

18 TROUBLESHOOTING

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18.1 INITIAL TROUBLESHOOTING

18.1.1 THIS IS NOT ABNORMAL

- Smells from Indoor Unit
Smell adheres on indoor unit after a long period of time.
Clean the air filter and panels or allow a good ventilation.
- Sound from Deforming Parts
During system starting or stopping, an abrading sound might be heard. However, this is due to thermal deformation of plastic parts. It is not abnormal.
- Steam from Outdoor Heat Exchanger
During defrosting operation, ice on the outdoor heat exchanger is melted, resulting in making steam.
- Dew on Air Panel
When the cooling operation continues for a long period of time under high humidity conditions (higher than 27°C DB/80% R.H), dew can form on the air panel.
- Refrigerant Flow Sound
While the system is being started or stopped, sound from the refrigerant flow may be heard.

18.1.2 NOT COOLING OR HEATING WELL

- Check for obstruction of air flow of the outside or inside units.
- Check if too much heat source exists in the room.
- Check if the air filter is clogged with dust.
- Check to see if the doors or windows are opened or not.
- Check if the temperature condition is not within the operation range.

18.1.3 NOT OPERATE

- Check for electrical wiring.
- Check for dip switch setting.
- Check whether the "SET TEMP" is set at the correct temperature.
- In the case that "RUN" lamp on remote control switch is flickering every 2 seconds, check for connection of remote control line.
- In the case that "RUN" lamp flashes 5 times (5 seconds) with unit number and alarm code displayed, refer to the next item "18.2 Troubleshooting by Alarm Code" and the "Service Manual".
- In the case that no alarm code is indicated and normal operation is not available, refer to the "Service Manual" because abnormality of some device is suspected.

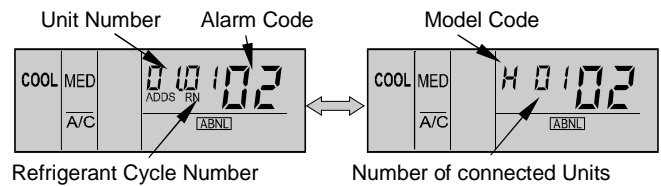
18.2 ALARM CODES

If RUN lamp flashes for 2 seconds, there is a failure in transmission between Indoor Unit and Remote Control Switch. Possible causes are:

- Remote Cable broken
- Contact Failure in Remote Control Cable
- IC or Microcomputer defective

In any case, ask your contractor for service

If RUN lamp flashes 5 times (5 seconds) with unit number and alarm code displayed, note the alarm code (see table below) and ask your contractor for service.

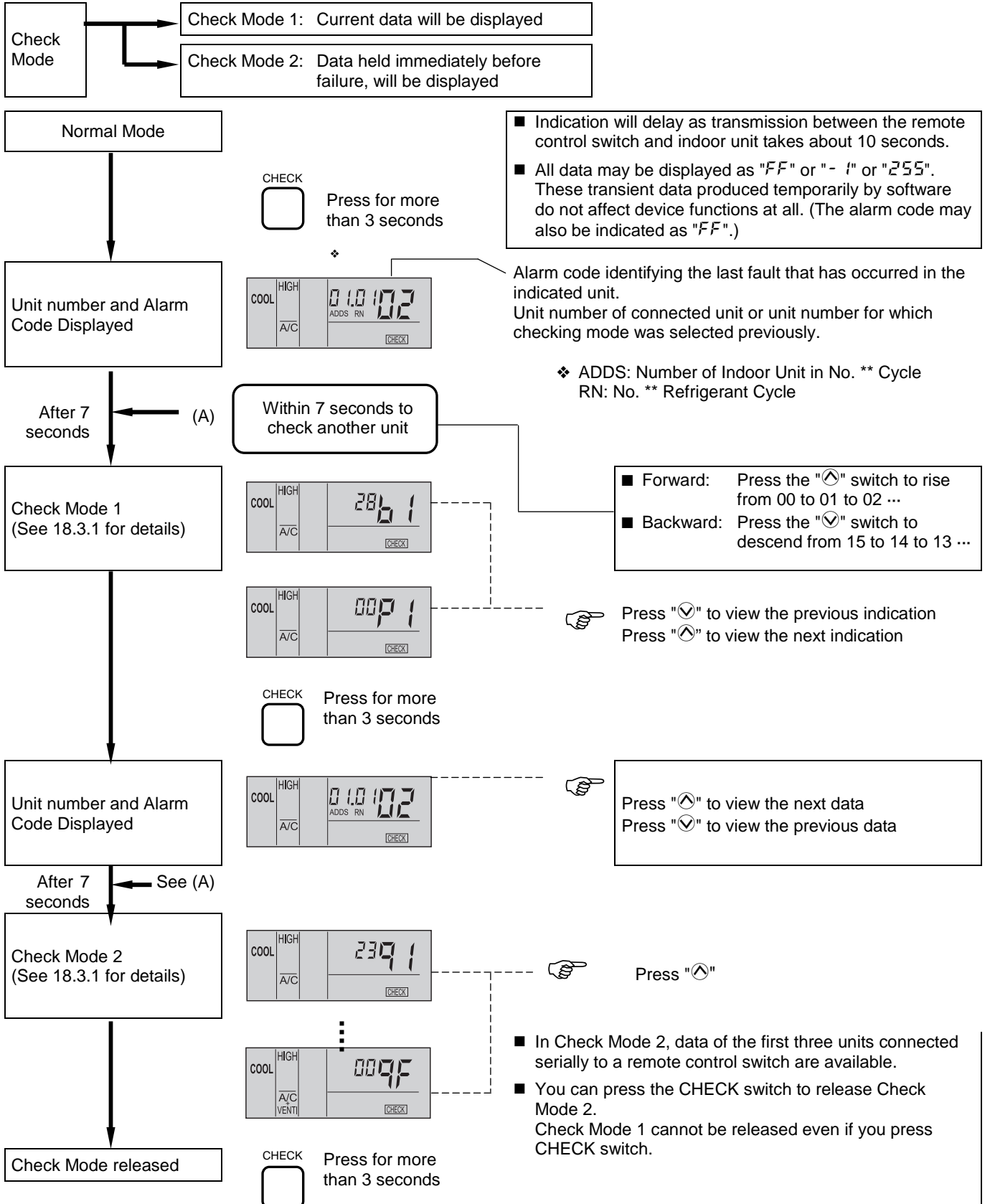


Code No.	Category	Content of Abnormality	Leading Cause
01	Indoor Unit	Tripping of Protection Device	Failure of Fan Motor, Drain Discharge, PCB, Relay.
02	Outdoor Unit	Tripping of Protection Device	Activation of PSH
03	Transmission	Abnormality between Indoor (or Outdoor) and Outdoor (or Indoor)	Incorrect Wiring. Failure of PCB. Tripping of Fuse. Power Supply OFF
04	Inverter	Abnormality between Inverter and Control PCB	Failure in Transmission between PCBs
05	Transmission	Abnormality of Power Source Wiring	Reverse Phase Incorrect Wiring.
06	Voltage Drop	Voltage Drop by Excessively Low or High Voltage to Outdoor Unit	Voltage Drop of Power Supply. Incorrect Wiring or insufficient Capacity of Power Supply Wiring.
07	Cycle	Decrease in Discharge Gas Superheat	Excessive Refrigerant Charge. Expansion Valve Open Lock.
08		Increase in Discharge Gas Temperature	Insufficient Refrigerant. Ref. Leakage, Clogging or Expansion Valve Close Lock
09	Outdoor Unit	Tripping of Protection Device	Failure of Fan Motor.
11	Sensor on Indoor Unit	Inlet Air Thermistor	Failure of Thermistor, Sensor, Connection.
12		Outlet Air Thermistor	
13		Freeze Protection Thermistor	
14		Gas Piping Thermistor	
19		Tripping of Protection Device for Fan Motor	Failure of Fan Motor
21	Sensor on Outdoor Unit	High Pressure Sensor	Failure of Thermistor, Sensor, Connection
22		Outdoor Air Thermistor	
23		Discharge Gas Thermistor on Comp.	
24		Evaporating Thermistor	
29		Low Pressure Sensor	
30	System	Incorrect Wiring Connection	Incorrect Wiring Connection between Outdoor Unit, CH Unit and Indoor Unit
31		Incorrect Setting of Outdoor and Indoor Unit	Incorrect Setting of Capacity Code.
32		Abnormal Transmission of Other Indoor Unit	Failure of Power Supply, PCB in other Indoor Unit. Failure of other Indoor Unit of the same Refrigerant Cycle
35		Incorrect Setting in Indoor Unit No.	Existence of the same Indoor Unit No. in the same Refrigerant Cycle
38		Abnormality of Protective Circuit in Outdoor Unit	Failure of Indoor Unit PCB. Incorrect wiring. Connection to PCB in Indoor Unit.
39		Abnormality of Running Current at Constant Compressor	Overcurrent, Blown Fuse of Failure of Current Sensor.
43	Pressure	Pressure Ratio Decrease Protection Activating	Failure of Compressor, Inverter
44		Low Pressure Increase Protection Activating	Overload to Indoor in Cooling. High Temperature of Outdoor Air In Heating Expansion Valve Open Lock
45		High Pressure Increase Protection Activating	Overload Operation. Excessive Refrigerant. Clogging of Heat Exchanger
46		High Pressure Decrease Protection Activating	Insufficient Refrigerant.
47		Low Pressure Decrease Protection Activating	Insufficient refrigerant .
51	Inverter	Abnormality of Current Sensor for Inverter	Failure of Sensor on Inverter PCB
52		Overcurrent Protection Activating	Overload, Overcurrent, Locking to Compressor.
53		IPM Protection Activating	Automatic Stoppage of IPM (Overcurrent, Low Voltage or Overheating).
54		Increase in Inverter Fin Temperature	Abnormal Inverter Fin Thermistor. Abnormal Outdoor Fan
56	Outdoor Fan	Abnormality of Detection for Fan Motor Position	Abnormal detection Circuit of Transmission
57		Fan Controller Protection Activating	Abnormal Fan Speed
58		Abnormality of Fan Controller	Overcurrent, Abnormal Fan Controller Fin
59	AC Chopper	AC Chopper Circuit Protection	Failure of FET, Power Supply, CT for Fan Motor
EE	Inverter	Compressor Protection	3 Time Occurrence of Alarm Giving Damage to Compressor within 6 hours

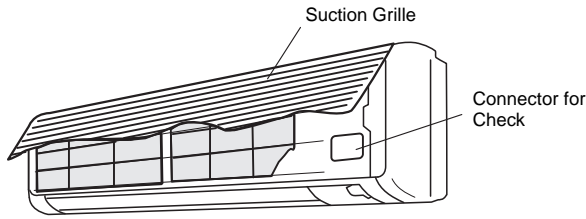
18.3 TROUBLESHOOTING IN CHECK MODE

Use the remote control CHECK switch in the following cases.

1. When the RUN lamp is flashing
2. To trace back the cause of trouble after restarting from stoppage with the RUN lamp flashing
3. To check during normal operation or stoppage
4. To monitor the temperature of intake and discharge air.



Although the wireless controller is used for wall type indoor unit with built-in receiver part, the alarm code can be checked by connecting PC-P1HE .

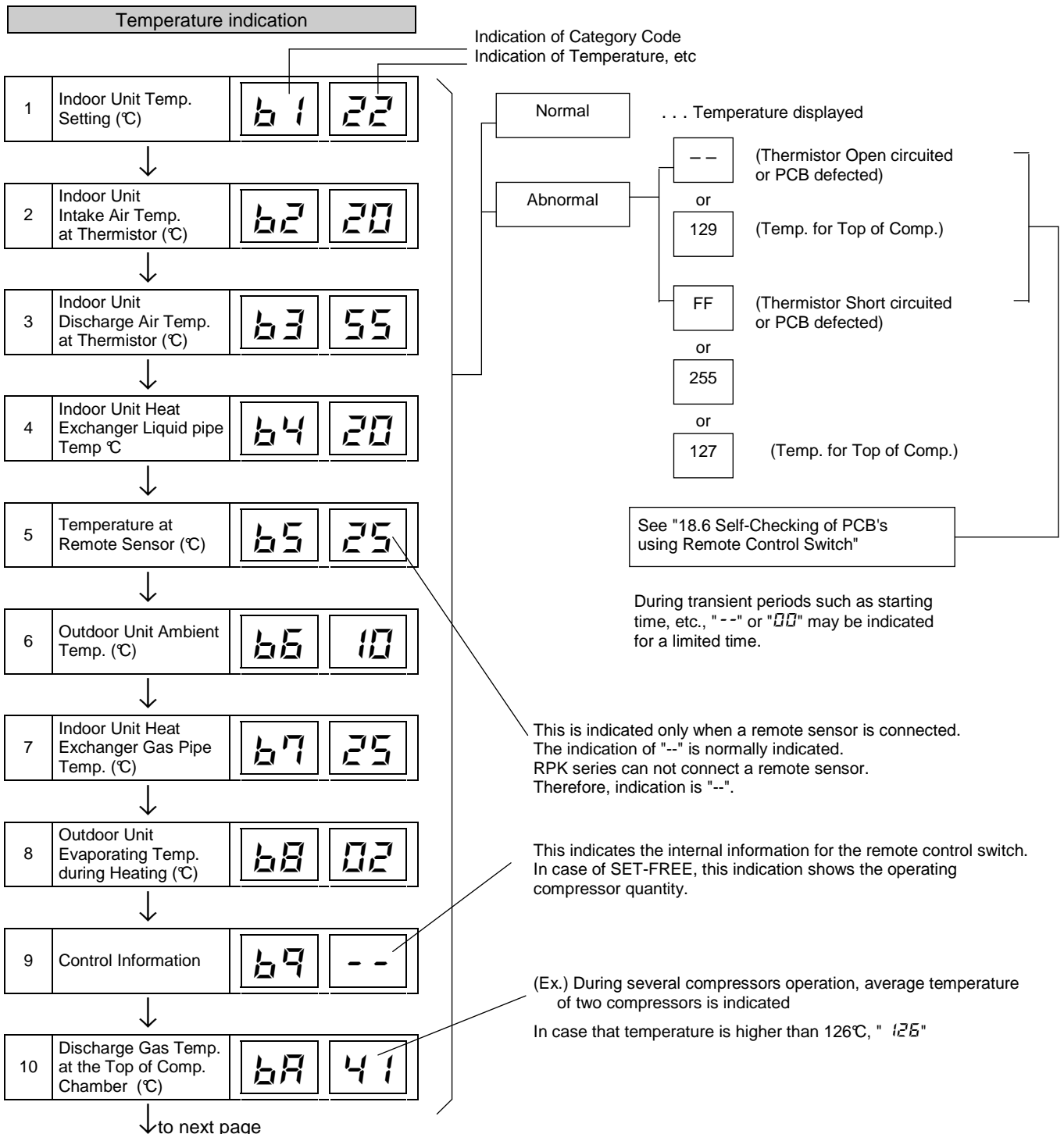


NOTE:

1. The unit is not operated by pressing operation switch.
2. The above function is available only when alarm occurs.
3. The PCB check by remote controller is not available.
4. The indication is the data when connecting PC-P1H, not the data before the alarm occurs.

18.3.1 CONTENTS OF CHECK MODE 1

The next indication is shown by pressing the part "▲" of "TEMP" switch. If the part "▼" of "TEMP" switch is pressed, the previous indication is shown.



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11	Thermo Temp. of Remote Control Switch	bb	23
----	---------------------------------------	----	----

Indication on Micro-Computer Input /Output

12	Micro Computer Input/Output in Indoor Unit	E1	4
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13	Micro Computer Input/Output in Outdoor Unit	E2	-
----	---	----	---

Indication of Unit Stoppage cause

14	Cause of Stoppage	d1	01
----	-------------------	----	----

Abnormality Occurrence Counter

15	Abnormality Occurrence Times	E1	01
----	------------------------------	----	----

16	Instantaneous Power Failure Occurrence Times in Indoor Unit	E2	00
----	---	----	----

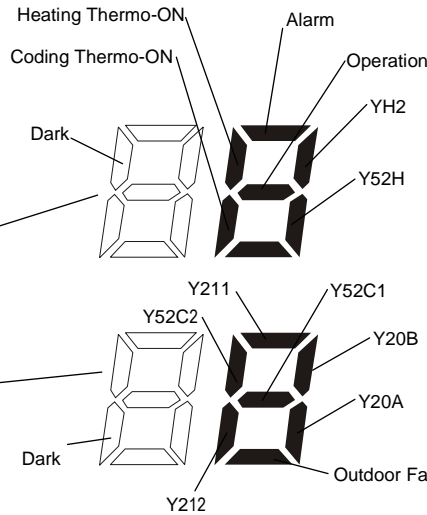
17	Transmission Error Occurrence Times between Remote Control Switch and Indoor Unit	E3	00
----	---	----	----

18	Abnormality Occurrence Times on Inverter	E4	00
----	--	----	----

Indication of Automatic Louver Condition

19	Louver Sensor	F1	00
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PCB Relay	Part Name
YH2	Relay for Drain pump (MD) and/or Dew Heater (EHW)
Y52H	Relay for Electric Heater (CEH)
Y211	Relay for 4-Way Valve
Y212	
Y52C1	Relay for Compressor
Y52C2	Relay for Solenoid Valve
Y20A	
Y20B	

Symbols with a letter Y are relays of PCB

00	Operation OFF, Power OFF
01	Thermo - OFF (Note 1)
02	Alarm (Note 2)
03	Freeze Protection, Overheating Protection
05	Instantaneous Power Failure at Outdoor Unit, Reset (Note 3)
06	Instantaneous Power Failure at Indoor Unit, Reset (Note 4)
07	Stoppage of Cooling Operation due to Low Outdoor Air Temperature, Stoppage of Heating Operation due to High Outdoor Air Temperature
08	Compressor Quantity Changeover, Stoppage (HP≥8)
10	Demand, Enforced Stoppage
11	Retry due to Pressure Ratio Decrease
12	Retry due to Low Pressure Increase
13	Retry due to High Pressure Increase
14	Retry due to Abnormal Current of Constant Compressor (HP≥8)
15	Retry due to Abnormal High Temperature of Discharge Gas, Excessive Low Suction Pressure
16	Retry due to Decrease of Discharge Gas Superheat
17	Retry due to Inverter Tripping
18	Retry due to Voltage Decrease
19	Expansion Valve Opening Change Protection
20	Operation Mode Changeover of Indoor Unit (Note 5)



NOTE:

1. **Explanation of Terms**
 Thermo-ON: A condition than an Indoor Unit is requesting compressor to operate.
 Thermo-OFF: A condition than an Indoor Unit is not requesting compressor to operate.
2. Even if stoppage is caused by "Alarm", "02" is not always indicated.
3. If transmission between the inverter printed circuit board and the control printed circuit board is not performed during 30 seconds, stoppage is d1-05 cause and the alarm code "04" may be indicated.
4. If transmission between the Indoor Unit and the Outdoor Unit is nor performed during 3 minutes, Indoor Units are stopped. In this case, stoppage is d1-06 cause and the alarm code "03" may be indicated.
5. In the FS(3/5) system "20" will be indicated at the difference mode between Indoor Units.

Countable up to 99.
Over 99 times, "99" is always indicated.



NOTE:

1. If a transmitting error continues for 3 minutes, one is added to the occurrence times.
2. The memorized data can be cancelled by the method indicated in 18.6 "Self-checking of PCBs using Remote Control Switch"

00 : Normal
FF : Abnormal

Compressor Pressure/Frequency Indication

20 Discharge Pressure (High) (x 0.1 MPa) H1 18



21 Suction Pressure (Low) (x 0.01 MPa) H2 04



22 Control Information H3 44

This is an indication for internal information for the remote control switch. This does not have any specific meaning.



23 Operation Frequency (Hz) H4 44

The total frequency is indicated when several compressors are running



Indoor Unit Capacity Indication

24 Indoor Unit Capacity J1 08

The capacity of the Indoor Unit is indicated as shown in the table below.

Capacity Code of Indoor Unit

Indication Code	Equivalent Capacity (HP)
06	0.8
08	1.0
10	1.3
13	1.5
14	1.8
16	2.0
18	2.3
20	2.5
22	2.8
26	3.0
32	4.0
40	5.0



25 Outdoor Unit Code J2 Fn

"n" indicates total number of Indoor Units;
n= 1 ~ 9, A, b, C, d, E, F, U
(10) (11) (12) (13) (14) (15) (16)



26 Refrigerant Cycle Number J3 01

J3: 01 ~ 16 (01: when shipment (DSW5),
Decimal indication
J4: 00 ~ 0F (00: when shipment (DSW5),
Indication with 16 numbers



27 Refrigerant Cycle Number J4 00



Expansion Opening Indication

28 Indoor Unit Expansion Valve Opening (%) L1 20



29 Outdoor Unit Expansion Valve MV1 Opening (%) L2 99

In case of models without Expansion Valve (MV2), the same figure is indicated



30 Outdoor Unit Expansion Valve MV2 Opening (%) L3 99



31 Outdoor Unit Expansion Valve MVB Opening (%) L4 00

FX series only



Estimated Electric Current Indication

32 Compressor Running Current (A) P1 25

The total current is indicated when several compressors are running.
In case of inverter compressor, the running current of primary side of inverter is indicated

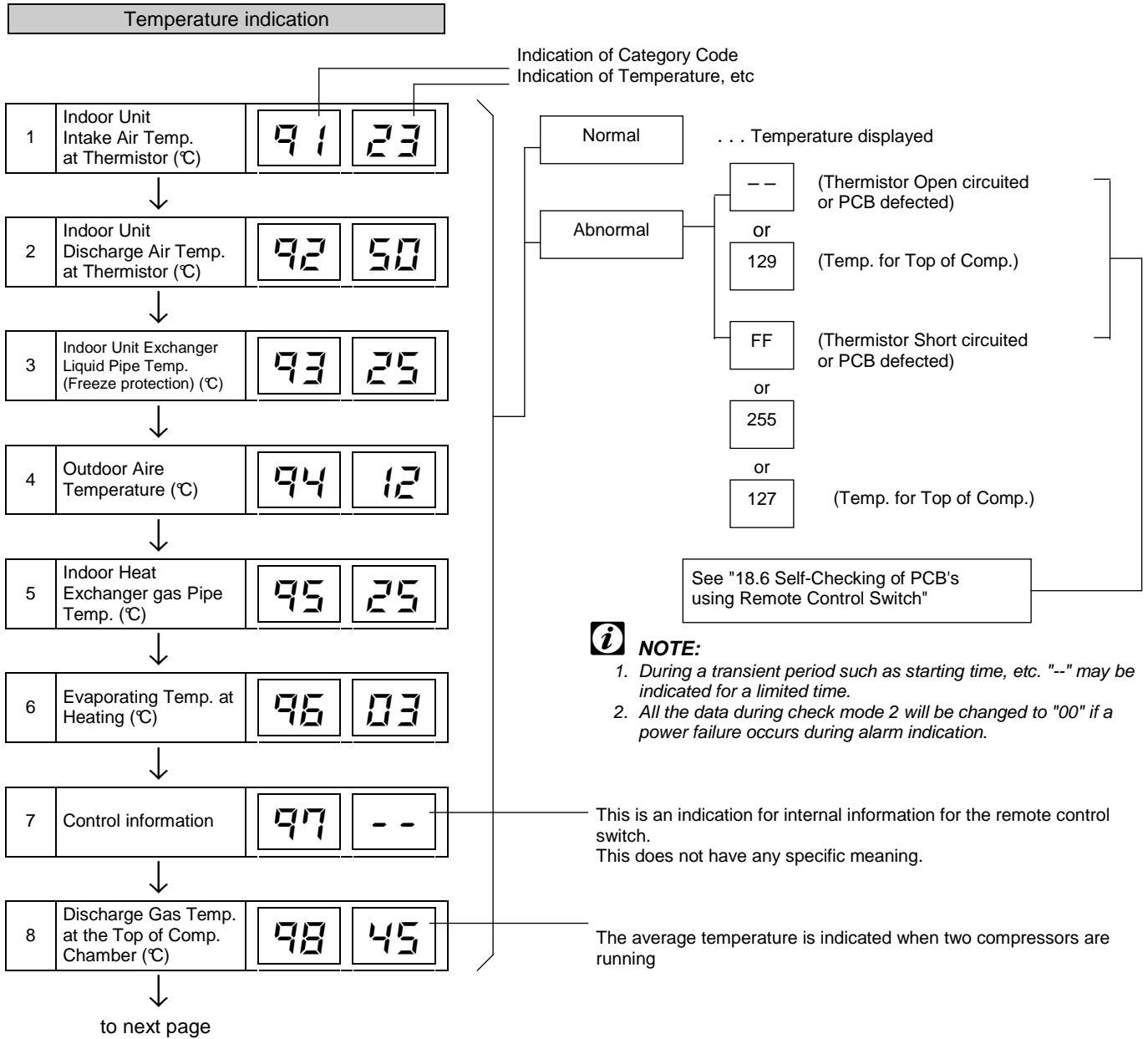
↓ Returns to Temperature Indication

Temperature Indication

18.3.2 CONTENTS OF CHECK MODE 2

The latest data of the first three indoor units only connected serially are indicated when more than three indoor units are connected to one remote control switch.

By pressing the "⊙" part of "TEMP" switch, the next display is indicated. If the part "⊚" of "TEMP" switch is pressed, the previous display is indicated.



Compressor Pressure/Frequency Indication

9	Discharge Pressure (High) (x 0.1 MPa)	99	18
---	---------------------------------------	----	----



10	Suction Pressure (Low) (x 0.01 MPa)	9A	04
----	-------------------------------------	----	----



11	Control Information	9b	44
----	---------------------	----	----

This is an indication for internal information for the remote control switch. This does not have any specific meaning.



12	Operating Frequency (Hz)	9C	44
----	--------------------------	----	----

The total frequency is indicated when several compressors are running



Expansion Opening Indication

13	Indoor Unit Expansion Valve Opening (%)	9d	20
----	---	----	----



14	Outdoor Unit Expansion Valve MV1 Opening (%)	9E	99
----	--	----	----



Estimated Electric Current Indication

15	Compressor Running Current (A)	9F	20
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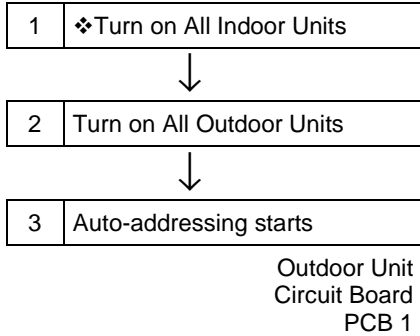
The total value is indicated when several compressors are running

↓ Returns to Temperature Indication

Temperature Indication

18.4 TROUBLESHOOTING BY 7-SEGMENT DISPLAY

18.4.1 SIMPLE CHECKING BY 7-SEGMENT DISPLAY



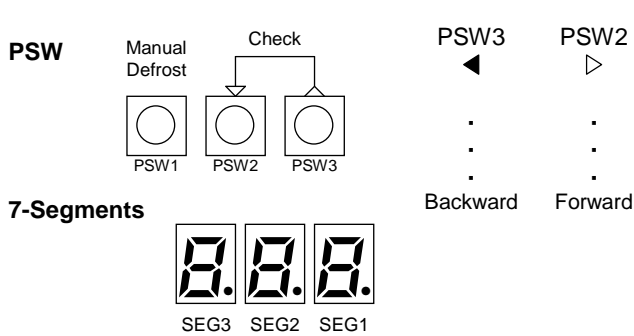
❖ All the Indoor Units Connected to the Outdoor Unit

During auto-addressing, the following items can be checked using the outdoor unit's on-board 7-segment LED display.

1. Disconnection of power supply to the Indoor Unit.
2. Reverse connection of the operating line between the Outdoor and Indoor Units
3. Duplication of Indoor Unit number.

18.4.2 CHECKING METHOD BY 7-SEGMENT DISPLAY

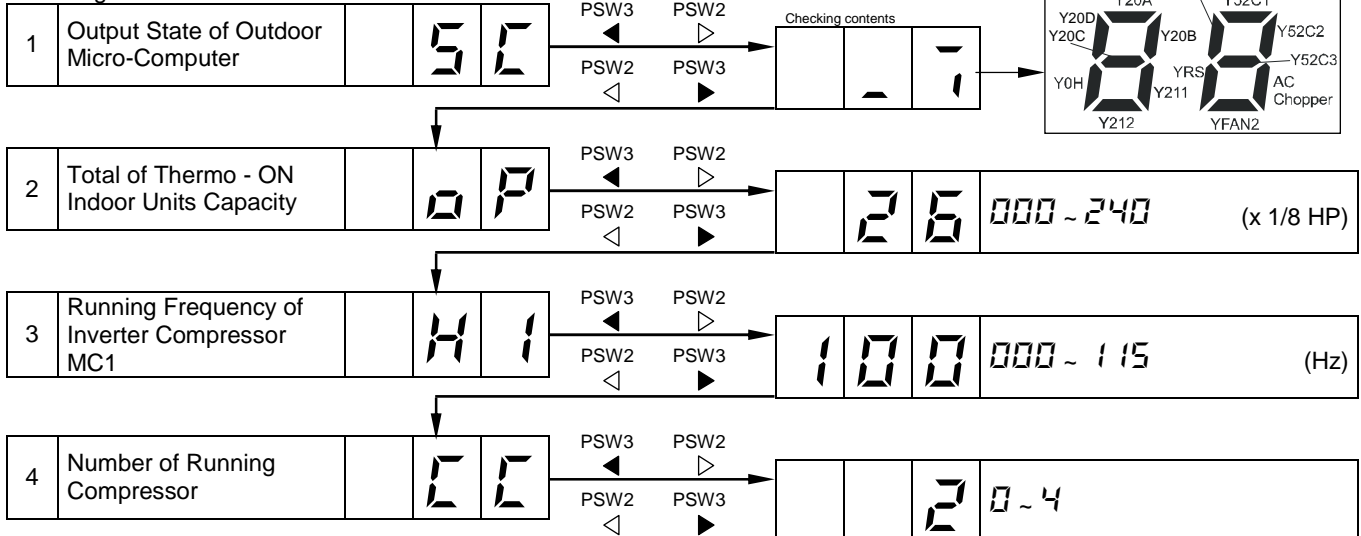
By using the 7-segments and check switch (PSW) on the PCB1 in the Outdoor Unit, total quantity of combined Indoor Units, 7-segments operation conditions and each part of refrigerant cycle can be checked.



- To start checking, press the "PSW2" switch for more than 3 seconds.
- To proceed checking, press the "PSW2" switch for less than 2 seconds.
- To proceed reversely, press the "PSW3" for less than 2 seconds.
- To cancel this checking, press the "PSW2" switch for more than 3 seconds. The display will be changed to the indication one step before. Then, press the PSW2"switch once again for more than 3 seconds.

PCB Relay	Part Name	PCB Relay	Part Name
Y20A	Relay for Solenoid Valve (SVA/B/C)	Y52C1	Relay for Compressor
Y20B		Y52C2	
Y20C		Y52C3	
Y20D	Relay for Cranckcase heater	Y52C4	
Y211	Relay for 4-way Valve	AC Chopper	Relay for AC Chopper Fan
Y212		YFAN2	Relay for 2 nd fan at fix speed
YRS	Relay for Relay Contactor		

Checking Item



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Checking item

5	Air flow ratio	F0	PSW3 PSW2 PSW2 PSW3 ◀ ▶ ◀ ▶	Checking contents	16	0 ~ 16	
6	Outdoor Expansion Valve MV1 Opening	0E1	PSW3 PSW2 PSW2 PSW3 ◀ ▶ ◀ ▶		38	0 ~ 100	(%)
7	Outdoor Expansion Valve MV2 Opening <small>(For 16 to 30HP FS5)</small>	0E2	PSW3 PSW2 PSW2 PSW3 ◀ ▶ ◀ ▶		38	0 ~ 100	(%)
8	Outdoor Expansion Valve MV3 Opening <small>(For 24, 30HP FS5)</small>	0E3	PSW3 PSW2 PSW2 PSW3 ◀ ▶ ◀ ▶		38	0 ~ 100	(%)
9	Outdoor Expansion Valve MVB Opening <small>(For 24, 30HP FS5)</small>	0Eb	PSW3 PSW2 PSW2 PSW3 ◀ ▶ ◀ ▶		10	0 ~ 100	(%)
10	Discharge Pressure (High)	Pd	PSW3 PSW2 PSW2 PSW3 ◀ ▶ ◀ ▶		1.8	0.0 ~ 3.0	(MPa)
11	Suction Pressure (Low)	P5	PSW3 PSW2 PSW2 PSW3 ◀ ▶ ◀ ▶		0.34	0.09 ~ 0.99	(MPa)
12	Discharge Gas Temp. on the Top of Compressor MC1 (TD1)	r d 1	PSW3 PSW2 PSW2 PSW3 ◀ ▶ ◀ ▶	□ = Open Circuited, 255 = Short - circuited	100	1 ~ 142	(°C)
13	Discharge Gas Temp. on the Top of Compressor MC2 (TD2) <small>(For 8 to 30HP)</small>	r d 2	PSW3 PSW2 PSW2 PSW3 ◀ ▶ ◀ ▶	□ = Open Circuited, 255 = Short - circuited	90	1 ~ 142	(°C)
14	Discharge Gas Temp. on the Top of Compressor MC3 (TD3) <small>(For 16 to 30HP)</small>	r d 3	PSW3 PSW2 PSW2 PSW3 ◀ ▶ ◀ ▶	□ = Open Circuited, 255 = Short - circuited	100	1 ~ 142	(°C)
15	Discharge Gas Temp. on the Top of Compressor MC4 (TD4) <small>(For 20 to 30HP)</small>	r d 4	PSW3 PSW2 PSW2 PSW3 ◀ ▶ ◀ ▶	□ = Open Circuited, 255 = Short - circuited	90	1 ~ 142	(°C)
16	Evaporating Temperature 1 at Heating	r E 1	PSW3 PSW2 PSW2 PSW3 ◀ ▶ ◀ ▶	- i27 = Open Circuited, i27 = Short - circuited	6	-42 ~ 88	(°C)
17	Evaporating Temperature 2 at Heating <small>(For 16 to 30HP)</small>	r E 2	PSW3 PSW2 PSW2 PSW3 ◀ ▶ ◀ ▶	- i27 = Open Circuited, i27 = Short - circuited	6	-42 ~ 80	(°C)

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Checking item

18	Evaporating Temperature 3 at Heating <small>(For 24, 30HP)</small>	FE3	PSW3 ← PSW2 PSW2 ↓ PSW3 →	- i27 = Open Circuited , i27 = Short - circuited	6	-42 ~ 80	(°C)

19	Ambient Air Temperature (TO)	FO	PSW3 ← PSW2 PSW2 ↓ PSW3 →	- i27 = Open Circuited , i27 = Short - circuited	35	-42 ~ 80	(°C)

20	Estimated Running Current of Compressor MC1	AI	PSW3 ← PSW2 PSW2 ↓ PSW3 →	Indicates running current of primary side of inverter	10	000 ~ 255	(A)

21	Estimated Running Current of Compressor MC2 <small>(For 8 to 30HP)</small>	AI	PSW3 ← PSW2 PSW2 ↓ PSW3 →		12	000 ~ 255	(A)

22	Estimated Running Current of Compressor MC3 <small>(For 16 to 30HP)</small>	AI	PSW3 ← PSW2 PSW2 ↓ PSW3 →		13	000 ~ 255	(A)

23	Estimated Running Current of Compressor MC4 <small>(For 20 to 30HP)</small>	AI	PSW3 ← PSW2 PSW2 ↓ PSW3 →		12	000 ~ 255	(A)

24	(No. 0 Unit)	IE0	PSW3 ← PSW2 PSW2 ↓ PSW3 →		12	No. 0 Unit	(%)
		↓				0 ~ 100	
	Note 1 (No. F Unit)	IEF	PSW3 ← PSW2 PSW2 ↓ PSW3 →		10	No. F Unit	(%)
						0 ~ 100	

(Indicates only the units number connected)

25	(No. 0 Unit)	FL0	PSW3 ← PSW2 PSW2 ↓ PSW3 →		12	No. 0 Unit	(°C)
		~				-62 ~ 127	
	Note 1 (No. F Unit)	FLF	PSW3 ← PSW2 PSW2 ↓ PSW3 →		12	No. F Unit	(°C)
						-62 ~ 127	

(Indicates only the units number connected)

26	(No. 0 Unit)	FG0	PSW3 ← PSW2 PSW2 ↓ PSW3 →		17	No. 0 Unit	(°C)
		~				-62 ~ 127	
	Note 1 (No. F Unit)	FGF	PSW3 ← PSW2 PSW2 ↓ PSW3 →		17	No. F Unit	(°C)
						-62 ~ 127	

(Indicates only the units number connected)

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Checking item

27	Indoor Unit Intake Air Temperature.	(No. 0 Unit)	7	,	0	PSW3 ←	PSW2 →	2	7	No. 0 Unit	-62 ~ 127	(°C)
		~			~	PSW2 ←	PSW3 →					
	Note 1	(No. F Unit)	7	,	F	PSW3 ←	PSW2 →	2	7	No. F Unit	-62 ~ 127	(°C)
						PSW2 ←	PSW3 →					

(Indicates only the units number connected)

28	Indoor Unit Discharge Air Temperature.	(No. 0 Unit)	7	.	0	PSW3 ←	PSW2 →	1	7	No. 0 Unit	-62 ~ 127	(°C)
		~			~	PSW2 ←	PSW3 →					
	Note 1	(No. F Unit)	7	.	F	PSW3 ←	PSW2 →	1	7	No. F Unit	-62 ~ 127	(°C)
						PSW2 ←	PSW3 →					

(Indicates only the units number connected)

29	Indoor Unit Capacity Setting.	(No. 0 Unit)	C	A	0	PSW3 ←	PSW2 →		8	No. 0 Unit	(x 1/8 HP)
		~			~	PSW2 ←	PSW3 →				
	Note 1	(No. F Unit)	C	A	F	PSW3 ←	PSW2 →	2	0	No. F Unit	(x 1/8 HP)
						PSW2 ←	PSW3 →				

(Indicates only the units number connected)

Refer to the "Capacity Code of Indoor Unit" table for the capacity code indication, page 18/6

30	Indoor Unit Cause of Stoppage	(No. 0 Unit)	d	1	0	PSW3 ←	PSW2 →		1	(No. 0 Unit)	0 ~ 80
		~			~	PSW2 ←	PSW3 →				
	Note 1	(No. F Unit)	d	1	F	PSW3 ←	PSW2 →		1	(No. F Unit)	0 ~ 80
						PSW2 ←	PSW3 →				

(Indicates only the units number connected)

Refer to the "Cause os Stoppage" table, for the code indication at page 18/5

31	Pressure Ratio Fall Protection Degeneration Control		c	1	1	PSW3 ←	PSW2 →		0	0: Degeneration Control is in Operation 1: Degeneration Control is not in Operation
						PSW2 ←	PSW3 →			

32	High-Pressure Rise Protection degeneration Control		c	1	3	PSW3 ←	PSW2 →		1	0: Degeneration Control is in Operation 1: Degeneration Control is not in Operation
						PSW2 ←	PSW3 →			

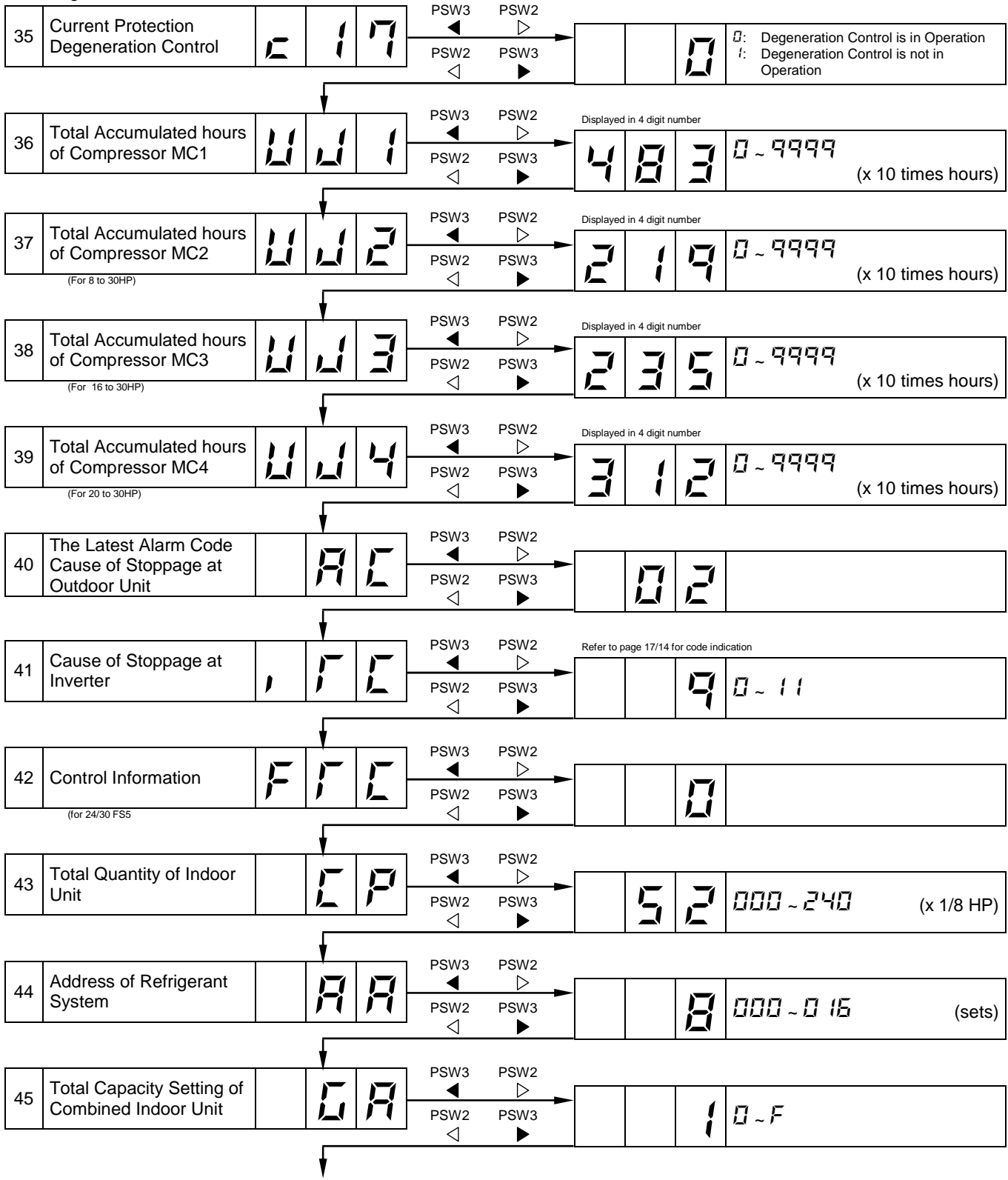
33	Discharge Gas Temp. Increase Protection Degeneration Control		c	1	5	PSW3 ←	PSW2 →		0	0: Degeneration Control is in Operation 1: Degeneration Control is not in Operation
						PSW2 ←	PSW3 →			

34	Discharge Gas Temp. Decrease Protection Degeneration Control		c	1	6	PSW3 ←	PSW2 →		0	0: Degeneration Control is in Operation 1: Degeneration Control is not in Operation
						PSW2 ←	PSW3 →			

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Checking item



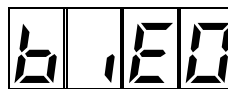
Return to START "5E"



NOTE 1

For RAS-24/30FS5, 7-segment information for all indoor Unit data has been added one number before data, as indicated beside.

Example: Indoor Unit Expansion Valve opening of Ref. Cycle No. 6 Indoor Unit No. 0



Refrigerant Cycle Address Checking Item

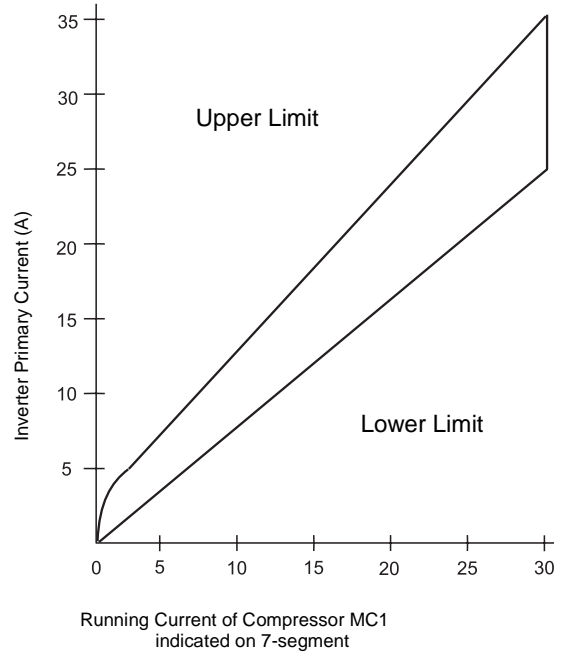
18.4.3 RUNNING CURRENT OF COMPRESSOR

■ Inverter Primary Current

The inverter primary current is estimated from the running current of the compressor MC1 indicated on 7-segments, as the right chart shows.

■ Indicated Running Current of Compressor MC2, MC3, MC4

The running current of the compressor MC2, MC3, MC4, is detected by current sensor. (CT2 ~ CT4)



■ Cause of Stoppage for Inverter (Content of Check Item " F E")

Code	Cause	Cause of Stoppage for Corresponding Unit	Remark	
			Indication during Retry	Alarm Code
1	Automatic Stoppage of Transistor Module (IPM Error) (Over Current, Decrease Voltage, Increase Temperature)	17	P 17	53
2	Instantaneous Over Current	17	P 17	52
3	Abnormal Inverter Fin Thermistor	17	P 17	54
4	Electronic Thermal Activation	17	P 17	52
5	Inverter Voltage Decrease	18	P 18	06
6	Increase Voltage	18	P 18	06
8	Abnormal Current Sensor	17	P 17	51
9	Instantaneous Power failure Detection	18	-	-
11	Reset of Micro-Computer for Inverter	18	-	-
12	Earth Fault Detection for Compressor (Only Starting)	17	P 17	53
13	Abnormal Power Source Phase	18	-	-

18.5 PROTECTION CONTROL CODE ON 7-SEGMENT DISPLAY

1. The protection control indication can be seen on 7-segment when a protection control is activated.
2. The 7-segment continues ON while function is working, and goes out when released.
3. When several protection controls are activated, code number with higher priority will be indicated (see below for the priority order).

- Higher priority is given to protection control related to frequency control than the other.

Priority Order:

- Pressure Ratio Control
 - High-Pressure Rise Protection
 - Current Protection
 - Discharge Gas Temperature Rise Protection
 - Low-Pressure Fall Protection
 - Reversing Valve Switching Control (For 16, 20HP and FS(3/5) Series)
 - High-Pressure Decrease Protection
 - Oil Return Control
 - Running Current Limit Control (for 24/30 FS5)
- In relation to retry control, the latest retrial will be indicated unless a protection control related to frequency control is indicated.

Code			Protection Control
P	0	1	Pressure Ratio Control (*)
P	0	2	High-Pressure Increase Protection (*)
P	0	3	Current Protection (*)
P	0	4	Inverter Fin Temp. Increase Protection (for 24, 30HP)
P	0	5	Discharge Gas Temperature Increase Protection (*)
P	0	6	Low-Pressure Decrease Protection
P	0	7	4-Way Valve Switching Control (For 16, 20HP)
P	0	8	Oil Return Control
P	0	9	High-Pressure Decrease Protection
P	0	A	Running Current Limit Control (for 24, 30 FS5)
P	1	1	Pressure Ratio Decrease Retry
P	1	2	Low-Pressure Increase Retry
P	1	3	High-Pressure Increase Retry
P	1	4	Over Current Retry of Constant Compressor
P	1	5	Vacuum/Discharge Gas Temperature Increase Retry
P	1	6	Discharge Gas SUPERHEAT Decrease Retry
P	1	7	Inverter Trip Retry
P	1	8	Insufficient Voltage / Excessive Voltage Retry

In the case that degeneration control is activated, ϵ is indicated instead of \square (*mark)

- Retry indication continues for 30 minutes unless a protection control is indicated.
- Retry indication disappears if the stop signal comes from all rooms.



NOTE:

The protection control code being indicated on 7-segment display is changed to an alarm code when the abnormal operation occurs. Also, the same alarm code is indicated on the remote control switch.

■ ACTIVATING CONDITION OF PROTECTION CONTROL CODE

For following the conditions as the temperature change, etc., the control of frequency, etc. is performed to prevent the abnormal conditions by the protection control.

The activating conditions of protection control are shown in the table below.

Code	Protection Control	Activating Condition	Remarks
P01	Pressure Ratio Control	Compression Ratio $\geq 9 \rightarrow$ Frequency Decrease (Pd/(Ps+1.3)) $\leq 2.2 \rightarrow$ Frequency Increase	Ps: Suction Pressure of Compressor
P02	High-Pressure Increase Protection	Pd ≥ 2.4 Mpa \rightarrow Frequency Decrease	Pd: Discharge Pressure of Compressor
P03	Current Protection	Inverter Output Current $\geq 25A$ (220 V), 14A (380, 415V) \rightarrow Frequency Decrease	-
P04	Inverter Fin Temperature Increase Protection	Inverter Fin Temperature ≤ 94 °C \rightarrow Frequency Decrease	-
P05	Discharge Gas Temperature Increase Protection	Temperature at the top of compressor is high \rightarrow Frequency Increase (Maximum temperature is different depending on the frequency.)	-
P06	Low-Pressure Decrease Protection	Low-Pressure Is Excessively Low \rightarrow Frequency Increase (Minimum pressure is different depending on the ambient temperature.)	-
P07	4-Way Valve Switching Control	For 16, 20HP When Switching, $\Delta P < 0.5$ MPa \rightarrow Frequency Increase $\Delta P < 1.3$ MPa \rightarrow Frequency Decrease	$\Delta P = P_d - P_s$
		For 24, 30HP When Switching, $\Delta P < 1.0$ MPa \rightarrow Frequency Increase $\Delta P < 2.1$ MPa \rightarrow Frequency Decrease	
P08	Oil Return Control	For 5, 20HP Frequency less than 40Hz is maintained for more than 1 hour \rightarrow Frequency ≥ 40 Hz	-
		For 24, 30HP Frequency less than 120Hz at cooling (150Hz at heating) is maintained for more than 1 hour \rightarrow Frequency ≥ 120 Hz at cooling (150Hz at heating).	
P09	High-Pressure Fall Protection	Pd ≤ 0.69 MPa \rightarrow Frequency Increase (When Cooling Operation) Pd ≤ 1.42 Mpa \rightarrow Frequency Increase (When Heating Operation)	Pd: Discharge Pressure of Compressor
P0A	Running Current Limit Control (for 24, 30HP)	Running Current for Comp. \geq Setting Value \rightarrow Frequency Decrease	Setting Value: Upper limit of total running current is set 80%, 70% and 60% at normal operation using input on PCB.
P11	Pressure Ratio Decrease Retry	Compression Ratio (Pd/(Ps+1.3)) < 1.8	When activating 3 times in an hour, "43" alarm is indicated.
P12	Low-Pressure Increase Retry	Ps > 0.9 MPa	When activating 3 times in an hour, "44" alarm is indicated.
P13	High-Pressure Rising Retry	For 5 to 20HP Pd > 2.65 MPa (In case of 20 ~ 30Hz: Pd > 2.5 MPa)	When activating 3 times in an hour, "45" alarm is indicated.
		For 24, 30HP Pd > 2.65 MPa	
P14	Overcurrent Retry of Constant Compressor	Current \geq Maximum Value(*1), or Current $< 0.9A$	When activating 3 times in an hour, "39" alarm is indicated.
P15	Vacuum/Discharge Gas Temperature Rising Retry	In Case of Ps < 0.02 MPa over 12 minutes, Discharge Gas Temperature ≥ 132 °C over 10 minutes or Discharge Gas Temperature ≥ 140 °C over 5 seconds	When activating 3 times in 30 minutes, "47"(Ps) or "08" (Discharge Gas) alarm is indicated.
P16	Discharge Gas SUPERHEAT Decrease Retry	For 5 to 20HP Discharge Gas SUPERHEAT less than 10 deg. is maintained for an hour	When activating 2 times in 2 hours (90min. for 24, 30HP), "07" alarm is indicated.
		For 24, 30HP Discharge Gas SUPERHEAT less than 10 deg. is maintained for 30 minutes.	
P17	Inverter Trip Retry	Automatic Stoppage of Transistor Module, Activation of Electronic Thermal or Abnormal Current Sensor	When activating 3 times in 30 minutes, "51", "52" and "53" alarm is indicated.
P18	Insufficient Voltage / Excessive Voltage Retry	Insufficient/Excessive Voltage at Inverter Circuit or CB Connector Part	When activating 3 times in 30 minutes, "06" alarm is indicated.



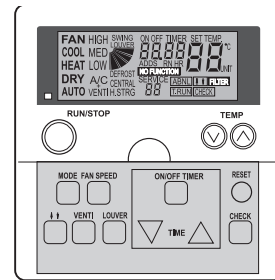
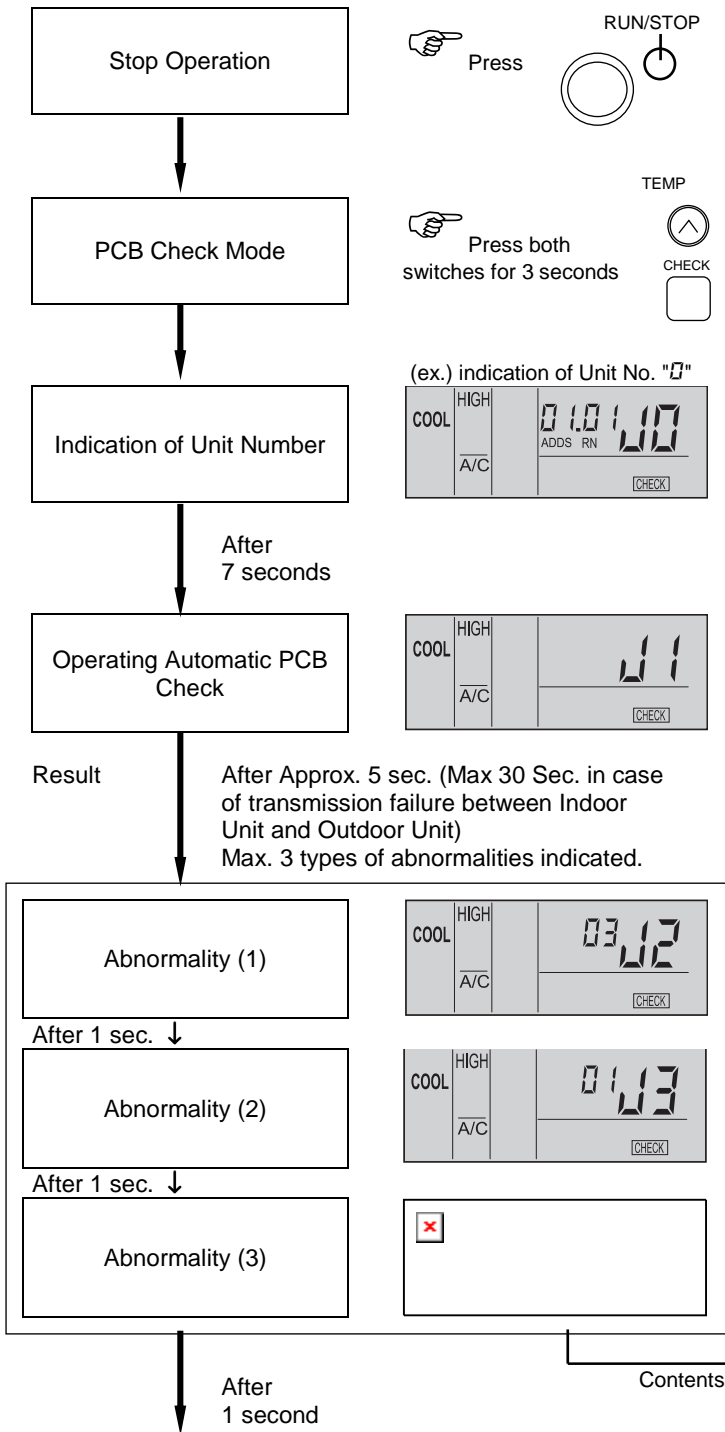
NOTE:

1. During protection control (except during alarm stoppage), the protection control code is indicated.
2. The protection control code is indicated during protection control and turns off when canceling the protection control.
3. After retry control, the condition of monitoring is continued for 30 minutes.
4. The maximum value (*1) is as follows:

Model	380-415V 50 Hz		380V 60 Hz	
8HP	12.1A		12.6A	
10HP	15.0A		15.8A	
16HP	17.8A		18.8A	
20HP	17.8A		18.8A	
Model	Comp. 1	Comp. 3, 4	Comp. 2	Comp. 3, 4
24HP	17.8A	21.6A	18.8A	22.8A
30HP	17.8A	31.7A	18.8A	33.4A

18.6 SELF CHECKING OF PCB'S USING REMOTE CONTROL SWITCH

Following troubleshooting procedure is utilized for function test of PCB's in the Indoor Unit and Outdoor Unit



Indication	Contents	
00	Normal	
	Abnormality (Open-circuit, Short-circuit, etc.) in circuit for:	
01	Intake Air Temp. Thermistor	Indoor Unit PCB
02	Discharge Air. Temp. Thermistor	
03	Liquid Pipe Temp. Thermistor	
04	Remote Thermistor abnormality	
05	Gas Pipe Temp. Thermistor	
06	Remote Sensor	
08	Transmission of Central Station	
0A	EEPROM	
0b	Zero Cross Input Failure	
EE	Transmission of indoor during this checking operation	
07	Transmission of Outdoor Unit	Outdoor Unit PCB
F4	ITO Input Failure	
F5	PSH Input failure	
F6	Protection Signal Detection Circuit	
F7	Phase Detection	
F8	Transmission of Inverter	
F9	High Pressure Sensor	
Fb	Comp. Discharge Gas Temp. Thermistor	
Fc	Low pressure Sensor	
Fd	Heat Exchanger Evaporation Temp. Thermistor	
Ff	Ambient Air Temp. Thermistor	

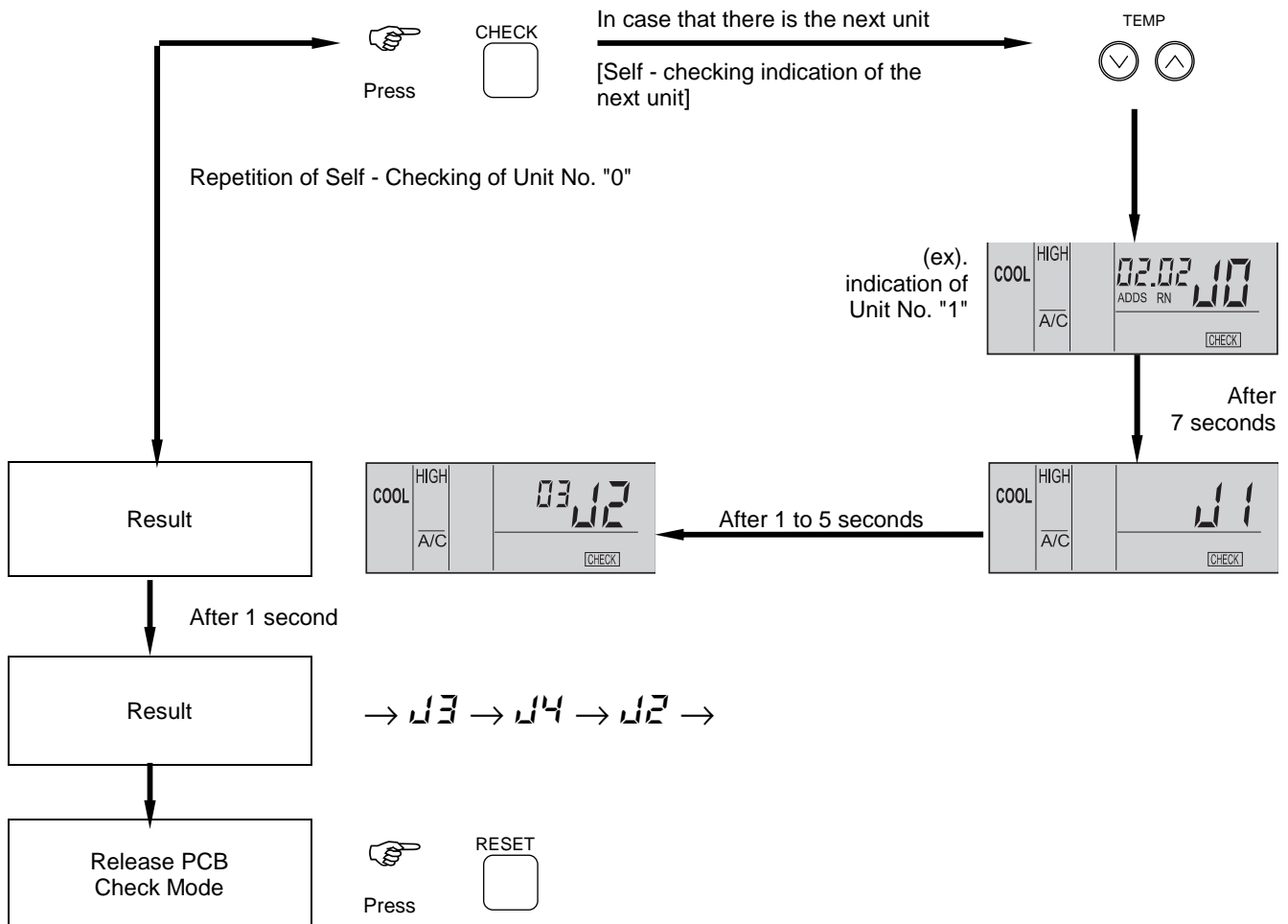
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For performing the above checking in the case that the wireless remote control switch is used with the built-in receiver part of the wall type indoor, perform the following procedures:


1. Turn OFF the power supply.
2. Disconnect the connector (CN25) on PWB(M).
3. Connect PC-P1HE.
4. Turn ON the power supply

After completion of checking, turn OFF the power supply again and make connectors as before checking.

From previous page



i NOTE:

1.  If this indication is continued and "1" is not shown, this indicated that each one of indoor unit is not connected to the remote control switch. Check the wiring between the remote control switch and indoor unit.
2. In this troubleshooting procedure, checking of the following part of the PCB's is not available.

PCB in Indoor Unit:	Relay Circuit, Dip Switch, Option Circuit, Fan Circuit, Protection Circuit.
PCB in Outdoor Unit:	Relay Circuit, Dip Switch, Option Circuit
3. In the case that this troubleshooting is performed in the system using the central station, indication of the central station may change during this procedure. However, this is not abnormal.
4. After this troubleshooting, the memory of abnormality occurrence times described before will be deleted.


18.7 SELF CHECKING OF REMOTE CONTROL SWITCH

Cases where CHECK switch is utilized.

1. If the remote control switch reads malfunction
2. For regular maintenance check.


1 Turn ON the power source

2 Simultaneously depress the following 3 switches. (During operation, they can be depressed.)

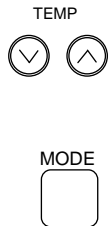


3 The LCD indication changes as shown in the right figure

4 After the LCD indication changes as shown in the right figure, the RUN indicator flickers twice.

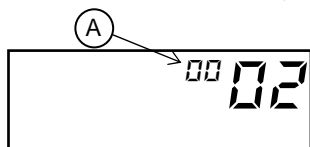


Only for cancellation of EEPROM, depress the following 3 switches simultaneously during changing LCD indication.



To 11

5 The LCD indication changes as shown below. Depress all the switches (13 switches) one by one. Every time the switch is depressed the number of the indication of (A) part in the figure below increases one by one.



Notes:- Any order of depressing switches is available.
- Depressing two or more switches simultaneously is invalid and not counted

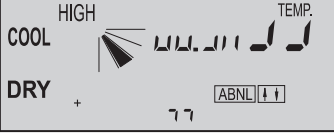
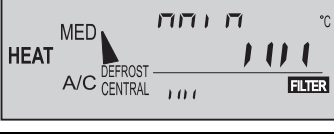

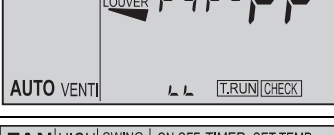

Unless all the switches are depressed, the checking do not proceed to the next item

6 The LCD indication changes as shown below. The remote control switch automatically starts to check the transmission circuit.




In case that transmission circuit is abnormal, the LCD indication remains as the left figure and the checking do not proceed to the next item.

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No.	LCD Indication	Indicating Period (sec.)
1		For 1 second
2		For 1 second
3		For 1 second
4		For 1 second
5		For 3 seconds

7


The LCD indication changes as shown below.
The detected temperature of remote control thermostat is indicated at the part (A) part in the figure below.



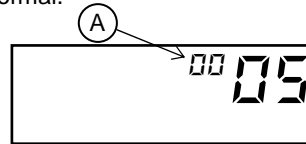
If the number "- -" or "FF" is indicated at the "A" part, the remote control thermostat is abnormal.

8

The LCD indication changes as shown below.




In case of depressing the RESET switch or leaving the switches for 15 seconds, the data of EEPROM (storage cell inside of the remote control switch) is cleared. At this time, the number is indicated at the (A) part shown in the figure below. When the number "99" is indicated, EEPROM is abnormal.



The number indicated at the (A) part is "99", the checking do not proceed to the next time

9

The LCD indication changes as shown below.



After several seconds are passed, the remote control switch is automatically activated again.

10

When the remote control switch is activated again, the RUN indicator is ON and the operation is started. Therefore, depress RUN/STOP switch and stop operation.

i NOTE:


1. In case that the operation is not automatically started when the remote control switch is activated again, the detection circuit for momentary stoppage may be abnormal. However, it would not interfere the normal operation.
2. There is a case that the operation is automatically stopped after the automatic operation when the remote control switch is activated again.

Cancellation of EEPROM

3


11

The LCD indication changes as shown below and the EEPROM is automatically cancelled by the remote control switch



12

The LCD indication changes as shown below



After several seconds are passed, the remote control switch is automatically activated again. In this case, the operation is not started automatically.