



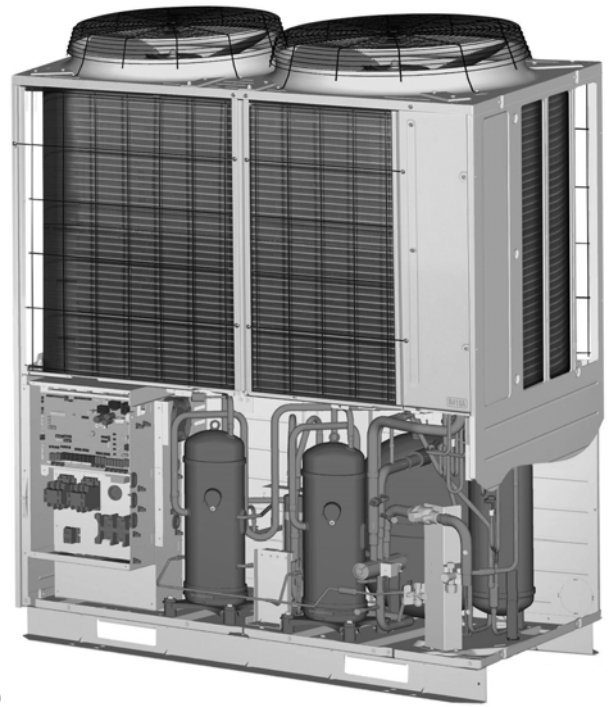
**MITSUBISHI**  
**HEAVY INDUSTRIES, LTD.**

# SERVICE MANUAL

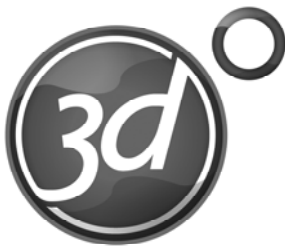
evolution 

KX4 2-pipe VRF Systems

KXR4 3-pipe VRF Systems



# R410A





# mitsubishi heavy industries - vrf service manual

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# 1 MAINTENANCE DATA

## (1) Before starting troubleshooting

(a) **Confirmation of the error code on the remote controller (by pressing the inspection switch) and the inspection display and normal display lamps on PCBs (Printed circuit board) of indoor/outdoor units**

The microcomputer detects errors on electrical components, which include the microcomputer itself, errors on the power supply line and errors (overload, etc.) on the refrigerant circuit and the location of trouble is displayed (with the combination of error symbols of remote controller, normal (green) and inspection (red) display LED on PCBs of indoor/outdoor units). When any error occurs, check first the inspection display. It will guide you to trouble point and assist you to complete the repair work quickly.

Error code of the remote controller is recorded on microcomputer after the trouble has been reset automatically so that, if you press the inspection switch of remote controller, the error code and the number of unit in trouble are displayed for 10sec.. The inspection display lamp on the indoor/outdoor unit PCB keeps flashing (glowing) even after the trouble was reset automatically. Inspection lamp on the indoor unit PCB is turned off if the remote controller is reset.

### 1) Inspection/normal: List of power display

Section	Display Section	Display	Contents of display
Remote controller	Power supply display	LCD	At power ON : Displays always the return air temperature and Center/Remote.
	Error code	LCD	At error : Displays E1 ~ E63 or blank depending on the kinds of error.
	Inspection display	Red-LED	At error : Flash continuously (indicates the occurrence of error).
Indoor/outdoor unit	Normal display	Green-LED2	At power ON (normal) : Flash continuously. At error : Off or continuous glowing or irregular illumination.
	Error display	Red-LED1	At error : Flash 1 ~ 3 times/5 sec for indoor unit depending on the kinds of error, continuous flash, irregular illumination or off. At error : Flash 1 ~ 6 times/10 sec for outdoor unit depending on the kinds of error, continuous flash, irregular illumination or off.
Invertes	Normaly display	Green-LED	At power ON (normal) : Flash continuously. At error : Off or continuous glowing or irregular illumination.
	Error display	Red-LED	1 time flashes: Current cut (power transistor over-current) <ul style="list-style-type: none"> <li>• Short-circuited compressor wiring</li> <li>• Trouble on inverter PCB</li> <li>• Trouble on power transistor</li> <li>• Compressor motor neutral line disconnected.</li> </ul> 2 time flashes: Power transistor overheat <ul style="list-style-type: none"> <li>• Fastening of the power transistor to the heat dissipation fins (tighten the screws, apply silicone) is insufficient.</li> <li>• Power transistor is defective.</li> </ul> 3 time flashes: Compressor rotor lock <ul style="list-style-type: none"> <li>• Compressor breakdown</li> <li>• Inverter board breakdown</li> </ul> 4 time flashes: Compressor starting is defective. <ul style="list-style-type: none"> <li>• Compressor breakdown</li> <li>• Inverter board breakdown</li> <li>• Power transistor breakdown</li> </ul> Lights up : Transmission error between inverter and outdoor unit <ul style="list-style-type: none"> <li>• Connectors CN11 or CN12 is disconnected or beoken wire between connectors</li> <li>• Error on outdoor control PCB</li> <li>• Error on inverter PCB</li> </ul>

## 2) 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 error code, indoor/outdoor unit green LED (power pilot lamp and microcomputer normality pilot lamp) or red LED (check pilot lamp).

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, T phase wiring is open, power source 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.	
E1	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	The remote controller wires are connected to A and B on the terminal block. The indoor/outdoor signal wire are connected in loop form. The indoor unit micro-computer runs away.	
	Stay OFF or Lights continuously	Stay OFF or Lights continuously	Keeps flashing	Stays OFF	Indoor unit PCB fault	
	Keeps flashing	*3 time flash	Keeps flashing	Stays OFF	Remote control wire breakage (signal) *For wire breaking at power ON, the LED is OFF.	
E2	Keeps flashing	1 time flash	Keeps flashing	Stays OFF	No. duplication at indoor unit addressing. More than 49 indoor unit are connected.	
E3	Keeps flashing	2 time flash	Stays OFF	Stays OFF	Outdoor unit power supply OFF (detected only during operation)	
	Keeps flashing	2 time flash	Keeps flashing	Stays OFF	The corresponding outdoor unit address No. is not found. (Detected only during operation)	
	Keeps flashing	2 time flash	Irregular illumination	Stays OFF or Lights continuously	Outdoor unit power OFF (Detected only during operation)	
E5	Keeps flashing	2 time flash	Keeps flashing	Stays OFF	Indoor / outdoor transmission error. Wire A and B swapping after power ON.	
	Keeps flashing	2 time flash	Stays OFF	Stays OFF	Outdoor power unit failure (when the indoor power supply is different from the outdoor one).	
	Keeps flashing	2 time flash	Irregular illumination	Stays OFF or Lights continuously	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	
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.	
E11	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	Addresses setting for plural remote controllers	
E12	Keeps flashing	1 time flash	Keeps flashing	Stays OFF	Addresses No. combination error or addressing is performed with the following combinations.	
					Outdoor No,	Indoor No,
					0~47	48, 49
					48, 49	0~47
E16 <sup>(1)</sup>	Keeps flashing	1 time flash	Keeps flashing	Stays OFF	Defect of fan motor.	
E28	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	Remote controller thermistor failure	

Note (1) In the case of FDT112, 140 or FDK22-56 type.

● Models FDCA224HKXRE4, 280HKXRE4, 335HKXRE4

Remote controller error code	Indoor unit LED		Outdoor unit LED		Outdoor LED 7-Segment	Cause
	Green	Red	Green	Red		
<b>E30</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E30	Unmatched indoor/outdoor connection
<b>E31</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E31	Duplication outdoor unit address No. Outdoor unit address setting error.
<b>E32</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E32	L3-phase wiring is open phase or reversal phase
<b>E36</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E36-1	Discharge temperature (Tho-D1) abnormality.
<b>E37</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E37-1	Outdoor unit heat exchanger thermistor (Tho-R1) failure
				2 time flash	E37-2	Outdoor unit heat exchanger thermistor (Tho-R2) failure
				3 time flash	E37-3	Outdoor unit heat exchanger thermistor (Tho-R3) failure
				4 time flash	E37-4	Outdoor unit heat exchanger thermistor (Tho-R4) failure
				5 time flash	E37-5	Outdoor unit heat exchanger thermistor (Tho-SC) failure
				6 time flash	E37-6	Outdoor unit heat exchanger thermistor (Tho-H) failure
<b>E38</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E38	Outdoor air temperature thermistor (Tho-A) failure
<b>E39</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E39-1	Discharge temperature thermistor (Tho-D1) failure
<b>E40</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E40	High pressure (63H1-1) error
<b>E41</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E41-1	Power transistor (CM1) overheat
<b>E42</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E42-1	Abnormal current cut of compressor (CM1)
<b>E43</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E43	The number of connectable units is exceeded.
<b>E45</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E45-1	Transmission error between inverter and outdoor unit control PCB (CM1)
<b>E46</b>	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	—	Automatic address setting and remote controller address setting coexists in the same network.
<b>E48</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E48-1	Abnormalities in an outdoor fan motor FM01
				2 time flash	E48-2	Abnormalities in an outdoor fan motor FM02
<b>E49</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E49	Low pressure error (PSL)
<b>E53</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E53	Suction pipe temperature thermistor (Tho-S) failure
<b>E54</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E54-1	Low pressure sensor (PSL) disconnection/output error
				2 time flash	E54-2	High pressure sensor (PSH) disconnection/output error
<b>E59</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E59-1	Compressor startup error (CM1)
<b>E60</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E60-1	Compressor loader position detection error (CM1)
<b>E63</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E63	Emergency stop of indoor unit

● Models FDCA335HKXRE4-K, 400HKXRE4, 450HKXRE4

Remote controller error code	Indoor unit LED		Outdoor unit LED		Outdoor LED 7-Segment	Cause
	Green	Red	Green	Red		
<b>E30</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E30	Unmatched indoor/outdoor connection
<b>E31</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E31	Duplication outdoor unit address No. Outdoor unit address setting error.
<b>E32</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E32	L3-phase wiring is open phase or reversal phase
<b>E36</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E36-1	Discharge temperature (Tho-D1) abnormality.
				2 time flash	E36-2	Discharge temperature (Tho-D2) abnormality.
<b>E37</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E37-1	Outdoor unit heat exchanger thermistor (Tho-R1) failure
				2 time flash	E37-2	Outdoor unit heat exchanger thermistor (Tho-R2) failure
				3 time flash	E37-3	Outdoor unit heat exchanger thermistor (Tho-R3) failure
				4 time flash	E37-4	Outdoor unit heat exchanger thermistor (Tho-R4) failure
				5 time flash	E37-5	Outdoor unit heat exchanger thermistor (Tho-SC) failure
				6 time flash	E37-6	Outdoor unit heat exchanger thermistor (Tho-H) failure
<b>E38</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E38	Outdoor air temperature thermistor (Tho-A) failure
<b>E39</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E39-1	Discharge temperature thermistor (Tho-D1) failure
				2 time flash	E39-2	Discharge temperature thermistor (Tho-D2) failure
<b>E40</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E40	High pressure (63H1-1, 2) error
<b>E41</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E41-1	Power transistor (CM1) overheat
				2 time flash	E41-2	Power transistor (CM2) overheat
<b>E42</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E42-1	Abnormal current cut of compressor (CM1)
				2 time flash	E42-2	Abnormal current cut of compressor (CM2)
<b>E43</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E43	The number of connectable units is exceeded.
<b>E45</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E45-1	Transmission error between inverter and outdoor unit control PCB (CM1)
				2 time flash	E45-2	Transmission error between inverter and outdoor unit control PCB (CM2)
<b>E46</b>	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	—	Automatic address setting and remote controller address setting coexists in the same network.
<b>E48</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E48-1	Abnormalities in an outdoor fan motor FM01
				2 time flash	E48-2	Abnormalities in an outdoor fan motor FM02
<b>E49</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E49	Low pressure error (PSL)
<b>E51</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E51-1	Power transistor overheating (CM1) (15 minute continuation)
				2 time flash	E51-2	Power transistor overheating (CM2) (15 minute continuation)
<b>E53</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E53	Suction pipe temperature thermistor (Tho-S) failure
<b>E54</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E54-1	Low pressure sensor (PSL) disconnection/output error
				2 time flash	E54-2	High pressure sensor (PSH) disconnection/output error
<b>E59</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E59-1	Compressor startup error (CM1)
				2 time flash	E59-2	Compressor startup error (CM2)
<b>E60</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E60-1	Compressor loader position detection error (CM1)
				2 time flash	E60-2	Compressor loader position detection error (CM2)
<b>E61</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E61	Communication error between outdoor unit master unit and slave units.
<b>E63</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E63	Emergency stop of indoor unit

### 3) Display sequence of error, inspection display lamp

#### a) One kind error

Display corresponding to the error is shown.

#### b) More than one errors.

Section	Display section
Error code of remote controller	• Displays the error of higher priority (When plural errors are persisting)
Inspection LED (red) of indoor unit PCB	<i>E1&gt;E10&gt;E11&gt;E2&gt;E3&gt;E5&gt;E7&gt;E9&gt;E12.....E63</i>
Inspection LED (red) of outdoor unit PCB	• Displays the present errors. (When a new error has occurred after the former error was reset.)

#### c) Timing of error detection

##### • Indoor unit side.

Error detail	Error code	Timing of error detection
Transmission error of remote controller indoor unit	<i>E1</i>	When the transmission error continuously for 2 min.
CPU is out of control		Resetting was performed at the rate of 1 time per second. An abnormal stop occurred 32-sec time flash.
Transmission error between indoor/outdoor units	<i>E5</i>	A check was made once every 20 second. An abnormal stop occurred 7 time running.
Broken wire of heat exchanger thermistor	<i>E6</i>	After a compressor ON command, this failure was detected for 5 second in the period of 2 minutes to 2 minutes and 20 seconds.
Broken wire of indoor unit return air thermistor	<i>E7</i>	This failure was detected continuously for 5 seconds.
Drain error (float switch motion)	<i>E9</i>	At all times from 31 seconds after power ON.

##### • Outdoor unit side.

Error detail	Error code	Timing of error detection
Discharge temperature abnormality	<i>E36</i>	A stop occurs when this abnormality occurs for 2 seconds running at 130°C. After a stop for 3 minutes, an recovery is automatically made. An abnormal stop occurs when this abnormality occurs 2 times for 60 minutes. (The abnormal state is held for 45 minutes.)
Broken wire of heat exchanger thermister	<i>E37</i>	This failure is detected when it occurs for 5 seconds running in the period of 2 minutes to 2 minutes and 20 seconds with the compressor ON. An abnormal stop occurs when this failure occurs 3 times for 40 minutes.
Broken wire of outdoor temperature thermistor	<i>E38</i>	
Broken wire of discharge thermistor	<i>E39</i>	This failure is detected when it occurs for 5 seconds running in the period of 10 minutes to 10 minutes and 20 seconds with the compressor ON. An abnormal stop occurs when this failure occurs 3 times for 40 minutes.
High pressure cut	<i>E40</i>	An abnormal stop occurs when this abnormality occurs 5 times for 60 minutes.
Power transistor overheat	<i>E41</i>	Stops at 110°C or higher, recovers automatically at 90°C or lower, abnormal stop if this occurs 5 times in 60 minutes.
Current cut	<i>E42</i>	An abnormal stop occurs when this abnormality occurs 4 times for 15 minutes.
Excessive number of indoor and outdoor units	<i>E43</i>	This error is detected when the number of connectable units is set over the specified value at remote control addressing.
Transmission error between inverter and outdoor unit PCB	<i>E45</i>	With a delay of 3 minutes, a recovery is automatically made. An abnormal stop occurs when this errors occurs 4 times for 15 minutes.
Broken wire of low pressures sensor	<i>E54</i>	This failure is detected when it occurs for 5 seconds running in the period of 2 minutes to 2 minutes and 20 seconds with the compressor ON. An abnormal stop occurs when this failure occurs 3 times for 40 minutes.
Broken wire of high pressures sensor		



#### d) Recording and reset of error

Error display	Memory	Reset
Error code	• Saves in memory the mode <sup>(1)</sup> of higher priority	<ul style="list-style-type: none"> <li>• Stop the unit operation by pressing the ON/OFF switch of remote controller.</li> <li>• Operation can be started again if the error has been reset.<sup>(2)</sup></li> </ul>
Indoor unit inspection lamp (red)	• Cannot save in memory	
Outdoor unit inspection lamp (red)	• Saves in memory the mode <sup>(1)</sup> of higher priority	

Notes (1) Priority is in the order of E1 > ... > E10 > ... > 63.

(2) Reset is disabled for 45min. at the error of outdoor unit or compressor overcurrent or the discharge gas temperature error.

#### e) Reset of error code in memory (when the error has been reset.)

**Indoor unit:** Press the Timer switch and the Stop switch while the Inspection switch of wired remote controller is held down or detach the power supply connector (CnW2) of indoor unit PCB and connect again or turn OFF the power.

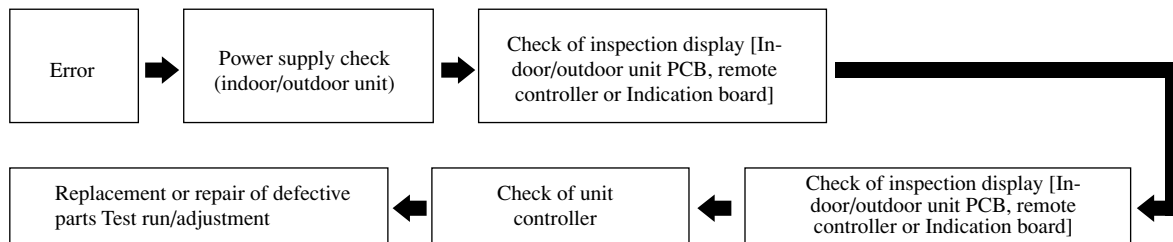
**Outdoor unit:** Detach the power supply connector (CNA2) of outdoor unit PCB and connect again or turn OFF the power supply or turn on and off the SW3-1.

#### 4) Indications with 7-segement indicator

Refer to page 166, 202.

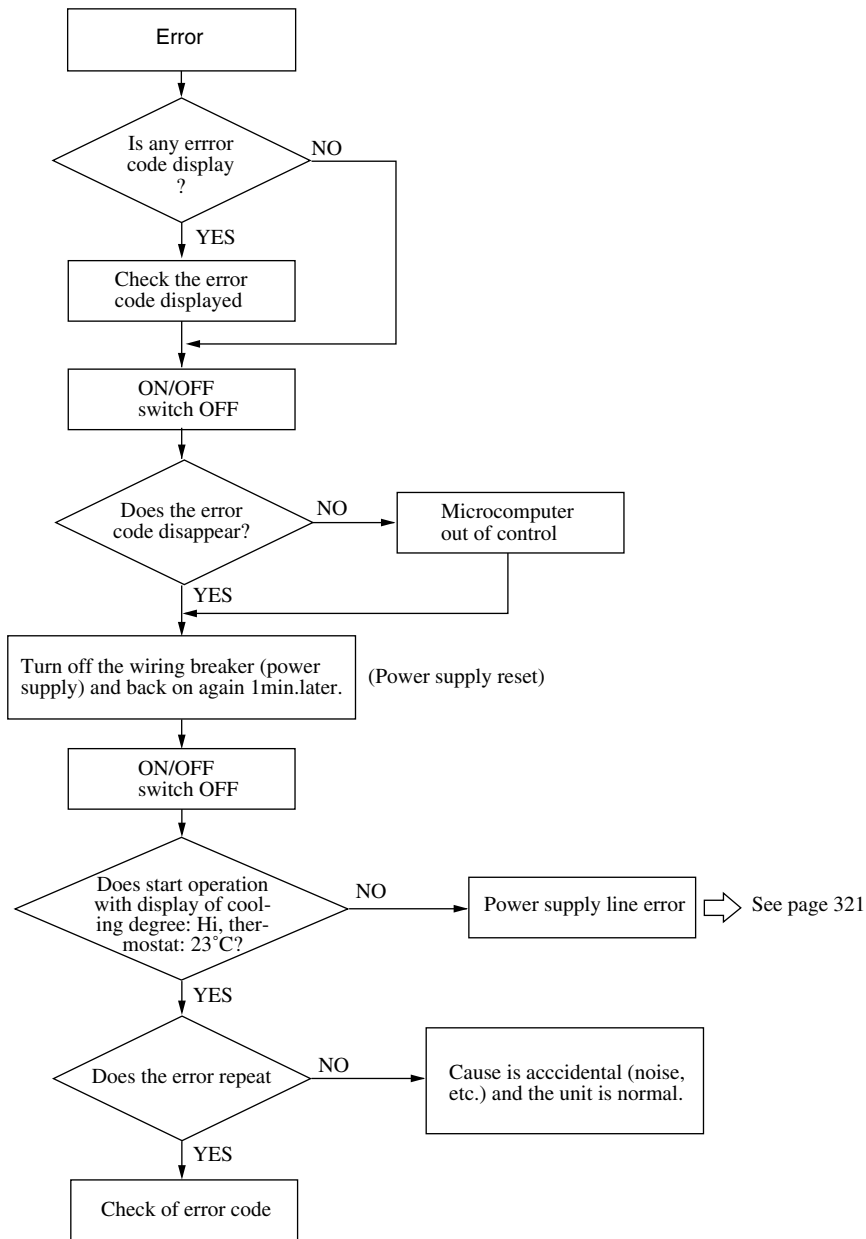
#### (2) Procedures of trouble diagnosis

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



**(a) Diagnosis by the power supply reset**

When any error occurs, reset the power supply as described below to see if it is the result of accidental noise, etc.  
Check at the indoor unit side.



**Errors due to external noise, etc.**

Error code may be displayed or the error may not be displayed normally even if the controller is normal because of external noise source<sup>(1)</sup> or joined or parallel arrangement of power cables and signal wires. It is because the wire of remote controller, wired remote controller signal wires for multiple units or the network signal wires may be influenced by external noises which are judged as signals by the microcomputer which reacts mistakenly.

When there is any noise source, it is necessary to shield wire for the remote controller and signal wires.

Note (1) High frequency medical machine, rectifier motor application device, thyristor, broadcast transmission tower, power transmission line, power line of electric train, automatic door motor, elevator (voltage drop), wireless telephone, high voltage power distribution line, computer, personal computer and their cables. These do not necessarily always cause problems but they can be a source of electrical noise.

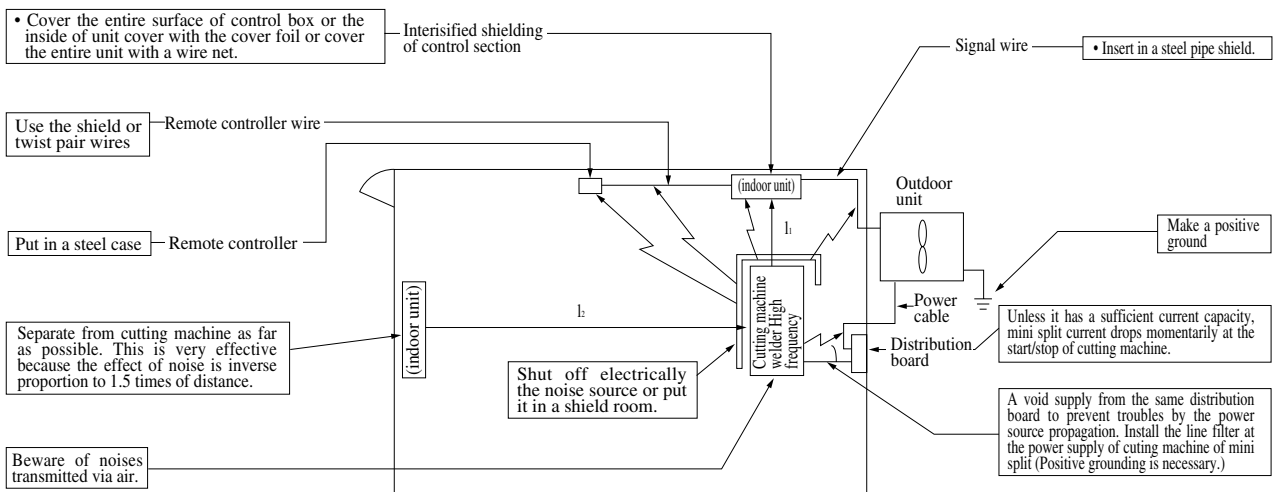
(2) Reference Effect of noise

- When noises intrude into remote controller.

Abnormal or irregular display such as the flashing of irrelevant display (lamp) (for example, LEDs of cooling and heating illuminated simultaneously or the like) is observed even if the remote controller is not operated or the remote or the remote controller and, as the result, the operation of units may be disabled or similar abnormal phenomena are observed.

- When noises intruded into the microcomputer of printed circuit board; State of operation becomes abnormal such as the units perform irregular operation while the remote controller is not operated, the operation cannot be stopped with the remote controller, etc.

**Electro magnetic noise prevention (example)**



**(b) Error diagnosis procedures at the indoor unit side**

To diagnose the error, measure the voltage (AC,DC), resistance, etc. at each connector around the printed circuit board of indoor unit PCB 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 discovered, replace with the assembly of parts as shown below.

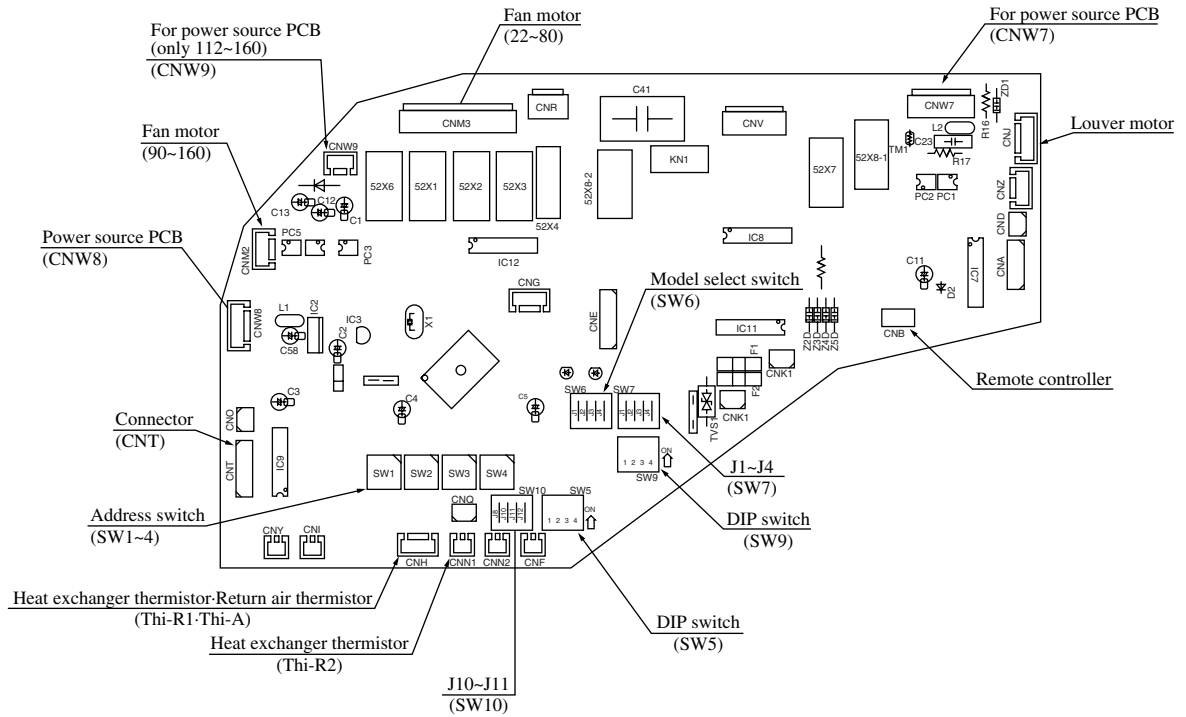
**(i) Unit of replacement parts related to indoor unit printed circuit board** ( Electric components on and around the microcomputer)

Indoor unit printed circuit board, thermistor (Return air, heat exchanger), remote controller switch, limit switch, transformer, fuse

Note (1) Judges the troubles on the parts of driving power circuit or cooling cycle with the ordinary check method.

**(ii) Parts layout on the indoor unit printed circuit board**

- The control board in the following figure shows for the FDT type.



● Function of jumper wires

Name			Function
J1 (SW7-1)	With		Filter sign: Valid
	None <sup>(1)</sup>		Filter sign: Invalid
J2 (SW7-2)	With		Normal operation operable
	None <sup>(1)</sup>		Operation permission prohibited
J3 (SW7-3)	With	J4 (SW7-4)	Heating thermostat OFF: Intermittent operation
	None <sup>(1)</sup>		Heating thermostat OFF: Lo operation
J10 (SW10-2)	With	J11 (SW10-3)	Heating thermostat OFF: Stop
	None <sup>(1)</sup>		Heating thermostat OFF: —
	With		Remote controller air flow: 3 speed
	None <sup>(1)</sup>		Remote controller air flow: 1 speed
	With		Remote controller air flow: 2 speed
	None <sup>(1)</sup>		Remote controller air flow: —

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

● Function of DIP switches (SW5, 9)

Switch	Function
SW5-1	ON Test run of condensate pump motor
	OFF Normal
SW5-3	ON Input Reverse Invalid
	OFF signal Run stop
SW5-4	ON Emergency stop signal: Invalid
	OFF Emergency stop signal: Valid
SW9-3	ON Louver stop: Louver Range
	OFF Louver stop: Normal
SW9-4	ON Fan control: UH, H, M
	OFF Fan control: H, M, L

Note (1) All OFF under load condition.

● Replacement procedure of indoor unit microcomputer printed circuit board

Microcomputer printed circuit board can be replaced with the following procedure.

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

Parts No.	Model	Parts No.	Model
PJA505A137ZG	FDTA28~90	PJA505A138ZC	FDQM, FDUM, FDTW, FDR, FDFL, FDFU, FDUR
PJA505A137ZF	FDTA112, 140	PJA505A138ZD	FDTQ, FDTS, FDKA71
PJA505A139ZH	FDE	PHA505A022ZB	FDKA22~56

● Model select switch (SW6)

Model	22	28	36	45	56	71	90	112	140
SW6-1	OFF	ON	OFF	ON	OFF	ON	ON	OFF	ON
SW6-2	OFF	OFF	ON	ON	OFF	OFF	ON	OFF	OFF
SW6-3	OFF	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
SW6-4	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON

**(iii) Check method when the error code is displayed**

Remote controller or Indication board: Inspection LED, error code

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

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

**(iv) Check procedure depending on indication lamps (For the indoor unit)**

The next page error diagnosis is applicable to cases where only 1 unit is installed in a network unless stated otherwise but the check method is the same even if there are multiple units on the network. Except for the network occupation state due to an out-of-control indoor unit CPU, the error display indicates the state of respective units. Check each unit specified by the error display as explained on the next page.

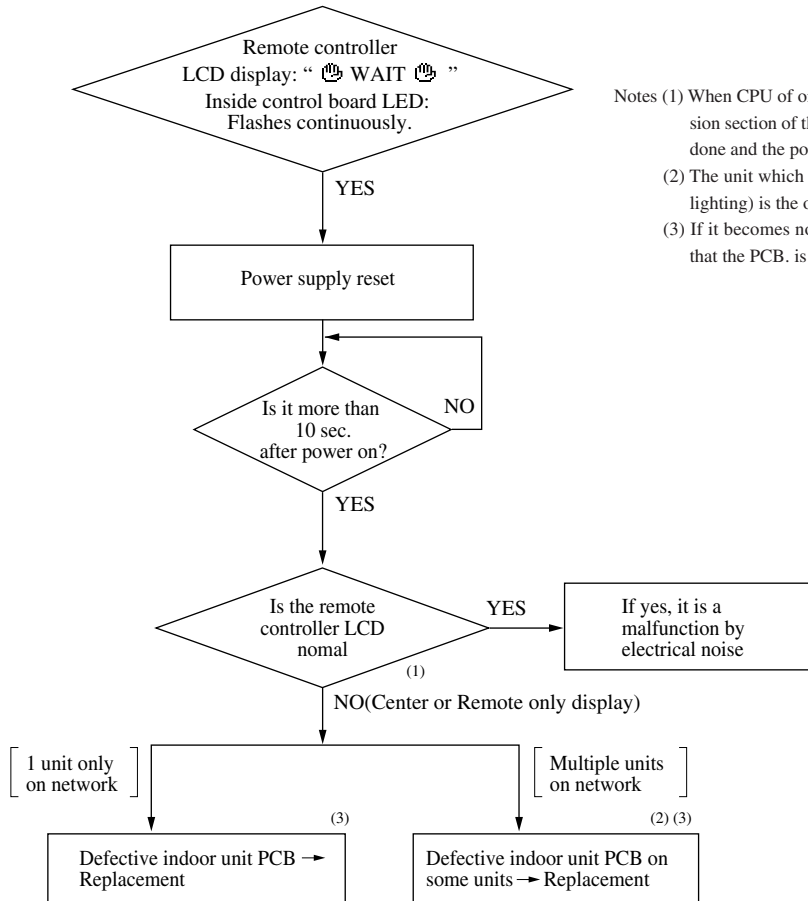
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**Error display : No display**  
**LCD display : No display**

[Polarity determination trouble]

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

- When the LCD display (Center/Remote, temperature display, etc.) of remote controller flashes, it means the polarity on the unit is not yet determined. Polarity determination is completed within a few seconds after the power on. If it is not completed in time, CPU out of control, etc. is suspected.



Notes (1) When CPU of one unit goes out of control, it occupying the transmission section of the network, so the transmission of other units are not done and the polarity of the whole network will not be determined.  
 (2) The unit which has its indoor and green LED keeps flashing (or no lighting) is the one with a defective indoor unit PCB.  
 (3) If it becomes normal after replacing the PCB, it can be considered that the PCB, is defective (defective network transmission circuit).

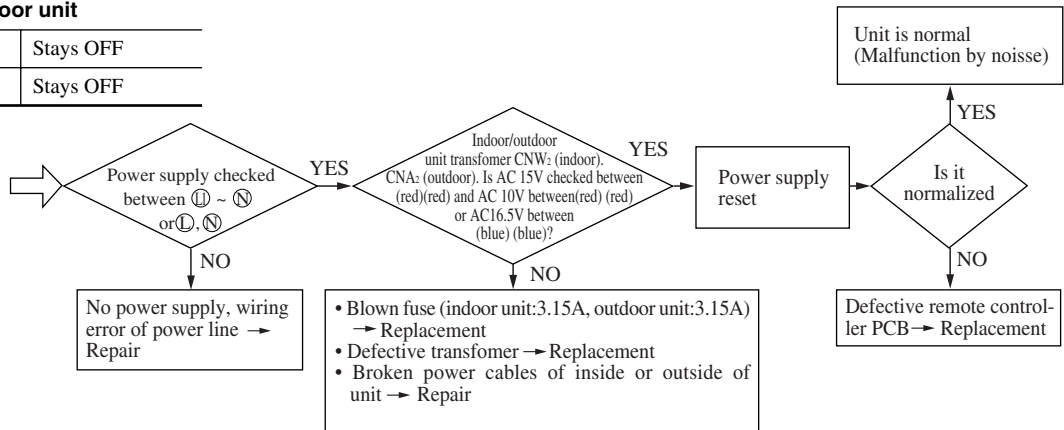
**2**

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

**[Power supply line error]**

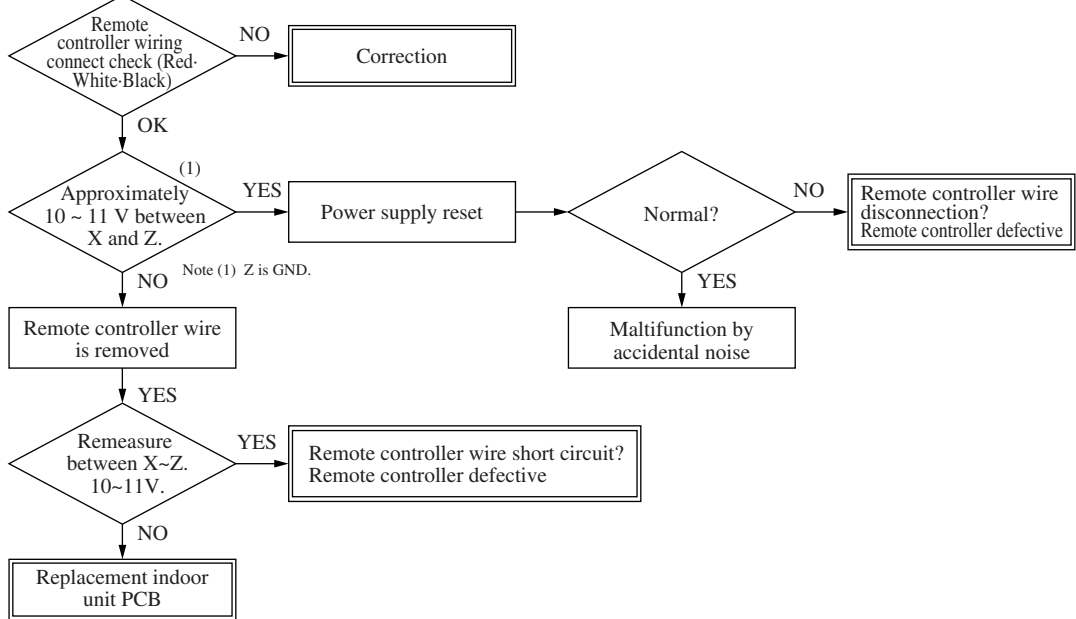
Outdoor unit	
Red LED	Stays OFF
Green LED	Stays OFF

Indoor unit	
Red LED	Stays OFF
Green LED	Stays OFF



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

Flash of green LED means CPU is normal.



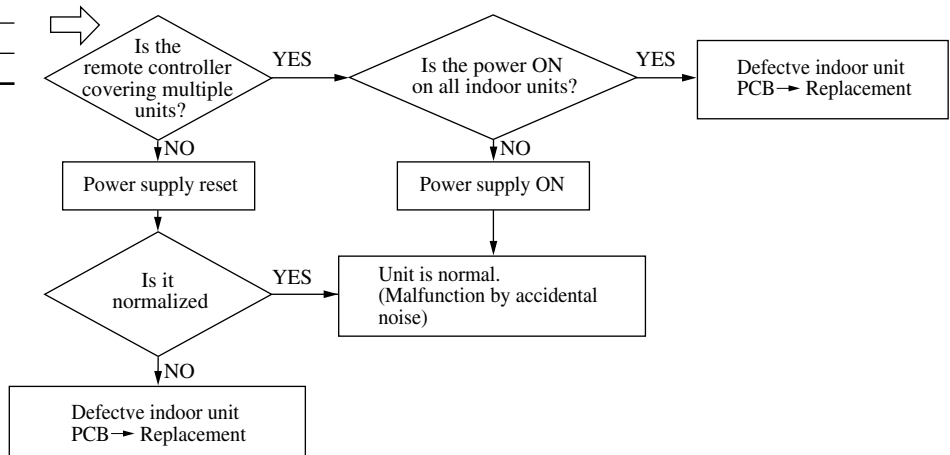
**3**

**Error display : E1**

**[Communication error between remote controller-Indoor unit]**

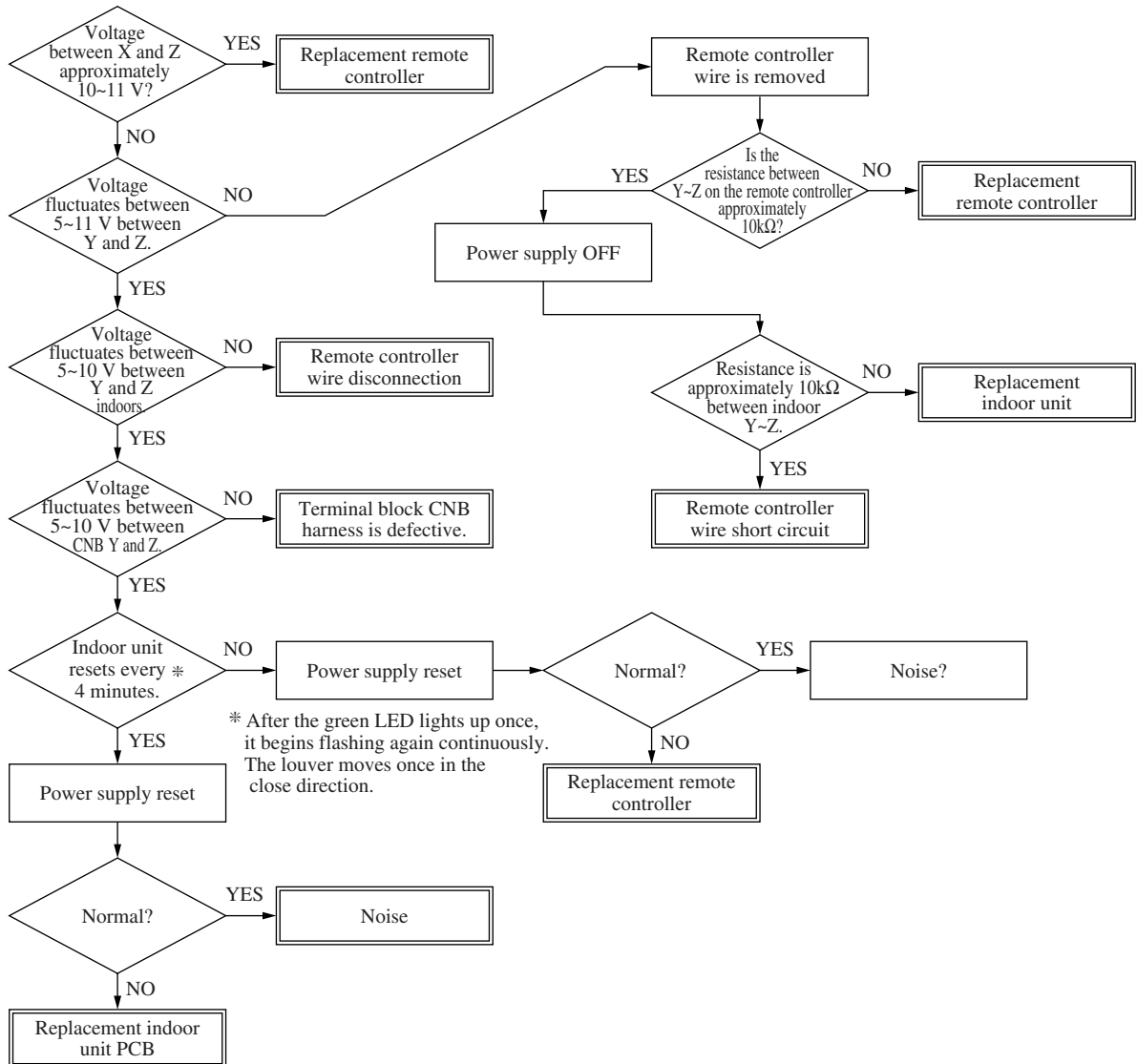
Indoor and outdoor unit	
Red LED	Stays OFF
Green LED	Keeps flashing <sup>(1)</sup>

Note (1) With the separate power supplies for indoor/outdoor units, the outdoor unit green LED may flash in some cases.



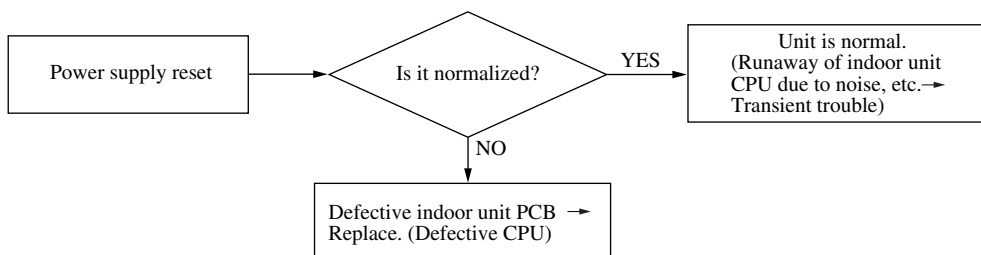
Indoor unit		Outdoor unit	
Red LED	*3 times flash	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing

\* Lamp OFF if remote controller wire is broken at power ON.



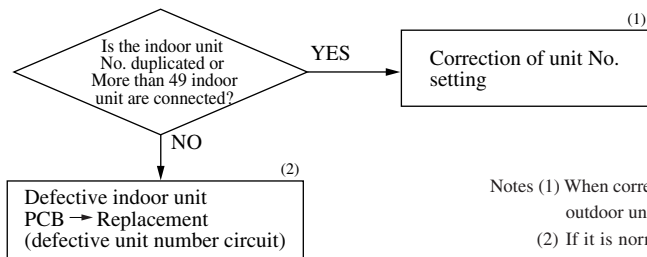

---

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



**4** Error display : **E2** [Duplicated indoor unit No. or More than 49 indoor unit are connected.]

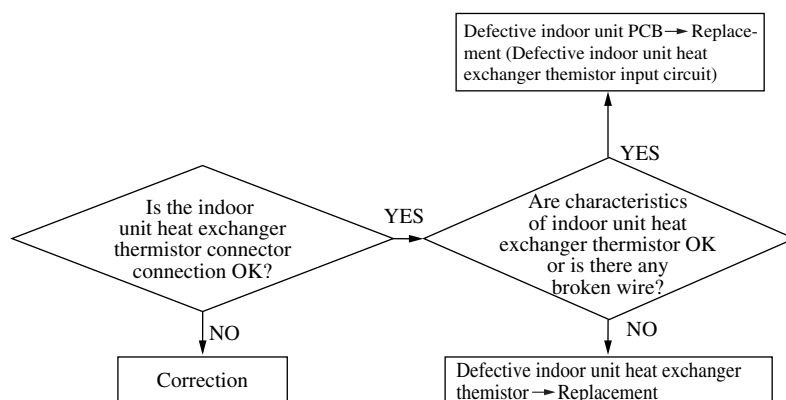
Indoor unit		Outdoor unit	
Red LED	1 time flash	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing



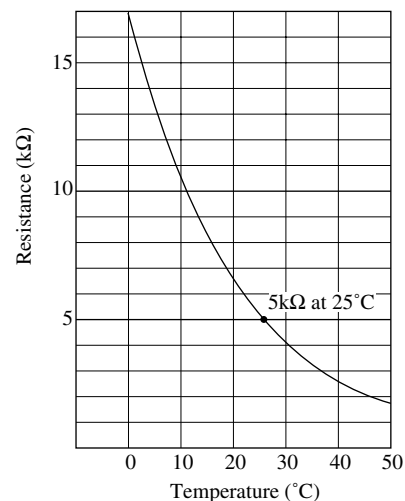
Notes (1) When correcting the unit number, check again the pairing of indoor/outdoor units (same Number assigned to coupled units) is correct.  
 (2) If it is normalized by changing PCB, judge the unit number input circuit is defective.

**5** 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



Return air thermistor (Th<sub>i</sub>-A)  
 Indoor unit heat exchanger thermistor (Th<sub>i</sub>-R1, R2, R3)  
 Resistance temperature characteristics

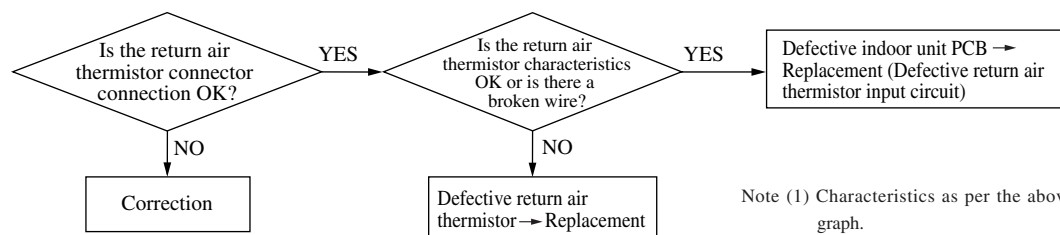


● Display condition

If a temperature of -40°C or lower is detected by the thermistor continuously for 5 seconds.

**6** 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) Characteristics as per the above graph.

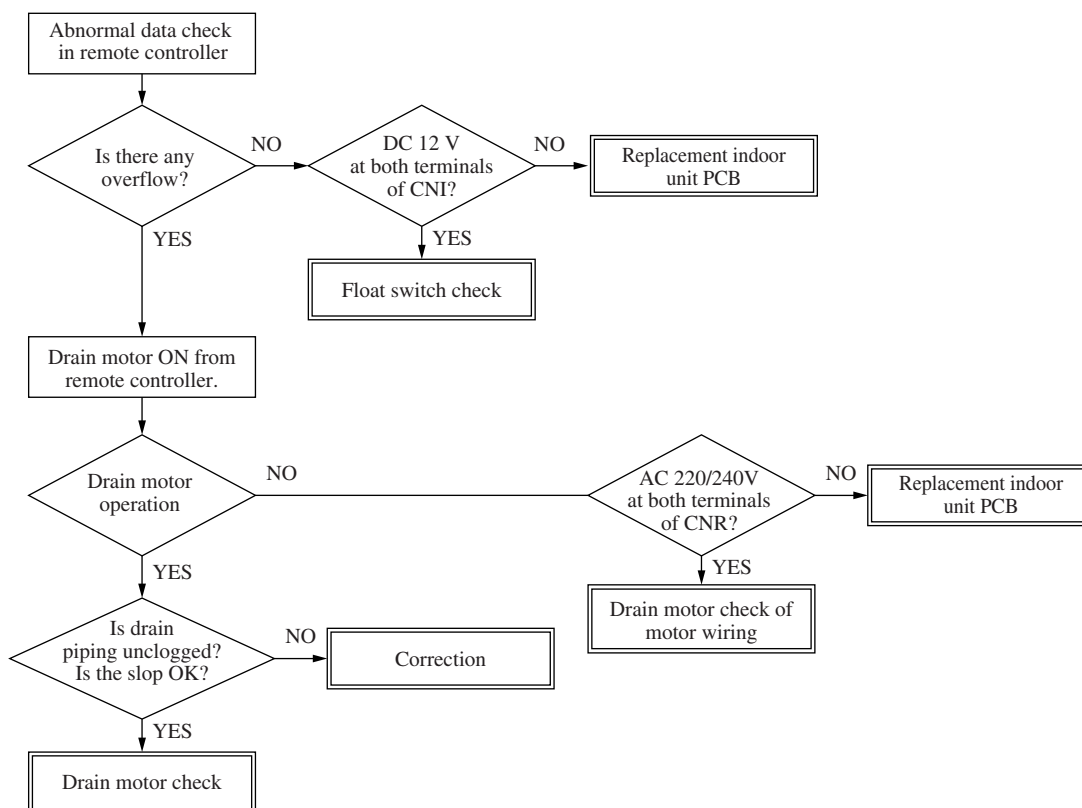
● Display Condition

If a temperature of -20°C or lower is detected by the thermistor continuously for 5 seconds.



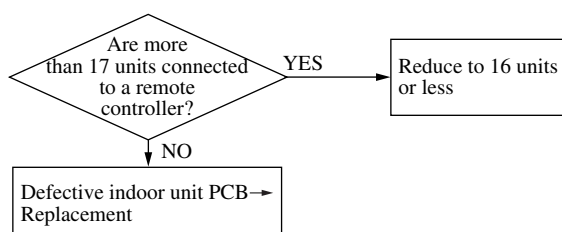
**7** Error display : *E9* [Drain trouble]

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



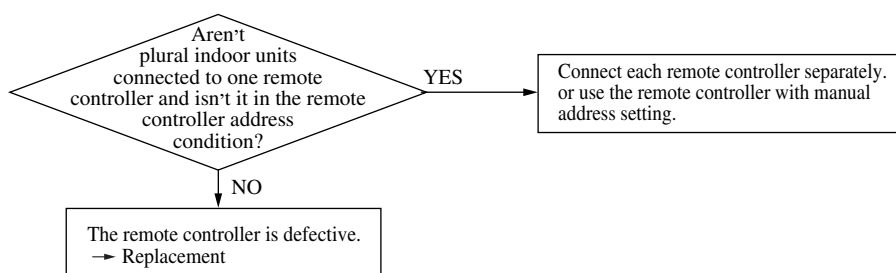
**8** Error display : *E10* [Control of 1 remote controller VS multiple units – Excessive number of units (more than 17 units) ]

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



**9** Error display : *E11* [Addresses setting for plural remote controllers]

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

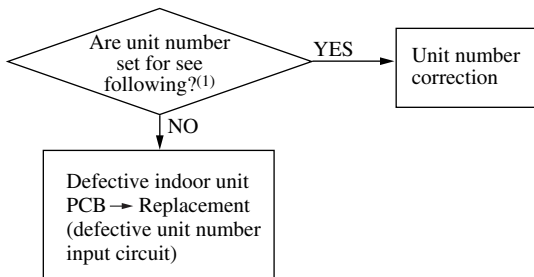


10

Error display : *E12*

[Address No. combination error or addressing is preformed with the following combinations.]

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



Note (1)

Outdoor unit address No.	Indoor unit address No.
00 ~ 47	48, 49
48, 49	00 ~ 47

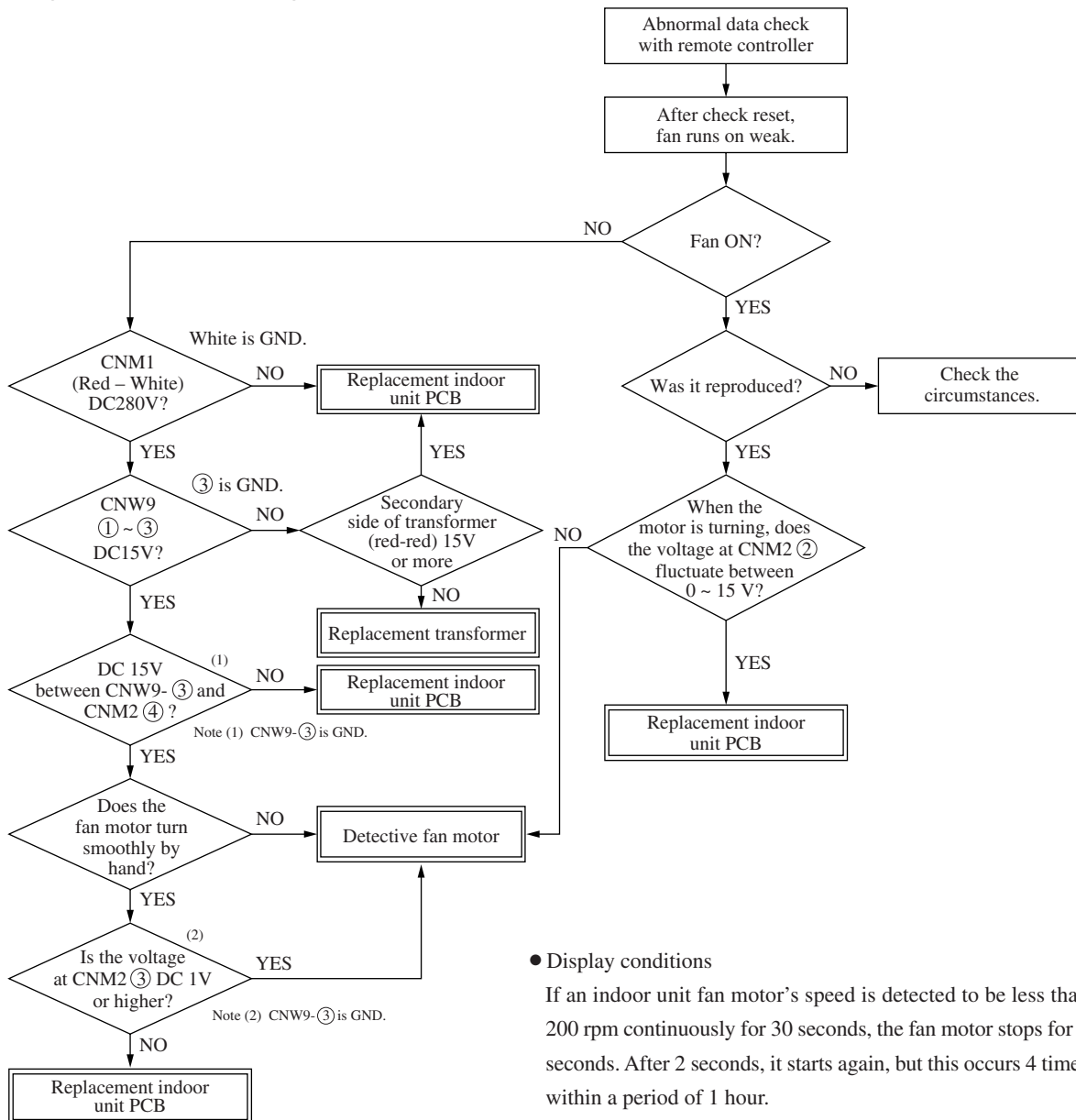
11

Error display : *E16*

[Indoor unit fan motor abnormal]

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

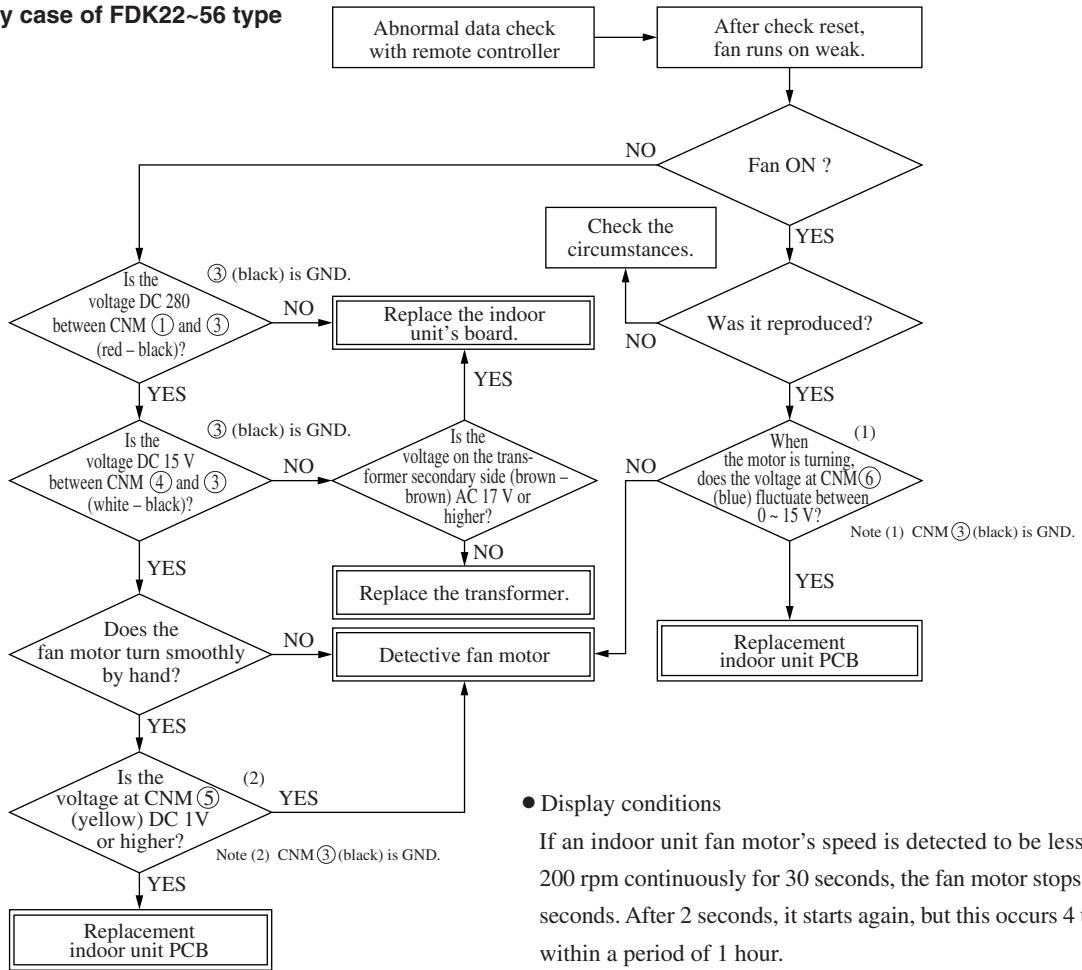
◆ Only case of FDT112, 114 type



● 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.

◆ Only case of FDK22~56 type



● Display conditions

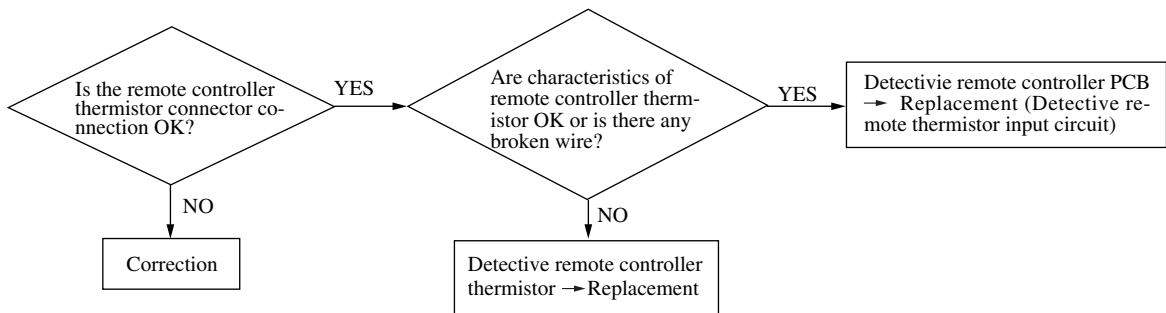
If an indoor unit fan motor's speed is detected to be less than 200 rpm continuously for 30 seconds, the fan motor stops for 2 seconds. After 2 seconds, it starts again, but this occurs 4 times within a period of 1 hour.

12

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



Resistance-temperature characteristic of remote controller thermister

Temperature(°C)	Resistance value (kΩ)	Temperature(°C)	Resistance value (kΩ)	Temperature(°C)	Resistance value (kΩ)	Temperature(°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

**(c) Error diagnosis procedures at the outdoor unit side**

At the error diagnosis related to the outdoor unit, check at first the error code of remote controller and the illumination patterns of norma 1 and inspection display lamps in the same manner as the case of indoor unit.

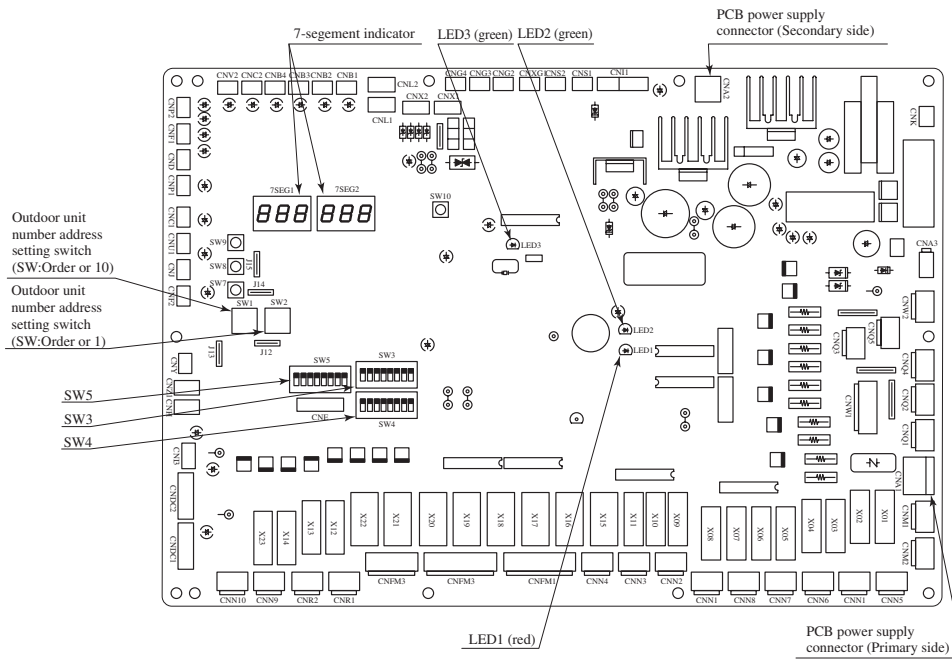
Then estimate the outline, the cause and the location of error based on the pattern and proceed to the inspection and repair. Since the self diagnosis function by means of the microcomputers of indoor/outdoor units provide the judgement of error of microcomputers themselves irregularity power supply 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 interrupted) after the irregularity is automatically recovered to give irregularity information to the service personnel. 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.

**(i) Replacement parts assembly related to the outdoor unit PCB**

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

**(ii) Parts layout on the outdoor unit PCB**



**• Function of DIP switch**

Name	Function
SW3-1	ON Inspection LED reset
	OFF Normal
SW3-2	ON Backup operation-With
	OFF Backup operation-None
SW3-3	ON Renewal
	OFF Normal
SW3-7	ON Forced cooling/heating
	OFF Normal
SW3-8	ON Test mode
	OFF Normal
SW5-1	ON Test run operatopm
	OFF Normal
SW5-2	ON Test run operation Cooling
	OFF Test run operation - Heating
SW5-3	ON Pump down
	OFF Normal

SW4-1	SW4-2	SW4-3	SW4-4	Models
OFF	OFF	OFF	OFF	<b>FDCA224HKXRE4</b>
ON	OFF	OFF	OFF	<b>FDCA280HKXRE4</b>
OFF	ON	OFF	OFF	<b>FDCA335HKXRE4</b>
OFF	ON	OFF	OFF	<b>FDCA335HKXRE4-K</b>
OFF	OFF	ON	OFF	<b>FDCA400HKXRE4</b>
ON	OFF	ON	OFF	<b>FDCA450HKXRE4</b>

**• Function of jumper wire**

Name	Function
J13	With External input level
	None <sup>(1)</sup> External input pulse
J14	With Defrosting temp. - Strengthening
	None <sup>(1)</sup> Defrosting temp. - Normal
J15	With Defrosting time - Cold weather region
	None <sup>(1)</sup> Defrosting time - Normal

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

Name	Function	
SW4-6	ON	ON Demando change (Compressor capability) 0%
	OFF	OFF Demando change (Compressor capability) 40%
		ON Demando change (Compressor capability) 60%
	OFF	OFF Demando change (Compressor capability) 80%
ON Address setup of master/slave unit-slave		
-	OFF Address setup of master/slave unit-master	

● **Replacement procedure of outdoor unit control printed circuit board.**

Micromputer 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.	Model
<b>PCB505A042RC</b>	FDCA224HKXRE4, 280HKXRE4, 335HKXRE4
<b>PCB505A042RF</b>	FDCA335HKXRE4-K, 400HKXRE4, FDCA450HKXRE4

(iii) **Parts layout on the outdoor unit inverter PCB**

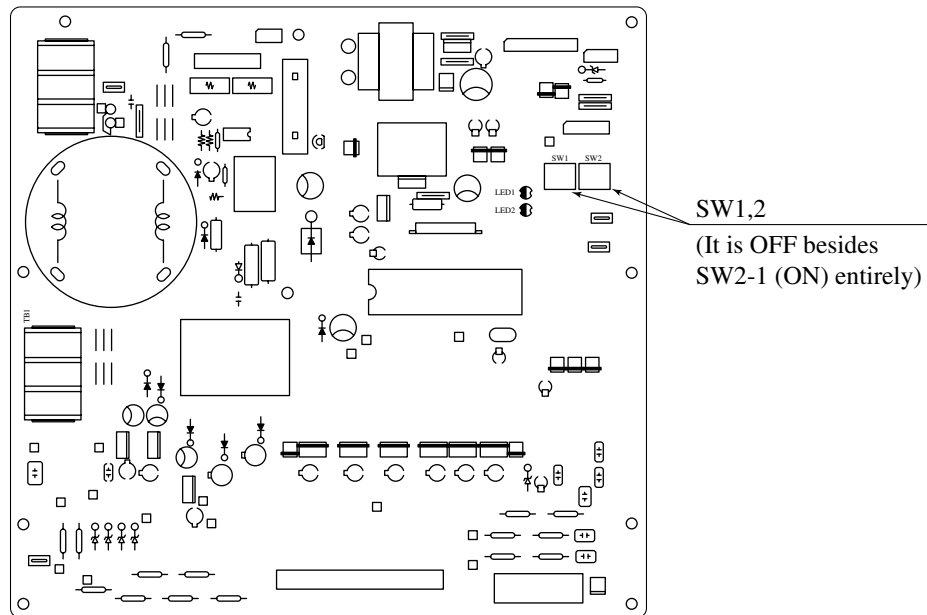
● **Replacement procedure of outdoor unit inverter printed circuit board**

Inverter printed circuit board can replaced with following procedure.

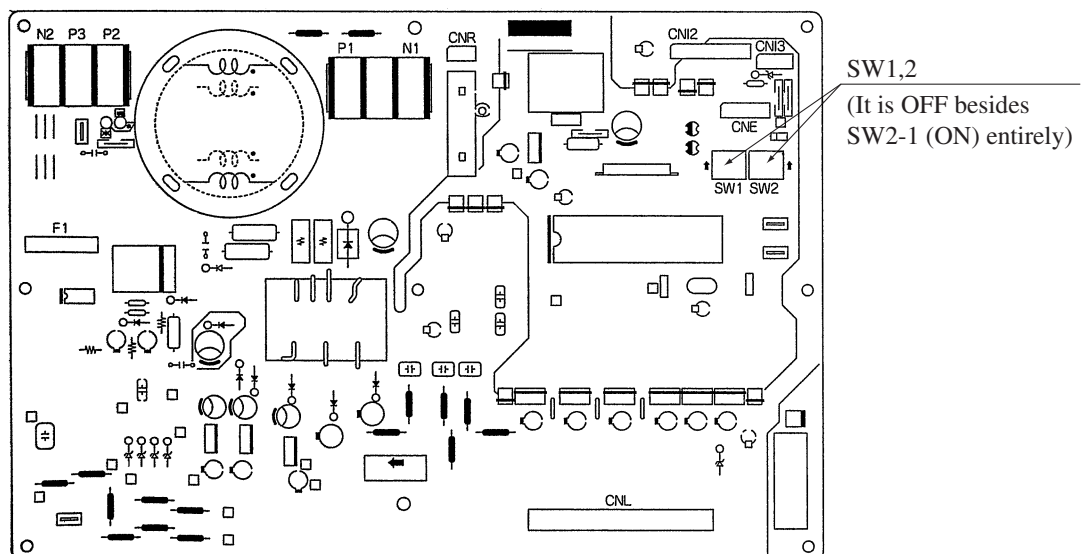
- 1) Confirm the parts numbers. (Refer to the following parts layout drawing for the location of parts number.)

Parts No.	Model
<b>PCB505A044ZA</b>	FDCA224HKXRE4, 280HKXRE4, 335HKXRE4
<b>PCB505A044ZB</b>	FDCA335HKXRE4-K, 400HKXRE4, 450HKXRE4

**Model FDCA224HKXRE4, 280HKXRE4, 335HKXRE4**



**Model FDCA335HKXRE4-K, 400HKXRE4, 450HKXRE4**

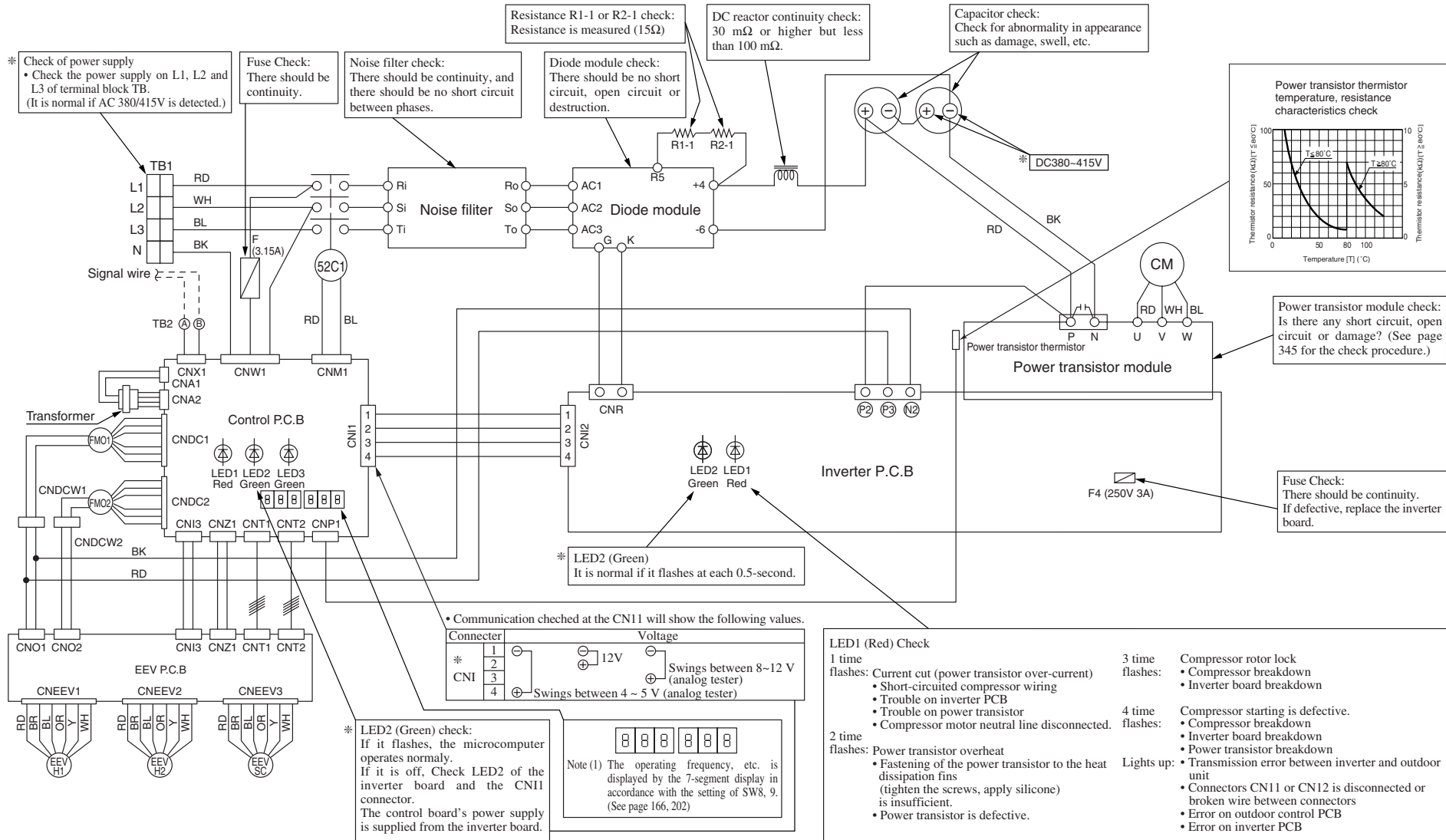


● Check points of inverter outdoor unit

▷ Check with power ON at the points marked with \*.

This figure applies to the FDCA224HKXRE4, 280HKXRE4, 335HKXRE4.

The FDCA335HKXRE4-K, 400HKXRE4 and 450HKXRE4 have 2 inverter related systems.



(iv) Check procedure depending on indication lamps (For the outdoor unit)

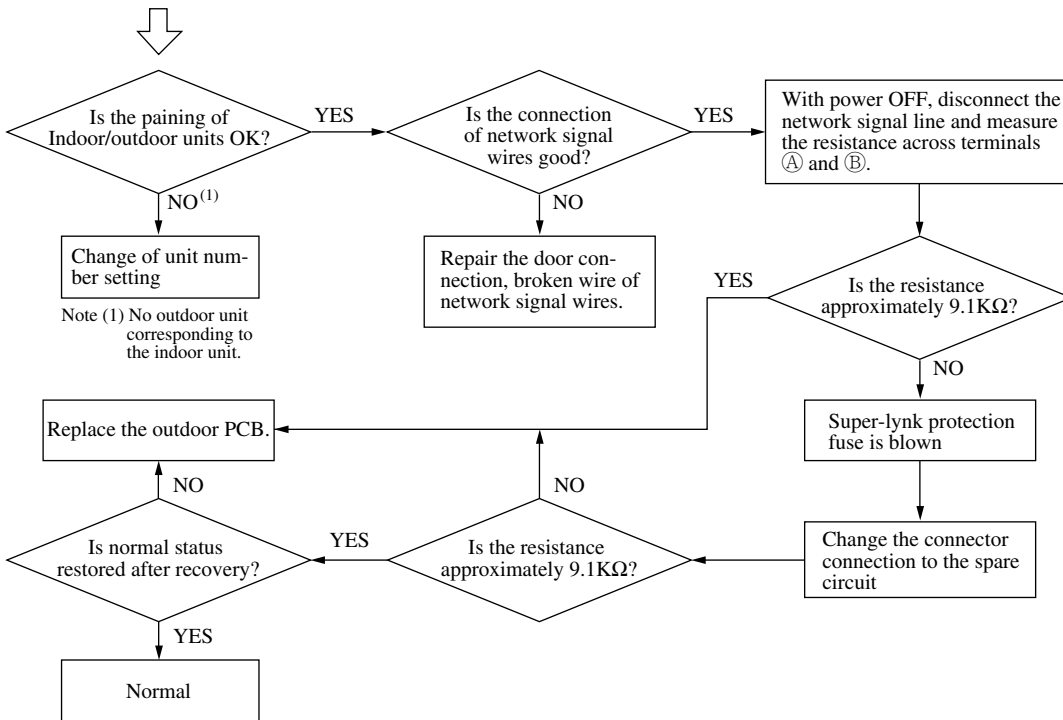
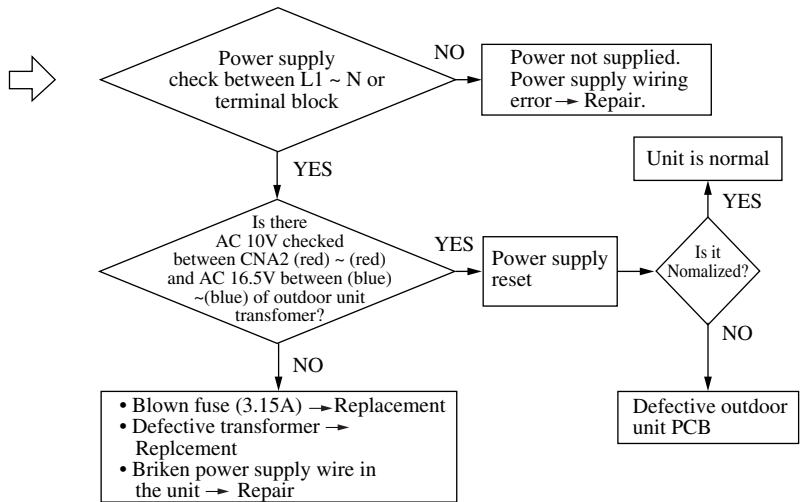
**1** Error display : **E3** [Error on the outdoor unit signal line]

(Detected during operation only)

Indoor unit	
Red LED	2 time flash
Green LED	Keeps flashing

Outdoor unit	
Red LED	Stays OFF
Green LED	Stays OFF

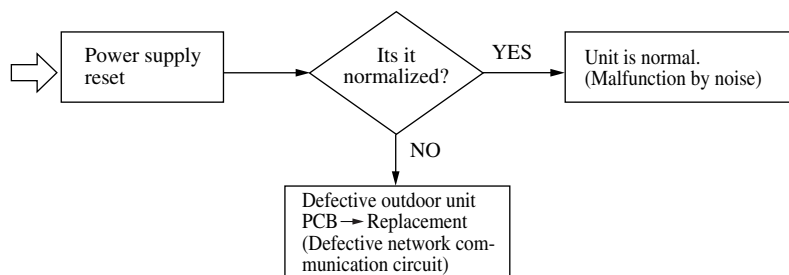
Outdoor unit	
Red LED	Stays OFF
Green LED	Keeps flashing



Error display : **E3** [Error on the outdoor unit signal line]

(Detection at the power on)

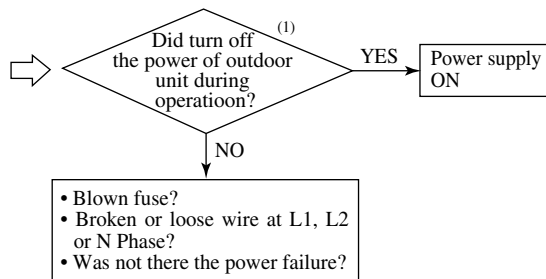
Outdoor unit	
Red LED	Stays OFF or Lights continuously
Green LED	Irregular illumination



**2** Error display : **E5** [Outdoor unit signal line error, power supply error]

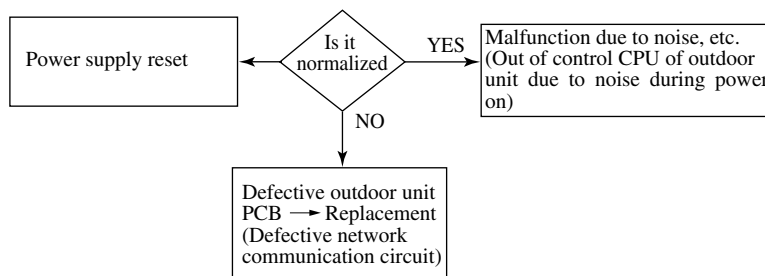
Indoor unit	
Red LED	2 time flash
Green LED	Keeps flashing

Outdoor unit	
Red LED	Stays OFF
Green LED	Stays OFF

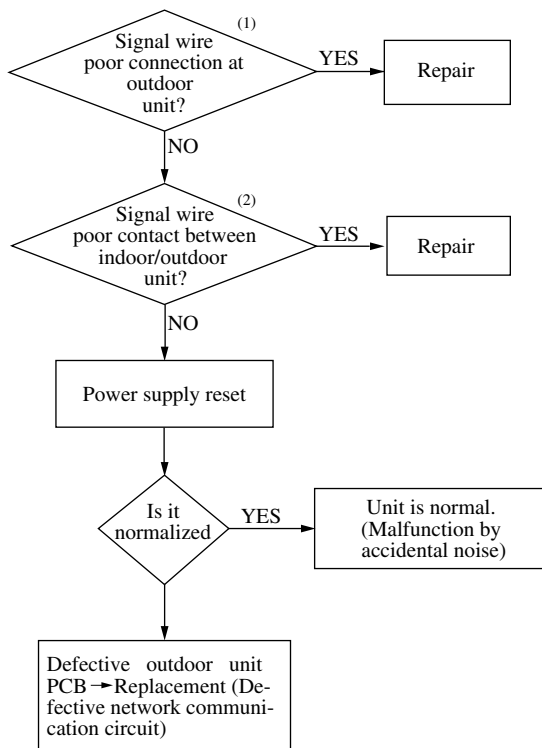


Note (1) This case is limited to the separate power supplies to indoor/outdoor units. (Combination of (indoor unit) red LED 2 time flash and (outdoor unit) green LED stays off means that the power supply to the outdoor unit has been interrupted during operation.)

Outdoor unit	
Red LED	Stays OFF or Keeps flashing
Green LED	Irregular illumination



Outdoor unit	
Red LED	Stays OFF
Green LED	Keeps flashing



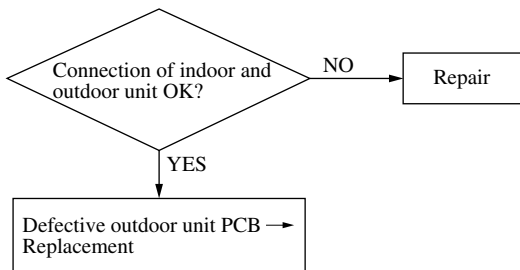
Notes (1) Check for poor connection (looseness, misconnection) at outdoor unit terminal block and broken signal wires between outdoor units.

(2) Check the poor connection or broken signal wires between indoor/outdoor units.



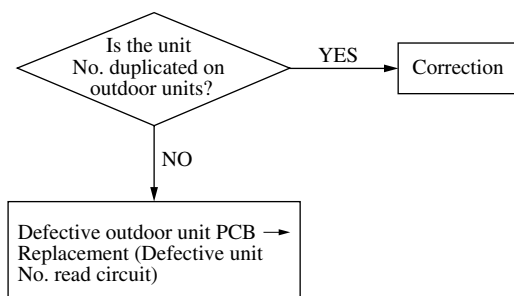
**3** Error display : *E30* [Connection error indoor and outdoor unit]  
 7-segment display : *E30*

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



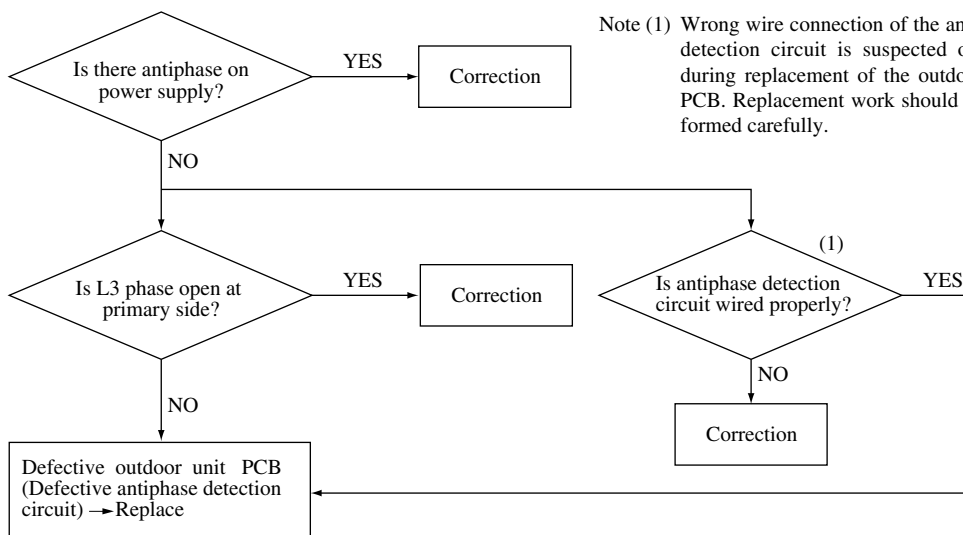
**4** Error display : *E31* [Duplicated unit No. of outdoor units]  
 7-segment display : *E31*

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



**5** Error display : *E32* [Antiphase on power supply or open 52C L3 phase (primary side) on power supply]  
 7-segment display : *E32*

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



Note (1) Wrong wire connection of the antiphase detection circuit is suspected occurred during replacement of the outdoor unit PCB. Replacement work should be performed carefully.

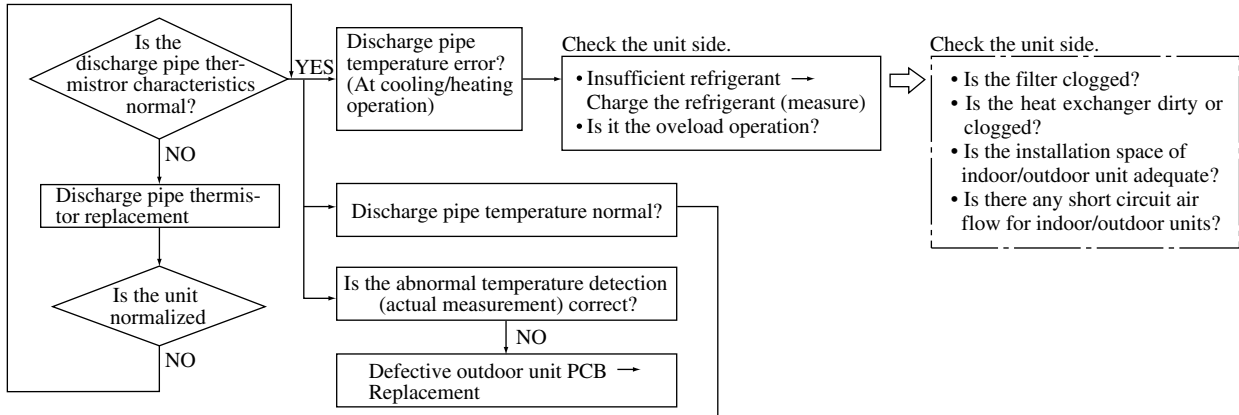
6

Error display : *E36*  
 7-segment display : *E36-1*  
                           *E36-2*

[Discharge temperature error]

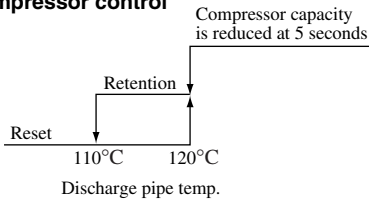
Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash <sup>(1)</sup>
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1): Single flashing of outdoor unit LED indicates Tho-D1 and double flashing indicates Tho-D2.



If the discharge pipe temperature (Tho-D1, 2) exceeds the set value the capacity of the compressor are controlled to restrict the rise in the discharge pipe temperature.

◆ Compressor control

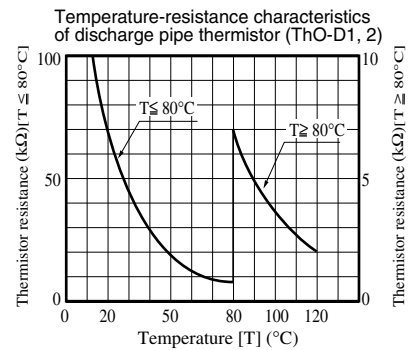
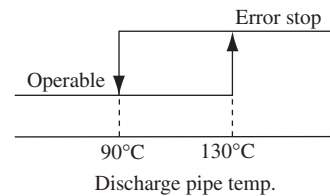


● Display conditions

If the discharge pipe temperature becomes 130°C or higher for 2 seconds, the compressor stops.

If it drops to 90°C or lower, the compressor restarts, but, if this operation occurs 2 times within 60 minutes.

● Abnormal temperature detection



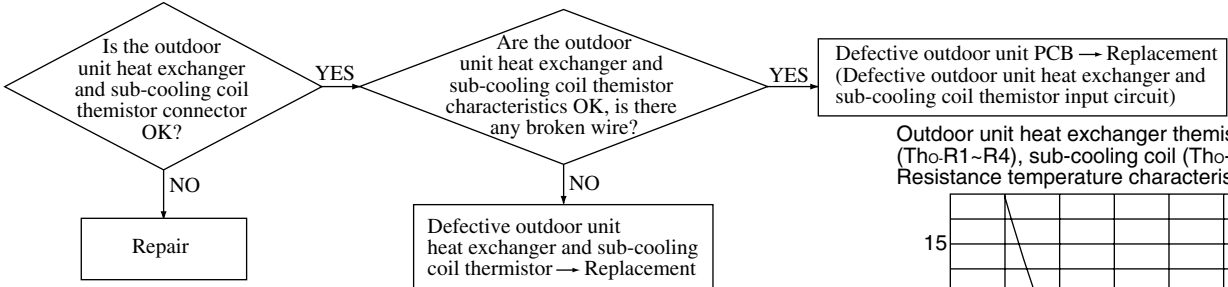
9

**Error display : E37**  
**7-segment display : E37-1**  
 E37-2  
 E37-3  
 E37-4  
 E37-5  
 E37-6

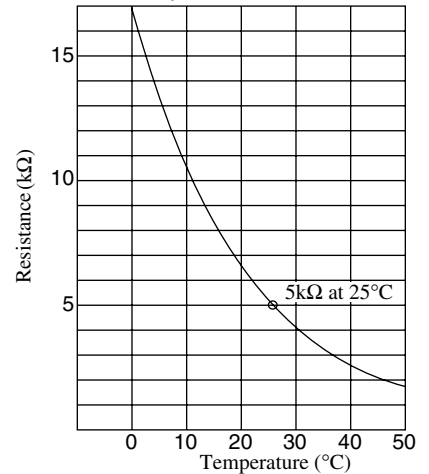
**[Defective outdoor unit heat exchanger and sub-cooling coil thermistor]**

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash <sup>(1)</sup>
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) Tho-R1 flashes 1 time, Tho-R2 flashes 2 times, Tho-R3 flashes 3 times,  
 Tho-R4 flashes 4 times, Tho-SC flashes 5 times, Tho-H flashes 6 times.



Outdoor unit heat exchanger thermistor (Tho-R1~R4), sub-cooling coil (Tho-SC, H) Resistance temperature characteristics



• Display conditions

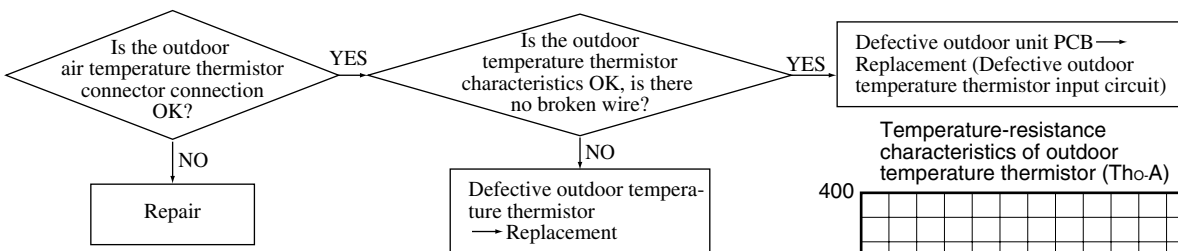
If the temperature sensed by the thermistor is  $-50^{\circ}\text{C}$  or lower continuously for 5 seconds between 2 minutes and 2 minutes 20 seconds after the compressor goes ON, the compressor stops. After a 3 minute delay, the compressor restarts. If this state is detected 3 times in 40 minutes.

10

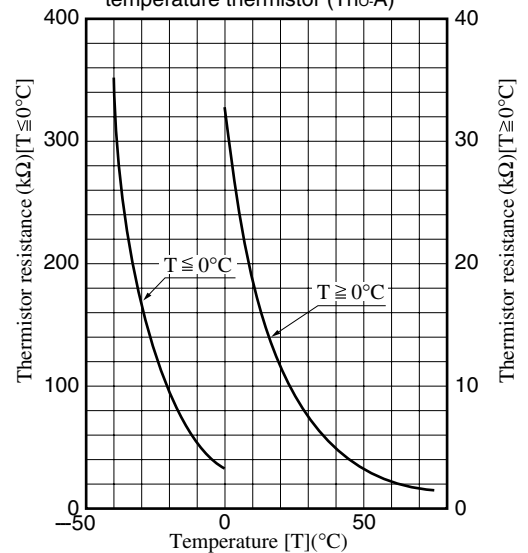
**Error display : E38**  
**7-segment display : E38**

**[Defective outdoor temperature thermistor]**

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



Temperature-resistance characteristics of outdoor temperature thermistor (Tho-A)



• Display Conditions

If the temperature detected by the thermistor is  $-30^{\circ}\text{C}$  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 condition is detected 3 times within 40 minutes.

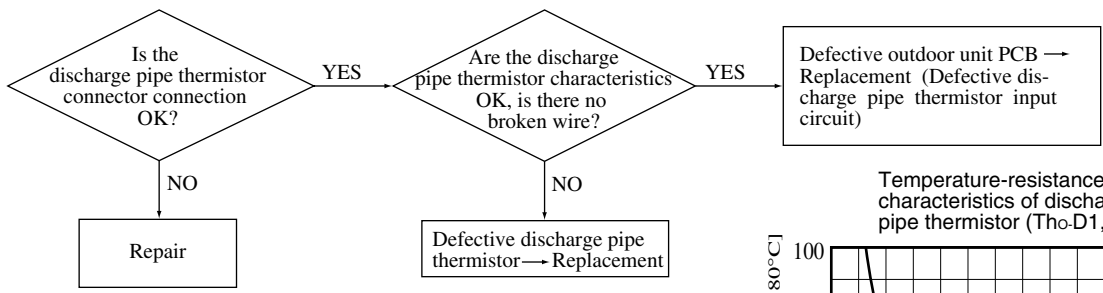
11

Error display : *E39*  
 7-segment display : *E39-1*  
                           *E39-2*

[Defective discharge pipe thermistor]

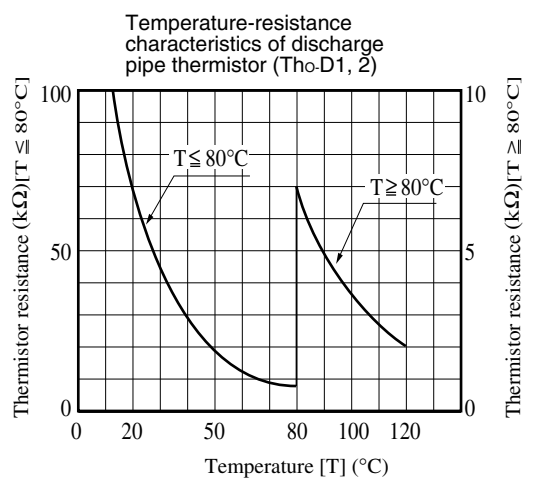
Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash <sup>(1)</sup>
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) Single flashing of outdoor unit LED indicates Tho-D1 and double flashing indicates Tho-D2.



• Display conditions

If the temperature sensed by the thermistor is 3°C 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.

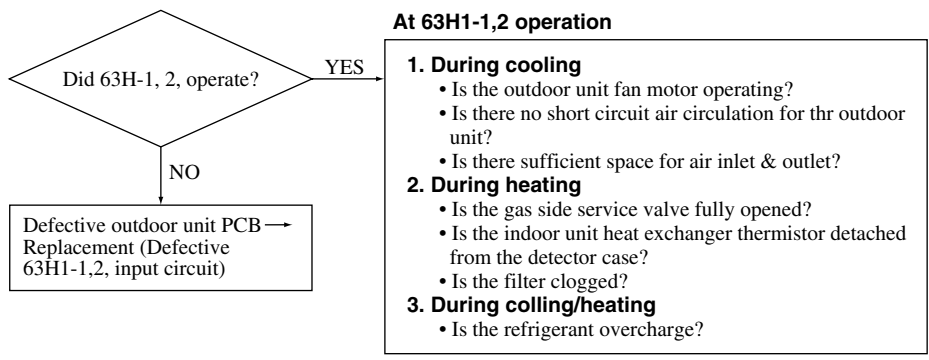


12

Error display : *E40*  
 7-segment display : *E40*

[63H1-1,2, motion]

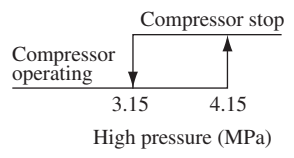
Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing



• Display conditions

If the 63H1-1,2 goes OFF (open), the compressor stops. After a 3 minute delay, the compressor restarts. If this condition is detected 5 times within 60 minutes, or if the (open) state continues for 60 minutes without interruption.

• Abnormal pressure detection



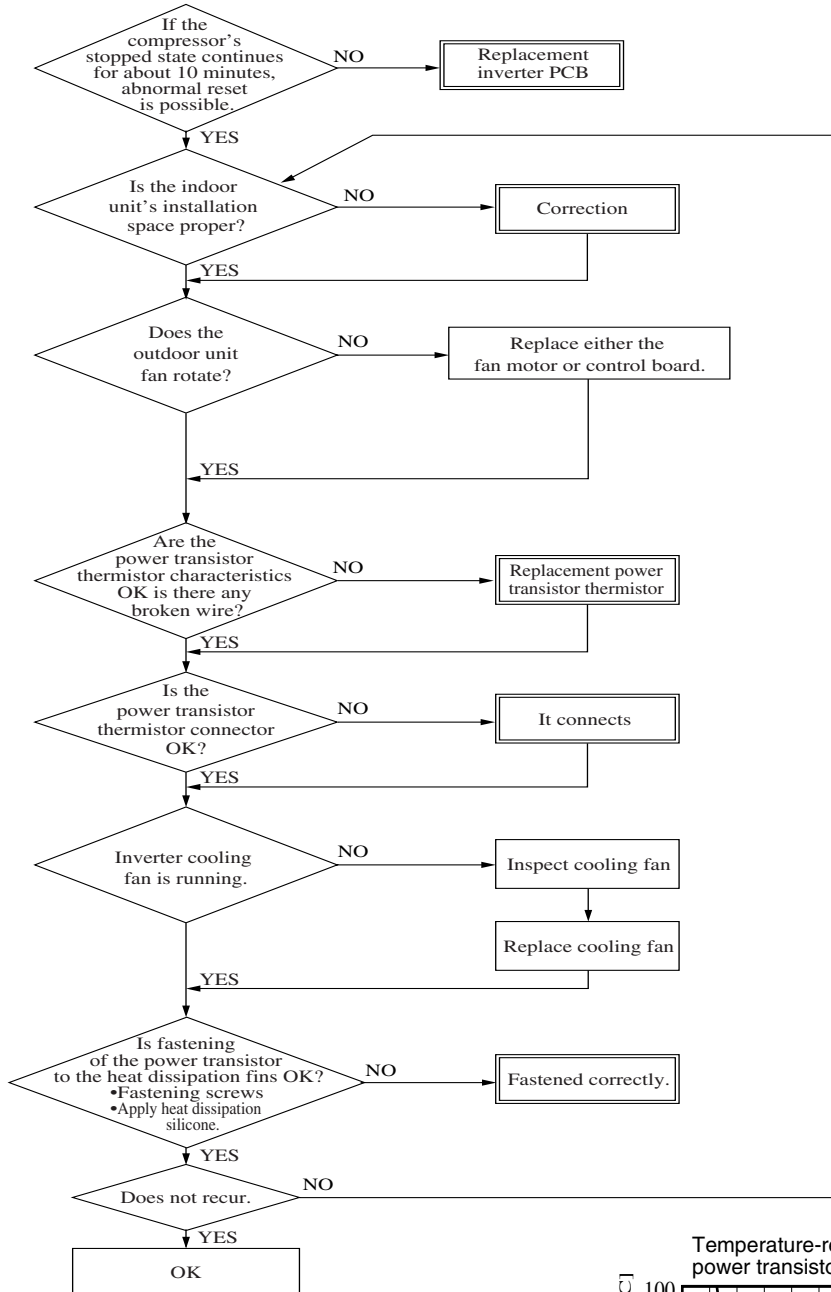
13

Error display : E41  
 7-segment display : E41-1  
 E41-2

[Power transistor overheating]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash <sup>(1)</sup>
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) Single flashing of outdoor unit LED indicates power transistor (CM1) overheat and double flashing indicates power transistor (CM2) overheat.

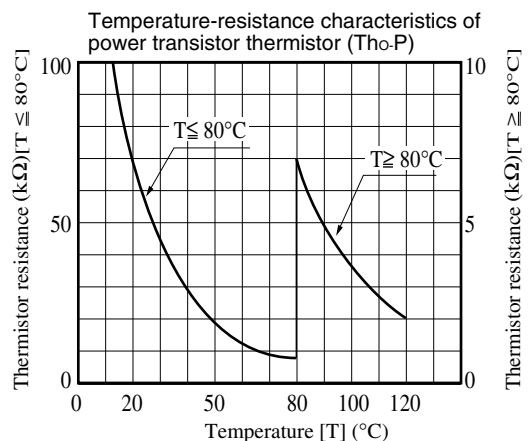
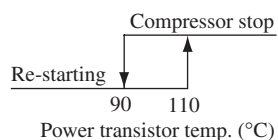


● Display conditions

If the power transistor's temperature exceeds the set value, the compressor stops.

When the temperature drops to 90°C or lower, the compressor restarts, but if this occurs 5 times within 1 hour, or if this condition continues uninterrupted for 1 hour.

● Abnormal temperature detection.



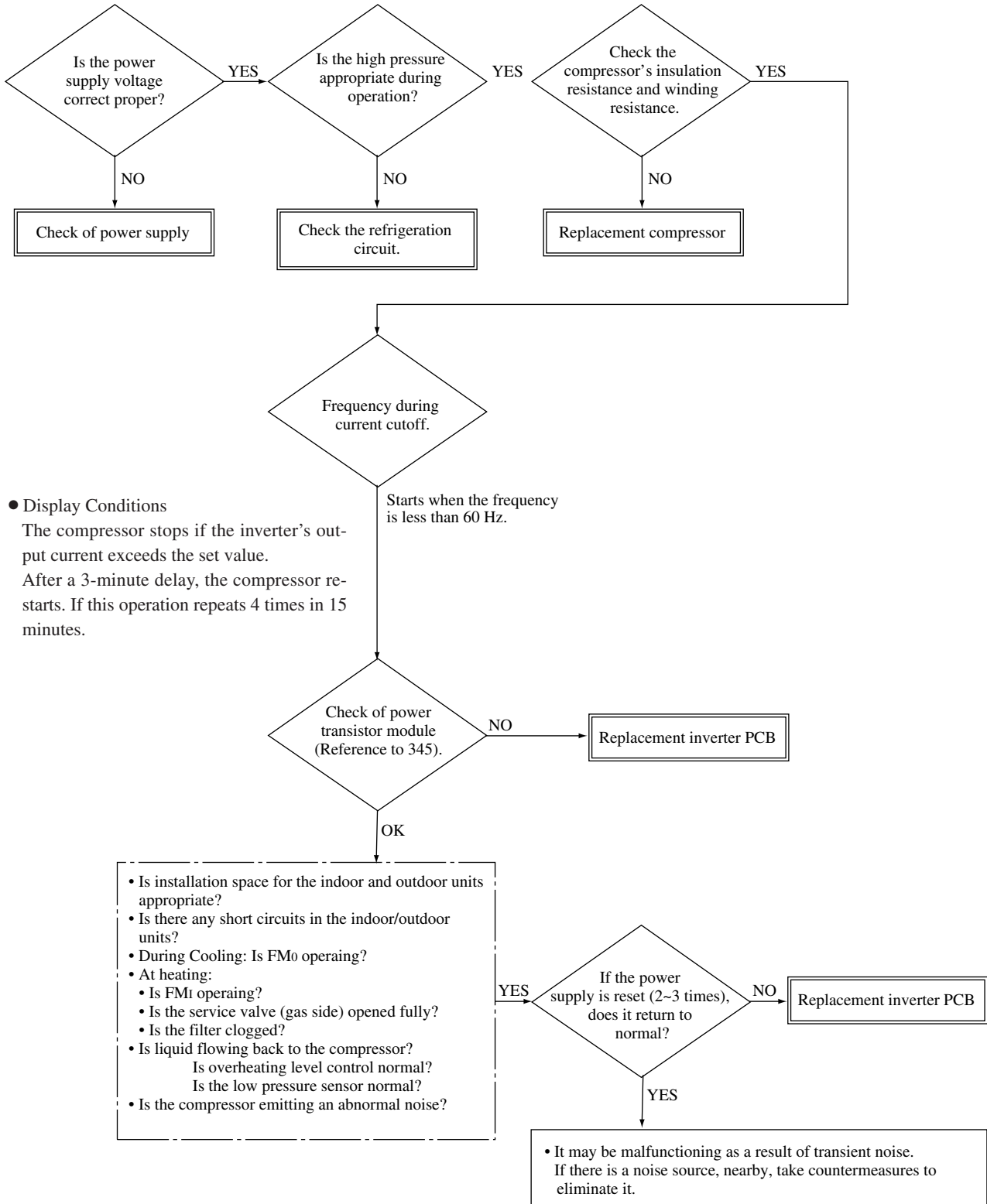
14

**Error display : E42**  
**7-segment display : E42-1**  
**E42-2**

[Current cut]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash <sup>(1)</sup>
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) Single flashing of outdoor unit LED indicates current cut (CM1) and double flashing indicates current cut (CM2).



• Display Conditions

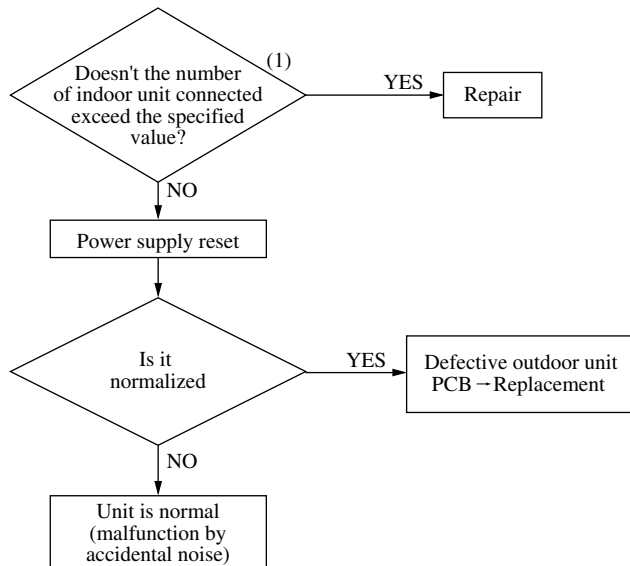
The compressor stops if the inverter's output current exceeds the set value. After a 3-minute delay, the compressor restarts. If this operation repeats 4 times in 15 minutes.

15

Error display : *E43*  
 7-segment display : *E43*

[Excessive number of indoor units connected]

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



- Notes (1) The maximum number of connectable units of each model is as follows :
- FDCA224 type 13, FDCA280 type 16
  - FDCA335 type 20, FDCA400 type 23
  - FDCA450 type 26, FDCA735 type 43
  - FDCA800 type 47, FDCA850, 900 type 48.
- (2) Outdoor No. setting check for indoor units (to see if outdoor No. is of other system)
- (3) In case of auto addressing erase the addresses stored in memory and perform re-setting

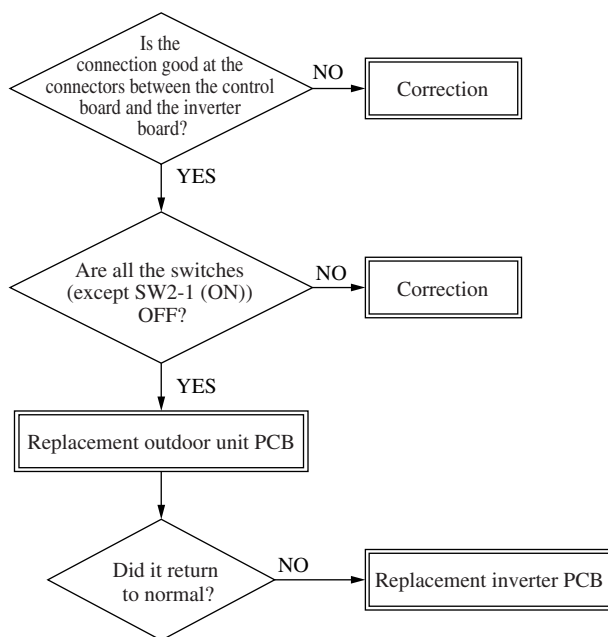
16

Error display : *E45*  
 7-segment display : *E45-1*  
*E45-2*

[Transmission error between inverter and Outdoor unit PCB]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash <sup>(1)</sup>
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) Single flashing of outdoor unit LED indicates transmission error between inverter and outdoor unit PCB (CM1).  
 Double flashing of outdoor unit LED indicates transmission error between inverter and outdoor unit PCB (CM2).

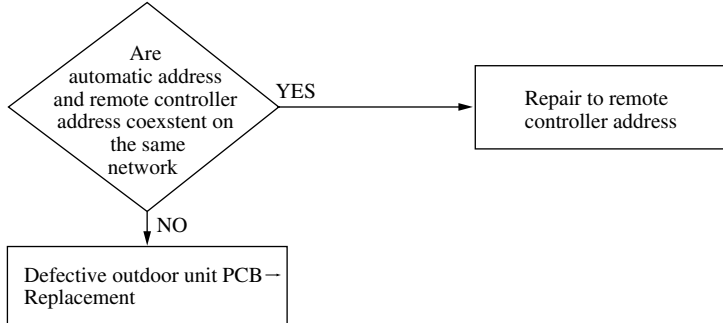


17

Error display : *E4B*  
7-segment display : —

( Automatic address setting and remote controller address setting coexist in the same network )

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



18

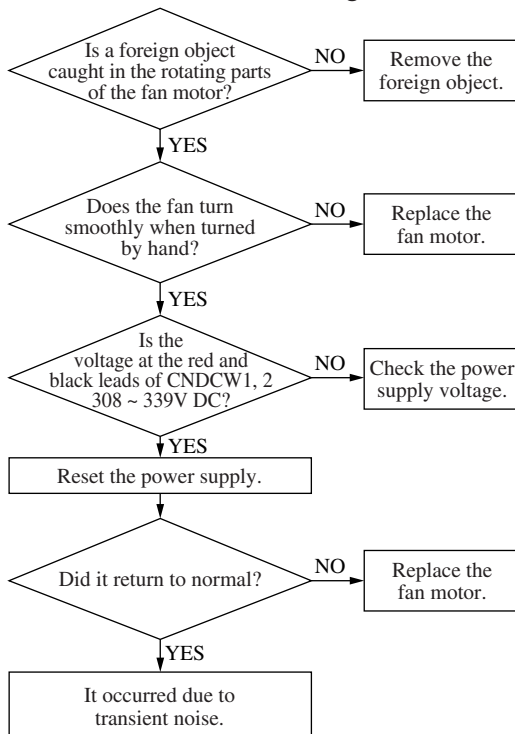
Error display : *E4B*  
7-segment display : *E4B-1*  
*E4B-2*

[Abnormalities in an outdoor fan motor]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash <sup>(1)</sup>
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) Single flashing of outdoor unit LED indicates FM01 and double flashing indicates FM02.

• When outdoor unit is running



• Display Conditions

If an overcurrent or overheating signal is received from the outdoor fan motors (FM01, 2), the compressor and outdoor fans stop. They start again after 3 minutes, but if this same trouble occurs 5 times (separately for FM01, 2) again within 1 hour, or once within 45 minutes of the power being turned ON, an abnormal stop occurs.

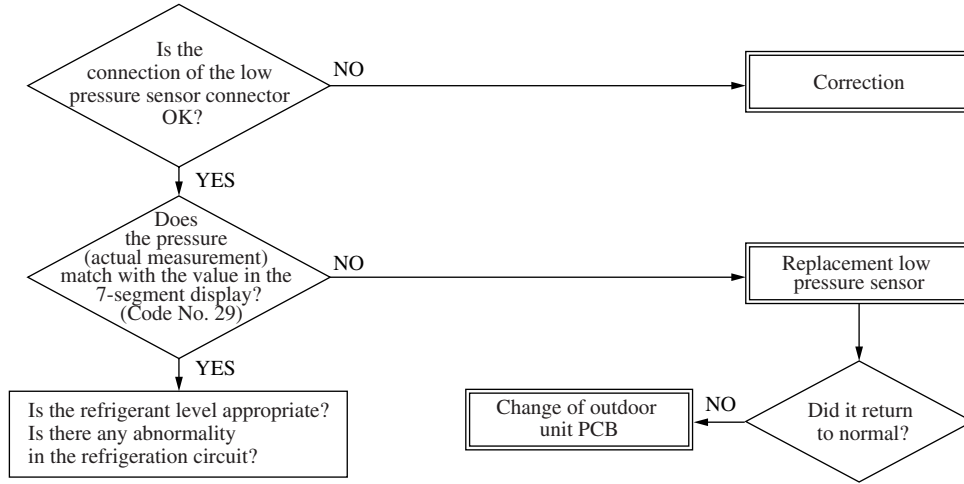


19

Error display : *E49*  
 7-segment display : *E49*

[Low pressure abnormal]

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

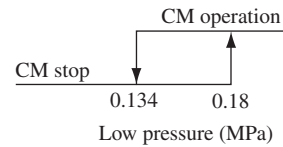


• Display conditions

- If the low pressure sensed by the low pressure sensor is 0.134 MPa or lower, the compressor stops. After a 3 minute delay, the compressor restarts. If this occurs 2 times within 60 minutes.
- If the pressure sensed by the low pressure sensor while the compressor is stopped is 0.18 MPa or lower. If this occurs 5 times within 60 minutes.

Note (1) It recovers only if there is a power supply reset.

• Abnormal pressure detection

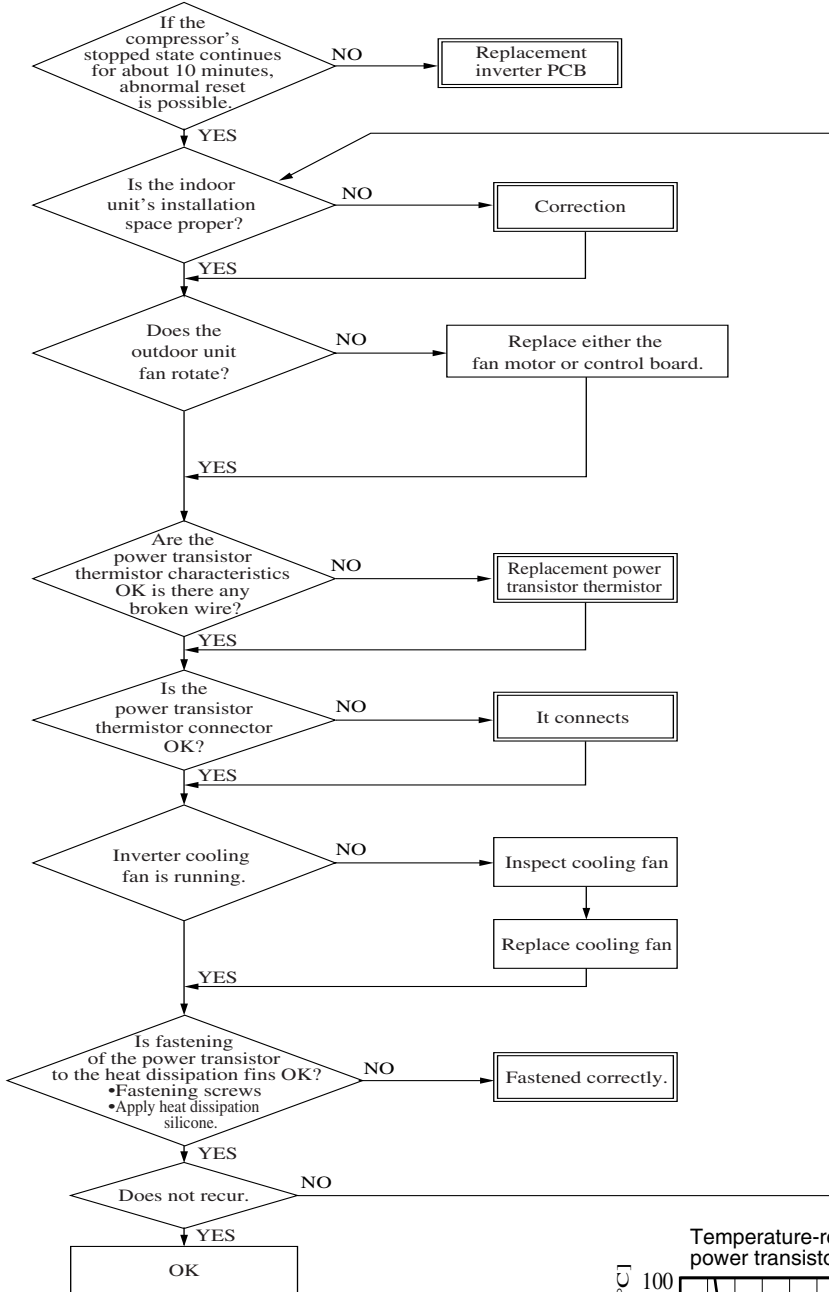


Error display : *E51*  
 7-segment display : *E51-1*  
                           *E51-2*

[Power transistor overheating (15 minute continuation)]  
 [Combination unit only]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash <sup>(1)</sup>
Green LED	Keeps flashing	Green LED	Keeps flashing

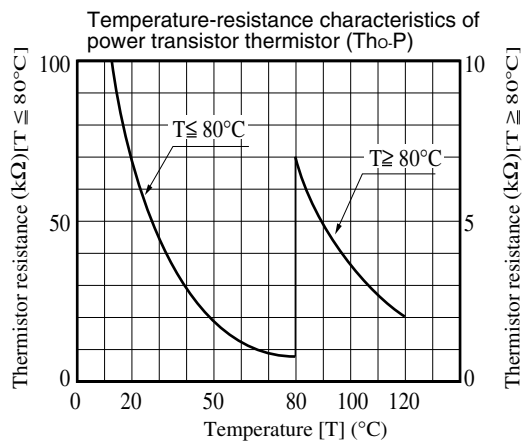
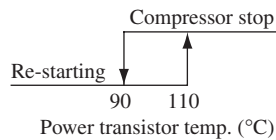
Note (1) Single flashing of outdoor unit LED indicates power transistor (CM1) overheat and double flashing indicates power transistor (CM2) overheat.



● Display conditions

A power transistor temperature error occurs when a temperature of 110°C or higher continues for 15 minutes, including compressor stops.

● Abnormal temperature detection.

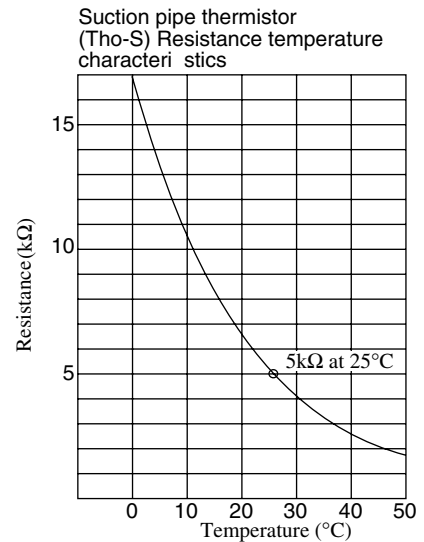
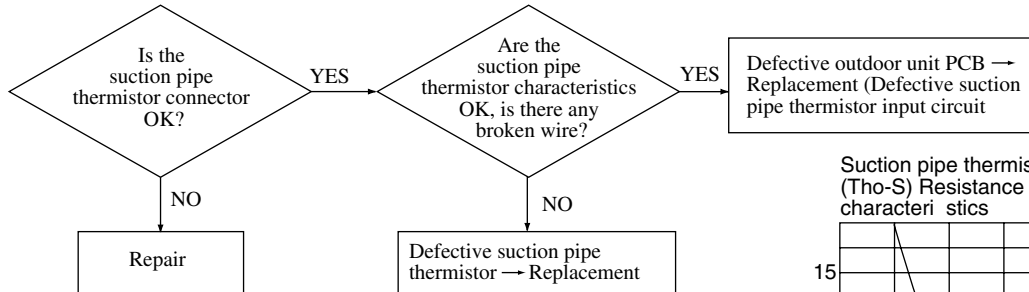


21

Error display : *E53*  
7-segment display : *E53*

[Defective suction pipe temperature thermistor]

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



• Display conditions

If the temperature detected by the thermistor is  $-50^{\circ}\text{C}$  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 condition is detected 3 times within 40 minutes.

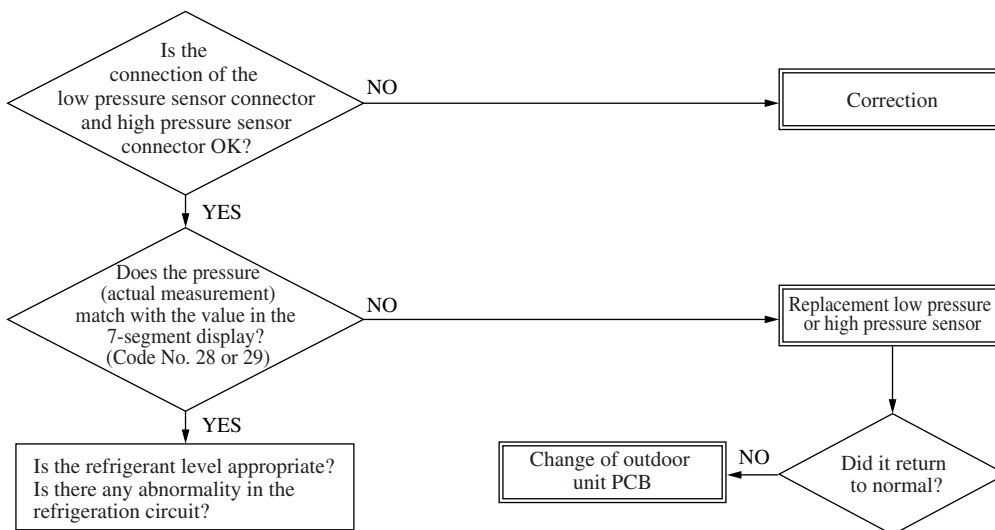
22

Error display : *E54*  
7-segment display : *E54-1*  
*E54-2*

[Defective low pressure and high pressure sensor]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash <sup>(1)</sup>
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) Single flashing indicates PSL and double flashing indicates PSH.



• Display conditions

If the voltage detected by the sensor is 0V or lower or 3.49 V or higher 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 condition is detected 3 times within 40 minutes.

23

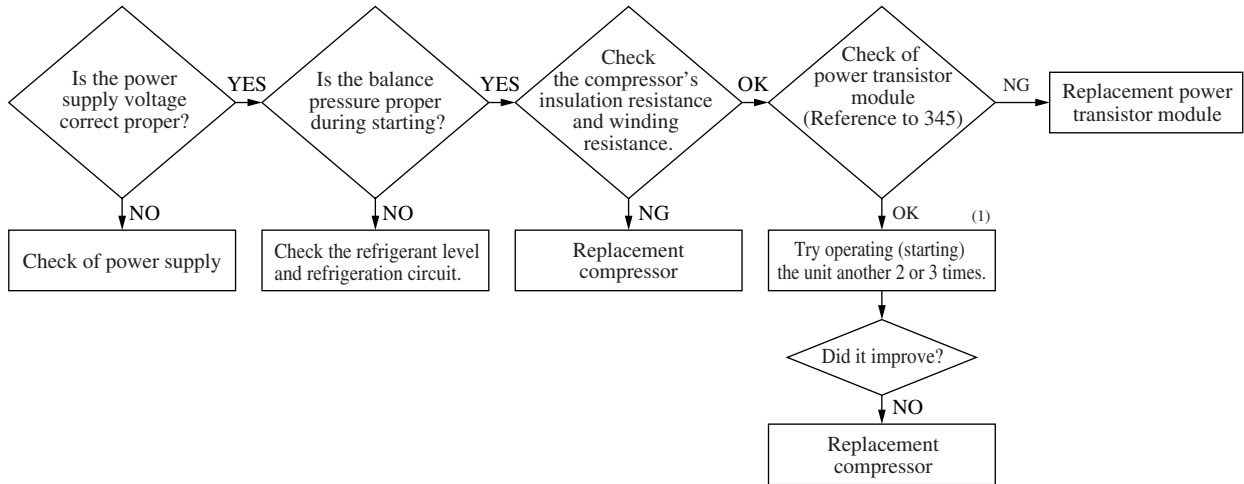
**Error display : E59**  
**7-segment display : E59-1**  
**E59-2**

**[Abnormalities in compressor starting]**

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash <sup>(2)</sup>
Green LED	Keeps flashing	Green LED	Keeps flashing

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

(2) Single flashing of outdoor unit LED indicates abnormalities in compressor (CM1) starting and double flashing indicates abnormalities in compressor (CM2) starting.



Note (1) While attempting to restart the compressor 2 or 3 times, the liquid refrigerant inside the compressor may be dispelled to outside the compressor and the starting abnormality may improve and recover.

• Display conditions

(1) If it can't be started 2 times in 7 attempts.

(2) A remote control reset is possible after 3 minutes passes.

24

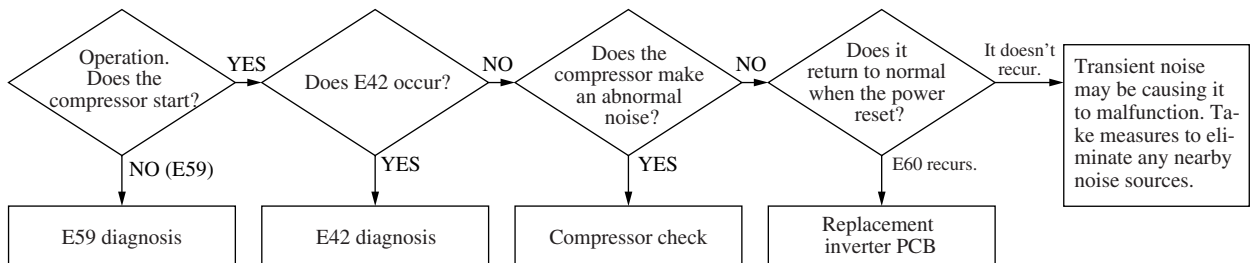
**Error display : E60**  
**7-segment display : E60-1**  
**E60-2**

**[Compressor loader position detection error]**

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash <sup>(2)</sup>
Green LED	Keeps flashing	Green LED	Keeps flashing

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

(2) Single flashing of outdoor unit LED indicates compressor (CM1) loader position detection error and double flashing indicates compressor (CM2) loader position detection error.



• Display conditions

(1) After rotor position detection operation, if the rotor's position cannot be detected again (4 times in 15 minutes), an error is displayed.

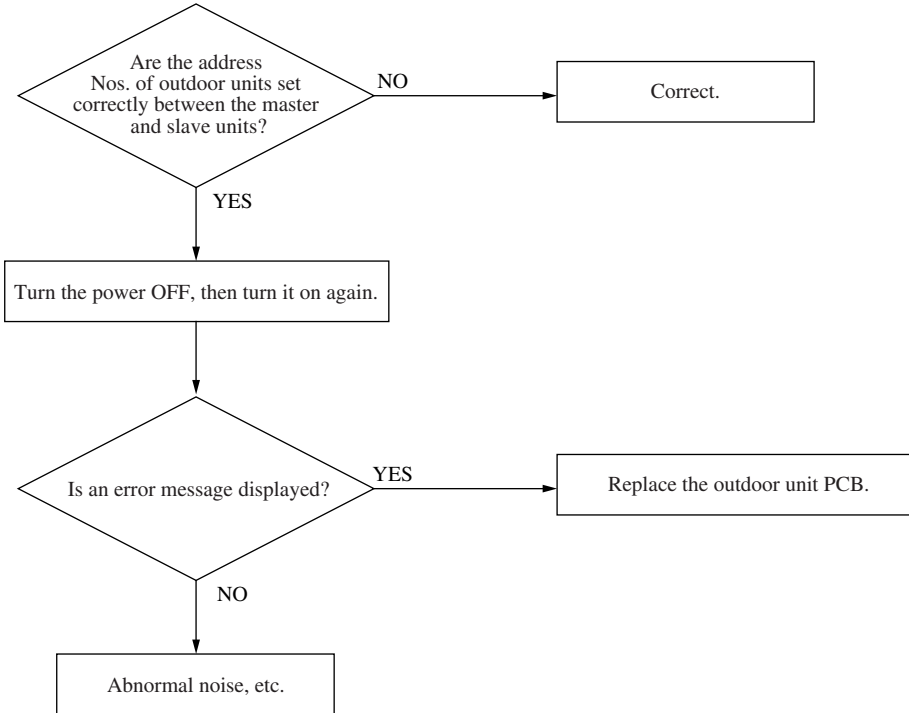
(2) A remote control reset is possible after 3 minutes passes.

25

Error display : *EE1*  
7-segment display : *EE1*

[Communications error between the master unit and slave units]  
[Combination unit only]

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



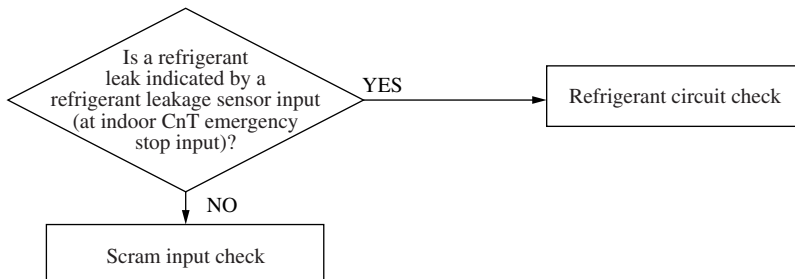
26

Error display : *EE3*  
7-segment display : *EE3*

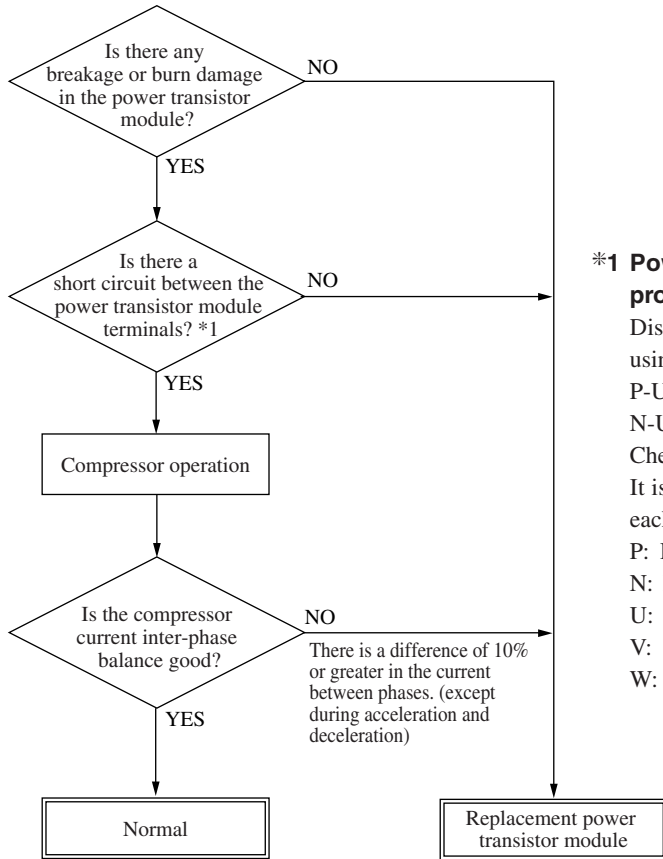
[Scram]

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

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



**Checking the power transistor module (including the drive circuit)**



**\*1 Power transistor module terminal short circuit check procedure**

Disconnect the compressor wiring, then check for short circuits using a tester.

P-U, P-V, P-W

N-U, N-V, N-W

Check between the P and N terminals.

It is easy to make tester contact with the following locations on each of the terminals.

P: Red harness side of the power transistor module terminal block.

N: Blue harness side of the power transistor module terminal block.

U: End of red harness to the compressor.

V: End of white harness to the compressor

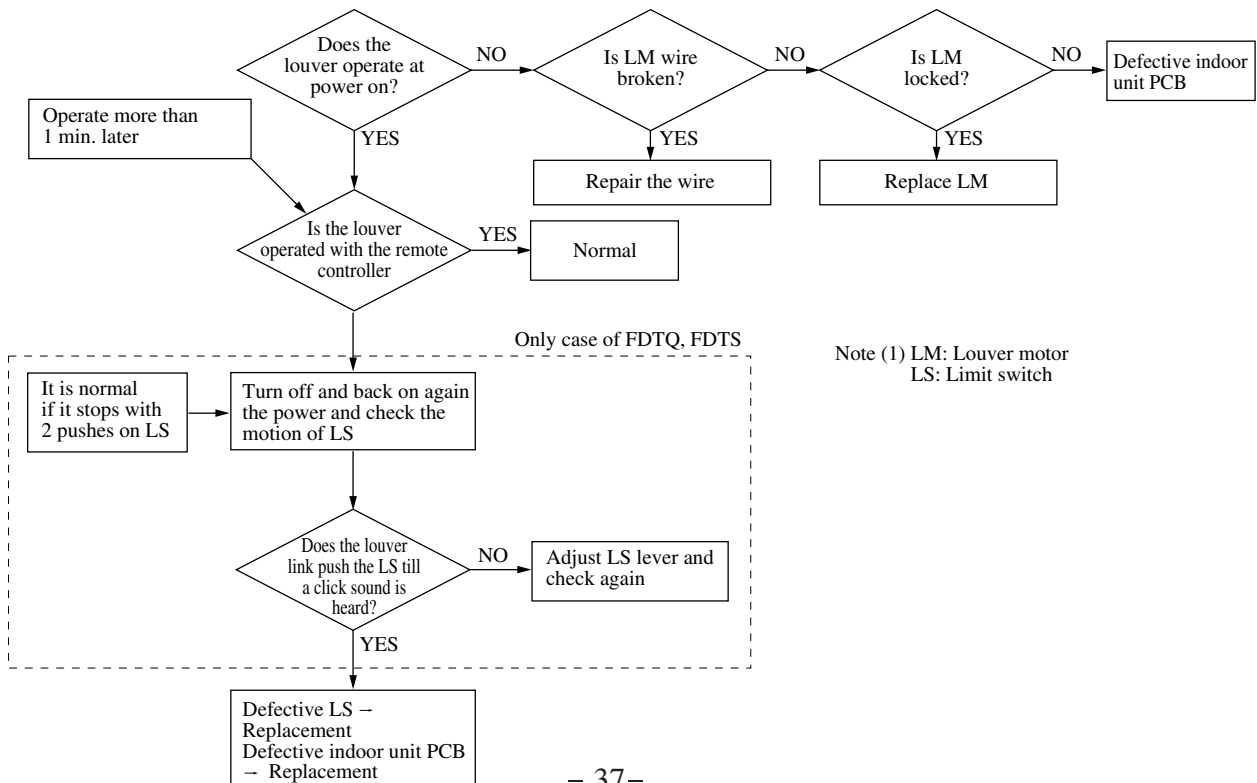
W: End of blue harness to the compressor

**(d) How to advance checks for each faulty symptom**

**(i) Inspection method when there is no error display**

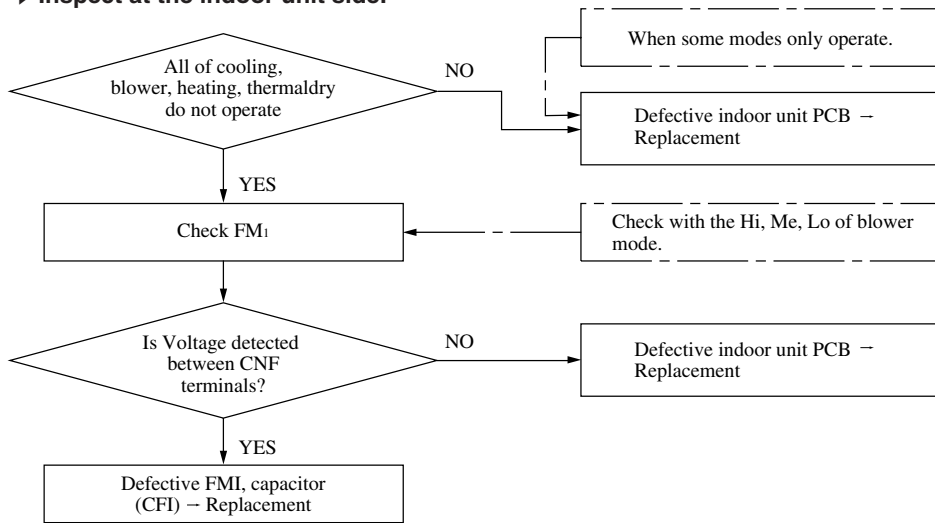
**1) Louver motor does not operate**

▶ Inspect at the indoor unit side.

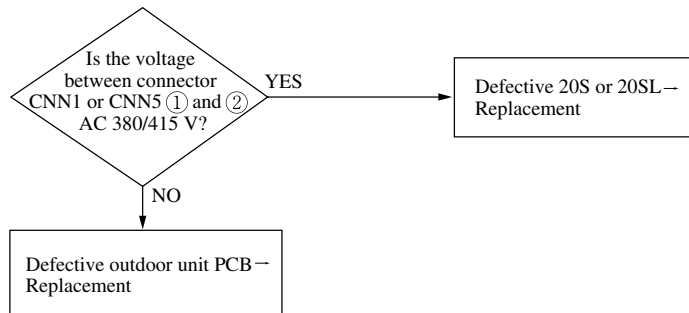


**2) When the indoor unit blower does not operate**

► Inspect at the indoor unit side.



**3) Four way valve does not switch during heating operation**



(ii) When the cooling (heating) effect is felt insufficient. (Check also the refrigeration cycle for the refrigerant quantity, etc. in addition to the following.)

**1) When the cooling effect is insufficient.**

- Check if the protective function has tripped and, as a result, the compressor operation frequency has dropped below the specified frequency
- Does the indoor expansion valve operate properly? Is it clogged?
- Is the frosting prevention function operated?

**Check method of the indoor unit electronic expansion valve**

Check the indoor controller output to the expansion valve with the following procedures.

► Check how much volt is detected at the expansion valve (SM) connector and at the pin at control side of the connector CnA (white, 7P (5 cores)), and measure also how many seconds the voltages are applied.

White~Brown	} Approx. DC 5V <sup>(2)</sup> is detected for approx. 15 seconds <sup>(1)</sup> at the power on.
Yellow~Brown	
Orange~Brown	
Blue~Brown	

► The indoor controller is normal if the seconds and voltages as indicated at left are confirmed.

When the expansion valve does not operate while the voltages are detected (operating sound is not heard), the expansion valve is defective.

► If the thermostat setting is changed, the expansion valve will operate approx. 20 seconds later. Then, approx. 5V will be confirmed at the CnA same as above.

Notes (1) 5V is maintained for 8 seconds after the power on, then it drops momentarily and recovers 5V for approx. 7 seconds.

(2) When measured with a digital multi-tester, voltages of approx. 6~3V are output one after another.

## 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 press any of the switches above and "INVALID OPER" is displayed, the switch has no function. But it does not mean a failure.



**(e) 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

- (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)
02	SET TEMP. 27°C
03	RETURN AIR 28°C
04	I/U HEAT EXCH1 6°C
05	I/U HEAT EXCH2 5°C
06	I/U HEAT EXCH3 4°C
07	I/U FAN Hi
08	REQUIRED HERTZ 45Hz
09	SELECTED HERTZ 45Hz
10	EEV 480PULS
11	TOTAL I/U RUN 10500H
21	OUTDOOR 35°C
22	O/U HEAT EXCH1 55°C
23	O/U HEAT EXCH2 56°C
24	COMP HERTZ 85.0Hz
25	Hi PRESSURE 2.0MPa
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 OFF
35	DEFROST OFF
36	TOTAL COMP RUN 8500H
37	EEV1 480PULS
38	EEV2 480PULS

## Maintenance Schedule

Unit	Item	Period	Check	Test	Maintenance
Indoor	Fan & Motor	6 Months	Running Noise Measure Winding Res	No Abnormal Noise Insulation 1M $\Omega$ +	Clean Blade/Replace Motor If less, replace
	Air Filter	3 Months	Clean Visually Check For Damage		Clean Replace if Damaged
	Condensate Drain system	6 Months	Check connections, mountings Check for blockage and dirt Check Pump and Float Switch	Pump clears drain tray. Float switch gives alarm	Tighten as necessary Clean as necessary Replace if necessary Replace if necessary
	Coil and refrigeration system	12 Months	Check operation  Check of contamination	Unit produces Cooling (Heating) on demand	Investigate and fix any faults  Clean as necessary
	Controllers	12 Months	Check operation	Operate in all modes	Replace if necessary
Outdoor	Compressor	6 Months	Running Noise Measure Winding Res	No Abnormal Noise Insulation 1M $\Omega$ +	Replace if necessary If less, replace
	Fan & Motor	6 Months	Running Noise Measure Winding Res	No Abnormal Noise Insulation 1M $\Omega$ +	Clean Blade/Replace Motor If less, replace
	Coil and refrigeration system	12 Months	Check operation  Check of contamination	Unit produces Cooling (Heating) on demand	Investigate and fix any faults  Clean as necessary
	Electrical system	6 Months	Check tightness of terminals		Tighten as necessary

## AIR CONDITIONING MAINTENANCE CHECK LIST

issue 04/03/02

SITE .....

Clients' Name .....

Sheet No .....

tick each box if applicable

Indoor Unit	Unit A	Unit B	Unit C	Unit D	Unit E	Unit F	Unit G	Unit H
Model No								
Serial No								
Unit No/Location								
Check for unusual noise/vibration								
Check unit mtg brackets/fixings								
Check duct connections where applicable								
Check condensate drain runs clear								
Check condensate pump operation where applicable								
Check fan runs smoothly								
Check electrical mains connections for tightness								
Record FLA fan motor								
Check for evidence of gas leaks								
Clean air filter, reset filter light								
Use Biocide clean capsule or liquid in drain tray								

Outdoor Unit	System 1	System 2	System 3	System 4
Model No				
Serial No				
Unit No/Location				
Check for unusual noise/vibration				
Check unit mounting brackets/fixings				
Check electrical mains connections for tightness				
Note nameplate amps				
Record actual running current				
Check overload settings where applicable				
Check for evidence of gas leaks				
Check Coil & clean if necessary				

System	System 1	System 2	System 3	System 4
Note if fault code displayed E?? (Last recorded fault will be shown)				
Investigate if fault remedied and reset display				
Run system in each mode to check operation				
System left fully operational				

Engineer .....

Date .....

Clients' Signature .....

Print Name .....

If you have any technical queries, please contact the 3D Air Sales Technical Department on 01376 565505





## 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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