MITSUBISHI HEAVY INDUSTRIES, LTD.

SERVICE MANUAL

FDA Series Split Systems

FDA Series Multi Systems

R410A

3D

HRP

INDEX

1. MAINTENANCE DATA

1.1 Servicing

(1) Evacuation

The evacuation is a procedure to purge impurities, such as noncondensable gas, air, moisture from the refrigerant equipment by using a vacuum pump. Since the refrigerant R410A is very insoluble in water, even a small amount of moisture left in the refrigerant equipment will freeze, causing what is called ice clogging.

Evacuation procedure

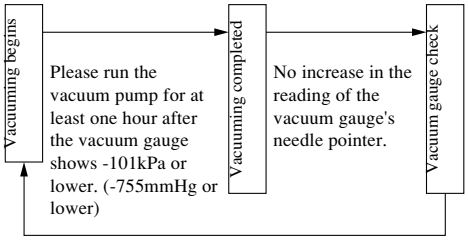
Make sure that the both service valves of gas and liquid line are fully opened.

(a) Check to ensure that there is no internal pressure in the unit. If there is an internal pressure, it should be relived through the service port.

(b) Connect the charging hose of the gauge manifold to the service port of the gas piping. Close high pressure valve ② of gange manifold.

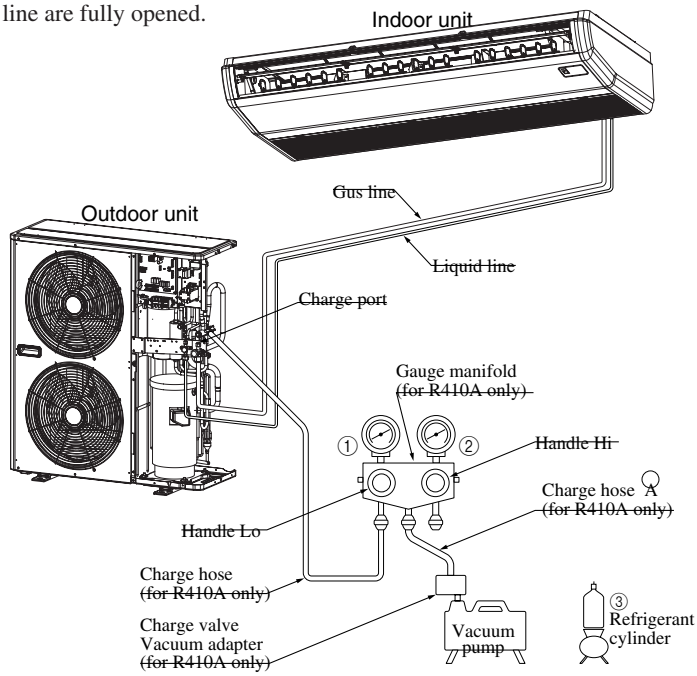
(c) Connect the charging hose Ⓐ to a vacuum pump.

Repeat evacuation in the following sequence.



When the vacuum gauge's needle pointer creeps up, there is moisture left in the system or a leak. Pull air again after you have checked the system for a leak and rectified it. Use a reverse flow stop adapter to prevent the vacuum pump's lubricant oil from flowing into the refrigerant system.

Notes (1) Do not use the refrigerant pressure to expel air.
(2) Do not use the compressor for evacuation.
(3) Do not operate the compressor in a vacuum condition.



Notes (1) Refer to the exterior-view drawing for the position of the service valve.
(2) When connecting of ther service valve, flare connection for both the indoor and outdoor unit.

(2) Refrigerant charging

(a) After the evacuation shown in the above, change the connection of the charge hose Ⓐ to the refrigerant cylinder.

(b) Purge air from the charge hose Ⓐ.

First loosen the connecting portion of the charge hose at the gauge manifold side and open valve ③ for a few seconds, and then immediately retighten it after observing that gas has blown out from loosened connecting portion.

(c) Open valves ① and ③ then gas refrigerant begins flowing from the cylinder into the unit.

When refrigerant has been charged into the unit to some extent, refrigerant flow becomes stagnant. When that happens, start the compressor in cooling cycle until the system is filled with the specified amount of gas, then close valves ① and ③ and remove the gauge manifold. Cover the service port with caps and tighten them securely.

(d) Check for gas leakage by applying a gas leak detector around the piping connection.

(e) Start the air conditioner and make sure of its operating condition.

1.2 Trouble shooting for refrigerant circuit

(1) Judgement of operating condition by operation pressure and temperature difference

Making an accurate judgement requires a skill that is acquired only after years of experience, one trouble may lead to an another trouble from a single trouble source and several other troubles may exist at the same time which comes from a undetected different trouble source.

Filtering out the trouble sources can be done easier by comparing with daily operating conditions. Some good guides are to judge the operating pressure and the temperature difference between suction air and delivery air.

Following are some pointers,

Pressure						Trouble cause
Indi-cation / Circuit	Too low	A little low	Normal	A little high	Too high	
High side					●	1) Excessive overcharging of refrigerant
Low side					●	2) Mixture of non condensable gas (air etc.)
High side	●					Ineffective compression
Low side					●	(defective compressor)
High side		●				1) Insufficient refrigerant in circuit
Low side	●					2) Clogging of strainer 3) Gas leakage 4) Clogging of air filter (in cooling) 5) Decrease in heat load (in cooling) 6) Locking of indoor fan (in cooling)
High side					●	1) Locking of outdoor unit fan (in cooling)
Low side				●		2) Dirty outdoor heat exchanger (in cooling) 3) Mixture of non condensable gas (air etc.)
High side				●		1) Too high temperature of room
Low side					●	

(1) Selfdiagnosis function

(a) Check Indicator Table

Whether a failure exists or not on the indoor unit and outdoor unit can be know by the contents of remote controller eroor code, indoor/outdoor unit green LED (power pilot lamp and microcomputer normality pilot lamp) or red LED (check pilot lamp).

1) Indoor unit side

Remote controller error code	Indoor unit LED		Outdoor unit LED		Cause
	Green	Red	Green	Red	
No-indication	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	Normal
	Stays OFF	Stays OFF	Stays OFF	Stays OFF	Power OFF, L phase wiring is open, power source failure
	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	Indoor unit microcomputer failure
	Keeps flashing	*3 time flash	Keeps flashing	Stays OFF	Remote controller wires X and Y are reversely connected. *For wire breaking at power ON, the LED is OFF. Remote controller wire is open. (X wire breaking : A beep is produced and no indication is made. Z wire breaking : No beep and no indication) The remote controller wires Y and Z are reversely connected.
LCD flashes continuously or is off.	Keeps flashing	Stays OFF	Keeps flashing	2 time flash	Poor connection or disconnection in wires connecting the indoor and outdoor units.
E1	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	When multiple remote controllers are used for control, the power supply to some indoor units is OFF.
	Stay OFF or Lights continously	Stay OFF	Keeps flashing	Stays OFF	Indoor unit PCB fault
	Keeps flashing	Stay OFF	Keeps flashing	Stays OFF	The remote controller wire Y is open. The remote controller wires X and Y are reversely connected. Noise is penetrating the remote control lines. The remote controller or indoor control PCB is faulty. (The communications circuit is faulty.)
E5	Keeps flashing	2 time flash	Keeps flashing	2 time flash	Indoor / outdoor transmission error.
	Keeps flashing	2 time flash	Stays OFF	Stays OFF	Outdoor unit control PCB is faulty when the power is turned on, or the inverter parts are faulty (FDCVA 151~251 type).
	Keeps flashing	2 time flash	Keeps flashing	Stays OFF	Outdoor unit microcomputer failure
E6	Keeps flashing	1 time flash	Keeps flashing	Stays OFF	Indoor unit heat exchanger thermistor failure
E7	Keeps flashing	1 time flash	Keeps flashing	Stays OFF	Indoor unit return air thermistor failure
E8	Keeps flashing	1 time flash	Keeps flashing	Stays OFF	Heating overload (indoor heat exchanger temperature is abnormally high) and indoor heat exchanger thermistor is faulty.
E9	Keeps flashing	1 time flash	Keeps flashing	Stays OFF	The float SW operates (with FS only). Drain up kit wiring fault.
E10	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	When multi-unit control by remote controller is performed, the number of units is over (more than 17 units). Two remote controller are provided for one controller is performed.
E16	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	Fan motor is faulty (FDTA 501, 601 type, FDKN type).
E28	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	Remote controller thermistor failure

Note (1) The green LED in the outdoor unit is used in the FDCA301 ~ 601 models only.

2) Outdoor unit side

Remote controller error code	Indoor unit LED		Outdoor unit LED		Cause
	Green	Red	Green	Red	
E32	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	Wiring is open or reversal phase (FDCA 301~601 type)
E33	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	Inverter primary side current is abnormal. (FDCVA151~251 type) Abnormal current cut of compressor (FDCA 301~601 type)
E34	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	52C secondary side L3-phase wiring is open. (FDCA 301~601 type)
E35	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	Outdoor heat exchanger temperature is high or outdoor heat exchanger thermistor is faulty.
E36	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	Discharge temperature abnormality.
E37	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	Outdoor unit heat exchanger thermistor failure
E38	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	Outdoor air temperature thermistor failure
E39	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	Discharge pipe thermistor failure
E40	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	63H1 operation (FDCA 301~601 type)
E42	Keeps flashing	Stays OFF		1 time flash	Current (Abnormalities in a compressor over current)
E47	Keeps flashing	Stays OFF		1 time flash	Inverter Over-voltage Trouble. (FDCVA 151~251 type)
E48	Keeps flashing	Stays OFF		1 time flash	DC fan motor abnormal. (FDCVA 151~251 type)
E52	Keeps flashing	Stays OFF	Keeps flashing	Lights contiously	52C abnormal. (FDCA 301~601 type)
E56	Keeps flashing	Stays OFF		1 time flash	Power transistor thermistor is faulty or disconnection or connector connections are poor. (FDCVA 151~251 type)
E57	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	Insufficient refrigerant.
E59	Keeps flashing	Stays OFF		1 time flash 2 time flash 3 time flash	Compressor startup error (FDCVA 151~251 type)
E60	Keeps flashing	Stays OFF		1 time flash	Compressor loader position detection error. (FDCVA 151~251 type)

Note (1) The green LED in the outdoor unit is used in the FDCA301 ~ 601 models only.

(b) Display sequence of error, inspection display lamp

1) One kind error
   Display corresponding to the error is shown.
2) More than one errors.

Section	Display section
Error code of remote controller	• Displays the error of higher priority (When plural errors are persisting) E1> E5> ..... E10 > E32 ..... E60 • Displays the present errors. (When a new error has occurred after the former error was reset.)
Inspection LED (red) of indoor unit PCB	
Inspection LED (red) of outdoor unit PCB	

3) Timing of error detection

● Indoor unit side.

Error detail	Error code	Timing of error detection
Drain error (float switch motion)	E9	Normally, 30 seconds after the power is turned ON.
Wrong connection between the indoor and outdoor units.	"Wait"	No communications even once with the outdoor unit.
Transmission error of remote controller indoor unit	E1	After 1 or more communications of the indoor unit with the remote controller following power on, transmission errors cause an interruption for 2 minutes.
Transmission error between indoor/outdoor units	E5	After communications with the outdoor unit 1 or more times, communications are abnormal continuously for 2 minutes.
The number of connected indoor units exceeds the connection limit (when multiple units are control by a single remote controller).	E10	Normally after the power is turned ON (during communications).
Broken wire of indoor unit return air thermistor	E7	When an input temperature of –50°C or lower is measured by the return air thermistor is measured for 5 seconds or longer within 60 minutes after the first detection.
Broken wire of heat exchanger thermistor	E6	When an input temperature of –50°C or lower is measured by the heat exchanger thermistor is measured for 5 seconds or longer within 60 minutes after the first detection.

● Outdoor unit side.

Error detail	Error code	Timing of error detection
Broken wire of outdoor air temperature thermistor	E38	When a thermistor input temperature of –30°C or lower is measured for 5 seconds or longer 3 times within 40 (60) minutes after the 1st detection between 2 minutes and 2 minutes 20 seconds after compressor operation starts.
Broken wire of heat exchanger thermister	E37	When a thermistor input temperature of –30°C or lower is measured for 5 seconds or longer 3 times within 40 (60) minutes after the 1st detection between 2 minutes and 2 minutes 20 seconds after compressor operation starts.
Broken wire of discharge pipe thermistor	E39	When a thermistor input temperature of –10°C or lower is measured for 5 seconds or longer 3 times within 40 (60) minutes after the 1st detection between 10 minutes and 10 minutes 20 seconds (between 2 minutes and 2 minutes 20 seconds) after compressor operation starts.
Broken wire of power transistor thermistor	E55	When the under-dome thermistor input temperature of –10°C is measured for 5 seconds or longer 3 times within 40 minutes after the 1st detection between 10 minutes and 10 minutes 20 seconds after compressor operation starts.

Notes (1) Values in ( ) show for the FDCA301~601 models.
(2) The power transistor temperature sensor is used in the FDCVA151~251 models only.

4) Recording and reset of error

Error display	Memory	Reset
Error code of remote controller	• Saves in memory the mode (1) of higher priority	• Stop the unit operation by pressing the ON/OFF switch of remote controller. • Operation can be started again if the error has been reset.
Indoor unit inspection lamp (red)	• Cannot save in memory	
Outdoor unit inspection lamp (red)	• Saves in memory the mode (1) of higher priority	

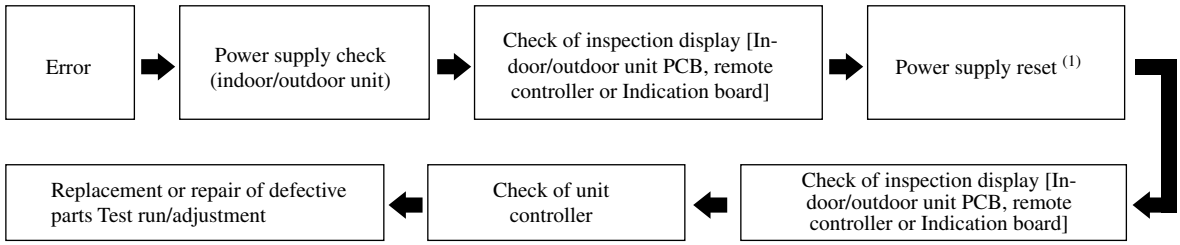
Notes (1) Priority is in the order of E1 > ... > E10 > ... > E60.

Indoor unit : Press the ON/OFF button on the remote controller. Or disconnect and reconnect the power supply connector (CNW1 or CNW0) on the indoor unit control PCB or turn the main power supply OFF.

Outdoor unit : Turn the main power supply OFF.

(2) Procedures of trouble diagnosis

When any error occurs, inspect in following sequence. Detailed explanation on each step is given later in this text.



Note (1) It means the operation to turn off the power and back on again more than 1 min. later in order to reset the malfunction of microcomputer due to the effect of power supply conditions or accidental noise.

(3) Error diagnosis procedures at the indoor unit side

To diagnose the error, measure the voltage (AC, DC), resistance, etc. at each connector around the circuit board of indoor unit based on the inspection display or the operation state of unit (no operation of compressor or blower, no switching of 4-way valve, etc.) If any defective parts are discoverd, replace with the assembly of parts as shown below.

(a) Single-unit replacement parts for circuit board of indoor unit. (Peripheral electric parts for circuit board.)

Indoor unit printed circuit board, thermistor (return, heat exchanger), operating switches, limit switches, transformers, fuses.

Note (1) Use normal inspection methods to determine the condition of strong electrical circuits and frozen cycle parts.

(b) Replacement procedure of indoor unit microcomputer printed circuit board

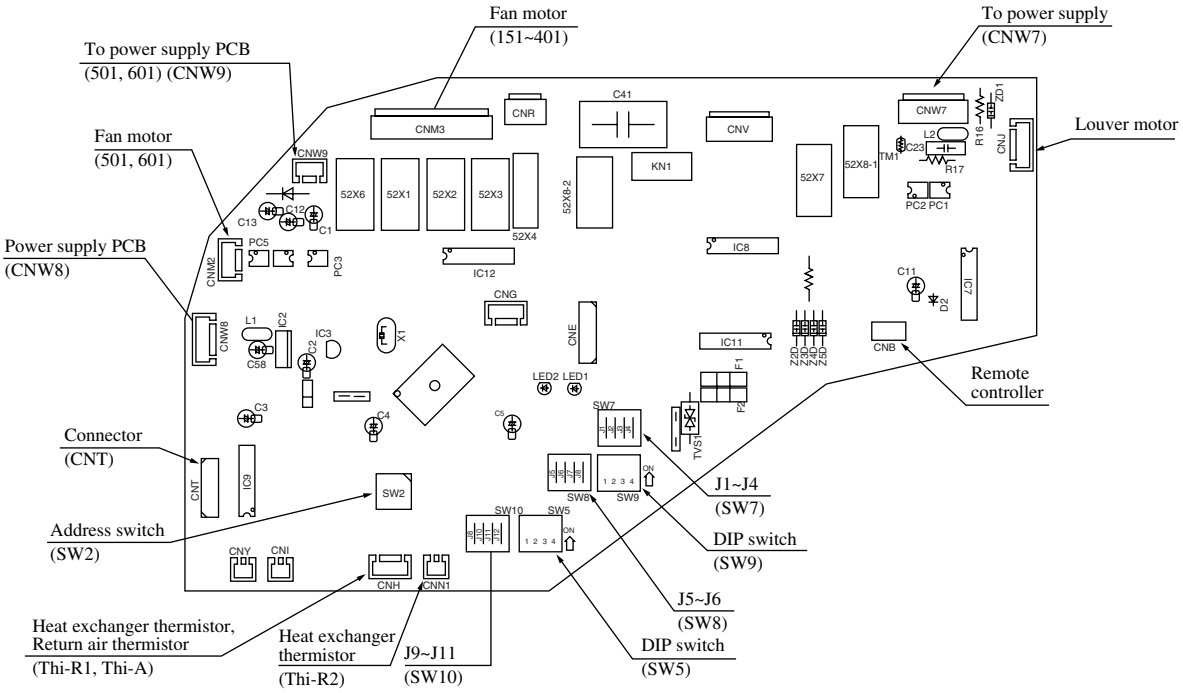
Microcomputer printed circuit board can be replaced with following procedure.

(i) Confirm the parts numbers. (Refer to the following parts layout drawing for the location of parts number.)

Model	Parts number	Model	Parts number
FDTA 151~401	PJA505A122ZD	FDKA 151~251	PHA505A018ZF
FDTA 501, 601	PJA505A122ZC	FDKA 301	PHA505A018ZG
FDE	PJA505A128ZF	FDUR	PJA505A131ZC

Parts layout on the indoor unit PCB

Model: FDT series



● Change by the jumper wire

Name		Function
J1 (SW7-1)	With	Input signal - Reverse invalid
	None (1)	Input signal - Rus stop
J2 (SW7-2)	With	Heating thermostat OFF-Lo
	None (1)	Heating thermostat OFF-Stop, Lo
J3 (SW7-3)	With	Normal operation operable
	None (1)	Operation permission prohibited
J4 (SW7-4)	With	Normal
	None (1)	Heating temp. +3
J5 (SW8-1)	With	Louver free stop control - Invalid
	None (1)	Louver free stop control - Effective
J6 (SW8-2)	With	Freeze prevention fan control activated.
	None (1)	Freeze prevention fan control deactivated.

Note (1) "None" means that jumper wire is not provided on the PCB or the connection is cut

(2) The replacement board is not equipped with jumpers J1 ~ J6. Instead, SW7 and 8, with the same functions as jumpers J1~J6, are used in the position where the jumpers were previously. Set SW7 and 8 locally in accordance with the above table.

● Control change switch (SW5, SW9, SW10)

Function of DIP switch SW5 (Usually all turned OFF)

Switch				Function
SW5-3	ON	SW5-4	ON	Setting time : 1000hrs. (Unit stop)
			OFF	Setting time : 1000hrs. (Display)
	OFF		ON	Setting time : 600hrs. (Display)
			OFF	Setting time : 180hrs. (when shipped from factory)

Function of DIP switch SW9 (Usually all turned OFF)

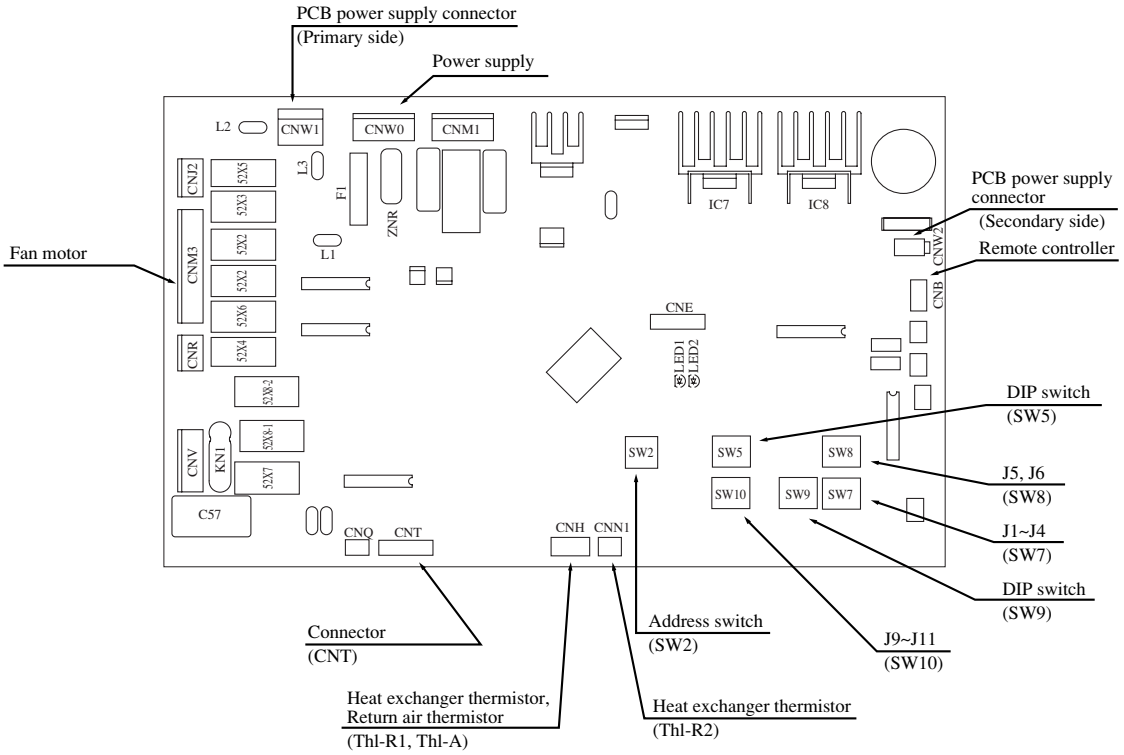
Switch		Function
SW9-3	ON	Emergency operation
	OFF	Normal
SW9-4	ON	Fan control : Powerful mode
	OFF	Fan control : Mild mode

Note (1) It is normally ON only in the case of SW9-4.

Function of DIP switch SW10 (Usually all turned OFF)

Switch				Function
SW10-1 (J9)			OFF	Auto swing fanction - None
			ON	Auto swing function - With
SW10-2 (J10)	OFF	SW10-3 (J11)	OFF	Remote controller air flow –
			ON	Remote controller air flow 1 speed
	ON		OFF	Remote controller air flow 2 speed
			ON	Remote controller air flow 3 speed

Model: FDEN series



● Change by the jumper wire

Name		Function
J1 (SW7-1)	With	Input signal - Reverse invalid
	None (1)	Input signal - Rus stop
J2 (SW7-2)	With	Heating thermostat OFF-Lo
	None (1)	Heating thermostat OFF-Stop, Lo
J3 (SW7-3)	With	Normal operation operable
	None (1)	Operation permission prohibited
J4 (SW7-4)	With	Normal
	None (1)	Heating temp. +3
J5 (SW8-1)	With	Louver free stop control - Invalid
	None (1)	Louver free stop control - Effective
J6 (SW8-2)	With	Freeze prevention fan control activated.
	None (1)	Freeze prevention fan control deactivated.

Note (1) "None" means that jumper wire is not provided on the PCB or the connection is cut

(2) The replacement board is not equipped with jumpers J1 ~ J6. Instead, SW7 and 8, with the same functions as jumpers J1~J6, are used in the position where the jumpers were previously. Set SW7 and 8 locally in accordance with the above table.

● Control change switch (SW5, SW9, SW10)

Function of DIP switch SW5 (Usually all turned OFF)

Switch				Function
SW5-3	ON	SW5-4	ON	Setting time : 1000hrs. (Unit stop)
			OFF	Setting time : 1000hrs. (Display)
	OFF		ON	Setting time : 600hrs. (Display)
			OFF	Setting time : 180hrs. (when shipped from factory)

Function of DIP switch SW9 (Usually all turned OFF)

Switch		Function
SW9-3	ON	Emergency operation
	OFF	Normal
SW9-4	ON	Fan control : Powerful mode
	OFF	Fan control : Mild mode

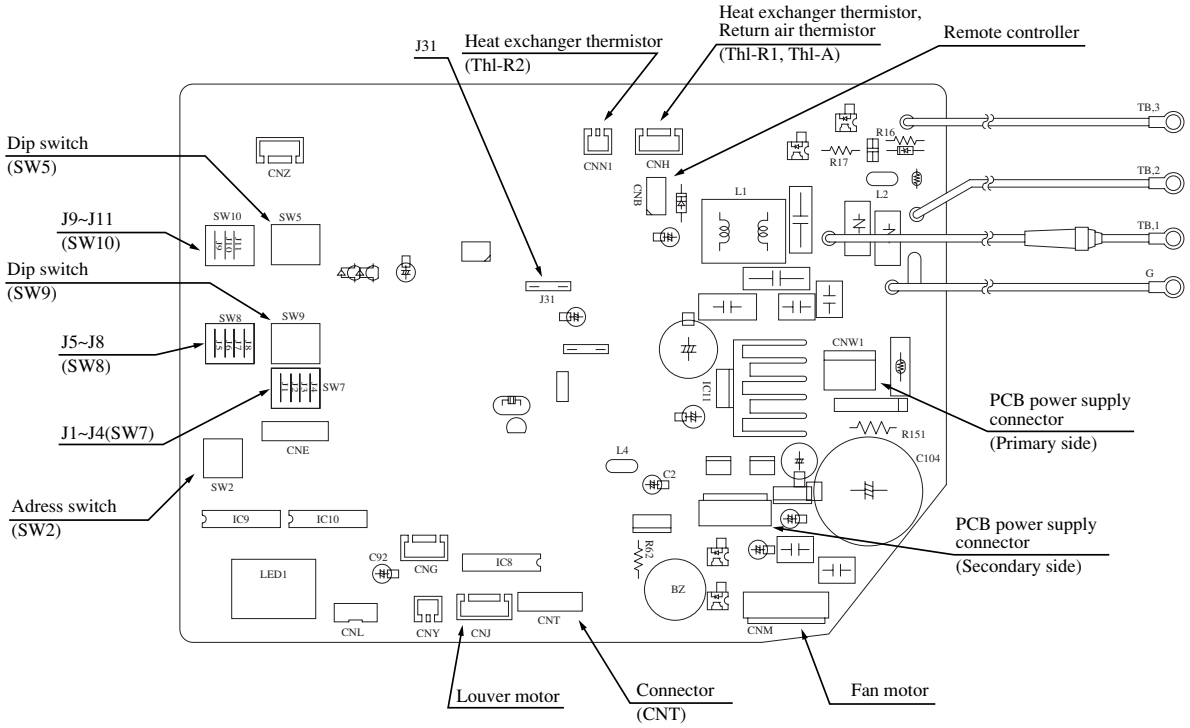
Note (1) It is normally ON only in the case of SW9-4.

Function of DIP switch SW10 (Usually all turned OFF)

Switch				Function
SW10-1 (J9)			OFF	Auto swing fanction - None
			ON	Auto swing function - With
SW10-2 (J10)	OFF	SW10-3 (J11)	OFF	Remote controller air flow –
			ON	Remote controller air flow 1 speed
	ON		OFF	Remote controller air flow 2 speed
			ON	Remote controller air flow 3 speed

Model: FDKN series

This diagram shows the PCB for the 151~251. The component layout on the 301 PCB is different, but the functions are the same.



● Change by the jumper wire

Name		Function
J1 (SW7-1)	With	Input signal - Reverse invalid
	None (1)	Input signal - Rus stop
J2 (SW7-2)	With	Heating thermostat OFF-Lo
	None (1)	Heating thermostat OFF-Stop, Lo
J3 (SW7-3)	With	Normal operation operable
	None (1)	Operation permission prohibited
J4 (SW7-4)	With	Normal
	None (1)	Heating temp. +3
J5 (SW8-1)	With	Louver free stop control - Invalid
	None (1)	Louver free stop control - Effective
J6 (SW8-2)	With	Freeze prevention fan control activated.
	None (1)	Freeze prevention fan control deactivated.
J8 (SW8-4)	With	Model 151~251
	None (1)	Model 301

Note (1) "None" means that jumper wire is not provided on the PCB or the connection is cut

(2) The replacement board is not equipped with jumpers J1 ~ J8. Instead, SW7 and 8, with the same functions as jumpers J1~J8, are used in the position where the jumpers were previously. Set SW7 and 8 locally in accordance with the above table.

● Control change switch (SW5, SW9, SW10)

Function of DIP switch SW5 (Usually all turned OFF)

Switch				Function
SW5-3	ON	SW5-4	ON	Setting time : 1000hrs. (Unit stop)
			OFF	Setting time : 1000hrs. (Display)
	OFF		ON	Setting time : 600hrs. (Display)
			OFF	Setting time : 180hrs. (when shipped from factory)

Function of DIP switch SW9 (Usually all turned OFF)

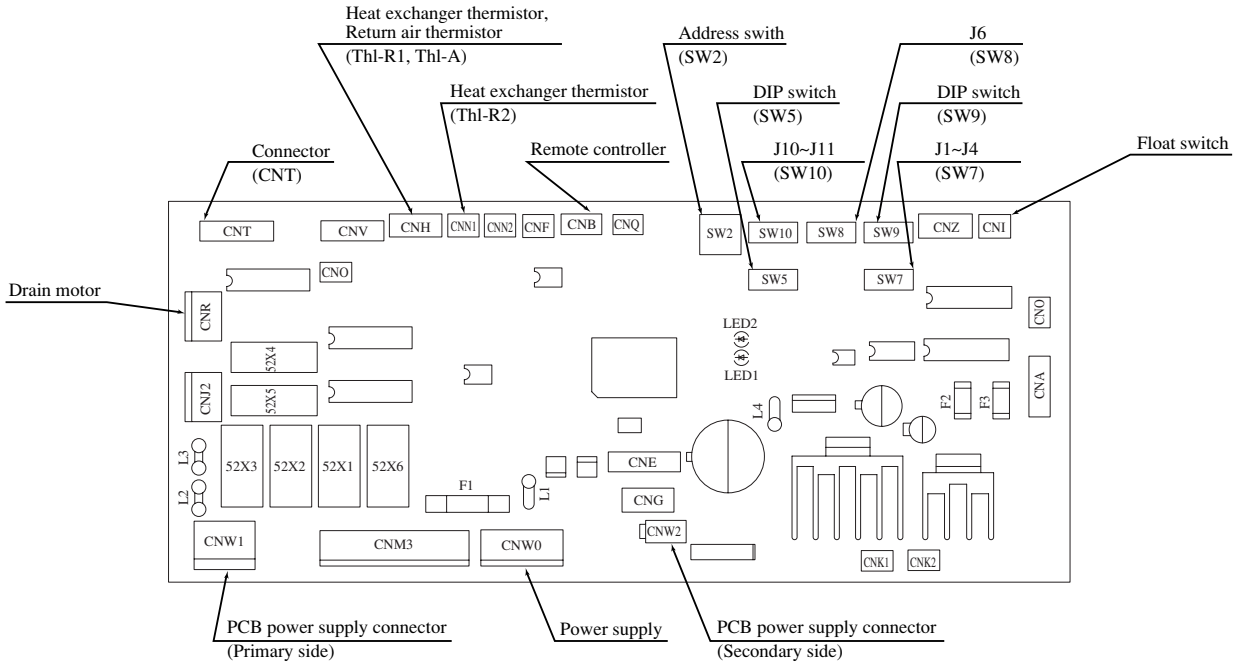
Switch		Function
SW9-1	OFF	Custom code - Change
	ON	Custom code - Normal
SW9-2	OFF	Power failure security - Effective
	ON	Power failure security - Invalid
SW9-3	ON	Emergency operation
	OFF	Normal
SW9-4	ON	Fan control : Powerful mode
	OFF	Fan control : Mild mode

Note (1) It is normally ON only in the case of SW9-4.

Function of DIP switch SW10 (Usually all turned OFF)

Switch				Function
SW10-1 (J9)			OFF	Auto swing fanction - None
			ON	Auto swing function - With
SW10-2 (J10)	OFF	SW10-3 (J11)	OFF	Remote controller air flow –
			ON	Remote controller air flow 1 speed
	ON		OFF	Remote controller air flow 2 speed
			ON	Remote controller air flow 3 speed

Model: FDUR series



● Change by the jumper wire

Name		Function
J1 (SW7-1)	With	Input signal - Reverse invalid
	None (1)	Input signal - Rus stop
J2 (SW7-2)	With	Heating thermostat OFF-Lo
	None (1)	Heating thermostat OFF-Stop, Lo
J3 (SW7-3)	With	Normal operation operable
	None (1)	Operation permission prohibited
J4 (SW7-4)	With	Normal
	None (1)	Heating temp. +3
J6 (SW8-2)	With	Freeze prevention fan control activated
	None (1)	Freeze prevention fan control deactivated

Note (1) "None" means that jumper wire is not provided on the PCB or the connection is cut

(2) The replacement board is not equipped with jumpers J1 ~ J4, J6. Instead, SW7 and 8, with the same functions as jumpers J1~J4, J6, are used in the position where the jumpers were previously. Set SW7 and 8 locally in accordance with the above table.

● Control change switch (SW5, SW9, SW10)

Function of DIP switch SW5 (Usually all turned OFF)

Switch				Function
SW5-3	ON	SW5-4	ON	Setting time : 1000hrs. (Unit stop)
			OFF	Setting time : 1000hrs. (Display)
	OFF		ON	Setting time : 600hrs. (Display)
			OFF	Setting time : 180hrs. (when shipped from factory)

Function of DIP switch SW9 (Usually all turned OFF)

Switch		Function
SW9-3	ON	Emergency operation
	OFF	Normal
SW9-4	ON	Fan control : High speed (High Ceiling)
	OFF	Fan control : Standard

Function of DIP switch SW10 (Usually all turned OFF)

Switch				Function
SW10-2 (J10)	OFF	SW10-3 (J11)	OFF	Remote controller air flow –
			ON	Remote controller air flow 1 speed
	ON		OFF	Remote controller air flow 2 speed
			ON	Remote controller air flow 3 speed

(c) Check method when the error code is display

Remote controller or Indication board: Inspection LED, error code

Indoor unit PCB: Red LED (inspection display), Green LED (CPU. normal display)

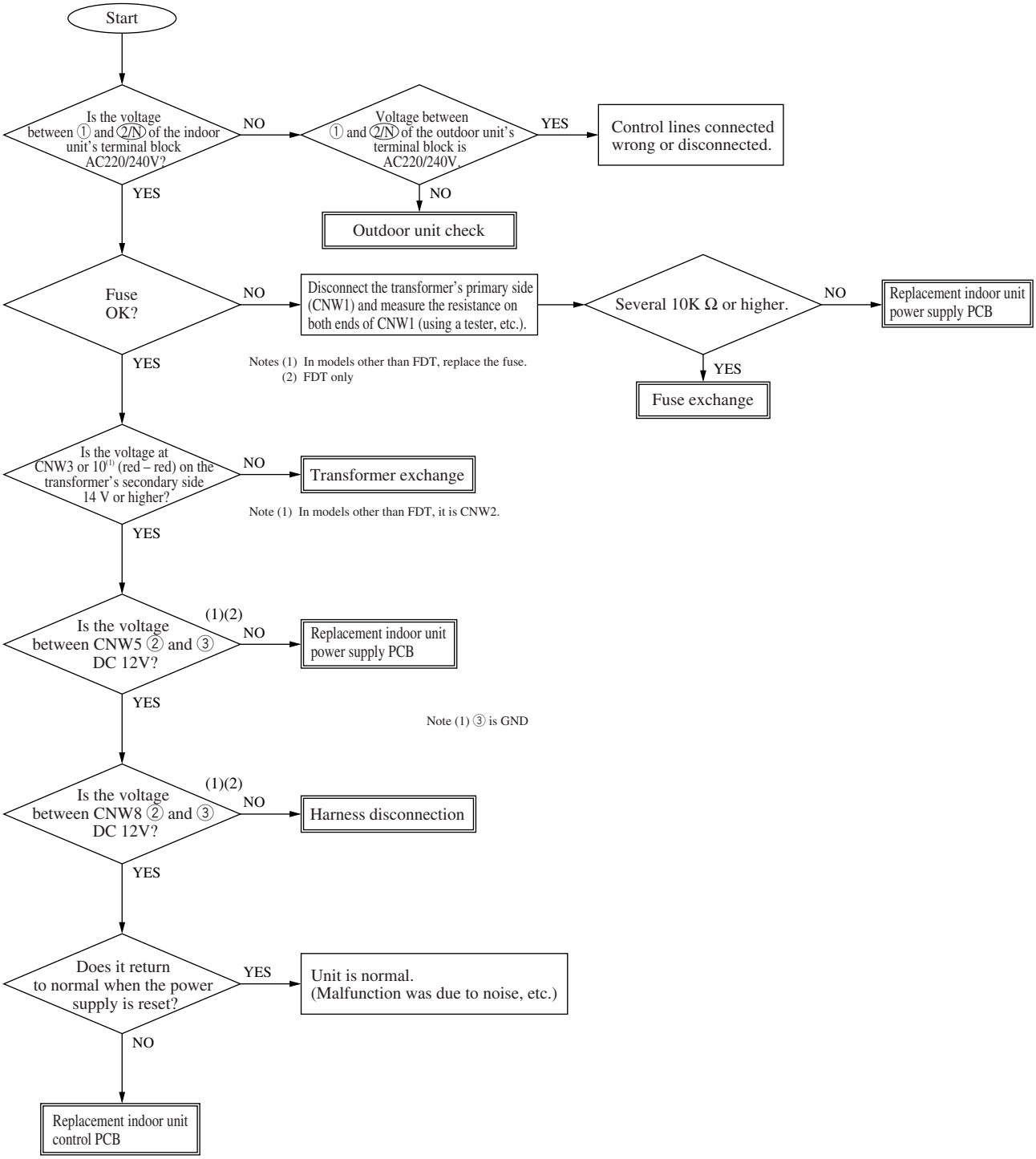
Outdoor unit PCB: ARed LED (inspection display), Green LED (CPU. normal display)

1 **Error display : No display**
LCD display : No display

[Power supply line error]

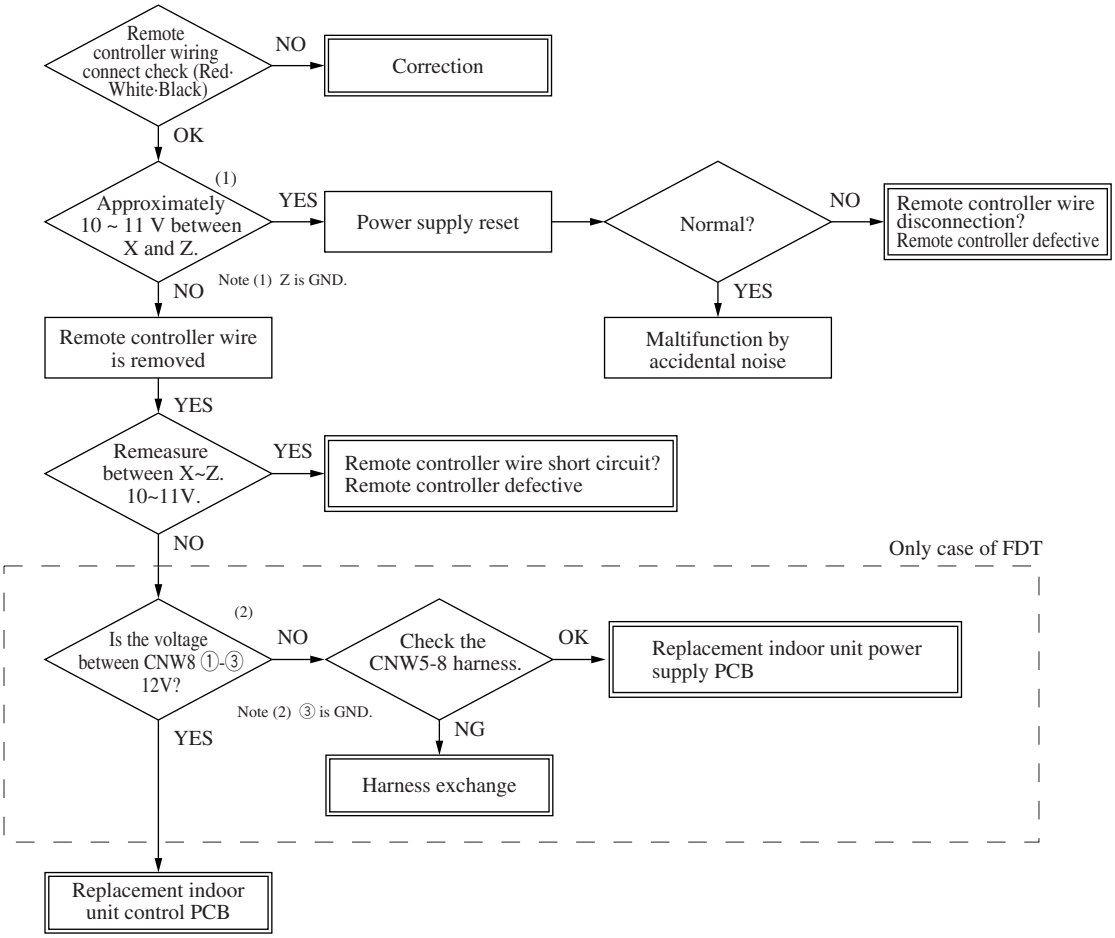
Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	Stays OFF
Green LED	Stays OFF	Green LED	Stays OFF

Note (1) The green LED in the outdoor unit is used in the FDCA301 ~ 601 models only.



Indoor unit		Outdoor unit	
Red LED	3 time flash	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) The green LED in the outdoor unit is used in the FDCA301 ~ 601 models only.



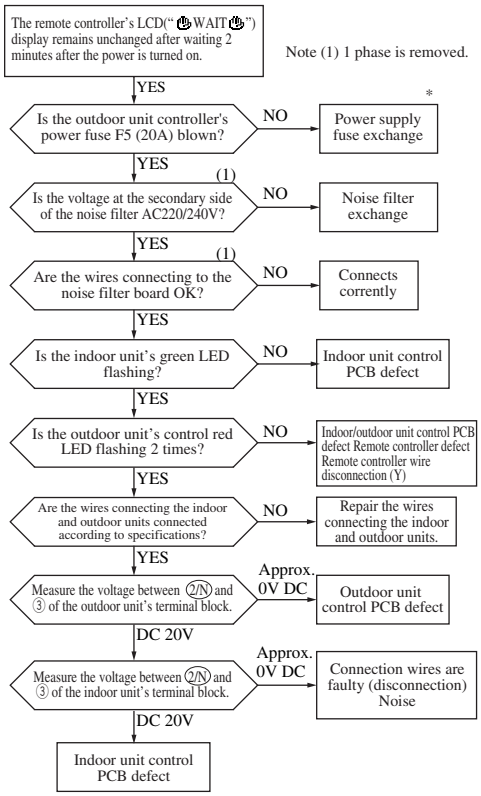
2 Error display "WAIT" — Indoor – outdoor communications trouble (Initial (when the power is turned on)

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	2 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing

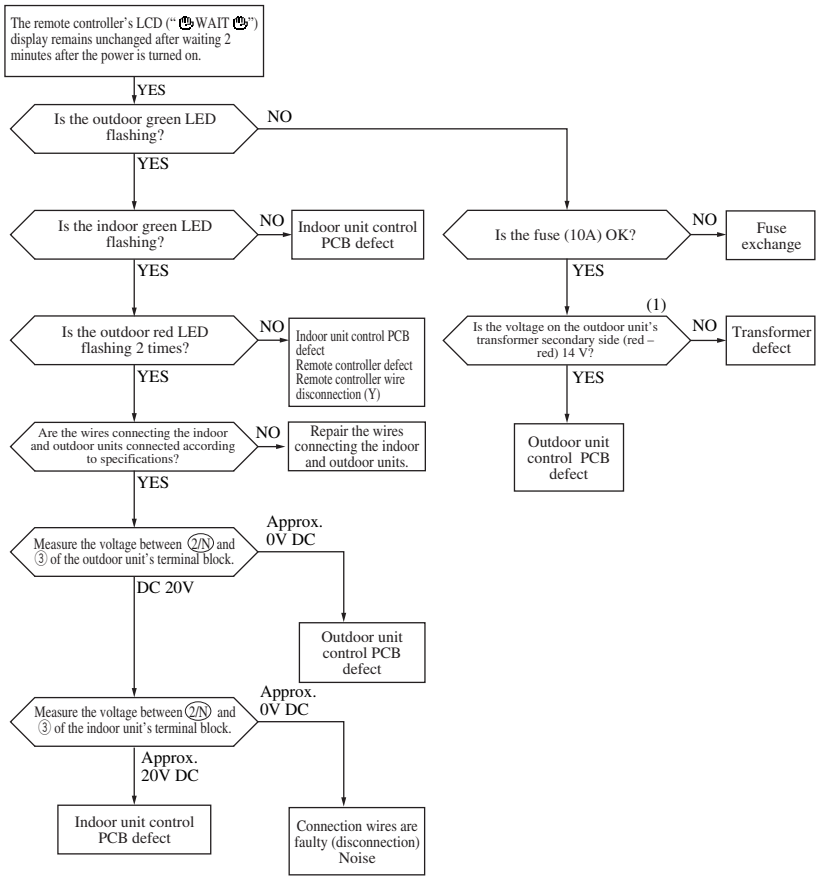
Notes (1) If trouble occurs during communications, the error code E5 is displayed (Outdoor, Red LED flashes 2 times). The check procedure is as shown below. (However, excluding connection related problems) Also, if the power supply is reset after E5 occurs, if the trouble is intermittent, it will be displayed in the LCD(" WAIT ").

(2) The green LED in the outdoor unit is used in the FDCA301 ~ 601 models only.

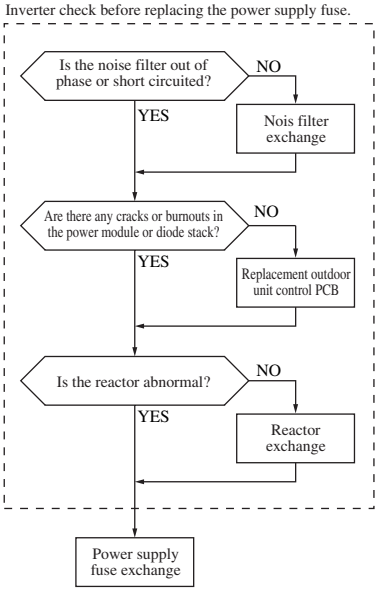
● 151~251

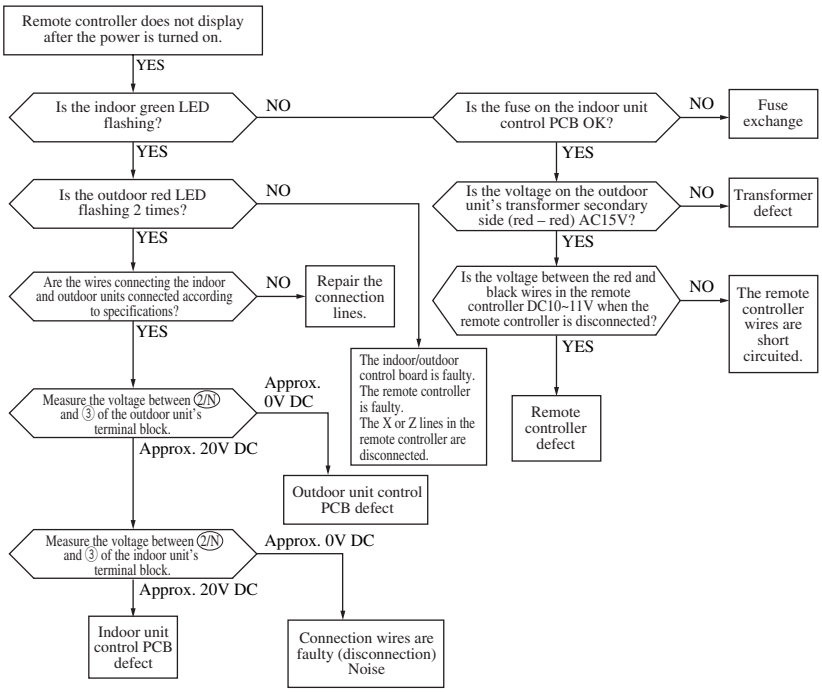


● 301~601



Inverter check before replacing the power supply fuse.

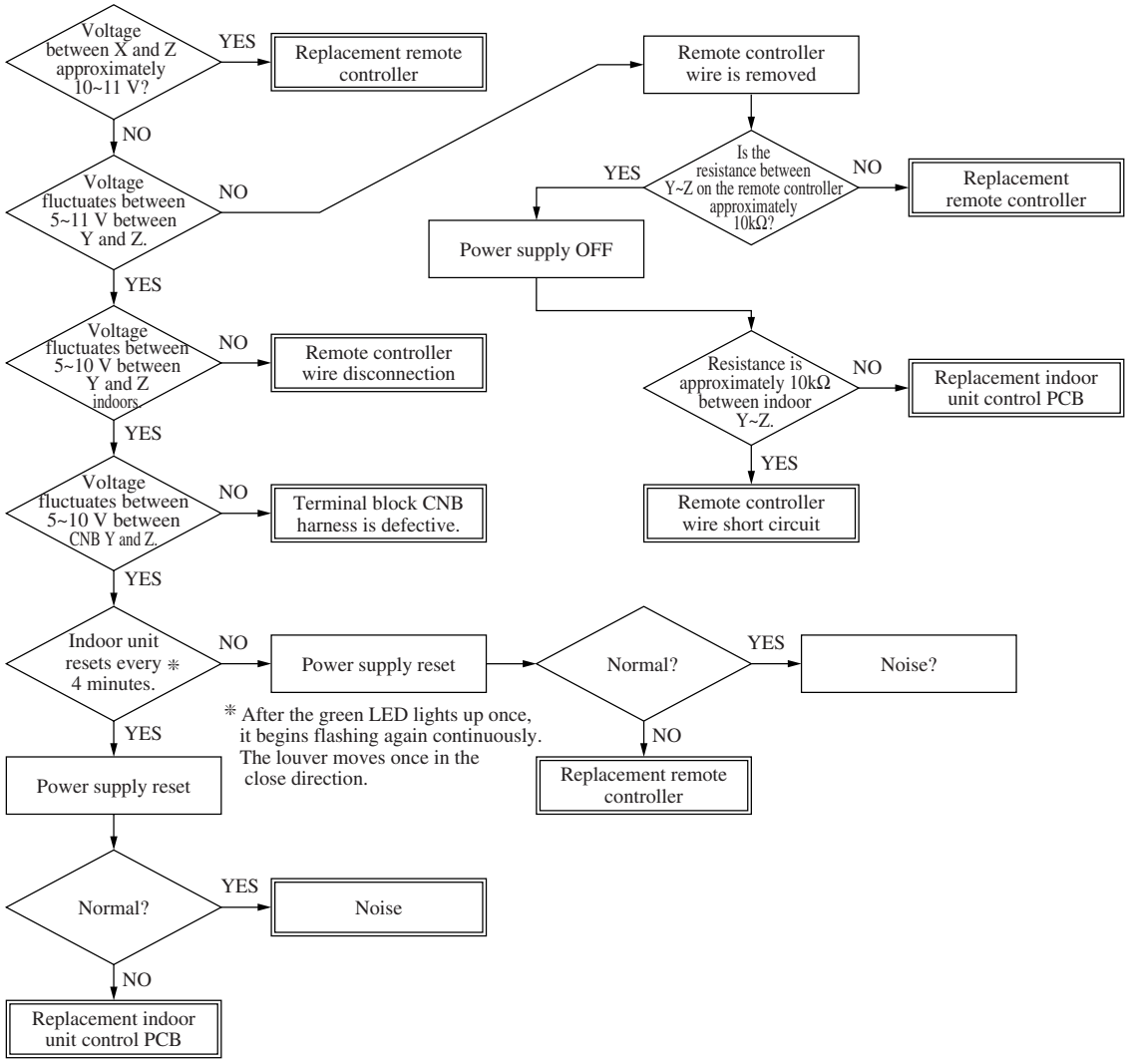




3 Error display : E1 [Communication error between remote controller~Indoor unit]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing

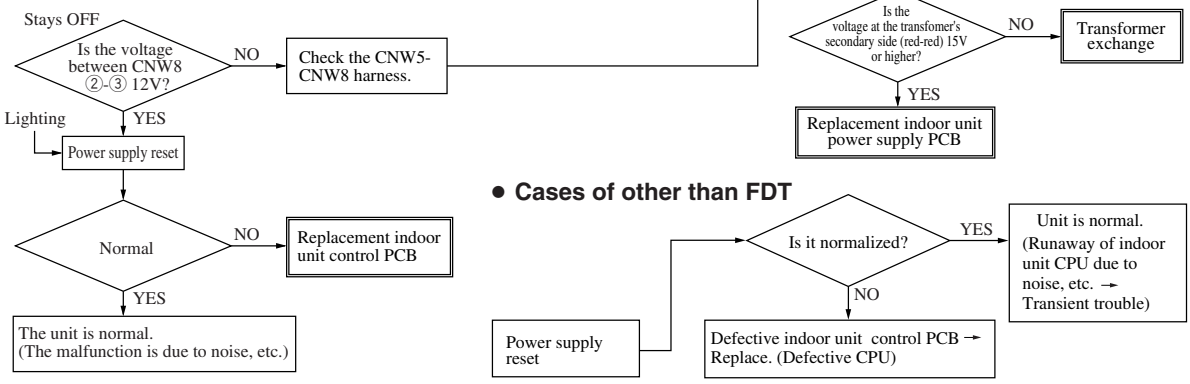
Note (1) The green LED in the outdoor unit is used in the FDCA301 ~ 601 models only.



Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	Stays OFF
Green LED	Stays OFF or Lights continuously	Green LED	Keeps flashing

Note (1) The green LED in the outdoor unit is used in the FDCA301 ~ 601 models only.

● Only case of FDT

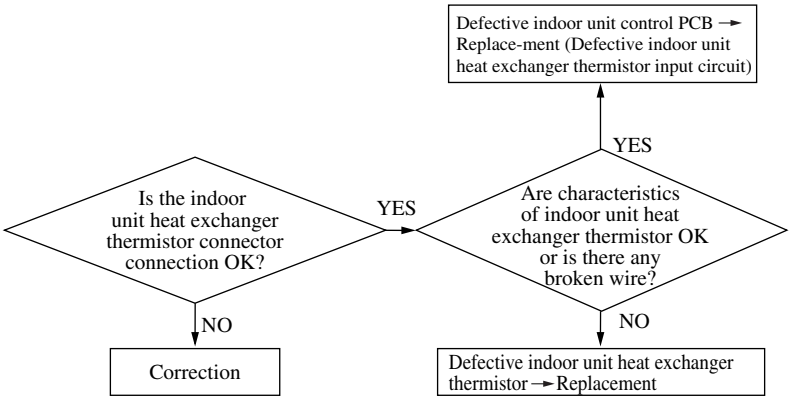


● Cases of other than FDT

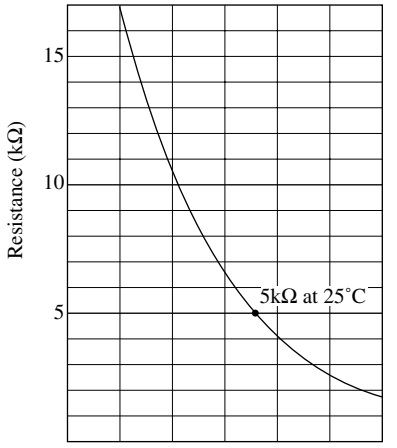
4 Error display : E6 [Defective indoor unit heat exchanger thermistor]

Indoor unit		Outdoor unit	
Red LED	1 time flash	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) The green LED in the outdoor unit is used in the FDCA301 ~ 601 models only.



Return air thermistor (Th_R-A)
Indoor unit heat exchanger thermistor (Th_R-R1, R2)
Resistance temperature characteristics



Note (1) 22.5 kΩ at -6˚C

- Display condition

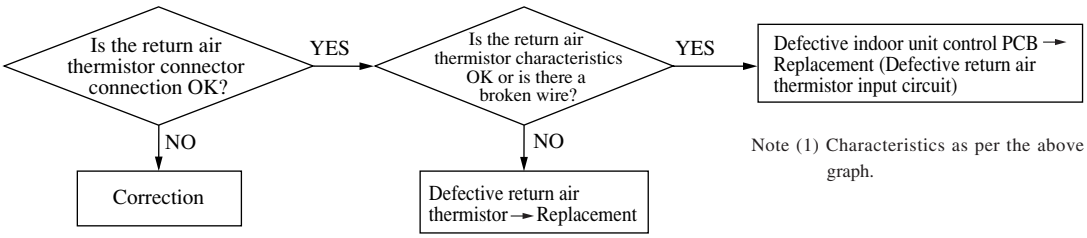
  If a temperature of –50ºC or lower is detected continuously for 5 seconds or longer by the thermistor, the compressor stops. After a 3 minute delay, the compressor restarts. If this state is detected again within 60 minutes after the first detection.

---

5 Error display : E7 [Detective return air thermistor]

Indoor unit		Outdoor unit	
Red LED	1 time flash	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) The green LED in the outdoor unit is used in the FDCA301 ~ 601 models only.



Note (1) Characteristics as per the above graph.

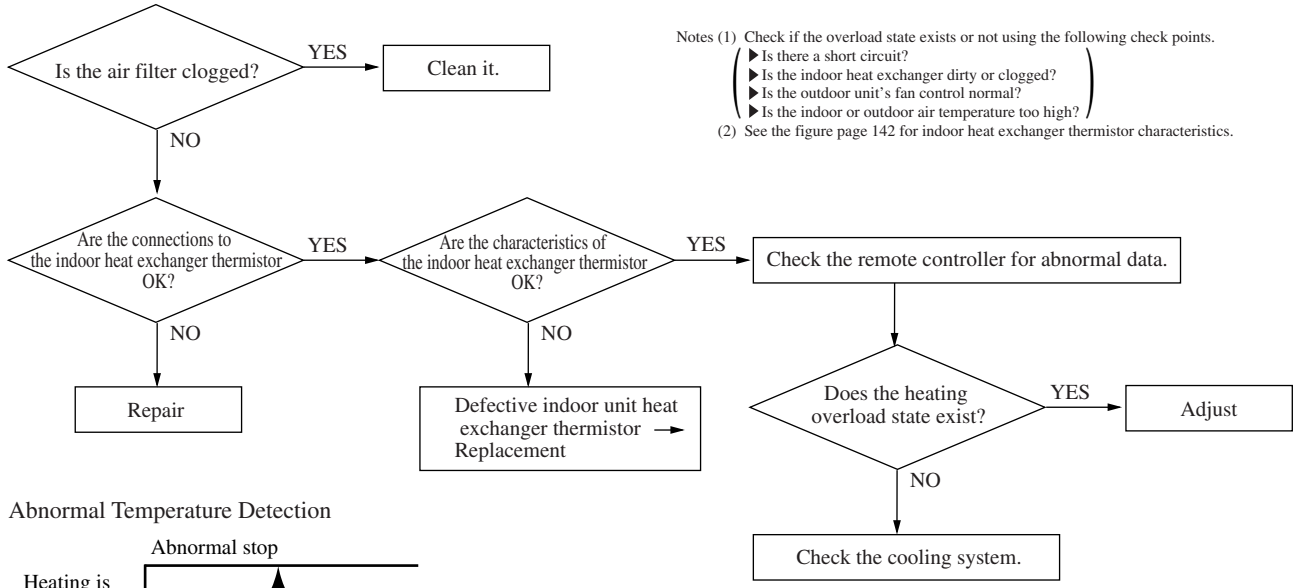
- Display condition

  If a temperature of –50ºC or lower is detected continuously for 5 seconds or longer by the thermistor, the compressor stops. After a 3 minute delay, the compressor restarts. If this state is detected again within 60 minutes after the first detection.

6 Error display : E8 [Heating overload]

Indoor unit		Outdoor unit	
Red LED	1 time flash	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing

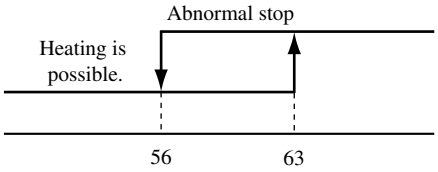
Note (1) The green LED in the outdoor unit is used in the FDCA301 ~ 601 models only.



Notes (1) Check if the overload state exists or not using the following check points.
- Is there a short circuit?
- Is the indoor heat exchanger dirty or clogged?
- Is the outdoor unit's fan control normal?
- Is the indoor or outdoor air temperature too high?

(2) See the figure page 142 for indoor heat exchanger thermistor characteristics.

● Abnormal Temperature Detection



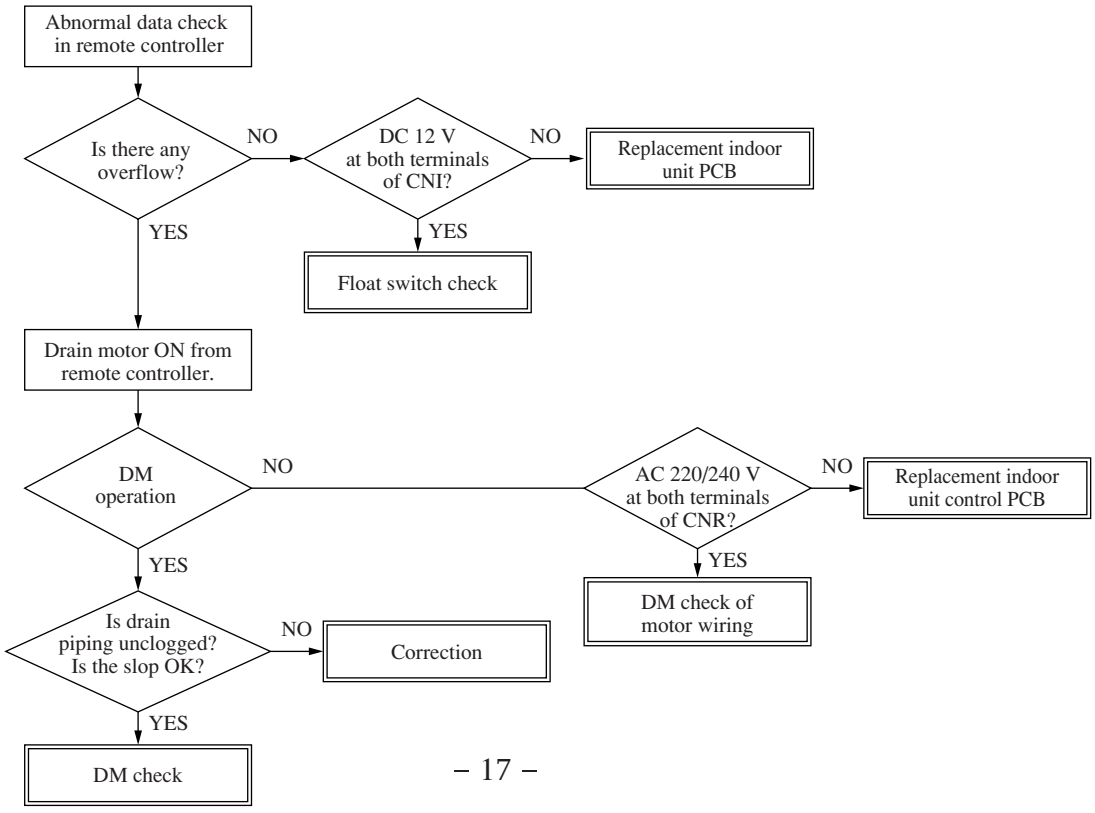
● Display condition

An abnormal stop occurs if this state is detected 5 times within 60 minutes of the first detection, or if the overload state is detected continuously for 6 minutes.

7 Error display : E9 [Drain trouble]

Indoor unit		Outdoor unit	
Red LED	1 time flash	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing

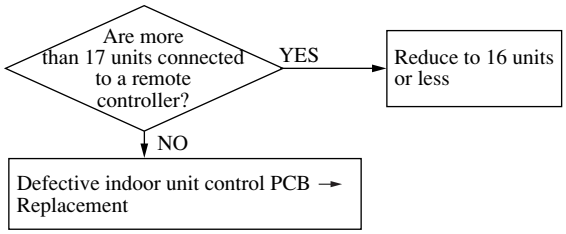
Note (1) The green LED in the outdoor unit is used in the FDCA301 ~ 601 models only.



8 Error display : E10 [Control of 1 remote controller VS multiple units — Excessive number of units (more than 17 units)]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) The green LED in the outdoor unit is used in the FDCA301 ~ 601 models only.

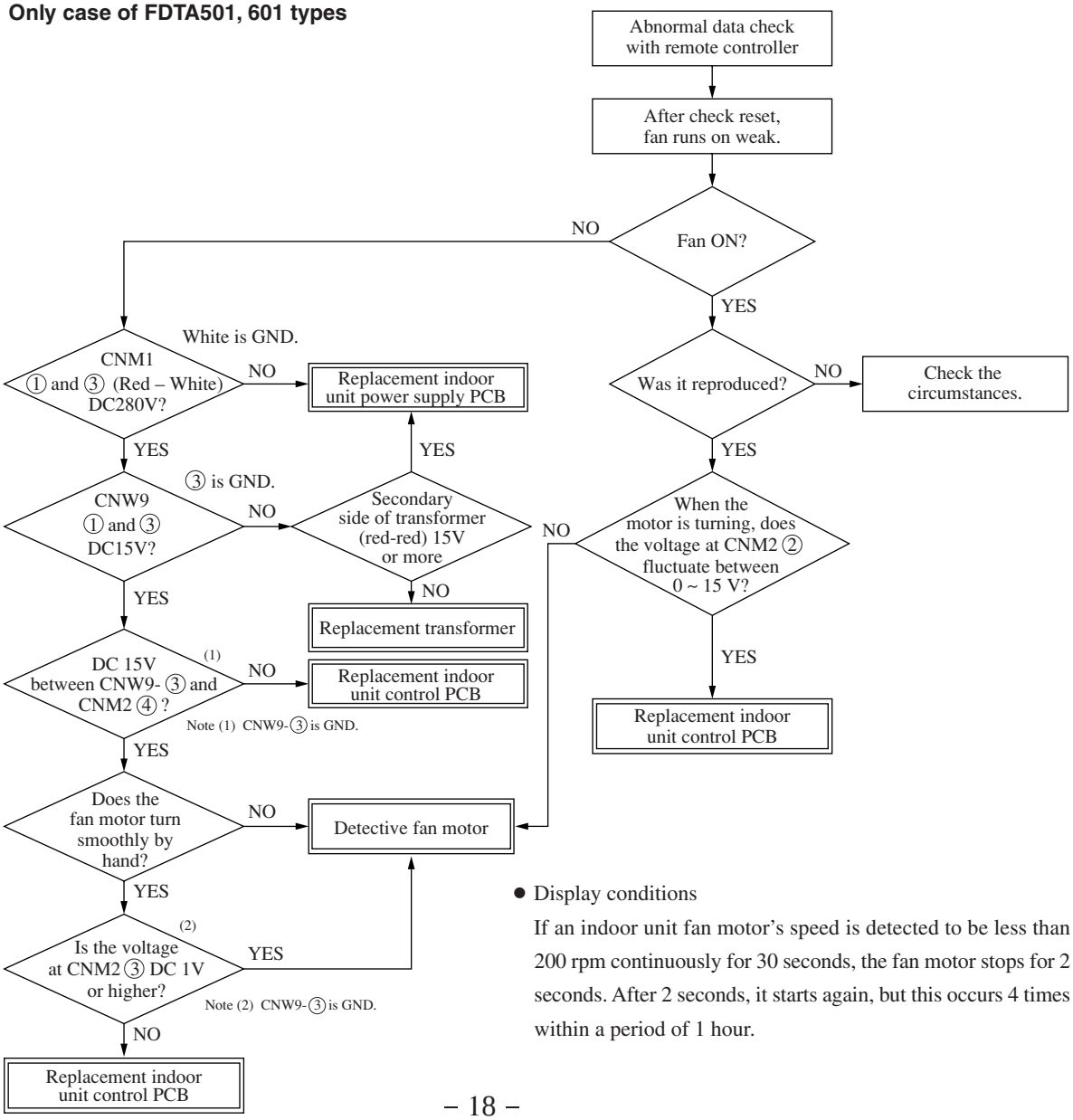


9 Error display : E16 [Fan motor abnormalities]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) The green LED in the outdoor unit is used in the FDCA301 ~ 601 models only.

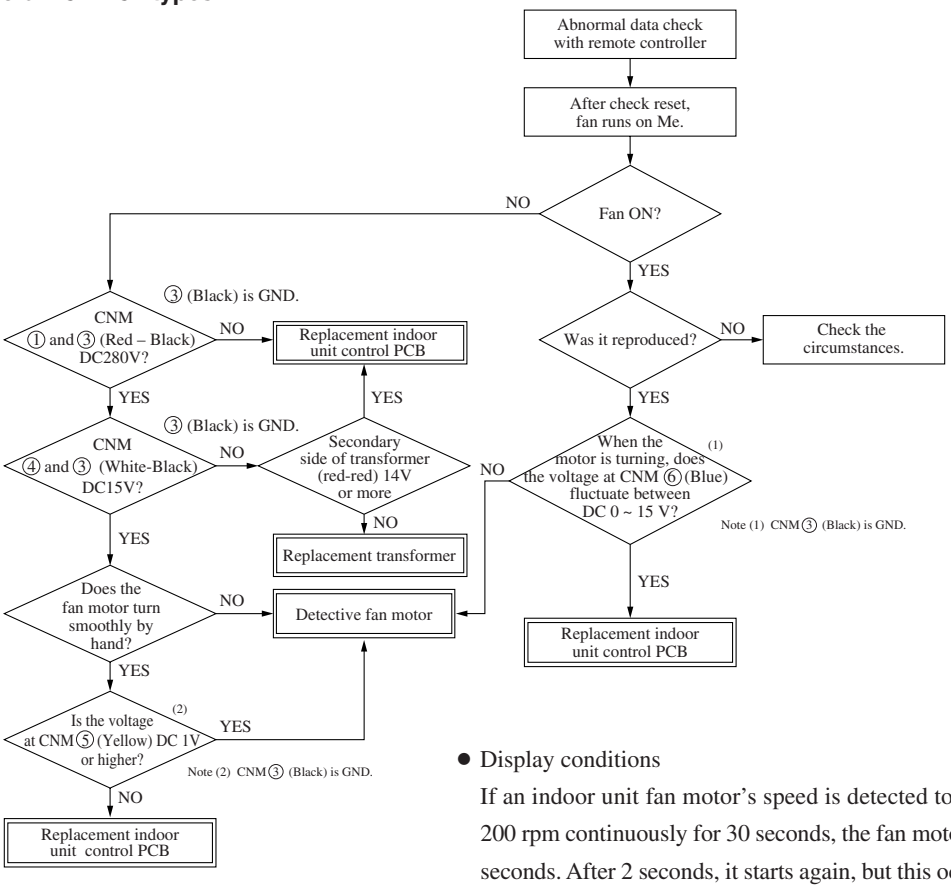
◆ **Only case of FDTA501, 601 types**



● Display conditions

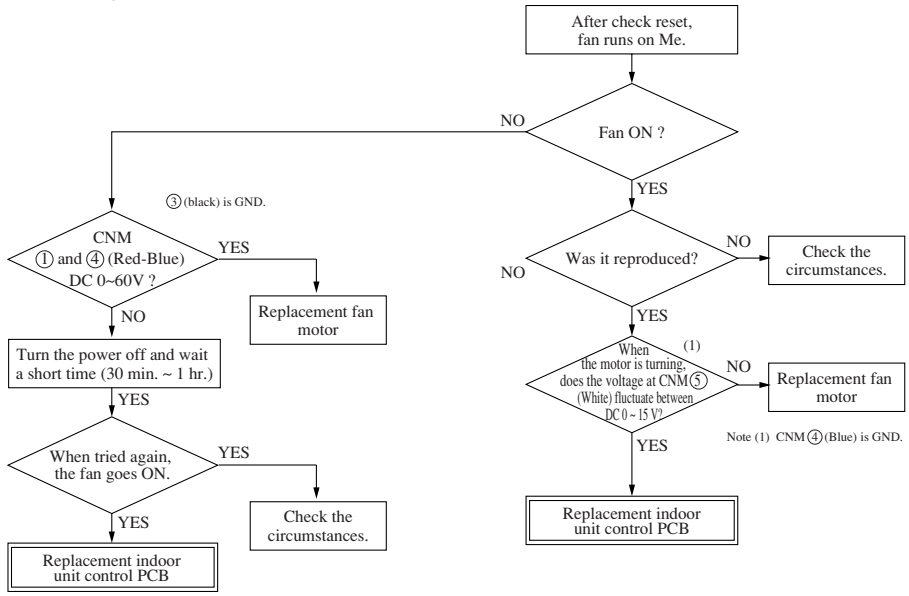
If an indoor unit fan motor's speed is detected to be less than 200 rpm continuously for 30 seconds, the fan motor stops for 2 seconds. After 2 seconds, it starts again, but this occurs 4 times within a period of 1 hour.

◆ **Only case of FDKN**
Only case of 151~251 types



- Display conditions
  If an indoor unit fan motor's speed is detected to be less than 200 rpm continuously for 30 seconds, the fan motor stops for 2 seconds. After 2 seconds, it starts again, but this occurs 4 times within a period of 1 hour.

Only case of 301 type

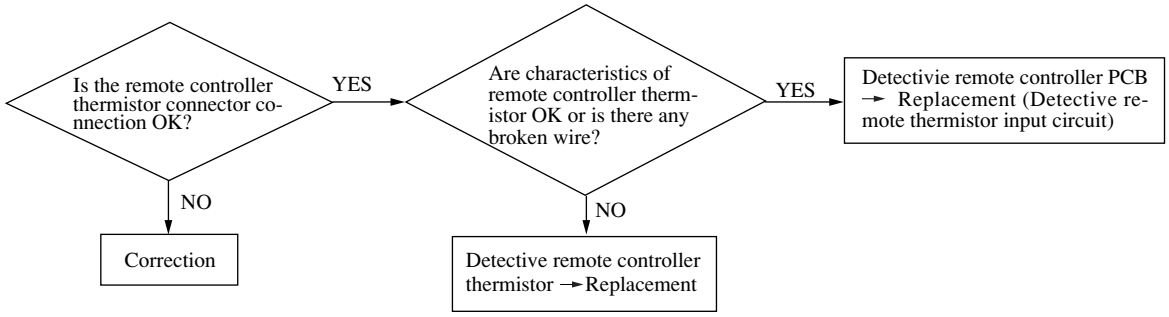


- Display conditions
  If an indoor unit fan motor's speed is detected to be less than 200 rpm continuously for 30 seconds, the fan motor stops for 2 seconds. After 2 seconds, it starts again, but this occurs 4 times within a period of 1 hour.

10 Error display : E28 [Directive remote controller thermistor.]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) The green LED in the outdoor unit is used in the FDCA301 ~ 601 models only.



Resistance-temperature characteristic of remote controller thermister

Temperrature(°C)	Resistance value (kΩ)	Temperrature(°C)	Resistance value (kΩ)	Temperrature(°C)	Resistance value (kΩ)	Temperrature(°C)	Resistance value (kΩ)
0	65	14	33	30	16	46	8.5
1	62	16	30	32	15	48	7.8
2	59	18	27	34	14	50	7.3
4	53	20	25	36	13	52	6.7
6	48	22	23	38	12	54	6.3
8	44	24	21	40	11	56	5.8
10	40	26	19	42	9.9	58	5.4
12	36	28	18	44	9.2	60	5.0

(4) Error diagnosis procedures at the outdoor units side

At the error diagnosis related to the outdoor unit, check at first the error code of remote controller and the illumination patterns of norma1 and inspection display lamps in the same manner as the case of indoor unit.
Then estimate the outline, the cause and the location of error based on the pattern and proceed to the inspcetion and repair.
Since the self diagnosis function by means of the microcomputers of indoor/outdoor units provide the judgement of error of microcomputers them selves irregularity power supply line, overload, etc. caused by the installation space, inadequate volume of refrigerant etc., the location and cause of trouble will be discovered without difficulty.
In addition, the display lamps error code of indoor/outdoor unit is kept flashing, (except when the power supply is iterrupted) after the irregularity is automatically recovered to give irregularity information to the service presonnel. If any mode of higher priority than the error retained in memory occurs after the reset of error, it is switched to that mode and saved in the memory.

(a) Replacement parts assembly related to the outdoor unit controller

Outdoor unit PCB, power transistor module, capacitor, noise filter, thermistor, (heat exchanger, discharge pipe, outdoor temperature, power transistor), fuse, transformer, etc.

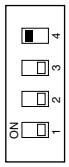
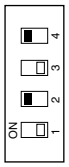
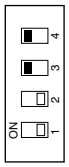
(b) Replacement procedure of outdoor unit microcomputer printed circuit board.

Microcomputer printed circuit board can replaced with following procedure.

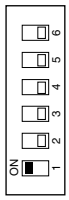
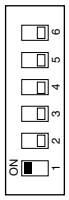
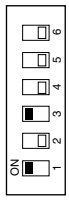
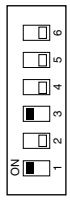
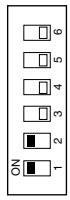
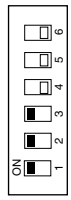
1) Confirm the parts numbers. (Refer to the following parts layout drawing for the location of parts number.)

Parts No.	Applicable Model
PCA505A080Z	FDCVA151HEN, 201HEN, 251HEN
PCA505A065ZN	FDCA301HEN, 401HEN
PCA505A065ZS	FDCA301HES, 401HES, 501HES, 601HES

2) Set the model using the model setting switch (SW6). (In the case of the 151~251 only).
Switch Setting Table (All switches are set in the OFF position when shipped from the factory.)

Model	151	201	251
Switch Setting Table Set the switches ON or OFF for each switch No. (■ON, □OFF)			

3) Set the overcurrent value using the overcurrent setting switch for CM (SW3). (In the case of the 301~601 only)
Switch Setting Table (All switches are set in the OFF position when shipped from the factory.)

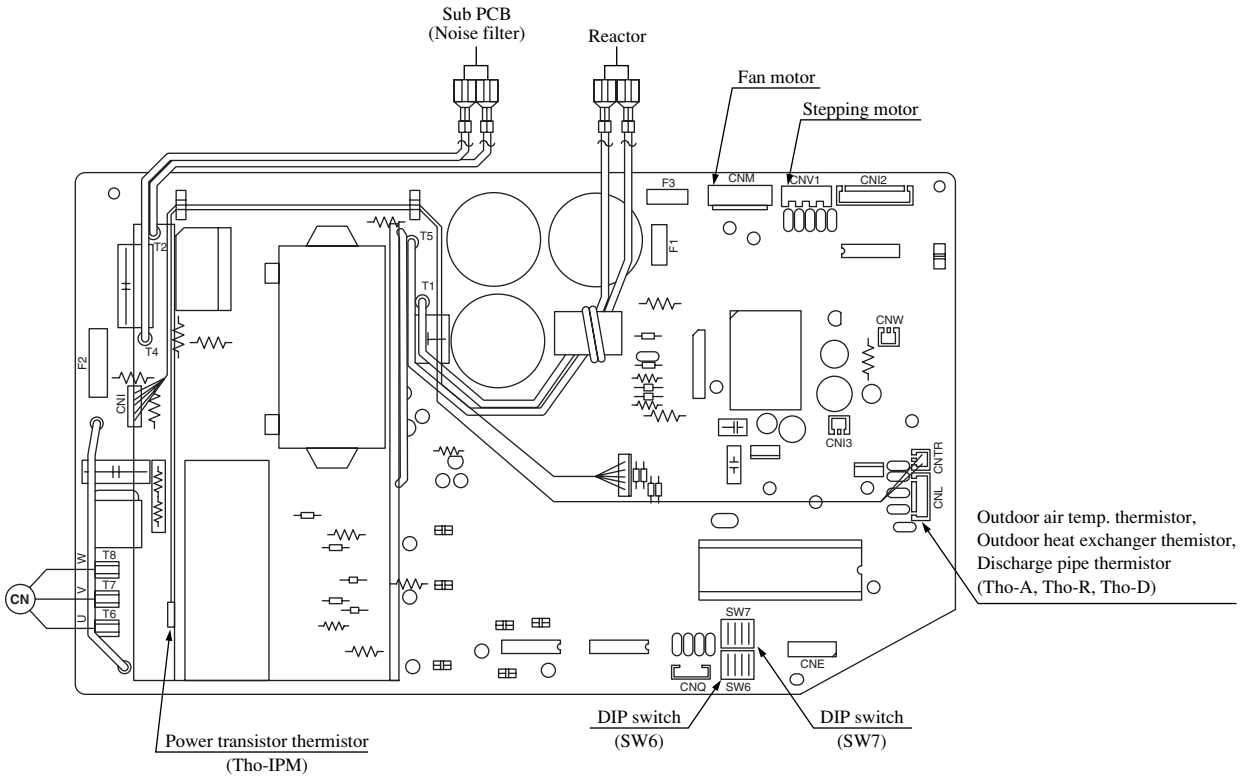
Model	301HEN	301HES	401HEN	401HES	501HES	601HES
Setting Value (A)	17	10	27	11	12	14
Switch Setting Table Set the switches ON or OFF for each switch No. (■ON, □OFF)						

4) Set the control select switch to match the previously set settings on the previous board.
If the previously set settings were set with jumper wires, the control select switch should be set in the ON position if there was a jumper wire and in the OFF position if there wasn't a jumper wire.
5) Connect the faston terminals and connectors to the control board.
When connecting the wires to the faston terminals, connect each wire to the terminal printed with the same color on the board.

Note (1) When connecting the faston terminals to the control board, connect them so that there is no deformation of the far end of the circuit board.

Parts layout on the outdoor unit PCB

◆ **FDCVA151~251 type**



● Change by the jumper wire

Model	151	201	251
JA1 (SW7-1)	None	None	None
JA5 (SW6-1)	None	None	None
JA6 (SW6-2)	None	With	None
JA7 (SW6-3)	None	None	With
JA8 (SW6-4)	With	With	With

Notes (1) "None" means that jumper wire is not provided on the PCB or the connection is cut
(2) The replacement PCB is not equipped with jumper wires JA1 and JA5~JA8. Instead, SW6 and 7 are mounted in the same position and have the same functions as jumper wires JA1 and JA5~JA8. Carry out the local settings in accordance with the table using SW6 and 7.

● Function of DIP switches (SW5) (Usually all turned OFF)

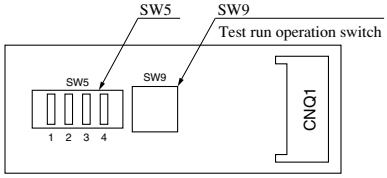
Switch		Function
SW5-1	ON	Defrost Setting Select For cold regions.
	OFF	Normal
SW5-2	ON	Snow-guard fan control-Effective
	OFF	Snow-guard fan control-Invalid
SW5-3	ON	Low refrigerant protection control-Effective
	OFF	Low refrigerant protection control-Invalid
SW5-4	ON	Test run operation-Heating
	OFF	Test run operation-Cooling

● Change by the JA3

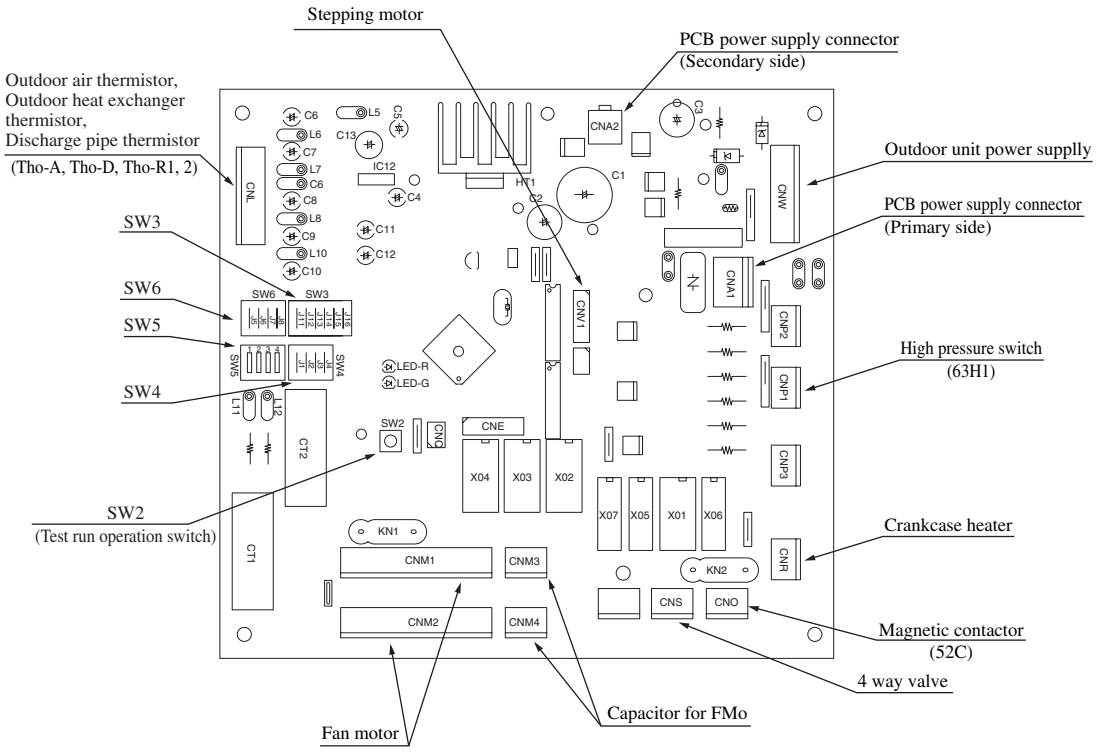
Switch		Function
JA3 (SW7-3)	with	Model selection-Energy saving
	None	Model selection-Standerd

Note (1) "None" means that jumper wire is not provided on the PCB or the connection is cut.

External PCB



◆ FDCA301~601 type



● Change by the jumper wire

Switch		Function
J1 (SW4-1)	with	1 Phase
	None(1)	3 Phase
J2 (SW4-2)	with	Cooling
	None(1)	Heating
J6 (SW6-2)	with	Defrost recovery temperature 14ºC
	None(1)	Defrost recovery temperature (See page 88)
J7 (SW6-3)	with	Defrost prohibited temperature 45 min.
	None(1)	Defrost prohibited temperature 37 min.
J8 (SW6-4)	None(1)	—

Notes (1) "None" means that jumper wire is not provided on the PCB or the connection is cut

(2) The replacement board is not equipped with jumper wires JA1~JA8. Instead, SW4 and 6 are mounted in the same position and have the same functions as jumper wires JA1~JA8. Carry out the local settings in accordance with the above table using SW4 and 6.

● Function of DIP switches (SW5) (Usually all turned OFF)

Switch		Function
SW5-1	ON	Defrost Setting Select For cold regions.
	OFF	Normal
SW5-2	ON	Snow-guard fan control-Effective
	OFF	Snow-guard fan control-Invalid
SW5-3	ON	Low refrigerant protection control-Effective
	OFF	Low refrigerant protection control-Invalid
SW5-4	ON	Test run operation-Heating
	OFF	Test run operation-Cooling

● Overcurrent Setting

Model	301HEN	301HES	401HEN	401HES	501HES	601HES
Setting Value (A)	17	10	27	11	12	14
J11 (SW3-1)	With	With	With	With	With	With
J12 (SW3-2)	None(1)	None(1)	None(1)	None(1)	With	With
J13 (SW3-3)	None(1)	None(1)	With	With	None(1)	With

Notes (1) "None" means that jumper wire is not provided on the PCB or the connection is cut

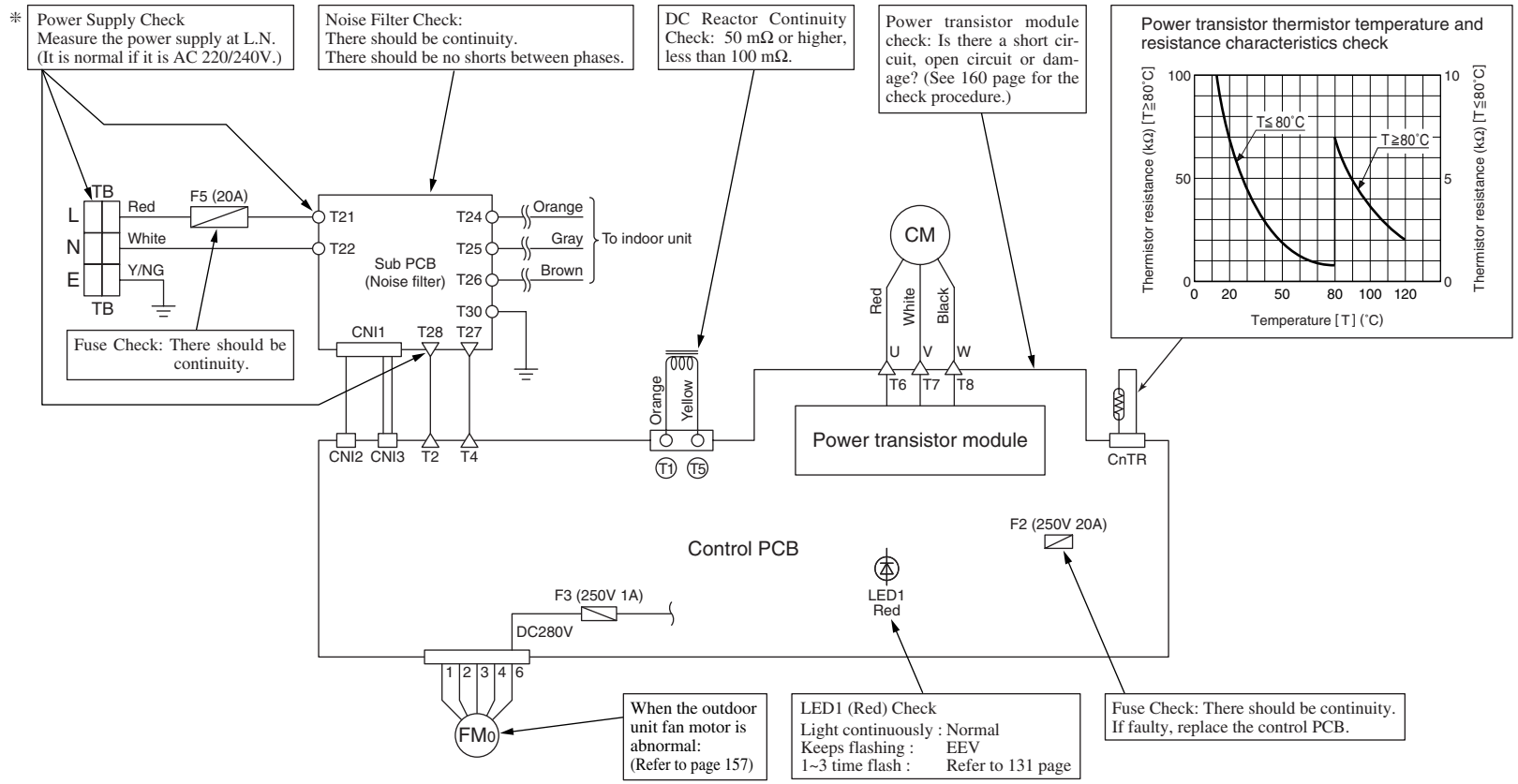
(2) The replacement board is not equipped with jumper wires J11~J13. Instead, SW3 is mounted in the same position and has the same functions as jumper wires J11~J13. Carry out the local settings in accordance with the above table using SW3.

(3) The overcurrent setting value becomes the above setting value (A) automatically in accordance with the settings on J11(SW3-1) ~ J13(SW3-3) and J1(SW4-1).

Outdoor Unit controller failure diagnosis circuit diagram

◆ FDCVA151~251 type

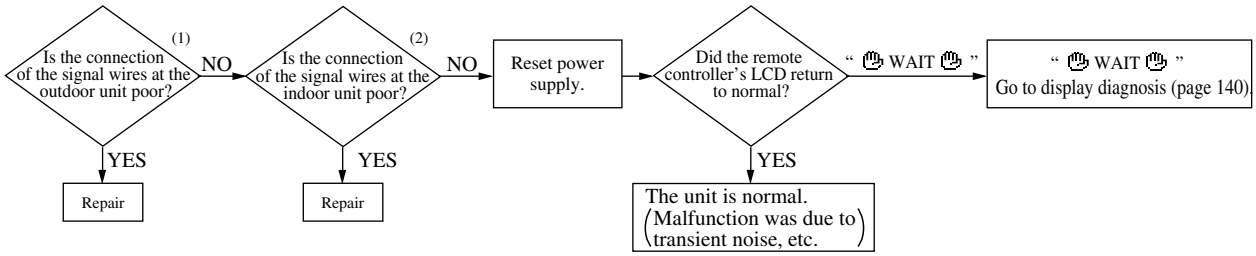
- Outdoor unit check points
  Check items with the *mark when the power is ON.



1 Error display : E5 [Communications error during operation]

Indoor unit		Outdoor unit	
Red LED	2 time flash	Red LED	2 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing

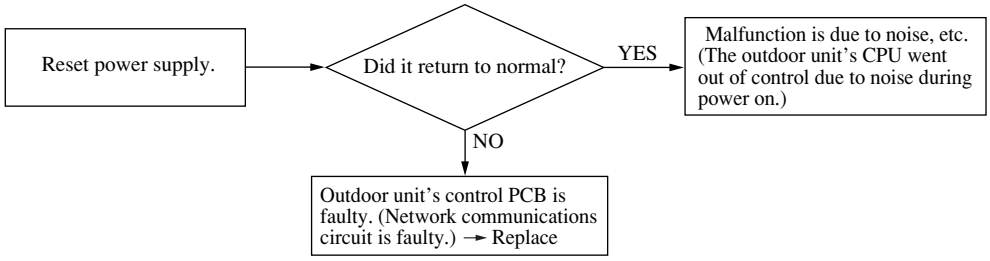
Note (1) The green LED in the outdoor unit is used in the FDCA301 ~ 601 models only.



Notes (1) Check for poor connections (disconnection, looseness) on the outdoor unit's terminal block.
(2) Check for poor connections or disconnection of the signal lines between the indoor and outdoor units.

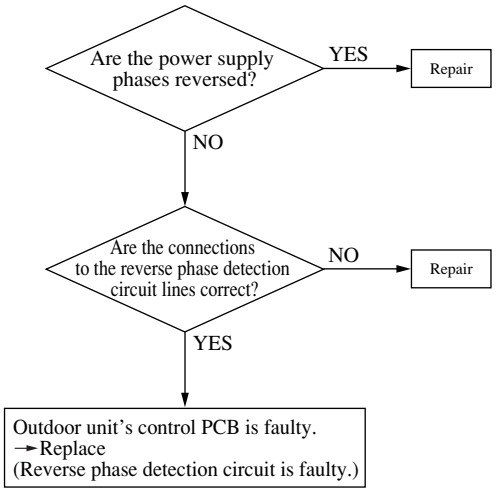
Indoor unit		Outdoor unit	
Red LED	2 time flash	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) The green LED in the outdoor unit is used in the FDCA301 ~ 601 models only.



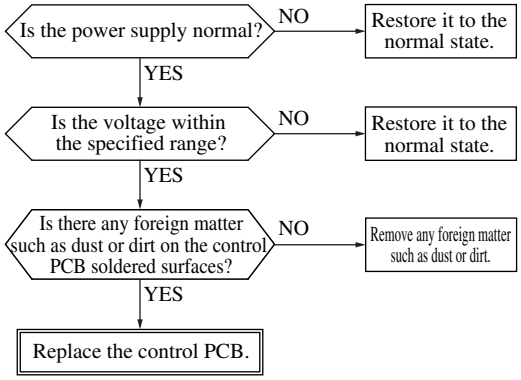
2 Error display : E32 [Power supply phases reversed] [Only case of 301~601 type]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing



3 Error display : E33 [Inverter primary current abnormal] [Only case of 151~251 type]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing		

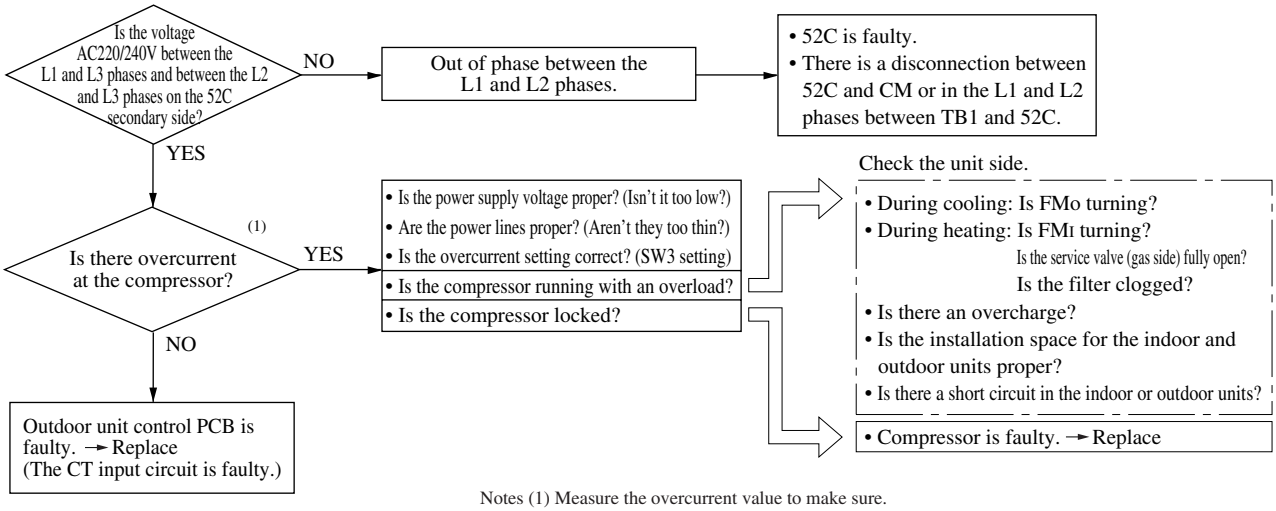


- Display Conditions

  If the inverter's primary current exceeds the set value for 3 seconds, the compressor stops. After a 3 minute delay, it restarts, but when this occurs 5 times within 60 minutes.

[Compressor overcurrent trouble] [Only case of 301~601 type]

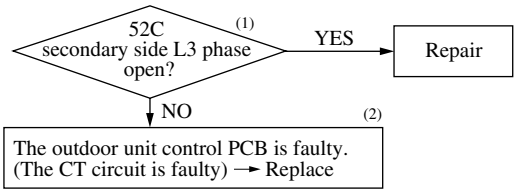
Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing



Notes (1) Measure the overcurrent value to make sure.
Also make sure the overcurrent setting set with SW3 and SW4-1 on the outdoor unit control PCB is not incorrect.

4 Error display : E34 [Open phase at L3 phase of 52C secondary side] (Only case of 301~601 type)

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing



Notes (1) Also check if there is voltage at the L3 phase on the 52C primary side, but no voltage on the secondary side (coil wire disconnection or faulty contacts).
(2) If there is voltage at the L3 phase on the 52C primary side and it is not abnormal, the outdoor unit control PCB is faulty.

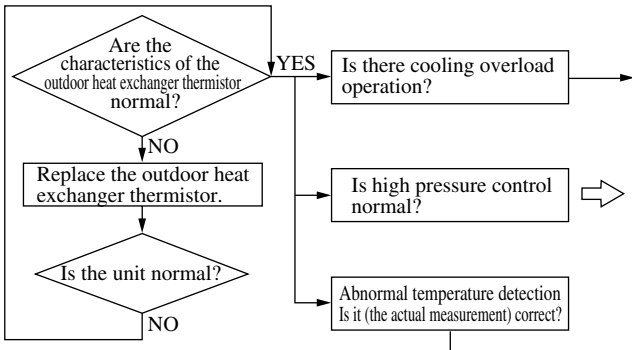
If the unit is operated with the service valve closed, 49C (internal thermostat) operates. E34 may also be displayed. Check the service valve.

---

5 Error display : E35 [Cooling overload operation]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) The green LED in the outdoor unit is used in the FDCA301 ~ 601 models only.



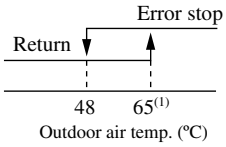
Check the unit side.
- Is there a short circuit in the outdoor unit?
- Is the installation space proper?
- Is the refrigerant level too high?
- Is the heat exchanger dirty or clogged?

(1) The compressor's speed drops when all the following conditions are met (151~251). In the case of the 301~601, expansion valve control is performed.
① Outdoor heat exchanger temperature: A˚C or higher
② Outdoor air temperature: 41ºC or higher
③ The outdoor unit's fan runs at 7 speed (UHi)(1) continuously for 30 seconds or longer.
(2) Control is cancelled when the temperature drops to BºC or lower.

Model	Item		A	B
151~251 type	Compressor speed (rps)	less than 88	58.5	53.5
		88 to less than 108	53.5	48.5
		108 or higher	48.5	43.5
301~601 type			58	53

Note (1) Values in ( ) show for the case of the 301~601 models.

◆ **Abnormal Temperature Detection**

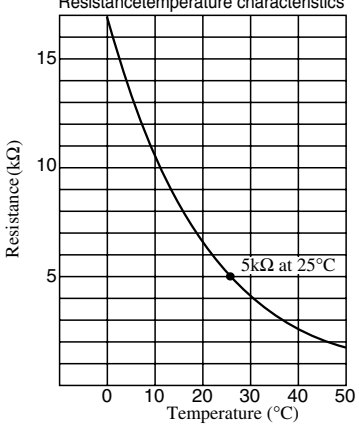


Note (1) In the case of the 151 ~ 251, the abnormal stop temperature differs depending on the compressor's speed.

Compressor speed (rps)	Indoor heat exchanger temprature (˚C)
less than 88	65 or more
88 to less than 108	60 or more
108 or higher	55 or more

● Display Conditions
If the outdoor heat exchanger temperature becomes 65ºC 5 times within 60 minutes, including while the compressor is stopped, or if it continues at that temperature for 10 minutes or longer.

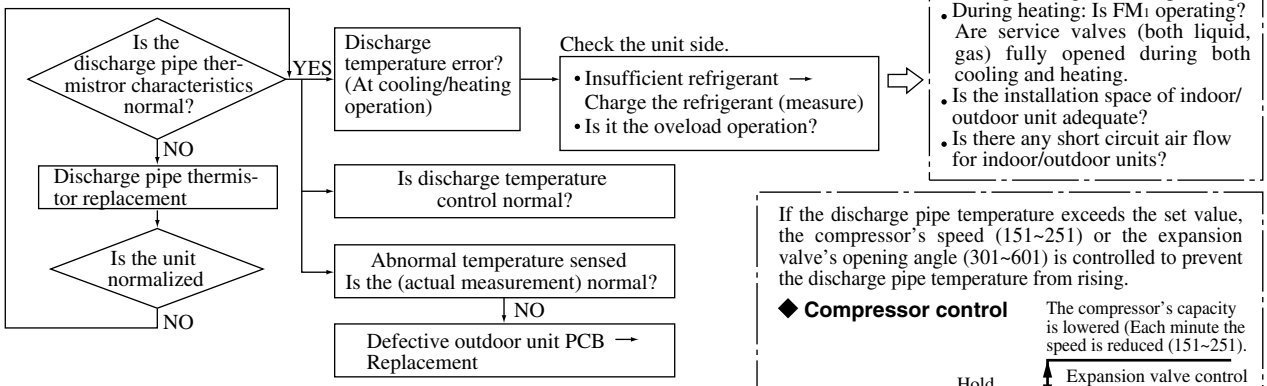
Outdoor unit heat exchanger themistor (Tho-R)
Resistancetemperature characteristics



6 Error display : E36 [Discharge temperature error]

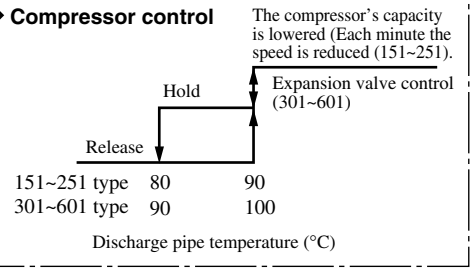
Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) The green LED in the outdoor unit is used in the FDCA301 ~ 601 models only.



If the discharge pipe temperature exceeds the set value, the compressor's speed (151~251) or the expansion valve's opening angle (301~601) is controlled to prevent the discharge pipe temperature from rising.

◆ Compressor control

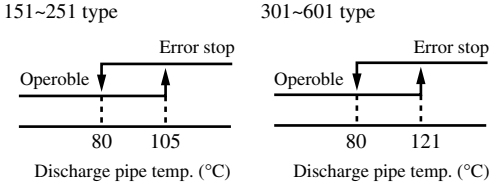


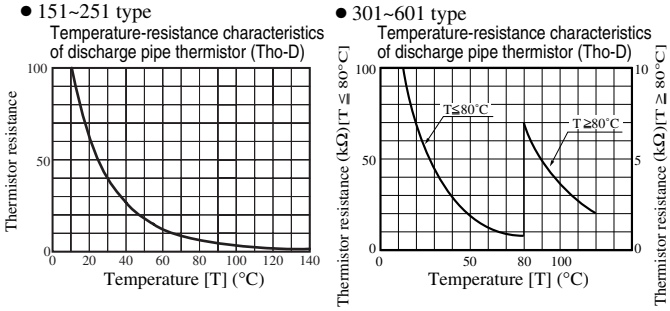
- Display conditions

  If the discharge temperature is as shown at left 2 (5) times within 60 minutes, or continuously for 60 minutes, including when the compressor is stopped.

  Note (1) Values in ( ) show for the case of the 301~601 models.

◆ Abnormal Temperature Detection



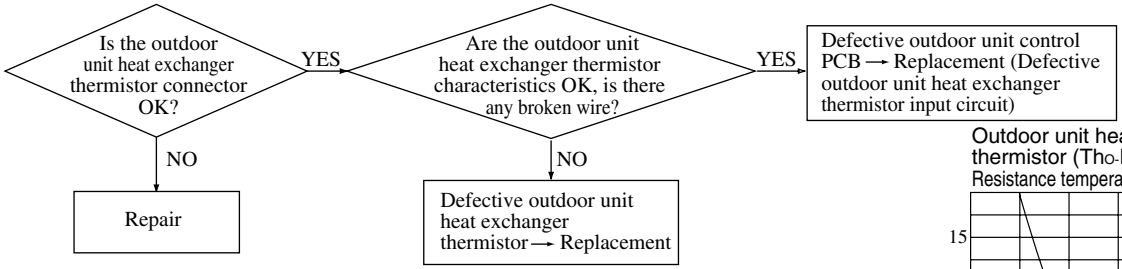


---

7 Error display : E37 [Defective outdoor unit heat exchanger thermistor]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing

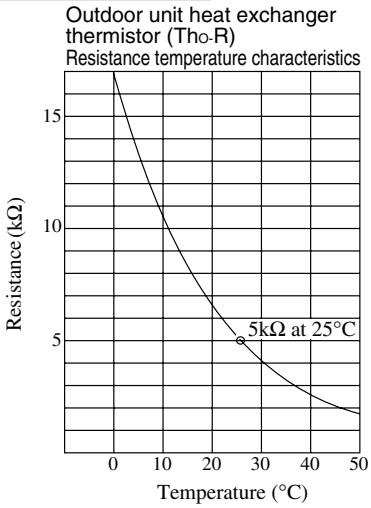
Note (1) The green LED in the outdoor unit is used in the FDCA301 ~ 601 models only.



- Display conditions

  If the temperature sensed by the thermistor is –30ºC or lower continuously for 5 seconds between 2 minutes and 2 minutes 20 seconds after the compressor goes ON, the compressor stops. After a 3 minute delay, the compressor restarts. If this state is detected 3 times in 40 (60) minutes.

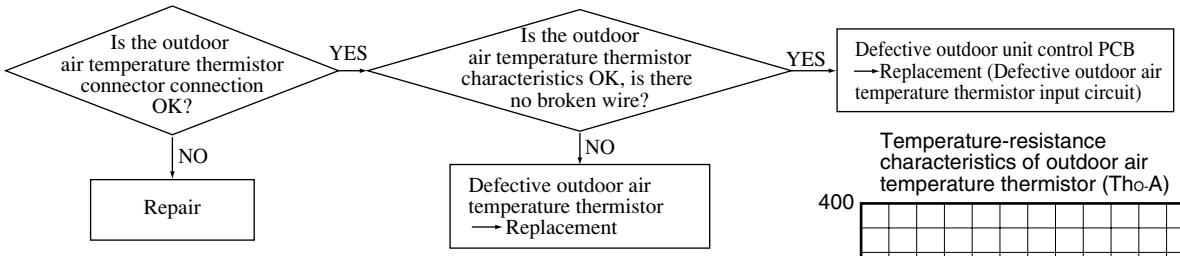
  Note (1) Values in ( ) show for the case of the 301~601 models.

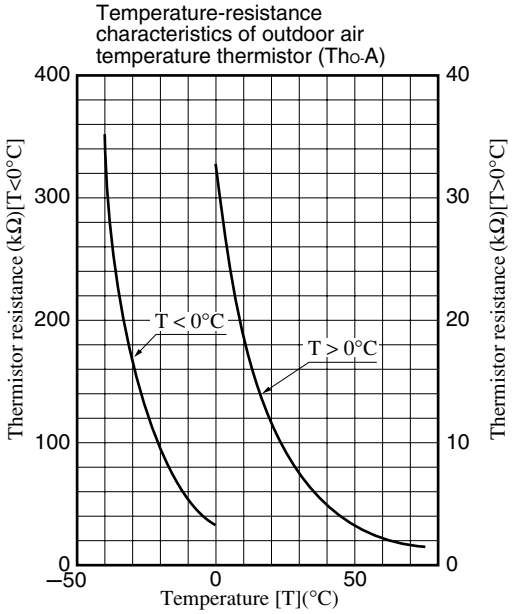


8 Error display : E38 [Defective outdoor air temperature thermistor]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) The green LED in the outdoor unit is used in the FDCA301 ~ 601 models only.





- Display conditions

  If the temperature sensed by the thermistor is –30ºC or lower continuously for 5 seconds between 2 minutes and 2 minutes 20 seconds after the compressor goes ON, the compressor stops. After a 3 minute delay, the compressor restarts. If this state is detected 3 times in 40 (60) minutes.

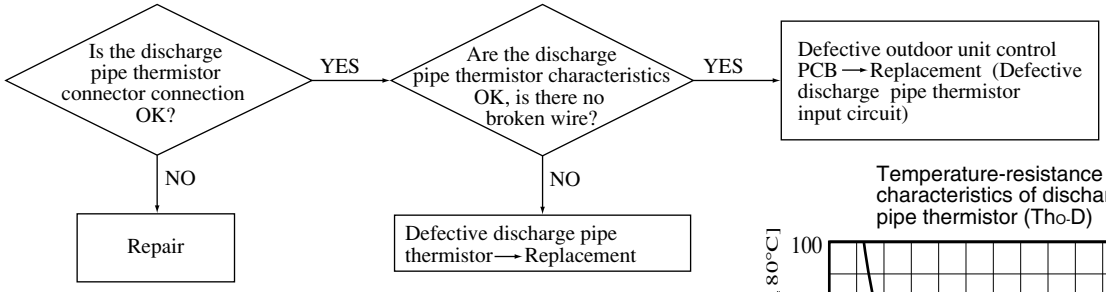
  Note (1) Values in ( ) show for the case of the 301~601 models.

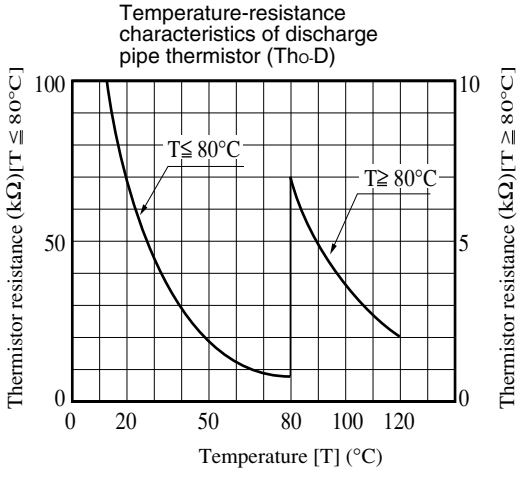
---

9 Error display : E39 [Defective discharge pipe thermistor]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) The green LED in the outdoor unit is used in the FDCA301 ~ 601 models only.





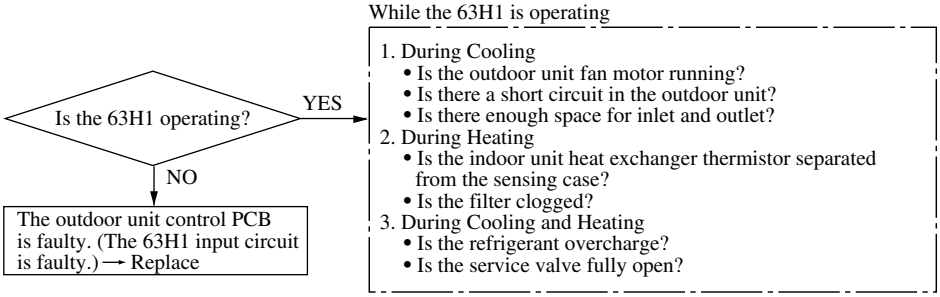
- Display conditions

  If the temperature sensed by the thermistor is –10ºC or lower continuously for 5 seconds between 10 minutes and 10 minutes 20 seconds (2minutes and 2minutes 20seconds) after the compressor goes ON, the compressor stops. After a 3 minute delay, the compressor restarts. If this state is detected 3 times in 40 (60) minutes.

  Note (1) Values in ( ) show for the case of the 301~601 models.

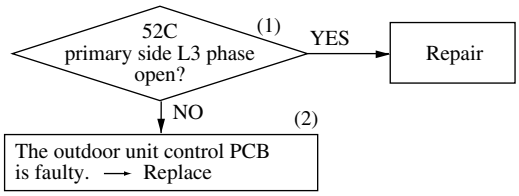
10 Error display : E40 [63H1 operation] (Only case of 301~601 type)

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing



[Open phase at L3-phase of 52C primary side]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing

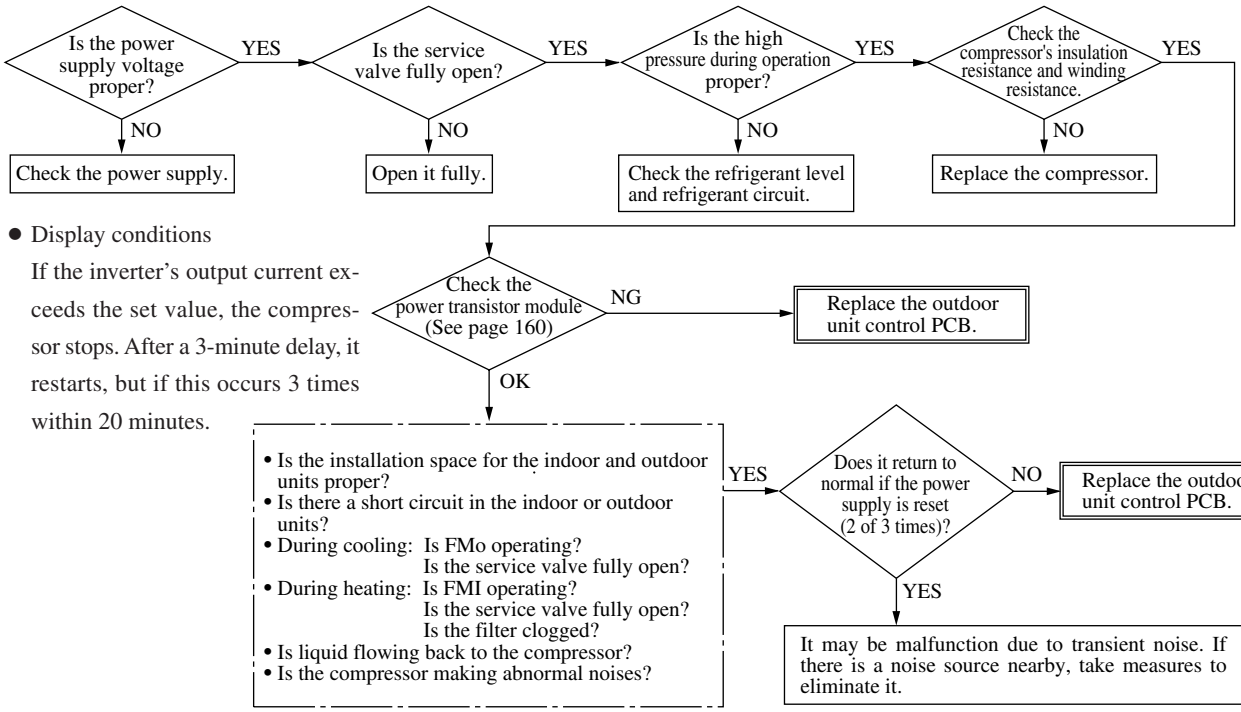


Notes (1) Also check if there is voltage at the L3 phase on the 52C primary side, but no voltage on the secondary side (coil wire disconnection or faulty contacts).
(2) If there is voltage at the L3 phase on the 52C primary side and it is not abnormal, the outdoor unit control PCB is faulty.

---

11 Error display : E42 [Current cut] (Only case of 151~251 type)

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing		

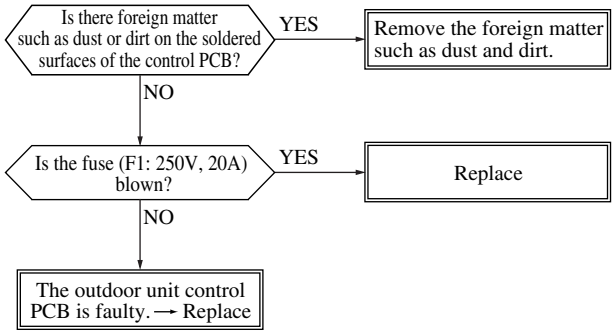


● Display conditions

If the inverter's output current exceeds the set value, the compressor stops. After a 3-minute delay, it restarts, but if this occurs 3 times within 20 minutes.

12 Error display : E47 [Inverter over-voltage trouble] (Only case of 151~251 type)

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing		

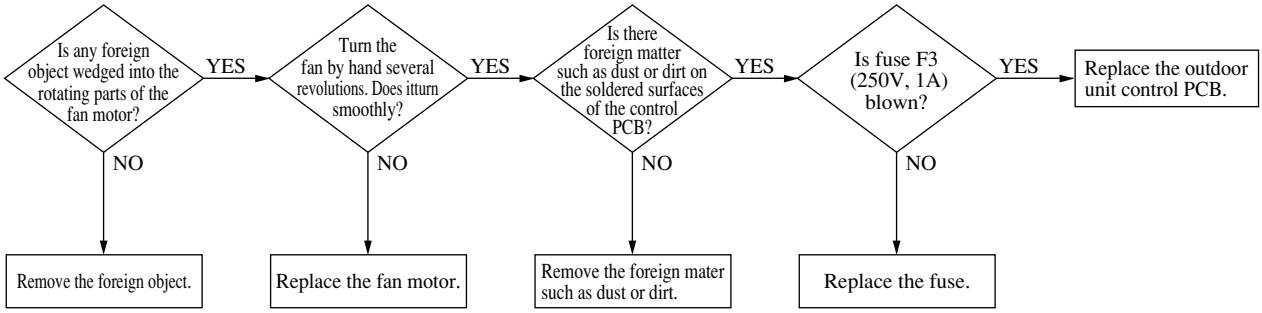


- Display Conditions
  If the inverter voltage exceeds 340V, (3 times in 20 minutes), this error is displayed. After 3 minutes passes, it can be reset using the remote controller.

---

13 Error display : E48 [DC Fan motor abnormal] (Only case of 151~251 type)

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing		

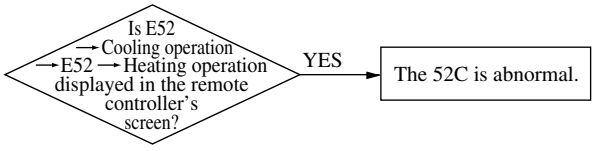


- Display conditions
  When the DC fan motor's output is ON, if the fan motor's speed drops to 75 rpm or lower continuously for 30 seconds or longer, the compressor stops. After a 3-minute delay, the compressor is restarted, but if this state is detected 5 times within 60 minutes.

---

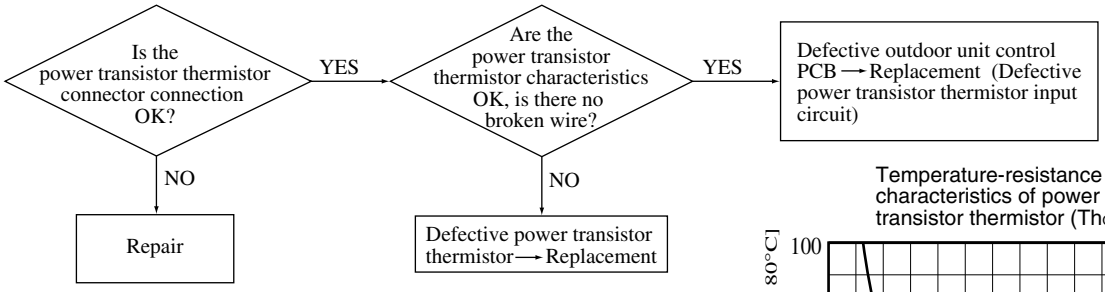
14 Error display : E52 [52C Abnormal] (Only case of 301~601 type)

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	Lights contiously
Green LED	Keeps flashing	Green LED	Keeps flashing



15 Error display : E56 [Power transistor thermistor faulty.] (Only case of 151~251 type)

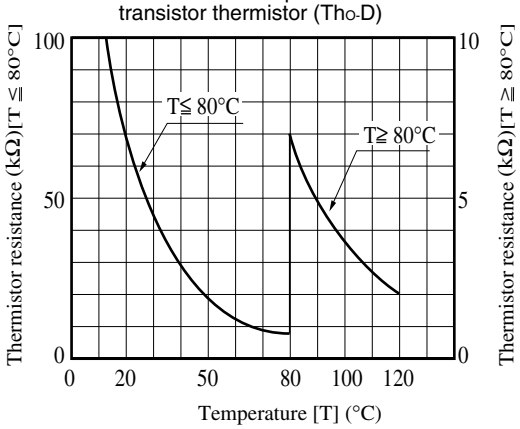
Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing		



- Display conditions

  If the temperature sensed by the thermistor is –10ºC or lower continuously for 5 seconds between 10 minutes and 10 minutes 20 seconds after the compressor goes ON, the compressor stops. After a 3 minute delay, the compressor restarts. If this state is detected 3 times in 40 minutes.

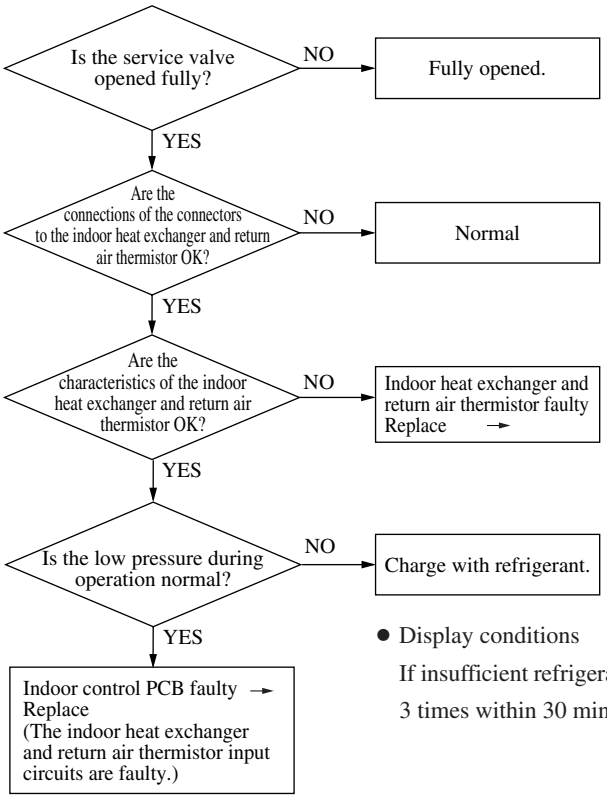
Temperature-resistance characteristics of power transistor thermistor (Tho-D)



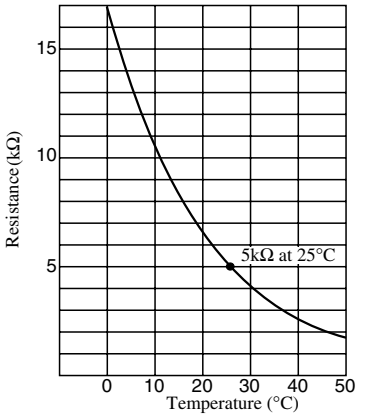
16 Error display : E57 [Insufficient refrigerant volume.]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) The green LED in the outdoor unit is used in the FDCA301 ~ 601 models only.



Return air thermistor (Thı-A)
Indoor unit heat exchanger thermistor (Thı-R1, R2)
Resistance temperature characterisics

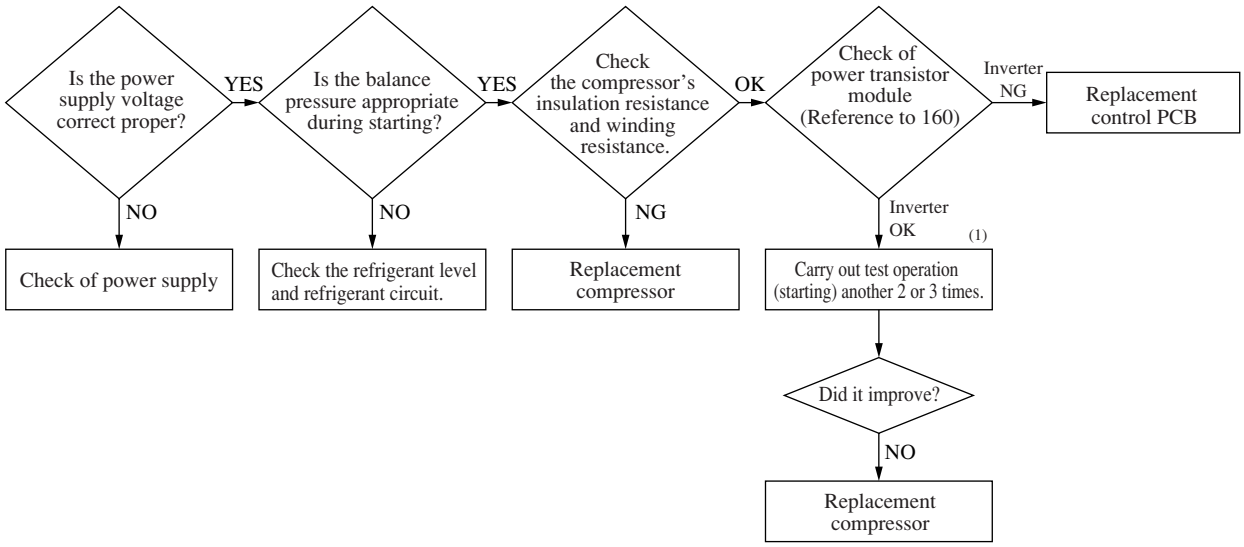


- Display conditions

  If insufficient refrigerant protection (See page 92) is implemented 3 times within 30 minutes.

17 Error display : E59 [Abnormalities in compressor starting] (Only case of 151~251 type)

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time, 2 time, 3 time flash
Green LED	Keeps flashing		



Note (1) If the test operation is repeated 2 or 3 times, the liquid refrigerant inside the compressor may be expelled from the compressor may recover from its starting abnormality.

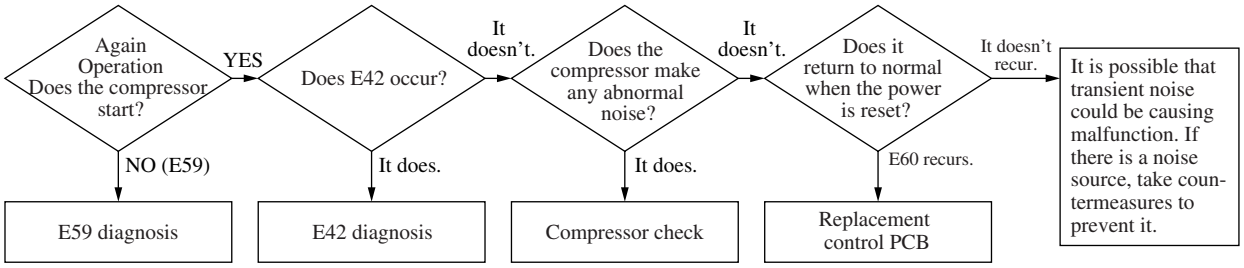
- Display conditions
  (1) If it won't start 2 times out of 7 attempted starts.
  (2) Remote controller reset is possible after 3 minutes have passed.

---

18 Error display : E60 [Compressor loader position detection error] (Only case of 151~251 type)

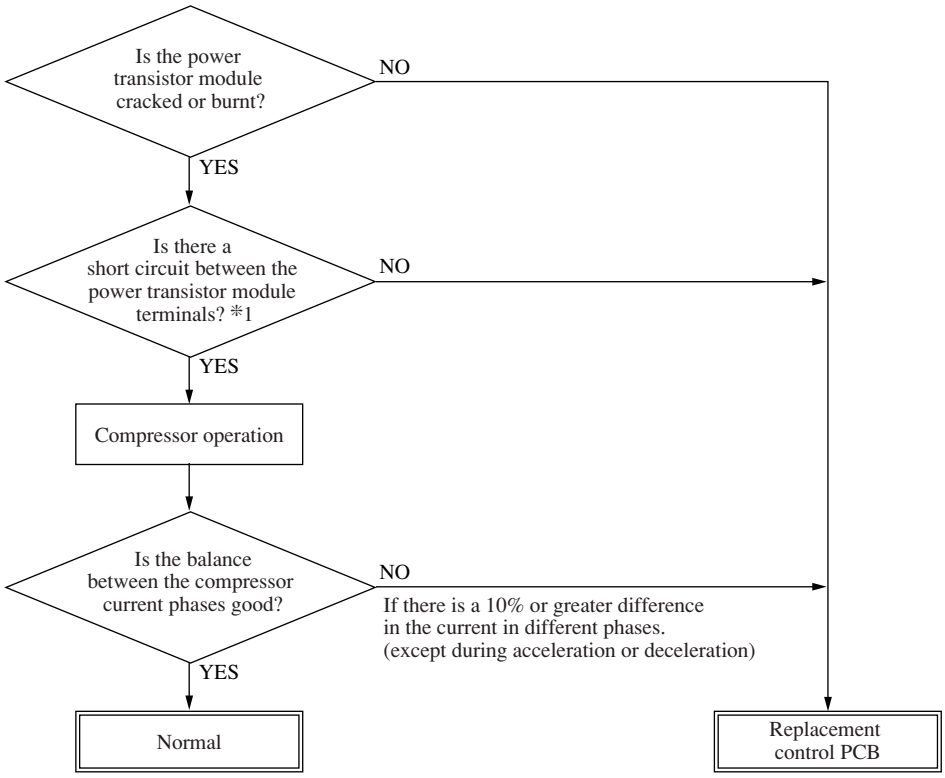
Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing		

Note (1) Check if the power supply system is normal.



- Display conditions
  (1) If a rotor position detection operation is conducted, then the rotor position cannot be detected again after that (4 times in 15 minutes), an abnormal state is displayed.
  (2) After 3 minutes passes, it is reset with the remote controller is possible.

Power transistor module (including drive circuit) check method



*1 Power transistor module terminal short circuit check procedure

Disconnect the compressor wiring, then conduct a short circuit check.

P-U, P-V, P-W

N-U, N-V, N-W

Check between the P-N terminals.

Bring the tester probes in contact with the following places on each terminal.

P: Power transistor P terminal,

N: Power transistor N terminal,

U: End of red harness to compressor

V: End of white harness to compressor

W: End of black harness to compressor

(4) Check abnormal operation data with the remote controller

Operation data are recorded when there is an abnormal state and these data can be displayed in the remote controller by operating the remote controller buttons.

(1) Press the CHECK button.
The display will change from " ◆ FUNCTION" → " ○ SET " → "OPERATION DATA ▼"

(2) Press the ▼ button once. The display will change to "ERROR DATA ▲".

(3) Press the SET button to enter the abnormal operation data display mode.

(4) If there are abnormalities from the past, they will be displayed by an error code and unit No.
(Example) "E8" (Lighted up)
"I/U No. 00 ▲" (Flashing)

(5) Using the ▲ or ▼ button, select the indoor unit No. you want to display the error data for.
If only one indoor unit is connected, the indoor unit No. does not change.

(6) Fix the selection using the SET button. (The displayed indoor unit No. will change from flashing to light up continuously.)
(Example) "E8"
"DATA LOADING" (This message flashes while data are being read.)
↓
"E8"
"ERROR DATA ◆"
The data are then displayed beginning with item No. 01.
Displayed items are as shown below.

(7) Display the other data for when the error occurred in order from the currently displayed operation data No. 01 using the ▲ or ▼ button.
✳ Depending on the model, items for which corresponding data do not exist are not displayed.

(8) To change the indoor unit, press the AIR CON No. button and return to the indoor unit selection display.

(9) Press the ON/OFF button to end the abnormal operation data check.

If you press the RESET button during the settings, the display returns to the previous setting screen.

No.	Data item	
01	Operation mode (Example: ❄)	
02	SET TEMP.	27°C
03	RETURN AIR	28°C
04	I/U HEAT EXCH1	6°C
05	I/U HEAT EXCH2	5°C
07	I/U FAN	Hi
11	TOTAL I/U RUN	10500H
21	OUTDOOR	35°C
22	O/U HEAT EXCH1	55°C
23	O/U HEAT EXCH2	55°C
24	COMP HERTZ	85.0Hz
26	Lo PRESSURE	0.40MPa
27	DISCHARGE	98°C
28	DOME BOTTOM	56°C
29	CT	26A
31	O/U FAN	Hi
32	SILENT MODE ON	
34	63H1 ON/OFF	
35	DEFROST OFF	
36	TOTAL COMP RUN	8500H
37	EEV1	480PULS
38	EEV2	480PULS

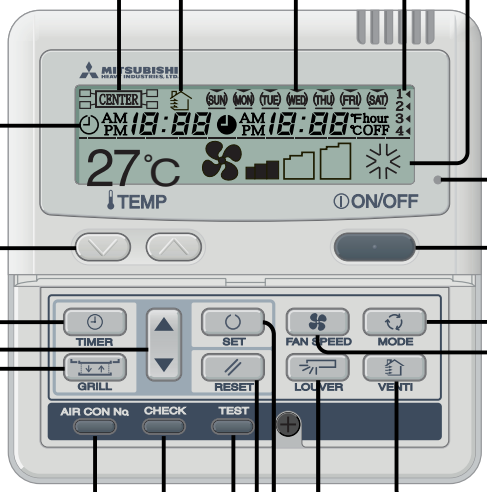
2 OUTLINE OF OPERATION CONTROL BY MICROCOMPUTER

(1) Remote controller

(a) Wired remote controller

The figure below shows the remote controller with the cover opened. Note that all the items that may be displayed in the liquid crystal display area are shown in the figure for the sake of explanation.
Characters displayed with dots in the liquid crystal display area are abbreviated.

Pull the cover downward to open it.



Central control display
Displayed when the air conditioning system is controlled by the option controller.

Timer operation display
Displays the settings related to timer operation.

Temperature setting switches
These switches are used to set the temperature of the room.

TIMER switch
This switch is used to select a timer mode.

Timer setting switches
These switches are used to set the timer mode and time.

GRILL switch
This switch has no function.
When this switch is pressed,
INVALID OPER (Invalid Operation)
is displayed, but it does not mean a failure.

AIR CON No. (Air conditioning system No.) switch
Displays the number of the connected air conditioning system.

CHECK switch
This switch is used at servicing.

TEST switch
This switch is used during test operation.

Vent Indicator
Indicates operation in the Ventilation mode.

Weekly timer display
Displays the settings of the weekly timer.

Operation setting display area
Displays setting temperature, airflow volume, operation mode and operation message.

Operation/Check indicator light
During operation: Lit in green
In case of error: Flashing in red

Operation/Stop switch
This switch is used to operate and stop the air conditioning system. Press the switch once to operate the system and press it once again to stop the system.

MODE switch
This switch is used to switch between operation modes.

FAN SPEED switch
This switch is used to set the airflow volume.

VENT switch
Switch that operates the connected ventilator.

LOUVER switch
This switch is used to operate/stop the swing louver.

SET switch
This switch is used to apply the timer operation setting.
This switch is also used to make silent mode operation settings.

RESET switch
Press this switch while making settings to go back to the previous operation.
This switch is also used to reset the "FILTER CLEANING" message display.
(Press this switch after cleaning the air filter.)

*If you oress any of the switches above and " INVALID OPER " is display, the switch has no function.
But it does not mean a failure.

(2) Setting functions using the remote controller

(a) The factory settings of this unit's functions are as follows: If you want to charge a setting, follow the procedure found in the installation manual and set to your desired setting.

For the method of setting, please refer to the installation manual of a remote control unit.

① Remote controller unit functions (FUNCTION ▼)

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ	Factory setting
01	GRILLE ↑↓ SET (Grille lift panel setting)	↑↓ INVALID	○
		50Hz AREA ONLY	
		60Hz AREA ONLY	
02	AUTO RUN SET	AUTO RUN ON	✻
		AUTO RUN OFF	
03	▼▲ TEMP S/W	▼▲ VALID	○
		▼▲ INVALID	
04	MODE S/W	MODE VALID	○
		MODE INVALID	
05	ON/OFF S/W	ON/OFF VALID	○
		ON/OFF INVALID	
06	FANSPEED S/W	FAN SPEED VALID	○
		FAN SPEED INVALID	
07	LOUVER S/W	LOUVER VALID	✻
		LOUVER INVALID	
08	TIMER S/W	TIMER VALID	○
		TIMER INVALID	
09	SENSOR S/W (Remote control sensor setting)	INSENSOR OFF (Invalid)	○
		SENSOR ON (Valid)	
10	POWER FAILURE COMPENSATION SET	INVALID	○
		VALID	✻
11	VENTI SET	NO VENTI	○
		VENTI LINK SET	
		NO VENTI LINK	○
12	TEMP RANGE SET	DISP CHARGE	
		NO DISP CHARGE	○
13	I/U FA SPEED (Indoor unit fan speed setting)	3 FAN SPEED	✻
		2 FAN SPEED	
		1 FAN SPEED	
14	MODEL TYPE	HEAT PUMP	✻
		COOLING ONLY	
15	EXTERNAL CONTROL SET	INDIVIDUAL OPERATION	○
		SAME OPERATION FOR ALL UNITS	
16	ERROR DISP SET	ERROR DISP	○
		NO ERROR DISP	
17	POSITION (Louver control setting)	FIX (1 OF 4) (4 position stop)	○
		IN MOTION (Free stop)	
18	°C/°F SET	°C	○
		°F	

Notes(1) Setting marked with [○] are the default setting.
(2) Setting marked with [✻] are those that are set automatically according to an indoor unit or an outdoor unit connected. Please check default settings with the indoor unit's installation manual.
(3) When Item 17 : " POSITION" is changed, please also change Item 04 " POSITION" setting found in "Indoor unit functions".

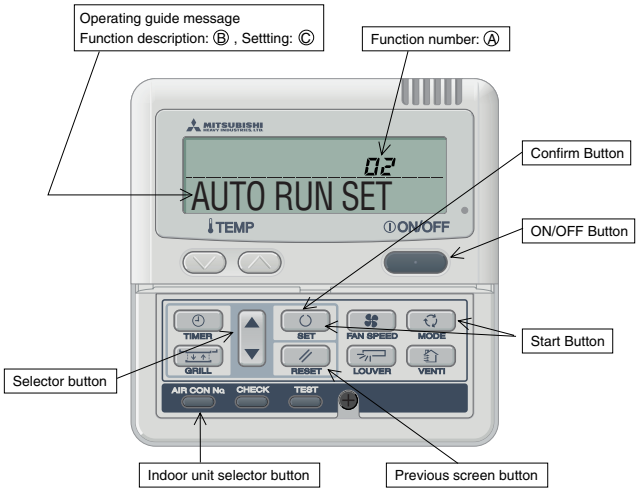
② Indoor unit functions (I/U FUNCTION ▲)

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ	Factory setting
01	Hi CEILING SET	STANDARD (Mild mode)	✻
		Hi CEILING 1 (Powerful mode)	
03	FILTER SIGN SET	NO DISPLAY	✻
		AFTER 180H	
		AFTER 600H	
		AFTER 1000H	
		1000H→STOP	
04	POSITION (Louver control setting)	FIX (1 OF 4) (4 positiion stop)	○
		IN MOTION (Free stop)	
05	EXTERNAL INPUT SET	LEVEL INPUT	○
		PULSE INPUT	
06	OPERATION PERMISSION PROHIBITED	NORMAL OPERATION	○
		VALID	
07	ROOM TEMP OFF SET (Heating room temperature off set)	NORMAL OPERATION	○
		TEMP SHIFT +3°C	
08	FAN CONTROL (Heating fan control)	LOW FAN	✻
		STOP→LOW FAN (Intermittent operation)	
09	FREEZE PREVENT TEMP	TEMP Hi	
		TEMP Lo	○
10	FREEZE PREVENT CONTROL	FAN CONTROL ON	○
		FAN CONTROL OFF	

Notes(1) Setting marked with [○] are the default setting.
(2) Setting marked with [✻] are those that are set automatically according to an indoor unit or an outdoor unit connected. Please check default settings with the indoor unit's installation manual.

(b) Function setting method

1) Stop the air conditioner
2) Press the SET and MODE buttons simultaneously for 3 seconds or longer.
   The screen display will be switched as follows:
   "SELECT ITEM" →
   "SET" →
   "FUNCTION SET ▼ "



3) Press the SET button.
   The unit will enter the function setting mode. The screen display will charge to " FUNCTION ▼".
4) Check which category your desired setting belongs to, " FUNCTION ▼ (Remote controller unit function)" or "I/U FUNCTION ▲" (Indoor unit function).
5) Press either ▲ or ▼ button.
   Select either " FUNCTION ▼ " or "I/U FUNCTION ▲".

6) Press the SET button.

When " FUNCTION▼ " is selected.

① "DATA LOADING" (blinking) → "FUNCTION"→
"GRILLE ↑↓ SET" (Function number: Ⓐ, Function description: Ⓑ)
The screen display will be switched like this.

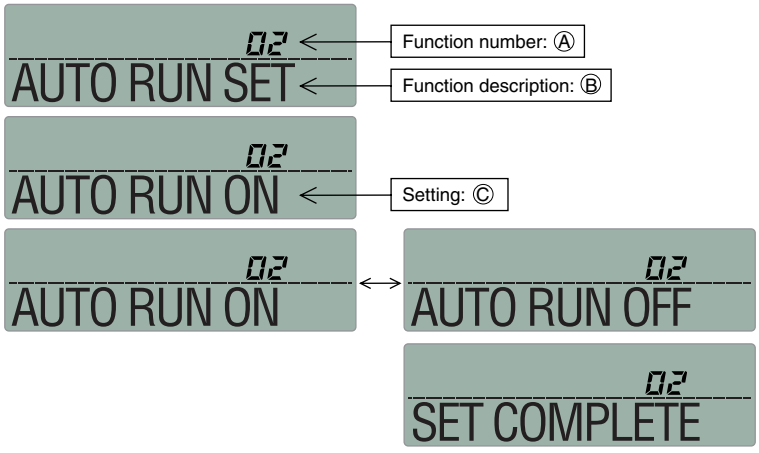
② Press either ▲ or ▼ button.
"Function number: Ⓐ, Function description: Ⓑ "from the list of remote controller unit functions will be displayed one by one. Select a desired function.

③ Press the SET button.
The screen display will be switched as follows:
"SETTING" → "Setting: Ⓒ" (ex. "AUTO RUN ON")

④ Press either ▲ or ▼ button.
A list of "Settings: Ⓒ" will be displayed one by one. Select your desired setting.

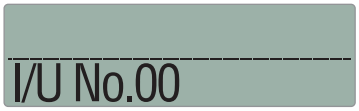
⑤ Press the SET button.
The selected setting is displayed for 2 seconds, then followed by "SET COMPLETE" and the function setting process is completed.
Then the screen display will be swiched to "Function number: Ⓐ, Function description: Ⓑ," so if you want to comtinue to set another function, repeat the steps as explained above.
To finish the function setting process, please proceed to Step (c).

* When "02 AUTO RUN SET " is selected.



When "I/U FUNCTION ▲" is selected.

① The screen display will be switched as follows:
"◆☝ I/U SELECT" → "○☝ SET" → "I/U No.00" (blinking)



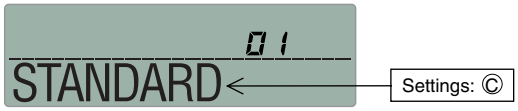
② Press either ▲ or ▼ button.
Select the indoor unit number that you want to change settings. If only one indoor unit is connected, the indoor unit number will not charge, so please proceed to Step ③.
If "ALL I/U ▼ " is selected while indoor group control is in effect, you can set all units to the same settings.

③ Press the SET button.
Indoor unit number indication will change from blinking to lit continuously, The screen display will be switched as follows:
"DATA LOADING" (blinking for about 2 to 23 seconds) → "◆☝ FUNCTION" → "Hi CEILING SET"
(Function number: Ⓐ, Function description: Ⓑ)

* When "01 Hi CEILING SET" is selected.

④ Press either ▲ or ▼ button.
"Function number: Ⓐ, Function description: Ⓑ" from the list of indoor unit functions will be displayed one by one. Select a desired function.

⑤ Press the SET button.
The screen display will be switched as follows: "◆☝ SETTING" → "Setting: Ⓒ" (ex. "STANDARD")



⑥ Press either ▲ or ▼ button.
A list "Setting: Ⓒ" will be displayed one by one. Select your desired setting.

⑦ Press the SET button.
The selected setting is displayed for 2 seconds, then followed by "SET COMPLETE" and the function setting process is completed.
Then the screen display will be switched to "Function number: Ⓐ, Function description: Ⓑ" so if you want to continue to set another function, repeat the stepa as explained above. To finish the function setting process, please proceed to Step 8.

⑧ Press AIR CON No. button.
The screen display will go back to the indoor unit selection screen (ex. " I/U No.00").
If you want to continue to set another indoor unit, please follow the steps explained above.

(c) Press the ON/OFF button.

This ends a function setting process. Even if a function setting process is not completed, this ends the process.
Please note that any setting that is not complated will become void.

- **Pressing the RESET button during a function setting process will allow you to go back the previous step. Please note that any setting that is not completed will become void.**
- **Method of checking the current setting**
  While following the above mentioned step, the setting that appears when the SET button is pressed for each "Function number: Ⓐ, Function description: Ⓑ" is the current setting "Stting: Ⓒ". (When "ALL I/U ▼" is selected, the setting of the indoor unit with the lowest number is displayed)
- **Settings are stored in the controller and not lost even a power outage occurs.**

(d) Changing the remote controller's temperature setting range

1) The temperature setting range of the remote controller can be changed.
   Through remote controller button operations, the upper limit and lower limit set temperature values can be changed individually.
   During heating operation, the changed upper limit value becomes valid and at times other than during heating operation, (during cooling, dehumidification, auto and fan operation), the changed lower limit value becomes valid.
   Range of Possible Changes
   Upper Limit Value: 22~30ºC (valid during heating) Lower Limit Value: 18 ~ 26ºC (valid at times other than during heating)
2) Operation
   a) With the remote controller in the stopped state, press the SET and MOFDE buttons simultaneously for 3 seconds or longer. The display will changed from " SELECT ITEM" → " SET" → "FUNCTION SET ▼ "
   b) Press the ▼ button once. The display will change to TEMP RANGE ▲ .
   c) Press the SET button to enter the temperature range setting mode.
   d) Using the ▲ or ▼ button, select "Hi LIMIT SET ▲ " or "Lo LIMIT SET ▼ ," the press the SET button.
   e) If "Hi LIMIT SET" is selected,
      ① The display changes from " SET UP" → "Hi LIMIT 22ºC " (flashing).
      ② Using the " " button, select the upper limit value. Display example: "Hi LIMIT 22ºC " (flashing)
      ③ Press the SET button to fix the setting. Display example: "Hi LIMIT 22ºC" (lighted up)
   f) If "Lo LIMIT SET" is selected,
      ① The display changes from " SET UP" → "Lo LIMIT 26ºC " (flashing).
      ② Using the button, select the upper limit value. Display example: "Lo LIMIT 26ºC " (flashing)
      ③ Press the SET button to fix the setting. Display example: "Lo LIMIT 26ºC" (lighted up)
   g) Press the ON/OFF button to end the setting procedure.
      (The procedure also ends if the ON/OFF button is pressed during the setting operation. However, settings which have not been fixed become invalid, so exercise caution.)

- If the RESET button is pressed during a setting operation, the display returns to the previously displayed setting screen. However, settings which have not been fixed become invalid, so exercise caution.
  * If "NO DISP CHANGE" is selected in No. 12, "TEMP RANGE SET" of the remote controller's functions, No. ① of the function setting modes, the remote controller's display does not change even if the temperature range has been changed.

(Example) If the upper limit is set at 28˚C

Function No. A	Function Contents B	Setting Contents C	Control Contents
12	TEMP RANGE SET	DISP CHANGE	The remote controller's display and sent data upper limit changes to 28°C.
		NO DISP CHANGE	The remote controller's display upper limit remains at 30ºC and only the upper limit of the sent data is changed to 28°C.

(3) Cooling Test Operation Procedure

Carry out the following test operation procedure using the remote controller.

(a) Starting the Cooling Test Operation

① Press the ON/OFF button to start operation.

② Press the MODE button and select "COOL."

③ Press the TEST button continuously for 3 seconds or longer.

The display changes from " ⬍ SELECT ITEM" → "○ SET" → " ✳ TEST RUN ▼ ."

④ When " ✳ TEST RUN ▼ " is displayed, press the SET button to begin the cooling test operation. The display shows " ✳ TEST RUN."

(b) Canceling the Cooling Test Operation

Pressing the ON/OFF button or the ▽ △ button ends the cooling test operation.

The " ✳ TEST RUN" display is cleared.

(4) Checking Operation Data

Operation data can be checked using the remote controller.

① Press the CHECK button.

The display will change from " ⬍ SELECT ITEM" → "○ SET" → "OPERATION DATA ▼ ."

② When "OPERATION DATA ▼ " is displayed, pres the SET button.

③ The display changes to "I/U No. 00 ▲ " (flashing).

Using the ▲ or ▼ button, select the number of the indoor unit you want to display.

(When there is only one indoor unit connected, the indoor unit No. does not change.)

④ Fix the No. by pressing the SET button.

(The indoor unit No. changes from flashing to lighted up continuously.)

The message "DATA LOADING" is displayed flashing while data are being read.

↓

"OPERATION DATA ⬍ " and data No. 01 are displayed.

⑤ Display the other data in order from the currently displayed operation data No. 01 by using the ▲ or ▼ button.

The items displayed are as shown at right.

Note (1) Depending on the model, items for which corresponding data do not exist are not displayed.

⑥ To change the indoor unit, press the AIR CON No. button and return to the indoor unit selection display.

⑦ Press the ON/OFF button to end the data check.

If the RESET button is pressed during the setting operation, the screen returns to the previous setting screen.

Number	DATA ITEM
01	Operation mode
02	Temperature setting
03	Intake temperature
04	Indoor heat exchanger temperature 1
05	Indoor heat exchanger temperature 2
07	Indoor fan speed
11	Indoor unit operation hours
21	Outside air temperature
22	Outdoor heat exchanger temperature 1
23	Outdoor heat exchanger temperature 2
24	Operation Hz
26	Low pressure
27	Discharge pipe temperature
28	Temperature beneath the dome
29	CT current
31	Outdoor fan speed
32	Silent mode enabled/disabled
33	63H2 ON/OFF
34	63H1 ON/OFF
35	Defrost ON/OFF
36	Compressor operation hours
37	Expansion valve opening 1
38	Expansion valve opening 2

(5) Test run

(a) Test run method

1) A test run can be initiated from an outdoor unit by using SW9 (SW2) and SW5-4 for on-site setting.

2) Models FDCVA151~251

When SW9 (press button switch) is pressed for 1 second and then released, the compressor will start operation approximately 5 seconds later.

Models FDCA301~601

Press SW2 (push-button switch) for one second. The compressor will start when the button is released. The compressor will stop when 30 minutes elaps.

3) The unit will start a cooling operation, when SW5-4 is OFF, or a heating operation, when SW5-4 is ON.

4) When a test run is completed, press SW9 (SW2) (push-button switch) again for one second and then release it.

Note (1) Items in ( ) show for the FDCA 301~601.

(b) Checking the state of the unit in operation

Check discharge pressure and suction pressure, using the check joint provided inside the outdoor unit and the gas charge valve charge port. The check joint in the unit is provided on the pipe connecting the four-way valva and the heat exchanger, and these points offer different pressure measurements depending on a cooling or heating operation as summarized in the table below.

	Check joint in the unit	Gas operation valve charge port
Cooling	Discharge pressure (high pressure)	Suction pressure (low pressure)
Heating	Suction pressure (low pressure)	Discharge pressure (high pressure)

(c) Setting SW5-1, SW5-2 on-site

1) Defrost conteol switching (SW5-1)

a) When this switch is turned on, the unit will run in the defrost mode more frequentiy.

b) Please set this switch to ON, when installed in a region where outdoor temperaure falls below zero during the season the unit is run for a heating operation.

2) Snow guard fan control (SW5-2)

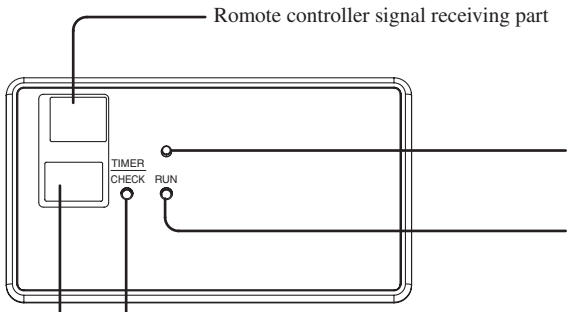
a) When this switch is turned on, the outdoor unit fan will run for 10 seconds in every 10 minutes, when outdoor temperature falls to 3˚C or lower and the compressor is not running.

b) When the unit is used in a very snowy country, please set this switch to ON.

3. Check display on wireless specification models (FDTN · FDEN · FDKN)

(1) Indication board

(a) FDEN Series



Romote controller signal receiving part

Backup switch

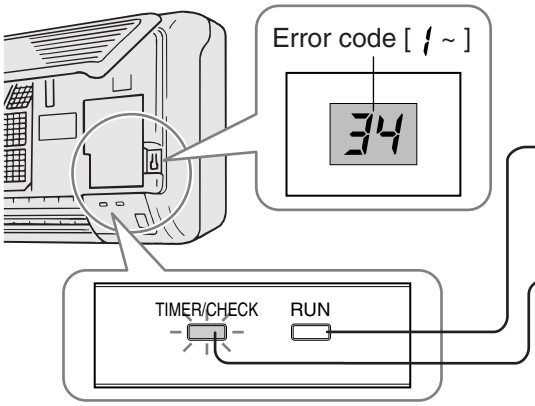
Operation display light (Green)
- Lights continously: Under air conditioner operaton
- Keeps flashing: Under heating preparation (At the time of heating operation)
- 3 time flash: Under reception of a remote controller signal

Timer/Check display light (Yellow)
- Lights continously: Under timer operation
- 0.5 second lighting,0.5 second stays OFF: At the time of abnormalities
- 2 second lighting, 1 second stays OFF: Filter sign

Check monitor
(Error code display E1~E60)

(b) FDKN Series

This figure shows the display on the 301 model. The shape of the display differs slightly on other models, but the functions are the same.

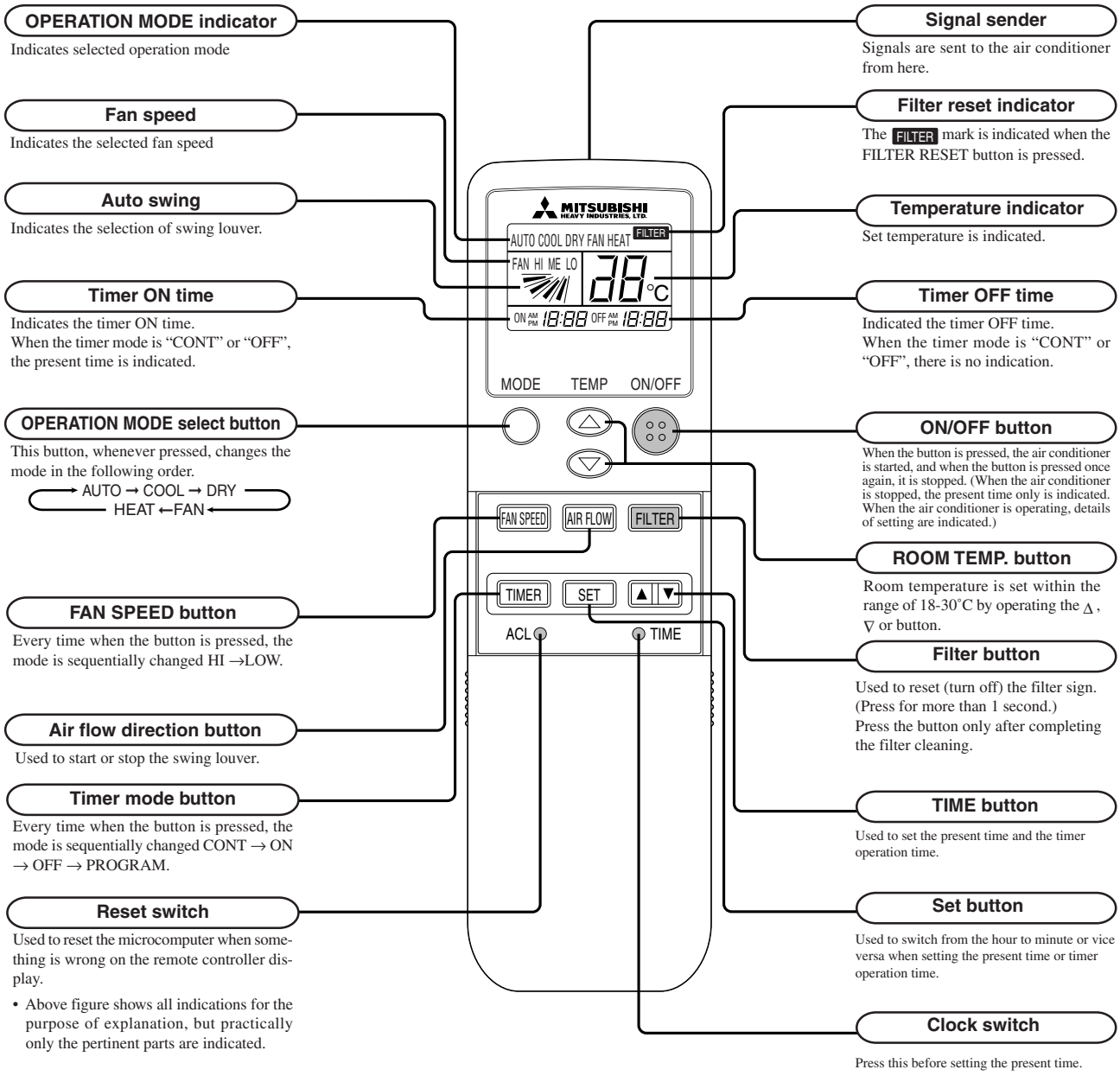


Operation display light (Green)
The following two kinds are displayed.
- Lights contimously: Under air conditioner operation
- Keeps flashing: Under heating preparation

Flashes 3 times when a signal is received from the remote controller.

Timer/Check display (Yellow)
The following three kinds are displayed.
- Lights contimously:Under timer operation
- Long lighting (2 second lighting, 1 second stays OFF): Filter sign
  (Clean the air filter when this display is output.)
- Short lighting (0.5 second lighting, 0.5 second stays OFF): At the time of the abnormalites air conditioner

(c) Wireless remote controller



MITSUBISHI
HEAVY INDUSTRIES, LTD.
air conditioning

NOTICE

The installation of this equipment must comply with all **NATIONAL, STATE and LOCAL CODES**.

This Service Guide does not cover all installation circumstances and is meant for guidance only and therefore will not form part of any legally binding contract. An installation guide is provided with the air conditioning equipment.

CE

These Air Conditioners comply with: -
EMC Directive 89/336/EEC
LV Directive 73/23/EEC

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