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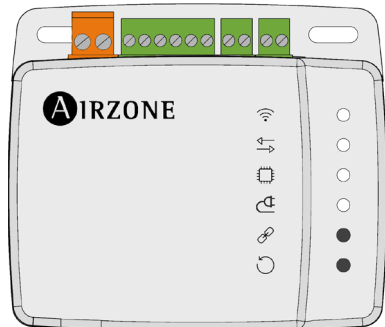
Priručnik za integraciju

Aidoo Pro Modbus Aquarea

Panasonic

Para PAW-AZAW-MBS-1

[Para AZAI6WSPPN2]



Za AZAI6WSPPN2



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Mjere opreza i politika zaštite okoliša

MJERE OPREZA

- Radi vaše sigurnosti i zaštite uređaja, slijedite upute u nastavku:
- Nemojte rukovati sustavom mokrim ili vlažnim rukama.
- Odvojite izvor napajanja prije bilo kakvog priključivanja.
- Pazite da ne dođe do kratkog spoja u bilo kojem priključku sustava.

POLITIKA ZAŠTITE OKOLIŠA



Nemojte odlagati ovu opremu u kućni otpad. Električna i elektronička oprema sadrži tvari koje mogu biti štetne za okoliš ako se njima ne postupa na odgovarajući način. Simbol prekržiene kante za otpad označava da električnu opremu treba prikupljati odvojeno od komunalnog otpada. Po isteku korisnog radnog vijeka opreme morate je odnijeti u odgovarajuće centre za prikupljanje otpada kako biste osigurali pravilno upravljanje zaštitom okoliša.

Komponente opreme moguće je reciklirati. Postupajte u skladu s važećim propisima o zaštiti okoliša.

Ako je zamijenite drugom opremom, morate je vratiti distributeru ili odnijeti u specijalizirani centar za prikupljanje otpada.

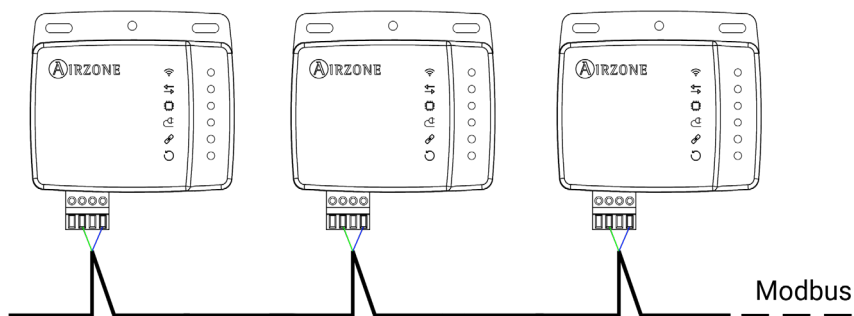
Osobe koje prekrše mjerodavan zakon ili propise podliježu novčanim kaznama i mjerama koje su propisane zakonodavstvom o zaštiti okoliša.

Komunikacijski priključak RS-485

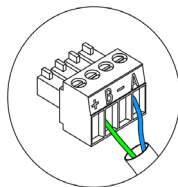
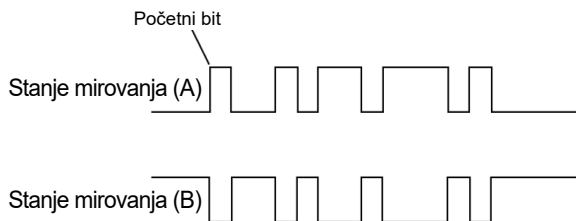
RS-485, poznat i kao EIA-485, komunikacijski je standard u sabirnici.

Integracijska sabirnica	
Brzina komunikacijskog priključka	19200 bps
Komunikacija	Poludupleksna
Duljina okvira	8-bitni
Završni bit	1-bitni
Kontrola toka	Nema
Paritet	Parni

PRIKLJUČAK



Kako biste osigurali pravilan rad sustava, provjerite jesu li na odgovarajuće domotičke sabirnice priključeni samo pripadajući komunikacijski kabeli (zeleno-plavi). Žice pričvrstite vijcima odgovarajuće boje.



A Plava
B Zelena

Protokol Modbus

Protokol Modbus je komunikacijska struktura za uspostavljanje **komunikacije po načelu nadređeni-podređeni uređaj / klijent-poslužitelj** između pametnih uređaja koji su povezani na različite vrste sabirnica ili mreža.

Svakom uređaju koji komunicira putem protokola Modbusa dodjeljuje se jedinstvena adresa. Nadređeni uređaji šalju naredbu unutar podatkovnog okvira koji sadrži adresu uređaja ili krajnjih (podređenih) uređaja. Podatkovni okvir šalje se svim uređajima, ali samo primatelj tumači i izvršava naredbu. Naredbe protokola Modbus sadrže informacije o kontrolnom zbroju kako bi primatelj mogao otkriti pogreške u prijenosu.

***Napomena:** informacije se mogu istovremeno slati na više uređaja s pomoću podatkovnog okvira koji se zove „Broadcast“.*

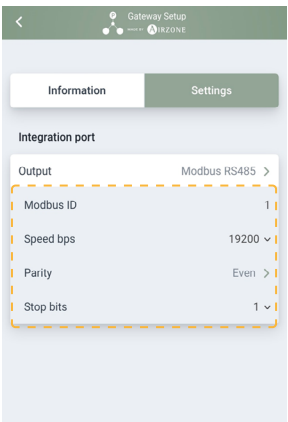
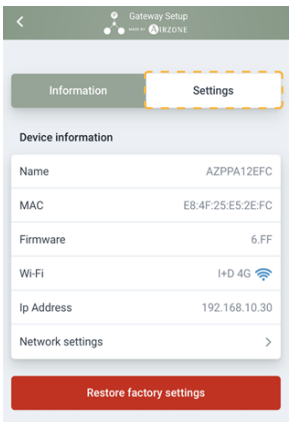
Svaka poruka sadrži redundantne informacije koje osiguravaju da je pravilno primljena. Ako nadređeni uređaj ne primi potvrdu nakon određenog vremena, to će protumačiti kao da je došlo do pogreške i prekinuti komunikaciju.

Korišteni način prijenosa je MODBUS-RTU. Svaki bajt podataka predstavljen je s dva 4-bitna znaka u heksadecimalnom formatu. Format podatkovnog okvira naveden je u nastavku:

Početak	0	1	2	3	4	5	6	7	Paritet	Završetak
---------	---	---	---	---	---	---	---	---	---------	-----------

KONFIGURACIJA PODREĐENE ADRESE ZA UREĐAJ AIDOO PRO MODBUS PANASONIC AQUAREA

Aidoo je **podređeni uređaj protokola Modbus** pa je potrebno navesti njegovu adresu. Da biste to učinili, povežite svoj Aidoo putem aplikacije „Gateway Setup for Panasonic“ (dostupne za iOS i Android) slijedeći korake opisane u odjeljku „Gateway Setup for Panasonic“.



Kodovi funkcija protokola Modbus

Osnovne naredbe protokola Modbus omogućuju upravljanje uređajem radi promjene vrijednosti njegovih registara (memorijski utor) ili zahtijevanje sadržaja tih registara, ovisno o kodovima:

Kod	Funkcija
03	Čitanje registara zadržavanja
04	Čitanje ulaznih registara
06	Postavljanje unaprijed / pisanje u jedan registar zadržavanja
16	Postavljanje unaprijed / pisanje u više registara zadržavanja

Naredbe protokola Modbus

U nastavku je naveden format naredbi za operacije čitanja/pisanja (8 bajtova):

Adresa podređenog uređaja	Kod operacije	Adresa registra	Podaci	CRC
1 bajt	1 bajt	1 bajt	1...2-N bajtova	2 bajta

- **Adresa podređenog uređaja:** definira sustav za pristupanje. Naredba protokola Modbus sadrži adresu uređaja Modbus za koji je namijenjena (1 do 247). Nulta (0) adresa rezervirana je za prijenos na sve uređaje (broadcast).
- **Kod operacije:** određuje operaciju koja se izvršava.
- **Adresa registra:** određuje operaciju kojoj se pristupa. U naredbama koje se izvršavaju u više registara, definira dnevnik pokretanja iz kojeg želite uzastopno djelovati.
- **Podaci:** sastavljeni su od 2 bajta (jednostavne operacije) ili skupa od 2 bajta (višestruke operacije) koji sadrže informacije u naredbi.
- **CRC:** dva bajta koji se dodaju na završetak toka podataka kako bi se otkrile pogreške u prijenosu ili prijmu. Ova se radnja izvodi s pomoću cikličkog redundantnog koda.

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

NAREDBE PISANJA

Pisanje u jedan registar zadržavanja

Bajt	Polje
0	Adresa podređenog uređaja (1 – 247) (0: Broadcast)
1	Pisanje u jedan registar (6)
2	Adresa registra
3	
4	Podaci koje treba zapisati
5	
6	CRC
7	

Ako nema vrste pogreške, odgovor mora biti potpuno istog formata kao naredba za pisanje.

Pisanje u više registara

Bajt	Polje
0	Adresa podređenog uređaja (1 – 247) (0: Broadcast)
1	Pisanje u više registara (16)
2	Početna adresa registra
3	Broj registara za pisanje (N)
4	
5	Ukupan broj bajtova podataka za pisanje (2·N)
6	Podaci koji treba upisati u registar 1
7	
...	
5 + 2·N	Podaci koji treba upisati u registar N
6 + 2·N	
7 + 2·N	CRC
8 + 2·N	

Ako nema pogrešaka, odgovor je:

Bajt	Polje
0	Adresa podređenog uređaja (1 – 247) (0: Broadcast)
1	Pisanje u više registara (16)
2	Početna adresa registra
3	
4	Broj registara za pisanje (N)
5	
6	CRC
7	

NAREDBE ČITANJA

Pitanje

Bajt	Polje
0	Adresa podređenog uređaja (1 – 247) (0: Broadcast)
1	Zapisi čitanja (3/4)
2	Početna adresa registra
3	
4	Broj registara za čitanje (N)
5	
6	CRC
7	

Odgovor

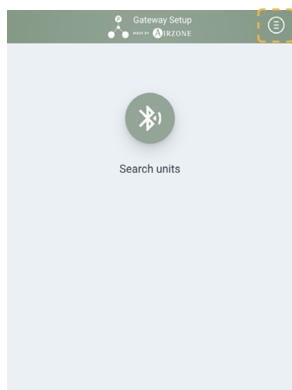
Bajt	Polje
0	Adresa podređenog uređaja (1 - 247) (0: Broadcast)
1	Čitanje registara zadržavanja (3/4)
2	Broj bajtova odgovora (2·N)
3	Podaci koji treba čitati u registru 0
4	
...	
3 + 2·N	Podaci koji treba čitati u registru N
4 + 2·N	
5 + 2·N	CRC
6 + 2·N	

Gateway Setup for Panasonic

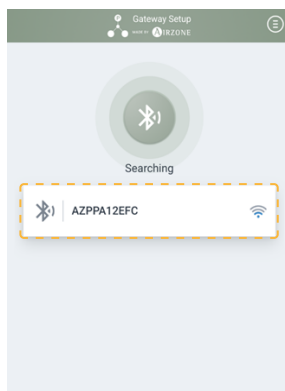
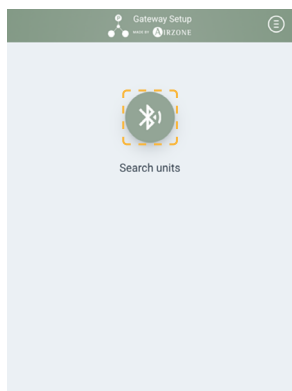
KONFIGURACIJA MREŽE

Ako kliknete gumb *Konfiguracija* na glavnom zaslonu aplikacije „Gateway Setup for Panasonic“, možete odabrati jezik aplikacije i jedinicu temperature.

- **Inačica.** Označava inačicu aplikacije.
- **Jezik.** Aplikacija je dostupna na 9 jezika (njemački, grčki, engleski, španjolski, francuski, talijanski, poljski, portugalski i turski).
- **Jedinice.** Celzij (°C) ili Fahrenheit (°F).
- **Aktivirane povratne informacije.** Ova funkcija zahtijeva aktiviranje vibracije uređaja.



Na glavnom zaslonu kliknite stavku *Bluetooth* da biste pokrenuli traženje obližnjih uređaja. Odaberite svoj „Aidoo Pro Modbus Panasonic Aquarea“ za nastavak.



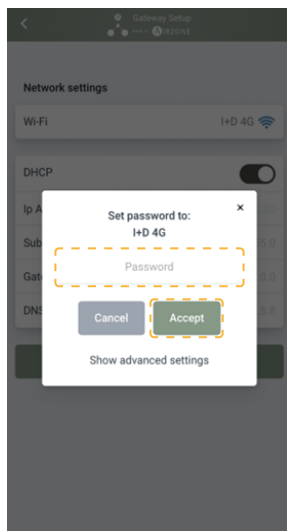
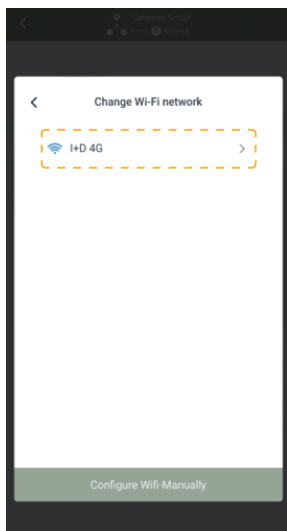
Nakon što je uređaj odabran prikazat će se izbornik s informacijama.

- **Naziv.** Naziv uređaja.
- **MAC.** MAC adresa uređaja.
- **Firmver.** Označava verziju uređaja.
- **Wi-Fi.** Mreža povezana s uređajem.
- **IP adresa.** Prikazuje IP adresu uređaja.
- **Konfiguracija mreže.** Upotrebljava se za konfiguriranje uređaja.

Pritisnite gumb *Vraćanje na tvorničke postavke* za vraćanje početnih vrijednosti.



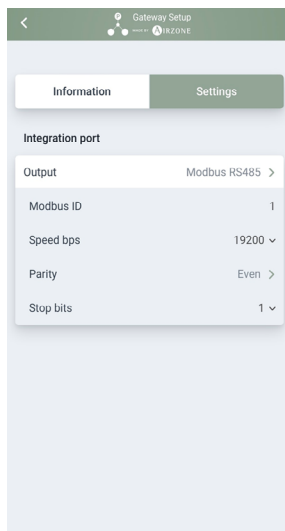
U podizborniku *Konfiguracija mreže* možete promijeniti Wi-Fi mrežu, ako je potrebno.



KONFIGURACIJA PRIKLJUČKA MODBUS RS-485

Otvaranjem konfiguracijskog izbornika možete promijeniti sljedeće parametre uređaja:

- **Modbus ID.** Vrijednost između 1 i 255.
- **Brzina u bps.** Moguće je birati među 14 dostupnih brzina (100, 300, 500, 600, 1200, 2400, 4800, 7800, 9600, 19200 (zadana vrijednost), 38400, 57600, 76800 i 115200 bps).
- **Paritet.** Nema, parni ili neparni.
- **Završni bit.** Odaberite 1 ili 2.



Preuzmite aplikaciju „Gateway Setup for Panasonic”

Registri protokola Modbus

AIDOO PRO MODBUS PANASONIC AQUAREA (PAW-AZAW-MBS-1 [AZAI6WSPPN2])

Registers	Description	Values	Read (R) Write (W)	Operations
0	Operation	0 → OFF 1 → ON	R & W	0x03, 0x04, 0x06, 0x10, 0x16
1	Outdoor actual temperature	-127 ~ 127 °C	R	0x03, 0x04
2	Outlet water temperature	-127 ~ 127 °C	R	0x03, 0x04
3	Inlet water temperature	-127 ~ 127 °C	R	0x03, 0x04
4	Mode	0 → Invalid 1 → Heat 2 → Heat Tank 3 → Tank 4 → Cool Tank 5 → Cool 6 → Auto (Default)	R & W	0x03, 0x04, 0x06, 0x10, 0x16
		7 → Auto Tank 8 → Auto Heat 9 → Auto Heat Tank 10 → Auto Cool 11 → Auto Cool Tank	R	0x03, 0x04
5	Heat mode water temperature sensor	1 → Compensation curve 2 → Direct	R & W	0x03, 0x04, 0x06, 0x10, 0x16
6	Cool mode water temperature sensor	1 → Compensation curve 2 → Direct	R & W	0x03, 0x04, 0x06, 0x10, 0x16
9	Zone 1 - Zone 2 ON/OFF	1 → On/Off 2 → Off/On 3 → On/On	R & W	0x03, 0x04, 0x06, 0x10, 0x16
10	Zone 1 sensors	1 → Water temperature 2 → External 3 → Internal 4 → Thermistor	R	0x03, 0x04
11	Zone 2 sensors	1 → Water temperature 2 → External 3 → Internal 4 → Thermistor	R	0x03, 0x04

Registers	Description	Values	Read (R) Write (W)	Operations
12	Zone 1: (Water shift/room/pool) set point temperature	HEAT Water Shift → -5 ~ 5 °C Water → 20 ~ 75 °C Room → 10 ~ 30 °C Pool → 15 ~ 35 °C COOL Water Shift → -5 ~ 5 °C Water → 5 ~ 20 °C Room → 18 ~ 35 °C	R & W	0x03, 0x04, 0x06, 0x10, 0x16
13	Zone 2: (Water shift/room/pool) set point temperature	HEAT Water Shift → -5 ~ 5 °C Water → 20 ~ 75 °C Room → 10 ~ 30 °C Pool → 15 ~ 35 °C COOL Water Shift → -5 ~ 5 °C Water → 5 ~ 20 °C Room → 18 ~ 35 °C	R & W	0x03, 0x04, 0x06, 0x10, 0x16
14	Zone 1: Actual (Water outlet/ room/pool) temperature	-127 ~ 127 °C	R	0x03, 0x04
15	Zone 2: Actual (Water outlet/ room/pool) temperature	-127 ~ 127 °C	R	0x03, 0x04
16	Zone 1: Temperature conf. mode	1 → Room 2 → Compensation curve 3 → Direct 4 → Pool	R	0x03, 0x04
17	Zone 2: Temperature conf. mode	1 → Room 2 → Compensation curve 3 → Direct 4 → Pool	R	0x03, 0x04
18	Zone 1: Min. set point temperature	HEAT Water Shift → -5 °C Water → 20 °C Room → 10 °C Pool → 15 °C COOL Water Shift → -5 °C Water → 5 °C Room → 18 °C	R	0x03, 0x04

Registers	Description	Values	Read (R) Write (W)	Operations
19	Zone 1: Max. set point temperature	HEAT Water Shift → 5 °C Water → 75 °C Room → 30 °C Pool → 35 °C COOL Water Shift → 5 °C Water → 20 °C Room → 35 °C	R	0x03, 0x04
20	Zone 2: Min. set point temperature	HEAT Water Shift → -5 °C Water → 20 °C Room → 10 °C Pool → 15 °C COOL Water Shift → -5 °C Water → 5 °C Room → 18 °C	R	0x03, 0x04
21	Zone 2: Max. set point temperature	HEAT Water Shift → 5 °C Water → 75 °C Room → 30 °C Pool → 35 °C COOL Water Shift → 5 °C Water → 20 °C Room → 35 °C	R	0x03, 0x04
30	Tank ON/OFF	0 → OFF 1 → ON	R & W	0x03, 0x04, 0x06, 0x10, 0x16
32	Tank actual temperature	-127 ~ 127 °C	R	0x03, 0x04
33	Tank water set temperature	40 ~ 75 °C	R & W	0x03, 0x04, 0x06, 0x10, 0x16
34	Tank heater	1 → Internal 2 → External	R	0x03, 0x04
35	Tank water min. set point temperature	40 °C	R	0x03, 0x04
36	Tank water max. set point temperature	75 °C	R	0x03, 0x04
45	Tank mode energy consumption	If H/J Series 0 ~ 50.800 W	R	0x03, 0x04

Registers	Description	Values	Read (R) Write (W)	Operations
46	Heat mode energy consumption	If H/J Series 0 ~ 50.800 W	R	0x03, 0x04
47	(Cool mode / Heat recovery mode) energy consumption	If H/J Series 0 ~ 50.800 W	R	0x03, 0x04
50	Version of Modbus gateway	Example: 0x0100 → v1.0.0	R	0x03, 0x04
52	Error code	0 → No error 1XXX → H + error 2XXX → F + error 3XXX → U + error	R	0x03, 0x04
64	Deice status	0 → OFF 1 → ON	R	0x03, 0x04
70	Current error status	0 → No error 1 → Error	R	0x03, 0x04
81	Tank connection	0 → No 1 → Yes	R	0x03, 0x04
82	Number Zones	1 → 1 Zone 2 → 2 Zones	R	0x03, 0x04
83	Zone 1 setup	1 → Room 2 → Pool	R	0x03, 0x04
84	Zone 2 setup	1 → Room 2 → Pool	R	0x03, 0x04
85	Direction	1 → Room 2 → Tank	R	0x03, 0x04
86	Outdoor type	1 → STD 2 → TCAP 3 → HWT	R	0x03, 0x04
112	Water pressure	If K Series onwards 0 ~ 5,08 bar Resolution: 0,02 bar	R	0x03, 0x04
117	Model series selection	0 - 1 → H-Series 2 → J-Series 3 → K-Series 4 → L-Series	R	0x03, 0x04
120	Heat mode energy consumption total (MSB)	0 ~ 4.294.967.295 kWh	R	0x03, 0x04
121	Heat mode energy consumption total (LSB)			

Registers	Description	Values	Read (R) Write (W)	Operations
124	(Cool mode / Heat recovery mode) energy consumption total (MSB)	0 ~ 4.294.967.295 kWh	R	0x03, 0x04
125	(Cool mode / Heat recovery mode) energy consumption total (LSB)			
128	Tank mode energy consumption (MSB)	0 ~ 4.294.967.295 kWh	R	0x03, 0x04
129	Tank mode energy consumption (LSB)			
269	Powerful (Actual)	0 → Invalid 1 → OFF 2 → ON	R	0x03, 0x04
270	Quiet (Actual)	0 → Invalid 1 → OFF 2 → ON	R	0x03, 0x04
360	Heat mode energy consumption (LSB)	If K Series onwards 0 ~ 65.534 W Resolution: 1 W	R	0x03, 0x04
361	Heat mode energy consumption (MSB)			
362	(Cool mode / Heat recovery mode) energy consumption (LSB)	If K Series onwards 0 ~ 65.534 W Resolution: 1 W	R	0x03, 0x04
363	(Cool mode / Heat recovery mode) energy consumption (MSB)			
364	Tank mode energy consumption (LSB)	If K Series onwards 0 ~ 65.534 W Resolution: 1 W	R	0x03, 0x04
365	Tank mode energy consumption (MSB)			

Kodovi pogrešaka

AIDOO PRO MODBUS PANASONIC AQUAREA

(PAW-AZAW-MBS-1 [AZAI6WSPPN2])

Diagnosis display	Abnormality / Protection control	Abnormality judgement	Primary location to verify
H00	No abnormality detected	-	-
H12	Indoor / Outdoor capacity unmatched	90s after power supply	- Indoor / Outdoor connection wire - Indoor / Outdoor PCB - Specification and combination table in catalogue
H15	Outdoor compressor temperature sensor abnormality	Continue for 5s	Compressor temperature sensor (defective or disconnected)
H20	Water pump abnormality	Continue for 10s	- Indoor PCB - Water pump (malfunction)
H23	Indoor refrigerant liquid temperature sensor abnormality	Continue for 5s	Refrigerant liquid temperature sensor (defective or disconnected)
H27	Service valve error	Continue for 5 minutes	High pressure sensor (defective or disconnected)
H28	Abnormal solar sensor	Continue for 5s	Solar temperature sensor (defective or disconnected)
H31	Abnormal swimming pool sensor	Continue for 5s	Pool temperature sensor (defective or disconnected)
H36	Abnormal buffer tank sensor	Continue for 5s	Buffer tank sensor (defective or disconnected)
H38	Brand code not match	When indoor and outdoor brand code not same	-
H42	Compressor low pressure abnormality	-	- Outdoor pipe temperature sensor - Clogged expansion valve or strainer - Insufficient refrigerant - Outdoor PCB - Compressor
H43	Abnormal Zone 1 sensor	Continue for 5s	Water temperature Zone 1 sensor
H44	Abnormal Zone 2 sensor	Continue for 5s	Water temperature Zone 2 sensor
H62	Water flow switch abnormality	Continue for 1 minute	Water flow switch

Diagnosis display	Abnormality / Protection control	Abnormality judgement	Primary location to verify
H63	Refrigerant low pressure abnormality	Continue for 5s	· Outdoor low pressure sensor (defective or disconnected)
H64	Refrigerant high pressure abnormality	Continue for 5s	· Outdoor high pressure sensor (defective or disconnected)
H65	Deice circulation error	Continue for 10s	· Water flow switch sensor (defective or disconnected) · Water pump malfunction · Buffer tank (is used)
H67	Abnormal external thermistor 1	Continue for 5s	· Room temperature Zone 1 sensor
H68	Abnormal external thermistor 2	Continue for 5s	· Room temperature Zone 2 sensor
H70	Back-up heater OLP abnormality	Continue for 60s	· Back-up heater OLP (disconnection or activated)
H72	Tank sensor abnormal	Continue for 5s	· Tank sensor
H74	PCB communication error	Communication or transfer error	· Indoor main PCB and Sub PCB
H75	Low water temperature control	Room heater disable and deice request to operate under low water temperature	· Heater operation must enable to increase water temperature
H76	Indoor - control panel communication abnormality	-	· Indoor - control panel (defective or disconnected)
H90	Indoor / Outdoor abnormal communication	> 1 minute after starting operation	· Internal / External cable connections · Indoor / Outdoor PCB
H91	Tank heater OLP abnormality	Continue for 60s	· Tank heater OLP (disconnection or activated)
H95	Indoor / Outdoor wrong connection	-	· Indoor / Outdoor supply voltage
H98	Outdoor high pressure overload protection	-	· Outdoor high pressure sensor · Water pump or water leakage · Clogged expansion valve or strainer · Excess refrigerant · Outdoor PCB
H99	Indoor heat exchanger freeze prevention	-	· Indoor heat exchanger · Refrigerant shortage
F12	Pressure switch active	4 times occurrence within 20 minutes	· Pressure switch
F14	Outdoor compressor abnormal revolution	4 times occurrence within 20 minutes	· Outdoor compressor

Diagnosis display	Abnormality / Protection control	Abnormality judgement	Primary location to verify
F15	Outdoor fan motor lock abnormality	2 times occurrence within 30 minutes	- Compressor tank temperature sensor - Clogged expansion valve or strainer - Insufficient refrigerant - Outdoor PCB - Compressor
F16	Total running current protection	3 times occurrence within 20 minutes	- Excess refrigerant - Outdoor PCB
F20	Outdoor compressor overheating protection	4 times occurrence within 30 minutes	- Compressor tank temperature sensor - Clogged expansion valve or strainer - Insufficient refrigerant - Outdoor PCB - Compressor
F22	IPM (power transistor) overheating protection	3 times occurrence within 30 minutes	- Improper heat exchange - IPM (power transistor)
F23	Outdoor direct current (DC) peak detection	7 times occurrence continuously	- Outdoor PCB - Compressor
F24	Refrigeration cycle abnormality	2 times occurrence within 20 minutes	- Insufficient refrigerant - Outdoor PCB - Compressor low compression
F25	Cooling / Heating cycle changeover abnormality	4 times occurrence within 30 minutes	4-way valve - V-coil
F27	Pressure switch abnormality	Continue for 1 minute	Pressure switch
F29	Low discharge superheat	1 time occurrence within 2550 minutes	- Discharge temperature sensor - Discharge pressure sensor - Pressure switch - Outdoor PCB
F30	Water outlet sensor 2 abnormality	Continue for 5s	Water outlet sensor 2 (defective or disconnected)
F32	Abnormal internal thermostat	Continue for 5s	Control panel PCB thermostat
F36	Outdoor air temperature sensor abnormality	Continue for 5s	Outdoor air temperature sensor (defective or disconnected)
F37	Indoor water inlet temperature sensor abnormality	Continue for 5s	Water inlet temperature sensor (defective or disconnected)
F40	Outdoor discharge pipe temperature sensor abnormality	Continue for 5s	Outdoor discharge pipe temperature sensor (defective or disconnected)
F41	PFC control	4 times occurrence within 10 minutes	Voltage at PFC

Diagnosis display	Abnormality / Protection control	Abnormality judgement	Primary location to verify
F42	Outdoor heat exchanger temperature sensor abnormality	Continue for 5s	· Outdoor heat exchanger temperature sensor (defective or disconnected)
F43	Outdoor defrost sensor abnormality	Continue for 5s	· Outdoor defrost sensor (defective or disconnected)
F45	Indoor water outlet temperature sensor abnormality	Continue for 5s	· Water outlet temperature sensor (defective or disconnected)
F46	Outdoor current transformer (CT) open circuit	-	· Insufficient refrigerant · Outdoor PCB · Compressor low
F48	Outdoor EVA outlet temperature sensor abnormality	Continue for 5s	· Outdoor EVA outlet temperature sensor (defective or disconnected)
F49	Outdoor bypass outlet temperature sensor abnormality	Continue for 5s	· Outdoor bypass outlet temperature sensor (defective or disconnected)
F95	Cooling high pressure overload protection	-	· Outdoor high pressure sensor · Water pump or water leakage · Clogged expansion valve or strainer · Excess refrigerant · Outdoor PCB

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