HITACHI

TECHNICAL CATALOG

HITACHI INVERTER-DRIVEN SPLIT SYSTEM
HEAT PUMP AIR CONDITIONERS

- SET FREE FSR INDOOR UNITS -

Technical Catalog

Models

< Indoor Units >

- **Ceiling Type**

RPC-1.5FSR	**RPC-2.0FSR**
RPC-2.5FSR	**RPC-3.0FSR**
RPC-4.0FSR	**RPC-5.0FSR**
RPC-6.0FSR	

TCI-20007

IMPORTANT NOTICE

- HITACHI pursues a policy of continuing improvement in design and performance of products. The right is therefore reserved to vary specifications without notice.
- HITACHI cannot anticipate every possible circumstance that might involve a potential hazard.
- This heat pump air conditioner is designed for standard air conditioning only. Do not use this heat pump air conditioner for other purposes such as drying clothes, refrigerating foods or for any other cooling or heating process.
- Do not install the unit at the following places. It may cause a fire, deformation, corrosion or failure.
  * Places where oil (including machinery oil) may be present in quantities.
  * Places where a lot of sulfide gas drifts, such as hot springs.
  * Places where inflammable gas may be generated or flow.
  * Places where strong salty wind blows, such as coast regions.
  * Places with an atmosphere of acidity or alkalinity.
- Do not install the unit in the place where silicon gas drifts. If the silicon gas attaches to the surface of the heat exchanger, the fin surface repels water. As a result, drain water splashes outside of the drain pan and splashed water runs inside of the electrical box. In the end, water leakage or electrical devices' failure may occur.
- Pay attention to the following points when installing the unit in a hospital or other facilities where electromagnetic waves are generated from medical equipment.
  * Do not install the unit in the place where electromagnetic waves are directly radiated to the electrical box, controller cable or wired controller.
  * Install the unit at least 3 meters away from devices generating electromagnetic waves, such as a radio.
- Do not install the unit in the place where animals and plants catch the direct outlet air. It could adversely affect animals and plants.
- The installer and system specialist shall secure safety against the refrigerant leakage according to the local regulations or standards. The following standards may be applicable, if the local regulations are not available;
  International Organization for Standardization, ISO5149 or European Standard, EN378 or Japan Standard, KHKS0010.
- No part of this manual may be reproduced without written permission.
- It is assumed that this heat pump air conditioner will be operated and serviced by English speaking people. If this is not the case, the customer should be provided with safety, caution and operating signs in the native language.
- If you have any questions, contact your distributor or dealer of HITACHI.
- This manual gives a common description and information for this heat pump air conditioner which you operate as well for other models.
- This heat pump air conditioner has been designed for the following temperatures. Operate the heat pump air conditioner within this range.

Temperature (°C)

		Maximum	Minimum
Cooling Operation	Indoor	30 DB	21.5 DB
	Outdoor	43 DB *	-5 DB *
Heating Operation	Indoor	25 DB	17 DB
	Outdoor	15.5 WB *	-10 WB *

DB: Dry Bulb, WB: Wet Bulb

* The temperature may change depending on the outdoor unit.

- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.

CHECKING PRODUCT RECEIVED

- Upon receiving this product, inspect it for any shipping damage.
  Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
- Check the model number, electrical characteristics (power supply, voltage and frequency) and accessories to determine if they are correct.

The standard utilization of the unit shall be explained in these instructions.
Therefore, the utilization of the unit other than those indicated in these instructions is not recommended.
Please contact your local agent, as the occasion arises.
HITACHI's liability shall not cover defects arising from the alteration performed by a customer without HITACHI's consent in a written form.

SAFETY SUMMARY

< Signal Words >

- Signal words are used to identify levels of hazard seriousness.
  Definitions for identifying hazard levels are provided below with their respective signal words.

⚠ DANGER : DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠WARNING : WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠CAUTION : CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE : NOTICE is used to address practices not related to personal injury.

NOTE : NOTE is useful information for operation and/or maintenance.

SAFETY SUMMARY

⚠ DANGER

- Do not perform the installation work, refrigerant piping work, drain pump, drain piping and electrical wiring connection without referring to our installation manual. If the instructions are not followed, it may result in a water leakage, electric shock or fire.
- Use the specified refrigerant (R410A or R32) to the outdoor unit in the refrigerant cycle.
  Do not charge the unit with material other than R410A or R32, such as hydrocarbon refrigerants (propane or etc.), oxygen, flammable gases (acetylene or etc.) or poisonous gases when installing, maintaining and moving the unit. These flammables are extremely dangerous and may cause an explosion, fire, and injury.
- Do not pour water into the indoor or outdoor unit. These products are equipped with electrical parts.
  If water is poured, it will cause a serious electrical shock.
- Do not open the service cover or access panel for the indoor or outdoor unit without turning OFF the main power supply.
- Do not touch or adjust safety devices inside the indoor unit or outdoor unit. If these devices are touched or readjusted, it may cause a serious accident.
- Refrigerant leakage can cause difficulty with breathing due to insufficient air. Turn OFF the main switch, extinguish any naked flames and contact your service contractor, if refrigerant leakage occurs.
- Make sure that a refrigerant leak test has been performed. Refrigerant (Fluorocarbon or Difluoromethane) for this unit is non-toxic, and odorless. If the refrigerant should somehow escape and come into contact with flame, toxic gas will form. This gas is heavier than air and will settle near floor areas and spread where it can cause suffocation to those nearby. In addition, difluoromethane is flammable and can cause fire.
- The installer and system specialist shall secure safety against refrigerant leakage according to the local regulations or standards.
- Use an ELB (Earth Leakage Breaker).
  In the event of fault, there is danger of an electric shock or fire if it is not used.
- Do not install the outdoor unit where there is high level of oil mist, flammable gases, salty air or harmful gases such as sulfur.
- For installation, firmly connect the refrigerant pipe before the compressor starts operating.
  For maintenance, relocation and disposal, remove the refrigerant pipe after the compressor stops.
- Do not perform a short circuit of the protection devices, such as the pressure switch during operation.
  It may cause a fire and explosion.

SAFETY SUMMARY

⚠WARNING

- Do not use any sprays such as an insecticide, lacquer or hair spray, or other flammable gases within approximately one (1) meter from the system.
- If the circuit breaker or fuse is often activated, stop the system and contact your service contractor.
- Check that the ground wire is securely connected. If the unit is not correctly grounded, it will lead to electric shock. Do not connect the ground wiring to a gas piping, water piping, lighting conductor or ground wiring for telephone.
- Connect a fuse of specified capacity.
- Before performing any brazing work, check to ensure that there is no flammable material around. When handling the refrigerant, be sure to wear leather gloves to prevent cold injuries.
- Protect the wires, electrical parts, etc. from rats or other small animals.
  If not, rats may gnaw at unprotected parts, which may lead to a fire.
- Fix the cables securely. External forces on the terminals could lead to a fire.
- Provide a sufficiently strong foundation. If not, the unit may fall down and it may lead to injuries.
- Do not install the unit in a place where oil, vapor, organic solvent and corrosive gas (ammonia, sulfur compound and acid) may be present in quantities.
  It may cause refrigerant leakage due to corrosion, electrical shock, deteriorated performance and breakage.
- Perform the electrical work according to Installation Manual and all the relevant regulations and standards. If the instructions are not followed, an electrical shock and fire may occur due to insufficient capacity and inadequate performance.
- Use specified cables between units and choose the cables correctly. If not, an electrical shock or fire may occur.
- Ensure that the wiring terminals are tightened securely with the specified torques. If not, a fire or an electrical shock at the terminal connection part may occur.

⚠CAUTION

- Do not step on the product nor put any material on it.
- Do not put any foreign material on the unit or inside the unit.
- Provide a strong and correct foundation so that;
  a. the outdoor unit does not incline.
  b. abnormal sound does not occur.
  c. the outdoor unit will not fall down due to a strong wind or an earthquake.

SAFETY SUMMARY

NOTICE

- Do not install the indoor unit, outdoor unit, wired controller and cables within approximately 3 meters from strong electromagnetic wave radiators, such as medical equipment.
- Supply electrical power to the system to energize the crankcase heater for 12 hours before startup after a long shutdown.
- Make sure that the outdoor unit is not covered with snow or ice, before operation.
- The packaged air conditioner may not be operated normally under the following cases.
  * In case that electrical power for the packaged air conditioner is supplied from the same power transformer as the device with high electricity consumption*.
  * In case that the power source wires for the device* and for the packaged air conditioner are located close to each other.

  (Device*: (Ex) Lift, container crane, rectifier for electric railway, inverter power device, arc furnace, electric furnace, large-sized induction motor and large-sized switch.)

  Regarding the cases mentioned above, surge voltage may be inducted in the power supply wiring for the packaged air conditioner due to a rapid change in power consumption of the device and an activation of switch. Therefore, check the field regulations and standards before performing electrical work in order to protect the power supply for the packaged air conditioner.

NOTE

- It is recommended that the room be ventilated every 3 to 4 hours.
- The heating capacity of the heat pump unit decreases according to the outdoor air temperature. Therefore, it is recommended that auxiliary heating equipment be used in the field when the units is installed in a low temperature region.

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1. Features

1.1 System Features

New SET FREE FSR Ceiling Type Indoor Units

HITACHI proudly introduces the New SET FREE FSR Ceiling Type Indoor Units, the highly-efficient and reliable air conditioning system. Recently, an increasing number of buildings are requiring "Intelligent" facilities - communication networks, office automation, as well as a comfortable environment. Particularly, a comfortable space is required all the day through the year in office buildings. This multi-split system air conditioner, SET FREE can meet these requirements. The proven combination of the scroll compressor and the inverter provides the best air conditioning for small/medium office buildings.

New Line-up of Indoor Units

Type		Model Name
Indoor Unit	Ceiling	RPC-1.5FSR
		RPC-2.0FSR
		RPC-2.5FSR
		RPC-3.0FSR
		RPC-4.0FSR
		RPC-5.0FSR
		RPC-6.0FSR

1.2 Appearance

1.3 Features on Indoor Units

Characteristic	Outline
Improvement of Energy Saving (1) The energy saving has been achieved with the combination of current outdoor units. (2) The energy saving is improved by the optional motion sensor.	• High efficiency has been achieved by adopted fan runner and fan motor and the performance of heat exchanger has also been improved. • The motion sensor function controls the setting temperature, air flow volume and air flow direction, according to the extent of human activity.
High Efficiency and Low Noise by Adopting Fan Runner	With fan runner with L-shaped fins, the air flow between fins has been improved and low noise has been achieved.
Louver Design	• Large-sized amenity auto louver softens the discomfort by temperature irregularity and cold draft. • The auto louver as a shutter during the operation stoppage improves design.
Flexibility of Installation to High Ceiling	The air flow volume “HIGH 2” has been added, which is larger than “HIGH”.
Added Optional Receiver Kit	• The air flow volume “HIGH 2” can be selected with the wireless controller. • By using the wired controller, the unit can be connected to the motion sensor kit.

NOTICE

The wired controller “PC-ARF1” must be used for this ceiling type indoor units.

The details are described as follows.

▮ Improvement of Energy Saving

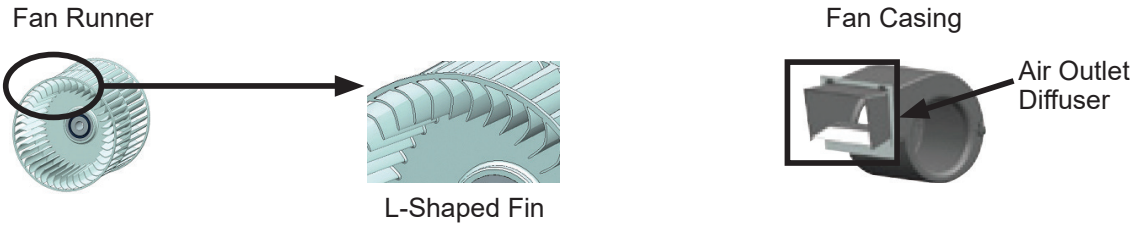
(1) The energy saving has been achieved with the combination of current outdoor units.

(2) Improvement of Energy Saving Operation by Motion Sensor

* Adoption of Motion Sensor Function
- The motion sensor function controls the setting temperature, air flow volume and air flow direction according to the extent of human activity.
- The energy saving has also been improved by combining the motion sensor function and the individual operating function, compared with the standard operation.

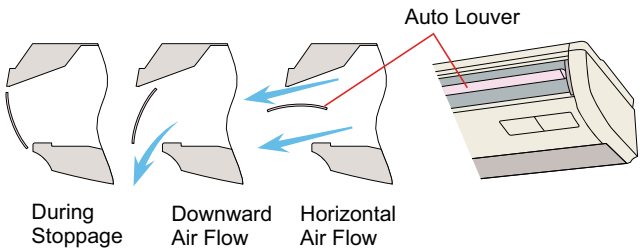
▮ High Efficiency and Low Noise by Adopting Fan Runner

Developed fan runner has been adopted. By improving shapes of fin and air outlet, the fan efficiency and the low noise have been improved.

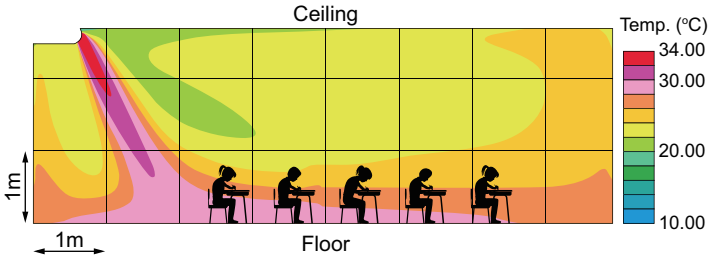


▮ Adoption of Amenity Auto Louver

Large-sized amenity auto louver with the same color as indoor unit body has been adopted. It softens the discomfort by temperature irregularity and cold draft. The auto louver as a shutter during the operation stoppage improves design.



< Temperature Distribution >



The comfortable heating air reaches every corner of the room, mainly around floor, during the heating operation.

- Simulation Condition
  Room Dimension: 2.7m (h) x 8m (d) x 8m (w)
  Horse Power: 5HP
  Air Flow Volume and Direction: HIGH 2 and Downward Air Flow
  Standard Condition for Heating: Air Inlet Temp. 20°C

- Wide Range Air Flow Volume Setting
  The number of air flow volume setting is 4 taps (HIGH 2, HIGH, MED and LOW).

- Adoption of Optional Receiver Kit (PC-ALHP1)
  Using Receiver Kit PC-ALHP1 with wireless controller PC-AWR makes wireless remote control possible.
  Receiver Kit PC-ALHP1 can uses “HIGH 2.”

  NOTES:
  1. When using the Receiver Kit PC-ALHP1 with wired controller PC-ARF1, set PC-ARF1 as the main wired controller.
  2. When using the Receiver Kit PC-ALHP1 with Motion Sensor Kit SOR-NEP, the setting from wireless controller PC-AWR is unavailable. Use wired controller PC-ARF1 for the setting.

Motion Sensor Control

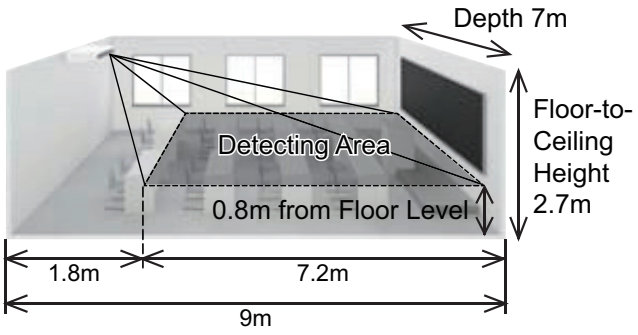
The air conditioning capacity is saved automatically depending on a situation and the amount of detected human activity by adopting the motion sensor on the corner of the lower cover. The energy saving can be improved more with the individual operating function. In addition, the operation can stop automatically if the absent situation continues for more than 30 minutes[*1)]. The motion sensor keeps the indoor environment more comfortable and reduces unnecessary operations[*2)].

*1): The default setting is “30 minutes”. However, the setting is changeable.
*2): The default setting is “Running Operation”. However, “Automatic Stop” can be selected by setting from the wired controller.

• Detecting Area for Human Activity
Detecting Diameter: Approx. 7.0m x 7.2m[*3)]
(0.8m…height from floor surface)
The motion sensor may not detect human activity just under the indoor unit (1.8m x 7.0m).

*3): The detecting area is smaller if a person in the room hardly moves just like when one stretches on a chair, etc. The detecting diameter can change to approximately 6.0m.

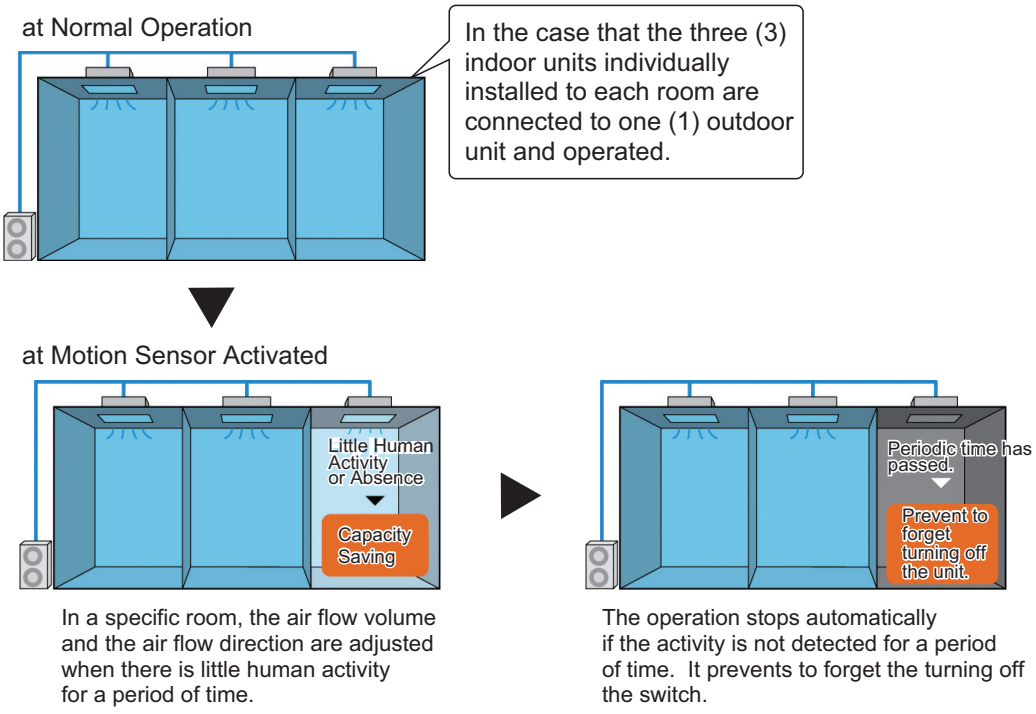
< Detecting Area >
Example for 1.5 to 6HP indoor units



NOTICE: Motion Sensor

1. The motion sensor detects human activity. However, if someone is in a room with a bit motion, the motion sensor may detect the absence of human.
2. The motion sensor may detect human activity, if the indoor unit with the motion sensor is installed near a moving object having different temperature from ambient atmosphere.
3. The motion sensor may detect the absence of human even if someone is in a room, when the indoor unit with the motion sensor is installed on a high ceiling (higher than 4m).

※ The outdoor unit connectable to the motion sensor kit is limited. Refer to the table “Corresponding Outdoor Units for Motion Sensor Function” in the item 6 for the corresponding models.



In a specific room, the air flow volume and the air flow direction are adjusted when there is little human activity for a period of time.

The operation stops automatically if the activity is not detected for a period of time. It prevents to forget the turning off the switch.

ATTENTION:
Do not use the motion sensor function when a baby or a handicapped person stays alone.
The motion sensor may detect the absence of human and the operation may stop in the case of someone staying for long time with a bit motion.

▮ Sequence of Detection by Motion Sensor

Motion Sensor detects the infrared variation by sensor elements.

↓

Analog voltage is generated according to the infrared variation.

↓

Analog voltage is convert to an digital signal at the threshold.

▮ Sequence of Controlling Motion Sensor at Indoor Unit

The Indoor unit detects whether someone is present or not according to the condition of the digital signal.

↓

The Indoor unit measures the frequency of detected human activity for a period of time.

↓

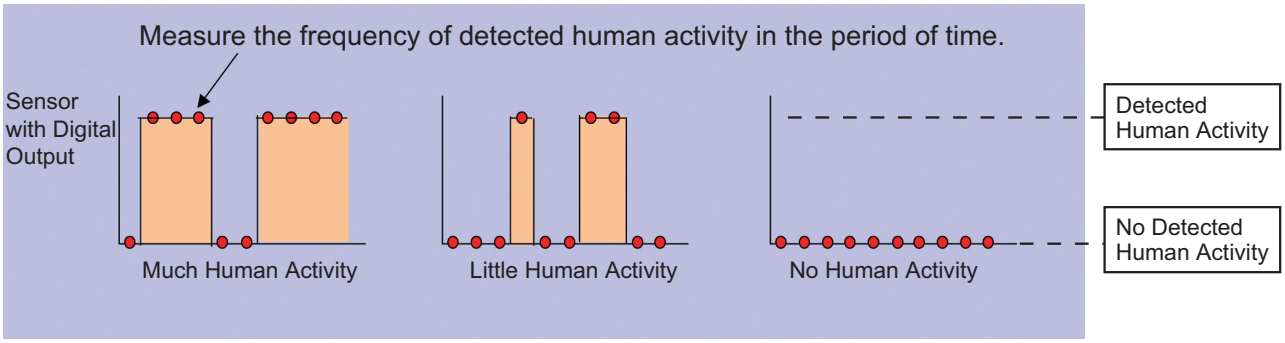
The Indoor unit determines the extent of human activity depending on the calculated reaction rate (frequency).

↓ *Reaction Rate (Frequency) = Detected Counts of Human Activity / Measured Counts of Time

The Indoor unit changes to each operating mode depending on the extent of human activity and the elapsed time.

↓

The Indoor unit controls the operation automatically in each operating mode.

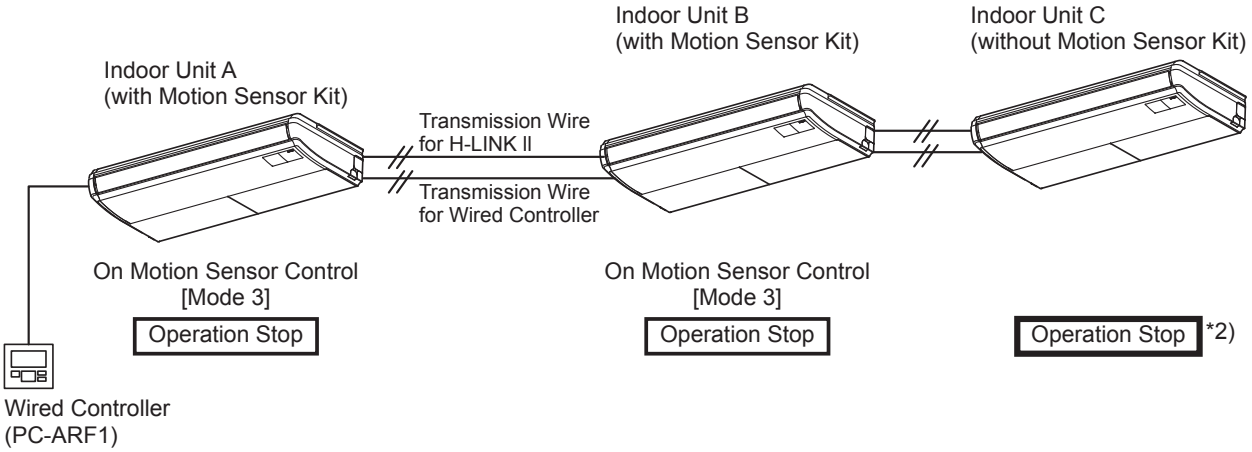


▮ Descriptions of Motion Sensor Control Condition

Condition		[Standard Operation]	[MODE 1]	[MODE 2]	[MODE 3]		
MENU on Wired Controller	"If Absent"	-	-	-	Running Operation	Standby	Stop*1)
Indoor Unit	Adjusting Value of Temperature Setting	Adjusting 0°C	Adjusting 1°C	Adjusting 2°C		Forced Thermo-OFF	[Mode3] Same Condition as Standby
	Air Flow Volume	Setting Air Flow Volume	Setting Air Flow Volume-1 (Min: Low)	Setting Air Flow Volume-1 (Min: Low)		Slo	
	Air Flow Direction	Set Air Flow Direction	Horizontal	Horizontal		Horizontal	

*1): The operation will be stopped by the wired controller PC-ARF1 when all the indoor units with the motion sensors switch to "MODE 3". If the operation is stopped by the wired controller PC-ARF1, it will not restart even if the motion sensor detects the human motion. The indoor unit without the motion sensor and the indoor unit with the motion sensor can be mixed. In this case, the indoor unit without the motion sensor will also be stopped by the wired controller PC-ARF1 as shown in the figure below*2).

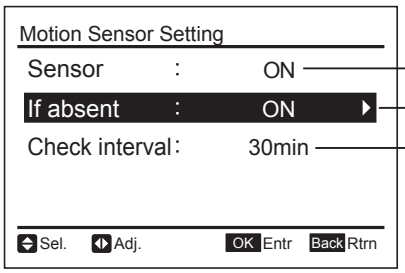
In the case of the motion sensor setting "If Absent: OFF" is set by the wired controller.



▮ Wired Controller (PC-ARF1) Setting and Display

The motion sensor setting can easily be set with the wired controller. The indication of “Motion Sensor ON” is displayed on the wired controller LCD during controlling the motion sensor.

LCD Indication during Setting



● Sensor

ON: The operating control function by the motion sensor is activated.

OFF: The operating control function by the motion sensor is not activated.

● If absent

The operation mode for activations during the automatic capacity save operation can be selected from “ON”, “Stand-by”, or “OFF” on the wired controller. It is set for the indoor unit operation after the motion sensor detects as an absence for the set time in “Check interval”.

ON: The operation continues with saving the capacity after being detected as an absence.
If human activity is detected over a period of time, normal operation is performed again.

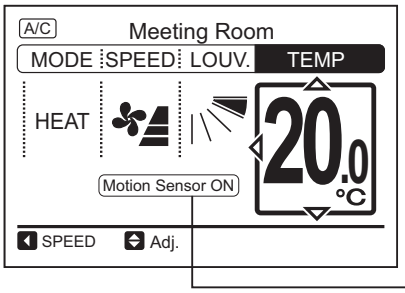
Stand-by:
The operation mode is the fan operating at “Slow” speed. If human activity is detected for a period of time, normal operation is performed again.

OFF: The operation is stopped by the wired controller when all the indoor units with motion sensor detect an absence that is connected with the same wired controller. If human activity is detected for a period of time by the stoppage, normal operation is performed again.

● Check interval

When the motion sensor detects an absence at a selected check time interval, the function “If absent” is executed. The interval can be selected from choices ranging from: 30, 60, 90, 120, or 180 minutes.
(The default setting is 30 minutes.)

LCD Indication during Operation



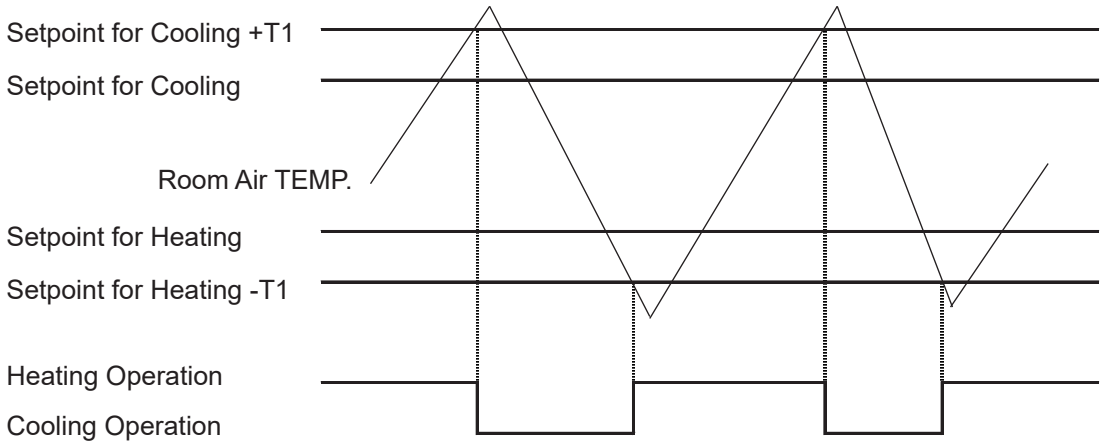
“Motion Sensor ON” is displayed on the wired controller LCD during capacity saved operation or operation stopped by the motion sensor control.

▮ Cooling/Heating Auto Changeover Dual Setpoint Control

This function is utilized to change cooling and heating operation automatically (the same operation mode for indoor units in the same refrigerant cycle) depending on both cooling setpoint and heating setpoint (dual setpoint).
This is applicable only to the Heat Recovery System.

Dual Setpoint Control Setting:
This setting is available through the optional function in the Function Selection Menu, which is located in the Test Run Menu of the wired controller.

< Control Operation Time Chart >



T1: Differential temperature for cooling/heating changeover

NOTE:
The function is absolutely possible to combine the units with PC-ARF1 that the update will be released in October 2018.

▮ Setback Temperature Control

Setback Temperature Control is mainly to sustain a comfort room air temperature while occupants are out of the room.

Four features are shown below:

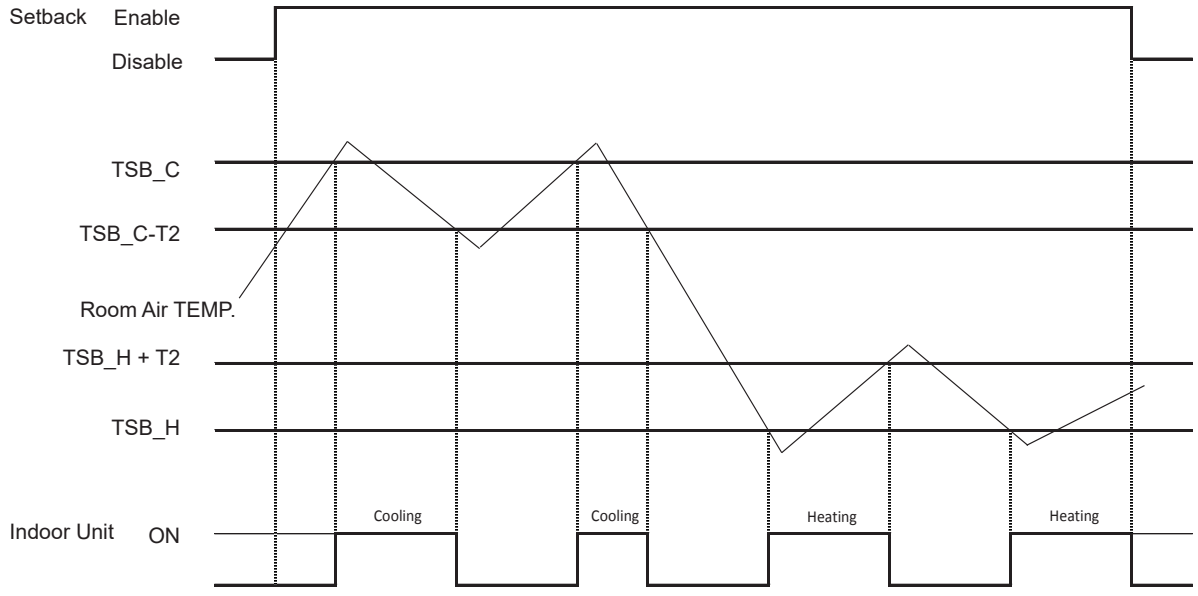
Mode	Usage Example
Setback Input	At hotel rooms, the Setback Temperature Control will be activated when the card key is taken out. As soon as the card key is inserted again, the normal control will be restored.
Setback Schedule	Setback Temperature Control works during a predetermined period such as during night time. The period should be configured by users. The normal control will be restored once the predetermined period is over.
Setback Manual	During a long down time such as during a vacation, the Setback Temperature Control will remain working as long as the user leaves it on. When turning off the Setback Temperature Control manually, the normal control will be restored.
Setback Always	Setback Temperature Control always runs.

During the control is operating, "Setback" must be displayed on the LCD of the wired controller.

Setback Control Setting:
This setting is available through the optional function in the Function Selection Menu, which is located in the Test Run Menu of the wired controller.
In case of using an external input, the external input setting will also be required on the Test Run Menu in the wired controller.

NOTE:
The function is absolutely possible to combine the units with PC-ARF1 that the update will be released in October 2018.

< Control Operation Time Chart >



TSB_C: Setback operation starting temperature for cooling.
TSB_H: Setback operation starting temperature for heating.
T2: Differential temperature for setback temperature.

1.4 Features on Options

HITACHI provides the optional accessories for indoor units.

		RPC-FSR
Wired Controller	PC-AR	×
	PC-ARF1	○ (*1)
Wireless Controller	PC-AWR	○ (*1)
7-Day Timer	PSC-A1T	○
Central Station	PSC-A64S	○ (*2)
	PSC-5S	○ (*2)
	PSC-A64GT	○
	PSC-A32MN	○
Central Station DX	PSC-A128WX2 + PSC-AS2048WXB2	○
Central Station NT	PSC-A128WEB3	○
Central Station EX	PSC-A128EX	○
Centralized ON/OFF Controller	PSC-A16RS	○
H-LINK Relay	PSC-5HR	○
Receiver Kit	PC-ALHP1	○
Controller Cable	PRC-5K	○
	PRC-10K	○
	PRC-15K	○
3P Connector Cable	PCC-1A	○
Remote Sensor	THM-R2A	○

○ : Available
× : Not Available

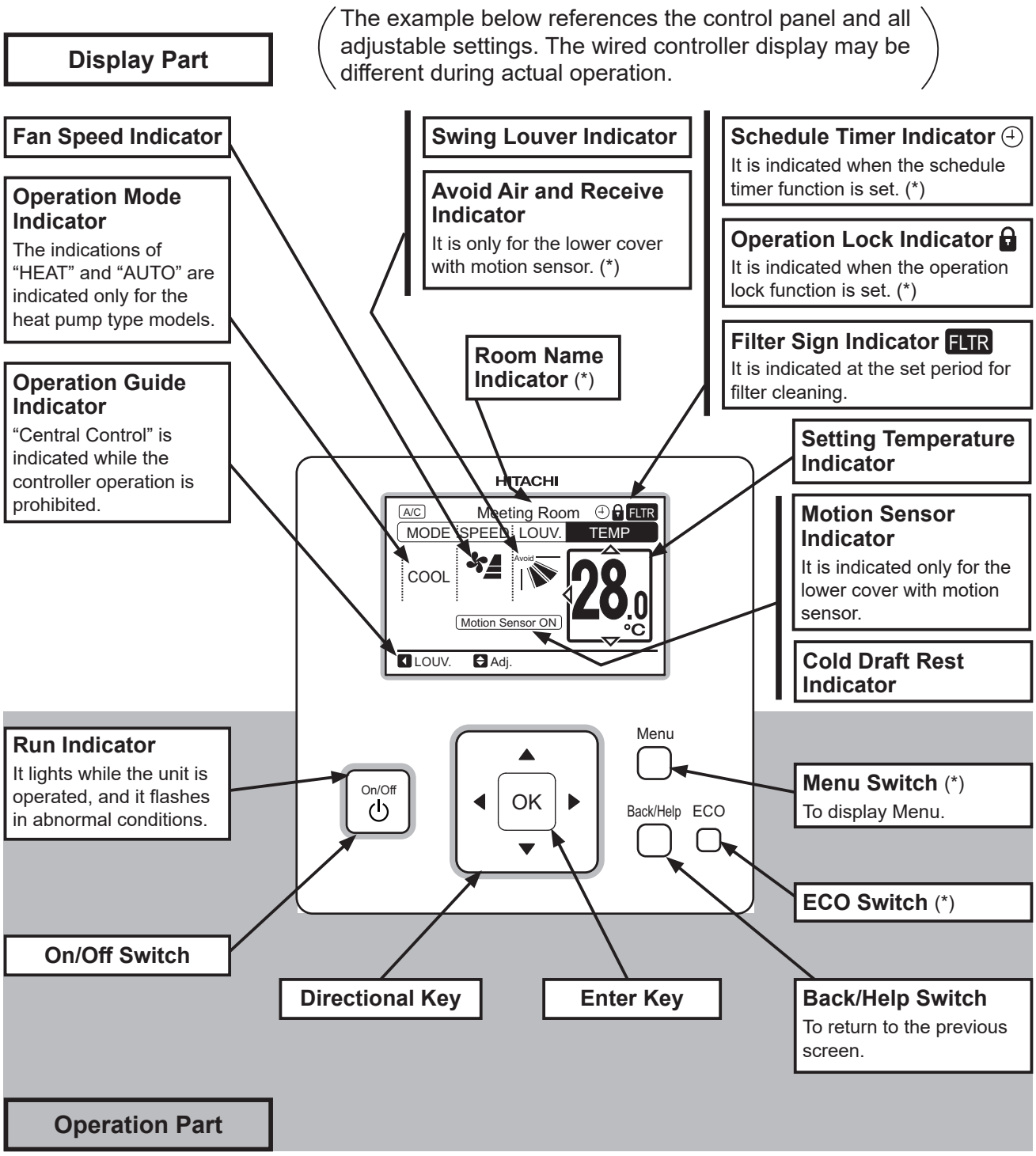
(*1): When this ceiling type indoor unit is used with the controller, PC-ARF1 or PC-AWR must be used.
(*2): These central stations do not provide support for the air flow volume function “HIGH 2” of this ceiling type. Therefore, when this ceiling type indoor unit is used with the central stations, the controller (PC-ARF1 or PC-AWR with PC-ALHP1) is required.

NOTE:
Refer to chapter 8 “Optional Accessories” for details.

1.4.1 Wired Controller: PC-ARF1

Model: PC-ARF1

Following is an example of how the PC-ARF1 is utilized. If other models of the controller are utilized, operate the unit according to the manual for that controller.

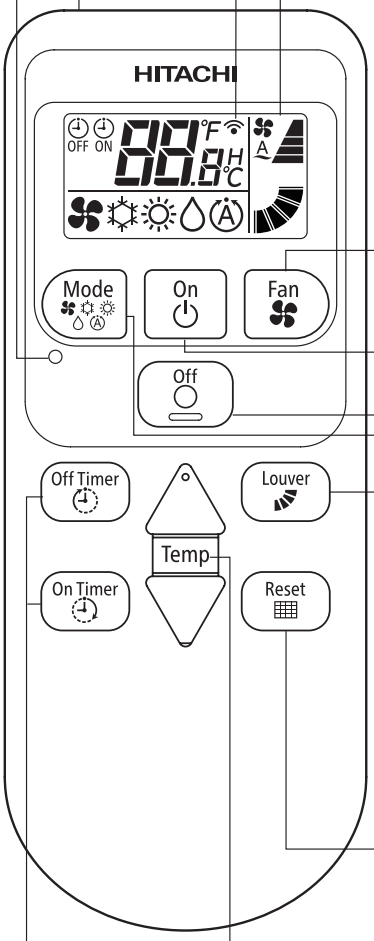


NOTE

* For detailed descriptions, refer to the "Operation Manual" for the wired controller.

1.4.2 Wireless Controller: PC-AWR

Model: PC-AWR



- Reset Switch
- Transmitter
  Point the transmitter towards the receiver of the indoor unit when sending commands. The transmitting indication on the liquid crystal display flashes when sending commands.
- Transmitting Indication: It will turn ON when sending commands by infrared rays.
- LCD (Liquid Crystal Display)
  The set temperature, timer operation, position of air louver, operation mode, air flow mode, etc., are indicated.
  NOTE:
  The diagram of the display shown on the left is for explanation purposes only. The display will differ during actual operation.
- Fan Speed Switch
  Press this switch to select the fan speed. By repeatedly pressing the switch, the setting will change sequentially through LOW, MED, HIGH, HIGH2 and AUTO.
  * Depending on the setting for selecting the function, it is possible to set the ON/OFF for the Fan Speed AUTO.

- On Switch
  Operation of the unit can be started by pressing this switch.
- Off Switch
  Operation of the unit can be stopped by pressing this switch.
- Mode Selection Switch
  By repeatedly pressing the mode switch, the unit cycles through the different operating modes in the order of FAN, COOL, HEAT, DRY, AUTO.
  * Depending on the setting for selecting the function, it is possible to set the ON/OFF for AUTO, HEAT and DRY display.

  FAN, COOL, HEAT, DRY, AUTO
- Louver Angle Switch
  The airflow angle and auto-louver operation can be set by this switch.
  When pressing the switch, the angle is changed in the following order.
  (In COOL or DRY or AUTO operation modes, steps 1-5 and Auto swing are available.)

- Filter Sign Reset Switch
  When it is time to perform the filter cleaning, the filter indicator lamp will be turned ON so turn is OFF.
  The alarm sound can be cancelled temporarily by pressing the switch.
- Temp. Switch
  The setting temperature can be adjusted using this switch.
  By " Δ " pressing, the temperature will increase by 1°C (or 0.5°C*) at a time.
  By " ∇ " pressing, the temperature will decrease by 1°C (or 0.5°C*) at a time.
  NOTE:
  Depending on the setting for selecting the function, it is possible to set the unit 1°C (or 0.5°C*) for the temperature range.
  * Only available for the combination of the indoor unit and receiver kit with the function "0.5°C increment".
- Timer Switches
  Used to set the timer.
  The set time can be changed by pressing "On Timer" or "Off Timer".
  The timer can be set from 0.5 to 23 hours. When 0.5 to 9.5 hours, the unit will set as 30 min. at a time, and when 10 to 23 hours, the unit will be set as 1 hour at a time.

NOTE

- Press lightly the switches to control the controller. Do not press the controller by sharp objects such as a pen. It may cause breakage of control part.
- For UTOPIA or SET FREE series, either wired or wireless controllers are available. However, when the centralized controller is connected, there are restrictions in order to operate the multiple indoor units by one wireless controller or utilize the wired and wireless controllers together. Contact your distributor or contractor.
- For twin, triple and quad combination, the wired controller shall be utilized. When the wireless controller is utilized, the optional receiver kit is required.

1.4.3 7-Day Timer: PSC-A1T

Model: PSC-A1T

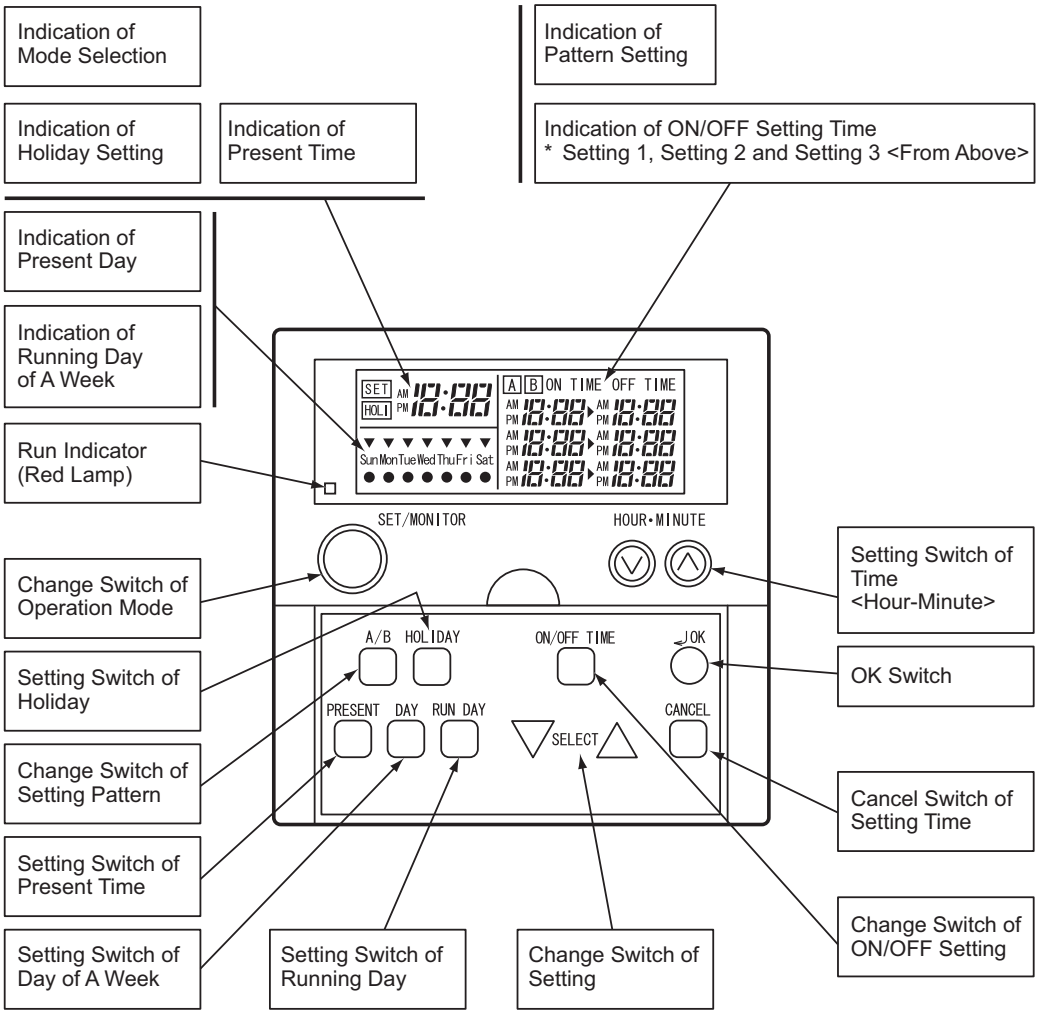
By plugging this timer into the optional wired controller, daily ON/OFF operation control throughout the week is available.
7-Day Timer has power failure back-up dry cell. The ON/OFF control is available three times a day at a maximum and the ON/OFF time can be set by the minute.

Functions
This 7-day timer provides the following functions.

- ON/OFF Setting Time in a Week.
- ON/OFF Setting is available three times a day.
- Present time is indicated.
- Running time is indicated.

Liquid Crystal Display Section

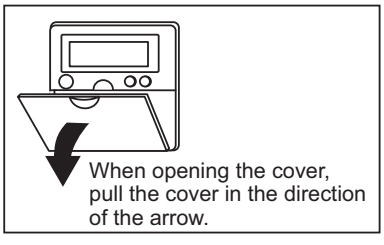
The figure below shows all the indications for reference.
The actual display during operation is different.



Operation Switch Section

The above figure shows the control timer with the cover opened.

The present time and the ON/OFF setting time are indicated by 12-hour units (AM0:00 – 11:59, PM0:00 – 11:59).

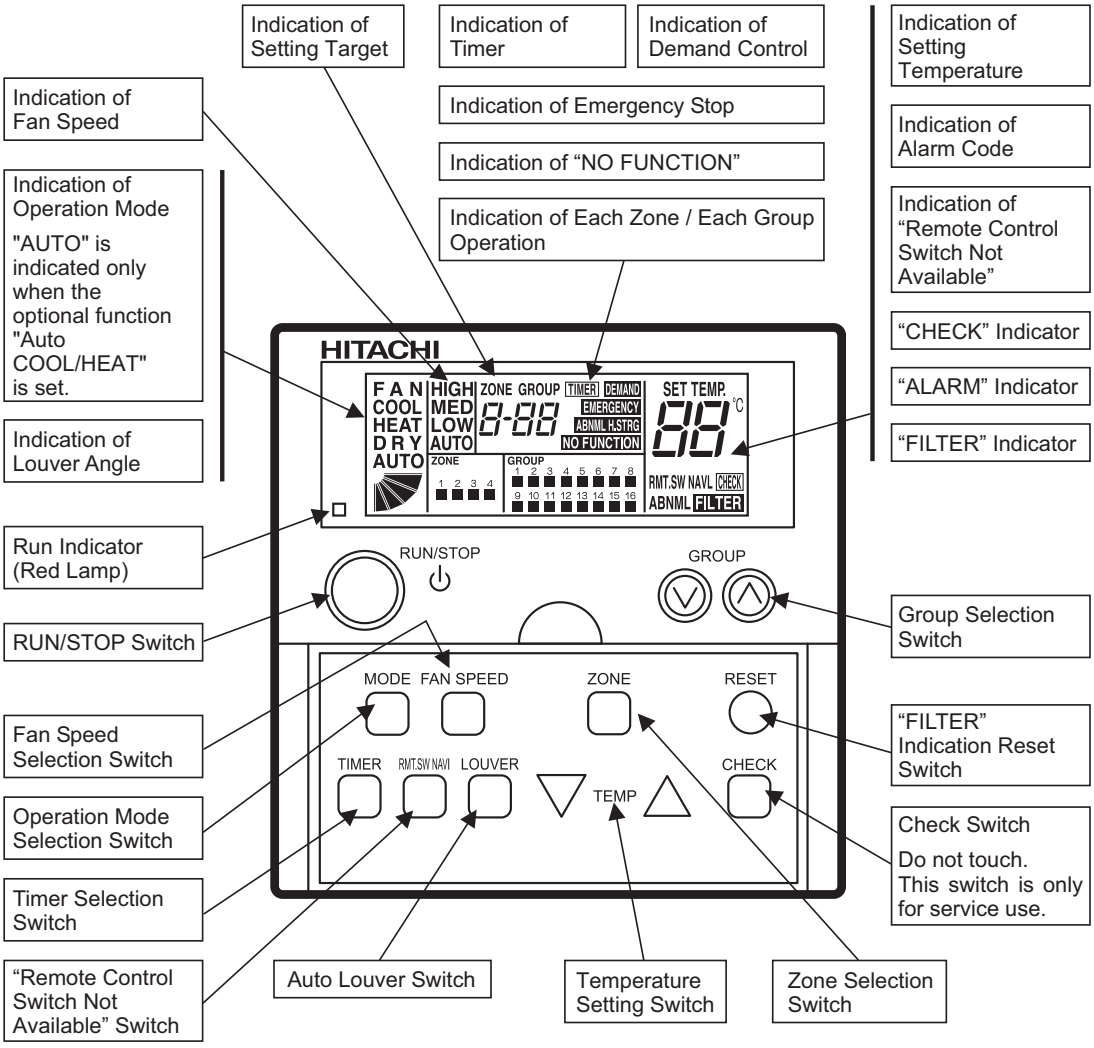


1.4.4 Central Station: PSC-A64S

Model: PSC-A64S

Liquid Crystal Display Selection

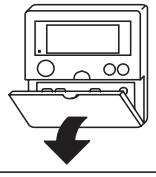
The figure below shows all the indications for reference.
The actual display during operation is different.



Operation Switch Selection

The above figure shows the control timer with the cover opened.

When opening the cover, pull the cover in the direction of the arrow.



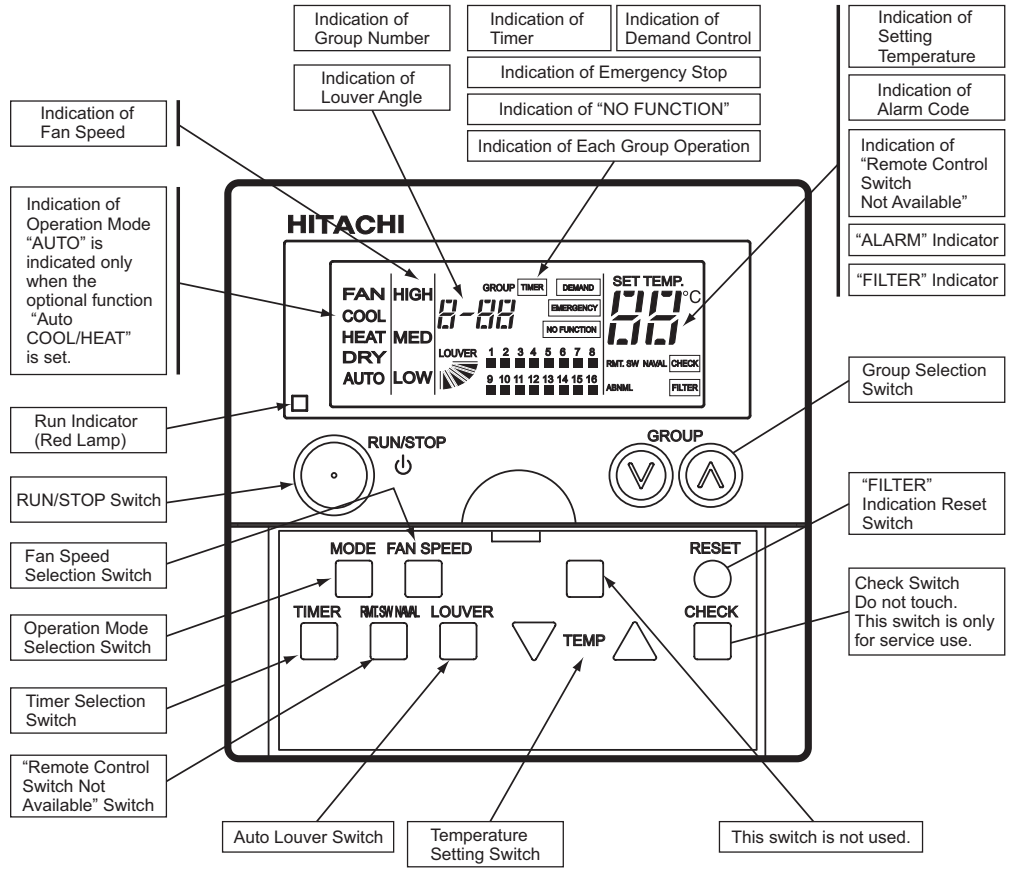
1.4.5 Central Station: PSC-5S

Model: PSC-5S

This central station is of the soft touch type. (Operation except with finger is not recommended.)
Activation can be checked by referring to the liquid crystal display and LEDs.

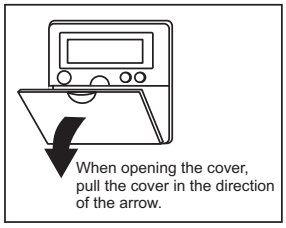
Liquid Crystal Display Section

The figure below shows all the indications for reference.
The actual display during operation is different.



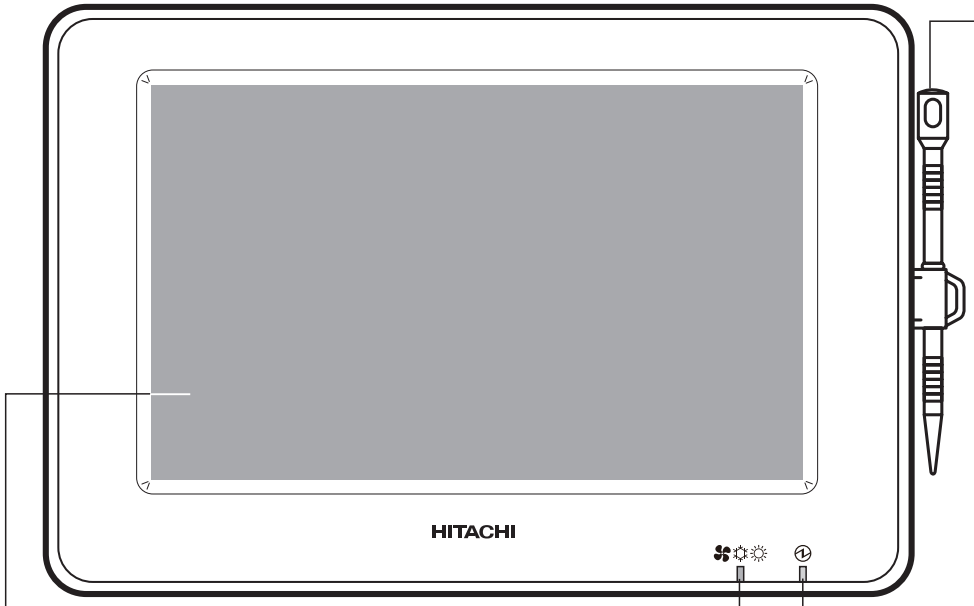
Operation Switch Section

The above figure shows the central station with the cover opened.



1.4.6 Central Station: PSC-A64GT

Model: PSC-A64GT



Touch Pen

To operate
the touchscreen of
the central station.

Color LCD Display with Touchscreen

To operate and monitor the units on the touchscreen display. It is operated by using touch pen (accessory). The touchscreen display will automatically sleep when the touchscreen is not operated for the given length of time.

Power Indicator

To indicate the power condition of the central station.
OFF (lamp): Power is turned OFF
ON (lamp): Power is turned ON

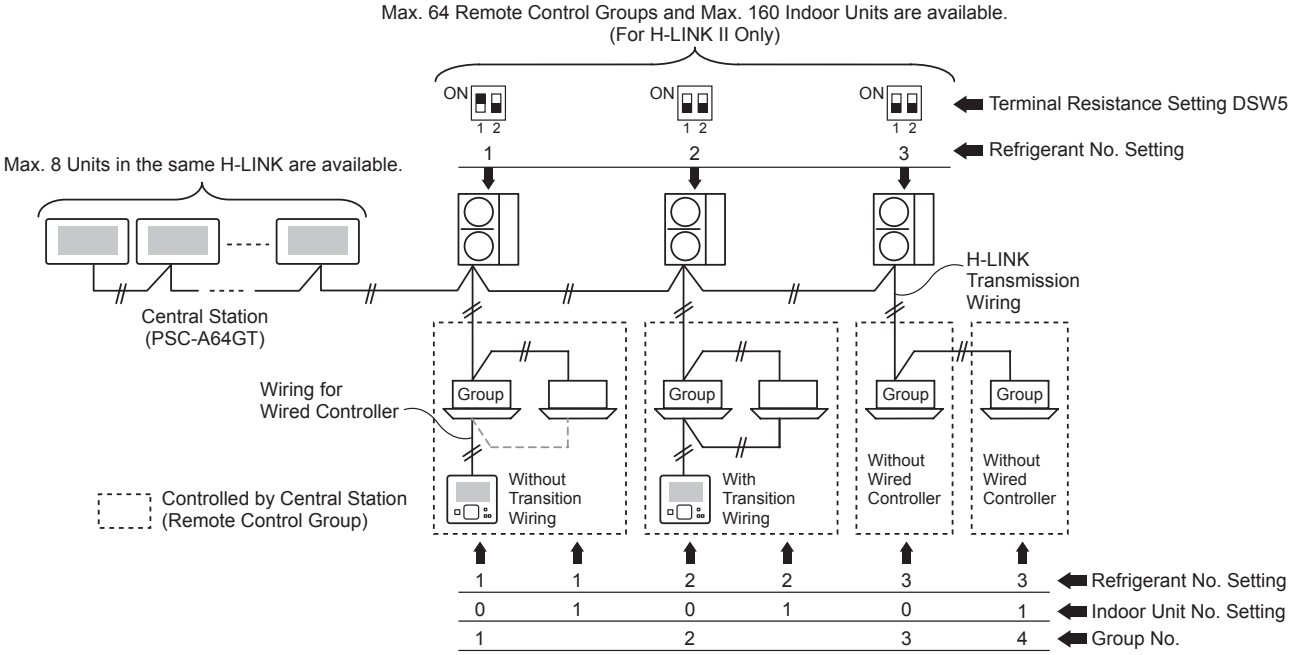
Operation Indicator

To indicate the Run/Stop condition of the units.
OFF: All the units are stopped.
ON (Green): One or more units are in operation.
Flashing (Red): In abnormal condition

NOTE:
Remove the protection sheet on LCD (liquid crystal display) before using this product.

▮ System Example (PSC-A64GT)

This central station (PSC-A64GT) is connected to H-LINK and used for the central control and monitoring of the air conditioners. The system configuration example is shown below.

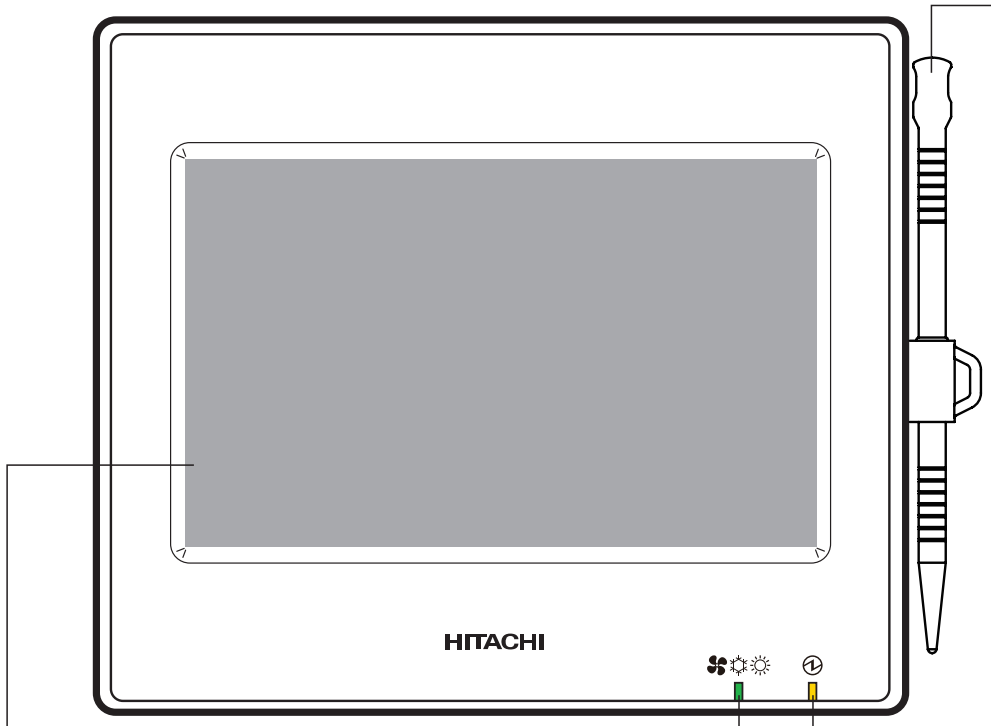


NOTES:

1. Turn OFF all the power supply of the indoor unit and the outdoor unit before dip switch setting. If not, the setting is invalid.
2. Do not set the same indoor unit number in the same refrigerant cycle. If the same number exists, the alarm code of “35” will appear.

1.4.7 Central Station: PSC-A32MN

Model: PSC-A32MN



Touch Pen

To operate
the touchscreen of
the central station.

Color LCD Display with Touchscreen

To operate and monitor the units by the touchscreen display. It is operated by using touch pen (accessory). The touchscreen display will automatically sleep when the touchscreen is not operated for the given length of time. Gesture control is not supported such as :

- Tap 2 places simultaneously
- Flick Operation

Power Indicator

To indicate the power condition of the central station.

OFF (lamp): Power is turned OFF
ON (lamp): Power is turned ON

Operation Indicator

To indicate the Run/Stop condition of the units.

OFF: All the units are stopped.
ON (Green): One or more units are in operation.
Flashing (Red): In abnormal condition

NOTE:
Remove the protection sheet on LCD (liquid crystal display) before using this product.

1.4.8 Central Station DX: PSC-A128WX2, PSC-AS2048WXB2

Product Name	Model
Central Station DX: Adapter	PSC-A128WX2
Central Station DX: Management Software	PSC-AS2048WXB2

(1) Managing Maximum 2048 Groups (2560 Indoor Units) of Air Conditioners
Up to 2560 units of Air Conditioners can be controlled and monitored by one computer.

(2) Improved Operability by Tree View and Simple Schedule Setting
- User-friendly display is achieved by laying out whole configuration of the air conditioning system by the tree view.
- "Simple Schedule Setting" is adopted to achieve easy schedule setting.

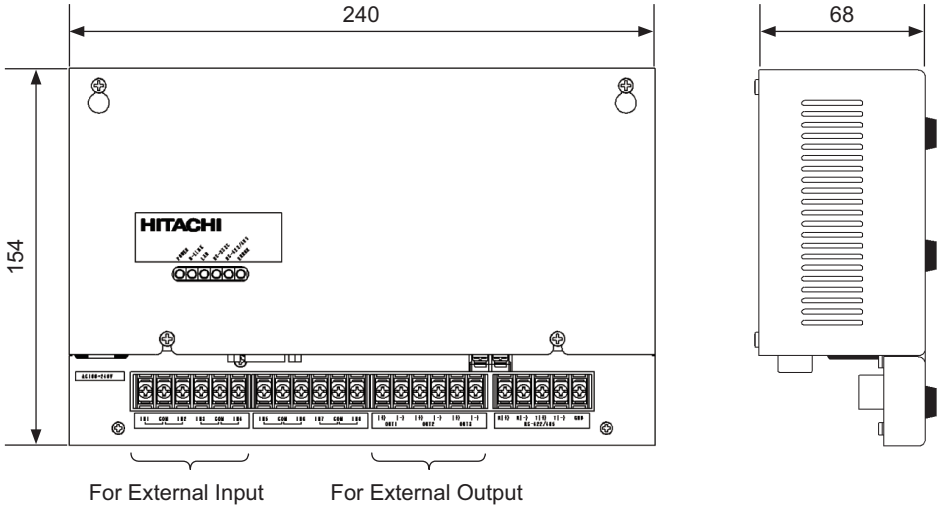
(3) Graphic Display for Trend Data
"Visualization" is achieved by showing graphics of elapsed operation time, temperature setting and intake temperature for each specified Group or air conditioner.
* Some items may be shown upon certain condition only.

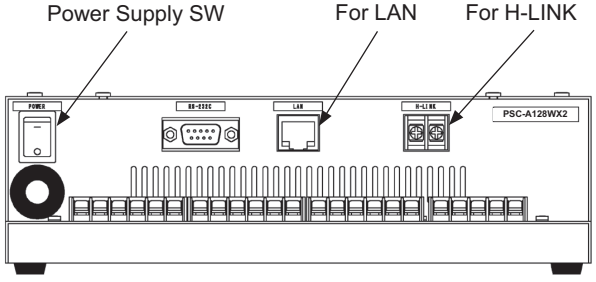
(4) Outdoor Unit Optional Function Setting, Capacity Control, Lower Noise Control
- Outdoor Unit Optional Function Setting, Capacity Control and Lower Noise Control can be set from this system.
- Capacity and Noise can be controlled via schedule setting or manual operation by a user.
* Available only if these functions are supported by the outdoor unit.

(5) Adopting Operation Ratio
The operation ratio function can be controlled on the same display with monitored air conditioners using the changeover button.

- Adapter
Model: PSC-A128WX2

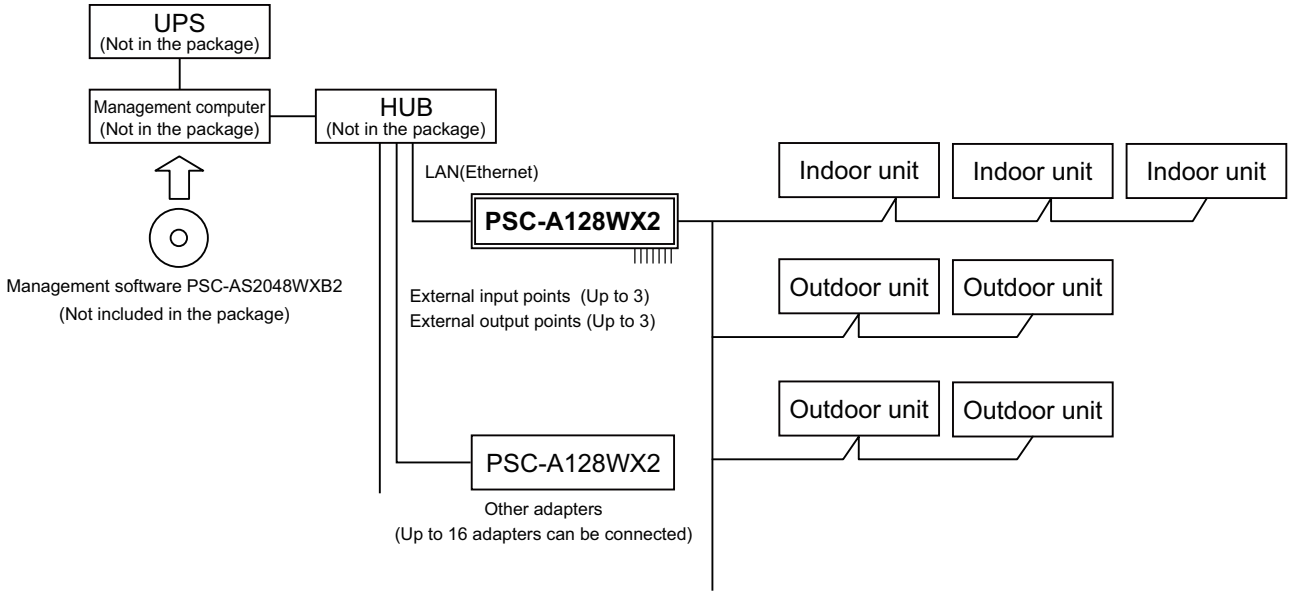
(Unit: mm)





- Management Software
Model: PSC-AS2048WXB2

< Example for System Configuration >



- The management computer upon which is stored the PSC-AS2048WXB2 software is solely dedicated to this system and is assumed to be in operation at all times. It should also be connected to the UPS (Uninterruptible Power Supply).
- The PSC-AS2048WXB2 management software is not included in this package.
- Up to 16 adapters can be connected to this system.
- External PSC-A128WX2 input connections numbered (4-8) cannot be used.
- The management computer, UPS, HUB and associated types of wiring are not included in this package.
- UPS (including its configuration), and RS-232C Interface or Wake on LAN function (including its configuration) for the management computer will be required if automatic shut down of the management computer upon power failure is required.
- UPS (including its configuration), and Wake on LAN function (including its configuration) for the management computer will be required if automatic restart of the management computer upon recovery from power failure is required.
- “Ethernet” is a trademark registered by the Xerox Corporation in the United States of America.

1.4.9 Central Station NT: PSC-A128WEB3

Model: PSC-A128WEB3

(1) Easy-to-View and Operable Screen
- User-friendly screen is achieved by laying out whole configuration of the air conditioning system in one window. Tree of Blocks and Groups can be displayed in a pop-up window .
- Detailed information (room names, icons and setting temperature) of Blocks, Groups and units are displayed altogether in one panel.
- It is easy to perform management by displaying all the groups (128 groups) on one screen without scrolling the screen.
- A [Simple setting] button is available to register the schedule easily in a dialogue.
- It is possible to manage the temperature display based on the installation area by switching in Celsius or Fahrenheit degrees.

(2) OS Compliant
Windows® 7 Home Premium (32bit/64bit)
Windows® 7 Professional (32bit/64bit)
Windows® 7 Ultimate (32bit/64bit)
Windows® 8 (32bit/64bit)
Windows® 8 Pro (32bit/64bit)

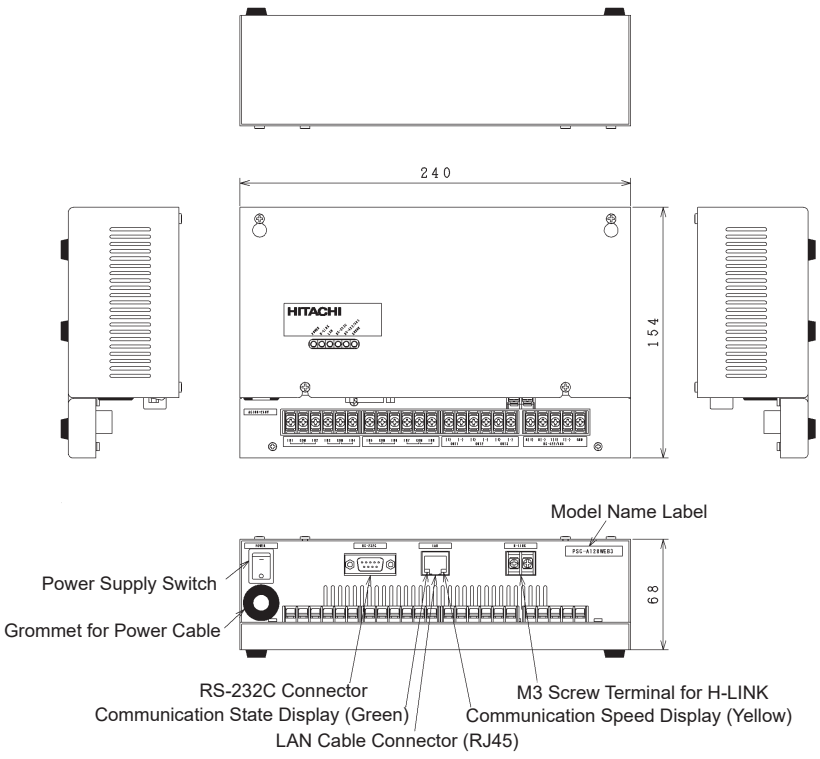
(3) Enlargement of Display Size
It is possible to match with the screen resolution of the monitor by selecting among the 3 types introduced below:
1024 x 768 pixels (Display around 15 inches)
1366 x 768 pixels (Wide screen display)
1280 x 1024 pixels (Display around 17 to 19 inches)

(4) Equipped to switch a display language function
It is possible to operate in the language according to the installation area by equipping with the English/French switching function.

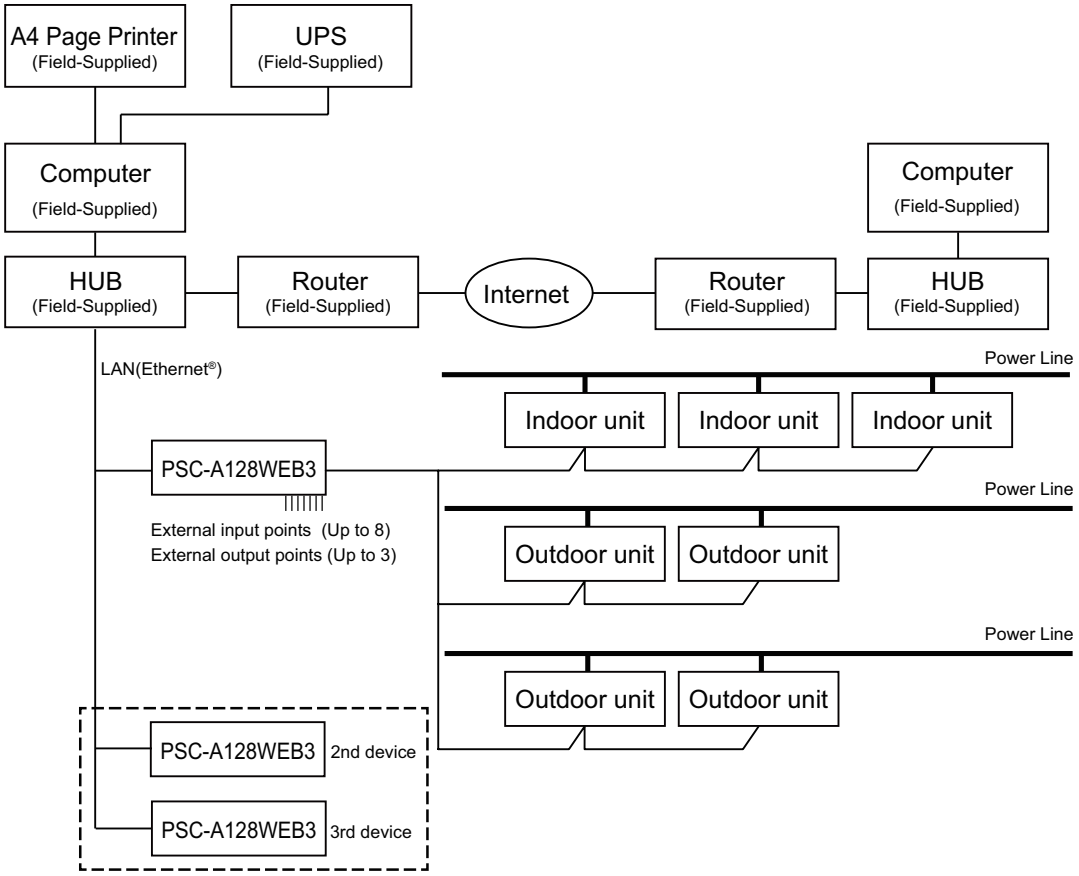
(5) Equipped with Filtering Function
By selecting conditions such as [Remote Controller prohibited] or [Filter Sign enable] in the filtering settings screen, the extracted indoor unit in a specific state can be displayed.

(6) Extension of External Input Number
The number of the external input increases 8 points than 3 points at the current central station web, so that the outdoor unit capacity can be easily controlled.

(Unit: mm)



< Example for System Configuration >



The 2nd and 3rd device connection is possible when air conditioning proportional rate division is not complete.

NOTES for System Configuration

1. [Emergency Stop] is the control with the highest priority within the whole control.

NOTES for Wiring Connection

1. If the computer automatically re-start when recovering from a power failure, the UPS with wiring wire are required.
2. When using the UPS, Wake on LAN function or RS-232C wire is required.

1.4.10 Central Station EX: PSC-A128EX

Model: PSC-A128EX

Product Name	Model
Central Station EX:	PSC-A128EX
Extension Adapter:	PSC-AD128EX *1
Energy Calculation Software:	PSC-AS01EXC *2

*1: Required only when the system consists of multiple H-LINKs
*2: Required only for calculating electricity

(1) Management of up to 2,048 groups (2,560 indoor units)*
This product alone can monitor and control air conditioners.
* With 15 extension adapters (optional) connected.

(2) Touch screen LCD
Adopted 12.1 inch wide color LCD will provide user-friendly touch screen operation.

(3) Supports SD memory card and USB flash device
Operation and status now can be saved and acquired. Utilize saved data for energy saving by displaying and analyzing on PC.

(4) Electricity ratio
Electricity ratio is now available as an optional feature.

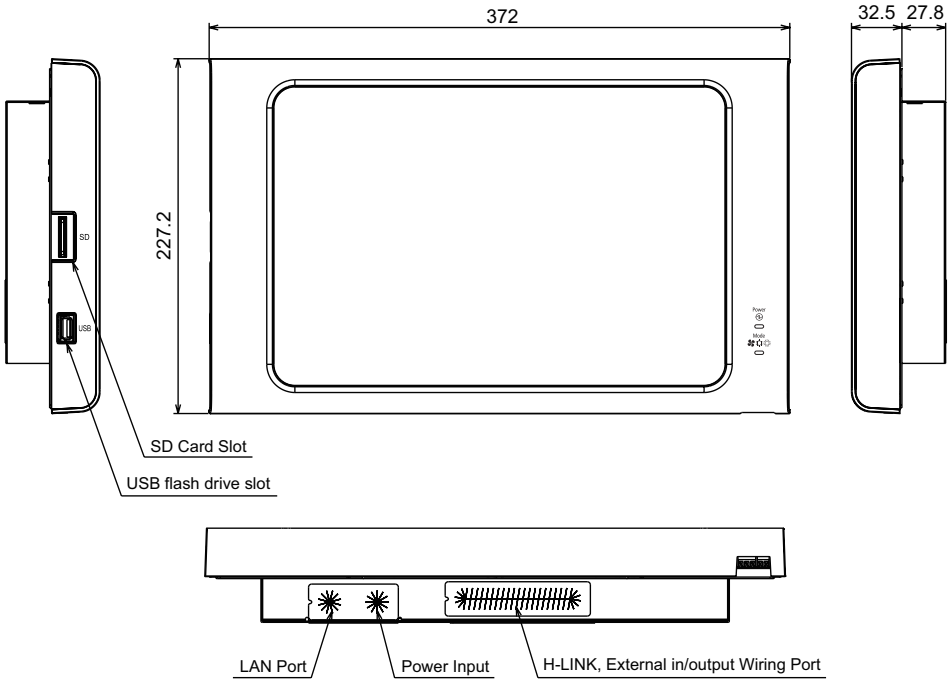
(5) Various information display styles
Choose from panel/layout/list display depending on the number of controlled points and items to be monitored.
- Panel: Displays items that are frequently controlled/monitored.
  Panel size can be selected from 7 types.
- Layout: Shows physical allocation of ACs from flat pattern and/or bird's eye view.
- List: Shows all information of air conditioners.*
  Information can be sorted/filtered by status and setting states to monitor only what is necessary.
  * Utilize sorting/filtering to narrow down the items to be shown.

(6) No more restrictions on H-LINK wiring
ACs on different H-LINKs now can be arranged into one target group (Block or Area).

(7) Pulse input count
Meter reading is now available by connecting pulse transmission meters.

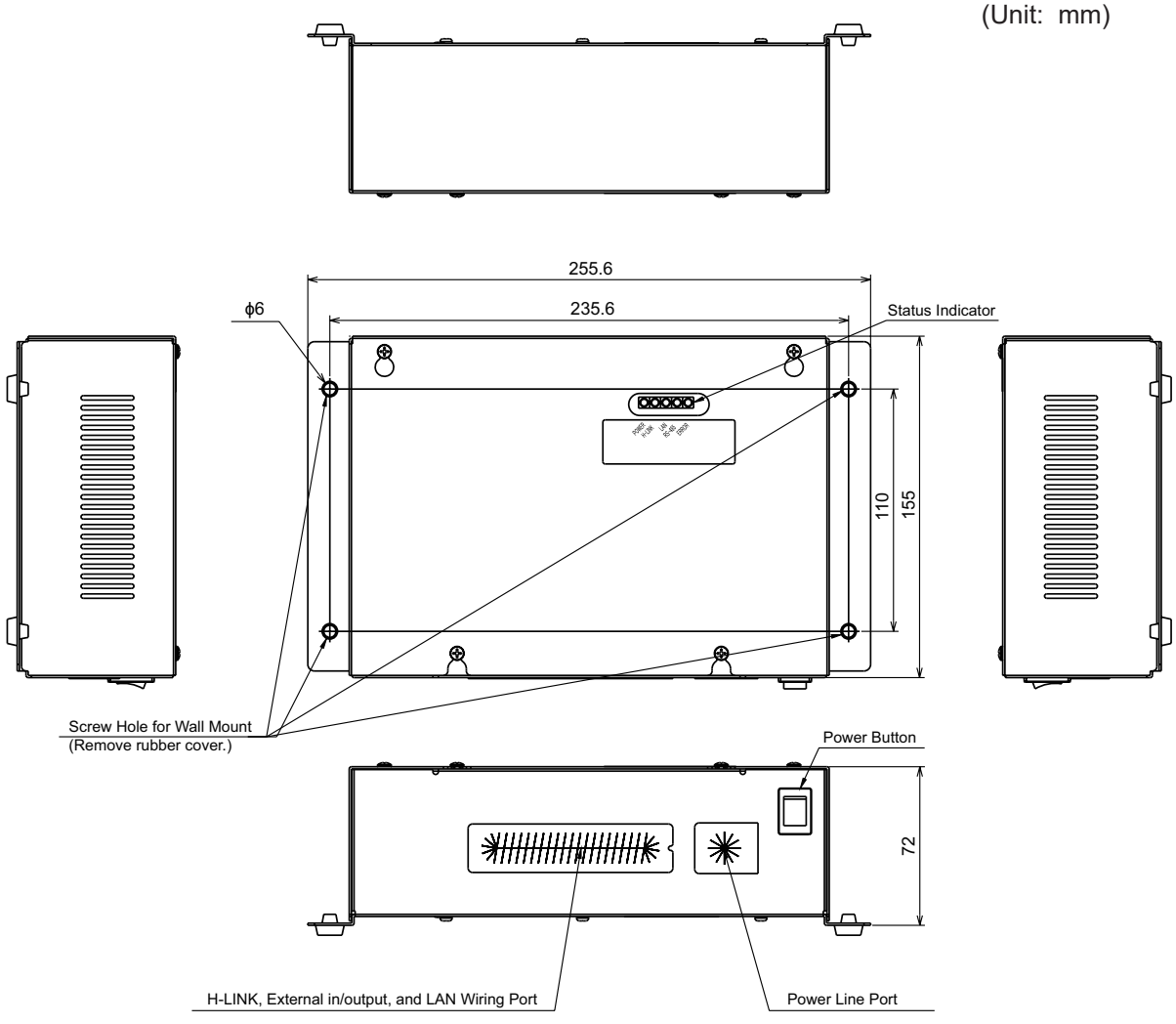
- Central Station EX: PSC-A128EX

(Unit: mm)

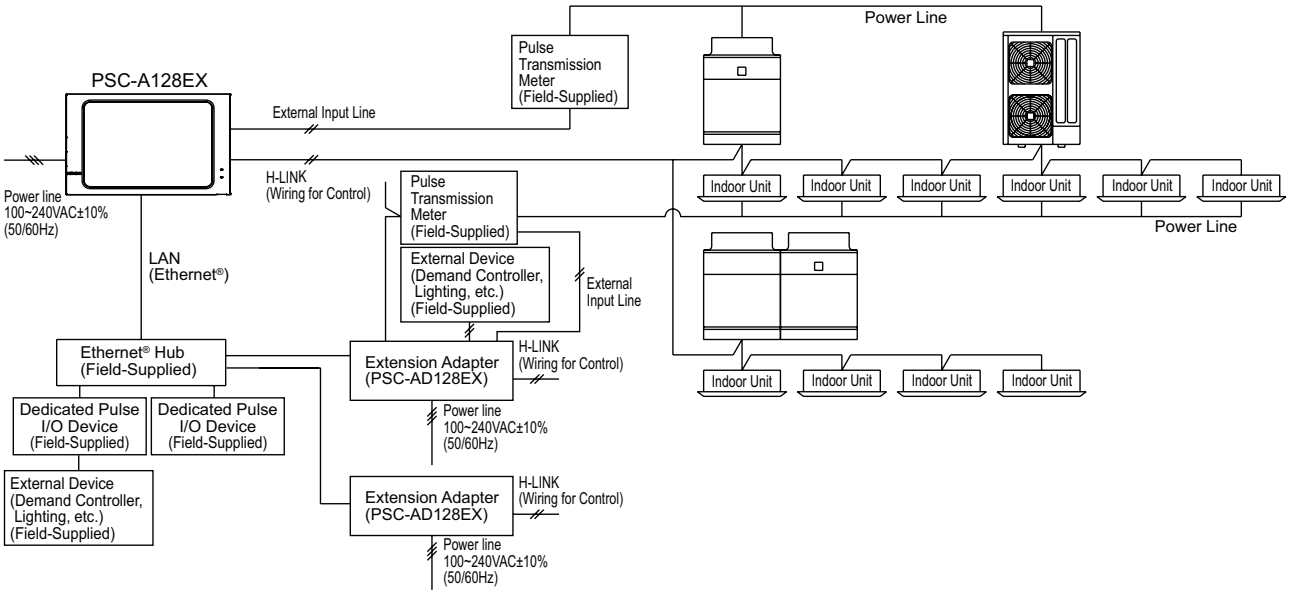


- Extension Adapter: PSC-AD128EX

(Unit: mm)



< Example for System Configuration >

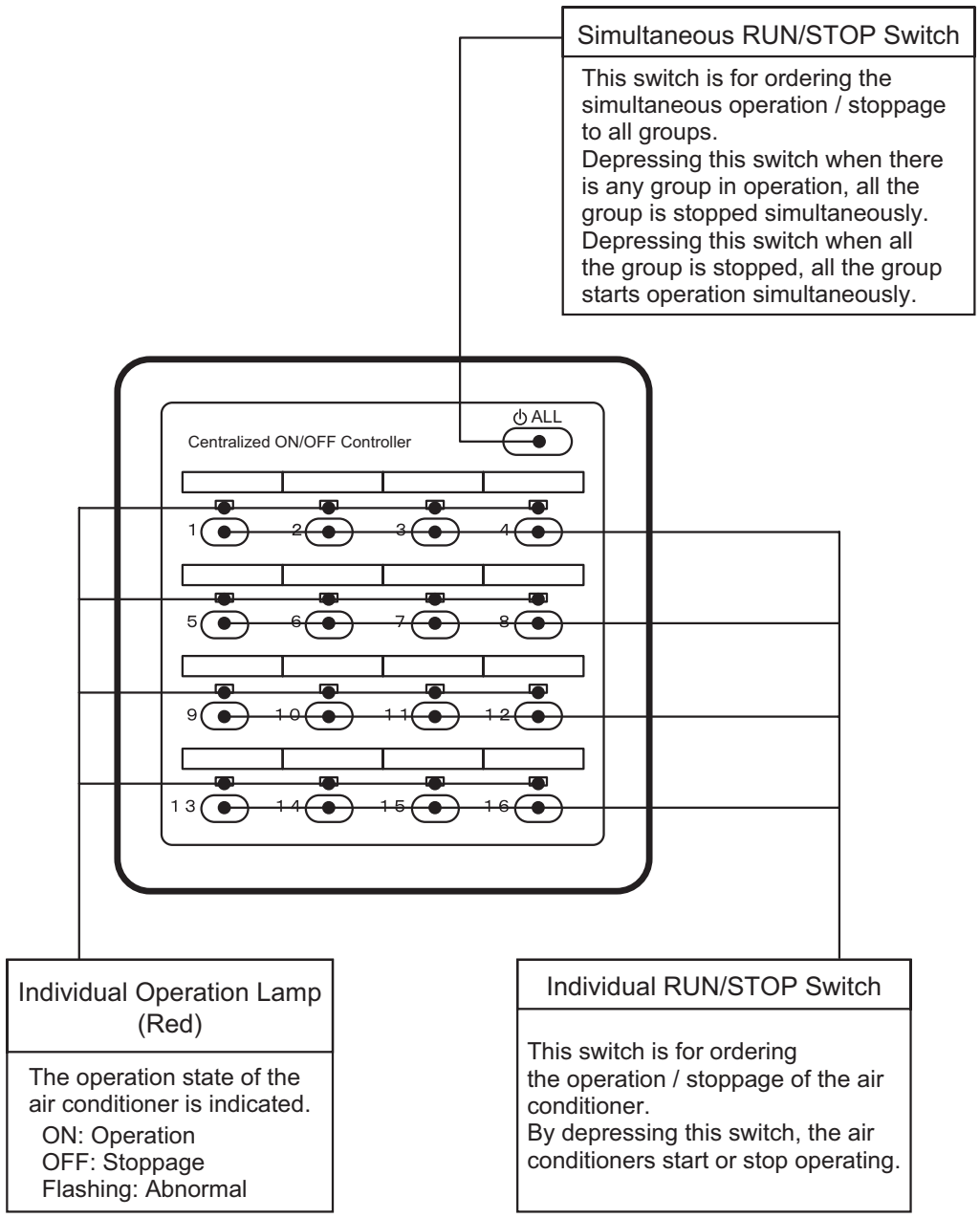


NOTES:

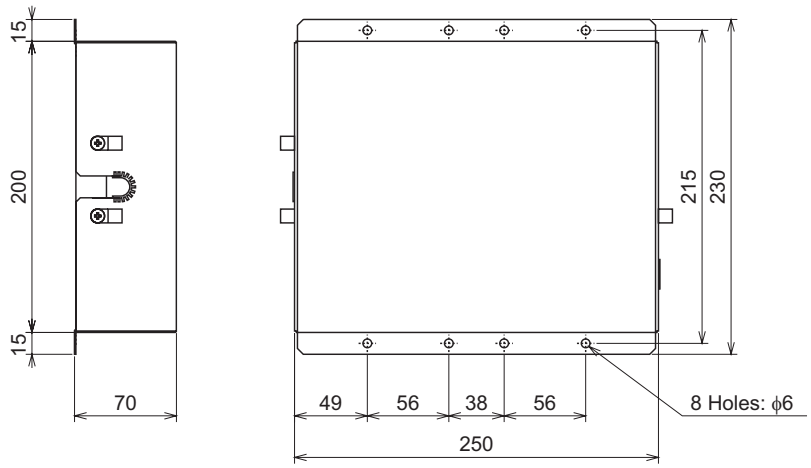
1. Up to 15 Extension Adapter (PSC-AD128EX) can be connected to 1 system.
2. Up to 64 outdoor units (H-LINK II compliant) and 160 indoor units (H-LINK II compliant) can be connected to Central Station EX (PSC-A128EX)/Extension Adapter (PSC-AD128EX).
   Refer to specification for connecting units for detail.
3. Up to 16 dedicated pulse I/O devices can be connected to 1 system.
4. Central Station EX and Extension Adapter can control and monitor up to 2 dedicated pulse I/O devices each.
5. A dedicated pulse I/O device shall be controlled via external output from only one peer Central Station EX /Extension Adapter. (Multiple Central Stations/Extension Adapters cannot control one dedicated pulse I/O device in the system.)
6. Use dedicated pulse I/O devices exclusively for this system.
7. Ensure to use straight LAN (Ethernet) cable to connect Central Station EX and Extension Adapter via Ethernet hub.
8. Ensure that the Ethernet hub has Auto-Negotiation enabled.

1.4.11 Centralized ON/OFF Controller: PSC-A16RS

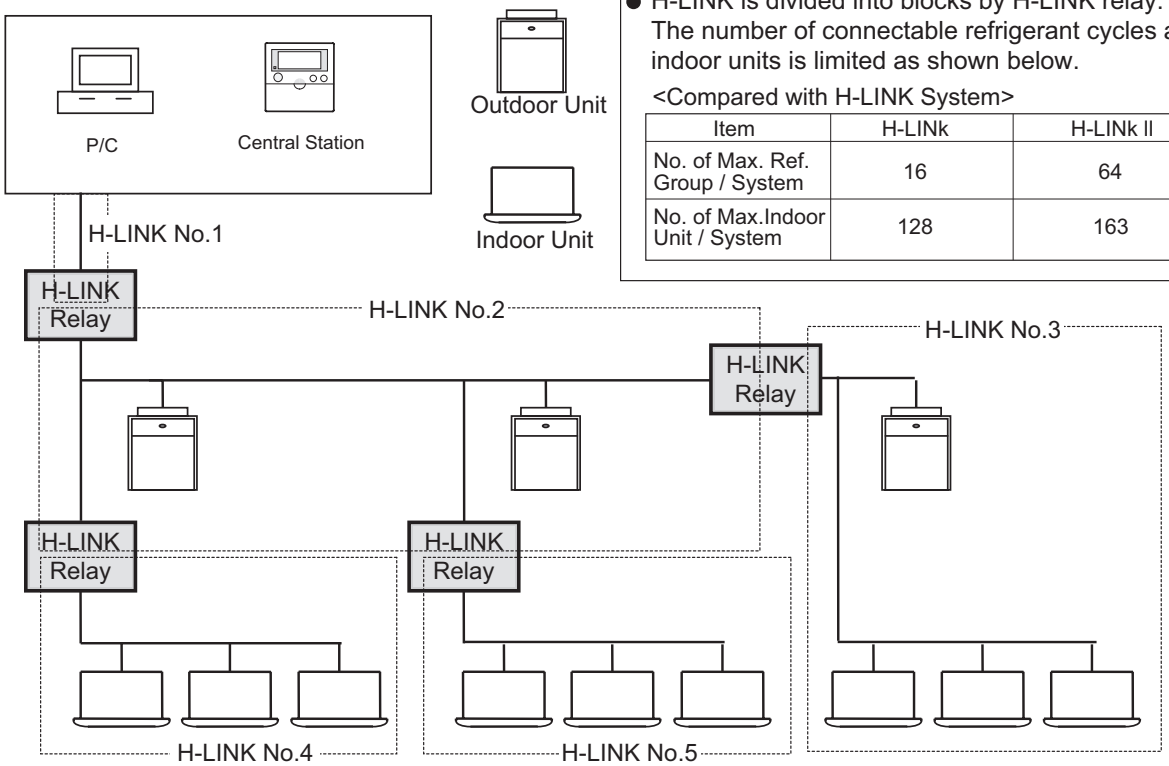
Model: PSC-A16RS



1.4.12 H-LINK Relay: PSC-5HR



< System Configuration >



- Four H-LINK Relays can be installed at a maximum.
- H-LINK is divided into blocks by H-LINK relay. The number of connectable refrigerant cycles and indoor units is limited as shown below.

<Compared with H-LINK System>

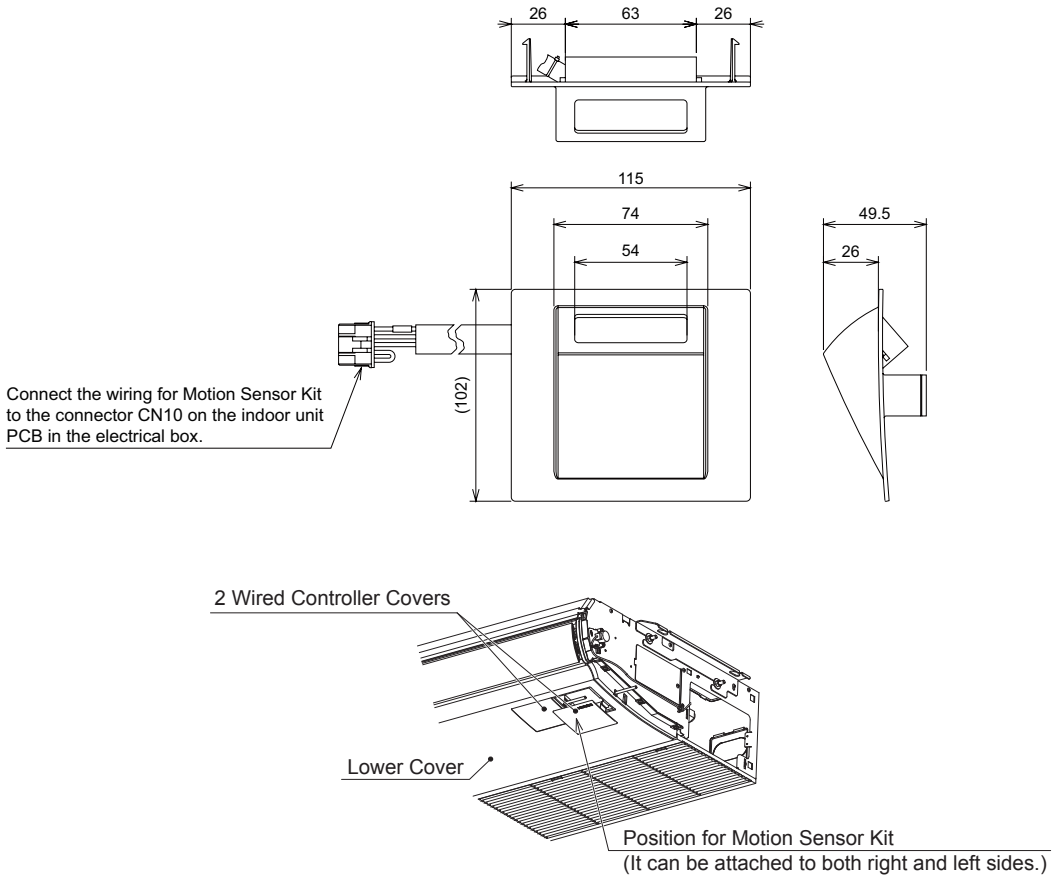
Item	H-LINk	H-LINk II
No. of Max. Ref. Group / System	16	64
No. of Max.Indoor Unit / System	128	163

< Adapted Wires and Wire Length >

- In the case of the above figure, H-LINK is divided into five blocks. Set up Terminal Resistance in each H-LINK. (Refer to “Operation & Installation Manual” of H-LINK Relay for details.)
- It is recommended to use twist pair cable (1P-0.75mm^2). The cable type is shown in the following table.
- If twist pair cable is used, the maximum length of each divided H-LINK is 1000m.
- Either shielded or non-shielded cable can be used.
- Twist Pair Cable is available as an optional system accessory.
  Model: PRC-50L (50m), PRC-100L (100m), PRC-200L (200m)

TYPE	NIHONDENSEN KOUGYOUKAI	HITACHIDENSEN	NIHONDENSEN KOUGYOUKAI	SEKISAIKISAI SIRYOU
without Shield	JKEV	KPEV	KNPEV	KPEV
with Shield (Copper foil)	JKEV-S	KPEV-S	KNPEV-S	KPEV-S
with Shield (stranded)	JKEV-SB	KPEV-SB	KNPEV-SB	KPEV-SV

1.4.13 Motion Sensor Kit: SOR-NEP



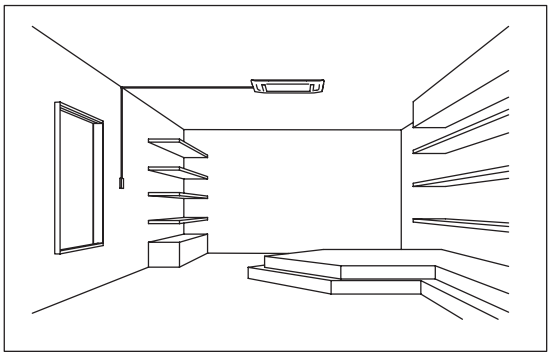
NOTES:

1. Motion Sensor Kit SOR-NEP must be installed according to the “Installation Manual.” If the kit is installed incorrectly, it may fall and lead to an injury.
2. Remove the cover of the wired controller (for Indoor Unit) and attach the Motion Sensor Kit SOR-NEP in the same procedure as the cover. It can be attached to both sides of the wired controller.
3. Connect the wiring for Motion Sensor Kit to the connector CN10 on the indoor unit PCB in the electrical box. Do not install the wiring along the 220~240V power line. Otherwise strange sound may be heard.
4. Refer to Installation Manual for Motion Sensor Kit SOR-NEP for the setting, detecting area and notes of the product.

Length of Wire Cable for Optional Wired Controller, Timer and Central Station

As the wired controllers, timer and central stations do not include a controller cable, prepare one in the field, or use PRC-5K, 10K or 15K.
Use the twist pair cable (1P-0.75mm^2) as transmission wire cable for prevention of the malfunction (The total cable length is max. 500m).
When the total cable length is within 30m, other types of cable (more than 0.3mm^2) can be used.

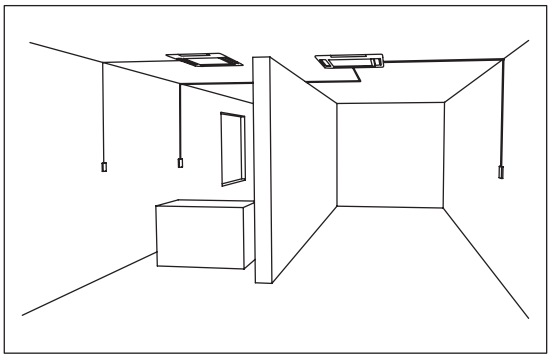
Indoor Unit Quantity: 1
Wired Controller Quantity: 1



Application Function of Wired Controller

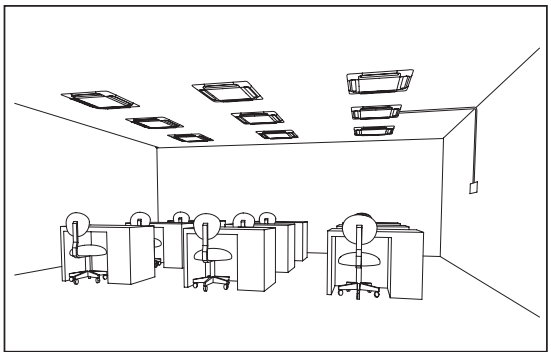
One indoor unit can be controlled by two optional wired controllers separately mounted on the wall.

Indoor Unit Quantity: 1
Wired Controller Quantity: 2



One optional wired controller can start/stop up to 16 indoor units.

Indoor Unit Quantity: 16 (Maximum)
Wired Controller Quantity: 1



2. General Data

Indoor Unit Type		Ceiling Type			
Model		RPC-1.5FSR	RPC-2.0FSR	RPC-2.5FSR	RPC-3.0FSR
Indoor Unit Power Supply		AC 1ϕ, 220-240V/50Hz, 220V/60Hz			
Sound Pressure Level (Overall A Scale) (Hi2/Hi/Me/Lo)	dB	37/35/31/28	38/35/31/28	38/35/31/28	40/37/33/29
Cabinet Color		Neutral White			
Outer Dimensions					
Height	mm	235	235	235	235
	(in.)	(9-1/4)	(9-1/4)	(9-1/4)	(9-1/4)
Width	mm	960	960	1270	1270
	(in.)	(37-4/5)	(37-4/5)	(50)	(50)
Depth	mm	690	690	690	690
	(in.)	(27-1/5)	(27-1/5)	(27-1/5)	(27-1/5)
Net Weight	kg	26	27	35	35
	(lbs.)	(57)	(60)	(78)	(78)
Refrigerant		R410A/R32			
Indoor Fan					
Air Flow Rate (Hi2/Hi/Me/Lo)	m^3/min.	15/13/11/9	15/13/11/9	19/16.5/14/11.5	21/18.5/15.5/12.5
	(cfm)	(530/459/388/318)	(530/459/388/318)	(671/582/494/406)	(741/653/547/441)
Motor	W	50	50	80	80
Connections		Flare-Nut Connection (with Flare Nuts)			
Refrigerant Piping					
Liquid Line	mm	ϕ6.35	ϕ6.35	ϕ9.52	ϕ9.52
	(in.)	(1/4)	(1/4)	(3/8)	(3/8)
Gas Line	mm	ϕ12.7	ϕ12.7	ϕ15.88	ϕ15.88
	(in.)	(1/2)	(1/2)	(5/8)	(5/8)
Condensate Drain		VP20	VP20	VP20	VP20
Approximate Packing Measurement	m^3	0.23	0.23	0.31	0.31

NOTES:

1. The above cooling and heating capacities show the maximum capacities when the outdoor and indoor temperature are below condition.
   - Cooling Operation Conditions
     - Indoor Air Inlet Temperature: 27°C DB (80°F DB)
       19.0°C WB (66.2°F WB)
     - Outdoor Air Inlet Temperature: 35°C DB (95°F DB)
   - Heating Operation Conditions
     - Indoor Air Inlet Temperature: 20°C DB (68°F DB)
     - Outdoor Air Inlet Temperature: 7°C DB (45°F DB)
       6°C WB (43°F WB)
   - Piping Length: 7.5 Meters Piping Lift: 0 Meter
2. The sound pressure level is based on following conditions.
   1 Meter Beneath the Unit and 1 Meter from Discharge Grille.
   The above data was measured in an anechoic chamber so that reflected sound should be taken into consideration in the field.

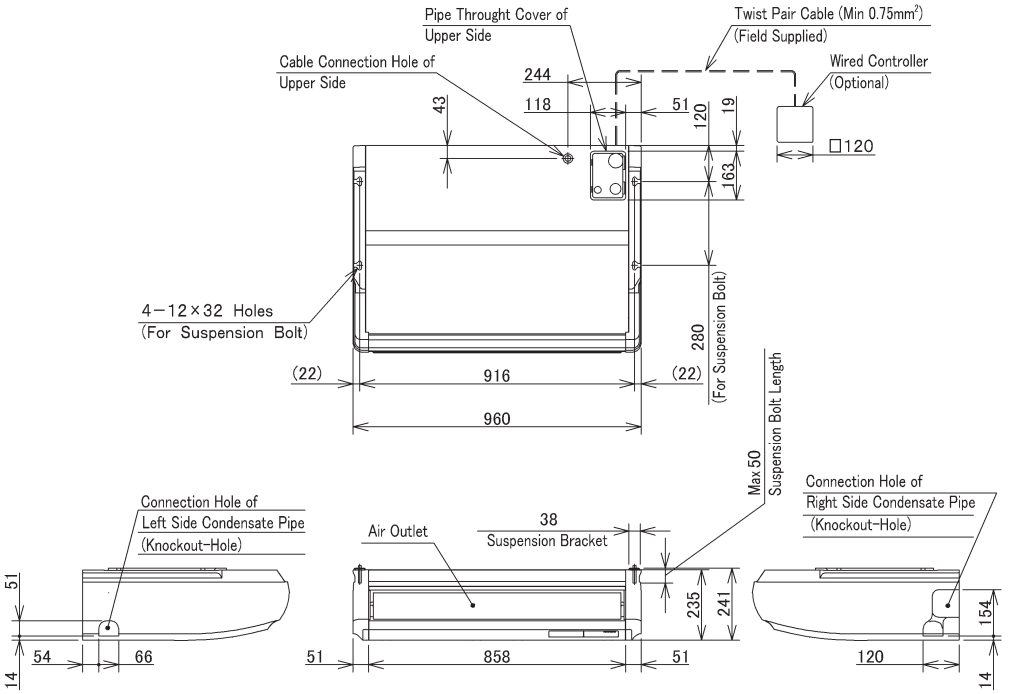
Indoor Unit Type		Ceiling Type		
Model		RPC-4.0FSR	RPC-5.0FSR	RPC-6.0FSR
Indoor Unit Power Supply		AC 1ϕ, 220-240V/50Hz, 220V/60Hz		
Sound Pressure Level (Overall A Scale) (Hi2/Hi/Me/Lo)	dB	44/42/37/32	48/45/41/35	49/47/42/36
Cabinet Color		Neutral White		
Outer Dimensions				
Height	mm	235	235	235
	(in.)	(9-1/4)	(9-1/4)	(9-1/4)
Width	mm	1580	1580	1580
	(in.)	(62-1/5)	(62-1/5)	(62-1/5)
Depth	mm	690	690	690
	(in.)	(27-1/5)	(27-1/5)	(27-1/5)
Net Weight	kg	41	41	41
	(lbs.)	(91)	(91)	(91)
Refrigerant		R410A/R32		
Indoor Fan				
Air Flow Rate (Hi2/Hi/Me/Lo)	m^3/min.	30/26.5/22/17	35/31/25.5/20	37/32.5/27/21
	(cfm)	(1059/935/777/600)	(1236/1094/900/706)	(1306/1147/953/741)
Motor	W	160	160	160
Connections		Flare-Nut Connection (with Flare Nuts)		
Refrigerant Piping				
Liquid Line	mm	ϕ9.52	ϕ9.52	ϕ9.52
	(in.)	(3/8)	(3/8)	(3/8)
Gas Line	mm	ϕ15.88	ϕ15.88	ϕ15.88
	(in.)	(5/8)	(5/8)	(5/8)
Condensate Drain		VP20	VP20	VP20
Approximate Packing Measurement	m^3	0.38	0.38	0.38

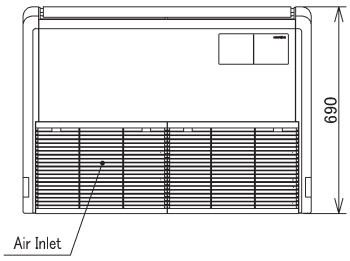
NOTES:

1. The above cooling and heating capacities show the maximum capacities when the outdoor and indoor temperature are below condition.
   - Cooling Operation Conditions
     - Indoor Air Inlet Temperature: 27°C DB (80°F DB) 19.0°C WB (66.2°F WB)
     - Outdoor Air Inlet Temperature: 35°C DB (95°F DB)
   - Heating Operation Conditions
     - Indoor Air Inlet Temperature: 20°C DB (68°F DB)
     - Outdoor Air Inlet Temperature: 7°C DB (45°F DB) 6°C WB (43°F WB)
   - Piping Length: 7.5 Meters Piping Lift: 0 Meter
2. The sound pressure level is based on following conditions.
   1 Meter Beneath the Unit and 1 Meter from Discharge Grille.
   The above data was measured in an anechoic chamber so that reflected sound should be taken into consideration in the field.

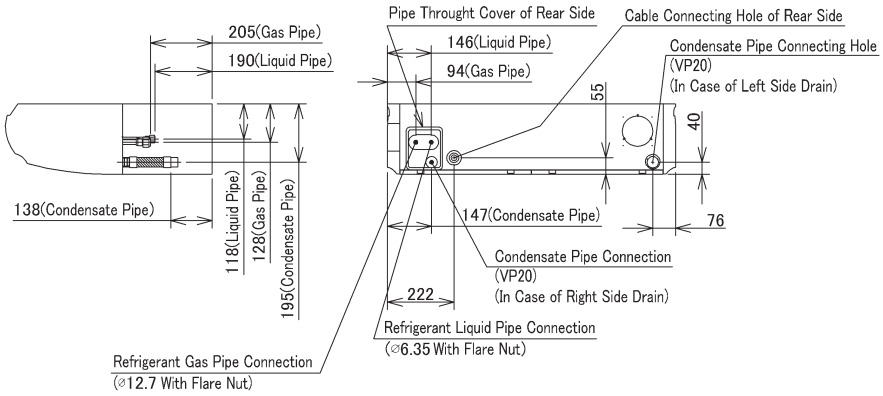
3. Dimensional Data

Models: RPC-1.5FSR and RPC-2.0FSR

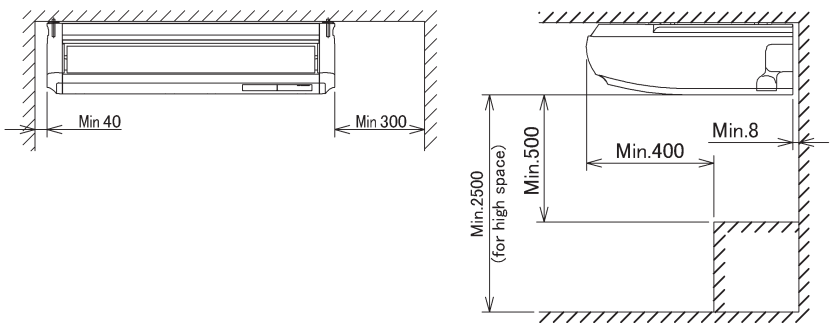




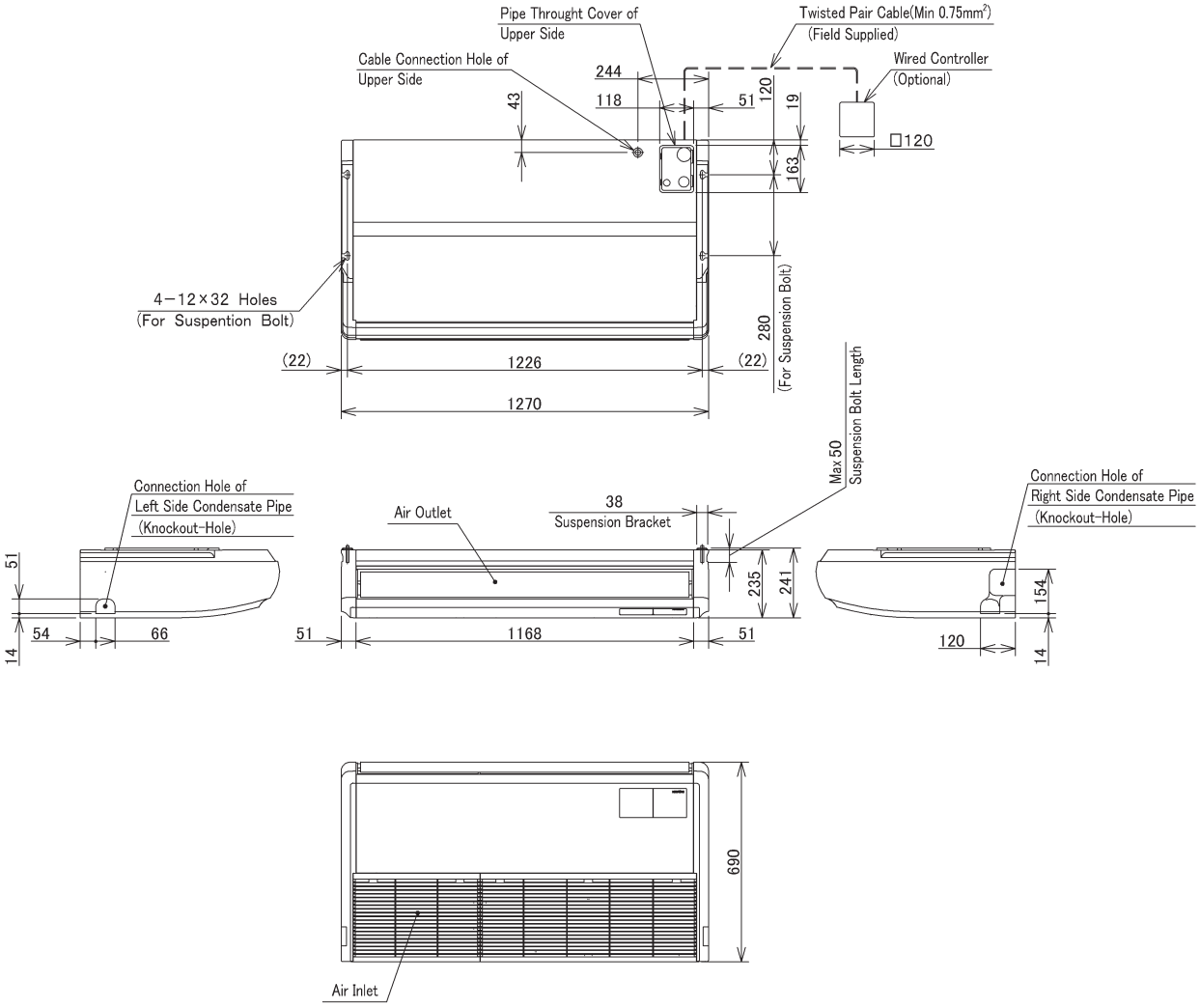
Pipe Connection



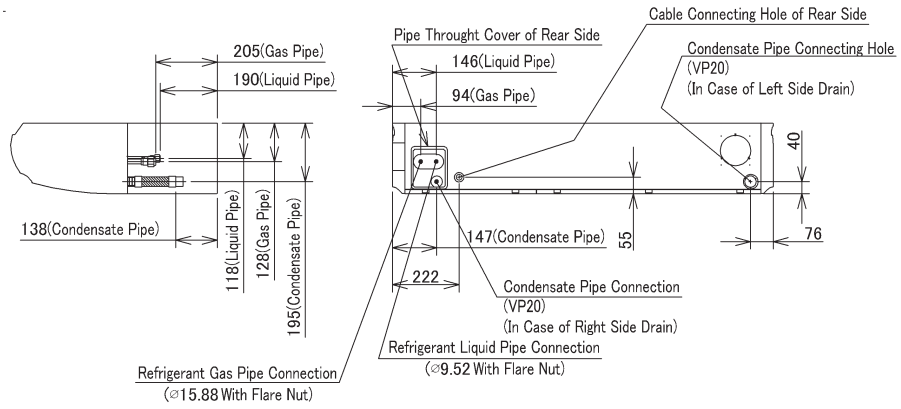
Service Space



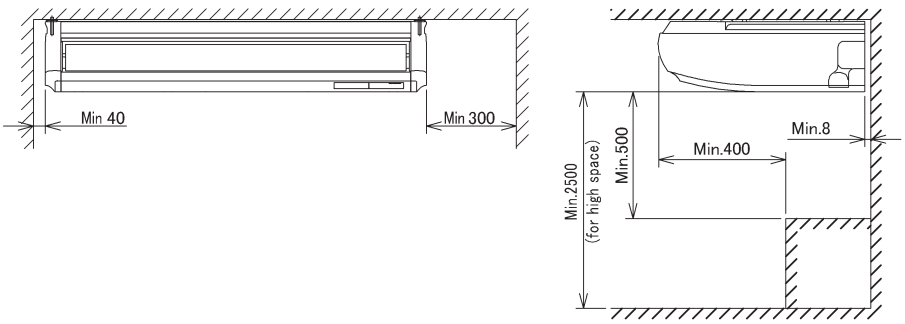
Models: RPC-2.5FSR and RPC-3.0FSR



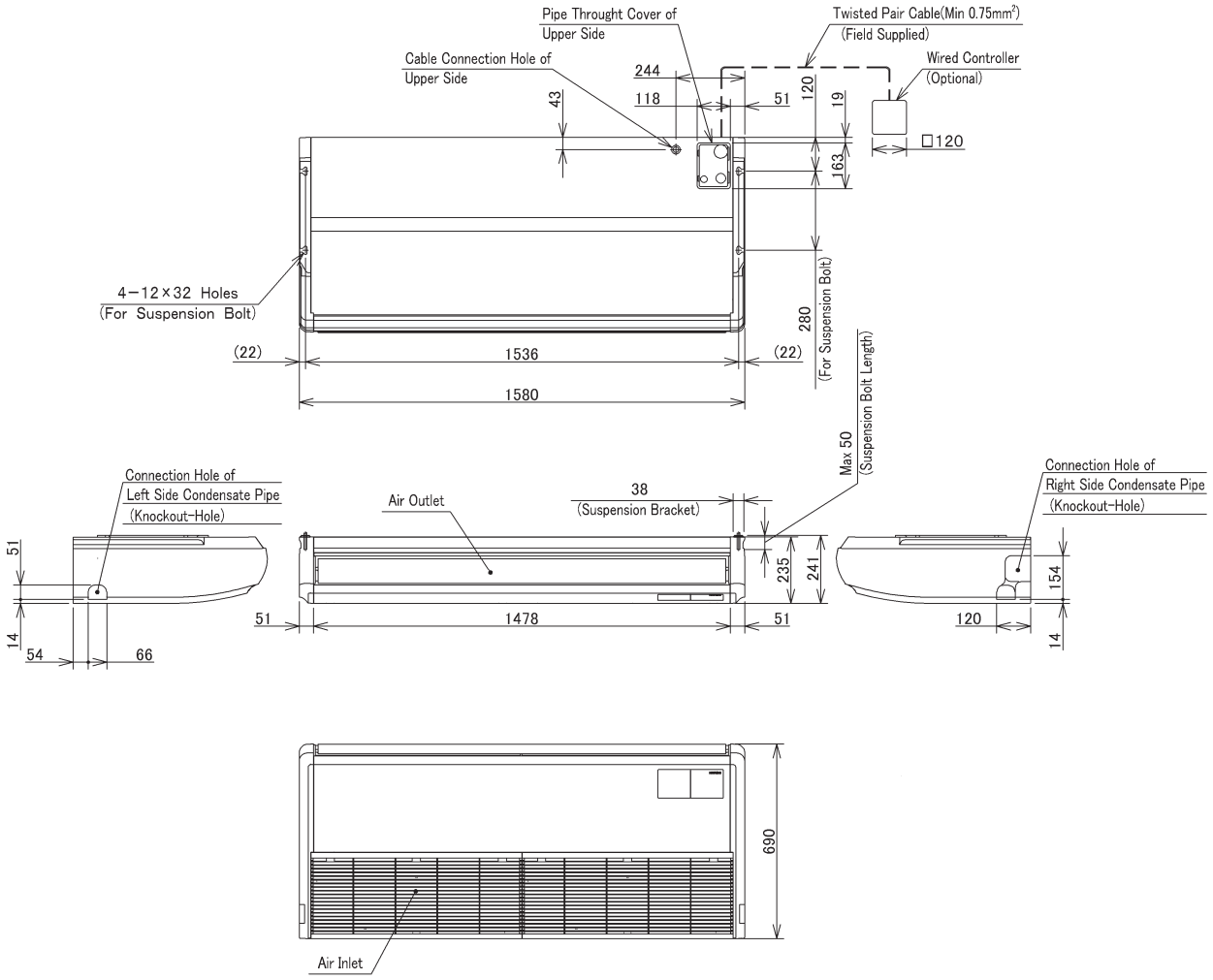
Pipe Connection

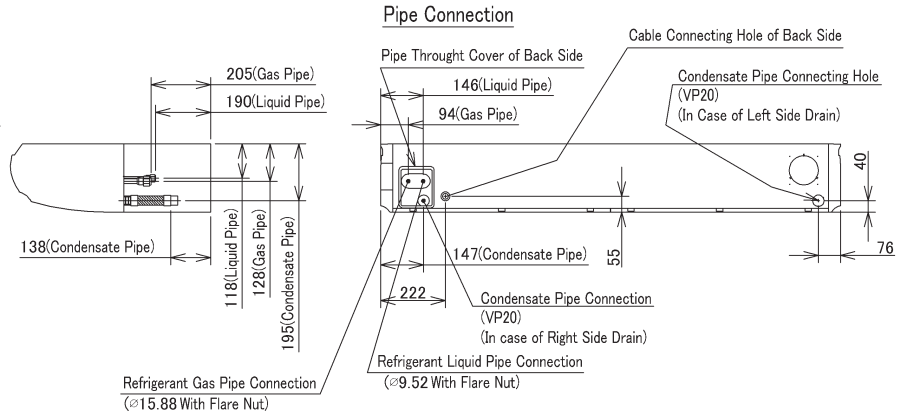


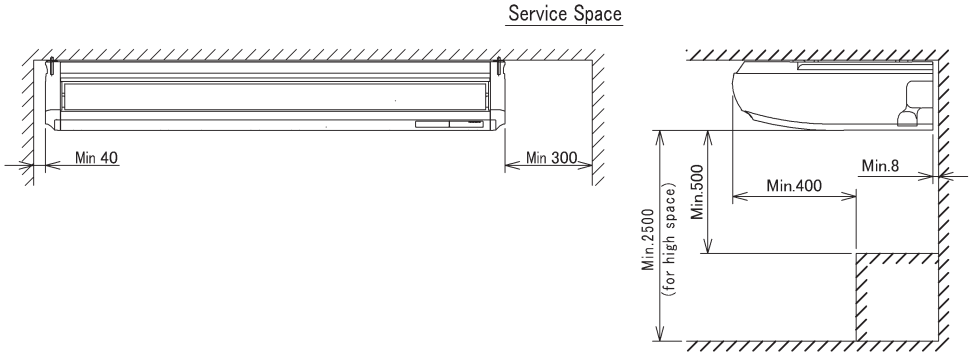
Service Space



Models: RPC-4.0FSR, RPC-5.0FSR and RPC-6.0FSR

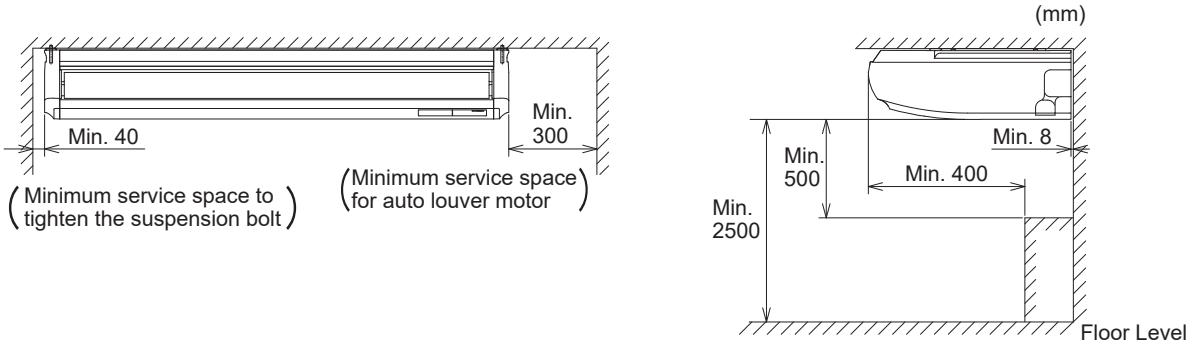




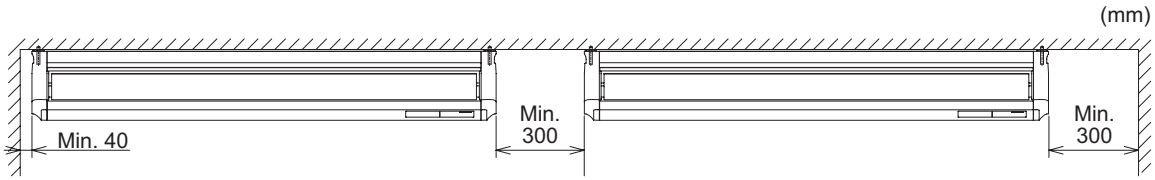


4. Selection Data

4.1 Operation Space



< For Single Installation >



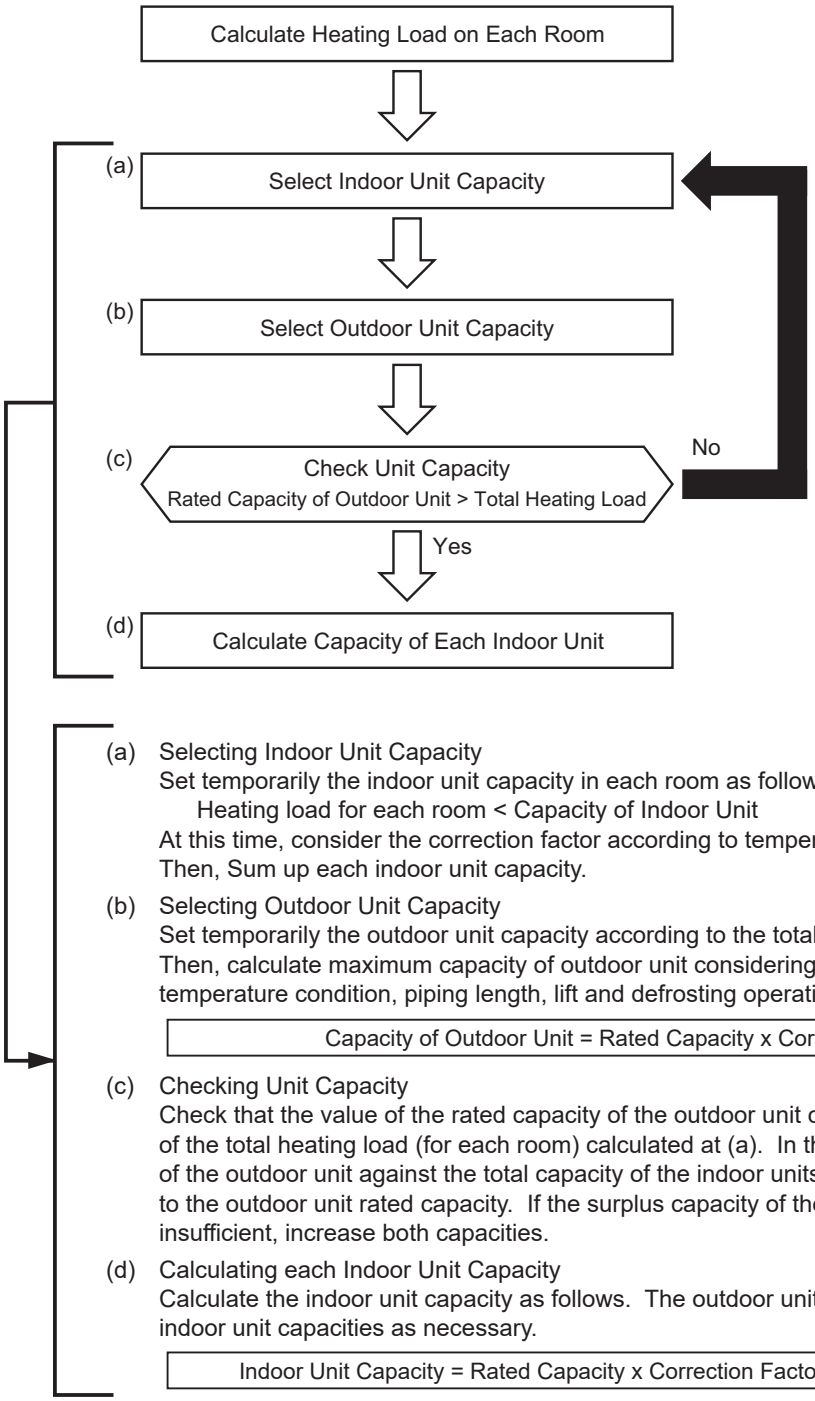
< For Parallel Installation >

NOTE:
If there is a cornice on the ceiling, measure the dimension from the front or undersurface.

4.2 Selection Guide

The various indoor units can be combined with the HITACHI DC Inverter UTOPIA Series.

Selection of Unit Model Capacity Procedure is shown below.



(a) Selecting Indoor Unit Capacity
Set temporarily the indoor unit capacity in each room as follows.
Heating load for each room < Capacity of Indoor Unit
At this time, consider the correction factor according to temperature condition.
Then, Sum up each indoor unit capacity.

(b) Selecting Outdoor Unit Capacity
Set temporarily the outdoor unit capacity according to the total connectable indoor unit capacity at (a). Then, calculate maximum capacity of outdoor unit considering the correction factor according to temperature condition, piping length, lift and defrosting operation.

Capacity of Outdoor Unit = Rated Capacity x Correction Factor

(c) Checking Unit Capacity
Check that the value of the rated capacity of the outdoor unit calculated at (b) is larger than the value of the total heating load (for each room) calculated at (a). In the case that there is the surplus capacity of the outdoor unit against the total capacity of the indoor units, increase the indoor unit capacity up to the outdoor unit rated capacity. If the surplus capacity of the outdoor unit and the indoor units are insufficient, increase both capacities.

(d) Calculating each Indoor Unit Capacity
Calculate the indoor unit capacity as follows. The outdoor unit capacity is divided by the calculated indoor unit capacities as necessary.

Indoor Unit Capacity = Rated Capacity x Correction Factor (Room Temperature)

(1) Meaning of Model Name for Indoor Unit

Example

RPC - 1.5 FS R

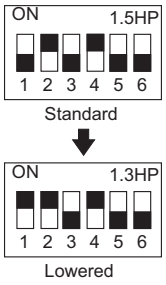
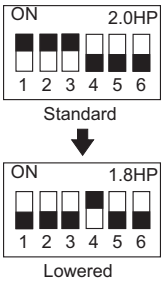
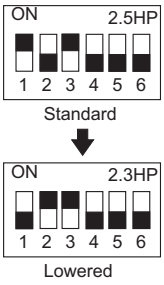
- R: Refrigerant Type — R: R410A and R32
- FS: SET FREE System
- 1.5: Capacity (HP)
- RPC: Unit Type — RPC: Ceiling Type

NOTE:
When selecting the indoor and outdoor units, make sure that the total indoor unit horsepower is closer to the outdoor unit horsepower.

(2) Nominal Capacity of Indoor Unit

Horsepower (HP)		1.5	2.0	2.5	3.0	4.0	5.0	6.0
Cooling Capacity	kW	4.0	5.0	7.1	8.0	11.2	14.0	16.0
Heating Capacity	kW	4.8	5.6	8.5	9.0	12.5	16.0	18.0

Capacity Adjustment by Dip Switch Setting

Horsepower (HP)		1.3	1.8	2.3
Variable Capacity (HP)		1.3 ← 1.5	1.8 ← 2.0	2.3 ← 2.5
Nominal Cooling Capacity	kW	3.8 ← 4.0	5.2 ← 5.6	6.7 ← 7.1
Nominal Heating Capacity	kW	4.2 ← 4.8	5.6 ← 6.3	7.5 ← 8.5
Applicable Model		RPC-1.5FSR	RPC-2.0FSR	RPC-2.5FSR
Indoor Unit Dip Switch Setting (DSW3)				

NOTE:
This function is usually not utilized. It is only for utilizing when adjusting the indoor and outdoor units capacity ratio or adjusting load of unit type selection.

(3) Given Condition (Example)

Total Load for Each Room

Item		Room (1)	Room (2)	Room (3)	(1) + (2) +(3)
Estimated Cooling Load	kW	2.92	3.86	4.88	11.66
Estimated Heating Load	kW	3.29	4.34	5.49	13.12

Temperature Condition

Cooling	Heating
Outdoor Coil Air Inlet	Outdoor Coil Air Inlet
Dry Bulb: 30°C	Dry Bulb: 1°C
Indoor Coil Air Inlet	Wet Bulb: 0°C
Dry Bulb: 27°C	Indoor Coil Air Inlet
Wet Bulb: 19°C	Dry Bulb: 20°C

Equivalent Piping Length between Indoor Units and Outdoor Unit: 60m
Piping Lift: 20m

(4) Selecting Matching Indoor Units and Nominal Capacity

Select Ceiling Type Indoor Units (Example)

Item		Room (1)	Room (2)	Room (3)	(1) + (2) + (3)
Selected Model		RPC-1.5FSR	RPC-2.0FSR	RPC-2.5FSR	-
Nominal Cooling Capacity	kW	4.0	5.0	7.1	16.1
Nominal Heating Capacity	kW	4.8	5.6	8.0	18.4

(5) Actual Capacity

In the case of the example, the total indoor horsepower is 6HP.
Therefore, the outdoor unit capacity at the nominal temperature selected from the “Capacity Characteristic Curve” is 16.0kW at the cooling operation, and 20.0kW at the heating operation under nominal conditions.

a) Actual Capacity of Outdoor Unit
Maximum Actual Capacity of Outdoor Unit
= Outdoor Unit Capacity at Nominal Temperature selected from Total Indoor Unit Capacity
× Correction Factor According to Piping Length and Lift
× Correction Factor According to Temperature Condition
× Correction Factor According to Defrosting Operation

Refer to the Correction Factor in Technical Catalog of outdoor unit.

< Example >
Cooling: 16.0kW × 0.84 × 1.05 = 14.11
Heating: 20.0kW × 0.95 × 0.87 × 0.85 = 14.05

b) Actual Capacity of Each Indoor Unit
Actual Capacity of Each Indoor Unit
= Actual Capacity of Outdoor Unit
× (Each Indoor Unit's Horsepower ÷ Summation of Each Indoor Unit Horsepower)

ex.
< RPC-1.5FSR >
Cooling Capacity: 14.11 × (1.5HP/6.0HP) = 3.53kW
Heating Capacity: 14.05 × (1.5HP/6.0HP) = 3.51kW
< RPC-2.0FSR >
Cooling Capacity: 14.11 × (2.0HP/6.0HP) = 4.70kW
Heating Capacity: 14.05 × (2.0HP/6.0HP) = 4.68kW
< RPC-2.5FSR >
Cooling Capacity: 14.11 × (2.5HP/6.0HP) = 5.88kW
Heating Capacity: 14.05 × (2.5HP/6.0HP) = 5.85kW

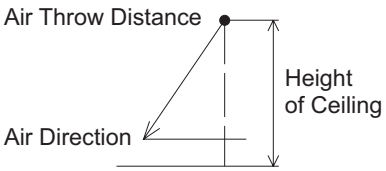
< Result >

Item			Room (1)	Room (2)	Room (3)	(1)+(2)+(3)
Selected Model			RPC-1.5FSR	RPC-2.0FSR	RPC-2.5FSR	-
Actual Capacity	Actual Maximum Cooling Capacity	kW	3.53	4.70	5.88	14.11
	Actual Maximum Heating Capacity	kW	3.51	4.68	5.85	14.05
Design Load	Estimated Cooling Load	kW	2.92	3.86	4.88	11.66
	Estimated Heating Load	kW	3.29	4.34	5.49	13.12

4.3 Air Throw Distance

Air Throw Distance (When Air Velocity is 0.3m/s)

Item / Model	Air Throw Distance (m)	Ceiling Height (m)	Air Flow Volume (m^3/min)
RPC-1.5FSR	4.5	3.5	15
RPC-2.0FSR	4.5	3.5	15
RPC-2.5FSR	4.8	3.5	19
RPC-3.0FSR	5.3	3.5	21
RPC-4.0FSR	6.4	4.3	30
RPC-5.0FSR	7.5	4.3	35
RPC-6.0FSR	8.0	4.3	37



NOTES:

1. The air throw distance is a distance the outlet air blowing from the air outlet obliquely downward reaches.
2. These are the values measured when there is no wind nor obstacle. The values can differ depending on actual installation conditions.

5. Electrical Data

< 220-240V/50Hz >

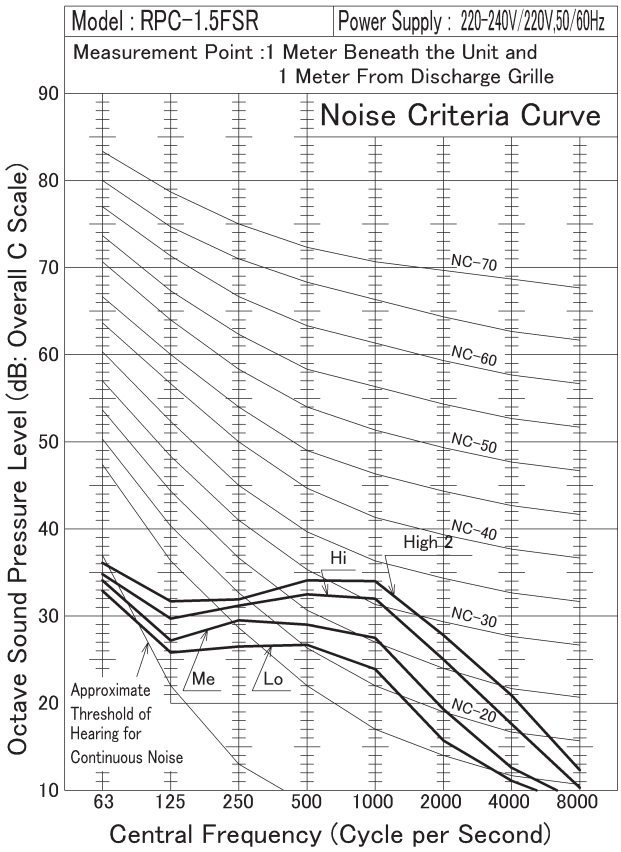
Model	Unit Main Power			Applicable Voltage		Indoor Fan Motor		
	VOL	PH	HZ	Maximum	Minimum	PH	RNC	IPT
RPC-1.5FSR	220-240	1	50	264	198	1	0.2-0.2	0.04-0.04
RPC-2.0FSR							0.2-0.3	0.05-0.05
RPC-2.5FSR							0.2-0.3	0.05-0.05
RPC-3.0FSR							0.3-0.3	0.06-0.06
RPC-4.0FSR							0.5-0.5	0.10-0.10
RPC-5.0FSR							0.8-0.9	0.16-0.16
RPC-6.0FSR							0.9-1.0	0.19-0.19

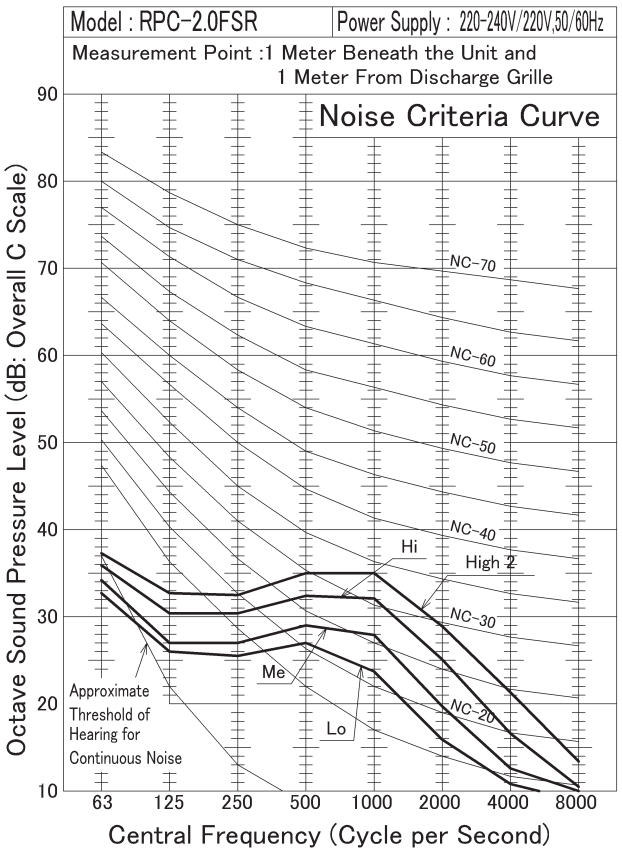
< 220V/60Hz >

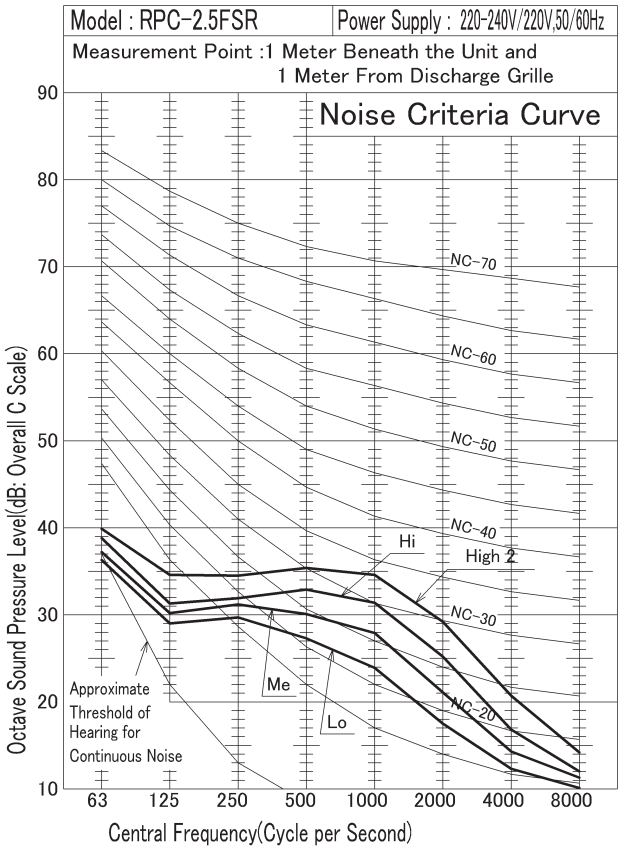
Model	Unit Main Power			Applicable Voltage		Indoor Fan Motor		
	VOL	PH	HZ	Maximum	Minimum	PH	RNC	IPT
RPC-1.5FSR	220	1	60	242	198	1	0.2	0.04
RPC-2.0FSR							0.2	0.05
RPC-2.5FSR							0.2	0.05
RPC-3.0FSR							0.3	0.06
RPC-4.0FSR							0.5	0.10
RPC-5.0FSR							0.8	0.16
RPC-6.0FSR							0.9	0.19

VOL: Rated Unit Power Supply Voltage (Plated)(V)
HZ: Frequency (Hz)
IPT: Input (kW)
RNC: Running Current (A)
PH: Phase (ϕ)

6. Sound Data


Model : RPC-1.5FSR
Power Supply : 220-240V/220V,50/60Hz
Measurement Point :1 Meter Beneath the Unit and 1 Meter From Discharge Grille
Noise Criteria Curve
Octave Sound Pressure Level (dB: Overall C Scale)
Central Frequency (Cycle per Second)
NC-70
NC-60
NC-50
NC-40
NC-30
NC-20
Hi
High 2
Me
Lo
Approximate Threshold of Hearing for Continuous Noise
63 125 250 500 1000 2000 4000 8000
10 20 30 40 50 60 70 80 90


Model : RPC-2.0FSR
Power Supply : 220-240V/220V,50/60Hz
Measurement Point :1 Meter Beneath the Unit and 1 Meter From Discharge Grille
Noise Criteria Curve
Octave Sound Pressure Level (dB: Overall C Scale)
Central Frequency (Cycle per Second)
NC-70
NC-60
NC-50
NC-40
NC-30
NC-20
Hi
High 2
Me
Lo
Approximate Threshold of Hearing for Continuous Noise
63 125 250 500 1000 2000 4000 8000
10 20 30 40 50 60 70 80 90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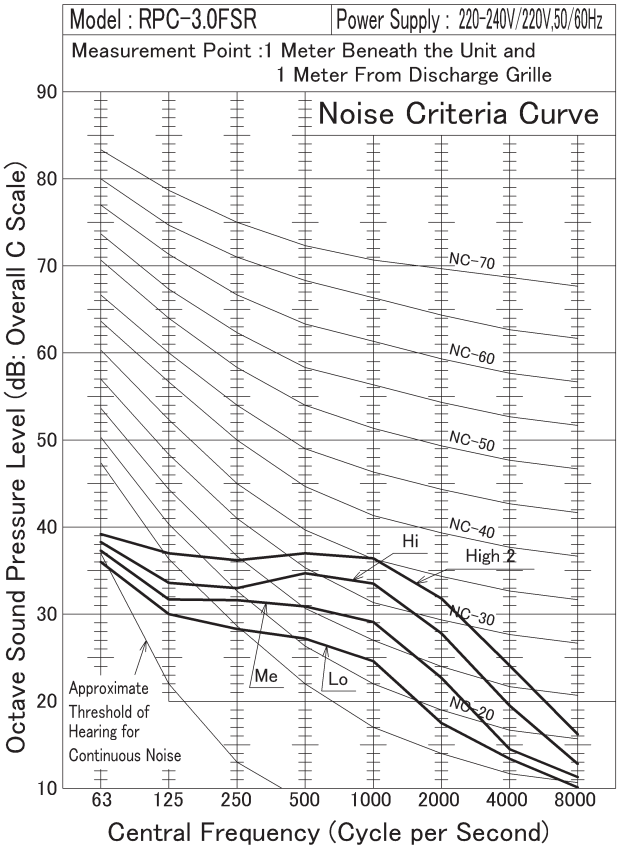
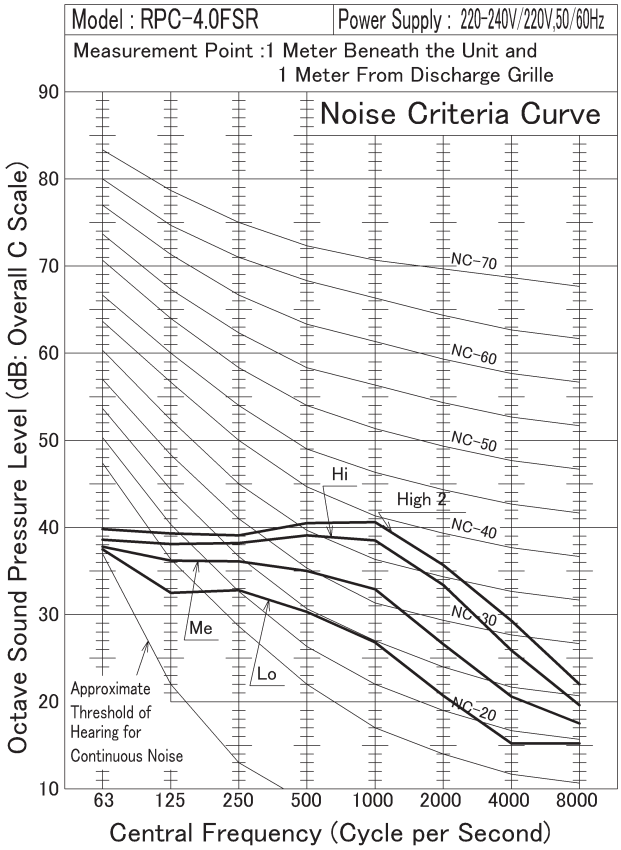
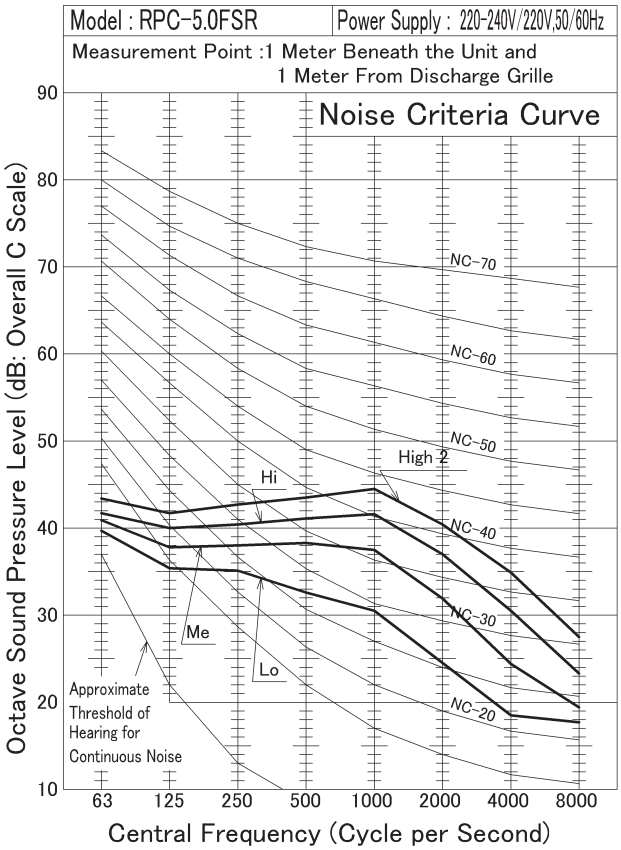
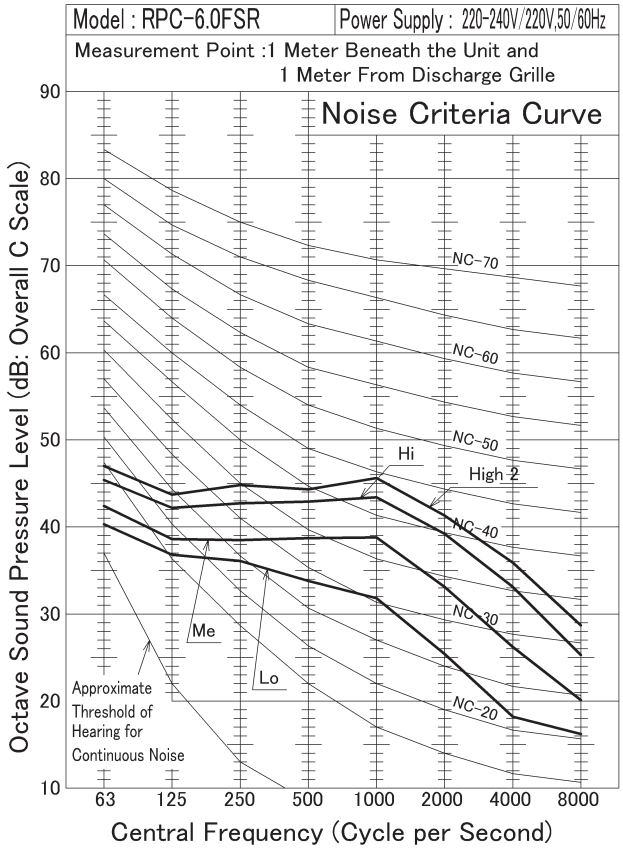
Power Supply : 220-240V/220V,50/60Hz
Measurement Point :1 Meter Beneath the Unit and 1 Meter From Discharge Grille
Noise Criteria Curve
Octave Sound Pressure Level(dB: Overall C Scale)
Central Frequency(Cycle per Second)
NC-70
NC-60
NC-50
NC-40
NC-30
NC-20
Hi
High 2
Me
Lo
Approximate Threshold of Hearing for Continuous Noise
63 125 250 500 1000 2000 4000 8000
10 20 30 40 50 60 70 80 90


Model : RPC-3.0FSR
Power Supply : 220-240V/220V,50/60Hz
Measurement Point :1 Meter Beneath the Unit and 1 Meter From Discharge Grille
Noise Criteria Curve
Octave Sound Pressure Level (dB: Overall C Scale)
Central Frequency (Cycle per Second)
NC-70
NC-60
NC-50
NC-40
NC-30
NC-20
Hi
High 2
Me
Lo
Approximate Threshold of Hearing for Continuous Noise
63 125 250 500 1000 2000 4000 8000
10 20 30 40 50 60 70 80 90


Model : RPC-4.0FSR
Power Supply : 220-240V/220V,50/60Hz
Measurement Point :1 Meter Beneath the Unit and
1 Meter From Discharge Grille
Noise Criteria Curve
NC-70
NC-60
NC-50
NC-40
NC-30
NC-20
Hi
High 2
Me
Lo
Approximate
Threshold of
Hearing for
Continuous Noise
Octave Sound Pressure Level (dB: Overall C Scale)
Central Frequency (Cycle per Second)
10
20
30
40
50
60
70
80
90
63
125
250
500
1000
2000
4000
8000


Model : RPC-5.0FSR
Power Supply : 220-240V/220V,50/60Hz
Measurement Point :1 Meter Beneath the Unit and
1 Meter From Discharge Grille
Noise Criteria Curve
NC-70
NC-60
NC-50
NC-40
NC-30
NC-20
Hi
High 2
Me
Lo
Approximate
Threshold of
Hearing for
Continuous Noise
Octave Sound Pressure Level (dB: Overall C Scale)
Central Frequency (Cycle per Second)
10
20
30
40
50
60
70
80
90
63
125
250
500
1000
2000
4000
8000


Model : RPC-6.0FSR
Power Supply : 220-240V/220V,50/60Hz
Measurement Point :1 Meter Beneath the Unit and
1 Meter From Discharge Grille
Noise Criteria Curve
NC-70
NC-60
NC-50
NC-40
NC-30
NC-20
Hi
High 2
Me
Lo
Approximate
Threshold of
Hearing for
Continuous Noise
Octave Sound Pressure Level (dB: Overall C Scale)
Central Frequency (Cycle per Second)
10
20
30
40
50
60
70
80
90
63
125
250
500
1000
2000
4000
8000

7. Working Range

Power Supply

Working Voltage: 90% to 110% of the Rated Voltage
Voltage Imbalance: Within a 3% Deviation from Each Voltage at the Main Terminal
Starting Voltage: Higher than 85% of the Rated Voltage

Temperature Range

The temperature range are given in the following table.

Temperature (°C)

		Maximum	Minimum
Cooling Operation	Indoor	30 DB	21.5 DB
	Outdoor	43 DB *	-5 DB *
Heating Operation	Indoor	25 DB	17 DB
	Outdoor	15.5 WB *	-10 WB *

DB: Dry Bulb, WB: Wet Bulb

* The temperature may change depending on the outdoor unit.

8. Optional Accessories

8.1 for Control Systems

HITACHI provides the optional accessories for indoor units.

		RPC-FSR
Wired Controller	PC-AR	×
	PC-ARF1	○ (*1)
Wireless Controller	PC-AWR	○ (*1)
7-Day Timer	PSC-A1T	○
Central Station	PSC-A64S	○ (*2)
	PSC-5S	○ (*2)
	PSC-A64GT	○
	PSC-A32MN	○
Central Station DX	PSC-A128WX2 + PSC-AS2048WXB2	○
Central Station NT	PSC-A128WEB3	○
Central Station EX	PSC-A128EX	○
Centralized ON/OFF Controller	PSC-A16RS	○
H-LINK Relay	PSC-5HR	○
Receiver Kit	PC-ALHP1	○
Controller Cable	PRC-5K	○
	PRC-10K	○
	PRC-15K	○
3P Connector Cable	PCC-1A	○
Remote Sensor	THM-R2A	○

○ : Available
× : Not Available

(*1): When this ceiling type indoor unit is used with the controller, PC-ARF1 or PC-AWR must be used.
(*2): These central stations do not provide support for the air flow volume function “HIGH 2” of this ceiling type. Therefore, when this ceiling type indoor unit is used with the central stations, the controller (PC-ARF1 or PC-AWR with PC-ALHP1) is required.

8.1.1 Wired Controller: PC-ARF1
Refer to chapter 1.4.1 for details.

8.1.2 Wireless Controller: PC-AWR
Refer to chapter 1.4.2 for details.

8.1.3 7-Day Timer: PSC-A1T
Refer to chapter 1.4.3 for details.

8.1.4 Central Station: PSC-A64S
Refer to chapter 1.4.4 for details.

8.1.5 Central Station: PSC-5S
Refer to chapter 1.4.5 for details.

8.1.6 Central Station: PSC-A64GT
Refer to chapter 1.4.6 for details.

8.1.7 Central Station: PSC-A32MN
Refer to chapter 1.4.7 for details.

8.1.8 Central Station DX: PSC-A128WX2, PSC-AS2048WXB2
Refer to chapter 1.4.8 for details.

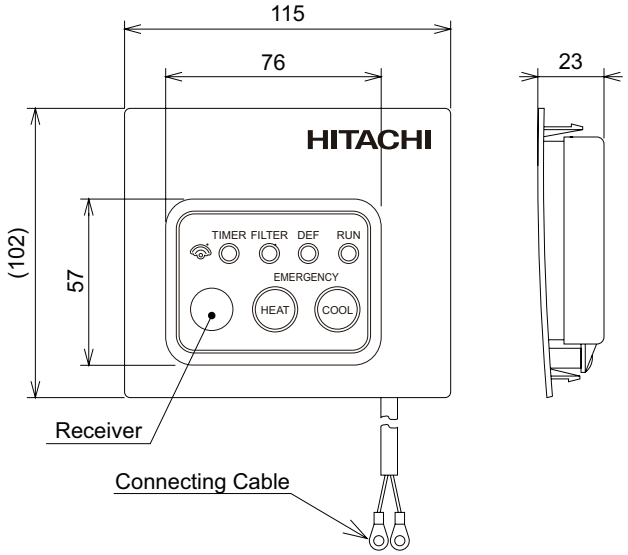
8.1.9 Central Station NT: PSC-A128WEB3
Refer to chapter 1.4.9 for details.

8.1.10 Central Station EX: PSC-A128EX
Refer to chapter 1.4.10 for details.

8.1.11 Centralized ON/OFF Controller: PSC-A16RS
Refer to chapter 1.4.11 for details.

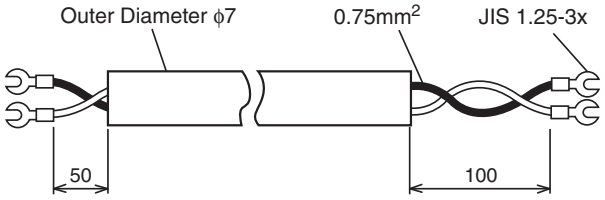
8.1.12 H-LINK Relay: PSC-5HR
Refer to chapter 1.4.12 for details.

8.1.13 Wireless Receiver Kit: PC-ALHP1



8.1.14 Controller Cable: PRC-5K to 15K (for Wired Controllers and Central Stations)

As the wired controllers and central stations do not include a controller cable, use PRC-5K to 15K, or prepare one in the field.



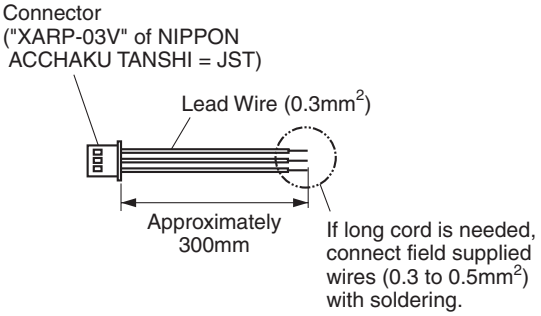
Shielded Twist-Pair Cable

Model	Cable Length
PRC-5K	5m
PRC-10K	10m
PRC-15K	15m

When the total cable length is within 30m, other types of cable (more than 0.3mm^2) can be used.

8.1.15 3P Connector Cable: PCC-1A

This connector is utilized when the remote ON/OFF device is connected or signals are taken out on the printed circuit board. (System Parts: One set contains five 3p cords.)

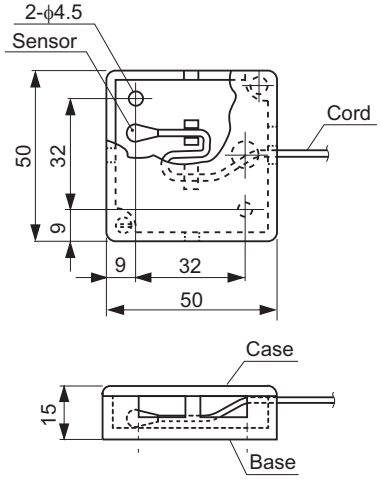


3P Connector Cable

Name	3P Connector Cable
Model	PCC-1A
Remarks	One set contains five 3P connector cables.

8.1.16 Remote Sensor: THM-R2A

When the room temperature sensing thermistor (Remote Sensor) is attached to the auxiliary connector, the unit is controlled at average air temperature at the indoor inlet and Remote Sensor point.



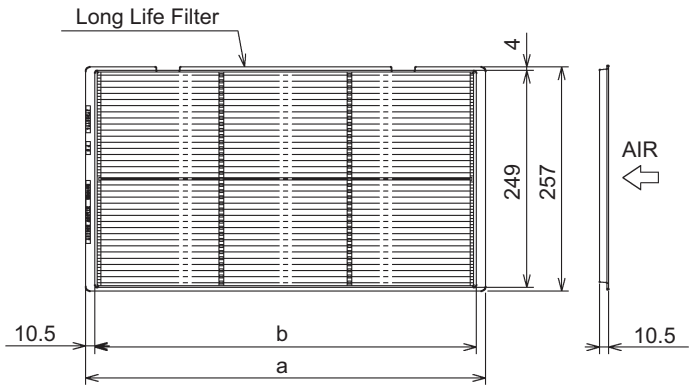
Specifications

Item		Specification
Model		THM-R2A
Case	Material	ABS Resin
	Color	Silky White
Base	Material	ABS Resin
	Color	Silky White
Sensor	Part Name	Thermistor
	Cord Length	approx. 8m

Connector: XARP-02V

8.2 for Ceiling Type

8.2.1 Long Life Filter: F-56LPC1, F-90LPC1 and F-160LPC1



(mm)

Model	Small	Large
a	431	741
b	410	720

Specifications

The following specifications are for air filters attached to the indoor units as standard equipment.

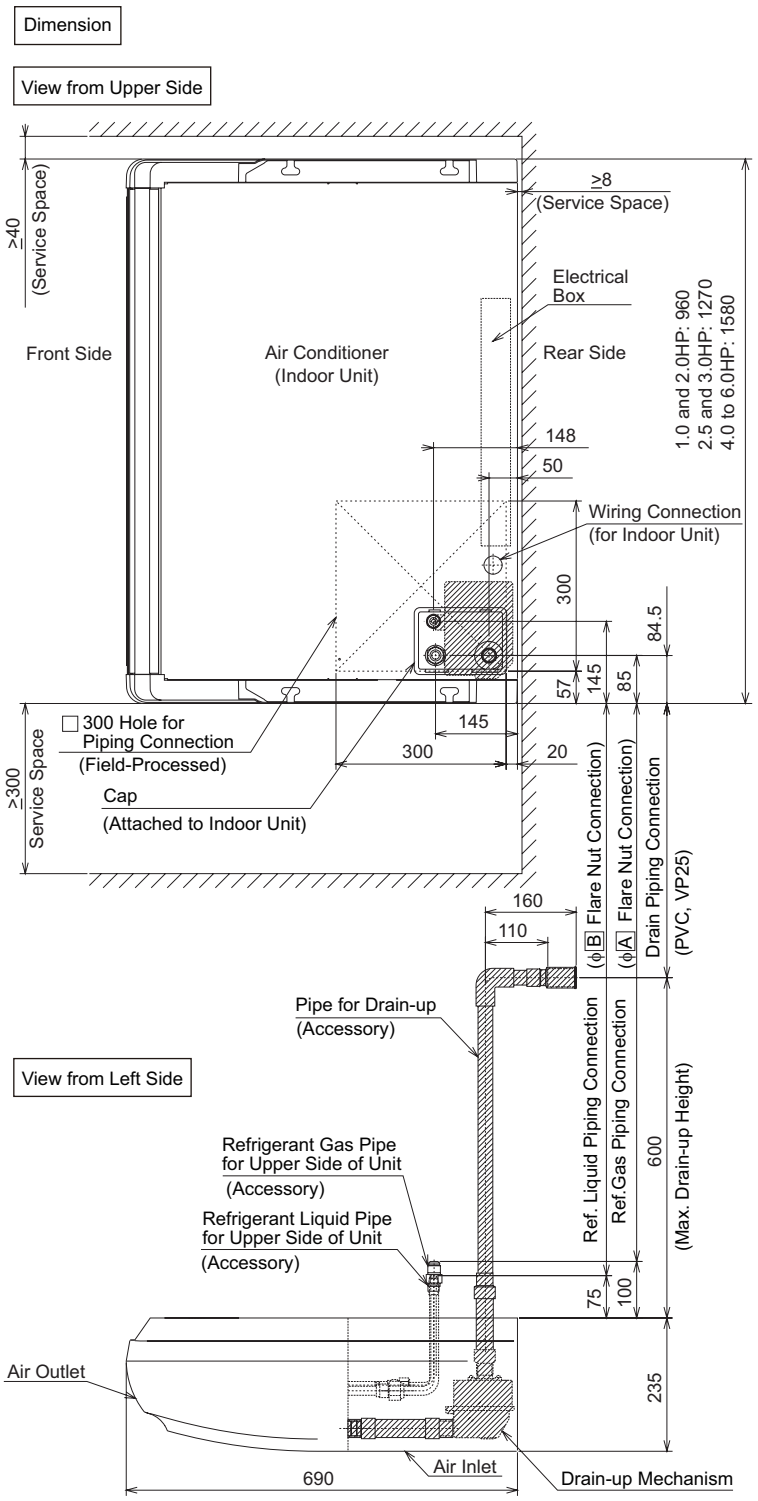
Item \ Model		F-56LPC1	F-90LPC1	F-160LPC1
Applicable Indoor Unit Model (RPC-**FSR)		1.5 and 2.0	2.5 and 3.0	4.0 to 6.0
Required Quantity per Unit	Small	2	1	-
	Large	-	1	2
Dust Collection Efficiency	%	30 (Gravimetric Method *1)		
Air Flow (High 2)	m^3/min.	15.0	24.0	37.0
Initial Pressure Loss	Pa	3.1	4.0	7.0
Material and Color of Filter Media		Material: PP Honeycomb (for protection from mold) and PS Resin Color (Filter/Flame): Black		
Life Period	h	2500		
Reuse		Available (by Water-washing)		
Weight	kg	0.4 x 2	0.4 + 0.8	0.8 x 2

NOTES:

1. This product is designed for standard air conditioning only.
   Do not use this product under such specific circumstances as in an atmosphere of oil.
2. This product can be reused by being washed with water. Wash grit and dust away from the clogged filter.
3. The life period may differ depending on environment.
4. The required quantity of filters per indoor unit are supposed to be shipped as 1 set.

8.2.2 Drain-Up Mechanism: DUPC-63K1, DUPC-71K1 and DUPC-160K1

The dimension of Drain-Up Mechanism attached to the indoor unit is shown with shaded portions in the figure below. Refer to Installation and Maintenance Manual attached to the product for details on its installation and use.



OPTIONAL ACCESSORIES

Item \ Model			For Ceiling Type		
			DUPC-63K1	DUPC-71K1	DUPC-160K1
Applicable Indoor Unit Model (RPC-**FSR)			1.5	2.0	2.5 to 6.0
Maximum Lift for Drain-Up		mm	600 (from the upper side of the indoor unit)		
Power Source			DC13V		
Power Consumption		W	4.2 or less		
Drain Piping Connection			PVC Tube, VP25		
Diameter of Field-processed Ref. Pipe (Flare Nut Connection)	mm	Gas [A]	12.7	12.7	15.88
		Liquid [B]	6.35	6.35	9.52
Applicable Refrigerant			R410A		
Weight			3.5 kg		
Accessory			Drain Hose, Pipe for Drain-Up, Ref. Gas/Liquid Pipes for Upper Side of Indoor Unit, Clamp, Insulation, Screws, Installation and Maintenance Manual		
Protection Device			Float Switch (for Alarm)		
Antimicrobial Agent			Silver-Ionic Antimicrobial Agent Using Dissoluble Glass		
Restrictions for Installation			1. When viewed from the front, the position of drain-up pipe must be on the right side of the indoor unit. 2. Ref. gas/liquid pipes (accessory) must be attached to the upper side of the indoor unit.		
Maintenance			Cleaning of Water tank: once a year Cleaning of Pump: once a year Cleaning of Float Switch: Once a year Replacement Cycles for Antimicrobial Agent: At 10.000 hours (approx. 5 years)		

NOTES:

1. Before installing the indoor unit, provide a hole (□ 300 mm) for piping connection. Use the accessory refrigerant gas/liquid pipes and pipe for drain-up to mount the drain-up mechanism.
2. PVC Tube (VP25) must be used for the drain connection.
3. Lower the indoor unit 10mm when the drain-up mechanism is installed.
   (In case of inclination beyond 10mm, it'll be water leakage or abnormal stoppage.)
4. Do not provide a trap or riser portion for the drain pipe. Install the pipe with a falling gradient of 1/25 ~ 1/100.
5. Cover the drain pipe and refrigerant gas/liquid pipes with insulations in order to avoid dew condensation.
6. Do not take out and put in connectors frequently. Constant taking out and putting in can lead to a PCB malfunction.
7. Install the indoor unit in a horizontal position only. An Inclined unit can result in water leakage or abnormal stoppage.
8. Before shipment, the accessory drain-up pipe's height from the upper surface of the unit is set to 600 mm, which can be lowered to 150 mm. If making the height lower, cut the pipe on site.
9. After installing the drain-up mechanism, sound of drain water flowing can be heard. This is the sound made when the drain water is discharged and so there are no safety concerns.

8.2.3 Motion Sensor Kit: SOR-NEP

Refer to chapter 1.4.13 for details.

9. Component Data

Indoor Heat Exchanger and Fan

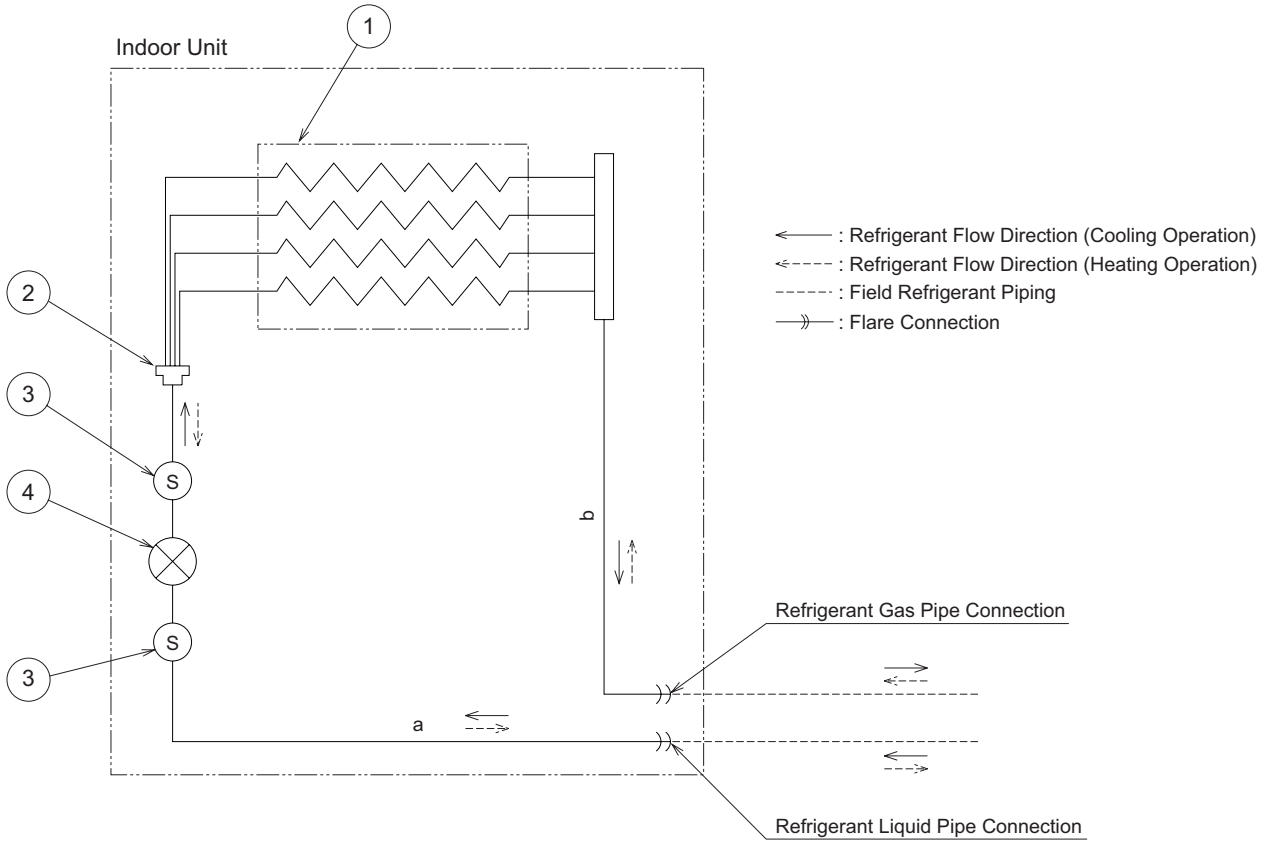
Model		RPC-1.5FSR	RPC-2.0FSR	RPC-2.5FSR	RPC-3.0FSR
Heat Exchanger Type		Multi-Pass Cross Finned Tube			
Tube Material		Copper Tube			
Outer Diameter	mm	7	7	7	7
Rows		2	3	3	3
Number of Tube/Coil		14	20	20	20
Fin Material		Aluminum			
Pitch	mm	1.6	1.8	1.8	1.8
Maximum Operating Pressure	MPa	4.15	4.15	4.15	4.15
Total Face Area	m^2	8.1	10.9	15.4	15.4
Number of Coil/Unit		1	1	1	1
Indoor Fan		Sirrocco Fan			
Number/Unit		1	1	1	1
Outer Diameter	mm	155	155	155	155
Revolution (Hi2/Hi/Me/Lo)	rpm	876/783/689/600	940/837/733/641	868/795/687/607	948/848/735/631
Nominal Air Flow (Hi2/Hi/Me/Lo)	m^3/min. (ℓ/s)	15/13/11/9 (530/459/388/318)	15/13/11/9 (530/459/388/318)	19/16.5/14/11.5 (671/582/494/406)	21/18.5/15.5/12.5 (741/653/547/441)
Indoor Fan Motor Starting Method		Drip-Proof Type Enclosure DC Motor			
Nominal Output	W	50	50	80	80
Quantity		1	1	1	1
Insulation Class		E	E	E	E

Model		RPC-4.0FSR	RPC-5.0FSR	RPC-6.0FSR
Heat Exchanger Type		Multi-Pass Cross Finned Tube		
Tube Material		Copper Tube		
Outer Diameter	mm	7	7	7
Rows		3	3	3
Number of Tube/Coil		20	20	20
Fin Material		Aluminum		
Pitch	mm	1.6	1.6	1.6
Maximum Operating Pressure	MPa	4.15	4.15	4.15
Total Face Area	m^2	22.6	22.6	22.6
Number of Coil/Unit		1	1	1
Indoor Fan		Sirrocco Fan		
Number/Unit		1	1	1
Outer Diameter	mm	155	155	155
Revolution (Hi2/Hi/Me/Lo)	rpm	1060/948/798/701	1216/1082/926/773	1272/1141/970/798
Nominal Air Flow (Hi2/Hi/Me/Lo)	m^3/min. (ℓ/s)	30/26.5/22/17 (1059/935/777/600)	35/31/25.5/20 (1236/1094/900/706)	37/32.5/27/21 (1306/1147/953/741)
Indoor Fan Motor Starting Method		Drip-Proof Type Enclosure DC Motor		
Nominal Output	W	160	160	160
Quantity		1	1	1
Insulation Class		E	E	E

10. Control System

10.1 Refrigeration Cycle

Models: RPC-1.5FSR, RPC-2.0FSR, RPC-2.5FSR, RPC-3.0FSR, RPC-4.0FSR, RPC-5.0FSR and RPC-6.0FSR

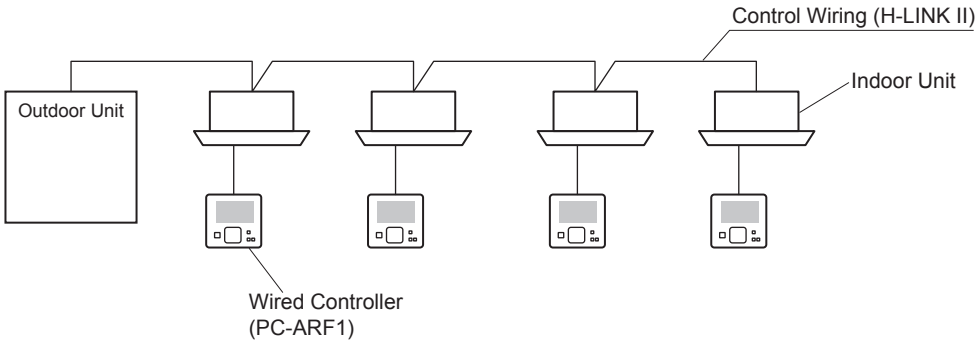


Mark	Part Name
1	Heat Exchanger
2	Distributor
3	Strainer
4	Micro-Computer Control Expansion Valve

HP	1.5	2.0	2.5	3.0	4.0	5.0	6.0
Liquid Pipe Connection	ϕ6.35	ϕ6.35	ϕ9.52	ϕ9.52	ϕ9.52	ϕ9.52	ϕ9.52
Gas Pipe Connection	ϕ12.7	ϕ12.7	ϕ15.88	ϕ15.88	ϕ15.88	ϕ15.88	ϕ15.88
a (OD x T)	ϕ12.7 x 0.8	ϕ12.7 x 0.8	ϕ12.7 x 0.8	ϕ12.7 x 0.8	ϕ12.7 x 0.8	ϕ12.7 x 0.8	ϕ12.7 x 0.8
b (OD x T)	ϕ12.7 x 0.8	ϕ12.7 x 0.8	ϕ15.88 x 1.0	ϕ15.88 x 1.0	ϕ15.88 x 1.0	ϕ15.88 x 1.0	ϕ15.88 x 1.0

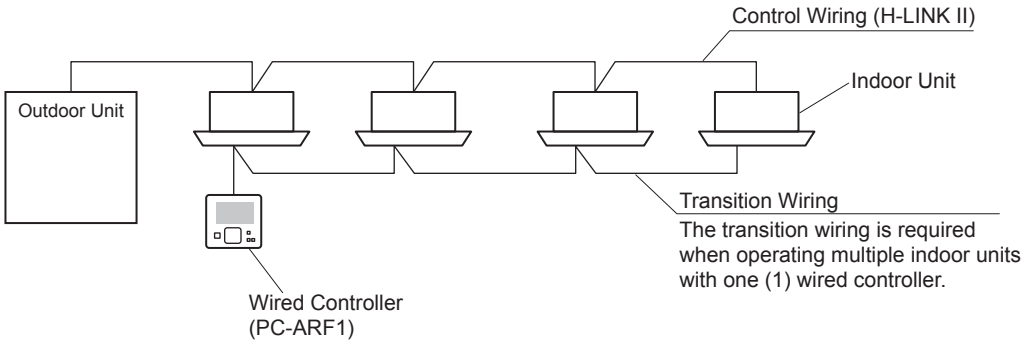
10.2 System Control

10.2.1 Individual Operation



< Individual Thermo ON/OFF Operation >

The individual Thermo ON/OFF operation for each indoor unit is available even if multiple indoor units are controlled simultaneously by one wired controller.



Control Method	by each Optional Wired Controller
Operation Method	by One Group
(1) ON/OFF	Yes
(2) Setting of Operation Mode	Yes *1)
(3) Room Temperature Setting	Yes
(4) Fan Speed Setting	Yes
(5) Timer Setting	Yes
(6) ON/OFF by Timer Control	Yes
(7) Operation Indication	Yes
(8) Alarm Indication	Yes
(9) Self-Checking	Yes
(10) Test Mode	Yes
(11) Motion Sensor Setting	Yes *2)

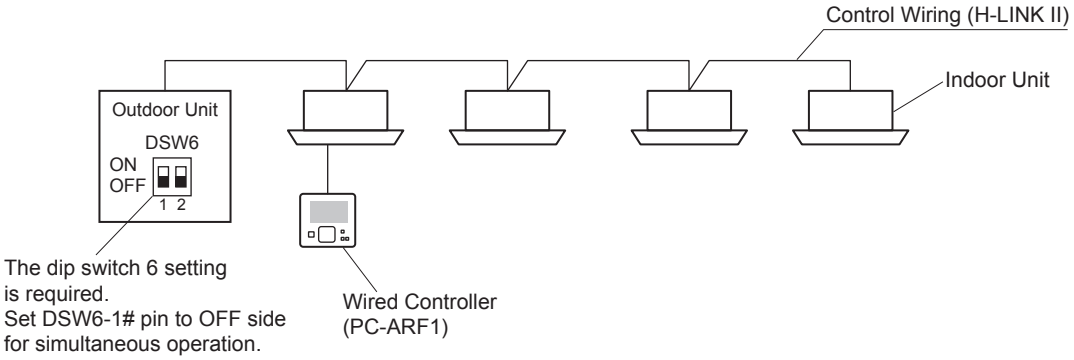
Yes : Available
*1) : Cooling and heating can not be operated simultaneously.
*2) : Only for RPC-FSR + SOR-NEP + PC-ARF1

NOTE:
Refer to “Installation and Maintenance Manual” of each equipment for details of electrical wiring.

10.2.2 Simultaneous Operation

■ Combination with DC Inverter UTOPIA Series Outdoor Unit

This unit can be operated simultaneously with twin, triple and quad combinations.
One wired controller (PC-ARF1) can control without transition wiring up to 4 units of FSN2 series or later model types (H-LINK II-supporting models) simultaneously.
(Available if it is with the transition wiring.)



Control Method	by One Optional Wired Controller
Operation Method	by One Group
(1) ON/OFF	Yes
(2) Setting of Operation Mode	Yes *1)
(3) Room Temperature Setting	Yes
(4) Fan Speed Setting	Yes
(5) Timer Setting	Yes
(6) ON/OFF by Timer Control	Yes
(7) Operation Indication	Yes
(8) Alarm Indication	Yes
(9) Self-Checking	Yes
(10) Test Mode	Yes
(11) Motion Sensor Setting	No

Yes : Available
*1) : Only if all units in one group are connected to the same outdoor unit.

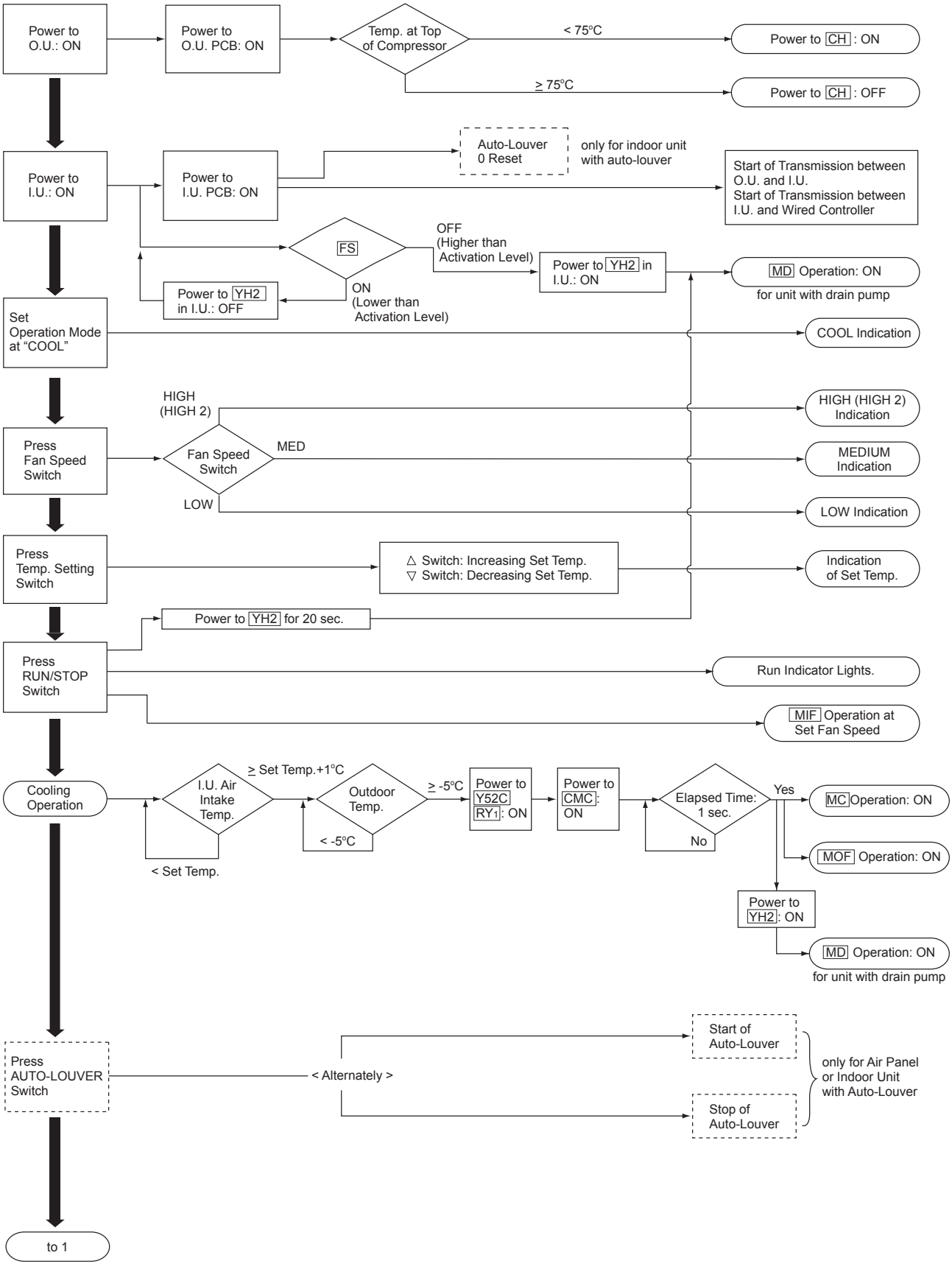
NOTE:
Refer to “Installation and Maintenance Manual” of each equipment for details of electrical wiring.

10.3 Standard Operation Sequence

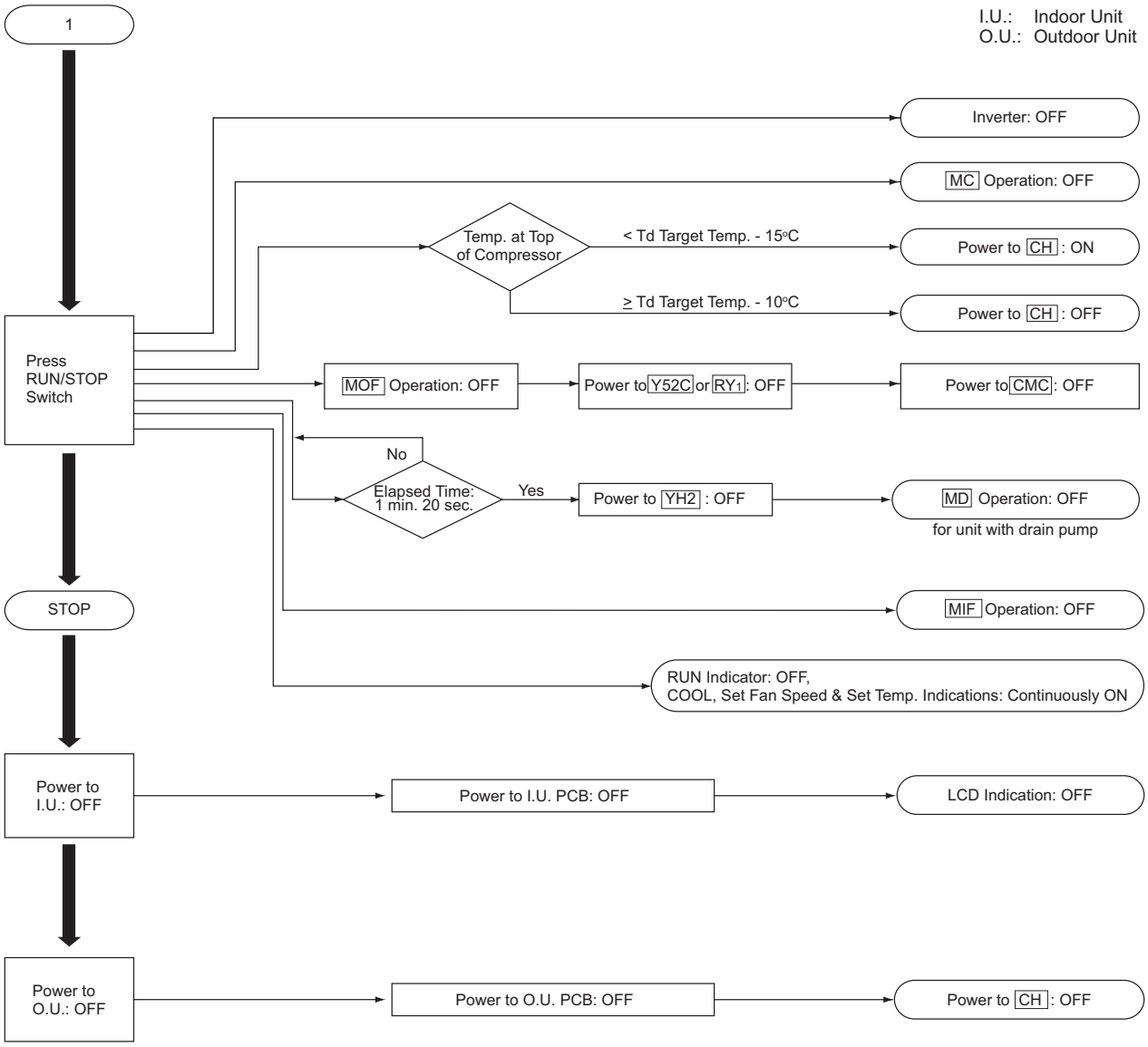
Each of the following operation sequences is just one example when the unit is combined with DC Inverter UTOPIA Series Outdoor Unit.

■ Cooling Operation

I.U.: Indoor Unit
O.U.: Outdoor Unit

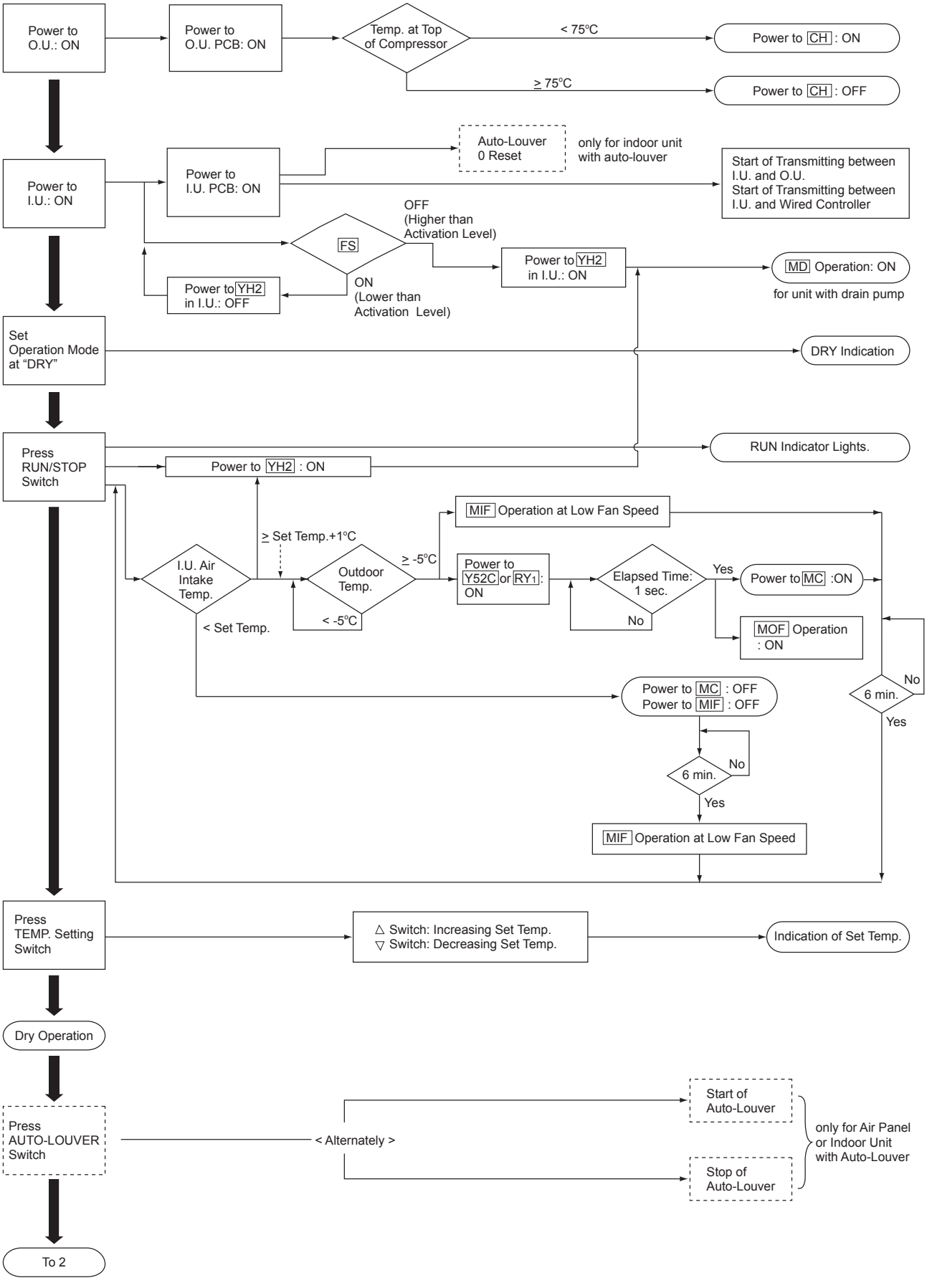


■ Cooling Operation

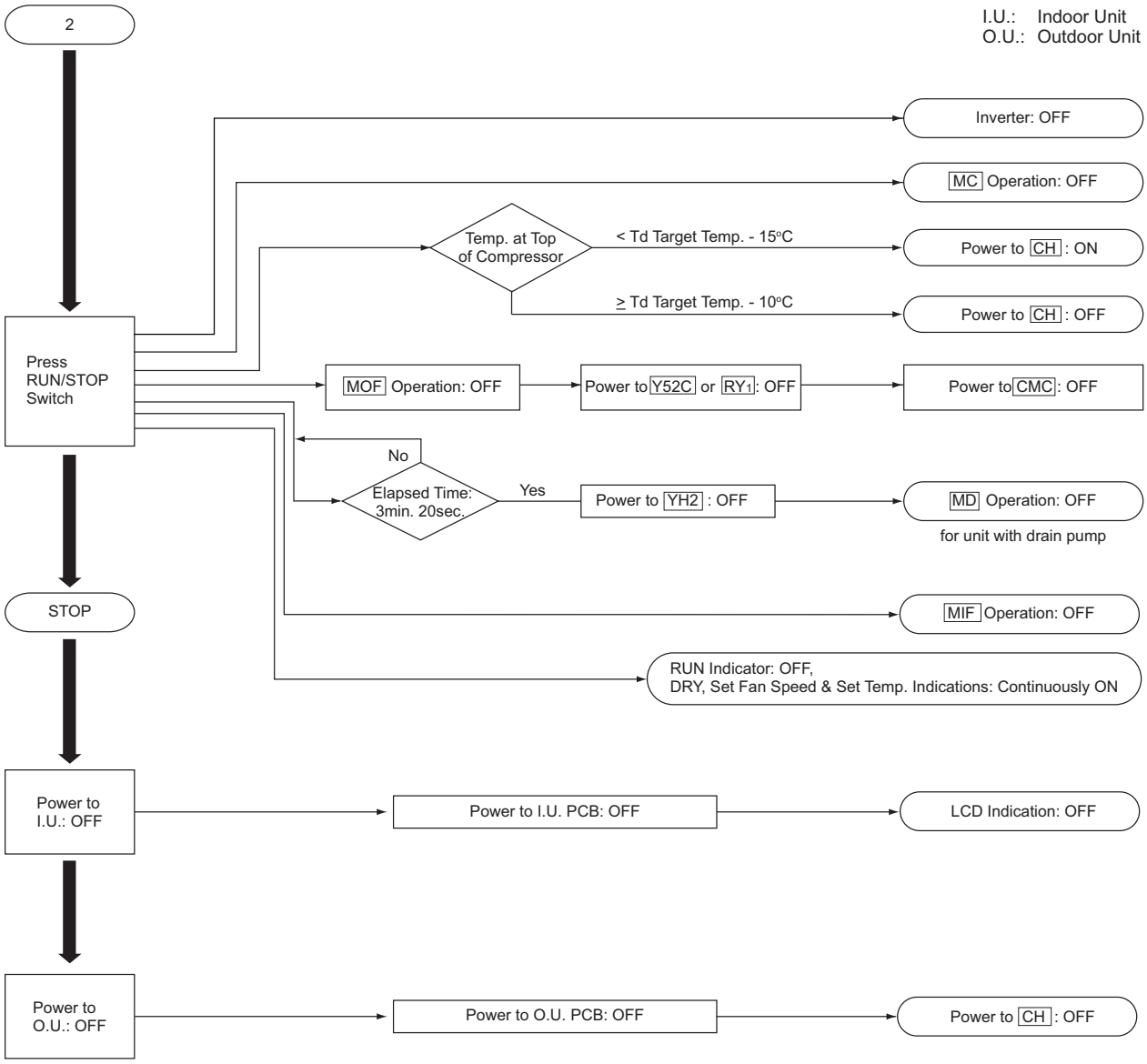


■ Dry Operation

I.U.: Indoor Unit
O.U.: Outdoor Unit

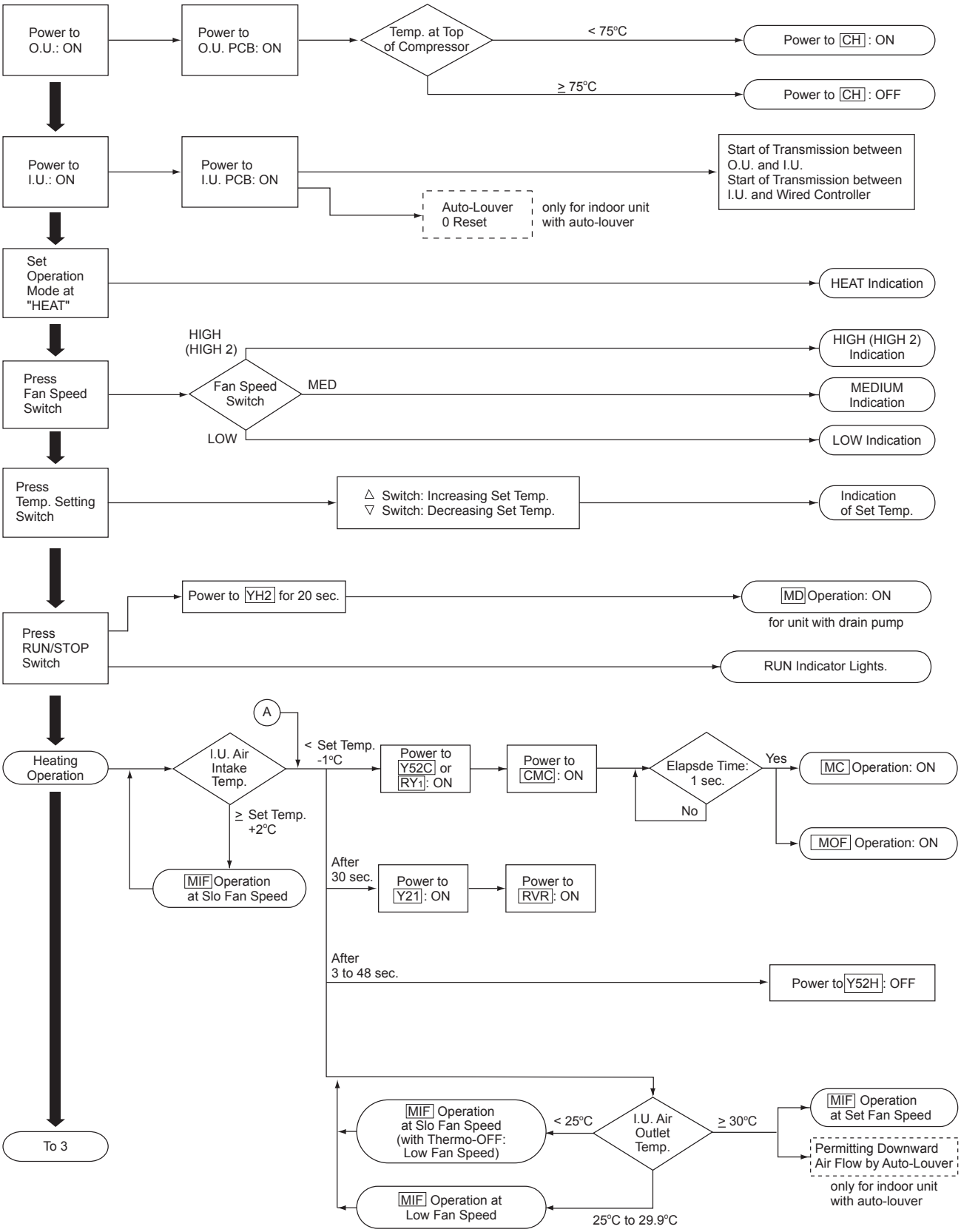


■ Dry Operation

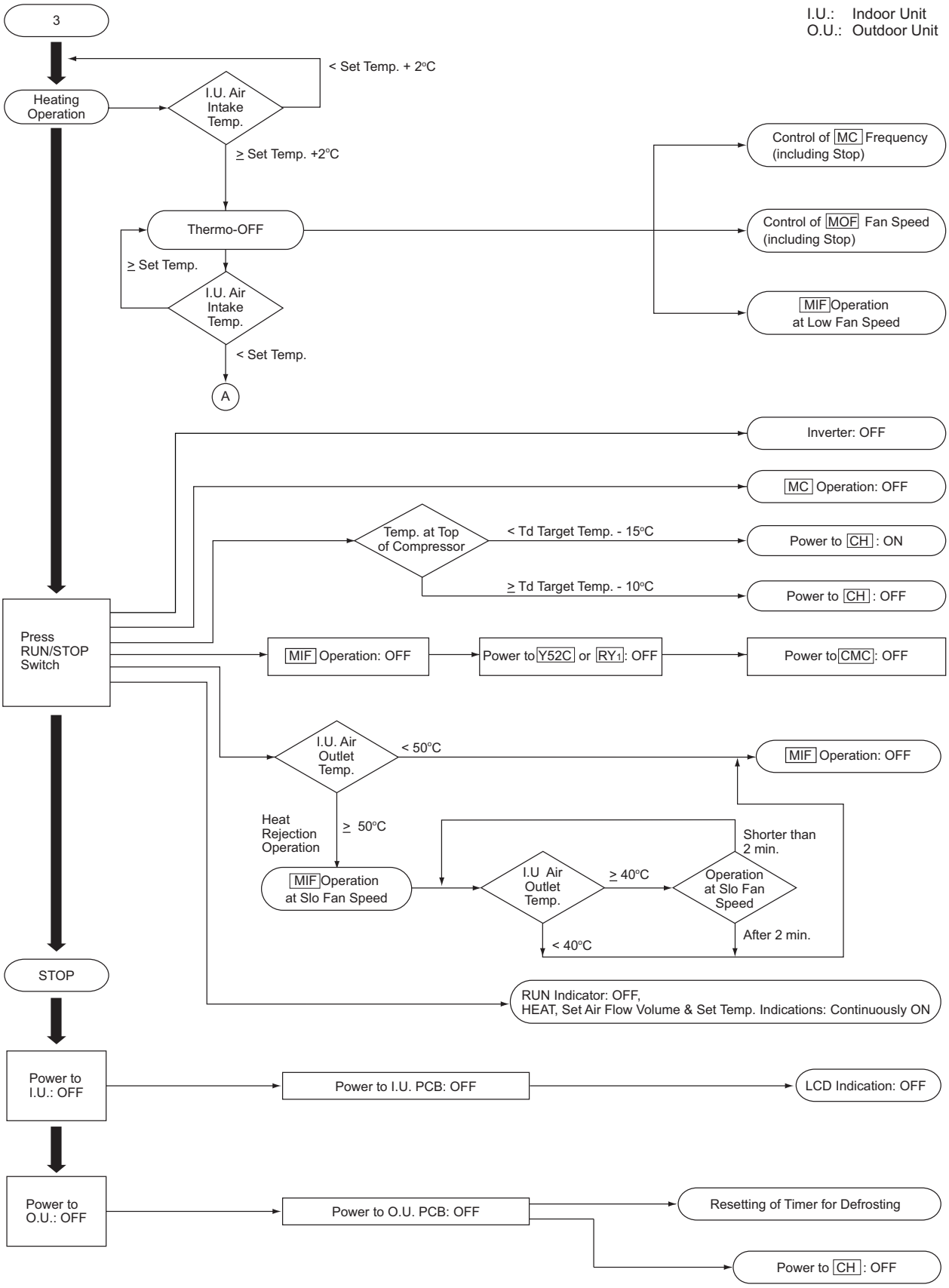


■ Heating Operation

I.U.: Indoor Unit
O.U.: Outdoor Unit

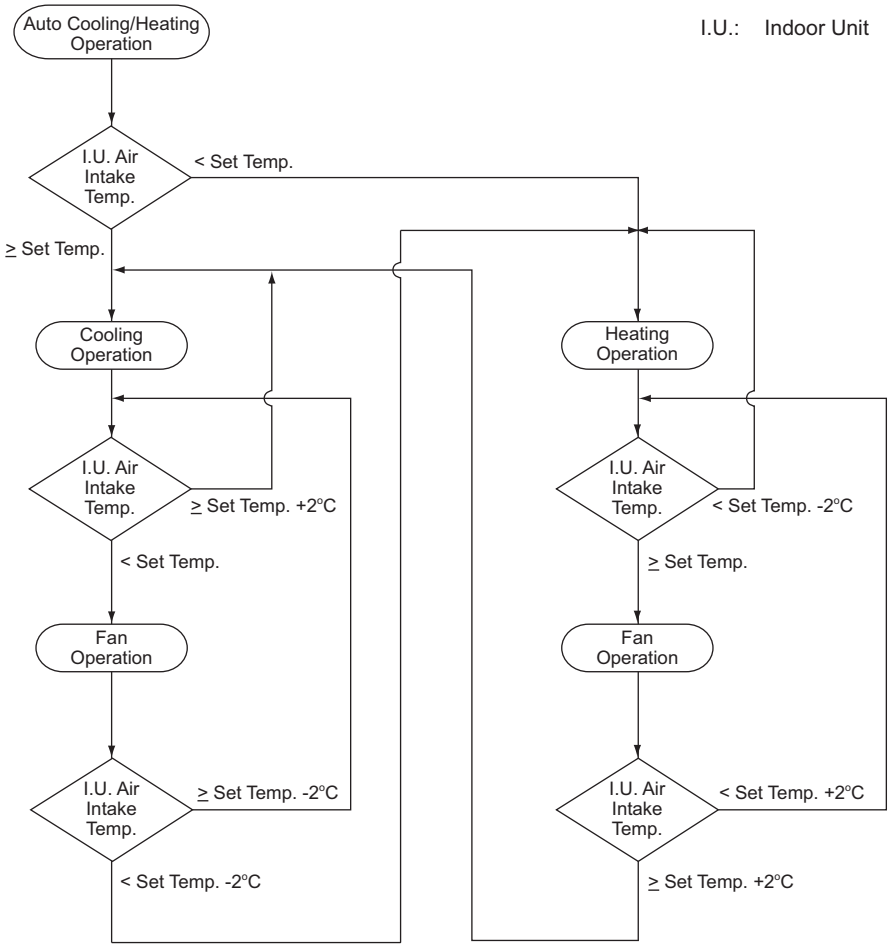


■ Heating Operation



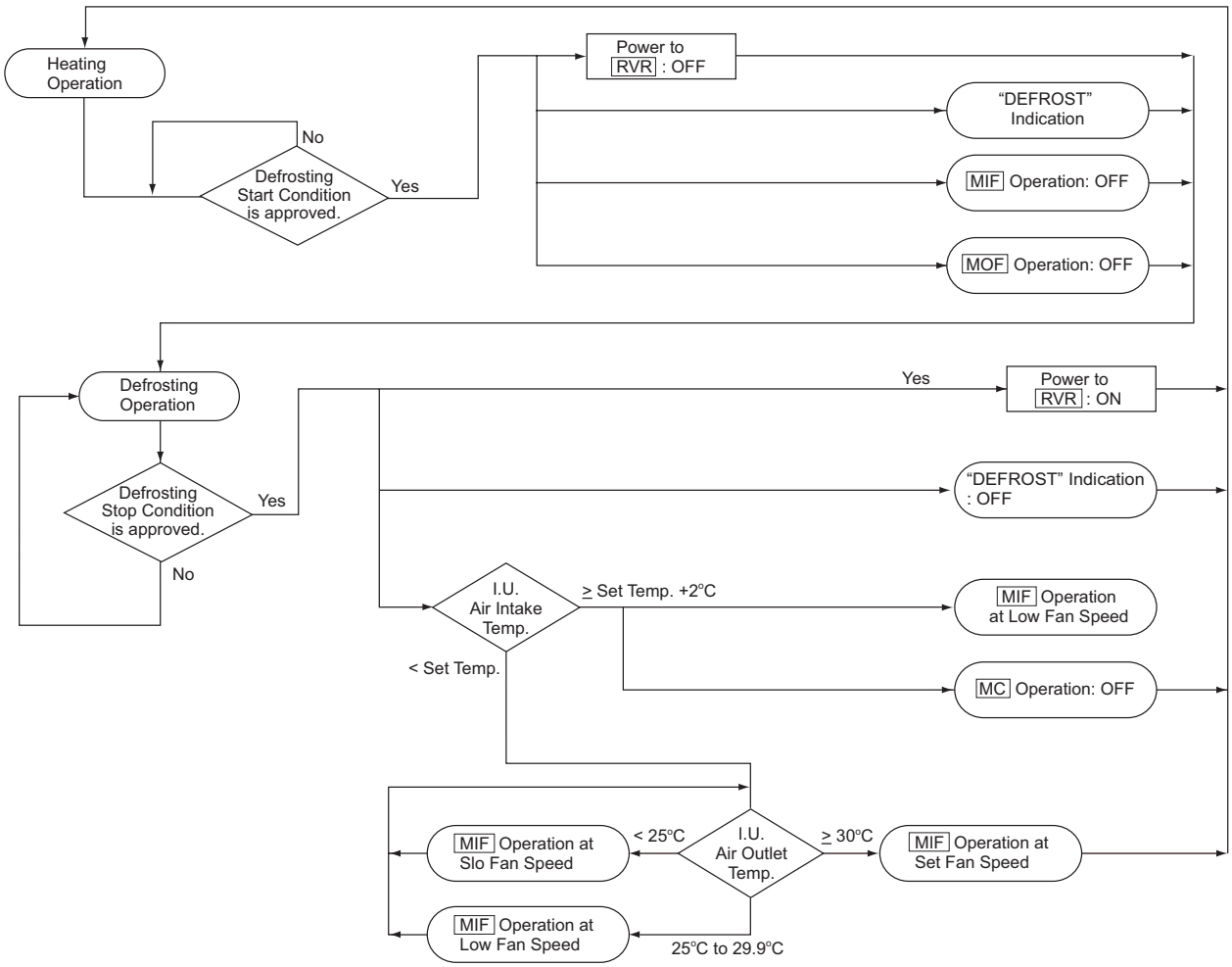
■ Automatic Cooling and Heating Operation

It is applicable only for single.



■ Defrosting Operation

I.U.: Indoor Unit



<Defrosting Operation>
The following defrosting operations, "Standard Defrost", "Forced Defrost" and "Manual Defrost" are available.

(1) Standard Defrost
This operation starts according to the outdoor temperature, the outdoor evaporating temperature and the operating time.

(2) Forced Defrost
This operation starts when Thermo-ON/OFF operation for each indoor unit is repeated and the standard defrost is not used.

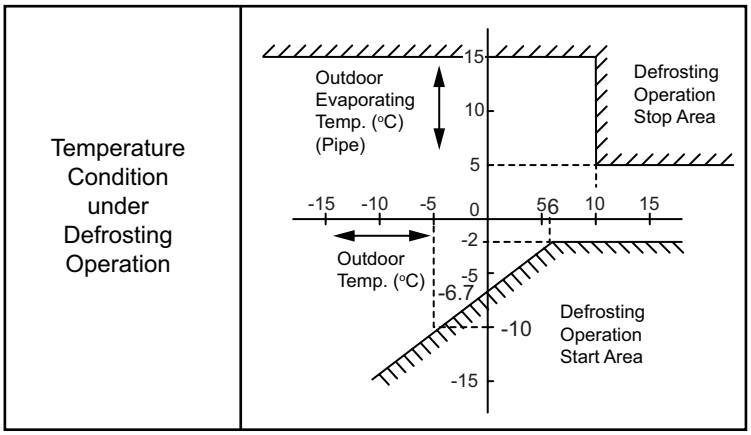
(3) Manual Defrost
This operation starts when the push switch "PSW1" on the outdoor PCB is pressed and hold for more than 3 seconds during the maintenance work. (This function cannot be used when the pressure and the outdoor evaporating temperature is high at the start of the defrosting operation.)

NOTE:
Do not repeat defrost operation frequently.

<Condition for Starting Defrost>

(1) Standard Defrost

(a) Temperature Condition



(b) Condition for Operating Time of Defrosting Operation Start

The defrosting operation starts when the temperature condition shown in "(a) Temperature Condition" is met after the heating operation is performed for 40 to 120 minutes. The heating operation time is determined by estimating the amount of frost on the heat exchanger.

(2) Forced Defrost

< Condition for Starting >

The forced defrosting operation starts when all the following conditions are met.

(a) The reversing valve is "ON" for more than 120 minutes.

(b) The outdoor temperature is lower than 10°C.

(c) The accumulated heating operation time is more than 60 minutes.
(The accumulated time is reset when the operation is stopped or the defrosting operation is performed.)

(d) The compressor is operated continuously for more than 1 and a half minutes.

(e) The outdoor evaporating temperature is lower than 5°C right before the operation starts.

(f) The pressure switch for control is "OFF".

<Condition for Completing Defrosting Operation>

The defrosting operation stops when any of the following conditions is met.

(1) The outdoor evaporating temperature reaches more than 25°C for 2 minutes after the defrosting operation starts.

(2) The outdoor evaporating temperature reaches more than 15°C (the outdoor temperature < 10°C) 2 minutes after the defrosting operation starts.

(3) The outdoor evaporating temperature reaches more than 5°C (the outdoor temperature ≥ 10°C) 2 minutes after the defrosting operation starts.

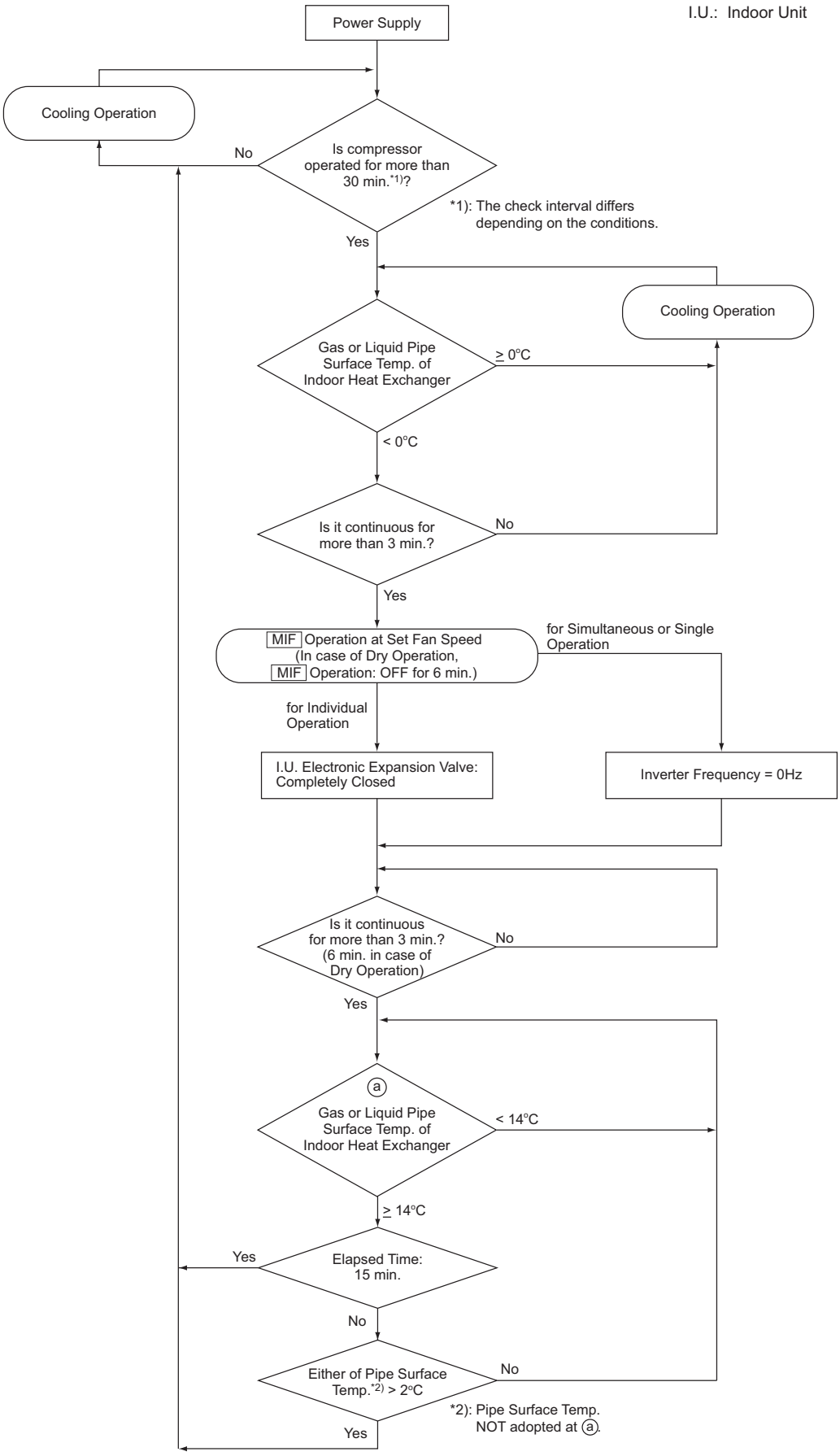
(4) The pressure switch for control is "ON".

(5) More than 9 minutes pass after the defrosting operation starts.

NOTE:

The defrosting operation does not start immediately even if the above conditions are met.
(The defrosting condition may be met temporarily depending on the refrigerant cycle variability.)
The defrosting operation starts when the conditions are met continuously for a period of time.

■ Freezing Protection Control during Cooling or Dry Operation



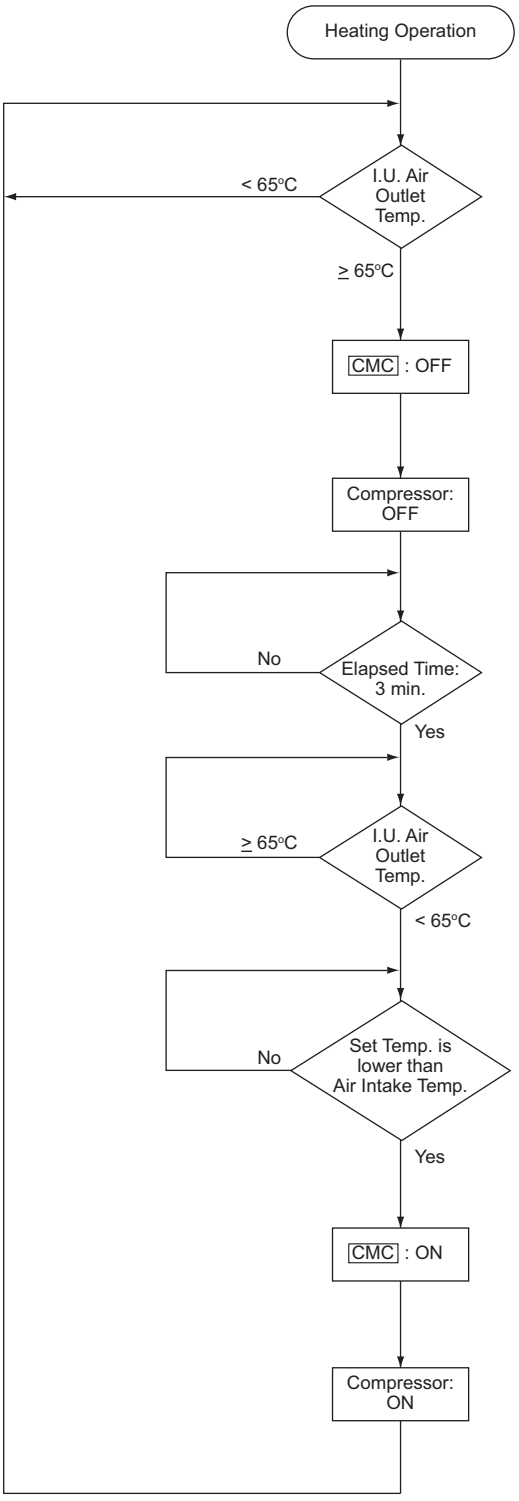
■ Prevention Control for High Pressure Increase during Cooling Operation

This function is performed to prevent the abnormal condition (Alarm Code: 02) when the air flow volume decreases due to a seasonal wind against air outlet of the outdoor unit. When the following conditions are met, the forced Thermo-OFF operation will be performed.
The cause of stoppage will be “13” during Thermo-OFF.

(1) Y52C is turned “ON” during the cooling operation, or RY1 is turned “ON” (during the compressor operation).

(2) High Pressure $\geq$ 3.8MPa

■ Prevention Control for Excessively High Discharge Gas Temperature

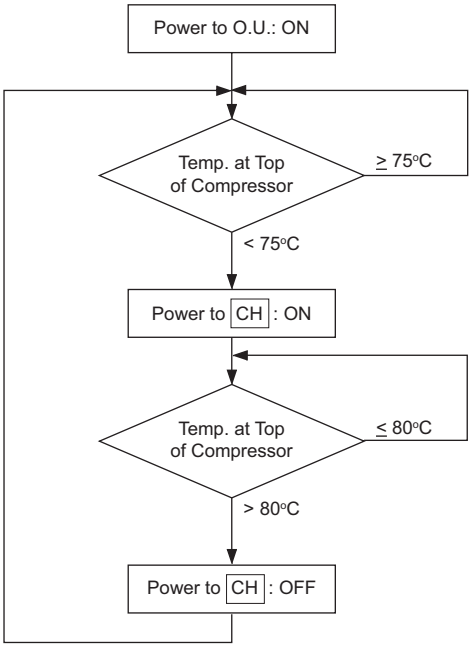


I.U.: Indoor Unit

Thermo-ON/OFF Control for Indoor Unit

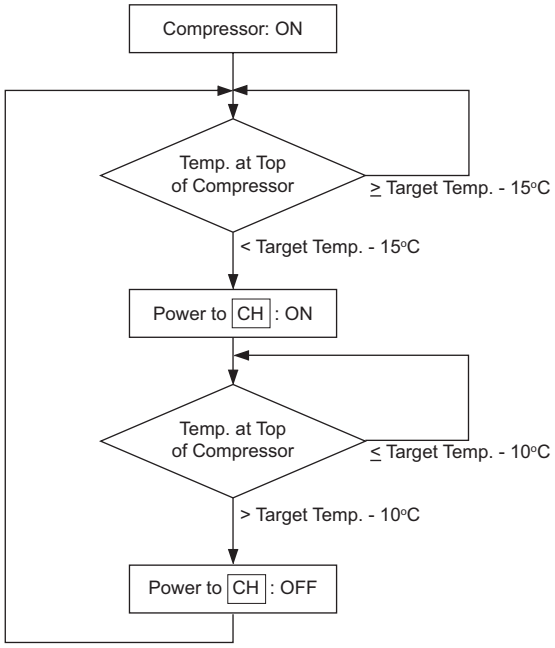
■ Control for Crankcase Heater

< During Stopping Compressor >

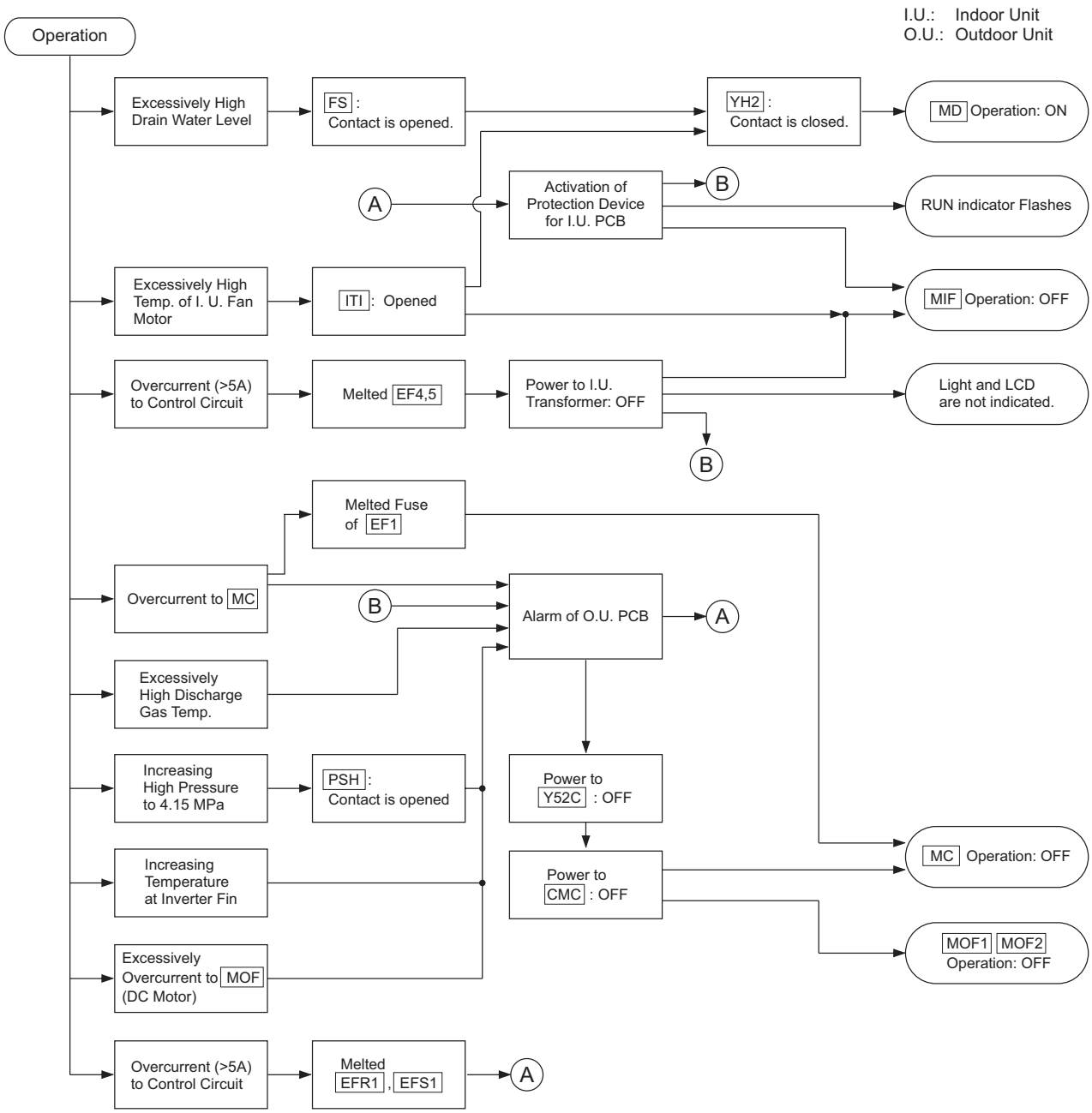


< During Operating Compressor >

O.U.: Outdoor Unit

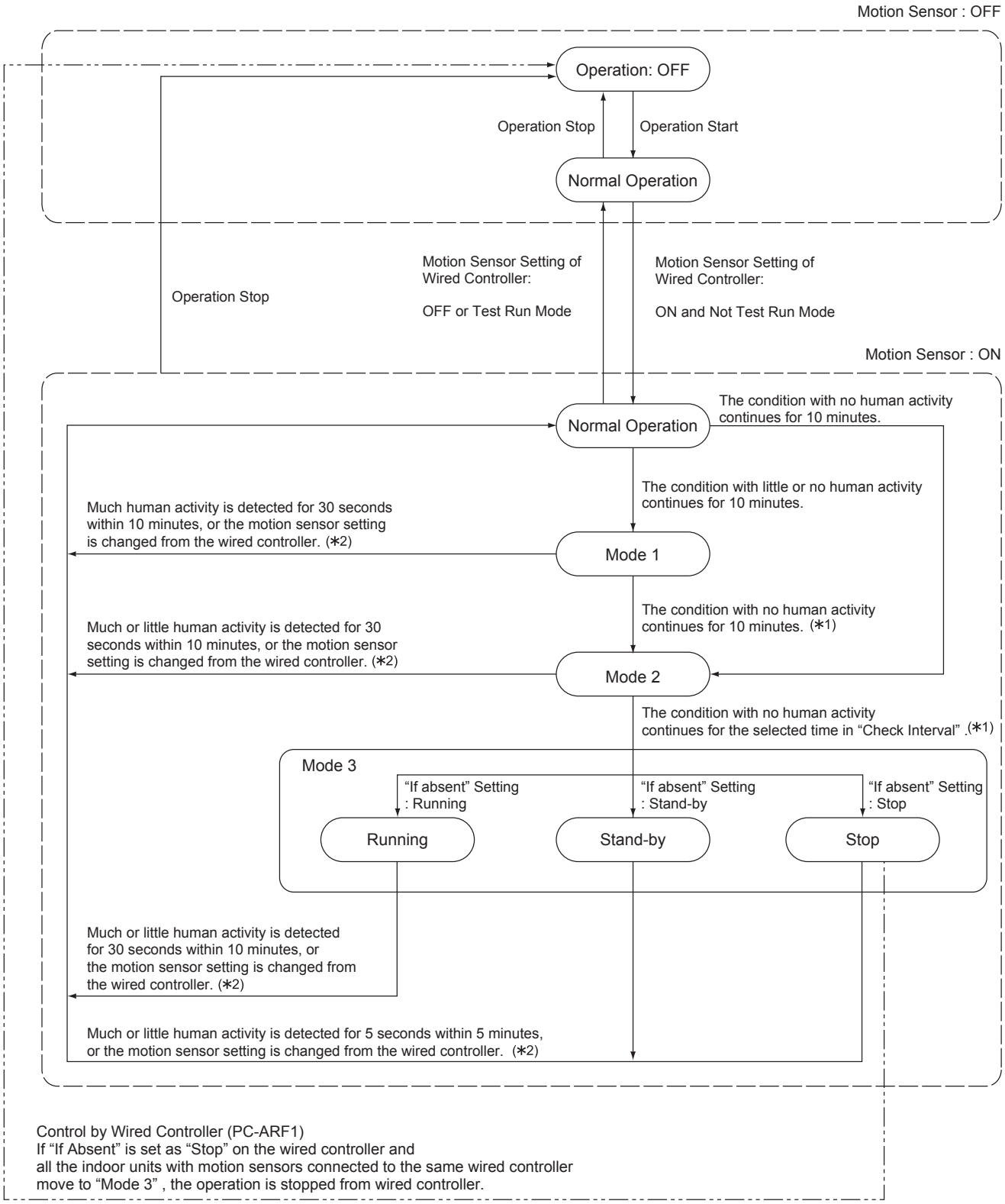


■ Actuation for Protection Instrument



■ Control for Motion Sensor

Following is only one example. The sequence may be different depending on the outdoor unit model to be connected. Refer to the “Outdoor Unit Technical Catalog” for details.



(*1) If the condition with no human activity continues before the indoor unit moves to the next mode, the accumulated time in “Check Interval” gets transferred to the next mode. (The duration of the condition with no human activity is not reset.)

(*2) The motion sensor settings on the wired controller are “Sensor”, “If Absent”, “Check Interval” and “Simultaneous Operation / Individual Operation”.

10.4 Protection and Safety Control

Compressor Protection
The compressor is protected by the following devices and their combinations.

High Pressure Switch - This switch cuts out the operation of the compressor when the discharge pressure exceeds the setting.

Crankcase Heater - This band type heater protects against oil Carry-over during cold starting, as it is energized while the compressor is stopped.

Chip Ceramic
PTC Thermistor (POSISTOR Ⓡ) in the DC fan motor controls the fan motor revolution when the fan motor internal temperature exceeds the setting.

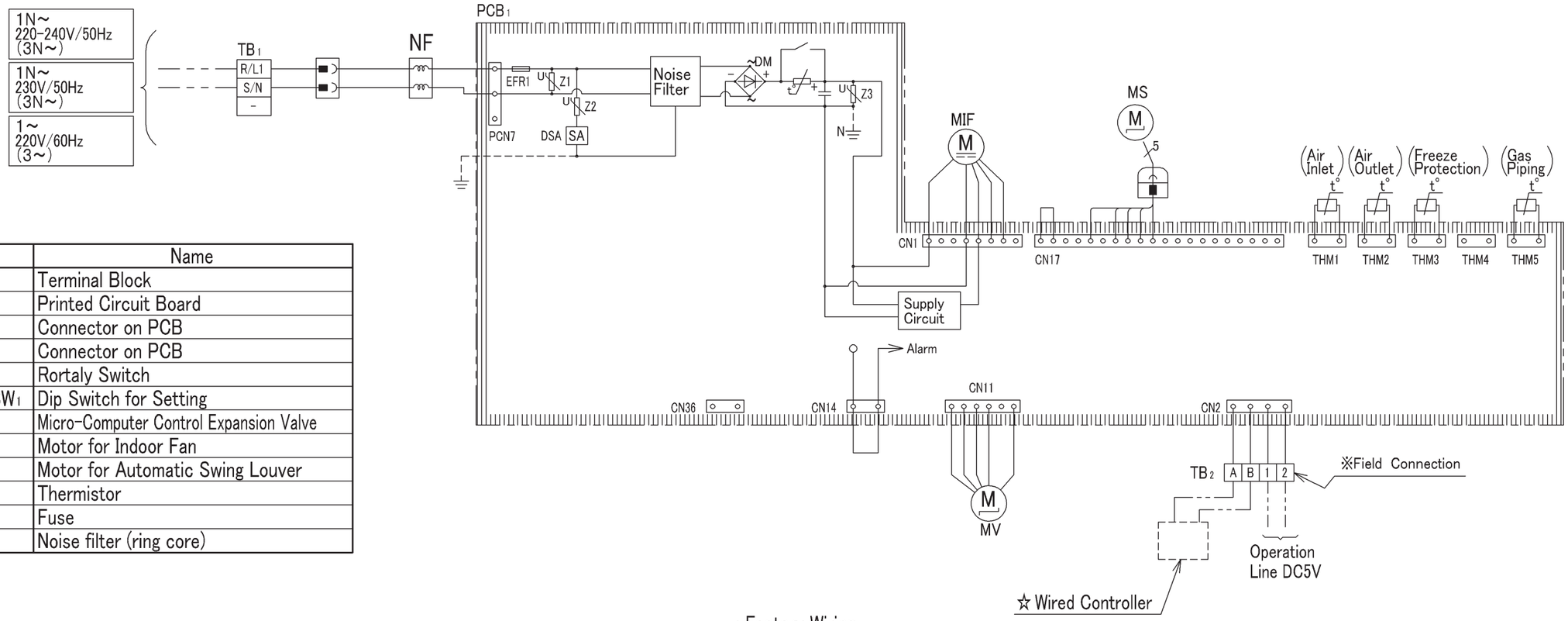
10.5 Safety and Control Device Setting

< Indoor Unit >

Model			RPC-1.5FSR, RPC-2.0FSR, RPC-2.5FSR, RPC-3.0FSR, RPC-4.0FSR, RPC-5.0FSR, RPC-6.0FSR
For Evaporator Fan Motor Internal Thermostat			Automatic Reset, Non-Adjustable (each one for each motor)
	Cut-Out	°C	-
	Cut-In	°C	-
Chip Ceramic PTC Thermistor		°C	100
For Control Circuit Fuse Capacity		A	5
Freeze Protection Thermostat	Cut-Out	°C	0
	Cut-In	°C	11
Thermostat Differential		°C	2

10.6 Electrical Wiring Diagram

ELECTRICAL WIRING DIAGRAM (FOR MODELS: RPC-1.5FSR, RPC-2.0FSR, RPC-2.5FSR, RPC-3.0FSR, RPC-4.0FSR, RPC-5.0FSR AND RPC-6.0FSR)



Mark	Name
$TB_{1,2}$	Terminal Block
PCB_1	Printed Circuit Board
$PCN_{4,7}$	Connector on PCB
$CN_{1\sim36}$	Connector on PCB
$RSW_{1,2}$	Rortaly Switch
$DSW_{3\sim7,9}$,SW_1	Dip Switch for Setting
MV	Micro-Computer Control Expansion Valve
MIF	Motor for Indoor Fan
MS	Motor for Automatic Swing Louver
$THM_{1\sim3,5}$	Thermistor
EFR_1	Fuse
NF	Noise filter (ring core)

: Factory Wiring

: Earth Wiring

: Field Wiring

※ : Field Connection

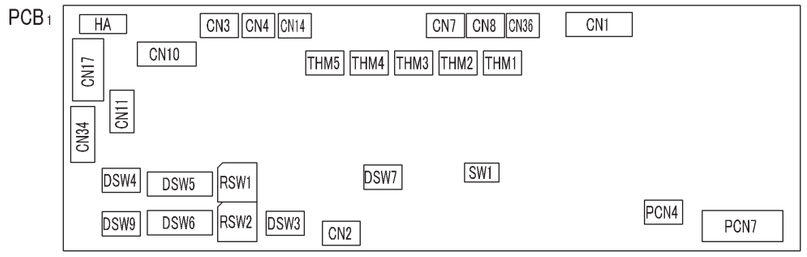
☆ : Optional Parts

Note:

1.All the field wiring and equipment must comply with local codes.

Electrical Control Box of Indoor Unit

Printed Circuit Board



11. Miscellaneous Notes

Special Notes

1. Provide a service access door near the unit piping connection part on the false ceiling for the ceiling type units.
2. Consider the air distribution from the unit to the space of the room, and select a suitable location so that uniform air temperature in the room can be obtained.
   Avoid unit installation in a room where the ceiling height (distance between the floor to the false ceiling) exceeds three meters. If the indoor unit is installed in a room with a ceiling more than three meters in height, it is recommended that an air circulation fan be installed separately to obtain uniform air temperature in the room, especially during the heating operation.
3. Check to ensure that the ceiling slab is strong enough and that the false ceiling is flat and level.
4. Avoid obstacles which may restrict the air intake or the discharge flow.
5. Do not install the unit in a machinery shop or kitchen where vapor from oil or its mist can enter the unit.
   The oil will deposit on the heat exchanger, which may reduce the unit performance, cause deformation, and in the worst case, break the plastic parts of the unit.
6. Pay attention to the following points when the unit is installed in a hospital or other facilities where electromagnetic wave is radiated from medical equipment.
   (A) Do not install the unit where the electromagnetic wave is directly radiated to the electrical box, controller cable or wired controller.
   (B) Install the unit and component as far from an electromagnetic wave radiator (at least three meters) as possible.
   (C) Prepare a steel box and install the wired controller in it. Prepare a steel conduit pipe and wire the controller cable in it. And then, connect earth wire with the box and the pipe.
   (D) Install a noise filter when the power supply emits harmful noise.
7. Do not install the units in an acid or alkaline environment, as the heat exchanger will be damaged by corrosive action. In the case that outdoor units are installed near the sea, it is recommended that optional corrosion-resistant-type outdoor unit be used.
8. Do not install the units in a flammable environment, as there is a danger of an explosion.
9. Regarding ceiling type indoor units, consider the direct and reflected sound level, when selecting the unit for spaces where extremely low sound is required.
10. During heating operation, the outdoor heat exchanger produces condensate dew condensation or melted frost water.
    Install the outdoor unit where such water can be drained, or provide a drain passage.
11. Heating Performance: The heating capacity normally decreases when outdoor temperatures decrease. Therefore, provide an auxiliary heating unit if outdoor temperatures are very low.
12. In the case that an outdoor temperature is low and humidity is high, the outdoor heat exchanger will covered with frost, resulting in lower heating capacity. In order to remove the frost, the unit is automatically changed to the defrosting mode. During this defrosting operation, the unit stops for approximately 3 to 10 minutes.
13. As this unit is of heat pump type by circulating hot air in the whole room space, it takes time to heat up the room temperature.
14. The operating sound data is based on an anechoic chamber. Therefore, the actual operating sound will be higher due to reflected sound from the floor and wall.
15. In the case that the unit is operated for a long time at an indoor temperature of over 27°C DB or at an indoor humidity of over 80%, dew condensation may occur on the cabinets, resulting in dew drops.
    If dew condensation occurs, it is required to add thermal insulator on the cabinets.
16. Provide snow-protection hoods to prevent snow from clogging the outdoor heat exchanger.
    If the unit is operated in an area where it snows heavily, provide a base under the outdoor unit, which should be 50cm higher than the presumable maximum snow height.
17. It is recommended that periodical service and maintenance be performed by authorized service engineers before air conditioning seasons, in order to avoid performance decrease due to dust or dirt.
18. This heat pump air conditioner has been designed for normal air conditioning for men. Do not use the product for other purposes such as for food, animals, plants, high precision machines or work of art. Also do not use the product for vehicles or vessels. It will results in water leakage or electrical leakage.
19. It is recommended that the system be installed by authorized engineers. If not, it may cause water leakage, electric shock or fire.
20. In a place where fibers or dusts are floating, the air filter or heat exchangers or the drain pipe may be clogged, resulting in water leakage from the drain pan.

12. Standard Specifications

UNIT - The unit shall be a multi-split system inverter-driven heat pump air conditioner for application with R410A or R32 refrigerants, and shall be composed of ceiling type indoor units and an outdoor unit, with a distributed refrigeration cycle, electrical components and enclosing cabinets. Optional accessories shall also be provided upon customer request. The indoor unit shall be constructed for installation, and the outdoor unit shall be completely weather-proofed for outdoor installation. Both indoor unit and the outdoor unit shall be properly assembled, internally piped and wired, throughly tested, and charged with R410A or R32 refrigerant at the factory and shall comply with Japanese Industrial Standards and other Japanese standardization statues.

CAPACITY - The total capacity of the multi-split system inverter-driven heat pump air conditioner shall be _____kW or greater with _____°C air inlet dry bulb, _____°C air inlet wet bulb, _____°C outdoor air inlet temperature and _____m^3/min. indoor air flow. The total compressor power inputs shall not exceed _____kW. The total heating capacity of the split-type air conditioners shall be _____kW or greater, with _____°C indoor heat exchanger air inlet dry bulb, _____°C outdoor heat exchanger air inlet dry bulb, _____°C outdoor heat exchanger air inlet wet bulb, and _____m^3/min. indoor air flow.
The total compressor power input shall not exceed _____kW.

INDOOR UNIT

CABINET - The cabinet shall be constructed of galvanized steel sheet or finished steel sheet, baked with synthetic resin-paint, with a plastic air panel assembly for cassette type unit, and be constructed of galvanized steel sheet for the in-the-ceiling duct type unit.

REFRIGERATION CYCLE - The refrigeration cycle shall be equipped with a heat exchanger, an electronic expansion valve, solenoid valves and flare connections.

INDOOR FAN AND FAN MOTOR - The indoor fan shall be the multi-blade centrifugal type, statically and dynamically balanced, and directly driven by a _____W motor for model _____ and a _____W motor for model _____. The fan motor bearing shall be permanently lubricated. The fan shall deliver _____m^3/min. air flow for model _____ and _____m^3/min. for model _____ at the nominal air flow. Three operating positions Hi, Me and Lo can be selected according to the required conditions.

INDOOR HEAT EXCHANGER - The heat exchanger shall be the multi-pass, cross-finned tube type, equipped with highly-efficient aluminum fins, mechanically bonded to seamless, oxygen-free copper tubes. The fins shall be spaced at no more than 12 fins per 25.4mm. The face area shall not be less than _____m^2 for model _____ and _____m^2 for model _____. The coil shall be cleaned, dehydrated and tested for leakage at the factory.

OUTDOOR UNIT

CABINET - The cabinet shall be constructed of galvanized steel sheet, baked with synthetic resin paint. The service panel shall be easily removable for service access to the electrical components and the compressor section.

REFRIGERATION CYCLE - Each refrigeration cycle shall be equipped with a scroll compressor, a solenoid valve, a heat exchanger, a 4-Way valve and flare connection parts.

COMPRESSOR PROTECTION - The compressor shall be protected against breakdown by a quick response overcurrent relay, a high pressure switch, a wrap-around type oil heater and a discharge gas thermistor.

OUTDOOR FAN AND FAN MOTOR - The outdoor fan(s) shall be the plastic propeller type, dynamically balanced, and the fan shall be directly driven by a _____W motor for horizontal-flow air discharge. The fan motor shall be permanently lubricated and be protected from ingress of water.

OUTDOOR HEAT EXCHANGER - The heat exchanger shall be the multi-pass, cross-finned tube type, equipped with highly-efficient aluminum fins, mechanically bonded to oxygen-free copper tubes. The coil shall be cleaned, dehydrated and tested for leakage at the factory.

CONTROL - All electrical control devices, shall be enclosed in the indoor and outdoor units.

In addition to the compressor protection devices, the indoor fan motor shall be equipped with an internal thermostat. The outdoor fan motor shall be protected by an internal thermostat. The indoor fan motor shall be directly supplied with the power source from the control circuit. The functions of these control devices shall compose an electrical sequence of manual starting and stopping, automatic continuous operation whenever the room thermostat requires, and the protection devices allow the operation.

CABINET - The cabinet shall be constructed of galvanized steel sheet.

REFRIGERATION CYCLE - The refrigeration cycle shall be equipped with solenoid valves and flare connections to changeover the cycle in mediating between outdoor unit and indoor unit.