					
108	SLEEVE-A	9364085005					
	SOCKET.PWB	0500296033					
343-1	SOLENOID	9703888014					
343-2	SOLENOID	9703888021					
343-3	SOLENOID	9703888038					
343-4	SOLENOID	9703888045					
343-5	SOLENOID	9703888052					
457	SOLENOID	9703889011					
457-1	SOLENOID	9703889028					
343-2	SOLENOID	9703342059					
343-3	SOLENOID	9703342066					
343-4	SOLENOID	9703342073					
343-5	SOLENOID	9703342080					
343-9	SOLENOID	9703342097					
343-6	SOLENOIDE	9703888069					
343-7	SOLENOIDE	9703888076					
343-8	SOLENOIDE	9703888083					
408/55	SPECIAL NUT M8	313252257701					
117-3	SPECIAL WASHER M6	313306391007					
737	SUC PIPE K ASSY	9363934007					
595	SUC PIPE N ASSY	9363929003					
621	SUC PIPE S ASSY	9365071007					
621-1	SUC PIPE T ASSY	9365514009					
596	SUC PIPE Y ASSY	9365436004					
331	SUC PIPE A ASSY	9363903003					
331-2	SUC PIPE D ASSY	9365513002					
	SWITCH.PUSH	9700450016					
	SWITCH.ROTARY	9701694013					
	SWITCH.SLIDE	9701393015					
109	TERMINAL COVER	9364087009					
109-1	TERMINAL COVER	9366265009					
111	TERMINAL PACKING	9364086002					
11-1	TERMINAL PACKING	9366264002					
815-2	TERMINAL 3P	9363276046					
815-1	TERMINAL 5P	9363275018					
652-1	THERM.HOLDER PIPE	313714262805					
454	THERMISTOR ASSY	9703880018					
454-1	THERMISTOR ASSY	9703881015					
163-21/184-1	THERMO.SPRING-A	313728262708					
343-2	TRANS SW	9703586019					
	TRANSISTOR	0000164016					
	TRANSISTOR	0000780094					
	TRANSISTOR	0000781053					
	TRANSISTOR	0000936033					
85	VALVE PLATE	9363063004					
	VARISTOR	0000038010					
	VARISTOR (ARRESTER)	0600280154					

Models : UTF-Y54A1A
 UTF-Y90A4A

Ref No.	Description	Parts No.		Ord Q'ty
		UTF-Y54A1A	UTF-Y90A4A	
108	BASE	-----	9362189002	
108	BASE ASSY	9362719001	-----	
199	BR SHEET	9363708011	9363708011	
199	BR SHEET	9363708028	9363708028	
910	CAPILLARY TUBE B	-----	9365965009	
212/466	CLAMP	313714328805	313714328805	
195	CLAMP	313361275805	313361275805	
464-1	COVER	9362718004	-----	
464	COVER ASSY	-----	9362190008	
450	DISCHARGE GAS PIPE	-----	9362179003	
450-1	DSCG GAS PP ASSY	9362222006	-----	
186	EDGE COVER	-----	9361049024	
964	FLARE NUT-A	-----	313996239804	
964	FLARE NUT-A	-----	9357352022	
150	HALF UNION-B	9357351018	9357351018	
468	HOOK METAL	9362865005	9362865005	
167-4	INS (SEPARATE WALL) A	-----	9362868068	
167-5	INS (SEPARATE WALL) B	-----	9365901007	
167-6	INS (SEPARATE WALL) C	-----	9365908006	
167-7	INS (SEPARATE WALL) D	-----	9367098002	
167	INSULATION A	9364188003	-----	
167-1	INSULATION A	-----	9364190006	
167-1	INSULATION B	9364189000	-----	
167-2	INSULATION B	-----	9364191003	
167-3	INSULATION C	-----	9364192000	
167	INSULATION (BASE)	9362868075	9362868075	
154	INSULATION (PIPE) A	-----	9364738000	
98/155	INSULATION (PIPE) B	-----	9364739007	
267	INSULATION (PIPE) C	-----	9364740003	
267-3	INSULATION (PIPE) D	-----	9364741000	
368	INSULATION (PIPE) E	-----	9364742007	
154	INSULATION (PIPE) A	9364735009	-----	
155	INSULATION (PIPE) B	9364736006	-----	
267	INSULATION (PIPE) C	9364737003	-----	
760	INSULATION (PIPE) F	9365850008	9365850008	
760-1	INSULATION (PIPE) G	9365851005	-----	
760-2	INSULATION (PIPE) H	-----	9365853009	
568-1	JNT WIRE (SLN VLV) A	9365848005	9365848005	
568-2	JNT WIRE (SLN VLV) A	9365849019	9365849019	
564-5	LIQUID PIPE ASSY	-----	9362182003	
	MANUAL (INSTALLATION)	-----	9366247012	
468	NUT-A M8	9356998009	9356998009	
	PACKING CASE-CARTON	9301094015	9301094015	
674	PROJECTION BOLT	9356901023	9356901023	
273	REAR PANEL	-----	9362191005	
273	REAR PANEL	9362721004	-----	
295-1	REDUCER A	9364430003	9364430003	
295-4	REDUCER D	-----	9364433004	
295-5	REDUCER F	-----	9364434001	
295-6	REDUCER F	-----	9364435008	
295-2	REDUCER I	9364438009	9364438009	
295-3	REDUCER J	9364439006	9364439006	
29	SEPARATE WALL	-----	9362192002	
29	SEPARATE WALL	9362722001	-----	
457-2	SOLENOID VALVE	9703889035	9703889035	
457-3	SOLENOID VALVE	9703889042	9703889042	
457-1	SOLENOID VALVE	9703889059	9703889059	
157-4	SOLENOIDE	9703888113	9703888113	
157-5	SOLENOIDE	9703888120	9703888120	
157-6	SOLENOIDE	9703888137	9703888137	
157-7	SOLENOIDE	9703888144	9703888144	
468	SPECIAL NUT-A (LARGE)	313005446653	313005446653	
169	SPECIAL NUT-B (SMALL)	313005446759	313005446759	
272	STRAINER	9363119008	9363119008	
909	STRAINER A	9365954003	9365954003	
909-1	STRAINER A	-----	9363118001	
910	STRAINER B	9365955000	9365955000	
910-1	STRAINER B ASSY	9363121001	9363121001	
327-1	SUC GAS PP A ASSY	9362224000	-----	
327-2	SUC GAS PP B ASSY	9362226004	-----	
327-3	SUC GAS PP C ASSY	-----	9362188005	
327-4	SUCTION GAS PIPE A	-----	9362185004	
326	3-WAY JOINT	9354901001	9354901001	

Models : ABY12TFAMF,ABY14TFAMF,ABY18TFAMF,ABY24TFAMF
 ABY30TFAMF,ABY36TFAMF,ABY45TFAMF,ABY54TFAMF

Ref No.	Description	Parts No.								Ord Qty
		ABY12TFAMF	ABY14TFAMF	ABY18TFAMF	ABY24TFAMF	ABY30TFAMF	ABY36TFAMF	ABY45TFAMF	ABY54TFAMF	
236	CONTROLLER PCB ASSY	9703834011	9703834011	9703834011	9703834011	---	---	---	---	---
236	CONTROLLER PCB ASSY	---	---	---	---	9703835018	---	---	---	---
236	CONTROLLER PCB ASSY	---	---	---	---	---	9703836015	---	---	---
236	CONTROLLER PCB ASSY	---	---	---	---	---	---	9703837012	---	---
236	CONTROLLER PCB ASSY	---	---	---	---	---	---	---	9703838019	---
8-1	AIR FILTER	9358567029	9358567029	9358567029	9358567029	---	---	---	---	---
8	AIR FILTER	---	---	---	---	9359739005	9359739005	9359739005	9359739005	---
169	ANCHOR BOLT	313806339400	313806339400	313806339400	313806339400	---	---	---	---	---
870-1	ARM	9358565001	9358565001	9358565001	9358565001	---	---	---	---	---
443	ARM BRACKET	9359281009	9359281009	9359281009	9359281009	---	---	---	---	---
833	AUXILIARY PIPE ASSY	---	---	---	---	---	9360463005	9360463005	9360463005	---
833	AUXILIARY PIPE ASSY	---	---	---	---	9361154001	---	---	---	---
833	AUXILIARY PIPE ASSY	---	---	---	---	9361155008	---	---	---	---
227	BADGE	---	---	---	---	9359735014	9359735014	9359735014	9359735014	---
108	BASE ASSY	9359061014	9359061014	9359061014	9359061014	---	---	---	---	---
108	BASE ASSY	---	---	---	---	9359680000	9359680000	9359680000	9359680000	---
578	BASE BRACKET	9358586006	9358586006	9358586006	9358586006	---	---	---	---	---
653-2	BOLT	0700190018	0700190018	0700190018	0700190018	---	---	---	---	---
653-1	BOLT (F.MOTOR FIXG)	0700156014	0700156014	0700156014	0700156014	---	---	---	---	---
967	BONNET-B	---	---	313045417959	313045417959	313045417959	---	---	---	---
199-	BR SHEET	---	---	---	---	---	9363708011	9363708011	9363708011	---
199-	BR SHEET	---	---	9363708028	9363708028	9363708028	---	---	---	---
199-	BR SHEET	---	---	---	---	---	9363708035	9363708035	9363708035	---
200	BR SHEET-B	---	---	---	313986108302	---	---	---	---	---
200-1	BR SHEET-B	---	---	9351990022	9351990022	9351990022	9351990022	9351990022	9351990022	---
361	BUSHING	9357942001	9357942001	9357942001	9357942001	---	---	---	---	---
361	BUSHING	---	---	---	---	9359733003	9359733003	9359733003	9359733003	---
631-2	BUSHING-B	9358554005	9358554005	9358554005	9358554005	---	---	---	---	---
361-3	BUSHING-C	9358553008	9358553008	9358553008	9358553008	---	---	---	---	---
68	BUZZER	9701298013	9701298013	9701298013	9701298013	9701298013	9701298013	9701298013	9701298013	---
68	CAP	9358563007	9358563007	9358563007	9358563007	---	---	---	---	---
64/34	CAPACITOR (FAN MOTOR)	---	---	313810068203	---	---	---	---	---	---
64/34	CAPACITOR (FAN MOTOR)	9700468080	9700468080	---	---	---	---	---	---	---
64/34	CAPACITOR (FAN MOTOR)	---	---	---	9703306044	---	---	---	---	---
64/34	CAPACITOR (FAN MOTOR)	---	---	---	---	9703306068	9703306068	9703306068	9703306068	---
109	CAPACITOR,ELEC	0301192558	0301192558	0301192558	0301192558	0301192558	0301192558	0301192558	0301192558	---
109	CAPACITOR,ELEC	0300256060	0300256060	0300256060	0300256060	0300256060	0300256060	0300256060	0300256060	---
109	CAPACITOR,PLASTIC	0300304099	0300304099	0300304099	0300304099	0300304099	0300304099	0300304099	0300304099	---
109	CAPACITOR,PLASTIC	0301052098	0301052098	0301052098	0301052098	0301052098	0301052098	0301052098	0301052098	---
755	CASING	9358543009	9358543009	9358543009	9358543009	---	---	---	---	---
755	CASING COVER	9358544006	9358544006	9358544006	9358544006	9359704003	9359704003	9359704003	9359704003	---
755	CASING COVER	---	---	---	---	---	---	---	---	---
577	CATCH	9359096009	9359096009	9359096009	9359096009	---	---	---	---	---
870-2	CENTER ARM	9359280002	9359280002	9359280002	9359280002	---	---	---	---	---
422	CERAMIC RESONATOR	9701261031	9701261031	9701261031	9701261031	9701261031	9701261031	9701261031	9701261031	---
422	CLAMP	9359183006	9359183006	9359183006	9359183006	---	---	---	---	---
187	CLAMP	313361271706	313361271706	313361271706	313361271706	313985355201	313985355201	313985355201	313985355201	---
195	CLAMP	313361275805	313361275805	313361275805	313361275805	313361275805	313361275805	313361275805	313361275805	---
196-2	CLAMP	313035356905	313035356905	313035356905	313035356905	313035356905	313035356905	313035356905	313035356905	---
196-1	CLAMP	312300787605	312300787605	312300787605	312300787605	312300787605	312300787605	312300787605	312300787605	---
461	CLAMP	313152375801	313152375801	---	---	---	---	---	---	---
223	CONTROL BOX	9358600016	9358600016	9358600016	9358600016	---	---	---	---	---
223	CONTROL BOX	---	---	---	---	9359708001	9359708001	9359708001	9359708001	---
923	CONTROL BOX BRACKET	9358717004	9358717004	9358717004	9358717004	---	---	---	---	---
514	CONTROL BOX COVER	9359097006	9359097006	9359097006	9359097006	---	---	---	---	---
472	CONTROL BOX	---	---	---	---	9359712008	9359712008	9359712008	9359712008	---
236	CONTROLLER PCB ASSY	9701042029	9701042029	9701042029	9701042029	---	---	---	---	---
236	CONTROLLER PCB ASSY	---	---	---	---	9701042036	---	---	---	---
236	CONTROLLER PCB ASSY	---	---	---	---	---	9701042043	---	---	---
236	CONTROLLER PCB ASSY	---	---	---	---	---	---	9701042050	---	---
236	CONTROLLER PCB ASSY	---	---	---	---	---	---	---	9701042067	---
625	CORD BUSHING	9359240006	9359240006	9359240006	9359240006	9359240006	9359240006	9359240006	9359240006	---
982	CORD CLAMP	9357886008	9357886008	9357886008	9357886008	---	---	---	---	---
982-1	CORD CLAMP-A	---	---	---	---	9359820017	9359820017	9359820017	9359820017	---
982-2	CORD CLAMP-B	---	---	---	---	9359821014	9359821014	9359821014	9359821014	---
36-2	CORD HOLDER	9356362008	9356362008	9356362008	9356362008	---	---	---	---	---
509	COSMETIC PANEL-L	9358536018	9358536018	9358536018	9358536018	---	---	---	---	---
508	COSMETIC PANEL-R	9358535011	9358535011	9358535011	9358535011	---	---	---	---	---
897	COUPLING PIPE A	---	---	---	---	9367091003	---	---	---	---
329	COUPLING PIPE ASSY	---	---	9364757001	---	---	---	---	---	---
329	COUPLING PIPE ASSY	---	---	---	---	---	9366445005	9366445005	9366445005	---
329	COUPLING PIPE ASSY	---	---	---	---	9366468004	---	---	---	---
329	COUPLING PIPE ASSY	---	---	---	9366524007	---	---	---	---	---
383	DECORATION COVER-L	---	---	---	---	9359745006	9359745006	9359745006	9359745006	---
382	DECORATION COVER-R	---	---	---	---	9359744009	9359744009	9359744009	9359744009	---
124	DEW PROOF PLATE	9359196006	9359196006	9359196006	9359196006	---	---	---	---	---
---	DIODE	0000353120	0000353120	0000353120	0000353120	0000353120	0000353120	0000353120	0000353120	---
---	DIODE	0000625036	0000625036	0000625036	0000625036	0000625036	0000625036	0000625036	0000625036	---
---	DIODE	0000746519	0000746519	0000746519	0000746519	0000746519	0000746519	0000746519	0000746519	---
---	DIODE	0000906500	0000906500	0000906500	0000906500	0000906500	0000906500	0000906500	0000906500	---
---	DIODE,MINIMOLD	0000684019	0000684019	0000684019	0000684019	0000684019	0000684019	0000684019	0000684019	---
---	DIODE,POWER	0000208024	0000208024	0000208024	0000208024	0000208024	0000208024	0000208024	0000208024	---
---	DIODE,POWER	0000689045	0000689045	0000689045	0000689045	0000689045	0000689045	0000689045	0000689045	---
---	DIODE,ZENER	0000852166	0000852166	0000852166	0000852166	0000852166	0000852166	0000852166	0000852166	---
735	DISTRIBUTOR ASSY	---	---	---	---	9365061008	---	---	---	---
735	DISTRIBUTOR ASSY	---	---	---	---	9366444008	9366444008	9366444008	9366444008	---
764	DRAIN CAP	9358746004	9358746004	9358746004	9358746004	9358746004	9358746004	9358746004	9358746004	---
127	DRAIN HOSE ASSY	9359242000	9359242000	9359242000	9359242000	---	---	---	---	---
160	DRAIN PAN	---	---	---	---	9359698005	9359698005	9359698005	9359698005	---
160	DRAIN PAN ASSY	9358568002	9358568002	9358568002	9358568002	---	---	---	---	---

Models : ABY12TFAMF, ABY14TFAMF, ABY18TFAMF, ABY24TFAMF, ABY30TFAMF, ABY36TFAMF, ABY45TFAMF, ABY54TFAMF

Ref No.	Description	Parts No.								Ord Q'ty
		ABY12TFAMF	ABY14TFAMF	ABY18TFAMF	ABY24TFAMF	ABY30TFAMF	ABY36TFAMF	ABY45TFAMF	ABY54TFAMF	
439	DRAIN PAN WIRE	9358598009	9358598009	9358598009	9358598009					
186	EDGE COVER					9361049017	9361049017	9361049017	9361049017	
186	EDGE COVER					9361049024	9361049024	9361049024	9361049024	
629	EMI FILTER	0400056133	0400056133	0400056133	0400056133	0400056133	0400056133	0400056133	0400056133	
629-1	EMI FILTER	0400197119	0400197119	0400197119	0400197119	0400197119	0400197119	0400197119	0400197119	
629-2	EMI FILTER	0400406396	0400406396	0400406396	0400406396	0400406396	0400406396	0400406396	0400406396	
146	EVAPORATOR ASSY					9358870013				
146	EVAPORATOR ASSY	9359379003	9359379003							
146	EVAPORATOR ASSY					9359696001	9359696001	9359696001	9359696001	
146	EVAPORATOR ASSY			9367755004						
588-2	EVAPORATOR BRACKET-L	9358588000	9358588000	9358588000	9358588000					
588-1	EVAPORATOR BRACKET-R	9358587003	9358587003	9358587003	9358587003					
574-2	EVAPORATOR FIXTURE-L	9358590003	9358590003	9358590003	9358590003					
574-1	EVAPORATOR FIXTURE-R	9358589007	9358589007	9358589007	9358589007					
825	EXPANSION VALVE	9366302018	9366302018	9366302018	9366302018	9366302018	9366302018	9366302018	9366302018	
164	FAN MOTOR ASSY					9360457004	9360457004	9360457004	9360457004	
164	FAN MOTOR ASSY	9600778012	9600778012							
164	FAN MOTOR ASSY			9600778029						
164	FAN MOTOR ASSY				9600778043					
473	FILTER BRACKET	9358607008	9358607008	9358607008	9358607008					
345-2	FILTER GUIDE-L					9359693000	9359693000	9359693000	9359693000	
345-1	FILTER GUIDE-R					9359692003	9359692003	9359692003	9359692003	
875	FILTER PCB ASSY	9703944017	9703944017	9703944017	9703944017					
875	FILTER PCB ASSY					9703947018	9703947018	9703947018	9703947018	
431	FIXTURE-A	313546156408	313546156408	313546156408	313546156408					
321	FLAP ASSY					9359731009	9359731009	9359731009	9359731009	
520	FLAP BASE	9358537015	9358537015	9358537015	9358537015					
555	FLAP LINK-LOWER	9358552001	9358552001	9358552001	9358552001					
554	FLAP LINK-UPPER	9358551004	9358551004	9358551004	9358551004					
436	FLAP SPRING					9359730002	9359730002	9359730002	9359730002	
321	FLAP (LOWER)	9358541012	9358541012	9358541012	9358541012					
320	FLAP (UPPER)	9358538012	9358538012	9358538012	9358538012					
964	FLARE NUT-A	313996239804	313996239804							
964	FLARE NUT-A					9357352022	9357352022	9357352022	9357352022	
965	FLARE NUT-B	9351062019	9351062019	9351062019	9351062019					
63	FRONT PANEL					9359734000	9359734000	9359734000	9359734000	
824-3	FUSE	0600222512	0600222512	0600222512	0600222512	0600222512	0600222512	0600222512	0600222512	
379	FUSE HOLDER	0500158072	0500158072	0500158072	0500158072	0500158072	0500158072	0500158072	0500158072	
472	GRILLE HINGE PLATE					9359694007	9359694007	9359694007	9359694007	
488	GRILLE SUPPORT	9358602003	9358602003	9358602003	9358602003					
150-1	GRILLE-F	9358532010	9358532010	9358532010	9358532010					
150-1	HALF UNION-B						9352768002	9352768002	9352768002	
174	HALF UNION-B						9357351018	9357351018	9357351018	
174	HANGER BRACKET					9359742005	9359742005	9359742005	9359742005	
173	HANGER BRACKET-L	9358596005	9358596005	9358596005	9358596005					
174	HANGER BRACKET-R	9358595008	9358595008	9358595008	9358595008					
91	HINGE					9359699002	9359699002	9359699002	9359699002	
731-2	HPLDER (GUIDE RAIL)	0600241018	0600241018	0600241018	0600241018					
181	HOLE COVER					9359691006	9359691006	9359691006	9359691006	
	HYBRID IC	0100335019	0100335019	0100335019	0100335019	0100335019	0100335019	0100335019	0100335019	
	IC	0100462104	0100462104	0100462104	0100462104	0100462104	0100462104	0100462104	0100462104	
	IC	0101461120	0101461120	0101461120	0101461120	0101461120	0101461120	0101461120	0101461120	
	IC	0101846071	0101846071	0101846071	0101846071	0101846071	0101846071	0101846071	0101846071	
	IC	0101525129	0101525129	0101525129	0101525129	0101525129	0101525129	0101525129	0101525129	
	IC (TRANSISTOR ARRY)	0100028041	0100028041	0100028041	0100028041	0100028041	0100028041	0100028041	0100028041	
385	INDICATOR PCB ASSY	9701873012	9701873012	9701873012	9701873012					
385	INDICATOR PCB ASSY					9702260019	9702260019	9702260019	9702260019	
147	INLET PIPE (EVA) ASSY			9364760001						
147	INLET PIPE (EVA) ASSY	9366525004	9366525004							
907-1	INS (PIPE THRM)					9360227003	9360227003	9360227003	9360227003	
296	INS (PIPE)			9359311041						
	INSTALLATION MANUAL	9367701018	9367701018	9367701018	9367701018					
	INSTALLATION MANUAL					9367702015	9367702015	9367702015	9367702015	
	INSULATION (DRAIN H)					9360464002	9360464002	9360464002	9360464002	
553	INSULATION (EVA) -L	9358857007	9358857007	9358857007	9358857007					
552	INSULATION (EVA) -R	9358575000	9358575000	9358575000	9358575000					
418	INSULATION (FLAP BASE)	9358572009	9358572009	9358572009	9358572009					
	INSULATION (LOUV.BASE)					9360219008	9360219008	9360219008	9360219008	
	INSULATION (LOUV.BASE)					9361044005	9361044005	9361044005	9361044005	
	INSULATION (LOUV.BASE)					9361045002	9361045002	9361045002	9361045002	
229	INSULATION (LOUVER) -L					9359722007	9359722007	9359722007	9359722007	
228	INSULATION (LOUVER) -R					9359721000	9359721000	9359721000	9359721000	
416	INSULATION (PANEL) -A	9358574003	9358574003	9358574003	9358574003					
417	INSULATION (PANEL) -B	9358914007	9358914007	9358914007	9358914007					
907	INSULATION (PIPE)					9367241002	9367241002	9367241002	9367241002	
97	INSULATION (PIPE)-A					9360213006	9360213006	9360213006	9360213006	
172	INSULATION (PIPE)-B			313209328104	313209328104					
98	INSULATION (PIPE)-B					9360214003	9360214003	9360214003	9360214003	
172-1	INSULATION (PIPE)-C	9350716012	9350716012	9350716012	9350716012					
267-2	INSULATION (PIPE)-C					9350716029	9350716029	9350716029	9350716029	
267-3	INSULATION (PIPE)-D					9352766015	9352766015	9352766015	9352766015	
74	INTAKE GRILLE					9359738008	9359738008	9359738008	9359738008	
388	JOINT ASSY					9359706007	9359706007	9359706007	9359706007	
	JOINT PIPE B					9365067000				
326	JOINT.3-WAY	9359419006	9359419006							
770	LABEL (DEELECTION C)	9363050004	9363050004	9363050004	9363050004	9363050004	9363050004	9363050004	9363050004	
	LABEL "R407C"	9362409001	9362409001	9362409001	9362409001	9362409001	9362409001	9362409001	9362409001	
	LED	0000813235	0000813235	0000813235	0000813235	0000813235	0000813235	0000813235	0000813235	
	LED	0000813242	0000813242	0000813242	0000813242	0000813242	0000813242	0000813242	0000813242	
	LED	0000813259	0000813259	0000813259	0000813259	0000813259	0000813259	0000813259	0000813259	
526	LOCKING CAP SPACER	9359100003	9359100003	9359100003	9359100003					
381-4	LOCKING APACER					0600118075	0600118075	0600118075	0600118075	
380	LOCKING APACER					313209391403	313209391403	313209391403	313209391403	

Models : AU45TFAMF,ARY54TFAMF
 AU20TFAMF

Ref No.	Description	Parts No.			Ord Q'ty	Ref No.	Description	Parts No.			Ord Q'ty
		AU45TFAMF	ARY54TFAMF	AU20TFAMF				AU45TFAMF	ARY54TFAMF	AU20TFAMF	
	RESISTOR.CHIP	0201010426	0201010426	0201010426							
	RESISTOR.CHIP	0201010501	0201010501	0201010501							
	RESISTOR.CHIP	0201010648	0201010648	0201010648							
	RESISTOR.CHIP	0201010747	0201010747	0201010747							
	RESISTOR.CHIP	0201010907	0201010907	0201010907							
	RESISTOR.CHIP	0201011010	0201011010	0201011010							
	RESISTOR.WIRING	0200244372	0200244372	0200244372							
472-4	REM (GRILLE) D	9362741002	9362741002	9362741002							
Jan-47	RUBBER (DISCHA.PIPE)	313194159807	313194159807	313194159807							
67	RUBBER (VIB.PROOF)	9362783002	9362783002	9362783002							
138	SEPARATE WALL	9362737005	9362737005	9362737005							
599	SIGNAL PCB ASSY	9703728013	9703728013	9703728013							
	SOCKET.PWB	0500296033	0500296033	0500296033							
155	SPECIAL NUT M6	9307615016	9307615016	9307615016							
468	SPECIAL NUT-A (LARGE)	313005446653	313005446653	313005446653							
469	SPECIAL NUT-B (SMALL)	313005446759	313005446759	313005446759							
476-2	SPECIAL WASHER	9362756006	9362756006	9362756006							
876-2	STEP MOTOR	9360307019	9360307019	9360307019							
909	STRAINER A	9365457009	9365457009	9365457009							
909	STRAINER B	-----	-----	9365456002							
997	STRAINER D	9365450000	9365450000	9365450000							
	SWITCH.PUSH	9700450016	9700450016	9700450016							
	SWITCH.RATARY	9701694013	9701694013	9701694013							
	SWITCH.SLIDE	9701393015	9701393015	9701393015							
	TEMPLATE	9363173000	9363173000	9363173000							
541	TERMINAL PLATE	9363642001	9363642001	9363642001							
815-2	TERMINAL 3P	9703345012	9703345012	9703345012							
815	TERMINAL 4P	9306488055	9306488055	9306488055							
652-1	THERM.HOLDER PIPE	313806262805	313806262805	313806262805							
918	THERMISTOR ASSY	9703756016	9703756016	9703756016							
234	THERMISTOR ASSY-ROOM	9703299025	9703299025	9703299025							
235	THERMISTOR ASSY-ROOM	9703299094	9703299094	9703299094							
163-2/184-1	THERMO.SPRING-A	313728262708	313728262708	313728262708							
462	TOP COVER PLATE	9362806015	9362806015	9362806015							
	TRANSFORMER (SWITCHG)	9702727017	9702727017	9702727017							
	TRANSISTOR	0000164047	0000164047	0000164047							
400	TRANSISTOR	0000699235	0000699235	0000699235							
	TRANSISTOR	0000781053	0000781053	0000781053							
	TRANSISTOR	0000936033	0000936033	0000936033							
474	TURBO FAN ASSY	9362803014	9362803014	9362803014							
	VARISTOR	0000038010	0000038010	0000038010							
	VARISTOR	0600168032	0600168032	0600168032							
197	WIND GUIDE BOARD	9363117004	9363117004	9363117004							
253-	WIRE ASSY	9703251016	9703251016	9703251016							
253-	WIRE ASSY	9703757044	9703757044	9703757044							
253-	WIRE ASSY (CAPACITOR)	9703254017	9703254017	9703254017							
253-	WIRE ASSY (CONNECTOR)	9702264017	9702264017	9702264017							
253-	WIRE ASSY (CONNECTOR)	9703258015	9703258015	9703258015							
253-	WIRE ASSY (CONNECTOR)	9703260018	9703260018	9703260018							
	WIRE ASSY (CONNECTOR)	9703875014	9703875014	9703875014							
253-	WIRE ASSY (FLOAT SW)	9703256011	9703256011	9703256011							
253-	WIRE ASSY (REMOTE)	9703267017	9703267017	9703267017							
253-	WIRE ASSY (STEP MO.)	9703255014	9703255014	9703255014							
253-1	WIRE ASSY	9702313043	9702313043	9702313043							
834-1	WIRE COVER-A	9362789004	9362789004	9362789004							
384-2	WIRE COVER-B	9362788007	9362788007	9362788007							
253	WIRE WITH CONNECTOR	9704004017	9704004017	9704004017							
	XTAL.RESONATOR	9703542015	9703542015	9703542015							

Models : ASY14TFAMF,ASY20TFAMF
 ASY24TFAMF,ASY30TFAMF

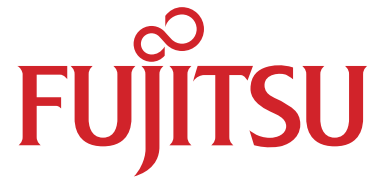
Ref No.	Description	Parts No.				Ord Qty
		ASY14TFAMF	ASY20TFAMF	ASY24TFAMF	ASY30TFAMF	
93	AIR FILTER	9364577012	9364577012	9364577012	9364577012	
683	BLANCE SPRING	9358151006	9358151006	9358151006	9358151006	
108	BASE	9357948010	9357948010	9357948010	9357948010	
967	BONNET-B	-----	313045417959	313045417959	313045417959	
767-1	BOTTOM COVER-A	9357949017	9357949017	9357949017	9357949017	
767-2	BOTTOM COVER-B	9357950013	9357950013	9357950013	9357950013	
199	BR SHEET	9363708028	9363708028	9363708028	9363708028	
401	BRACKET PANEL	9357952000	9357952000	9357952000	9357952000	
958	BRACKET PANEL (EVA)	9358626009	9358626009	9358626009	9358626009	
394	BRACKET PANEL (PIPE)	9357951003	9357951003	9357951003	9357951003	
251	BRACKET (HOSE)-B	-----	9362208017	9362208017	9362208017	
361	BUSHING	9357942001	9357942001	9357942001	9357942001	
	BUZZER	9701298013	9701298013	9701298013	9701298013	
64/34	CAPACITOR (FAN MOTOR)	9700468073	9700468073	9700468073	9700468073	
	CAPACITOR.ELEC	0301192558	0301192558	0301192558	0301192558	
	CAPACITOR.ELEC	0300256060	0300256060	0300256060	0300256060	
	CAPACITOR.PLASTIC	0300304099	0300304099	0300304099	0300304099	
	CAPACITOR.PLASTIC	0301052098	0301052098	0301052098	0301052098	
109	CASING	9361280014	9361280014	9361280014	9361280014	
110	CASING ASSY	-----	9358182116	9358182116	9358182116	
291-1	CASING SPACER A	9364151007	9364151007	9364151007	9364151007	
291-2	CASING SPACER B	9364152004	9364152004	9364152004	9364152004	
291-3	CASING SPACER C	9364177007	9364177007	9364177007	9364177007	
	CERAMIC RESONATOR	9701261031	9701261031	9701261031	9701261031	
195	CLAMP	313361275805	313361275805	313361275805	313361275805	
196-2	CLAMP	313035356905	313035356905	313035356905	313035356905	
196-1	CLAMP	312300787605	312300787605	312300787605	312300787605	
223	CONTROL BOX	9357953007	9357953007	9357953007	9357953007	
236	CONTROLLER PCB ASSY	9701042012	9701042012	9701042012	9701042012	
	CONTROLLER PCB ASSY	9703766015	9703766015	9703766015	9703766015	
982	CORD CLAMP	9357886008	9357886008	9357886008	9357886008	
329	COUPLING PIPE ASSY E	-----	9366829003	9366829003	9366829003	
329	COUPLING PIPE ASSY E	-----	9366829003	9366829003	9366829003	
756	COVER (CASING)-B	9363787016	9363787016	9363787016	9363787016	
755	COVER (CASING)-L	9363786019	9363786019	9363786019	9363786019	
679	COVER (POWER)	9357916019	9357916019	9357916019	9357916019	
762	COVER (SIDE)-L	9357902012	9357902012	9357902012	9357902012	
761	COVER (SIDE)-R	9357901015	9357901015	9357901015	9357901015	
938	COVER (SWITCH)	9357956015	9357956015	9357956015	9357956015	
685	COVER (TERMINAL)	9357955001	9357955001	9357955001	9357955001	
326	CROSS FLOW FAN-L ASY	9357919003	9357919003	9357919003	9357919003	
325	CROSS FLOW FAN-R ASY	-----	9357918006	9357918006	9357918006	
141-1	CUSHION (BASE) L	9366864011	9366864011	9366864011	9366864011	
141-2	CUSHION (BASE) R	9366864028	9366864028	9366864028	9366864028	
	CUSHION (BRKT.PANEL) A	9361152014	9361152014	9361152014	9361152014	
268-1	CUSHION (CASING) A	9364410005	9364410005	9364410005	9364410005	
268-2	CUSHION (CASING) B	9364411002	9364411002	9364411002	9364411002	
268-3	CUSHION (CASING) K	9364416007	9364416007	9364416007	9364416007	
268-4	CUSHION (CASING) L	9364417004	9364417004	9364417004	9364417004	
268-5	CUSHION (CASING) M	9364418001	9364418001	9364418001	9364418001	
268-6	CUSHION (CASING) N	9364419008	9364419008	9364419008	9364419008	
268-7	CUSHION (CASING) O	9364420004	9364420004	9364420004	9364420004	
268-8	CUSHION (CASING) P	9364421001	9364421001	9364421001	9364421001	
268-9	CUSHION (CASING) Q	9364422008	9364422008	9364422008	9364422008	
268-10	CUSHION (CASING) R	9364408002	9364408002	9364408002	9364408002	
268-11	CUSHION (CASING) S	9364519012	9364519012	9364519012	9364519012	
35	CUSHION (CONTROL BOX)	9358720004	9358720004	9358720004	9358720004	
269-1	CUSHION (HIGH PLATE) A	9364478012	9364478012	9364478012	9364478012	
269-2	CUSHION (ROD) A	9364472010	9364472010	9364472010	9364472010	
960	DIFFUSER	9357941011	9357941011	9357941011	9357941011	
556	DIFFUSER LINK	9357926001	9357926001	9357926001	9357926001	
557	DIFFUSER SPRING	9357947006	9357947006	9357947006	9357947006	
	DIODE	0000353120	0000353120	0000353120	0000353120	
	DIODE	0000625036	0000625036	0000625036	0000625036	
	DIODE	0000746519	0000746519	0000746519	0000746519	
	DIODE	0000906500	0000906500	0000906500	0000906500	
	DIODE.MINIMOLD	0000684019	0000684019	0000684019	0000684019	
	DIODE.POWER	0000208024	0000208024	0000208024	0000208024	
	DIODE.POWER	0000689045	0000689045	0000689045	0000689045	
	DIODE.ZENER	0000852166	0000852166	0000852166	0000852166	
976	DISPLAY WINDOW	9357903019	9357903019	9357903019	9357903019	
735-1	DISTRIBUTOR	-----	-----	-----	9304394006	
425	FARTH PLATE	9357957005	9357957005	9357957005	9357957005	
629	EMI FILTER	0400056133	0400056133	0400056133	0400056133	
629-1	EMI FILTER	0400197119	0400197119	0400197119	0400197119	
629-2	EMI FILTER	0400406396	0400406396	0400406396	0400406396	
146	EVAPORATOR ASSY	-----	-----	-----	9358308004	
146	EVAPORATOR ASSY	9361995000	9361995000	9361995000	-----	
825	EXPANSION VALVE	9366301011	9366301011	9366301011	9366301011	
963	FAN GUARD	9357936000	9357936000	9357936000	9357936000	
164	FAN MOTOR ASSY-IN	-----	-----	-----	9358643013	

Models : ASY14TFAMF,ASY20TFAMF
 ASY24TFAMF,ASY30TFAMF

Ref No.	Description	Parts No.				Ord Q'ty
		ASY14TFAMF	ASY20TFAMF	ASY24TFAMF	ASY30TFAMF	
164	FAN MOTOR ASSY-IN	-----	-----	9601016014	-----	
164	FAN MOTOR ASSY-IN	-----	9601016021	-----	-----	
875	FILTER PCB ASSY	9703772016	9703772016	9703772016	9703772016	
431	FIXTURE-A	313546156408	313546156408	313546156408	313546156408	
555	FLAP LINK-LOWER	9357925004	9357925004	9357925004	9357925004	
554	FLAP LINK-UPPER	9357924007	9357924007	9357924007	9357924007	
321	FLAP (LOWER)	9357940014	9357940014	9357940014	9357940014	
320	FLAP (UPPER)-F	9357938011	9357938011	9357938011	9357938011	
964	FLARE NUT-A	-----	-----	-----	-----	
965	FLARE NUT-B	9351062019	9351062019	9351062019	-----	
63	FRONT PANEL ASSY	9358181010	9358181010	9358181010	9358181010	
824-3	FUSE	0600222512	0600222512	0600222512	0600222512	
	FUSE HOLDER	0500158072	0500158072	0500158072	0500158072	
91	HINGE PLATE	9361281011	9361281011	9361281011	9361281011	
273	HOLDER (LAMP)	9357958002	9357958002	9357958002	9357958002	
686	HOLDER (RELAY)	9357960005	9357960005	9357960005	9357960005	
777	HOOK (GRILLE)-L	9357985015	9357985015	9357985015	9357985015	
776	HOOK (GRILLE)-R	9357986012	9357986012	9357986012	9357986012	
127	HOSE (DRAIN) ASSY	-----	9367348015	9367348015	9367348015	
	HYBRID IC	0100335019	0100335019	0100335019	0100335019	
	IC	0100462104	0100462104	0100462104	0100462104	
	IC	0101461120	0101461120	0101461120	0101461120	
	IC	0101846071	0101846071	0101846071	0101846071	
	IC (PHOTO AMP)	0101525129	0101525129	0101525129	0101525129	
	IC (TRANSISTOR ARRAY)	0100028041	0100028041	0100028041	0100028041	
385	INDICATOR PCB ASSY	9701869015	9701869015	9701869015	9701869015	
	INSTALLATION MANUAL	9366521006	9366521006	9366521006	9366521006	
268-6	INSU (CASING COVER) A	9364409009	9364409009	9364409009	9364409009	
230-1	INSU (DIFFUZER) C	9366842019	9366842019	9366842019	9366842019	
478-1	INSU (HING PLATE B) H	9358383001	9358383001	9358383001	9358383001	
478-2	INSU (HING PLATE E)	9358386002	9358386002	9358386002	9358386002	
331	INSU (HING PLATE G) H	9358964002	9358964002	9358964002	9358964002	
331	INSULATION (BASE)-A	9357959009	9357959009	9357959009	9357959009	
268-1	INSULATION (BASE)-B	9364426006	9364426006	9364426006	9364426006	
268-2	INSULATION (CASING)-A	9364412009	9364412009	9364412009	9364412009	
268-4	INSULATION (CASING)-B	9364413006	9364413006	9364413006	9364413006	
268-6	INSULATION (CASING)-D	9364414003	9364414003	9364414003	9364414003	
268-8	INSULATION (CASING)-F	9365778005	9365778005	9365778005	9365778005	
268-	INSULATION (CASING)-H	9358703007	9358703007	9358703007	9358703007	
478-4	INSULATION (DRAIN H)	-----	9358793008	9358793008	9358793008	
478-5	INSULATION (HINGE)-F	9364423005	9364423005	9364423005	9364423005	
478-6	INSULATION (HINGE)-J	9364425009	9364425009	9364425009	9364425009	
759	INSULATION (HINGE)-X	9364424002	9364424002	9364424002	9364424002	
158	INTAKE GRILLE-F	9357896014	9357896014	9357896014	9357896014	
158	JOINT PIPE ASSY-E	-----	-----	-----	9366764007	
	JOINT PIPE ASSY-E	-----	9366826002	9366826002	-----	
	LABEL "R407C"	9362409001	9362409001	9362409001	9362409001	
	LED	0000813235	0000813235	0000813235	0000813235	
	LED	0000813242	0000813242	0000813242	0000813242	
	LED	0000813259	0000813259	0000813259	0000813259	
	LOUVER	9357933016	9357933016	9357933016	9357933016	
408	LOUVER LINK	9357935003	9357935003	9357935003	9357935003	
470-2	LOUVER ROD	9357932002	9357932002	9357932002	9357932002	
470-3	LOUVER STOPPER	9357934006	9357934006	9357934006	9357934006	
	MANUAL (INSULATION)	9361758001	9361758001	9361758001	9361758001	
684	MOTOR BASE	9357929002	9357929002	9357929002	9357929002	
470-1	MOTOR ROD	9357931005	9357931005	9357931005	9357931005	
	NETWORK.(CR ABSORBER)	0301241072	0301241072	0301241072	0301241072	
	PACKING CASE-CARTON	9301094015	9301094015	9301094015	9301094015	
	PACKING CASE-CARTON	-----	9366522010	-----	-----	
	PACKING CASE-CARTON	-----	-----	9366522027	-----	
	PACKING CASE-CARTON	-----	-----	-----	9366522034	
	PACKING CASE-CARTON	9366522041	-----	-----	-----	
	PACKING INNER	9358527009	9358527009	9358527009	9358527009	
	PACKING INNER-CORNER	9352170041	9352170041	9352170041	9352170041	
	PACKING PAD	9358166000	9358166000	9358166000	9358166000	
	PACKING PAD-LOWER	9358277003	9358277003	9358277003	9358277003	
	PACKING PAD-UPPER	9358276006	9358276006	9358276006	9358276006	
925	PSNEL (EVAPORATR-R)-B	9357909004	9357909004	9357909004	9357909004	
	PHOTO COUPLER	0000117074	0000117074	0000117074	0000117074	
	PLUG CONTACT	0500536016	0500536016	0500536016	0500536016	
	PLUG.PWB	0500005321	0500005321	0500005321	0500005321	
	PLUG.PWB	0500005345	0500005345	0500005345	0500005345	
	PLUG.PWB	0500006069	0500006069	0500006069	0500006069	
	PLUG.PWB	0500011742	0500011742	0500011742	0500011742	
	PLUG.PWB	0500011773	0500011773	0500011773	0500011773	
	PLUG.PWB	0500011827	0500011827	0500011827	0500011827	
	PLUG.PWB	0500951048	0500951048	0500951048	0500951048	
	PLUG.PWB	0500957026	0500957026	0500957026	0500957026	
	PLUG.PWB	0501045012	0501045012	0501045012	0501045012	
	PLUG.PWB	0501045043	0501045043	0501045043	0501045043	

Models : ASY14TFAMF,ASY20TFAMF
 ASY24TFAMF,ASY30TFAMF

Ref No.	Description	Parts No.				Ord Q'ty
		ASY14TFAMF	ASY20TFAMF	ASY24TFAMF	ASY30TFAMF	
67-2	RUBBER B	-----	9366485018	9366485018	-----	
67-2	RUBBER-B	-----			9361237001	
122	SHAFT HOLDER-B	-----	9357921006	9357921006	9357921006	
158	SUCTION PIPE ASSY E	-----	9358523001	9358523001	9358523001	
163-2/184-1	THERMO.SPRING-A	313728262708	313728262708	313728262708	313728262708	
253-	WIRE ASSY 2P	9702080013	9702080013	9702080013	9702080013	
253-	WIRE ASSY (COMMUNICAT)	9703757013	9703757013	9703757013	9703757013	
253-	WIRE ASSY (CONNECTOR)	9701856015	9701856015	9701856015	9701856015	
253-	WIRE ASSY (CONNECTOR)	9703875014	9703875014	9703875014	9703875014	
253-	WIRE ASSY (FAN.CAPA.)	9701951017	9701951017	9701951017	9701951017	
253-	WIRE ASSY (POWER)	9358955000	9358955000	9358955000	9358955000	
253-	WIRE ASSY (TERMINAL)	9701880010	9701880010	9701880010	9701880010	
253-1	WIRE ASSY	9702313036	9702313036	9702313036	9702313036	
234	THERMISTOR ASSY-ROOM	9703299018	9703299018	9703299018	9703299018	
336	SUCTION PIPE ASSY E	-----			9366765004	
336	SUCTION PIPE ASSY E	-----	9366827009	9366827009	-----	
558	ROD-A	9357927008	9357927008	9357927008	9357927008	
559	ROD-B	9357928005	9357928005	9357928005	9357928005	
599	SIGNAL PCB ASSY	9703728013	9703728013	9703728013	9703728013	
652-1	THERM.HOLDER PIPE	313806262805	313806262805	313806262805	313806262805	
850	RECEIVER WINDOW	9357917016	9357917016	9357917016	9357917016	
876-1	STEP MOTOR-H	9359763000	9359763000	9359763000	9359763000	
876-2	STEP MOTOR-V	9359762003	9359762003	9359762003	9359762003	
909	STRAINER A	-----			9365457009	
909	STRAINER C	9365443002	9365443002	9365443002	9365443002	
918	THERMISTOR ASSY	9703756016	9703756016	9703756016	9703756016	
918	THERMISTOR (ROOM)	9703299124	9703299124	9703299124	9703299124	
928-1	U-PIPE (B)	9359081005	9359081005	9359081005	-----	
996	STRAINER G	9365455005	9365455005	9365455005	-----	
	SOCKET.PWB	0500296033	0500296033	0500296033	0500296033	
	VARISTOR (VARISTOR)	0600168032	0600168032	0600168032	0600168032	
	PLUG.PWB	0501045050	0501045050	0501045050	0501045050	
	PLUG.PWB	0501045067	0501045067	0501045067	0501045067	
	PLUG.PWB	0501045210	0501045210	0501045210	0501045210	
	PLUG.PWB	0501045227	0501045227	0501045227	0501045227	
	PLUG.PWB	0501045357	0501045357	0501045357	0501045357	
	PLUG.PWB	0501045517	0501045517	0501045517	0501045517	
	PRCS PIPE	9359979005	9359979005	9359979005	-----	
	RELAY	9701316014	9701316014	9701316014	9701316014	
	RELAY	9701566013	9701566013	9701566013	9701566013	
	RELAY.SOLID	9701829019	9701829019	9701829019	9701829019	
	RESISTOR.CHIP	0200306667	0200306667	0200306667	0200306667	
	RESISTOR.CHIP	0200230627	0200230627	0200230627	0200230627	
	RESISTOR.CHIP	0201010013	0201010013	0201010013	0201010013	
	RESISTOR.CHIP	0201010426	0201010426	0201010426	0201010426	
	RESISTOR.CHIP	0201010501	0201010501	0201010501	0201010501	
	RESISTOR.CHIP	0201010648	0201010648	0201010648	0201010648	
	RESISTOR.CHIP	0201010747	0201010747	0201010747	0201010747	
	RESISTOR.CHIP	0201010907	0201010907	0201010907	0201010907	
	RESISTOR.CHIP	0201011010	0201011010	0201011010	0201011010	
	RESISTOR.WIRING	0200244372	0200244372	0200244372	0200244372	
	SEAL (BASE) A	9364429014	9364429014	9364429014	9364429014	
	SEAL (BASE) B	9364429021	9364429021	9364429021	9364429021	
	SEAL (BASE) C	9364429038	9364429038	9364429038	9364429038	
	SEAL (CASING) A	9364429045	9364429045	9364429045	9364429045	
	WIRE WITH TERMINAL	9704251015	9704251015	9704251015	9704251015	
	SWITCH PUSH	9700450016	9700450016	9700450016	9700450016	
	SWITCH.ROTARY	9701694013	9701694013	9701694013	9701694013	
	SWITCH.SLIDE	9701393015	9701393015	9701393015	9701393015	
	TERMINAL	9704243010	9704243010	9704243010	9704243010	
	TRANSFORMER (SWITCHG)	9702727017	9702727017	9702727017	9702727017	
	TRANSISTOR	0000164047	0000164047	0000164047	0000164047	
	TRANSISTOR	0000699235	0000699235	0000699235	0000699235	
	TRANSISTOR	0000781053	0000781053	0000781053	0000781053	
	TRANSISTOR	0000936033	0000936033	0000936033	0000936033	
	VARISTOR	0000038010	0000038010	0000038010	0000038010	
	XTAL.RESONATOR	9703542015	9703542015	9703542015	9703542015	



FUJITSU GENERAL LIMITED

1116, Suenaga, Takatsu-ku, Kawasaki 213-8502, Japan