HITACHI

Hitachi Cooling & Heating Service Training

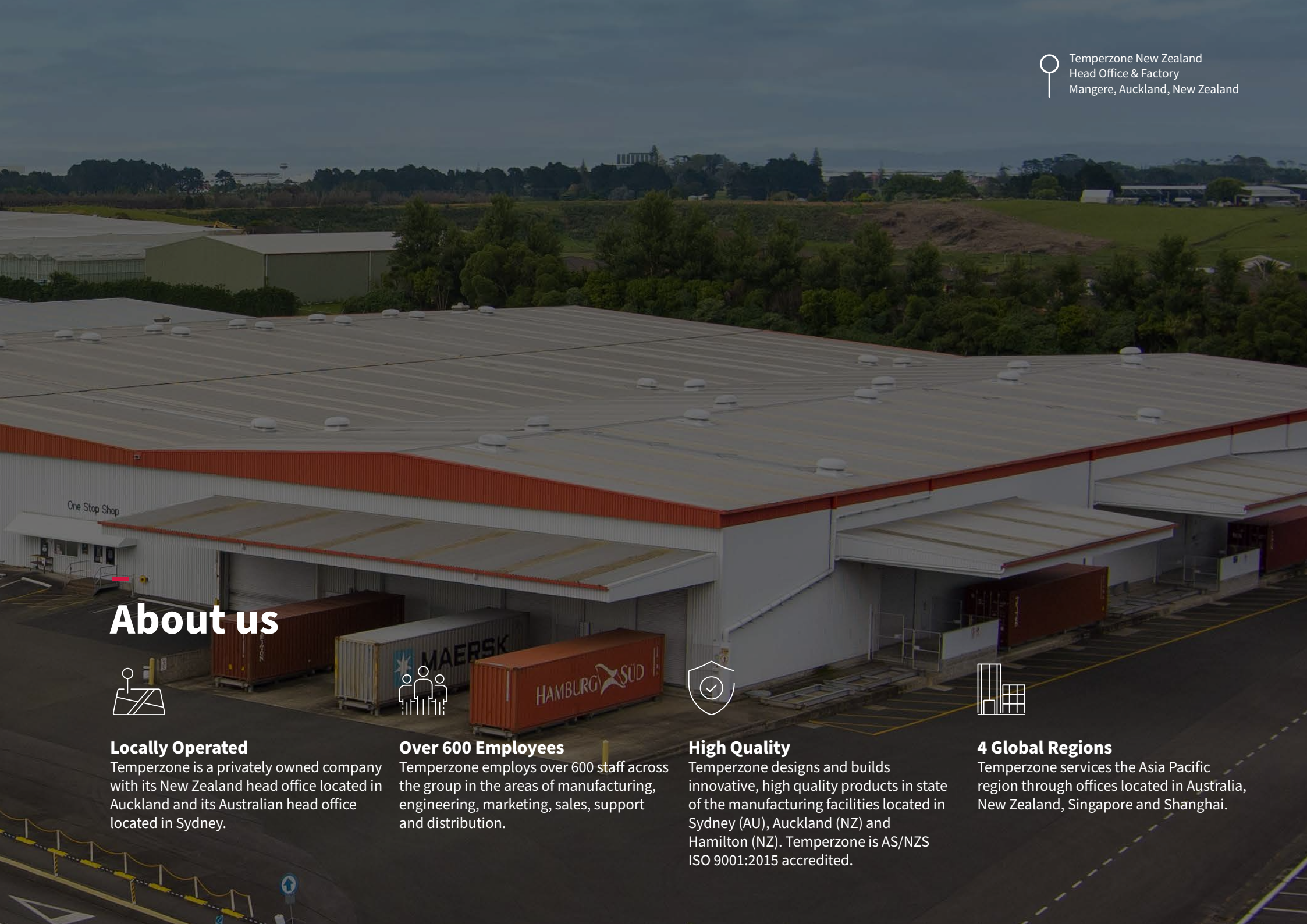
Cooling & Heating

Leading manufacturer of HVAC equipment in Australia and New Zealand for over 65 Years

65 years and counting: that's how long we've been designing, building and testing some of the industry's mostinnovative products. Today, we're the longest-serving and largest air conditioning manufacturer in Australasia.

temperzone

Hitachi Cooling & Heating
Official Distributor



Temperzone New Zealand
Head Office & Factory
Mangere, Auckland, New Zealand

About us

Locally Operated
Temperzone is a privately owned company with its New Zealand head office located in Auckland and its Australian head office located in Sydney.

Over 600 Employees
Temperzone employs over 600 staff across the group in the areas of manufacturing, engineering, marketing, sales, support and distribution.

High Quality
Temperzone designs and builds innovative, high quality products in state of the manufacturing facilities located in Sydney (AU), Auckland (NZ) and Hamilton (NZ). Temperzone is AS/NZS ISO 9001:2015 accredited.

4 Global Regions
Temperzone services the Asia Pacific region through offices located in Australia, New Zealand, Singapore and Shanghai.

Training

With training facilities located in Auckland, Sydney and Melbourne, customers can benefit from a wide range of hands-on interactive training sessions covering everything from installation, service, and maintenance.

It is also an excellent opportunity to learn about the products' most innovative technologies and how they can be best applied to individual applications. Off-site training is also a service for those in regional or metropolitan areas. Courses are certified by modules, and training can be tailored to suit individual requirements for the entire product life cycle. This personalised service extends across Australia, New Zealand and Southeast Asia. All Temperzone and Hitachi products sold and installed within Australia and New Zealand are backed by a comprehensive warranty. The warranty period varies based on the model and application type.

Temperzone Australia
Head Office & Factory
Blacktown, Sydney, Australia

AUSTRALIA

nswsales@temperzone.com
Sydney: (02) 8822 5700

vicsales@temperzone.com
Melbourne: (03) 8769 7600

qldsales@temperzone.com
Brisbane: (07) 3308 8333

sasales@temperzone.com
Adelaide: (08) 8115 2111

Distributors

Newcastle: (02) 4962 1155
Perth: (08) 6399 5900
Launceston: (03) 6331 4209

Warranty & Technical support

Warranty: auwarrantyservice@temperzone.com
Tech Support: autechnicalsupport@temperzone.com
Freecall (AU): 1800 21 1800

NEW ZEALAND

nzsales@temperzone.com
Auckland: (09) 279 5250
Wellington: (04) 569 3262
Christchurch: (03) 379 3216

Warranty & Technical Support

Warranty: customerservices@temperzone.com
Freecall (NZ): 0800 69 24 72
Tech Support: nztechsupport@temperzone.com
Freecall (NZ): 0800 89 92 77 - Option 2

Hitachi Warranty Terms & Conditions
www.temperzone.com/warranty

Terms of the Temperzone Warranty

What it covers:

If any defect in your Temperzone or Hitachi air conditioning system is caused by FAULTY MATERIAL or WORKMANSHIP within the warranty term, starting from the date of original purchase, it will be rectified without cost for both labour and material by the Temperzone Service Centre or a Temperzone appointed agent.

What isn't covered by the warranty?

1. Failure to start due to voltage conditions, blown fuses or other damage caused by inadequate or interrupted electricity supply.
2. Damage caused by accident, misapplication, abuse, alteration, tampering or servicing by anyone other than a qualified person.
3. Damage resulting from incorrect installation, commissioning or use other than in accordance with the supplied installation and operating instructions.
4. Damage caused by using the air conditioning unit in a corrosive atmosphere or by filter neglect.
5. Replacement of any worn air filters, drive belts or remote control batteries if applicable.
6. Damage or deterioration to the external surfaces, coils or components caused by normal weathering.
7. Freight and travel charges for work performed or parts supplied outside the area normally service by Temperzone service personnel or appointed agent.
8. Field wiring, refrigerant pipe run between units, the condensation drainpipe or other accessories by third party.
9. Consequential damage or loss including any financial losses as a consequence of equipment failure.
10. Any costs or additional labour associated with gaining acceptable service access to equipment to carry out repairs in a safe manner.
11. Damage caused by vermin, foreign matter, misuse, or acts of god such as fire, floods and earthquakes.
12. Damage or problems resulting from the use of an accessory not supplied by Temperzone.
13. The equipment has been re-installed at any location other than the original location.

The warranty does not apply if:

1. Issues relate to unsatisfactory performance as a result of operation or conditions that are outside of the operating conditions specified in Temperzone or Hitachi technical/sales documentation.
2. Issues or unsatisfactory performance is the result of misapplication of the equipment.
3. Any unauthorised modification has been made to the equipment or any part has been substituted or replaced with non-original items.
4. Regular service has not been carried out by a qualified serviceperson (In Australia, service person must be ARC licensed). (Hitachi)
5. The unit is used other than for the heating and cooling of air for human comfort - unless approved by Temperzone.
6. The system is installed in a mobile application (e.g. caravan, boat, crane).

* Full Warranty conditions can be found at **temperzone.com**

Hitachi Trainer Biography

Siva Suppramaniam

Leading the Hitachi Technical Support Team based in Sydney, Siva possesses a comprehensive 30-year career dedicated to Hitachi air conditioning products. His journey commenced in the Quality, Testing, and R&D division at Hitachi Malaysia, where he contributed to product development. Subsequently, he held a pivotal role at Hitachi Australia before joining Temperzone in 2009.

Siva has been actively engaged in the design and enhancement of Hitachi's product range, encompassing High Wall Splits, Multi Systems, IVX Ducted, VRF, Chillers, Bacnet, and Centralised Controls. His expertise extends to providing technical support, coaching, and training to internal teams, field technicians, contractors, and dealers.

Siva is committed to knowledge dissemination and fostering industry growth through comprehensive support.

Contents

HITACHI

air Home

Wall Mounted Systems

Training Agenda

SESSION	TOPICS OF CONTENT
PART I	PRODUCT OVERVIEW • Product Line Up For Air Home 400, Air Home 500, Air Home 600 • Product Line Up for • Product Line Up for Multizone models – R32
PART II	R32 REFRIGERANT . Application of R32 & Safety Precaution
PART III	INSTALLATION . Pipe Length, Wiring, Drain-pipe height, Wall controller ** ECO Mode
PART IV	TROUBLESHOOTING & DIAGNOSIS . Important Check Points – Troubleshooting Procedure Air Home Series & RAM models . System Diagnosis , Service Mode , Service Functions.
PART V	INTERFACE CONNECTION . BACnet , Central Station SPX-RAMHLK (for RAM models) •Optional Function , Relay Kit for Run & Alarm Status

Product Overview

Product Line Up (airHome 400 series)

	Heat Pump		Default (Wireless)	Optional (Wireless/Wired/Wired Timer)
1.	RAK/RAC-DJ25PHAT	2.5kW	RC-AGU1EA0G	SPX-RCDB1/ SPX-WKT4
2.	RAK/RAC-DJ35PHAT	3.5kW	RC-AGU1EA0G	SPX-RCDB1/ SPX-WKT4
3.	RAK/RAC-DJ50PHAT	5.0kW	RC-AGU1EA0G	SPX-RCDB1/ SPX-WKT4
4.	RAK/RAC-DJ60PHAT	6.0kW	RC-AGU1EA0G	SPX-RCDB1/ SPX-WKT4
5.	RAK/RAC-DJ70PHAT	7.0kW	RC-AGU1EA0G	SPX-RCDB1/ SPX-WKT4

Product Line Up (airHome 500 series - Cooling only)

			Default (Wireless)	Optional (Wireless /Wired/Wired Timer)
1.	RAK/RAC-DJ25PCAT	2.5kW	RC-AGU1EA0A	SPX-RCDB1/ SPX-WKT4
2.	RAK/RAC-DJ35PCAT	3.5kW	RC-AGU1EA0A	SPX-RCDB1/ SPX-WKT4
3.	RAK/RAC-DJ50PCAT	5.0kW	RC-AGU1EA0A	SPX-RCDB1/ SPX-WKT4
4.	RAK/RAC-DJ60PCAT	6.0kW	RC-AGU1EA0A	SPX-RCDB1/ SPX-WKT4
5.	RAK/RAC-DJ70PCAT	7.0kW	RC-AGU1EA0A	SPX-RCDB1/ SPX-WKT4

Product Line Up (airHome 600 series)

	Heat Pump		Default (Wireless)	Optional (Wireless/Wired/Wired Timer)
1.	RAK/RAC-VJ25PHAT	2.5kW	RC-AGS1EA0E	SPX-RCDB1/ SPX-WKT4
2.	RAK/RAC-VJ35PHAT	3.5kW	RC-AGS1EA0E	SPX-RCDB1/ SPX-WKT4
3.	RAK/RAC-VJ50PHAT	5.0kW	RC-AGS1EA0E	SPX-RCDB1/ SPX-WKT4
4.	RAK/RAC-VJ60PHAT	6.0kW	RC-AGS1EA0E	SPX-RCDB1/ SPX-WKT4
5.	RAK/RAC-VJ70PHAT	7.0kW	RC-AGS1EA0E	SPX-RCDB1/ SPX-WKT4

Product Line Up (HWS ‘P’ series - Scene Camera Technology)

	Heat Pump		Default (Wireless)	Optional (Wired/Wired Timer)
1.	RAS-P25YHAB/RAC-P25YHAB	2.5kW	RAR-6NA1	SPX-RCDB/ SPX-WKT4
2.	RAS-P35YHAB/RAC-P35YHAB	3.5kW	RAR-6NA1	SPX-RCDB/ SPX-WKT4
3.	RAS-P50YHAB/RAC-P50YHAB	5.0kW	RAR-6NA1	SPX-RCDB/ SPX-WKT4

RAR-6NA1

RAR-5G2 (SPX-RCDB)

SPX-RCDB

SPX-WKT4

Product Line Up (Multizone RAM series - R32)

Mulit Combination (Indoor Units)

1.	RAM-53NP2E	5.3kW	2
2.	RAM-53NP3E	5.3kW	Min = 2 , Max = 3
3.	RAM-68NP3E	6.8kW	Min = 2 , Max = 3
4.	RAM-70NP4E	7.0kW	Min = 2 , Max = 4
5.	RAM-90NP5E	8.5kW	Min = 2 , Max = 5

Introduction - P Series

Product Line Up (Multizone Indoor - R32)

Wall mounted (Premium)	Capacity	Standard	Optional
1. RAK-18QXE	1.8kW	SPX-RCKA4 (RAR-6NE1)	Wired SPX-RCDB1/SPX-WKT4
2. RAK-25RXE	2.5kW	SPX-RCKA4 (RAR-6NE1)	Wired SPX-RCDB1/SPX-WKT4
3. RAK-35RXE	3.5kW	SPX-RCKA4 (RAR-6NE1)	Wired SPX-RCDB1/SPX-WKT4
4. RAK-50RXE	5.0kW	SPX-RCKA4 (RAR-6NE1)	Wired SPX-RCDB1/SPX-WKT4

Wall mounted (Std)	Capacity	Standard	Optional
1. RAK-15QPE	1.5kW	SPX-RCKA4 (RAR-6NE1)	Wired SPX-RCDB1/SPX-WKT4
2. RAK-18RPE	2.0kW	SPX-RCKA4 (RAR-6NE1)	Wired SPX-RCDB1/SPX-WKT4
3. RAK-25RPE	2.5kW	SPX-RCKA4 (RAR-6NE1)	Wired SPX-RCDB1/SPX-WKT4
4. RAK-35RPE	3.5kW	SPX-RCKA4 (RAR-6NE1)	Wired SPX-RCDB1/SPX-WKT4
5. RAK-42RPE	4.2kW	SPX-RCKA4 (RAR-6NE1)	Wired SPX-RCDB1/SPX-WKT4
6. RAK-50RPE	5.0kW	SPX-RCKA2 (RAR-6NE1)	Wired SPX-RCDB1/SPX-WKT4
6. RAK-60RPE	6.0kW	SPX-RCKA2 (RAR-6N1) Optional	Wired SPX-RCDB1/SPX-WKT4

Product Line Up (Multizone Indoor - R32)

Ceiling Cassette	Capacity	Optional
1. RAI-25RPE	2.5kW	SPX-RCKA3 (RAR-6N2) /Wired SPX-RCDB1/ SPX-WKT4
2. RAI-35RPE	3.5kW	SPX-RCKA3 (RAR-6N2) /Wired SPX-RCDB1/ SPX-WKT4
3. RAI-50RPE	5.0kW	SPX-RCKA3 (RAR-6N2) /Wired SPX-RCDB1/ SPX-WKT4
4. RAI-60RPE	6.0kW	SPX-RCKA3 (RAR-6N2) /Wired SPX-RCDB1/ SPX-WKT4
Fascia Panel : P-AP56NAMS		

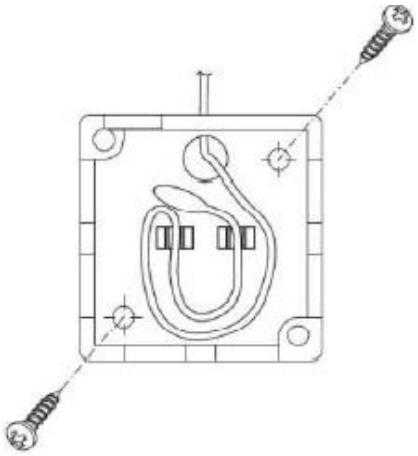
Floor Type	Capacity	Standard	Optional
1. RAF-25RXE	2.5kW	RAR-6NE4	Wired SPX-RCDB1/ SPX-WKT4
2. RAF-35RXE	3.5kW	RAR-6NE4	Wired SPX-RCDB1/ SPX-WKT4
3. RAF-50RXE	5.0kW	RAR-6NE4	Wired SPX-RCDB1/ SPX-WKT4

Product Line Up (Multizone Indoor - R32)

Ducted		Capacity	Optional
1.	RAD-18QPE	1.8kW	SPX-RCKA1 (RAR-6N5) /Wired SPX-RCDA1/ SPX-WKT4
2.	RAD-25RPE	2.5kW	SPX-RCKA1 (RAR-6N5) /Wired SPX-RCDA1/ SPX-WKT4
3.	RAD-35RPE	3.5kW	SPX-RCKA1 (RAR-6N5) /Wired SPX-RCDA1/ SPX-WKT4
4.	RAD-50RPE	5.0kW	SPX-RCKA1 (RAR-6N5) /Wired SPX-RCDA1/ SPX-WKT4
5.	RAD-60RPE	6.0kW	SPX-RCKA1 (RAR-6N5) /Wired SPX-RCDA1/ SPX-WKT4

Remote Sensor SPX-RTH1

- Purpose is to sense room temperature
- Remove the original thermistor from CN1 (Black) and connect the remote sensor (15m).



Installation: Application of R32 Refrigeration

- R32 refrigerant has 1/3 the Global Warming Potential as R410A and has similar design pressure.
- The same equipment tools and materials can be used for installation and services.
- Please make sure to separate the tank for charging and collecting from R410A tanks. Please prepare a tank just for R32 use.

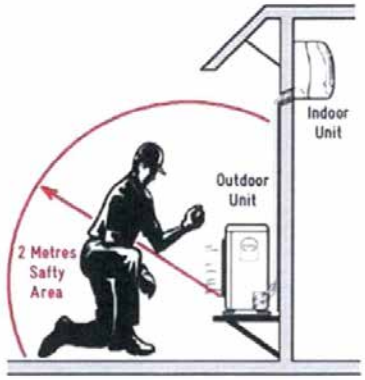
- When changing R410A models to R32 models, the existing refrigerating pipe can be used.
- Please make sure to check that the connecting piping thickness is t0.81mm, and there are no damages and dents.

<u>About the refrigerating pipe connection:</u>

- R32 models are of same design pressure as R410A. The same refrigerating pipe as R410A can be used.

Installation: Safety Precaution

- Take into consideration the safety issues;
  a. Smoking while working will have dangerous consequences and should be strictly prohibited in the work area.
  b. Mobile phones not allowed. Can create static spark.
  c. Do not work within 2 meters of any ignition source.
  d. Repair or service work in well ventilated area.
  e. Wear Personal Protective Equipment (PPE).
  f. Use dry powder fire extinguisher.



Installation: Installation Manual

*** Please read through the Installation manual at least once before installation.***

Information:-

- Pipe sizes
- Pipe Length – minimum & maximum length
- Positioning of Indoor unit – clearance between unit & ceiling, pipe direction
- Positioning of outdoor unit – clearance to return & discharge air
- Wiring method and cable sizes between indoor & outdoor
- Optional part connection such as wired controller & etc
- Drain hose installation

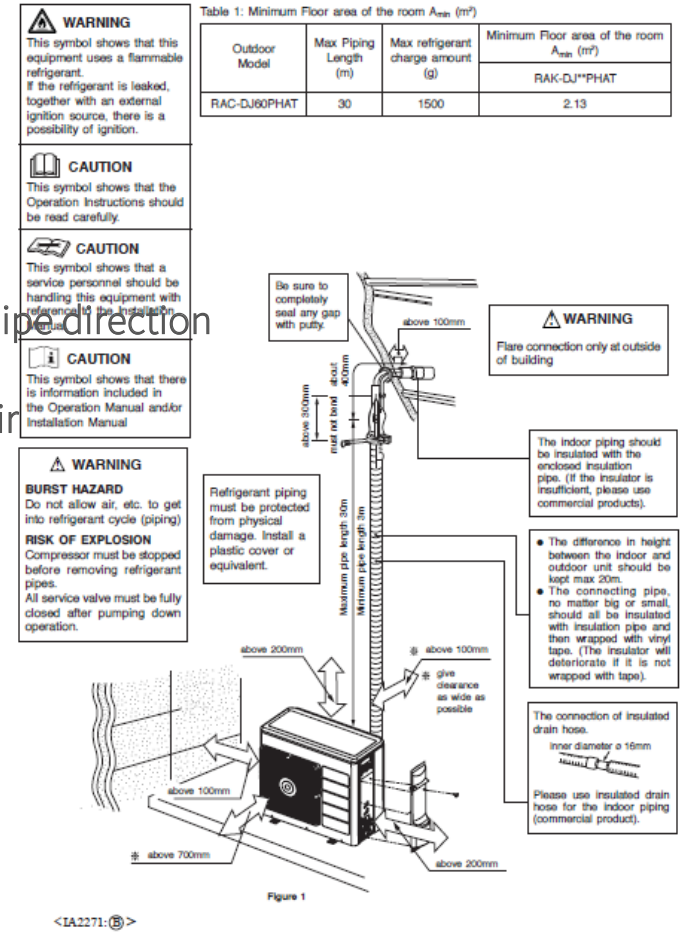
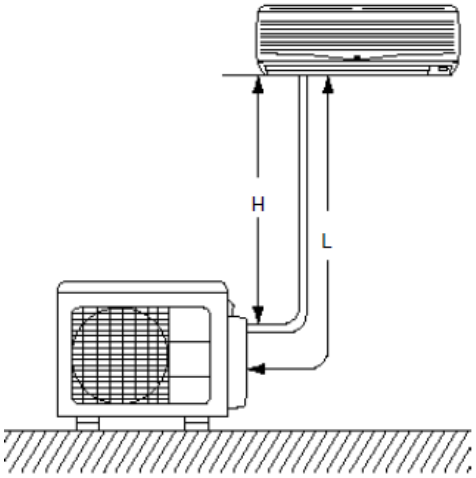


Figure 1

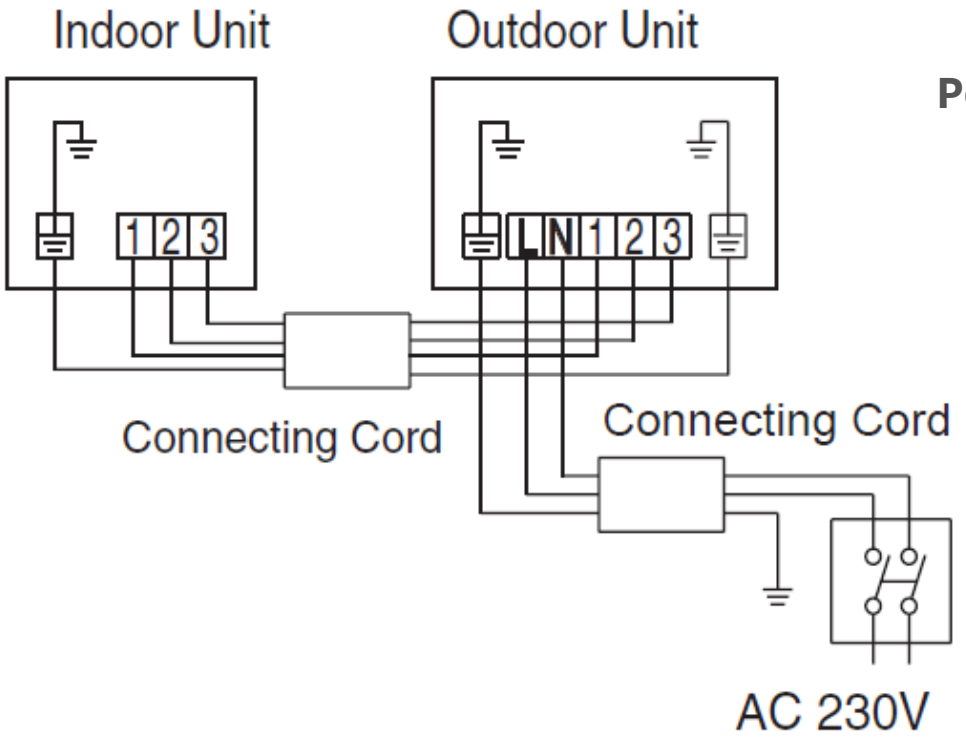
<IA2271:Ⓑ>

Installation: Pipe Length

Model	Minimum Pipe Length(m)	Maximum Pipe Length(m)	Maximum Height(m)
Air Home 400 Series			
RAK/RAC-DJ25PHAT	3	20	15
RAK/RAC-DJ35PHAT	3	20	15
RAK/RAC-DJ50PHAT	3	30	20
RAK/RAC-DJ60PHAT	3	30	20
RAK/RAC-DJ70PHAT	3	30	20
Air Home 500 Series			
RAK/RAC-DJ25PCAT	3	20	15
RAK/RAC-DJ35PCAT	3	20	15
RAK/RAC-DJ50PCAT	3	30	20
RAK/RAC-DJ60PCAT	3	30	20
RAK/RAC-DJ70PCAT	3	30	20
Air Home 600 Series			
RAK/RAC-VJ25PHAT	3	20	15
RAK/RAC-VJ35PHAT	3	20	15
RAK/RAC-VJ50PHAT	3	30	20
RAK/RAC-VJ60PHAT	3	30	20
RAK/RAC-VJ70PHAT	3	30	20
P-Series			
RAS/RAC-P25YHAB	3	20	10
RAS/RAC-P35YHAB	3	20	10
RAS/RAC-P50YHAB	3	20	10



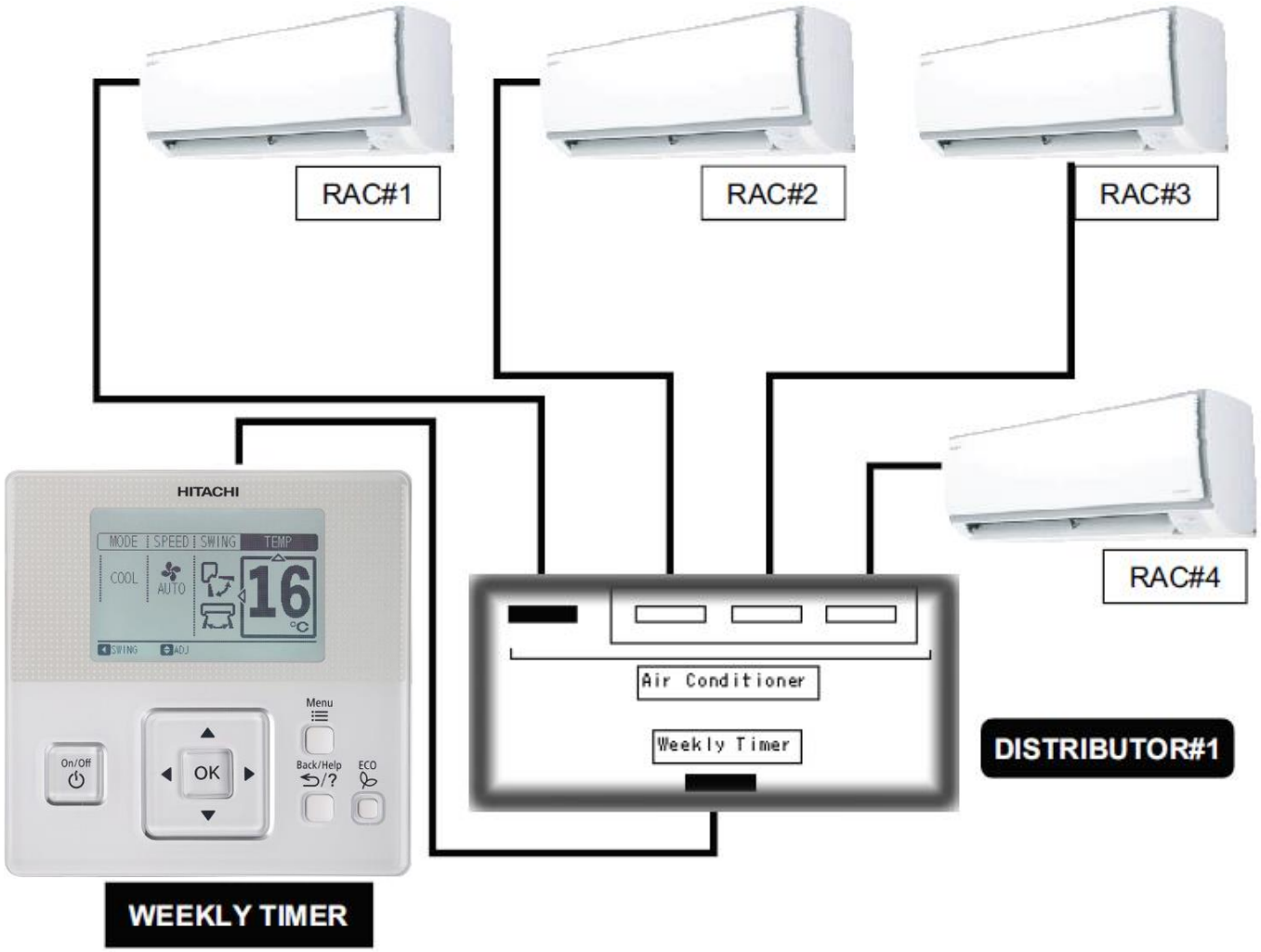
Installation: Wiring



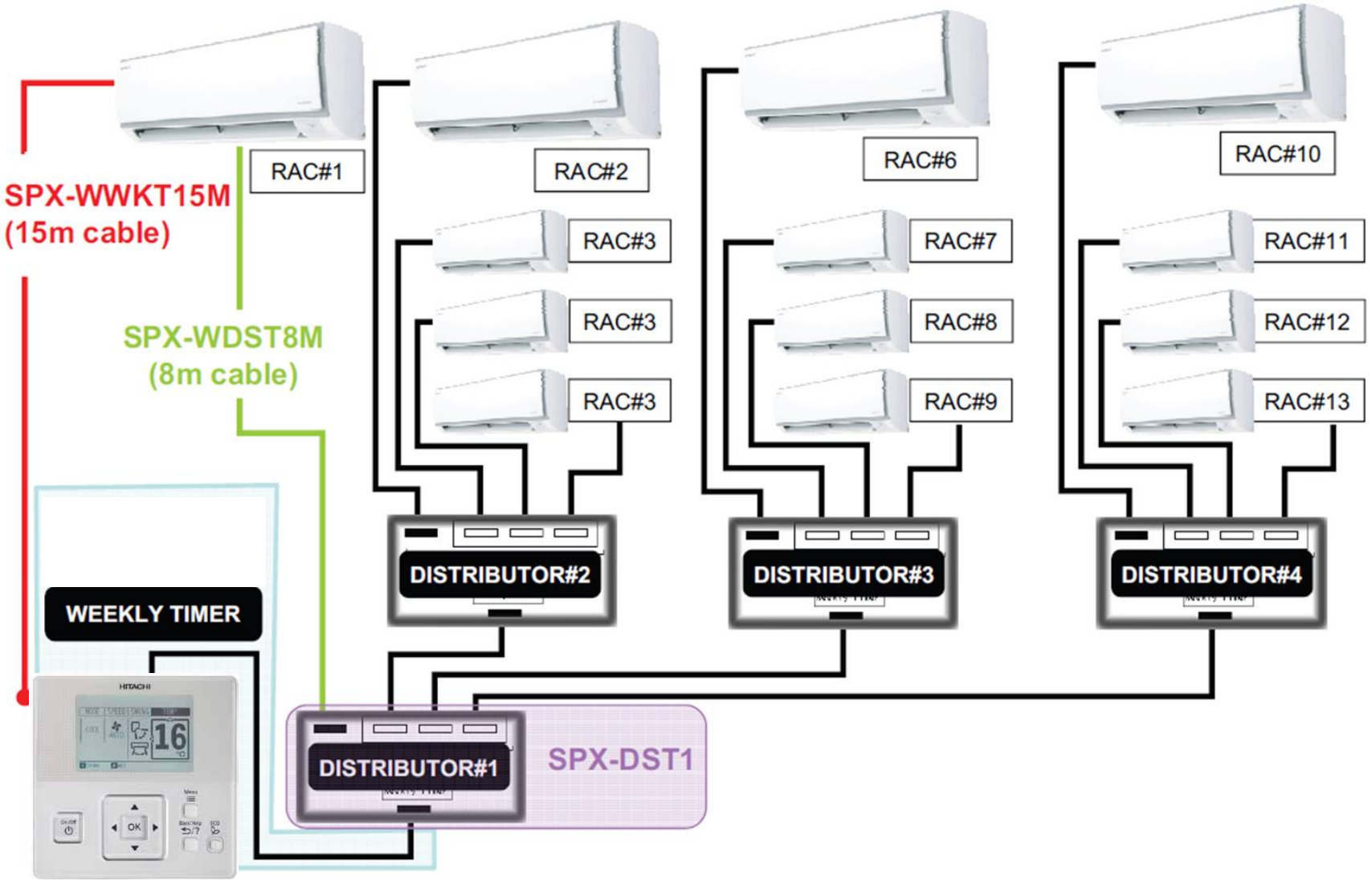
Power Supply from Outdoor Unit

	2.5 ~ 3.5kw	5.0 ~ 7.0kw
Fuse capacity / Circuit Breaker	15A	20A

Installation: SPX-WKT4 Wall Controller - Multiple Units

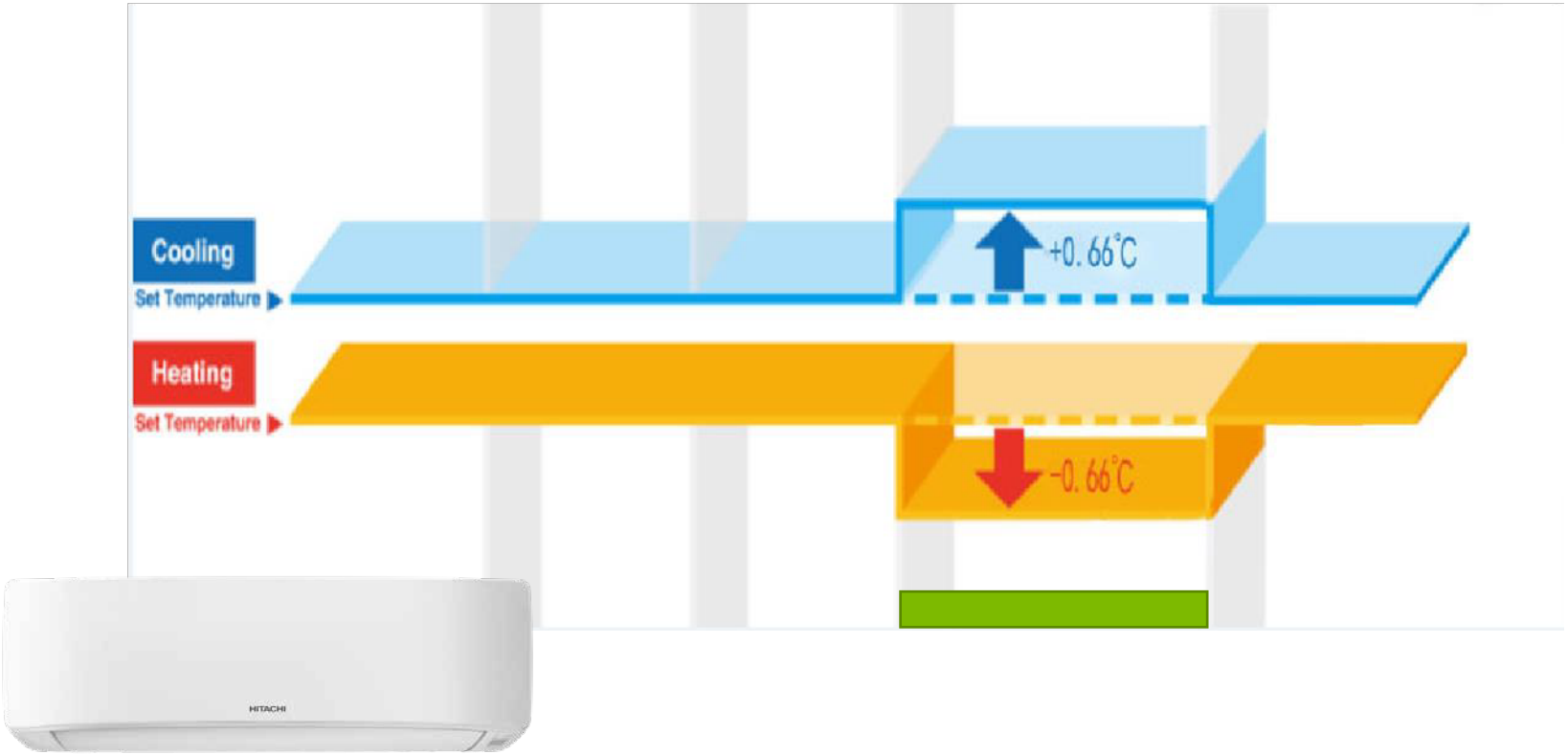


Installation: SPX-WKT4 Wall Controller - Multiple Units

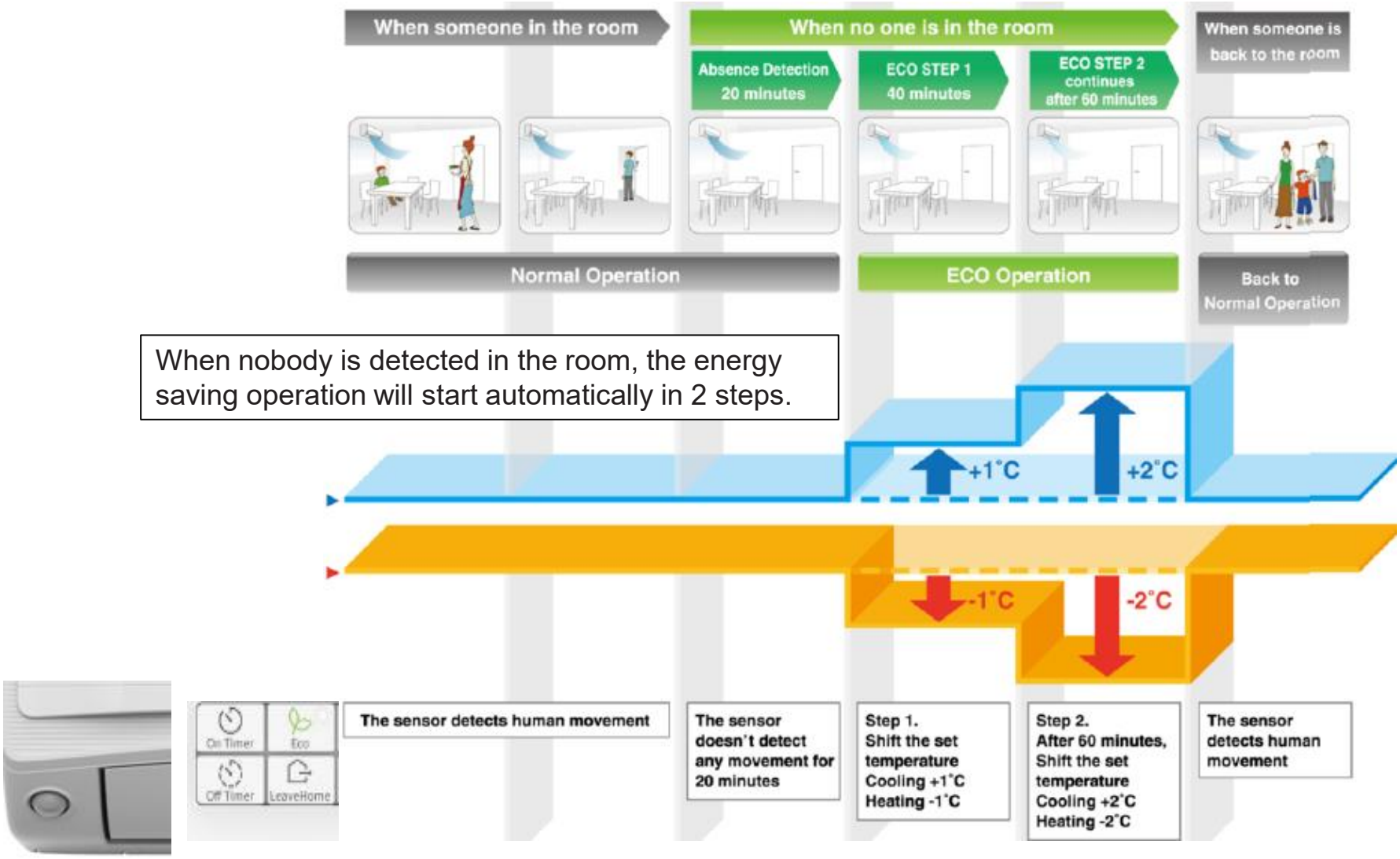


ECO Function - airHome 400 Series

Energy saving operation will start by changing the set temperature higher or lower automatically and reducing operation power consumption. This function may vary based on the connected outdoor unit.



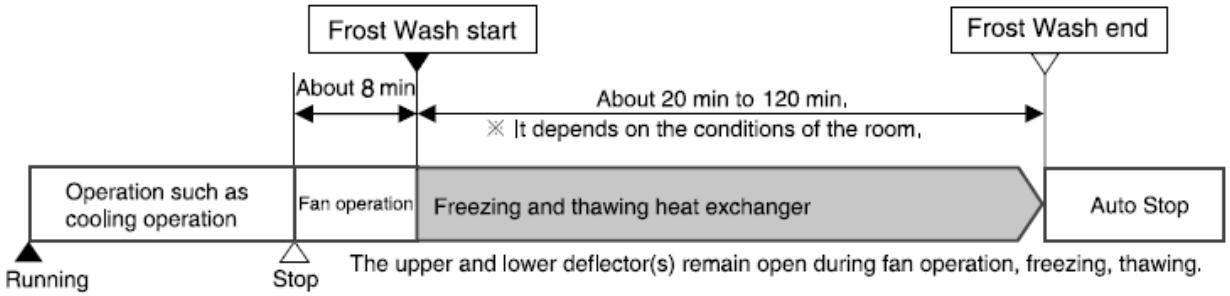
ECO Function - airHome 500 & 600 Series



FrostWash™

Frost Wash achieves a **91% reduction*** of bacteria and **87% reduction*** of mould in your unit.

The process of Frost Wash

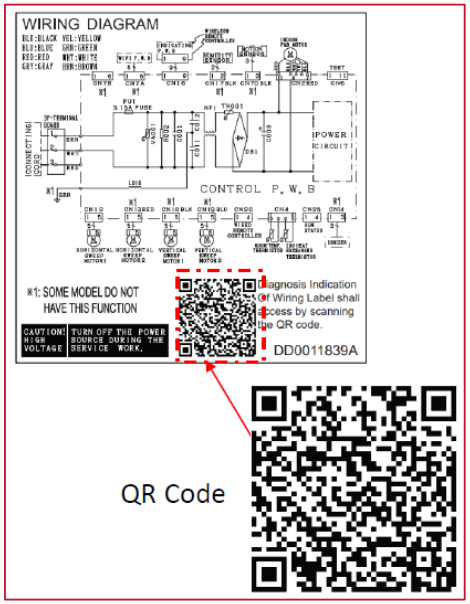


- " " lamp on the indoor unit lights up during Frost Wash operation.
- If you want to stop Frost Wash operation, press the ⏻ (START/STOP) button twice.
- In order to protect the product, Frost Wash function cannot be carried out again for about 60 minutes after Frost Wash operation is completed.

Troubleshooting & Diagnosis

IMPORTANT CHECK POINTS

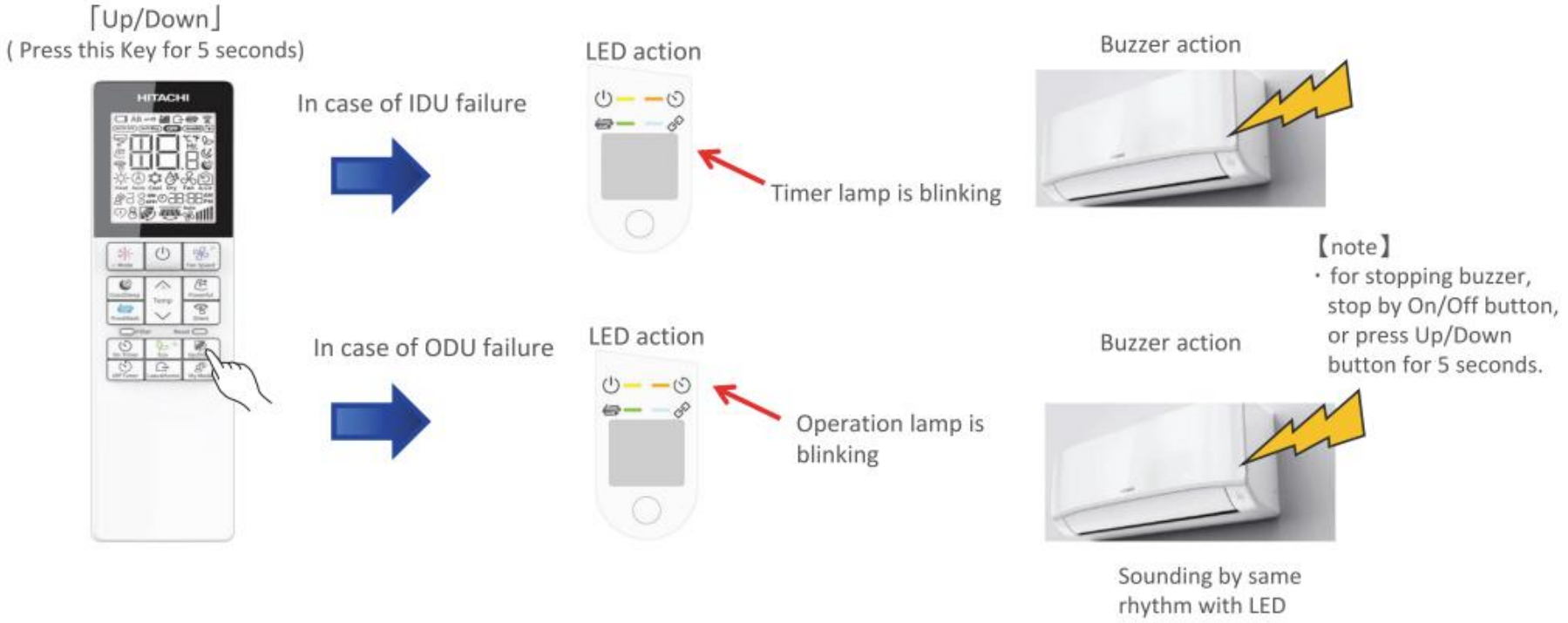
1. Check the indoor Timer LED / Operation LED status (flashing)
   - Refer to the Diagnosis table inside indoor front cover.



Troubleshooting & Diagnosis

IMPORTANT CHECK POINTS (continue)

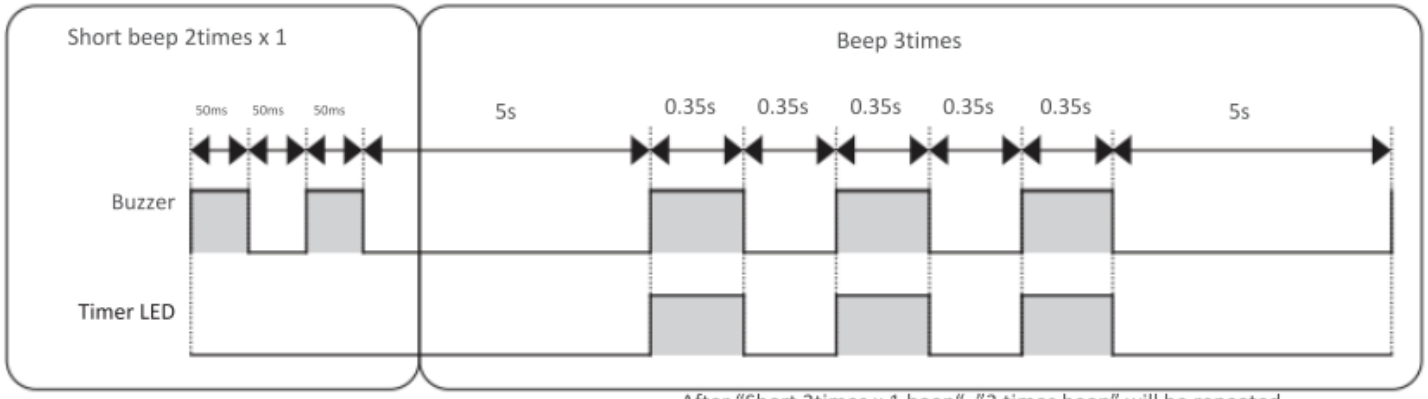
1(a) – Checking Error Contents and Buzzer Sounding



Troubleshooting & Diagnosis

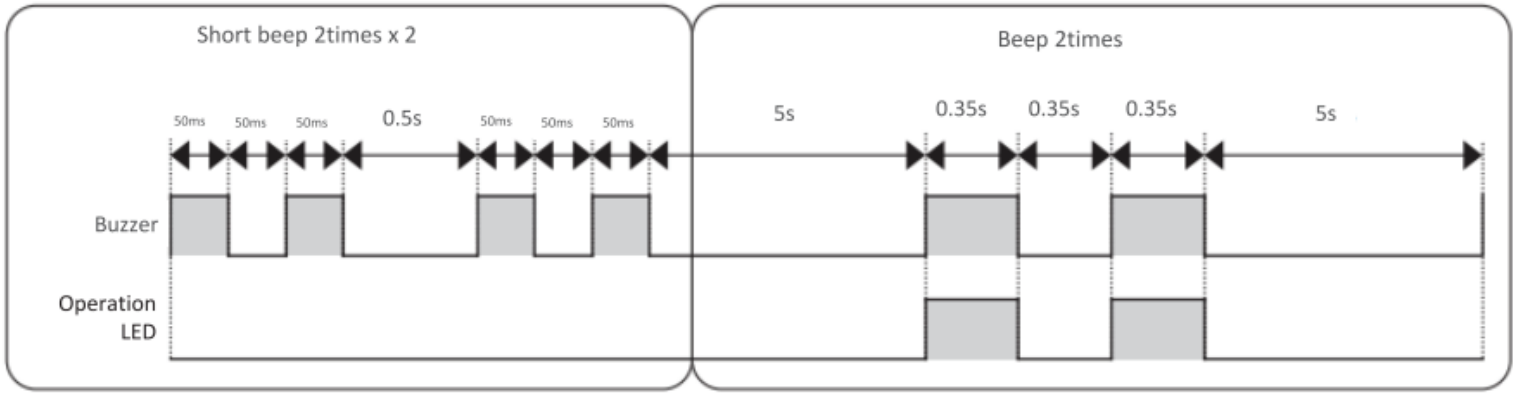
IMPORTANT CHECK POINTS (continue)

<IDU error example: timer LED will blink 3 times(interface defective(IDU) >



After "Short 2times x 1 beep", "3 times beep" will be repeated.

<ODU error example: operation LED will blink 2 times(peak current cut) >



After "Short 2times x 2 beep", "2 times beep" will be repeated.

Troubleshooting & Diagnosis

IMPORTANT CHECK POINTS (continue)

1(b) - Refer to the Diagnosis table inside indoor front cover.
Scan the barcode to see the Diagnosis table.

LAMP BLINKING MODE	MAIN DEFECTIVE
■ 2S ■ ——— ONCE	REFRIGERANT CYCLE DEFECTIVE
■■ 2S ■ ——— 2 TIMES	FORCED COOLING OPERATION
■■■ 2S ■ ——— 3 TIMES	INTERFACE DEFECTIVE(INDOOR)
■■■■ 2S ■ ——— 4 TIMES	OUTDOOR UNIT DEFECTIVE
■■ ■■ 2S ■ — 9 TIMES	INDOOR THERMISTOR DEFECTIVE
■■ ■■ 2S ■ — 10 TIMES	ABNORMAL ROTATING NUMBERS OF DC FAN MOTOR
■■ ■■ 2S ■ — 12 TIMES	INTERFACE DEFECTIVE(OUTDOOR)
■■ ■■ 2S ■ — 13 TIMES	EEPROM IC DEFECTIVE
■■ ■■ 2S ■ — 21 TIMES	INTERFACE DEFECTIVE(OTHER MACHINE CAUSE)
■■ ■■ 2S ■ — ※25 TIMES	CN7A & CN7B CONNECTED WITH BOTH RAC OR WIFI ADAPTER.

(■— LIGHT FOR 0.35 SEC AT INTERVAL OF 0.35 SEC.)

Communication failure caused by other device.

⇩

Check point:
> Cabel
> ODU communication
> Noise source near RAC

Misconnection of RAC adapter or WIfi adapter

⇩

Check point:
> Not proper connection

Troubleshooting & Diagnosis

IMPORTANT CHECK POINTS (continue)

Timer Lamp blinking

Self-diagnosis lamp blinking is done by the Timer LED.

No.	Blinking of Timer lamp	Reason for indication	Possible cause
1	2sec. once	Refrigerant cycle defective	Refrigerant cycle defective
2	2sec. 2 times	Outdoor unit forced operation When the outdoor unit is in forced operation or balancing operation after forced operation	Electrical parts in the outdoor unit
3	2sec. 3 times	Indoor interface defective	Indoor interface circuit
4	2sec. 4 times	Outdoor electrical assembly defective.	Please check at the outdoor electrical led lamp blinking (LD301) and refer to self diagnosis lighting mode for outdoor unit.
5	2sec. 9 times	Room thermistor or heat exchanger thermistor or humidity sensor is faulty. When room thermistor or heat exchanger thermistor or humidity sensor is opened circuit or short circuit.	(1) Room thermistor (2) Heat exchanger thermistor (3) Humidity sensor
6	2sec. 10 times	Over-current detection at the DC fan motor when over-current is detected at the DC fan motor of the indoor unit.	(1) Indoor fan locked (2) Indoor fan motor (3) Indoor control P.W.B.
7	2sec. 12 times	Outdoor interface defective When the interface signal from the outdoor unit is interrupted.	Outdoor interface circuit
※1 8	2sec. 13 times	IC531 data reading error When data read from IC531 is incorrect.	IC531 abnormal
9	2sec. 21 times	Outdoor communication error Communication failure due to other home appliances	(1) Connecting cable check (2) Removal of noise cause (3) Connection cable is reverse
※2 10	2sec. 25 times	CN7A & CN7B connected with both RAC, wifi or H-link	Please don't connect same external device CN7A & CN7B

Checking point : Indoor PCB Failure

Checking point : Wire Connection indoor & outdoor reverse, Outdoor PCB Failure

Checking Point : Check Others appliance

Checking Point : Check connection wifi or adapter

Troubleshooting & Diagnosis

IMPORTANT CHECK POINTS (continue)

Indoor Terminal Connection Inspection

Checking the connection of 1, 2, 3 terminal to the indoor.
1) Power ON the unit.
2) After around 1 minute, check the AC voltage between terminal as below table.

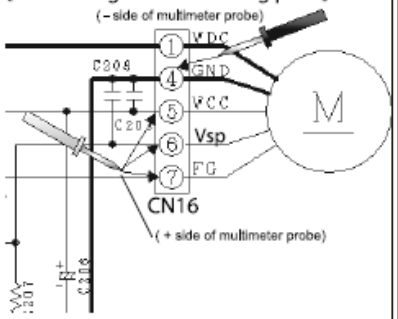
Connection condition	Voltage value between terminal			Outdoor LD301 indication
	1 to 2	2 to 3	1 to 3	
All connection OK	240V	around 0.3V	240V	Off or 1 time blink
Terminal 1 no connection	240V	0.1-0.4V	240V	9 times blink
Terminal 2 no connection	240V	100 - 120V	120-140V	9 times blink
Terminal 3 no connection	240V	0.1-0.4V	240V	9 times blink

Indoor Fan Motor Inspection

Fan Motor Check	Resistance	Operation
(+) Red (Pin1) & (-) Black(Pin4)	> 2MΩ/OL	360VDC
(+) White (Pin5) & (-) Black(Pin4)	35kΩ~40kΩ	15VDC
(+) Yellow (Pin6) & (-) Black(Pin4)	230kΩ~250kΩ	3~6VDC
(+) Blue (Pin7) & (-) Black(Pin4)	> 2MΩ/OL	7.5VDC

(+) Positive probe (-) Negative probe

[Circuit diagram of checking parts]



Troubleshooting & Diagnosis

IMPORTANT CHECK POINTS (continue)

Basic Servicing steps for IDU & ODU

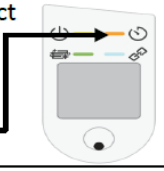
1.) Check error blinking on indoor

a.) If blinking 1, ,3 , 9 , 10 , 13 , 21 & 25 times on indoor , please check IDU by refer below indoor diagnosis table & Summary of trouble shooting (page :2)

b.) If blinking 4 times or 12 times , it is shown ODU problem .

12 times : ODU PCBA interface circuit defect

4 times : ODU general defect



IDU diagnosis table

IDU Timer lamp blinking :

LAMP BLINKING MODE	MAIN DEFECTIVE
▮ 2S ▮ ——— ONCE	REFRIGERANT CYCLE DEFECTIVE
▮▮ 2S ▮ ——— 2 TIMES	FORCED COOLING OPERATION
▮▮▮ 2S ▮ ——— 3 TIMES	INTERFACE DEFECTIVE(INDOOR)
▮▮▮▮ 2S ▮ ——— 4 TIMES	OUTDOOR UNIT DEFECTIVE
▮▮ ≪ ▮▮ 2S ▮ — 9 TIMES	INDOOR THERMISTOR DEFECTIVE
▮▮ ≪ ▮▮ 2S ▮ — 10 TIMES	ABNORMAL ROTATING NUMBERS OF DC FAN MOTOR
▮▮ ≪ ▮▮ 2S ▮ — 12 TIMES	INTERFACE DEFECTIVE(OUTDOOR)
▮▮ ≪ ▮▮ 2S ▮ — 13 TIMES	EEPROM IC DEFECTIVE
▮▮ ≪ ▮▮ 2S ▮ — 21 TIMES	INTERFACE DEFECTIVE(OTHER MACHINE CAUSE)
▮▮ ≪ ▮▮ 2S ▮ — ※25 TIMES	CN7A & CN7B CONNECTED WITH BOTH RAC OR WIFI ADAPTER.

c.) If IDU cannot operate and no shown any blinking.

-- Check FU1 (3.15A fuse) condition

-- Check CN16 connector insertion condition

-- Check Indoor board by refer summary of trouble shooting (page:2)

2.) Recall ODU error blinking in indoor operation lamp by wireless remote :

<HOW TO DISPLAY ERROR CODE>

1.Press three key ([On Timer] + [Fan Speed] + [Reset]) button on the remote control for 5 seconds to avoid access by User.

2. Press " Temp " (Temperature) button of the remote control and select the "7J" option.

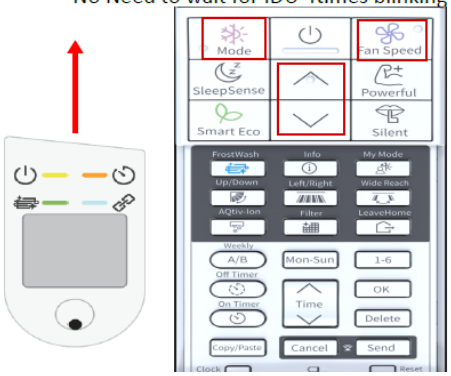
3. Press " Fan Speed " (Fan Speed) button of the remote control, then Press " Temp " (Temperature) button select the "t0" option.

4. Press " Fan Speed " (Fan Speed) button of the remote control, then Press " Temp " (Temperature) button select the "01" option.

5. Press " ⏻ " (On/Off) button of the remote control, the fault information will be seen.

Function Name	Value	Layer1 Category	Layer2 Function	Layer3 Value
Display self-diagnosis memory(※)	Display History 1 (Latest(newest) of last Five)	7J	t0	01
	Display History 2			02
	Display History 3			03
	Display History 4			04
	Display History 5			05

**No Need to wait for IDU 4times blinking occurred , can use remote recall function immediately .

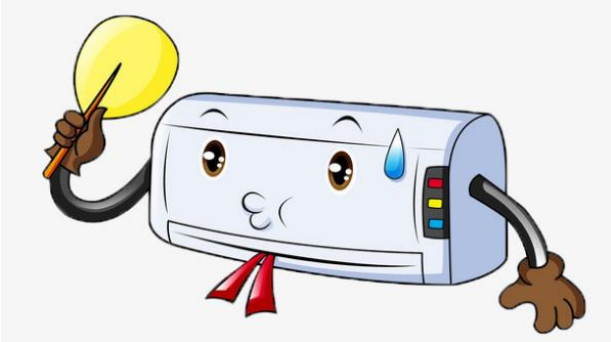


Key	Function
Temp UP/DOWN	: Selection (In same layer)
MODE	: Move to previous layer
FAN SPEED	: Move to next layer
ON/OFF	: Decision/Send (at layer 3) : Current Setting Check (at layer 2)
FILTER	: Category Initialization (at layer 1)
FILTER + ON/OFF	: All Category Initialization (at layer 1)

❑ To exit from service setting mode, Service technician need to either not operate the HHRC for 30 seconds OR

❑ press and hold the Up/Down key for 5 seconds.

Troubleshooting & Diagnosis



IMPORTANT CHECK POINTS (continue)

2. Check the outdoor LED 301 .

   Please refer to the diagnosis table on top of the electrical box cover (under the top cover)

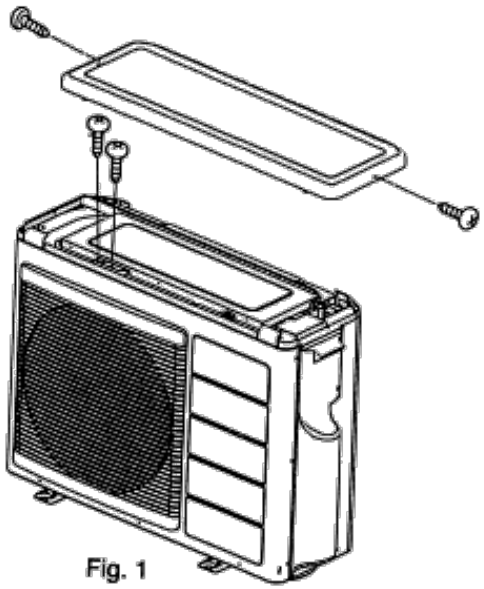


Fig. 1

DANGER (DC 360V)

- SWITCH OFF MAIN POWER SUPPLY TO THE OUTDOOR UNIT AT LEAST 10 MINUTES BEFORE START THE SERVICING WORK
- MAKE SURE THE LEVEL DC VOLTAGE BETWEEN TAB7/WHT(+) AND TAB8/BLK(-) IS LESS THAN 10V.
- DO NOT TOUCH ANY OTHER PARTS EXCEPT TEST (SERVICE) SWITCH WHEN SERVICE OPERATION IS CONDUCTED.

SELF DIAGNOSIS LIGHTING MODE
■ LIT ☒ BLINKING □ OFF

LD301 (RED)	SELF-DIAGNOSIS NAME	MAIN CHECK POINT	HOW TO REPAIR
[1] DURING OPERATION			
■	NORMAL OPERATION	COMPRESSOR OPERATION	NOT MALFUNCTION
☒	OVERLOAD OPERATION	COMPRESSOR OPERATION	THIS SHOW AN OVERLOAD, NOT MALFUCTION
[2] DURING STOP			
□	NORMAL STOP (STOPPED BY INDOOR THERMOSTAT OR MAIN OPERATION OFF)	1. NO NEED TO CHECK ⇨	1. NOT ANY MALFUNCTION
☒ 1 TIME	FAN MODE OPERATION, RESET STOP	1. WAITING FOR COMPRESSOR START ⇨ 2. OTHER THAN ABOVE ⇨	1. NORMAL 2. CHANGE THE P.W.B.s
☒ 2 TIMES	PEAK CURRENT CUT	1. P.W.B.s DEFECTIVE ⇨ 2. COMPRESSOR ABNORMAL LOAD →	1. CHANGE THE P.W.B.s 2. CHECK THE COMPRESSOR
☒ 3 TIMES	ABNORMAL LOW SPEED ROTATION	1. P.W.B.s DEFECTIVE → 2. COMPRESSOR ABNORMAL LOAD ⇨	1. CHANGE THE P.W.B.s 2. CHECK THE COMPRESSOR
☒ 4 TIMES	SWITCHING FAILURE	1. COMPRESSOR CONNECTOR OPEN ⇨ 2. COMPRESSOR ABNORMAL LOAD ⇨ 3. P.W.B.s DEFECTIVE ⇨	1. INSERT THE CONNECTOR 2. CHECK THE COMPRESSOR 3. CHANGE THE P.W.B.s
☒ 5 TIMES	OVERLOAD LOWER LIMIT CUT	1. OBSTACLE SURROND THE OUTDOOR UNIT → 2. OTHER CAUSE ⇨	1. REMOVE THE OBTRUCTION 2. CHECK CYCLE PIPE
☒ 6 TIMES	OH THERMISTOR TEMPERATURE RISE	1. THERMISTOR WIRE SHORT CIRCUIT ⇨ 2. LEAKAGE OF REFRIGERANT → 3. OTHER CAUSE ⇨	1. CHANGE THE THERMISTOR 2. CHECK THE CYCLE PIPE AND RECHARGE THE REFRIGERANT 3. CHANGE THE P.W.B.s
☒ 7 TIMES	THERMISTOR ABNORMAL	1. CONNECTOR MIS INSERT ⇨ 2. THERMISTOR WIRE OPEN/SHORT CIRCUIT ⇨ 3. P.W.B.s DEFECTIVE ⇨	1. INSERT PROPERLY 2. CHANGE THE THERMISTOR 3. CHANGE THE P.W.B.s
☒ 9 TIMES	COMMUNICATIONS ERROR	1. CONNECTING CABLE MIS CONNECTION ⇨ 2. CONNECTING CABLE DISCONNECTION ⇨ 3. P.W.B.s DEFECTIVE ⇨	1. CONNECT CONNECTING CABLE PROPERLY 2. CHANGE THE CONNECTING CABLE 3. CHANGE THE P.W.B.s
☒ 10 TIMES	ABNORMAL POWER SOURCE	1. REACTOR IS UNCONNECTED → 2. ABNORMAL AC INPUT: OUT OF RANGE (230±10%) ⇨ 3. AC INPUT IS NORMAL →	1. CONNECT REACTOR PROPERLY 2. CONNECT TO NORMAL AC POWER SOURCE 3. CHANGE THE P.W.B.s
☒ 11 TIMES	OUTDOOR FAN STOP BY STRONG REVERSE WIND	1. OUTDOOR FAN STOP BY STRONG REVERSE WIND →	1. IT WILL RE-START AFTER WIND BECOME WEAK
☒ 12 TIMES	OUTDOOR FAN LOCK ERROR	1. OUTDOOR FAN STOP BY STRONG REVERSE WIND ⇨ 2. PROPELLY FAN LOCK ⇨ 3. OUTDOOR FAN MOTOR LOCK ⇨ 4. OUTDOOR FAN MOTOR OK →	1. IT WILL RE-START AFTER WIND BECOME WEAK 2. REMOVE THE OBSTRUCTION 3. CHANGE THE FAN MOTOR 4. CHANGE THE P.W.B.s
☒ 13 TIMES	EEPROM READING ERROR	CHANGE THE P.W.B.s	
☒ 14 TIMES	ACTIVE VOLTAGE ABNORMAL	1. P.W.B.s DEFECTIVE → 2. ABNORMAL COMPRESSOR LOAD ⇨	1. CHANGE THE P.W.B.s 2. CHECK THE COMPRESSOR
☒ 15 TIMES	CIRCUIT ABNORMAL	CHANGE THE P.W.B.s	
☒ 16 TIMES	HIGH LOAD STOP	1. SERVICE VALVE CLOSE ⇨ 2. OBSTACLE SURROND THE OUTDOOR UNIT → 3. CLOGGED FILTER IN INDOOR UNIT →	1. CHECK SERVICE VALVE 2. REMOVE THE OBTRUCTION 3. CHECK FILTER

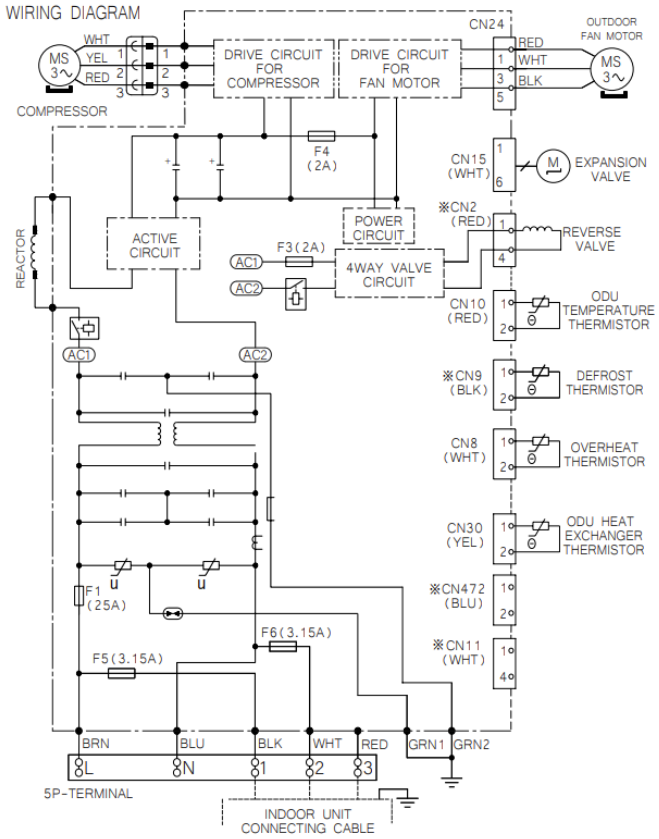
● BLINKING DURING OVERLOAD ■ 0.3SEC ■ ■ (■▪▪ LIGHTS FOR 2 SEC. AT INTERVAL OF 0.3 SEC.)

● EXAMPLE OF BLINKING(5 TIMES) ■■■■■ 2SEC ■ (■▪▪ LIGHTS FOR 0.25 SEC. AT INTERVAL OF 0.25 SEC.)

Troubleshooting & Diagnosis

IMPORTANT CHECK POINTS (continue)

3. Initial Voltage Check Troubleshooting. Based on Circuit Troubleshooting Guide.



(circuit will be slightly different depending on models)

Troubleshooting Air Home 400, 500, 600
Troubleshooting P series 2.5kW, 3.5kW, 5.0kW

① Measure incoming voltage across
Terminal L & N = 240VAC

② Measure output voltage across
Terminal 1 & 2 = 240VAC

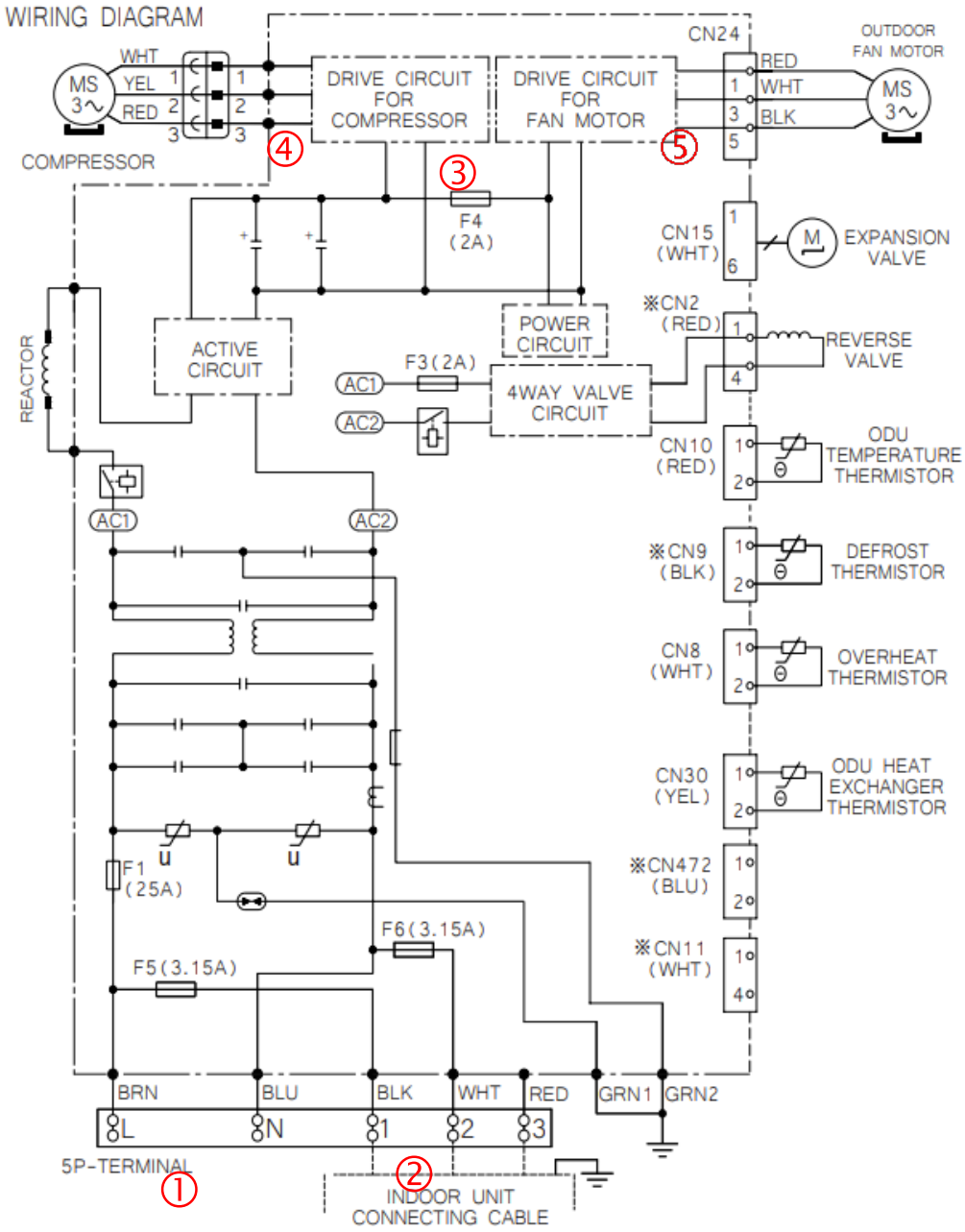
③ Check VDC at IPM terminal
N(-) J41 , P(+)Fuse F4 = 300VDC
(Standby Mode = 16VDC)

④ Check VDC at Compressor terminal
N(-) J41 , P(+)U,V,W = 150VDC

⑤ Check VDC at Fan Motor terminal
N(-) J41 , P(+)U,V,W = 150VDC

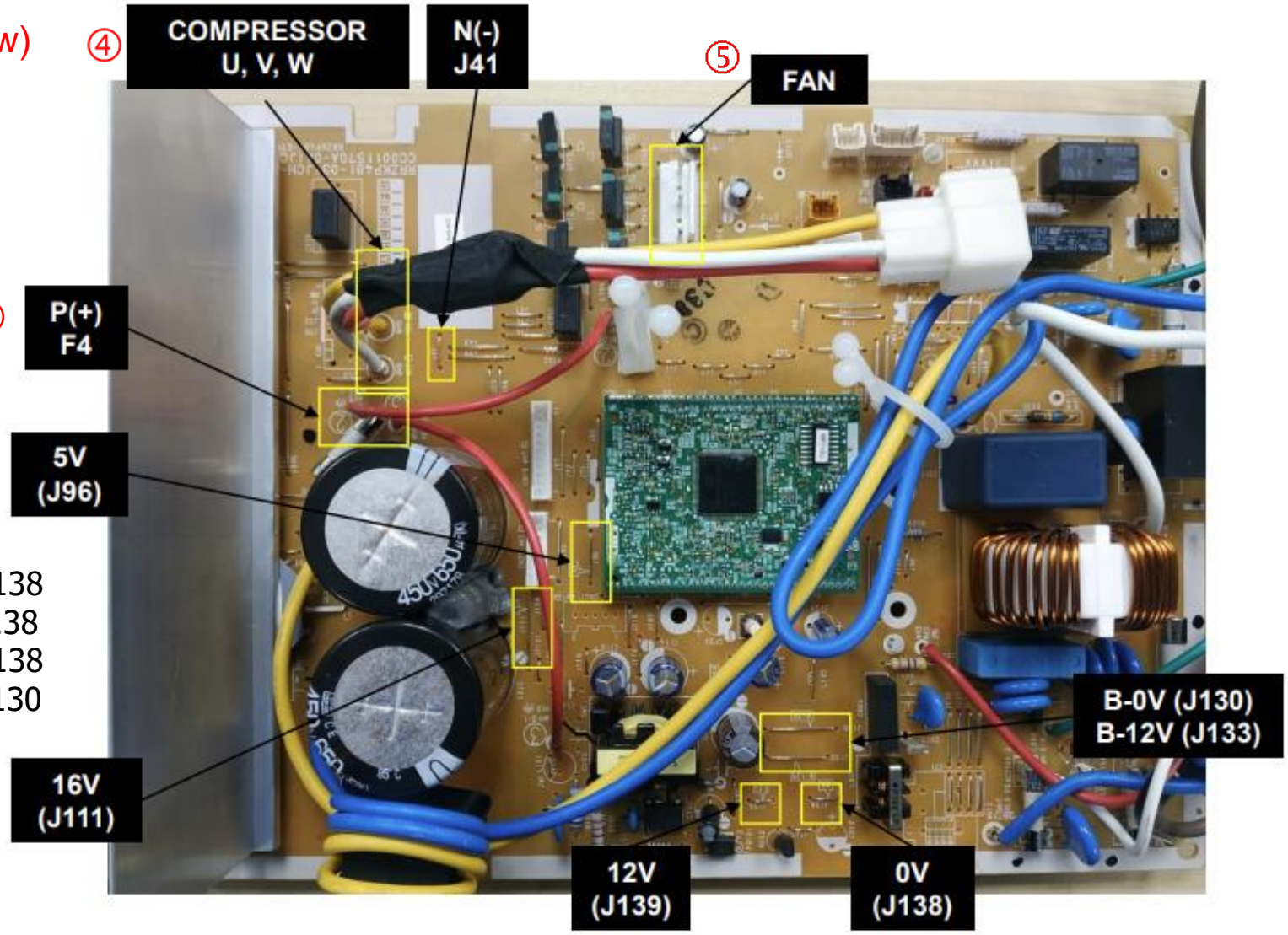
Notes:

Compressor winding : 0.9 ~ 1.2 ohms
Fan motor winding : 20 ~ 50 ohms
Reversing valve coil : 135 ohms
OH Thermistor : 10 ~ 35k ohms
DEF Thermistor : 2 ~ 3k ohms
OD Air Thermistor : 2 ~ 3k ohms
OD Hex Thermistor : 2~ 3k ohms



Troubleshooting Air Home 400, 500, 600 system
Troubleshooting P series 2.5kW, 3.5kW, 5.0kW

(PCB Front View)

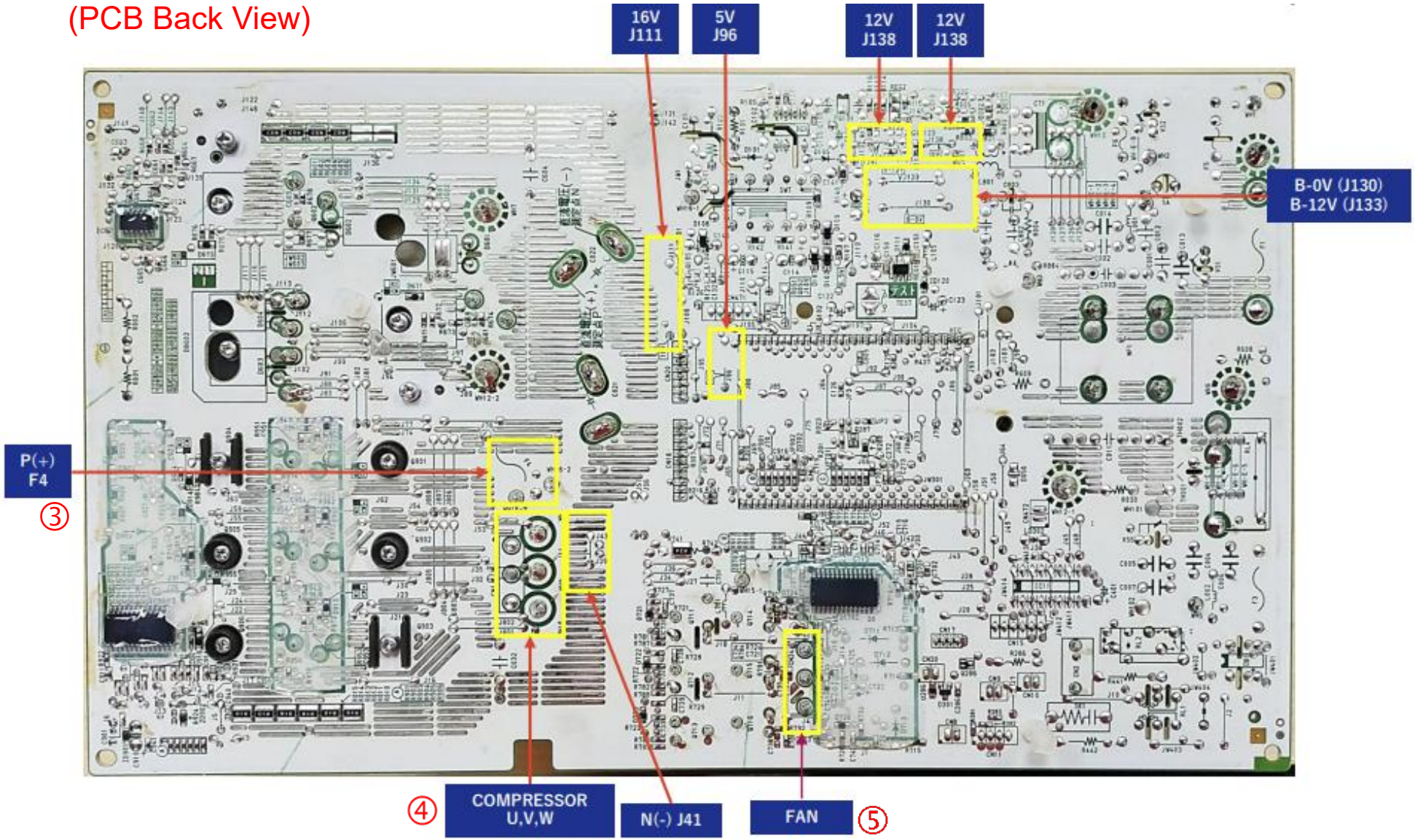


Additional Checks:

16VDC	(+)J111	(-)J138
5VDC	(+)J96	(-)J138
12VDC	(+)J139	(-)J138
B12VDC	(+)J133	(-)J130

Troubleshooting Air Home 400, 500, 600 system
Troubleshooting P series 2.5kW, 3.5kW, 5.0kW

(PCB Back View)



Troubleshooting & Diagnosis

Self-Diagnosis Outdoor to Check PCB Or Compressor

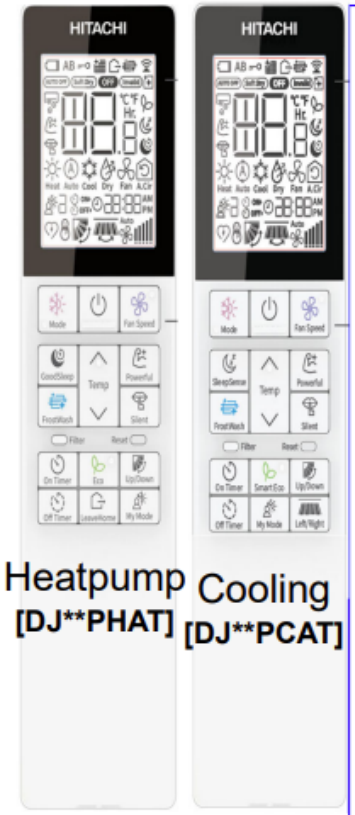
1. Switch OFF main power supply.
2. Disconnect communication wire ID/OD (pin no.3 at terminal)
3. Insert external service switch at CN18
4. Switch ON main power supply (wait until LD 301 will 9 times blinking)
5. Keep pressing the test switch for more than 5sec until LD301 blink fast and then release the test switch.
6. Self-Check result will display by LD301 blinking times. Refer to self-check diagnosis result table.
7. Switch OFF main power supply once done.

[SELF-CHECK] DIAGNOSIS RESULT		
LD301 BLINKS	DIAGNOSE CONTENT	REPAIR METHOD
1 TIME	ELECTRICAL OK.	CHANGE COMPRESSOR
2 TIMES	PEAK CURRENT CUT OFF SIGNAL DETECTED.	CHANGE ELECTRICAL.
7 TIMES	COMPRESSOR CURRENT ABNORMAL.	COMPRESSOR CONNECTOR LOOSE. ⇒ CHECK CONNECTOR.
		COMPRESSOR CONNECTOR OK. ⇒ AFTER CHECK COMPRESSOR, CHANGE ELECTRICAL.
10 TIMES	DC VOLTAGE ABNORMAL	AC VOLTAGE INPUT ABNORMAL (BEYOND ±10% OF RATED VOLTAGE) ↳ CONNECT TO CORRECT AC SUPPLY.
		AC VOLTAGE INPUT ABNORMAL (WITHIN ±10% OF RATED VOLTAGE) ↳ CHANGE ELECTRICAL.
13 TIMES	EEPROM READING ERROR	CHANGE ELECTRICAL.

IF outdoor blinking 2,3,4 & 5 Times, Please perform self-check.

Service Mode & Optional Setting

Service Mode Function



Heatpump
[DJPHAT]**

Cooling
[DJPCAT]**

Function

- 5 Speed (S.Hi, Hi, Me, Low, Silent)
- Set temp. interval 0.5˚ C
- MODE (Cooling – Dry – Fan – Air Circulation)
- Powerful
- Refresh
- Frost Wash
- Good Sleep (Air Sleep Timer)
- ON/OFF Timer
- Up/Down swing
- Left/Right swing
- Silent
- Power Safe
- Mold Guard (Internal Clean)
- A/B Identifier: Yes
- Key printing: 4 different colors
  Keypad type: Tile keys

Service Mode

- **Shift Value**
- **Run indoor only**
- **Dry contact**
- **Error Diagnosis (history)**
- **Fan setting during Thermo Off**
- **Enable or disable auto restart**

Special Setting for Remote

1.Change temperature gradient 1 deg & 0.5 deg
2.Change Fan speed Sequence
3.Enable or disable auto fan speed
4.Enable or disable auto high
5.Setting temperature limit
6.Enable or disable operation mode

Service Mode & Optional Setting

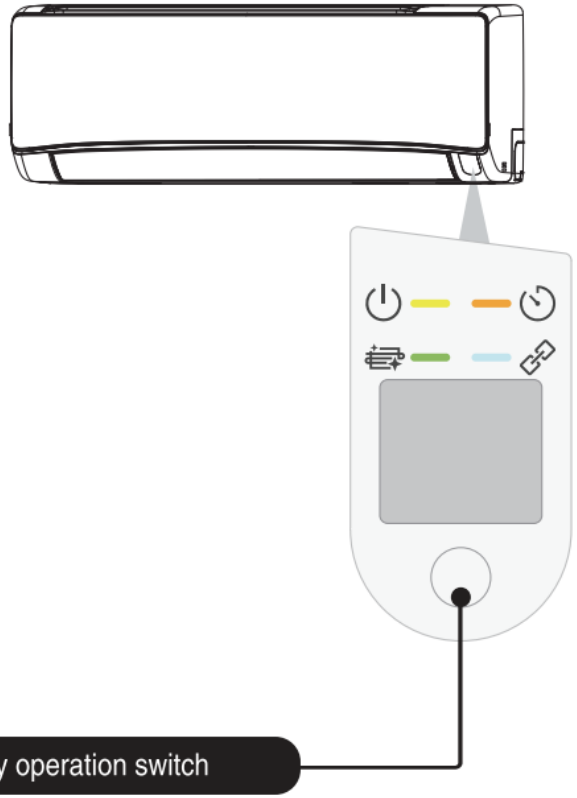
Service Mode : Force Cooling Operation

The cooling operation can be forcibly performed for collecting refrigerant and inspecting failures.
Do not perform the forced cooling operation continuously for long hours,
because the compressor continues to be in operational status, regardless of room temperature.

＜How to start the operation＞
・The operation of the unit should be stopped.
・Press and hold the "Temporary operation SW"
shown in the right figure for 5 sec.

＜How to stop the operation＞
・Press and hold the "Temporary operation SW" again.
Or stop the operation using the remote controller.

※During the forced cooling operation,
the "Timer indicator" blinks twice.

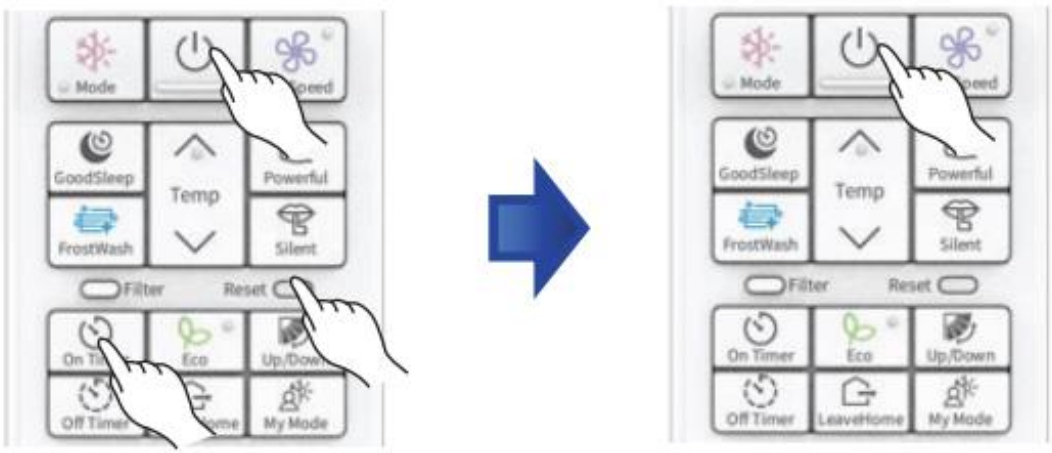


When performing the forced cooling operation, turn the power off once. If you press and hold the switch for 5 sec or longer, the forced cooling operation starts. To stop the forced cooling operation, press the switch once again or stop the operation using the remote controller.

Service Mode & Optional Setting

Service Mode : Run Indoor Only

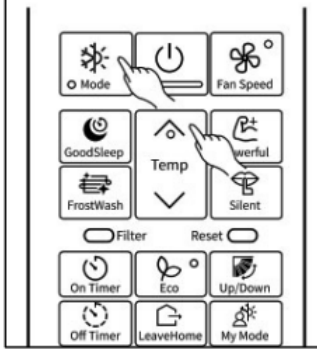
1. Press “On Timer button” and “On/Off button” and “Reset button, and release “Reset button”.
2. Fan speed icon（ ）on LCD will blink.
3. Press “On/Off button” towards IDU.



Service Mode & Optional Setting

Service Mode : Operation Mode Lock

Lock Heating Mode



■ Method to lock Heat Mode (including Fan Mode) operation.

Press [Mode] (Mode) and [Temp] buttons simultaneously for about 3 seconds when the remote controller is OFF.

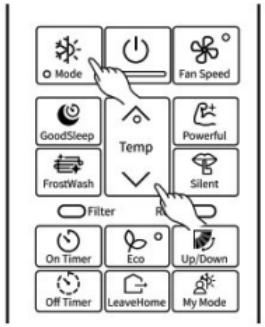
" Heat ", " Fan " and " 🔑 " will be displayed for about 10 seconds. Later, " Heat " and " 🔑 " will remain.

This indicates that Heat Mode operation is locked.

When pressing [Mode] (Mode) button, " Heat ", or " Fan " will be displayed.

***Return to normal, repeat same step

Lock Cooling Mode



■ Method to lock Cool Mode and Dry Mode (including Fan Mode) operations.

Press [Mode] (Mode) and [Temp] buttons simultaneously for about 3 seconds when the remote controller is OFF.

" Cool ", " Dry ", " Fan " and " 🔑 "will be displayed for about 10 seconds. Later, " Cool " and " 🔑 " will remain.

This indicates that Cool Mode and Dry Mode operation is locked.

When pressing [Mode] (Mode) button, " Cool ", " Dry ", or " Fan " will be displayed.

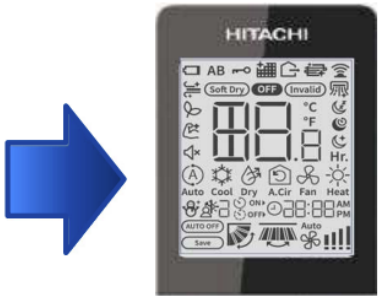
***Return to normal, repeat same step

Service Mode & Optional Setting

Optional Setting : How to set up Service Setting Mode

「On timer」+「Fan speed」+「Reset」

(Press three Key for 5 seconds to avoid access by User)

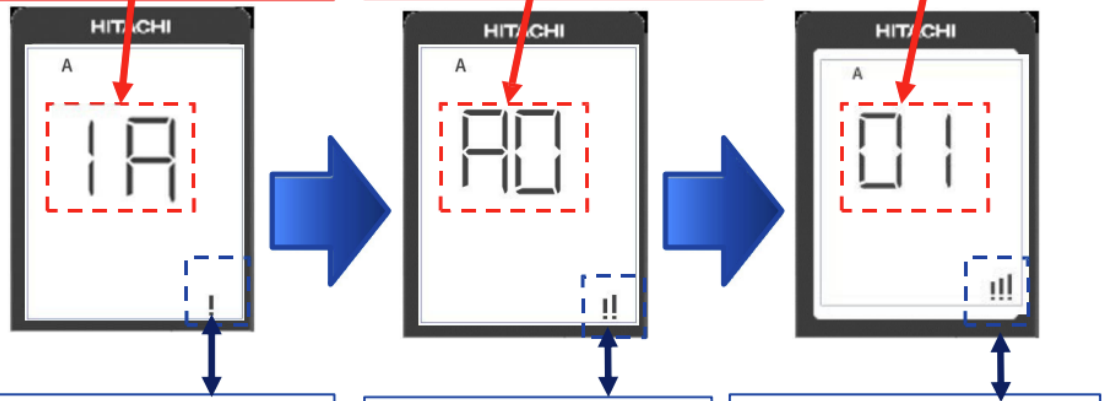


All icon ON for 2 Seconds

Layer1
(category selection):
Installation

Layer2
(function selection):
Card key

Layer3
(setting select):
Disable



Fan Speed one tab
: Layer 1

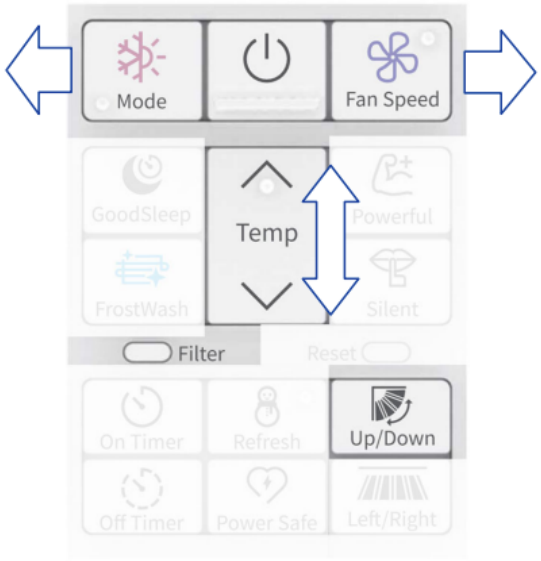
Fan Speed two tab
: Layer 2

Fan Speed three tab
: Layer 3

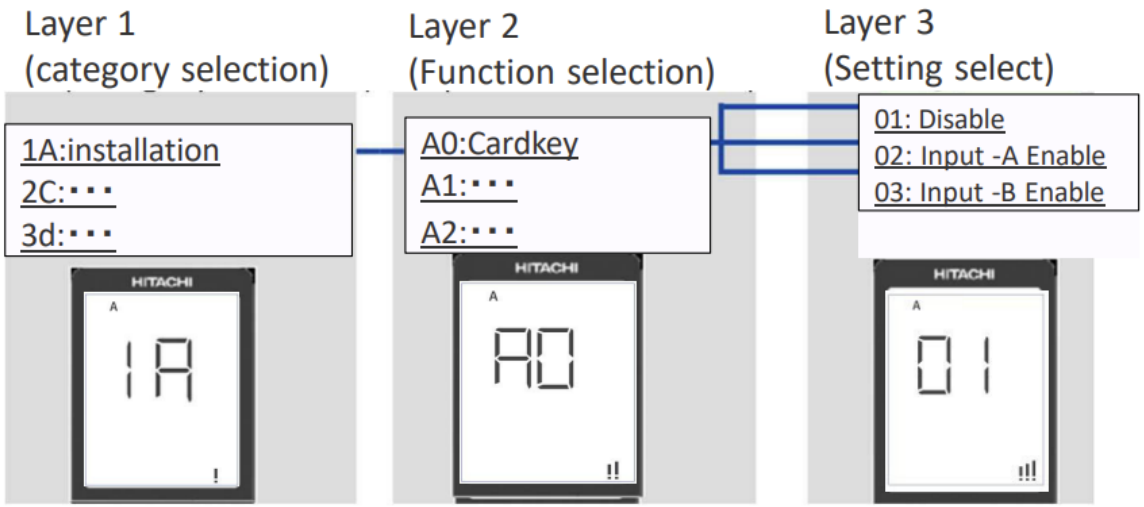
※ If there is not response from user within 30s, this remote controller automatically return to standby mode.

Service Mode & Optional Setting

Optional Setting : How to set up Service Setting Mode



Temp △▽ : Selection (while in the same layer)
Fan Speed : Move to the next layer
Mode : Move to the previous layer
On/Off : Send signal (while in layer 3) *or,*
: Check setting (while in layer 2)
Filter : Category initialization (while in layer 1)
Filter + On/Off : all category initialization (while in layer 1)
Up/Down 5s : Exit from setting mode
※ If user did not press any button in 30s, the HHRC will automatically exit the service mode.



Service Mode & Optional Setting

Optional Setting : 1A Installation

Category	Function Name	Value	HHRC LCD Display		
			Layer1	Layer2	Layer3
			Category	Function	Value
Installation	Card Key	Disable	1A	A0	01
		Card Key Input - A enable			02
		Card Key Input - B enable			03
		reserve			04-99
	Auto Restart	Auto restart Changeover Disable	1A	A2	01
		Auto restart by Previous Mode			02
		reserve			03-99

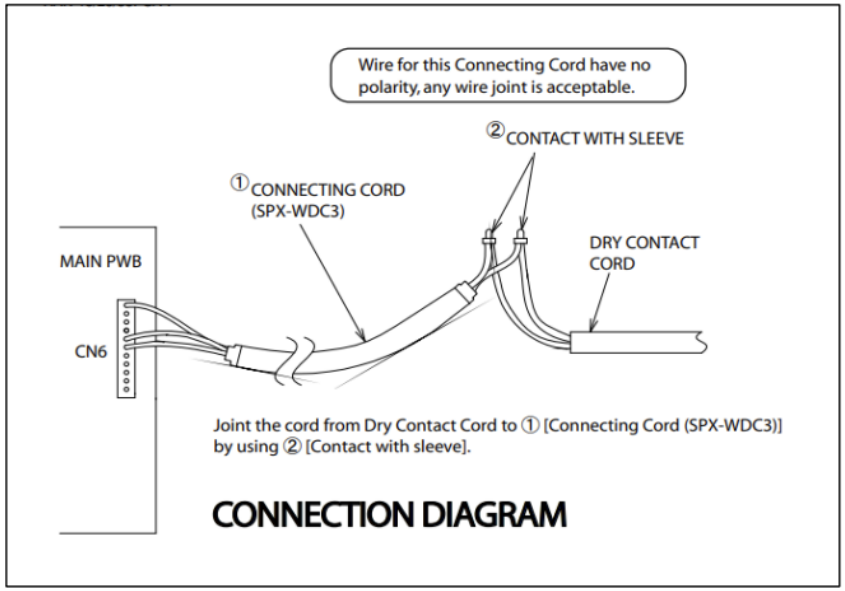
L1 (Category)
1A Installation
2C Clean
3d cycle operation adjustment
4E Fan control
5F supporting service
6H HHRC
7J Diagnosis
8L Future

Service Mode & Optional Setting

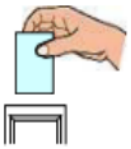
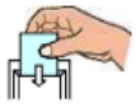
Optional Setting : 1A Installation (Dry Contact)

Method to Set Dry Contact using SPX-WDC3

- Connect connecting cord (SPX-WDC3) with connector CN6 indoor main PCB
- Set Service Mode as below for dry contact
- Card Key must in on condition, then set by remote control.
- When card key is remove unit will off about 10 sec.
- When card key insert, unit operate as normal



[i] CHECK DRY CONTACT OF CARD KEY UNIT

	AIR CONDITIONER Standby	AIR CONDITIONER Operating
CARD KEY (DOOR SWITCH)	REMOVE 	INSERT 
contact type **a**	 OPEN	 CLOSE
contact type **b**	 CLOSE	 OPEN

Service Mode & Optional Setting

Optional Setting : 3d Cycle Operation

Category	Function Name	Value	HHRC LCD Display Layer1 Category	Layer2 Function	Layer3 Value
Cycle Operation	Shift value adjustment of setting temperature (Cool Mode)	-5° C	3d	E1	01
		-4° C			02
		-3° C			03
		-2° C			04
		-1° C			05
		0° C			06
		+1° C			07
		+2° C			08
		+3° C			09
		+4° C			10
		+5° C			11
		reserve			04-99
	IDU fan control at cooling thermo off	ultra low	3d	E3	01
		set fan speed			02
		reserve			03-99

L1 (Category)
1A Installation
2C Clean
3d cycle operation adjustment
4E Fan control
5F supporting service
6H HHRC
7J Diagnosis
8L Future

※ red letters: factory setting

Service Mode & Optional Setting

Optional Setting : 6H HHRC Remote Change Setting

Category	Function Name	Value	HHRC LCD Display Layer1 Category	Layer2 Function	Layer3 Value
HHRC	Temperature gradient change 0.5 --> 1	0.5°C		P0	01
		1°C			02
	Fan Speed key sequence	Auto - Silent - Low - Med - Hi - Super Hi		P1	01
		SuperHi - Hi - Med - Low - Silent - Auto			02
	Operation Mode: Cool	Disable selection on HHRC	6H	P3	01
		Enable Selection on HHRC			02
	Operation Mode: Dry	Disable selection on HHRC		P4	01
		Enable Selection on HHRC			02
	Operation Mode: Fan	Disable selection on HHRC		P5	01
		Enable Selection on HHRC			02
	Operation Mode: Air Cir	Disable selection on HHRC		P7	01
		Enable Selection on HHRC			02

L1 (Category)
1A Installation
2C Clean
3d cycle operation adjustment
4E Fan control
5F supporting service
6H HHRC
7J Diagnosis
8L Future

※ red letters: factory setting

Service Mode & Optional Setting

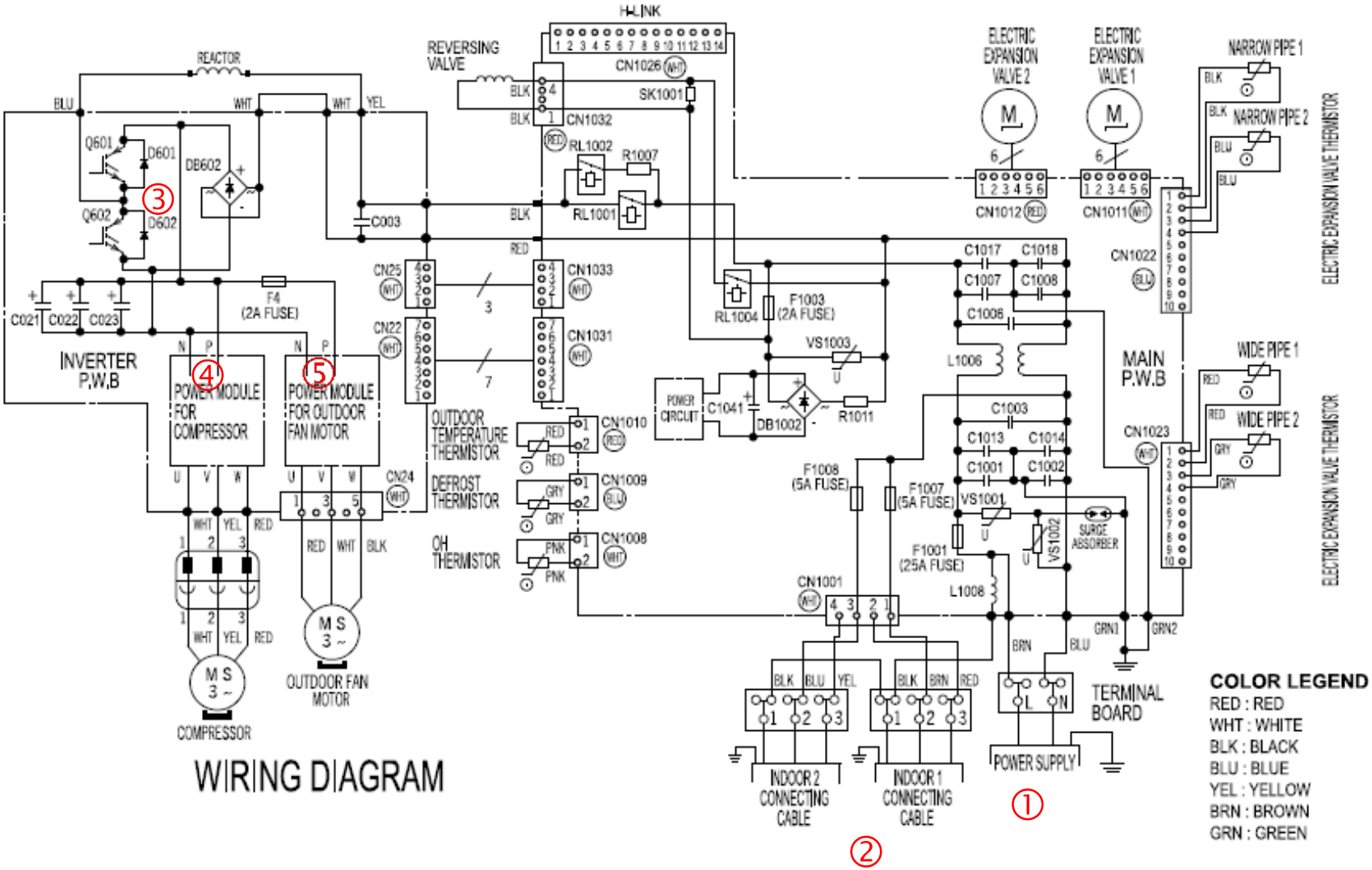
Optional Setting : 6H HHRC Remote Change Setting

Category	Function Name	Value	HHRC LCD Display Layer1 Category	Layer2 Function	Layer3 Value
HHRC	Cooling Lower limit setting	16 ° C	6H	PC	01
		17 ° C			02
		18 ° C			03
		19 ° C			04
		20 ° C			05
		21 ° C			06
		22 ° C			07
		23 ° C			08
		24 ° C			09
		25 ° C			10
		26 ° C			11
		27 ° C			12
		28 ° C			13
		29 ° C			14
		30 ° C			15
		31 ° C			16
		32 ° C			17
HHRC	Heating Upper limit setting	32 ° C	6H	Pd	01
		31 ° C			02
		30 ° C			03
		29 ° C			04
		28 ° C			05
		27 ° C			06
		26 ° C			07
		25 ° C			08
		24 ° C			09
		23 ° C			10
		22 ° C			11
		21 ° C			12
		20 ° C			13
		19 ° C			14
		18 ° C			15
		17 ° C			16
		16 ° C			17

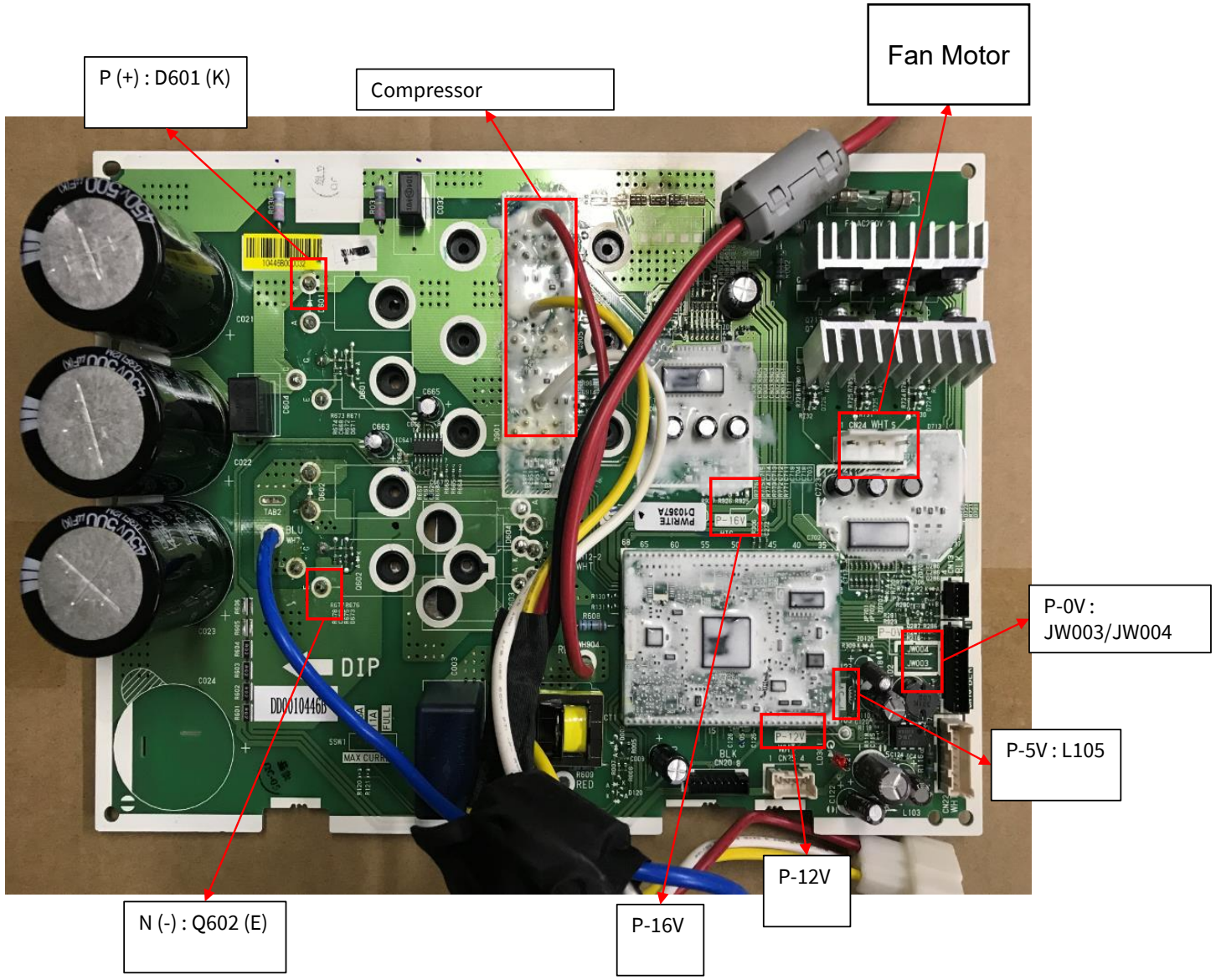
L1 (Category)
1A Installation
2C Clean
3d cycle operation adjustment
4E Fan control
5F supporting service
6H HHRC
7J Diagnosis
8L Future

※ red letters: factory setting

Multizone: RAM-53NP2E Wiring Diagram



Multizone: RAM-53NP2E Wiring Diagram



Troubleshooting & Diagnosis

Troubleshooting Multi RAM-R32 Series

① Measure incoming voltage across
Terminal L & N = 240VAC

② Measure output voltage across
Terminal 1 & 2 = 240VAC

③ Check VDC at IPM terminal
(-)Q602(E) , (+)D601(K) = 320VDC

④ Check VDC at Compressor terminal
(-)Q602(E) , (+)U,V,W = 160VDC

⑤ Check VDC at Fan Motor terminal
(-)Q602(E) , (+)U,V,W = 160VDC

Additional Checks:
16VDC (+)P16V (-)JW003/JW004
5VDC (+)P5V (-)JW003/JW004
12VDC (+)P12V (-)JW003/JW004

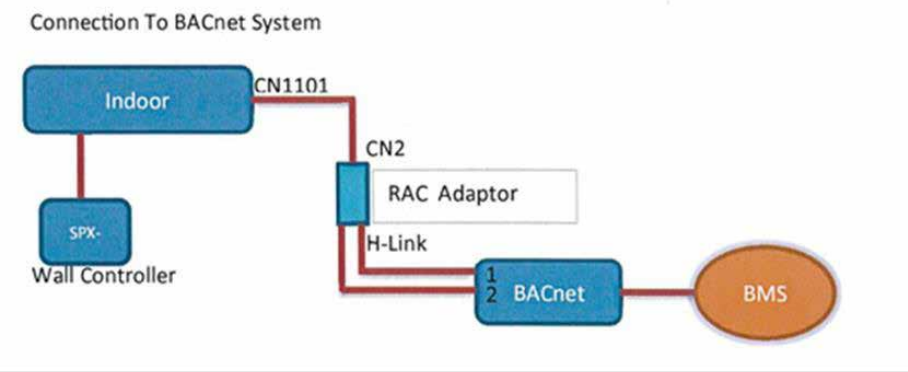
Notes:

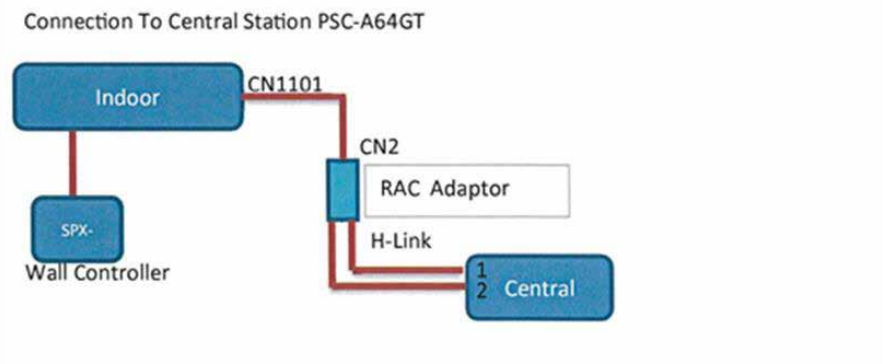
Compressor winding : 0.5 ohms
Fan motor winding : 38 ~ 40 ohms
Reversing valve coil : 135 ohms
OH Thermistor : 10 ~ 40k ohms
DEF Thermistor : 2 ~ 3k ohms
OD Air Thermistor : 2 ~ 3k ohms
Wide Pipe Thermistor : 2.4k ohms
Narrow Pipe Thermistor : 2.4k ohms

Interface Connection

Bacnet & Central Station Connection

1. Connection to Bacnet and Central Station need to be done via a RAC Adaptor model PSC-6RAD. (Except for RAM models –uses SPX-RAMHLK)
2. Indoor units must be connected to the SPX-WKT4 wired controller.
3. RAC Adaptor will need to be set as another refrigerant cycle by DIP Switch (DSW3).



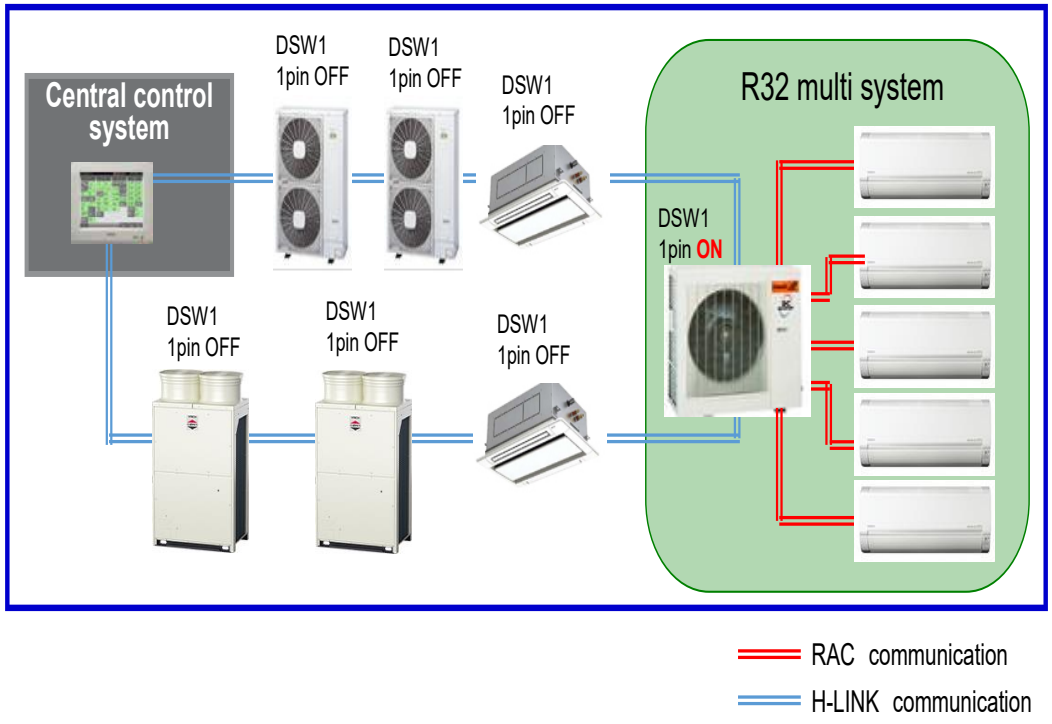


Interface Connection

RAM Multi Model – Interface PCB

1. RAM models –uses SPX-RAMHLK Interface PCB board to connect to Central Station.
2. Indoor units must be connected to the SPX-WKT4 wired controller.
3. Interface PCB will need to be set as another refrigerant cycle.

Correct setting for DSW1



Interface Connection

RAM Multi Model – Interface PCB

9.1 H-LINK Board (SPX-RAMHLK) Installation Manual

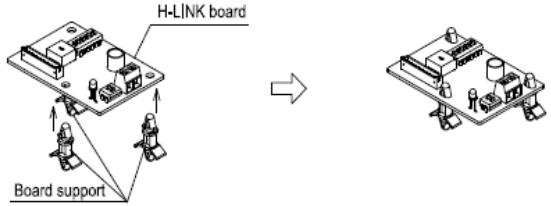
9.1.1 Check through H-LINK board accessories.

Table 1

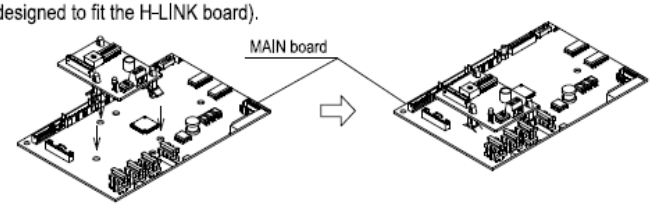
No	Part Name	Quantity
①	H-LINK board	1
②	Board support	3
③	14 pin cord	1
④	Installation manual	1

9.1.2 H-LINK board installation

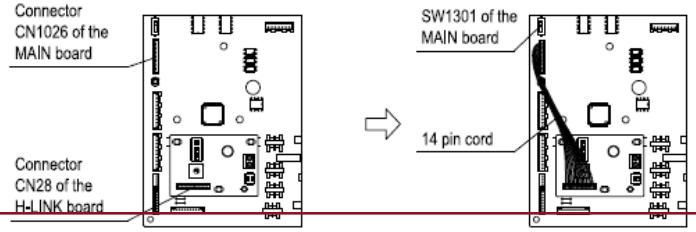
i. Assemble board support (3 pcs) to H-LINK board holes as following picture.



ii. Insert the H-LINK board into the MAIN board (please use 3 holes on MAIN board that designed to fit the H-LINK board).

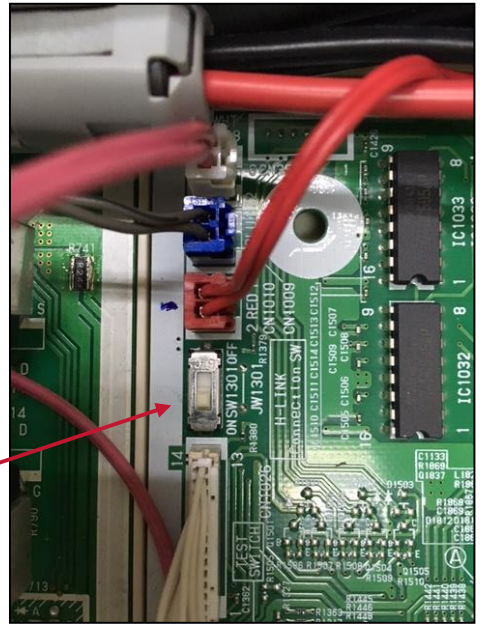


iii. Insert the 14 pin cord to the CN28 of the H-LINK board and CN1026 of the MAIN board.



iv. Set the SW1301 of the MAIN board to ON condition before start the H-LINK operation (default position from factory is OFF condition).

These H link can connect to PSC-A64GT Central Station

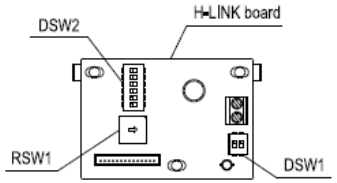


Dip Switch must on to operate H link

Interface Connection

RAM Multi Model – Interface PCB

9.1.3 DIP switch setting.

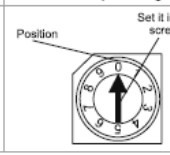


i. DSW1 setting (terminal resistance setting).
Terminal resistance setting set by pin number 1 of DSW1.
(Default setting from factory is pin number 1 of DSW1 set to OFF condition).

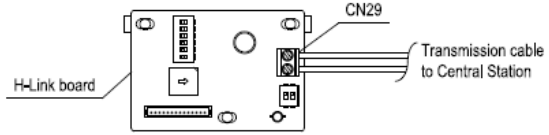
Terminal resistance should be ON in only one position in whole H-LINK.
After checking terminal resistance setting of whole H-LINK, pin number 1 of DSW1 should be set properly.

Example: If set pin number 1 to ON condition
DSW1


ii. DSW2 and RSW1 setting.
Refrigerant cycle number is set by DSW2 and RSW1.

DSW2 (tens digit)	RSW1 (ones digit)	Example: Setting cycle number to 15	
		DSW2	RSW1
			
Default setting from factory for DSW2 and RSW1 are set to OFF and 0 respectively.		Pin number 1 is ON	The set position is 5

9.1.4 Connect the H-LINK board to the Central Station by fixing the transmision cable at CN29.



The transmission cable used shall be as below.
i. 2 cores cable (0.75mm² to 1.25mm²). Model : VCTF, VCT, CVV, MVVS, CVVS VVR, VVF.
ii. 2 cores twist pair cable. Model : KPEV, KPEV-S.
Total length of the transmission cable shall be below than 1000m.

End Resistance DIP Switch

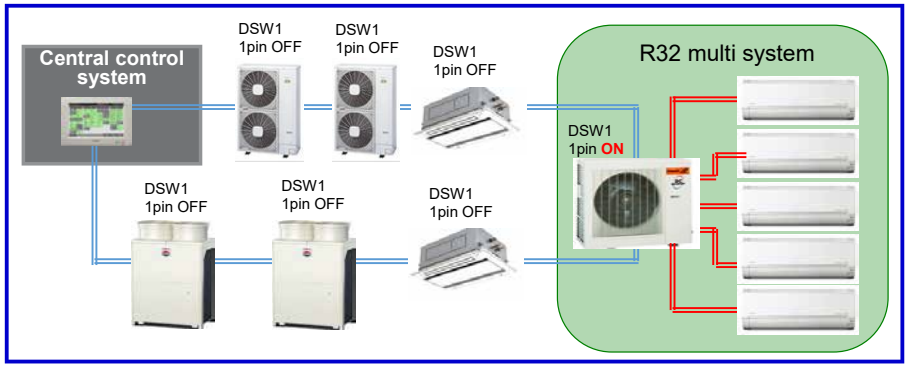
Refrigerant Cycle Address

Interface Connection

RAM Multi Model – Interface PCB

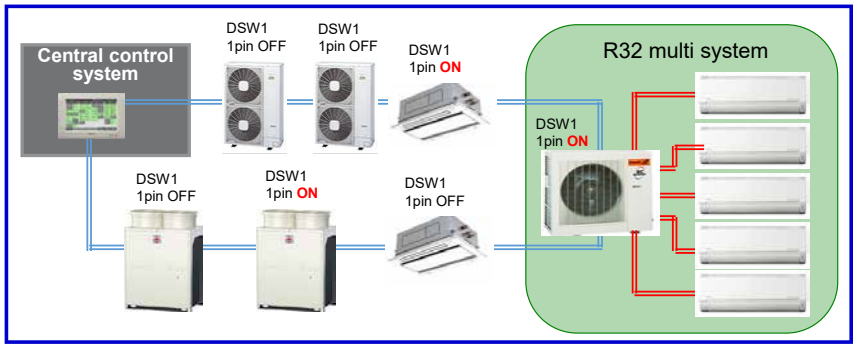
Example connection for DSW1 setting

Correct setting for DSW1



RAC communication
H-LINK communication

Wrong setting for DSW1

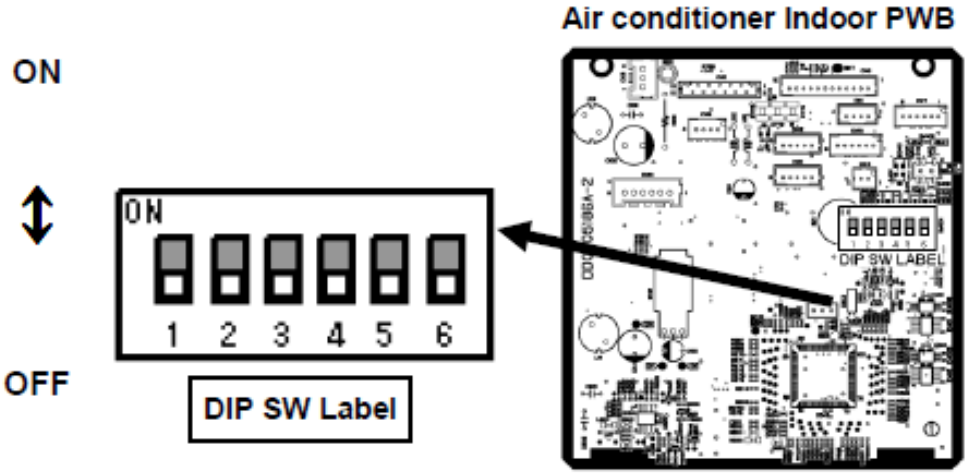


When two or more DSW1 termination resistor are set, the H-LINK communication waveform level is lower. This may result in bad communication.

RAC communication
H-LINK communication

Optional Function for Multizone Indoor

Available Features:



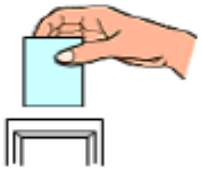
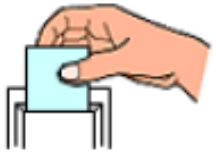
Pin No.	Function	Switch Position / Setting					
1	AUTO RESTART function	OFF	Enable	ON	Disable		
2	DRY CONTACT function	OFF	Disable	ON	Enable		
3	DRY CONTACT Logic Select	OFF	HI Input Active	ON	LO Input Active		
4	HEATING / COOLING ONLY MODE SELECT	OFF	NORMAL (HEAT AND COOL)	OFF	HEATING ONLY	ON	COOLING ONLY
5		OFF		ON		OFF	
6	REMOCON ID SELECT	OFF	SELECT ID A	ON	SELECT ID B		

1. Auto Restart function : Pin 1 - OFF = Enable (default) , ON = Disable

Optional Function for HWS & Multizone

2&3. Dry Contact function : Contact 'Type a' = Level switching Pin 2-ON , 3-OFF
Contact 'Type b' = reverse level switching Pin 2-OFF, 3-OFF

[1] CHECK DRY CONTACT OF CARD KEY UNIT

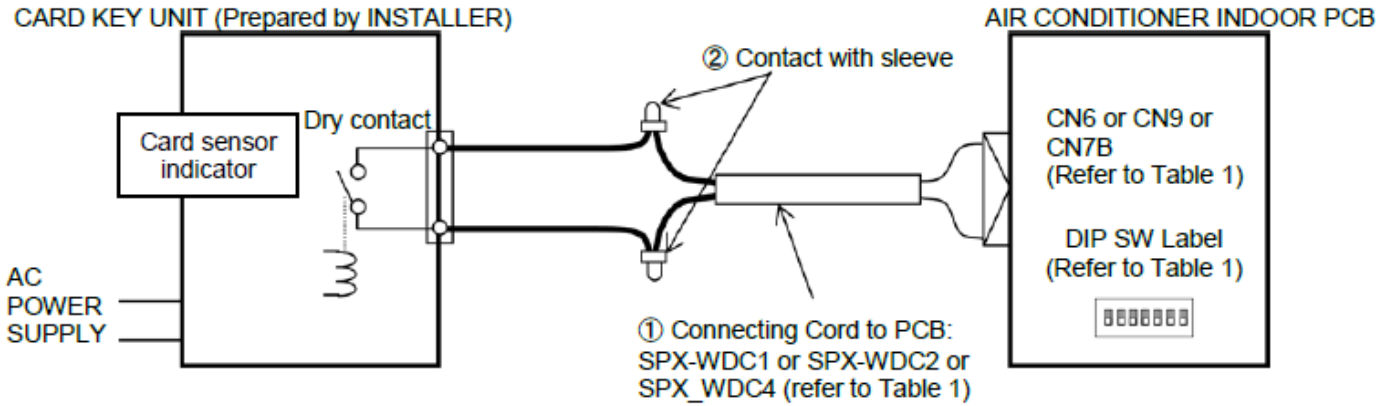
	AIR CONDITIONER Standby	AIR CONDITIONER Operating
CARD KEY (Door Switch)	REMOVE 	INSERT 
Contact type a	OPEN 	CLOSE 
Contact type b	CLOSE 	OPEN 

[2] SET THE POSITION OF DIP SWITCH

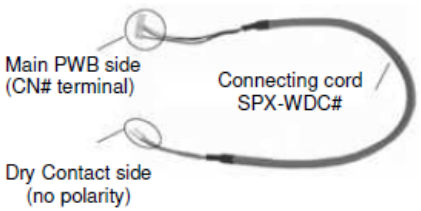
POSITION CONDITION OF DIP SWITCH	
INITIAL CONDITION (CARD KEY NO USE) 	No.2 : OFF No.3 : OFF
	**HI Input Active** No.2 : ON No.3 : OFF
	**LO Input Active** No.2 : ON No.3 : ON

Optional Function for HWS & Multizone

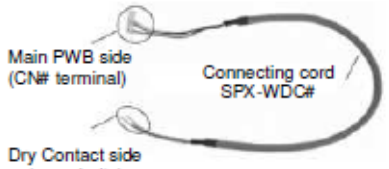
2&3. Dry Contact : Sample of wiring connection



Multizone Indoor

Optional Connecting cord Accessory SPX-WDC#		Model	DIP SW Label	CN#
	SPX-WDC2	RAI-25/35/50/60RPE	SW501	CN9
		RAD-18QPE RAD-25/35/50/60RPE	SW501	CN9
	SPX-WDC3	RAK-18QXE RAK-25/35/50RXE	DSW1	CN6
		RAK-15QPE RAK-18/25/35/42/50RPE	DSW1	CN6
		RAK-50RPE1 RAK-60RPE	DSW1	CN6
		RAF-25/35/50RXE	DSW1	CN6

HWS Indoor

Optional Connecting cord Accessory SPX-WDC#	
	SPX-WDC3

Optional Function for HWS & Multizone

4&5. Operation Mode Lock Selection : Selectable between Cooling or Heating only.

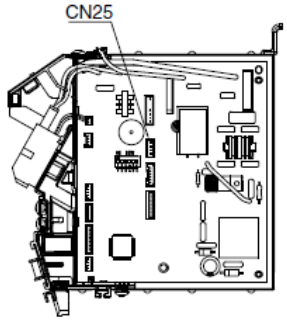
Heating Mode : Pin 4 – OFF , Pin 5 – ON
Cooling Mode : Pin 4 – ON , Pin 5 – OFF

6. Remote ID Selection : To prevent mutual interference of communication signal.
(applicable when using wireless weekly remote controller)

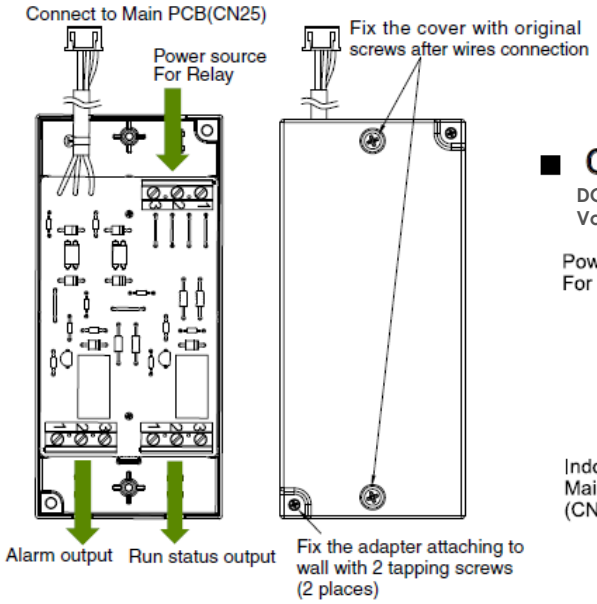
Select ID A : Pin 6 – OFF
Select ID B : Pin 6 - ON

Relay kit(SPX-WDC8) for Run status, Alarm signal output

■ How to Connect



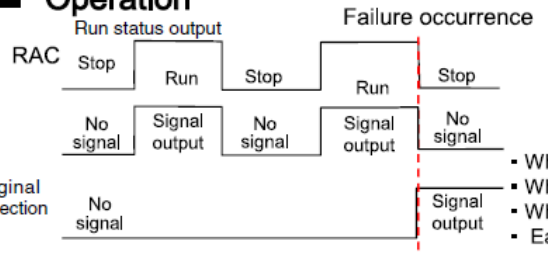
The CN25 of RAC-35YHA6 is refer to the left image.
The location on PCB of CN25 is different due to different models.



■ Cautions

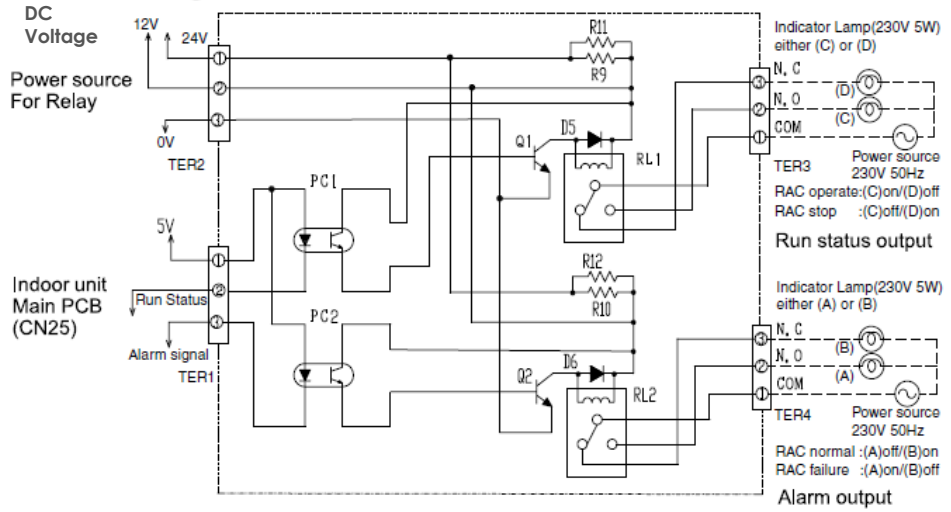
- Adapter has to be used. It is necessary to prevent noise from occurring.
  If Adapter is not used, it may cause false operation and malfunction of RAC by noise.
- Load side is a high voltage line, please be careful from electric shock and install the Indication Lamp as near as possible to the Relay Kit. The maximum length of the wiring cable should be below 100m.

■ Operation



- When operating RAC, Run Status signal is output.
- When operation stops, the signal disappears.
- When RAC gets malfunction, alarm signal is output.
- Each signal has to be taken out through the Adapter.

■ Circuit Diagram



Q & A

Q : What is the minimum pipe length connection for HWS?

A : 3m

Q : Where is the Power Supply connected to for HWS system?

A : Outdoor Unit – Terminal L&N

Q : What are troubleshooting procedure for HWS?

A : 1. Check the indoor timer light count

2. Check the outdoor LED301 light count

3. Do the initial voltage check

Q: What is the Input voltage to IPM?

A: 300VDC

Q: What is the Input Voltage to compressor?

A: 150VDC

Notes

Notes

HITACHI

airCore 700

Single Split Heat Pump System

Cooling & Heating

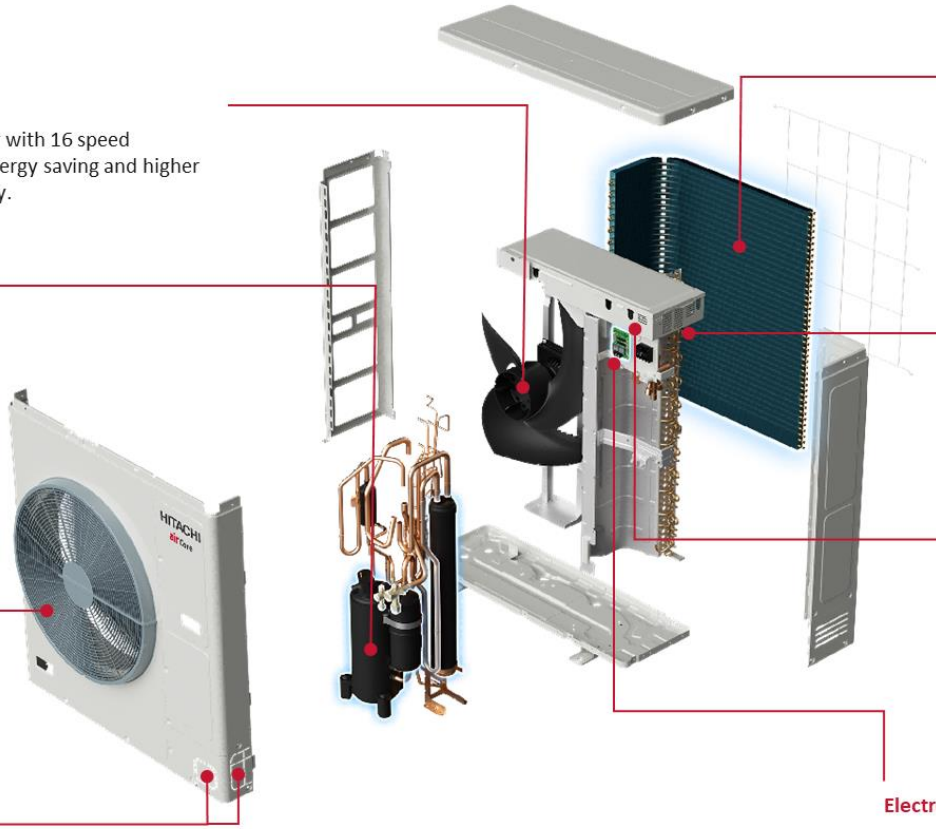
Training Agenda

SESSION	TOPICS OF CONTENT
PART I	PRODUCT OVERVIEW • Product Line Up For airCore 700 outdoor series • Product Line Up for airCore 700 indoor models
PART II	PRODUCT FEATURES . Outdoor Features – new design . Indoor features – separable fan cover, zone controller, Air Cloud Go App.
PART III	GENERAL INSTALLATION . Service Space, Air-Tight Test & Vacuuming, Electrical Wiring. •Communication H-Link Wiring and Dip Switch Setting.
PART IV	TROUBLESHOOTING & DIAGNOSIS . Reading Error Code . Service Function – Check Mode 1 & 7 Segment Display (Data Collection). . Inspection – Main PCB, Inverter PCB, Component Check.
PART V	INTERFACE CONNECTION . Optional Function – Remote Start/Stop, Run/Fault status. . DRED Connection. . Additional – Zone Controller GC-AZKP Setup.

Product Line Up

Nominal Cooling Capacity			5.0kW	6.0kW	7.1kW	10.0kW	12.0kW	14.0kW	16.0kW
Outdoor Unit	PAS-**UFASNQ1 (Single Phase) PAS-**UFASMQ1 (Three Phase)		 PAS-2.0UFASNQ1	 PAS-2.5UFASNQ1	 PAS-3.0UFASNQ1	 PAS-4.0UFASNQ1 PAS-4.0UFASMQ1	 PAS-5.0UFASNQ1 PAS-5.0UFASMQ1	 PAS-6.0UFASNQ1 PAS-6.0UFASMQ1	 PAS-6.5UFASNQ1 PAS-6.5UFASMQ1
Indoor Unit	Ducted	MSP	 PPIM-2.0UFA1NQ	 PPIM-2.5 UFA1NQ	 PPIM-3.0UFA1NQ	 PPIM-4.0UFA1NQ	 PPIM-5.0UFA1NQ	 PPIM-6.0UFA1NQ	
		HSP			 PPIH-3.0UFA1NQ	 PPIH-4.0UFA1NQ	 PPIH-5.0UFA1NQ	 PPIH-6.0UFA1NQ	 PPIH-6.5UFA1NQ
	Cassette	Standard Panel	 PCI-2.0UFA1NQ	 PCI-2.5UFA1NQ	 PCI-3.0UFA1NQ	 PCI-4.0UFA1NQ	 PCI-5.0UFA1NQ	 PCI-6.0UFA1NQ	 PCI-6.5UFA1NQ
		Human Sensor Panel (optional)	 P-AP160NAE2*EX	 P-AP160NAE2*EX	 P-AP160NAE2*EX	 P-AP160NAE2*EX	 P-AP160NAE2*EX	 P-AP160NAE2*EX	 P-AP160NAE2*EX
		Silent Iconic Panel (optional)			 P-GP160NAPU*EX	 P-GP160NAP*EX	 P-GP160KAP*EX		
	Ceiling Suspended		 PPFC-2.0UFA1NQ	 PPFC-2.5UFA1NQ	 PPFC-3.0UFA1NQ	 PPFC-4.0UFA1NQ	 PPFC-5.0UFA1NQ	 PPFC-6.0UFA1NQ	
Controllers			 PC-ARFG2-Z Controller optional all indoor units		 GA-WFG Wi-Fi module optional all indoor units		 GC-ZKT Zone controller + GC-AZKP 8 modulating zone controller kit available on all ducted units		

Outdoor Features



Fan design

- Adopt DC motor with 16 speed control,more energy saving and higher energy efficiency.

Compressor pre-heating through internal coil induction

- Compressor pre-heating in low outdoor ambient temperatures
- Uses advanced multi-pulse control induction on coil, core, rotor and stator, eliminating use of external crankcase heater
- Enhances efficiency of pre-heating in low ambient conditions, and reduces startup time

Fan grille design

- Discover a whole new level of performance with better heat dissipation and a modern look

Easy installation and service access

- Piping options in 4 directions: depending on the installation situation, installers can choose from 4 running pipe directions.
- Easier removal of front service cover: the screws you need to open/close the front serve cover are all on the front side.

Heat exchanger design

- Features a newly improved refrigerant path and a new fin shape,make the unit more efficient.

New printed circuit board

- With Hitachi's exclusive Compressor Control Technology, operation is more comfortable and consistent.

Electrical Box protection

- Equipped with advanced electrical box protection, which is vital for safety as it prevents dust, moisture, and physical damage, ensuring proper function, easier maintenance, compliance with regulations, and ultimately extends component lifespan.

Electronic expansion valve

- Adopt high precision electronic expansion valves for higher control accuracy and more accurate temperature control.

Indoor Features

HSP DUCTED

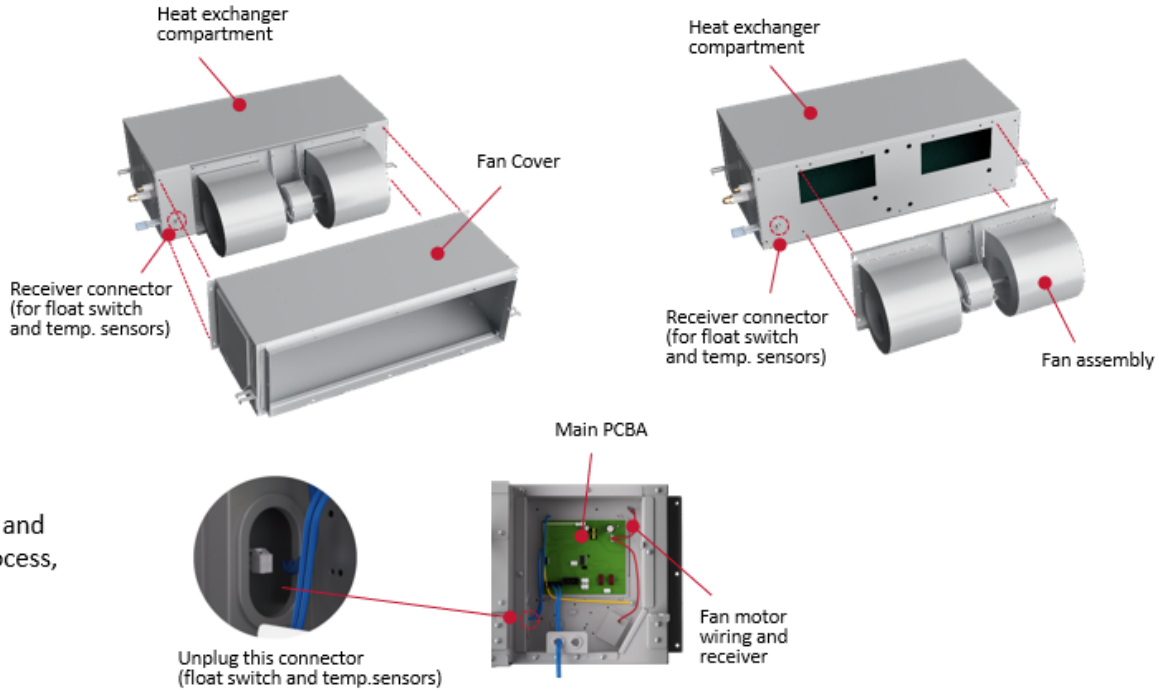
High Performance
Enhanced efficiency DC fan motor paired with a powerful centrifugal fan for high airflow delivery.

HESP Ducted Indoor Units

airCore 700 high-ESP ducted indoor units are designed to be easily separable. The fan cover can be effortlessly removed from the heat exchanger compartment and reassembled with just a simple "one click" mechanism.

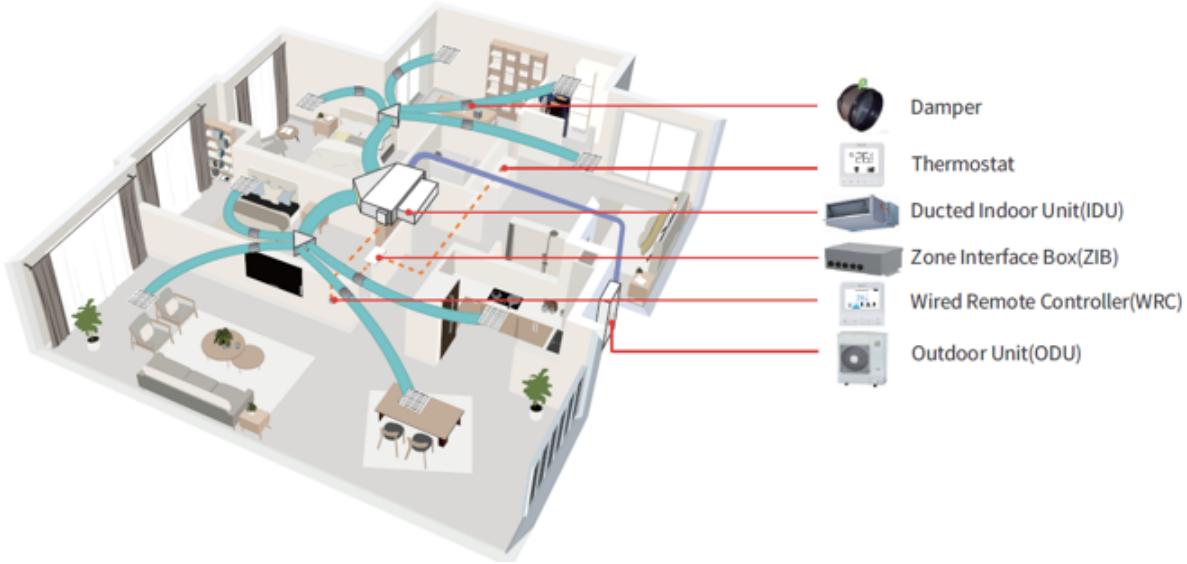
These units come equipped with a receiver connector for a float switch and temperature sensor. By unplugging the connector, the main PCBA, fan motor wiring, and receiver become easily accessible for connection.

This disassembled design offers an ideal solution for installations in crowded or confined spaces, such as rooftop attics, as well as narrow and elongated spaces. It greatly facilitates the delivery and installation process, making it more convenient and feasible.



Indoor Features

PREMIUM ZONING KIT _ Ducted only



The Premium Zoning Kit can be used on airCore 700 MESP or HESP ducted type indoor units, to control dampers in each ducts connected to the air outlet of the indoor unit. The dampers can be turned on when there is an air conditioning demand, and turned off when there is no air conditioning demand.
By controlling the damper angle, the airflow rate of each zone can be selected in three taps (High/Med/Low).

Controllers & Apps

APPS | airCloud Go

airCloud Go

Connect your Hitachi air conditioners to airCloud Go via wifi.

Available on the App Store

Google Play

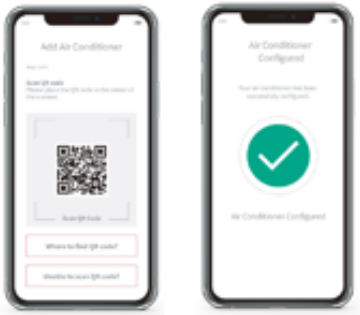
visit hitachiaircon.com

Control your AC from anywhere!

Quick set up

QR code recognition enables you to pair your app to your air conditioner in an instant.

New UI 2023



App available in 21 languages

English, French, Italian, Spanish, German, Portuguese (BR & EU), Dutch, Danish, Swedish, Thai, Chinese (Traditional & Simplified), Indonesia, Polish, Hungarian, Czech, Romanian, Greek, Croatian, Slovenian, Vietnamese, Malay

Controllers & Apps

APPS | airCloud Pro

airCloud Pro
24/7 control at your fingertips
on smartphone app or web

[Gateway]

Available on the App Store

Google Play

visit aircloudproapp.com

iOT Solution:
Cloud-Based Control System with Dedicated App

A simple yet powerful tool.

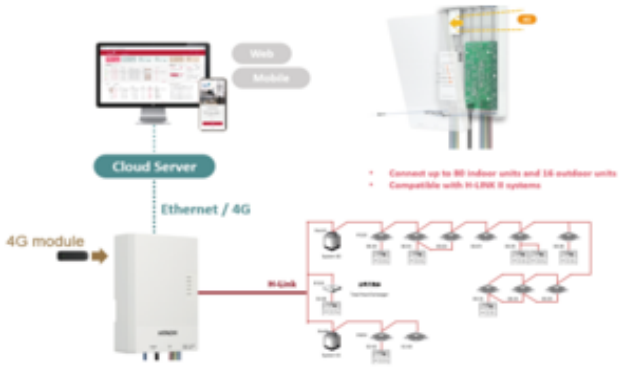
✓ Intuitive simplicity

airCloud Pro is designed to make your job easier. An intuitive app that anyone can use, airCloud Pro makes managing your AC systems easier than ever before.

✓ Control from anywhere

Enjoy the freedom of remote access from your smartphone, tablet or laptop. airCloud Pro allows you to remotely control your AC system(s) from a single app, saving you travel time.

System configuration



Controllers & Apps

APPS | airCloud Tap

airCloud Tap (NFC)
for using with PC-ARFG1/PC-ARFG2-*

Improved serviceability with airCloud Tap

"airCloud Tap" is used setting the controller from smartphone easily.

(NFC feature on PC-ARFG2-Z is disabled when connected with Zone interface box.)

To download the "airCloud Tap" application, search for it on the "App Store" *1 or "Google Play"*2. Alternatively, you can scan the code provided below with your smartphone to directly access the application.

Available on the App Store

Google Play

*1 App Store® is a service mark of Apple Inc.
*2 Google Play and the Google Play logo are trademarks of Google LLC.

Example: Setting weekly schedule

1. Set Weekly schedule on airCloud Tap

2. Tap your smartphone to controller to set the schedule

Controllers & Apps

INTEGRATE WITH BMS

BMS ADAPTER for BACnet®

HC-A64BNP1
CONTROL UP TO 64 INDOOR UNITS

General Functions

- Run / Stop
- Operation Mode
- Temperature Setting / Status
- Fan Speed
- Filter Sign / Reset
- Prohibited / Permitted RC Operation
- Indoor Air Intake Temperature (IDU Inlet Temp)
- Communication State
- Alarm Signal
- Alarm Code

General Installation

Important Information : Installation Manual

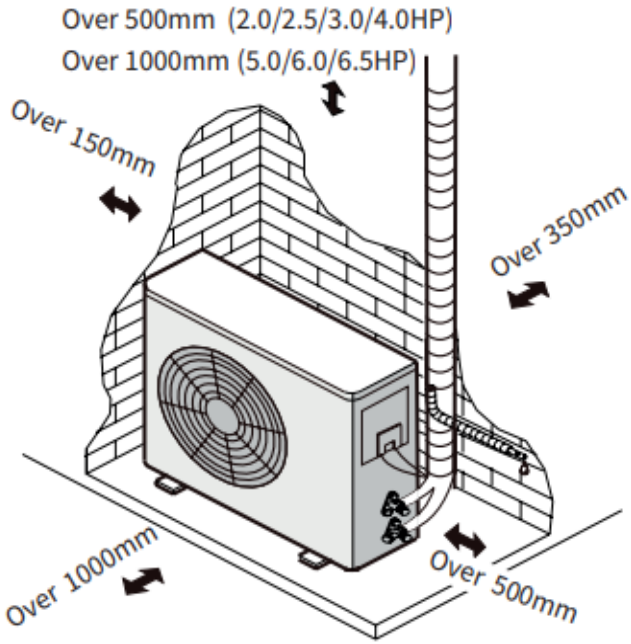
* Please read through the Installation manual at least once before installation.*

Information:-

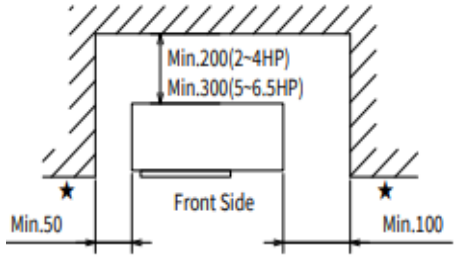
- Pipe sizes
- Pipe Length – minimum & maximum length, maximum Height
- Service space – positioning of Indoor & Outdoor unit
- Branch Pipe/ Kit information
- Wiring method and cable sizes between indoor, outdoor and wall controller
- Dip & Rotary switches setting to address the units
- Additional Refrigerant charge calculation
- Option setting, External Input / Output setting
- List of Error Codes

General Installation

Outdoor Service Space (example)

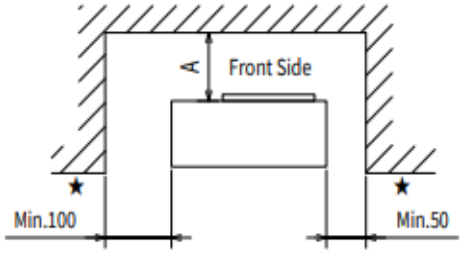


(Around sides are closed)

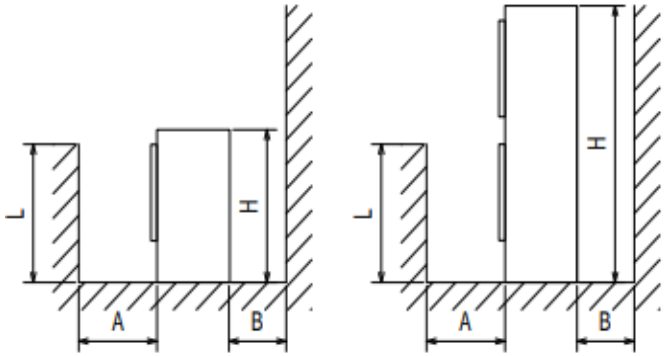


Fit positions "★" with unit front side.

(Obstacles on Discharge Side)



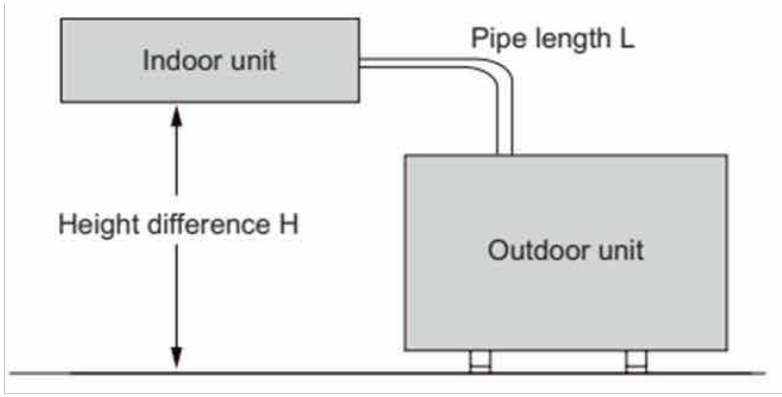
Fit positions "★" with unit front side.



L	A	B
0 < L ≤ 1/2H	600 or more	300 or more
1/2H < L ≤ H	1400 or more	350 or more

General Installation

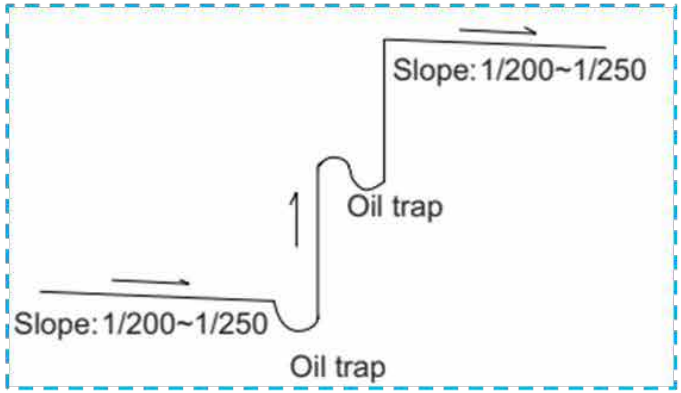
Refrigerant Piping Restriction



Model	Max. pipe length (L)	Max. height difference (H)	Add. refrigerant (exceed 30m)
2.0~2.5HP	50 (m)	30 (m)	18 (g/m)
3.0HP	75 (m)	30 (m)	18 (g/m)
4.0~6.5HP	75 (m)	30 (m)	35 (g/m)

Model	Outer diameter of pipe (mm)	
	Gas	Liquid
2.0/2.5/3.0HP	12.7	6.35
4.0/5.0/6.0/6.5HP	15.88	9.52

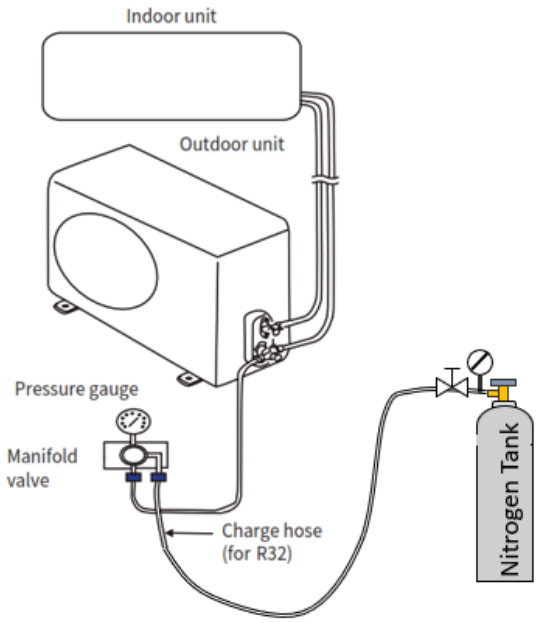
- A shorter refrigerant piping will be better the performance. So, the connecting pipe should be as short as possible.
- Set an oil trap every 5m of height difference in suction piping when the indoor unit is lower 5m or less than outdoor unit.
- The horizontal piping should be slope down (1/200~1/250) along the refrigerant flow direction to return the oil to compressor.

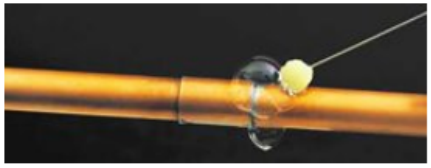


General Installation

Air-Tight Test

Perform air-tight test to check for leakage in the piping system





Ensure the stop valves are closed before the test.

Connect a manifold gauge to the check joints on the stop valves of the liquid line and the gas lines using charging hoses with a nitrogen cylinder.

Apply nitrogen gas pressure little by little until it reaches to 4.15MPa.

Repair the leakage point after returning to atmospheric pressure.

Check the leakage by a leakage detector or foaming agent.

There is a leakage

No leakage

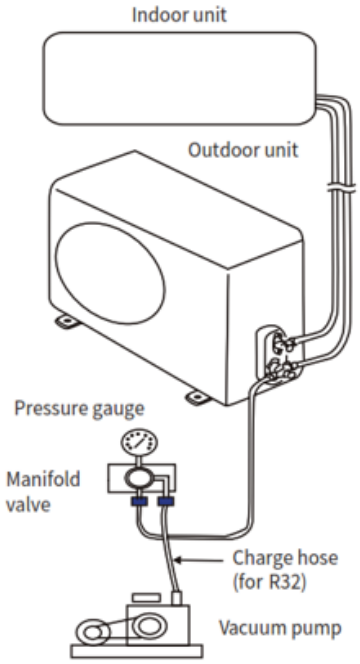
Pass the air-tight test.

Release nitrogen gas.

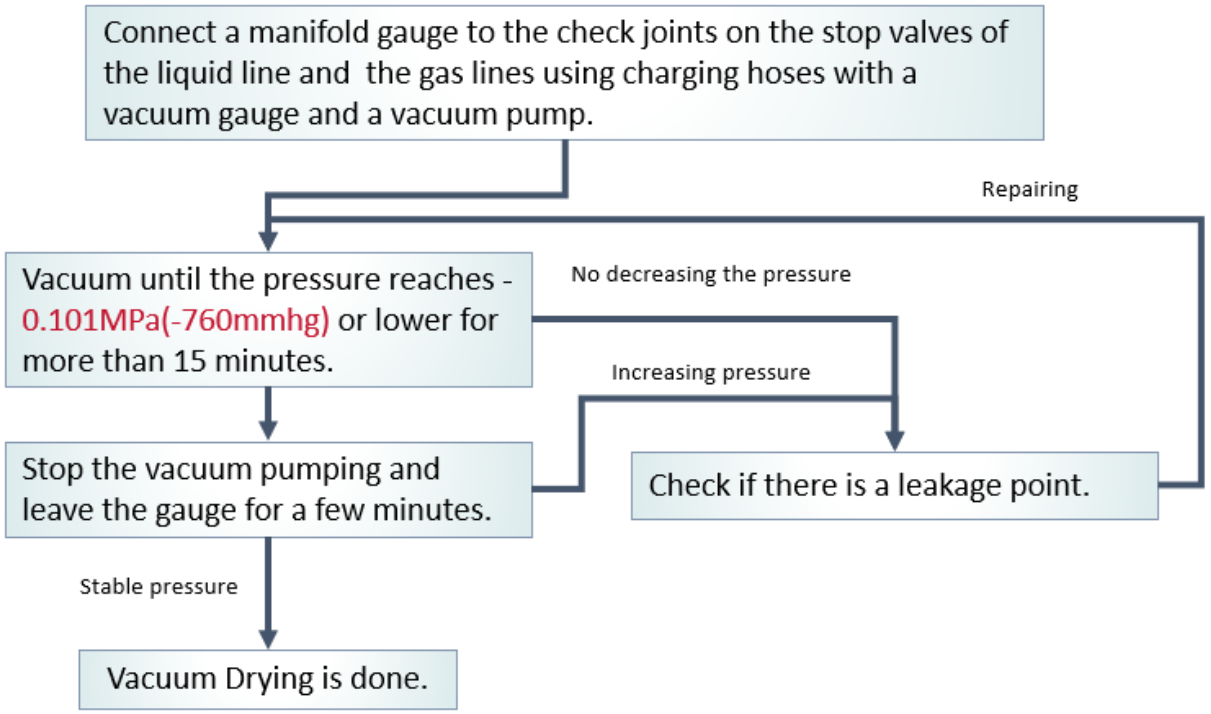
General Installation

Vacuum Drying

Perform Vacuum Drying to remove air and moisture from piping system

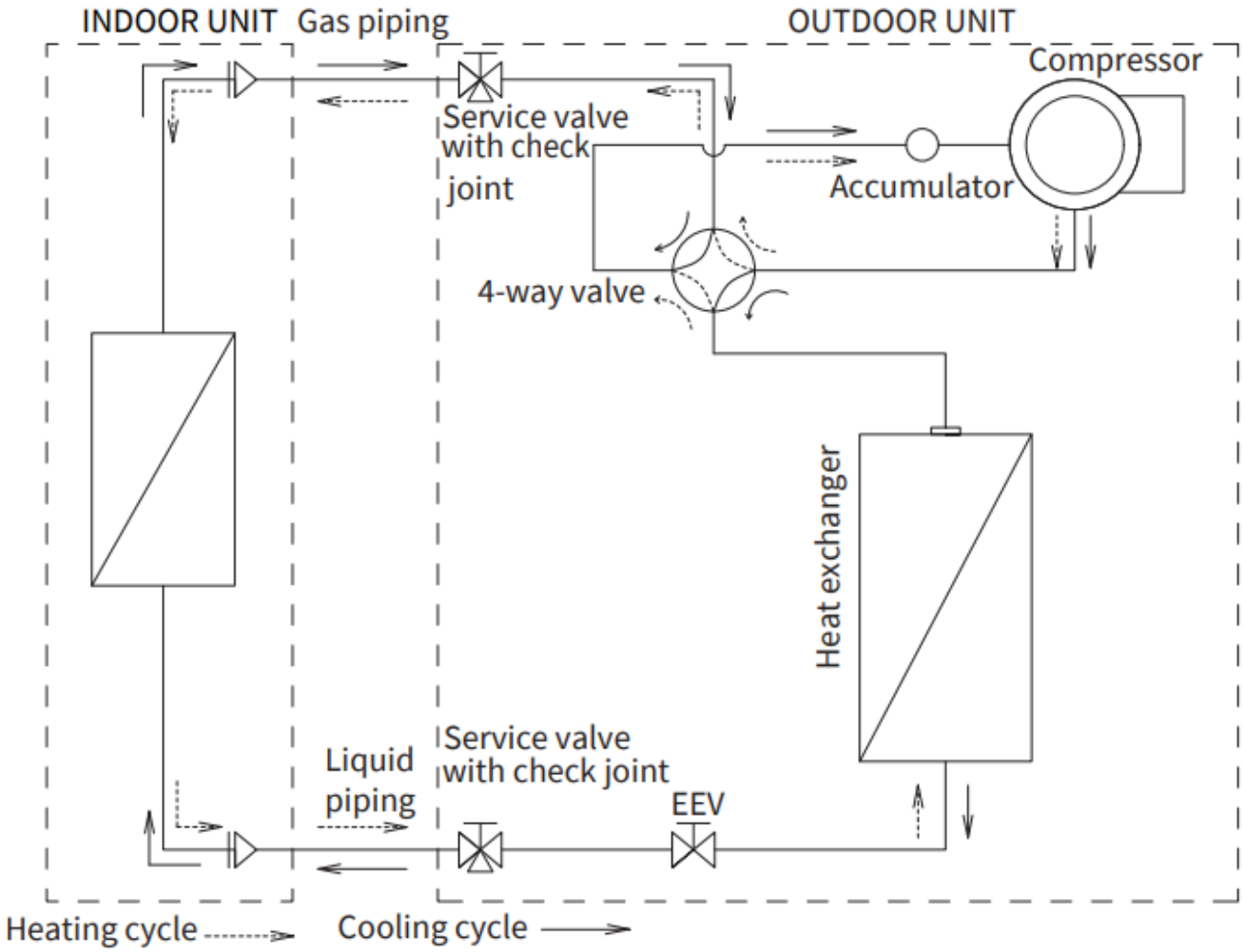


< Basic Method >



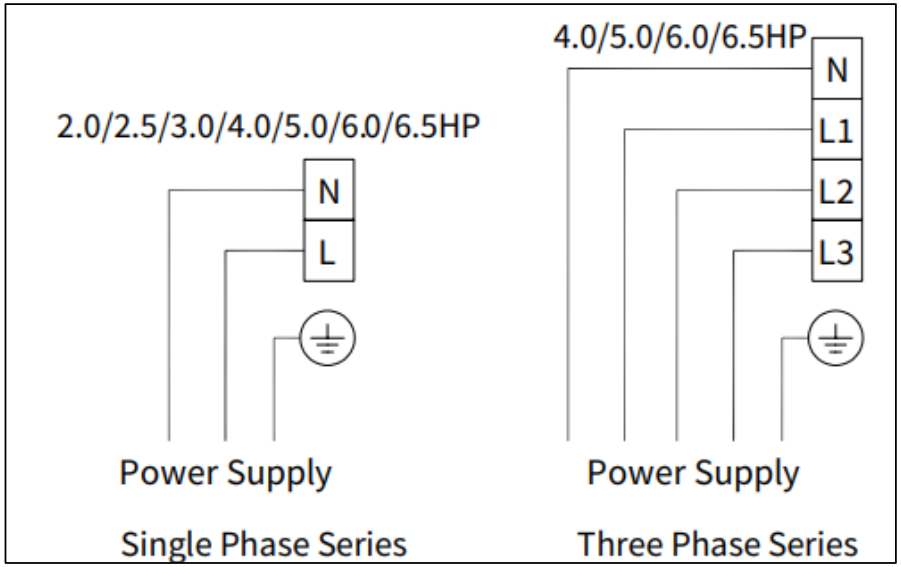
General Installation

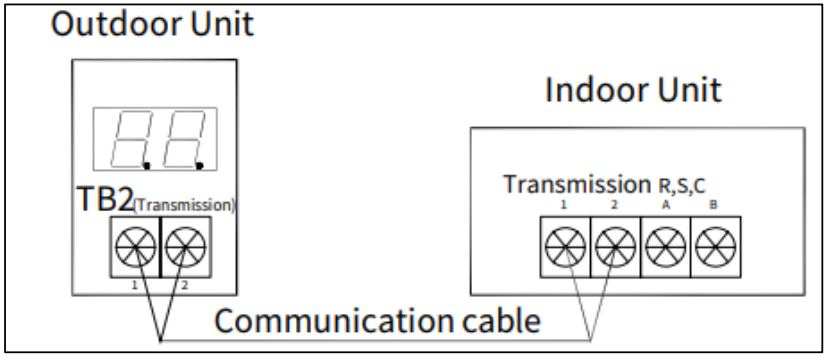
Refrigerant Cycle Flow (example)



General Installation

Electrical Wiring Diagram

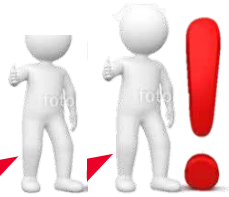




General Installation

- Communication Wiring – H-Link

What is H-LINK?



A.
H-LINK is a "Hitachi" original communication system that can be used to control multiple outdoor and indoor units from one control point. Its use assists installers and service engineers by simplifying commissioning and service maintenance. For building owners and occupants, it provides outstanding versatility enabling the connection of various types of central control options, enabling better system management. Our proprietary high-performance communication system enables the connection of control wiring between indoor and outdoor units, and between a centralized control system and indoor/outdoor units across two or more refrigerant systems.

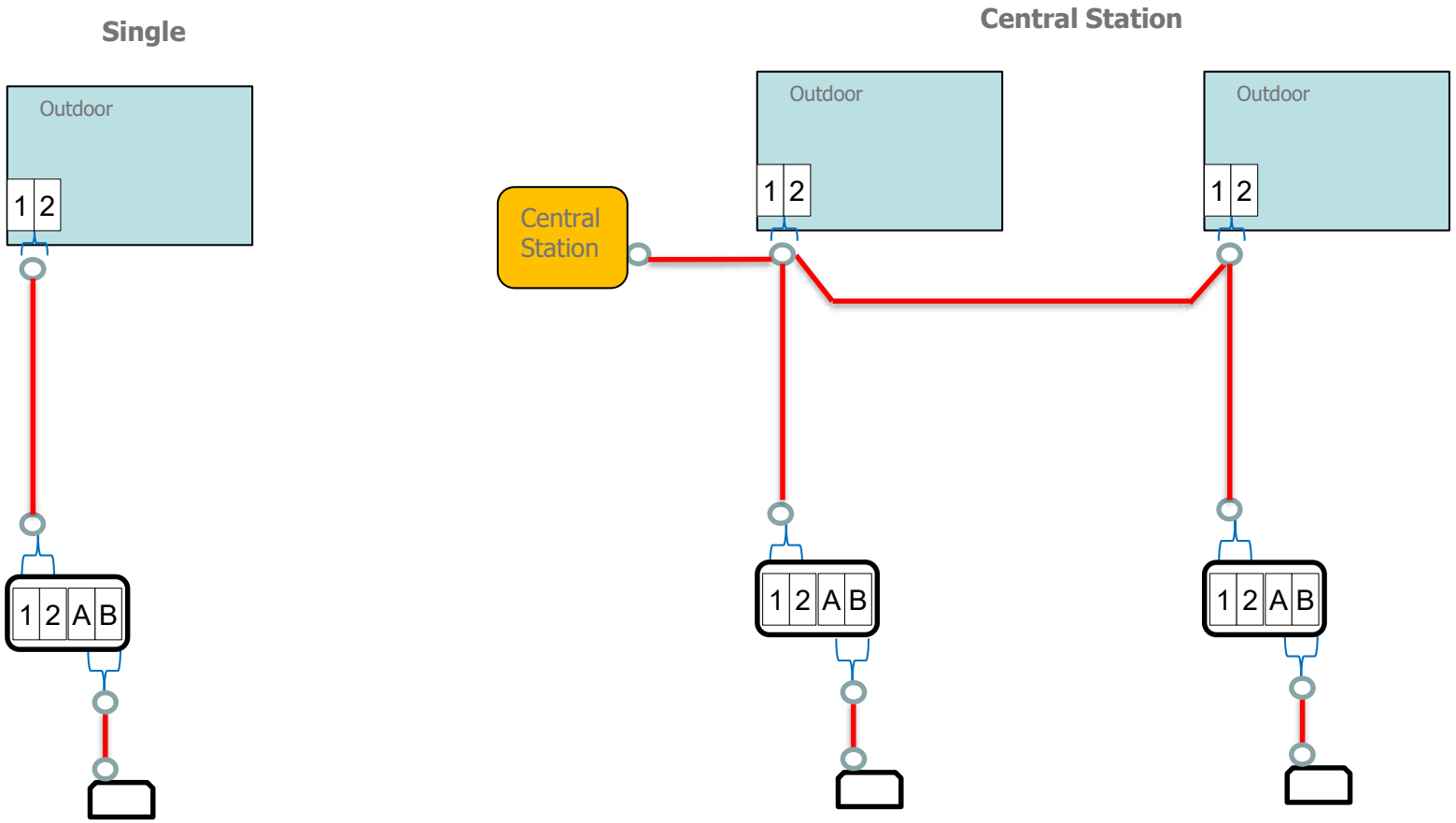
< Wiring Specification >

5 VDC Pulse – **CANNOT** be measured with Digital Meter
An Oscilloscope can be used to see actual communication sign wave / signal strength and any electromagnetic interference.

Contents	Specifications
Voltage	5VDC (Non-pole)
Terminal resistance	75Ω (Setting by DSW10-1)
Wiring length	Max. 1,000m
Cable	2-core, 0.75mm^2 to 1.25mm^2
Cable model	JKPEV-S, JKEV-S, CVV

General Installation

Wiring : Communication between Outdoor and Indoor.



General Installation

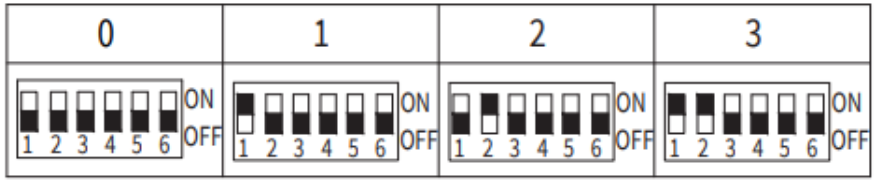
Setting : DIP & Rotary switches settings.

1. Addressing Indoor and Outdoor units.
   ** (No setting is required on a single system setting)

2. Setting only required on multi system setting and with a Central Control function.

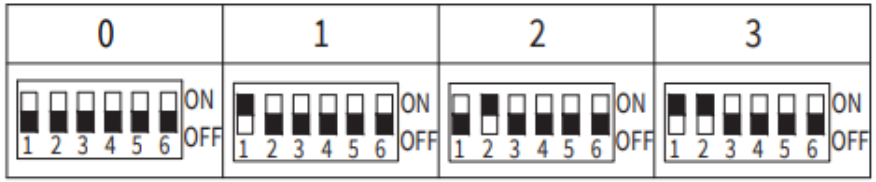
   Indoor

   DIP Switch 5 = Refrigerant System Setting
   Example :-



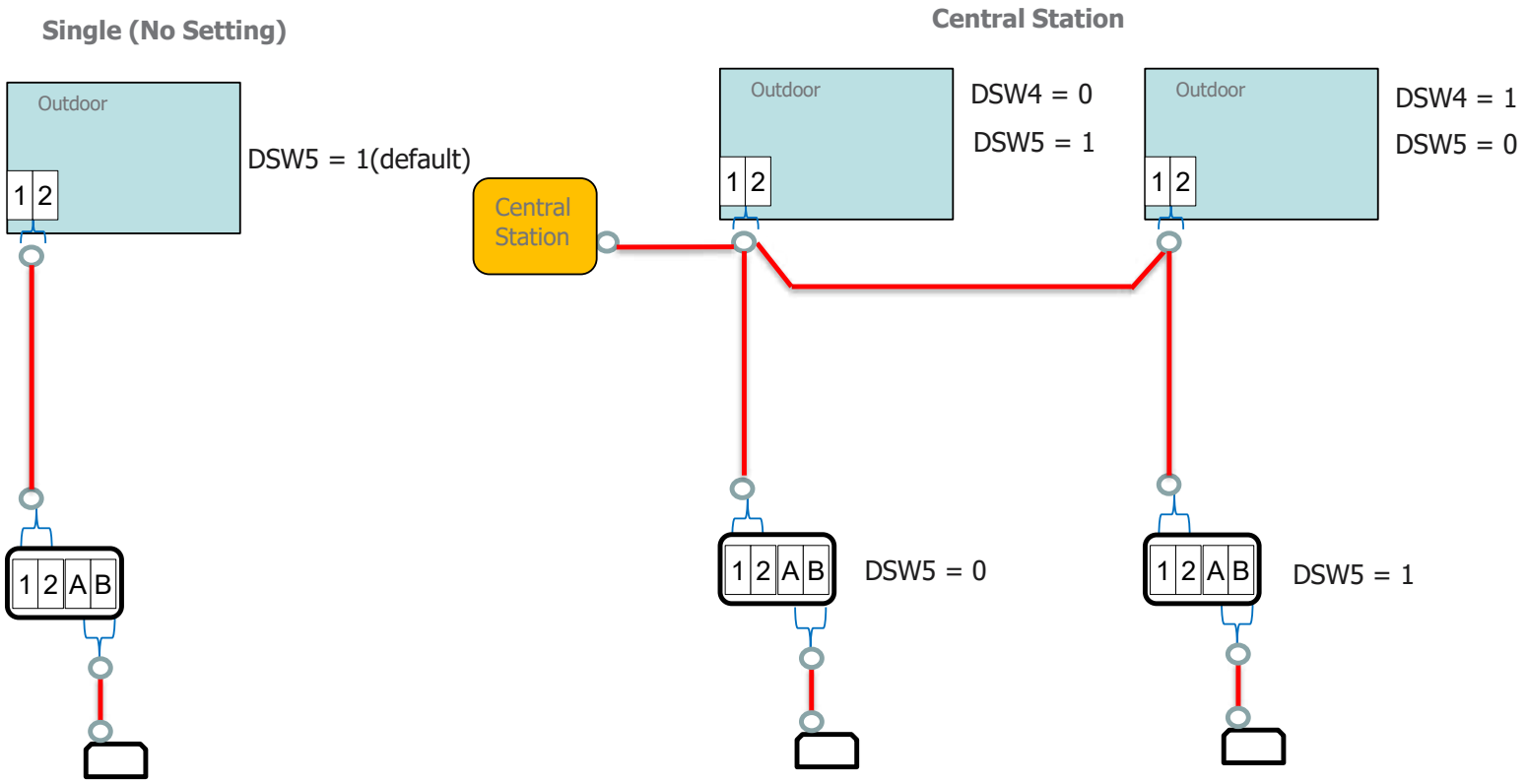
   Outdoor

   DIP Switch 4 = Refrigerant System Setting
   Example :-



General Installation

Setting : DIP & Rotary switches settings.



Important: One H-Link system must only have One End Resistance (Outdoor DSW 5 setting) turned ON.

General Installation

NFC (Near Field Communication) Function

airCloud Tap – Read & Write settings with simple tap of your smart phone.

- ✓ Less button to press
- ✓ No need to stay close to the controller during editing
- ✓ Easier to edit on the phone rather than controller
- ✓ More complete descriptions of functionalities

1

Activate the NFC function on the controller.

2

Open the airCloud Tap app and tap the controller with your phone to read the settings.

3

Edit the desired settings on your phone via airCloud Tap app.

4

Tap the controller again with your phone to write the new settings and apply them to the controller.

General Installation

NFC (Near Field Communication) Function

airCloud Tap – Read & Write Function Menu.

- airCloud Tap app available to all HVAC professionals
- Free download
- Open to all contractors, installers, building managers.
- Simplified sign-up with minimal information to create an account
- Available in Japanese, English, Portuguese, Spanish, French, Chinese simplified, Chinese traditional.

HITACHI

Available on the App Store

Google Play

Home Menu	Function Menu	Read(R)/Write(W)	Advanced- Color
Remote Controller Settings	Room Name	R/W	△*1
	Date/Time	R/W	○
	Language	R/W	○
	Temperature	R/W	○
	Run Indicator Brightness	R/W	○
Operation Schedule	Schedule	R/W	○
	Operation Schedule	R/W	○
	Holiday Setting	R/W	○
	Reset All	R/W	○
Power Saving Setting	Power Saving Setting	R/W	○
	Power Saving Detailed Settings	R/W	○
Service & Installation	Function Selection	R/W	△*2
	External Input/output	R/W	△*2
	Contact Information	R/W	△*1
	Hotel Mode	R/W	○
	Temperature Range Restriction	R/W	○
	Dual Setpoint	R/W	○
	Main/Sub Display	R/W	○
	Thermistor Selection	R/W	○
	Thermistor Calibration in Controller	R/W	○
	Auto-Restart: auto turn ON (d1)	R/W	△*2
	Auto-Restart: follow latest status from before outage (d3)	R/W	△*2
	Hi Fan Speed (C5)	R/W	△*2
	Lock Function	R/W	○
	Fan Speed at Cooling Thermo-OFF	R/W	△*2
	Fan Speed at Heating Thermo-OFF	R/W	△*2
	Cancel preheating control	W	○
	Power Up	R/W	○
Test Run	Mode	W	○
	Test Time	W	○
	Start Test Run	W	○
	Stop Test Run	W	○

○: Indicates this item is operable.
△: Indicates this item is partially operable.
— : Indicates this item is not operable.

*1. Only English and numbers can be registered.
*2. If multiple indoor units are connected, individual settings are not possible.

Troubleshooting

Procedure :

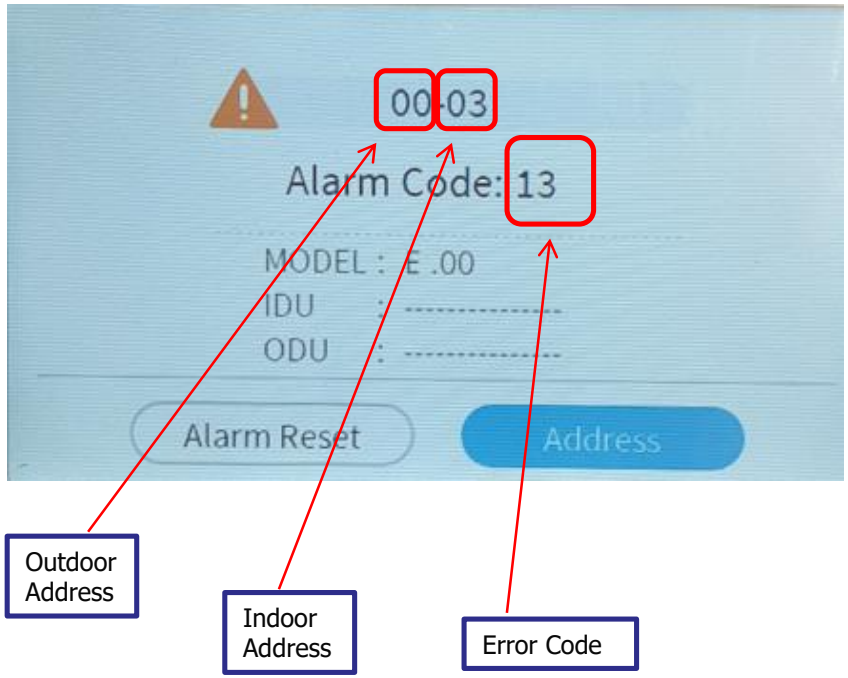
1. Read and understand the Error Code from the Wall Controller.
2. Go to Check Mode 1 and record all the parameters.
3. Record the display from the outdoor 7 segment display and its parameter.
4. Check all the recorded data to find the fault with the system.

Troubleshooting

Procedure : 1. Read and understand the Error Code from the wall controller (PC-ARFG1A/PC-ARFG2Z).

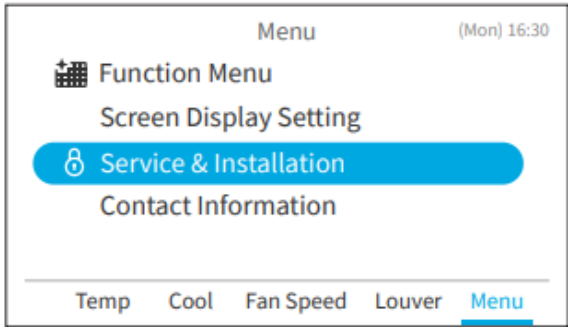
Alarm Code Table

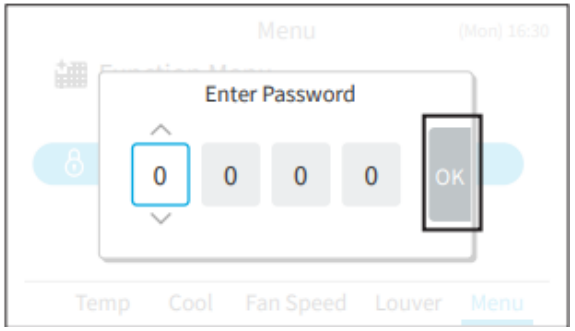
Code	Category	Content of Abnormality	Leading Cause
01	Indoor Unit	Activation of Protection Device (Float Switch)	Activation of Float Switch (High Water Level in Drain Pan, Abnormal Drain Pipe, Float Switch or Drain Pan)
02	Outdoor Unit	Activation of Protection Device (High Pressure Cut)	Activation of PSH (Pipe Clogging, Excessive Refrigerant, Insert Gas Mixing, Fan Motor Locking at Cooling Operation)
03	Transmission	Transmission Failure between Indoor and Outdoor	Incorrect Wiring, Loose Terminals, Disconnected Wire, Blowout of Fuse, Outdoor Unit Power OFF
04		Transmission Failure between Inverter PCB and Outdoor PCB	Inverter PCB - Outdoor PCB Transmission Failure (Loose Connector, Wire Breaking, Blowout of Fuse)
05	Supply Phase	Abnormal Power Source Phases	Reverse Phase due to Incorrect Wiring
06	Voltage	Abnormal Inverter Voltage	Abnormal Inverter Board, Fan Controller, DM, CB
07	Cycle	Decrease in Discharge Gas Superheat	Excessive Refrigerant Charge, Failure of Thermistor, Incorrect Wiring, Incorrect Piping Connection, Expansion Valve Locking at Opened Position (Disconnected Connector)
08		Excessively High Discharge Gas Temperature at Top of Compressor Chamber	Shortage of Refrigerant, Leaking, Pipe Clogging
11	Sensor on Indoor Unit	Abnormal Inlet Air Thermistor	Incorrect Wiring, Disconnected Wire, Wire Breaking, Short Circuit
13		Abnormal Temperature Sensor in Indoor Tube	
18	Fan Motor on Indoor Unit	Activation of Protection Device for Inverter PCB of Indoor Fan Motor	
19		Activation of Protection Device for Indoor Fan Motor	Fan Motor Overheat, Lockup
20	Sensor on Outdoor Unit	Abnormal Compressor Thermistor	Incorrect Wiring, Disconnected Wire, Wire Breaking, Short Circuit
21		Abnormal High Pressure Sensor	
22		Abnormal Outdoor Air Thermistor	
24		Abnormal Heat Exchanger Liquid Side Temperature (Te) Thermistor	Incorrect Wiring, Disconnected Wire, Wire Breaking, Short Circuit, Fan Motor Locking at Heating Operation
31	System	Incorrect Capacity Setting of Outdoor Unit and Indoor Unit	Incorrect Capacity Code Setting of Combination Excessive or Insufficient Indoor Unit Total Capacity Code
35		Incorrect Setting of Indoor Unit No.	Duplication of Indoor Unit No. in same Ref. Group, The number of the indoor unit is out of range.
36		Incorrect of Indoor Unit Combination	Outdoor unit and indoor unit are different tier, brand exception combination.

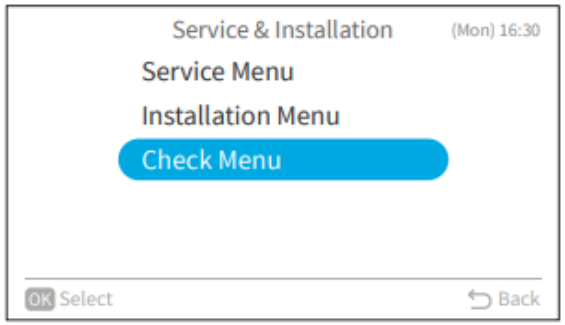


Troubleshooting

Procedure : 2. Go to Check Mode 1 and record the parameters (PC-ARFG1A/PC-ARFG2Z)







● Items of Check Mode 1

No.	Item	Data Name
1	b1	Set Temp.
2	b2	Inlet Air Temp.
3	b3	Discharge Air Temp.
4	b4	Liquid Pipe Temp.
5	b5	Remote Thermistor Temp.
6	b6	Outdoor Air Temp.
7	b7	Gas Pipe Temp.
8	b8	Evaporating Temp. at Heating
9	b9	Condensing Temp. at Cooling
10	bA	Comp. Top Temp.
11	bb	Thermo Temp. of Remote Control Switch
12	bC	Not Prepared
13	C1	I.U. Micro-Computer
14	C2	O.U. Micro-Computer
15	d1	Stopping Cause State Indication
16	E1	Times of Abnormality
17	E2	Times of Power Failure

No.	Item	Data Name
18	E3	Times of Abnormal Transmitting
19	E4	Times of Inverter Tripping
20	F1	Louver Sensor State
21	H1	Discharge Pressure
22	H2	Suction Pressure
23	H3	Control Information
24	H4	Operating Frequency
25	J1	I.U. Capacity
26	J2	O.U. Code
27	J3	Refrigerant Cycle Number (1)
28	J4	Refrigerant Cycle Number (2)
29	L1	I.U. Expansion Valve
30	L2	O.U. Expansion Valve 1
31	L3	O.U. Expansion Valve 2
32	L4	O.U. Expansion Valve B
33	P1	Comp. Current
34	q1	Motion Sensor Reaction Rate (0 ~ 100%)

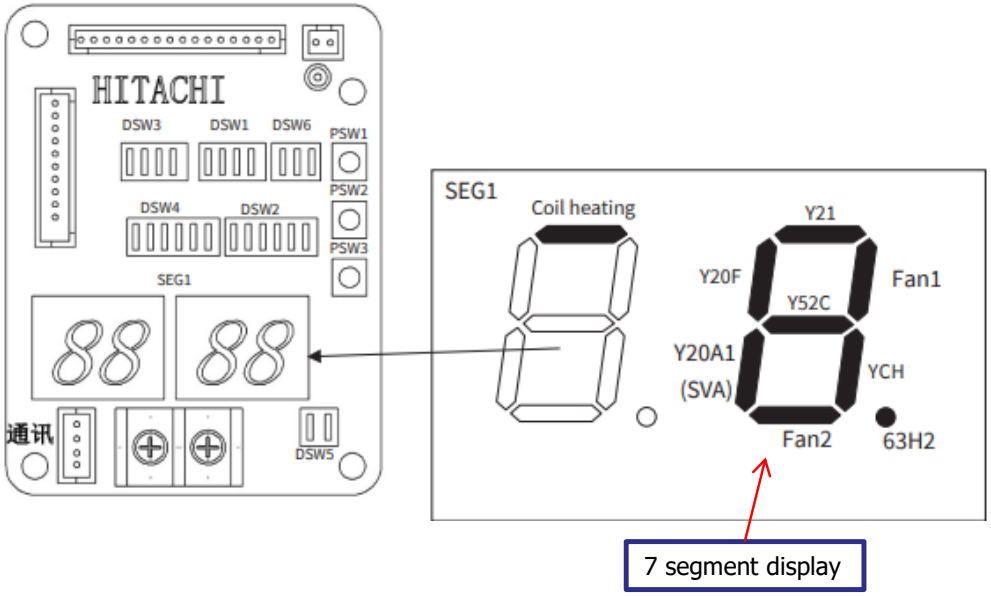
Password is required to prevent unintentional operations.
The default user password is "0000".

Troubleshooting

Procedure : 3. Record the display from the outdoor 7 segment and its parameters.

Details of 7-Segment Display

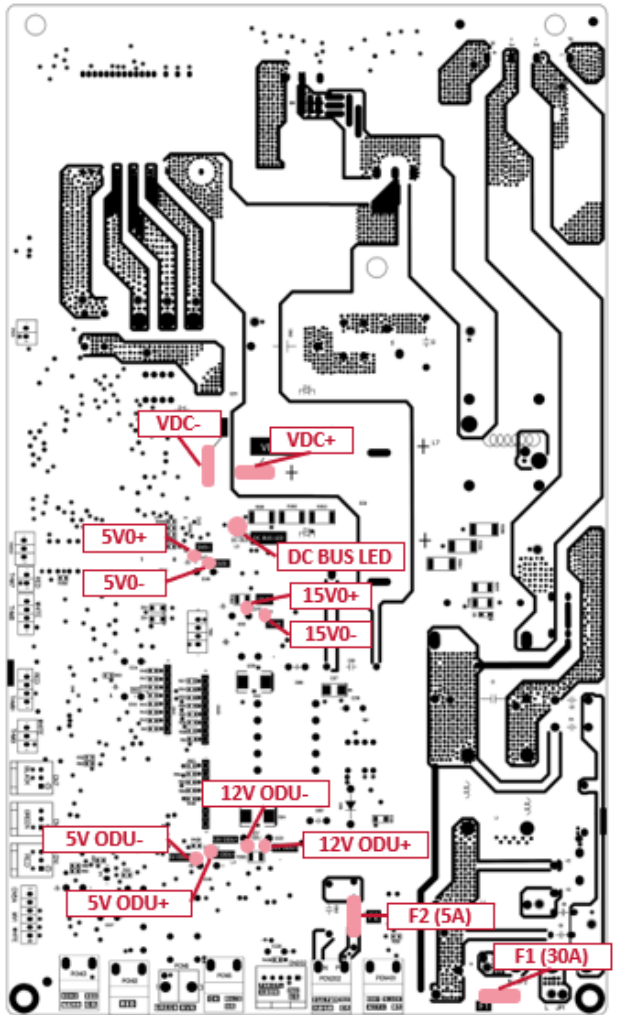
Item	Item 1	Contents
Input/Output State of Outdoor Micro-Computer	SC	Indication only for segments corresponding to equipment in "Location of Push Switches and 7-Segment Display"
Capacity of Operating Indoor Unit	oP	0 ~ 199 When capacity is higher than 100, last 2 digits flash.
Control Software No.	SP	Control Software No. in use is indicated. Alternately upper 2 digits and lower 2 digits are indicated every 0.5 sec.
Inverter Software No.	iP	Inverter Software No. in use is indicated. Alternately upper 2 digits and lower 2 digit are indicated every 0.5 sec.
Inverter Order Frequency to Compressor	HI	0 ~ 199 (Hz) When frequency is higher than 100Hz, last 2 digits flash.
Air Flow Ratio	Fo	0 ~ 16
Outdoor Unit Expansion Valve Opening	Eo	0 ~ 100(%) When expansion valve opening is 100%, "00" flashes.
Discharge Pressure	Pd.	0.1 ~ 4.9 (MPa)
Discharge Pressure (Estimated value)	Pd.	0.1 ~ 4.9 (MPa)
Suction Pressure (Low)	PS.	0.0 ~ 1.9 (MPa)
Suction Pressure (Estimated value)	PS.	0.0 ~ 1.9 (MPa)
Temperature at the Top of Compressor	Td	1 ~ 142 (°C) When temperature is higher than 100°C, last 2 digits flash.
Evaporating Temperature at Heating	TE	-19 ~ 80 (°C)
Ambient Air Temperature	To	-19 ~ 80 (°C)
Condensing Temperature at Cooling	TC	-19 ~ 80 (°C)
Compressor Suction Temperature	TS	-19 ~ 80 (°C)
Inverter Fin Temperature	TF	-19 ~ 127 (°C) When temperature is 100°C, "00" flashes.
Inverter Firstly Current	A1	00 ~ 199 (A) When current is higher than 100A, last 2 digits flash.
Inverter Secondary Current	A2	00 ~ 199 (A) When current is higher than 100A, last 2 digits flash.
Indoor Unit Address	nA	0 ~ 3 (Unit No.)
Indoor Unit Expansion Valve Opening	EA	00 ~ 100(%) When opening is 100%, "00" flashes.
Middle Temperature of Indoor Unit A Pipe	LA	-19 ~ 127 (°C)
Indoor Unit Inlet Air Temperature	iA	-19 ~ 127 (°C)
Cause of Indoor Unit Stoppage	dA	0 ~ 99
Nth Indoor unit	nn	0 ~ 3
Expansion valve opening of the Nth Indoor unit	En	0 ~ 100(%) When opening is 100%, "00" flashes.
Temperature in the tube of the Nth Indoor unit	Ln	-19 ~ 127 (°C)
Suction Temperature of the Nth Indoor unit	in	

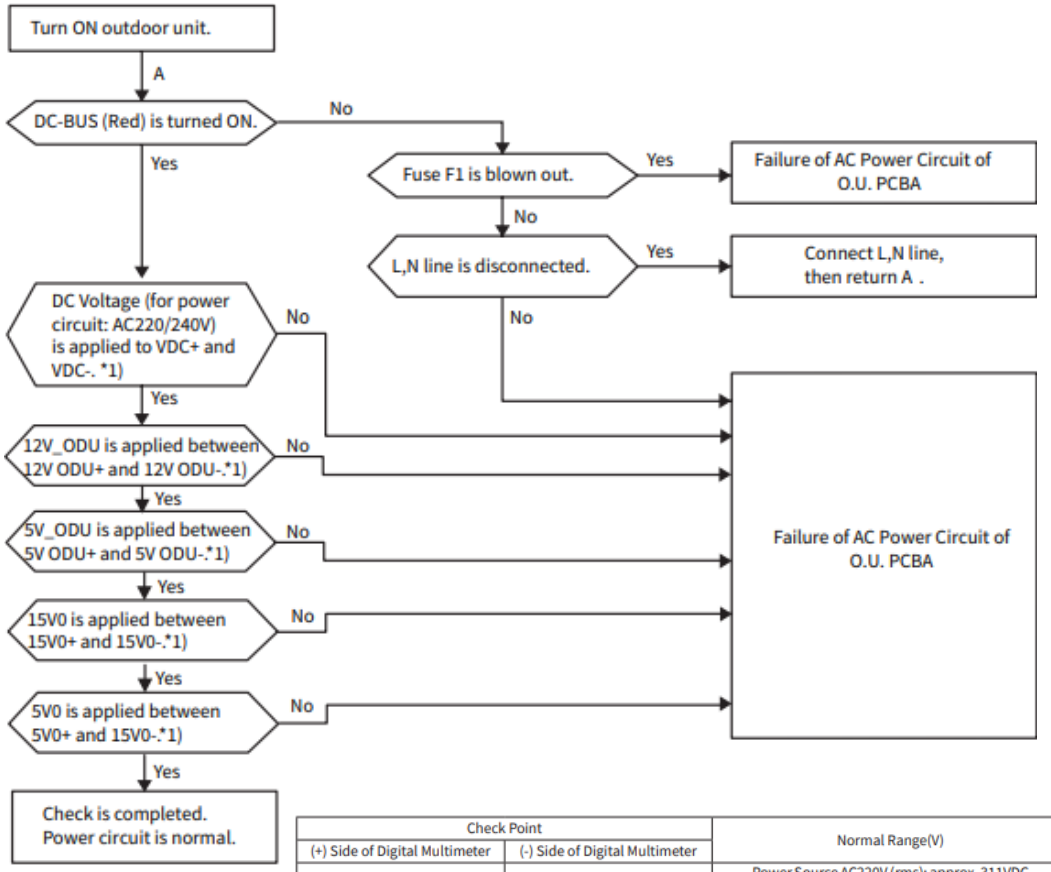


1. Press and Hold PSW2 for 3 seconds.
2. Use PSW2 or PSW3 to scroll to the other parameters.

Troubleshooting

Main PCB Checking Method – PCB 2.0~3.0HP Single Phase

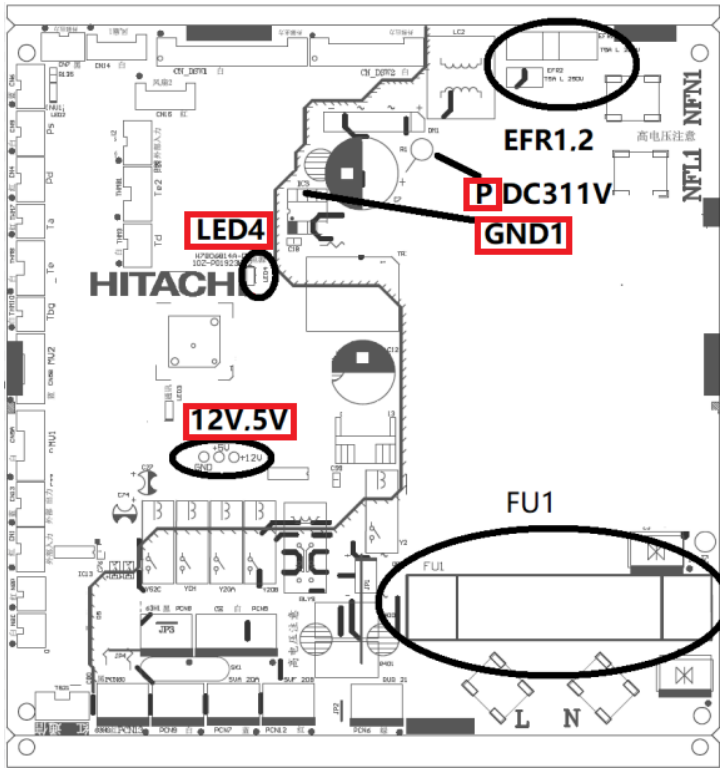




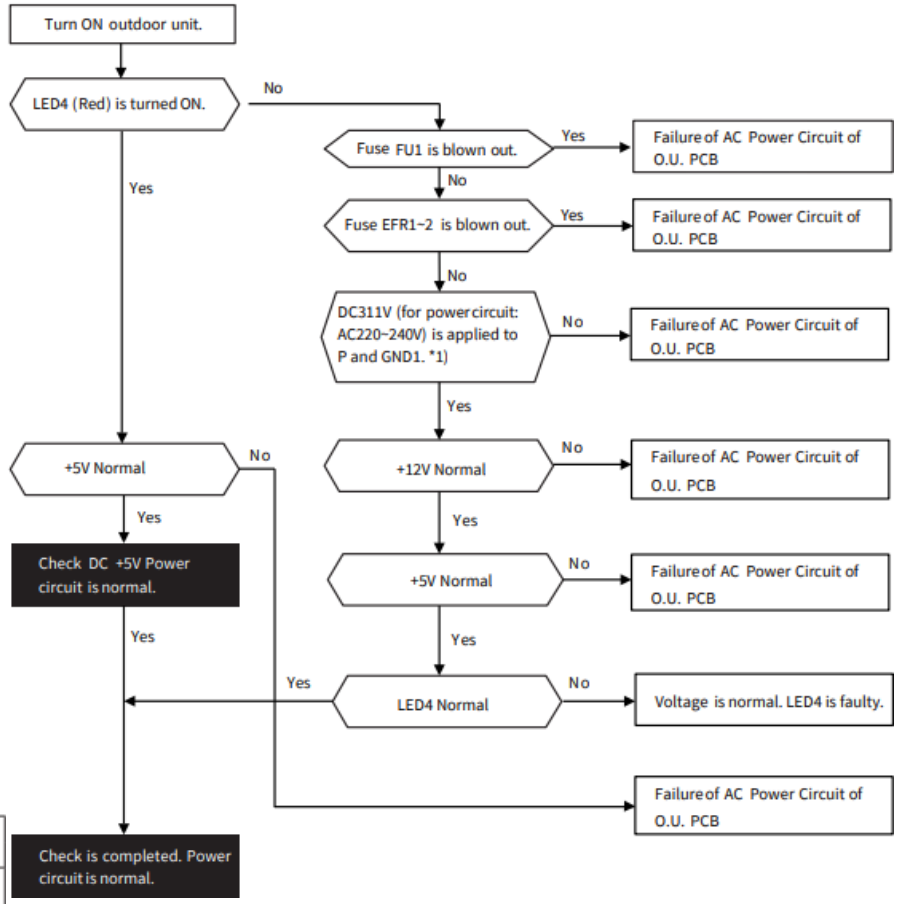
Check Point		Normal Range(V)
(+) Side of Digital Multimeter	(-) Side of Digital Multimeter	
VDC+	VDC-	Power Source AC220V (rms): approx. 311VDC Power Source AC230V (rms): approx. 325VDC Power Source AC240V (rms): approx. 339VDC
12V ODU+	12V ODU-	11.7VDC~14.3VDC
5V ODU+	5V ODU-	4.75VDC~5.25VDC
15V0+	15V0-	13.5VDC~16.5VDC
5V0+	5V0-	4.75VDC~5.25VDC

Troubleshooting

Main PCB Checking Method – PCB 4.0~6.5HP Single Phase

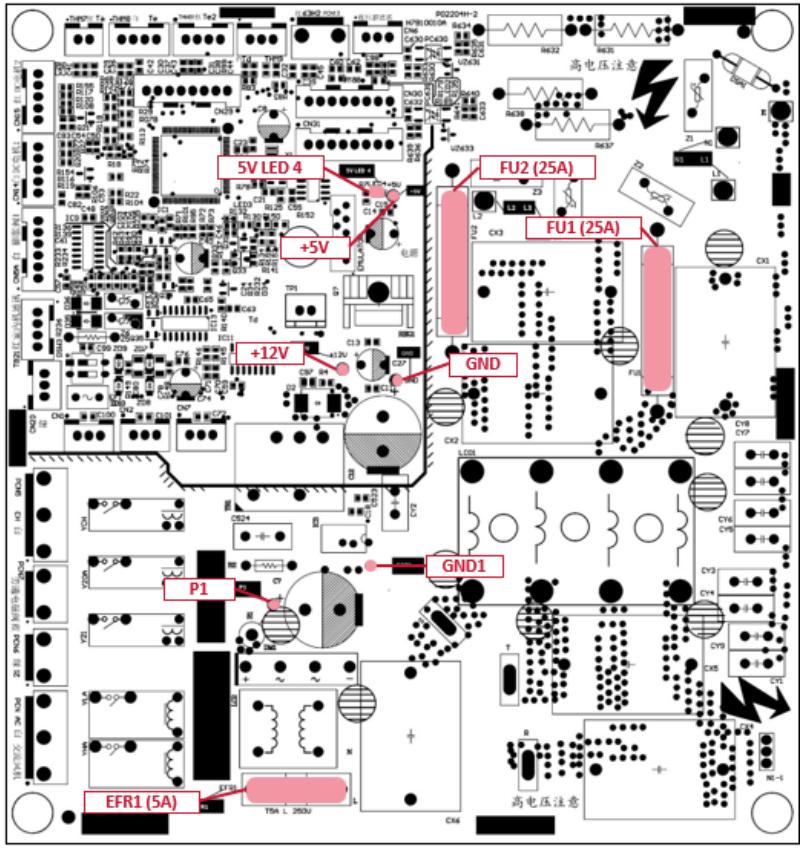


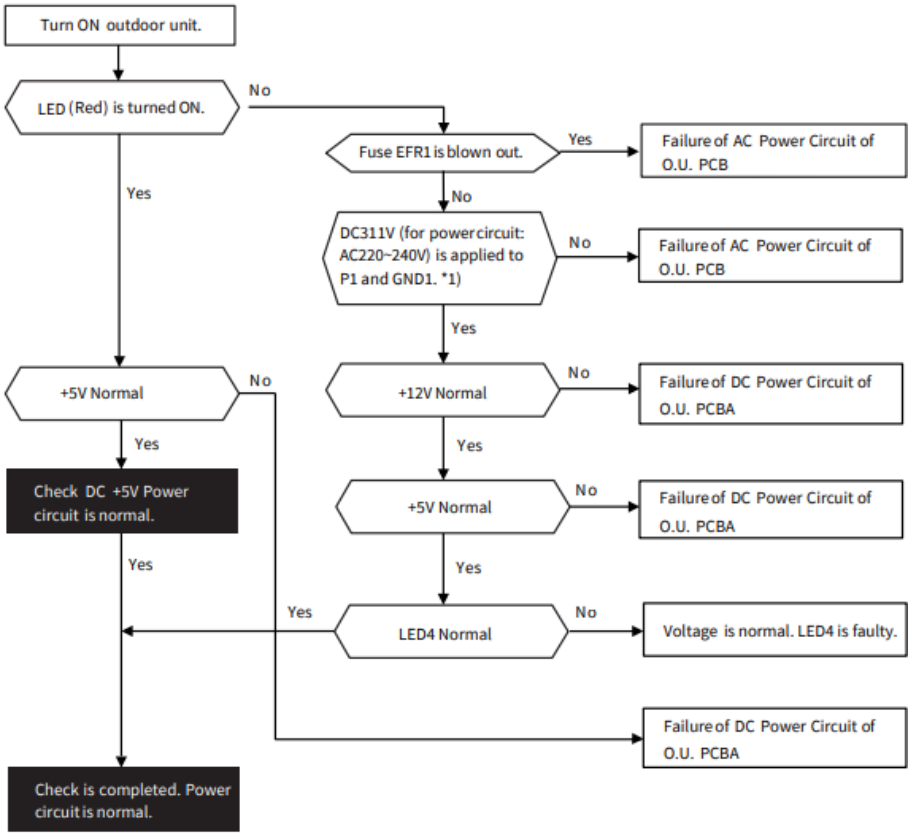
Check Point		Normal Range(V)
(+) Side of Digital Multimeter	(-) Side of Digital Multimeter	
P	GND1	Power Source AC220V (rms): approx. 311VDC Power Source AC230V (rms): approx. 325VDC Power Source AC240V (rms): approx. 339VDC
+5V	GND	4.75VDC~5.25VDC
+12V		11.7VDC~14.3VDC



Troubleshooting

Main PCB Checking Method – PCB 4.0~6.5HP Three Phase



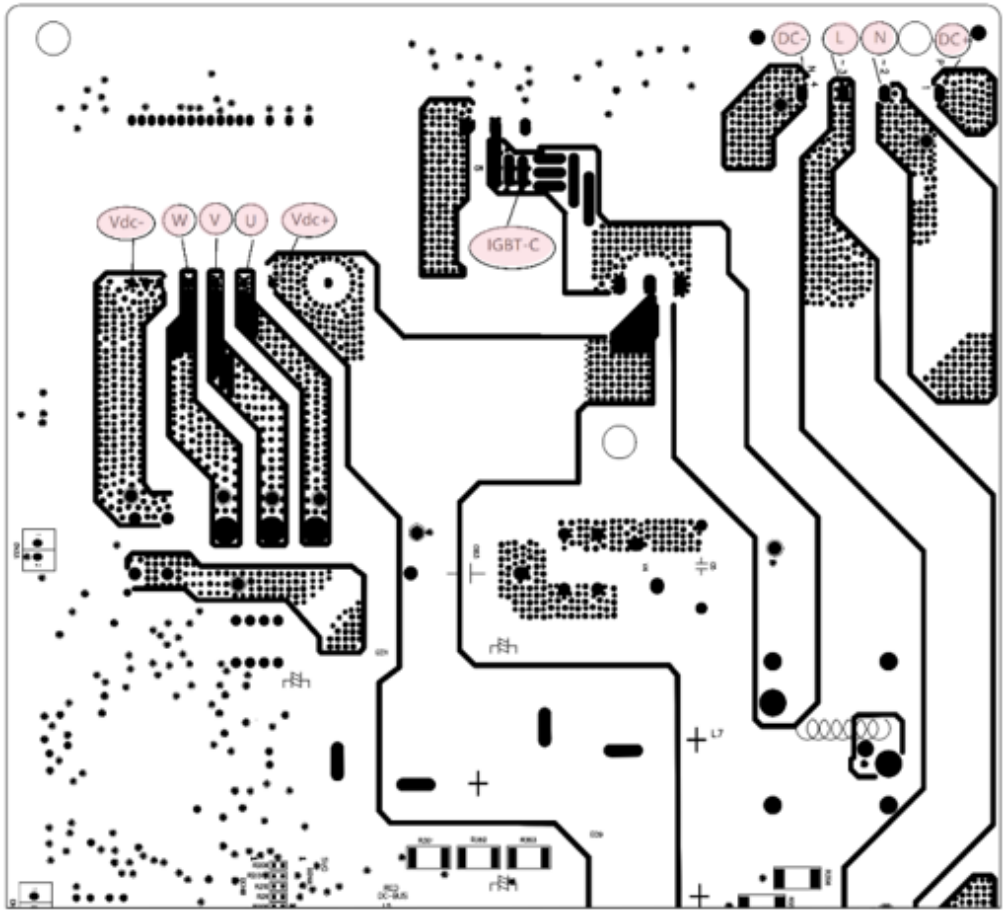


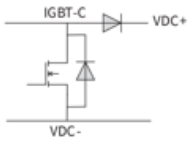
Check Point		Normal Range(V)
(+) Side of Digital multimeter	(-) Side of Digital multimeter	
P1	GND1	Power Source AC220V (rms): approx. 311VDC Power Source AC230V (rms): approx. 325VDC Power Source AC240V (rms): approx. 339VDC
+5V	GND	4.75VDC~5.25VDC
+12V		11.7VDC~14.3VDC

Troubleshooting

Inverter PCB Checking Method

PCB 2.0~3.0HP : Single Phase
Remove all the terminals of the inverter PCBA before check.

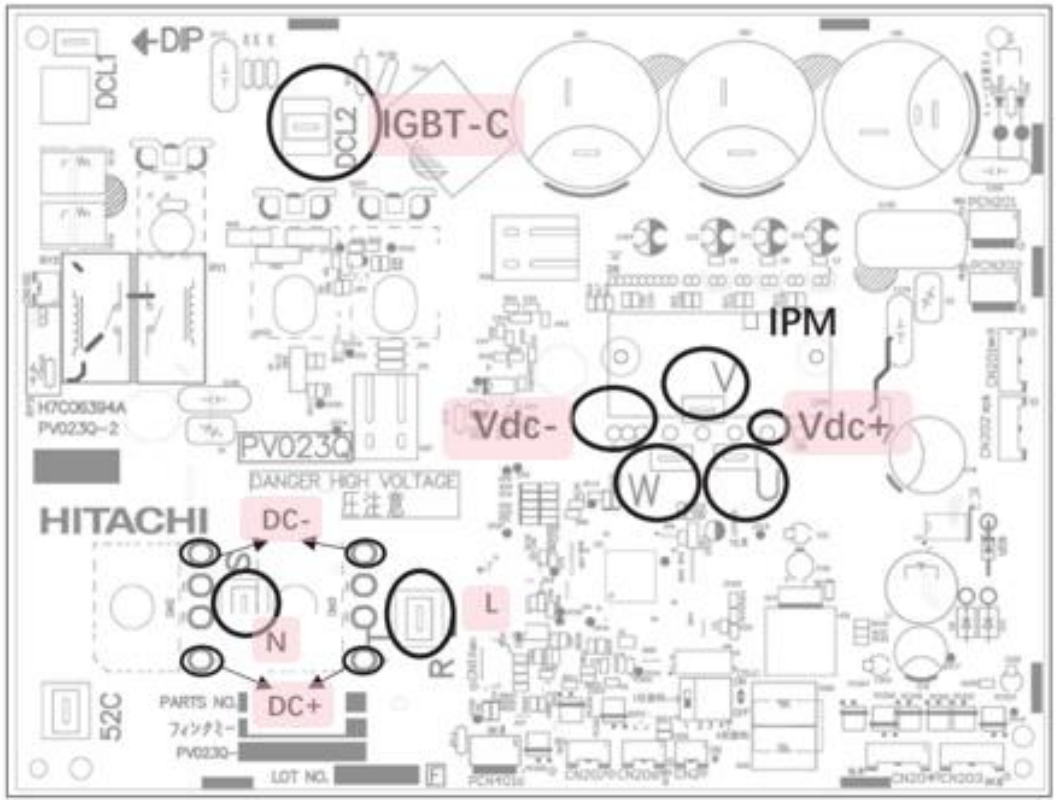


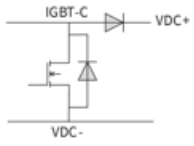
Part	No.	Digital Tester		
		Positive Prove (+)	Negative Prove (-)	Range
Rectifier Circuit 	1	DC+	L/N	≥2.0V or OL
	2	L/N	DC+	0.3 – 0.85V
	3	DC-	L/N	0.3 – 0.85V
	4	L/N	DC-	≥2.0V or OL
PFC Circuit 	5	VDC+	IGBT-C	≥2.0V or OL
	6	IGBT-C	VDC+	0.3 – 0.85V
	7	VDC-	IGBT-C	0.3 – 0.85V
	8	IGBT-C	VDC-	≥2.0V or OL

Troubleshooting

Inverter PCB Checking Method

PCB 4.0~6.5HP : Single Phase
Remove all the terminals of the inverter PCBA before check.

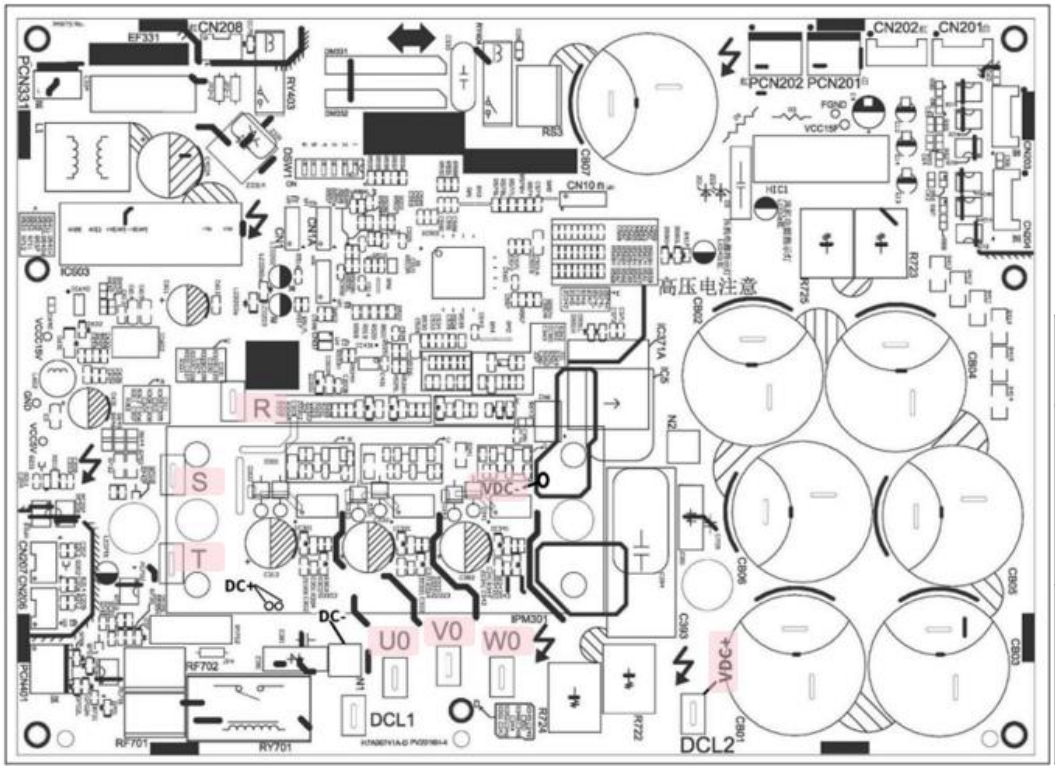


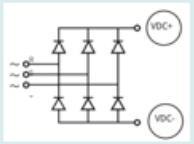
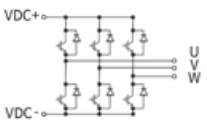
Part	No.	Digital Tester		
		Positive Prove (+)	Negative Prove (-)	Range
Rectifier Circuit 	1	DC+	L/N	≥2.0V or OL
	2	L/N	DC+	0.3 – 0.85V
	3	DC-	L/N	0.3 – 0.85V
	4	L/N	DC-	≥2.0V or OL
PFC Circuit 	5	VDC+	IGBT-C	≥2.0V or OL
	6	IGBT-C	VDC+	0.3 – 0.85V
	7	VDC-	IGBT-C	0.3 – 0.85V
	8	IGBT-C	VDC-	≥2.0V or OL

Troubleshooting

Inverter PCB Checking Method

PCB 4.0~6.5HP : Three Phase
Remove all the terminals of the inverter PCBA before check.



Part	No.	Digital Tester		
		Positive Prove (+)	Negative Prove (-)	Range
Rectifier Circuit 	1	VDC+	R/S/T	≥2.0V or OL
	2	R/S/T	VDC+	0.3 – 0.85V
	3	VDC-	R/S/T	0.3 – 0.85V
	4	R/S/T	VDC-	≥2.0V or OL
Inverter Module 	5	VDC+	U/V/W	≥2.0V or OL
	6	U/V/W	VDC+	0.3 – 0.85V
	7	VDC-	U/V/W	0.3 – 0.85V
	8	U/V/W	VDC-	≥2.0V or OL

Troubleshooting

Replacing New Outdoor PCB - Setup

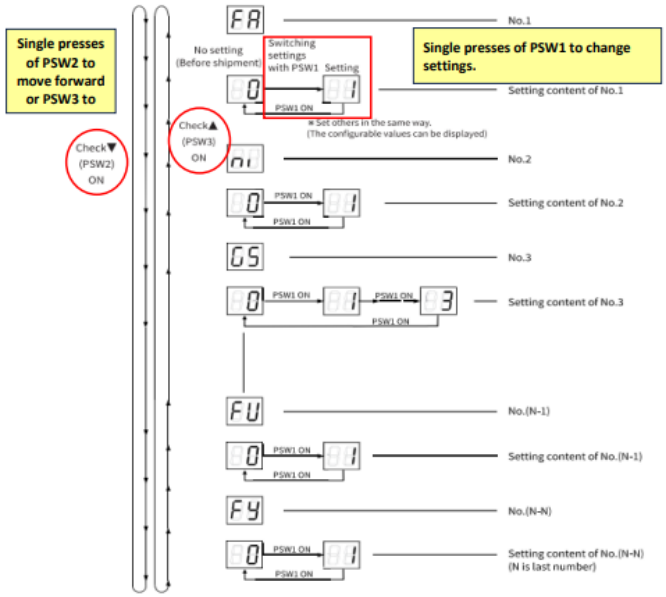
Carefully read instructions before commencing.
Function settings for **b0** = Region, **b1** = Model Capacity, & **b3** = Power Supply
Note :- Alarm Code 31 will display if setup is not complete

4.6.3 Function Setting from Outdoor Unit PCB

The setting should be performed during the outdoor unit stoppage. This setting is not available during External Input / Output Setting.

Go to DSW2, Turn ON dip Sw 5 to begin.
"FA" will display.
Turn OFF when complete.

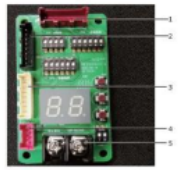
The display content and setting method of the function setting Mode are shown in the following figure.



HINT: It will take 68 Single presses of PSW2 to navigate through the function menus until **b0** setting is reached.

< Arrangement of Push Switches on PCB1 >

PAS-2.0~3.0UFASNQ1, PAS-4.0~6.5UFASMQ1



No	Mark	Description
1	CN31	Connect to PV2207H/PV2016H CN31
2	CN29	Connect to PV2207H/PV2016H CN29
3	CN30	Connect to PV2207H/PV2016H CN30
4	TB21	Connect to PV2207H/PV2016H TB21
5	TB2	Connect to indoor communication

PAS-4.0~6.5UFASNQ1

No	Mark	Description
1	CN_DSW1	Connect to PO1923H CN_DSW1
2	CN_DSW2	Connect to PO1923H CN_DSW2
3	TB2	Connect to indoor communication
4	TB21	Connect to PO1923H TB21

When b0 is displayed, press PSW2 once then press PSW1 to change settings.
Each time PSW1 is pressed, the setting number increases 0 > 1 > 2 > 3 etc.
Then press PSW2 to move forward to the next setting.
Press PSW3 to move backwards if needed to go back to the previous settings.
Note :- Turn OFF DSW2 dip Sw 5 when settings are complete.

No.	7-Segment Display		Setting Item	Contents
40	b0	0	Product series (region)	No setting
		1		ANZ
		2		PH(Prepared)
		3		NA
		4-15		Others(Prepared)
41	b1	0	Unit capacity	No setting
		1		1.0HP
		2		1.5HP
		3		1.8HP
		4		2.0HP
		5		2.5HP
		6		3.0HP
		7		3.5HP
		8		4.0HP
		9		5.0HP
		10		6.0HP
		11		6.5HP
		12		7.0HP
		13		8.0HP
		14		10.0HP
		15		12.0HP
42	b2	0	Power supply	1Ph/220~240V/50Hz
		1		Prepared
		2		Prepared
		3		3Ph/380~415V/50Hz
		4		1Ph/208~230V/60Hz

Set to ANZ

Press PSW1 twice to go to No.1 settings then press PSW 2 to go to the next setting.

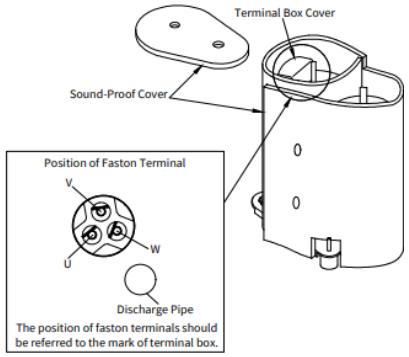
Select Model Capacity.
Example :- For model PAS-4.0UFASNQ1 go to setting No. 8

Select Models Power Supply

Troubleshooting

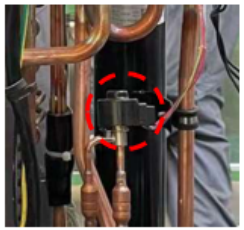
Component Check - Resistances of Coils

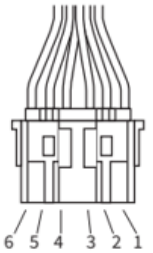
< Compressor Coil >



Outdoor unit capacity	Resistance
2.0/2.5HP	1.82Ω (at 20°C)
3.0HP	1.03 ± 5%Ω (at 20°C)
4.0/5.0/6.0/6.5HP	0.5Ω (at 20°C)

< Expansion Valve Coil >

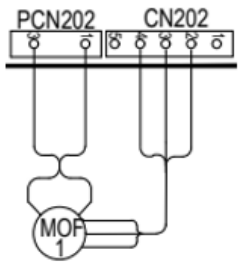




Arrangement of Connector No.

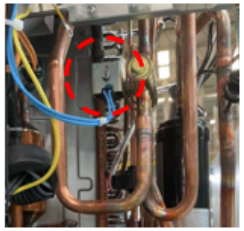
Wire color and Connector No.		Resistance
Red(1) COM	Brown(2)	46 ± 4Ω (at 20°C)
	Blue(3)	
	Orange(4)	
	Yellow(5)	
	White(6)	

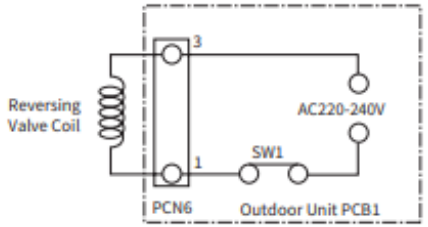
< Fan motor Coil >



Outdoor unit capacity	PCN202/PCN201	CN202/CN201	Resistance
2.0 – 3.0HP	GND (Black)	Vcc	∞
		Vm	1.88MΩ
		Vs	205.1kΩ
4.0 – 6.5HP	GND (Black)	Vcc	3MΩ
		Vm	5MΩ
		Vs	143MΩ

< Reversing Valve Coil >





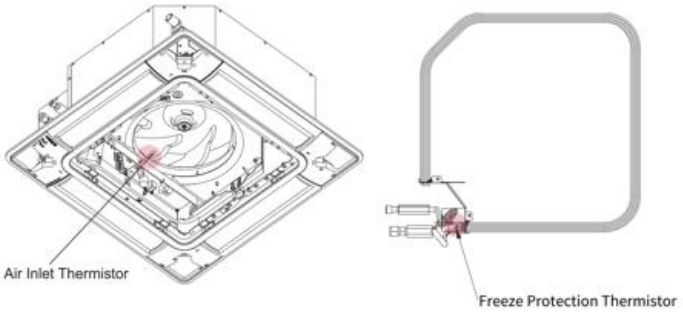
Outdoor unit capacity	Resistance
2.0 - 6.5HP	2085 ± 10%Ω (at 20°C)

Troubleshooting

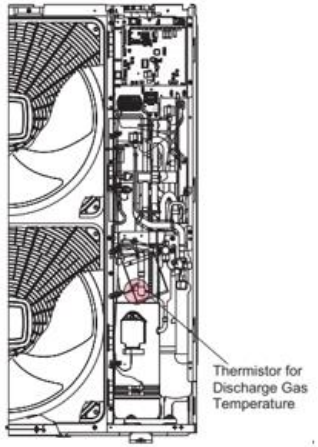
Component Check - Resistances of Thermistors

- Resistances of Thermistors

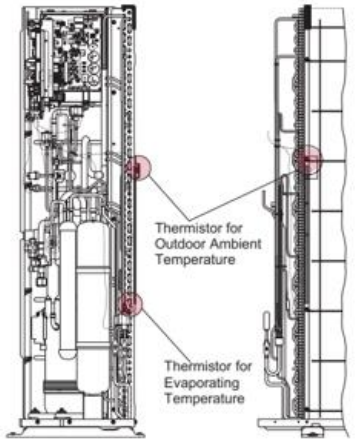
< for Air inlet and Freeze protection on Indoor unit >

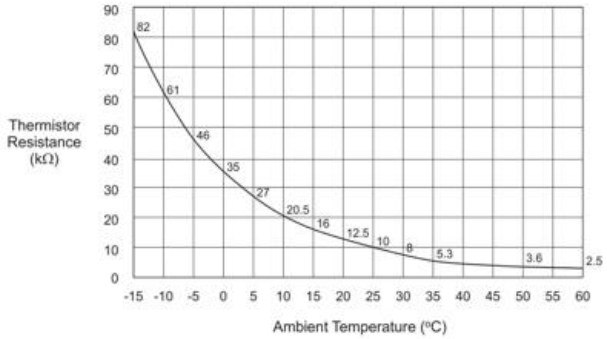


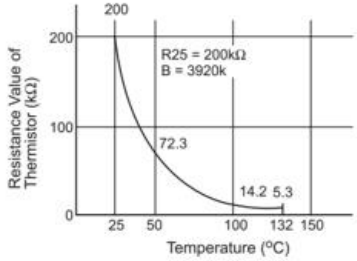
< for Discharge gas on Outdoor unit >

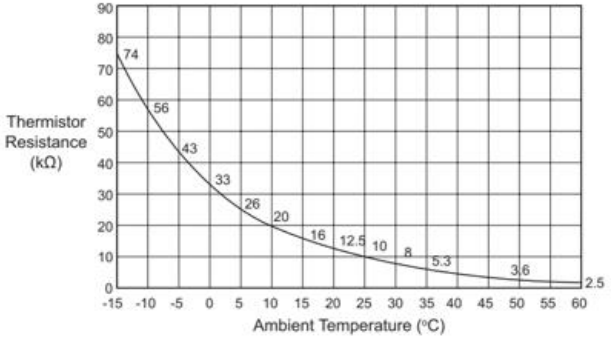


< for Ambient and Evaporating on Outdoor unit >









Optional Setting

List of the Optional Functions are available in the Installation Manual of the wall controller.

Most commonly requested functions are :-

1. Activation of the Automatic Mode (b8).
2. Power supply ON/OFF 2 (resume operation after power failure)(d3)
3. Fixing operation mode (except Auto mode)(b5).
4. Return air sensing (c8).

There are also other Optional Functions available from the outdoor 7 segment settings. Please refer to the outdoor Installation Manual.

Table A. Optional Setting Items for Function Selection

No.	Item	Optional Function	Individual Setting	Setting Condition	Contents	Setting
1	b1	Set heating temperature compensation(*1)	○	00 01 02 03 04	Tset +4°C(default setting)(*2) Tset+0°C(no compensation) Tset+2°C (*3) Tset+3°C Tset+1°C	
2	b2	Circulator Function during Heating Thermo-OFF	○	00 01	Unavailable Available	
3	b3	Not used	×	00 01	00 01	
4	b4	Change of filter cleaning period	○	00 01 02 03 04	1200h(default setting)(*4) 100h 1200h 2500h No Indication	
5	b5	Lock operation mode on controller	×	00 01	Usual setting Locked (*5)	
6	b6	Lock temperature setting on remote controller	×	00 01	Standard Fixed	
7	b7	Set operation mode as Cooling Unit	×	00 01	Usual setting Locked	
8	b8	Automatic Cool/Heat operation	×	00 01	Unavailable Available	
9	b9	Lock fan speed setting on controller	×	00 01	Standard Locked	
10	bA	Not used	-	-	Not Used(Use as 00 setting conditions)	
11	bb	Set cooling temperature compensation	×	00 01 02	Tset+0°C(no compensation, default setting) Tset–1°C Tset–2°C	
12	bC	Not used	-	00 01	00 01	
13	bd	Not used	-	00 01	00 01	
14	bE	Not used	-	00 01	00 01	
15	C1	Not used	-	00 01	00 01	
16	C2	Not used	-	-	Not Used(Use as 00 setting conditions)	
17	C3	Not used	-	00 01	00 01	
18	C4	Not used	-	00 01	00 01	
19	C5	Static pressure sel. / Increase Fan Hi speed	○	00 01 02	Standard static pressure/ Standard speed High static pressure/ Hi speed 1(*6) Low static pressure/ Hi speed 2	
20	C6	Increase of fan speed at heating Thermo-OFF	○	00 01	Unavailable Available	
21	C7	Cancel 3 min. compressor starting delay	○	00 01	Standard Cancellation	
22	C8	Sensor selection for indoor temp. control	○	00 01 02	Indoor air suction sensor/ average air suction-THM4 Wired controller sensor/ THM4(remote sensor) Average return air sensor and (controller sensor or remote sensor)	
23	C9	Not used	-	-	Not Used(Use as 00 setting conditions)	
24	CA	Not used	-	-	Not Used(Use as 00 setting conditions)	
25	Cb	Selection of forced stoppage logic	○	00 01	Normally Open Normally Closed	

Interface Connection

All the interface connection are done with the PCC-1A (CN3/CN7) connector (Part number 171000002).

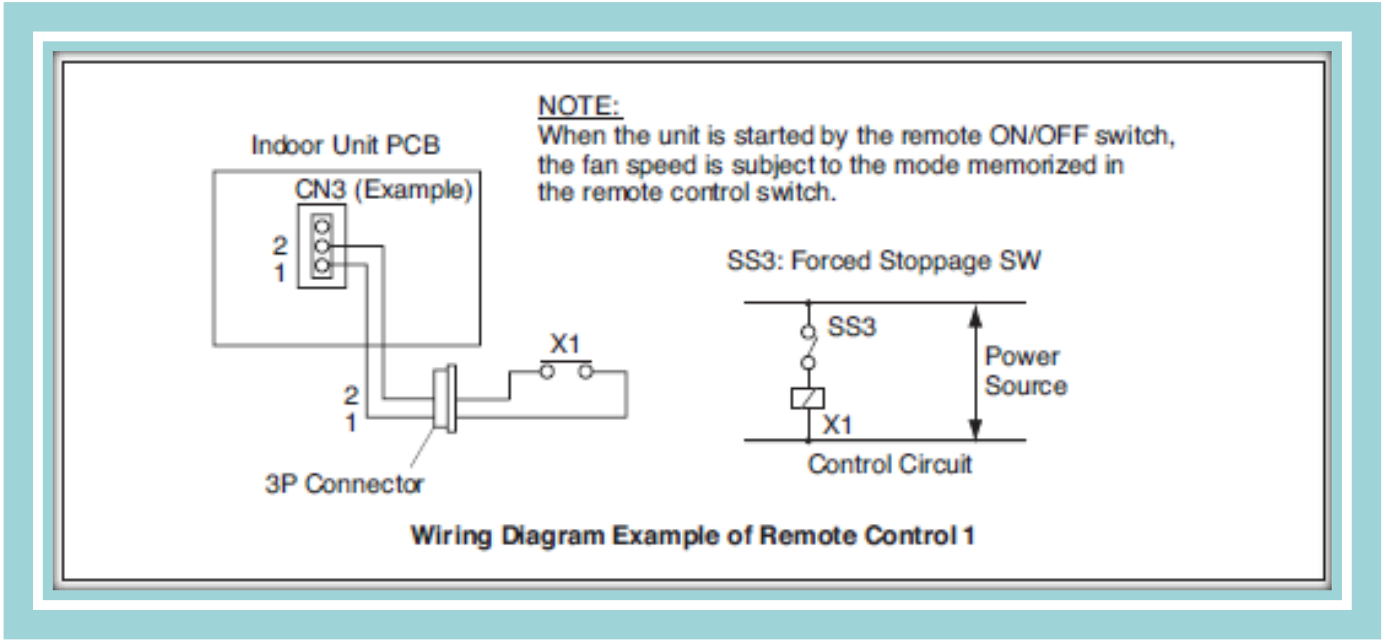
Most commonly used / requested function are as below:- (external input / output)

1. Remote start / stop operation
2. Picking Up Operation Signal (External Fan Control / Fresh Air Fan)
3. Picking Up Alarm Signal
4. Fire Trip

Interface Connection

1. Remote Start / Stop Operation. (level signal input)

Connect to CN3 pin 1&2.

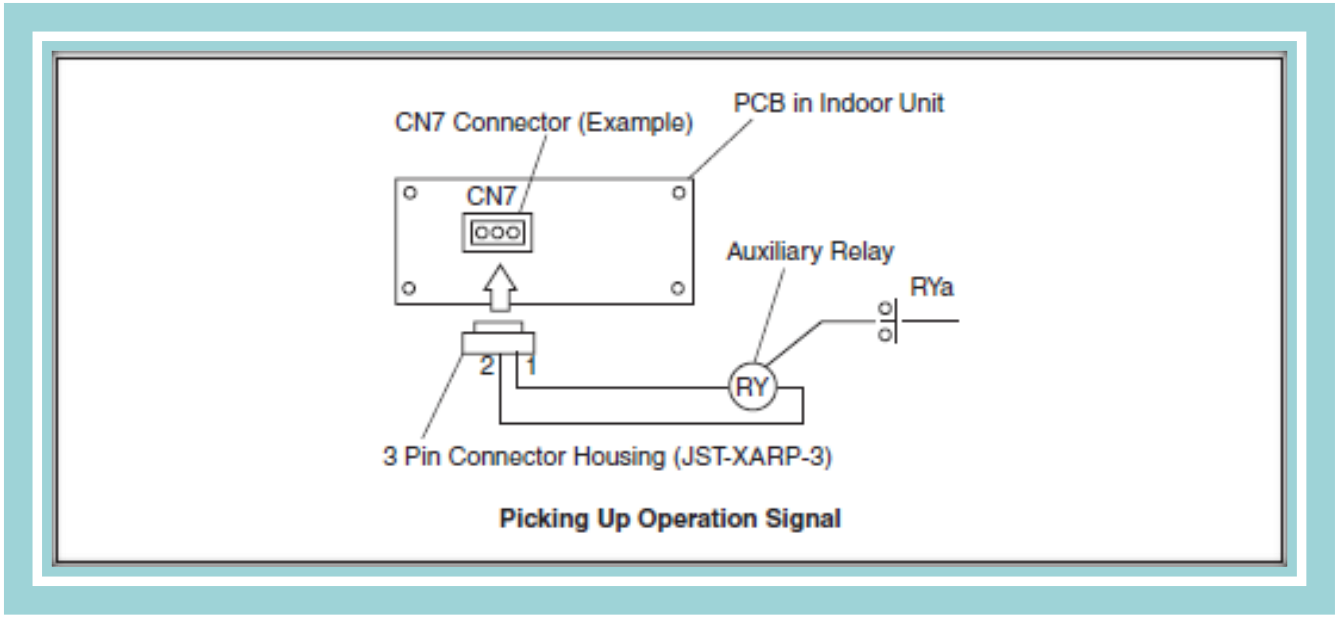


Wiring Diagram Example of Remote Control 1

Interface Connection

2. Picking Up Operation Signal (External fan control / Fresh Air Fan)

Connect to CN7 pin 1&2.



Picking Up Operation Signal

Required Parts for Modification

Parts Name	Specification / Model
Auxiliary Relay *	OMRON made High Power Relay Model LY2F DC12V
Connector Cable	PCC-1A (3P Connector Cable)

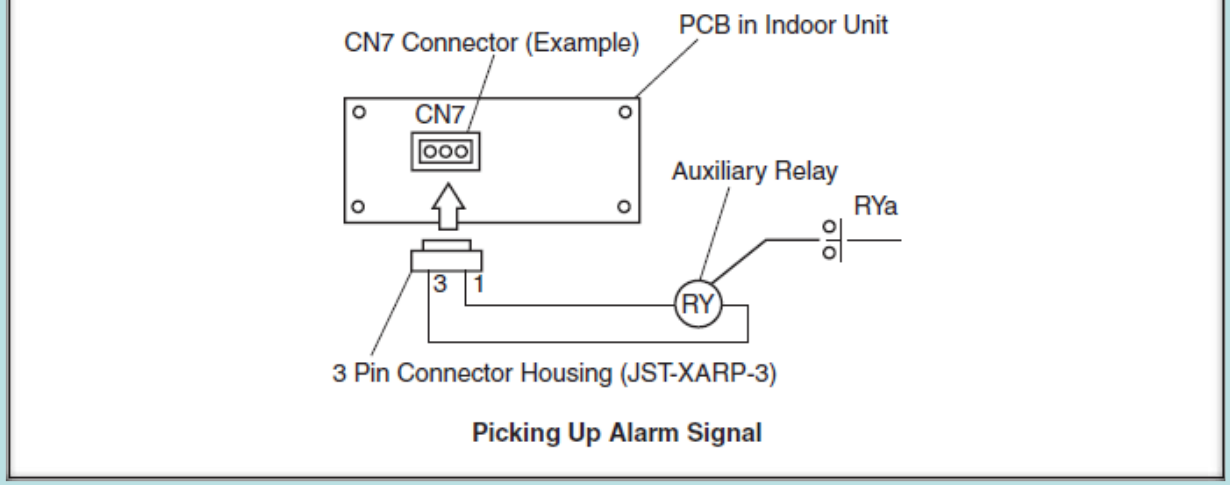
*: Do not use the relay with diode.

Interface Connection

3. Picking Up Alarm Signal.

This signal is utilized to pick up activation of safety devices.

Connect to CN7 pin 1&3.



Picking Up Alarm Signal

Required Parts for Modification

Parts Name	Specification / Model
Auxiliary Relay *	OMRON made High Power Relay Model LY2F DC12V
Connector Cable	PCC-1A (3P Connector Cable)

*: Do not use the relay with diode.

Interface Connection

4. Fire Trip / Forced Stoppage

This is done at the outdoor unit pcb. Firstly, need to change the Input 1 setting 'Force Stoppage' Input by below procedure :-

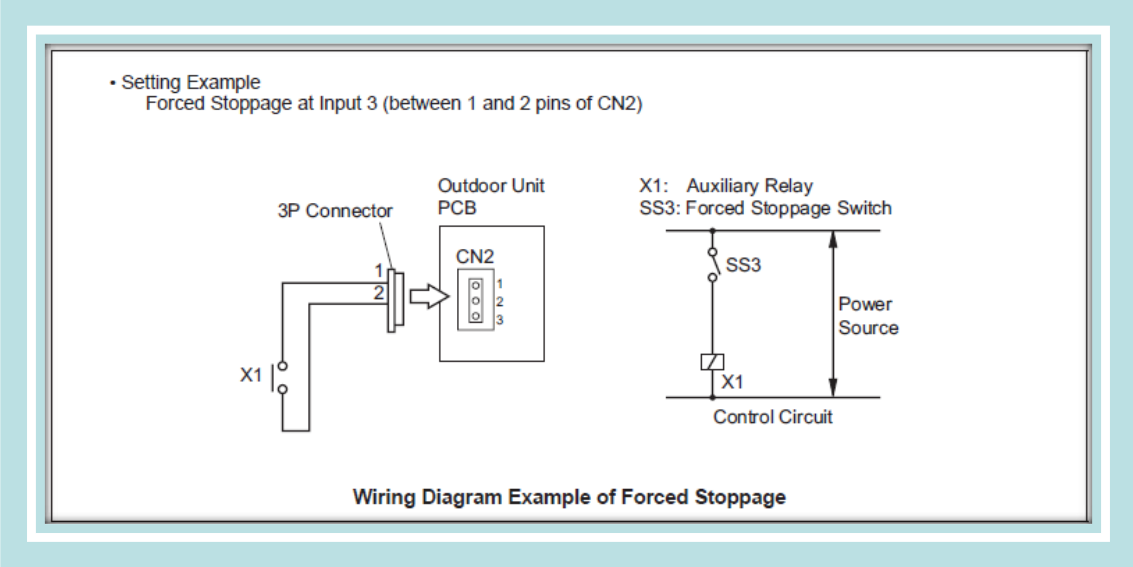
1. Switch ON DSW2 pin 6.

2. Select the Input no. & Control Function no. (example no.5) by using PSW2 & PSW3.

Use PSW1 to change the function no.

3. Switch OFF DSW2 pin 6.

4. Connect CN2 pin 1&2. If shorted circuited, it will Switch OFF compressor, outdoor & indoor fan .



Wiring Diagram Example of Forced Stoppage

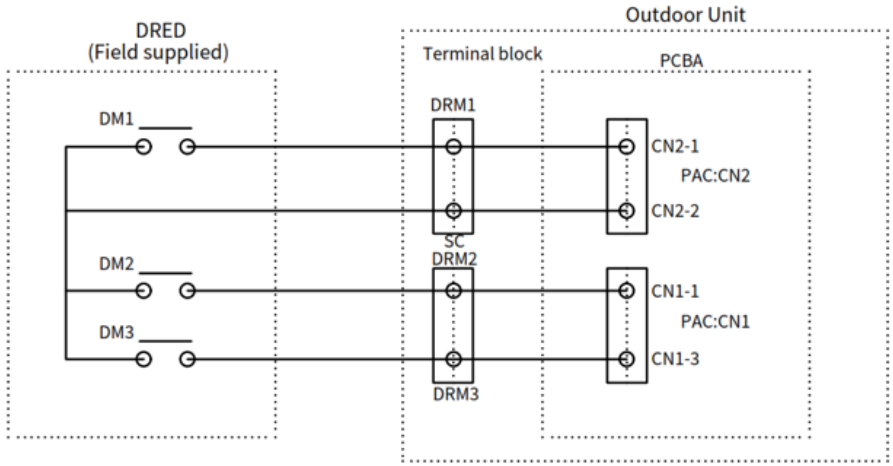
Interface Connection

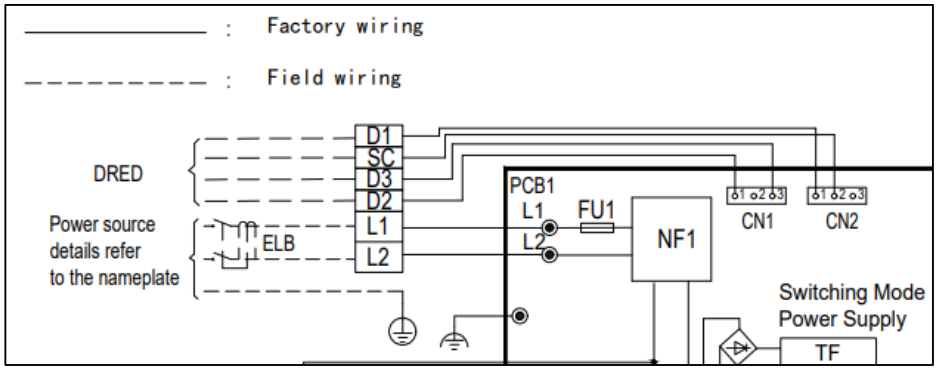
Connection between Demand Response Enabling Device (DRED)

- Set function setting “dr” to activate DRED function.

No.	7-Segment Display		Setting Item
	SEG2	SEG1	
38	dr	0	The setting before shipment
		1	DR instruction setting

- The demand level on each terminal is shown below;
  - DRM1: Forcibly stoppage (d1=10)
  - DRM2: The compressor is limited the load to 50%
  - DRM3: The compressor is limited the load to 75%





Additional: Zone Controller GC-AZKP Setup (1/4)

Zone Interface Setup Guide

This document is an overview of the set-up process. For further details, please refer to the relevant installation and operation manuals.

Process of Setting Zone Controller & Zone Configuration

1. **To access the "Zone Installation Menu": -**
    a. From the home screen, scroll right the Menu setting icon and press "OK".
    b. Scroll down to the "Service & Installation' settings and press "OK".
    c. Enter the passcode (0000 is the default passcode)
    d. When in the "Service & Installation" menu, scroll down to the "Zone Installation Menu" and press "OK".
2. **"Common Zone Setup"** All other settings are greyed out and unavailable until the common zone setting is made. (A common zone is a zone that does not have a damper motor and is always ON whenever the system is operating).
    a. Select "Common Zone Setup" and press "OK" to enter the "Common Zone Setup".
    b. Press "OK" again to change the setting.
    c. Select "Available or "Not Available" to indicate whether there is a common zone and then press "OK".
    d. Press "⮌" to return to the previous menu.
3. **"Zone Activation"**
    a. Scroll down to the "Zone Activation" menu and press "OK".
    b. For each zone to be activated, select the zone and press "<" to activate. (the zone number follows the same connection numbering on the zone interface box)
    c. Once the connected number of zones have been activated, press "OK" to confirm the settings and return to the previous menu or press "⮌" to discard the settings and return to the previous menu.
4. **"Zone Labelling":** Refer to the PC-ARFG2Z installation manual for details on zone labelling.

5. **Nominate Spill Zone(s):** If there is no common zone, then a spill zone must be set. A spill zone is a zone that has a zone motor and damper installed that is set to automatically open when either too few zones are open, or all zones are turned off. Up to three spill zones can be set. Spill Zone1-3 should be set to different zones. By default, the first zone is set to be the spill zone. This can be changed by following the steps below.
    a. Select "Spill Zone 1" and press "<" or ">" to select the zone to be set as the spill zone.
    b. Press "OK" to set or "⮌" to discard the changes and return to the previous menu screen.
    c. If the second and third spill zones need to be set, follow the two steps above.

Additional: Zone Controller GC-AZKP Setup (2/4)

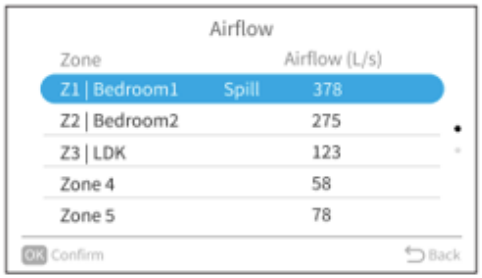
Zone Interface Setup Guide

6. **Sensor Assignment:** Sensor assignments to each zone controls the operation/capacity of the system as a whole and not the temperature control in each zone - which is controlled by the individual zone thermostats. Up to five sensors can be used: -
    i. Indoor return air sensor
    ii. Main controller sensor
    iii. Secondary Zone controller (if used)
    iv. Remote temperature sensor 1 (if used)
    v. Remote temperature sensor 2 (if used)
    a. Select "Sensor Assignment" and press "OK".
    b. Press "^" or "v" to select sensor.
    c. Press "<" or ">" to select and assign a zone to the sensor.
    d. Repeat the above to assign the other available sensors to zones.
    e. Press "OK" to save the settings and return to the previous screen.
7. **Zone Airflow:** This function is to set the airflow value (in l/s) for each activated zone and common zone (if available). The zone airflow value is the sum of the airflows out of each outlet in that zone.
    a. Select "Airflow" and press "OK".
    b. Press "^" or "v" to select a zone and press "OK" to continue to the next screen.
    c. Press "<" or ">" to select the hundreds, tens or unit value.
    d. Press "^" or "v" to set the value for each zone.
    e. Press ">" to scroll across to "OK" on the screen and press "OK" to save the setting.
    f. Repeat the above steps for all zones.

Additional: Zone Controller GC-AZKP Setup (3/4)

Zone Interface Setup Guide

8. **Minimum airflow ratio:** The minimum airflow ratio sets the ratio of the spill zone to the total airflow of all zones



In this example to the left, the spill zone airflow is 378l/s and the total airflow is
378+275+123+58+78 = 912l/s

The ratio of the spill zone (Z1) to the total is (378 ÷ 912) x 100 = 41.4%.

So, the minimum airflow ratio value to be set is 40%

   a. Select Minimum AirFlow Ratio and press "OK".
   b. Press" <" or ">" to scroll through the hundreds, tens or units value and "^" or "v" to set the value.
   c. Press ">" to scroll across to "OK" on the screen and press "OK" to save the setting and return to the previous screen.

9. **Damper timing**: It is extremely important to set the accurate damper timing from fully open to fully closed (or vice versa) as this determines the opening angle of the zone damper during operation. All damper motors must have the same timing. The value range of damper timing is 6 ~ 150 seconds. Refer to Damper motor manufacturer's specs.
   a. Select damper timing and press "OK".
   b. Press" <" or ">" to scroll through the hundreds, tens or units value and "^" or "v" to set the value.
   c. Press ">" to scroll across to "OK" on the screen and press "OK" to save the setting and return to the previous screen.

10. **ESP setting:** The external static pressure (ESP) can either be automatically detected or manually set. The steps below are to run the Auto ESP setting. To manually set the ESP, refer to the PC-ARFG2-Z installation manual.
   a. In the Zone Installation menu, scroll down to "Turn ON All Zones" and press "OK".
   b. Select "Yes" to confirm the selection and press "OK".
   c. Press "↩" to go back to the main "Service and Installation" screen.
   d. Select "Service Menu" and press "OK".
   e. Press "v" to scroll down to "ESP Setting" and press "OK".
   f. Select "ESP Auto Setting and press "OK".
   g. Select "Yes" to confirm and press "OK" to start the Auto ESP process. This can take up to 20 minutes.
   h. To check the ESP that has been set, scroll down to "Display ESP Setting".
   i. Press "↩" to return to the previous screen.

Additional: Zone Controller GC-AZKP Setup (4/4)

Zone Interface Setup Guide

11. **Temperature control settings**: By default, function setting C8 is set to 00 and the temperature is sensed from indoor unit return air thermistor. Setting function setting C8 to 01 allows the individual zone temperatures to be sensed from each active zone thermostat.
    a. From the “Service & Installation” menu screen, scroll down to “Installation Menu” and press “OK”.
    b. Scroll down to “Function Selection” and press “OK”.
    c. Use the arrow buttons to scroll across to function C8 and press “OK”.
    d. Press “<” or “>” to change the setting from C8-00 to C8-01.
    e. Press “⮌” to confirm the setting.
    f. Select "Yes" to confirm and press "OK" to confirm the setting and return to Step b.
    g. Press “⮌” to return to the home screen.
12. **Pairing the individual zone thermostats (GC-ZKT) to the zone motors:** If the thermostat has not been previously paired to a zone, then the screen display shows "00" in the top right-hand corner of the display. If this is the case, the thermostat needs to be paired to a zone by following the steps below: -
    a. Press and hold “ ” and “ ” for 3 seconds on the zone thermostat to enter the pairing mode.
    b. Press "^" or "v" to select the zone number.
    c. Press “ ” to set the zone number.
    d. The set zone number should now be displayed in the top right-hand corner of the display.
    e. Repeat the above steps for all zone thermostats.

Q & A

Q : Please explain how to activate the Auto Mode ?

A : Unit in OFF mode, then activate optional function ‘b8’.

Q : What are the H-Link terminal?

A : Terminal 1 & 2.

Q : What connection is used to make the Remote Start/Stop Function?
A : CN3 pin 1 & 2.

Q: What is the output voltage for the Fan interlock connection on CN7?

A: 12VDC.

Q: Where do you connect a PC-ARFG2Z wall controller at the Indoor unit?

A: Terminal A,B.

Notes

Notes

Notes

HITACHI

air365 Max

–

VRF

Training Agenda

SESSION	TOPICS OF CONTENT
PART I	PRODUCT OVERVIEW • Product Line Up For Outdoor Units – air365 Standard & High Efficiency Models • Product Line Up for Indoor Units – RPI, RPIM, RCI, RCIM,RCD, RPK, RPC • Product Line Up for Controllers – PC-ARFG2Z , PC-ARC, HC-IOTGW, PSC-A32MN, PSC-A64GT, HC-A64BNP1
PART II	Product Features . Outdoor Unit Features . Outdoor New Technology . Change Over Box – CH Box
PART III	INSTALLATION . Service Space, Piping Direction, Air Tight Test, Vacuum Drying, Layout of Outdoor Unit Components, Communication Wiring & DIP Switches ** Additional Refrigerant Charge
PART IV	CONTROLS . Central Station PSC-A64GT, PC-ARFG2Z Wired Controller Optional Function . Interface Connection
PART V	TROUBLESHOOTING & DIAGNOSIS . Read & Understand Error Code, Check Mode 1 Service Information •Common Installation Alarm, Component Check – IPM & Key Parts

Product Line Up

Region: ANZ

Power Supply: 3N~ 380 V - 415 V 50 Hz/4 Wires

- High Efficiency

HP	8HP	10HP	12HP	14HP	16HP	18HP	20HP
Model	RAS-080RNCBLW	RAS-100RNCBLW	RAS-120RNCBLW	RAS-140RNCBLW	RAS-160RNCBLW	RAS-180RNCBLW	RAS-200RNCBLW

- Standard

HP	8HP	10HP	12HP	14HP	16HP	18HP	20HP	22HP
Model	RAS-080RNCCLW	RAS-100RNCCLW	RAS-120RNCCLW	RAS-140RNCCLW	RAS-160RNCCLW	RAS-180RNCCLW	RAS-200RNCCLW	RAS-220RNCCLW

HP	24HP
Model	RAS-240RNCCLW

Product Line up: Nomenclature

RAS - 100 H N C C L W

W	Production Location I: JCH-IN W:JCH-WH
L	R: 3~220V 60Hz/3 wires L: 3N~ 380-415V 50Hz/4 wires 3N~ 380V 60Hz/4 wires
C	B: High Efficiency C: Standard
C	C: 3rd Generation
N	N: R410A
H	H: Heat Pump R: Heat Recovery J: Heat pump for High Ambient
100	System Capacity (e.g. 100=10HP, H02=102HP)
RAS	RAS: Outdoor Unit

Product Line Up: Combination Module

- High Efficiency

HP	22HP	24HP	26HP	28HP	30HP	32HP	34HP	36HP
Model	RAS-220RNCBLW	RAS-240RNCBLW	RAS-260RNCBLW	RAS-280RNCBLW	RAS-300RNCBLW	RAS-320RNCBLW	RAS-340RNCBLW	RAS-360RNCBLW
Combination	RAS-120RNCBLW	RAS-120RNCBLW	RAS-140RNCBLW	RAS-140RNCBLW	RAS-160RNCBLW	RAS-160RNCBLW	RAS-180RNCBLW	RAS-180RNCBLW
	RAS-100RNCBLW	RAS-120RNCBLW	RAS-120RNCBLW	RAS-140RNCBLW	RAS-140RNCBLW	RAS-160RNCBLW	RAS-160RNCBLW	RAS-180RNCBLW

HP	38HP	40HP	42HP	44HP	46HP	48HP
Model	RAS-380RNCBLW	RAS-400RNCBLW	RAS-420RNCBLW	RAS-440RNCBLW	RAS-460RNCBLW	RAS-480RNCBLW
Combination	RAS-200RNCBLW	RAS-200RNCBLW	RAS-140RNCBLW	RAS-160RNCBLW	RAS-160RNCBLW	RAS-160RNCBLW
	RAS-180RNCBLW	RAS-200RNCBLW	RAS-140RNCBLW	RAS-140RNCBLW	RAS-160RNCBLW	RAS-160RNCBLW
	-	-	RAS-140RNCBLW	RAS-140RNCBLW	RAS-140RNCBLW	RAS-160RNCBLW

- Standard

HP	26HP	28HP	30HP	32HP	34HP	36HP	38HP	40HP
Model	RAS-260RNCCLW	RAS-280RNCCLW	RAS-300RNCCLW	RAS-320RNCCLW	RAS-340RNCCLW	RAS-360RNCCLW	RAS-380RNCCLW	RAS-400RNCCLW
Combination	RAS-140RNCCLW	RAS-160RNCCLW	RAS-180RNCCLW	RAS-180RNCCLW	RAS-180RNCCLW	RAS-180RNCCLW	RAS-220RNCCLW	RAS-220RNCCLW
	RAS-120RNCCLW	RAS-120RNCCLW	RAS-120RNCCLW	RAS-140RNCCLW	RAS-160RNCCLW	RAS-180RNCCLW	RAS-160RNCCLW	RAS-180RNCCLW

HP	42HP	44HP	46HP	48HP	50HP	52HP	54HP	56HP
Model	RAS-420RNCCLW	RAS-440RNCCLW	RAS-460RNCCLW	RAS-480RNCCLW	RAS-500RNCCLW	RAS-520RNCCLW	RAS-540RNCCLW	RAS-560RNCCLW
Combination	RAS-240RNCCLW	RAS-220RNCCLW	RAS-240RNCCLW	RAS-240RNCCLW	RAS-180RNCCLW	RAS-180RNCCLW	RAS-180RNCCLW	RAS-220RNCCLW
	RAS-180RNCCLW	RAS-220RNCCLW	RAS-220RNCCLW	RAS-240RNCCLW	RAS-180RNCCLW	RAS-180RNCCLW	RAS-180RNCCLW	RAS-180RNCCLW
	-	-	-	-	RAS-140RNCCLW	RAS-160RNCCLW	RAS-180RNCCLW	RAS-160RNCCLW

HP	58HP	60HP	62HP	64HP
Model	RAS-580RNCCLW	RAS-600RNCCLW	RAS-620RNCCLW	RAS-640RNCCLW
Combination	RAS-220RNCCLW	RAS-240RNCCLW	RAS-220RNCCLW	RAS-240RNCCLW
	RAS-180RNCCLW	RAS-180RNCCLW	RAS-220RNCCLW	RAS-220RNCCLW
	RAS-180RNCCLW	RAS-180RNCCLW	RAS-180RNCCLW	RAS-180RNCCLW

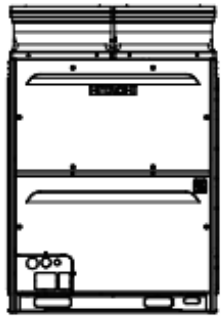
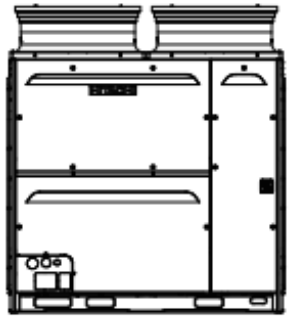
Product Line up: Overview

air365 Max

Product Line Up: Outdoor Standard Type

- Specification

  - ANZ (Standard)

Items \ HP		8	10	12	14	16	18	20	22	24
Appearance		Type II 			Type II 			Type II 		
Dimension (W x D x H) (mm)		975 × 765 × 1795			1235 × 765 × 1795			1625 × 765 × 1795		
Cooling Capacity (kW)		22.4	28.0	33.5	40.0	45.0	50.4	56.0	61.5	67.0
Heating Capacity (kW)		25.0	31.5	37.5	45.0	50.0	56.0	63.0	69.0	77.5
Weight (kg)		197	203	217	271	272	272	350	350	375
Sound (dB(A), SPL) (Full-anechoic)	Cool Rating	52	55	57	59	61	61	62	62	61
	Heat Rating	55	57	59	61	62	63	64	63	63
Sound (dB(A), PWL)	Cool Rating	76	81	83	83	84	84	86	87	84
	Heat Rating	79	81	83	85	86	86	88	88	88

Product Line up: Indoor Units

Various Indoor Units and Combinations

Indoor Unit Type List

Indoor Unit Type	Nominal Capacity																								
	0.4	0.6	0.7	0.8	0.9	1	1.1	1.3	1.5	1.6	1.8	2	2.3	2.5	3	3.3	3.6	4	4.5	5	6	8	10	12	16	20
1-Way Cassette				o		o			o			o		o	o											
2-Way Cassette				o		o			o			o		o	o			o		o	o					
4(R)-Way Cassette						o			o			o		o	o			o		o	o					
AC Compact Ducted				o		o		o	o		o	o	o	o												
AC Low Static Ducted				o		o		o	o		o	o	o	o	o	o		o		o	o	o	o			
AC M/H Static Ducted				o		o		o	o		o	o	o	o	o	o		o		o	o	o	o		{o}	{o}
AC Slim/Mini Ducted				o		o		o	o																	
All Fresh Air																				o		o	o	o	o	o
Convertible																									{o}	{o}
DC Low Static Ducted				o		o		o	o		o	o	o	o	o			o		o	o					
DC M/H Static Ducted				o		o			o			o		o	o			o		o	o	o	o			
DX-AHU kit												o						o			o		o			o
Floor Celling											o	o	o	o	o	o		o		o	o					
Floor Concealed						o			o			o		o												
Floor Exposed						o			o			o		o												
Mini 4-Way Cassette		o		o		o			o			o		o												
Wall Mounted		o		o		o		o	o		o	o	o	o	o			o								

O: Available, { }: India only

Product Line Up: Controls

HC-A64BNP1
BACnet

PC-ARFG2Z
(Wall Controller)

PC-ARC
(Eco Compact Wall Controller)

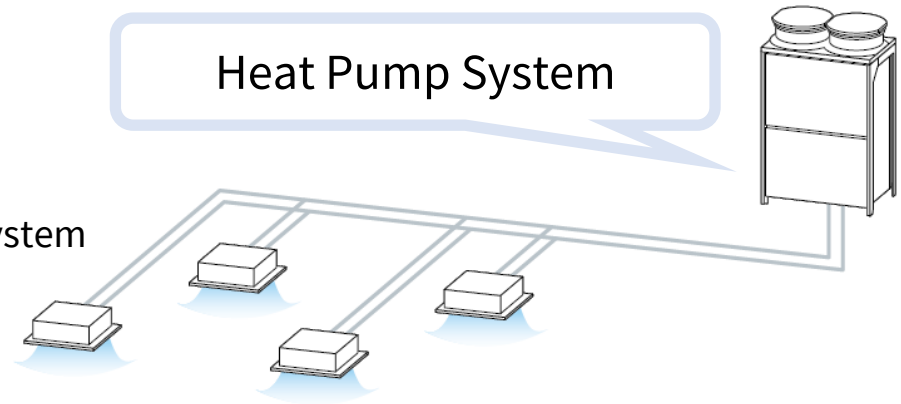
PSC-A32MN
(Mini Central station)

HC-IOTGW
(Air Cloud Pro)

PSC-A64GT
(Central station)

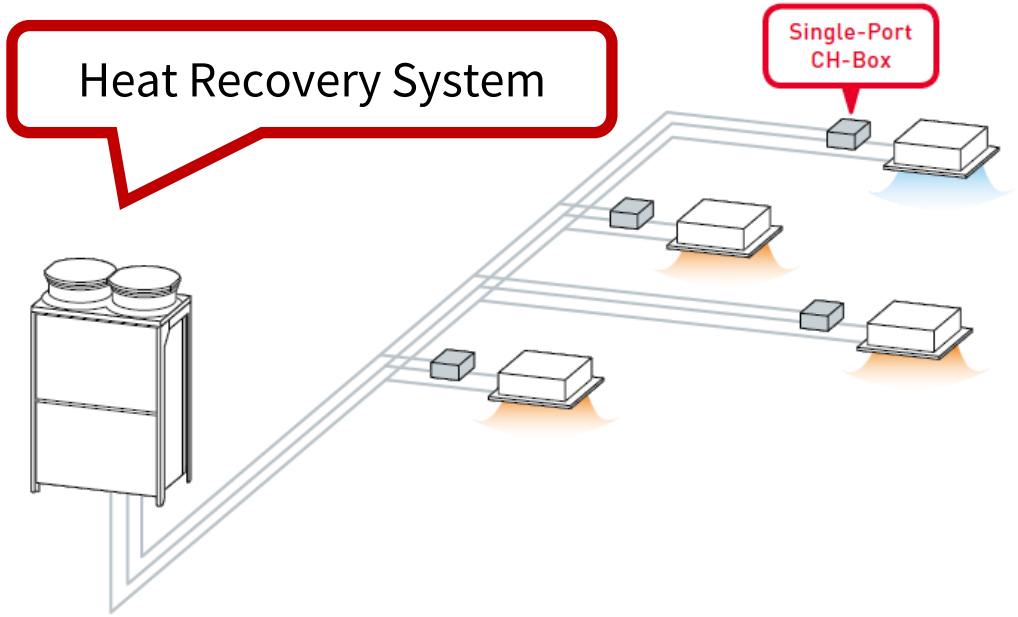
Product Features: Outdoor

- RAS-HNCCLW



Heat Pump (2-pipe) system =
Either Heating OR cooling in one system

- RAS-RNCCLW



Heat Recovery (3-pipe) system =
the system can provide **simultaneous heating and cooling** while transferring any excess heat or cooling from one zone to another.

Product Features: Outdoor

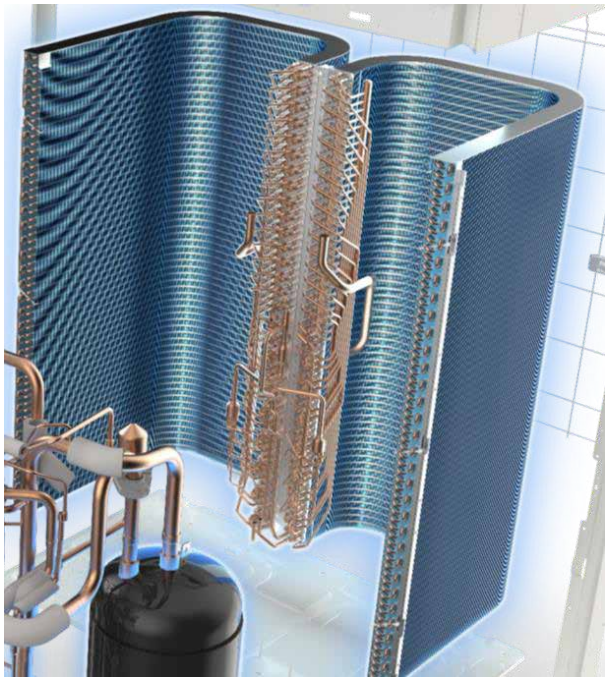
1. Gas- injection Scroll Compressor

With 10 to 140rps (by 0.1Hz step) driven by DC inverter motor, gas injection Scroll Compressor extends compressor operating range and increases heating/cooling capacity, leading to a wider outdoor unit operating temperature range & better efficiency.

Product Features: Outdoor

2. Sigma-shape heat exchanger with patented path structure

The sigma-shaped (Σ) heat exchanger has around 6000 pieces aluminum fins as thin as of 0.1mm and characterized with its complicated surface to expand heat-transfer area. Around 350 copper tubes with special inner structure, and a new 3-way path structure which expands the heat-transfer area and efficiency enormously..



Product Features: Outdoor

3. Integration of smartphone apps into HVAC maintenance and operation

airCloud Tap

Utilizing NFC technology, airCloud Tap is designed for installers and service engineers, enabling them to access advanced settings and operational data for both ODUs and IDUs by ‘tapping’ a smartphone near the unit (or against a compatible wired remote controller for IDUs).

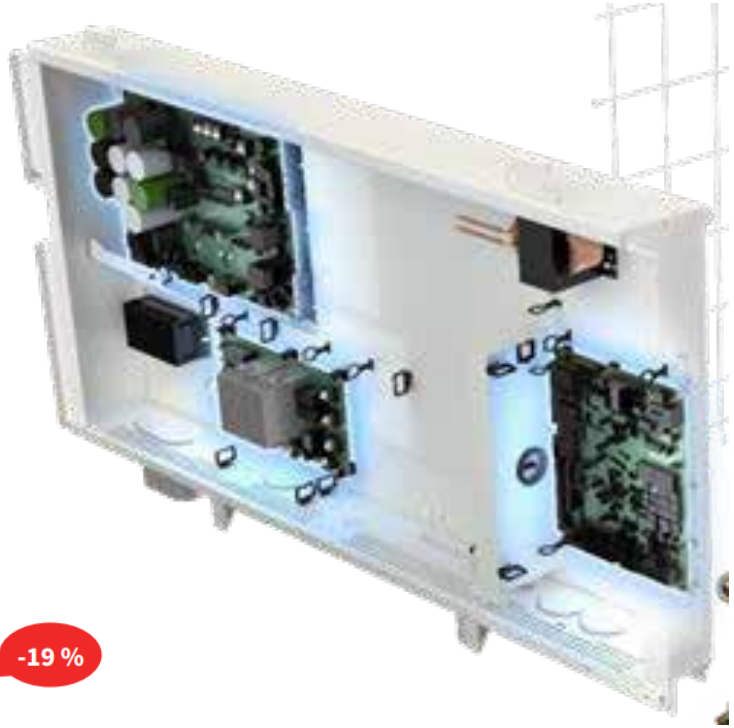
This technology enables 4X faster configuration of outdoor units and 6X faster data checking by removing the need to open the cabinets and connect to a PCB.

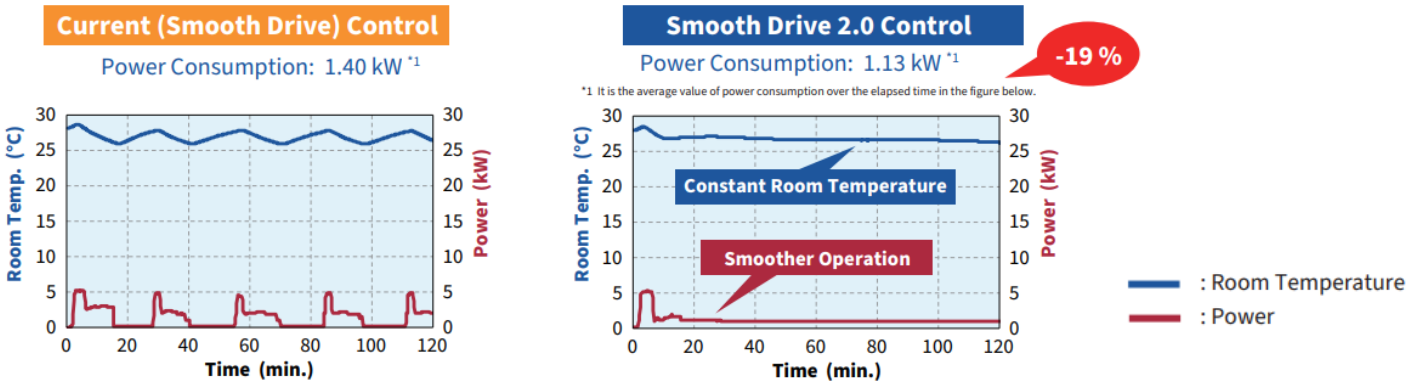
Product Features: Outdoor

4. SmoothDrive 2.0 direct capacity control

Hitachi's direct capacity control technology utilizes precise temperature monitoring and control of scroll compressor frequency to reduce compressor on/off cycles and improve temperature stability under part-load conditions.

Smooth Drive 2.0 is up to 39% more efficient under the part-load conditions that regulatory energy efficiency ratings do not account for.

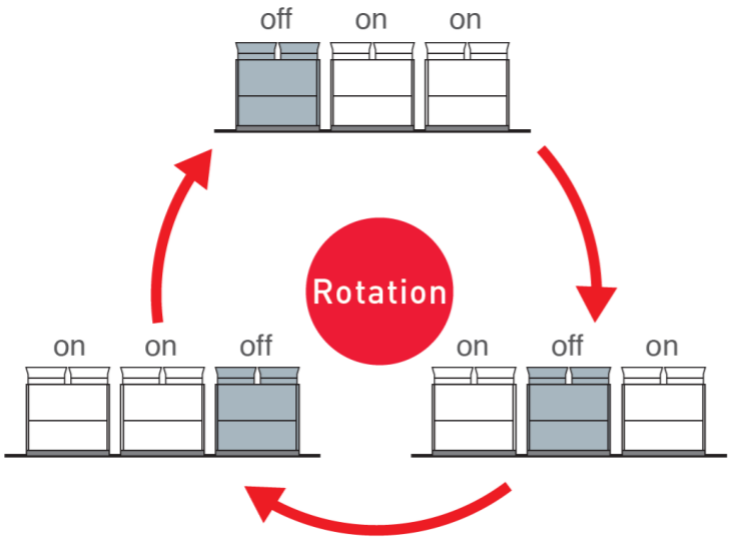




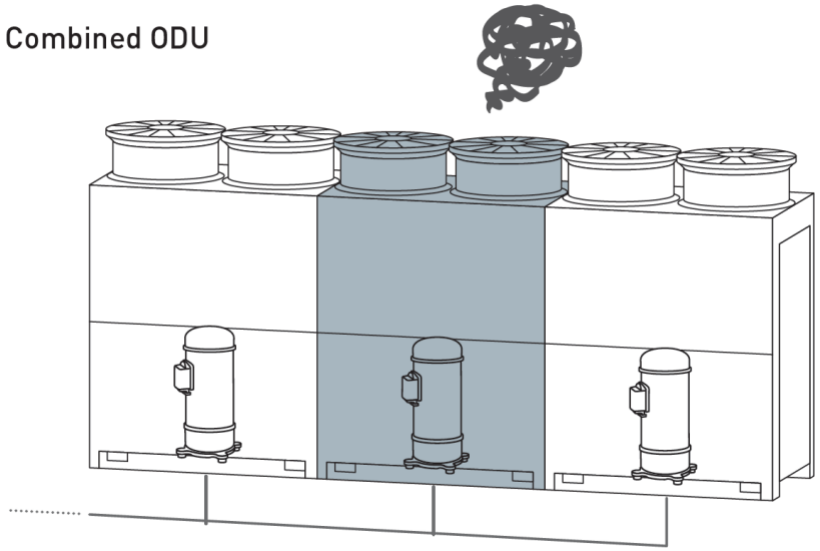
Product Features: Outdoor

- Balanced System Operation & Back-up Function

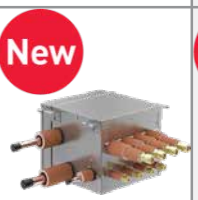
Standardize the running time of the individual outdoor units and distribute the load by rotating the order of operation of the compressors of the outdoor units.



Full introduction of backup operation function. If one outdoor unit should fail, the model can continue to operate using the remaining outdoor units, thereby preventing total system failure.



Change over Box - CH Box Line Up

Type		Single-Port		Multi-Port			
Model Name		CH-AP160SSX	CH-AP280SSX	CH-AP04MSSX	CH-AP08MSSX	CH-AP12MSSX	CH-AP16MSSX
Images							
Dimensions (h*w*d) (mm)		191 x 301 x 214	191 x 301 x 214	260 x 303 x 352	260 x 543 x 352	260 x 783 x 352	260 x 1023 x 352
N/W (kg)		6	6	14	25	36	47
Electrical Details	Power Supply	AC1ϕ 230V/50Hz, 220-240V/50Hz, 220V/60Hz		AC1ϕ 230V/50Hz, 220-240V/50Hz, 220V/60Hz			
	Power Input (W)	5	5	11.2	22.4	33.6	44.8
	Current (A)	0.1	0.1	0.2	0.4	0.6	0.8
Maximum Total Capacity Index (kW)		16	28	44.8	85	85	85
Number of Port (for IDU)		1	1	4	8	12	16
Maximum Connectable IDUs per Port		7	8	6	6	6	6
Maximum Piping length	between CH-Box and the farthest IDU	40m					
Maximum Height difference	between CH-Boxes	15m					
	Between CH-Box and IDU	15m					
	between IDUs connecting to same CH-Box	4m					

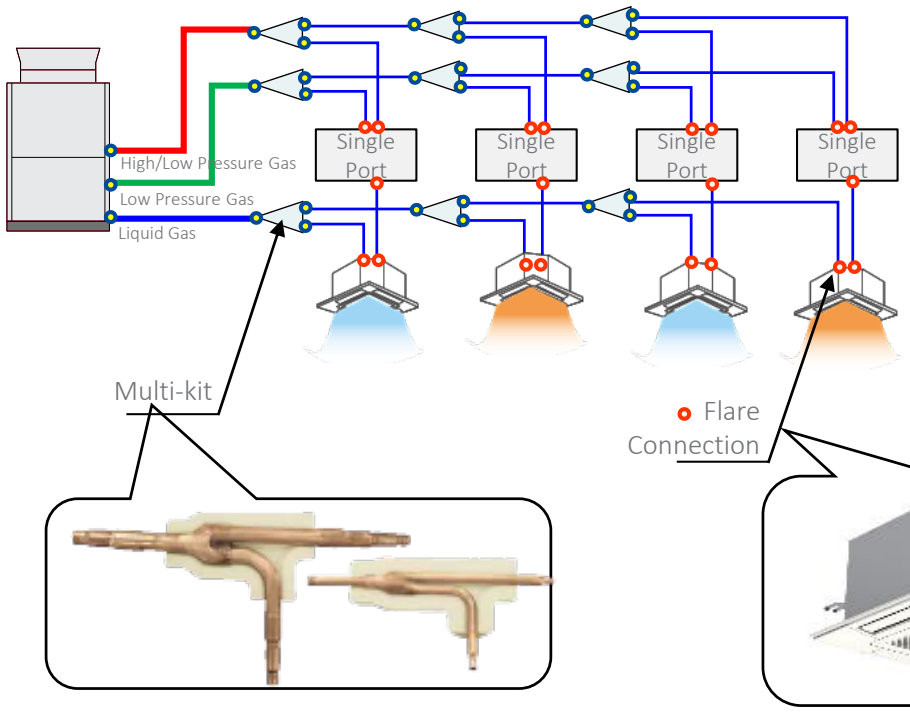
➢ Installation Cost Reduction !

➢ Installation Time reduction !

Change over Box

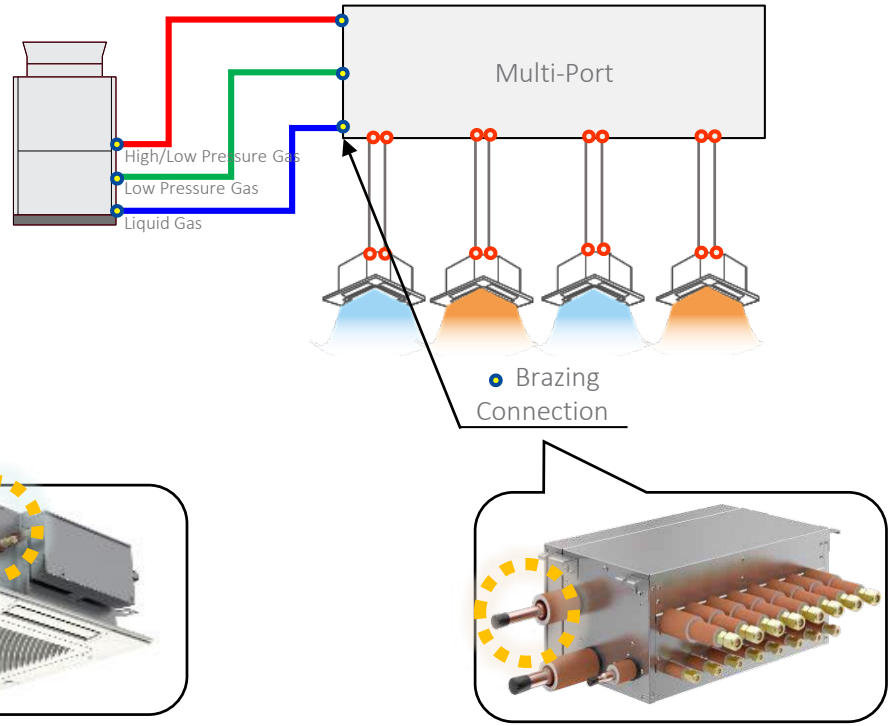
- System Configuration

Single-port



The liquid line does not connect to single port CH-Box

Multi-port



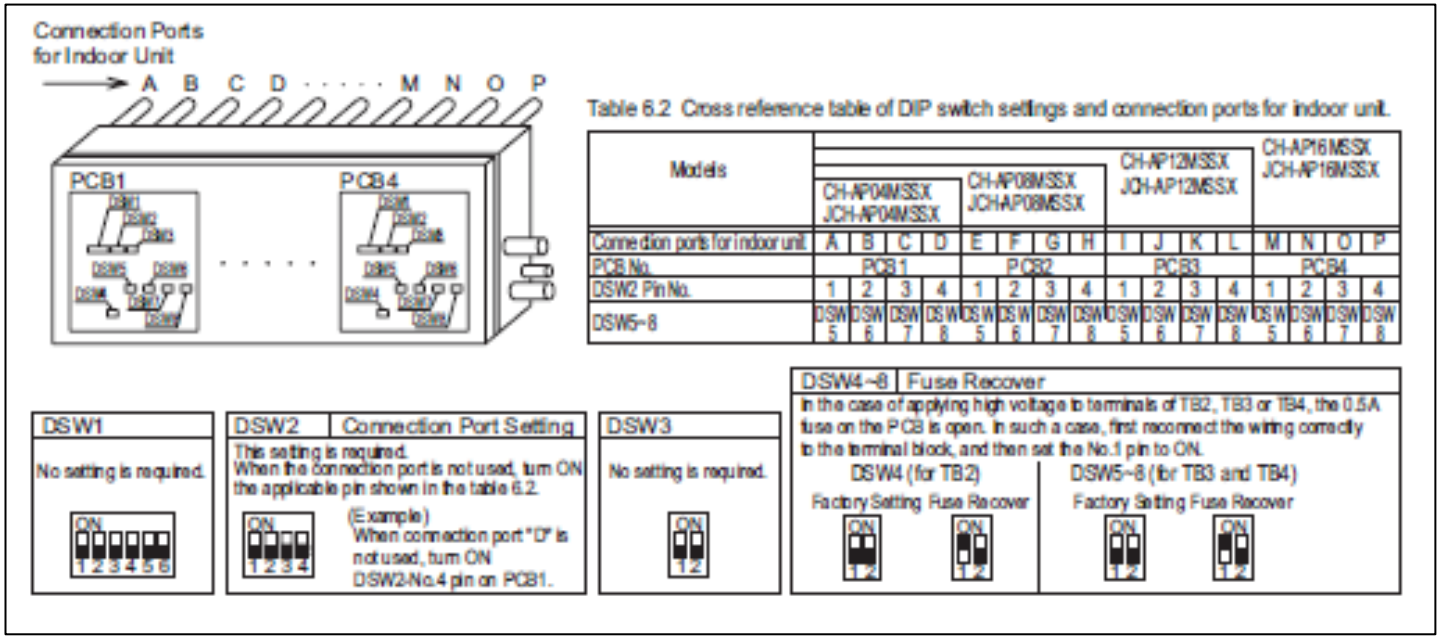
The Liquid Line connects to the CH-Box on multi Port CH-Box

Change over Box

- Multi Port

Dip Switches

- Multi-port boxes have multiple DIP Switches but **ONLY** DSW2 requires a setting per PCB.
  - This setting is only made when identifying any unused port.



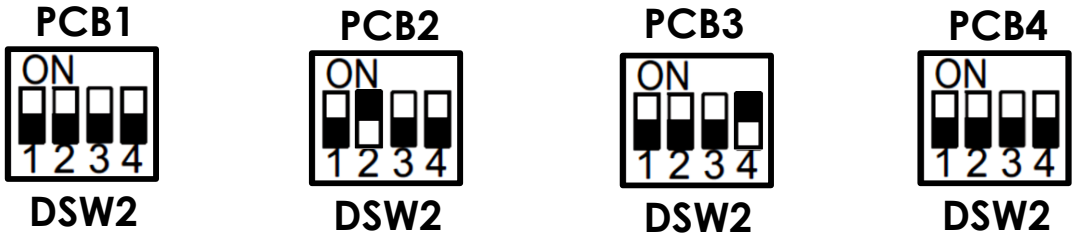
Change over Box

- Multi Port

Dip Switches (Example)

- Based on the below dip switch configuration, which ports are unused?

Models	CH-AP04MSSX JCH-AP04MSSX				CH-AP08MSSX JCH-AP08MSSX				CH-AP12MSSX JCH-AP12MSSX				CH-AP16MSSX JCH-AP16MSSX			
Connection ports for indoor unit	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
PCB No.	PCB1				PCB2				PCB3				PCB4			
DSW2 Pin No.	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4



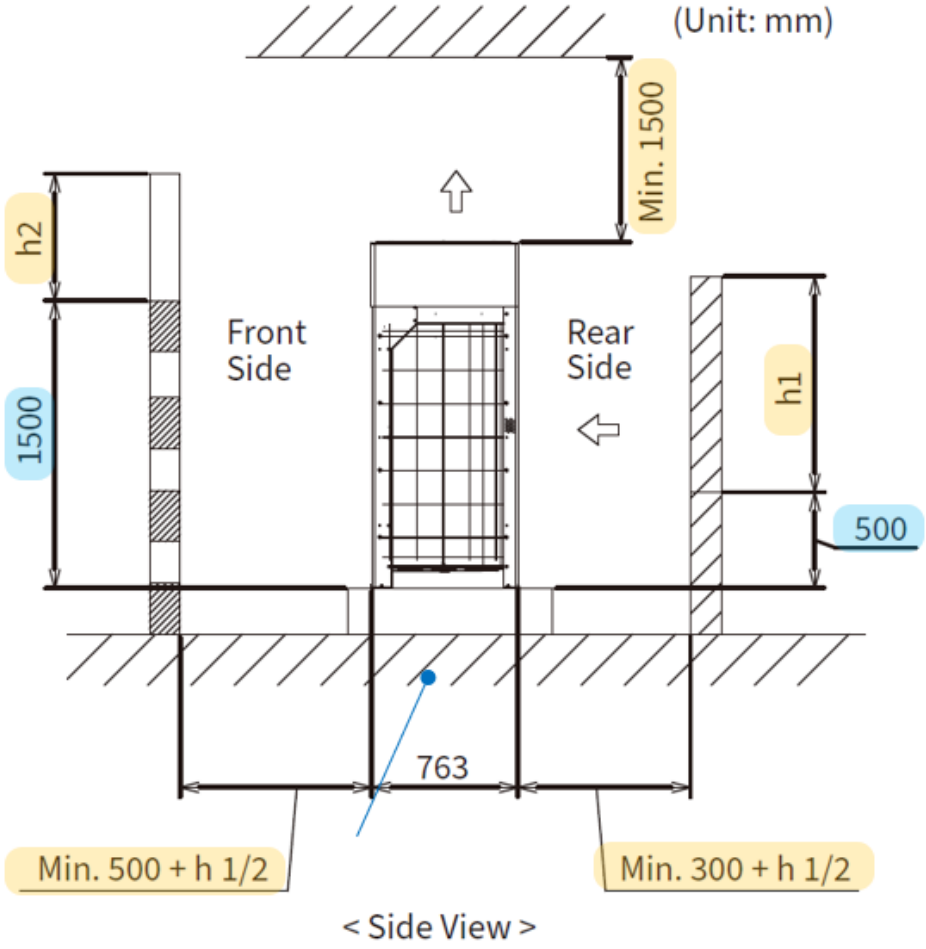
Installation

- Service Space (single unit)

1. If the wall on the front side is over 1500mm, the space of 500+h2/2 mm is required.

2. If the wall on the rear side is over 500mm high, the space of 300=h1/2 mm is required.

3. Please refer to the Installation Manual for the details of service space for the multi combinations.

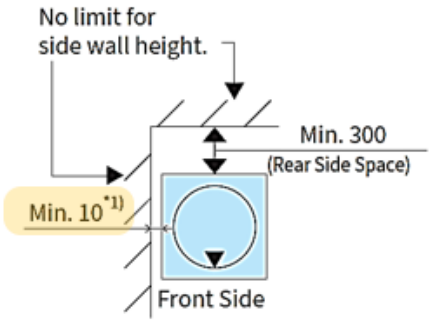


< Side View >

Installation

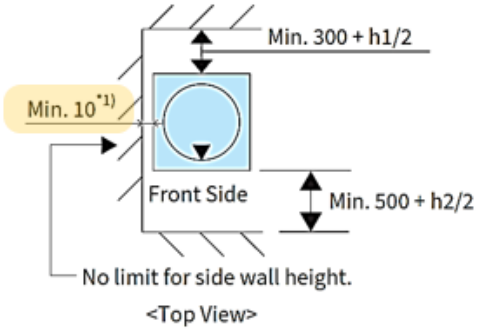
- Service Space (single unit)

(For walls on 2 sides)



<Top View>

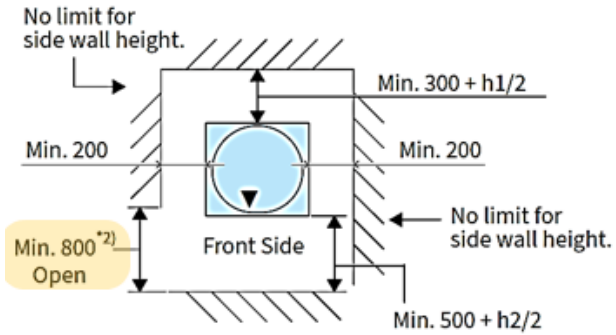
(For walls on 3 sides)



<Top View>

*1): 50mm is required for snow protection food or air outlet duct.
*2): Partly open a wall if the unit is surrounded by walls on four sides.

(For walls on 4 sides)



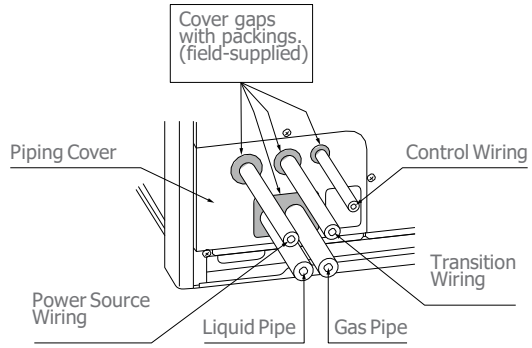
<Top View>

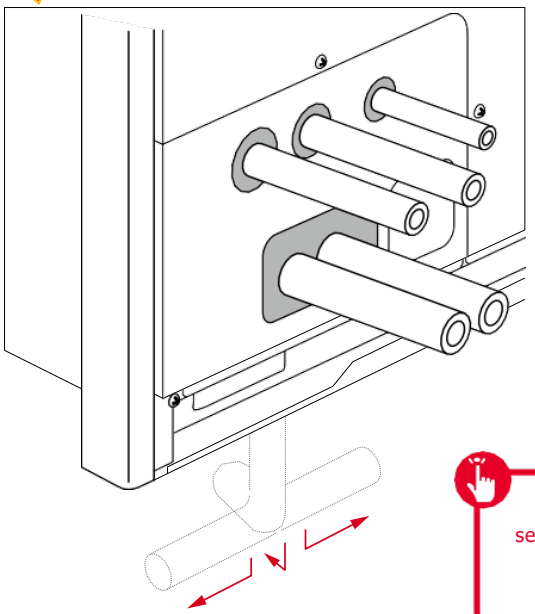
Installation

- Outdoor Piping Direction

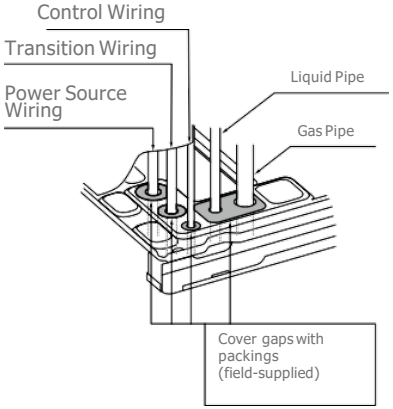
4 directions
→←↓↑

For Piping from Front cover





For Piping from Bottom base to Left, Right and Rear side



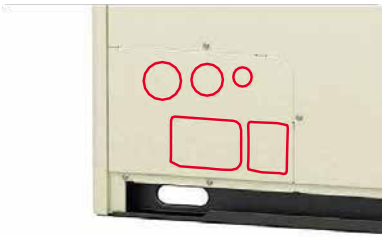


image: front

For more service space in front.

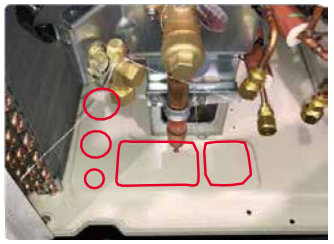
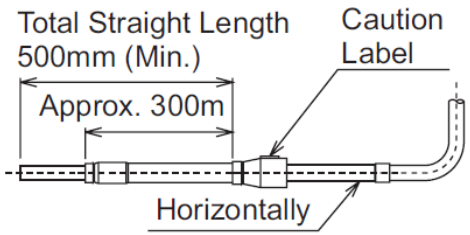


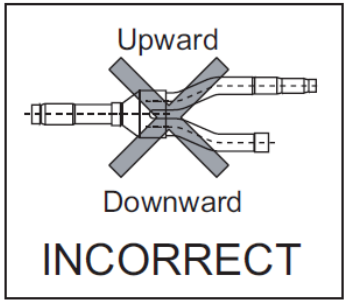
image: bottom

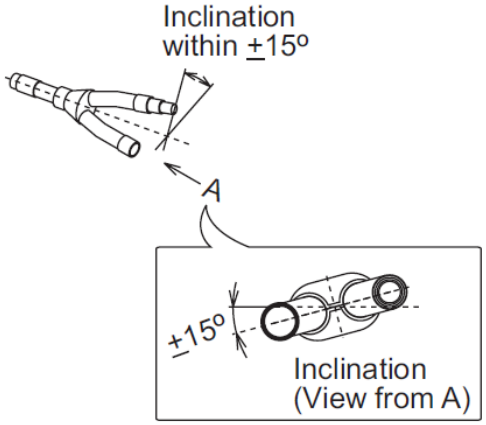
Installation

- Branch Kit

• Horizontal Installation
Locate the branch pipes to become the caution label uppermost on the same horizontal plane.
(Inclination within ±15°)
Make the straight length a minimum of 500mm after the vertical bend.
Incorrect installation may lead to a failure of outdoor unit.







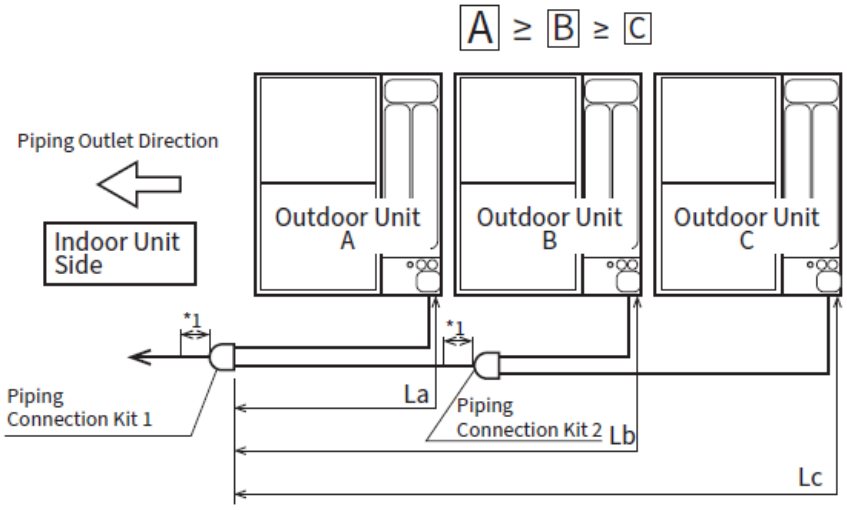
Installation

Combination Restriction

2 and 3 Units Combination

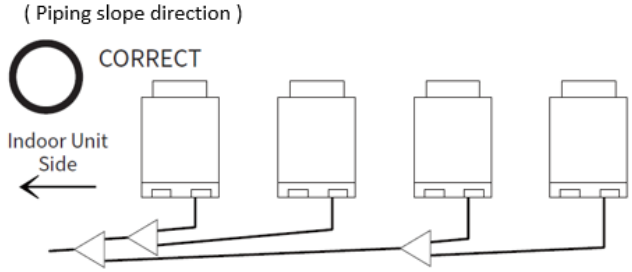
- ❑ Install the outdoor units in the order of capacity (A ≥ B ≥ C).
- ❑ The outdoor unit “A” should be connected to the piping connection kit 1.
- ❑ The piping length between the piping connection kit 1 and the outdoor unit should be La < Lb < Lc < 25m

The biggest capacity outdoor unit A (Main unit)
must be installed nearest to the indoor unit side.



Piping length for combination unit is following the restriction below.

- ✓ La < Lb < Lc < 25m
- ✓ Lc - La ≤ 10m
- ✓ Lb - La ≤ 10m



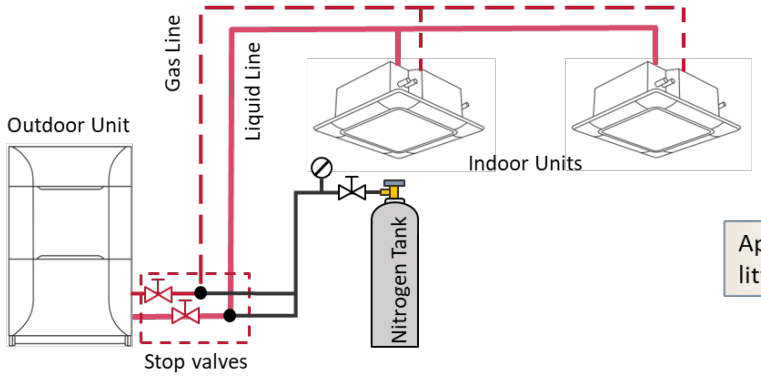
Place the outdoor unit pipe horizontally or with the pipe slanted downward towards the indoor unit side to avoid accumulation of refrigerant oil in the pipe

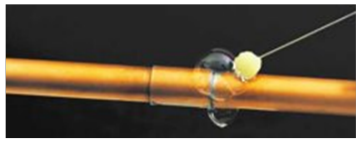
*1. Keep the straight-line distance of 500 mm or more for piping after piping connection kit.

Installation

Air-Tight Test

- Perform air-tight test to check for leakage in the piping system





Ensure the stop valves are closed before the test.

Connect a manifold gauge to the check joints on the stop valves of the liquid line and the gas lines using charging hoses with a nitrogen cylinder.

Apply nitrogen gas pressure little by little until it reaches to 4.15MPa.

Repair the leakage point after returning to atmospheric pressure.

There is a leakage

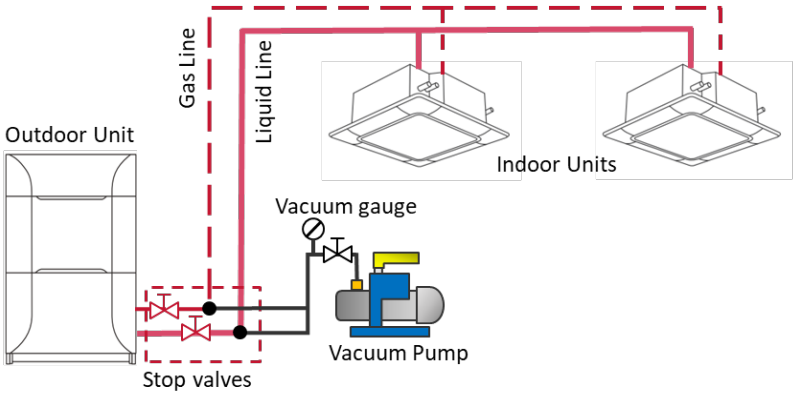
No leakage

Pass the air-tight test.

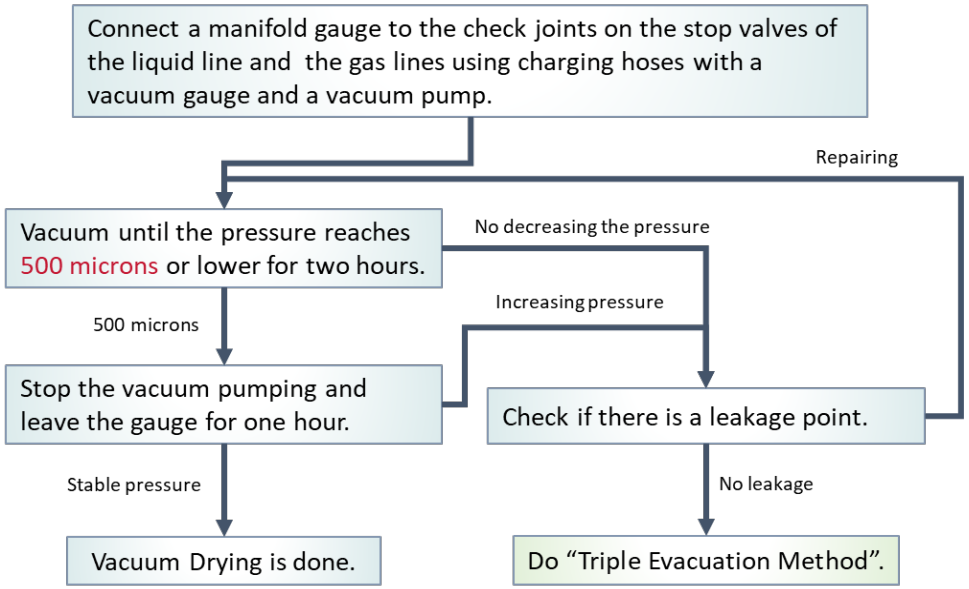
Installation

Vacuum Drying

- Vacuum Drying to remove air and moisture from the piping



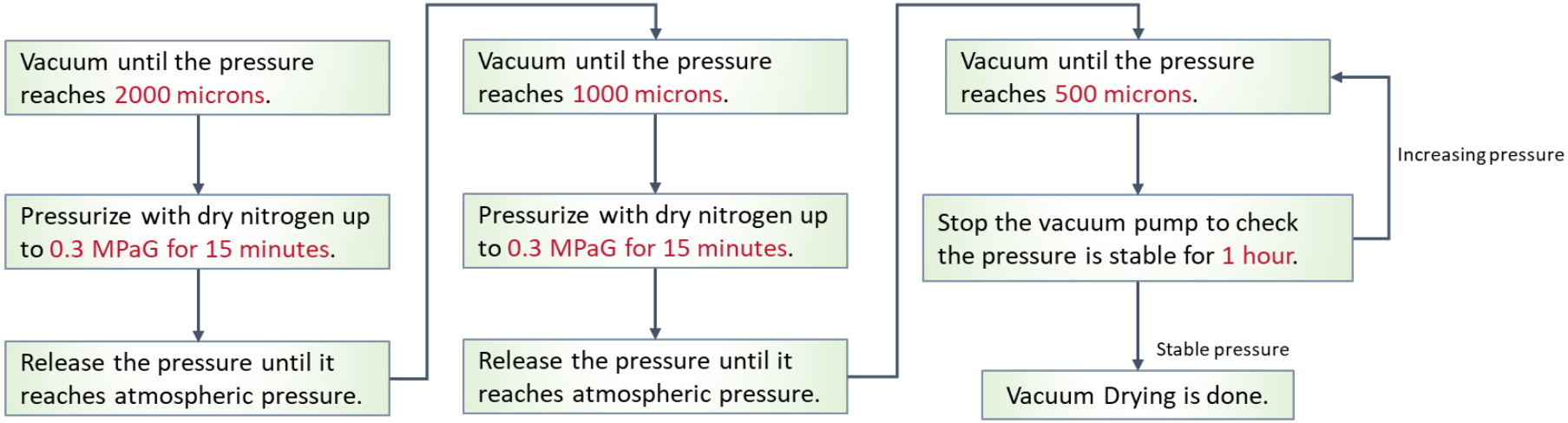
< Basic Method >

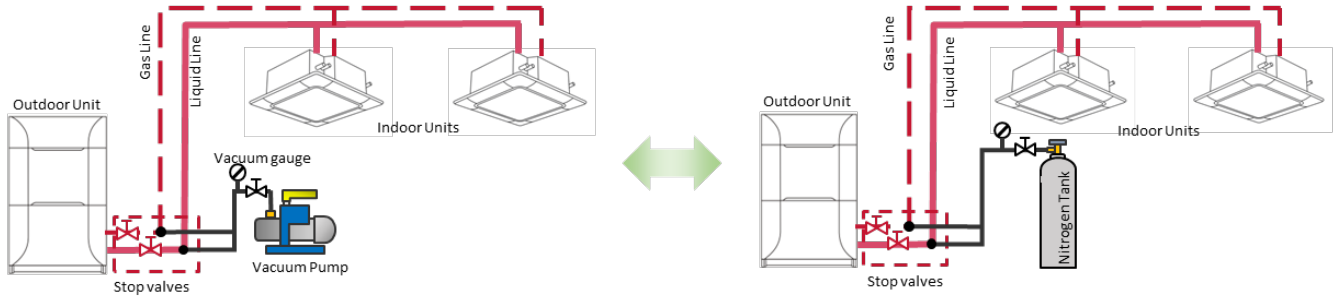


Installation

Vacuum Drying – Triple Evacuation Method

< Triple Evacuation Method >





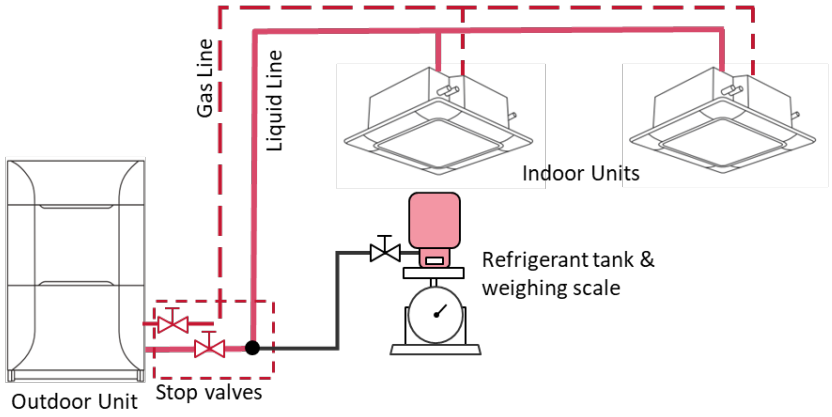
Installation

Additional Refrigerant Charge

- Calculate the refrigerant charge quantity based on the items below.
  - ✓ Liquid piping length and diameter
  - ✓ Indoor unit capacity
  - ✓ CH-box
  - ✓ Outdoor unit capacity

- Do not exceed the maximum refrigerant quantity to charge, even if the calculated refrigerant quantity is over the maximum value.

- Charge the calculated refrigerant quantity from the check joint of liquid stop valve after vacuuming work.



For ANZ

Outdoor Unit Capacity (HP)	Max. Additional Ref. Charge (kg)										
	8,10	12	14-18	20, 22	24	26	28	30-40	42	44-48	50-54
RAS-*RNCBLW	28.0	36.0	40.0	51.0	51.0	63.0	63.0	63.0	63.0	63.0	-
RAS-*RNCCLW	28.0	36.0	40.0	46.0	51.0	56.5	56.5	56.5	63.0	63.0	63.0

Installation

Additional Refrigerant Charge

- Additional refrigerant must be calculated and added to the system based on the Refrigerant Calculation Table.

(1) Calculating Method of Additional Refrigerant Charge (W kg)

No.	Symbol	Contents	Additional Ref. Charge
1	W1	Additional Refrigerant Charge Calculation for Liquid Piping (W1 kg)	kg
2	W2	Additional Refrigerant Charge Calculation for Indoor Unit (W2 kg)	kg
3	W3	Additional Refrigerant Charge Quantity for Each CH-Box (Multiple Branch Type) Connected (W3 kg)	kg
4	W4	The additional refrigerant charge is required depending on the number of connected outdoor units. (P1 kg)	
5	W	Calculation of Additional Ref. Charge W (W1 + W2 + W3 + W4) =	kg

Additional Refrigerant Charge Calculation for Liquid Piping (W1 kg)

Pipe Diameter (mm)	Total Piping Length (m)	Refrigerant Amount for 1m Pipe (kg/m)	Additional Ref. Charge (kg)
φ28.58		×0.67 =	
φ25.4		×0.52 =	
φ22.2		×0.36 =	
φ19.05		×0.26 =	
φ15.88		×0.17 =	
φ12.7		×0.11 =	
φ9.52		×0.056 =	
φ6.35		×0.024 =	
Total Additional Ref. Charge For Liquid Piping			

NOTE:
Round off the numbers two decimal places.

Additional Refrigerant Charge Calculation for Indoor Unit (W2 kg)
The additional refrigerant charge is required depending on the number of connected indoor units and ratio of indoor unit connection capacity (Indoor Unit Total Capacity / Outdoor Unit Capacity).
Additional Refrigerant Charge Quantity (kg)

Indoor Unit Capacity (HP)	Additional Charge Ref. (kg)/unit	
	I.U. Capacity Ratio is less than 95%	I.U. Capacity Ratio is 95% or more
0.6-1.3	0.0	0.3
1.5-2.0	0.0	0.5
2.3-3.3	0.0	0.9
4.0-6.0	0.0	1.1
8.0-10.0	0.0	1.4

NOTE:
1. The table above shows the quantity of additional refrigerant charge per indoor unit.
   e.g. 12 indoor units of 1.5 HP are connected and I.U. Capacity Ratio is 95% or more.
   0.5kg/unit × 12 unit = 6.0kg
2. The quantity of additional refrigerant based on the above calculation must not be exceed the following formula.
   Maximum additional refrigerant charge = ("Total Indoor Unit Capacity (HP)" × 0.112)kg or 13.2kg whichever is bigger.
   (Round off the numbers two decimal places.)

Additional Refrigerant Charge Quantity for Each CH-Box (Multiple Branch Type) Connected (W3 kg)
If CH-Boxes (multiple branch type) are connected, additional refrigerant charge is required.
Select adequate refrigerant charge from the table below.

CH-Box Model	CH-AP04MSSX	CH-AP08MSSX	CH-AP12MSSX	CH-AP16MSSX
Additional Ref. Charge (kg)	0.1	0.2	0.3	0.4

The additional refrigerant charge is required depending on the number of connected outdoor units. (P1 kg)
Select adequate refrigerant charge from the table below.

For ANZ

	Additional Charge Ref. (kg)/unit
Outdoor Unit Capacity (HP)	24
RAS-*RNCCLW	0.8

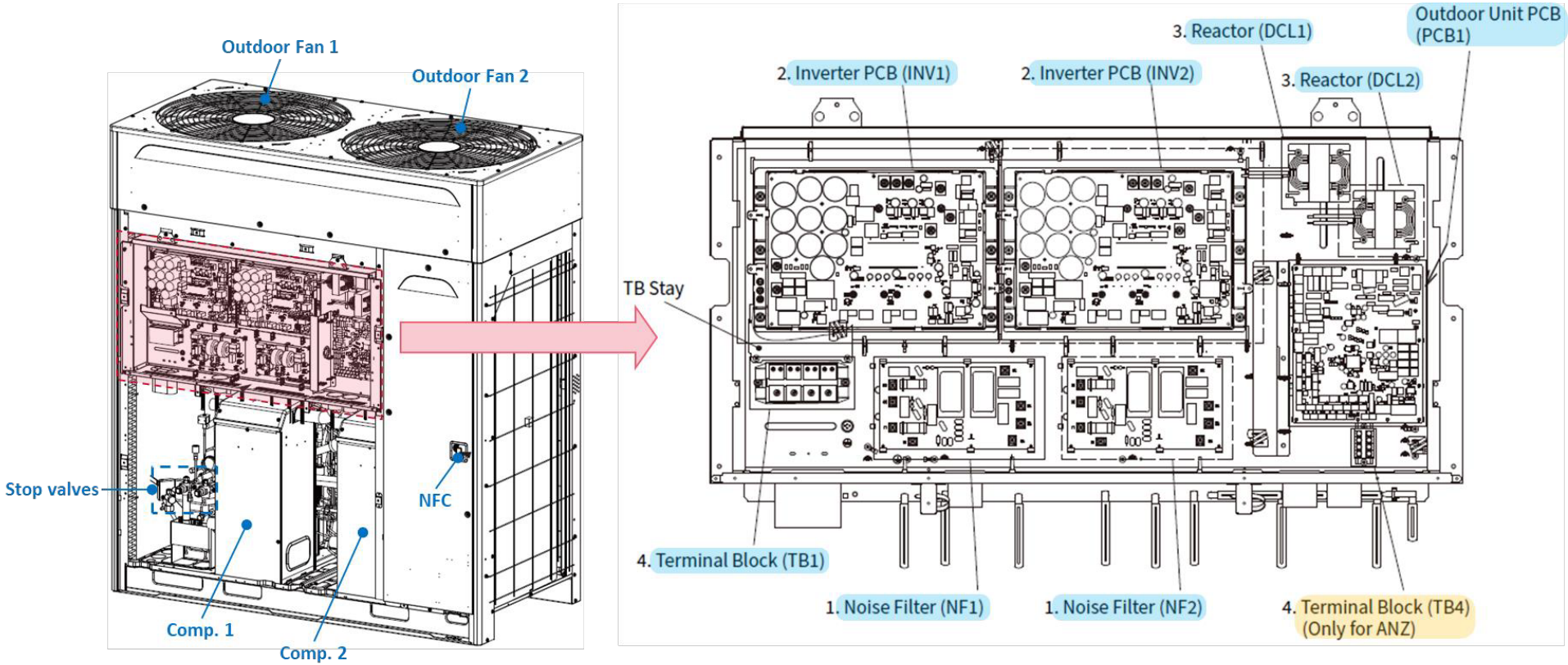
For LA

	Additional Charge Ref. (kg)/unit		
Outdoor Unit Capacity (HP)	24	26	28
RAS-*RNCC(L/R)W	0.8	1.8	1.8

NOTE:
The table above shows the quantity of additional refrigerant charge per outdoor unit.
e.g. RAS-480RNCCLW is 2 outdoor unit of 24HP connected.
0.8kg/unit × 2 unit = 1.6kg

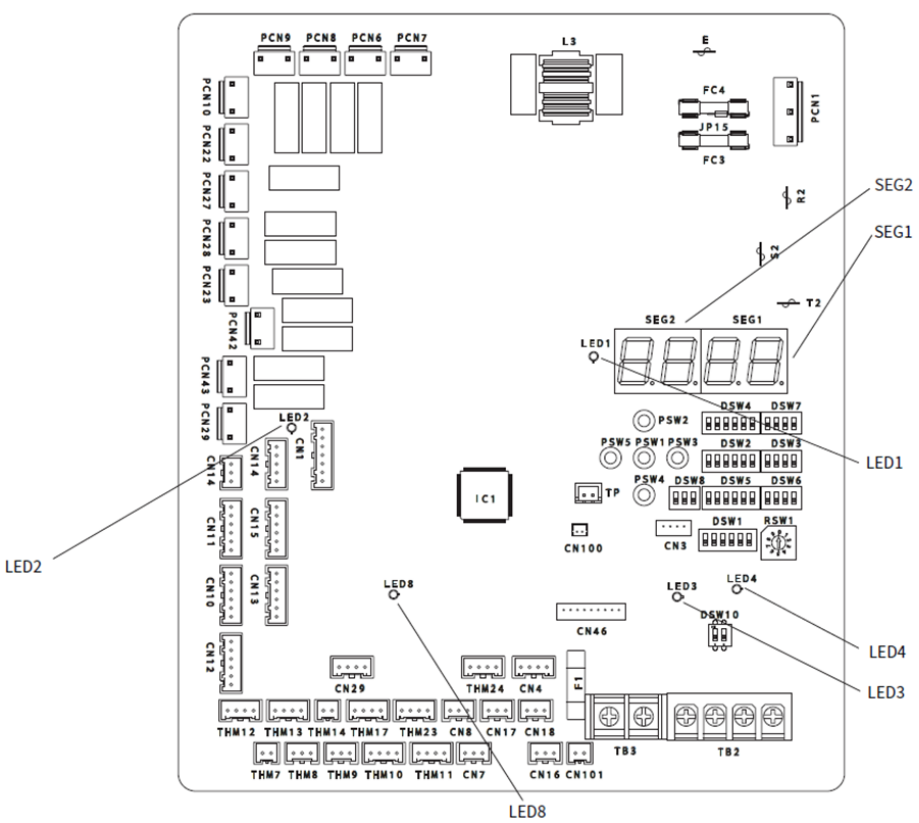
Installation

- Layout of Outdoor Unit : Electrical Box



Installation

- Outdoor Electrical : PCB1 (Main PCB)



Switches

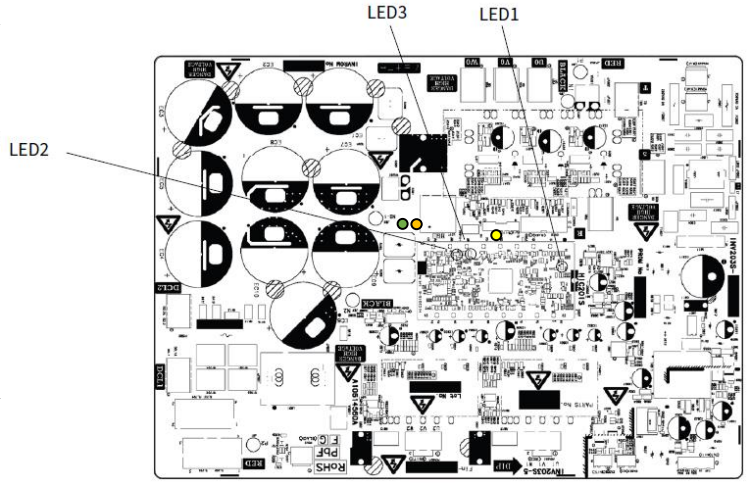
No.	Switches	Description	No.	Switches	Description
1	DSW1	Refrigerant Cycle Number	6	DSW5	Function Setting
2	RSW1		7	DSW6	Outdoor Unit No./ Function Setting
3	DSW2	Capacity Settings	8	DSW7	Unit model Setting
4	DSW3	Function Settings (No setting is required.)	9	DSW8	High Static Pressure
5	DSW4*	Test Run/ Service/ Emergency	10	DSW10	Terminal Resistance/ Fuse

LEDs and 7-Segment Display

Part Name		Function Information
LEDs	LED1 (Red)	Power Source Indicator for Out door Unit PCB (Low Voltage). Normal Condition: Activated / ON Abnormal Condition: Deactivated / OFF
	LED2 (Green)	This LED2 indicates the communication state between the outdoor unit PCB and inverter PCB. Normal Condition: Flashing Abnormal Condition: Activated / ON or Deactivated / OFF
	LED3 (Yellow)	This LED3 indicates the communication state between the indoor unit PCB and outdoor unit PCB. Normal Condition: Flashing Abnormal Condition: Activated / ON or Deactivated / OFF
	LED4 (Orange)	This LED4 indicates the communication state between the outdoor unit PCBs. Normal Condition: Flashing Abnormal Condition: Activated / ON or Deactivated / OFF
	LED8 (Green)	This LED8 indicates the communication state between the outdoor unit and NFC PCB. Normal Condition: Flashing Abnormal Condition: Activated / ON or Deactivated / OFF
SEGs	SEG1, SEG2	These indicate: "Alarm", "Protective Safety Device has Tripped" or "Checking Items".

Installation

Outdoor Electrical : INV 1 / 2 (Inverter PCB)



Switches

Switches	Description
DSW101	INV unit setting/ Service

*The DSW settings can only be changed during power OFF.

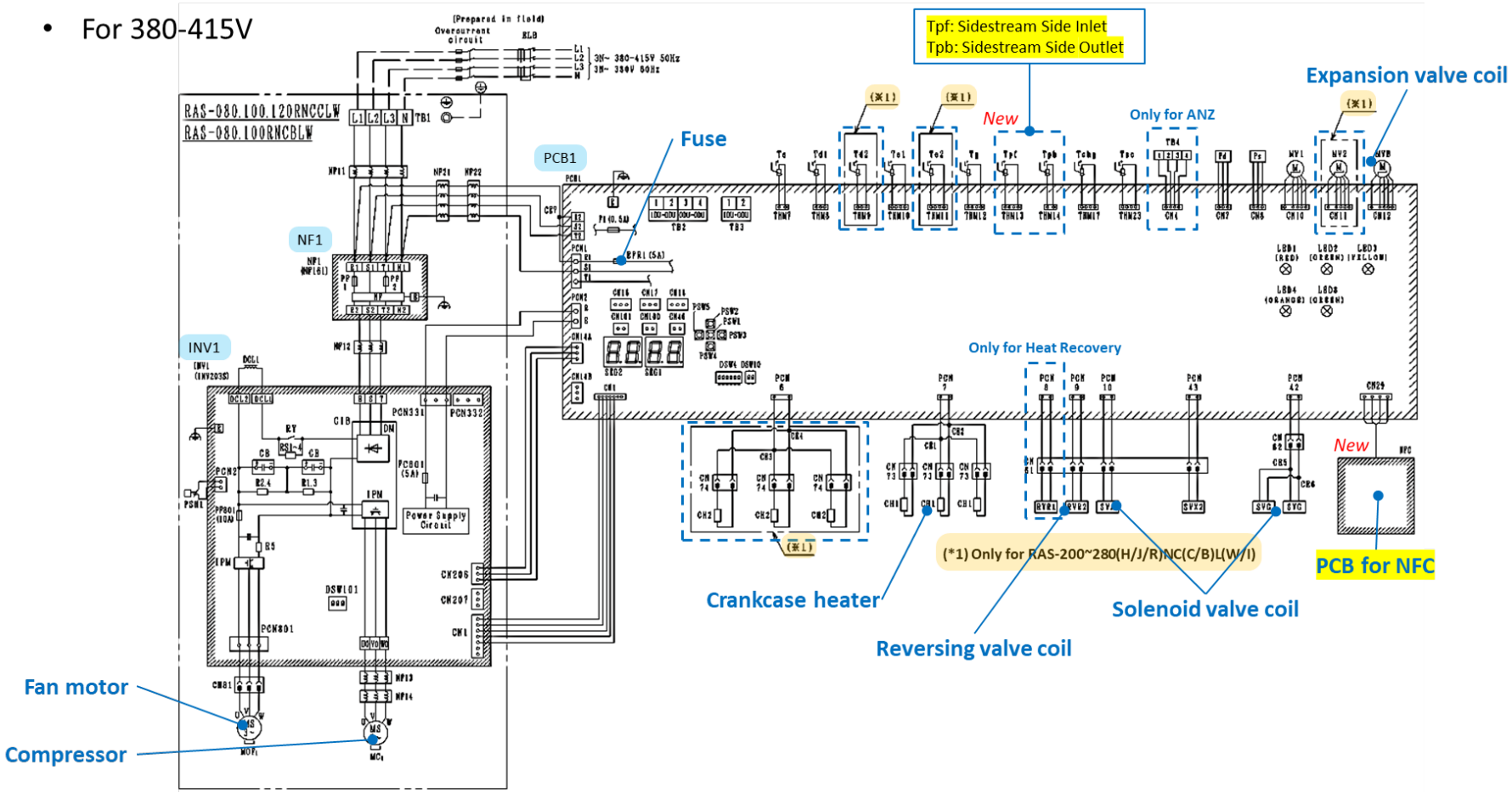
LEDs and 7-Segment Display

Part Name	Function Information
LED3 (Orange)	Power Source Indicator for Inverter PCB Normal Condition: Activated/ON Abnormal Condition: Deactivated/OFF
LED1 (Yellow)	This indicates the state of the microcomputer. Normal Condition: Activated/ON Abnormal Condition: Deactivated/OFF
LED2 (Green)	This indicates the state of communication between inverter PCB and fan controller Normal Condition: Activated/ON Abnormal Condition: Deactivated/OFF

Installation

Outdoor Electrical Diagram

- For 380-415V



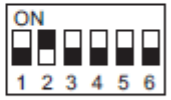
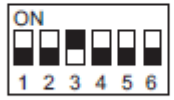
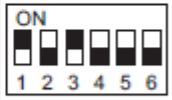
Installation

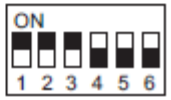
- DIP Switches & Rotary Switch Setting

DSW2 (PCB1) | Capacity Setting

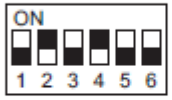
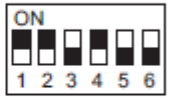
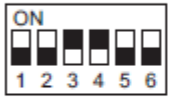
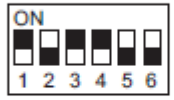
No setting is required.

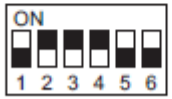
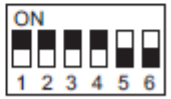
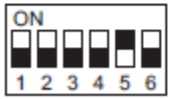
< Standard Type >

Capacity	8HP	10HP	12HP	14HP	16HP
DSW2 Setting					

Capacity	18HP	20HP	22HP	24HP
DSW2 Setting				

< High Efficiency Type >

Capacity	5HP	6HP	8HP	10HP
DSW2 Setting				

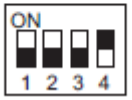
Capacity	12HP	14HP	16HP	18HP
DSW2 Setting				

DSW3 (PCB1) | Function Setting

No setting is required.

Setting Before Shipment except Middle East

Setting Before Shipment only Middle East



DSW 2 and DSW3 = No Setting Required but make sure settings are correct.

Installation

- Communication Wiring – H-Link

What is H-LINK?

A.
H-LINK is a "Hitachi" original communication system that can be used to control multiple outdoor and indoor units from one control point. Its use assists installers and service engineers by simplifying commissioning and service maintenance. For building owners and occupants, it provides outstanding versatility enabling the connection of various types of central control options, enabling better system management. Our proprietary high-performance communication system enables the connection of control wiring between indoor and outdoor units, and between a centralized control system and indoor/outdoor units across two or more refrigerant systems.

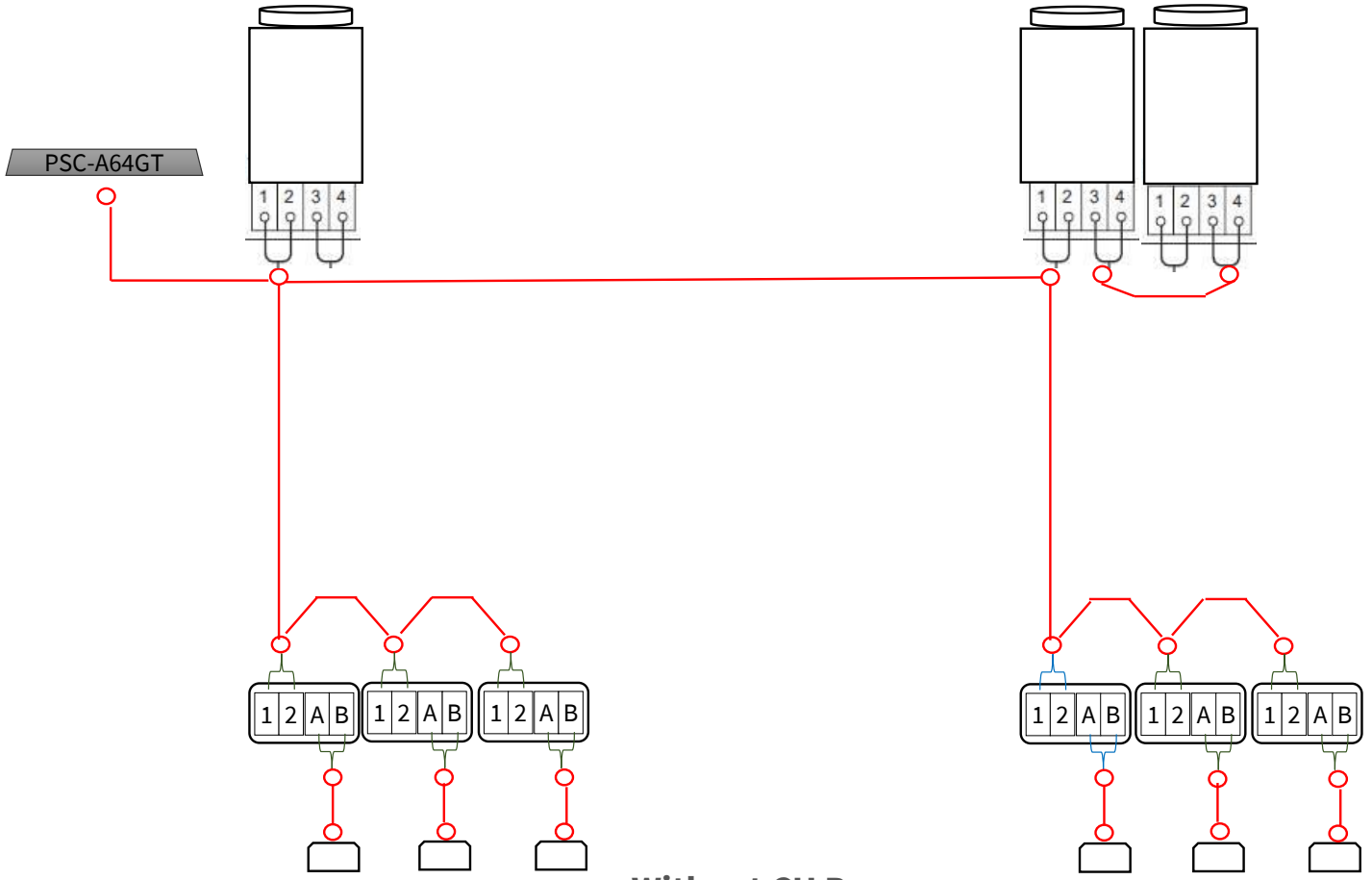
< Wiring Specification >

5 VDC Pulse – **CANNOT** be measured with Digital Meter
An Oscilloscope can be used to see actual communication sign wave / signal strength and any electromagnetic interference.

Contents	Specifications
Voltage	5VDC (Non-pole)
Terminal resistance	75Ω (Setting by DSW10-1)
Wiring length	Max. 1,000m
Cable	2-core, 0.75mm^2 to 1.25mm^2
Cable model	JKPEV-S, JKEV-S, CVV

Installation

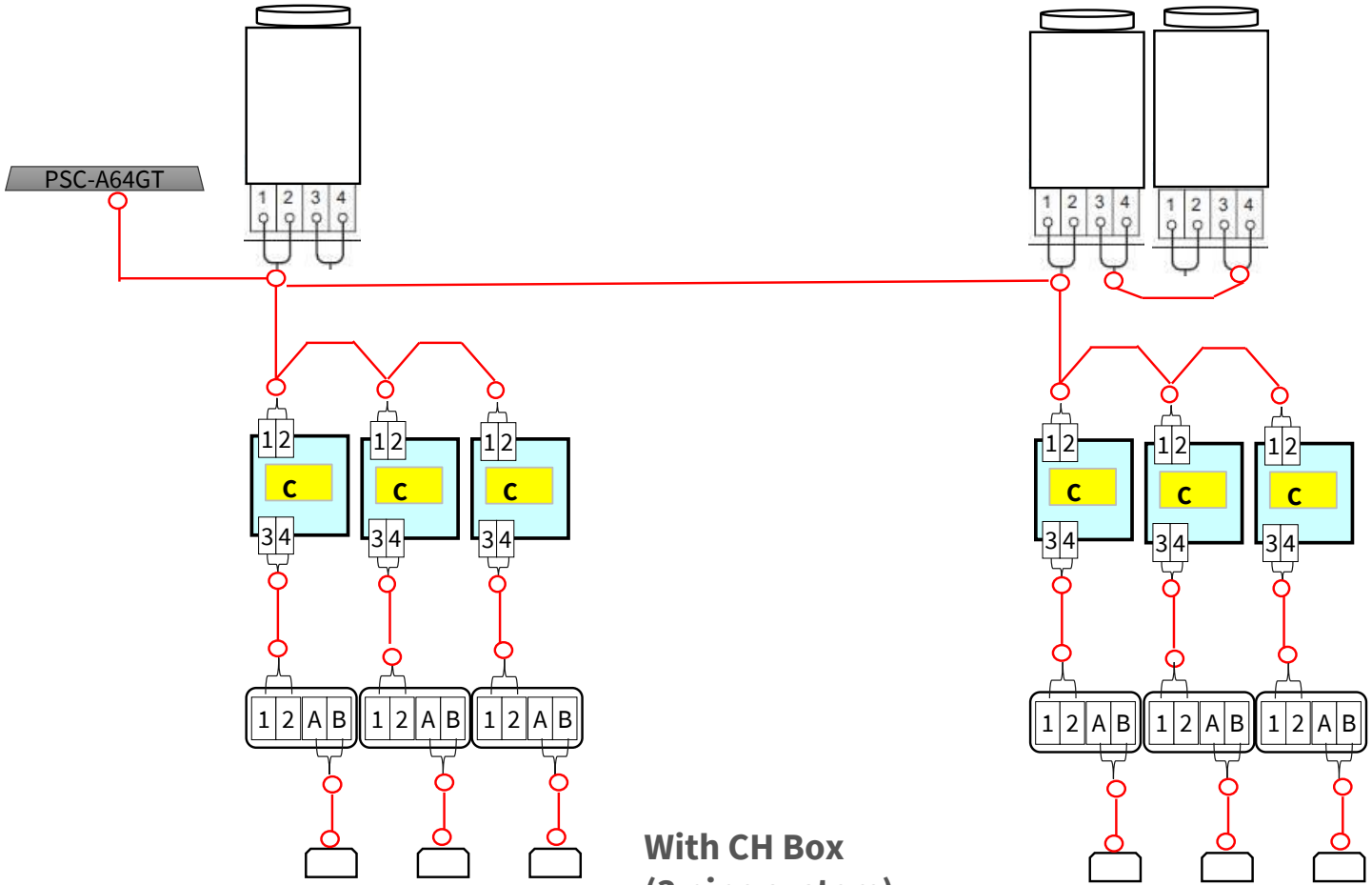
- Communication Wiring – H-Link



Without CH Box
(2 pipe system)

Installation

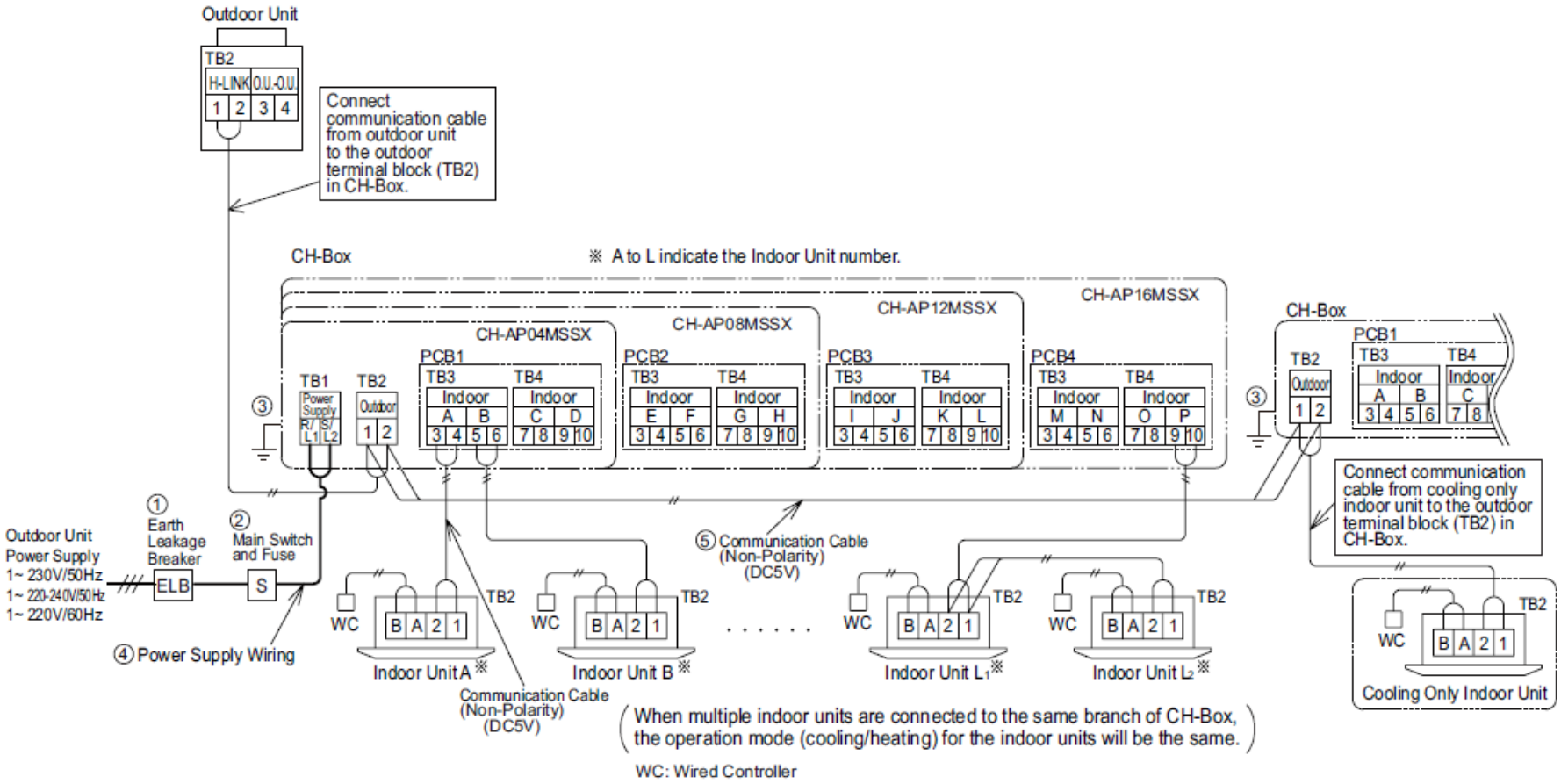
- Communication Wiring – H-Link



With CH Box
(3 pipe system)

Installation

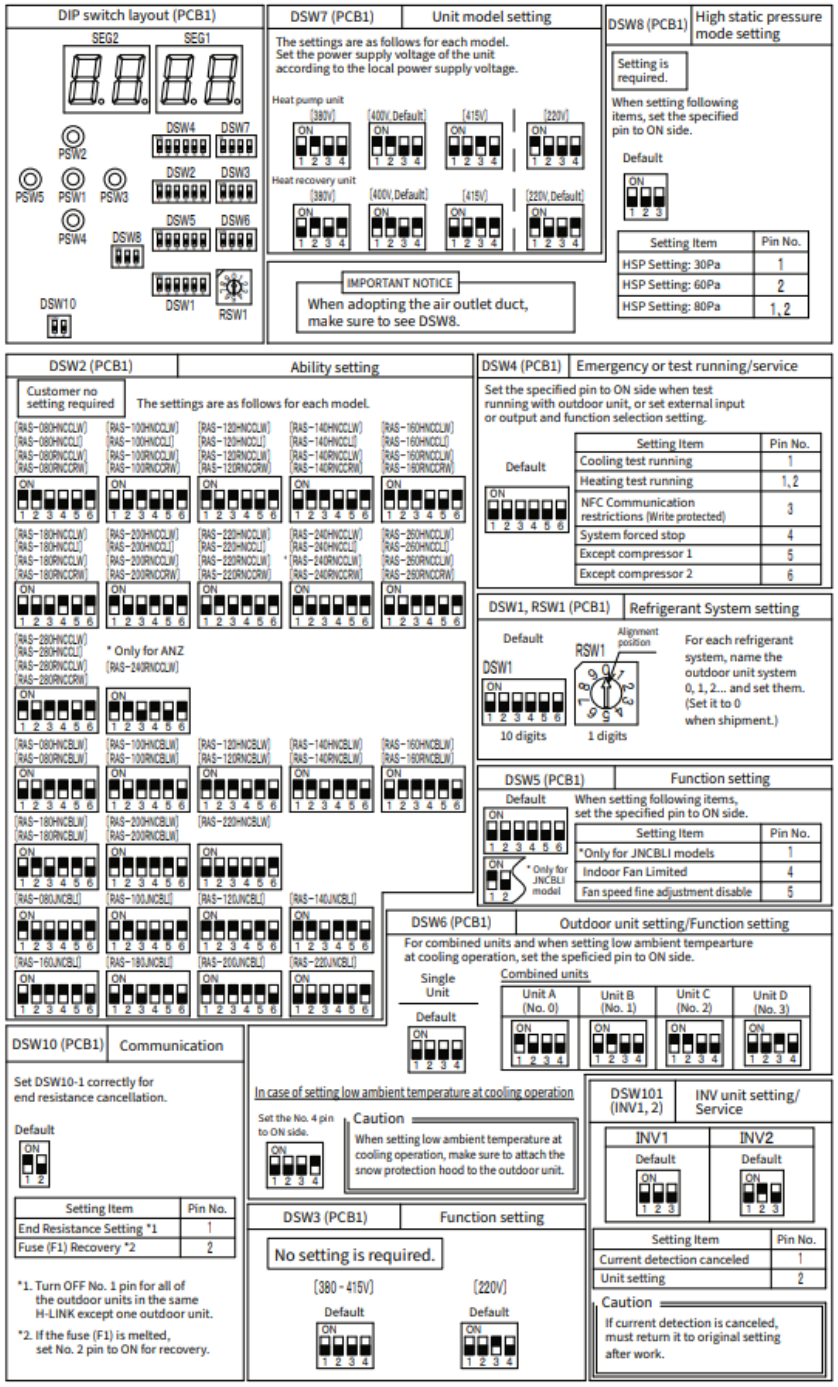
- Communication Wiring – H-Link



Multiple Branch CH Boxes

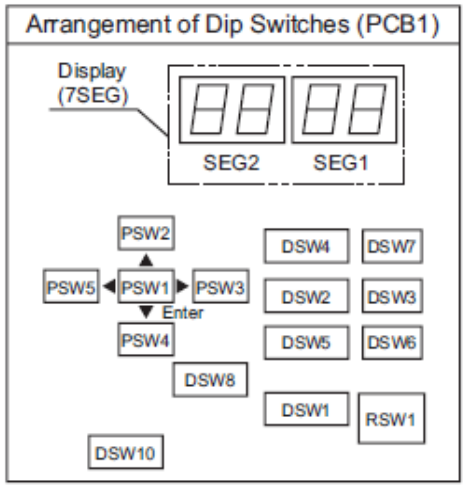
Installation

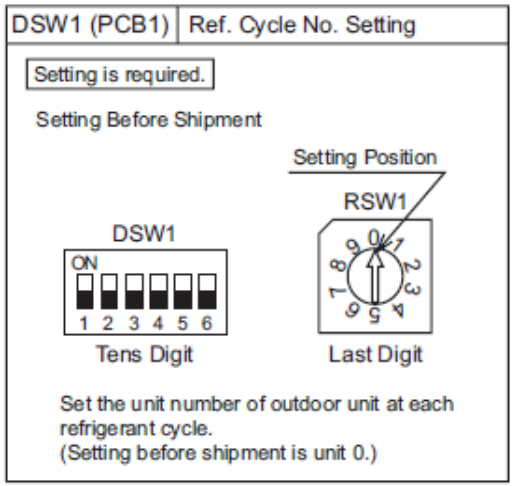
- DIP Switches & Rotary Switch Setting



Installation

- DIP Switches & Rotary Switch Setting





RSW 1 and DSW1 are for setting the Refrigerant Cycle Address.

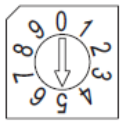
- RSW1 is for setting Refrigerant Cycle number 0~9.
- DSW1 (Tens Digit)is used when the Refrigerant Cycle Number is more than 9.

Important:
Setting of the outdoor Ref. Cycle number must match with the setting at the indoor side.

	Setting Switch	
	10 digit	1 digit
Outdoor Unit	DSW1	RSW1
Indoor Unit (H-LINK II)	DSW5	RSW2

Ex.: In Case of Setting Refrigerant Cycle No. 25

Turn ON No. 2 pin.



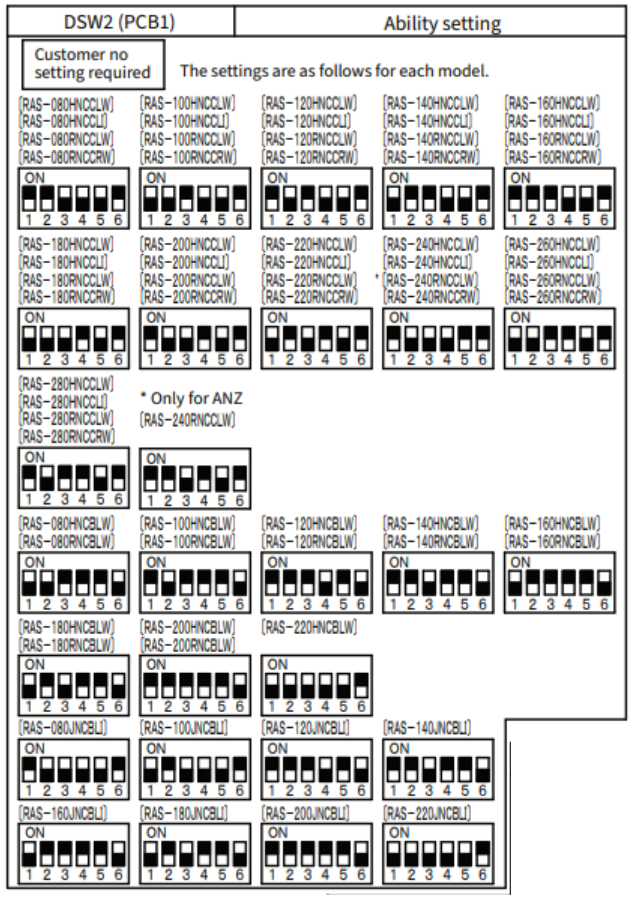
Set Dial No.5.

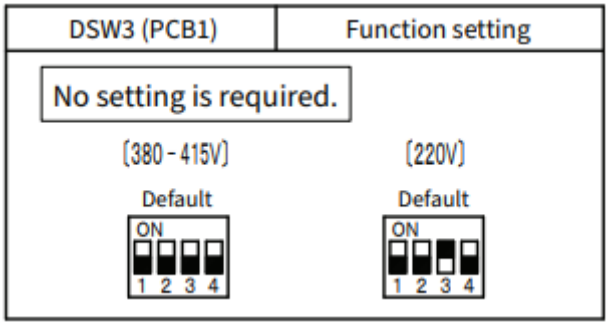
DSW and RSW setting before shipment is 0.
Maximum in setting refrigerant cycle No. is 63.

Installation

Installation

- DIP Switches & Rotary Switch Setting





DSW 2 and DSW3 = No Setting Required but make sure settings are correct.

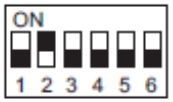
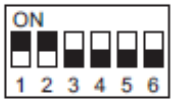
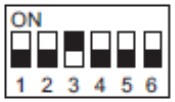
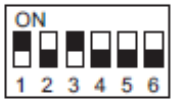
Installation

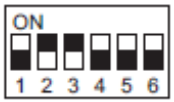
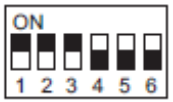
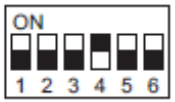
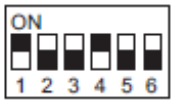
- DIP Switches & Rotary Switch Setting

DSW2 (PCB1) | Capacity Setting

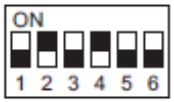
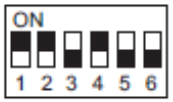
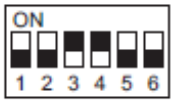
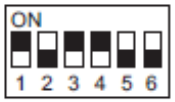
No setting is required.

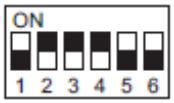
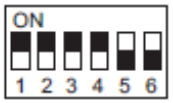
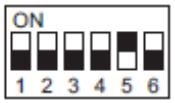
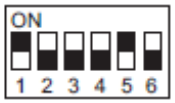
< Standard Type >

Capacity	8HP	10HP	12HP	14HP	16HP
DSW2 Setting					

Capacity	18HP	20HP	22HP	24HP
DSW2 Setting				

< High Efficiency Type >

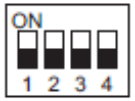
Capacity	5HP	6HP	8HP	10HP
DSW2 Setting				

Capacity	12HP	14HP	16HP	18HP
DSW2 Setting				

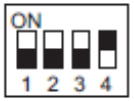
DSW3 (PCB1) | Function Setting

No setting is required.

Setting Before Shipment except Middle East



Setting Before Shipment only Middle East



DSW 2 and DSW3 = No Setting Required but make sure settings are correct.

Installation

Installation

- DIP Switches & Rotary Switch Setting

DSW4 (PCB1)	Emergency or test running/service

Set the specified pin to ON side when test running with outdoor unit, or set external input or output and function selection setting.

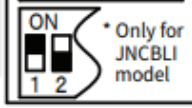
Default

Setting Item	Pin No.
Cooling test running	1
Heating test running	1, 2
NFC Communication restrictions (Write protected)	3
System forced stop	4
Except compressor 1	5
Except compressor 2	6

DSW4 pin 1 = Test Cooling Operation
DSW4 pin 1,2 = Test Heating Operation
DSW4 pin 3 = NFC Communication restriction (write protect)
DSW4 pin 4 = System forced stop.
DSW4 pin 5 = To switch OFF compressor no.1
DSW4 pin 6 = To switch OFF compressor no. 2

DSW5 (PCB1)	Function setting

Default



* Only for JNCBLI model

When setting following items, set the specified pin to ON side.

Setting Item	Pin No.
*Only for JNCBLI models	1
Indoor Fan Limited	4
Fan speed fine adjustment disable	5

DSW5 – No setting Required

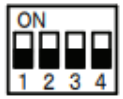
Installation

- DIP Switches & Rotary Switch Setting

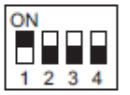
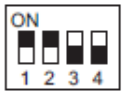
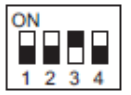
DSW6 (PCB1) | Outdoor Unit No. Setting/Function Setting

Single Unit

Default



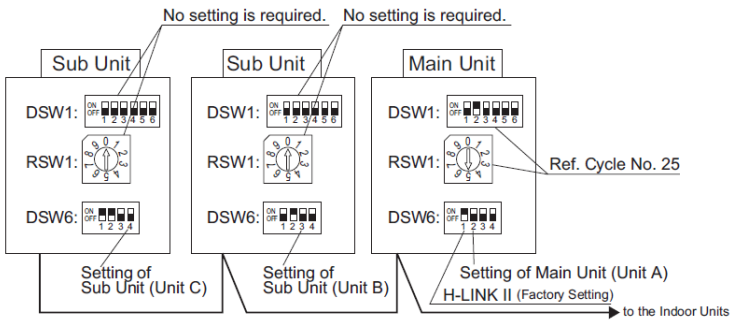
Combination Setting

Unit A (No.0 Unit)	Unit B (No.1 Unit)	Unit C (No.2 Unit)	Unit D (No.3 Unit)
			

Turn ON the dip switch when use the below functions.

Setting Item	Pin No.	IMPORTANT NOTICE
Outdoor Unit No. Setting	1, 2, 3	The outdoor unit is not single, the combination setting is necessary. Be sure to do this setting.
Cooling Operation Under Low Load Operation (Low Ambient Setting)	4	Make sure to apply Snow Protection Hood (Optional Parts).

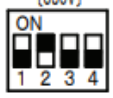
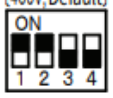
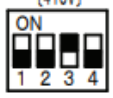
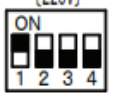
DSW6 is only applicable for the combination of outdoor units – main/sub system.



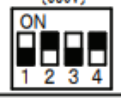
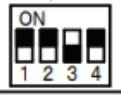
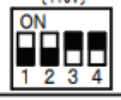
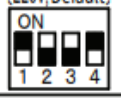
DSW7 (PCB1) | Unit model setting

The settings are as follows for each model.
Set the power supply voltage of the unit according to the local power supply voltage.

Heat pump unit

(380V)	(400V, Default)	(415V)	(220V)
			

Heat recovery unit

(380V)	(400V, Default)	(415V)	(220V, Default)
			

DSW7 must be set correctly to 415V

Installation

- DIP Switches & Rotary Switch Setting

DSW8 (PCB1)	High Static Pressure Mode Setting

Setting is required. Turn ON the dip switch when use the below functions.

Setting Before Shipment

ON
1 2 3

Setting Item	Pin No.
HSP Setting: 30Pa	1
HSP Setting: 60Pa	2
HSP Setting: 80Pa	1, 2

IMPORTANT NOTICE

When adopting the air outlet duct (field-supplied), make sure to set DSW8.

DSW8 setting is required when the field supplied air outlet duct is in use.

DSW10 (PCB1)	Transmission Setting

Setting is required. Set DSW10-1 correctly for end resistance cancellation.

Setting Before Shipment

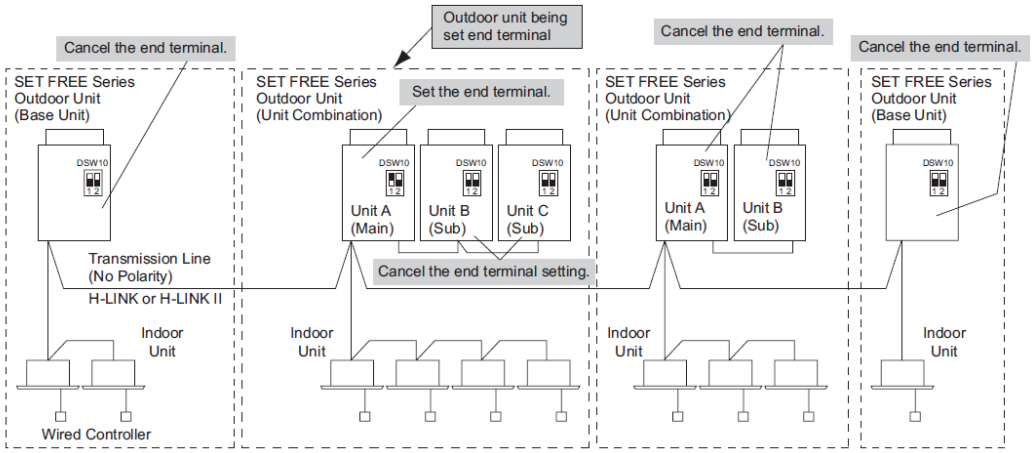
ON
1 2

Setting Item	Pin No.
End Resistance Setting *1	1
Fuse Recovery *2	2

*1: Turn OFF No.1 pin for all of the outdoor units in the same H-LINK system except one outdoor unit.
*2: If the fuse (EF1) is melted, set No.2 pin to ON for recovery.

DSW10 pin 2 is for EF1 fuse recovery.

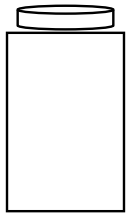
DSW10 pin 1 ON for End Resistance setting for H-Link.



Installation

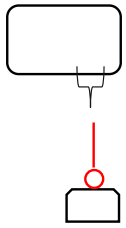
- DIP Switches & Rotary Switch Setting (on a general installation)

Outdoor



RSW1 ---- Refrigeration cycle no.
(DSW1) ---- (Tens Digit)
DSW7 ---- Power supply setting
DSW10 ---- End Resistance setting
DSW6 ---- Outdoor combination setting

Indoor

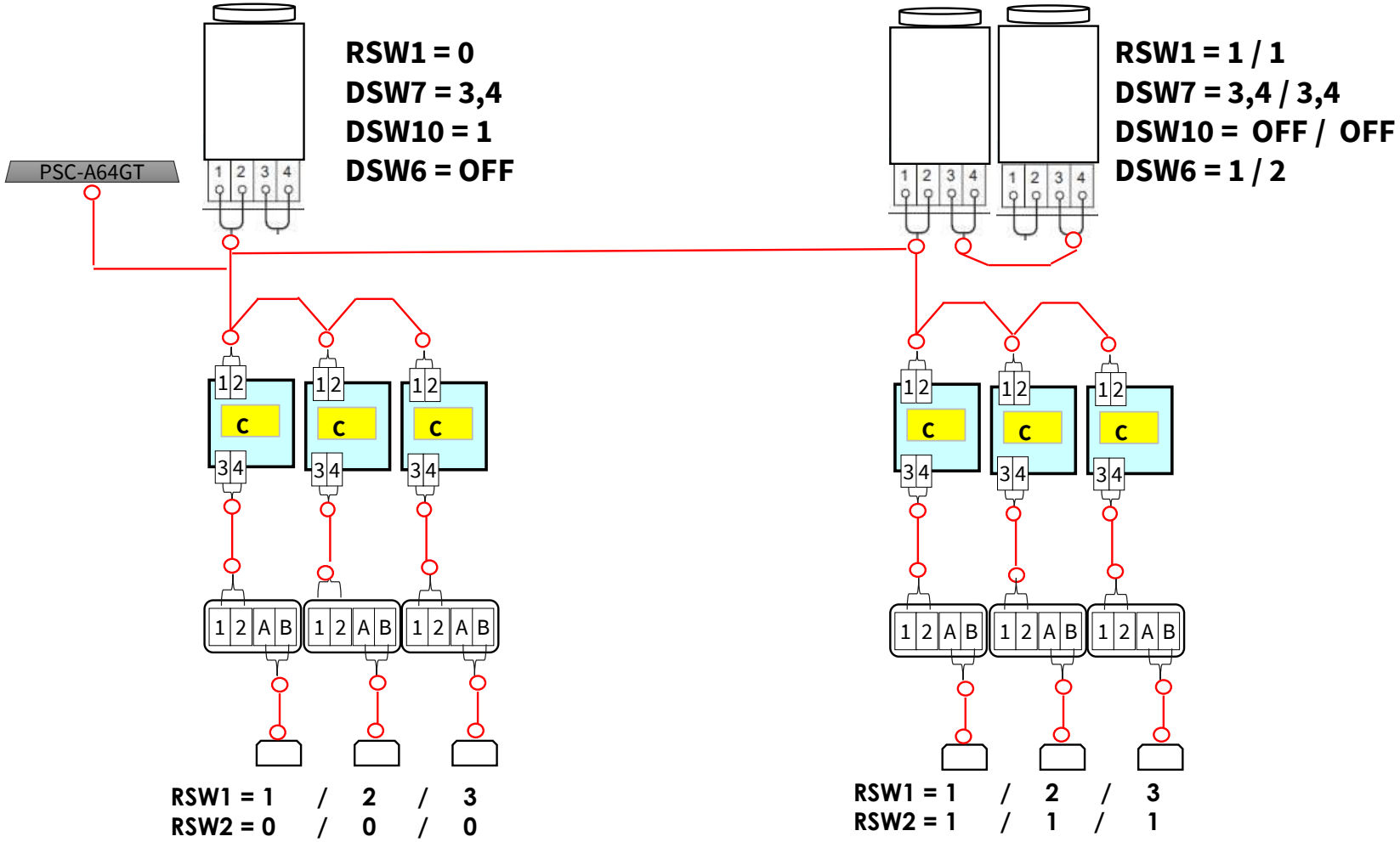


RSW1 ---- Please refer to Installation Manual
(DSW6) ---- (Tens Digit)
RSW2 ---- Please refer to Installation Manual
(DSW5) ---- (Tens Digit)

SW2 (RPK) ---- Wired / Wireless

Installation

- DIP Switches & Rotary Switch Setting (on a general installation)



Controls

HC-A64BNP1
BACnet

PC-ARFG2Z
(Wall Controller)

PC-ARC
(Eco Compact Wall Controller)

PSC-A32MN
(Mini Central station)

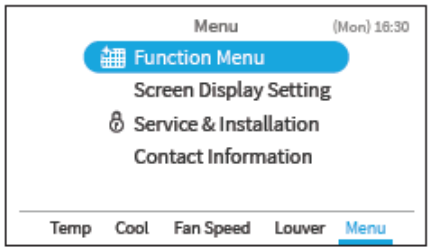
HC-IOTGW
(Air Cloud Pro)

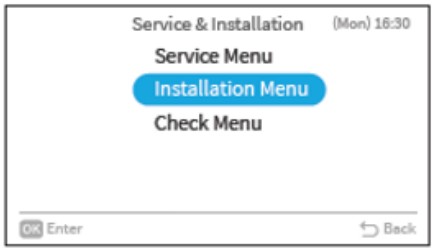
PSC-A64GT
(Central station)

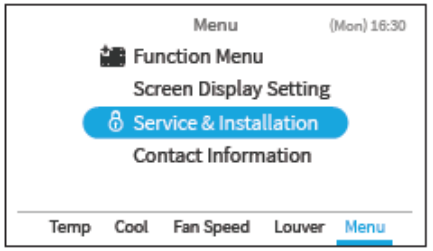
Controls: New Wall Controller PC-ARFG2Z

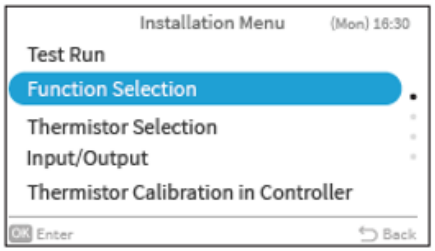
PC-ARFG2Z
(Wall Controller)

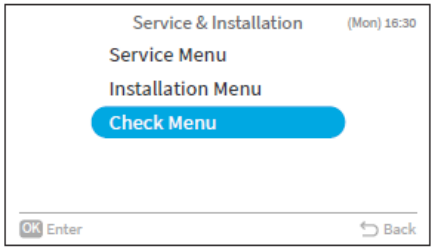
Password is required to prevent unintentional operations.
The default user password is "0000".











Controls: PC-ARFG2Z Optional Function Setting

List of the Optional Functions are available in the Installation Manual of the wall controller.

Most commonly requested functions are :-

1. Activation of the Automatic Mode (b8).
2. Power supply ON/OFF 2 (resume operation after power failure)(d3).
3. Fixing operation mode (except Auto mode)(b5).
4. Return air sensing (c8).

There are also other Optional Functions available from the outdoor 7 segment settings. Please refer to the outdoor Installation Manual.

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents	Setting
1	b1	Cancellation of Heating Temperature Compensation due to Uneven Heat Load	○	00 01 02 03 04	Standard (Set Temp. +4°C) (*1) Removal (Set Temp.) Set Temp. +2°C (*2) Set Temp. +3°C Set Temp. +1°C	
2	b2	Circulator Function during Heating Thermo-OFF	○	00 01	Not Available Available	
3	b3	Not Prepared	-	-	Not Used (Use as 00 conditions)	
4	b4	Change of Filter Cleaning Time	○	00 01 02 03 04	Standard (It depends on the model) 100 hrs 1,200 hrs 2,500 hrs No Indication	
5	b5	Fixing of Operation Mode	X	00 01	Standard Fixed	
6	b6	Fixing of Setting Temperature	X	00 01	Standard Fixed	
7	b7	Fixing of Operation as Exclusive Cooling Unit	X	00 01	Standard Fixed	
8	b8	Automatic COOL/HEAT Operation	X	00 01	Not Available Available	
9	b9	Fixing of Fan Speed	X	00 01	Standard Fixed	
10	bA	Not Prepared	-	-	Not Used	
11	bb	Cooling Temperature Compensation due to Uneven Heat Load	○	00 01 02	Standard (No Compensation) Set Temp. –1°C Set Temp. –2°C	
12	bC	Not Prepared	-	-	Not Used (Use as 00 conditions)	
13	bd	Not Prepared	-	-	Not Used (Use as 00 conditions)	
14	bE	Not Prepared	-	-	Not Used (Use as 00 conditions)	
15	C1	Not Prepared	-	-	Not Used (Use as 00 conditions)	
16	C2	Not Prepared	-	-	Not Used	
17	C3	Not Prepared	-	-	Not Used	
18	C4	Not Prepared	-	-	Not Used	
19	C5	Hi Speed (Except for Hi Speed during Heating Thermo-OFF)	○	00 01 02	Standard Hi Speed 1 (*3) Hi Speed 2	
20	C6	Hi Speed during Heating Thermo-OFF	○	00 01	Not Available Available	
21	C7	Canceling of Enforced 3 Minutes Minimum Operation Time of Compressor	○	00 01	Standard Cancelation	
22	C8	Thermistor of Wired Controller	○	00 01 02 00 01 02	< If Wired Controller Thermistor is Selected > Control by Indoor Suction Thermistor Control by Thermistor of Wired Controller Control by Average Value of Indoor Suction Thermistor and Thermistor of Wired Controller < If Remote Sensor is Selected > Control by Average Value of Indoor Suction Thermistor and Remote Sensor Control by Remote Sensor Same as "00"	
23	C9	Not Prepared	-	-	Not Used	
24	CA	Not Prepared	-	-	Not Used	
25	Cb	Selection of Forced Stoppage Logic	○	00 01	Forced Stoppage Input: A Contact Forced Stoppage Input: B Contact	
26	CC	Not Prepared	-	-	Not Used (Use as 00 conditions)	
27	Cd	Not Prepared	-	-	Not Used (Use as 00 conditions)	
28	CE	Not Prepared	-	-	Not Used (Use as 00 conditions)	

Controls: Central Station Features

✓START/STOP

✓OPERATON MODE

✓SET POINT

✓FAN SPEED

✓LOUVER

✓FILTER RESET

✓CONTROL BY GROUP

✓START/STOP BY EXTERNAL INPUT

✓EXTERNAL OUTPUT (12VDC)

✓TIMER SCHEDULE (10 Setting)

Controls: Central Station External Input/Output Setting

PSC-A32MN (Mini Central station)

Input and Output	Connection	Function	
Input 1	CN1 1-2 Pin	*All Run/Stop (Level) *All Run (Pulse) *All Stop (Pulse) *No Setting (Factory Setting)	*Emergency Stop (Level) *Demand (Stop/Run mode Shift/ Outdoor Unit Capacity Control)
Input 2	CN1 2-3 Pin		
Input 3	CN2 1-2 Pin		
Input 4	CN2 2-3 Pin		
Output 1	CN3 1-2 Pin	*All Run *All Alarm	*No Setting (Factory Setting)
Output 2	CN3 1-3 Pin		

- Require CN3 Plug Kit – Part Number 171-000-002

PSC-A64GT(Central station)

Input and Output	Connection	Function	
Input 1	TB3 1-2 Pin	All Run/Stop (Level)	Emergency Stop (Level)
Input 2	TB3 2-3 Pin	All Run (Pulse) All Stop (Pulse)	Demand Function (Input 1 only) No Setting (Factory Setting)
Output 1	TB3 4-5 Pin	All Run	
Output 2	TB3 5-6 Pin	All Alarm No Setting (Factory Setting)	

Controls: BACnet (HC-A64BNP1)

BMS ADAPTER for BACnet®

HC-A64BNP1
CONTROL UP TO 64 INDOOR UNITS

General Functions

- Run / Stop
- Operation Mode
- Temperature Setting / Status
- Fan Speed
- Filter Sign / Reset
- Prohibited / Permitted RC Operation
- Indoor Air Intake Temperature (IDU Inlet Temp)
- Communication State
- Alarm Signal
- Alarm Code

Hardware Specifications

Upper-level communication (BMS Side / BMS Protocol)	BACnet IP Control
Lower-level communication (AC side)	H-Link II
Central Controller used together with the same H-Link	Up to 4 units can be used in combination with BACnet adapter (CC: PSC –A16RS, PSC – A64S, PSC –A64GT)
Dimensions (H x W x D)	68mm x 204mm x 154mm
Weight	1.4kg
Power	AC 220-240V 50/60Hz

Note: Two BACnet adapters cannot be used together.
Note: BACnet adapter cannot be used with Central Controller EX.

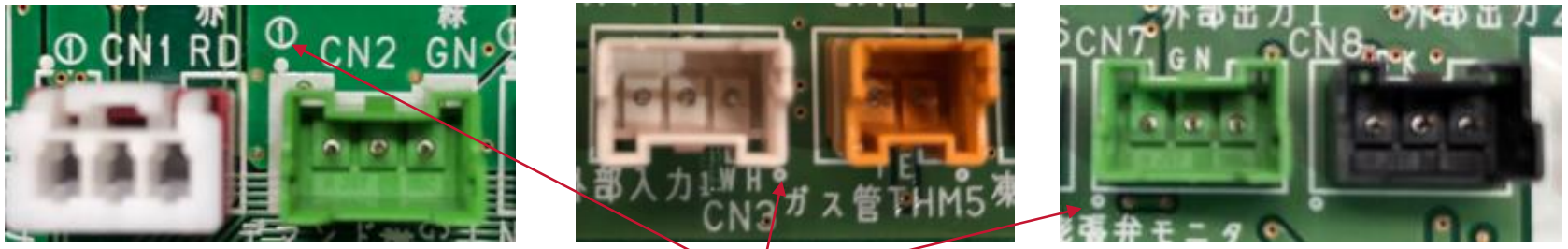
Controls: Interface Connection (Indoor Input/Output)

All the interface connection are done with the PCC-1A (CN3/CN7) connector .

Most commonly used / requested function are as below:- (external input / output)

1. Remote start / stop operation
2. Picking Up Operation Signal (External Fan Control / Fresh Air Fan)
3. Picking Up Alarm Signal
4. Fire Trip

Example on how to identify the starting of the connector pin – Pin no. 1

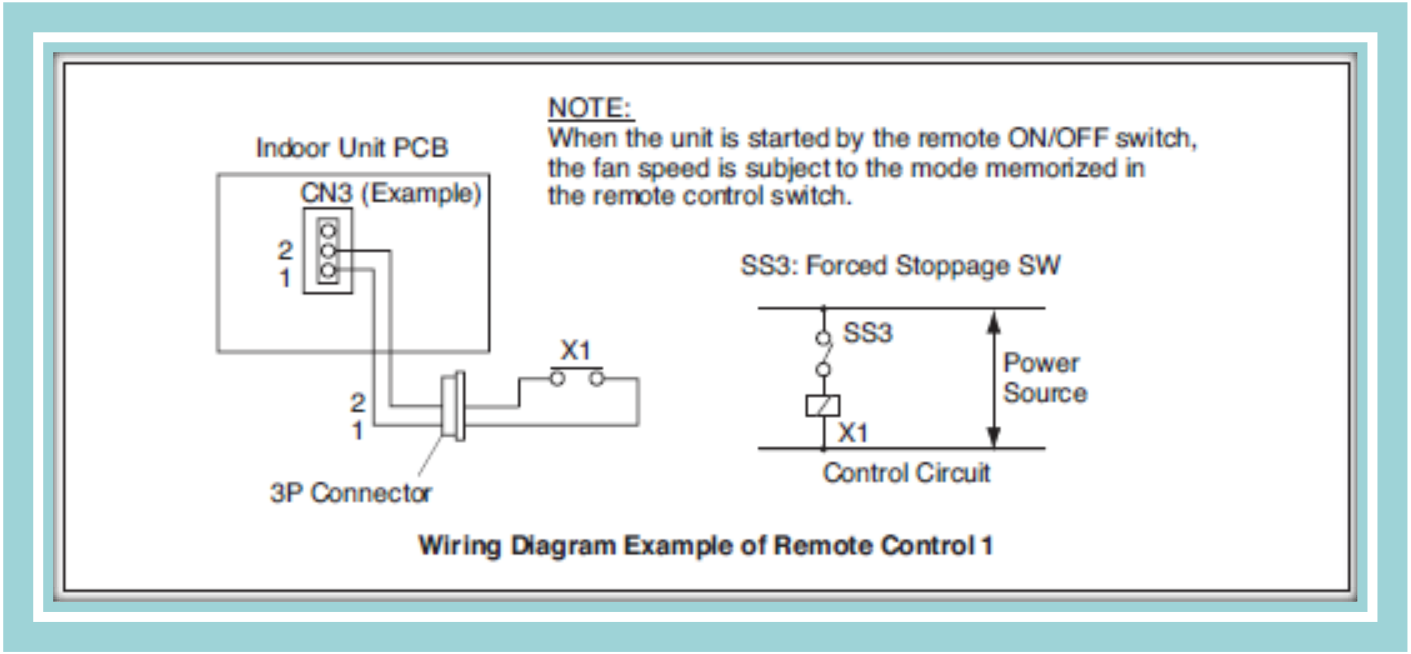


Pin no.1 is indicated by number '1' or 'dot' mark

Controls: Interface Connection - Indoor Input

1. Remote Start / Stop Operation. (level signal input)

   Connect to CN3 pin 1&2.

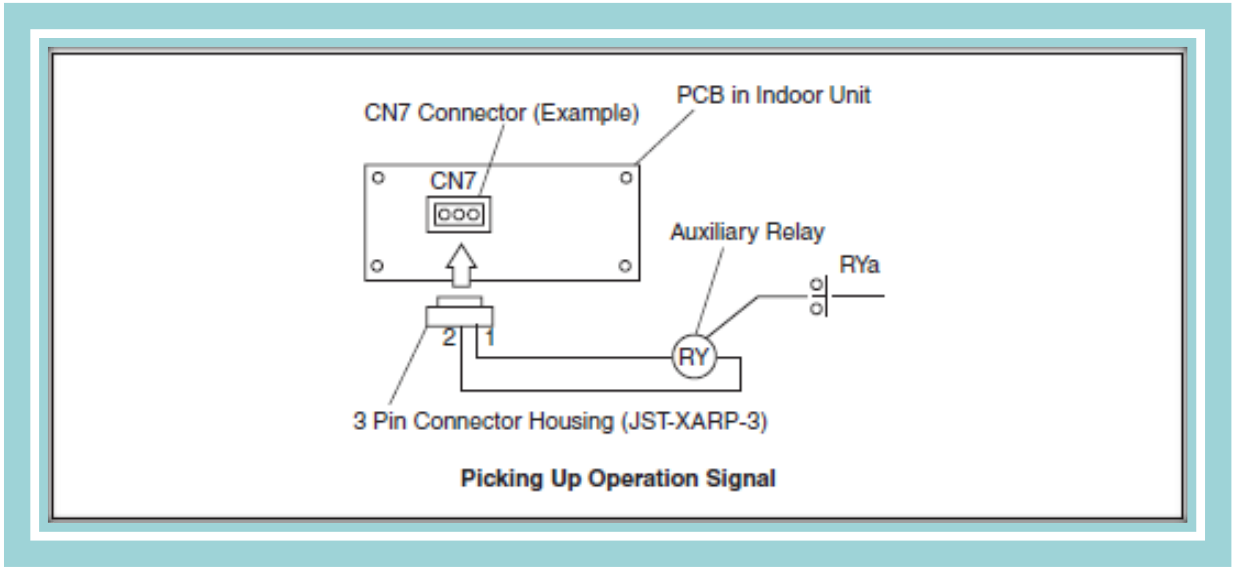


Wiring Diagram Example of Remote Control 1

Controls: Interface Connection - Indoor Input

2. Picking Up Operation Signal (External fan control / Fresh Air Fan)

Connect to CN7 pin 1&2.



Picking Up Operation Signal

Required Parts for Modification

Parts Name	Specification / Model
Auxiliary Relay *	OMRON made High Power Relay Model LY2F DC12V
Connector Cable	PCC-1A (3P Connector Cable)

*: Do not use the relay with diode.

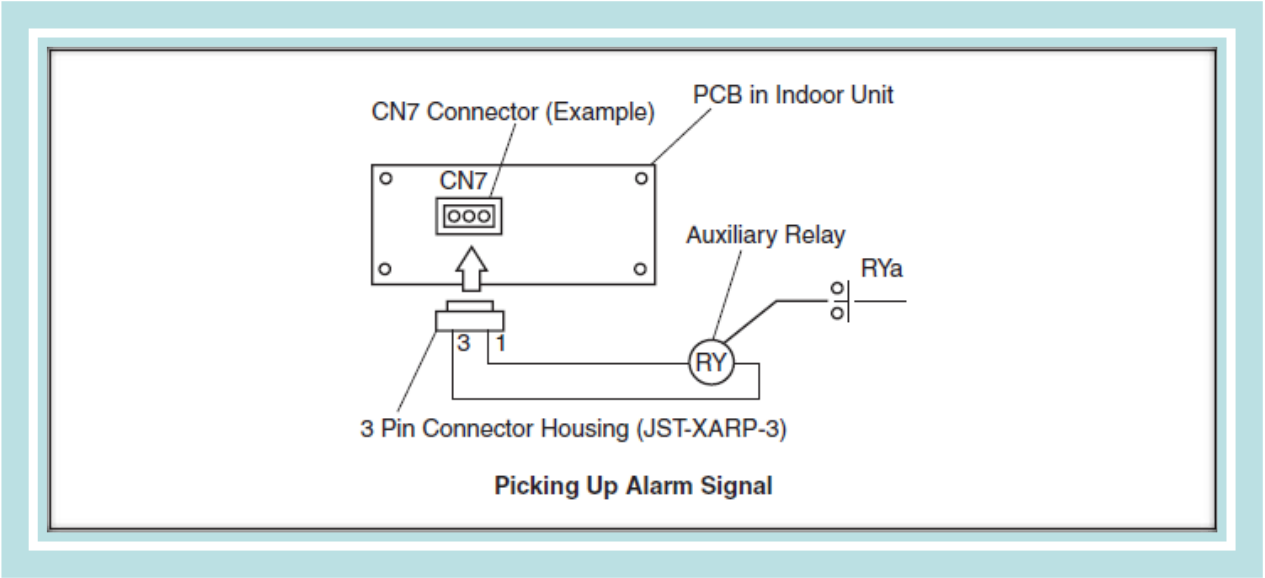
** same function is available from outdoor unit : CN16 pin 1&2**

Controls: Interface Connection - Indoor Input

3. Picking Up Alarm Signal.

This signal is utilized to pick up activation of safety devices.

Connect to CN7 pin 1&3.



Picking Up Alarm Signal

Required Parts for Modification

Parts Name	Specification / Model
Auxiliary Relay *	OMRON made High Power Relay Model LY2F DC12V
Connector Cable	PCC-1A (3P Connector Cable)

*: Do not use the relay with diode.

** same function is available from outdoor unit : CN16 pin 1&3**

Controls: Interface Connection - Outdoor Input

4. Force Stoppage / Fire Trip

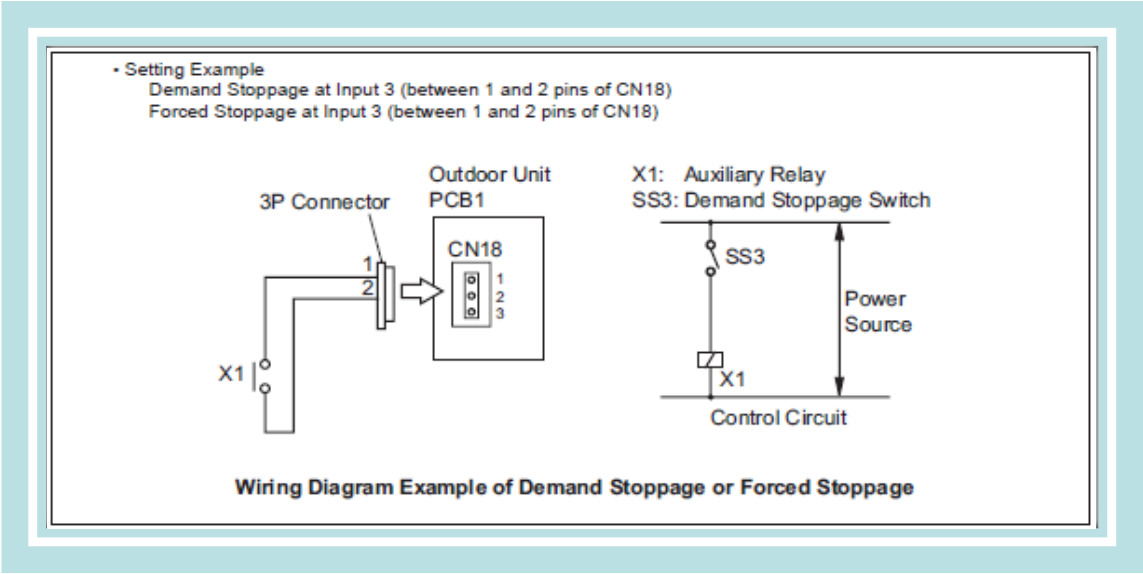
This is done at the outdoor unit pcb. Firstly, need to change the Input 3 setting to Function No. 5 setting ‘Force Stoppage‘ by below procedure :-

1. Switch ON DSW4 pin 4 & DSW4 pin 6.

2. Select the input no. 3 by using PSW4 and select Function No.5 by using PSW3.

3. Switch OFF DSW4 pin 4 and DSW4 pin 6.

4. Connect CN18 pin 1&2. If shorted circuited, it will Switch OFF compressor, outdoor & indoor fan .



The stoppage code No. “10” is given. In this case, if the input terminals are opened, operation is resumed.

Specific Features: NFC (Near Field Communications)

NFC function is available to modify the settings without removing the covers.

airCloud Tap application can be downloaded
through apple app store or google play by free.

HITACHI

Available on the App Store

Google Play

- 3 roles are available.
  - Facility manager
  - Installer
  - Authorized service (Activation code is required.)

* For security

Setting	Contents
DSW4-3 is ON	To prohibit data writing from NFC and allow only data acquisition.
Installation setting “nS=1”	NFC communication can be disabled.

Specific Features: NFC (Near Field Communications)

- Available function list

Home Menu	Function Menu	Read/ Write	Facility Manager	Installer	Authorized Service
Site Information	Model Name	R	●	●	●
	Serial No.	R	●	●	●
	Site Name	R/W	●*1	●	●
	Outdoor Unit Site No.	R/W	●*1	●	●
	GPS Location Information	R/W			●
	Add Note	R/W		●	●
	Refrigerant Amount (Installation)	R/W	●*1*2	●*2	●*2
	Refrigerant Charge (Service Additional)	R/W	●*1	●*2	●*2
	Refrigerant Amount (Current)	R	●*1	●*2	●*2
Installation Settings	Ref. Cycle No. Setting	R/W		●	●
	Outdoor Unit No. Setting	R/W		●	●
	High Static Pressure Mode Setting	R/W		●	●
	Low Ambient Cooling Mode Setting	R/W		●	●
	Fan Speed Adjustment Invalid Setting	R/W		●	●
	Power Supply Voltage Setting	R/W			●
	Indoor Unit Fan Restriction Setting	R/W		●*2	●*2
Function Settings	Function Settings	R/W		●*2	●*2
External Input/Output	External Input/Output	R/W		●*2	●*2
Test Run	Cooling/Heating Test Run *3	R/W		●*2*3	●*2*3
	Forced Defrost	W		●*2	●*2

*1: Read only
*2: Only outdoor unit A can be set
*3: May not work with some Samsung Galaxy phone models

Home Menu	Function Menu		Read/ Write	Facility Manager	Installer	Authorized Service
FrostWash	Start FrostWash		W		●*2	●*2
	Check Status		R		●*2	●*2
Check Menu	Operation Data Check *3		R		●*2*3	●*2*3
	Connecting Information		R		●*2	●*2
	Cause of Alarm Code Information		R		●*2	●*2
	Operation Data Before Alarm *3		R		●*2*3	●*2*3
	Abnormal Code History Information		R		●*2	●*2
System Forced Stop	System Forced Stop		R/W		●	●
Configuration Settings	Configuration Setting 1 - 9		R/W			●
	Configuration Setting A - E		R/W			●
Saved Settings	Edit Saved Settings		-		●	●
	Write Copied Settings		W		●	●
	Export Saved Settings		-		●	●
Side Menu	User Profile		-	●	●	●
	Display Unit		-	●	●	●
	Record Files *3	Cooling Test Run Result	-		●	●
		Heating Test Run Result	-		●	●
		Operation Data Check	-		●	●
		Operation Data Before Alarm	-		●	●

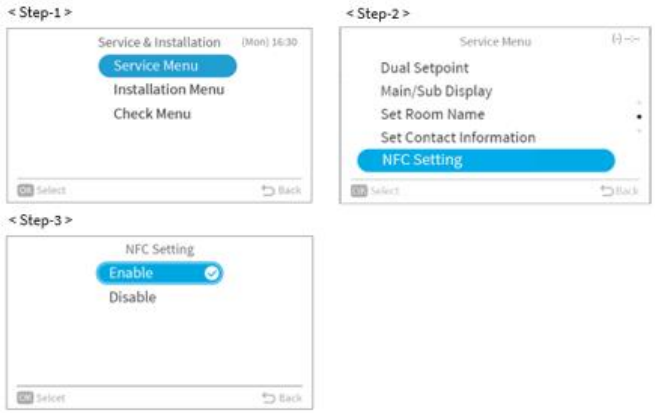
- The following settings are not available on airCloud Tap.
  - Termination resistor setting
  - Compressor exclusion operation
  - Inverter failure diagnosis
  - Inverter PCBA number setting

Specific Features: NFC (Near Field Communications)

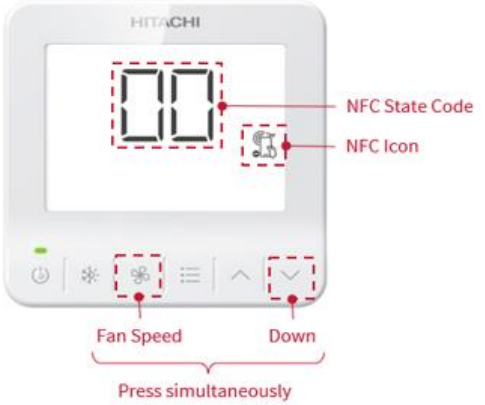
To disable NFC on the product:

1. Advanced Color Wired Remote Controller:
   NFC can be disabled by accessing the "Service Menu" and selecting "NFC Settings" on the Wired Remote Controller and setting it to "Disable".
2. Eco Compact Wired Remote Controller:
   NFC can be disabled by pressing and holding the [ ] and [V] buttons for 3 seconds or longer on the home screen of the Wired Remote Controller and set 00(Disabled).
3. Outdoor Unit:
   NFC communication can be disabled on the outdoor unit by setting DIP switch DSW4-3 to "ON", which will prohibit data writing from NFC and allow only data acquisition. In addition, NFC communication can be disabled by setting the installation setting "nS" to "1" in the "setting mode" of the outdoor unit.

NFC Setting PC-ARFG2Z



NFC Setting (PC-ARC)

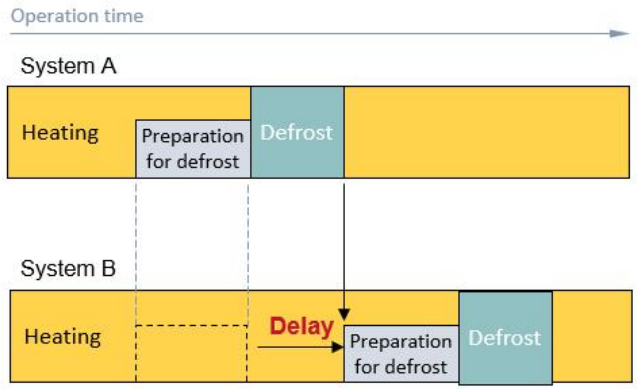


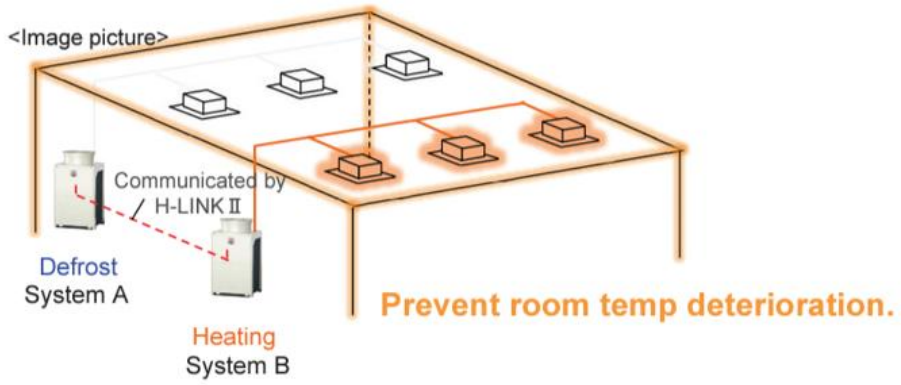
Specific Features: Smart Defrost - Networked Defrosting

Alternative defrost operation in one H-LINK system

✓ When multiple ODUs are connected by H-LINK communication cable, it can maintain continuous heating operation by avoiding all ODUs defrosting at the same time.

< Time chart >





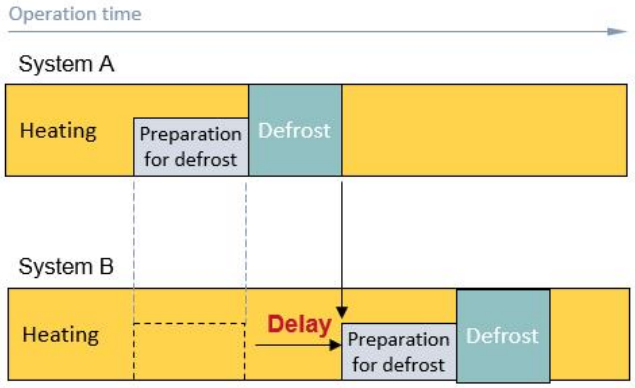
23	Alternate Defrosting Function (See 4.6.2-(12) for details.)	LF	00	Initial Setting (Disabled)
			01	Enabled

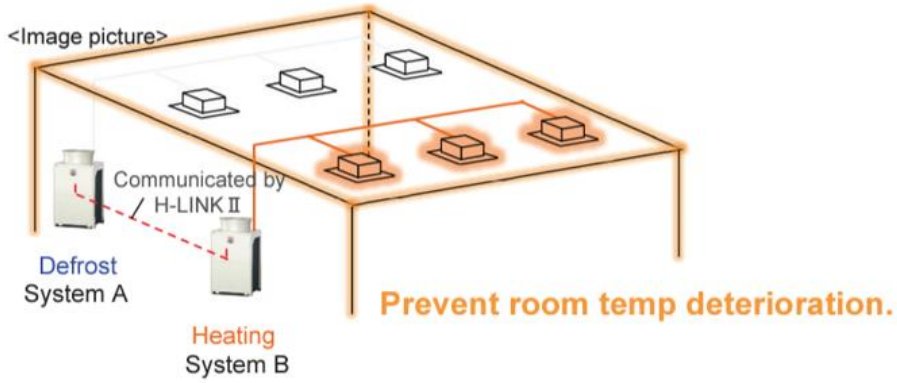
Specific Features: Smart Defrost - Networked Defrosting

Alternative defrost operation in one H-LINK system

✓ When multiple ODUs are connected by H-LINK communication cable, it can maintain continuous heating operation by avoiding all ODUs defrosting at the same time.

< Time chart >





23	Alternate Defrosting Function (See 4.6.2-(12) for details.)	LF	00	Initial Setting (Disabled)
			01	Enabled

Troubleshooting

Procedure :

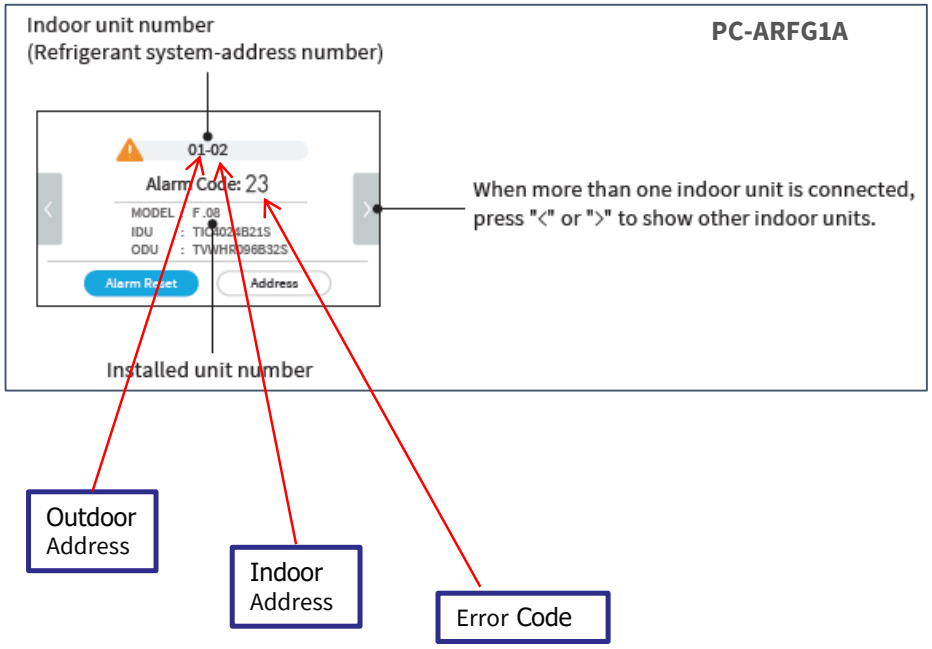
1. Read and understand the Error Code from the Wall Controller & Outdoor 7 segment display.
2. Go to Check Mode 1 and record all the parameters.
3. Record the display from the outdoor 7 segment display and it’s parameter.
4. Check all the recorded data to find the fault with the system.

Troubleshooting

Procedure : 1. Read and understand the Error Code from the wall controller (PC-ARF1/PC-AFRG1A).

■ Alarm Code Table

Code	Category	Content of Abnormality	Leading Cause
01	Indoor Unit	Activation of Protection Device (Float Switch)	Activation of Float Switch (High Water Level in Drain Pan, Abnormality of Drain Pipe, Float Switch, or Drain Pan)
02	Outdoor Unit	Activation of Protection Device (High Pressure Cut)	Activation of PSH (Pipe Clogging, Excessive Refrigerant, Inert Gas Mixing)
03	Communication	Abnormal Communication between Indoor Units and Outdoor Units	Incorrect Wiring, Loose Terminals, Disconnected Communication Cable, Blowout of Fuse, Indoor Unit Power OFF
04		Abnormal Communication between Inverter PCB and Outdoor PCB	Inverter PCB -Outdoor PCB Communication Failure (Loose Connector, Wire Breaking, Blowout of Fuse)
05	Supply Phase	Abnormality of Power Supply Phases	Incorrect Power Supply, Connection to Reversed Phase, Open-Phase
06	Voltage	Abnormal Inverter Voltage	Outdoor Voltage Decrease, Insufficient Power Capacity
07	Cycle	Decrease in Discharge Gas Superheat	Excessive Refrigerant Charge, Failure of Thermistor, Incorrect Wiring, Incorrect Piping Connection, Expansion Valve Locking at Opened Position (Disconnect Connector)
08		Increase in Discharge Gas Temperature	Insufficient Refrigerant Charge, Pipe Clogging, Failure of Thermistor, Incorrect Wiring, Incorrect Piping Connection, Expansion Valve Locking at Closed Position (Disconnect Connector)
0A	Communication	Abnormal Communication between Outdoor Units	Incorrect Wiring, Breaking Wire, Loose Terminals
0b	Outdoor Unit	Incorrect Outdoor Unit Address Setting	Duplication of Address Setting for Outdoor Units (Sub Units) in Same Refrigerant Cycle Number
0C		Incorrect Outdoor Unit Main Unit Setting	Two (or more) Outdoor Units Set as "Main Unit" Exist in Same Refrigerant Cycle Number
11	Sensor on Indoor Unit	Abnormality of Inlet Air Thermistor	Incorrect Wiring, Disconnecting Wiring, Breaking Wire, Short Circuit
12		Abnormality of Outlet Air Thermistor	
13		Abnormality of Freeze Protection Thermistor	
14		Abnormality of Gas Piping Thermistor	
15		Abnormality of Outdoor Air Thermistor (EconoFresh)	
16		Abnormality of Remote Sensor (DOAS*1))	
17		Abnormality of Thermistor Built-in Remote Controller (DOAS)	
18	Indoor Fan Motor	Abnormality of Indoor Fan System	Abnormality of Indoor Fan Motor (Step-Out), Indoor Fan Controller Failure
19		Activation of Protection Device for Indoor Fan	Fan Motor Overheat, Lockup
1A	Indoor Fan Controller	Abnormality of Fan Controller Fin Temperature	Abnormality of Fin Thermistor or Fan Controller, Heat Exchanger Clogging, Abnormality of Fan Motor
1b		Activation of Overcurrent Protection	Abnormality of Fan Motor
1C		Problem with Current Sensor	Abnormality of Fan Controller Current Sensor
1d		Activation Fan Controller Protection	Driver IC Error Signal Detection, Instantaneous Overcurrent
1E		Abnormality of Indoor Fan Controller Voltage	Indoor Voltage Decrease, Insufficient Capacity of Power Supply Wiring
21	Sensor on Outdoor Unit	Abnormality of High Pressure Sensor	Incorrect Wiring, Disconnecting Wiring, Breaking Wire, Short Circuit
22		Abnormality of Outdoor Air Thermistor	
23		Abnormality of Discharge Gas Thermistor on Top of Compressor	
24		Abnormality of Heat Exchanger Liquid Pipe Thermistor	

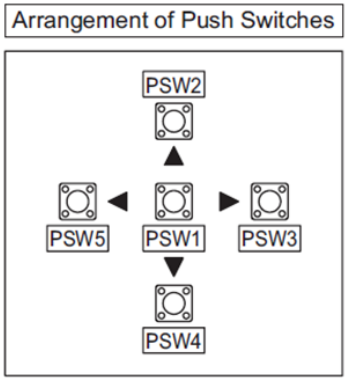


Troubleshooting

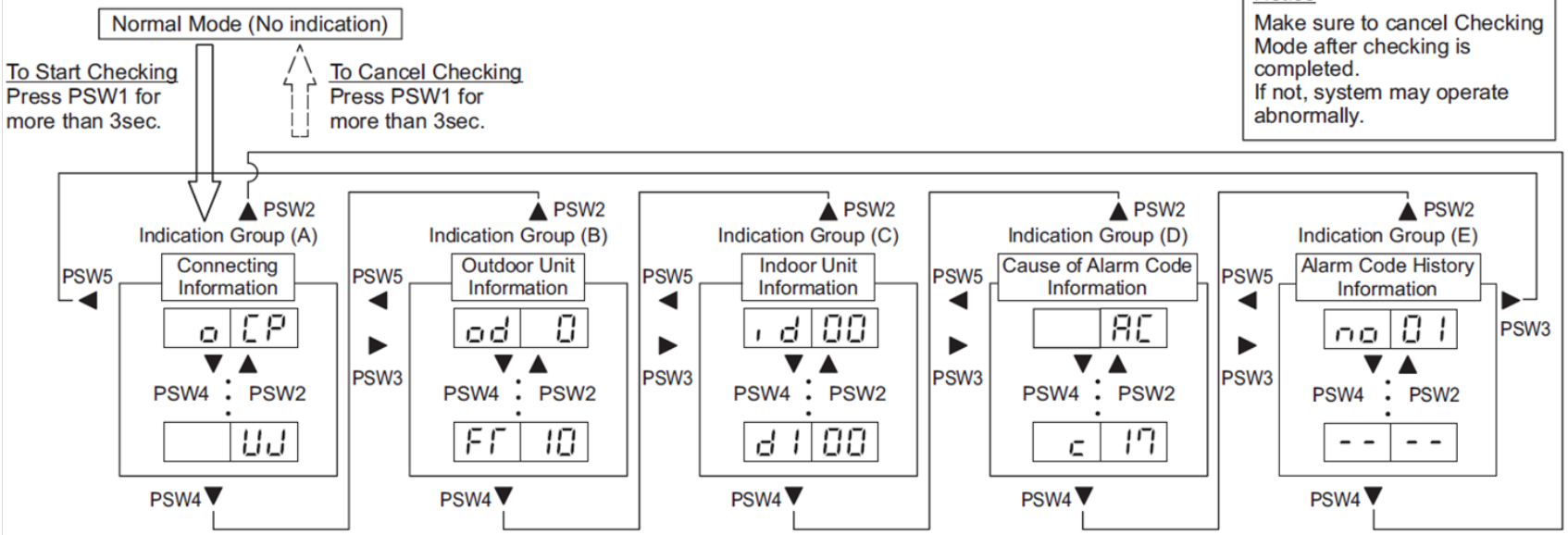
Procedure 2: Check Mode (Outdoor)

- Operating conditions can be checked by using the 7–segment display at the main outdoor unit.

1. Press PSW1 for 3 seconds to enter the checking mode.
2. Press PSW3 or PSW5 to select an indication group.
3. Press PSW2 or PSW4 to see the detail items.
4. Press PSW1 for 3 seconds to cancel the checking mode.

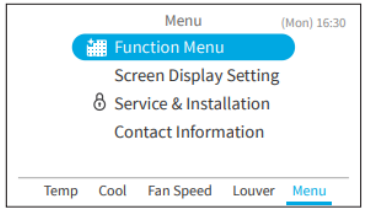


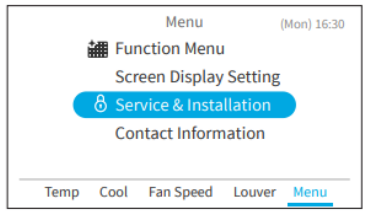
Notice
Make sure to cancel Checking Mode after checking is completed.
If not, system may operate abnormally.

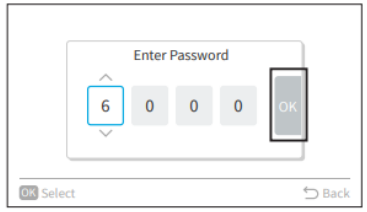


Troubleshooting

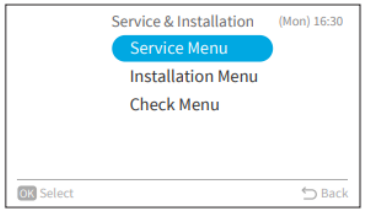
Procedure 2: Check Mode (Wall Controller)







The default user password is "0000".



● Items of Check Mode 1

No.	Item	Data Name
1	b1	Set Temp.
2	b2	Inlet Air Temp.
3	b3	Discharge Air Temp.
4	b4	Liquid Pipe Temp.
5	b5	Remote Thermistor Temp.
6	b6	Outdoor Air Temp.
7	b7	Gas Pipe Temp.
8	b8	Evaporating Temp. at Heating
9	b9	Condensing Temp. at Cooling
10	bA	Comp. Top Temp.
11	bb	Thermo Temp. of Wired Controller
12	bC	Not Prepared
13	C1	I.U. Micro-Computer
14	C2	O.U. Micro-Computer
15	d1	Stopping Cause State Indication
16	E1	Times of Abnormality
17	E2	Times of Power Failure
18	E3	Times of Abnormal Transmitting
19	E4	Times of Inverter Tripping
20	F1	Louver Sensor State
21	H1	Discharge Pressure

No.	Item	Data Name
22	H2	Suction Pressure
23	H3	Control Information
24	H4	Operating Frequency
25	J1	I.U. Capacity
26	J2	O.U. Code
27	J3	System Number (1)
28	J4	System Number (2)
29	L1	I.U. Expansion Valve
30	L2	O.U. Expansion Valve 1
31	L3	O.U. Expansion Valve 2
32	L4	O.U. Expansion Valve B
33	P1	Comp. Current
34	P2	Comp. Operating Accumulated Time
35	q1	Motion Sensor Reaction Rate *1
36	q2	Radiation Sensor Temp. *1
37	q3	Motion Sensor 1 Reaction Rate *1
38	q4	Motion Sensor 2 Reaction Rate *1
39	q5	Motion Sensor 3 Reaction Rate *1
40	q6	Motion Sensor 4 Reaction Rate *1
41	q7	Setting Temp. Collected Value

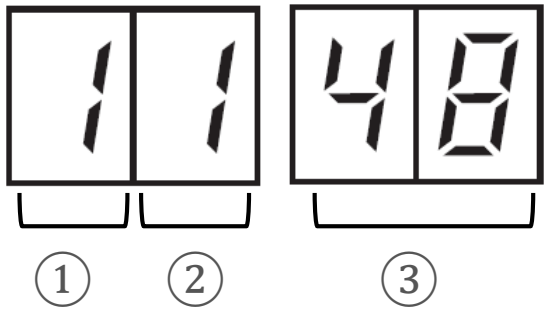
*1 The average value for 30 seconds (update cycle time of Check Mode) is displayed on the LCD.

Troubleshooting

Procedure : 1a. Read and understand the Error Code from Outdoor 7 segment display.

Please read the alarm Code firstly to understand whether the fault is related to an Indoor or Outdoor unit.

Example 1 : Outdoor Main unit with Alarm Code 48 (Compressor)

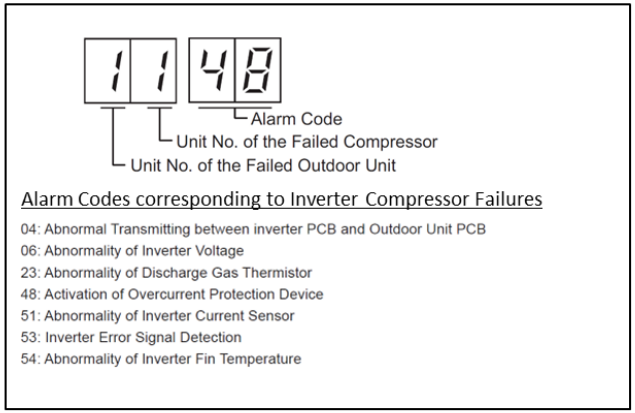


① Unit No. of failed ODU
② Unit No. of failed Compressor
③ Alarm Code

Troubleshooting

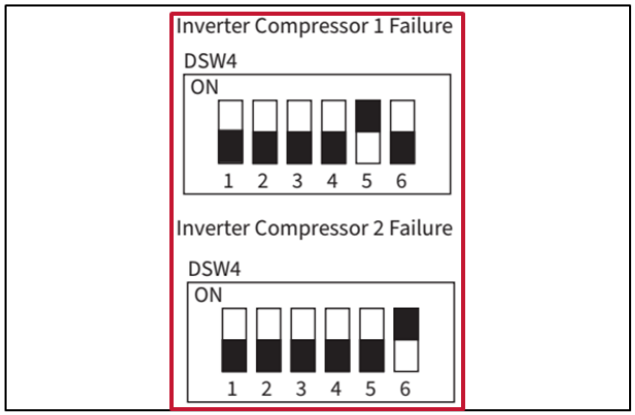
Example 1 : Outdoor Main unit with Alarm Code 48 (Compressor)

* For combinational units or multiple compressor units only



Alarm Codes corresponding to Inverter Compressor Failures

04: Abnormal Transmitting between inverter PCB and Outdoor Unit PCB
06: Abnormality of Inverter Voltage
23: Abnormality of Discharge Gas Thermistor
48: Activation of Overcurrent Protection Device
51: Abnormality of Inverter Current Sensor
53: Inverter Error Signal Detection
54: Abnormality of Inverter Fin Temperature



Compressor Failure

↓

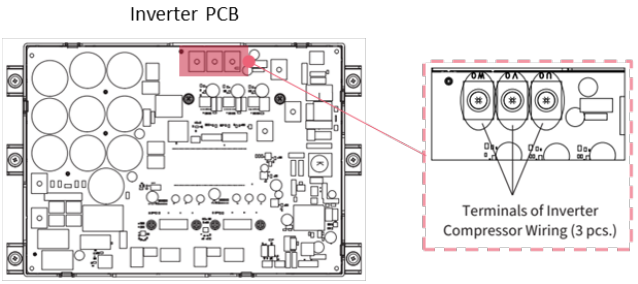
Identify the location and error code

↓

Isolate the affected compressor

a. Turn OFF all main switches to the outdoor and indoor units

b. Disconnect the compressor wiring from the inverter PCB terminals.



↓

Switch the appropriate DSW4 pin(s) "ON"

↓

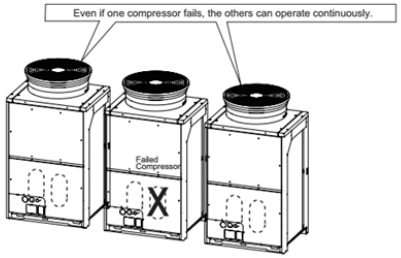
Start emergency operations

a. Turn ON all the main switches

b. Start the operation via wired controller

↓

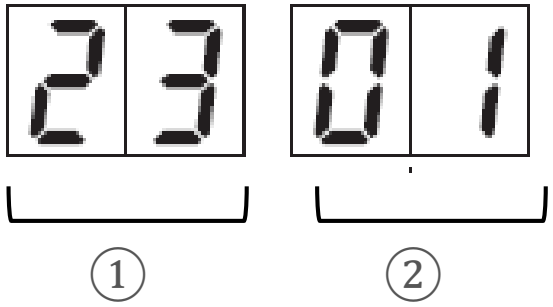
End



- Alarm codes "07", "43", "44","45" or "47" may be triggered due to reduced capacity.
- This is a temporary solution, and the damaged compressor needs to be replaced as soon as possible.

Troubleshooting

Example 2 : Indoor unit no. 23 with Alarm Code 01 (Float Switch)

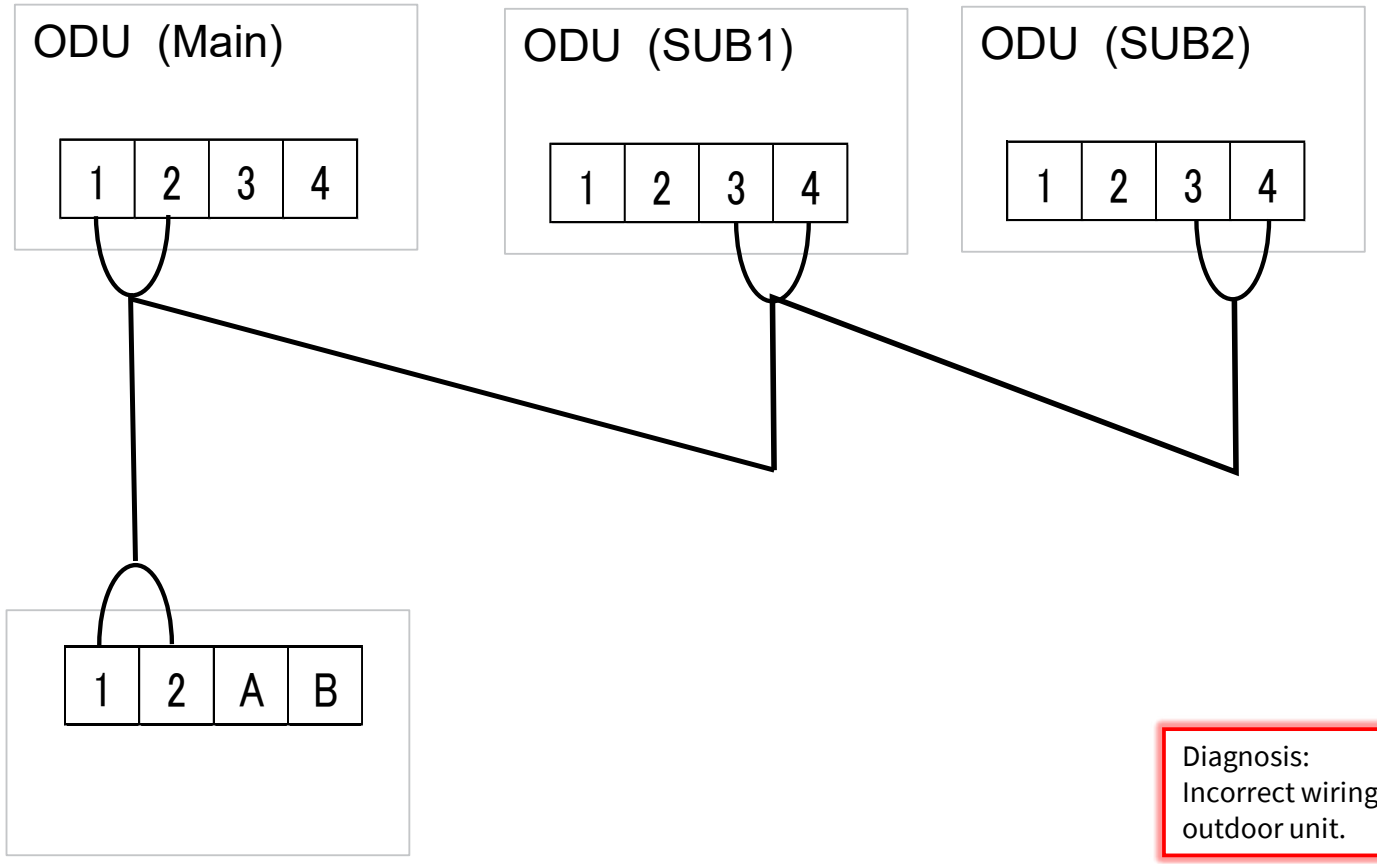


① IDU Unit No.
② Alarm Code

Troubleshooting: Transmission Alarm

Alarm Code	Abnormal Transmitting between Outdoor Units

After 1 minute of turning on power

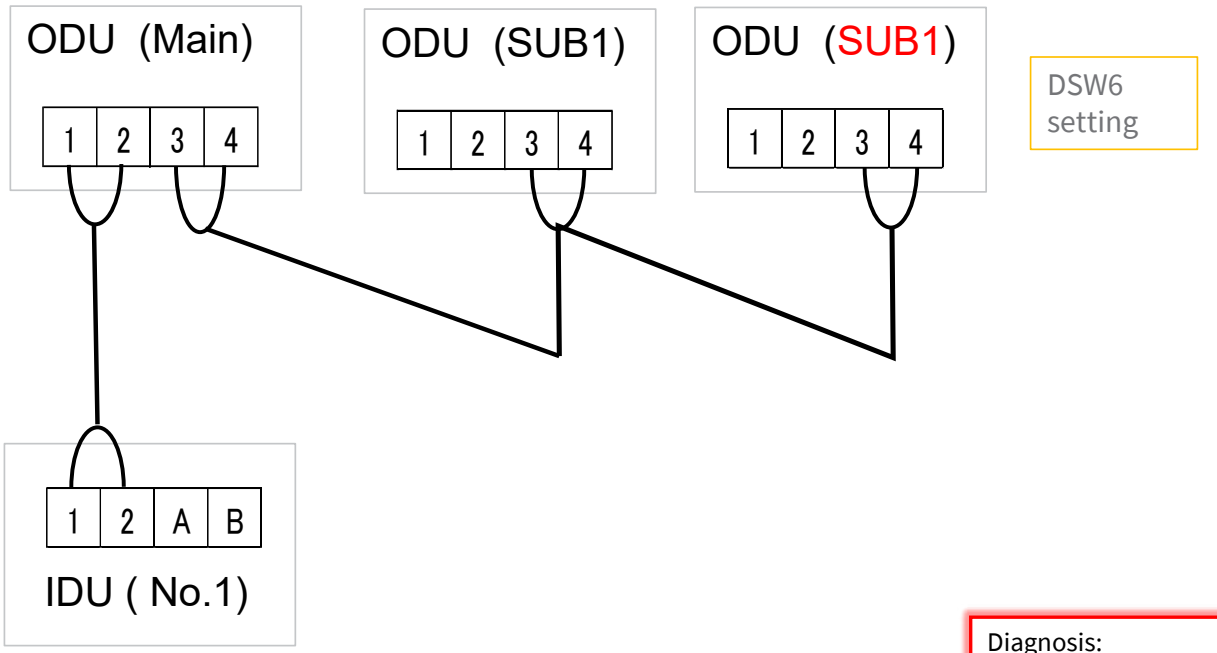


Diagnosis:
Incorrect wiring from Main outdoor unit.

Troubleshooting: Outdoor Addressing Alarm

Alarm Code	Incorrect Outdoor Unit Address Setting

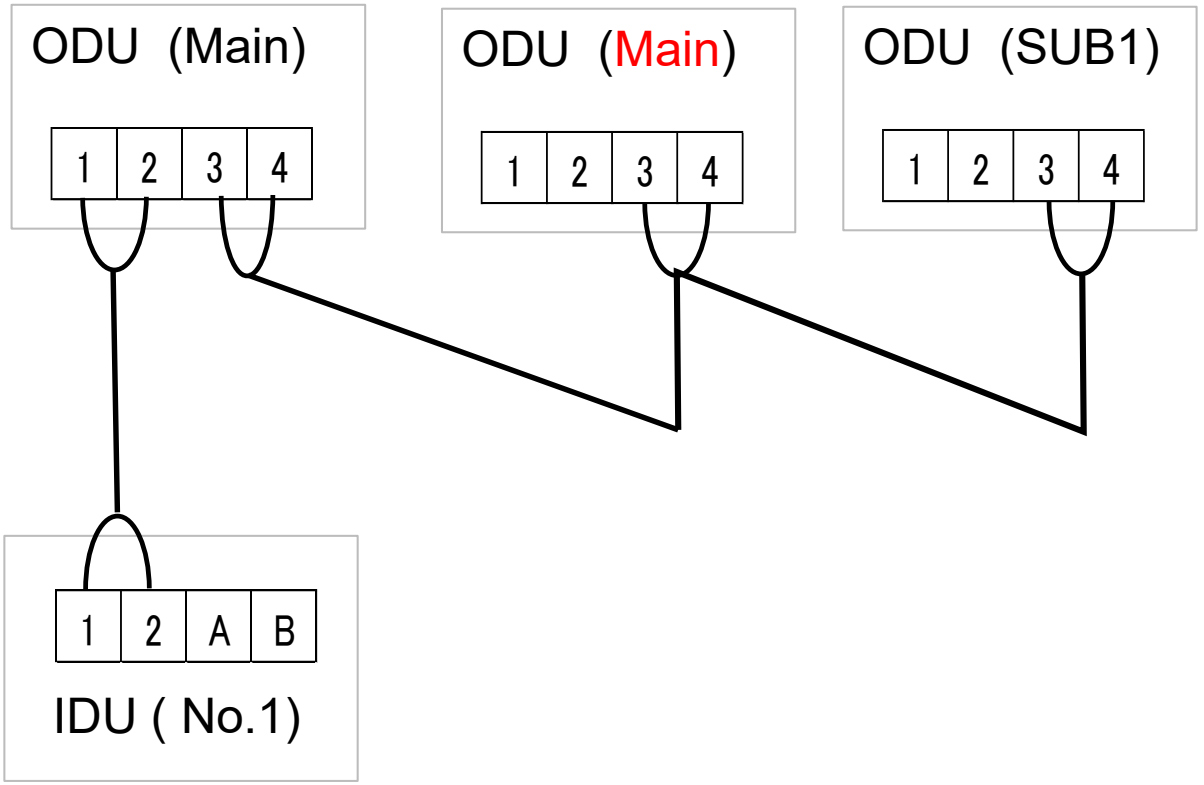
After 1 minute of turning on power



Diagnosis:
Incorrect DSW6 Setting for both outdoor Sub units.

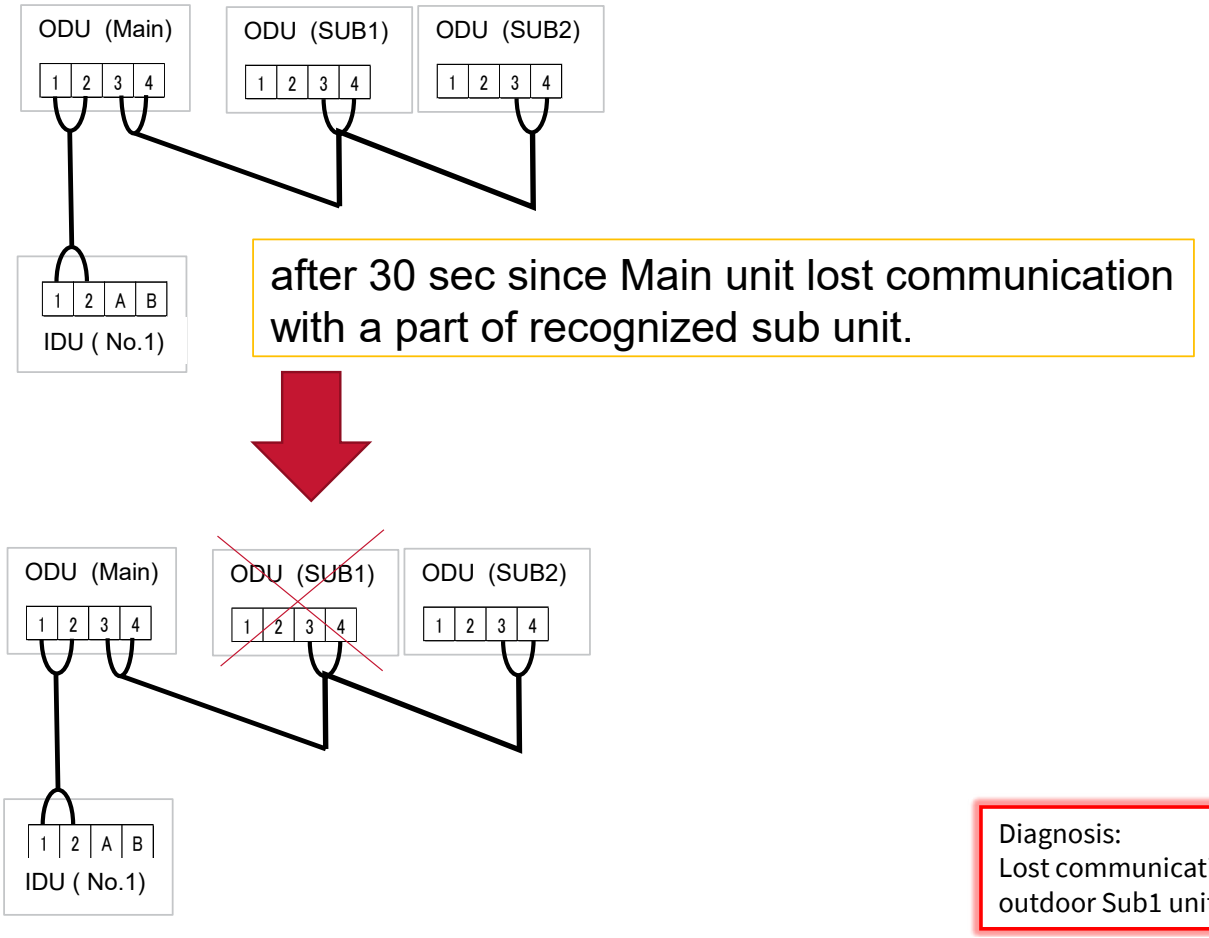
Troubleshooting: Outdoor Unit Setting Alarm

Alarm Code	Incorrect Setting of Main Outdoor Unit



Troubleshooting: Transmission Failure between Outdoor

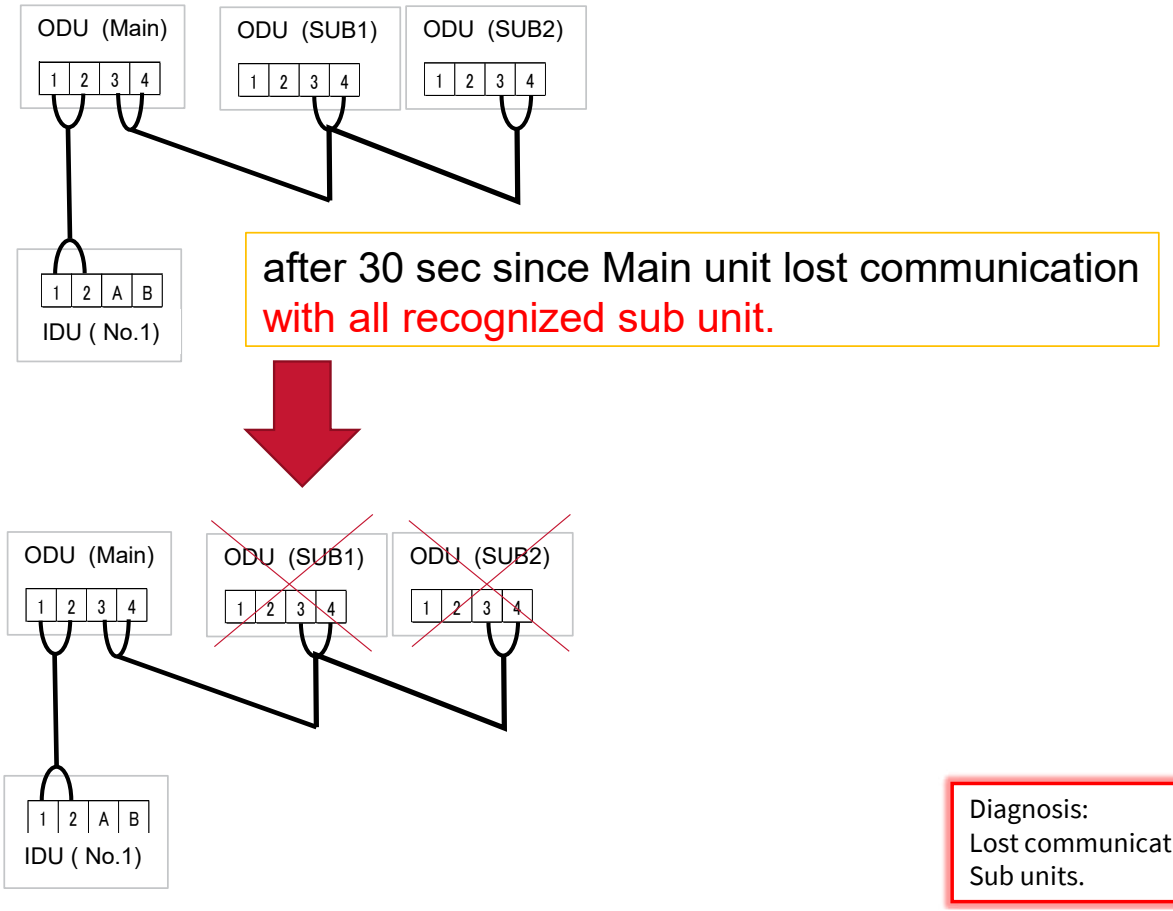
Alarm Code	Transmission Failure between Main Unit and Sub Unit(s)



Diagnosis:
Lost communication to outdoor Sub1 unit.

Troubleshooting: Transmission Failure between Outdoor

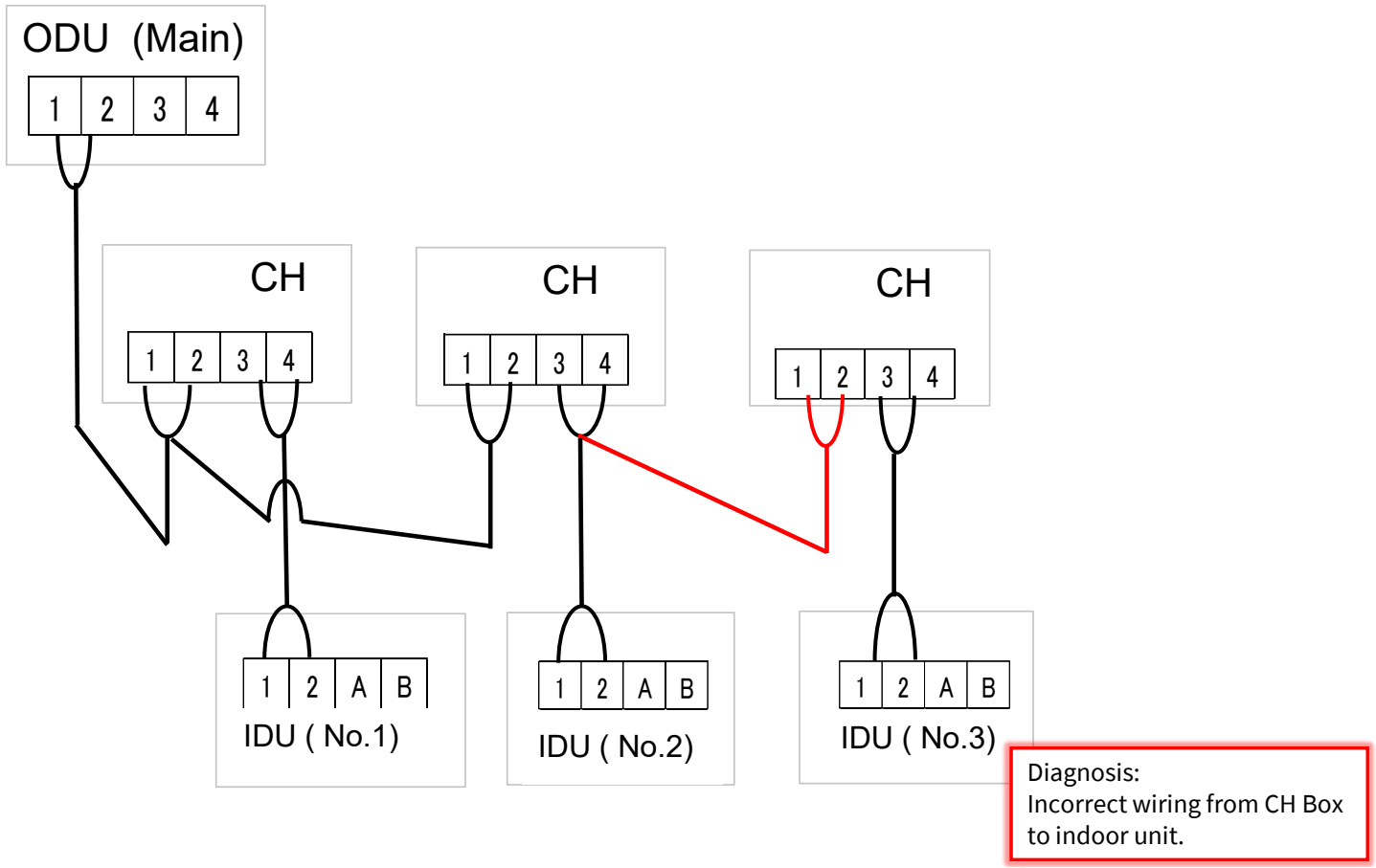
Alarm Code	3 1	Abnormal Transmitting between Outdoor Units



Diagnosis:
Lost communication to all Sub units.

Troubleshooting: Transmission Failure Indoor

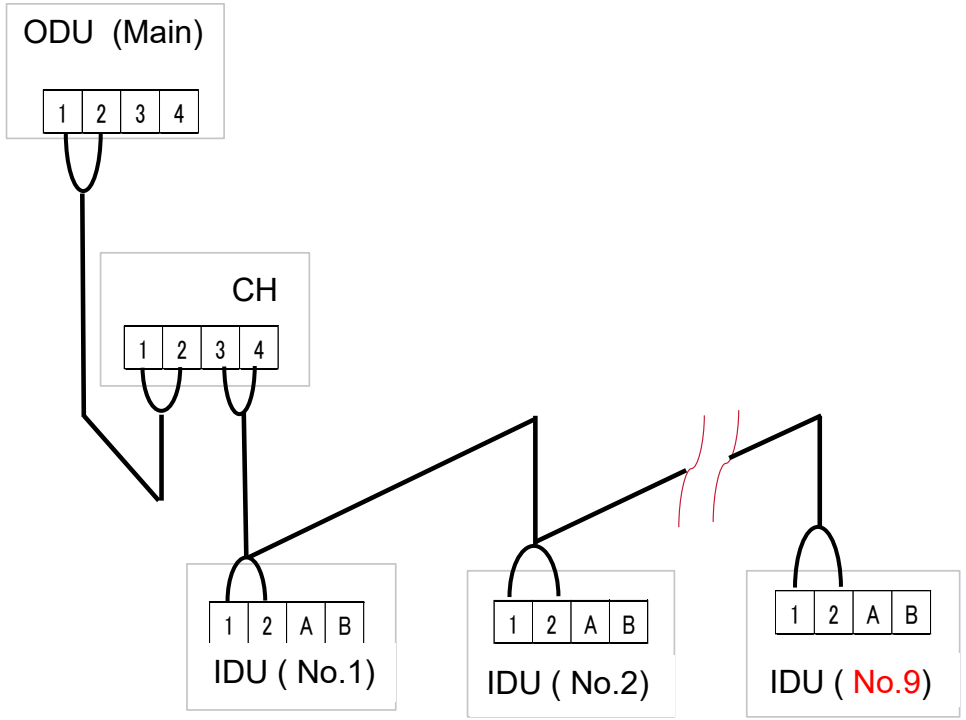
Alarm Code	Incorrect Indoor Unit Connection (CH-Box)



Diagnosis:
Incorrect wiring from CH Box to indoor unit.

Troubleshooting: Indoor Unit Connection Setting

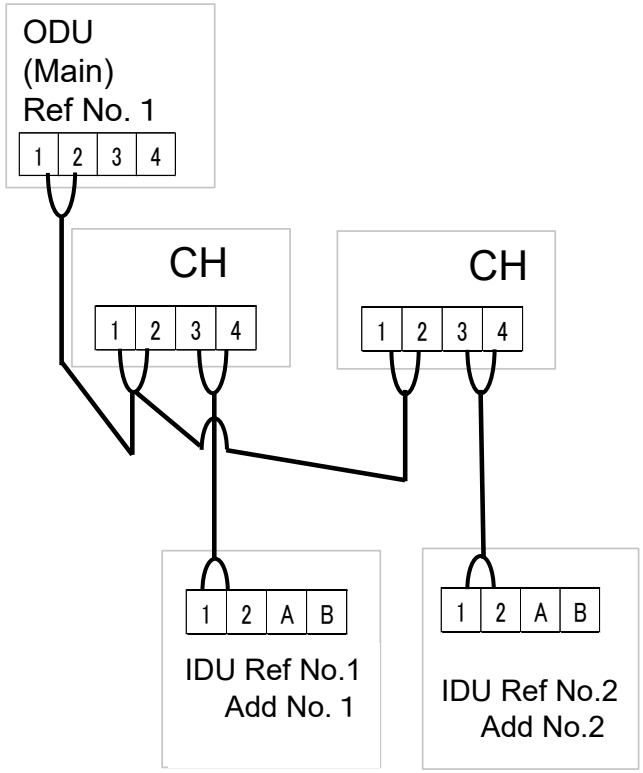
Alarm Code	Incorrect Indoor Unit Connection No. Setting (CH-Box)



Diagnosis:
Exceeded number of indoor unit to one CH Box.

Troubleshooting: Indoor Unit Connection Setting

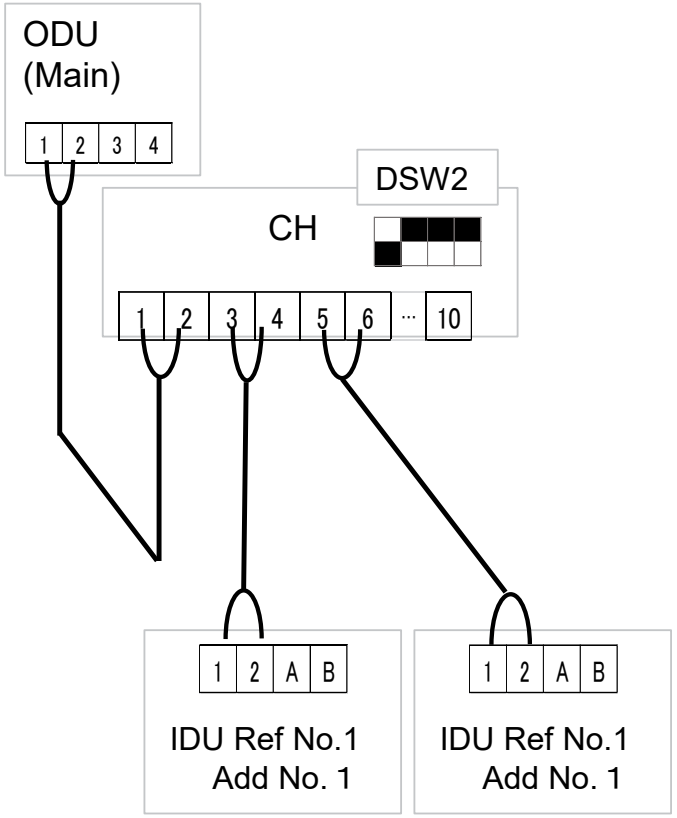
Alarm Code	Incorrect Indoor Unit Connection (CH-Box)



Diagnosis:
Incorrect Indoor ref. cycle setting.

Troubleshooting: Outdoor Unit Connection

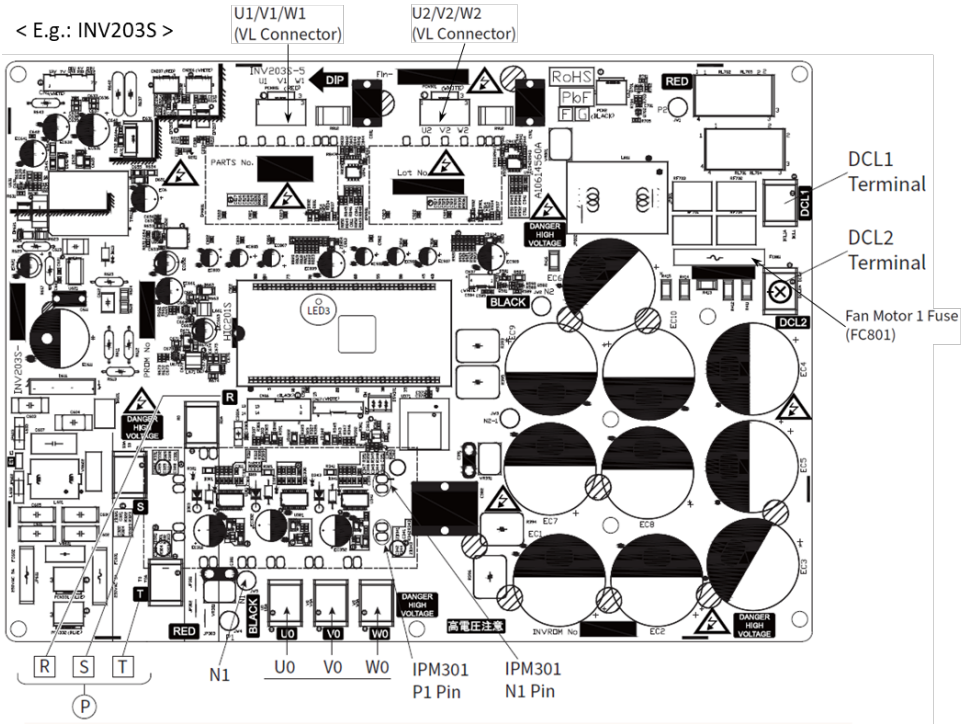
Alarm Code	Incorrect Connection Port Setting



Diagnosis:
Incorrect DSW2 setting on the CH Box.

Troubleshooting: Component Check Inverter PCB

- Inverter PCB: INV201S/INV202S/INV203S



Important: Turn OFF all main switch and ensure all high voltages have been discharged before work!

Part	No.	Positive Prove (+)		Negative Prove (-)		Analog Tester	Digital Tester*1
Rectification Circuit	1	DCL1		R/S/T		1kΩ or more	Over Load
	2	R/S/T		DCL1		100kΩ or more	1.0 V or less
	3	R/S/T		INV201S INV202S INV203S	Bus Bar IPM301 N1 Pin	1kΩ or more	Over Load
	4	INV201S INV202S INV203S	Bus Bar IPM301 N1 Pin	R/S/T		100kΩ or more	1.0 V or less
Output Circuit	5	IPM301 P1 Pin		U/V/W		1kΩ or more	Over Load
	6	U/V/W		IPM301 P1 Pin		5kΩ or more	1.0 V or less
	7	U/V/W		INV201S INV202S INV203S	Bus Bar IPM301 N1 Pin	1kΩ or more	Over Load
	8	INV201S INV202S INV203S	Bus Bar IPM301 N1 Pin	U/V/W		5kΩ or more	1.0 V or less
Fan Controller Circuit	9	FC801		U1/V1/W1		1kΩ or more	Over Load
	10	U1/V1/W1		FC801		5kΩ or more	1.0 V or less
	11	U1/V1/W1		INV201S INV202S INV203S	Bus Bar IPM301 N1 Pin	1kΩ or more	Over Load
	12	INV201S INV202S INV203S	Bus Bar IPM301 N1 Pin	U1/V1/W1		5kΩ or more	1.0 V or less
	13	FC901*2		U2/V2/W2		1kΩ or more	Over Load
	14	U2/V2/W2		FC901*2		5kΩ or more	1.0 V or less
	15	U2/V2/W2		INV201S INV202S INV203S	Bus Bar IPM301 N1 Pin	1kΩ or more	Over Load
	16	INV201S INV202S INV203S	Bus Bar IPM301 N1 Pin	U2/V2/W2		5kΩ or more	1.0 V or less

*1: Use “Diode Check Mode” of Digital tester.

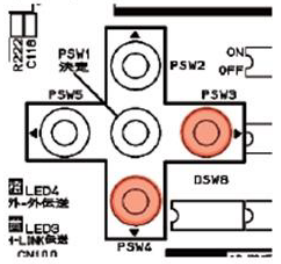
*2: Only FC801 is installed on INV203S and use FC801 to check.

Troubleshooting: Inverter Failure Diagnosis Mode

If alarm code 03, 48 or 53 occurs, use the inverter failure diagnosis mode to identify the failure location.

Step 1. Switch DSW4-4 (compressor forced stop) on the outdoor unit PCB (PCB1) to the ON position.

Step 2. Press and hold PSW3 (▶) and PSW4 (▼) on the outdoor PCB (PWB1) for 3 sec.



Step 3. Press and hold PSW3 and PSW4 on the outdoor PCB (PWB1) for 3 sec. to leave the diagnosis mode.

This can be performed when the inverter is selected in Step 2-1. or the results of the check are shown in Step 2-4.

Step 4. Switch DSW4-4 on the outdoor unit PCB (PCB1) to the OFF position.

Step 2-1. To select the relevant inverter, display the faulty inverter and press PSW1 (Enter).

Unit 1

Press PSW1 (Confirm) to return to the inverter unit number selection screen.

Step 2-2. Press PSW1 (Confirm).

Step 2-3. Inverter failure diagnosis will start . (Judgment time is 5 to 10 sec.)

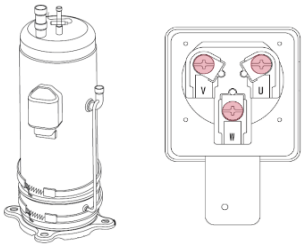
Step 2-4. Results of the diagnosis will be shown.

Error Code	Details	Remarks
EC01	Normal	
EC02	Inverter PCB Failure	Failure of the current detection circuit or power relay.
EC03	Open or Short Circuit	The compressor or Inverter PCB has failed due to an open/short circuit.
EC04	Abnormality of Outdoor Unit Protective Device (Pressure Switch)	Check the outdoor unit protective device (PSH) according to the troubleshooting Alarm Code 38.
EC99	Judgment Error	Carry out the diagnosis again. Turn outdoor unit power off and then turn it on again before diagnosis. If the result is EC99, it may be a EC02 Inverter PCB failure.

Troubleshooting: Component Check for Key Parts

- Resistances of Coils

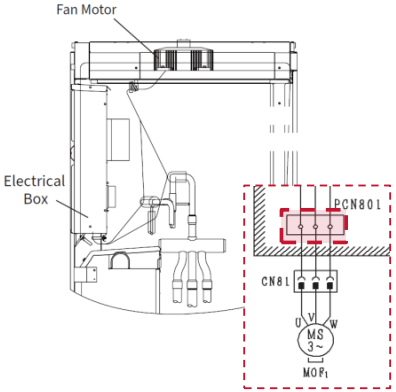
< Compressor Coil >

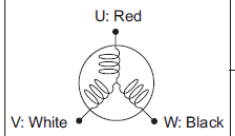


Resistance between U-V/U-W/V-W

Inverter Compressor	Voltage	Resistance, Ω
AA55PHDK-A1Y2	220V/60Hz	0.064 at 75°C (167°F)
DC65PHDK-A1Y2		0.056 at 75°C (167°F)
DA80PHDK-A1Y2		0.088 at 75°C (167°F)
DD98PHDK-A1Y2		0.057 at 75°C (167°F)
AA55PHDPA-D1Y2	400V/50Hz 380-415V/50Hz, 380V/60Hz	0.229 at 75°C (167°F)
DC65PHDPA-D1Y2		0.171 at 75°C (167°F)
DA80PHDPA-D1Y2		0.209 at 75°C (167°F)
DD98PHDPA-D1Y2		0.167 at 75°C (167°F)
AA55PHDGA-D1Y2		0.229 at 75°C (167°F)
DC65PHDGA-D1Y2		0.171 at 75°C (167°F)
DA80PHDGA-D1Y2		0.209 at 75°C (167°F)
DD98PHDGA-D1Y2		0.167 at 75°C (167°F)

< Fan motor Coil >



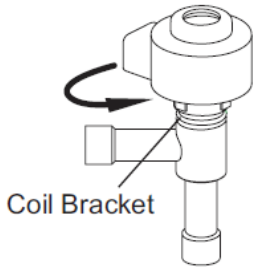
Power Source Voltage	Rated Voltage	Rated Output	Electrical Wiring Diagram	Resistance
220V/60Hz	DC280V	750W		2.62±0.26Ω at 20°C (68°F)
400V/50Hz 380-415V/50Hz 380V/60Hz	DC650V			9.42±0.94Ω at 20°C (68°F)

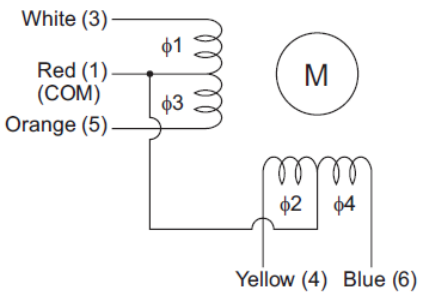
Troubleshooting: Component Check for Key Parts

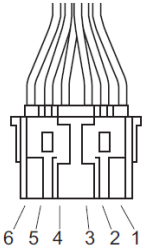
- Resistances of Coils

< Expansion Valve Coil >

MV1/MV2

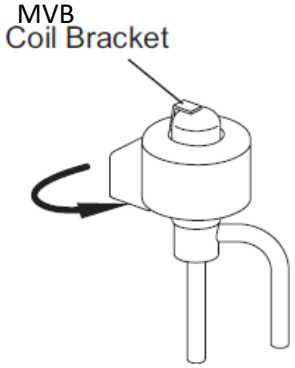


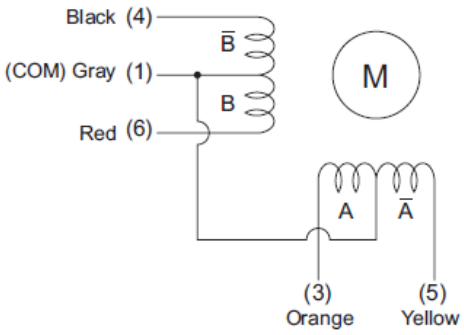




Red(1) COM	White(3)	100Ω (at 20°C)
	Yellow(4)	
	Orange(5)	
	Blue(6)	

MVB



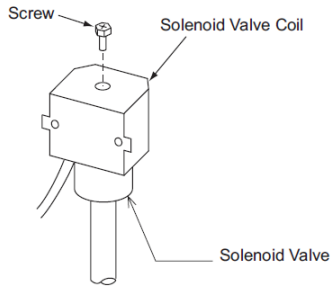


Gray(1) COM	Orange(3)	46+3Ω (at 20°C)
	Black(4)	
	Yellow(5)	
	Red(6)	

Troubleshooting: Component Check for Key Parts

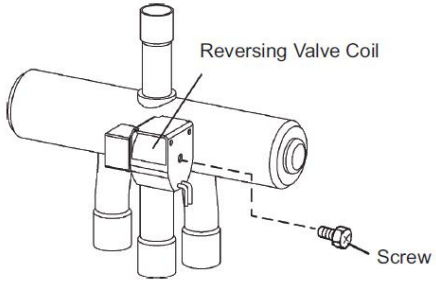
- Resistances of Coils

< Solenoid Valve Coil >



Electrical Coil Model			Resistance
SVA	Coil	FQ-A0520D	2142±214Ω at 20°C
	Body	FDF5A11	
SVG	Coil	TEV-SM0AJ2066A1	2496±174.7Ω at 20°C
	Body	TEV-S2020DQ50	

< Reversing Valve Coil >



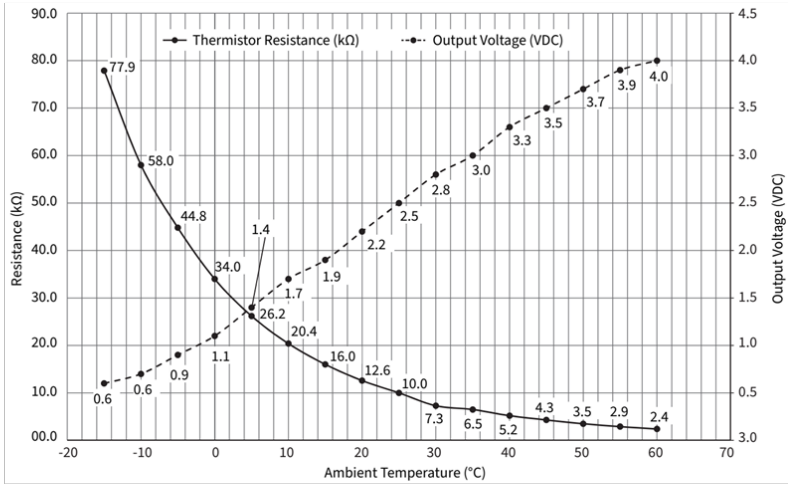
Electrical Coil Model		Resistance
Coil	STF-H01AQ2338A1	1567.5±156.8Ω at 20°C
Body	STF-H0712	
Coil	STF-01AQ2339A1	1190.35±119Ω at 20°C
Body	STF-1511G	

Troubleshooting

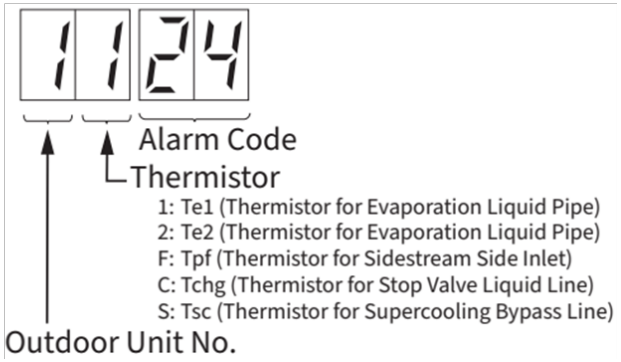
Additional Information : Alarm Code 24 & 25 – Abnormality Of Thermistor

- Alarm Code 24/25: Abnormality of Thermistor

  - ✓ This alarm is displayed when a short circuit (0.2kΩ or less) or open sensor (840kΩ or more) of the thermistor is detected for 8 minutes during operation.
  - ✓ The outdoor unit number, the thermistor code and the alarm code are displayed on 7 segment of PCB1 at main outdoor unit.
  - ✓ Check the connected position, the connector's condition and the resistance/output voltage.



< Display for alarm code 24: Abnormality of ODU Evaporating Thermistor >



< Display for alarm code 24: Abnormality of ODU Heat Exchanger Gas Pipe thermistor >

Troubleshooting: Component Check (Thermistors)

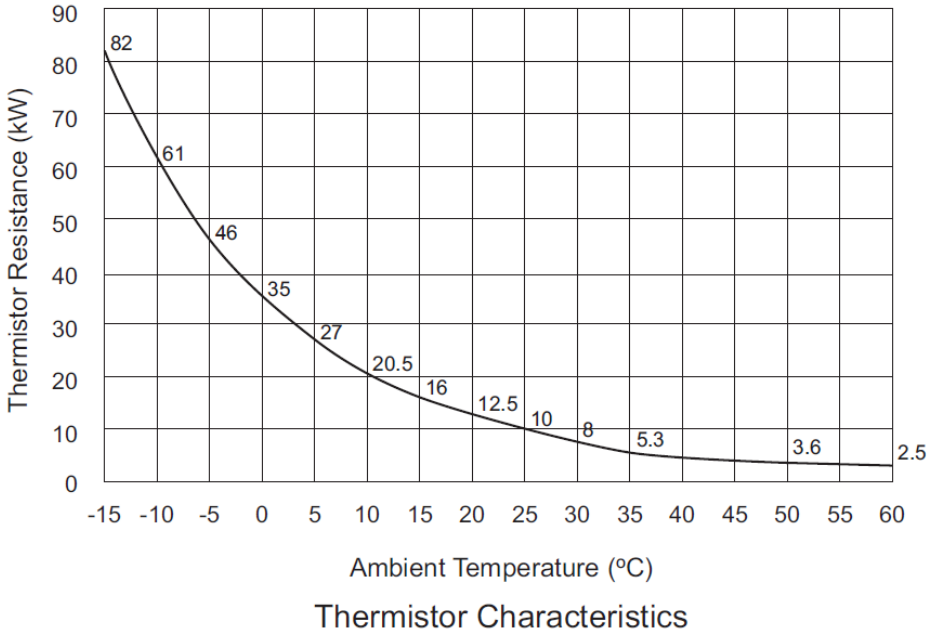
- Thermistors
  - Use this chart to determine if the thermistor in question is within range

Indoor Unit

- Inlet Air Thermistor (THM1)
- Outlet Air Thermistor (THM2)
- Liquid Pipe Thermistor (THM3)
- Remote Thermistor (THM4)
- Gas Pipe Thermistor (THM5)

Outdoor Unit

- Ambient Temperature Thermistor (THM7)
- Evaporation Liquid Line Thermistor (THM10)
- Evaporation Gas Line Thermistor (THM11)
- Supercooling Main Line Thermistor (THM17)
- Supercooling Bypass Line Thermistor (THM23)



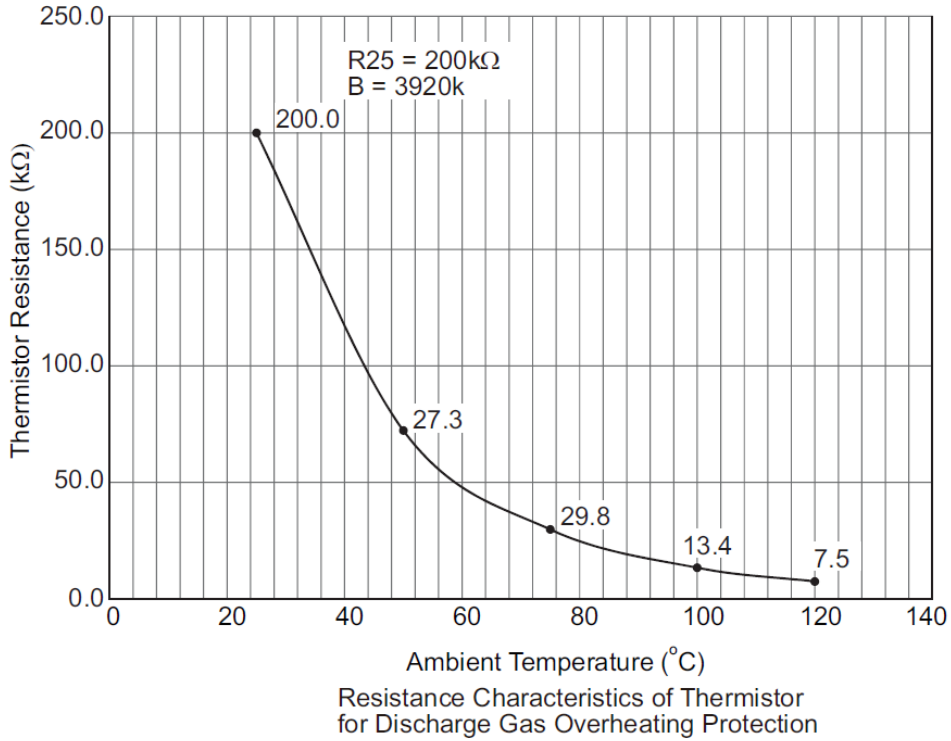
Thermistor Characteristics

Troubleshooting: Component Check (Thermistors)

- Thermistors
  - This check is for the discharge gas thermistor only

Outdoor Unit

- Discharge Gas Thermistor
  - (THM8) and (THM9)



Resistance Characteristics of Thermistor for Discharge Gas Overheating Protection

Q & A

Q : Please explain how to activate the Auto Mode ?

A : Unit in OFF mode, then activate optional function ‘b8’.

Q : What are the H-Link terminal?

A : Terminal 1 & 2.

Q : What connection is used to make the Remote Start/Stop Function?

A : CN3 pin 1 & 2.

Q: What is the output voltage for the Fan interlock connection on CN7?

A: 12VDC.

Q: Where do you connect a PC-ARFG2Z wall controller at the Indoor unit?

A: Terminal A,B.

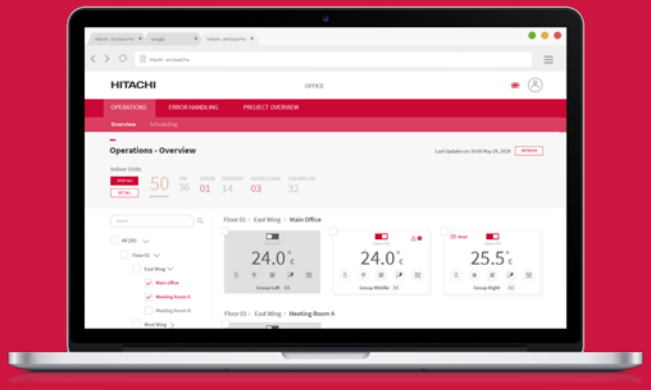
Notes

Notes

Notes

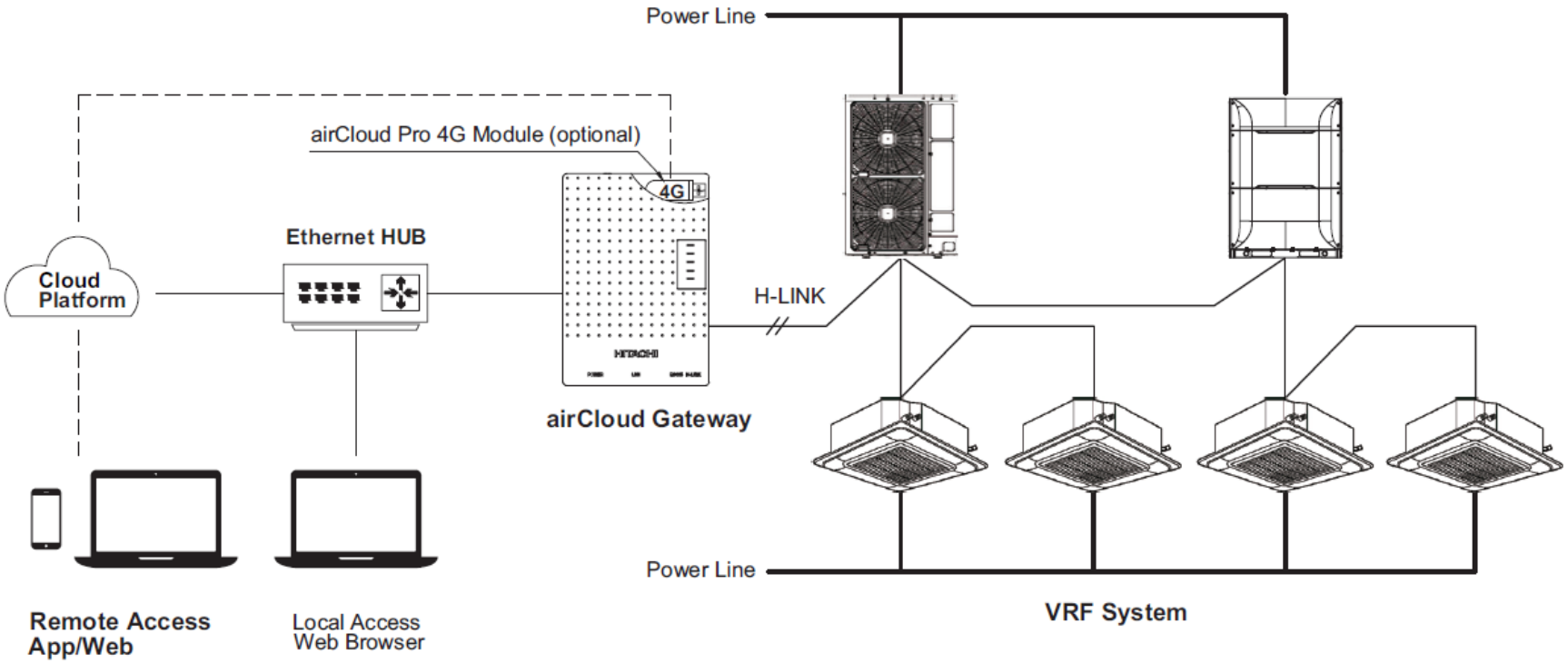
HITACHI

airCloud Pro



Cooling & Heating

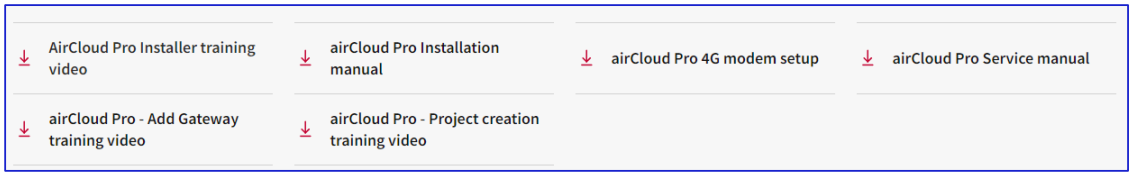
airCloud Pro Frame Map



airCloud Pro Solution Frame Map

airCloud Pro Gateway Installation – Documentation & Video Availability

1. Installation and Maintenance Manual
2. Aircloud Pro Service Manual
3. 4G module User quick start guide



Download Link : https://www.hitachiaircon.com/au/ranges/vrf-systems/aircloud-pro

airCloud Pro Connectivity Check

LED Indicator	Step Ⅰ ▶	Step Ⅱ ▶	Step Ⅲ ▶	Step Ⅳ ▶	Step Ⅴ
	Operation system startup	Application program startup	Checking H-Link connection	Connect to Cloud successfully	Work normally
POWER	●	●	●	●	●
ERROR	●	● ON for 1s	☼ Flash once every 5s	●	●
H-LINK	●	●	☼	☼	☼
UPLINK	●	●	●	●	●
4GLINK	▯▯▯	▯▯▯	▯▯▯	▯▯▯	▯▯▯

● ● ▮▮▮: LED ON. ☼ ☼: LED flash. ● ▯▯▯: LED OFF.

Ethernet Connectivity Status:
IF UPLINK LED is Green, the cloud connection is successfully established.

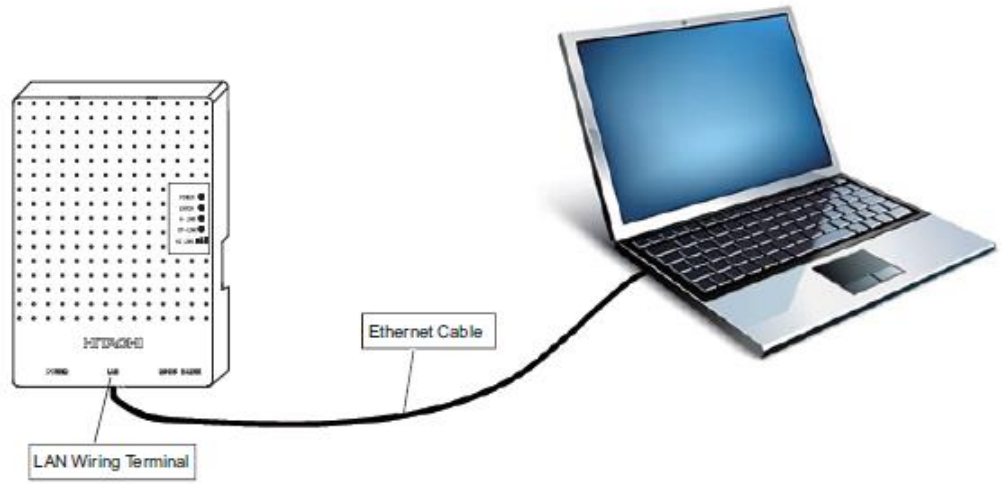
LED Indicator	Step 1 ▶	Step 2 ▶	Step 3 ▶	Step 4 ▶	Step 5 ▶	Step 6
	Operation system startup	Application program startup	Checking H-Link connection	4G module start normal work	Connect to Cloud successfully	Work normally
POWER	●	●	●	●	●	●
ERROR	●	● ON for 1s	☼ Flash once every 5s	●	●	●
H-LINK	●	●	☼	☼	☼	☼
UPLINK	●	●	●	●	●	●
4GLINK	▯▯▯	▯▯▯	▯▯▯	▮▮▮	▮▮▮	▮▮▮

● ● ▮▮▮: LED ON. ☼ ☼: LED flash. ● ▯▯▯: LED OFF.

4G Connectivity Status:
If UPLINK and the 4GLINK LEDs are GREEN, the cloud connection is Successfully established thru 4G.

airCloud Pro Configuration

The airCloud gateway can be configured via web browser from PC.
Connect your PC and airCloud gateway directly with Ethernet cable as below:-
Make sure PC are in the same Sub Network with airCloud gateway.

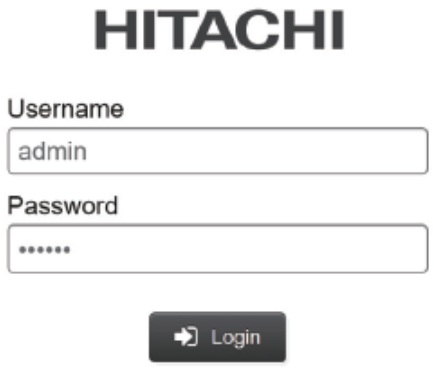


Factory Default Setting	
IP Address	192.168.0.23
Subnet Mask	255.255.255.0
Default Gateway	192.168.0.1
Primary DNS Servers	192.168.0.1

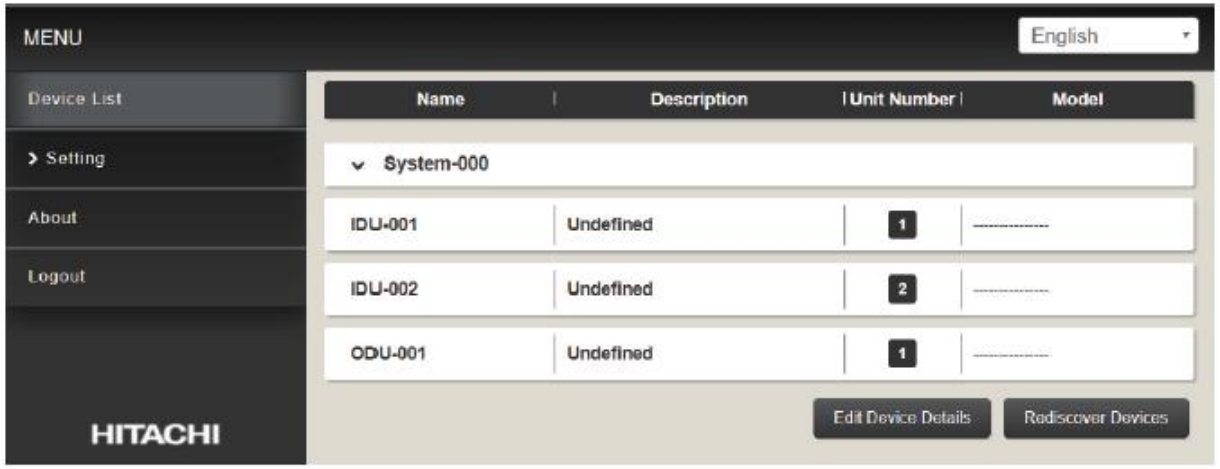
** Go to Start – Control Panel – Network and Sharing Center – Local Area Connection – Properties – Internet protocol version 4 (TCP/IP4).
Set IP address of PC and ensure the last digit of PC IP address is different from airCloud gateway. Example: If IP address for airCloud gateway is 192.168.0.23, then the IP address for the PC can be 192.168.0.30.

airCloud Pro Configuration

Open the web browser in PC, enter the airCloud gateway's IP address in the address bar, input the Username and Password in the login screen. Username and Password are located at the back of the Installation Manual.

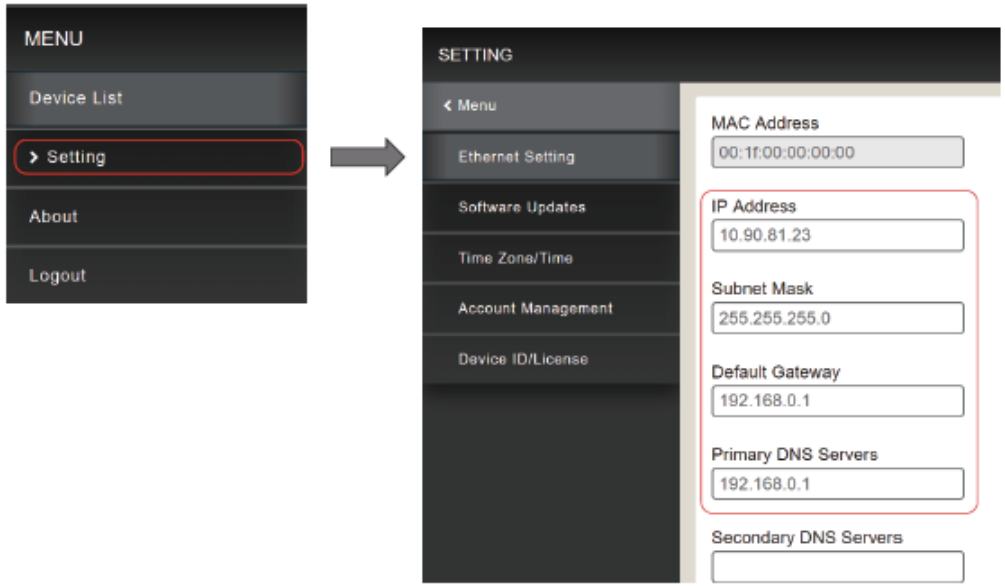


Once logged in, initial screen as below will appear:-



airCloud Pro Configuration

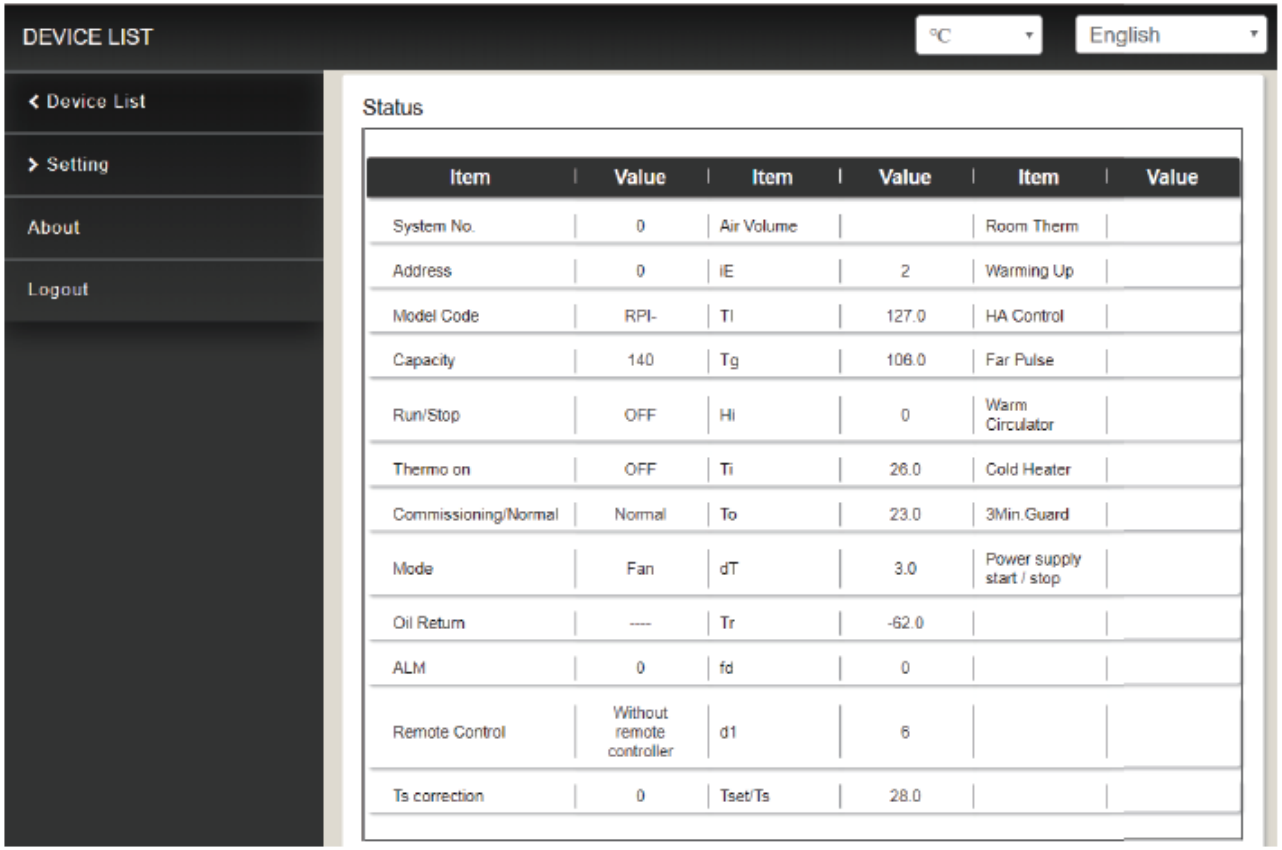
If require to change the IP address of the airCloud gateway to meet target network then click “Setting” and then go into “Ethernet Setting”.

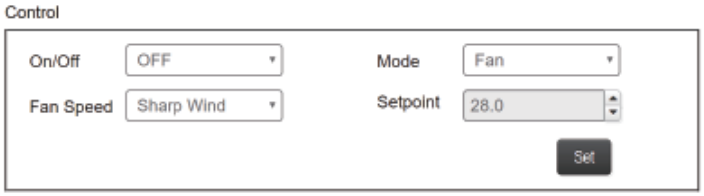


Switch		Mode Setting			Factory Setting
	Pin No.	DHCP Mode	Static Mode	Restore Factory Setting	
DS1 (4-position DSW)	1	ON	ON	OFF	ON
	2	OFF	ON	OFF	OFF
	3	ON	ON	OFF	ON
	4	OFF	OFF	ON	OFF

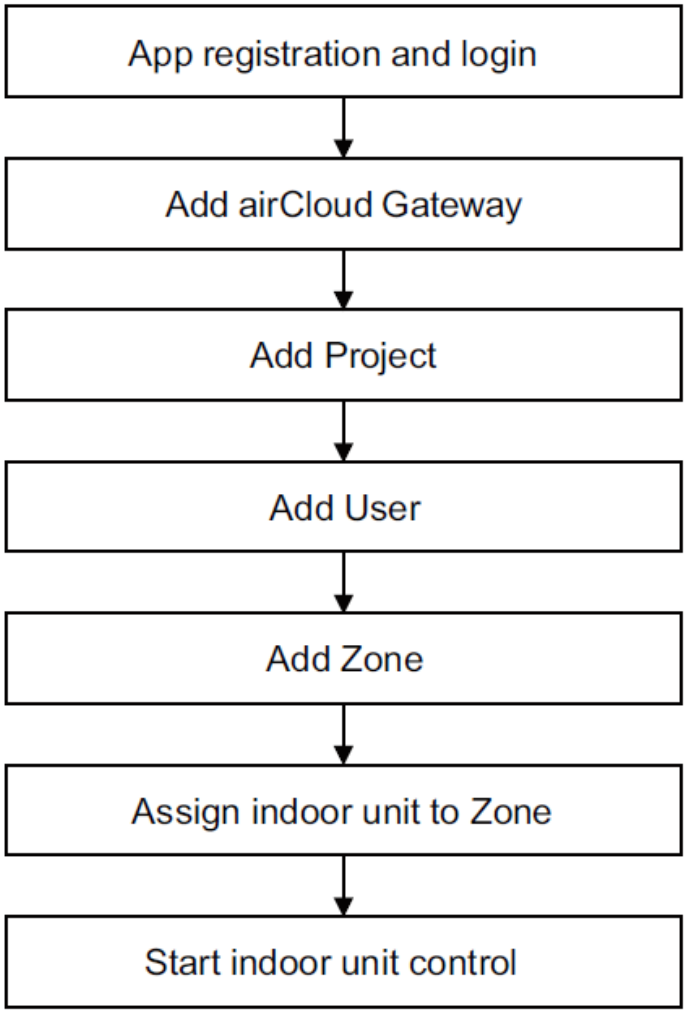
-Use Static Mode when connecting directly by using web browser.
-Use DHCP Mode when using the Website App.

airCloud Pro Configuration

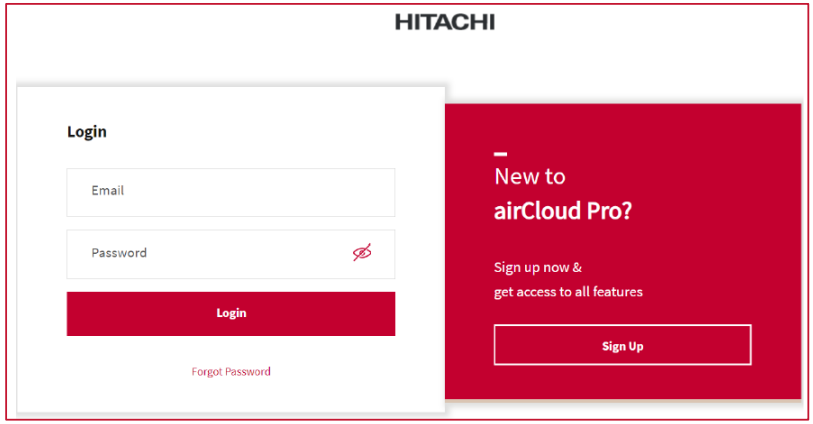




airCloud Pro - Website App Process

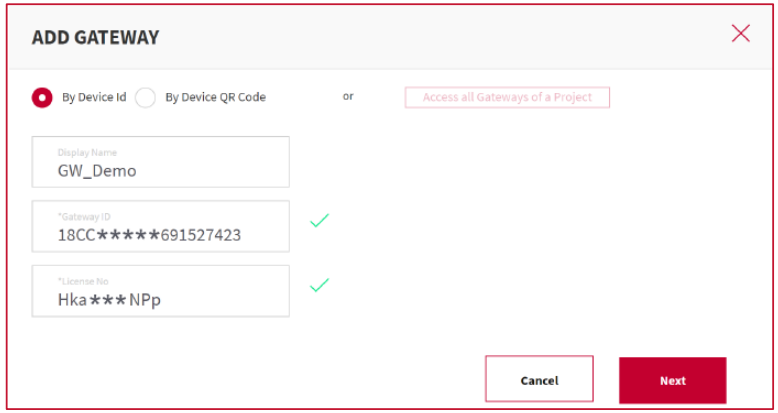


- Web Site
  https://aircloudpro.hitachiaircon.com/

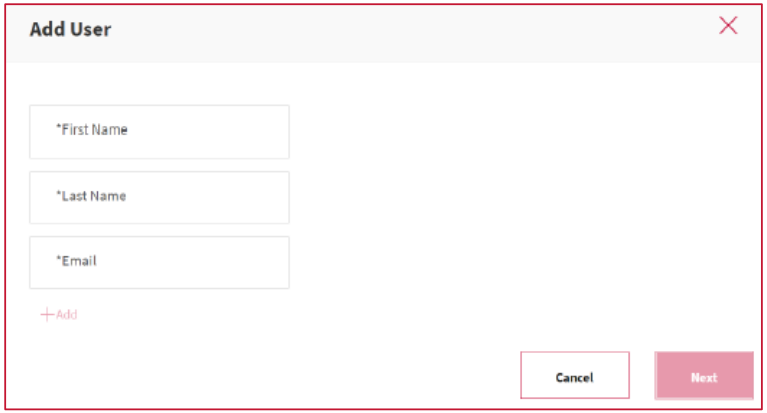


airCloud Pro - Website App Process

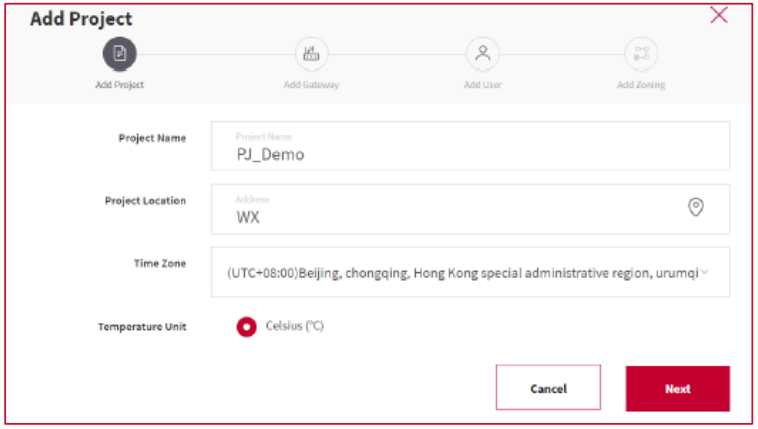
Add airCloud Gateway



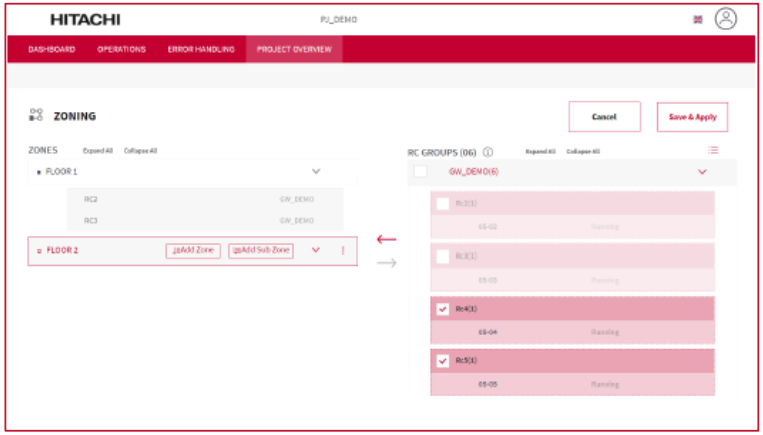
Add User



Add Project

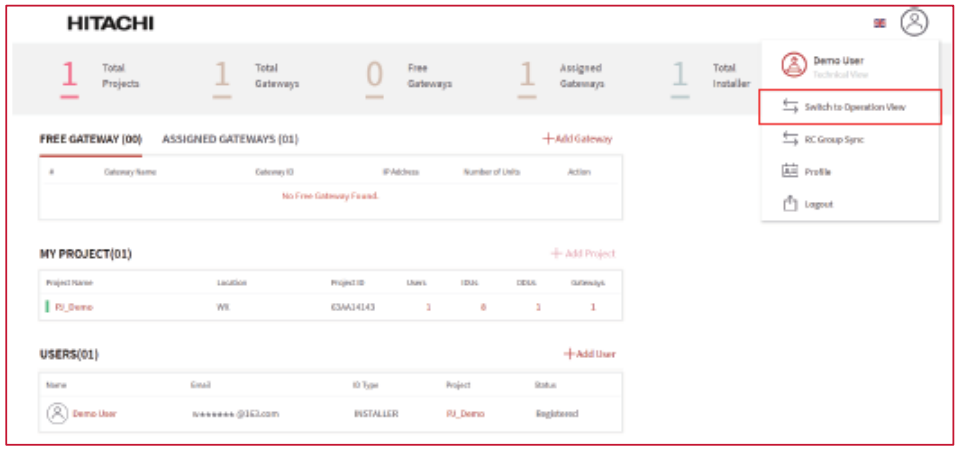


Add Zone

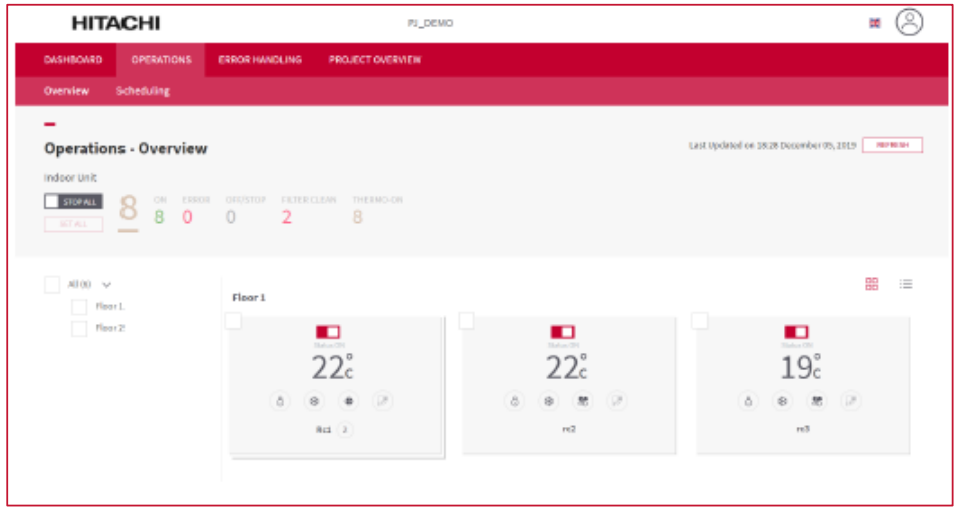


airCloud Pro - Website App Process

Installer View

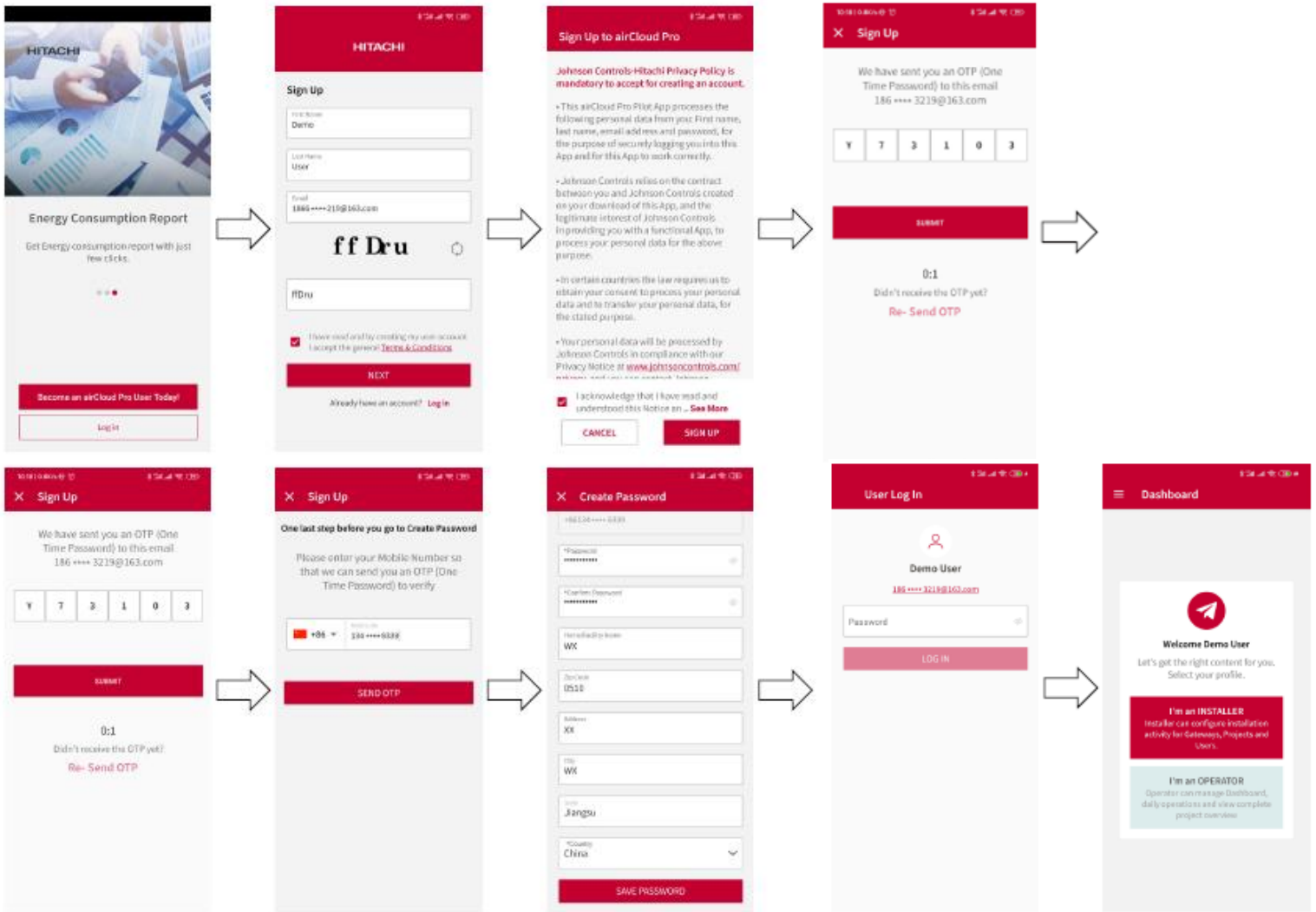


Control Monitor (switch to Operation View)



airCloud Pro - Mobile App

Register an account on mobile phone App following below picture:



Notes

Notes

Notes

North Kellyville Public School NSW, Australia

North Kellyville Public School in Sydney was built with limited cooling, but thanks to a rapid installation by Fredon Air Service, the school now boasts 24 Hitachi Set Free Sigma VRF systems utilising 95 4-Way Cassettes with motion sendor. The project was completed under tight deadlines to meet the NSW government's Cooler Classrooms Program. The new system includes energy-saving features like human activity sensors and central BMS control, ensuring students and staff stay comfortable while minimizing energy consumption.

Hitachi products installed by Fredon Air

24 Set Free Sigma Series VRF Outdoor Units

95 4-Way Cassette Indoor Units with Motion Sensor

7 Touch Screen EZ Central Controllers

179-191 New South Head Road Edgecliff, NSW, Australia

An office building in Sydney's Edgecliff underwent a recent renovation, which included an upgrade of its HVAC system. Due to space constraints and high static pressure requirements, a Hitachi Set Free Σ Heat Recovery VRF system utilising ducted indoor units were installed. This system, combined with Hitachi's airCloud Pro IoT remote management system, offers efficient energy management and remote control capabilities. The compact design of the Hitachi units and their ability to handle high static pressure were key factors in overcoming the challenges of the project.

Hitachi products installed by Techline Air Conditioning Services

3 Set Free Sigma Heat Recovery VRF Outdoor Units

20 Ducted High Static & Mid Static Ducted Indoor Units

airCloud Pro Gateway

Central Station Mini Controller

Thank You


KOZCO
AIR CONDITIONING
ELECTRICAL
SOLAR


NO NEED TO THINK
Helps to redu
Smart Eco
How does it work?

Hitachi Warranty Terms & Conditions
www.temperzone.com/warranty

HITACHI

AUSTRALIA

nswsales@temperzone.com
Sydney: (02) 8822 5700

vicsales@temperzone.com
Melbourne: (03) 8769 7600

qldsales@temperzone.com
Brisbane: (07) 3308 8333

sasales@temperzone.com
Adelaide: (08) 8115 2111

Distributors
Newcastle: (02) 4962 1155
Perth: (08) 6399 5900
Launceston: (03) 6331 4209

Warranty & Technical support
Warranty: auwarrantyservice@temperzone.com
Tech Support: autechnicalsupport@temperzone.com
Freecall (AU): 1800 21 1800

NEW ZEALAND

nzsales@temperzone.com
Auckland: (09) 279 5250
Wellington: (04) 569 3262
Christchurch: (03) 379 3216

Warranty & Technical Support
Warranty: customerservices@temperzone.com
Freecall (NZ): 0800 69 24 72
Tech Support: nztechsupport@temperzone.com
Freecall (NZ): 0800 89 92 77 - Option 2

air

Cooling & Heating

HIT0924