EN

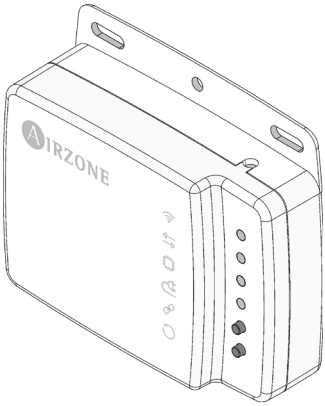
Integration manual

Aidoo Modbus

Panasonic

For PAW-AZAC-MBS-1 and PAW-AZRC-MBS-1

[For AZAI6WSCPN0 and AZAI6WSCPN1]



Modbus

AIRZONE

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Precautions and environmental policy

PRECAUTIONS

- For your security, and to protect the devices, follow these instructions:
- Do not manipulate the system with wet or damp hands.
- Disconnect the power supply before making any connections.
- Take care not to cause a short circuit in any of the system connections.

ENVIRONMENTAL POLICY

Do not dispose of this equipment in the household waste. Electrical and electronic equipment contain substances that may damage the environment if they are not handled appropriately. The symbol of a crossed-out waste bin indicates that electrical equipment should be collected separately from other urban waste. For correct environmental management, it must be taken to the collection centers provided for this purpose, at the end of its useful life.

The equipment components may be recycled. Act in accordance with current regulations on environmental protection.
If you replace it with other equipment, you must return it to the distributor or take it to a specialized collection center.

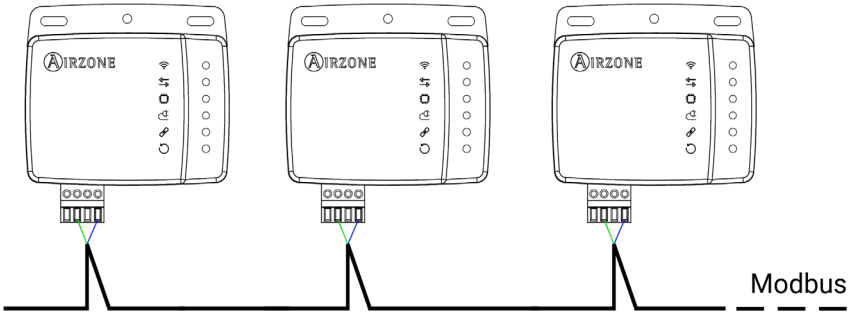
Those breaking the law or by-laws will be subject to such fines and measures as are laid down in environmental protection legislation.

RS-485 Communication port

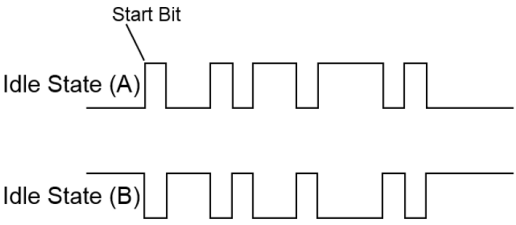
RS-485, also known as EIA-485, is a communication standard in bus.

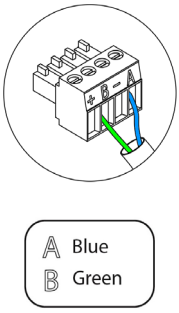
Integration bus	
Speed of the communication port	19200 bps
Communication	Half duplex
Frame length	8-bits
Stop bit	1-bit
Stream control	None
Parity	Even

CONNECTION



For proper operation of the system, verify that only the communication cables (green-blue) are connected to their matching domotic buses. Attach the wires with the terminal screws following the color code.





Modbus protocol

Modbus protocol is a communication structure used to establish **master-slave/client-server communication** between intelligent devices connected on different types of buses or networks.

Each device intended to communicate using Modbus is given a unique address. Master devices send a command in a frame which contains the address of the device or the end-devices (slaves). All devices are sent the frame, but only the recipient interprets and executes the command. Modbus commands contain checksum information, to allow the recipient to detect transmission errors.

Note: *It is possible to send information to multiple devices simultaneously using a frame called "Broadcast".*

Each message includes redundant information that ensures it is properly received. If, after a certain time, the master does not receive a confirmation it interprets that an error has occurred and terminates communication.

The mode of transmission used is MODBUS-RTU. Each byte of data is represented by two 4-bit characters in hexadecimal format. The format of the frame is the following:

Start	0	1	2	3	4	5	6	7	Parity	Stop

CONFIGURATION OF THE SLAVE ADDRESS FOR THE AIDOO MODBUS PANASONIC DEVICE

The Aidoo is a **Modbus slave device**, so it is necessary to indicate its address. Configurate the following parameters from a master device:

Register	Description	Values
56	Modbus address	Modbus slave address (Default 1)
57	Config. Baudrate	0 → 100 bps 1 → 300 bps 2 → 500 bps 3 → 1200 bps 4 → 2400 bps 5 → 4800 bps 6 → 7800 bps 7 → 9600 bps 8 → 19200 bps (Default) 9 → 57600 bps 10 → 115200 bps 11 → 600 bps 12 → 38400 bps 13 → 76800 bps
58	Config. Port parity	0 → None (Default) 1 → Odd 2 → Even

Modbus function codes

Modbus basic commands allow the control of a device to change the value of its registers (memory slot) or to request the content of these registers, depending on the codes:

Code	Function
03	Read holding registers
04	Read input registers
06	Preset/write single holding register
16	Preset/write multiple holding registers

Modbus commands

The format of the commands for the read/write operations is as follows (8 byte):

Slave address	Operation code	Register address	Data	CRC
1 byte	1 byte	1 byte	1...2·N bytes	2 bytes

- **Slave address:** Defines the system to access. A Modbus command contains the Modbus address of the device it is intended for (1 to 247). 0 address is reserved for a transmission to all devices (broadcast).
- **Operation code:** Specifies the operation to be performed.
- **Register address:** Specifies the operation to be accessed. In commands to be performed in multiple registers, defines the boot log, from which you want to operate consecutively.
- **Data:** Formed by 2 bytes (simple operations) or a set of 2 bytes (multiple operations) that contain the information in the command.
- **CRC:** Two bytes are added to the end of the stream in order to detect transmission o reception errors. This action is done using the Cyclic Redundant Code.

  Generator polynomial: **CRC-16 = $x^{16} + x^{15} + x^2 + 1$.**

WRITE COMMANDS

Write a single holding register

Byte	Field
0	Address of the slave (1 - 247) (0: Broadcast)
1	Write single register (6)
2	Register address
3	
4	Data to be written
5	
6	CRC
7	

The response, as long as there is no error type, must be exactly the same format as the write command.

Write multiple registers

Byte	Field
0	Address of the slave (1 - 247) (0: Broadcast)
1	Write multiple register (16)
2	Starting register address
3	Number of registers to be written (N)
4	
5	Total number of bytes of write data (2·N)
6	Data to be written in register 1
7	
...	
5 + 2·N	Data to be written in register N
6 + 2·N	
7 + 2·N	CRC
8 + 2·N	

The response, as long as it is error-free, will be:

Byte	Field
0	Address of the slave (1-247) (0: Broadcast)
1	Write multiple registers (16)
2	Starting register address
3	
4	Number of registers to be written (N)
5	
6	CRC
7	

READ COMMANDS

Question

Byte	Field
0	Address of the slave (1 - 247) (0: Broadcast)
1	Reading records (3/4)
2	Starting register address
3	
4	Number of registers to be read (N)
5	
6	CRC
7	

Response

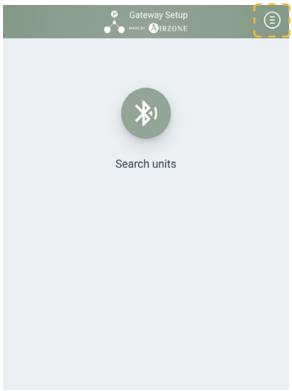
Byte	Field
0	Slave address (1 - 247) (0: Broadcast)
1	Read holding registers (3/4)
2	Number of response bytes (2·N)
3	Data to be read in register 0
4	
...	
3 + 2·N	Data to be read in register N
4 + 2·N	
5 + 2·N	CRC
6 + 2·N	

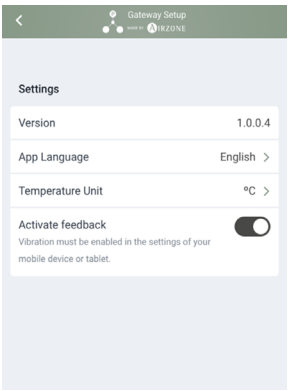
Gateway Setup for Panasonic

NETWORK CONFIGURATION

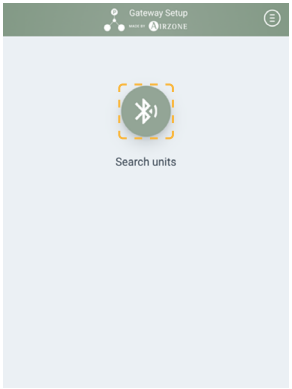
If you click the *Configuration* button on the main screen of the "Gateway Setup for Panasonic" app, you can select the application's working language, as well as the temperature units.

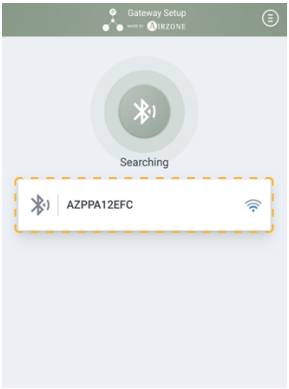
- **Version.** It indicates the application version.
- **Language.** The app is available in 9 languages (German, Greek, English, Spanish, French, Italian, Polish, Portuguese and Turkic).
- **Units.** Celsius (°C) or Fahrenheit (°F).
- **Active feedback.** This functionality requires the device's vibration to be activated.





Once again, on the main screen, click the *Bluetooth* item to begin to search for nearby devices. Select your "Aidoo Modbus Panasonic" to continue.

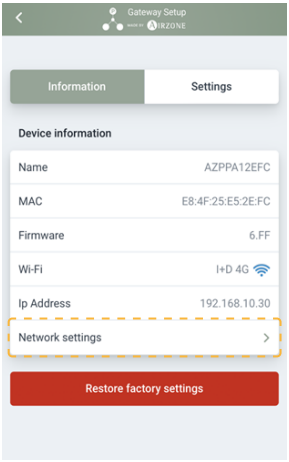




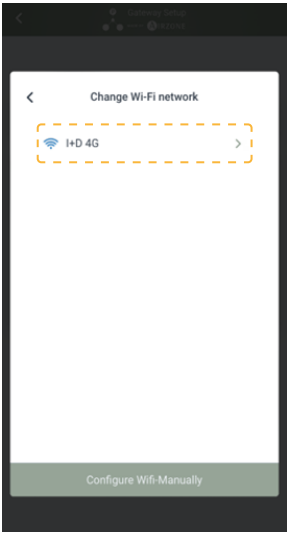
Once the device has been selected, the information menu will be displayed.

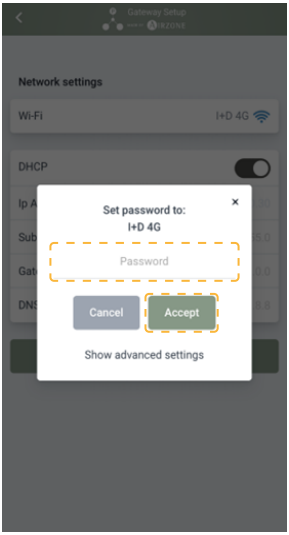
- **Name.** Device name.
- **MAC.** Device's MAC address.
- **Firmware.** It indicates the device version.
- **Wi-Fi.** Network linked to the device.
- **IP Address.** It displays the device's IP address.
- **Network configuration.** It is used to configure the device.

Press the *Factory reset* button to restore the initial values.



By entering the *Network configuration* submenu you can change the Wi-Fi network if necessary.

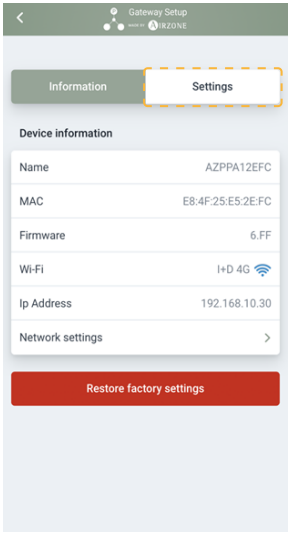


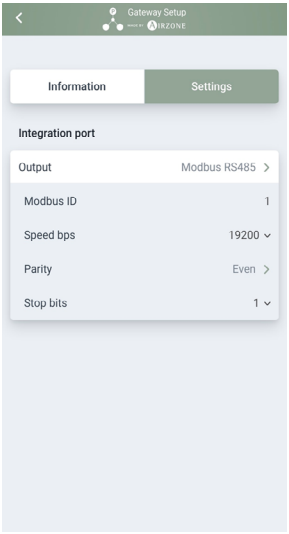


CONFIGURATION MODBUS RS-485

By accessing the configuration menu you can change the following device parameters:

- **Modbus ID.** Value between 1 and 255.
- **Speed in bps.** There are 14 selectable speeds (100, 300, 500, 600, 1200, 2400, 4800, 7800, 9600, 19200 (default), 38400, 57600, 76800 and 115200 bps).
- **Parity.** None, even or odd.
- **Stop bit.** Select a value between 1 and 2.





Download the Gateway Setup for Panasonic App

Modbus registers

AIDOO MODBUS PANASONIC RAC DOMESTIC (PAW-AZAC-MBS-1 [AZAI6WSCPNO])

Registers	Description	Values	Read (R) Write (W)	Operations
0	Unit status On / Off [1]	0 → OFF 1 → ON	R & W	0x03, 0x04, 0x06, 0x10, 0x16
1	Set point [2]	Setpoint x10 Example: 23 °C → 230	R & W	0x03, 0x04, 0x06, 0x10, 0x16
2	Local temperature [3]	Room Temp x10 Example: 23 °C → 230	R	0x03, 0x04
3	Modes	1 → Auto 2 → Cool 3 → Heat 5 → Dry	R & W	0x03, 0x04, 0x06, 0x10, 0x16
5	Louver vertical	0-4 → Louver pos 8 → Auto pos	R & W	0x03, 0x04, 0x06, 0x10, 0x16
7	Unit error code 1 (first part)	Ascii value	R	0x03, 0x04
8	Unit error code 2 (second part)	Ascii value	R	0x03, 0x04
14	Available modes	Bit 0 → Auto Bit 1 → Cool Bit 2 → Heat Bit 4 → Dry	R	0x03, 0x04
15	Available speeds	Bit 0 → Auto Bit 2 → Low Bit 3 → Medium-Low Bit 4 → Medium Bit 5 → Medium-High Bit 6 → High	R	0x03, 0x04
16	Available louvers	Bit 0 → Auto U/D Bit 8-11 → Vertical positions (0-4)	R	0x03, 0x04

(1) If the read value is greater than 1, the least significant bit of the register (Bit 0) will be addressed.
(2) The minimum / maximum limits depends on your AC unit.
(3) Must be greater than 0.

Registers	Description	Values	Read (R) Write (W)	Operations
17	Limit temp. max air cool	Limit x10 Example: 23 °C → 230	R	0x03, 0x04
18	Limit temp. min air cool	Limit x10 Example: 23 °C → 230	R	0x03, 0x04
19	Limit temp. max air heat	Limit x10 Example: 23 °C → 230	R	0x03, 0x04
20	Limit temp. min air heat	Limit x10 Example: 23 °C → 230	R	0x03, 0x04
21	Limit temp. max air auto	Limit x10 Example: 23 °C → 230	R	0x03, 0x04
22	Limit temp. min air auto	Limit x10 Example: 23 °C → 230	R	0x03, 0x04
25	Limit temp. max air dry	Limit x10 Example: 23 °C → 230	R	0x03, 0x04
26	Limit temp. min air dry	Limit x10 Example: 23 °C → 230	R	0x03, 0x04
35	Outdoor temp.	Temp x10 Example: 23 °C → 230	R	0x03, 0x04
36	Return temp.	Temp x10 Example: 23 °C → 230	R	0x03, 0x04
45	Consumption	Consumption x10 Example: 7 A → 70	R	0x03, 0x04
53	Work temperature [4]	Temp x10 Example: 23 °C → 230	R	0x03, 0x04
54	Speeds numeric	0 → Auto 1 → Silent 2 → Low 3 → Medium 4 → High 5 → Maximum	R & W	0x03, 0x04, 0x06, 0x10, 0x16
55	Error value	Value of error Example: 0x009	R	0x03, 0x04
56	Modbus address	Modbus slave address (Default 1)	R & W	0x03, 0x04, 0x06, 0x10, 0x16

(4) *Temperature which the unit uses as working temperature.*

Registers	Description	Values	Read (R) Write (W)	Operations
57	Config. port baudrate	0 → 100 bps 1 → 300 bps 2 → 500 bps 3 → 1200 bps 4 → 2400 bps 5 → 4800 bps 6 → 7800 bps 7 → 9600 bps 8 → 19200 bps 9 → 57600 bps 10 → 115200 bps 11 →600 bps 12 → 38400 bps 13 → 76800 bps	R & W	0x03, 0x04, 0x06, 0x10, 0x16
58	Config. port parity	0 → None 1 → Odd 2 → Even	R & W	0x03, 0x04, 0x06, 0x10, 0x16
102	Nanoe On / Off	0 → OFF 1 → ON	R & W	0x03, 0x04, 0x06, 0x10, 0x16

AIDOO MODBUS PANASONIC PACI (PAW-AZRC-MBS-1 [AZAI6WSCPN1])

Registers	Description	Values	Read (R) Write (W)	Operations
0	Unit status On / Off [1]	0 → OFF 1 → ON	R & W	0x03, 0x04, 0x06, 0x10, 0x16
1	Set point [2]	Setpoint x10 Example: 23 °C → 230	R & W	0x03, 0x04, 0x06, 0x10, 0x16
2	Local temperature [3]	Room Temp x10 Example: 23 °C → 230	R	0x03, 0x04
3	Modes	1 → Auto 2 → Cool 3 → Heat 4 → Fan 5 → Dry	R & W	0x03, 0x04, 0x06, 0x10, 0x16
5	Louver vertical [4]	0-4 → Louver pos 9 → Swing pos	R & W	0x03, 0x04, 0x06, 0x10, 0x16
7	Unit error code 1 (first part)	Ascii value	R	0x03, 0x04
8	Unit error code 2 (second part)	Ascii value	R	0x03, 0x04
14	Available modes	Bit 0 → Auto Bit 1 → Cool Bit 2 → Heat Bit 3 → Ventilation Bit 4 → Dry	R	0x03, 0x04
15	Available speeds [5]	Bit 0 → Auto Bit 2 → Speed 1 Bit 3 → Speed 2 Bit 4 → Speed 3 Bit 5 → Speed 4* Bit 6 → Speed 5*	R	0x03, 0x04
16	Available louvers [4]	Bit 0 → Auto U/D Bit 8-11 → Vertical positions (0-4)	R	0x03, 0x04

(1) If the read value is greater than 1, the least significant bit of the register (Bit 0) will be addressed.
(2) The minimum / maximum limits depends on your AC unit.
(3) Must be greater than 0.
(4) If "Stop louvers" is selected in the unit, position 0 will be represented in this register, although internally the unit will remain in "Stop louvers". It is not possible to send a "Stop louvers" to the unit.
*(5) The number of speeds will depend on your AC unit. *Speeds 4 and 5 may not be available on all models.*

Registers	Description	Values	Read (R) Write (W)	Operations
17	Limit temp. max air cool	Limit x10 Example: 23 °C → 230	R	0x03, 0x04
18	Limit temp. min air cool	Limit x10 Example: 23 °C → 230	R	0x03, 0x04
19	Limit temp. max air heat	Limit x10 Example: 23 °C → 230	R	0x03, 0x04
20	Limit temp. min air heat	Limit x10 Example: 23 °C → 230	R	0x03, 0x04
21	Limit temp. max air auto	Limit x10 Example: 23 °C → 230	R	0x03, 0x04
22	Limit temp. min air auto	Limit x10 Example: 23 °C → 230	R	0x03, 0x04
25	Limit temp. max air dry	Limit x10 Example: 23 °C → 230	R	0x03, 0x04
26	Limit temp. min air dry	Limit x10 Example: 23 °C → 230	R	0x03, 0x04
35	Outdoor temp.	Temp x10 Example: 23 °C → 230	R	0x03, 0x04
36	Return temp.	Temp x10 Example: 23 °C → 230	R	0x03, 0x04
45	Consumption	Consumption x10 Example: 7 A → 70	R	0x03, 0x04
53	Work temperature [6]	Temp x10 Example: 23 °C → 230	R	0x03, 0x04
54	Speeds numeric [5]	0 → Auto 1 → Speed 1 2 → Speed 2 3 → Speed 3 4 → Speed 4* 5 → Speed 5*	R & W	0x03, 0x04, 0x06, 0x10, 0x16
55	Error value	Value of error Example: 0x009	R	0x03, 0x04
56	Modbus address	Modbus slave address (Default 1)	R & W	0x03, 0x04, 0x06, 0x10, 0x16

*(5) The number of speeds will depend on your AC unit. *Speeds 4 and 5 may not be available on all models.*
(6) Temperature which the unit uses as working temperature.

Registers	Description	Values	Read (R) Write (W)	Operations
57	Config. port baudrate	0 → 100 bps 1 → 300 bps 2 → 500 bps 3 → 1200 bps 4 → 2400 bps 5 → 4800 bps 6 → 7800 bps 7 → 9600 bps 8 → 19200 bps 9 → 57600 bps 10 → 115200 bps 11 → 600 bps 12 → 38400 bps 13 → 76800 bps	R & W	0x03, 0x04, 0x06, 0x10, 0x16
58	Config. port parity	0 → None 1 → Odd 2 → Even	R & W	0x03, 0x04, 0x06, 0x10, 0x16
102	Nanoe On / Off	0 → OFF 1 → ON	R & W	0x03, 0x04, 0x06, 0x10, 0x16
103	Nanoe Error	0 → No 1 → Yes	R	0x03, 0x04

Error codes

AIDOO MODBUS PANASONIC RAC DOMESTIC (PAW-AZAC-MBS-1 [AZAI6WSCPNO])

Diagnosis display	Abnormality / Protection control	Abnormality judgement	Protection operation	Problem	Check location
H00	No memory of failure	-	Normal operation	-	-
H11	Indoor / Outdoor abnormal communication	After operation for 1 minute	Indoor fan only operation can start by entering into force cooling operation	Indoor / Outdoor communication not establish	· Indoor / Outdoor wire terminal · Indoor / Outdoor PCB · Indoor / Outdoor connection wire
H12	Indoor unit capacity unmatched	90s after power supply	-	Total indoor capability more than maximum limit or less than minimum limit, or number of indoor unit less than two	· Indoor / Outdoor connection wire · Indoor / Outdoor PCB · Specification and combination table in catalogue
H14	Indoor intake air temperature sensor abnormality	Continuous for 5s	-	Indoor intake air temperature sensor open or short circuit	· Indoor intake air temperature sensor lead wire and connector
H15	Compressor temperature sensor abnormality	Continuous for 5s	-	Compressor temperature sensor open or short circuit	· Compressor temperature sensor lead wire and connector
H16	Outdoor current transformer (CT) abnormality	-	-	Current transformer faulty or compressor faulty	· Outdoor PCB faulty or compressor faulty
H19	Indoor fan motor mechanism lock	Continuous happen for 7 times	-	Indoor fan motor lock or feedback abnormal	· Fan motor lead wire and connector · Fan motor lock or block
H23	Indoor heat exchanger temperature sensor abnormality	Continuous for 5s	-	Indoor heat exchanger temperature sensor open or short circuit	· Indoor heat exchanger temperature sensor lead wire and connector
H24	Indoor heat exchanger temperature sensor 2 abnormality	Continuous for 5s	-	Indoor heat exchanger temperature sensor 2 open or short circuit	· Indoor heat exchanger temperature sensor 2 lead wire and connector
H25	Indoor ion device abnormality	Port is ON for 10s during ion device off	-	-	· Ion device PCB
H27	Outdoor air temperature sensor abnormality	Continuous for 5s	-	Outdoor air temperature sensor open or short circuit	· Outdoor air temperature sensor lead wire and connector

Diagnosis display	Abnormality / Protection control	Abnormality judgement	Protection operation	Problem	Check location
H28	Outdoor heat exchanger temperature sensor 1 abnormality	Continuous for 5s	-	Outdoor heat exchanger temperature sensor 1 open or short circuit	· Outdoor heat exchanger temperature sensor 1 lead wire and connector
H30	Outdoor discharge pipe temperature sensor abnormality	Continuous for 5s	-	Outdoor discharge pipe temperature sensor open or short circuit	· Outdoor discharge pipe temperature sensor lead wire and connector
H32	Outdoor heat exchanger temperature sensor 2 abnormality	Continuous for 5s	-	Outdoor heat exchanger temperature sensor 2 open or short circuit	· Outdoor heat exchanger temperature sensor 2 lead wire and connector
H33	Indoor / Outdoor misconnection abnormality	-	-	Indoor and outdoor rated voltage different	· Indoor and outdoor units check
H34	Outdoor heat sink temperature sensor abnormality	Continuous for 2s	-	Outdoor heat sink temperature sensor open or short circuit	· Outdoor heat sink sensor
H36	Outdoor gas pipe temperature sensor abnormality	Continuous for 5s	Heating protection operation only	Outdoor gas pipe temperature sensor open or shot circuit	· Outdoor gas pipe temperature sensor lead wire and connector
H37	Outdoor liquid pipe temperature sensor abnormality	Continuous for 5s	Cooling protection operation only	Outdoor liquid pipe temperature sensor open or shot circuit	· Outdoor liquid pipe temperature sensor lead wire and connector
H38	Indoor / Outdoor mismatch (brand code)	-	-	Brand code not match	· Check indoor unit and outdoor unit
H39	Abnormal indoor operating unit or standby units	3 times happen within 40 minutes	-	Wrong wiring and connection pipe, expansion valve abnormality, indoor heat exchanger sensor open circuit	· Check indoor / outdoor connection wire and connection pipe · Indoor heat exchanger sensor lead wire and connector · Expansion valve and lead wire and connector
H41	Abnormal wiring or piping connection	-	-	Wrong wiring and connecting pipe, expansion valve abnormality	· Check indoor / outdoor connection wire and connection pipe · Expansion valve and lead wire and connector
H59	ECONAVI sensor abnormality	Continuous for 25s	-	ECONAVI sensor open or short circuit	· ECONAVI sensor (defective or disconnected) · ECONAVI PCB
H64	Outdoor high pressure sensor abnormality	Continuous for 1 minute	-	High pressure sensor open circuit durind compressor stop	· High pressure sensor · Lead wire and connector

Diagnosis display	Abnormality / Protection control	Abnormality judgement	Protection operation	Problem	Check location
H67	Nanoe abnormality	Nanoe stop for 5 minutes for 3 times	-	Nanoe faulty	· PCB · Nanoe system · High voltage
H70	Light sensor abnormality	Continuous for 24 hours, 15 days	-	Light sensor open or short circuit	· Light sensor (defective or disconnected)
H85	Abnormal communication between indoor & wireless LAN module	Communication error for 10 minutes for 3 times	-	Wireless LAN LED Off or timer LED blinking	· Network adaptor · Router · Network coverage
H97	Outdoor fan motor mechanism lock	2 times happen within 30 minutes	-	Outdoor fan motor lock or feedback abnormal	· Outdoor fan motor lead wire and connector · Fan motor lock or block
H98	Indoor high pressure protection	-	-	Indoor high pressure protection (Heating)	· Check indoor heat exchanger · Air filter dirty · Air circulation short circuit
H99	Indoor operating unit freeze protection	-	-	Indoor freeze protection (Cooling)	· Check indoor heat exchanger · Air filter dirty · Air circulation short circuit
F11	4-way valve switching abnormality	4 times happen within 30 minutes	-	4-way valve switching abnormal	· 4-way valve · Lead wire and connector
F17	Indoor standby units freezing abnormality	3 times happen within 40 minutes	-	Wrong wiring and connecting pipe, expansion valve leakage, indoor heat exchanger sensor open circuit	· Checker indoor / outdoor connection wire and pipe · Indoor heat exchanger sensor lead wire and conector · Expansion valve lead wire and conenctor
F90	Power factor correction (PFC) circuit protection	4 times happen within 10 minutes	-	Power factor correction circuit abnormal	· Outdoor PCB faulty
F91	Refrigeration cycle abnormality	2 times happen within 20 minutes	-	Refrigeration cycle abnormal	· Insufficient refrigerant or valve close
F93	Compressor abnormal revolution	4 times happen within 20 minutes	-	Compressor abnormal revolution	· Power transistor module faulty or compressor lock
F94	Compressor discharge overshoot protection	4 times happen within 30 minutes	-	Compressor discharge pressure overshoot	· Check refrigeration system
F95	Outdoor cooling high pressure protection	4 times happen within 20 minutes	-	Cooling high pressure protection	· Check refrigeration system · Outdoor air circuit

Diagnosis display	Abnormality / Protection control	Abnormality judgement	Protection operation	Problem	Check location
F96	Power transistor module overheating protection	4 times happen within 30 minutes	-	Power transistor module overheat	· PCB faulty · Outdoor air circuit (fan motor)
F97	Compressor overheating protection	3 times happen within 30 minutes	-	Compressor overheat	· Insufficient refrigerant
F98	Total running current protection	3 times happen within 20 minutes	-	Total current protection	· Check refrigeration system · Power source or compressor lock
F99	Outdoor direct current (DC) peak detection	Continuous happen for 7 times	-	Power transistor module current protection	· Power transistor module faulty or compressor lock

AIDOO MODBUS PANASONIC PACI (PAW-AZRC-MBS-1 [AZAI6WSCPN1])

ECO G units

Diagnosis display	Abnormality / Protection control	Problem
A01	Engine oil pressure error	-
A02	Engine oil error	-
A03	Engine high-revolution error	-
A04	Engine low-revolution error	-
A05	Ignition source error	-
A06	Engine start failure	-
A07	Fuel gas valve error	-
A08	Engine stall	-
A10	Exhaust gas temperature high	-
A12	Throttle	Stepping motor failure
A14	Engine oil pressure switch	-
A15	Start power source output short circuit	-
A16	Starter lock	-
A17	CT error	Starter current detection failure
A19	Low coolant temperature	-
A20	High coolant temperature	-
A21	Coolant level error	-
A22	Coolant pump error	-
A23	Crankshaft angle sensor	-
A24	Camshaft angle sensor error	-
A25	Clutch error	-
A26	Flameout error	-
A27	Catalyst temperature error	-
A30	Low fuel gas pressure error	-
E01	Remote controller receive failure	-
E02	Remote controller transmission failure	-
E03	Indoor unit receive failure from remote controller (central)	-
E04	Indoor unit receive failure from outdoor unit	-
E05	Indoor unit transmission failure to outdoor unit	-
E06	Outdoor unit receive failure from indoor unit	-
E07	Outdoor unit transmission failure to indoor unit	-

Diagnosis display	Abnormality / Protection control	Problem
E08	Duplicated indoor unit address setting	-
E09	Multiple main remote controller units set	-
E11	Indoor unit receive failure from signal outpot board	-
E12	Automatic address setting in progress	-
E13	Indoor unit transmission failure to remote controller	-
E15	Automatic address alarm (too few units)	-
E16	Automatic address alarm (too many units)	-
E18	Group control wiring communication failure	-
E20	No indoor unit in automatic address setting	-
E21	Outdoor main board failure	-
E22	Outdoor main board sensor error	-
E24	Communication failure betweenoutdoor units	-
E26	Inconsistencies in number of outdoor units	-
E31	Communication failure between units	-
F01	Indoor heat exchanger inlet temperature sensor (E1)	-
F02	Water heat exchanger anti-freeze sensor (E2)	-
F03	Water heat exchanger refrigerant outlet temperature sensor (E3)	-
F04	Compressor outlet temperature sensor	-
F06	Outdoor heat exchanger inlet temperature sensor / Outdoor heat exchanger 2 inlet temperature sensor (3WAY only)	-
F08	Outside air temperature sensor	-
F10	Indoor unit intake temperature sensor / Hot and cold water inlet sensor	-
F11	Indoor unit discharge temperature sensor / Hot and cold water outlet sensor	-
F12	Compressor inlet temperature sensor	-
F13	Coolant temperature sensor	-
F16	Compressor inlet / outlet pressure sensor error	-
F17	Hot water outlet temperature sensor	-
F18	Exhaust gas temperature sensor	-
F20	Clutch coil temperature sensor error	-
F21	Clutch coil 2 temperature sensor error	-
F29	Indoor nonvolatile memory (EEPROM) error	-
F31	Outdoor nonvolatile memory (EEPROM) error	-
H07	Compressor oil deplation error	-
L02	Inconsistencise in indoor / outdoor unit models	-
L03	Multiple main units set for group control	-

Diagnosis display	Abnormality / Protection control	Problem
L04	Duplicate system (outdoor unit) address setting	-
L05	Duplicate indoor unit priority setting	-
L06	Duplicate indoor unit priority setting	-
L07	Group control wire present for individual-control indoor unit	-
L08	Indoor unit address not set	-
L09	Indoor unit capacity not set	-
L10	Outdoor unit capacity not set	-
L13	Indoor unit model type seeting failure	-
L15	Defective pairing of indoor units	-
L16	Faulty water heat exchanger unit parallel array addresses	-
L19	Duplicated water heat exhanger unit parallel arrays addresses	-
L21	Gas type setting failure	-
P01	Indoor fan error / Indoor unit fan rpm error	-
P03	High compressor discharge temperautre	-
P04	Refrigerant high-pressure switch operation	-
P05	Power source error	-
P09	Indoor unit ceiling panel connector connection failure	-
P10	Indoor unit float switch operation	-
P11	Indoor unit drain pump error / Water heat exchanger unit anti-icing sensor error	-
P12	Indoor DC fan error	-
P13	Refrigerant circuit error (W MULTI / Models with suction bypass valve (85kW type) / Refrigerant circuit error (3 Way))	-
P15	Complete refrigerant gas depletion	-
P18	Bypass valve error	-
P19	Four-Way valve lock error (no detected 3WAY MULTI)	-
P20	Refrigerant high-pressure error	-
P22	Outdoor unit fan error	-
P23	Water heat exhanger unit interlock error (for only water heat exhanger unit)	-
P26	Clutch connection error	-
P30	Group control's sub unit error	-
P31	Group control error	-

ECOi EX 2 Way units

Diagnosis display	Abnormality / Protection control	Problem
E06	Outdoor unit receiving failure from indoor unit	-
E12	Prohibit starting auto address setting	-
E15	Auto address alarm (a small number of indoor units)	-
E16	Auto address alarm (a large number of indoor units)	-
E20	No indoor unit during auto address setting	-
E21	Receiving failure of main system from sub system when link wiring is used for outdoor units	-
E22	Receiving failure of sub system from main system when link wiring is used for outdoor units	-
E24	Receiving failure of relay control unit from outdoor unit(s)	-
E25	Failure of outdoor unit address setting (duplicative)	-
E26	Inconsistencies in number of outdoor units	-
E29	Failure of outdoor unit to receive relay control unit	-
E30	Failure of transferring outdoor unit serial	-
E31	Wiring error between the P.C. board ([L-Pow], [HIC] wire)	-
F04	Compressor 1 discharge temperature sensor abnormal [DISCH1]	-
F05	Compressor 2 discharge temperature sensor abnormal [DISCH2]	-
F06	Outdoor unit heat exchanger 1 gas (inlet) temperature sensor abnormal [EXG1]	-
F07	Outdoor unit heat exchanger 1 liquid (outlet) temperature sensor abnormal [EXL1]	-
F08	Outdoor temperature sensor abnormal [TO]	-
F12	Compressor inlet temperature sensor abnormal [SCT]	-
F14	Supercooling gas temperature sensor abnormal [SCG]	-
F16	High pressure sensor abnormal, high-load [HPS]	-
F17	Low pressure sensor abnormal [LPS]	-
F23	Outdoor unit heat exchanger 2 gas (inlet) temperature sensor abnormal [EXG2]	-
F24	Outdoor unit heat exchanger 2 liquid (outlet) temperature sensor abnormal [EXL2]	-
F31	Outdoor unit nonvolatile memory (EEPROM) error	-
H01	Compressor 1 abnormal current values	Overcurrent
H03	Compressor 1 CT sensor disconnected, short-circuit	-
H05	Compressor 1 discharge temperature sensor disconnected	-
H06	Low pressure abnormal lowering	-
H07	Oil loss - error	-
H08	Oil sensor (connection) error 1	-

Diagnosis display	Abnormality / Protection control	Problem
H11	Compressor 2 abnormal current values	Overcurrent
H13	Compressor 2 CT sensor disconnected, short-circuit	-
H15	Compressor 2 discharge temperature sensor disconnected	-
H21	Compressor 2 HIC alarm	-
H27	Oil sensor (connection) error 2	-
H31	Compressor 1 HIC alarm	-
L04	Outdoor unit address settings duplicated	-
L05	Indoor unit priority duplicated (for priority indoor)	-
L06	Indoor unit priority duplicated (not for priority indoor) and outdoor unit	-
L10	Outdoor unit capacity settings not made	-
L17	Inconsistencies in outdoor unit models	-
L18	4-way valve coil disconnected, line disconnected	-
P03	Compressor 1 discharge temperature error	-
P04	Actuation of high pressure switch	-
P05	Compressor 1 open-phase detection	-
P11	Cooling water freeze	Chiller
P14	Actuation of O2 sensor	-
P15	Compressor 2 open-phase detection	-
P16	Compressor 1 secondary overcurrent	-
P17	Compressor 2 discharge temperature error	-
P19	Compressor 2 start failure	Compressor lock / Compressor wiring open-phase / DCCT failure
P20	High load	Forgot to open valves
P22	Outdoor unit fan1 failure	IPM damage / Overcurrent / Invertor failure / DC fan lock / Hole IC open-phase
P23	Inter lock not cancellation	Chiller
P24	Outdoor unit fan2 failure	IPM damage / Overcurrent / Invertor failure / DC fan lock / Hole IC open-phase
P26	Compressor 2 secondary overcurrent	-
P29	Compressor 1 start failure	Compressor lock / Compressor wiring open-phase / DCCT failure

ECOi EX 3 Way units

Diagnosis display	Abnormality / Protection control	Problem
E06	Some indoor units does not respond to outdoor unit	-
E12	Auto address failed to start	-
E15	Fewer indoor units are found in auto addressing than the setting on outdoor PCB	-
E16	More indoor units are found in auto addressing than the setting on outdoor PCB	-
E20	No indoor unit responded in auto addressing	-
E24	No response from sub outdoor unit	-
E25	The outdoor unit address is duplicating	-
E26	The number of responding outdoor units does not match with the setting on the main outdoor unit	-
E29	No response from main outdoor unit	-
E31	Error in communication inside outdoor unit control box	-
F04	Compressor 1 discharge temperature sensor has failure (DISCH1)	-
F05	Compressor 2 discharge temperature sensor has failure (DISCH2)	-
F06	Outdoor unit heat exchanger 1 gas temperature sensor has failure (EXG1)	-
F07	Outdoor unit heat exchanger 1 liquid temperature sensor has failure (EXL1)	-
F08	Outdoor temperature sensor has failure (TO)	-
F12	Compressor inlet temperature sensor has failure (SCT)	-
F14	Subcooling heat exchanger temperature sensor has failure (SCG)	-
F16	High pressure sensor has failure (HPS)	-
F17	Low pressure sensor has failure (LPS)	-
F23	Outdoor unit heat exchanger 2 gas temperature sensor has failure (EXG2)	-
F24	Outdoor unit heat exchanger 2 liquid temperature sensor has failure (EXL2)	-
F31	EEPROM on outdoor unit PCB has failure	-
H01	Compressor 1 primary current is overcurrent	-
H03	Compressor 1 current sensor is disconnected or shorted	-
H05	Compressor 1 discharge temperature sensor is disconnected, shorted or misplaced	-
H06	Low pressure sensor value is too low	-
H07	Compressor or refrigerant circuit has low oil	-
H08	Compressor 1 oil temperature sensor has failure (OIL1)	-
H11	Compressor 2 primary current is overcurrent	-

Diagnosis display	Abnormality / Protection control	Problem
H13	Compressor 2 current sensor is disconnected or shorted	-
H15	Compressor 2 discharge temperature sensor is disconnected, shorted or misplaced	-
H21	Compressor 2 HIC has failure	HIC is overcurrent or overheat / VDC is undervoltag
H27	Compressor 2 oil temperature sensor has failure (OIL2)	-
H31	Compressor 1 HIC has failure	HIC is overcurrent or overheat / VDC is undervoltag
L04	Duplicate system address setting on outdoor units	-
L10	Capacity setting of outdoor unit is not correct	-
L11	Incorrect wiring of remote group control wiring (in case of shared solenoid valve)	-
L17	Model mismatch between outdoor units	-
P03	Compressor 1 discharge temperature is too high	-
P04	High pressure switch is activated	-
P05	Compressor 1 AC power supply has abnormal	-
P11	Cooling water freeze	-
P14	O2 sensor has activated	-
P15	Compressor 2 AC power supply has abnormal	-
P16	Compressor 1 secondary current is overcurrent	-
P17	Compressor 2 discharge temperature is too high	-
P19	Compressor 2 start failure	Compressor 2 is missing phase
P22	Outdoor unit fan motor has failure	-
P25	High pressure is out of compressor operating range	-
P26	Compressor 2 secondary current is overcurrent	-
P27	Low pressure is out of compressor operating range	-
P29	Compressor 1 start failure	Compressor 1 is missing phase

Mini ECOi units

Diagnosis display	Abnormality / Protection control	Problem
C17	Indoor unit does not respond to central control equipment	-
E01	Indoor unit does not respond to remote controller	-
E02	Remote controller is having error in sending serial communication signal	-
E03	Remote controller does not respond to indoor unit	-
E04	Oudoor unit does not respond to indoor unit	-
E06	Some indoor units does not respond to outdoor unit	-
E08	Indoor unit address is dupulicating	-
E09	Two or more remote controllers are set as main on R1-R2 link	-
E12	Auto address failed to start	-
E14	Two or more indoor units are set as main, in the group controlled indoor units	-
E15	Fewer indoor units are found in auto addressing than the setting on outdoor PCB	-
E16	More indoor units are found in auto addressing than the setting on outdoor PCB	-
E18	No response from sub indoor to the main indoor unit in group control wiring	-
E20	No indoor unit responded in auto addressing	-
E31	Error in communication inside outdoor unit control box	-
F01	Indoor unit heat exchanger liquid temperature sensor has failure (E1)	-
F02	Indoor unit heat exchanger temperature sensor has failure (E2)	-
F03	Indoor unit heat exchanger gas temperature sensor has failure (E3)	-
F04	Compressor discharge temperature sensor has failure (DISCH)	-
F06	Outdoor unit heat exchanger gas temperature sensor has failure (EXG)	-
F07	Outdoor unit heat exchanger liquid temperature sensor has failure (EXL)	-
F08	Outdoor temperature sensor has failure (TO)	-
F10	Indoor suction air (room) temperature sensor has failure (TA)	-
F11	Indoor discharge air temperature sensor has failure (BL)	-
F12	Compressor inlet temperature sensor has failure (SCT)	-

Diagnosis display	Abnormality / Protection control	Problem
F14	Subcooling heat exchanger temperature sensor has failure (SCG)	-
F16	High pressure sensor has failure (HPS)	-
F17	Low pressure sensor has failure (LPS)	-
F29	EEPROM on indoor unit PCB has failure	-
F31	EEPROM on outdoor unit PCB has failure	-
H01	Compressor primary current is overcurrent	-
H02	PFC is overcurrent or VDC is overvoltage (single phase only)	-
H03	Compressor current sensor is disconnected or shorted	-
H05	Compressor discharge temperature sensor is disconnected, shorted or misplaced (DISCH)	-
H06	Low pressure sensor value is too low	-
H31	Compressor HIC has failure	HIC is overcurrent or overheat. VDC is undervoltage or overvoltage
L01	Indoor unit address setting has error	No main indoor unit in group control
L02	Indoor unit model does not match with the outdoor unit model (multi-split/mini-split)	-
L03	Two or more indoor units are set as main in group control	-
L04	Duplicate system address setting on outdoor units	-
L05	Two or more indoor units are set as priority indoor unit (priority indoor unit)	-
L06	Two or more indoor units are set as priority indoor unit (non-priority indoor unit)	-
L07	Group control wiring is detected for indoor unit set as individual control	-
L08	Indoor unit address is not set	-
L09	Capacity setting of indoor unit is not correct	-
L10	Capacity setting of outdoor unit is not correct	-
L13	Indoor unit model does not match with outdoor unit	-
L17	Model mismatch between outdoor units	-
L18	4-way valve has failure	-
P01	Thermal protector for indoor unit fan motor is activated	-
P03	Compressor discharge temperature is too high	-
P04	High pressure swich is activated	-
P05	AC power supply has abnormal	-
P09	Connection to the panel of indoor unit is not good	-

Diagnosis display	Abnormality / Protection control	Problem
P10	Float switch of drain pan safety is activated	-
P11	Drain pump failure or locked rotor	-
P12	Indoor unit fan inverter protection control is activated	-
P14	O2 sensor has activated	-
P16	Compressor secondary current is overcurrent	-
P20	Too high load in refrigerant circuit	-
P22	Outdoor unit fan motor has failure	-
P29	Compressor start failure	Compressor is missing phase or reverse phase
P31	Other indoor unit in group control has an alarm	-

Big PACi units

Diagnosis display	Abnormality / Protection control	Problem
E01	Remote controller reception error	-
E02	Remote controller transmission error	-
E03	Error in indoor unit receiving signal from remote controller (central)	-
E04	Error in indoor unit receiving signal from the outdoor unit	-
E05	Error in indoor unit transmitting signal to the outdoor unit	-
E06	Outdoor unit failed to receive serial communication signals from indoor unit	-
E08	Duplicate indoor unit address settings error	-
E09	More than one remote controller set to main error	-
E12	Automatic address setting start is prohibited while auto-address setting in progress	-
E14	Main unit duplication in simultaneous-operation multi control	Detected outdoor unit
E15	Automatic address alarm	The total capacity of indoor units is too low
E16	Automatic address alarm	The total capacity of indoor units is too high or the total number of indoor units is too many
E18	Faulty communication in group control wiring	-
E20	Connection problem of indoor/outdoor units	-
F04	Compressor discharge temperature sensor (TD) trouble	-
F06	Inlet temperature sensor (C1) in heat exchanger trouble	-
F07	Intermediate temperature sensor (C2) in heat exchanger trouble	-
F08	Outdoor air temperature sensor (TO) trouble	-
F12	Compressor inlet suction temperature sensor (TS) trouble	-
F31	Outdoor unit nonvolatile memory (EEPROM) trouble	-
H01	Primary (input) overcurrent detected	-
H02	PAM trouble	-
H03	Primary current CT sensor (current sensor) failure	-
H31	HIC trouble	-
L04	Outdoor unit address duplication	-
L10	Outdoor unit capacity not set or invalid	-
L13	Indoor unit type setting error	-
L18	4-way valve operation failure	-
P03	Compressor discharge temperature trouble	-

Diagnosis display	Abnormality / Protection control	Problem
P04	High pressure trouble	-
P05	AC power supply trouble	-
P13	Alarm valve open	-
P14	O2 sensor detect	-
P15	Insufficient gas level detected	-
P16	Compressor overcurrent trouble	-
P22	Outdoor unit fan motor trouble	-
P29	Lack of INV compressor wiring, INV compressor actuation failure (including locked), DCCT failure	-
P31	Group control error	-

PACi NX units

Diagnosis display	Abnormality / Protection control	Abnormality judgement	Protection operation	Problem	Check location
E04	Indoor / Outdoor abnormal communication	After operation for 1 minute	Indoor fan only operation can start by entering into force cooling operation	Indoor / Outdoor communication not establish	· Indoor / Outdoor wire terminal · Indoor / Outdoor PCB · Indoor / Outdoor connection wire
F04	Compressor temperature sensor abnormality	Continuous for 5s	-	Compressor temperature sensor open or short circuit	· Compressor temperature sensor lead wire and connector
F06	Outdoor heat exchanger temperature sensor 1 abnormality	Continuous for 5s	-	Outdoor heat exchanger temperature sensor 1 open or short circuit	· Outdoor heat exchanger temperature sensor 1 lead wire and connector
F08	Outdoor air temperature sensor abnormality	Continuous for 5s	-	Outdoor air temperature sensor open or short circuit	· Outdoor air temperature sensor lead wire and connector
H01	Indoor high pressure protection	-	-	Indoor high pressure protection (Heating)	· Check indoor heat exchanger · Air filter dirty · Air circulation short circuit
H02	Power factor correction (PFC) circuit protection	4 times happen within 20 minutes	-	Power factor correction circuit abnormal	· Outdoor PCB faulty
H03	Outdoor current transformer (CT) abnormality	-	-	Current transformer faulty or compressor faulty	· Outdoor PCB faulty or compressor faulty
L18	4-way valve switching abnormality	4 times happen within 30 minutes	-	4-way valve switching abnormal	· 4-way valve · Lead wire and connector
P03	Compressor overheating protection	4 times happen within 20 minutes	-	Compressor overheat	· Insufficient refrigerant
P04	Outdoor cooling high pressure protection	4 times happen within 20 minutes	-	Cooling high pressure protection	· Check refrigeration system · Outdoor air circuit
P05	Indoor / Outdoor misconnection adnormality	-	-	Indoor and outdoor rated voltage different	· Indoor and outdoor units check

Diagnosis display	Abnormality / Protection control	Abnormality judgement	Protection operation	Problem	Check location
P07	Power transistor module overheating protection	4 times happen within 30 minutes	-	Power transistor module overheat	· PCB faulty · Outdoor air circuit (fan motor)
P15	Refrigeration cycle abnormality	2 times happen within 20 minutes	-	Refrigeration cycle abnormal	· Insufficient refrigerant or valve close
P16	Outdoor direct current (DC) peak detection	Continuous happen for 7 times	-	Power transistor module current protection	· Power transistor module faulty os compressor lock
P22	Outdoor fan motor mechanism lock	2 times happen within 20 minutes	-	Outdoor fan motor lock or feedback abnormal	· Outdoor fan motor lead wire and connector · Fan motor lock or block
P29	Compressor abnormal revolution	4 times happen within 20 minutes	-	Compressor abnormal revolution	· Power transistor module faulty os compressor lock

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