

Set Free

Modular FSXN

Engineering for tomorrow. And the tomorrow after that.



Introducing a new addition to Hitachi's Set Free range of VRF air conditioning units - enhancing efficiency and user experience

There is increasing demand for a holistic approach to air conditioning in modern offices – units that are capable of simultaneously cooling and heating, adapting to the different seasons and various temperature requirements of rooms. Customers also want to save time, money and space with their air conditioning and the flexibility to extend an air conditioning set-up to suit changing needs.

And of course there is a growing demand for air conditioning to be as environmentally friendly as possible – enabled through an air-conditioning management system that makes it easier for users to have simple, effective control of their air conditioning units to avoid unnecessary energy wastage, including overheating, overcooling and unattended operation.

To meet and go beyond these important requirements, Hitachi has developed the Set Free FSXN air conditioning system.

Hitachi air conditioning successfully meets installer and customer demands – offering greater functionality, control and cost savings



Needs of end user

- Heat recovery operation
- Energy efficient
- Greater user control
- Flexibility to extend system



Needs of consultants

- Time saving with equipment layout design
- Flexible, modular system designs
- Intelligent controls



Needs of contractor and installer

- Modular and lightweight for quicker (or phased) installations
- Increased piping lengths for flexibility

Set Free FSXN

Set Free FSXN benefits

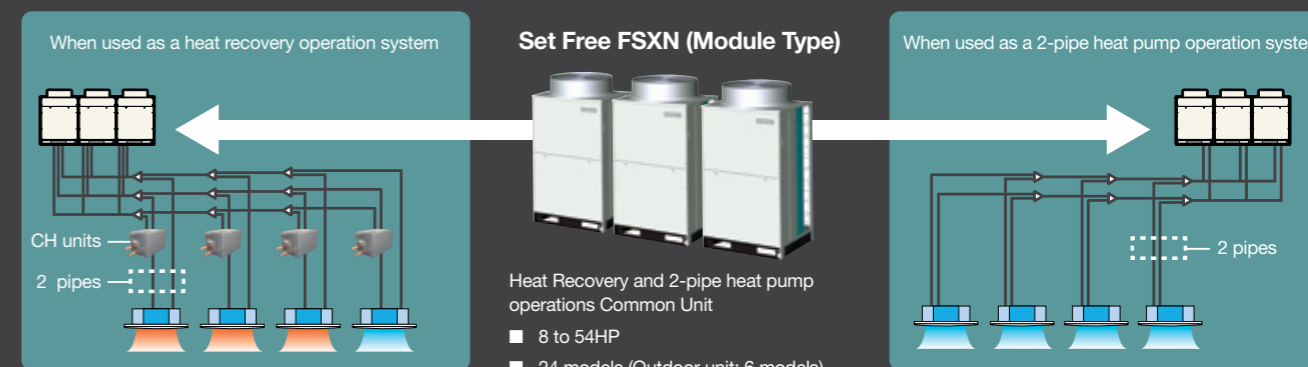
- Compatible with Hitachi's system free indoor units and heat recovery ventilation units
- Wide product range
 - All models (8 to 54HP)
- Energy saving
 - Heat recovery and DC Inverter Driven Compressor
- Flexibility of installation
 - Compact and lightweight design and flexible refrigerant piping
- Comfort and reliability
 - Capable of impressively low noise levels with noise reduction preference mode (option)
- Control by Network System
- Off coil temperature control



Capable of heat recovery and 2-pipe heat pump operations

Hitachi's outdoor units feature a heat recovery operation system as well as a 2-pipe heat pump operation system.

This avoids the need for review work when designing the equipment layout, while reducing the workload and time spent installing the units on site.



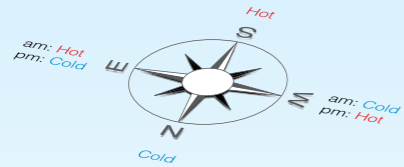
The heat recovery and 2-pipe heat pump operation systems cannot be switched over after installation is complete.

Heat recovery operation

Heat recovery operation - the most important requirement

Temperature control in today's modern spaces is vitally important. There's increasing customer demand for the need to switch between cooling and heating, depending if it's day or night or whether a room is directly facing the sun or not. There's also often a huge difference in room temperatures across the year, with humid conditions in the summer to sub-zero winter temperatures. And of course, equipment such as computers and terminal devices can also add to the heat in spaces. Therefore, heat recovery operation is often a top priority when considering air conditioning systems for buildings.

To meet these needs, Hitachi has developed the Set Free FSXN, offering effective heat recovery operation. Based on our existing heat recovery operation system - Set Free FXN - we have expanded the range; enhancing efficiency, reducing the dimensions and improving workability. As a result, Set Free FSXN offers superb energy-saving efficiency and better comfort.



- There are hot and cold rooms in the same building depending on the direction of sunshine.
- You want to condition the air separately from room to room because there is a difference in temperatures that people require.
- You want to handle changes in air-conditioning needs (differences in cooling/heating requirements) due to the turnover of residents or the alteration of partitions.
- You want to manage rooms that need to be cooled all through the year.
- You want to reduce annual power consumption.



Heat recovery operation system - meeting different air conditioning needs in the same building

In office buildings

The heat inside buildings is less likely to be released due to recent changes in building structures, such as the improvement of heat insulator performance and the use of double-pane windows. Cooling is required all through the year where there are lighting fixtures and IT equipment; equally other areas can be affected by ambient temperatures and sunshine so either cooling or heating is required according to changes in the flow of heat.



Meeting Room



Offices

In commercial buildings

Heat recovery operation is essential in commercial buildings where, for example, restaurants and shops coexist.



Restaurant



Shop

In hotels

In hotels there is a huge difference in the temperatures required. Room temperatures should be set independently according to the personal preferences of the guests.



Entrance



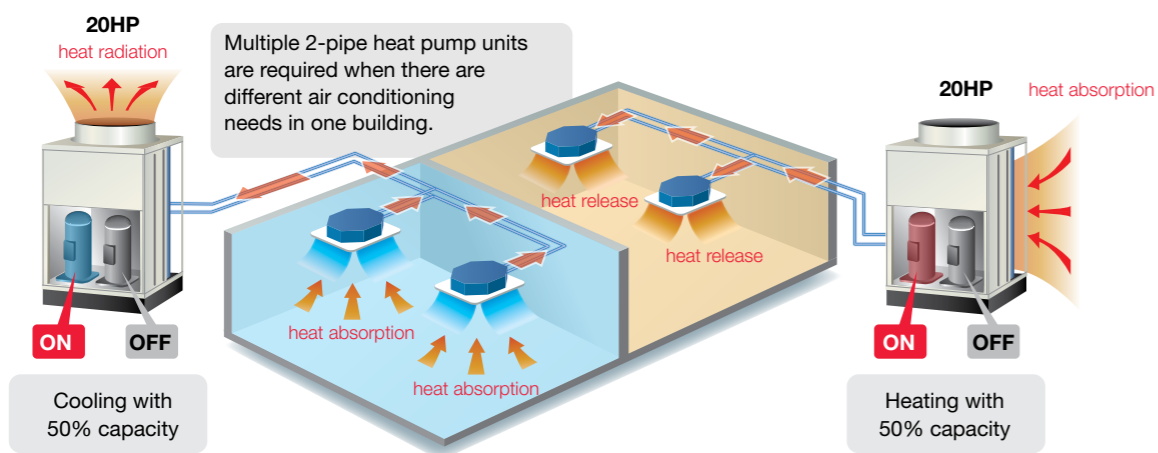
Guest Room

Heat Recovery Operation

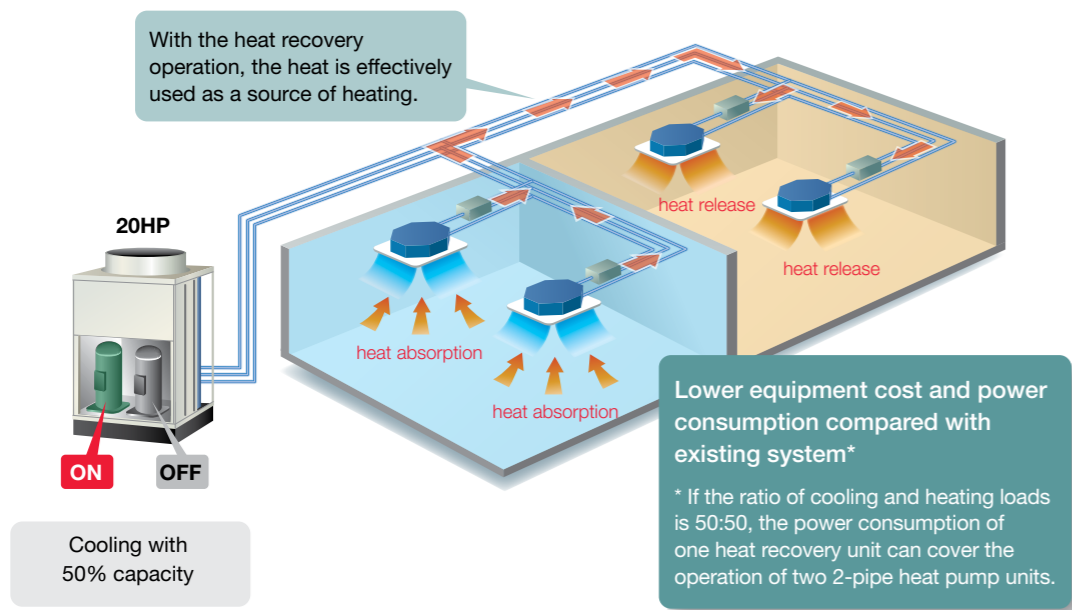
Heat recovery operation - significantly enhancing energy efficiency

A heat recovery system offers high energy-saving efficiency by drawing heat from the rooms to be cooled, and effectively using it as a heat source for the rooms to be heated.

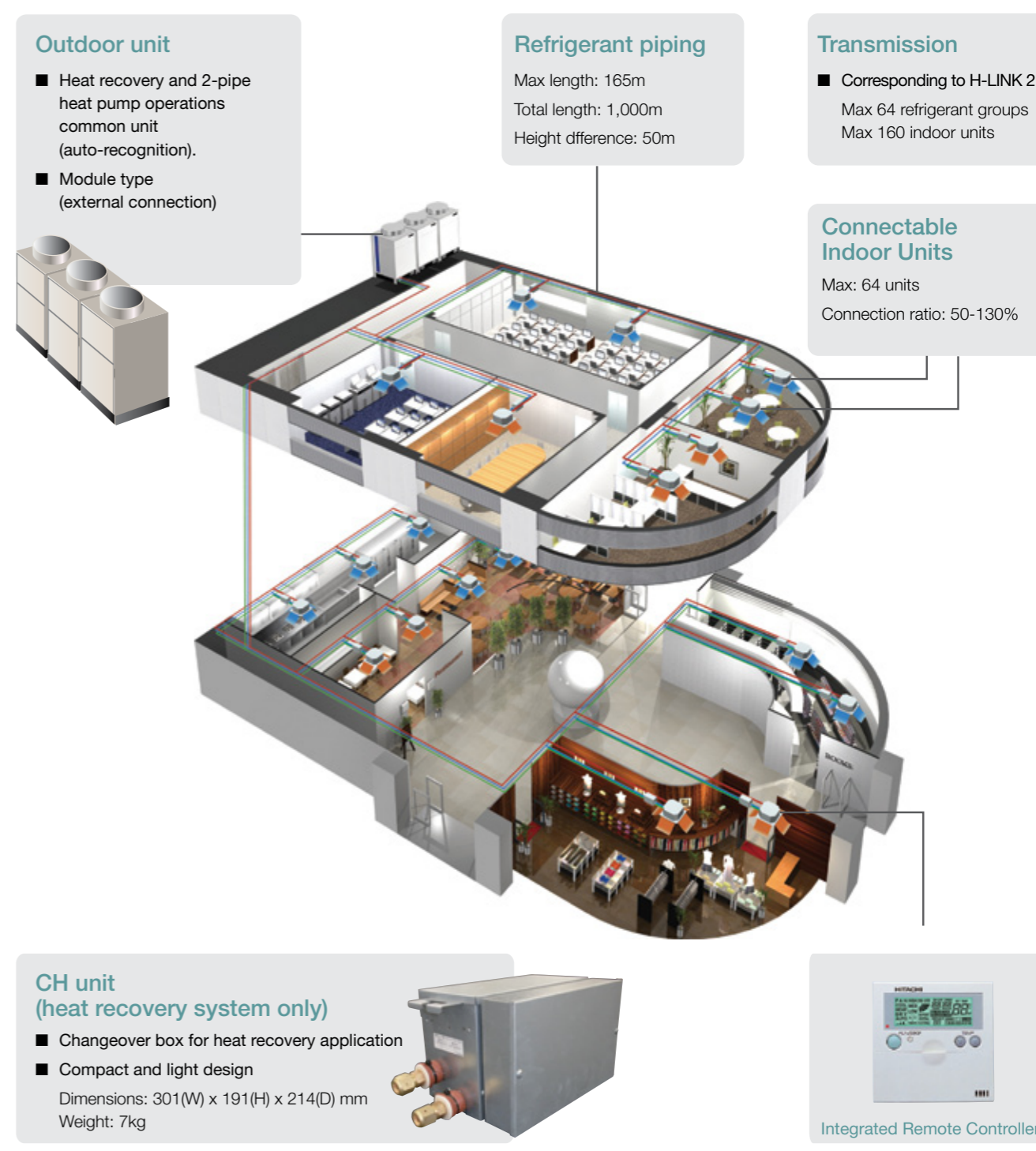
Existing system (2-pipe heat pump operation)



Advanced system (3 pipe heat pump operation)



System configuration



Product range

Choose from a selection of 6 models used individually or in combinations (8 to 54HP) – all integrating heat recovery and heat pump operation to suit customer requirements.

Hitachi's Set Free FSXN Series offers 6 types of modular outdoor units and 10 types (52 models) of indoor units. By combining units from a wide selection of models, you can create a tailored air conditioning environment to satisfy your specific building conditions. Outdoor unit capacity has been extended by up to 54HP by combining the outdoor units (max. 3). This system can provide heat recovery operation or 2-pipe heat pump operation systems as follows:

Outdoor unit

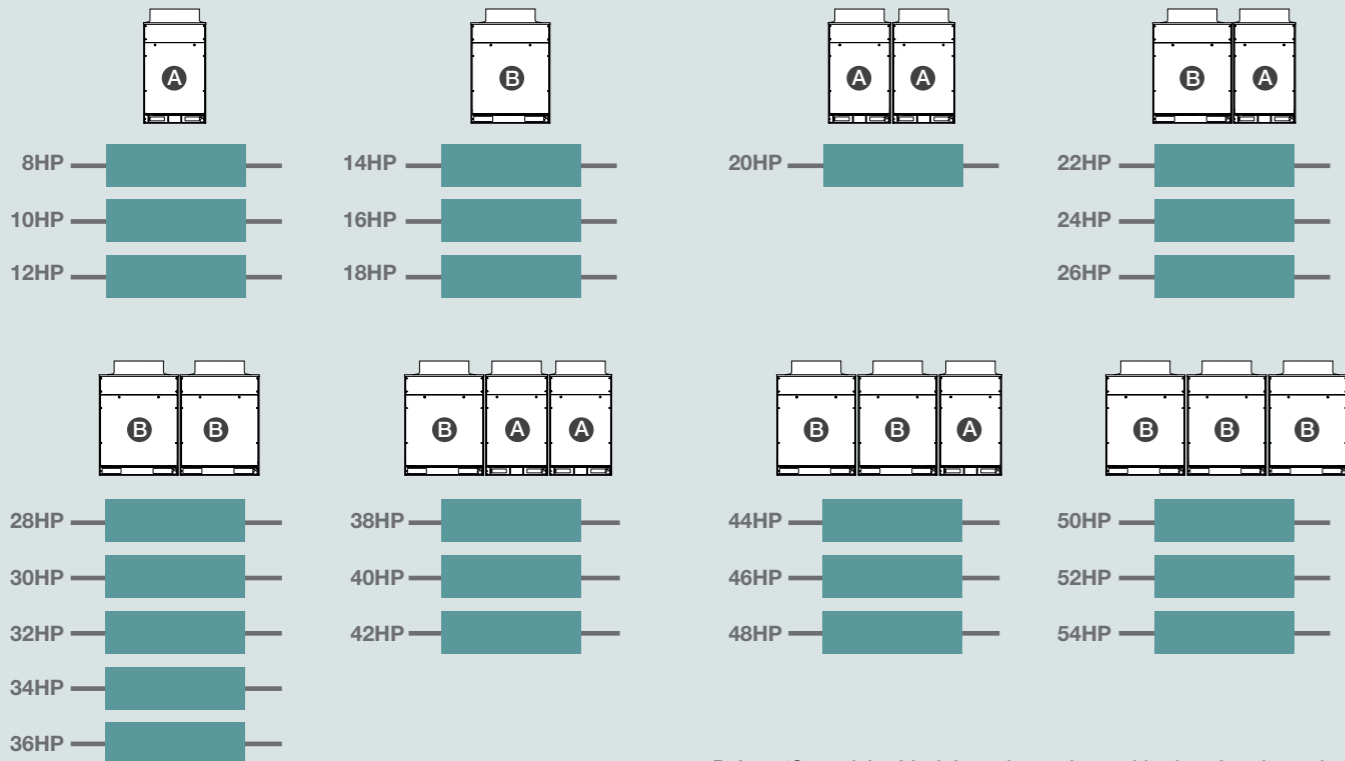
A RAS 8.0FSXN ~ 12.0FSXN

Outer dimensions
Width: 950 mm
Depth: 765 mm
Height: 1,720 mm
Net weight
210 kg



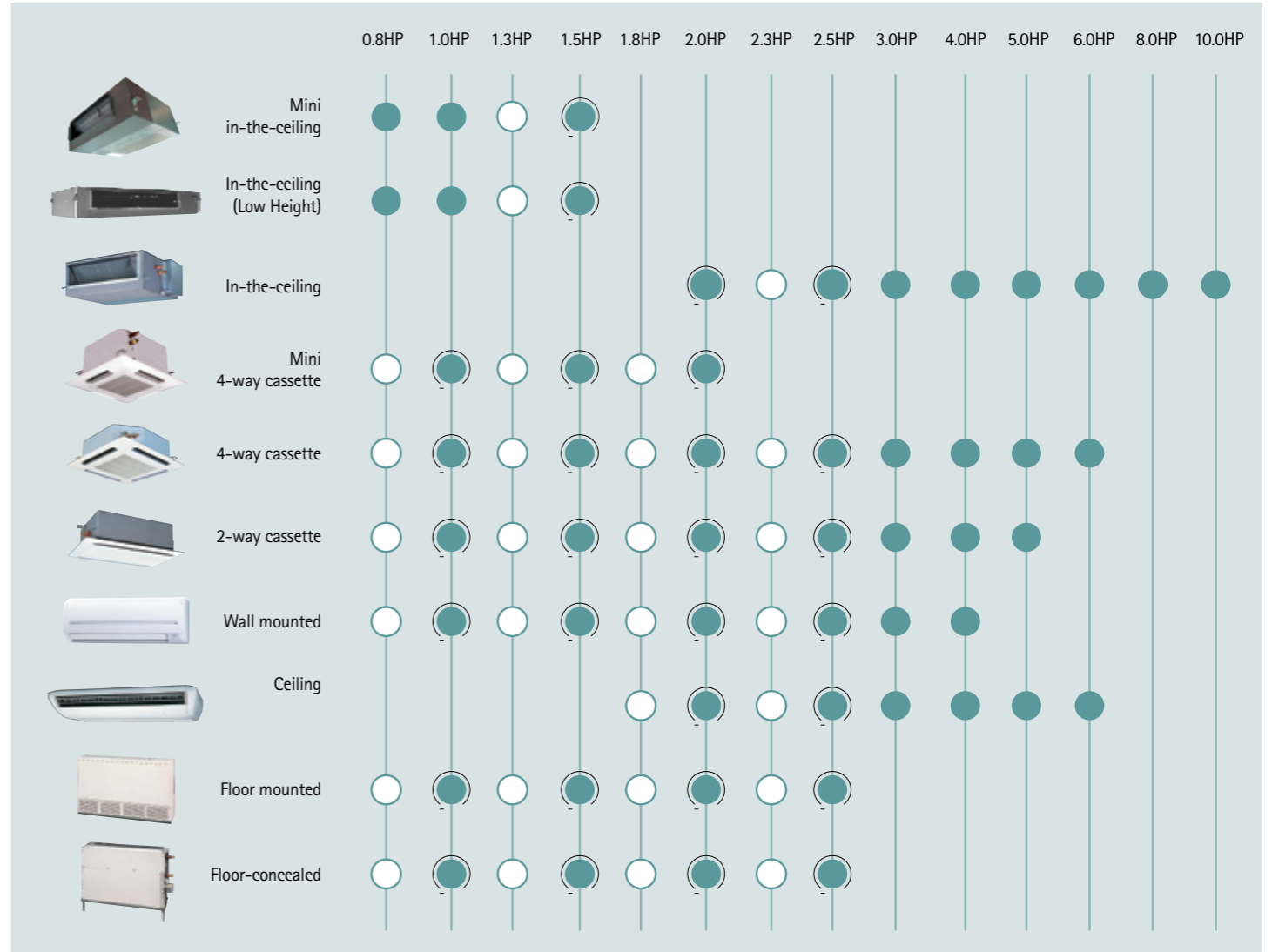
B RAS 14.0FSXN ~ 18.0FSXN

Outer dimensions
Width: 1,210 mm
Depth: 765 mm
Height: 1,720 mm
Net weight
14 & 16HP: 295 kg
18HP: 315 kg



Refer to 'General data' for information on the combination of outdoor units.

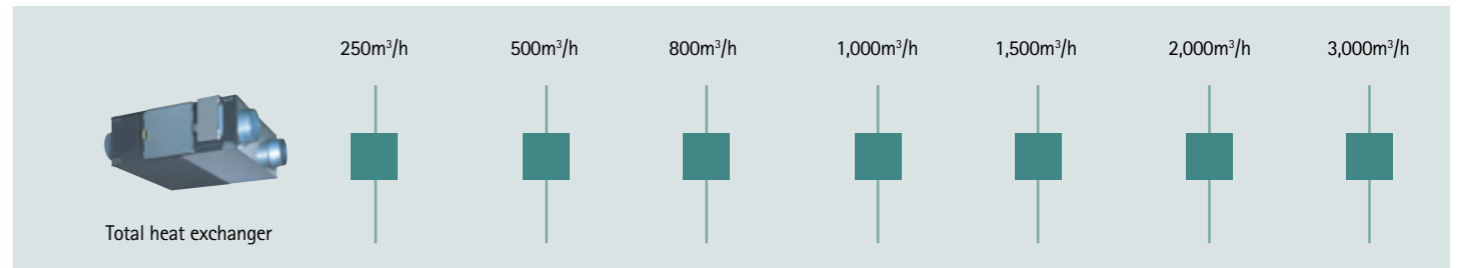
Indoor unit



○ Capacity available with dip switch setting capacity range (HP)

○ Adjustable by dip switch setting

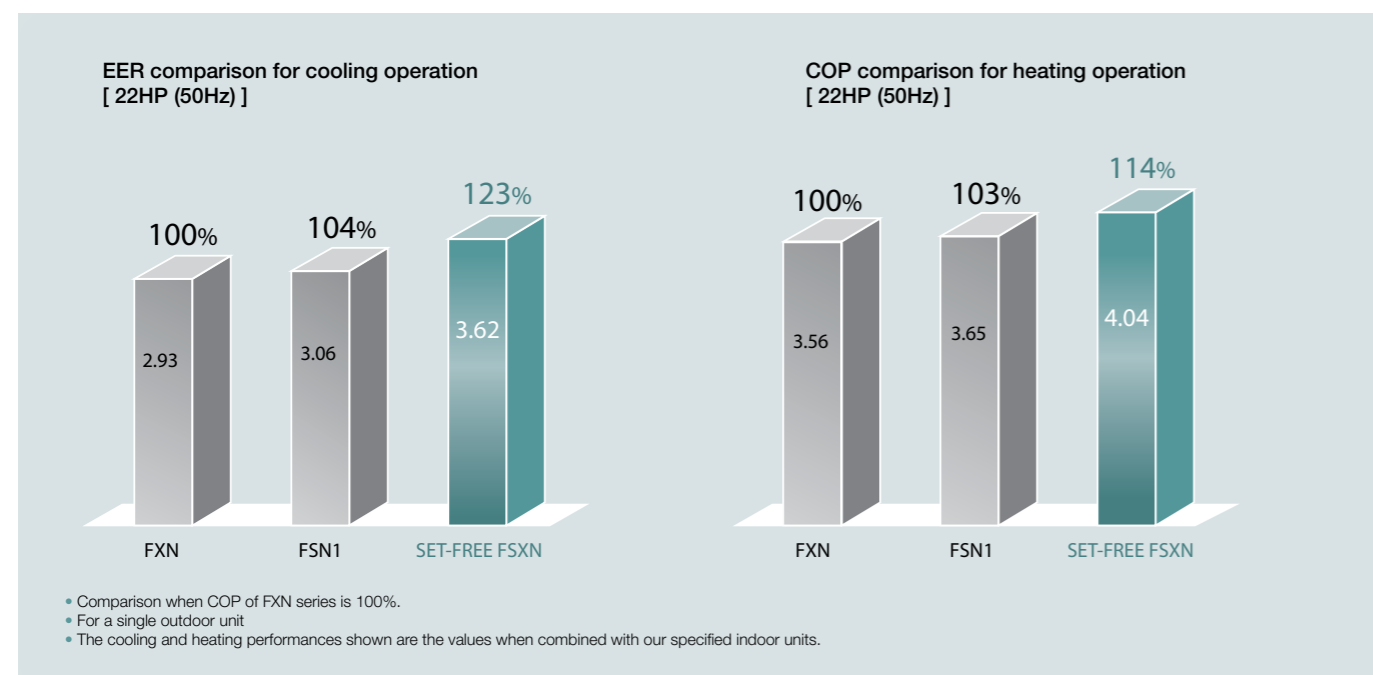
System equipment



Energy-saving and comfort

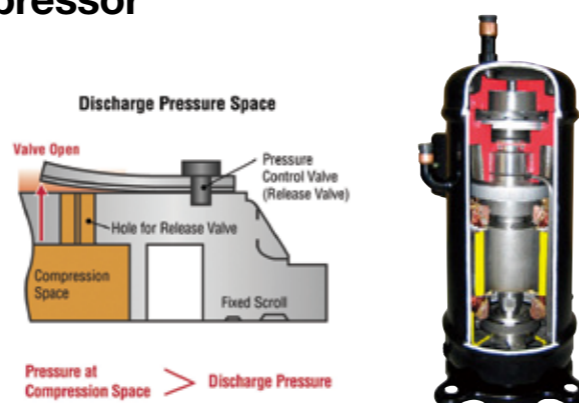
Energy-saving technology delivers outstanding performance

Refrigerant cycle and control achieve a high level of efficiency and energy-saving performance.



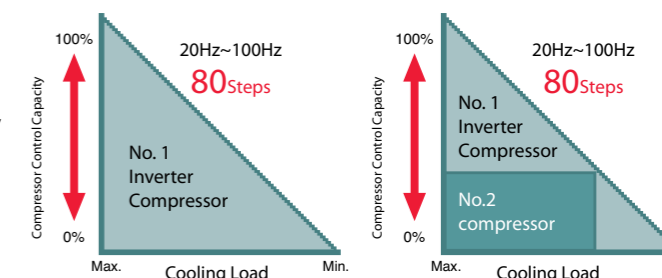
Cutting-edge DC inverter scroll compressor

Intermediate pressure performance is greatly improved thanks to the new compression mechanism's release valve and optimising orbiting scroll-lifting force. This increases the system's energy efficiency. The release valve prevents the occurrence of over-compression and the orbiting scroll lifting force optimisation minimises leakage loss.



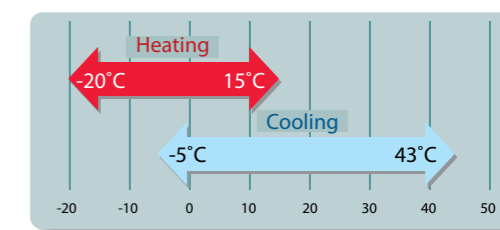
Capacity control by 1Hz steps

Performance is greatly improved by the high efficiency DC inverter compressor and 100% load compressor, and lossless energy-saving operation is achieved (depending on the building).



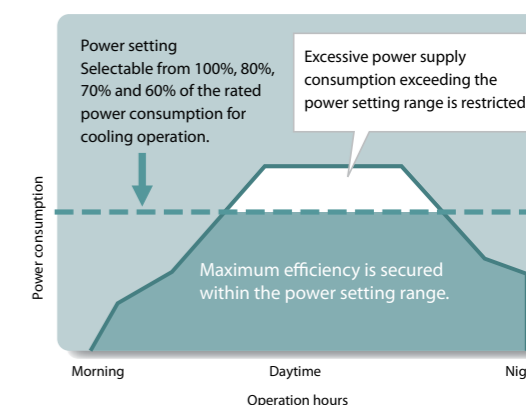
Wide operating range

The Set Free FSXN can operate within a wide range of ambient conditions, extending the flexibility of the installation.



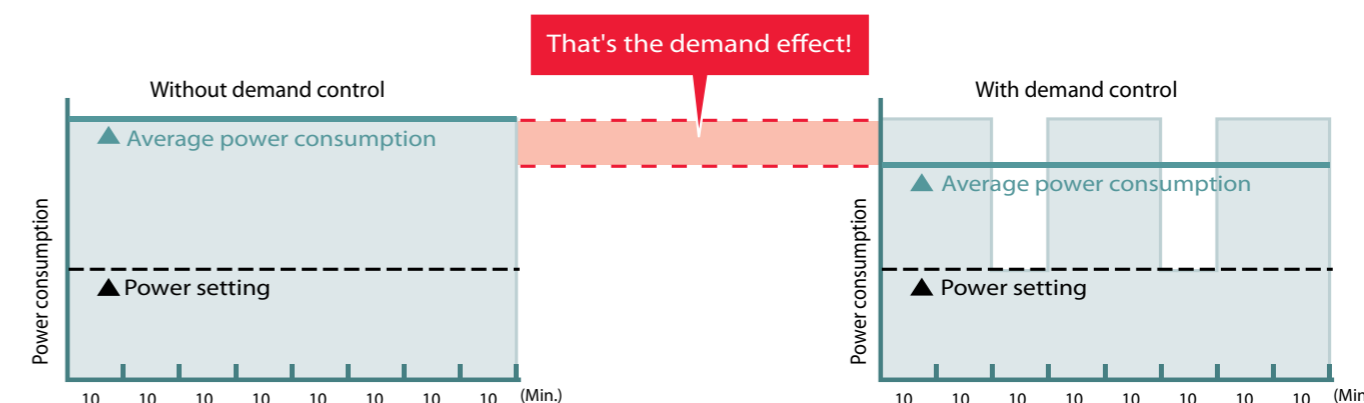
Self-demand control

A newly developed self-demand function has largely improved energy-saving capabilities. Since the current is self-detected and demand control performed automatically, no signal wiring work is required. Conventional demand control using demand signals is also available and you can select various operations as required.



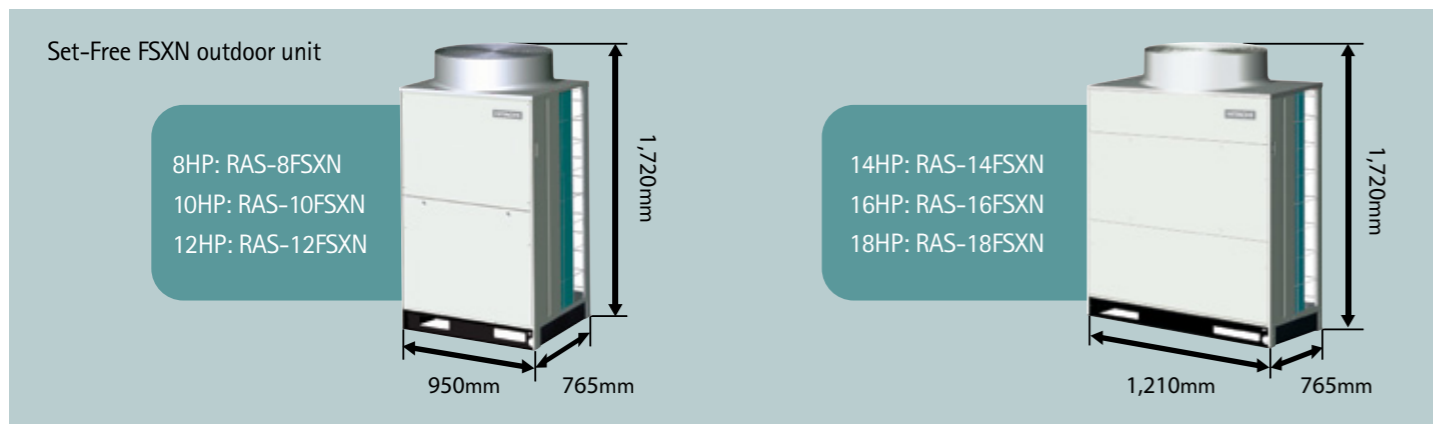
Wave mode

Wave mode turns demand control ON and OFF alternately at intervals of 10 minutes or 20 minutes. While power consumption is reduced temperature changes are minimised to maintain a comfortable room temperature.



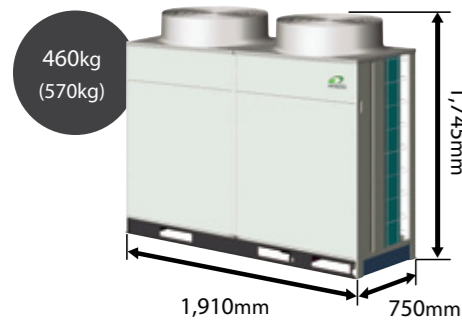
Flexible installation

Compact and lightweight design

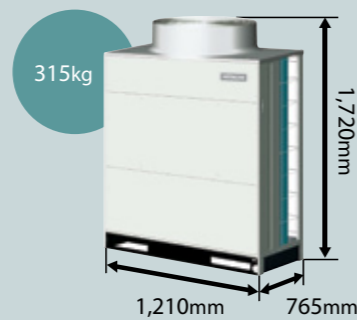


Ease and flexibility of installation is further enhanced due to the outdoor unit's lightweight and compact design.

18HP RAS-18FSN1 (18FXN)



18HP RAS-18FSXN



- Installation space: **Reduced by 35%**
- Weight: **Reduced by 32% (45%)**

Transportation and handling using elevator

An elevator can be used to transport the outdoor unit separately.

Even the largest unit (18HP model) can be carried in an elevator

Elevator
Door opening: 800mm
Depth: 1,350mm

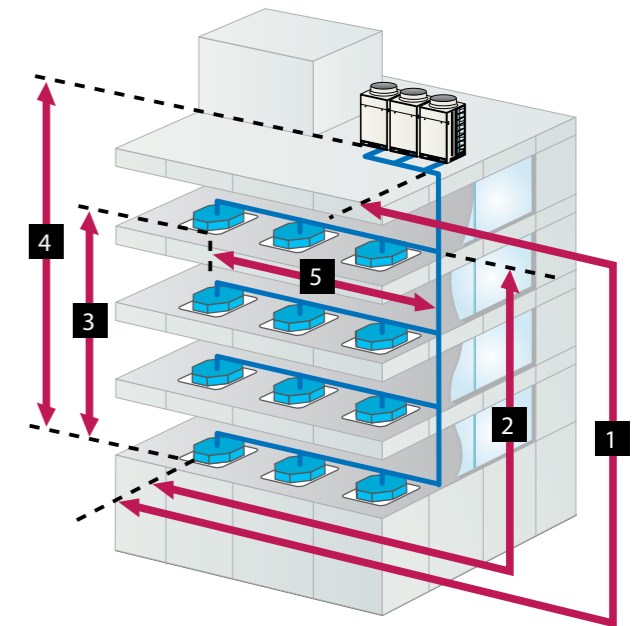


Increased flexibility of refrigerant piping work

Improved flexibility of design by increasing the pipe length to 165m maximum (equivalent length of 190m) in FSXN series.

- 1 Max. piping length: **165m***
- 2 Between first branch and indoor unit: **90m or less**
- 3 Height difference between highest and lowest indoor units: **15m or less**
- 4 Height difference between outdoor and indoor units: **50m****
- 5 Max. length after branch: **40m**

	Current model (FSN1)	New model (FSXN)
Total maximum piping length	300m	1,000m
Maximum piping length	150m	165m
Distance between first branch and indoor unit	40m	90m
Maximum piping length after branch	30m	40m



* For 100m or more, the pipe diameter will be one size larger.
** In case the outdoor unit is installed at a higher level than indoor units. If the outdoor unit is installed lower than indoor units, the maximum height difference is 40m.

Connectable to 64 indoor units

The number of connectable indoor units has been increased to 64 maximum*

		Connection ratio: 50 - 130%													
		HP	5	8	10	12	14	16	18	20	22	24	26	28	30
Maximum number of connectable Indoor units	Current models	FSN(1) Series	8	13	16	16	20	20	20	20	20	27	29	31	32
		FSN Series	-	13	16	-	-	20	20	20	20	27	29	-	32
	New model	FSXN Series	-	13	16	19	23	26	26	33	36	40	43	47	50
Maximum number of connectable Indoor units	Current models	FSN(1) Series	32	34	36	38	40	42	44	46	48	50	52	54	-
		FSN Series	32	-	-	-	-	-	-	-	-	-	-	-	-
	New model	FSXN Series	53	56	59	64	64	64	64	64	64	64	64	64	64

For a system in which all indoor units are operated simultaneously, the maximum total capacity will be 100%. Determine the number of indoor units carefully so that a problem such as decreased outlet air temperature will not occur. Refer to Technical Catalogue for more details.

Compared to indoor units of over 1.5HP, indoor units of 0.8 and 1.0HP are set with higher air flow. Do not install these units in a place where a cold draft may occur during heating operation. Determine the usage environment and installation location carefully.

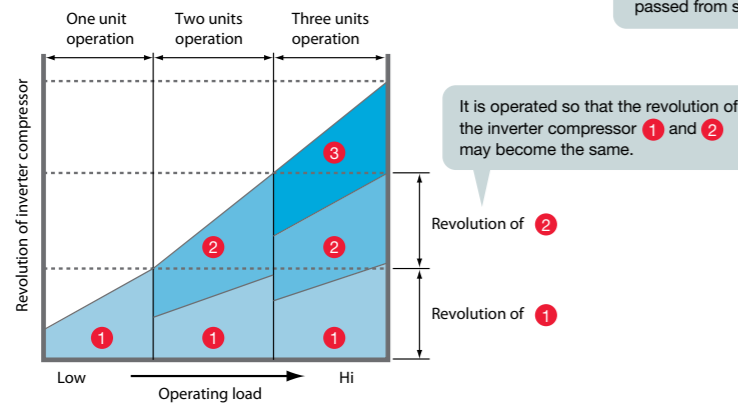
*Maximum number of connectable indoor units. Values may be varied in accordance with the total length of refrigerant piping. Refer to the technical manual for more details.

Other advanced technologies

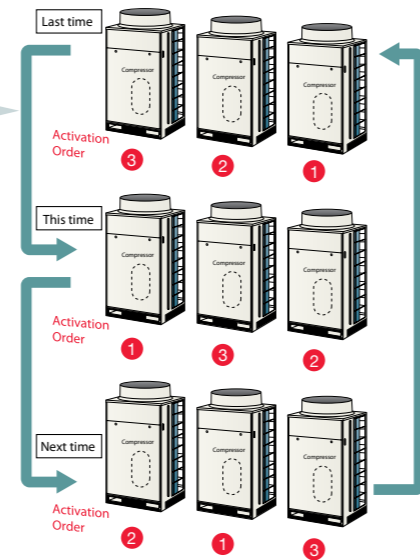
Rotational operation* to distribute load of outdoor units

Regulating the operation time of each outdoor unit leads to load reduction on compressors**. During multiple unit operation, the same rotation frequency of inverter compressor results in an equivalent load on each compressor. Therefore, outdoor unit endurance is improved.

Inverter compressor rotation frequency control



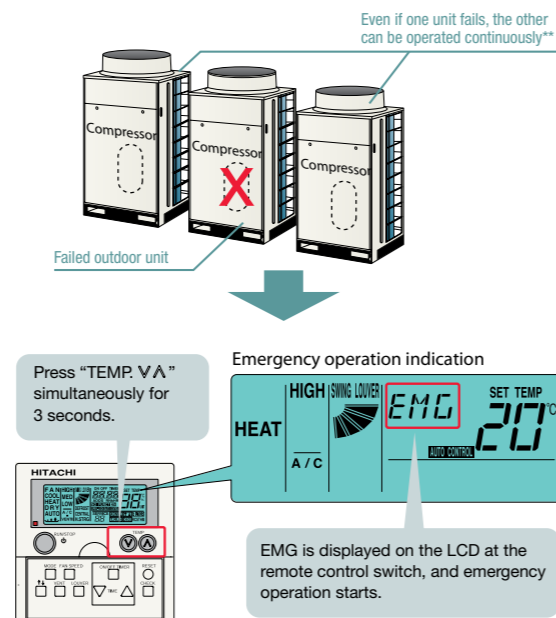
* At least 2 outdoor units are required for this function.
** Comparison between rotation operation function and non-rotation operation function based on the same system.



Emergency backup operation function

The backup operation function prevents the system from coming to a complete stop when outdoor unit failure occurs*. Emergency operation starts with the remote control switch after an alarm***. Refer to "Alarm Code for Emergency Operation".

* At least 2 outdoor units are required for this function.
** Emergency operation can be performed within 8 hours after unit stoppage. After 8 hours passed from unit stoppage, emergency operation can not be performed.
*** Emergency operation can be performed when the specified alarm code occurs. Refer to "Alarm Code for Emergency Operation".



Noise reduction mode

With the new noise reduction preference mode, the sound pressure level for a particular time zone can be set based upon the usage environment*. Therefore, the operation/management of air conditioners is facilitated in areas where the noise level at night time is restricted by laws and regulations.

You can select from 3 sound pressure levels

Optional noise reduction function	Setting from outdoor unit input and output function	Sound pressure level (dB) (Approx. Value**)
11	Setting 1 (standard value - 2dB)	56
12	Setting 2 (standard value - 5dB)	53
13	Setting 3 (standard value - 8dB)	50

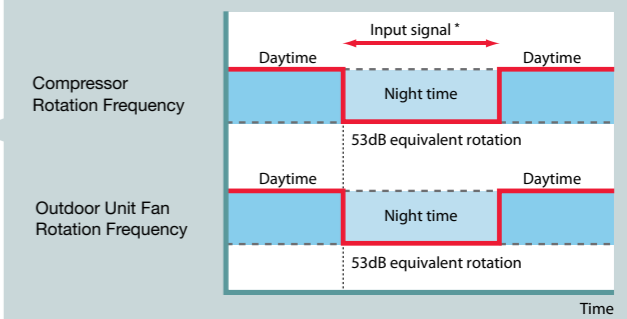
* The range of performance and operation is restricted, because the rotation frequency of the compressor and outdoor fan is forcibly decreased.

Target Capacity of Each Setting
Noise Reduction Setting 1: 80% of Standard Capacity
Noise Reduction Setting 2: 60% of Standard Capacity
Noise Reduction Setting 3: 40% of Standard Capacity

** The table above shows an approximate value of 10HP. In some cases, the value may temporarily become higher than the approximate value in the table above due to operation control conditions.

Setting example

Low-sound operation during night time only by using timer



Automatic refrigerant assessment system

Use this automatic assessment system to check whether or not the refrigerant amount is sufficient in one refrigerant cycle.

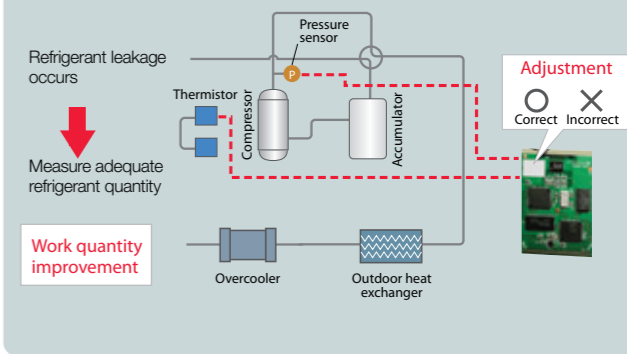
Factors for judgement

The appropriate refrigerant amount is calculated based upon the following data.

- 1 Refrigerant cycle temperature
- 2 Refrigerant saturation temperature
- 3 Outdoor unit expansion valve data
- 4 Indoor unit data

- Refrigerant over-charging is not detected. Over-charging can be detected by gradually adding refrigerant from the under-charged state at test run or when refrigerant leakage occurs.
- This function does not provide automatic refrigerant charging.
- The adjustment (estimate) is changed according to the operation condition (the number of operating units and temperature).

Refrigerant cycle configuration [schematic diagram]



General data

		RAS-8FSXN	RAS-10FSXN	RAS-12FSXN	RAS-14FSXN	RAS-16FSXN	RAS-18FSXN	RAS-20FSXN (RAS-8FSXN + RAS-12FSXN)	RAS-22FSXN (RAS-8FSXN + RAS-14FSXN)	RAS-24FSXN (RAS-10FSXN + RAS-14FSXN)	RAS-26FSXN (RAS-12FSXN + RAS-14FSXN)	RAS-28FSXN (RAS-14FSXN + RAS-14FSXN)	RAS-30FSXN (RAS-14FSXN + RAS-16FSXN)							
Power supply (kW)		AC 3Ø, 400V/50Hz (380-415V / 50Hz), 380V/60Hz, 220V/60Hz						AC 3Ø, 400V/50Hz (380-415V / 50Hz), 380V/60Hz, 220V/60Hz												
Nom capacity (kW)	Cooling	22.4	28.0	33.5	40.0	45.0	50.0	56.0	61.5	69.0	73.0	80.0	85.0							
	Heating	25.0	31.5	37.5	45.0	50.0	56.0	63.0	69.0	77.5	82.5	90.0	95.0							
EER/COP (50/60Hz)	Cooling	3.85 / 3.85	3.79 / 3.79	3.41 / 3.41	3.25 / 3.21	3.23 / 3.19	3.37 / 3.35	3.58 / 3.58	3.62 / 3.58	3.37 / 3.35	3.38 / 3.36	3.25 / 3.21	3.24 / 3.20							
	Heating	4.17 / 4.17	4.11 / 4.11	3.60 / 3.60	3.89 / 3.90	3.90 / 3.93	3.81 / 3.85	3.81 / 3.81	4.04 / 4.05	3.89 / 3.89	3.75 / 3.76	3.89 / 3.90	3.90 / 3.92							
Cabinet color (munsell code)		Natural grey (1.0Y 8.5/0.5)						Natural grey (1.0Y 8.5/0.5)												
Maximum sound pressure level dB(A)	Overall A scale	58	58	60	62	62	63	62	63	63	64	65	65							
	Night-shift	53	53	55	57	57	58	57	58	58	59	60	60							
Outer Dimensions (mm) & Weight (Kg)	Height	1720						1720												
	Width	950			1210			1920			2180			2440						
	Depth	765						765												
	Weight	210			295			315			225 + 225			210 + 295		295 + 295				
Refrigerant (flow control)		R410A (micro-computer control expansion valve)						R410A (micro-computer control expansion valve)												
Compressor (Hermetic (scroll))	Model	E656DHD			E656DHD + E655DH			E656DHD + E855DH		E656DHD + E656DHD		E656DHD + E656DHD + E655DH		E656DHD + E655DH + E656DHD + E655DH						
	Quantity	1			1 + 1			1 + 1		1 + 1 + 1		1 + 1 + 1		1 + 1 + 1 + 1						
	Motor output (pole)	4.8(4)	6.0(4)	7.2(4)	4.8(4) + 4.4(2)	6.0(4) + 4.4(2)	6.0(4) + 5.6(2)	4.8(4) + 7.2(4)	4.8(4) + 4.8(4) + 4.4(2)	6.0(4) + 4.8(4) + 4.4(2)	4.8(4) + 4.8(4) + 4.4(2)	4.8(4) + 4.4(2) + 4.8(4) + 4.4(2)	4.8(4) + 4.4(2) + 6.0(4) + 4.4(2)							
Heat exchanger		Multi-pass cross-finned tube						Multi-pass cross-finned tube												
Main refrigerant piping cooling/heating changeover operation system (mm (in))	Liquid line	Ø9.53* (3/8in)			Ø12.7* (1/2in)			Ø15.88* (5/8in)			Ø19.05* (3/4in)									
	2 pipes	Ø9.53 - Ø12.7 (3/8in - 1/2in)			Ø12.7 - Ø15.88 (1/2in - 5/8in)			Ø15.88 - Ø19.05 (5/8in - 3/4in)			Ø19.05 - Ø22.2 (3/4in - 7/8in)									
	Gas line	Ø19.05* (3/4in)			Ø22.2* (7/8in)			Ø25.4* (1in)			Ø28.6* (1 1/8in)									
	2 pipes	Ø19.05 - Ø22.2 (3/4in - 7/8in)			Ø22.2 - Ø25.4 (7/8in - 1in)			Ø25.4 - Ø28.6 (1in - 1 1/8in)			Ø28.6 - Ø31.75 (1 1/8in - 1 1/4)									
Main refrigerant piping cooling/heating simultaneous operation system (mm (in))	Liquid line	Ø9.53* (3/8in)			Ø12.7* (1/2in)			Ø15.88* (5/8in)			Ø19.05* (3/4in)									
	3 pipes	Ø9.53 - Ø12.7 (3/8in - 1/2in)			Ø12.7 - Ø15.88 (1/2in - 5/8in)			Ø15.88 - Ø19.05 (5/8in - 3/4in)			Ø19.05 - Ø22.2 (3/4in - 7/8in)									
	Gas line low pres.	Ø19.05* (3/4in)			Ø22.2* (7/8in)			Ø25.4* (1in)			Ø28.6* (1 1/8in)									
	3 pipes	Ø19.05 - Ø22.2 (3/4in - 7/8in)			Ø22.2 - Ø25.4 (7/8in - 1in)			Ø25.4 - Ø28.6 (1in - 1 1/8in)			Ø28.6 - Ø31.75 (1 1/8in - 1 1/4)									
Gas line high pres.	3 pipes	Ø15.88* (5/8in)			Ø19.05* (3/4in)			Ø22.2* (7/8in)			Ø25.4* (1in)									
	3 pipes	Ø15.88 - Ø19.05 (5/8in - 3/4in)			Ø19.05 - Ø22.2 (3/4in - 7/8in)			Ø22.2 - Ø25.4 (7/8in - 1in)			Ø25.4 - Ø28.6 (1in - 1 1/8in)									
Refrigerant charge (Kg)		6.5			7.0			9.0			10.5		13.5		15.5		16.0		18.0	
Packing dimensions (mm)	Height	1,895						1,895												
	Width	990			1,250			1,250			-			-						
	Depth	810						810												
Approximate packing measurement (m³)		1.52			1.92			1.92			-			-						

NOTES:

1. The cooling and heating performances are the values when combined with our specified indoor units. (100% rating)

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)

Piping length: 7.5 meters / Piping lift: 0 meter

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)

2. The sound pressure is based on the following conditions.

1 meter from the unit service cover surface, and 1.5 meters from floor level.

The above data is based on the cooling mode. In case of heating mode, the sound pressure level increases by approximately 1~2 dB. The above data was measured in an anechoic chamber so that reflected sound should be taken into consideration in the field.

3. *If the specified main refrigerant piping on the table is not available on site, follow the allowable piping size in parentheses.

When using the main refrigerant piping indicated in parentheses, prepare an appropriate reducer on site.

4. Except for the specified combination in the table (20~30HP), there is no other combination of the base unit.

5. The width of outer dimension, it is the value when each distance between the base outdoor units is specified to 20mm.

General data

		RAS-32FSXN (RAS-16FSXN + RAS-16FSXN)	RAS-34FSXN (RAS-16FSXN + RAS-18FSXN)	RAS-36FSXN (RAS-18FSXN + RAS-18FSXN)	RAS-38FSXN (RAS-12FSXN + RAS-12FSXN + RAS-14FSXN)	RAS-40FSXN (RAS-12FSXN + RAS-12FSXN + RAS-16FSXN)	RAS-42FSXN (RAS-12FSXN + RAS-12FSXN + RAS-18FSXN)	RAS-44FSXN (RAS-12FSXN + RAS-14FSXN + RAS-18FSXN)	RAS-46FSXN (RAS-12FSXN + RAS-16FSXN + RAS-18FSXN)	RAS-48FSXN (RAS-12FSXN + RAS-18FSXN + RAS-18FSXN)	RAS-50FSXN (RAS-14FSXN + RAS-18FSXN + RAS-18FSXN)	RAS-52FSXN (RAS-16FSXN + RAS-18FSXN + RAS-18FSXN)	RAS-54FSXN (RAS-18FSXN + RAS-18FSXN + RAS-18FSXN)			
Power supply (kW)		AC 3Ø, 400V/50Hz (380-415V / 50Hz), 380V/60Hz, 220V/60Hz						AC 3Ø, 400V/50Hz (380-415V / 50Hz), 380V/60Hz, 220V/60Hz								
Nom capacity (kW)	Cooling	90.0	95.0	100.0	109.0	112.0	118.0	125.0	132.0	136.0	140.0	145.0	150.0			
	Heating	100.0	106.0	112.0	118.0	125.0	132.0	140.0	145.0	150.0	155.0	160.0	165.0			
EER/COP (50/60Hz)	Cooling	3.32 / 3.19	3.30 / 3.27	3.37 / 3.35	3.29 / 3.28	3.34 / 3.32	3.32 / 3.31	3.27 / 3.24	3.16 / 3.15	3.24 / 3.23	3.33 / 3.31	3.32 / 3.30	3.37 / 3.35			
	Heating	3.90 / 3.93	3.85 / 3.89	3.81 / 3.85	3.87 / 3.88	3.71 / 3.72	3.65 / 3.66	3.75 / 3.75	3.71 / 3.71	3.74 / 3.76	3.98 / 3.99	3.98 / 4.00	4.01 / 4.03			
Cabinet color (munsell code)		Natural grey (1.0Y 8.5/0.5)						Natural grey (1.0Y 8.5/0.5)								
Maximum sound pressure level dB(A)	Overall A scale	65	66	66	66	66	66	67	67	67	67	67	68			
	Night-shift	60	61	61	61	61	61	62	62	62	62	62	63			
Outer dimensions (mm) & Weight (Kg)	Height	1,720						1,720								
	Width	2,440			3,150			3,150			3,410			3,670		
	Depth	765						765								
	Weight	295 + 295	295 + 315	315 + 315	210 + 210 + 295			210 + 210 + 315	210 + 295 + 315		210 + 315 + 315	295 + 315 + 315		315 + 315 + 315		
Refrigerant (flow control)		R410A (Micro-computer control expansion valve)						R410A (Micro-computer control expansion valve)								
Compressor (hermetic scroll)	Model	E656DHD + E655DH + E656DHD + E655DH	E656DHD + E655DH + E656DHD + E655DH	E656DHD + E655DH + E656DHD + E655DH	E656DHD + E656DHD + E656DHD + E655DH			E656DHD + E656DHD + E656DHD + E655DH	E656DHD + E656DHD + E655DH + E656DHD + E655DH	E656DHD + E656DHD + E655DH + E656DHD + E655DH	E656DHD + E655DH + E656DHD + E655DH		E656DHD + E655DH + E656DHD + E655DH			
	Quantity	1 + 1 + 1 + 1						1 + 1 + 1 + 1								
	Motor output (pole)	6.0(4) + 4.4(2) + 6.0(4) + 4.4(2)	6.0(4) + 4.4(2) + 6.0(4) + 5.6(2)	6.0(4) + 5.6(2) + 6.0(4) + 5.6(2)	7.2(4) + 7.2(4) + 4.8(4) + 4.4(2)	7.2(4) + 7.2(4) + 6.0(4) + 4.4(2)	7.2(4) + 7.2(4) + 6.0(4) + 5.6(2)	7.2(4) + 4.8(4) + 4.4(2) + 6.0(4) + 5.6(2)	7.2(4) + 6.0(4) + 4.4(2) + 6.0(4) + 5.6(2)	7.2(4) + 6.0(4) + 5.6(2) + 6.0(4) + 5.6(2)	4.8(4) + 4.4(2) + 6.0(4) + 5.6(2) + 6.0(4) + 5.6(2)	6.0(4) + 4.4(2) + 6.0(4) + 5.6(2) + 6.0(4) + 5.6(2)	6.0(4) + 4.4(2) + 6.0(4) + 5.6(2) + 6.0(4) + 5.6(2)			
Heat exchanger		Multi-pass cross-finned tube						Multi-pass cross-finned tube								
Main refrigerant piping cooling/heating changeover operation system (mm (in))	Liquid line	Ø19.05* (3/4in)						Ø19.05* (3/4in)								
	2 pipes	Ø19.05 - Ø22.2 (3/4in - 7/8in)						Ø19.05 - Ø22.2 (3/4in - 7/8in)								
	Gas line	Ø31.75* (1 1/4in)			Ø38.1* (1 1/2in)			Ø38.1* (1 1/2in)								
2 pipes	Ø31.75 - Ø34.9 (1 1/4in - 1 3/8)			Ø38.1 - Ø41.3 (1 5/8in)			Ø38.1 - Ø41.3 (1 5/8in)									
Main refrigerant piping cooling/heating simultaneous operation system (mm (in))	Liquid line	Ø19.05* (3/4in)						Ø19.05* (3/4in)								
	3 pipes	Ø19.05 - Ø22.2 (3/4in - 7/8in)						Ø19.05 - Ø22.2 (3/4in - 7/8in)								
	Gas line low pres.	Ø31.75* (1 1/4in)			Ø38.1* (1 1/2in)			Ø38.1* (1 1/2in)								
	3 pipes	Ø31.75 - Ø34.9 (1 1/4in - 1 3/8)			Ø38.1 - Ø41.3 (1 5/8in)			Ø38.1 - Ø41.3 (1 5/8in)								
	Gas line high pres.	Ø15.88* (5/8in)		Ø19.05* (3/4in)		Ø22.2* (7/8in)		Ø31.75* (1 1/4in)								
3 pipes	Ø15.88 - Ø19.05 (5/8in - 3/4in)		Ø19.05 - Ø22.2 (3/4in - 7/8in)		Ø22.2 - Ø25.4 (7/8in - 1in)		Ø31.75 - Ø34.9 (1 1/4in - 1 3/8)									
Refrigerant charge (Kg)		18.0	19.5	21.0	23.0			24.5	26.5		28.0	30.0		31.5		
Packing dimensions (mm)	Height	-	-	-	-	-	-	-	-	-	-	-	-			
	Width	-	-	-	-	-	-	-	-	-	-	-	-			
	Depth	-	-	-	-	-	-	-	-	-	-	-	-			
Approximate packing measurement (m ³)		-	-	-	-	-	-	-	-	-	-	-	-			

NOTES:

1. The cooling and heating performances are the values when combined with our specified indoor units. (100% rating)

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)

Piping length: 7.5 meters / Piping lift: 0 Meter

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)

2. The sound pressure is based on the following conditions.

1 meter from the unit service cover surface, and 1.5 meters from floor level.

The above data is based on the cooling mode. In case of heating mode, the sound pressure level increases by approximately 1~2 dB.

The above data was measured in an anechoic chamber so that reflected sound should be taken into consideration in the field.

3. *If the specified main refrigerant piping on the table is not available on site, follow the allowable piping size in parentheses.

When using the main refrigerant piping indicated in parentheses, prepare an appropriate reducer on site.

4. Except for the specified combination in the table (32~54HP), there is no other combination of the base unit.

5. The width of outer dimension, it is the value when each distance between the base outdoor units is specified to 20mm.

