

**SPLIT TYPE
ROOM AIR CONDITIONER**

**Cassette type
INVERTER**

SERVICE INSTRUCTION

Models	Indoor unit	Outdoor unit
AUXG30LRLB		AO*G30LBTA
AUXG36LRLB		AO*G36LBTA
AUXG45LRLB		AO*G45LBTA
AUXG54LRLB		AO*G54LBTA
RCG30LRLB		ROG30LBTA
RCG36LRLB		ROG36LBTA
RCG45LRLB		ROG45LBTA
RCG54LRLB		ROG54LBTA

Refrigerant

R410A

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Cassette type **INVERTER**

1 . DESCRIPTION OF EACH CONTROL OPERATION

1-1. COOLING OPERATION

1-1-1 COOLING CAPACITY CONTROL

A sensor (room temperature thermistor) built in the indoor unit will usually perceive difference or variation between a set temperature and present room temperature, and controls the operation frequency of the compressor.

* If the room temperature is 6.0°C higher than a set temperature, the compressor operation frequency will attain to maximum performance.

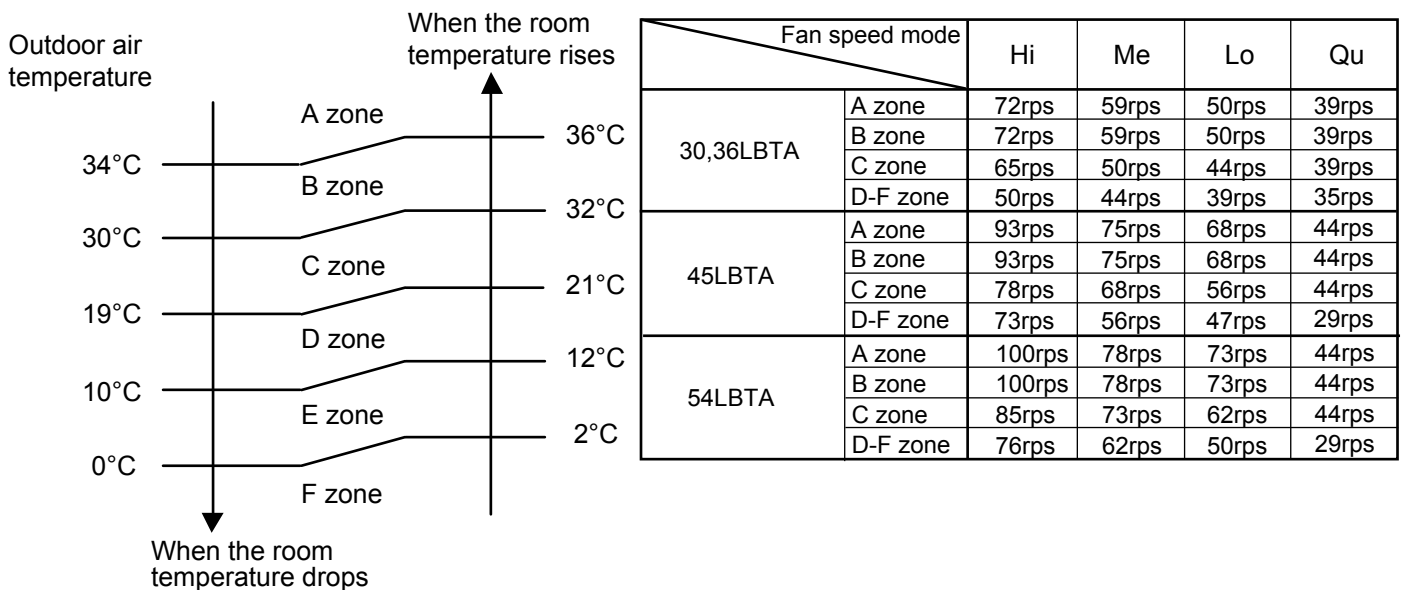
* If the room temperature is 1.0°C lower than a set temperature, the compressor will be stopped.

* When the room temperature is between +6.0°C to -1.0°C of the setting temperature, the compressor frequency is controlled within the range shown in Table1. However, the maximum frequency is limited in the range shown in Fig.1 based on the fan speed mode and the outdoor temperature.

(Table 1 : Compressor Frequency Range)

	minimum frequency	maximum frequency
30,36LBTA	16rps	90rps
45LBTA	16rps	100rps
54LBTA	16rps	110rps

(Fig. 1 : Limit of Maximum Frequency based on Outdoor Temperature)



1-2. HEATING OPERATION

A sensor (room temperature thermistor) built in the indoor unit will usually perceive difference or variation between a set temperature and present room temperature, and controls the operation frequency of the compressor.

- * If the room temperature is lower 6.0°C than a set temperature, the compressor operation frequency will attain to maximum performance.
- * If the room temperature is higher 1.0°C than a set temperature, the compressor will be stopped.
- * When the room temperature is between +1.0°C to -6.0°C of the setting temperature, the compressor frequency is controlled within the range shown in Table2.

(Table 2 : Compressor Frequency Range)

MODEL	minimum frequency	maximum frequency
30,36LBTA	16rps	90rps
45,54LBTA	16rps	110rps

1-3. DRY OPERATION

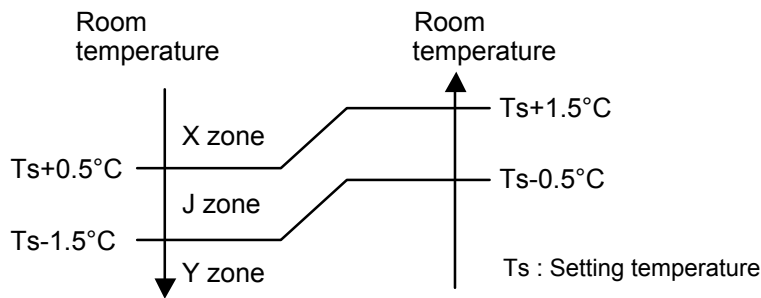
1-3-1 INDOOR UNIT CONTROL

The compressor rotation frequency shall change according to set temperature and room temperature variation which the room temperature sensor of the indoor unit has detected as shown in the Table 3.

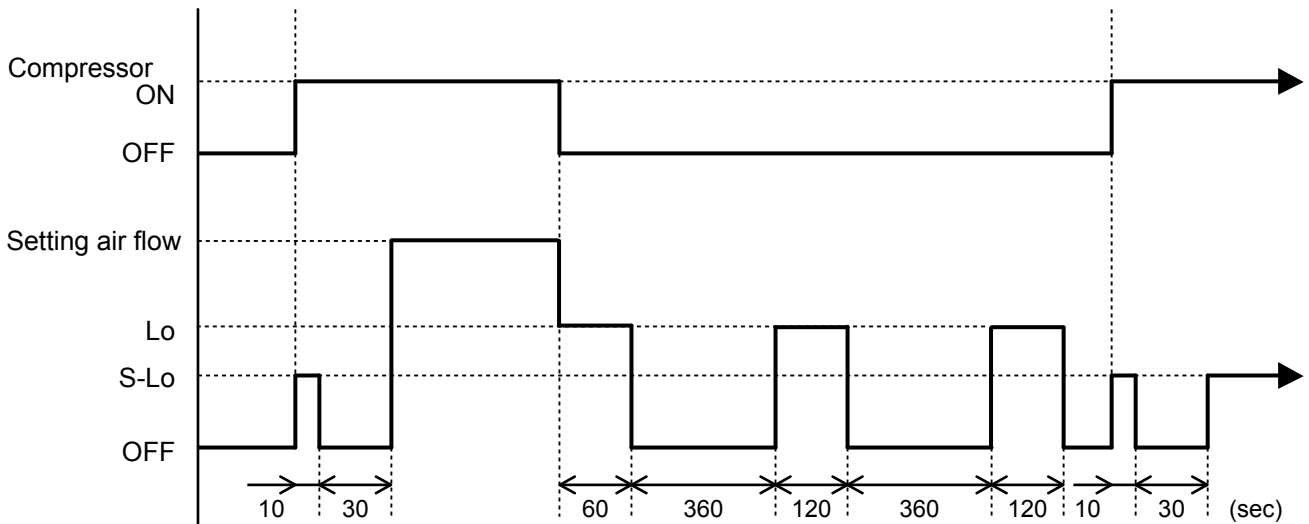
(Table 3 : Compressor frequency)

	Operating frequency	
	30,36LRLB	45,54LRLB
X zone	39rps	44rps
J zone		
Y zone	0rps	0rps

(Fig.2 : Compressor Control based on Room Temperature)



(Fig.3 : Indoor Fan Control)



1-4. AUTO CHANGEOVER OPERATION

When the air conditioner is set to the Auto mode by remote controller, operation starts in the optimum mode from among the Heating, Cooling, and Monitoring mode. During operation, the optimum mode is automatically switched in accordance with temperature changes. The temperature can be set between 18°C and 30°C in 0.5°C (wireless and 2WIRE remote controller) Or 1.0°C(3WIRE remote controller) steps.

- ① When operation starts, indoor fan and outdoor fan are operated for around 1 minutes. Room temperature and outdoor temperature are sensed, and the operation mode is selected in accordance with the table below. <Monitoring mode>

(Table 4 : Operation mode selection table)

Room temperature (TR)	Operation mode
$TR > Ts + 2^{\circ}\text{C}$	Cooling
$Ts + 2^{\circ}\text{C} \geq TR \geq Ts - 2^{\circ}\text{C}$	*Middle zone
$TR < Ts - 2^{\circ}\text{C}$	Heating

TR : Room temperature
Ts : Setting temperature

*If it's Middle zone, operation mode of indoor unit is selected as below.

- (1). Same operation mode is selected as outdoor unit.

If outdoor unit is operating in Cooling and Heating mode, indoor unit will be operated by the same operation mode.

- (2). Selected by the outdoor temperature.

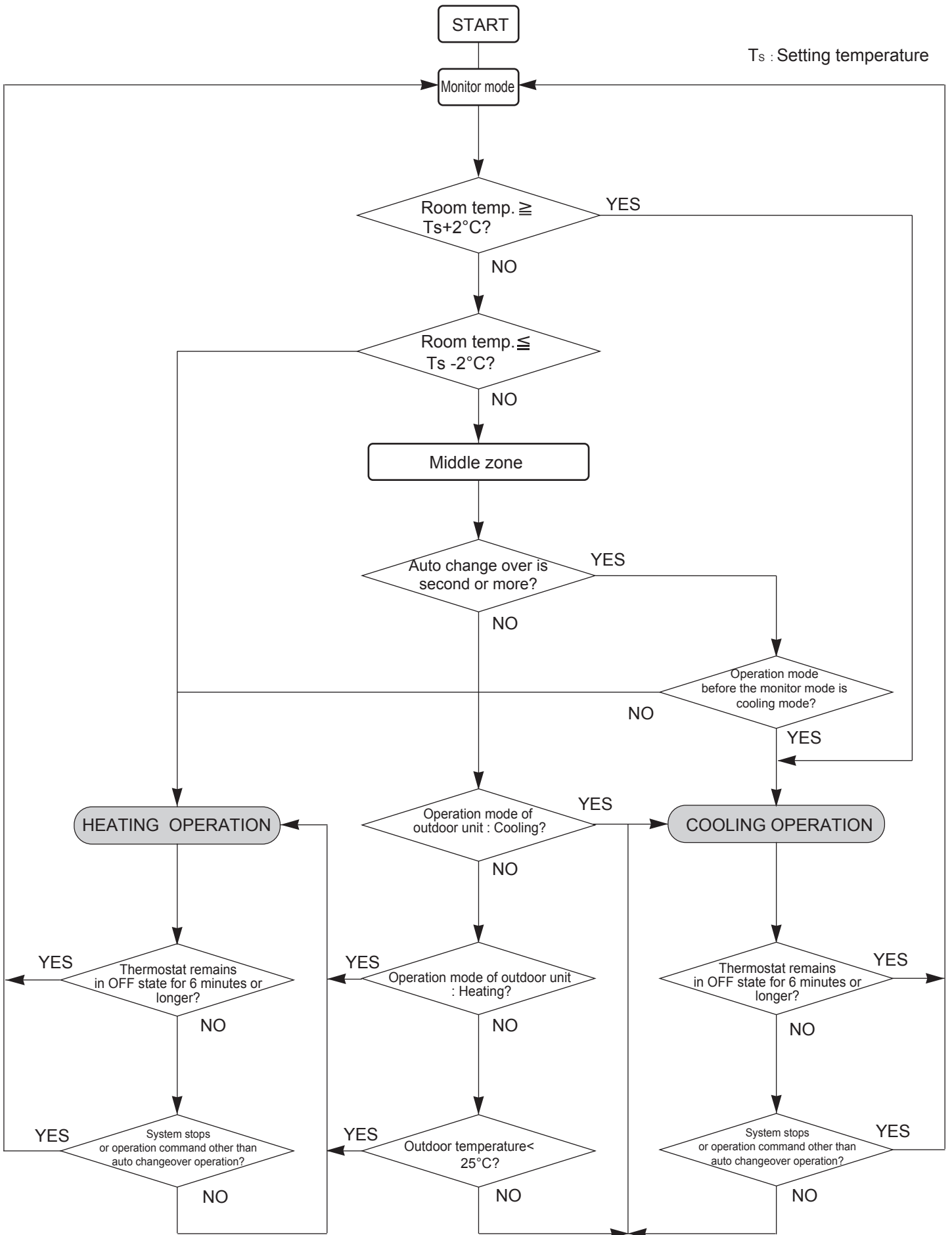
If outdoor unit is operating in other than Cooling and Heating mode, indoor unit will be operated according to the outdoor temperature as below.

(Fig.4 : Outdoor temperature zone selection)

Temperature	Mode
25°C and over	Cooling
25°C under	Heating

- ② When the compressor was stopped for 6 consecutive minutes by the temperature control function after the Cooling or Heating mode was selected at ① above, operation is switched to Monitoring and the operation mode is selected again.
- ③ When the middle zone is selected on the predetermining of the operation mode, the operation mode before the changing to the monitor mode is selected.

■ AUTO CHANGEOVER operation flow chart



1-5. INDOOR FAN CONTROL

1. Fan speed

(Table 5 : Standard of Indoor Fan Speed)

*The following fan speed is a standard value.

Operation mode	Air flow mode	Speed (rpm)			
		30LRLB	36LRLB	45LRLB	54LRLB
Heating	HIGH	560	660	700	740
	MED+	530	600	630	680
	MED	510	560	590	630
	LOW	470	510	530	570
	Quiet	420	430	470	480
	Cool air prevention	300	300	300	300
Cooling	HIGH	560	660	700	740
	MED	510	560	590	630
	LOW	470	510	530	570
	Quiet	420	430	470	480
FAN	*Soft Quiet	300	300	300	300
S-Lo		270	270	270	270
Dry		420	430	470	480

*Note, during Economy operation and operation mode is FAN, the air flow is 1 step downs.
(Hi > Me, Me > Lo, Lo > Quiet, Quiet > Soft Quiet)

2. FAN OPERATION

The airflow can be switched in 5 steps such as AUTO, QUIET, LOW, MED, HIGH, while the indoor fan only runs.

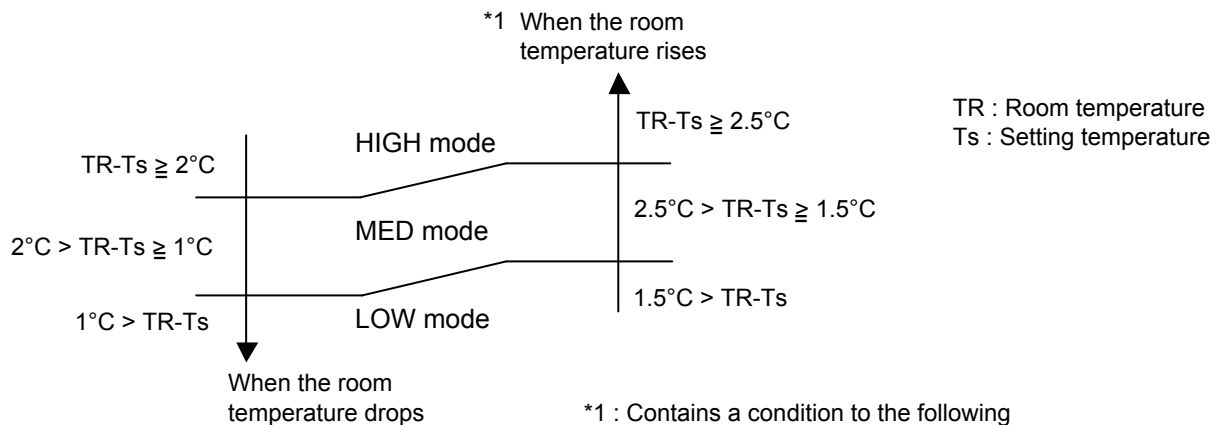
When [AUTO] is selected, the indoor Fan motor runs MED.

3. COOLING OPERATION

Switch the airflow [AUTO], and the indoor fan motor will run according to a room temperature, as shown in Fig.5.

On the other hand, if switched in [HIGH] ~ [LOW], the indoor motor will run at a constant airflow of [COOL] operation modes LOW, MED, HIGH, as shown in Table 5.

(Fig.5 : Airflow change - over (Cooling : AUTO))



*1 : Contains a condition to the following

- 1 When the operation mode is set to AUTO mode at the start of operation.
- 2 When the setting temperature was changed.
- 3 When the operation mode was changed to COOLING mode.
- 4 When the airflow mode was changed to AUTO mode.

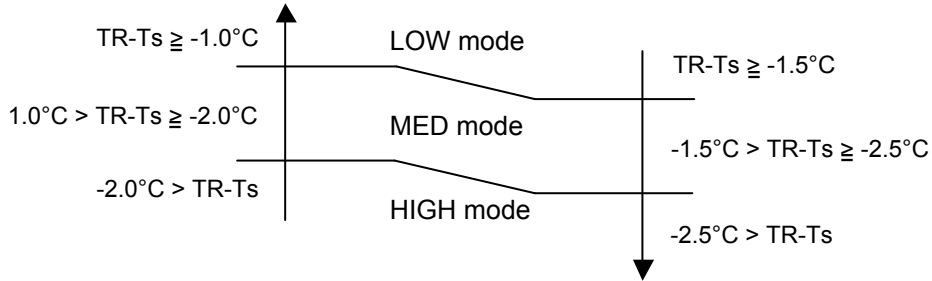
4. HEATING OPERATION

Switch the airflow [AUTO], and the indoor fan motor will run according to a room temperature, as shown in Fig.6.

On the other hand, if switched in [HIGH] ~ [LOW], the indoor motor will run at a constant airflow of [HEAT] operation modes LOW, MED, HIGH as shown in the Table 5.

(Fig.6 : Airflow change - over (Heating : AUTO))

Indoor heat exchanger temperature

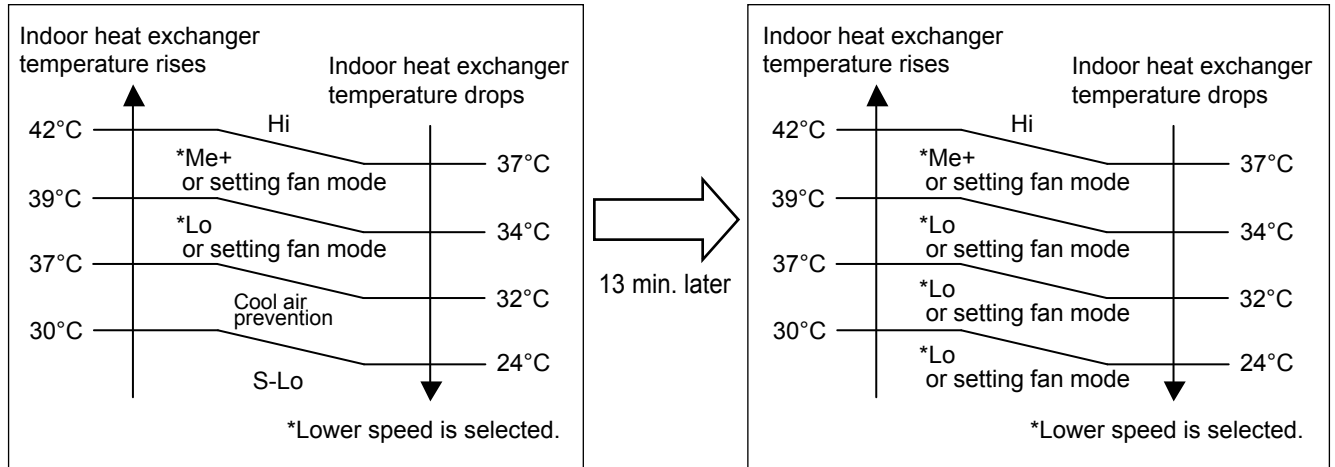


5. COOL AIR PREVENTION CONTROL (Heating mode)

The maximum value of the indoor fan speed is set as shown in Fig.7, based on the detected temperature by the indoor heat exchanger sensor on heating mode.

When the compressor does not operate, the indoor fan motor operates [S-Lo] or [Stop] mode.

(Fig.7 : Cool Air Prevention Control)



6. DRY OPERATION

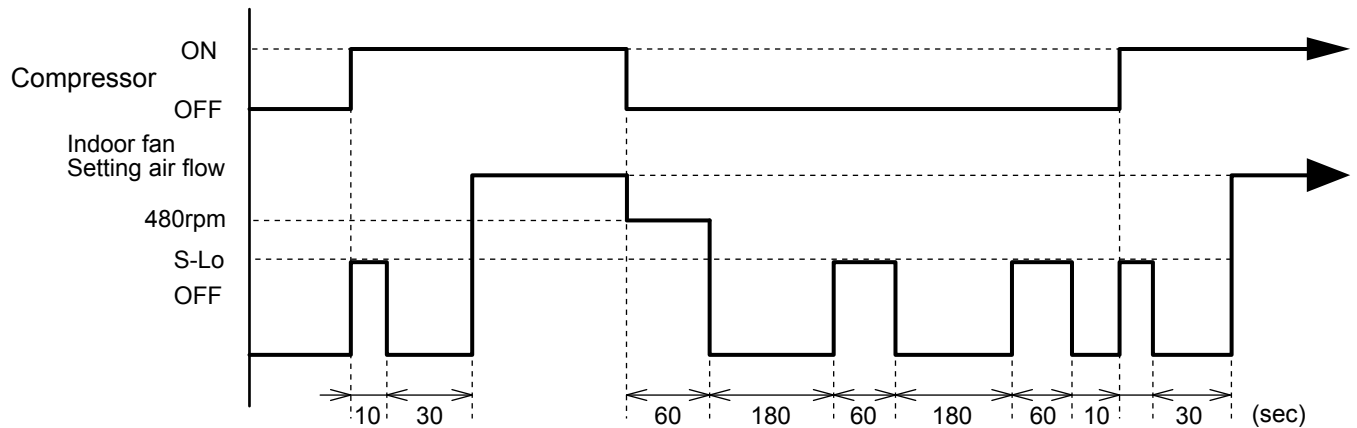
Refer to the Table 5

During the dry mode operation, the fan speed setting can not be changed.

7. FAN CONTROL FOR ENERGY SAVING

When the air flow setting except AUTO mode, the indoor fan motor will run as shown in Fig.8.

(Fig 8 : Indoor Fan Control)



(◆ . . .Factory setting)

Setting Description	Function Number	Setting Value
Disable	49	00
Enable		01
Remote controller		02

00 : When the outdoor unit is stopped, the indoor unit fan operates continuously following the setting on the remote controller.

01 : When the outdoor unit is stopped, the indoor unit fan operates intermittently at a very low speed.

02 : Enable or disable this function by remote controller setting.

Set to "00" or "01" when connecting a remote controller that cannot set the Fan control for energy saving function or connecting a network converter.

To confirm if the remote controller has this setting, refer to the operating manual of each remote controller.

8. DEFROST OPERATION

When the defrost operation starts, the indoor fan runs according to cool air prevention control for 20 seconds. And the fan is stopped if 20 seconds have passed.

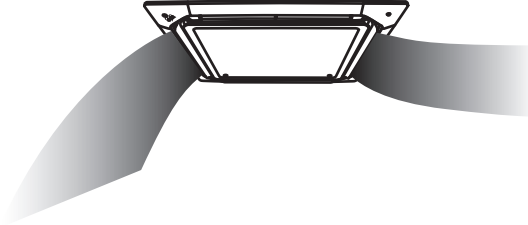
When 60 seconds have passed after defrost operation is released, the fan runs according to cool air prevention control.

1-6. AIR FLOW DIRECTION CONTROL

Individual control

To independently can be set the airflow pattern of each louver as this image.

(Fig.10 : Independent louver control image)

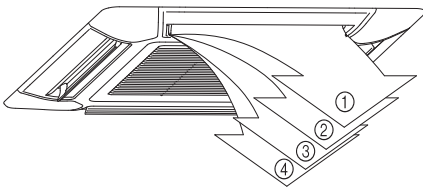


This function is given priority to overall louver control.
But this function is release during the following operation.

- Cold air prevention control
- Monitor mode on the auto change over operation
- Defrost operation

The air direction range will change as follows:

(Fig.11 : Air Direction Range)



Use the wired remote controller to set this function.

This function is only available by 2 wire remote controller.

*When the 2 wire remote controller is disconnected, clear the individual setting.
Otherwise, this setting can't change.

All louver control

- All louver operation

Cooling mode standard position: 2

Dry mode standard position: 2

Heating standard position Model 30,36 : 4 / Model 45,54 : 3

Monitor mode position: 2

} When the mode is selected, the standard louver position of the each mode is set.

*Setting of the wireless remote controller is not displayed on the wired remote controller.

*The setting louver of the individual control function cannot be controlled.

1-7. OUTDOOR FAN CONTROL

1. Outdoor Fan Motor

Following table shows the fan speed of the outdoor unit.

(Table 6 : Fan speed of the outdoor unit)

rpm

MODEL	Cooling	Heating
30LBTA	850/ 800/ 620/ 550/ 500/ 450/ 400/ 320/ 300/ 250/ 200	900/ 850/ 800/ 620/ 550/ 450
36LBTA	900/ 800/ 620/ 550/ 500/ 450/ 400/ 320/ 300/ 250/ 200	900/ 850/ 800/ 620/ 550/ 450
45,54LBTA	850(800)/ 780(750)/ 750(700)/ 540(520)/ 360(340)/ 290(270)/ 480(0)/ 400(0)/ 350(0)/ 280(0)	900(880)/ 850(830)/ 780(750)/ 720(700)/ 570(550)/ 500(480)/ 370(350)/ 300(280)/ 220(200)

Upper fan(Lower fan)

- * The outdoor fan speed changes in the range mentioned above depending on the compressor frequency and outdoor temperature.
(When the compressor frequency and outdoor temperature increase, the outdoor fan speed also changes to the higher speed.
When the compressor frequency and outdoor temperature decrease, the outdoor fan speed also changes to the lower speed.)
- * The compressor and the fan start-up at the same time, and the fan stops after the compressor stops and 60 seconds has passed.
- * The fan doesn't operates fan 10 seconds after the fan stops.
- * After operating the defrost control function on heating mode except economy operation, its speed becomes 900 (Lower:880) rpm regardless of the compressor speed.
However, it returns to the normal speed control when the defrosting operation does not function for 240 minutes after releasing the defrost operation or when the outdoor temperature sensor detection value becomes higher than 5°C.
- * It runs at 500rpm for 20 seconds after starting up the outdoor fan.
However, the fan operates at 200rpm when the initial rotation speed is 300rpm or less.

1-8. COMPRESSOR CONTROL

1. OPERATION FREQUENCY RANGE

The operation frequency of the compressor is different based on the operation mode as shown in Table 7.

(Table 7 : Compressor Operation Frequency Range)

MODEL	Coolin/Dry/Heating	
	Min	Max
30,36LBTA	16rps	90rps

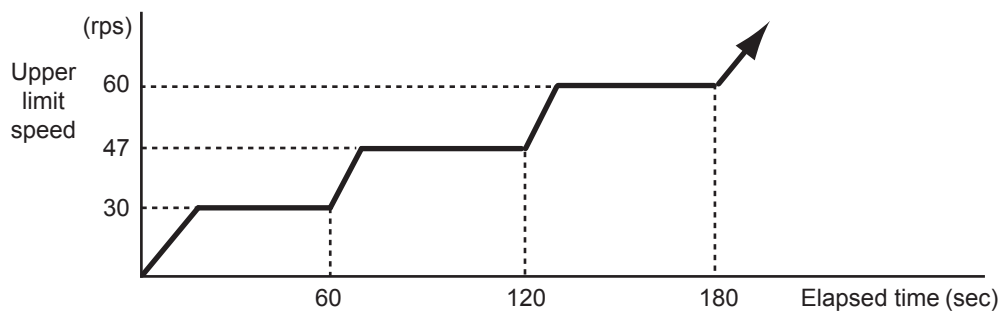
2. OPERATION FREQUENCY CONTROL AT START UP

The compressor frequency soon after the start-up is controlled as shown in Fig.9.

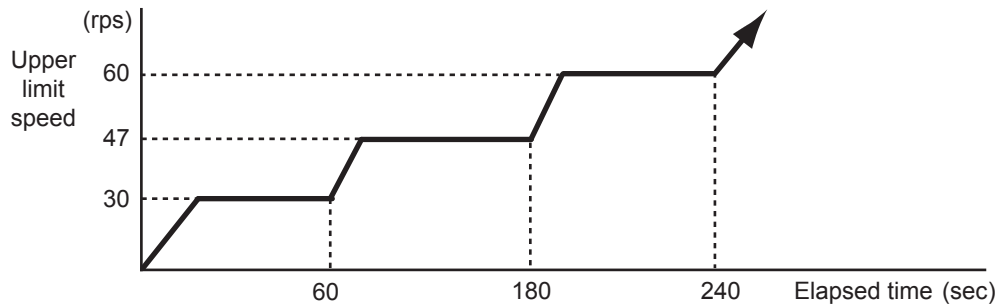
(Fig.9 : Compressor Control at Start-up)

30,36LBTA

< Normal start-up Cooling/ Dry >



< Immediate start-up after power-ON / Heating >



1. OPERATION FREQUENCY RANGE

The operation frequency of the compressor is different based on the operation mode shown in Table 8.

(Table 8 : Compressor Operation Frequency Range)

MODEL	Cooling		Heating	
	Min	Max	Min	Max
45LBTA	16rps	100rps	16rps	110rps
54LBTA	16rps	110rps	16rps	110rps

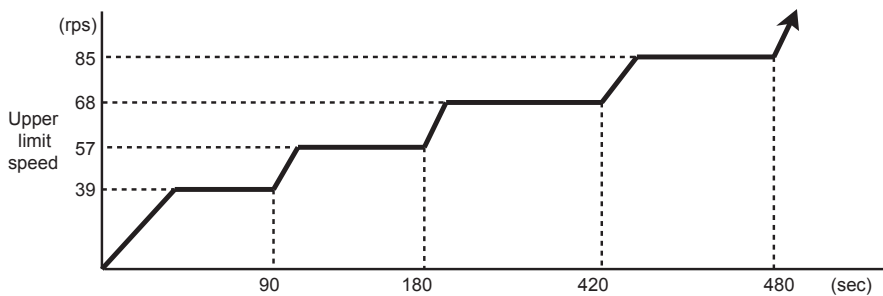
2. OPERATION FREQUENCY CONTROL AT START UP

The compressor frequency soon after the start-up is controlled as shown in Fig.10.

(Fig.10 : Compressor Control at Start-up)

45,54LBTA

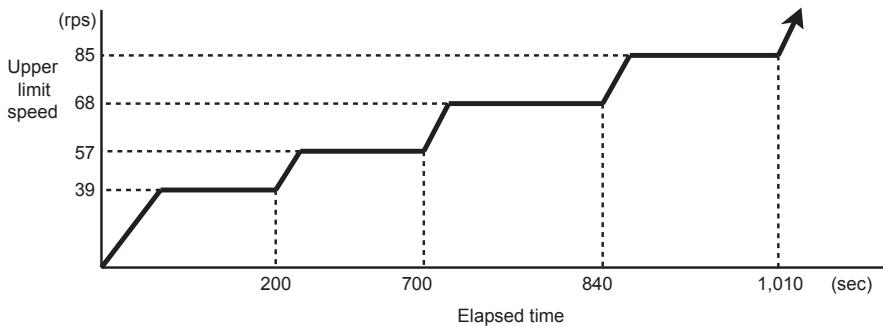
< Normal start-up >



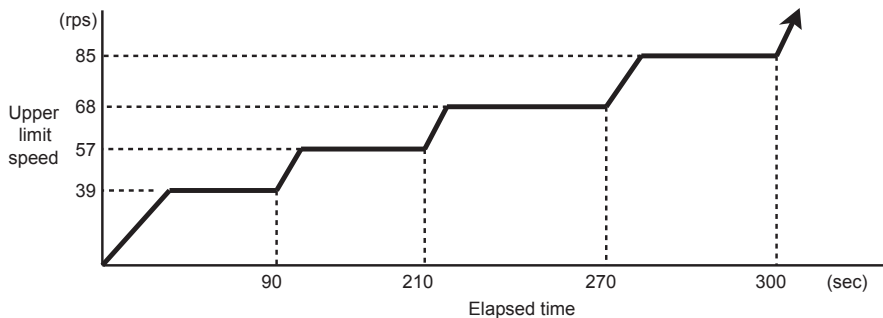
Ta : Outdoor temperature
Tc : Compressor temperature

Condition
Mode: Cooling
Mode: Heating Below 3 hours from comp stop Tc ≥ 15 °C

< Immediate / under specific conditions start-up >



Condition
Mode: Heating Below 3 hours from comp stop Ta < 10 °C Tc < 15 °C 3 hours longer from comp stop Ta < 10 °C



Condition
Mode: Heating Below 3 hours from comp stop Ta ≥ 10 °C Tc < 15 °C 3 hours longer from comp stop Ta ≥ 10 °C

1-9. TIMER OPERATION CONTROL

1-9-1 Wired Remote Controller

UTY-RNR*Z1(2 wire remote controller)

- ON / TIMER
- OFF / TIMER
- WEEKLY TIMER

*3 wire remote controller can be connected

If 3 wire remote controller is connected, set the DIP-SW on the controller PCB

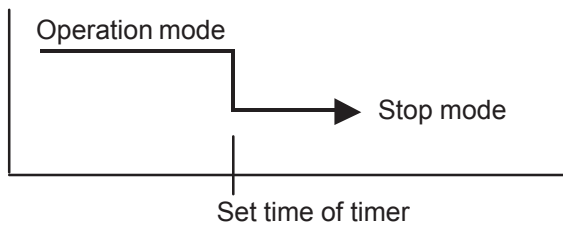
Refer to the installation manual for detailed.

If used in combination with wireless and wired remote controller, the following function is limited.

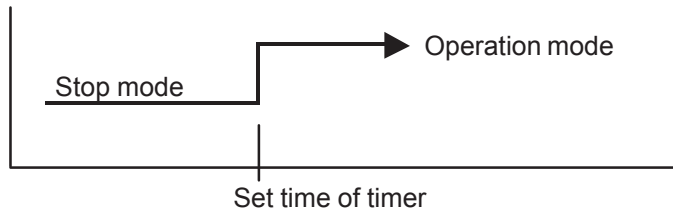
- Sleep timer
- Timer
- 10°C heat operation

1. ON / OFF TIMER

- OFF timer : When the clock reaches the set time, the air conditioner will be turned off.



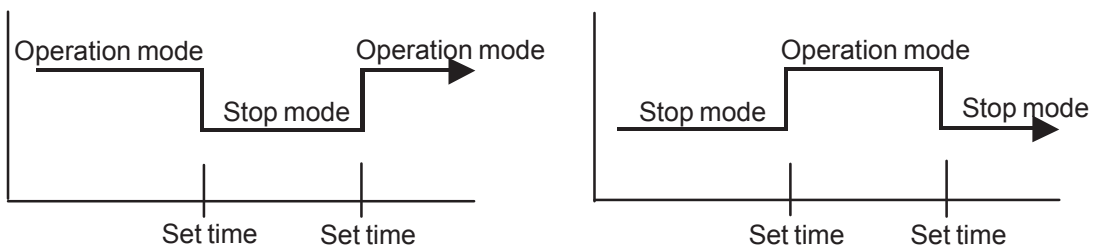
- ON timer : When the clock reaches the set time, the air conditioner will be turned on.



2. WEEKLY TIMER

2-1. WEEKLY TIMER

- Use this timer function to set operating time for each day of the week.
- The weekly timer allows up to two ON and OFF time to set up per day.

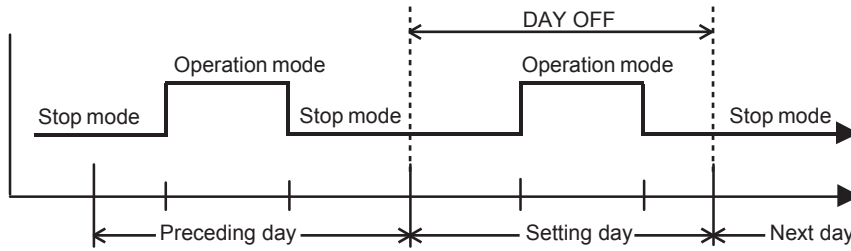


- The operating time can be set in 30 min increments only.
- The OFF time can be carried over to next day.
- The ON timer and the OFF timer functions cannot be set with using the weekly timer. Both ON and OFF time must be set.

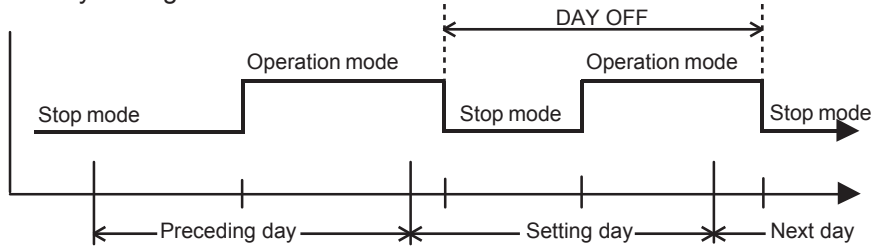
2-2. DAY OFF setting

- The DAY OFF setting is only available for days for which weekly settings already exist.
- If the operating time carries over to the next day (during a next day setting), the effective DAY OFF range will be set as shown below.

• Normal



• Next day setting



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

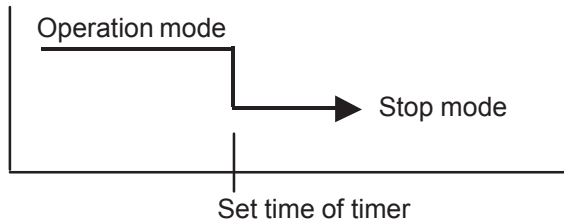
1-9-2 Wireless Remote Controller (OPTION)

AR-REJ1E

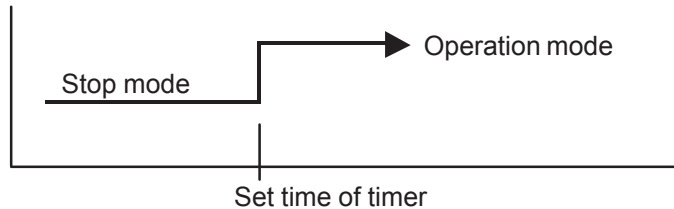
- ON / TIMER
- OFF / TIMER
- PROGRAM TIMER
- SLEEP TIMER

1. ON / OFF TIMER

- OFF timer : When the clock reaches the set time, the air conditioner will be turned off.

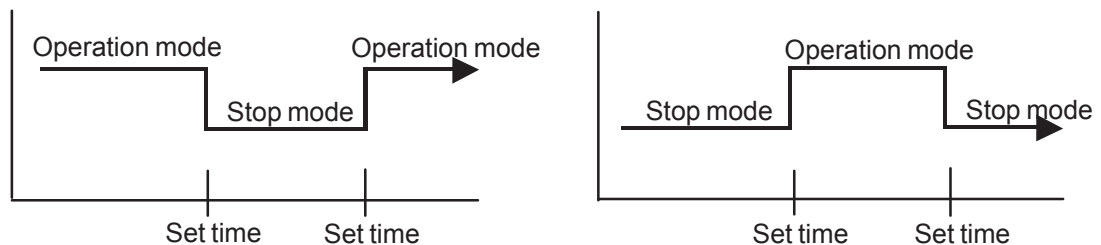


- ON timer : When the clock reaches the set time, the air conditioner will be turned on.



2. PROGRAM TIMER

- The program timer allows the OFF timer and ON timer to be used in combination one time.



- Operation will start from the timer setting (either OFF timer or ON timer) whichever is closest to the clock's current timer setting.
The order of operations is indicated by the arrow in the remote control unit's display.
- SLEEP timer operation cannot be combined with ON timer operation.

3. SLEEP TIMER

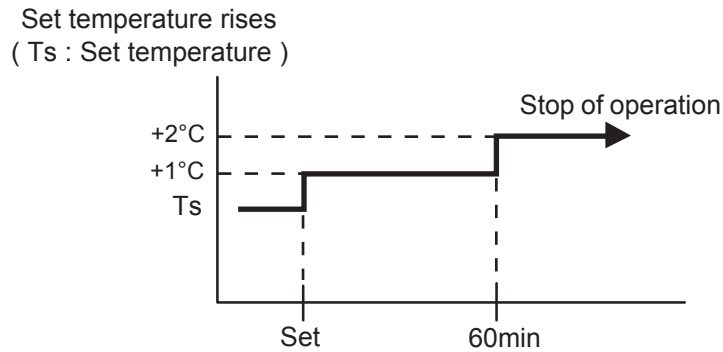
- If the sleep timer is set, the room temperature is monitored and the operation is stopped automatically. If the operation mode or the set temperature is change after the sleep timer is set, the operation is continued according to the changed setting of the sleep timer from that time ON.

In the COOLING operation mode

When the sleep timer is set, the setting temperature is increased 1 degC.

It increases the setting temperature another 1 degC after 1 hour.

After that, the setting temperature is not changed and the operation is stopped at the time of timer setting.

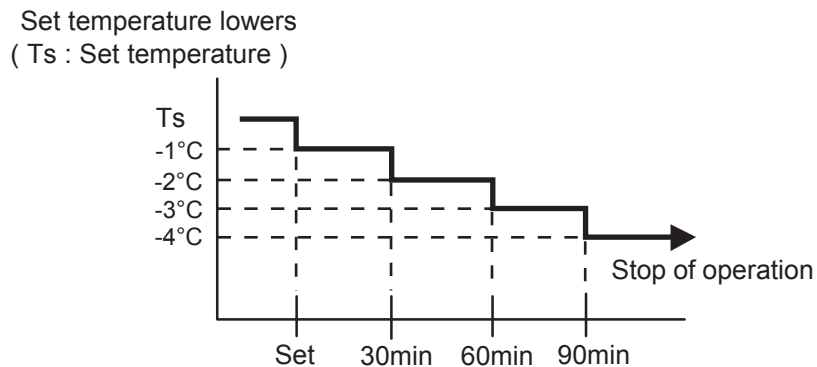


In the HEATING operation mode

When the sleep timer is set, the setting temperature is decreased 1 degC.

It decreases the setting temperature another 1 degC every 30 minutes.

Upon lowering 4 degC, the setting temperature is not changed and the operation stops at the time of timer setting.



1-10. ELECTRONIC EXPANSION VALVE CONTROL

The most proper opening of the electronic expansion valve is calculated and controlled under the present operating condition based on the following values.

The compressor frequency, the temperatures detected by the discharge temperature sensor and the outdoor temperature sensor.

30,36LBTA	The pulse range of the electronic expansion valve control is 53 ~ 480 pulses (Cooling) and 40 ~ 480 pulses (Heating).
45,54LBTA	The pulse range of the electronic expansion valve control is 53 ~ 480 pulses (Cooling) and 53 ~ 480 pulses (Heating).

- * At the time of supplying the power to the outdoor unit, the initialization of the electronic expansion valve is operated (528 pulses are input to the closing direction).

1-11. TEST OPERATION CONTROL

▪ With Wired Remote Controller

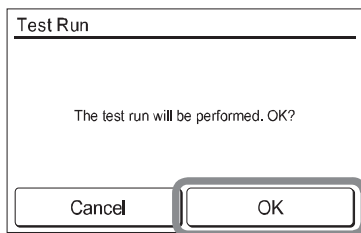
Touch the [Test run] in the "Maintenance" screen.
(Installer password* is required.)

The "Test Run" screen is displayed.

Touch [OK] to return to the Maintenance screen, and start the test run.

The test run will automatically end is approximately 60 min.

If you wish to cancel the test run before it is complete, return to the "Monitor Mode screen", and touch the On/Off button.



*If the password has been changed from the default setting "0000", please contact the installer.

▪ With Wireless Remote Controller

Under the condition where the air conditioner runs, press the TEST RUN button, and the test operation control mode will appear.

During test running, the Operation LED and Timer LED of the air conditioner body blinks simultaneously. Set the test operation mode, and the compressor will continue to run regardless of whether the room temperature sensor detects.

The test operation mode is released if 60 minutes have passed after setting up the test operation.

1-12. PREVENT TO RESTART FOR 3 MINUTES (3 MINUTES ST)

The compressor won't enter operation status for 3 minutes after the compressor is stopped, even if any operation is given.

1-13. 4-WAY VALVE EXTENSION SELECT

At the time when the air conditioner is switched from the cooling mode to heating mode, the compressor is stopped, and the 4-way valve is switched in 3 minutes later after the compressor stopped.

1-14. AUTO RESTART

When the power was interrupted by a power failure, etc. during operation, the operation contents at that time are memorized and when power is recovered, operation is automatically resumed with the memorized operation contents.

When the power is interrupted and recovered during timer operation, timer operation is canceled, but only setting time is memorized.

[Operation contents memorized when the power is interrupted]

- Operation mode
- Set temperature
- Set air flow
- Timer mode and timer time (Set by wireless remote controller)
- 10°C HEAT (Wireless remote controller is in use)
- ECONOMY
- Air flow direction (Swing setting)
- Individual air flow direction (Swing setting)
- Human sensor auto saving (setting/timer)
- Human sensor auto off (setting/timer)
- Energy saving setting
- Each central setting

1-15. PUMP DOWN For Model 30,36

PUMP DOWN (Refrigerant collecting operation)

Perform the following procedures to collect the refrigerant when moving the indoor unit or the outdoor unit.

- (1) Close the 3-way valve (Liquid).
- (2) Press the push-button switch on the circuit board once.
The LED on the circuit board starts lighting. This indicates the start of PUMP DOWN operation.
- (3) PUMP DOWN operation continues for about 1 minute.
Then close the 3-way valve (Gas) immediately.
The compressor stops automatically.
- (4) Turn the power off.

⚠ WARNING

This part (Choke coil) generates high voltages. Never touch this part.

Never touch electrical components such as the terminal blocks except the button on the display board. It may cause a serious accident such as electric shock.

During the pump-down operation, make sure that the compressor is turned off before you remove the refrigerant piping.
Do not remove the connection pipe while the compressor is in operation with 3-way valve open. This may cause abnormal pressure in the refrigeration cycle that leads to breakage and even injury.

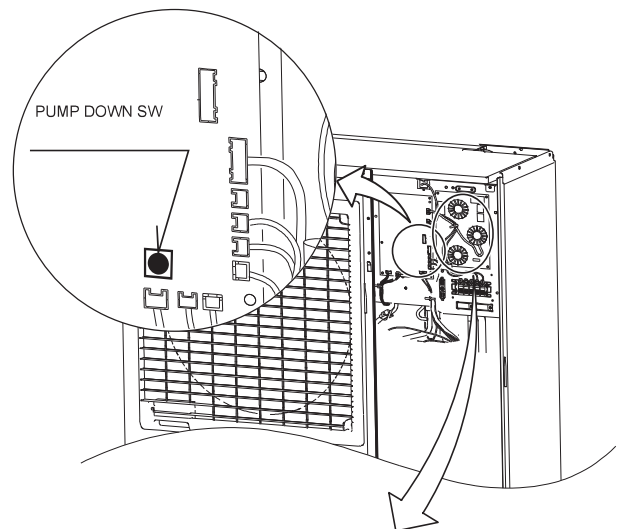
⚠ CAUTION

Perform the pump down operation before disconnecting any refrigerant pipe or electric cable.

Collect refrigerant from the service port or the 3-way valve if pump down cannot be performed.

In case of group control system installation, disconnect all remote controller cables before starting the pump down operation.
(Group control system installation is described in "SPECIAL INSTALLATION METHODS" in the installation manual of the indoor unit.)

Please check the refrigerant circuit for any leaks before starting the pump down operation.
Do not proceed with the pump down operation if there is no refrigerant left in the circuit due to bent or broken piping.



1-15. PUMP DOWN For Model 45,54

⚠ WARNING

Never touch electrical components such as the terminal blocks except the button on the display board. It may cause a serious accident such as electric shock.

During the pump-down operation, make sure that the compressor is turned off before you remove the refrigerant piping.
Do not remove the connection pipe while the compressor is in operation with 2-way or 3-way valve open. This may cause abnormal pressure in the refrigeration cycle that leads to breakage and even injury.

⚠ CAUTION

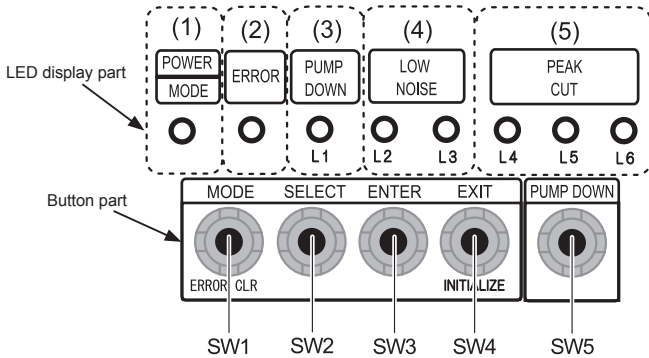
Perform the pump down operation before disconnecting any refrigerant pipe or electric cable.

Collect refrigerant from the service port or the 3-way valve if pump down cannot be performed.

In case of a group control system installation, do not turn the power off pump down is completed in all outdoor units.
(Group control system installation described in "SPECIAL INSTALLATION METHODS" in the installation manual of the indoor unit.)

Please check the refrigerant circuit for any leaks before starting the pump down operation.
Do not proceed with the pump down operation if there is no refrigerant left in the circuit due to bent or broken piping.

- Operate "PUMP DOWN" button on the display board in the manner described below.



14.1. Preparation for pump down

- Confirm that the power is off, and then open the service panel.

14.2. Pump down procedure

- Check the 3-way valves (both the liquid side and gas side) are opened.
- Turn the power on.

POWER/MODE	ERROR	PUMP DOWN			LOW NOISE			PEAK CUT		
		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)			
●	○	○	○	○	○	○	○	○	○	○

Sign "○": Lights off, "●": Lights on

- Press "PUMP DOWN" button for 3 seconds or more after 3 minutes after power on.

POWER/MODE	ERROR	PUMP DOWN			LOW NOISE			PEAK CUT		
		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)			
●	○	●	○	○	●	●	●	●	●	●

Sign "○": Lights off, "●": Lights on

LED display lights on as shown in the above figure, and the fans and the compressor start operating.

- If the "PUMP DOWN" button is pressed while the compressor is operating, the compressor will stop, then start again in about 3 minutes.

- LED display will change as shown below about 3 minutes after the compressor starts. Fully close the 3-way valve on the liquid pipe side at this stage.

POWER/MODE	ERROR	PUMP DOWN			LOW NOISE			PEAK CUT		
		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)			
●	○	●	○	○	○	●	●	●	●	●

Sign "○": Lights off, "●": Lights on

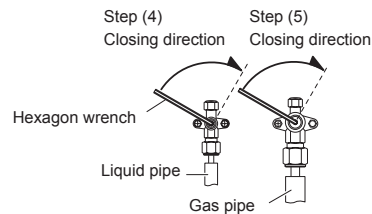
- If the valve on the liquid pipe side is not closed, the pump down cannot be performed.

- When LED display changes as shown in the below figure, close the 3-way valve on the gas pipe side tightly.

POWER/MODE	ERROR	PUMP DOWN			LOW NOISE			PEAK CUT		
		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)			
●	○	●	○	○	○	○	○	○	○	●

Sign "○": Lights off, "●": Lights on

- If the valve on the gas pipe side is not closed, refrigerant may flow into the piping after the compressor stops.



- LED display changes after 1 minute as shown in the figure below.

POWER/MODE	ERROR	PUMP DOWN			LOW NOISE			PEAK CUT		
		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)			
●	○	●	○	○	○	○	○	○	○	○

Sign "○": Lights off, "●": Lights on

Fans and compressor stop automatically.

- If the pump down is successfully completed (the above LED display is shown), the outdoor unit remains stopped until the power is turned off.

- Turn the power off.

POWER/MODE	ERROR	PUMP DOWN			LOW NOISE			PEAK CUT		
		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)			
○	○	○	○	○	○	○	○	○	○	○

Sign "○": Lights off

PUMP DOWN is completed.

(Note)

- To stop pump down, press the "PUMP DOWN" button again.
- To start the pump down again after the compressor is automatically stopped due to an error, turn the power off and open the 3-way valves. Wait 3 minutes, turn the power on and start the pump down again.
- When starting the operation after completion of the pump down, turn the power off, and then open the 3-way valves. Wait 3 minutes, turn the power on and perform a test run in the "COOL" operation mode.
- If an error occurs, recover the refrigerant from service port.

1-16. COMPRESSOR PREHEATING

When the outdoor temperature is lower than 20°C and the all operation mode has been stopped for 30 minutes, power is applied to the compressor and the compressor is heated. (By heating the compressor, warm air is quickly discharged when operation is started.) When operation was started and when the outdoor temperature rises to 26°C or greater, preheating is ended.

1-17. 10°C HEAT OPERATION

The 10°C HEAT operation functions by pressing 10°C HEAT button on the remote controller. The 10°C HEAT operation can be set by the wireless remote controller. The 10°C HEAT operation is almost the same operation as below settings.

(Table9)

Mode	Heating
Setting temperature	10°C
Fan mode	AUTO

1-18. ECONOMY OPERATION

The ECONOMY operation functions by pressing ECONOMY button on the remote controller. The ECONOMY operation is almost the same operation as below settings.

(Table10)

Mode	Cooling/ Dry	Heating
Target temperature	Setting temp.+1°C	Setting temp.-1°C

1-19. DEFROST OPERATION CONTROL

1. CONDITION OF STARTING THE DEFROST OPERATION

The defrost operation starts as shown in the following Table 11, 12, and 13.

(Table 11 : Condition of 1st defrost operation)

1st defrost after starting operation	Compressor integrating operation time		
	Less than 22 minutes	More than 22 minutes	More than 62 minutes
	Does not operate	Outdoor heat exchanger temp. Below -9°C	Outdoor heat exchanger temp. Below -5°C

(Table 12 : Condition of 2nd defrost operation)

From 2nd and later defrost after starting operation	Compressor integrating operation time	
	Less than 35 minutes	More than 35 minutes
	Does not operate	Outdoor heat exchanger temp. Below -10°C

(Table 13 : Condition of Integrating defrost operation)

Integrating defrost (Constant monitoring)	Compressor integrating operation time	
	More than 240 minutes (For long continuous operation)	Less than 10 minutes * (For intermittent operation)
	Outdoor heat exchanger temp. Below -3°C	OFF count of the compressor 40 times

* If the compressor continuous operation time is less than 10 minutes, the OFF number of the compressor is counted.
If any defrost operated, the compressor OFF count is cleared.

2. CONDITION OF THE DEFROST OPERATION COMPLETION

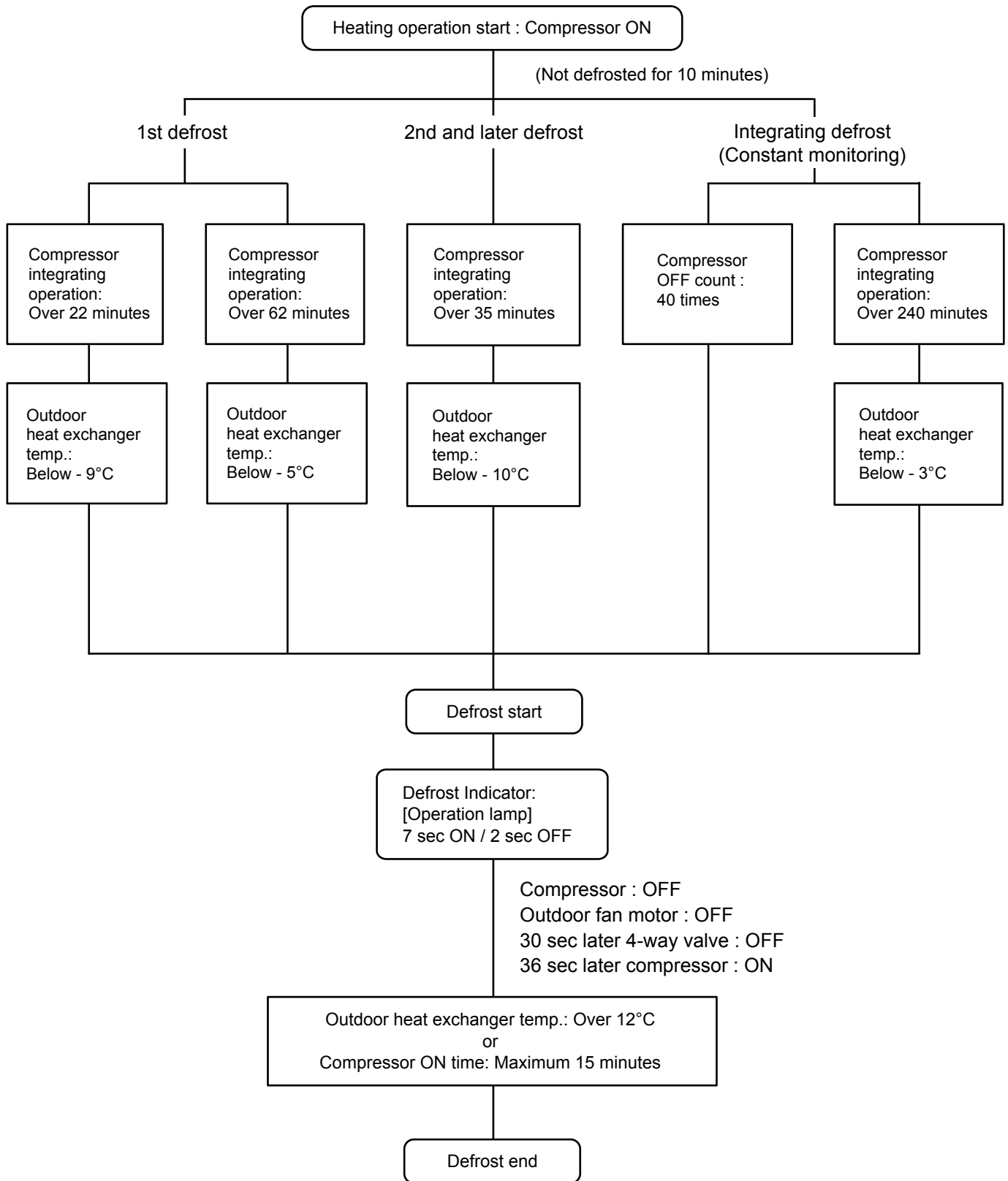
Defrost operation is released when the conditions becomes as shown in Table 14.

(Table 14 : Condition of defrost release)

Release Condition
Outdoor heat exchanger temp. is higher than 12°C or Compressor operation time has passed 15 minutes.

3. Defrost Flow Chart

The defrosting shall proceed by the integrating operation time, outdoor temperature and outdoor heat exchanger temperature as follows.



1-20. OFF DEFROST OPEARTION CONTROL

When operation stops in the [Heating operation] mode, if frost is adhered to the outdoor unit heat exchanger, the defrost operation will proceed automatically. In this time, if indoor unit operation lamp flashes slowly (7 sec ON / 2 sec OFF), the outdoor unit will allow the heat exchanger to defrost, and then stop.

1. OFF DEFROST OPERATION CONDITION

In heating operation, the outdoor heat exchanger temperature is less than -4°C , and compressor operation integrating time lasts for more than 30 minutes.

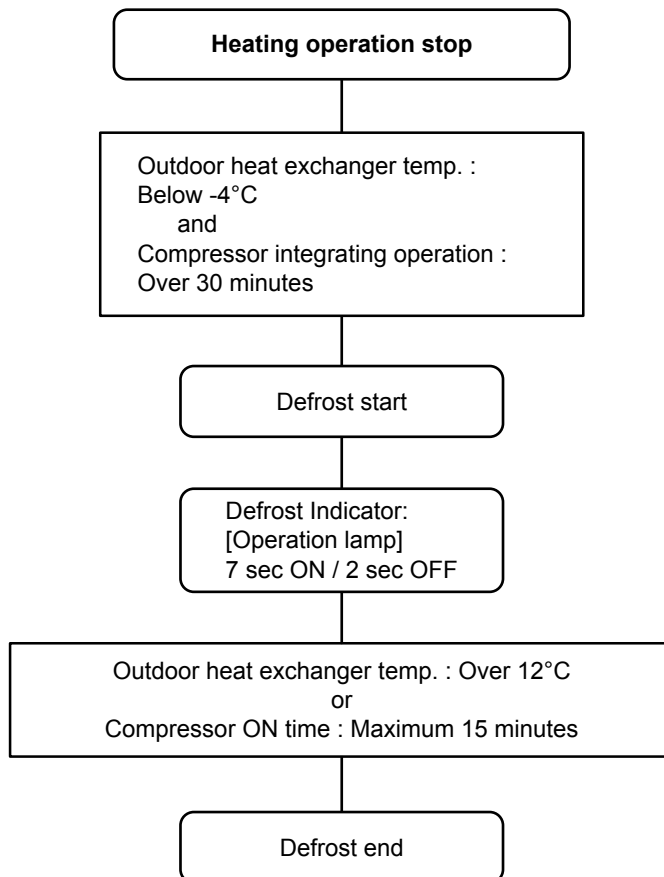
2. OFF DEFROST RELEASE CONDITION

OFF defrost operation is released when the conditions becomes as shown in Table 15.

(Table 15 : OFF Defrost Release Condition)

Release Condition
Outdoor heat exchanger temp. is higher than 12°C or Compressor operation time has passed 15 minutes.

OFF Defrost Flow Chart



1-21. VARIOUS PROTECTIONS

1. DISCHARGE GAS TEMPERATURE OVERRISE PREVENTION CONTROL

The discharge gas thermosensor (discharge thermistor : Outdoor side) will detect discharge gas temperature.

When the discharge temperature becomes higher than Temperature I ,the compressor frequency is decreased 10rps(30,36) 14rps(45,54), and it continues to decrease the frequency for 10/14rps every 120 seconds until the temperature becomes lower than Temperature I .

When the discharge temperature becomes lower than Temperature II, the control of the compressor frequency is released.

When the discharge temperature becomes higher than Temperature III,the compressor is stopped and the indoor unit LED starts blinking.

(Table16 : Discharge Temperature Over Rise Prevention Control / Release Temperature)

MODEL	Temperature I	Temperature II	Temperature III
30,36LBTA 45,54LBTA	104°C	101°C	110°C

2. CURRENT RELEASE CONTROL

The compressor frequency is controlled so that the outdoor unit input current does not exceeds the current limit value that was set up with the outdoor temperature.

The compressor frequency returns to the designated frequency of the indoor unit at the time when the frequency becomes lower than the release value.

30LBTA

[Heating]

T0 (Control / Release)	
17°C	$\frac{10.0A}{11.5A} / \frac{9.5A}{11.0A}$
12°C	$\frac{14.5A}{14.0A}$
5°C	$\frac{14.5A}{14.0A}$

T0 : Outdoor Temperature

[Cooling]

T0 (Control / Release)	
50°C	$\frac{9.0A}{10.0A} / \frac{8.5A}{9.5A}$
46°C	$\frac{12.5A}{12.0A}$
40°C	$\frac{14.5A}{14.0A}$

T0 : Outdoor Temperature

36LBTA

[Heating]

T0 (Control / Release)	
17°C	$\frac{10.0A}{11.5A} / \frac{9.5A}{11.0A}$
12°C	$\frac{16.0A}{15.5A}$
5°C	$\frac{18.0A}{17.5A}$

T0 : Outdoor Temperature

[Cooling]

T0 (Control / Release)	
50°C	$\frac{9.0A}{10.0A} / \frac{8.5A}{9.5A}$
46°C	$\frac{13.0A}{12.5A}$
40°C	$\frac{16.5A}{16.0A}$

T0 : Outdoor Temperature

45,54LBTA

[Heating] (Table 17 : Current Release Operation Value / Release Value)

(Control / Release)

	Outdoor unit fan speed (UP / LO)									
	900/880rpm	850/830rpm	780/750rpm	720/700rpm	570/550rpm	500/480rpm	370/350rpm	300/280rpm	220/200rpm	
20°C ≤ Ta	14.5A/14.0A									
12°C ≤ Ta < 20°C	16.5A/16.0A									
Ta < 12°C	19.5A/19.0A									

Ta : Outdoor Temperature

45,54LBTA

[Cooling]

(Control / Release)

	Outdoor unit fan speed (UP / LO)									
	850/800rpm	780/750rpm	750/700rpm	540/520rpm	360/340rpm	290/270rpm	480/ 0rpm	400/ 0rpm	350/ 0rpm	280/ 0rpm
50°C ≧ Ta			6.5A/6.0A							
46°C ≧ Ta < 50°C	13.5A/13.0A	12.5A/12.0A	9.0A/8.5A							
40°C ≧ Ta < 46°C	16.5A/16.0A			10.0A/9.5A						
38°C ≧ Ta < 40°C	19.0A/18.5A	17.5A/17.0A	16.5A/16.0A	13.5A/13.0A	10.0A/9.5A	9.0A/8.5A	6.0A/5.5A			
31°C ≧ Ta < 38°C	19.5A/19.0A			19.0A/18.5A						
19°C ≧ Ta < 31°C		15.0A/14.5A			11.0A/10.5A	10.0A/9.5A				
13°C ≧ Ta < 19°C		15.5A/15.0A			10.5A/10.0A					
7°C ≧ Ta < 13°C		16.0A/15.5A			12.5A/12.0A					
0°C ≧ Ta < 7°C					14.5A/14.0A	12.5A/11.5A				
-5°C ≧ Ta < -0°C			15.5A/15.0A				11.5A/11.0A			
-10°C ≧ Ta < -5°C							12.5A/12.0A			
-15°C ≧ Ta < -10°C							13.0A/12.5A			
Ta < -15°C							8.0A/7.5A			

Ta : Outdoor Temperature

3. ANTIFREEZING CONTROL (Cooling and Dry mode)

The compressor frequency is decrease on cooling & dry mode when the indoor heat exchanger temperature sensor detects the temperature lower than Temperature I. Then, the anti-freezing control is released when it becomes higher than Temperature II.

(Table 18 : Anti-freezing Protection Operation / Release Temperature)

Outdoor temperature	Temperature I	Temperature II
Over than 10°C *1 or 12°C *2	4°C	7°C
Less than 10°C *1 or 12°C *2		13°C

*1. When the temperature rises.

*2. When the temperature drops.

4. COOLING PRESSURE OVER RISE PROTECTION

On cooling mode, the compressor frequency is controlled as following based on the detection value of the outdoor heat exchanger temperature sensor.

30,36LBTA

Outdoor heat exchange temperature

Compressor is OFF (3 minutes stop)
After 60sec. temp detection starts

67°C —————

Release of protection

45,54LBTA

Outdoor heat exchange temperature

Compressor is OFF

68°C —————

The compressor frequency is decreased 7rps every 120seconds.

63°C —————

Release of protection

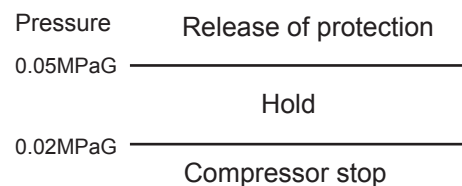
5. LOW PRESSURE PROTECTION CONTROL (For Cooling mode) *Model 45,54LBTA

5-1. Low Pressure Protection 1

<After the compressor start-up and 1 minute has passed>

- (a). The detected value of pressure sensor is 0.02MPaG or less, continues for 5 minutes, the compressor is stopped.
- (b). When 7 minutes has passed and low pressure sensor detects value is more than 0.05MPaG after the protection stop by (a), the compressor restarts.
- (c). When the protection (a) operates 5 times within 2 hours after the restart by (b), the error is displayed and the compressor stops. **[Permanent stop]**

(Fig 12 : Low pressure protection 1)

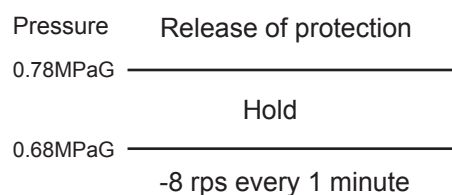


5-2. Low Pressure Protection 2

<After the compressor start-up and 10 minutes has passed>

- (a). When the low pressure value becomes 0.68MPaG or less continues for 1 minute, the compressor speed -8 rps.
- (b). When the low pressure value becomes 0.68MPaG or less after the protection (a), the compressor continues speed -8 rps every 1 minute until the detected value becomes more than 0.68MPaG.
- (c). When the low pressure value becomes more than 0.78MPaG, this protection is released.

(Fig 13 : Anti freezing protection)



6. INDOOR UNIT FAN MOTOR ROTATION FREQUENCY LIMITATION

The suction temperature and the fan motor rotation speed are monitored, and there is limitations on the rotational frequency of the fan motor.

- Operation conditions

In the case that the condition 1 and the condition 2 are fulfilled from the start of driving the fan motor.

Condition 1 : Suction temperature > 32°C

Condition 2 : Target number of rotations > 720 rpm

- Operation content

The maximum number of revolutions is restricted to 720 rpm

- Release conditions

In the case that the condition 1 or the condition 2 are fulfilled from the start of this limitation.

Condition 1 : Suction temperature \leq 30°C

Condition 2 : Target number of rotations \leq 720 rpm

7. COMPRESSOR STOP CONTROL

When the detection value of outdoor temperature sensor is lower than temperature I in the table below, the compressor is stopped.

(Table 19 : Operation temperature of compressor stop control)

	Temperature I	
	Cooling	Heating
Operation temperature	- 20°C	—

1-22. LOW NOISE OPERATION

The compressor speed and the outdoor unit fan speed are limited to reduce the operation noise by External Input.

During the LOW NOISE OPERATION, "CURRENT OVERLOAD OPERATION", "ECONOMY OPERATION" and "PEAK CUT OPERATION" are effective, and the outdoor unit operates by lowest current of them.

However, during the DEFROST OPERATION, the compressor operates by the speed for DEFROST OPERATION.

(Table 20 : Detail of Low Noise Operation)

Low Noise mode		Outdoor fan speed (Upper / Lower) [rpm]	Compressor speed [rps]	
			Model 45	Model 54
LEVEL 1	Cooling	540/520	68	75
	Heating	570/550	75	85
LEVEL 2	Cooling	540/520	54	58
	Heating	570/550	62	68

*The performance drops when operating in the LOW NOISE OPERATION.

Capacity priority mode

(1) Operation condition

- The function setting is set the "1" for the capacity priority mode.

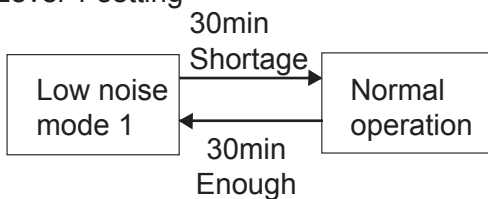
(2) Check the capacity condition

Shortage	Required compressor speed > Limited compressor speed of low noise mode
Enough	Required compressor speed \leq Limited compressor speed of low noise mode

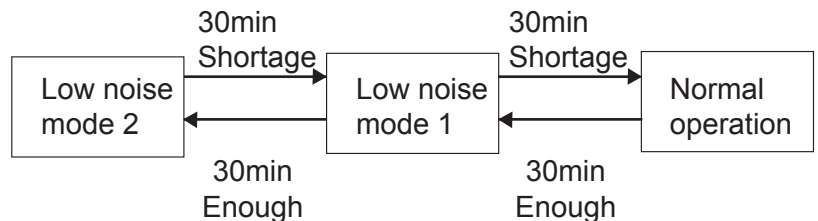
(3) Operation

- When detect the shortage capacity or enough capacity condition continuous 30 minute, the mode is upped or downed for 1 step.

Automatic switching 1
Level 1 setting



Automatic switching 2
Level 2 setting



1-23. PEAK CUT OPERATION

The Current Value is limited to reduce the power consumption by External Input.

During the PEAK CUT OPERATION,

"CURRENT OVERLOAD OPERATION", "ECONOMY OPERATION" and "LOW NOISE OPERATION" are effective, and the outdoor unit operates by lowest current of them.

However, this function becomes invalid during DEFROST OPERATION.

(Table 22 : Outline of Peak Cut Operation)

PEAK CUT LEVEL	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
Peak Cut For Rated Capacity	Forced thermostat-OFF	50%	75%	100%

*Percentage is rated electrical power ratio.

1-24. HUMAN SENSOR (OPTION)

Auto saving operation

If no one enters the room during the set time (15, 30, 60, 90, 120, 180 minutes), the set temperature will be automatically controlled.

(When someone comes back into the room, the human sensor will detect this, and automatically revert to the original settings).

(Table 10)

Operation mode	Operation details (if there is no one in the room for a while)
Cool / Dry	The set temperature will be increased by a maximum of approximately 2°C.
Heat	The set temperature will be decreased by a maximum of approximately 2°C.

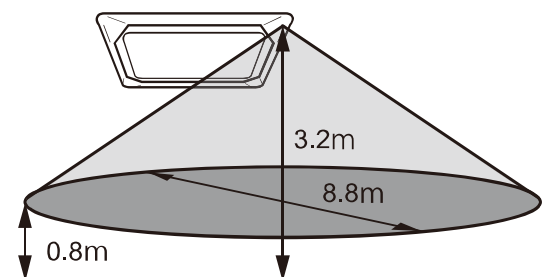
* High limit : 30°C

* Low limit : 16°C

Auto off operation

If no one enters the room during the set time (1 to 24 hours in 1 hour increments), the air conditioner will automatically stop operation.

Application range



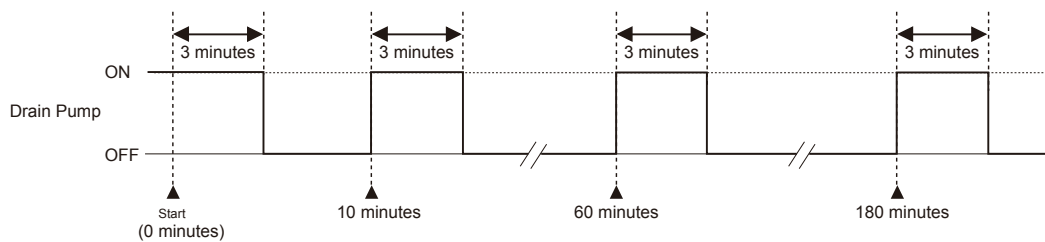
Equal sensitivity range of temperature	Ceiling height : 3.2m
	Detecting position : 0.8m from floor surface

1-25. DRAIN PUMP OPERATION

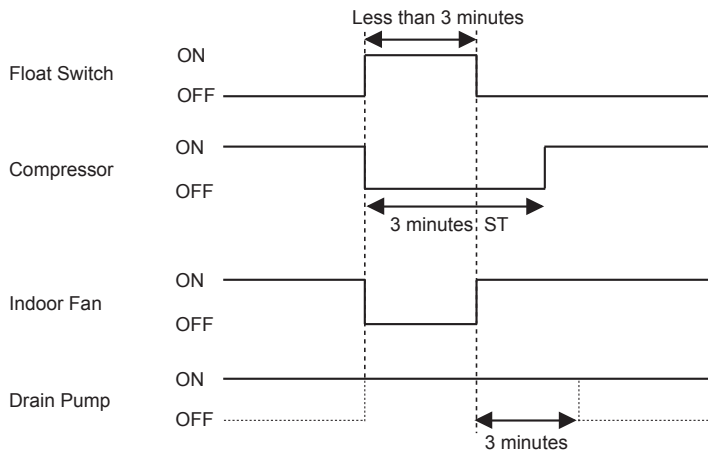
• During Cooling / Dry mode

1. When the compressor starts, the drain pump starts simultaneously.
2. The drain pump operates continuously for 3 minutes after the compressor is turned off as show in Fig15.
3. When the compressor stops by the "Anti-freezing protection", 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 The compressor, indoor and outdoor fan motor operation are stopped.
 - ② Drain pump operates continuously for 3 minutes after the float switch is turned off. (Almost condensing water may be drained)
 - ③ The indoor unit fan motor operates after the float switch is turned off.
5. When the float switch turns ON continuously for 3 minutes, "FAILURE INDICATION" operates. (It is necessary to turn off power for release it.)
6. When the float switch turns OFF less than 3 minutes, the unit starts Cooling operation.

(Fig 15 : Detail of Drain Pump Operation)

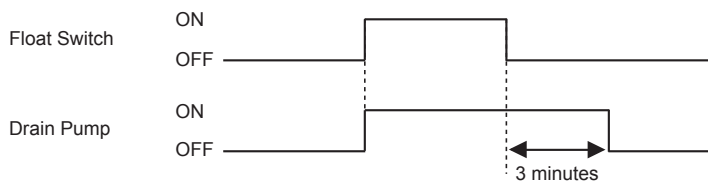


<Float Switch turns OFF less than 3 minutes>



• During Heating / Fan mode / Stop operation

1. When the water level in the drain pan rises up and then the float switch functions:
 - ① Drain pump operates continuously for 3 minutes after the float switch is turned off. (Almost condensing water may be drained)
2. When the float switch turns ON continuously for 3 minutes, "FAILURE INDICATION" operates. Thereafter, even if the float switch turns OFF, the "FAILURE INDICATION" is not released. (It is necessary to turn off power for release it.)

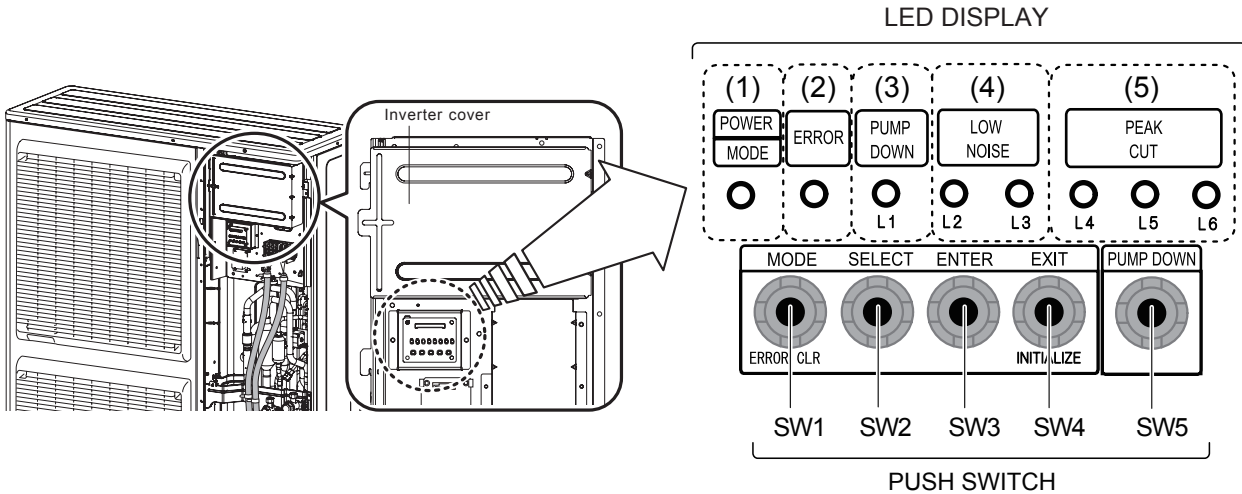


1-26. DESCRIPTION OF DISPLAY UNIT

For Model 45,54

1-26-1 Layout of Display Unit

- Various settings can be adjusted by changing Push switches on the board of the outdoor unit.
(Excerpt from the "INSTALATION MANUAL")



Display lamp		Function or operation method
(1) POWER / MODE	Green	Lights on while power on. Local setting in outdoor unit or error code is displayed with blink.
(2) ERROR	Red	Blinks during abnormal air-conditioner operation.
(3) PUMP DOWN (L1)	Orange	Lights on during pump down operation.
(4) LOW NOISE MODE (L2, L3)	Orange	Lights on during "Low noise" mode when local setting is activated. (Lighting pattern of L2 and L3 indicates low noise level)
(5) PEAK CUT (L4, L5, L6)	Orange	Lights on during "Peak cut" mode when local setting is activated. (Lighting pattern of L4, L5 and L6 indicates peak cut level)

Switch		Function or operation method
MODE	SW1	To switch between "Local setting" and "Error code display".
SELECT	SW2	To switch between the individual "Local settings" and the "Error code displays".
ENTER	SW3	To fix the individual "Local settings" and the "Error code displays".
EXIT / INITIALIZE	SW4	To return to "Operation status display".
PUMP DOWN	SW5	To start the pump down operation.

1-26-2 Display mode

- In this mode, the "Operation Condition" and "Error Code" can be displayed by Push Switch on outdoor unit PCB

(Table :23 Procedure for Present Value)

○ : Light OFF ● : Light ON ◐ : Blinking ◆1 : 1 Time Blinking

Procedure	Operation	Power Mode	Error	L1	L2	L3	L4	L5	L6
		1	During status display, press the MODE SWITCH 1 time. (Status display : Outdoor unit is stopping and no error)	◆1	○	○	○	○	○
2	When the POWER / MODE LED blinking 1 time, press the ENTER SWITCH.	◆1	○	○	○	◐	○	○	○
3	Press the SELECT SWITCH and adjust to DISPLAY ITEM (from L1 to L3) that you want to confirm. (Refer to Table : 23)	◆1	○	○	◐	○	○	○	○
4	Press the ENTER SWITCH. (Data is displayed by lighting LED. Refer to Table : 24)	◆1	○	○	●	○	DATA		
5	Selecting display items can be done by pressing the SELECT SWITCH. (Return to Procedure 3)	◆1	○	○	◐	○	○	○	○
	When the EXIT SWITCH is pressed, this mode ends and returns to the status display.	●	○	○	○	○	○	○	○

(Table :24 Display pattern)

○ : Light OFF ● : Light ON ◐ : Blinking ◆n : n Time Blinking

Power / Mode LED	Display Item	LED			
		ERROR	L1	L2	L3
Present Value Of Each Item ◆1	Compressor frequency	○	○	○	●
	Upper fan speed (Outdoor unit)	○	○	●	○
	Lower fan speed (Outdoor unit)	○	○	●	●
	EEV pulse	○	●	○	○
	Pressure sensor value (Low pressure range)	○	●	○	●
	Pressure sensor value (High pressure range)	○	●	●	○
	Outdoor air temperature sensor value	○	●	●	●
	Discharge temperature sensor value	●	○	○	○
	Heat-exchanger temperature sensor value (Middle)	●	○	○	●
	Current value	●	○	●	○
	Compressor accumulated time	●	○	●	●

(Table 25 : Detail of LED Display Data)

○ : Light OFF ● : Light ON ◆1 : 1 Time Blinking

Item No.	Display Item		Power Mode	Error	L1	L2	L3	L4	L5	L6
1	Compressor Frequency (0 ~ 95rps)	0	◆1	○	○	○	●	○	○	○
		1 ~ 15	◆1	○	○	○	●	○	○	●
		16 ~ 30	◆1	○	○	○	●	○	●	○
		31 ~ 45	◆1	○	○	○	●	○	●	●
		46 ~ 60	◆1	○	○	○	●	●	○	○
		61 ~ 75	◆1	○	○	○	●	●	○	●
		76 ~ 90	◆1	○	○	○	●	●	●	○
		90 ~ 95	◆1	○	○	○	●	●	●	●
2	Outdoor Unit Upper Fan Speed (0 ~ 900rpm)	0	◆1	○	○	●	○	○	○	○
		1 ~ 150	◆1	○	○	●	○	○	○	●
		151 ~ 300	◆1	○	○	●	○	○	●	○
		301 ~ 450	◆1	○	○	●	○	○	●	●
		451 ~ 600	◆1	○	○	●	○	●	○	○
		601 ~ 750	◆1	○	○	●	○	●	○	●
		751 ~ 900	◆1	○	○	●	○	●	●	○
		901 ~	◆1	○	○	●	○	●	●	●
3	Outdoor Unit Lower Fan Speed (0 ~ 900rpm)	0	◆1	○	○	●	●	○	○	○
		1 ~ 150	◆1	○	○	●	●	○	○	●
		151 ~ 300	◆1	○	○	●	●	○	●	○
		301 ~ 450	◆1	○	○	●	●	○	●	●
		451 ~ 600	◆1	○	○	●	●	●	○	○
		601 ~ 750	◆1	○	○	●	●	●	○	●
		751 ~ 900	◆1	○	○	●	●	●	●	○
		901 ~	◆1	○	○	●	●	●	●	●
4	EEV Pulse (0 ~ 480pulse)	0	◆1	○	●	○	○	○	○	○
		1 ~ 80	◆1	○	●	○	○	○	○	●
		81 ~ 160	◆1	○	●	○	○	○	○	○
		161 ~ 240	◆1	○	●	○	○	○	○	●
		241 ~ 320	◆1	○	●	○	○	○	○	○
		321 ~ 400	◆1	○	●	○	○	○	○	●
		401 ~ 480	◆1	○	●	○	○	○	○	○
		481 ~	◆1	○	●	○	○	○	○	●
5	Pressure sensor value <Low pressure range> (0 ~ 2.1MPa) Check the High Pressure Range if it is displayed [1.81 ~ 2.1]	~ 0.0	◆1	○	●	○	●	○	○	○
		0.01 ~ 0.3	◆1	○	●	○	●	○	○	●
		0.31 ~ 0.6	◆1	○	●	○	●	○	○	○
		0.61 ~ 0.9	◆1	○	●	○	●	○	○	●
		0.91 ~ 1.2	◆1	○	●	○	●	○	○	○
		1.21 ~ 1.5	◆1	○	●	○	●	○	○	●
		1.51 ~ 1.8	◆1	○	●	○	●	○	○	○
		1.81 ~ 2.1	◆1	○	●	○	●	○	○	●
6	Pressure sensor value <High pressure range> (2.1 ~ 4.2MPa) Check the Low Pressure Range if it is displayed [~ 2.1]	~ 2.1	◆1	○	●	●	○	○	○	○
		2.11 ~ 2.4	◆1	○	●	●	○	○	○	●
		2.41 ~ 2.7	◆1	○	●	●	○	○	○	○
		2.71 ~ 3.0	◆1	○	●	●	○	○	○	●
		3.01 ~ 3.3	◆1	○	●	●	○	○	○	○
		3.31 ~ 3.6	◆1	○	●	●	○	○	○	○
		3.61 ~ 3.9	◆1	○	●	●	○	○	○	○
		3.91 ~ 4.2	◆1	○	●	●	○	○	○	○

○ : Light OFF ● : Light ON ◆1 : 1 Time Blinking

Item No.	Display Item		Power Mode	Error	L1	L2	L3	L4	L5	L6
7	Outdoor Air Temperature (-30 ~ 70°C)	~ -15	◆1	○	●	●	●	○	○	○
		-15 ~ -5	◆1	○	●	●	●	○	○	●
		-5 ~ 5	◆1	○	●	●	●	○	●	○
		5 ~ 15	◆1	○	●	●	●	○	●	●
		15 ~ 25	◆1	○	●	●	●	●	○	○
		25 ~ 35	◆1	○	●	●	●	●	○	●
		35 ~ 45	◆1	○	●	●	●	●	●	○
		45 ~	◆1	○	●	●	●	●	●	●
8	Discharge Temperature (-30 ~ 120°C)	~ 55	◆1	●	○	○	○	○	○	○
		55 ~ 65	◆1	●	○	○	○	○	○	●
		65 ~ 75	◆1	●	○	○	○	○	●	○
		75 ~ 85	◆1	●	○	○	○	○	●	●
		85 ~ 95	◆1	●	○	○	○	●	○	○
		95 ~ 105	◆1	●	○	○	○	●	○	●
		105 ~ 115	◆1	●	○	○	○	●	●	○
		115 ~	◆1	●	○	○	○	●	●	●
9	Heat-exchanger Temperature <Middle> (-30 ~ 80°C)	~ 53	◆1	●	○	○	●	○	○	○
		53 ~ 55	◆1	●	○	○	●	○	○	●
		55 ~ 57	◆1	●	○	○	●	○	●	○
		57 ~ 59	◆1	●	○	○	●	○	●	●
		59 ~ 61	◆1	●	○	○	●	●	○	○
		61 ~ 63	◆1	●	○	○	●	●	○	●
		63 ~ 65	◆1	●	○	○	●	●	●	○
		65 ~	◆1	●	○	○	●	●	●	●
10	Current (0 ~ 10A)	~ 0.0	◆1	●	○	●	○	○	○	○
		0.0 ~ 1.5	◆1	●	○	●	○	○	○	●
		1.5 ~ 3.0	◆1	●	○	●	○	○	●	○
		3.0 ~ 4.5	◆1	●	○	●	○	○	●	●
		4.5 ~ 6.0	◆1	●	○	●	○	●	○	○
		6.0 ~ 7.5	◆1	●	○	●	○	●	○	●
		7.5 ~ 9.0	◆1	●	○	●	○	●	●	○
		9.0 ~	◆1	●	○	●	○	●	●	●
11	Compressor Accumulated Time (H) <Round up by 1 hour>	0	◆1	●	○	●	●	○	○	○
		0 ~ 10000	◆1	●	○	●	●	○	○	●
		10000 ~ 20000	◆1	●	○	●	●	○	●	○
		20000 ~ 30000	◆1	●	○	●	●	○	●	●
		30000 ~ 40000	◆1	●	○	●	●	●	○	○
		40000 ~ 50000	◆1	●	○	●	●	●	○	●
		50000 ~ 60000	◆1	●	○	●	●	●	●	○
		60000 ~	◆1	●	○	●	●	●	●	●

1-26-3 Error history mode

- In this mode, the history of abnormality that occurred in the past can be confirmed.

(Table :26 Procedure for History Mode) ○ : Light OFF ● : Light ON ◐ : Blinking ◆2 : 2 Times Blinking ◆n : n Times Blinking

Procedure	Operation	Power	Error	L1	L2	L3	L4	L5	L6
		Mode							
1	During status display, press the MODE SWITCH 2 times. (Status display : Outdoor unit is stopping and no error)	◆2	○	○	○	○	○	○	○
2	When the POWER / MODE LED blinking 2 times, press the ENTER SWITCH.	◆2	○	○	○	◐	○	○	○
3	Press the SELECT SWITCH and adjust to DISPLAY ITEM (from L1 to L3) that you want to confirm. (Refer to Table : 27)	◆2	○	○	◐	○	○	○	○
4	Press the ENTER SWITCH, Error code is displayed by lighting LED. (Refer to TROUBLESHOOTING)	◆2	●	◆n	◆n	DATA			
5	Selecting display items can be done by pressing the SELECT SWITCH. (Return to Procedure 3)	◆2	○	○	◐	○	○	○	○
	When the EXIT SWITCH is pressed, this mode ends and returns to the status display.	●	○	○	○	○	○	○	○

(Table :27 Display pattern)

○ : Light OFF ● : Light ON ◐ : Blinking ◆n : n Time Blinking

Power / Mode LED	Display Item	LED			
		ERROR	L1	L2	L3
Error Code ◆2	Newest error code	○	○	○	◐
	Error code before 1 time	○	○	◐	○
	Error code before 2 times	○	○	◐	◐

Cassette type ***INVERTER***

2 . TROUBLE SHOOTING

2 ERROR DISPLAY

2-1 INDOOR UNIT AND WIRED REMOTE CONTROLLER DISPLAY

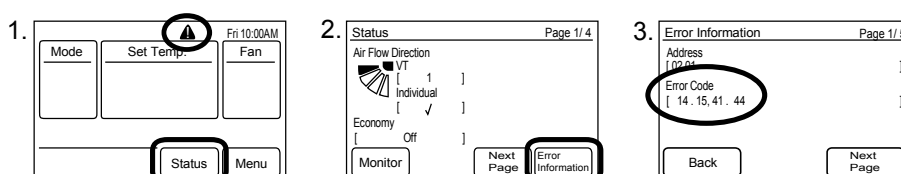
Check the Error LED display on the Indoor unit (IR Receiver *Option)

1. Check ECONOMY (Green) LED Blinking, it means the Error on the system. (Not blinking: No Error)
2. Count OPERATION (Green) LED blinks: The number of blinking means the first digit of Error code.
3. Count TIMER (Orange) LED blinks: The number of blinking means the second digit of Error code.

Example) ECONOMY: Blinking continuous / OPERATION: **4** times / TIMER: **1** time ⇒ Indoor Room Thermistor Error

Check the Error code on the wired remote controller (Remote controller *Option)

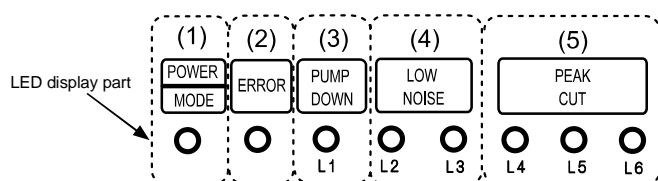
1. If an error occurs, an error icon appears on the "Monitor mode screen".
Touch the [Status] on the "Monitor mode screen". The "Status" screen is displayed.
2. Touch the [Error Information] on the "Status" screen. The "Error Information" screen is displayed.
(If there are no errors, the [Error Information] will not be displayed.)
3. 2-digit numbers correspond to the error code in the table below. Touch the [Next page] (or [Previous page]) to switch to other connected indoor units. Example) 2WIRE remote controller



Error Contents	Error Code	Trouble shooting	Error Contents	Error Code	Trouble shooting
Serial Communication Error	11	1,2	Active filter voltage error	64	18
Wired Remote Controller Communication Error	12	3	IPM Error	65	19
External communication Error	18	4	Discharge Thermistor Error	71	20
Combination error	23	5	Compressor Thermistor Error	72	21
Indoor unit address setting Error	26	6	Heat Ex. Liquid Outlet Thermistor Error	73	22
Connection unit number error (Indoor unit Wired remote controller Error)	29	7	Outdoor Thermistor Error	74	23
Indoor unit PCB model information Error	32	8	Heat Sink Thermistor Error	77	24
Manual Auto SW error	35	9	Current sensor Error	84	25
Indoor unit Communication circuit (wired remote controller) Error	3A	10	Pressure sensor Error	86	26
Indoor Room Thermistor Error	41	11	Over Current Error	94	27
Indoor Heat Ex. Thermistor Error	42	12	Compressor Control Error	95	28
Human Sensor Error	44	13	Outdoor Unit Fan Motor 1 Error	97	29
Indoor Unit Fan Motor Error	51	14	Outdoor Unit Fan Motor 2 Error	98	30
Drain pump Error	53	15	4-way Valve Error	99	31
Indoor Unit Error	5U	1- 15	Discharge Temp. Error	A1	32
Outdoor unit main PCB model information Error	62	16	Compressor Temp. Error	A3	33
Inverter Error	63	17	Low Pressure Error	A5	34

2-1-2 OUTDOOR UNIT DISPLAY For Model 45,54

You can determine the operating status by the lighting up and blinking of the LED lamp.



Display when an error occurs.

POWER/ MODE	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT		
		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)	
●	Blink (Hi speed)	○	○	○	○	○	○	○

Sign "○": Lights off, "●": Lights on

- (1) Check that the "ERROR" LED blinks, then press the "ENTER" button once.
- (2) For details, refer to the following table.

Check that the "ERROR" LED blinks, then press the [Enter] button once.

For details, refer to the following table. ●: Light OFF ●: Light ON ◆2: 2Times Blinking ◆1 ~ ◆15: 1~ 15 Times Blinking

Error Contents	LED DISPLAY								Trouble shooting
	POWER	ERROR	PUMP	LOW			PEAK		
	MODE		DOWN	NOISE	CUT	(L4)	(L5)	(L6)	
			(L1)	(L2)	(L3)	(L4)	(L5)	(L6)	
Serial Communication Error	◆2	●	◆1	◆1	○	○	●	●	1,2
Indoor Unit Error	◆2	●	◆5	◆15	○	○	○	●	1-15
Inverter Error	◆2	●	◆6	◆3	○	○	○	●	17
IPM Error	◆2	●	◆6	◆5	○	○	●	●	19
Discharge Thermistor Error	◆2	●	◆7	◆1	○	○	○	●	20
Compressor Thermistor Error	◆2	●	◆7	◆2	○	○	○	●	21
Heat Ex. Liquid Outlet Thermistor Error	◆2	●	◆7	◆3	○	○	●	●	22
Outdoor Thermistor Error	◆2	●	◆7	◆4	○	○	○	●	23
Heat Sink Thermistor Error	◆2	●	◆7	◆7	○	○	○	●	24
Current sensor Error	◆2	●	◆8	◆4	○	○	○	●	25
Pressure sensor Error	◆2	●	◆8	◆6	○	●	○	○	26
Over Current Error	◆2	●	◆9	◆4	○	○	○	●	27
Compressor Control Error	◆2	●	◆9	◆5	○	○	○	●	28
Outdoor Unit Fan Motor 1 Error	◆2	●	◆9	◆7	○	○	●	●	29
Outdoor Unit Fan Motor 2 Error	◆2	●	◆9	◆8	○	○	●	●	30
4-way Valve Error	◆2	●	◆9	◆9	○	○	○	●	31
Discharge Temp. Error	◆2	●	◆10	◆1	○	○	○	●	32
Compressor Temp. Error	◆2	●	◆10	◆3	○	○	○	●	33
Low Pressure Error	◆2	●	◆10	◆5	○	○	○	●	34

2-2 TROUBLE SHOOTING WITH ERROR CODE

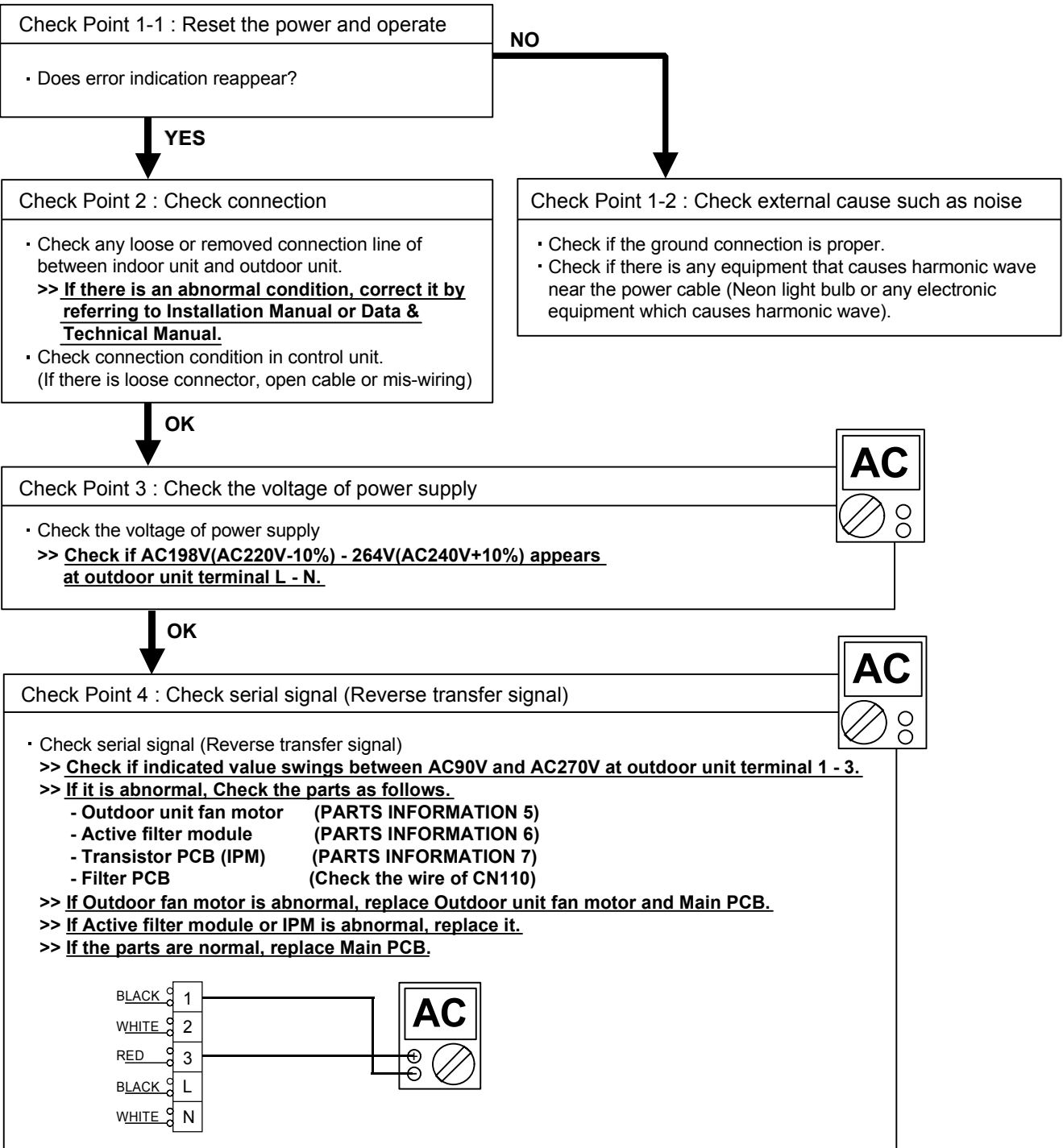
Trouble shooting 1 OUTDOOR UNIT Error Method: Serial Communication Error (Serial Reverse Transfer Error)	Indicate or Display: Outdoor unit : Model 45.54 Error code : 11
---	--

POWER	ERROR	PUMP DOWN			LOW NOISE			PEAK CUT		
MODE	(L1)	(L2)	(L3)	(L4)	(L5)	(L6)	(L1)	(L2)	(L3)	(L4)
◆2	●	◆5	◆15	○	○	○	○	○	○	●

Detective Actuators: Outdoor unit Main PCB Outdoor unit Fan motor	Detective details: When the indoor unit cannot receive the serial signal from Outdoor unit more than 2minutes after power ON, or the indoor unit cannot receive the serial signal more than 15seconds during normal operation.
--	--

Forecast of Cause:

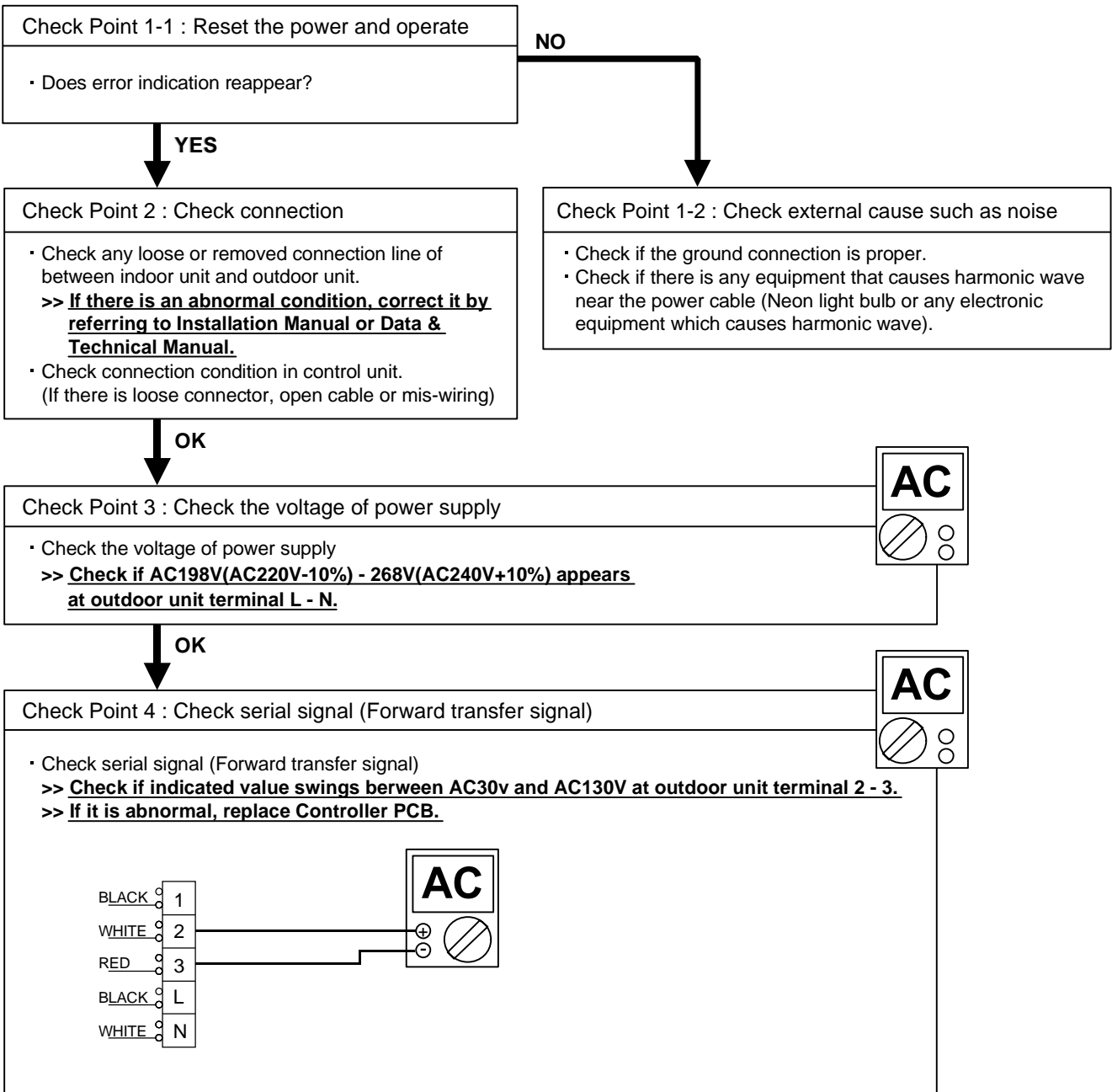
1. Connection failure 2. External cause 3. Main PCB failure 4. Active filter module failure
 5. Transistor PCB (IPM) failure 6. Filter PCB failure 7. Outdoor unit Fan motor failure



Trouble shooting 2 INDOOR UNIT Error Method: Serial Communication Error (Serial Forward Transfer Error)	Indicate or Display: Error code : 11	Outdoor unit : Model 45.54						
		POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT	
		MODE		(L1)	(L2)	(L3)	(L4)	(L5)
◆2	●	◆1	◆1	○	○	●	●	
◆2	●	◆1	◆1	○	●	○	○	

Detective Actuators: Indoor unit Controller PCB	Detective details: When the outdoor unit cannot properly receive the serial signal from indoor unit for 10 seconds or more.
---	---

Forecast of Cause:
1. Connection failure 2. External cause 3. Controller PCB failure



<p>Trouble shooting 3 INDOOR UNIT Error Method: Wired Remote Controller Communication Error</p>	<p>Indicate or Display:</p> <p>Error code : 12</p>	<p>Outdoor unit : Model 45.54</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="font-size: 8px;">POWER</td> <td style="font-size: 8px;">ERROR</td> <td style="font-size: 8px;">PUMP DOWN</td> <td colspan="3" style="font-size: 8px;">LOW NOISE</td> <td colspan="3" style="font-size: 8px;">PEAK CUT</td> </tr> <tr> <td style="font-size: 8px;">MODE</td> <td></td> <td style="font-size: 8px;">(L1)</td> <td style="font-size: 8px;">(L2)</td> <td style="font-size: 8px;">(L3)</td> <td style="font-size: 8px;">(L4)</td> <td style="font-size: 8px;">(L5)</td> <td style="font-size: 8px;">(L6)</td> <td></td> </tr> <tr> <td style="font-size: 8px;">◆2</td> <td style="font-size: 8px;">●</td> <td style="font-size: 8px;">◆5</td> <td style="font-size: 8px;">◆15</td> <td style="font-size: 8px;">○</td> <td style="font-size: 8px;">○</td> <td style="font-size: 8px;">○</td> <td style="font-size: 8px;">○</td> <td style="font-size: 8px;">●</td> </tr> </table>	POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT			MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)		◆2	●	◆5	◆15	○	○	○	○	●
POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT																							
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)																						
◆2	●	◆5	◆15	○	○	○	○	●																					

<p>Detective Actuators:</p> <p>Indoor unit Controller PCB Wired Remote Controller</p>	<p>Detective details:</p> <p>When the indoor unit cannot properly receive the signal from Wired Remote Controller for 1 minute or more.</p>
---	--

Forecast of Cause:

1. Connection failure 2. Wired Remote Controller failure 3. Controller PCB failure

Check Point 1 : Check the connection of terminal

After turning off the power,
Check & correct the followings.

- Check the connection of terminal between Wired Remote Controller and indoor unit, and check if there is a disconnection of the cable.



<p>Check Point 1-2 : Check Wired Remote Controller and Controller PCB</p> <ul style="list-style-type: none"> • Check Voltage at CN14 of Controller PCB. (Terminal 1-3, Terminal 1-2) (Power supply for the Remote Control) >> If it is DC 13V, Remote Control is failure. (Controller PCB is normal) >> Replace Remote Control >> If it is DC 0V, Controller PCB is failure. (Check Remote Control once again) >> Replace Controller PCB 	
--	--

Check Point 2 : Wire installation Wrong RCgroup setting

- Wrong wire connection in RCgroup (Please refer to the installation manual)
- The number of connecting indoor unit and Remote controller in one RCgroup were less than 32 units.



Check Point 2-1 : Check Indoor unit controller PCB

- Check if controller PCB damage
- Change controller PCB and check the Error after setting remote controller address

Trouble shooting 4 INDOOR UNIT Error Method: External communication error	Indicate or Display: Error code : 18	Outdoor unit : Model 45.54																							
		<table border="1"> <thead> <tr> <th>POWER</th> <th>ERROR</th> <th>PUMP DOWN</th> <th colspan="3">LOW NOISE</th> <th colspan="2">PEAK CUT</th> </tr> <tr> <th>MODE</th> <th></th> <th>(L1)</th> <th>(L2)</th> <th>(L3)</th> <th>(L4)</th> <th>(L5)</th> <th>(L6)</th> </tr> </thead> <tbody> <tr> <td>◆2</td> <td>●</td> <td>◆5</td> <td>◆15</td> <td>○</td> <td>○</td> <td>○</td> <td>●</td> </tr> </tbody> </table>	POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT		MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)	◆2	●	◆5	◆15	○	○	○
POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT																			
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)																		
◆2	●	◆5	◆15	○	○	○	●																		

Detective Actuators: External communication error	Detective details: After receiving a signal from the external I/O PCB, the same a signal has not been received for 15sec
---	--

Forecast of Cause : 1. Connection failure 2.External I/O PCB failure 3.Controller PCB failure

Check Point 1 : Check the connection
<ul style="list-style-type: none"> • Check any loose or removed connection of between the controller PCB to the external I/O PCB >>If there is an abnormal condition, correct it by refer to installation manual or the technical manual. • Check the condition condition on the external I/O PCB and the controller PCB (If there is loose connector, open cable or mis-wiring)



Check Point 2: Replace external I/O PCB
▶ If Check Point 1 do not improve the symptom, change External I/O PCB.



Check Point 3: Replace Controller PCB
▶ If Check Point 2 do not improve the symptom, change Controller PCB.

Trouble shooting 5 <u>INDOOR UNIT Error Method:</u> Combination error	<u>Indicate or Display:</u> Error code : 23	Outdoor unit : Model 45.54 <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <th style="font-size: small;">POWER</th> <th style="font-size: small;">ERROR</th> <th style="font-size: small;">PUMP DOWN</th> <th colspan="3" style="font-size: small;">LOW NOISE</th> <th colspan="3" style="font-size: small;">PEAK CUT</th> </tr> <tr> <th style="font-size: x-small;">MODE</th> <th></th> <th style="font-size: x-small;">(L1)</th> <th style="font-size: x-small;">(L2)</th> <th style="font-size: x-small;">(L3)</th> <th style="font-size: x-small;">(L4)</th> <th style="font-size: x-small;">(L5)</th> <th style="font-size: x-small;">(L6)</th> </tr> <tr> <td style="font-size: x-small;">◆2</td> <td style="font-size: x-small;">●</td> <td style="font-size: x-small;">◆5</td> <td style="font-size: x-small;">◆15</td> <td style="font-size: x-small;">○</td> <td style="font-size: x-small;">○</td> <td style="font-size: x-small;">○</td> <td style="font-size: x-small;">●</td> </tr> </table>	POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT			MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)	◆2	●	◆5	◆15	○	○	○	●
POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT																					
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)																				
◆2	●	◆5	◆15	○	○	○	●																				

<u>Detective Actuators:</u> Indoor unit	<u>Detective details:</u> 1. When the outdoor unit type is multi.
---	---

Forecast of Cause:
 1. The selection of indoor units is incorrect

Check Point 1 : Check the type of indoor unit

- Check the type of the connected indoor unit.

>> If abnormal condition is found, correct it.



Check Point 2 : Replace Main PCB

▶ If Check Point 1 do not improve the symptom, replace Main PCB of Outdoor unit.

<p>Trouble shooting 6 INDOOR UNIT Error Method: Indoor unit address setting error</p>	<p>Indicate or Display: Error code : 26</p>	<p>Outdoor unit : Model 45.54</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="font-size: 8px;">POWER</td> <td style="font-size: 8px;">ERROR</td> <td style="font-size: 8px;">PUMP DOWN</td> <td colspan="3" style="font-size: 8px;">LOW NOISE</td> <td colspan="2" style="font-size: 8px;">PEAK CUT</td> </tr> <tr> <td style="font-size: 8px;">MODE</td> <td></td> <td style="font-size: 8px;">(L1)</td> <td style="font-size: 8px;">(L2)</td> <td style="font-size: 8px;">(L3)</td> <td style="font-size: 8px;">(L4)</td> <td style="font-size: 8px;">(L5)</td> <td style="font-size: 8px;">(L6)</td> </tr> <tr> <td style="font-size: 8px;">◆2</td> <td style="font-size: 8px;">●</td> <td style="font-size: 8px;">◆5</td> <td style="font-size: 8px;">◆15</td> <td style="font-size: 8px;">○</td> <td style="font-size: 8px;">○</td> <td style="font-size: 8px;">○</td> <td style="font-size: 8px;">●</td> </tr> </table>	POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT		MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)	◆2	●	◆5	◆15	○	○	○	●
POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT																				
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)																			
◆2	●	◆5	◆15	○	○	○	●																			

<p>Detective Actuators: Wired remote controller (2-Wire) Indoor unit Controller PCB circuit</p>	<p>Detective details: When the address number set by auto setting and manual setting are mixed in one RC group. When the duplicated address number exists in one RC group.</p>
--	---

Forecast of Cause : 1. Wrong wiring of RCgroup 2. Wrong remote address setting 3. Indoor unit controller PCB failure
 4. Remote controller failure

<p>Check Point 1 :Wire installation</p>
<p><input type="checkbox"/> Wrong wire connection in RCgroup (Please refer to the installation manual)</p>



<p>Check Point 2 : Wrong RCgroup setting</p>
<p><input type="checkbox"/> The given address number by auto setting (00) and the manual set number (Except 00) were not existing in one RCG. <input type="checkbox"/> The remote controller address setting by U.I. were not existing same address. <input type="checkbox"/> The duplicated address number is not existing in one RCgroup</p>



<p>Check Point 3 : Check Indoor unit controller PCB</p>
<p><input type="checkbox"/> Check if controller PCB damage <input type="checkbox"/> Change controller PCB and check the Error after setting remote controller address</p>

Trouble shooting 7 INDOOR UNIT Error Method: Connection unit number error (Indoor unit in Wired remote controller system)	Indicate or Display: Error code : 29	Outdoor unit : Model 45.54					
		POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆5	◆15	○	○	○	●

Detective Actuators: Wired remote controller (2-Wire) Indoor unit Controller PCB circuit	Detective details: When the number of connecting indoor units are out of specified rule.
---	--

Forecast of Cause : 1. Wrong wiring / Number of I.U, RC in RCgroup 2. Indoor unit controller PCB defective

Check Point 1 : Wire installation

- Wrong number of connecting indoor unit



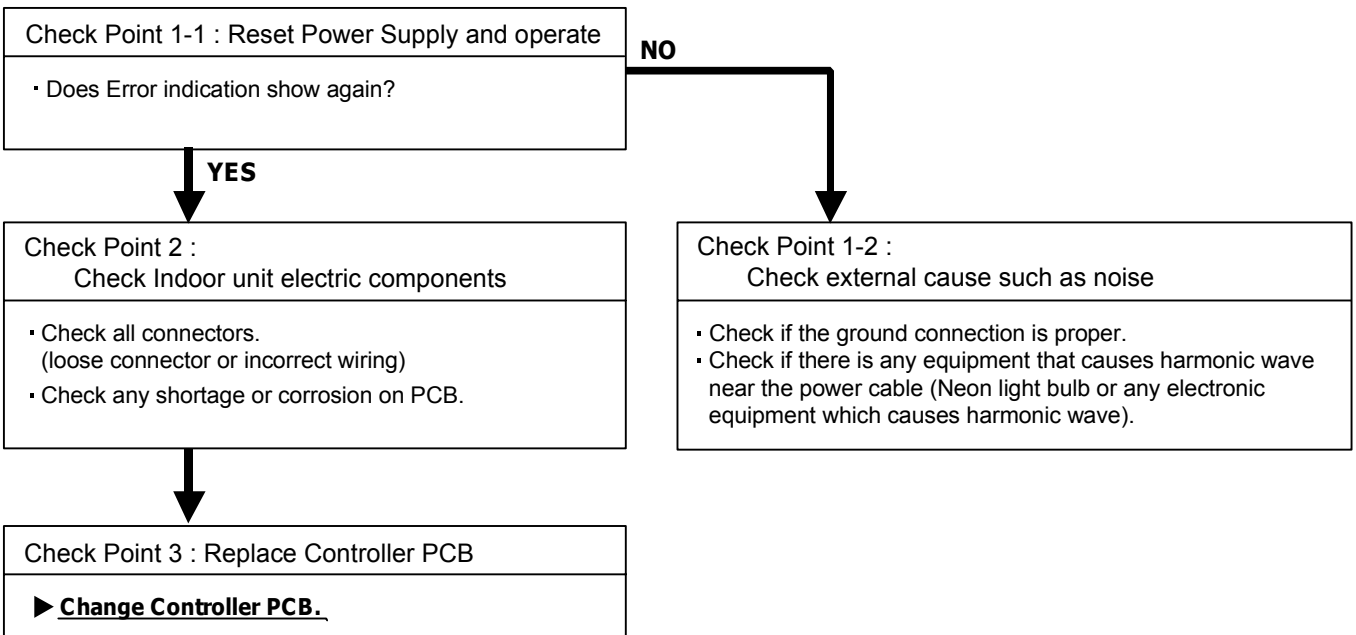
Check Point 2 : Check Indoor unit controller PCB

- Check if controller PCB damage
- Check if controller PCB and check the Error after setting remote controller address

Trouble shooting 8 INDOOR UNIT Error Method: Indoor unit PCB model information error	Indicate or Display: Error code : 32	Outdoor unit : Model 45.54																								
		<table border="1"> <thead> <tr> <th>POWER</th> <th>ERROR</th> <th>PUMP DOWN</th> <th colspan="3">LOW NOISE</th> <th colspan="3">PEAK CUT</th> </tr> <tr> <th>MODE</th> <th></th> <th>(L1)</th> <th>(L2)</th> <th>(L3)</th> <th>(L4)</th> <th>(L5)</th> <th>(L6)</th> </tr> </thead> <tbody> <tr> <td>◆2</td> <td>●</td> <td>◆5</td> <td>◆15</td> <td>○</td> <td>○</td> <td>○</td> <td>●</td> </tr> </tbody> </table>	POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT			MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)	◆2	●	◆5	◆15	○	○	○
POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT																				
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)																			
◆2	●	◆5	◆15	○	○	○	●																			

Detective Actuators: Indoor unit Controller PCB	Detective details: When power is on and there is some below case. 1. When model information of EEPROM is incorrect. 2. When the access to EEPROM failed.
---	--

Forecast of Cause: 1. External cause 2. Defective connection of electric components 3. Controller PCB failure



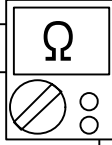
Note : EEPROM

EEPROM(Electronically Erasable and Programmable Read Only Memory) is a non-volatile memory which keeps memorized information even if power is turned off. It can change the contents electronically. To change the contents, it uses higher voltage than normal, and it can not change a partial contents. (Rewriting shall be done upon erasing the all contents.) There is a limit in a number of rewriting.

Trouble shooting 9 INDOOR UNIT Error Method: Manual Auto Switch Error	Indicate or Display:	Outdoor unit : Model 45.54																							
	ERROR CODE : 35	<table border="1"> <tr> <td>POWER</td> <td>ERROR</td> <td>PUMP DOWN</td> <td colspan="3">LOW NOISE</td> <td colspan="2">PEAK CUT</td> </tr> <tr> <td>MODE</td> <td></td> <td>(L1)</td> <td>(L2)</td> <td>(L3)</td> <td>(L4)</td> <td>(L5)</td> <td>(L6)</td> </tr> <tr> <td>◆2</td> <td>●</td> <td>◆5</td> <td>◆15</td> <td>○</td> <td>○</td> <td>○</td> <td>●</td> </tr> </table>	POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT		MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)	◆2	●	◆5	◆15	○	○	○
POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT																			
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)																		
◆2	●	◆5	◆15	○	○	○	●																		

Detective Actuators: Indoor Unit Controller PCB Indicator PCB Manual Auto Switch	Detective details: When the Manual Auto Switch becomes ON for consecutive 30 or more seconds.
--	---

Forecast of Cause : 1. Manual Auto Switch failure 2. Controller PCB and Indicator PCB failure
--

Check Point 1 : Check the Manual Auto Switch	
<ul style="list-style-type: none"> • Check if Manual Auto Switch is kept pressed. • Check ON/OFF switching operation by using a meter. >> If Manual Auto Switch is disabled (on/off switching), replace it.	



Check Point 2 : Replace Controller PCB and Indicator PCB
► If Check Point 1 do not improve the symptom, replace Controller PCB and Indicator PCB and execute the check operation again.

Trouble shooting 10 INDOOR UNIT Error Method: Indoor unit Communication circuit (wired remote controller) error	Indicate or Display: Error code : 3A	Outdoor unit : Model 45.54					
		POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT
		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
	◆2 ●	◆5	◆15	○	○	○	●

Detective Actuators: Indoor unit Controller PCB circuit	Detective details: Detect the communication error of microcomputer and communication PCB.
---	---

Forecast of Cause : 1.Communication PCB defective
 2. Indoor unit controller PCB defective

Check Point 1 : Check the connection of terminal

After turning off the power supply, check & correct the followings

- Indoor unit - Check the connection the communication PCB and the controller PCB



Check Point 2 : Replace the communication PCB

If the Check point 1 is ok, replace the communication PCB



Check Point 3 : Replace the controller PCB

If condition doesn't change, replace the controller PCB

<p>Trouble shooting 11 INDOOR UNIT Error Method: Indoor Room Thermistor Error</p>	<p>Indicate or Display: Error code : 41</p>	<p>Outdoor unit : Model 45.54</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="font-size: 8px;">POWER</td> <td style="font-size: 8px;">ERROR</td> <td style="font-size: 8px;">PUMP DOWN</td> <td colspan="3" style="font-size: 8px;">LOW NOISE</td> <td colspan="3" style="font-size: 8px;">PEAK CUT</td> </tr> <tr> <td style="font-size: 8px;">MODE</td> <td style="font-size: 8px;">(L1)</td> <td style="font-size: 8px;">(L2)</td> <td style="font-size: 8px;">(L3)</td> <td style="font-size: 8px;">(L4)</td> <td style="font-size: 8px;">(L5)</td> <td style="font-size: 8px;">(L6)</td> <td style="font-size: 8px;">(L6)</td> <td style="font-size: 8px;">(L6)</td> </tr> <tr> <td style="font-size: 8px;">◆2</td> <td style="font-size: 8px;">●</td> <td style="font-size: 8px;">◆5</td> <td style="font-size: 8px;">◆15</td> <td style="font-size: 8px;">○</td> <td style="font-size: 8px;">○</td> <td style="font-size: 8px;">○</td> <td style="font-size: 8px;">○</td> <td style="font-size: 8px;">●</td> </tr> </table>	POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT			MODE	(L1)	(L2)	(L3)	(L4)	(L5)	(L6)	(L6)	(L6)	◆2	●	◆5	◆15	○	○	○	○	●
POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT																							
MODE	(L1)	(L2)	(L3)	(L4)	(L5)	(L6)	(L6)	(L6)																					
◆2	●	◆5	◆15	○	○	○	○	●																					

<p>Detective Actuators: Indoor Unit Controller PCB Circuit Indoor Temperature Thermistor</p>	<p>Detective details: Indoor unit thermistor is open or short is detected always.</p>
---	---

Forecast of Cause : 1. Connector failure connection 2. Thermistor failure 3. Controller PCB failure

Check Point 1 : Check connection of Connector

- Check if connector is loose or removed
- Check erroneous connection
- Check if thermistor cable is open

>>Reset Power when reinstalling due to removed connector or incorrect wiring.



Check Point 2 : Remove connector and check Thermistor resistance value

Thermistor Characteristics(Rough value)

Temperature (°C)	0	5	10	15	20	25	30	35
Resistance value (kΩ)	33.6	25.9	20.2	15.8	12.5	10.0	8.0	6.5

Temperature (°C)	40	45	50
Resistance value (kΩ)	5.3	4.35	3.59

▶ **If Thermistor is either open or shorted, replace it and reset the power.**



Check Point 3 : Check Voltage of Controller PCB (DC 5.0V)

Make sure circuit diagram of each indoor unit and check terminal voltage at Thermistor (DC5.0V)

CN32	1	BLACK	—	—	—	
	2	BLACK	—	—	—	
H/E Thermistor						
CN8	1	BLACK	—	—	—	
	2	BLACK	—	—	—	
Room Temp. Thermistor						

▶ **If the voltage does not appear, replace Controller PCB and execute the check operation again.**

<p>Trouble shooting 12 INDOOR UNIT Error Method: Indoor Heat Ex. Thermistor Error</p>	<p>Indicate or Display: Outdoor unit : Model 45.54 Error code : 42</p>	<table border="1" style="border-collapse: collapse; width: 100%;"> <tr> <td style="font-size: 8px;">POWER</td> <td style="font-size: 8px;">ERROR</td> <td style="font-size: 8px;">PUMP DOWN</td> <td colspan="2" style="font-size: 8px;">LOW NOISE</td> <td colspan="2" style="font-size: 8px;">PEAK CUT</td> </tr> <tr> <td style="font-size: 8px;">MODE</td> <td></td> <td style="font-size: 8px;">(L1)</td> <td style="font-size: 8px;">(L2)</td> <td style="font-size: 8px;">(L3)</td> <td style="font-size: 8px;">(L4)</td> <td style="font-size: 8px;">(L5)</td> <td style="font-size: 8px;">(L6)</td> </tr> <tr> <td style="text-align: center;">◆2</td> <td style="text-align: center;">●</td> <td style="text-align: center;">◆5</td> <td style="text-align: center;">◆15</td> <td style="text-align: center;">○</td> <td style="text-align: center;">○</td> <td style="text-align: center;">○</td> <td style="text-align: center;">●</td> </tr> </table>	POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)	◆2	●	◆5	◆15	○	○	○	●
POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT																				
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)																		
◆2	●	◆5	◆15	○	○	○	●																		

<p>Detective Actuators: Indoor Unit Controller PCB Heat Exchanger (MID) Thermistor</p>	<p>Detective details: Indoor unit thermistor is open or short is detected always.</p>
---	---

Forecast of Cause : 1. Connector failure connection 2. Thermistor failure 3. Controller PCB failure

Check Point 1 : Check connection of Connector

- Check if connector is loose or removed
- Check erroneous connection
- Check if thermistor cable is open

>>Reset Power when reinstalling due to removed connector or incorrect wiring.



Check Point 2 : Remove connector and check Thermistor resistance value

Thermistor Characteristics(Rough value)

Temperature (°C)	0	5	10	15	20	25	30	35
Resistance value (kΩ)	176	134	103	80.3	62.9	49.7	39.6	31.7

Temperature (°C)	40	45	50
Resistance value (kΩ)	25.6	20.8	17.1

▶ If Thermistor is either open or shorted, replace it and reset the power.



Check Point 3 : Check voltage of Controller PCB (DC5.0V)

Make sure circuit diagram of each indoor unit and check terminal voltage at Thermistor (DC5.0V)

CN32	1	BLACK	—	—	
	2	BLACK	—	—	
H/E Thermistor					
CN8	1	BLACK	—	—	
	2	BLACK	—	—	
Room Temp. Thermistor					

▶ If the voltage does not appear, replace Controller PCB and execute the check operation again.

Trouble shooting 13 <u>INDOOR UNIT Error Method:</u> Human sensor error	<u>Indicate or Display:</u> Outdoor unit : Model 45.54 Error code : 44 <table border="1" style="float: right; margin-top: 10px; border-collapse: collapse; text-align: center;"> <tr> <th style="font-size: small;">POWER</th> <th style="font-size: small;">ERROR</th> <th style="font-size: small;">PUMP DOWN</th> <th colspan="3" style="font-size: small;">LOW NOISE</th> <th colspan="3" style="font-size: small;">PEAK CUT</th> </tr> <tr> <th style="font-size: x-small;">MODE</th> <th></th> <th style="font-size: x-small;">(L1)</th> <th style="font-size: x-small;">(L2)</th> <th style="font-size: x-small;">(L3)</th> <th style="font-size: x-small;">(L4)</th> <th style="font-size: x-small;">(L5)</th> <th style="font-size: x-small;">(L6)</th> </tr> <tr> <td style="font-size: x-small;">◆2</td> <td style="font-size: x-small;">●</td> <td style="font-size: x-small;">◆5</td> <td style="font-size: x-small;">◆15</td> <td style="font-size: x-small;">○</td> <td style="font-size: x-small;">○</td> <td style="font-size: x-small;">○</td> <td style="font-size: x-small;">●</td> </tr> </table>	POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT			MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)	◆2	●	◆5	◆15	○	○	○	●
POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT																				
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)																			
◆2	●	◆5	◆15	○	○	○	●																			

<u>Detective Actuators:</u> Indoor unit Main PCB	<u>Detective details:</u> 1 Detect the open condition of the sensor. 2 When the signal from the sensor is "L"(=0V) for more than 10 min.
--	---

<u>Forecast of Cause:</u> 1. Connection failure 2. Sensor failure 3. Indoor unit Main PCB failure

Check Point 1 : Check the connector connection and cable open
<input type="checkbox"/> Check if connector is loose or removed <input type="checkbox"/> Check erroneous connection <input type="checkbox"/> Check if sensor cable is open >>Reset Power when reinstalling due to removed connector or incorrect wiring.

↓ **OK (Sensor connections error)**

↓ **OK(Sensor signal error)**

Check Point 2 : Conduction check
Disconnect the sensor and check the 2-3pin on sensor connector. >>With conduction : Main PCB failure >>Without conduction : Sensor failure

Check Point 2 : Voltage check
Disconnect the sensor and check the Voltage of 1pin of the CN10 on the Main PCB >>5V: Sensor failure >>Other than 5V: Main PCB failure

Trouble shooting 14 INDOOR UNIT Error Method: Indoor Unit Fan Motor1 Error	Indicate or Display: Error code : 51		Outdoor unit : Model 45.54					
	POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT	
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)	
◆2	●	◆5	◆15	○	○	○	●	

Detective Actuators: Indoor unit Power Supply PCB Indoor unit fan motor	Detective details: When the fan motor speed is less than 1/3 of the target fan speed for 56 seconds. When detect the 0 rpm for 56 seconds after fan motor started.
--	---

Forecast of Cause:

1. Fan rotation failure 2. Fan motor winding open 3. Motor protection by surrounding temperature rise
 4. Power Supply PCB failure 5. Indoor unit fan motor failure

Check Point 1 : Check rotation of Fan

• Rotate the fan by hand when operation is off.
 (Check if fan is caught, dropped off or locked motor)
>>If Fan or Bearing is abnormal, replace it.



Check Point 2 : Check ambient temp. around motor

• Check excessively high temperature around the motor.
 (if there is any surrounding equipment that causes heat)
>>Upon the temperature coming down, restart operation.



Check Point 3 : Check Indoor unit fan motor

• Check Indoor unit fan motor. (PARTS INFORMATION 4)
>>if Indoor unit fan motor is abnormal, replace Indoor unit fan motor.



Check Point 4 : Replace Power Supply PCB

► **if Check Point 1- 3 do not improve the symptom, replace Power Supply PCB.**

Trouble shooting 15 INDOOR UNIT Error Method: Drain pump Error	Indicate or Display: Error code : 53	Outdoor unit : Model 45.54 <table border="1"> <tr> <td>POWER</td> <td>ERROR</td> <td>PUMP DOWN</td> <td colspan="3">LOW NOISE</td> <td colspan="3">PEAK CUT</td> </tr> <tr> <td>MODE</td> <td></td> <td>(L1)</td> <td>(L2)</td> <td>(L3)</td> <td>(L4)</td> <td>(L5)</td> <td>(L6)</td> <td></td> </tr> <tr> <td>◆2</td> <td>●</td> <td>◆5</td> <td>◆15</td> <td>○</td> <td>○</td> <td>○</td> <td>○</td> <td>●</td> </tr> </table>	POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT			MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)		◆2	●	◆5	◆15	○	○	○	○	●
	POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT																						
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)																						
◆2	●	◆5	◆15	○	○	○	○	●																					

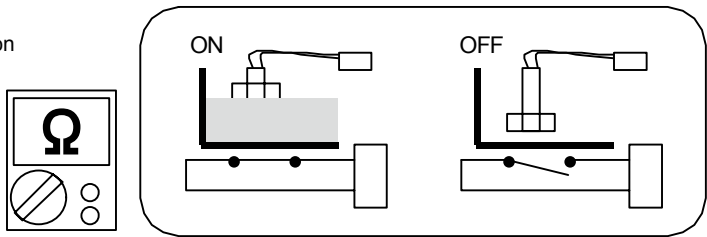
Detective Actuators: Indoor Unit Controller PCB Circuit Float Switch	Detective details: When Float switch is ON for more than 3 minutes.
---	---

Forecast of Cause : 1. Float switch failure 2. Shorted connector/wire 3. Controller PCB failure
 4. Drain pump failure 5. Hose clogging

Check Point 1 : Check Float Switch

- ❑ Check operation of float switch. (any blocking by dust, etc.)
- ❑ Remove Float switch and check ON/OFF switching operation by using a meter.

>>If Float switch is abnormal, replace it.



OK

Check Point 2 : Check Connector and Wire

- ❑ Check loose contact of CN9 and shorted wire (pinched wire).

>>Replace Float switch if the wire is abnormal

OK

Check Point 3 : Check Drain Hose

- ❑ Check Drain Hose .

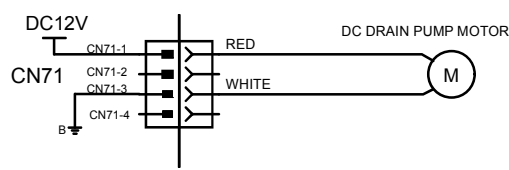
>>If there is Hose clogging. Please clear the clog.

OK

Check Point 4 : Check Controller PCB and Drain Pump

- ❑ Check Drain Pump.

If drain pump is not run on the working condition, check the voltage of the CN71 on the controller PCB.

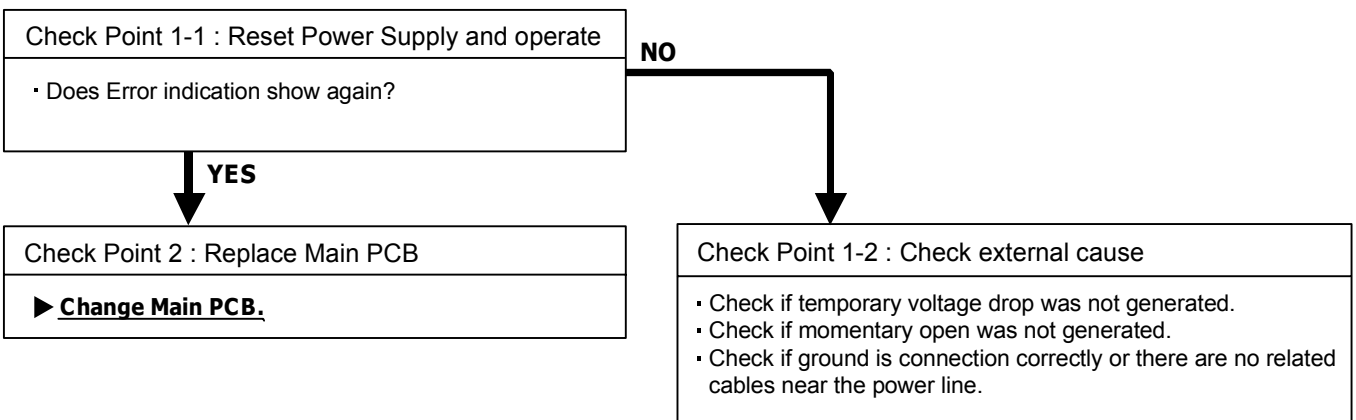


Measurement result
 12V : Replace the Drain Pump
 Other than 12V : Replace the controller PCB

Trouble shooting 16 OUTDOOR UNIT Error Method: Outdoor unit main PCB model information error	Indicate or Display: Outdoor unit : Model 45.54 Error code : 62																										
	<table border="1"> <thead> <tr> <th>POWER</th> <th>ERROR</th> <th>PUMP DOWN</th> <th colspan="3">LOW NOISE</th> <th colspan="3">PEAK CUT</th> </tr> <tr> <th>MODE</th> <th></th> <th>(L1)</th> <th>(L2)</th> <th>(L3)</th> <th>(L4)</th> <th>(L5)</th> <th>(L6)</th> <th></th> </tr> </thead> <tbody> <tr> <td>◆2</td> <td>●</td> <td>◆6</td> <td>◆2</td> <td>○</td> <td>○</td> <td>○</td> <td>○</td> <td>●</td> </tr> </tbody> </table>	POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT			MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)		◆2	●	◆6	◆2	○	○	○	○
POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT																					
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)																				
◆2	●	◆6	◆2	○	○	○	○	●																			

Detective Actuators: Outdoor unit Main PCB	Detective details: Access to EEPROM failed due to some cause after outdoor unit started.
--	--

Forecast of Cause:
 1. External cause (Noise, temporary open, voltage drop) 2. Main PCB failure



Trouble shooting 17 OUTDOOR UNIT Error Method: Inverter Error	Indicate or Display: Outdoor unit : Model 45.54 Error code : 63																							
	<table border="1"> <tr> <td>POWER</td> <td>ERROR</td> <td>PUMP DOWN</td> <td colspan="2">LOW NOISE</td> <td colspan="3">PEAK CUT</td> </tr> <tr> <td>MODE</td> <td></td> <td>(L1)</td> <td>(L2)</td> <td>(L3)</td> <td>(L4)</td> <td>(L5)</td> <td>(L6)</td> </tr> <tr> <td>◆2</td> <td>●</td> <td>◆6</td> <td>◆3</td> <td>○</td> <td>○</td> <td>○</td> <td>●</td> </tr> </table>	POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT			MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)	◆2	●	◆6	◆3	○	○	○
POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT																			
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)																	
◆2	●	◆6	◆3	○	○	○	●																	

Detective Actuators: Transistor PCB	Detective details: ▪Error information received from Transistor PCB
---	--

Forecast of Cause : 1. External cause. 2. Power supply to Filter PCB to Inverter PCB wiring disconnection, open 3. Filter PCB failure 4. Transistor PCB failure

Check Point 1-1 : Turn the power on again. Error displayed again?	NO →	Check Point 1-2 : External cause <input type="checkbox"/> Check if temporary voltage drop was not generated. <input type="checkbox"/> Check if temporary open was not generated. <input type="checkbox"/> Check if ground is connected correctly or there are no related cables near the power line.
---	-------------	---

YES ↓

Check Point 2 : Check the wiring (Power supply to Filter PCB to Inverter PCB) <input type="checkbox"/> Connector and wiring connection state check <input type="checkbox"/> Cable open check
--

OK ↓

Check Point 3 : Replace Filter PCB (INV) and Inverter PCB <input type="checkbox"/> Replace Filter PCB and Inverter PCB.
--

<p>Trouble shooting 18 <u>OUTDOOR UNIT Error Method:</u> Active filter voltage error</p>	<p><u>Indicate or Display:</u></p> <p>Error code : 64</p> <p style="text-align: right;">Outdoor unit : No indication</p>
---	--

<p><u>Detective Actuators:</u></p> <p>Outdoor unit Main PCB Active filter module Transistor PCB</p>	<p><u>Detective details:</u></p> <p>① When inverter input DC voltage is higher than 430V or lower than 110V. ② When a momentary power cut off occurred on low voltage</p>
--	---

<p><u>Forecast of Cause :</u></p> <p>1. External cause 2. Connector connection failure 3. Main PCB failure 4. Active filter module failure 5. Transistor PCB failure</p>
--

<p>Check Point 1 : Check external cause at Indoor and Outdoor (Voltage drop or Noise)</p> <ul style="list-style-type: none"> • Instant drop : Check if there is a large load electric apparatus in the same circuit. • Momentary power failure : Check if there is a defective contact or leak current in the power supply circuit. • Noise : Check if there is any equipment causing harmonic wave near electric line. (Neon bulb or electric equipment that may cause harmonic wave) Check the complete insulation of grounding.
--



<p>Check Point 2 : Check connection of Connector</p> <ul style="list-style-type: none"> • Check if connector is removed. • Check erroneous connection. • Check if cable is open. <p>>><u>Upon correcting the removed connector or mis-wiring, reset the power.</u></p>
--



<p>Check Point 3 : Check Active filter module</p> <ul style="list-style-type: none"> • Check Active filter module. <p>>><u>If Active filter module is abnormal, replace it.</u></p>



<p>Check Point 4 : Check Transistor PCB</p> <ul style="list-style-type: none"> • Check Transistor PCB <p>>><u>If Transistor PCB is abnormal, replace it.</u></p>
--



<p>Check Point 5 : Replace Main PCB</p> <p>▶ <u>If Check Point 1 - 4 do not improve the symptom, change Main PCB.</u></p>
--

Trouble shooting 19 OUTDOOR UNIT Error Method: IPM Error	Indicate or Display: Error code : 65	Outdoor unit : Model 45.54 <table border="1"> <tr> <td>POWER</td> <td>ERROR</td> <td>PUMP DOWN</td> <td colspan="2">LOW NOISE</td> <td colspan="2">PEAK CUT</td> </tr> <tr> <td>MODE</td> <td></td> <td>(L1)</td> <td>(L2)</td> <td>(L3)</td> <td>(L4)</td> <td>(L5) (L6)</td> </tr> <tr> <td>◆2</td> <td>●</td> <td>◆6</td> <td>◆5</td> <td>○</td> <td>○</td> <td>● ●</td> </tr> </table>	POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		MODE		(L1)	(L2)	(L3)	(L4)	(L5) (L6)	◆2	●	◆6	◆5	○	○	● ●
	POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT																	
MODE		(L1)	(L2)	(L3)	(L4)	(L5) (L6)																	
◆2	●	◆6	◆5	○	○	● ●																	

Detective Actuators: Outdoor unit Main PCB Compressor Transistor PCB	Detective details: 1 When more than normal operating current to IPM in Main PCB flows, the compressor stops. 2 After the compressor restarts, if the same operation is repeated within 40sec, the compressor stops again. 3 If 1 and 2 repeats 5 times, the compressor stops permanently.
--	---

Forecast of Cause : 1. Defective connection of electric components 2. Outdoor Fan Operation failure 3. Outdoor Heat Exchanger clogged 4. Compressor failure 5. Main PCB failure 6. Transistor PCB failure
--

Check Point 1 : Check connections of Outdoor Unit Electrical Components <ul style="list-style-type: none"> • Check if the terminal connection is loose. • Check if connector is removed. • Check erroneous connection. • Check if cable is open. >>Upon correcting the removed connector or mis-wiring, reset the power.



Check Point 2 : Check Outdoor Fan, Heat Exchanger <ul style="list-style-type: none"> • Is there anything obstructing the air distribution circuit? • Is there any clogging of Outdoor Heat Exchanger? • Is the Fan rotating by hand when operation is off ? >>If the Fan Motor is locked, replace it.



Check Point 3 : Check Outdoor Fan <ul style="list-style-type: none"> • Check Outdoor Fan Motor. (Refer to Trouble shooting 29,30) >>If the Fan Motor is failure, replace it.
--



Check Point 4 : Check Compressor <ul style="list-style-type: none"> • Check Compressor. (PARTS INFORMATION 2)



Check Point 5 : Check Transistor PCB <ul style="list-style-type: none"> • Check Transistor PCB >>If Transistor PCB is abnormal, replace it.



Check Point 6 : Replace Main PCB ► If Check Point 1~ 5 do not improve the symptom, change Main PCB.
--

<p>Trouble shooting 20 OUTDOOR UNIT Error Method: Discharge Thermistor Error</p>	<p>Indicate or Display: Outdoor unit : Model 45.54</p> <p>Error code : 71</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>POWER</th> <th>ERROR</th> <th>PUMP DOWN (L1)</th> <th colspan="3">LOW NOISE (L2) (L3) (L4)</th> <th colspan="2">PEAK CUT (L5) (L6)</th> </tr> </thead> <tbody> <tr> <td>◆2</td> <td>●</td> <td>◆7</td> <td>◆1</td> <td>○</td> <td>○</td> <td>○</td> <td>●</td> </tr> </tbody> </table>	POWER	ERROR	PUMP DOWN (L1)	LOW NOISE (L2) (L3) (L4)			PEAK CUT (L5) (L6)		◆2	●	◆7	◆1	○	○	○	●
POWER	ERROR	PUMP DOWN (L1)	LOW NOISE (L2) (L3) (L4)			PEAK CUT (L5) (L6)											
◆2	●	◆7	◆1	○	○	○	●										

<p>Detective Actuators:</p> <p>Discharge temperature thermistor</p>	<p>Detective details:</p> <ul style="list-style-type: none"> • Discharge temperature thermistor short detected • Discharge thermistor open detected
--	--

Forecast of Cause :

1. Connector connection failure, open
2. Thermistor failure
3. Main PCB failure

Check Point 1 : Check the connector connection and cable open

<input type="checkbox"/> Connector connection state check <input type="checkbox"/> Cable open check
--



Check Point 2 : Check the thermistor

<input type="checkbox"/> Thermistor characteristics check (Disconnect the thermistor from the PCB and check.) * For the thermistor characteristics, refer to the "Service Parts Information 8".
--



Check Point 3 : Check voltage of Main PCB (DC5.0V)

<p>[30/36]</p> <div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>Discharge temperature thermistor (CN63:1-3)</p> </div>	<p>[45/54]</p> <div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>Discharge temperature thermistor (CN62:1-2)</p> </div>
---	---

► If the voltage does not appear, replace Main PCB, and execute the check operation again.

Trouble shooting 21 OUTDOOR UNIT Error Method: Compressor Thermistor Error	Indicate or Display: Error code : 72	Outdoor unit : Model 45.54						
		POWER	ERROR	PUMP DOWN (L1)	LOW NOISE (L2)	(L3)	PEAK CUT (L4)	(L5)
MODE	◆2	●	◆7	◆2	○	○	○	●

Detective Actuators: Compressor temperature thermistor	Detective details: <ul style="list-style-type: none"> Compressor temperature thermistor short detected Compressor thermistor open detected
--	---

Forecast of Cause :

1. Connector connection failure, open
2. Thermistor failure
3. Main PCB failure

Check Point 1 : Check the connector connection and cable open

Connector connection state check

Cable open check



Check Point 2 : Check the thermistor

Thermistor characteristics check (Disconnect the thermistor from the PCB and check.)

* For the thermistor characteristics, refer to the "Service Parts Information 8".



Check Point 3 : Check voltage of Main PCB (DC5.0V)

Main PCB 30/36(CN64:1-3) 45/54(CN62:3-4) voltage value = 5V
Remove the thermistor from Main PCB, check the voltage.

[30/36]

Compressor temperature thermistor(CN64:1-3)

[45/54]

Compressor temperature thermistor(CN62:3-4)

► If the voltage does not appear, replace Main PCB, and execute the check operation again.

Trouble shooting 22 OUTDOOR UNIT Error Method: Heat Ex. Outlet Temp. Thermistor Error	Indicate or Display: Error code : 73	Outdoor unit : Model 45.54 <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>POWER</th> <th>ERROR</th> <th colspan="3">PUMP DOWN</th> <th colspan="3">LOW NOISE</th> <th colspan="2">PEAK CUT</th> </tr> <tr> <th>MODE</th> <th></th> <th>(L1)</th> <th>(L2)</th> <th>(L3)</th> <th>(L4)</th> <th>(L5)</th> <th>(L6)</th> <th></th> </tr> </thead> <tbody> <tr> <td>◆2</td> <td>●</td> <td>◆7</td> <td>◆3</td> <td>○</td> <td>○</td> <td>●</td> <td>○</td> <td></td> </tr> <tr> <td>◆2</td> <td>●</td> <td>◆7</td> <td>◆3</td> <td>○</td> <td>○</td> <td>●</td> <td>●</td> <td></td> </tr> </tbody> </table>	POWER	ERROR	PUMP DOWN			LOW NOISE			PEAK CUT		MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)		◆2	●	◆7	◆3	○	○	●	○		◆2	●	◆7	◆3	○	○	●	●	
POWER	ERROR	PUMP DOWN			LOW NOISE			PEAK CUT																															
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)																																
◆2	●	◆7	◆3	○	○	●	○																																
◆2	●	◆7	◆3	○	○	●	●																																

Detective Actuators: Heat exchanger liquid temperature thermistor	Detective details: · Heat exchanger outlet temperature thermistor short or open detected
---	--

Forecast of Cause :

1. Connector connection defective, open
2. Thermistor failure
3. Main PCB failure

Check Point 1 : Check the connector connection and cable open

- Connector connection state check
- Cable open check



Check Point 2 : Check the thermistor

- Thermistor characteristics check (Disconnect the thermistor from the PCB and check.)
 * For the thermistor characteristics, refer to the "Service Parts Information 8".



<p>Check Point 3 : Check voltage of Main PCB (DC5.0V)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Main PCB 30/36(CN65:1-3) 45/54(CN63:1-2) voltage value = 5V Remove the thermistor from Main PCB, check the voltage. <div style="display: flex; justify-content: space-around;"> <div style="width: 45%;"> <p>[30/36]</p> <p style="text-align: center;">Compressor temperature thermistor(CN65:1-3)</p> </div> <div style="width: 45%;"> <p>[45/54]</p> <p style="text-align: center;">Compressor temperature thermistor(CN63:1-2)</p> </div> </div> <p>▶ <u>If the voltage does not appear, replace Main PCB, and execute the check operation again.</u></p>	<div style="border: 1px solid black; padding: 5px; width: 40px; margin: 0 auto;"> <p style="margin: 0;">DC</p> </div>
--	--

Trouble shooting 23 OUTDOOR UNIT Error Method: Outdoor Thermistor Error	Indicate or Display: Error code : 74	Outdoor unit : Model 45.54 <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <th>POWER</th> <th>ERROR</th> <th>PUMP DOWN</th> <th colspan="3">LOW NOISE</th> <th colspan="3">PEAK CUT</th> </tr> <tr> <td>MODE</td> <td></td> <td>(L1)</td> <td>(L2)</td> <td>(L3)</td> <td>(L4)</td> <td>(L5)</td> <td>(L6)</td> <td></td> </tr> <tr> <td>◆2</td> <td>●</td> <td>◆7</td> <td>◆4</td> <td>○</td> <td>○</td> <td>○</td> <td>○</td> <td>●</td> </tr> </table>	POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT			MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)		◆2	●	◆7	◆4	○	○	○	○	●
POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT																							
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)																						
◆2	●	◆7	◆4	○	○	○	○	●																					

Detective Actuators: Outdoor temperature thermistor	Detective details: · Outdoor temperature thermistor short or open detected
---	--

Forecast of Cause :

1. Connector connection defective, open
2. Thermistor failure
3. Main PCB failure

Check Point 1 : Check the connector connection and cable open

- Connector connection state check
- Cable open check




Check Point 2: Check the thermistor

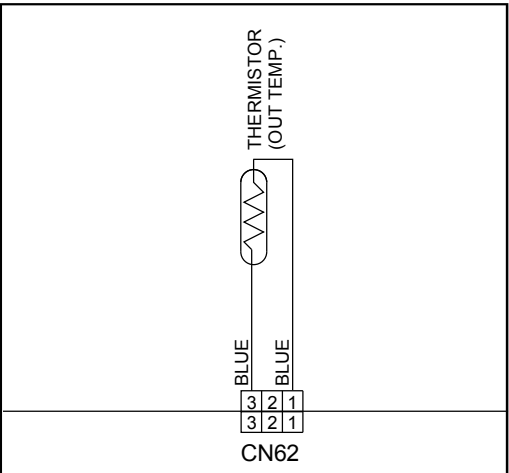
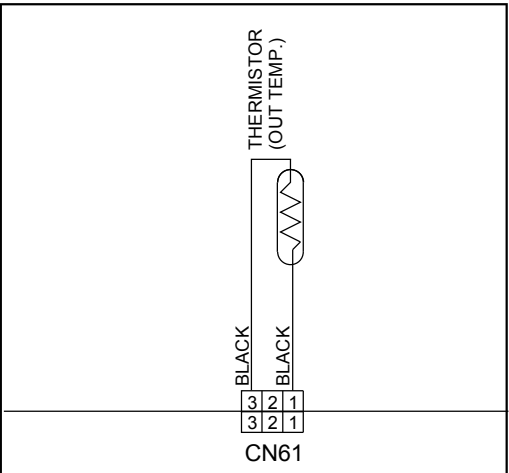
- Thermistor characteristics check (Disconnect the thermistor from the PCB and check.)
 * For the thermistor characteristics, refer to the "Service Parts Information 8".



Check Point 3 : Check voltage of Main PCB (DC5.0V)

DC


- Main PCB 30/36(CN62:1-3) 45/56(CN61:1-3) voltage value =5V
Remove the thermistor from Main PCB, check the voltage.

<p>[30/36]</p> <div style="text-align: center;">  <p>Compressor temperature thermistor(CN62:1-3)</p> </div>	<p>[45/54]</p> <div style="text-align: center;">  <p>Compressor temperature thermistor(CN61:1-3)</p> </div>
---	--

► **If the voltage does not appear, replace Main PCB, and execute the check operation again.**

Trouble shooting 24 OUTDOOR UNIT Error Method: Heat Sink Thermistor Error	Indicate or Display:	Outdoor unit : Model 45.54																						
	Error code : 77	<table border="1"> <thead> <tr> <th>POWER</th> <th>ERROR</th> <th>PUMP DOWN</th> <th colspan="2">LOW NOISE</th> <th colspan="2">PEAK CUT</th> </tr> <tr> <th>MODE</th> <th></th> <th>(L1)</th> <th>(L2)</th> <th>(L3)</th> <th>(L4)</th> <th>(L5)</th> <th>(L6)</th> </tr> </thead> <tbody> <tr> <td>◆2</td> <td>●</td> <td>◆7</td> <td>◆7</td> <td>○</td> <td>○</td> <td>○</td> <td>●</td> </tr> </tbody> </table>	POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)	◆2	●	◆7	◆7	○	○	○
POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT																			
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)																	
◆2	●	◆7	◆7	○	○	○	●																	

Detective Actuators: Outdoor unit Main PCB	Detective details: · Heat sink temperature thermistor (Built-in IPM) open/short detected
--	--

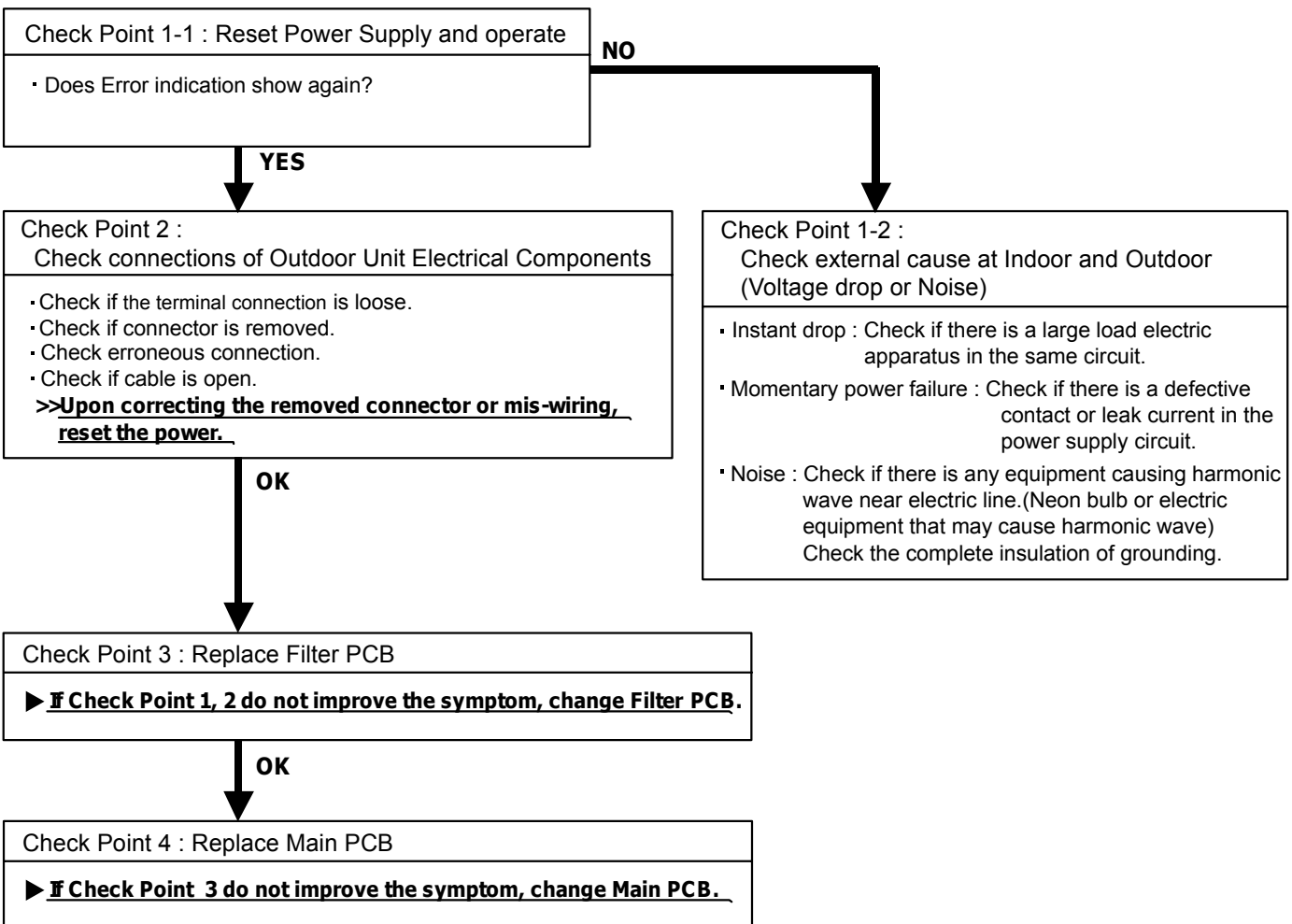
Forecast of Cause : 1. Main PCB failure ► <u>If this error is displayed, replace Main PCB</u>
--

Attention!!
 This unit does not have a heat sink themistor
 In this case, replace Main PCB

Trouble shooting 25 OUTDOOR UNIT Error Method: Current Sensor Error	Indicate or Display: Error code : 84	Outdoor unit : Model 45.54					
		POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT
		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
	◆2 ●	◆8	◆4	○	○	○	●

Detective Actuators: Outdoor unit Main PCB	Detective details: When Input Current Sensor has detected 0A, while Inverter Compressor is operating at higher than 56rps, after 1minute upon starting the Compressor. (Except during the defrost operation)
--	--

Forecast of Cause : 1. Defective connection of electric components 2. External cause 3. Filter PCB failure 4. Main PCB failure



Trouble shooting 26 OUTDOOR UNIT Error Method: Pressure Sencer Error	Indicate or Display: Error code : 86	Outdoor unit : Model 45.54																										
		<table border="1"> <thead> <tr> <th>POWER</th> <th>ERROR</th> <th>PUMP DOWN</th> <th colspan="3">LOW NOISE</th> <th colspan="3">PEAK CUT</th> </tr> <tr> <th>MODE</th> <th></th> <th>(L1)</th> <th>(L2)</th> <th>(L3)</th> <th>(L4)</th> <th>(L5)</th> <th>(L6)</th> <th></th> </tr> </thead> <tbody> <tr> <td>◆2</td> <td>●</td> <td>◆8</td> <td>◆6</td> <td>○</td> <td>●</td> <td>○</td> <td>○</td> <td>○</td> </tr> </tbody> </table>	POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT			MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)		◆2	●	◆8	◆6	○	●	○	○
POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT																						
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)																					
◆2	●	◆8	◆6	○	●	○	○	○																				

Detective Actuators: High pressure switch	Detective details: • When the power was turned on, "high pressure switch : open" was detected.
---	--

Forecast of Cause : 1. High pressure switch connector disconnection, open
 2. High pressure switch characteristics failure
 3. Main PCB failure

Check Point 1 : Check the high pressure switch connection state

- Connector and wiring connection state check
- Cable open check



Check Point 2 : Check the high pressure switch characteristics

- Switch characteristics check
 * For the characteristics of high pressure switch, refer to below.



Check Point 3 : Replace Main PCB

- Change Main PCB, and execute the check operation again.**

▪ Type of contact

▪ Characteristics of pressure switch (30/36:CN90,45/54:CN101)

	Pressure switch 1
Contact : Short ⇒ Open	4.2±0.1MPa
Contact : Open ⇒ Short	3.2±0.15MPa

Trouble shooting 27 OUTDOOR UNIT Error Method: Over Current Error	Indicate or Display: Error code : 94	Outdoor unit : Model 45.54																							
		<table border="1"> <thead> <tr> <th>POWER</th> <th>ERROR</th> <th>PUMP DOWN</th> <th colspan="3">LOW NOISE</th> <th colspan="2">PEAK CUT</th> </tr> <tr> <th>MODE</th> <th></th> <th>(L1)</th> <th>(L2)</th> <th>(L3)</th> <th>(L4)</th> <th>(L5)</th> <th>(L6)</th> </tr> </thead> <tbody> <tr> <td>◆2</td> <td>●</td> <td>◆9</td> <td>◆4</td> <td>○</td> <td>○</td> <td>○</td> <td>●</td> </tr> </tbody> </table>	POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT		MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)	◆2	●	◆9	◆4	○	○	○
POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT																			
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)																		
◆2	●	◆9	◆4	○	○	○	●																		

Detective Actuators: Outdoor unit Main PCB Compressor Transistor PCB	Detective details: ▪ "Protection stop by overcurrent generation after inverter compressor start processing completed" generated consecutively 10 times. * The number of generations is reset if the start-up of the compressor succeeds.
--	--

Forecast of Cause :

1. Outdoor unit fan operation defective, foreign matter on heat exchanger, excessive rise of ambient temperature
2. Main PCB
3. Inverter compressor failure (lock, winding short)
4. Transistor PCB (IPM) failure

Check Point 1 : Check the outdoor unit fan operation, heat exchanger, ambient temperature

- No obstructions in air passages?
- Heat exchange fins clogged
- Outdoor unit fan motor check
- Ambient temperature not raised by the effect of other heat sources?
- Discharged air not sucked in?

↓
OK

Check Point 2: Check Transistor PCB (IPM)

- Check IPM. **(PARTS INFORMATION 7)**
 >> **If IPM is abnormal, replace Transistor PCB.**

↓
OK

Check Point 3: Replace Main PCB

▶ **If Check Point 1 or 1,2 do not improve the symptom, change Main PCB.**

↓
OK

Check Point 4: Replace Compressor

▶ **If Check Point 3 do not improve the symptom, change Compressor.**

Trouble shooting 28 OUTDOOR UNIT Error Method: Compressor Control Error	Indicate or Display: Error code : 95	Outdoor unit : Model 45.54						
		POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT	
		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)	
MODE	◆2	●	◆9	◆5	○	○	○	●

Detective Actuators: Outdoor unit Main PCB Compressor Transistor PCB	Detective details: ① While running the compressor, if the detected rotor location is out of phase with actual rotor location more than 90°, the compressor stops. ② After the compressor restarts, if the same operation is repeated within 40sec, the compressor stops again. ③ If ① and ② repeats 5 times, the compressor stops permanently.
--	--

Forecast of Cause : 1. Defective connection of electric components 2. Main PCB failure 3. Compressor failure 4. Transistor PCB (IPM) failure

Check Point 1 : Check Noise from Compressor • Turn on Power and check operation noise. ▶ If an abnormal noise show, replace Compressor.



Check Point 2 : Check connection of around the Compressor components For Compressor Terminal, Main PCB • Check if connector is removed. • Check erroneous connection. • Check if cable is open. (Refer to PARTS INFORMATION 2) >>Upon correcting the removed connector or mis-wiring, reset the power.
--



Check Point 3: Check Transistor PCB (IPM) • Check IPM. (PARTS INFORMATION 7) >>If IPM is abnormal, replace Transistor PCB.



Check Point 4: Replace Main PCB ▶ If Check Point 1,2 or 1~3 do not improve the symptom, change Main PCB.



Check Point 5: Replace Compressor ▶ If Check Point 4 do not improve the symptom, change Compressor.
--

Trouble shooting 29 OUTDOOR UNIT Error Method: Outdoor Unit Fan Motor 1 Error	Indicate or Display: Error code : 97		Outdoor unit : Model 45.54					
	POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT	
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)	
◆2	●	◆9	◆7	○	○	●	●	

Detective Actuators: Outdoor unit Main PCB Outdoor unit fan motor	Detective details: ① When outdoor fan rotation speed is less than 100rpm in 20 seconds after fan motor starts, fan motor stops. ② After fan motor restarts, if the same operation within 60sec is repeated 3 times in a row, compressor and fan motor stops. ③ If ① and ② repeats 5 times in a row, compressor and fan motor stops permanently.
--	---

Forecast of Cause: 1. Fan rotation failure 2. Motor protection by surrounding temperature rise 3. Main PCB failure 4. Outdoor unit fan motor failure

Check Point 1 : Check rotation of Fan • Rotate the fan by hand when operation is off. (Check if fan is caught, dropped off or locked motor) >>If Fan or Bearing is abnormal, replace it.



Check Point 2 : Check ambient temp. around motor • Check excessively high temperature around the motor. (If there is any surrounding equipment that causes heat) >>Upon the temperature coming down, restart operation.
--



Check Point 3 : Check Outdoor unit fan motor • Check Outdoor unit fan motor. (PARTS INFORMATION 5) >>If Outdoor Fan Motor is abnormal, replace Outdoor fan motor and Main PCB.



Check Point 4 : Check Output Voltage of Main PCB • Check outdoor unit circuit diagram and the voltage. (Measure at Main PCB side connector)	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> DC </div>																									
<table border="1" style="display: inline-table; margin-right: 20px;"> <tr> <td style="text-align: center;">1</td><td style="text-align: center;">1</td><td style="text-align: center;">RED</td><td rowspan="6" style="text-align: center; vertical-align: middle;"> Fan motor 1 (Upper) </td> </tr> <tr> <td style="text-align: center;">2</td><td style="text-align: center;">2</td><td></td> </tr> <tr> <td style="text-align: center;">3</td><td style="text-align: center;">3</td><td style="text-align: center;">BLACK</td> </tr> <tr> <td style="text-align: center;">4</td><td style="text-align: center;">4</td><td style="text-align: center;">WHITE</td> </tr> <tr> <td style="text-align: center;">5</td><td style="text-align: center;">5</td><td style="text-align: center;">YELLOW</td> </tr> <tr> <td style="text-align: center;">6</td><td style="text-align: center;">6</td><td style="text-align: center;">BROWN</td> </tr> </table>	1	1	RED	Fan motor 1 (Upper) 	2	2		3	3	BLACK	4	4	WHITE	5	5	YELLOW	6	6	BROWN	<table border="1" style="display: inline-table;"> <thead> <tr> <th>Read wire</th> <th>DC voltage</th> </tr> </thead> <tbody> <tr> <td>Red - Black</td> <td>280V (AC220V-10%) ~ 373V (AC240+10%)</td> </tr> <tr> <td>White - Black</td> <td>15 ± 1.5V</td> </tr> </tbody> </table>	Read wire	DC voltage	Red - Black	280V (AC220V-10%) ~ 373V (AC240+10%)	White - Black	15 ± 1.5V
1	1	RED	Fan motor 1 (Upper) 																							
2	2																									
3	3	BLACK																								
4	4	WHITE																								
5	5	YELLOW																								
6	6	BROWN																								
Read wire	DC voltage																									
Red - Black	280V (AC220V-10%) ~ 373V (AC240+10%)																									
White - Black	15 ± 1.5V																									
► If the voltage is not correct, replace Main PCB.																										

Trouble shooting 30 OUTDOOR UNIT Error Method: Outdoor Unit Fan Motor 2 Error For Model 45/54	Indicate or Display: Error code : 98	Outdoor unit : Model 45.54 <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td>POWER</td> <td>ERROR</td> <td>PUMP DOWN</td> <td colspan="3">LOW NOISE</td> <td colspan="2">PEAK CUT</td> </tr> <tr> <td>MODE</td> <td></td> <td>(L1)</td> <td>(L2)</td> <td>(L3)</td> <td>(L4)</td> <td>(L5)</td> <td>(L6)</td> </tr> <tr> <td>◆2</td> <td>●</td> <td>◆9</td> <td>◆8</td> <td>○</td> <td>○</td> <td>●</td> <td>●</td> </tr> </table>	POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT		MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)	◆2	●	◆9	◆8	○	○	●	●
POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT																				
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)																			
◆2	●	◆9	◆8	○	○	●	●																			

Detective Actuators: Outdoor unit Main PCB Outdoor unit fan motor	Detective details: ① When outdoor fan rotation speed is less than 100rpm in 20 seconds after fan motor starts, fan motor stops. ② After fan motor restarts, if the same operation within 60sec is repeated 3 times in a row, compressor and fan motor stops. ③ If ① and ② repeats 5 times in a row, compressor and fan motor stops permanently.
--	---

Forecast of Cause:

1. Fan rotation failure 2. Motor protection by surrounding temperature rise 3. Main PCB failure
 4. Outdoor unit fan motor failure

Check Point 1 : Check rotation of Fan

• Rotate the fan by hand when operation is off.
 (Check if fan is caught, dropped off or locked motor)
>>If Fan or Bearing is abnormal, replace it.



Check Point 2 : Check ambient temp. around motor

• Check excessively high temperature around the motor.
 (If there is any surrounding equipment that causes heat)
>>Upon the temperature coming down, restart operation.



Check Point 3 : Check Outdoor unit fan motor

• Check Outdoor unit fan motor. **(PARTS INFORMATION 5)**
>>If Outdoor Fan Motor is abnormal, replace Outdoor fan motor and Main PCB.



Check Point 4 : Check Output Voltage of Main PCB

• Check outdoor unit circuit diagram and the voltage. (Measure at Main PCB side connector)

Read wire	DC voltage
Red - Black	280V (AC220V-10%) ~ 373V (AC240+10%)
White - Black	15 ± 1.5V

► If the voltage is not correct, replace Main PCB.

Trouble shooting 31 OUTDOOR UNIT Error Method: 4-Way Valve Error	Indicate or Display:		Outdoor unit : Model 45.54																							
	Error code : 99		<table border="1"> <tr> <td>POWER</td> <td>ERROR</td> <td>PUMP DOWN</td> <td colspan="3">LOW NOISE</td> <td colspan="2">PEAK CUT</td> </tr> <tr> <td>MODE</td> <td></td> <td>(L1)</td> <td>(L2)</td> <td>(L3)</td> <td>(L4)</td> <td>(L5)</td> <td>(L6)</td> </tr> <tr> <td>◆2</td> <td>●</td> <td>◆9</td> <td>◆9</td> <td>○</td> <td>○</td> <td>○</td> <td>●</td> </tr> </table>	POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT		MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)	◆2	●	◆9	◆9	○	○	○
POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT																				
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)																			
◆2	●	◆9	◆9	○	○	○	●																			

Detective Actuators: Indoor Unit Controller PCB Circuit Heat Exchanger Temperature Thermistor Room Temperature Thermistor 4-way valve	Detective details: When the indoor heat exchanger temperature is compared with the room temperature, and either following condition is detected continuously two times, the compressor stops. <ul style="list-style-type: none"> •Cooling or Dry operation [Indoor heat exchanger temp.] - [Room temp.] > 20°C •Heating operation [indoor heat exchanger temp.] - [Room temp.] < -14°C If the same operation is repeated 5 times, the compressor stops permanently.
--	---

Forecast of Cause : 1. Connector connection failure 2. Thermistor failure 3. Coil failure 4. 4-way valve failure 5. Main PCB failure

Check Point 1 : Check connection of Connector • Check if connector is removed. • Check erroneous connection. • Check if thermistor cable is open. >> Upon correcting the removed connector or mis-wiring, reset the power.
--



Check Point 2 : Check thermistor of Indoor unit • Isn't it fallen off the holder? • Is there a cable pinched? >> Check characteristics of thermistor, (Refer to Trouble shooting 12,13), If defective, replace the thermistor.



Check Point 3 : Check the solenoid coil and 4-way valve [Solenoid coil] • Remove 30/36:CN500,45/54:CN6 from PCB and check the resistance value of coil. Resistance value is about 1.7kΩ >> If it is Open or abnormal resistance value, replace Solenoid Coil. [4-way valve] • Check each piping temperature, and the location of the valve by the temperature difference. >> If the value location is not proper, replace 4-way valve.
--

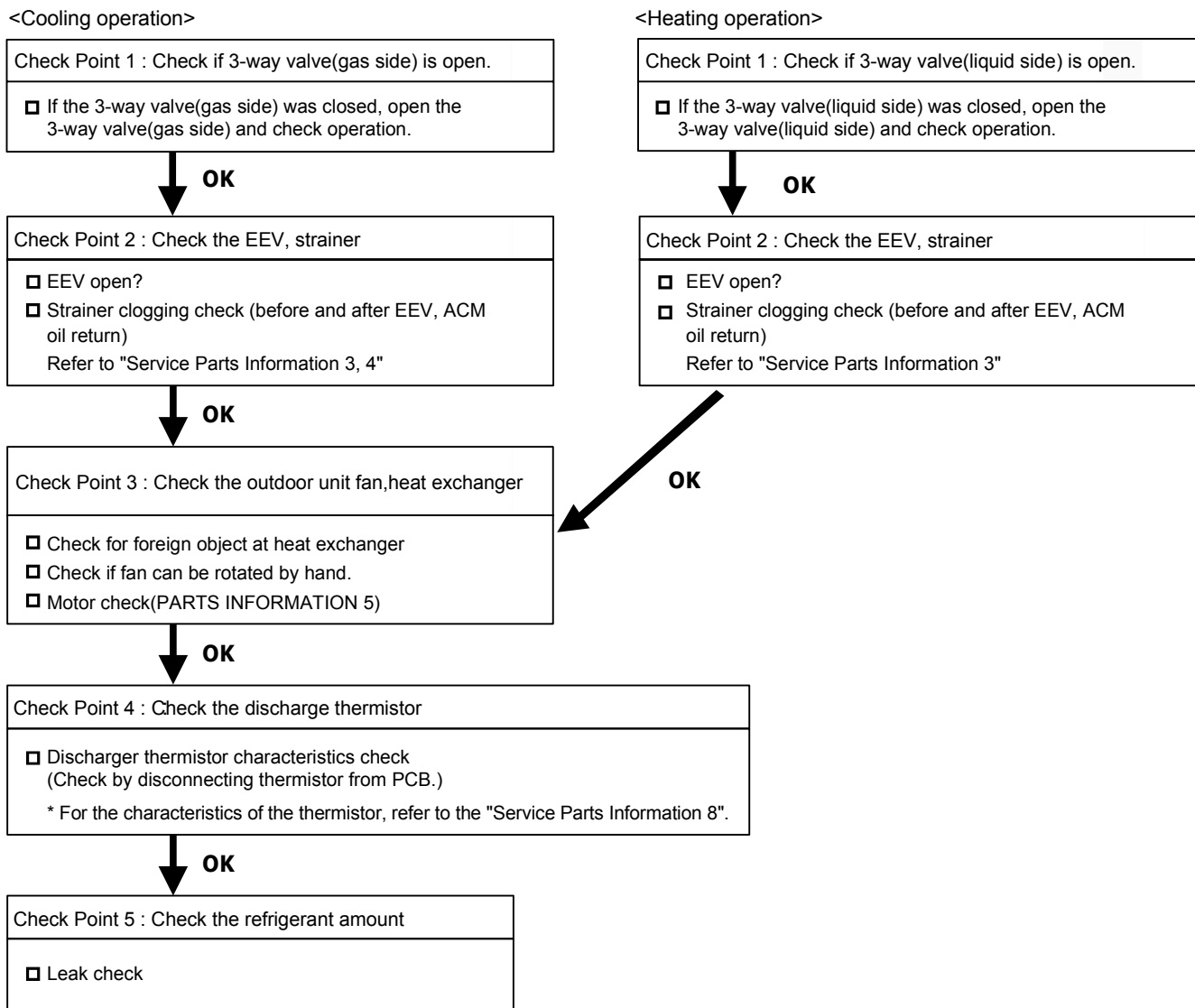


Check Point 4 : Replace Main PCB ► If Check Point 1- 3 do not improve the symptom, replace Main PCB.

Trouble shooting 32 OUTDOOR UNIT Error Method: Discharge Temp. Error	Indicate or Display: Error code : A1		Outdoor unit : Model 45.54																													
			<table border="1"> <tr> <td>POWER</td> <td>ERROR</td> <td>PUMP DOWN</td> <td colspan="3">LOW NOISE</td> <td colspan="2">PEAK CUT</td> </tr> <tr> <td>MODE</td> <td></td> <td>(L1)</td> <td>(L2)</td> <td>(L3)</td> <td>(L4)</td> <td>(L5)</td> <td>(L6)</td> </tr> <tr> <td>◆2</td> <td>●</td> <td>◆10</td> <td>◆1</td> <td>○</td> <td>○</td> <td>○</td> <td>●</td> </tr> </table>	POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT		MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)	◆2	●	◆10	◆1	○	○	○	●					
POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT																										
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)																									
◆2	●	◆10	◆1	○	○	○	●																									

Detective Actuators: Discharge temperature thermistor	Detective details: ▪ "Protection stop by "discharge temperature $\geq 115^{\circ}\text{C}$ during compressor operation"" generated 2 times within 24 hours.
---	---

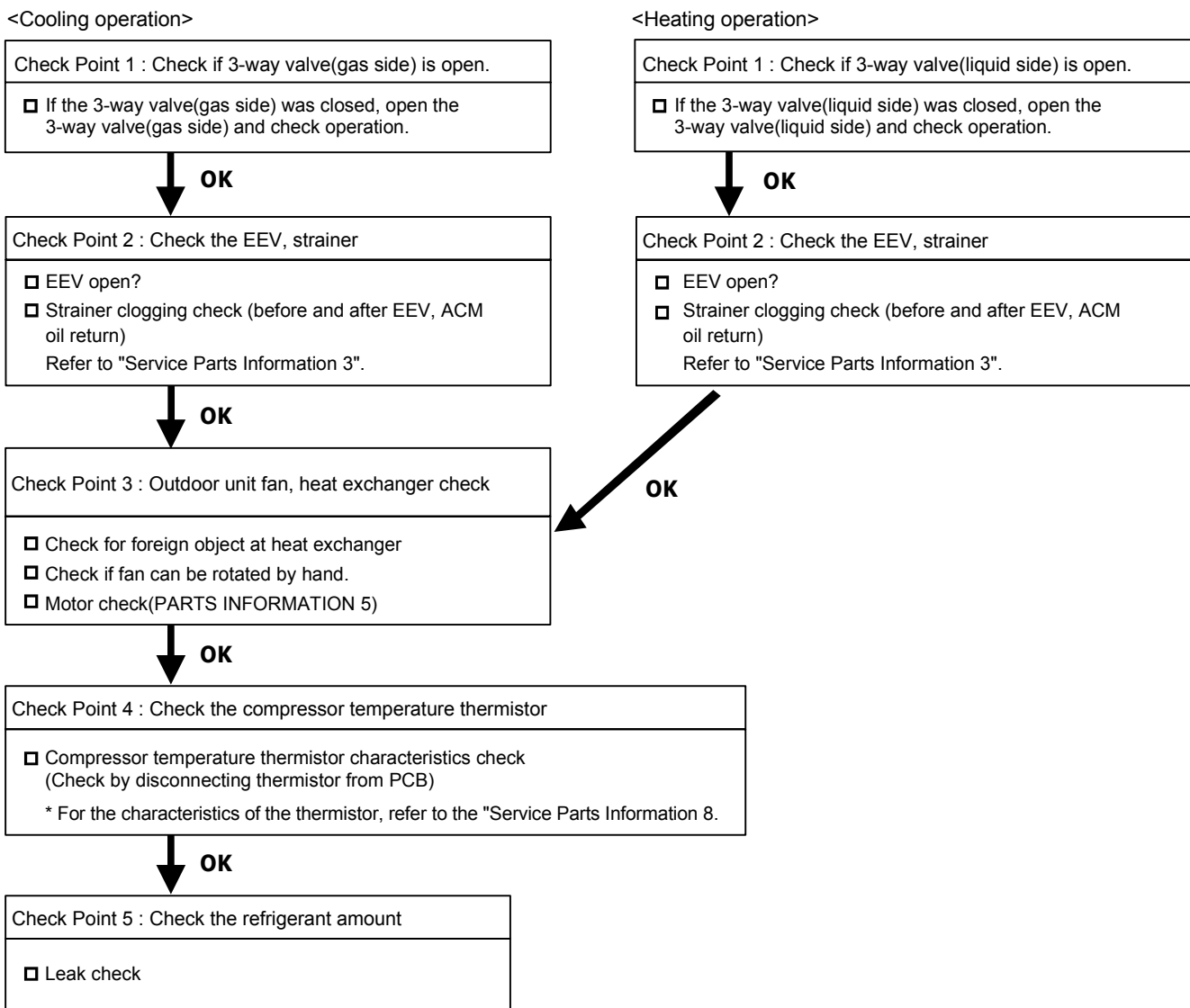
Forecast of Cause : <ol style="list-style-type: none"> 1. 3-way valve not opened 2. EEV defective, strainer clogged 3. Outdoor unit operation failure, foreign matter on heat exchanger 4. Discharge temperature thermistor failure 5. Insufficient refrigerant



Trouble shooting 33 OUTDOOR UNIT Error Method: Compressor Temp. Error	Indicate or Display: Error code : A3	Outdoor unit : Model 45.54					
		POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆10	◆3	○	○	○	●

Detective Actuators: Compressor temperature thermistor	Detective details: ▪ "Protection stop by "compressor temperature" $\geq 110^{\circ}\text{C}$ during compressor operation""generated 2 times within 24 hours
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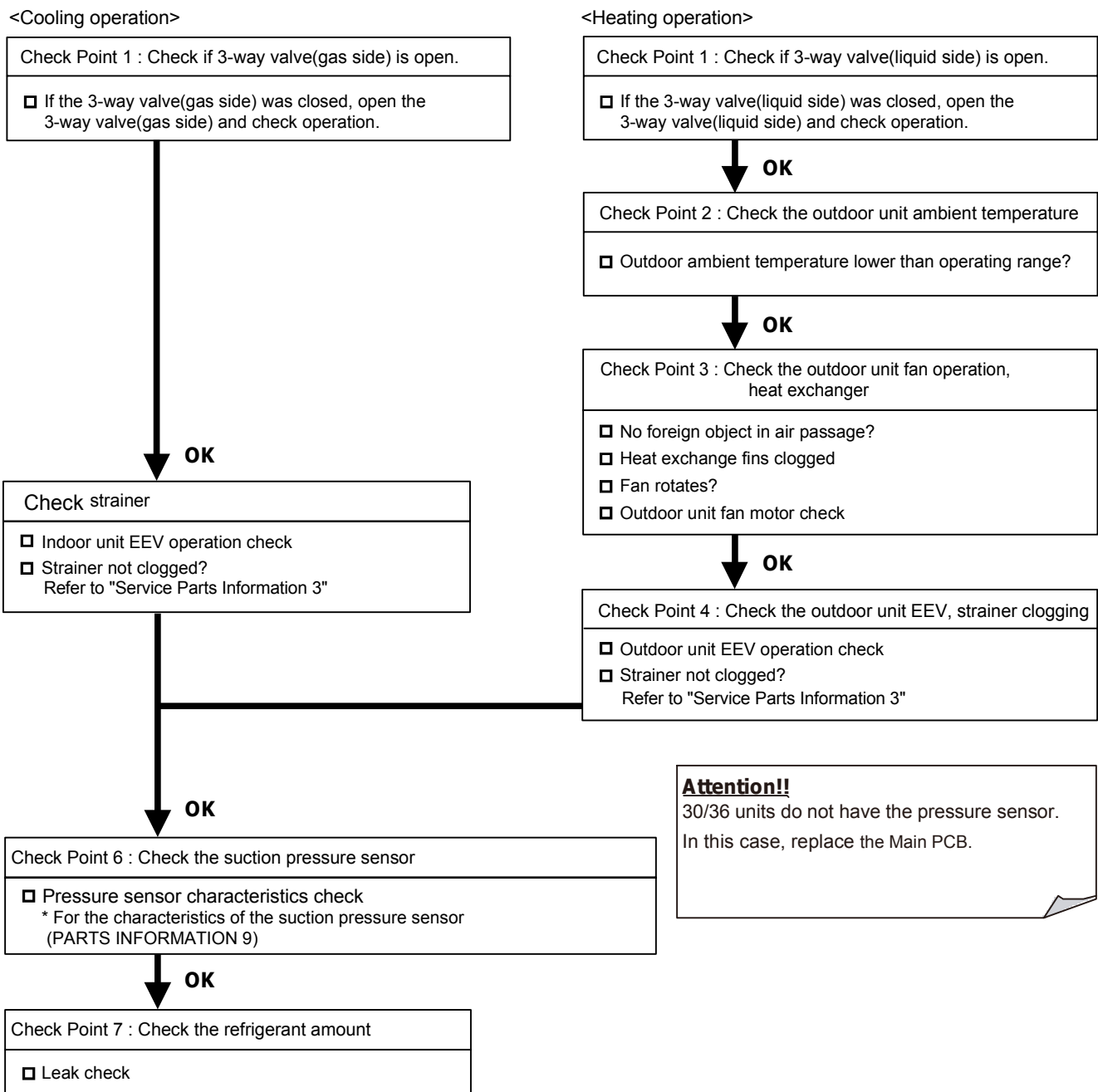
Forecast of Cause : <ol style="list-style-type: none"> 1. 3-way valve not opened 2. EEV defective, strainer clogged 3. Outdoor unit operation failure, foreign matter on heat exchanger 4. Compressor temperature thermistor failure 5. Insufficient refrigerant
--



Trouble shooting 34 OUTDOOR UNIT Error Method: Low Pressure Error	Indicate or Display: Error code : A5	Outdoor unit : Model 45.54 <table border="1"> <tr> <td>POWER</td> <td>ERROR</td> <td>PUMP DOWN</td> <td colspan="3">LOW NOISE</td> <td colspan="3">PEAK CUT</td> </tr> <tr> <td>MODE</td> <td></td> <td>(L1)</td> <td>(L2)</td> <td>(L3)</td> <td>(L4)</td> <td>(L5)</td> <td>(L6)</td> <td></td> </tr> <tr> <td>◆2</td> <td>●</td> <td>◆10</td> <td>◆5</td> <td>○</td> <td>○</td> <td>○</td> <td>○</td> <td>●</td> </tr> </table>	POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT			MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)		◆2	●	◆10	◆5	○	○	○	○	●
	POWER	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT																						
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)																						
◆2	●	◆10	◆5	○	○	○	○	●																					

Detective Actuators: Pressure sensor	Detective details: <ul style="list-style-type: none"> "Protection stop by suction pressure \leq 0.02MPaG continued for 5 minutes" repeats 5 times within 2 hours.
--	---

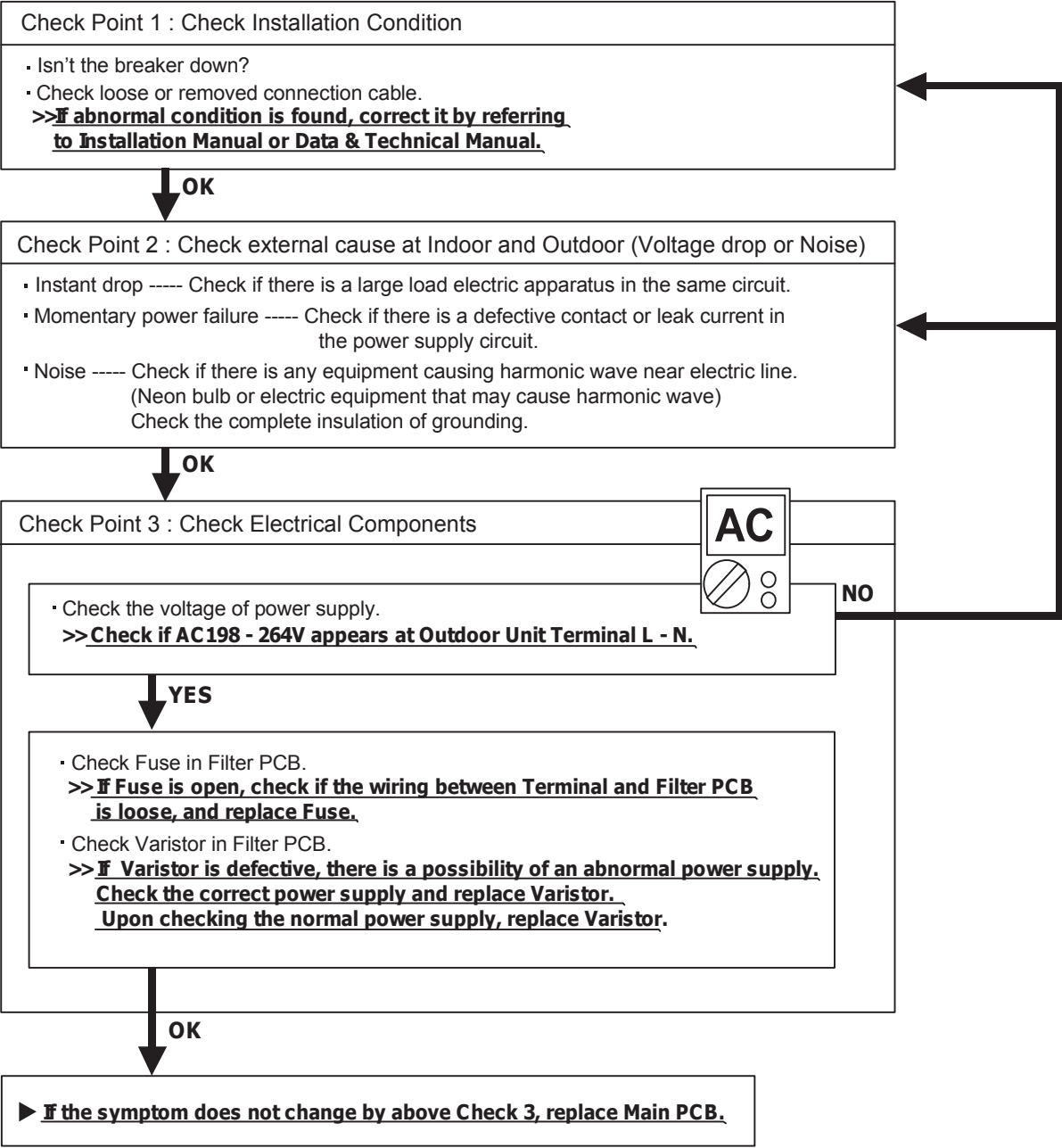
Forecast of Cause : 1. 3-way valve not opened 2. Outdoor unit ambient temperature too low
 3. Outdoor unit fan operation defective, foreign matter at heat exchanger
 4. EEV defective, strainer clogged 5. Solenoid valve defective
 6. Pressure sensor characteristics defective 7. Insufficient refrigerant



2-3 TROUBLE SHOOTING WITH NO ERROR CODE

Trouble shooting 35
Indoor Unit - No Power

Forecast of Cause:
1. Power Supply failure 2. External cause
3. Electrical Components defective

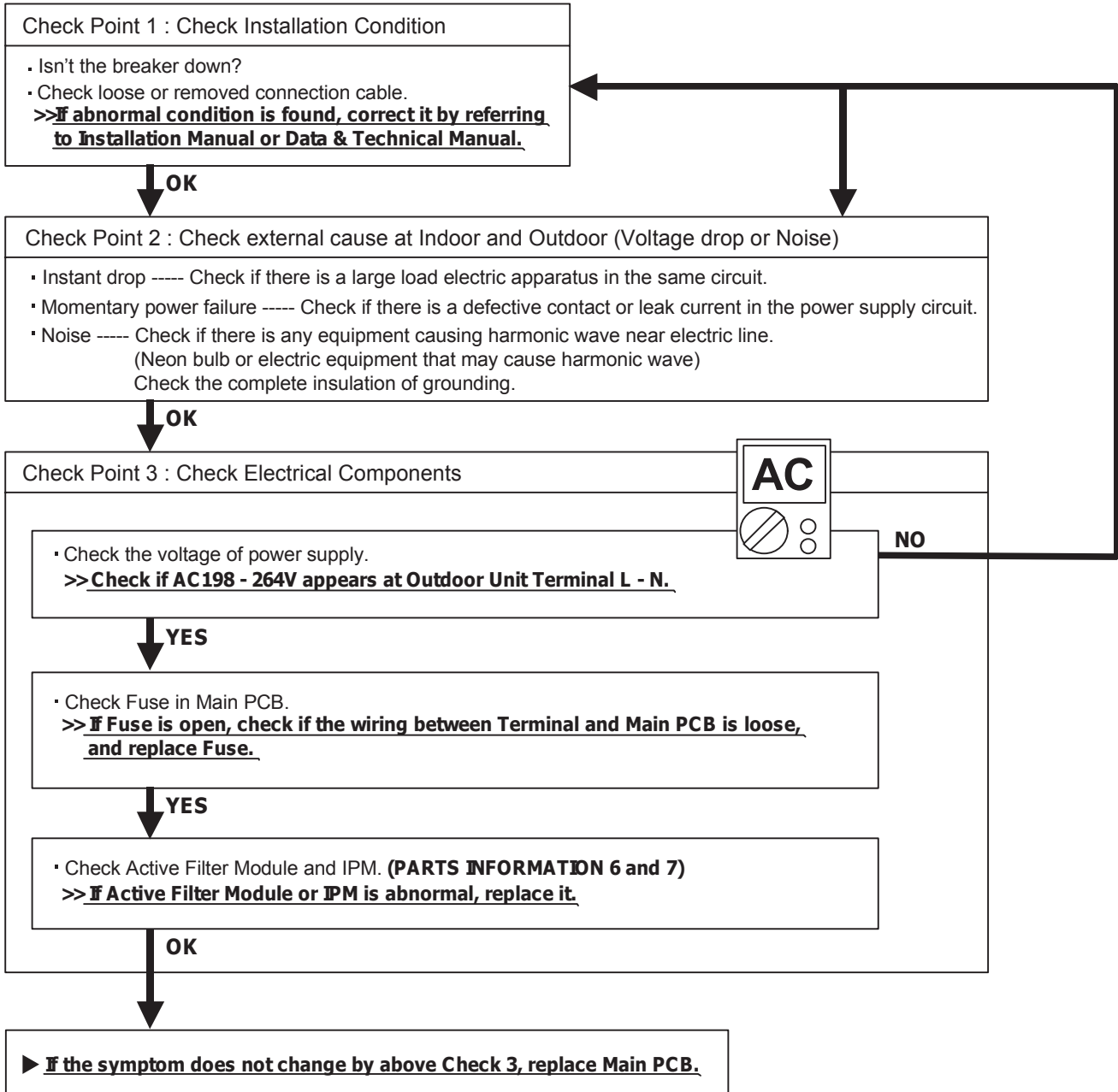


Trouble shooting 36

Outdoor Unit - No Power

Forecast of Cause:

- 1. Power Supply failure
- 2. External cause
- 3. Electrical Components defective



Trouble shooting 37

No Operation (Power is ON)

Forecast of Cause:

1. Setting/ Connection failure
2. External cause
3. Electrical Component defective

Check Point 1 : Check indoor and outdoor installation condition

- Indoor Unit - Check incorrect wiring between Indoor Unit - Remote Control.
Or, check if there is an open cable connection.
- Are these Indoor Unit, Outdoor Unit, and Remote Control suitable model numbers to connect?
>> If there is some abnormal condition, correct it by referring to Installation manual and Data & Technical Manual.

OK

Turn off Power and check/ correct followings.

- Is there loose or removed communication line of Indoor Unit and Outdoor Unit?

OK

Check Point 2 : Check external cause at Indoor and Outdoor (Voltage drop or Noise)

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

OK

Check Point 3 : Check Wired Remote Controller and Controller PCB

- Check Voltage at CN14 of Controller PCB. (terminal 1-3)
(Power supply to Remote Control)
>> If it is DC13V, Remote Control is failure. (Controller PCB is normal) >> Replace Remote Control
>> If it is DC 0V, Controller PCB is failure. (Check Remote Control once again) >> Replace Controller PCB
>> If the symptom does not change by above Check 1, 2, 3, replace Main PCB of Outdoor unit.

DC



Trouble shooting 38

No Cooling / No Heating

Forecast of Cause:

1. Indoor Unit error
2. Outdoor Unit error
3. Effect by Surrounding environment
4. Connection Pipe / Connection Wire failure
5. Refrigeration cycle failure

Check Point 1 : Check Indoor Unit

- Does Indoor Unit FAN run on HIGH FAN?
- Is Air Filter dirty?
- Is Heat Exchanger clogged?
- Check if Energy save function is operated.



Check Point 2 : Check Outdoor Unit Operation

- Check if Outdoor Unit is operating
- Check any objects that obstruct the air flow route.
- Check clogged Heat Exchanger.
- Is the Valve open?



Check Point 3 : Check Site Condition

- Is capacity of Indoor Unit fitted to Room size?
- Any windows open? Or direct sunlight ?



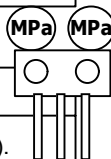
Check Point 4 : Check Indoor/ Outdoor Installation Condition

- Check connection pipe (specified pipe length & Pipe diameter?)
- Check any loose or removed communication line.
- >> If there is an abnormal condition, correct it by referring to Installation Manual or Data & Technical Manual.**



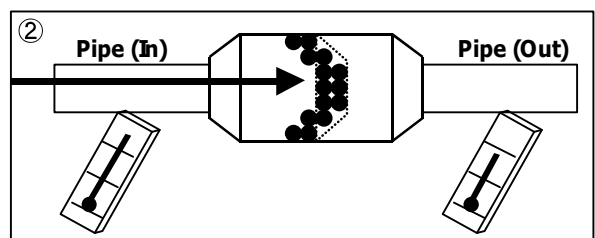
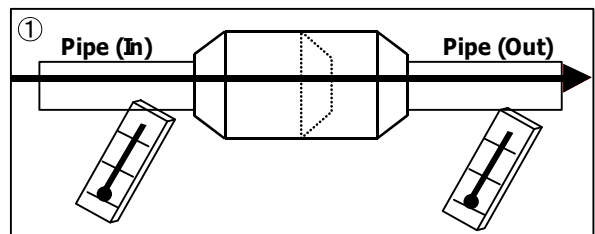
Check Point 5 : Check Refrigeration Cycle

- Check if Strainer is clogged (Refer to the figure at right).
- Measure Gas Pressure and if there is a leakage, correct it.
- >> When recharging the refrigerant, make sure to perform vacuuming, and recharge the specified amount.**
- Check EEV (PARTS INFORMATION 3)
- Check Compressor (PARTS INFORMATION 1,2)



Attention

Strainer normally does not have temperature difference between inlet and outlet as shown in ①, but if there is a difference like shown in ②, there is a possibility of inside clogged. In this case, replace Strainer.



Trouble shooting 39

Abnormal Noise

Forecast of Cause :

1. Abnormal installation (Indoor/ Outdoor)
2. Fan failure (Indoor/ Outdoor)
3. Compressor failure (Outdoor)

Diagnosis method when Abnormal Noise is occurred

- Abnormal noise is coming from Indoor Unit.
(Check and correct followings)

- Is Main Unit installed in stable condition?
- Is the installation of Air suction grille and front panel normal?

OK

- Is Fan broken or deformed?
- Is the screw of Fan loose?
- Is there any object which obstruct the Fan rotation?

- Abnormal noise is coming from Outdoor Unit.
(Check and correct followings)

- Is Main Unit installed in stable condition?
- Is Fan Guard installed normally?

OK

- Is Fan broken or deformed?
- Is the screw of Fan loose?
- Is there any object which obstruct the Fan rotation?

OK

- Check if vibration noise by loose bolt or contact noise of piping is happening.

OK

- Is Compressor locked?
>> Check Compressor (PARTS INFORMATION 1,2)

Trouble shooting 40

Water Leaking

Forecast of Cause:

1. Erroneous installation
2. Drain hose failure

Diagnosis method when water leak occurs

- Is Main Unit installed in stable condition?
- Is Main Unit broken or deformed at the time of transportation or maintenance?

OK

- Is Drain Hose connection loose?
- Is there a trap in Drain Hose?
- Is Drain Hose clogged?

OK

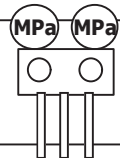
- Is Fan rotating?

Diagnosis method when water is spitting out.

- Is the filter clogged?

OK

- Check Gas Pressure and correct it if there was a gas leak.

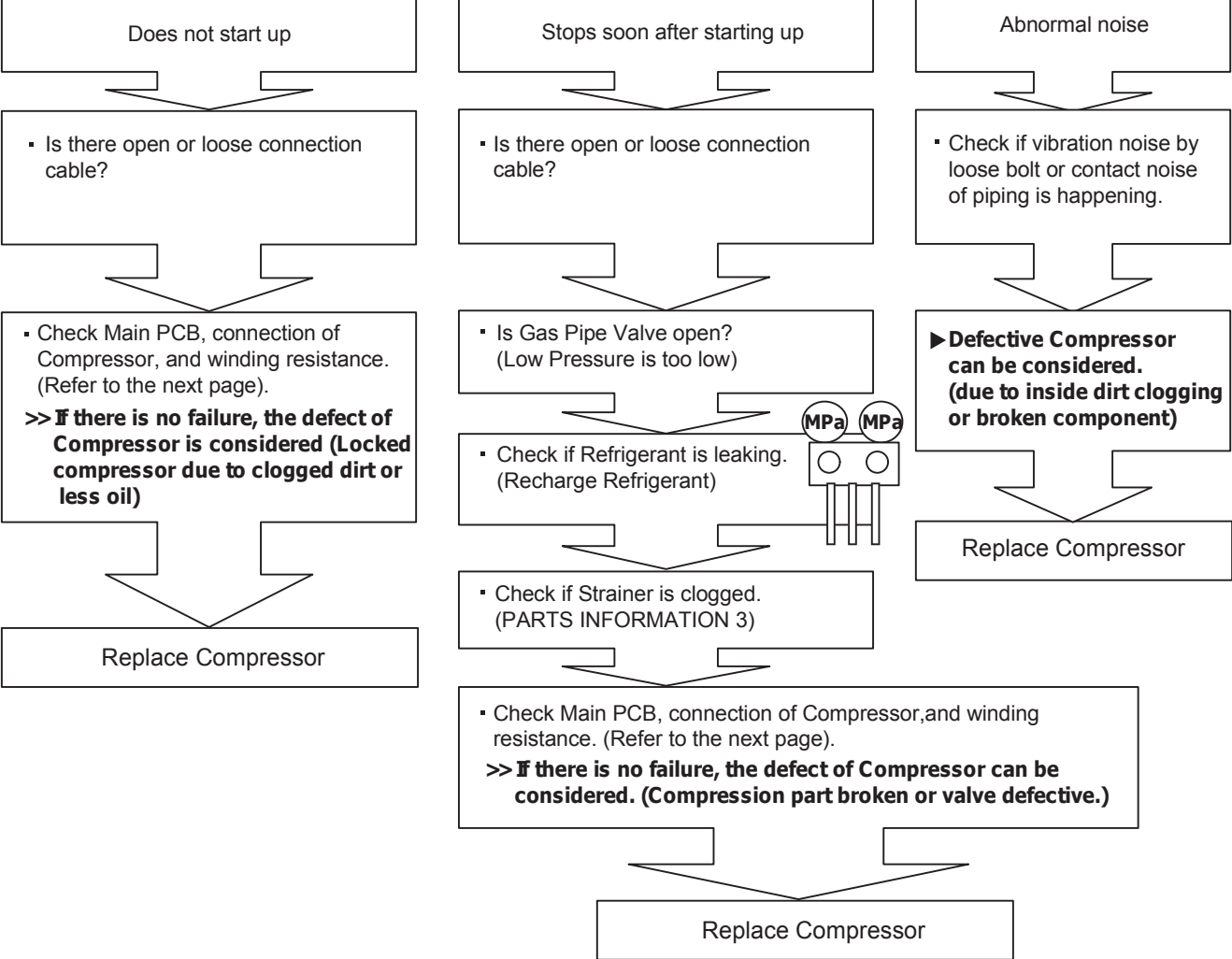


2-4 SERVICE PARTS INFORMATION

SERVICE PARTS INFORMATION 1

Compressor

Diagnosis method of Compressor (If Outdoor Unit LED displays Error, refer to Trouble shooting)

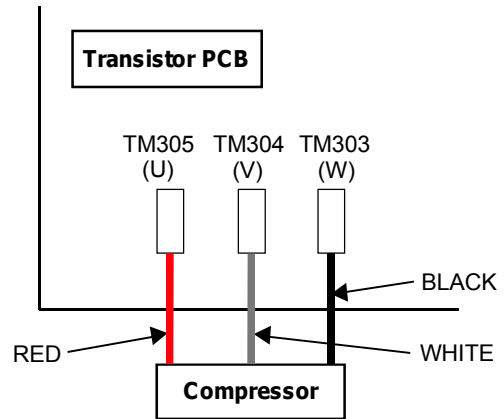
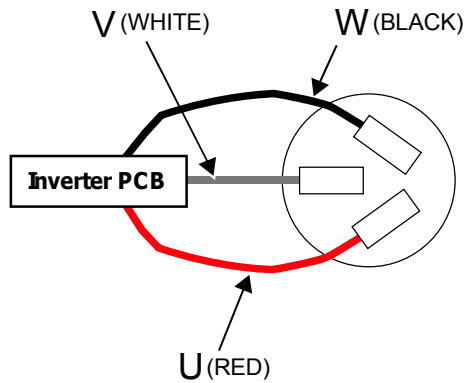


SERVICE PARTS INFORMATION 2

Inverter Compressor

Check Point 1 : Check Connection

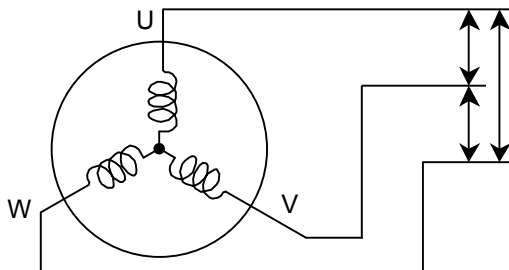
- Check terminal connection of Compressor (loose or incorrect wiring)



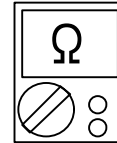
Check Point 2 : Check Winding Resistance

- Check winding resistance of each terminal

► **If the resistance value is 0Ω or infinite, replace Compressor.**



Resistance Value :
0.64Ω at 20°C (30/36)
0.43Ω at 20°C (45/54)



Check Point 3 : Replace Main PCB

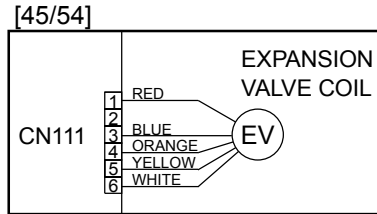
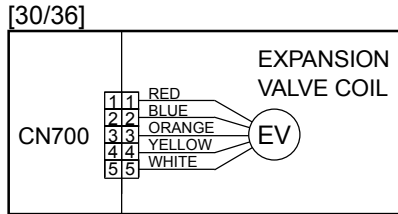
► **If the symptom does not change with above Check 1, 2, replace Main PCB.**

SERVICE PARTS INFORMATION 3

Outdoor unit Electronic Expansion Valve (EEV)

Check Point 1 : Check Connections


- Check connection of connector (Loose connector or open cable)



Check Point 2 : Check Coil of EEV

- Remove connector, check each winding resistance of Coil.

Read wire	Resistance value
White - Red	$46\ \Omega \pm 4\ \Omega$ at 68°F(20°C)
Yellow - Red	
Orange - Red	
Blue - Red	



► **If Resistance value is abnormal, replace EEV.**

Check Point 3 : Check Noise at start up

- Turn on Power and check operation noise.
- **If an abnormal noise does not show, replace Main PCB.**

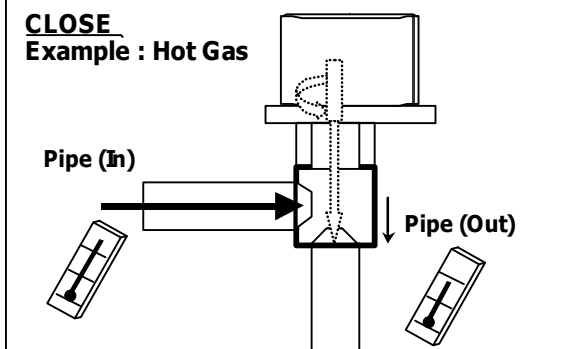
Check Point 4 : Check Voltage from Main PCB.

- Remove Connector and check Voltage (DC12V)
- **If it does not appear, replace Main PCB.**

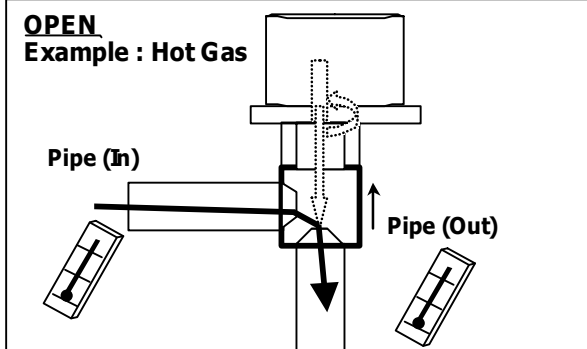


Check Point 5 : Check Opening and Closing Operation of Valve

When Valve is closed, it has a temp. difference between Inlet and Outlet.

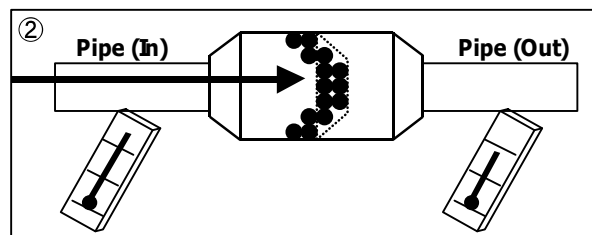
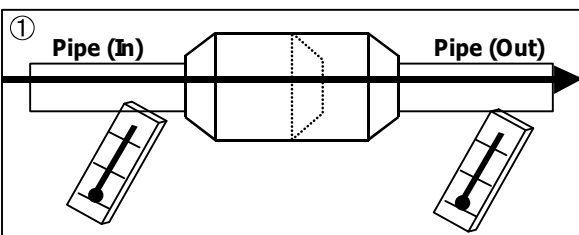


If it is open, it has no temp. difference between Inlet and Outlet.



Check Point 6 : Check Strainer

Strainer normally does not have temperature difference between inlet and outlet as shown in ①, but if there is a difference as shown in ②, there is a possibility of inside clogged. In this case, replace Strainer.



SERVICE PARTS INFORMATION 4

Indoor unit fan motor

Check Point 1 : Check rotation of Fan

- Rotate the fan by hand when operation is off.
(Check if fan is caught, dropped off or locked motor)

>>If Fan or Bearing is abnormal, replace it.

Check Point 2 : Check resistance of Indoor Fan Motor

Check resistance when the main power supply is OFF.

- Refer to below. Circuit-test "Vm" and "GND" terminal.
(Vm: DC voltage, GND: Ground terminal)

>>If they are short-circuited (below 300 kΩ), replace Indoor fan motor and Controller PCB.

Pin number (wire color)	Terminal function (symbol)
1 (Red)	DC voltage (Vm)
2	No function
3	No function
4 (Black)	Earth terminal (GND)
5 (White)	Control voltage (Vcc)
6 (Yellow)	Speed command (Vsp)
7 (Brown)	Feed back (FG)

SERVICE PARTS INFORMATION 5

Outdoor unit fan motor

Check Point 1 : Check rotation of Fan

- Rotate the fan by hand when operation is off.
(Check if fan is caught, dropped off or locked motor)

>>If Fan or Bearing is abnormal, replace it.

Check Point 2 : Check resistance of Outdoor Fan Motor 1 or 2

- Refer to below. Circuit-test "Vm" and "GND" terminal
Check resistance when the main power supply is OFF.
(Vm: DC voltage, GND: Earth terminal)

>>If they are short-circuited (below 300 kΩ), replace Outdoor fan motor and Main PCB.

[30/36]

Pin number (wire color)	Terminal function (symbol)
1 (Red)	DC voltage (Vm)
2	No function
3	No function
4 (Black)	Ground terminal (GND)
5 (White)	Control voltage (Vcc)
6 (Yellow)	Speed command (Vsp)
7 (Brown)	Feed back (FG)

[45/54]

Pin number (wire color)	Terminal function (symbol)
1 (Red)	DC voltage (Vm)
2	No function
3 (Black)	Earth terminal (GND)
4 (White)	Control voltage (Vcc)
5 (Yellow)	Speed command (Vsp)
6 (Brown)	Feed back (FG)

SERVICE PARTS INFORMATION 6

Active filter module

Check Point 1 : Check Open or Short-circuit and Diode (D1)

- Remove connector, check the open or short-circuit and the diode in the module

Check the open or short-circuit

Table.1 Each type standard value

Terminal		Resistance value	
		Type A	Type B
multimeter (+)	multimeter (-)	SACT32010 [HITACHI] LACT33020 [HITACHI]	PM-604 [FGEL] PM-703 [FGEL]
		PM-601 [FGEL] LOT No. - 1302931395	PM-601 [FGEL] LOT No. 1302931396 -
+ (+IN)*	- (-IN)*	360kΩ ± 20%	360kΩ ± 20%
- (-IN)*	N1 (N)*	0 Ω	0 Ω
※ P	+ (+IN)*	720kΩ ± 20%	900kΩ ± 20%
L1	L2	1.01MΩ / 0.76MΩ (Ref. value 1) (Ref. value 2)	1.01MΩ / 0.76MΩ (Ref. value 1) (Ref. value 2)
P	N1 (N)*	360kΩ ± 20%	540kΩ ± 20%
L1 , L2	Control Box	∞ Ω	∞ Ω
※ L2	N1 (N)*	1.65MΩ / 1.14MΩ (Ref. value 1) (Ref. value 2)	1.65MΩ / 1.14MΩ (Ref. value 1) (Ref. value 2)

* () is FGEL terminal name.

Table.2 Standard value is changed by the tool specification
(Type A and B are the same value)

Terminal		Resistance value
multimeter (+)	multimeter (-)	
※ L2	P	1.32MΩ / 0.66MΩ (Ref. value 1) (Ref. value 2)
※ P	L2	1.01MΩ / 0.76MΩ (Ref. value 1) (Ref. value 2)

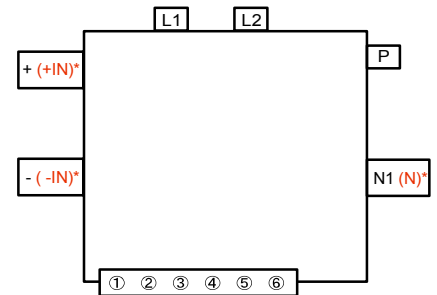
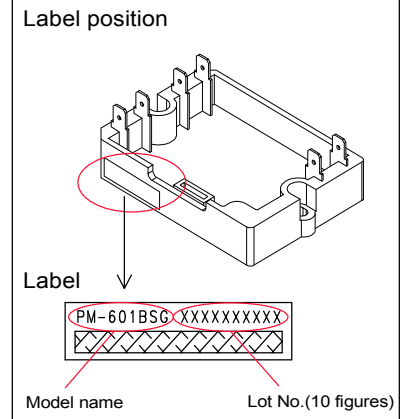
※ By kind of multimeter , the value may change significantly.

Ref. value 1
Specifications for Multimeter
Manufacturer : FLUKE
Model name : FLUKE11
Power source : DC9V.

Ref. value 2
Specifications for Multimeter
Manufacturer : SANWA
Model name : PM3
Power source : DC3V.

► **It is abnormal,replace ACTME FILTER MODULE**

LOT No. of PM-601 [FGEL] type



Check Point 2 : Check the Output DC voltage (between P and N)

- Check the Output DC voltage (between P and N) of compressor stopping and operating.
 - >> If the output voltage of compressor operating is less than the output voltage of compressor stopping, Active Filter Module is defective. >> **Replace Active Filter Module**

SERVICE PARTS INFORMATION 7

IPM

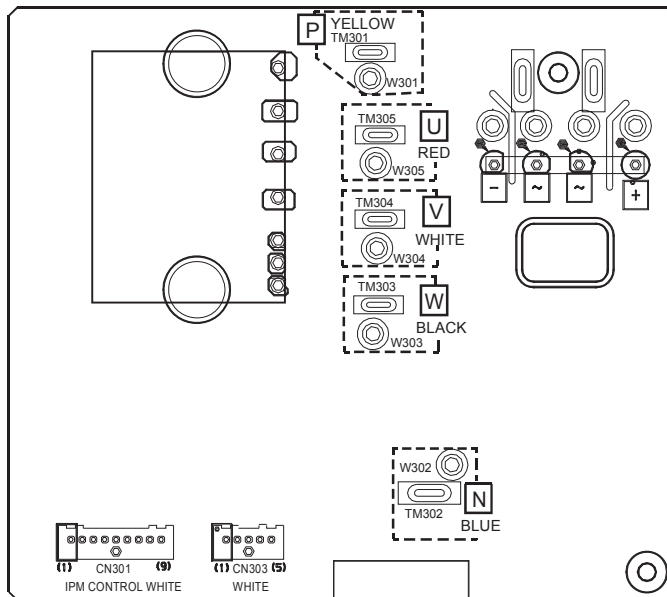
(Mounted on Transistor PCB)

Check Point 1



- ① Disconnect the connection wires between the Transistor PCB - Capacitor PCB and Transistor PCB - Inverter Compressor.
- ② Set the tester to the "Resistance" mode, and measure the resistance between the following terminals.
 TM301 (P) - TM305(U) / TM304(V) / TM303(W)
 TM302 (N) - TM305(U) / TM304(V) / TM303(W)
- ③ Judge the result of ② as follows:

Terminal		Resistance value
Tester(+)	Tester(-)	
P	U	Over 2kΩ (Including ∞Ω)
	V	
	W	
U	P	Over 20kΩ (Including ∞Ω)
V		
W		
N	U	Over 2kΩ (Including ∞Ω)
	V	
	W	
U	N	Over 2kΩ (Including ∞Ω)
V		
W		



Check Point 2



- ④ Set the tester to the "Diode" mode, and measure the voltage value between the following terminals.
- ⑤ Judge the result of ④ as follows:

Terminal		Tester display
Tester(+)	Tester(-)	
P	U	∞
	V	
	W	
U	P	0.3V~0.7V
V		
W		
N	U	0.3V~0.7V
	V	
	W	
U	N	∞
V		
W		

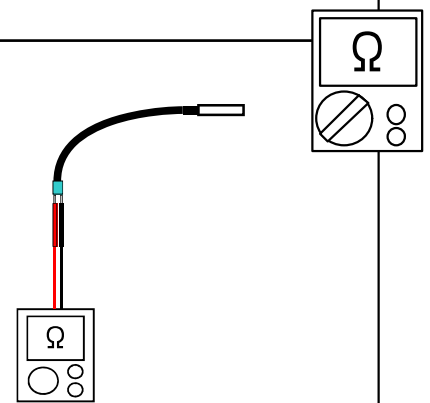
SERVICE PARTS INFORMATION 8

Thermistor

Check Point : Check Thermistor resistance value

- Remove connector and check Thermistor resistance value.

Temperature [°C]	Resistance Value [kΩ]			
	Thermistor A	Thermistor B	Thermistor C	Thermistor D
- 20	---	---	105.4	---
- 10	---	27.8	58.2	27.4
- 5	---	21.0	44.0	20.7
0	168.6	16.1	33.6	15.8
5	129.8	12.4	25.9	12.2
10	100.9	9.6	20.2	9.5
15	79.1	7.6	15.8	7.5
20	62.6	6.0	12.5	5.9
25	49.8	4.8	10.0	4.7
30	40.0	3.8	8.0	3.8
40	26.3	2.5	5.3	2.5
50	17.8	1.7	3.6	1.7
60	12.3	1.2	---	1.2
70	8.7	---	---	0.8
80	6.3	---	---	0.6
90	4.6	---	---	0.4
100	3.4	---	---	0.3
110	2.6	---	---	---
120	2.0	---	---	---
Applicable Thermistors	Discharge temp. TH Compressor temp. TH	Heat exchanger. TH	Outdoor temp. TH	Heat sink temp. TH

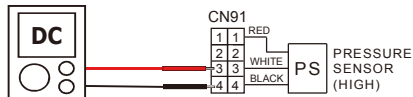


SERVICE PARTS INFORMATION 9

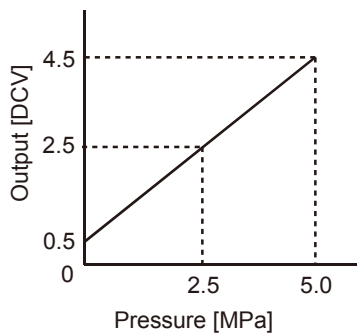
Pressure Sensor

Check Point : Check Voltage from Main PCB

- With the connector connected to the PCB, measure the voltage between CN91:3-4 of the Main PCB.



- Characteristics of pressure sensor





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