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## SELECTION



Grouping 1

RAS-10FSN1E		CORRECTION FACTORS			
Max Connection Rate :	130,00 %		<u>SENSIBLE</u>		
Connection Rate :	118,00 %		Fan speed :		Medium
Available Power :	1,20 HP		<u>TEMPERATURE</u>		
Corrected Cooling Cap. :	29,40 kW		COOLING MODE		HEATING MODE
Corrected Heating Cap. :	29,24 kW		Indoor (WB) 22,00 °C		Indoor (DB) 20,00 °C
Voltage	400V/3/50Hz		Outdoor (DB) 30,00 °C	Outdoor (WB) 6,00 °C	
<u>Dimensions</u>			<u>LENGTH AND HEIGHT</u>		
Length :	950 mm		Max length 65,00m		Max height 3,00m
Height :	1745 mm				
Depth :	750 mm				
Weight :	225 kg		<u>USE DEFROSTING</u>		



119

IU Type	IU Reference	Cool Cap. (kW)	Heat Cap. (kW)	CONTROL SYSTEM				ACCESSORIES			
				RCS	Gr.	CCS	Timer	Remote Sensor	Eco. Kit	Panel	IR Receiver
	RPK-1.0FSN2M (1)	1,79	2,46	 PC-ART	0	PSC-A16RS					



120

IU Type	IU Reference	Cool Cap. (kW)	Heat Cap. (kW)	CONTROL SYSTEM				ACCESSORIES			
				RCS	Gr.	CCS	Timer	Remote Sensor	Eco. Kit	Panel	IR Receiver
	RPK-1.0FSN2M (0,8<-1)	1,40	1,92	 PC-ART	1	PSC-A16RS					

121

IU Type	IU Reference	Cool Cap. (kW)	Heat Cap. (kW)	CONTROL SYSTEM				ACCESSORIES			
				RCS	Gr.	CCS	Timer	Remote Sensor	Eco. Kit	Panel	IR Receiver
	RPK-1.0FSN2M (0,8<-1)	1,40	1,92	 PC-ART	2	PSC-A16RS					



122

IU Type	IU Reference	Cool Cap. (kW)	Heat Cap. (kW)	CONTROL SYSTEM				ACCESSORIES			
				RCS	Gr.	CCS	Timer	Remote Sensor	Eco. Kit	Panel	IR Receiver
	RPK-1.0FSN2M (0,8<-1)	1,40	1,92	 PC-ART	3	PSC-A16RS					



## SELECTION

Grouping 1



### 123

IU Type	IU Reference	Cool Cap. (kW)	Heat Cap. (kW)	CONTROL SYSTEM				ACCESSORIES			
				RCS	Gr.	CCS	Timer	Remote Sensor	Eco. Kit	Panel	IR Receiver
	RPK-1.0FSN2M (0,8<-1)	1,40	1,92	 PC-ART	4	PSC-A16RS					



### 124

IU Type	IU Reference	Cool Cap. (kW)	Heat Cap. (kW)	CONTROL SYSTEM				ACCESSORIES			
				RCS	Gr.	CCS	Timer	Remote Sensor	Eco. Kit	Panel	IR Receiver
	RPK-1.5FSN2M (1,5)	2,87	3,84	 PC-ART	5	PSC-A16RS					



### 124a

IU Type	IU Reference	Cool Cap. (kW)	Heat Cap. (kW)	CONTROL SYSTEM				ACCESSORIES			
				RCS	Gr.	CCS	Timer	Remote Sensor	Eco. Kit	Panel	IR Receiver
	RPK-1.0FSN2M (0,8<-1)	1,40	1,92	 PC-ART	6	PSC-A16RS					



### 125

IU Type	IU Reference	Cool Cap. (kW)	Heat Cap. (kW)	CONTROL SYSTEM				ACCESSORIES			
				RCS	Gr.	CCS	Timer	Remote Sensor	Eco. Kit	Panel	IR Receiver
	RCI-1.0FSN2E (1)	1,91	2,46	 PC-ART	7	PSC-A16RS				P-N23WA	

### 126

IU Type	IU Reference	Cool Cap. (kW)	Heat Cap. (kW)	CONTROL SYSTEM				ACCESSORIES			
				RCS	Gr.	CCS	Timer	Remote Sensor	Eco. Kit	Panel	IR Receiver
	RCI-1.0FSN2E (1)	1,91	2,46	 PC-ART	8	PSC-A16RS				P-N23WA	



### 127

IU Type	IU Reference	Cool Cap. (kW)	Heat Cap. (kW)	CONTROL SYSTEM				ACCESSORIES			
				RCS	Gr.	CCS	Timer	Remote Sensor	Eco. Kit	Panel	IR Receiver
	RCI-1.0FSN2E (1)	1,91	2,46	 PC-ART	9	PSC-A16RS				P-N23WA	

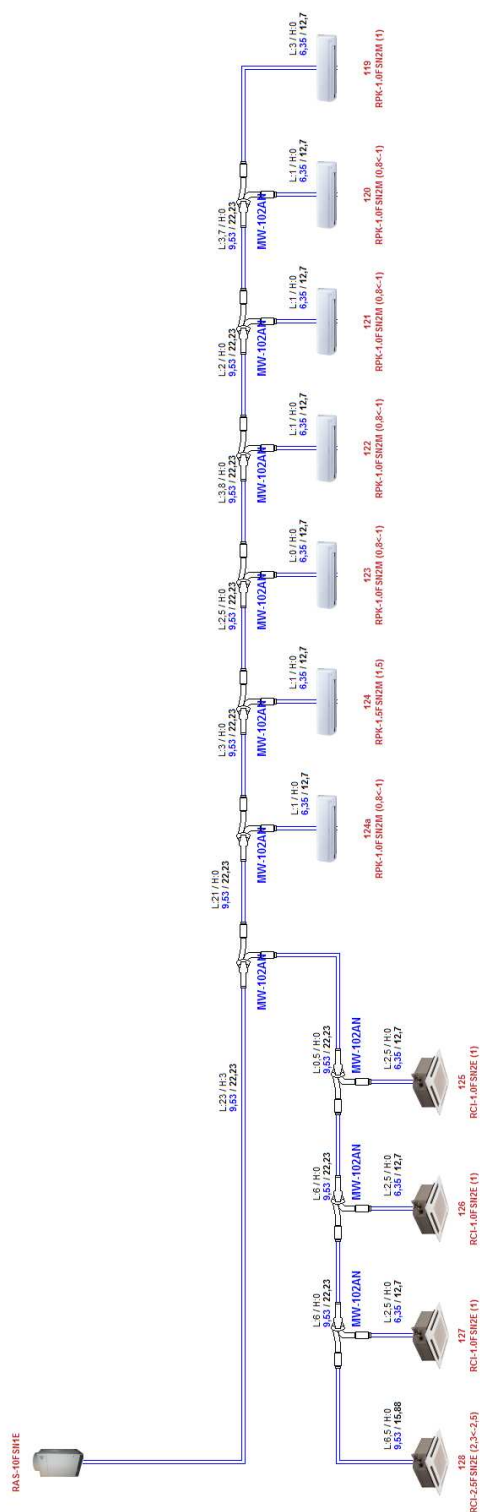
## SELECTION

Grouping 1

128

IU Type	IU Reference	Cool Cap. (kW)	Heat Cap. (kW)	CONTROL SYSTEM				ACCESSORIES			
				RCS	Gr.	CCS	Timer	Remote Sensor	Eco. Kit	Panel	IR Receiver
	RCI-2.5FSN2E (2,3<-2,5)	4,09	5,99	 PC-ART	10	PSC-A16RS				P-N23WA	

## Grouping 1



## DRAWING 1

## PIPING DRAWING

Grouping 1

### LEGEND

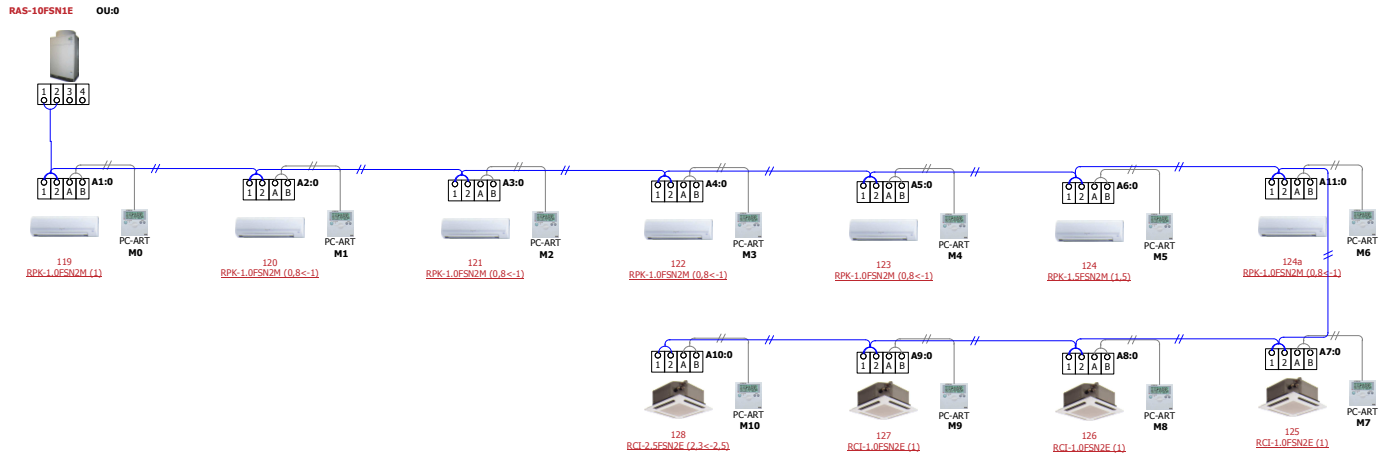
Length Piping Rules	Current	Max
Max length between OU and furthest IU	62	150
Max length between the first multikit and each IU	39	40
Max total length from first multikit to all IU	70,5	300
Max length from each multikit to IU	6,5	30
Height Piping Rules	Current	Max
Max height between OU to IU (OU higher)	3	50
Max height between OU to IU (OU lower)	0	-40
Max height between IU	0	15
Max height between multikit and IU	0	15

OU refrigerant load :	8,50 kg
To be provided :	5,93 kg
Total refrigerant load :	<b>14,43 kg</b>

### RECOMMENDATION

## CONTROL SYSTEM

Grouping 1



**DRAWING 1**



## CONTROL SYSTEM

Grouping 1

### LEGEND



#### RCS link description

- Minimum recommended section (up to 500 m) : 2 x 0.75 mm<sup>2</sup> connected to earth at one point.
- Cable characteristics : non polar, twisted shielded pair of cable.
- One Remote Control Switch can control up to 16 Indoor Units as a maximum.
- Two Remote Control Switch can be connected in the same unit or unit group.
- The second one is a subsidiary remote control switch.



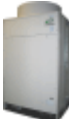





#### H-Link communication line description

- Minimum recommended section : 2 x 0.75 mm<sup>2</sup> connected to earth at one point
- Transmitting wires : non polar, twisted shielded pair of cable
- Maximum H-Link communication line length is 1000 m.
- Maximum number of Outdoor Units is 16.
- Maximum number of Indoor Units is 128.
- Number of CSS : 1

## POWER SUPPLY

Grouping 1

<b>PSC-A16RS</b>	<b>RCI-2.5FSN2E</b>
<b>Connection :</b> LN ⊕ <b>Voltage :</b> 230V/1/50Hz <b>Elect. Prot. Size :</b> 3A <b>Power Supply Line Size :</b> 3 x 2.5mm <sub>L</sub> 	<b>Connection :</b> L1 N ⊕ <b>Voltage :</b> 230V/1/50Hz <b>Max current :</b> 5A <b>Elect. Prot. Size :</b> 10A <b>Power Supply Line Size :</b> 3 x 2.5 mm <sub>L</sub> 
<b>RAS-10FSN1E</b>	<b>RCI-1.0FSN2E</b> X 3
<b>Connection :</b> L1 L2 L3 N ⊕ <b>Voltage :</b> 400V/3/50Hz <b>Max current :</b> 20A <b>Elect. Prot. Size :</b> 20A <b>Power Supply Line Size :</b> 5 x 4.0 mm <sub>L</sub> 	<b>Connection :</b> L1 N ⊕ <b>Voltage :</b> 230V/1/50Hz <b>Max current :</b> 5A <b>Elect. Prot. Size :</b> 10A <b>Power Supply Line Size :</b> 3 x 2.5 mm <sub>L</sub> 
<b>RPK-1.5FSN2M</b>	
<b>Connection :</b> L1 N ⊕ <b>Voltage :</b> 230V/1/50Hz <b>Max current :</b> 5A <b>Elect. Prot. Size :</b> 10A <b>Power Supply Line Size :</b> 3 x 2.5 mm <sub>L</sub> 	
<b>RPK-1.0FSN2M</b> X 6	
<b>Connection :</b> L1 N ⊕ <b>Voltage :</b> 230V/1/50Hz <b>Max current :</b> 5A <b>Elect. Prot. Size :</b> 10A <b>Power Supply Line Size :</b> 3 x 2.5 mm <sub>L</sub> 	

The above wire size and protections are selected at the maximum current of the unit according to EN-60 335-1. Adapt this data to local codes and field configuration.  
If nominal voltage of indoor units is 240V, change the primary voltage of the transformer by using connector CN20 instead of CN21.

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## EQUIPMENT LIST

### 1- HITACHI AIR CONDITIONING EQUIPMENT

#### Outdoor Units

PRODUCT REFERENCE	HITACHI CODE	QUANTITY	Nominal Cooling Capacity (kW)	Nominal Heating Capacity (kW)
RAS-10FSN1E	7E878779	1	28	31,5
<b>TOTAL</b>		<b>1</b>		

#### Indoor Units

PRODUCT REFERENCE	HITACHI CODE	QUANTITY	Nominal Cooling Capacity (kW)	Nominal Heating Capacity (kW)
RCI-1.0FSN2E	7E400001	3	2,8	3,2
RCI-2.5FSN2E	7E400004	1	7,1	8,5
RPK-1.0FSN2M	60277941	6	2,8	3,2
RPK-1.5FSN2M	60277942	1	4,5	5
<b>TOTAL</b>		<b>11</b>		

#### Remote Control System

PRODUCT REFERENCE	HITACHI CODE	QUANTITY	Type of remote control system
PC-ART	70510000	11	WIRED REMOTE CONTROL
<b>TOTAL</b>		<b>11</b>	

#### Central Control System

PRODUCT REFERENCE	HITACHI CODE	QUANTITY	Type of central control system
PSC-A16RS	60291484	1	Central station system
<b>TOTAL</b>		<b>1</b>	

## EQUIPMENT LIST

### Control system accessories : Panels

PRODUCT REFERENCE	HITACHI CODE	QUANTITY	TYPE
P-N23WA	70530000	4	4 way air panel
TOTAL		4	

### Branch Kit : MultiKit

PRODUCT REFERENCE	HITACHI CODE	QUANTITY
MW-102AN	70522001	10
TOTAL		10

## EQUIPMENT LIST

### 2- FIELD PROVIDINGS

#### Piping Materials

PIPE SIZE	TOTAL LENGTH (m)
1/4"	15,5
3/8"	78
1/2"	15,5
5/8"	6,5
7/8"	71,5

#### Refrigerant

REFRIGERANT TYPE	QUANTITY to be provided (kg)
R410A	5,93

#### Electrical Materials

##### Electrical cables

RECOMMENDED ELECTRICAL CABLE SIZE	PURPOSE
5 x 4.0 mm <sub>c</sub>	Outdoor Unit power line
3 x 2.5 mm <sub>c</sub>	Indoor Unit power line
3 x 2.5mm <sub>c</sub>	Central Control System power line
2 x 0.75 mm <sub>c</sub>	Communication line
minimum required line size: 2x0,75 mm <sup>2</sup>	Control line

##### Electrical protection

CIRCUIT BREAKER CAPACITY	QUANTITY	PURPOSE
20A	1	Outdoor Unit protection (three-phased)
10A	11	Indoor Unit protection (single-phased)

## INSTALLATION DESCRIPTION

Set Free 2 pipes FSN (R410A)

### 1 - General Specifications of Selected Technology

The "heating and air-conditioning" package will cover the supply and installation of 1 reversible air-conditioning system of the **HITACHI-make SET FREE type VRF**.

This VRF refrigerant system will be **air-cooled** and will use direct expansion of a coolant that is not harmful to the ozone layer: **R410a type refrigerant**, as the heat transport medium for heating and cooling.

The external units will be reference RAS-10FSN1E (Grouping 1) and will be of the **monobloc** type and will include at least one **Scroll** compressor **DC Linear Inverter** type with a frequency variation band (30Hz - 115Hz) permitting instantaneous speed adjustment, thus refrigerant flow, according to the cooling or heating requirements.

Each unit will be connected to 4 Way Cassette RCI / Wall RPK type HITACHI air-conditioners up to 16 (Grouping 1) **maximum**.

The internal units will be connected **directly** to external units reference RAS-10FSN1E via **two** refrigeration-quality **copper pipes** and sets of specific "**MULTIKIT or header**" factory-preformed connectors.

These systems, known as "**2-pipe reversible**", will offer the possibility for all of the units connected to the same external unit to operate simultaneously in either heating or cooling mode, in any season of the year.

The operating conditions of each internal unit will be chosen individually by the user via WIRED REMOTE CONTROL type remote controls and will be supervised by a PSC-A16RS "" type central control system.

### 2- Description of Production Units

Production units will be of the **SET FREE** type and manufactured by **HITACHI**. They will be delivered as a completely factory-tested **monobloc** and will be ready for connection to the air-conditioning network.

Construction will be galvanised sheet steel, with oven-baked white resin paintwork to give good resistance to UV.

Their design will enable them to function in **heating mode to -20°C** (wet bulb) external, and in **cooling mode from -5°C to +43°C** (dry bulb) external.

#### Product reference RAS-10FSN1E

#### Quantity 1

Nominal cooling capacity  
Nominal heating capacity

28 kW  
31,5 kW

## INSTALLATION DESCRIPTION

### Set Free 2 pipes FSN (R410A)

Power Supply Voltage	400V/3/50Hz
<b>Sound Pressure Level</b> (low noise setting)	58 (53) dBa
<b>Number</b> and types of compressors	1 x inverter Scroll + 0 x Scroll constant(s)
Inverter regulation type	ISPM
<b>Power variation range</b>	8%-130%
<b>Dimensions (HxWxD)</b>	1745x950x750 mm
Weight	225 kg
Refrigerant load	8,5 kg
<b>Available static pressure</b>	60 Pa
Maximum number of internal units	16 units

The refrigeration circuit will comprise "HITACHI **Scroll**" **compressor(s)** protected upstream by a suction trap, an oil separator (except for FSVN units), one or more R410a air exchangers equipped with a sub-cooling circuit and coated as standard with an acrylic **anti-corrosion** protective layer, electronic expansion valves protected upstream and downstream by 2 filters, a 4-way valve, liquid reservoir and a set of manually-operated valves at the inlet from the pipes.

The compressors used will be HITACHI-make Scroll **high-pressure spiral** type. Lubrication occurs by means of the pressure difference between delivery and inlet, which makes an **oil pump unnecessary**. The scroll compressor inverter will have a neodymium rotor and will be powered by DC to optimise **performance of the installation** in de-rated operation.

All compressors will have **anti-vibration mountings** and will be connected to inlet and outlet pipes via **Flare** connections. They will be **precharged** with polyvinyl ether oil, electrically protected, and for refrigeration purposes, by a **phase-rotation control** PCB, casing resistors, HP safety pressure sensor, current-surge relay, outlet temperature sensor, and time-out device.

Electronic regulation modules integrated into these units will be of the ISPM type and will provide continuous, **linear** control of the **Scroll** compressor **inverter DC** and **external fan (s) DC motor inverter(s)** rotation speeds.

This state-of-the-art electronic regulation, associated with a high-efficiency refrigeration circuit and hot gas injection, will (FSVN units only) allow assurance of optimum comfort (proportional control), while maintaining **high values of performance coefficient** for the entire operating range of the external unit.

The external fan will be of helical type and will force the air vertically, for the condensing unit units reference RAS-10FSN1E.

Each fan module will have:

- a DC motor, permanently lubricated and protected against water infiltration

## INSTALLATION DESCRIPTION

Set Free 2 pipes FSN (R410A)

- a **2-blade high-efficiency fan**, dynamically balanced (except for FSVN units).

These characteristics, specific to HITACHI units, allow delivery of an **available static pressure of 60 Pa** for all units (30 Pa for FSVN units respectively), while assuring one of the **lowest sound levels** on the market.

When the environment requires particularly quiet operation, it will be possible to lower the sound level of the external units to **5dBa** in cooling mode by a simple adjustment at commissioning.

A user-friendly 7-segment display will make it possible to **directly read** the value of **all** the installation's **operating and safety parameters** (external and internal units), with a maximum storage capacity of 139 (Grouping 1) parameters.

The main values accessible will be:

- operating pressures and temperatures: HP and LP,
- % opening of each electronic expansion valve,
- operating frequency of inverter compressor,
- current and operating time of each compressor,
- temperatures (demand, blown air, liquid, gas) of each air-conditioning unit,
- fault codes.

"Free contacts" on the main electronics circuit board of the external units will be available as standard for **remote on/off control** of the installation (e.g.: connection to a clock, frost-free thermostat, etc.), to impose the **"operating mode"** (heating or cooling), or impose **"return to default settings"**.

By simple programming, external units in the FSN and FXN ranges can operate while **keeping their operating current** within a programmed range of 60% to 100% of their maximum current, allowing reduced energy consumption.

## 3- Description of Internal Units

The HITACHI-make internal units will be installed within the area to be conditioned.

Refrigeration fluid will be routed from the external unit in a state corresponding to the operating mode demanded (warming or cooling) and heat transfer will occur directly with the **air in the relevant zone**.

Each internal unit will be equipped with the following essential elements: a multi-pass heat exchanger (high quality grooved copper pipes, high-efficiency aluminium fins with step efficiency of 12), an **adjustable-range electronic expansion valve** protected by two filters, an internal fan capable of giving **4 ventilation speeds** (depending on model), two



## INSTALLATION DESCRIPTION

Set Free 2 pipes FSN (R410A)

refrigerant control sensors (**liquid & gas**), two air sensors (**discharge and supply**), a readily-removable, washable filter for conditioned air.

The regulation of each internal unit will be ensured by an electronics PCB incorporating **Proportional-Integral-Derivative** technology, to guarantee keeping to the temperature demand within a **differential range of 0°C/ 2°C** in heating as well as cooling mode.

In addition, each PCB will be equipped with DIP switches and a set of free contacts, which allow, as a standard feature, programming of additional functions such as: **power calibration** for the internal unit, **automatic restarting** after power failure, unit " **start/stop** " (e.g. : connection of a window contact), the unit's "**fault signal**", or "**operation signal** " (e.g.: control of external systems).

Internal units will be of the 4 Way Cassette RCI / Wall RPK **type**.

<b>Product reference RCI-1.0FSN2E</b>	<b>Quantity 3</b>
Nominal cooling capacity	2,8 kW
Nominal heating capacity	3,2 kW
<b>Power rating adjustment</b>	0,8 - 1,3 hp
Supply Voltage	230V/1/50Hz +N+E
<b>Sound Pressure Level (Lo)</b>	28 dBa
Air Flow (Lo)	11 m3/min
Dimensions of unit (HxWxD)	248x840x840 mm
Dimensions of the ventilation panel (HxWxD)	31x950x950 mm
Weight	23 kg
Refrigerant diameters (gas & liquid)	1/2" - 1/4"

<b>Product reference RCI-2.5FSN2E</b>	<b>Quantity 1</b>
Nominal cooling capacity	7,1 kW
Nominal heating capacity	8,5 kW
<b>Power rating adjustment</b>	2,3 - 2,8 hp
Supply Voltage	230V/1/50Hz +N+E
<b>Sound Pressure Level (Lo)</b>	28 dBa
Air Flow (Lo)	15 m3/min
Dimensions of unit (HxWxD)	248x840x840 mm
Dimensions of the ventilation panel (HxWxD)	31x950x950 mm
Weight	24 kg
Refrigerant diameters (gas & liquid)	5/8" - 3/8"

<b>Product reference RPK-1.0FSN2M</b>	<b>Quantity 6</b>
Nominal cooling capacity	2,8 kW

## INSTALLATION DESCRIPTION

### Set Free 2 pipes FSN (R410A)

Nominal heating capacity	3,2 kW
<b>Power rating adjustment</b>	0,8 - 1 hp
Supply Voltage	230V/1/50Hz +N+E
<b>Sound Pressure Level (Lo)</b>	34 dBa
Air Flow (Lo)	7 m3/min
Dimensions of unit (HxWxD)	280x780x210 mm
Weight	10 kg
Refrigerant diameters (gas & liquid)	1/2" - 1/4"

### Product reference RPK-1.5FSN2M

### Quantity 1

Nominal cooling capacity	4,5 kW
Nominal heating capacity	5 kW
<b>Power rating adjustment</b>	1,3 - 1,5 hp
Supply Voltage	230V/1/50Hz +N+E
<b>Sound Pressure Level (Lo)</b>	36 dBa
Air Flow (Lo)	9 m3/min
Dimensions of unit (HxWxD)	280x780x210 mm
Weight	10 kg
Refrigerant diameters (gas & liquid)	1/2" - 1/4"

### Description of unit type

**4-way-outlet cassette-type units**, models RCI-1.0FSN2E / RCI-2.5FSN2E will all be equipped with a DC motor and a fan with a wide-edged blade formed in three dimensions to provide high energy efficiency and very low sound level (for 7.3kW unit: 28dBa at low speed).

They will have a thin (**31mm**) outlet panel, fully motorized, in silky-smooth ABS plastic that can be equipped with an **infrared receiver** (optional). Depending on the installation, it will be possible for these panels to be converted to 2-way or 3-way outlet channels.

**Less than 300mm** high and with fixed area (**840x840mm**) over the power range (from 2.8kW to 16kW), these cassettes will be readily inserted into the majority of false ceilings. Equipped as standard with an "**air booster**" function which can be selected via remote control, it will also be possible for these units to also be used in high-ceiling applications (up to 4.2m).

The body of the unit will be implemented in polystyrene, reducing the **weight** of the cassettes compared with traditional units by about 30% (29kg for a 16kW model).

Condensates will be removed by a HITACHI **pump** with the ability to lift **850mm** from the bottom of the container. All **maintenance** work will be done via the **underside of the unit**, with the exception of examination for leaks, for which it will be advisable to provide an access hatch close to the refrigerant connections.

## INSTALLATION DESCRIPTION

Set Free 2 pipes FSN (R410A)

All cassettes will have as standard one pre-perforation, allowing the introduction of a maximum of **fresh air** equivalent to 10% of the flow rating and 2 pre-perforations for remote outlet (40% of the maximum flow, over a 5m length).

**Wall** units, model RPK-1.0FSN2M / RPK-1.5FSN2M will be installed on the upper part of vertical walls.

The new casing flat design implemented in white ABS plastic will be harmonised to the whole range from 2.2kw to 11.2kw. With its **Compact design** ( **280mm height, 780mm length up to 4.5kw**), these units will easily fit above doors.

Treated air will be distributed via the lower part of the front face of the unit after **filtration** (easily removable, washable, synthetic anti-bacterial filters). The outlet will be via a **motorised outlet shutter** to assure even temperature distribution.

All of these units will be equipped as standard with an **integral infrared receiver**.

## 4- System Installation

### >>> REFRIGERATION CIRCUIT

The connection between the external unit and the internal units will be via refrigeration quality, dehydrated **copper pipes** with a **thickness suitable for the use of R410a**. These pipes will be run on a cable tray and will have to be fixed to the latter by insulated clamps every 15m (maximum). Preferably, they will run in technical trunking on false ceilings. Routing will have to be optimised to limit network load losses. installed with a view to optimizing layout and limiting network load losses.

It will be imperative that all brazed joints will be made under nitrogen flow and special attention will have to be given during installation to reduce all risks of moisture or impurities causing oxidation inside the pipes.

The different types of distribution go via "**Multikit**" or "**Header**" type refrigeration connections supplied by HITACHI and installed **vertically** or **horizontally** in accordance with the recommendations in the installation manual.

The refrigeration circuit will be implemented in **constant** for external units reference: RAS-10FSN1E, **diameter** from the outdoor unit to the last multikit of the main branch.

Each pipe will be **insulated independently** with M0 or M1 isothermal sleeving with a minimum thickness of 9 mm for the liquid line and 13 mm for the gas line.

**Refrigeration connections will comply with the following manufacturer's data:**

**External Model**  
**(Grouping 1)**

**RAS-10FSN1E**

## INSTALLATION DESCRIPTION

### Set Free 2 pipes FSN (R410A)

Maximum length (furthest OU/ IU)	150 m
Maximum total length after 1 <sup>st</sup> multikit in OU outlet	300 m
Maximum total length of refrigeration circuit	<b>does not exist</b> m
Maximum length between each multikit and IU	30 m
Maximum lift (OU/ IU - OU above)	50 m
Maximum lift (OU/ IU - OU below)	40 m
Maximum lift (IU/ IU)	15 m
Maximum lift between IU and multikit	15 m
Maximum length (1st multikit/ furthest IU)	40 m
Diameter of refrigerant connections	7/8" / 3/8"
Oil trap every <b>(NOT NEEDED)</b> m (OU/ IU - OU below)	

## >>> ELECTRICAL CIRCUIT

### Electrical connections of production units:

Each RAS-10FSN1E (Grouping 1) type external unit will be powered from the general panel 400V/3/50Hz + **Neutral + Earth** with protection at the head of the line and **D-curve** circuit breakers. A proximity isolating switch will be installed on each condensing unit to meet the standards in force.

External units reference RAS-10FSN1E	Quantity 1
--------------------------------------	------------

Supply Voltage	400V/3/50Hz
Maximum current	20A
Circuit breaker recommended	20A

### Communications bus:

A bus-type link will provide communications between the external unit and all internal units. This bus will comprise 2 conductors with a minimum cross section of 0.75mm<sup>2</sup>, **non-polarized, screened** (metal braid connected to earth at one point).

When **"several external units"** of the SET FREE type will be installed on the same site, they can be connected together on a bus with **H-LINK wiring** (open loop encompassing all OUs and all internal units {FSN systems} respectively the external units and the distribution boxes {FXN systems}), limiting the risks of installation errors. This wiring will be able to group together a maximum of **16 external units and 128 internal units** while limiting the length of the H-LINK bus to **1000m** (standard application) or **5000m** (using optional HITACHI H-LINK relays).

### Electrical connections of the internal units:

## INSTALLATION DESCRIPTION

Set Free 2 pipes FSN (R410A)

Each internal unit will be supplied from the general panel at **220-240V/1/50Hz+ Neutral + Earth** with protection at the head of the line and **C-curve** circuit breakers.

A proximity switch must be installed on each internal unit for maintenance and repair purposes.

### Internal units reference RCI-1.0FSN2E

**Quantity 3**

Supply Voltage	230V/1/50Hz +N+E
Maximum current	5A
Circuit breaker recommended	10A

### Internal units reference RCI-2.5FSN2E

**Quantity 1**

Supply Voltage	230V/1/50Hz +N+E
Maximum current	5A
Circuit breaker recommended	10A

### Internal units reference RPK-1.0FSN2M

**Quantity 6**

Supply Voltage	230V/1/50Hz +N+E
Maximum current	5A
Circuit breaker recommended	10A

### Internal units reference RPK-1.5FSN2M

**Quantity 1**

Supply Voltage	230V/1/50Hz +N+E
Maximum current	5A
Circuit breaker recommended	10A

## 5- Regulation

Internal units will be controlled from a set of remote controls **type** WIRED REMOTE CONTROL **reference** PC-ART.

Each remote control can individually or simultaneously control up to 16 internal units and will be equipped with a liquid crystal **display** and a keypad enabling users to select and display their main operating parameters:

- unit start / stop,

## INSTALLATION DESCRIPTION

Set Free 2 pipes FSN (R410A)

- temperature demand (available range: 17°C/30°C)
- fan speed (Hi/ Me/ Lo)

### Product reference < PC-ART >

Quantity 11

This remote control will likewise make it possible to select operating mode (5 modes, among them **automatic** heating/cooling), outlet shutter position, access to a **weekly timer**, **anti freeze protection** and adjustment by **remote sensor**.

By simple programming, this remote control will offer, among other things, the possibility of **locking main operating parameters** (temperature demand, operating mode, fan speed) or limiting the temperature setting range (**energy saving**) and will serve as a true **technical tool for maintenance** (display of error codes, operating parameters of the installation, auto-diagnostics for PCBs).

Moreover, this installation will be supervised by a PSC-A16RS "" type centralised management system.

### Product reference<PSC-A16RS>

Quantité <#compteur>

Simple installation (connected to the bus), it will make to run or stop 16 units, or areas. These actions may be done individually : made unit (zones) per unit or together with dedicated button for this purpose. Addressing key affectation is done automatically in the order of units (areas).