HITACHI

INDOOR UNITS SYSTEM FREE SERIES & COMPLEMENTARY SYSTEMS





Technical Catalogue

RCI - FSN4
RCIM - FSN4E
RCD - FSN3
RPC - FSN3
RPI - FSN(3/5)(P)E(-f)
RPIM - FSN4E(-DU)
RPK - FSN(H)4M
RPF - FSN2E
RPFI - FSN2E
KPI - (E/X)4E
DX - Interface - EXV-E2
Econofresh - EF-456N1E

HITACHI

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1.1 General information

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1.1.1 Introduction

HITACHI offers the SYSTEM FREE range of indoor units, the main advantage of which is that they can be combined with UTOPIA and SET-FREE series outdoor units.

This eliminates the need to duplicate models of indoor units and reduces stock.

SYSTEM FREE Line up of Indoor Units	Complementary systems
RCI-FSN4 RCIM-FSN4E RCD-FSN3 RPC-FSN3 RPI-FSN5E RPI-FSN3(P)E(-f) RPIM-FSN4E(-DU) RPK-FSN(H)4M RPF-FSN2E RPFI-FSN2E	KPI-(E/X)4E DX-Interface EXV-E2 Econofresh EF-456N1E

1.2 Applied symbols

During normal heat pump system design work or unit installation, greater attention must be paid in certain situations requiring particular care in order to avoid damage to the unit, the installation or the building or property.

Situations that pose a risk to the safety of those in the surrounding area or to the unit itself are clearly indicated in this manual.

A series of special symbols are used to clearly identify these situations.

Pay close attention to these symbols and to the messages following them, as your safety and that of others depends on it.

DANGER

- ***The text following this symbol contains information and instructions relating directly to your safety.***
- ***Not taking these instructions into account could lead to serious, very serious or even fatal injuries to you and others.***

In the texts following the danger symbol you can also find information on safe procedures during unit installation.

CAUTION

- *The text following this symbol contains information and instructions relating directly to your safety.*
- *Not taking these instructions into account could lead to minor injuries to you and others.*
- *Not taking these instructions into account could lead to unit damage.*

In the texts following the caution symbol you can also find information on safe procedures during unit installation.

NOTE

- *The text following this symbol contains information or instructions that may be of use or that require a more thorough explanation.*
- *Instructions regarding inspections to be made on unit parts or systems may also be included.*

1.3 Norms and Regulations

Following Regulation EU Nº 517/2014 on Certain Fluorinated Greenhouse gases, it is mandatory to fill in the label attached to the unit with the total amount of refrigerant charged on the installation.

Do not vent R410A into the atmosphere: R410A are fluorinated greenhouse gases covered by the Kyoto protocol global warming potential (GWP) R410A = 2088.

Tn of CO_2 equivalent of fluorinated greenhouse gases contained is calculated by indicated GWP * Total Charge (in kg) indicated in the product label and divided by 1000.

Appropriate refrigerant

The refrigerant used in each unit is identified on the specification label and manuals of the unit. HITACHI shall not be held liable for any failure, trouble, malfunction or accident caused by units illegally charged with refrigerants other than the specified one.

Consequences of charging non-specified refrigerant

It may cause mechanical failure, malfunction and other accidents.

It may cause operational failure of protection and safety devices of air conditioners.

It may also cause lubrication failure of the sliding part of the compressor due to deterioration of refrigerant oil.

In particular, hydrocarbon refrigerants (such as propane, R441A, R443A, GF-08, etc.) are not allowed, since these are combustible and may cause major accidents such as fire and explosion in case of improper handling.

Once a non-specified refrigerant has been charged, no further servicing (including draining of refrigerant) shall be performed, even in case of malfunction. Improper handling of refrigerant may be a cause of fire and explosion, and servicing in such cases may be considered an illegal act.

End clients and costumers shall be informed that servicing is not approved, and the installer who charged the nonspecified refrigerant shall be asked to fix the unit.

HITACHI will accept no responsibility for units that have been charged with non-specified refrigerant once.

1.4 Product classification and line-up

1.4.1 Classification of indoor unit models

Unit type (indoor unit): RCI, RCIM, RCD, RPC, RPI, RPIM, RPK, RPF, RPFI									
	Position-separating hyphen (fixed)								
		Capacity (HP): 0.4, 0.6, 0.8, 1.0, 1.5, 2.0, 2.5, 3.0, 4.0, 5.0, 6.0, 8.0, 10.0, 16.0, 20.0							
			FS = SYSTEM FREE						
				N = R410A refrigerant					
					H = Hotel (RPK-(0.4-1.5) only)				
						2/3/4/5 = series			
							P= Pair		
								E = Made in Europe M = Made in Malaysia – = Made in Japan or China	
									(-DU) = Drain Up (RPIM only) (-f) = Non-flammable insulation (RPI-(8.0-20.0)FSN3E-f only)
XXX	–	X.X	FS	N	(H)	X	(P)	(X)	(-xx)

1.4.2 Classification of KPI models

KPI- Ventilation system							
	Position-separating hyphen (fixed)						
		Capacity (m^3/h): 250, 500, 800, 1000, 1500, 2000					
			2 = 1~ 230V 50Hz				
				E = Energy recovery X = Active (Energy recovery + DX section)			
					4 = series		
						E = Made in Europe	
KPI	–	(Y)YY	2	Y	4	E	

1.4.3 Classification of DX-Interface models

DX-Interface type					
	Position-separating hyphen (fixed)				
		Capacity (HP): 2.0, 2.5, 3.0, 4.0, 5.0, 6.0, 8.0, 10.0			
			E = Made in Europe		
				2 = series	
EXV	–	X.X	E	2	

1.4.4 Classification of Econofresh models

Econofresh unit type						
	Position-separating hyphen (fixed)					
		Capacity (HP): 4.0, 5.0, 6.0				
			N: R410A refrigerant			
				1 = series		
					E = Made in Europe	
EF	-	456	N	1	E	

1.4.5 Product line-up: indoor units

NOTE

- *The indoor unit models and codes are the last updated at time of publication; other previous models and coming developments could be available for combination with the outdoor unit series.*
- *Check the exact classification for each unit (model, type, power and series) in "1.4.1 Classification of indoor unit models".*

◆ RCI and RCIM indoor units

RCI		RCIM	
❄ ☀			
			
4-way cassette		4-way cassette (compact)	
Unit	Code	Unit	Code
		RCIM-0.4FSN4E (*1)	7E411148
		RCIM-0.6FSN4E (*2)	7E411137
		RCIM-0.8FSN4E (*3)	7E411100
RCI-1.0FSN4	70405001	RCIM-1.0FSN4E	7E411101
RCI-1.5FSN4	70405002	RCIM-1.5FSN4E	7E411102
RCI-2.0FSN4	70405003	RCIM-2.0FSN4E (*4)	7E411103
RCI-2.5FSN4	70405004	RCIM-2.5FSN4E (*4)	7E411104
RCI-3.0FSN4	70405005		
RCI-4.0FSN4	70405007		
RCI-5.0FSN4	70405008		
RCI-6.0FSN4	70405009		
Panel		Panel	
P-N23NA2 (without Motion Sensor)	70532000	P-AP56NAM (without Motion Sensor)	70533000

NOTE

- *The RCI and RCIM models must be used in combination with the indicated panels.*
- *(*1): Follow the detailed information about the combinability and restrictions for 0.4 HP Indoor Units, which can only be used in combination with current SET FREE RAS-FSXNSE and RAS-FSXNPE.*
- *(*2): 0.6 HP Indoor Units can only be used in combination with SET FREE RAS-FSXNSE and RAS-FSXNPE series.*
- *(*3): 0.8 HP Indoor Units set to a lower capacity (0.6 HP) can only be used in combination with SET FREE MINI series 3 (RAS-(4-6) FS(V)N(Y)3E)series.*
- *(*4): 1 indoor unit combinations with IVX Premium / Standard series not allowed.*

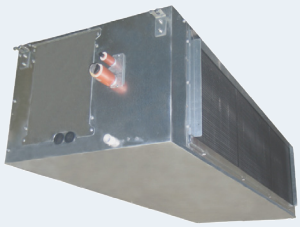
◆ RCD and RPC indoor units

RCD				RPC	
❄ ☀					
					
2-way cassette				Ceiling type	
Unit	Code	Unit	Code	Unit	Code
RCD-0.8FSN3 (*)	60278242				
RCD-1.0FSN3 (*)	60278243				
RCD-1.5FSN3 (*)	60278244			RPC-1.5FSN3	60278164
RCD-2.0FSN3 (*)	60278245			RPC-2.0FSN3	60278165
RCD-2.5FSN3 (*)	60278246			RPC-2.5FSN3	60278166
RCD-3.0FSN3 (*)	60278247			RPC-3.0FSN3	60278167
		RCD-4.0FSN3 (*)	60278248	RPC-4.0FSN3	60278168
		RCD-5.0FSN3 (*)	60278249	RPC-5.0FSN3	60278169
		RCD-6.0FSN3 (*)	60278250	RPC-6.0FSN3	60278170
Panel		Panel			
P-AP90DNA	60297319	P-AP160DNA	60297320		

NOTE

- *The RCD models must be used in combination with the indicated panels.*
- *(*): 1 indoor unit combinations with IVX Premium / Standard series not allowed.*

◆ RPI indoor units

RPI					
❄ ☀					
					
Indoor ducted unit					
Unit	Code	Unit	Code	Unit	Code
RPI-0.4FSN5E(*1)	7E422048				
RPI-0.6FSN5E (*2)	7E422037				
RPI-0.8FSN5E (*3)	7E422013				
RPI-1.0FSN5E	7E422014				
RPI-1.5FSN5E	7E422015				
RPI-2.0FSN5E	7E422016				
RPI-2.5FSN5E	7E422017				
RPI-3.0FSN5E	7E422018				
RPI-4.0FSN5E	7E422020				
RPI-5.0FSN5E	7E422021				
RPI-6.0FSN5E	7E422022				
		RPI-8.0FSN3E (*4) RPI-8.0FSN3E-f (*4)	7E424010 7E424410		
		RPI-10.0FSN3E (*4) RPI-10.0FSN3E-f (*4)	7E424011 7E424411		
				RPI-16.0FSN3PE (*5) RPI-16.0FSN3PE-f (*5)	7E425038 7E425438
				RPI-20.0FSN3PE (*5) RPI-20.0FSN3PE-f (*5)	7E425039 7E425439

NOTE

- *(*1): Follow the detailed information about the combinability and restrictions for 0.4 HP Indoor Units, which can only be used in combination with current SET FREE RAS-FSXNSE and RAS-FSXNPE.*
- *(*2) 0.6 HP Indoor Units can only be used in combination with SET FREE RAS-FSXNSE and RAS-FSXNPE series.*
- *(*3): 0.8 HP Indoor Units set to a lower capacity (0.6 HP) can only be used in combination with SET FREE MINI series 3 (RAS-(4-6) FS(V)N(Y)3E)series.*
- *(*4): In combination with UTOPIA IVX Premium/Standard series: 1 indoor unit system only.*
- *(*5): RPI-FSN3PE(-f) can only be used in combination with SET FREE FSXNSE, FSXNPE series.*

◆ RPIM indoor units

RPIM	
	
Indoor ducted unit (compact)	
Unit	Code
RPIM-0.6FSN4E (*1)	7E430037
RPIM-0.6FSN4E-DU (*1)	7E431037
RPIM-0.8FSN4E (*2)	7E430013
RPIM-0.8FSN4E -DU (*2)	7E431013
RPIM-1.0FSN4E	7E430014
RPIM-1.0FSN4E -DU	7E431014
RPIM-1.5FSN4E	7E430015
RPIM-1.5FSN4E -DU	7E431015

NOTE

- *(*1) 0.6 HP Indoor Units can only be used in combination with SET FREE RAS-FSXNSE and RAS-FSXNPE series.*
- *(*2): 0.8 HP Indoor Units set to a lower capacity (0.6 HP) can only be used in combination with SET FREE MINI series 3 (RAS-(4-6) FS(V)N(Y)3E)series.*

◆ RPK, RPF and RPFI indoor units

RPK		RPF		RPFI	
❄ ☀					
					
Wall type		Floor type		Floor concealed type	
Unit	Code	Unit	Code	Unit	Code
RPK-0.4FSN4M (*1)	60279066				
RPK-0.4FSNH4M (*1)	60279075				
RPK-0.6FSN4M (*2)	60279067				
RPK-0.6FSNH4M (*2)	60279076				
RPK-0.8FSN4M (*3)	60279068				
RPK-0.8FSNH4M (*3)	60279077				
RPK-1.0FSN4M	60279069				
RPK-1.0FSNH4M	60279078	RPF-1.0FSN2E	7E450001	RPFI-1.0FSN2E	7E460001
RPK-1.5FSN4M	60279070				
RPK-1.5FSNH4M	60279079	RPF-1.5FSN2E	7E450002	RPFI-1.5FSN2E	7E460002
RPK-2.0FSN4M	60279071	RPF-2.0FSN2E (*4)	7E450003	RPFI-2.0FSN2E (*4)	7E460003
RPK-2.5FSN4M	60279072	RPF-2.5FSN2E (*4)	7E450004	RPFI-2.5FSN2E (*4)	7E460004
RPK-3.0FSN4M	60279073				
RPK-4.0FSN4M	60279074				
Expansion valve kit (*5)					
EV-1.5N1 (*5)	60921791				

NOTE

- *(*1): Follow the detailed information about the combinability and restrictions for 0.4 HP Indoor Units, which can only be used in combination with current SET FREE RAS-FSXNSE and RAS-FSXNPE.*
- *(*2) 0.6 HP Indoor Units can only be used in combination with SET FREE RAS-FSXNSE and RAS-FSXNPE series.*
- *(*3): 0.8 HP Indoor Units set to a lower capacity (0.6 HP) can only be used in combination with SET FREE MINI series 3 (RAS-(4-6) FS(V)N(Y)3E)series.*
- *(*4) 1 indoor unit combinations with IVX Premium / Standard series not allowed.*
- *(*5) For RPK-(0.4-1.5)FSNH4M models only.*

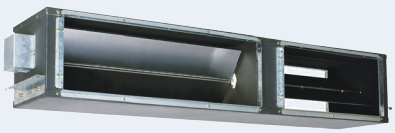
1.4.6 Product line-up: KPI energy recovery unit

KPI			
			
Energy recovery		Active (Energy Recovery+DX section)	
Unit	Code	Unit	Code
KPI-252E4E	70603000		
KPI-502E4E	70603001	KPI-502X4E	70603201
KPI-802E4E	70603002	KPI-802X4E	70603202
KPI-1002E4E	70603003	KPI-1002X4E	70603203
KPI-1502E4E	70603004		
KPI-2002E4E	70603005		

1.4.7 Product line-up: DX-Interface

DX-Interface		
 Control box  Expansion valve box	Unit	Code
	EXV-2.0E2	7E611000
	EXV-2.5E2	7E611001
	EXV-3.0E2	7E611002
	EXV-4.0E2	7E611003
	EXV-5.0E2	7E611004
	EXV-6.0E2	7E611005
	EXV-8.0E2	7E611006
	EXV-10.0E2	7E611007

1.4.8 Product line-up: Econofresh

Econofresh	
	
Unit	Code
EF-456N1E	7E560001

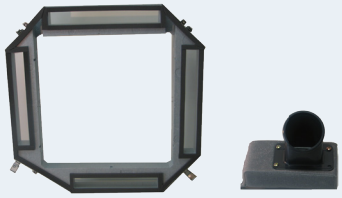
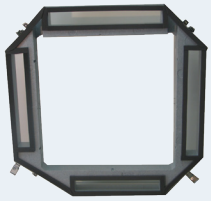
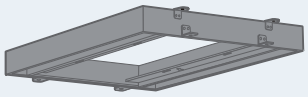
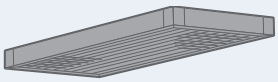
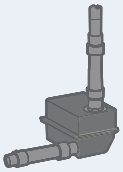
NOTE

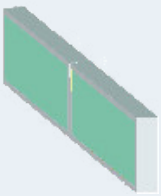
The EF-456N1E unit can only be installed in combination with the following units:

- *RPI-4.0FSN5E (7E422020)*
- *RPI-5.0FSN5E (7E422021)*
- *RPI-6.0FSN5E (7E422022)*

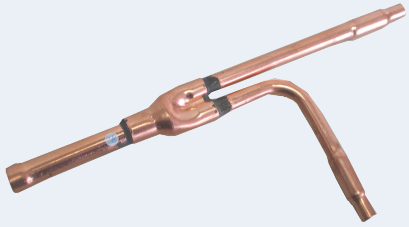
1.4.9 Accessory code list

HITACHI has a wide range of accessories and remote control systems that can be used with the SET FREE and UTOPIA outdoor units. Consult the Technical Catalogue for controls and for the corresponding outdoor units.

Name	Unit reference	Description	Code	Figure
PD-75A	RCI-FSN4	Duct adapter for fresh outdoor air intake kit	60291763	
PD-75C	RCIM-FSN4E		60292014	
PD-150D	RCD-FSN3		60292064	
OACI-160K2	RCI-FSN4	Fresh outdoor air intake kit	60291761	
TKCI-160K	RCI-FSN4	T-shaped duct connection kit for fresh outdoor air intake kit	60291762	
PDF-71C1	RCI-(1.0-2.5)FSN4	Duct connecting flange for indoor air outlet	60299436	
PDF-160C1	RCI-(3.0-6.0)FSN4		60299437	
PI-160LS1	RCI-FSN4	3-way outlet parts set	60291756	
B-160H2	RCI-FSN4	Filter Box (Adapter for deodorising filter)	60291759	
F-71L-D1	RCI-(1.0-2.5)FSN4	Deodorant air filter (installation on the Filter Box B-160H2)	60291757	
F-160L-D1	RCI-(3.0-6.0)FSN4		60291758	
B-90HD	RCD-(0.8-3.0)FSN3	Filter Box (Adapter for antibacterial long life air filter)	60292061	
B-160HD	RCD-(4.0-6.0)FSN3		60292062	
F-90MD-K1	RCD-(0.8-3.0)FSN3	Antibacterial long life air filter high performance filter (installation on the filter box F-90MD-K1→B-90HD F-160MD-K1→B-160HD)	60292058	
F-160MD-K1	RCD-(4.0-6.0)FSN3		60292059	
F-56LPC1	RPC-(1.5-2.0)FSN3	Long life filter (Installation on the indoor unit)	60299279	
F-90LPC1	RPC-(2.5-3.0)FSN3		60299280	
F-160LPC1	RPC-(4.0-6.0)FSN3		60299281	
DUPC-63K1	RPC-1.5FSN3	Drain-up Mechanism	60291935	
DUPC-71K1	RPC-2.0FSN3		60291936	
DUPC-160K1	RPC-(2.5-6.0)FSN3		60291937	
DU-M1E	RPIM	Drain-up kit	7E897304	

Name	Unit reference	Description	Code	Figure
SOR-MSK	RPI-(0.4-3.0)FSN5E	Motion sensor kit	70590912	
PS-MSK2	RCI-FSN4		70590903	
SOR-NEP	RPC-FSN3		60291825	
SOR-NEC	RCIM-FSN4E		70590904	
SOR-NED	RCD-FSN3		60292055	
SLT-30-200-L600	KPI-502(X/E)4E	Noise damper	70550200	
SLT-30-250-L600	KPI-802(X/E)4E		70550201	
SLT-30-300-L600	KPI-1002(X/E)4E		70550202	
SLT-30-355-L600	KPI-(1502-2002)E4E		70550203	
HEF-252	KPI	High efficiency filter	70552201	
HEF-502			70552202	
HEF-802			70552203	
HEF-1002			70552204	
HEF-1502			70552205	
HEF-2002			70552206	
D-ICA04	RPI-0.4FSN5E	Inlet change accessory	7E590908	-
D-ICA15	RPI-(0.6-1.5)FSN5E		7E590909	-

1.4.10 Multi-Kits

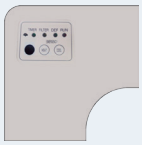
Name	Description	Code	Figure
E-102SN4	Line Branch	70524201	
E-162SN4		70524202	
E-242SN3		70524104	
E-302SN3		70524105	
MW-NP2682A3		60292295	
E-52XN3		70525100	
E-102XN3		70525101	
E-162XN3		70525102	
E-202XN3		70525103	
E-242XN3		70525104	
E-322XN3		70525106	
MH-84AN1	Header Branch	70522009	
MH-108AN		70522008	
MH-108XN		70523108	

1.4.11 Individual remote controls

Name	Description	Code	Figure
PC-ARFP(1)E	Remote control with timer	tbc (Availability date Jan'19 pending confirmation)	
PC-ARH1E	Simplified remote control	tbc (Availability date Jan'19 pending confirmation)	
PC-AWR	Wireless remote control	60291969	

(*) available date will be confirmed

1.4.12 Receiver kit for combination with wireless remote control switch

Receiver kit name	Indoor unit application	Compatible wireless remote control	Code	Figure
on the panel				
PC-ALH3	RCI-FSN4	PC-AWR	60291767	
PC-ALHC1	RCIM-FSN4E	PC-AWR	70590906	
PC-ALHD1	RCD-FSN3	PC-AWR	60292053	
PC-ALHP1	RPC-FSN3	PC-AWR	60291823	
on the wall				
PC-ALHZ1	RPI-FSN(3/5)(P)E RPIM-FSN4E(-DU) RPF(I)-FSN2E RCI-FSN4 RCIM-FSN4E RCD-FSN3 RPK-FSN(H)4M RPC-FSN3	PC-AWR	60292245	

1.4.13 Centralised remote controls

Name	Description	Code	Figure
PSC-A64GT	Touch screen central station	60291730	
PSC-A32MN	Touch screen central station mini	60291966	
PSC-A64S	Centralised remote control	60291479	
PSC-A16RS	Centralised ON/OFF control	60291484	

1.4.14 Building air conditioning controls

Name	Description	Code	Figure
CSNET WEB (PSC-A160WEB1)	Centralised control system which runs CSNET WEB software to control the indoor units	7E512000	
CSNET Manager LT	Centralised control with a touch interface of 12 inches which runs CSNET MANAGER software to control the indoor units.	7E512201	
CSNET Manager XT	Centralised control with a touch interface of 17 inches which runs CSNET MANAGER software to control the indoor units.	7E512202	
HC-A64NET	H-LINK gateway used by CSNET MANAGER Screens to communicate with indoor units (Max. 64 indoor units)	7E512200	

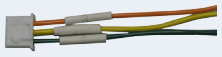
1.4.15 Gateways for building management systems (BMS)

Name	Description	Code	Figure
HC-A8MB	Integration with installation with intelligent control (Building Management System) Gateway Interface to MODBUS systems (Max. 8 indoor units).	7E513204	
HC-A64MB	Integration with installation with intelligent control (Building Management System) Gateway Interface to MODBUS systems (Max. 64 indoor units).	7E513205	
HC-A16KNX	Integration with installations with intelligent control (BMS). Gateway Interface to KNX systems.	7E513300	
KNX001	Integration with installations with intelligent control (BMS) through CSNET WEB. Gateway Interface to KNX systems.	7E5121000	
HARC-BX E (A)	Integration with installation with intelligent control (Building Management System) Gateway Interface to LONWORKS systems. (H-LINK I communication) (Max. 64 units with 8 parameters)	60290874	
HARC-BX E (B)	Integration with installation with intelligent control (Building Management System) Gateway Interface to LONWORKS systems. (H-LINK I communication) (Max. 32 units with 16 parameters)	60290875	
BAC001	BACnet gateway connectable to HC-A8MB	7E512103	
BAC002	BACnet gateway connectable to HC-A16MB	7E512104	

1.4.16 Control support devices

Name	Description	Code	Figure
PSC-A1T	Programmable timer	60291482	
PSC-6RAD	H-LINK RAC Adapter	60063017	
PC-A1IO	Integration of external equipment into H-LINK	7E519000	
PSC-5HR	H-LINK Relay	60291105	
THM-R2AE	Remote temperature sensor (THM4)	7E299907	

1.4.17 Control accessories

Name	Description	Code	Figure
Wall support	Wall mounted support (for both CSNET Manager LT/XT)	7E512300	
Stand support	Stand mounted support (for both CSNET Manager LT/XT)	7E512301	
PCC-1A	Optional function connector	70590901	
PRC-10E1	2P-Extension cord (10 metres)	7E790211	
PRC-15E1	2P-Extension cord (15 metres)	7E790212	
PRC-20E1	2P-Extension cord (20 metres)	7E790213	
PRC-30E1	2P-Extension cord (30 metres)	7E790214	
Net Configuration Kit	Net configuration kit for HC-A(8/64)MB and HC-A64NET	7E512306	

1.4.18 Other devices compatible with HITACHI Air Conditioning systems

In addition to all the aforementioned HITACHI controls, there are some non-HITACHI devices for combination with HITACHI Air Conditioning systems. These are the following:

- HITACHI-AIRZONE gateway (HTI11001): Applicable to HITACHI RPI(M) units providing compatibility with the AIRZONE systems, zone-based climate-control systems.
- Power meter: Siemens power meter for CSNET WEB and CSNET MANAGER.
- MODBUS-FIDELIO gateway: Solution offered by Intesis Software company which transfers MODBUS data into FIDELIO data.

2. Features and benefits

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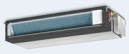
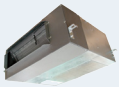
2.1 Benefits of the choice

2.1.1 Choice range

◆ Wide range of indoor units

HITACHI indoor units have a wide range of capacities from 0.4 to 20.0 HP.

The capacity of each indoor unit is flexible; they are set to the maximum possible capacity by default, and can be easily adjusted to precise lower values in line with installation requirements (depending on the model).

System Free																				
Model		Capacity (HP)																		
		0.4 (*3)	0.6 (*2)	0.6 (*1)	0.8	1.0	1.3	1.5	1.8	2.0	2.3	2.5	3.0	4.0	5.0	6.0	8.0	10.0	16.0	20.0
RCI-FSN4 4-way cassette						●	○	◐	○	◐	○	◐	●	●	●	●				
RCIM-FSN4E 4-way cassette (compact)		●	●	○	◐	●	○	◐	○	◐	○	◐								
RCD-FSN3 2-way cassette					●	●	○	◐	○	◐	○	◐	●	●	●	●				
RPC-FSN3 Ceiling type							○	◐	○	◐	○	◐	●	●	●	●				
RPI-FSN5E Indoor ducted unit (slim)		●	●	○	◐	●	○	◐												
RPI-FSN5E Indoor ducted unit (Medium external static pressure)									○	◐	○	◐	●	●	●	●				
RPI-FSN3E Indoor ducted unit (High external static pressure)																	●	●		
RPI-FSN3PE Indoor ducted unit (High external static pressure)																			● (**)	● (**)
RPIM-FSN4E Indoor ducted unit			●	○	◐	●	○	◐												
RPK-FSN(H)4M Wall type		●	●	○	◐	●	○	◐	○	◐	○	◐	●	●						
RPF-FSN2E Floor type						●	○	◐	○	◐	○	◐								
RPFI-FSN2E Floor concealed type						●	○	◐	○	◐	○	◐								

● Constant capacity unit.

◐ Unit whose capacity can be set one step lower, marked with ○, using the DIP switch.

NOTE

- *(*1): 0.8 HP Indoor Units set to a lower capacity (0.6 HP) can only be used in combination with SET FREE MINI series 3 (RAS-(4-6)FS(V)N(Y)3E) series.*
- *(*2): 0.6 HP Indoor Units can only be used in combination with SET FREE RAS-FSXNSE and RAS-FSXNPE series.*
- *(*3): Follow the detailed information about the combinability and restrictions for 0.4 HP Indoor Units, which can only be used in combination with current SET FREE RAS-FSXNSE and RAS-FSXNPE.*
- *(**) RPI-FSN3PE can only be used in combination with SET FREE RAS-FSXNSE and RAS-FSXNPE series.*

2.1.2 Remote control range

HITACHI has a range of remote control systems classified according to the type of management and the number of units being managed:

- Individual remote control systems.
- Centralised remote control systems.
- Building air conditioning systems.
- Building management systems BMS (Building Management System).

◆ Individual remote control systems

The individual remote control systems, whether they are wireless or connected directly by cable, have a wide range of functions for easier unit management, the programming of specific settings or the identification of incidents. Recommended for managing a small number of units.

Remote controls and wireless receiver kits

Wire remote control switch
PC-ARFP(1)E



Wireless remote control
PC-AWR



Wireless Receiver Kit
on the wall



on the panel



NOTE

1 RCI-FSN4, RCIM-FSN4E, RCD-FSN3 and RPC-FSN3 Wireless remote controller can be used only with the addition, easily, the properly receiver kit in the Indoor Units.

2 Wireless Receiver Kit on the wall needs a switch box

3 RPK-FSN(H)4M

The built-in receiver can be used only for a single operation and individual operations. However, it cannot be used for the following operations:

- *Operation with 2 Remote Control Switches (wireless and wired remote control switch PC-ARFP(1)E). This is because the switch "SW2" on the dip switch PCB must be set "WIRED" when using PC-ARFP(1)E.*
- *Simultaneous Operation of Multiple Units.*

4 When using the wireless remote control switch for simultaneous operation, the receiver kit (on the wall) is required (sold separately as an option). SW2 must be set "WIRED".

◆ Centralised remote control systems

The centralised remote control systems combine the functions of the remote controls and extend the management and setting possibilities for several air conditioning systems distributed around the entire floor of a building.



◆ Computerised remote control systems

Computerised remote control systems multiply management and setting possibilities, allowing these to be carried out from any point of the local communications network via a two-core, non-polarity cable or even over the internet.

Recommended for managing more than two floors of a building independently.



◆ Building Management System (BMS)

Integration into installations with intelligent management. Gateway interface with Lonworks BMS, KNX, MODBUS BMS and BACnet BMS systems.

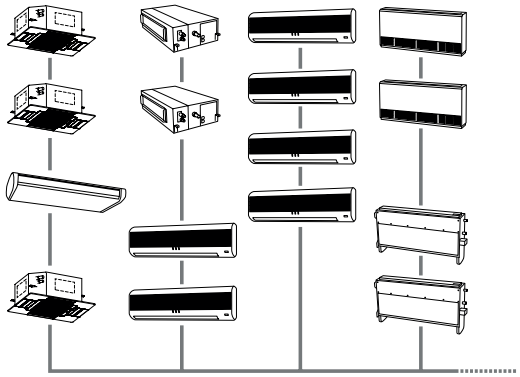


2.1.3 Flexible system

◆ Combination of different units

The indoor units of the SYSTEM FREE series can be combined as appropriate in both UTOPIA and SET-FREE systems to create the most appropriate air conditioning system for each room.

The variety of capacities and mounting accessories largely facilitate installation design. Furthermore, unit management through any of the remote control systems available means that the total performance of the system is optimised.



◆ Adapting the capacity of each unit using the DIP switches

In some situations, it is handy to be able to adjust the capacity of the indoor units to adapt them to actual installation requirements (as show the table in section: *"Wide range of indoor units"*).

The power of each indoor unit in the SYSTEM FREE range can be set precisely using a DIP switch located on the circuit board.

The DIP switch allows for more precise on-site adjustments to be made to the installation after mounting is complete, during start-up or at any time, optimising the total performance of the system.

◆ Unit management through the range of remote controls

As well as the normal functions available on remote controls, the HITACHI range of SYSTEM FREE indoor units includes simultaneous management functions for groups of units.

- It is possible to use one remote control for each indoor unit or just one remote control, arranging the indoor units in control groups (e.g. from 1 to 16 units in each group).
- The built-in safety functions keep the timer running in the event of problems with the power supply (including power cuts lasting several weeks).

The management functions also include the solving of any incident that may arise.

- Automatic check for incident solving that provides real-time information through an alarm code.
- Incident codes displayed on the remote control screen where an operating anomaly arises. Detailed information is also displayed on these codes.

2.2 Installation advantages

◆ Installation work optimisation

The HITACHI installation system is one of the most flexible and easy to install in the market, providing substantial savings in costs of installation, start up and throughout its working life, including maintenance work.

The different members of the SYSTEM FREE group of indoor units include commonly installed parts, thus making installation work simpler and requirements for material less.

◆ Reduction and standardising of installation pipe diameters

During the design process of the SYSTEM FREE indoor units, the necessary connection pipe diameters have been standardised wherever possible. Therefore, most indoor units use connection pipes of similar diameters for the entire installation, thus making installation work easier.

Depending on system configuration and components used, it is possible to configure the entire installation of an air conditioning system using a maximum of two or three different pipe diameters.

◆ Longer pipes between outdoor and indoor units

The distance between units is no longer a determining factor and has become a factor that favours freedom of design in air conditioning installations. The design of the outdoor units means that indoor units can be installed at a greater distance.

The possibility of installing indoor units further away offers greater decision-making autonomy and means that the most favourable location can be chosen. Depending on the model, the distance between both units may be up to 165 metres.

Nor is it necessary to install connection pipes between outdoor units of the same system, thus simplifying installation work.

2.2.1 Easy and flexible communication between units

◆ Complete communication

The indoor units maintain active communications between them, with the outdoor units and with the control systems over a communication line (bus) called H-LINK II. Thus, the performance of each unit, among other aspects, is adapted to the circumstances at all times and remains the most appropriate in each situation.

◆ H-LINK II bus

Easy connection

The communication bus is formed by a pair of small-diameter cores with no specific polarity. Given that no multi-way communication cables are used, the installation is simple, fast and effective. The connections cannot be confused.

The two-core non-polarity communication bus provides significant savings in terms of materials and installation, as the same cable is used for all the units and is quickly and simply connected directly to them.

Long distance

The total length of the communication bus between all the units can reach 1000 m. If the communication line must be longer (e.g. to expand the air conditioning system or to manage the units from a unified station in the building), the total distance can be extended to 5000 m by using the accessories available.

Auto-configuration of system units

The air conditioning system control systems are auto-configuring. They recognise the type of unit they are connected to, along with the type of indoor unit and its capacity. The installation is started quickly and efficiently.

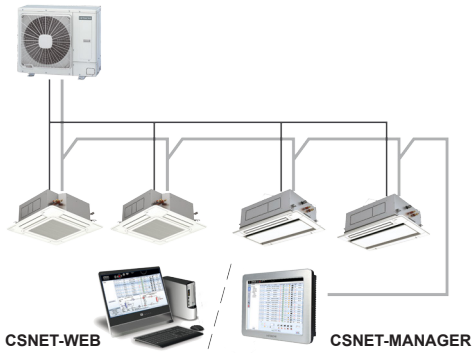
It is also possible to configure all units manually to adjust the installation in line with personalised parameters.

Up to 160 units connected together in a single H-LINK II bus line

It is possible to connect up to 160 indoor units and up to 64 refrigerant cycles from the SYSTEM FREE range in a single H-LINK II bus line. To expand the installation or increase the bus lines available, simply add a new line.

All units are managed as one through the control systems installed.

Example of the H-LINK II system:



Specifications	
Transmission cable:	2 conductors
Transmission cable polarity:	No polarity
Maximum number of outdoor units connected:	64 units per H-LINK II system
Maximum number of indoor units connected:	160 units per H-LINK II system
Maximum number of units:	200
Maximum wiring length:	Total 1000 m (including CSNET-WEB - CSNET-MANAGER) (5000 m (*))
Recommended cable:	Shielded twisted pair cable or shielded pair cable over 0.75 mm^2 (equivalent to KPEV-S)
Voltage:	5 V DC

NOTE

- *When the H-LINK II bus is used, the DIP switches must be adjusted. Otherwise, or if incorrectly adjusted, a transmission problem may occur.*
- *The H-LINK II system offers great flexibility for the design of air conditioning systems, as installation is simple and the total cost affordable. Furthermore, centralised management is possible by connecting the CSNET-WEB or CSNET-MANAGER system to the H-LINK II network cables.*
- *Additionally, it is possible to manage the installation over the internet using the CSNET-WEB or CSNET-MANAGER.*
- *(*) Using 4 H-Link relays PSC-5HR (sold separately as an option).*

Fast connection of new units

Extending the air conditioning system is now even easier. To add new units to the communication bus, simply connect its two cores to the communication terminals.

The new units added to the bus line are recognised by the control system and are automatically configured.

Remote controller switch application

One indoor unit can be controlled separately by two wired remote control switches (sold separately as an option).

One remote control switch (sold separately as an option) can start/stop up to 16 indoor units.

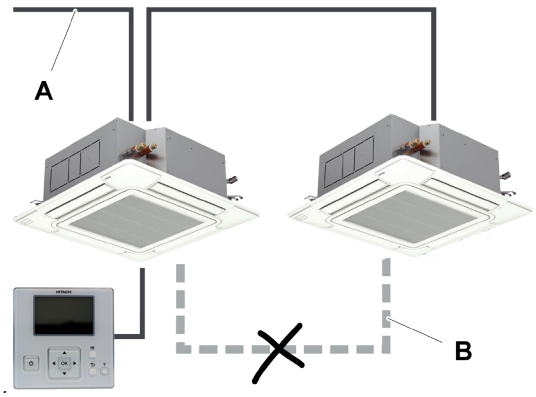
No need for remote control relay wiring in UTOPIA IVX systems in simultaneous operation

In the case of IVX systems comprising several indoor units (up to 4 indoor units), the indoor units set to simultaneous operation can be controlled from a single remote controller, without the need to link them up with dedicated remote control relay wiring.

A: Service cable.

B: Dedicated cable for remote control relay, not required when units are set to simultaneous operation.

The indoor units must be H-LINK II-compatible models.



2.3 Start-up benefits

2.3.1 Automatic start-up

The installation is started up automatically, therefore considerably reducing the time required for the process.

There are three types of start-up:

- Test run and identification of the units forming the system.
- Test run from the remote control.
- Test run from the outdoor unit.

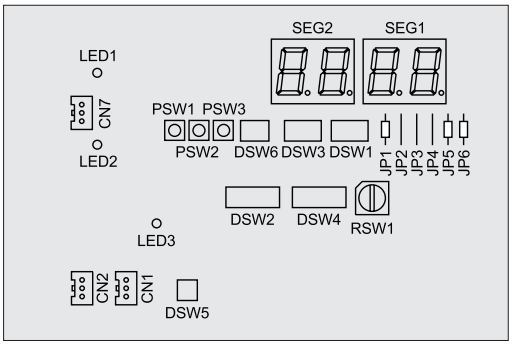
◆ Test run and identification of the system units

The test run can be carried out from either the rotating DIP switches on the outdoor unit or from the remote control for the indoor unit.

The seven-segment indicator on the outdoor unit provides all of the information required to check the system is operating properly.

The units forming part of the system are identified separately for the outdoor and indoor units:

- Outdoor units: the remote control can be use to allocate the series to which the operational outdoor units belong (e.g. single or multiple series).
- Indoor units: using the rotating DIP switch on each unit.



◆ Test run from the remote control

Three operations for the test run are possible from the remote control:

1 Auto-diagnostic: quick check of the operating conditions of the indoor units and outdoor unit.

2 Data memory query: in the event of an alarm, the remote control saves all the operating parameters of the unit at that particular time and the screen displays the corresponding fault code. The air conditioning system diagnostic is simple and effective.

3 Optional function setting: the remote control is able to make settings on up to 29 possible options, such as the four-degree offset in heating mode or the increase in fan speed. It is possible to set several indoor units at the same time and to modify the unit configuration once installation is complete.



◆ Test run from the outdoor unit

The seven-segment indicator on the outdoor unit displays parameters relating to its working order.

Any incident arising during start-up or normal operation can be diagnosed from the indicator.

2.3.2 Service verification

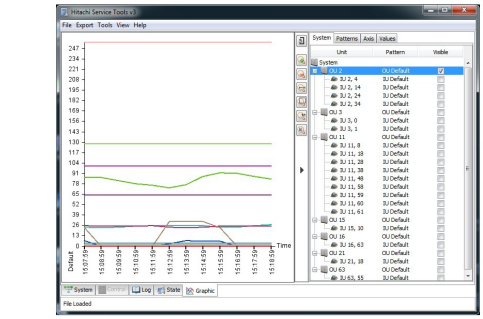
◆ System operation control

The working order of the system is continuously monitored through the control system. All operating parameters that the system uses to manage the outdoor and indoor units are continuously supervised.

◆ Assisted-management air conditioning system

The air conditioning system can be conveniently managed using the HITACHI Service Tools assisted-management software.

This software allows for a laptop, for example, to be connected to the air conditioning system via an interface connected to the H-LINK II bus. Through different menus, the software effectively manages all of the systems connected and obtains data for optimised system performance.





All of the data obtained using HITACHI Service Tools is collected in different formats and monitored in several ways. The software user can configure the processing of the data to monitor the parameters of most interest in each installation and allows reporting of the logged data, exporting each of its screens in different ways.

The data reports can be used to continuously check the correct working order of the system. Any deviation in the ranges of foreseen values is immediately detected.

Additionally, Service Tools adds the option to control the units remotely, helping the user to evolve its test without moving away of his computer and it is possible to configure its optional functions from Service Tools without the need to perform further setup on each unit.

Service Tools can be updated online using an internet connection. If properly configured and registered, Service Tools will check for new updates and advise the user to download them.

2.4 Functional benefits

2.4.1 Indoor units

The design of the fans in the SYSTEM FREE range of indoor units reduces the friction of the air forced by the blades. The aim is to improve the air discharge and its flowing over the supply blades. The result is a reduction in consumption and in noise emissions from the electric fan motors.

2.4.2 Improvement of optional functions for fan stop in Thermo-off conditions

◆ Heating mode. Fan stop in thermo-off conditions

Existing optional functions E8 and CE for fan stop in thermo-off conditions are improved.

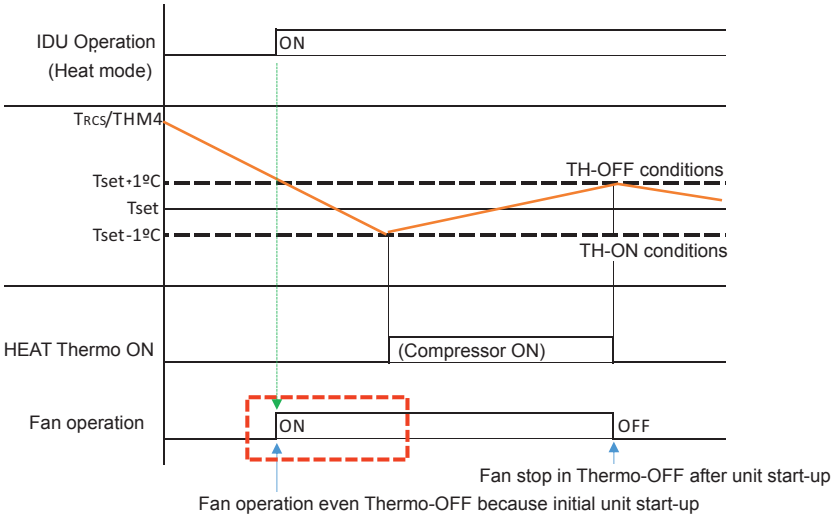
Optional Function setting:

- "E8=01" : Fan stop operation in thermo-off conditions when using THM-R2AE (connected to the THM4 port on the IU PCB)
- "CE=01" : Fan stop operation in thermo-off conditions when using the PC-ARFP(1)E sensor ("C8=01" must be set in this case)

Previous behaviour of the unit with "E8/CE=01"

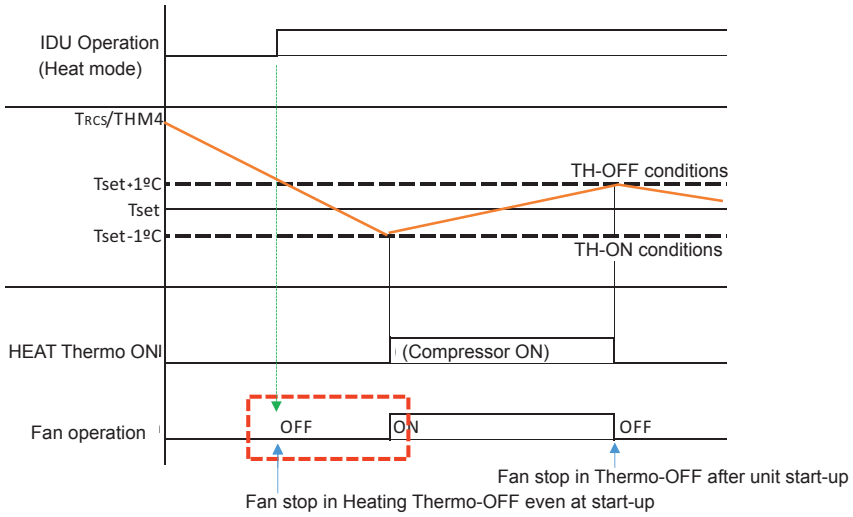
With the previous software, when the indoor unit was started (ON operation in heating mode) being already in thermo-off conditions, the fan was turned on and kept running all the time, even if these optional functions were set.

The fan was stopped only once the unit was in a shifting sequence from thermo-on to thermo-off.



Behaviour of the unit with "E8/CE=01"

Now the fan will not be turned on when the indoor unit is switched on in thermo-off conditions.



NOTE

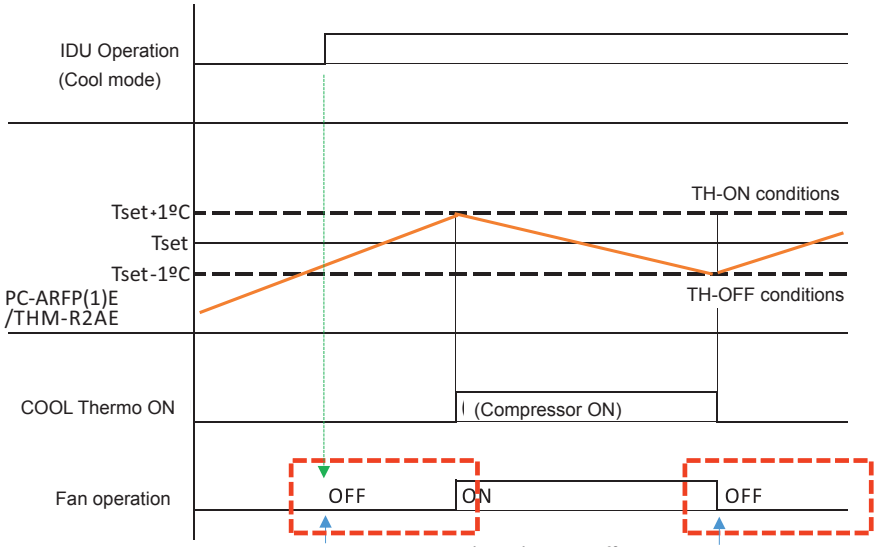
- *These functions are only available when using the remote control sensor (in PC-ARFP(1)E) or the remote sensor (THM-R2AE)*
- *Note: When using CE function:*
  - *"C8=00" : this setting is not permitted*
  - *"C8=02" : this setting is not recommended since it may cause that comfort conditions are never reached (C8 set at 02 means that unit control is carried out with the average value of the remote control sensor and the air inlet sensor of the indoor unit)*
- *In case that Automatic louver is set, the louver will keep operating in both thermo-on and thermo-off conditions*

◆ Cooling mode. Fan stop in thermo-off conditions

This optional function keeps the fan stopped when the indoor unit is in thermo-off conditions, even upon start-up.

Optional Function setting:

- "Cd=01": Fan stop operation in thermo-off conditions when using the additional remote temperature sensor THM-R2AE (connected to THM4) or PC-ARFP(1)E temperature sensor ("C8=01" setting is recommended in this case).



Fan stop in Cooling Thermo-OFF even at start-up

NOTE

It is advised to pay attention to the following points:

- *Do not set this function if no remote control sensor (in PC-ARFP(1)E) or remote sensor (THM-R2AE) are installed; otherwise, comfort conditions may never be reached.*
- *Do not set "Cd" function when indoor unit temperature control is based on:*
  - "C8=00" : Temperature control with the air inlet sensor of the indoor unit.
  - "C8=02" : Temperature control with the average value of the remote control sensor and the air inlet sensor of the indoor unit.
  In these cases, comfort conditions may never be reached.
- *In case that Automatic louver is set, the louver will keep operating in both thermo-on and thermo-off conditions.*

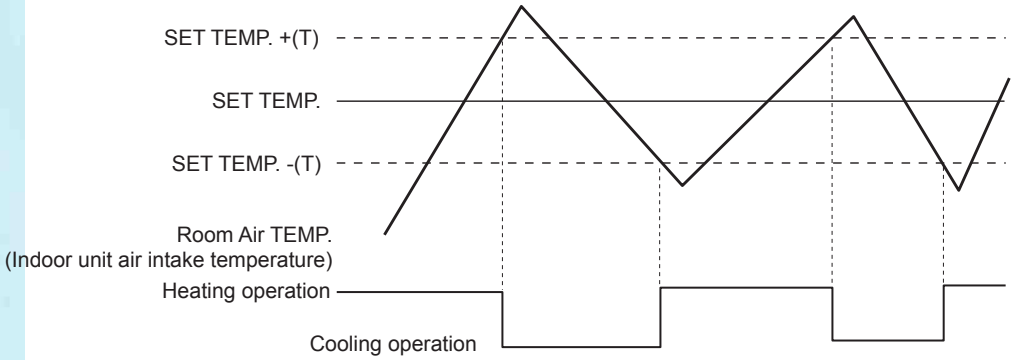
2.4.3 Improvement of Automatic COOL/HEAT Operation

By improving differential temperature for automatic COOL/HEAT operation, it is possible to perform polite and responsive operation and more comfortable air conditioned environment is realized.

Differential Temperature (T)	2ºC

(T): Temperature difference between "SET TEMP" and "Room Air TEMP".

Control Flow of AUTO Mode



This function allows the system to be switched automatically to COOL/HEAT mode based on the difference between the temperature setting and the temperature of the suction air. If the intake air exceeds the temperature setting by 2ºC, the system will switch to COOL mode and, if it is 2ºC less than the temperature setting, the system will switch to HEAT mode.

2.4.4 Motion sensor control

The air conditioning capacity is saved automatically depending on a situation and detecting amount of human activity by adopting the motion sensor on the corner of the air panel.

The energy-saving can be improved more with the individual operating function. In addition, the operation can be stopped automatically if the absent situation continues for more than 30 minutes (1).

The motion sensor allows maintaining the comfortable indoor environment and eliminating the unnecessary operation (2).

The motion sensor control adjusts automatically the following items depending on a situation:

- Setting temperature: is adjusted 1ºC or 2ºC for energy saving.
- Air flow volume: is adjusted to lower one volume or to “Slo” (except during the dry operation).
- Air flow directions: is adjusted to horizontal.

NOTE

- *(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 remote control switch.*

The following indoor units can adopt the Motion Sensor function:

RCI-FSN4	Using Motion Sensor Kit (sold separately as an option)	Wire remote control PC-ARFP(1)E (Required, sold separately as an option)
RCIM-FSN4E		
RPC-FSN3		
RCD-FSN3		
RPI-(0.4-3.0)FSN5E		

The motion sensor kit is only combinable with UTOPIA IVX Premium, IVX Standard, Centrifugal VRF and SET FREE FSXNSE and FSXNPE.

◆ Effect of Energy-Saving by Motion Sensor

In the case of the motion sensor being set as “ON” by the remote control switch and comparing with the temperature setting before adjusting the operation as shown below (at cooling mode):

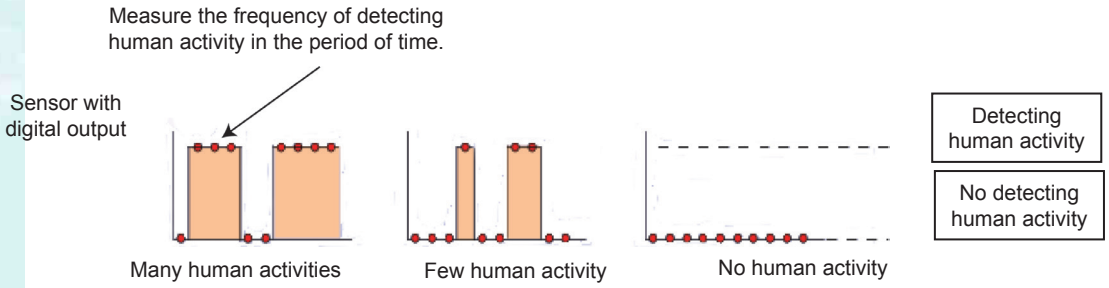
- The power consumption can be reduced max 7% by adjusting 1ºC increased.
- The power consumption can be reduced max 14% by adjusting 2ºC increased.

Sequence of Detection by Motion Sensor

Detect the infrared variation by the sensor element
↓
Generate the analog voltage to the appropriate infrared variation
↓
Convert the analog voltage to the digital signal by the threshold

Sequence of Controlling Motion Sensor at Indoor Unit

Detect whether someone is available or not by the condition of the digital signal
↓
Measure the frequency of detecting human activity in the period of time
↓
Determine amount of the human activity depending on the calculated reaction rate (frequency)
↓ *Reaction Rate (Frequency) = Detected Counts of Human Activity / Measured Counts of Time
Change to each operating mode depending on amount of the human activity and the elapsed time
↓
Control automatically by each operating mode



2.5 Maintenance benefits

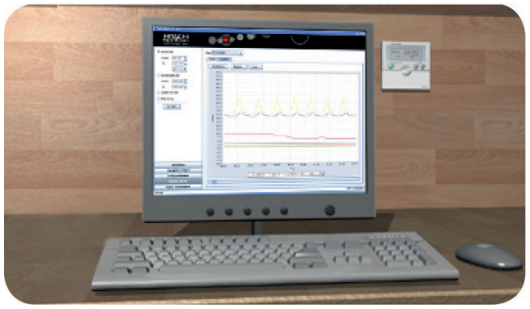
2.5.1 Availability of maintenance tools

◆ HITACHI Service Tools

All of the functions of the HITACHI Service Tools software can also be used for unit maintenance (preventive or corrective). Any incident can be quickly detected and solved in a shorter time.

The CSNET-WEB system is also a powerful tool that is extremely useful for maintenance work.

HITACHI has a range of different remote control systems that can be used with the SET-FREE and UTOPIA outdoor units. Consult the corresponding Technical Catalogue for controls.



◆ Monitoring the system and simplifying maintenance work

The HITACHI Service Tools software is a very powerful tool for the control and management of air conditioning installations. To do so, it supervises the working order of the entire system and displays data that allows for potential incidents to be detected.

Management via software improves the advanced scheduling of planned technical stoppages and means that any unit can be inspected without altering the operation of the air conditioning system. The data obtained is processed and interpreted directly by the software, without the need to waste time or personnel on data reading or on-site checks.

◆ Decrease in operation costs

Monitored operation allows for real-time observation of the performance of the entire air conditioning system. The control system is responsible for ensuring all parts work according to the foreseen conditions, with the maximum performance and efficiency at all times. In this situation, the utmost benefit is obtained from the entire installation at minimum operation costs.

Any range of values tending to be outside that foreseen is an indication of a situation that must be corrected as quickly as possible. The management software clearly displays situations of this type and, therefore, is an interesting ally for reducing costs generated by extraordinary maintenance stoppages.

The more in-depth analysis of the tendencies offers a starting point for realistic maintenance schedules, adapted to the operating conditions of each system.

2.5.2 Simple maintenance

◆ Optimised design to simplify maintenance

The components of the indoor units of the entire range have a strong, long-lasting design bearing in mind the demanding requirements of the market insofar as maintenance cost reduction.

The interior structure of the units and the layout of the internal parts make any removal and assembly operations easier where technical work is required for some reason.

◆ Minimum or zero maintenance

All units and components of the System Free range of indoor units have been designed for simple, easy maintenance operations.

◆ Absence of replacement consumable

Parts subject to inspection are practically inexistent throughout the range. On some specific models, only the regular long-term replacement of the air and deodorising filters is required. Consumable or replacement parts are not required.

◆ Loyal to the HITACHI philosophy

The indoor units of the System Free range have been designed in line with HITACHI philosophy to guarantee the highest reliability and reduce maintenance work to an essential minimum.

2.6 RCI - 4-way cassette

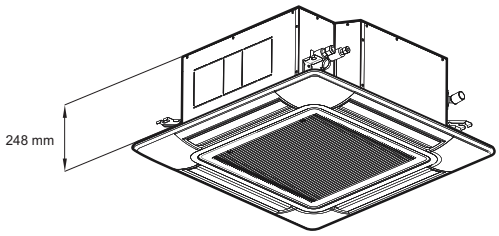


NOTE

HITACHI recommends PC-ARFP(1)E remote control (sold separately as an option) in order to obtain the maximum RCI-(1.0-6.0)FSN4 performance.

2.6.1 Installation advantages

- These compact units featuring a low height are suitable for installation in narrow spaces behind false ceilings: the units measure only 248 mm (1.0-2.5 HP) and 298 mm (3.0-6.0 HP) in height, which places them among the smallest in the market.



- One panel for the entire line-up: Only one panel for the entire line-up, with the option to add the motion sensor kit and the wireless remote control receiver kit as accessories (both sold separately as an option).
- Flexibility of installation to high ceiling: The availability of four fan speeds (“HIGH 2” “HIGH”, “MED” and “LOW) allows to obtain a proper airflow from units installed in high ceilings, even without the need to set up the optional high speed mode (C5).
  Different ceiling heights can be effectively covered by selecting the appropriate fan speed in the remote controller:

Supported ceiling height (With PC-ARFP(1)E or PC-AWR remote control switch)			
High Speed Mode (C5)	Air Flow Volume Mode	1 to 3HP	4 and 5HP
Standard (00)	HIGH	2.7m	3.2m
	HIGH 2	3.5m	4.2m

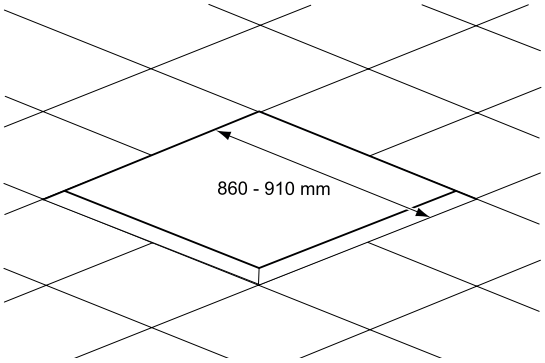
Additionally, the “High Speed Mode (C5)” setting allows to fix different airflow volumes for each fan speed, making use of the five different airflow volume modes (HH2, HH1, Hi, Me and Lo) handled internally by the 4-way cassette units.

The High Speed Mode is selected thought the optional functions C5 from the remote control switch. If the High Speed Mode (C5) is set as High Speed 2 (setting 02) , the air flow volume of “HIGH 2” and “HIGH” will be equaled as shown in the table, because the air flow volume, “HIGH 2” and “HIGH” are used as “HH2” in high speed 2 setting.

	Air flow volume mode selected by remote controller			
High Speed Mode (C5)	HIGH 2	HIGH	MED	LOW
Standard (00)	HH2	Hi	Me	Lo
High Speed 1 (01)	HH2	HH1	Hi	Me
High Speed 2 (02)	HH2	HH2	HH1	Hi

In the case of using the sold separately as an option filter (except the long life filter), the high speed mode setting is required.

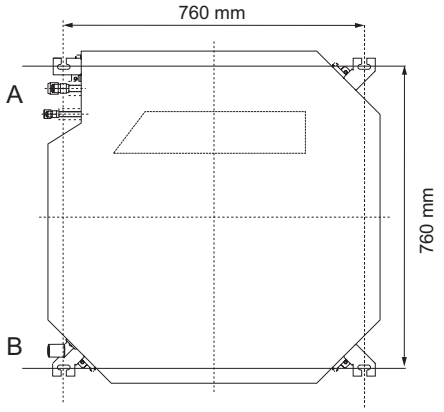
- Less need for housing space in ceilings for new installations and renewed units: the size of the opening required in the ceiling has been modified from the usual 910 mm to a range of between 860 and 910 mm, which means a smaller hole is required in the ceiling.



NOTE

The minimum installation space is 860 mm. A 910 mm hole should be made for easier installation.

- Flexible unit installation: Installation is notably easier thanks to the unit mounting system. The distance between its suspension points at each corner of the unit is 760 mm.
- The direction in which the unit is installed can be easily modified to adapt to the pipe run, the positions of the unit fixing points do not have to be modified.
- The simple design, even for continuous installations, means that refrigerating pipes and drain hoses can be run along different corners for easier distribution and improved installation efficiency.
- The space between the drain pipe connection and the refrigerant pipe connections improves access during installation work.

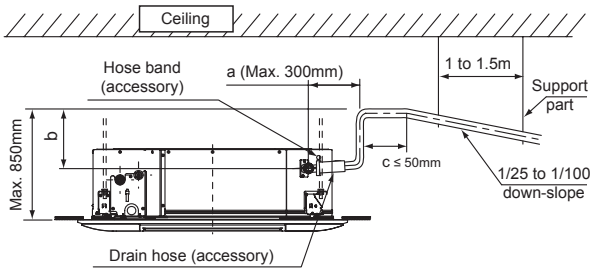


A: refrigerant pipe connection

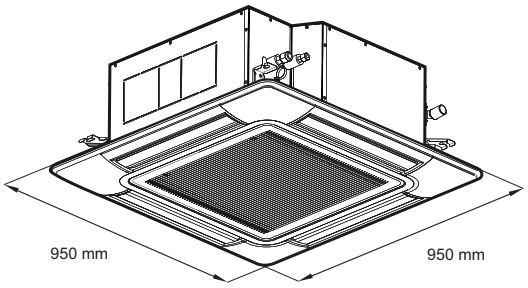
B: drain pipe connection

- Equipped with a drain pump to force condensates up to 850 mm in height in relation to the unit. The pump is automatically enabled when the accumulated water level is too high.

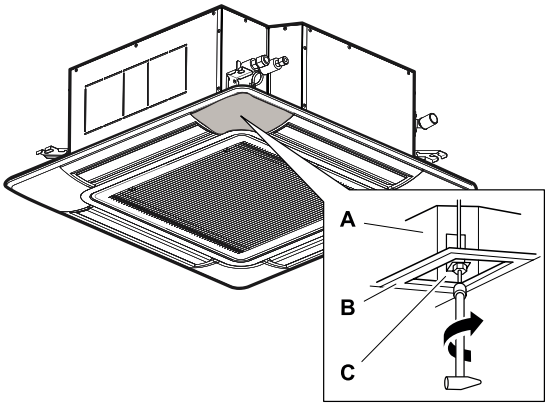
  A: ≤ 300 mm (A + B + C ≤ 1100 mm).



- Standard panel size: the size of the panels has been standardised to 950 mm in width to make them easy to swap with other, different capacity models.



- Unit height easily adjustable from each corner: each of the four corners of the air panel includes access for easy adjustment of the height of the unit without having to remove the panel.



A: unit cabinet.

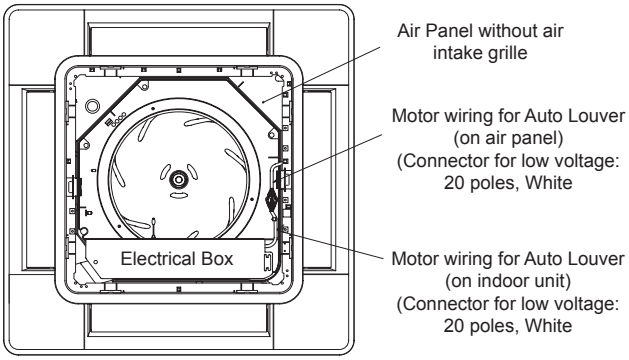
B: air panel.

C: access for height adjustment.

NOTE

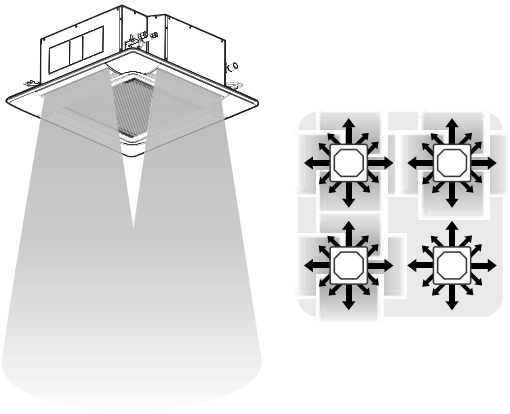
The unit can be precisely lined up with the ceiling -arrow by moving the structure up or down using the set screws accessible on the four corners.

- The electrical connection for the air panel is located inside the air inlet grille on the unit. The electrical box cover does not have to be opened to connect the panel.



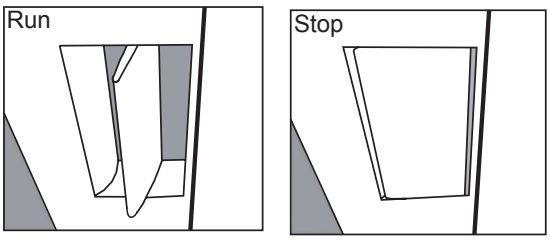
2.6.2 Functional features

- The conditioned air is evenly distributed in all directions thanks to the widening effect achieved by the optimized design of the fan and the air panel. In addition, individual control of each louvre allows a precise control of the orientation of the discharge air flow..



- Intelligent louver closure system

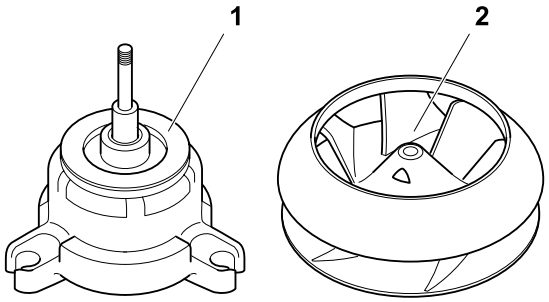
  When the unit is stopped, the louvers return to their horizontal position and the air outlet closes to avoid the accumulation of dust or particles of dirt. The louvers closed horizontally give the unit an elegant image when it is switched off.



- Silent running

  The low sound pressure level, 27 dB(A) on RCI(1.0-2.0) HP models at low speed is achieved through the use of a DC motor (1) for the fan and a new vibration-proof structure on the turbo fan shaft (2). Both parts protect the turbo fan from generating and emitting abnormal noise.

  The following table shows the sound pressure levels, expressed in dB(A).



Sound pressure level - Standard operation dB(A)				
Model	Fan speed setting			
	High 2	High	Medium	Low
RCI-1.0FSN4	33	30	28	27
RCI-1.5FSN4	35	31	30	27
RCI-2.0FSN4	37	32	30	27
RCI-2.5FSN4	42	36	32	28
RCI-3.0FSN4	42	36	32	28
RCI-4.0FSN4	48	43	39	33
RCI-5.0FSN4	48	45	40	35
RCI-6.0FSN4	48	46	41	37

- Drive motors with PWM management

  The electric motors in the SYSTEM FREE indoor units are the main beneficiaries of the functional and construction studies carried out. The technologies applied to each type of unit are, of the entire range of possibilities, the most suitable in each case. For example, application of DC motors with PWM (Pulse Width Modulation) management on the supply fans of the RCI(M) models reduces energy consumption by half. In this case, where the range of working hours of the air supply motors is relatively high, a considerable amount of energy is saved.

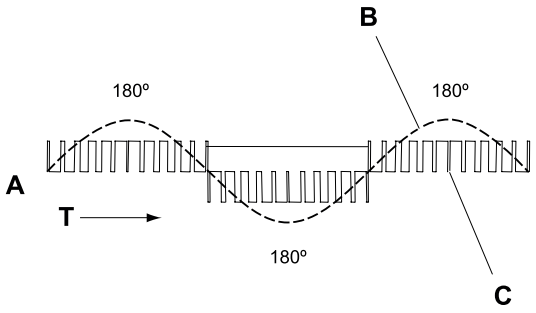
  Furthermore, there is a significant improvement in noise comfort, as the electronic management allows for very precise setting values for each situation.

  A: electricity.

  B: current.

  C: voltage.

  T: time.



- Reduced current consumption thanks to the use of DC motors

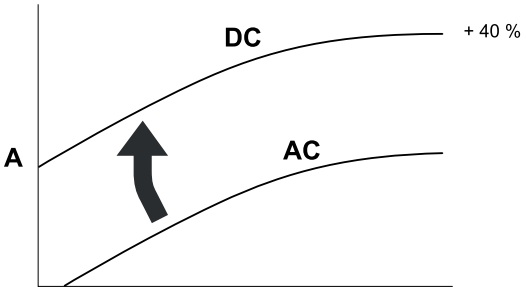
  A: motor efficiency (%).

  DC: direct current motor.

  AC: alternating current motor.

  In comparison with conventional products that use an AC motor, the DC fan motor significantly improves operating efficiency. Furthermore, DC motor rotation speed management means that the formation of gusts in the forced air are reduced.

  The motor is fitted with a rotor with a ferrite magnetic surface, a centralised coil and a split core to reduce electricity consumption. All aspects of motor efficiency have been improved: it is 50% smaller and lighter than the motors used in conventional units.

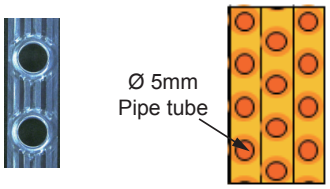


◆ Energy Saving

Adopting High Performance Heat Exchanger, High Efficient Turbo Fan, DC Drain Pump and Motion sensor.

Adopting high performance heat exchanger

The high energy-saving operation is realized to adopt a high performance high efficiency heat exchanger with a smaller pipe diameter (Ø5 mm) and an innovative fin design has been adopted. This, together with the 3D twisted blade turbo fan and the electrical power saving, DC motor driven drain pump, results in a remarkable improvement in energy-saving operation.



Concentrated pipe tube layout

Adopting a high efficient turbo fan

High efficiency turbo-fan is adopted. By improving 3D twisted blade of turbo-fan and air outlet, the fan efficiency is improved and the low noise performance is achieved.

Adopting a DC Drain Pump

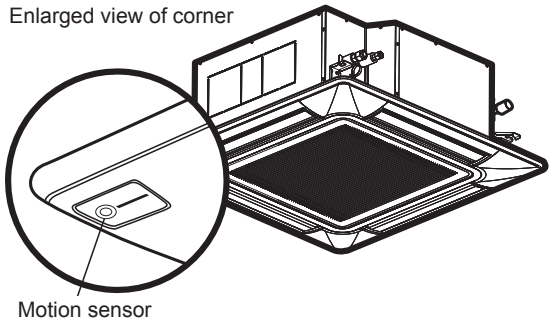
Lower electrical power drain pump with DC motor is equipped in these indoor units as standard.

Adopting Motion Sensor Function

Improvement of Energy-Saving Operation by adopting Air Panel with Motion Sensor

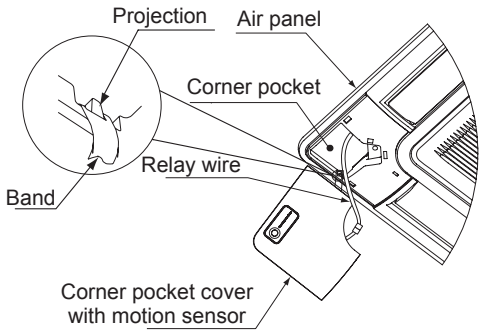
The motion sensor function can adjust the setting temperature according to the human activity, and it controls the air flow volume and the air flow direction.

The energy-saving is improved by combining the motion sensor function and the individual operating function comparing with the standard operation.



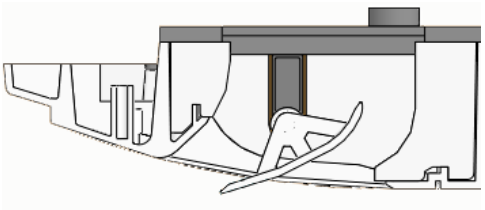
◆ Easy Motion sensor kit installation

The motion sensor comes mounted on a corner pocket that can be attached to any of the corners of the panel. The user can freely choose the place of attachment of the sensor, where it better fits specific needs. The installation of the motion sensor is completed by just connecting the relay wire to CN10 in the electrical box.



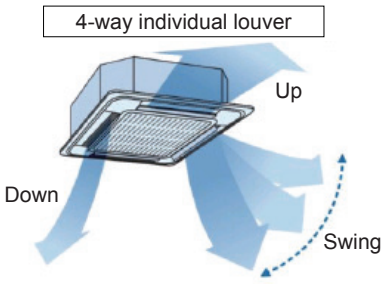
◆ Louver structure

A louver structure has been adopted to avoid vertical air flow and soften the discomfort by the temperature irregularity and the cold draft.



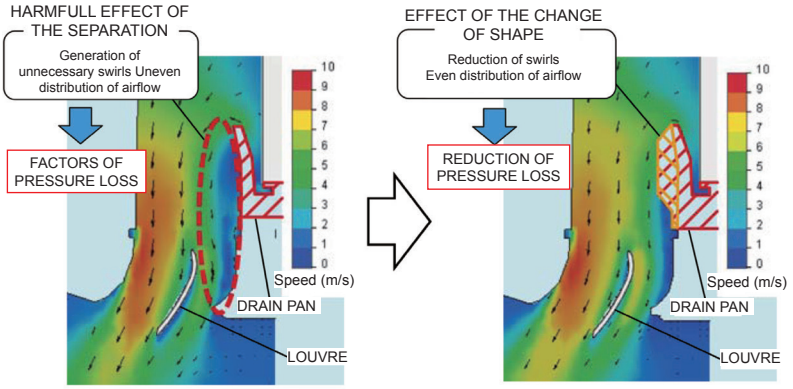
◆ Individual control setting for each louver

The individual control setting for each louver is available through the PC-ARFP(1)E remote control menu, allowing to select easily the louver direction for each ones of the four louvers. Refer to the PC-ARFP(1)E Installation and Operation Manual.



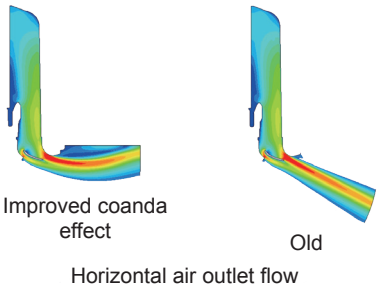
◆ Reduction of pressure loss at the discharge outlet. Improvement of the shape of the discharge outlet

The shape of the discharge outlet has been reviewed to restrain the occurrence of unnecessary swirls, thus reducing pressure loss. In the picture can see the distribution of the air floe in a section view of the discharge outlet.



◆ Improved coanda effect

The renewed design of the panel louvers and the shape of air outlets improves the Coanda effect, resulting in better comfort for the users, since the direct incidence of cold airflow is avoided



◆ Wide Range Air Flow Volume Setting

The air flow volume 4 taps setting is adopted a in order to have a more comfortable installations.

RCI
4 Taps
HIGH 2(*)
HIGH
MED
LOW

(*) Available through the PC-ARFP(1)E or PC-AWR remote control switch without additional setting.

2.6.3 Maintenance benefits

Silver ions antibacterial agent

- The silver ions antibacterial agent is newly adopted in the drain pan, and it inhibits generation of mold or bacterium which is the cause of slime. The antibacterial agent (cased) is fixed in the drain pan (Exchangeable, term of validity is 10,000 hours of the cooling operation (Approx.5 years)).



Larger diameter of drain plug

- The maintainability is improved because the VP25 drain plug diameter is adopted. (outer diameter ø32 mm)

2.7 RCIM - 4-way cassette (compact)



NOTE

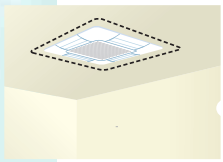
HITACHI recommends PC-ARFP(1)E remote control (sold separately as an option) in order to obtain the maximum RCIM-(0.4-2.5)FSN4E performance.

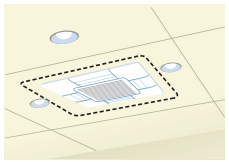
2.7.1 Installation advantages

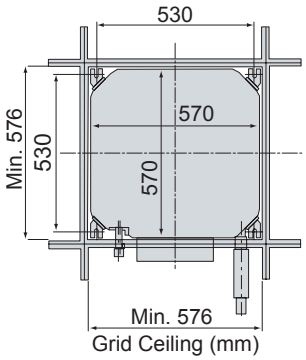
- The mini version of the RCIM series keeps the reduced height of the larger models, which makes them fit for installation in narrow spaces behind false ceilings; with just 295 mm in height, these are among the smallest units available in their class.
- Adaptable to high ceilings: this model has been adapted for installations in high ceilings of up to 3.5 m.

Remote control setting	Ceiling height (m)	
	(0.4-1.5) HP	2.0 HP
Standard	Below 2.5	Below 2.7
Speed increase 1	2.5 to 2.9	2.7 to 3.1
Speed increase 2	2.9 to 3.2	3.1 to 3.5

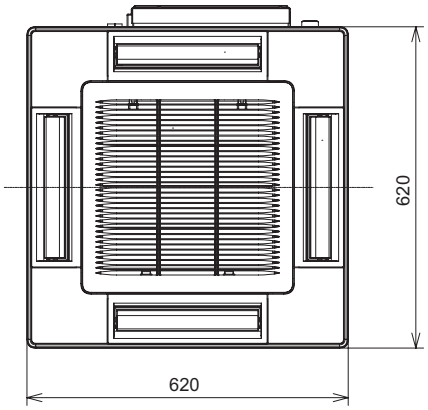
- Suitable for being installed in a narrow space, like powder room, between ceiling lights, in a grid ceiling with a 600mm x 600mm opening without cutting the grid.





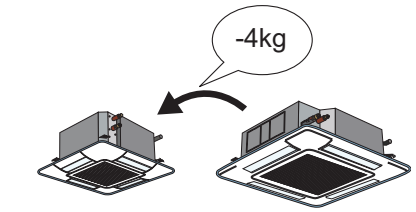


- Standard panel size: the size of the panels has been standardised to 620 mm in width.
- The unit measurements (570 x 570 mm) mean that standard European panels measuring 600 x 600 mm can be used.



- Light-weight Unit

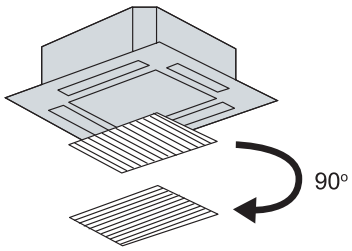
  Compared with the standard 4-Way Cassette Type indoor unit, the weight of this compact model has been reduced approximately 4kg. This makes the transportation and installation much easier.



RCIM-(0.4-2.5)FSN4 RCI-(1.0-2.0)FSN3

- Adjustable Grille Direction

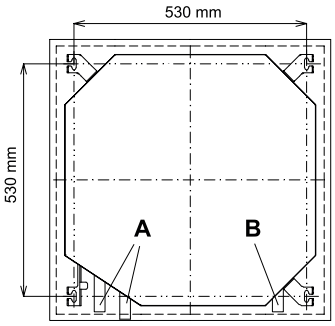
  As the grille size is also small, the grille direction can easily be adjusted even after the unit installation. The grille direction can be changed by 90 degrees.



- Flexible unit installation: Installation is notably easier thanks to the unit mounting system. The distance between its suspension points at each corner of the unit is 530 mm.
- The direction in which the unit is installed can be easily modified to adapt to the pipe run: the positions of the unit mooring points do not have to be modified.
- The simple design, even for continuous installations, means that refrigerating pipes and drain hoses can be run along different corners for easier distribution and improved installation efficiency.
- The space between the drain pipe connection and the refrigerant pipe connections improves access during installation work.

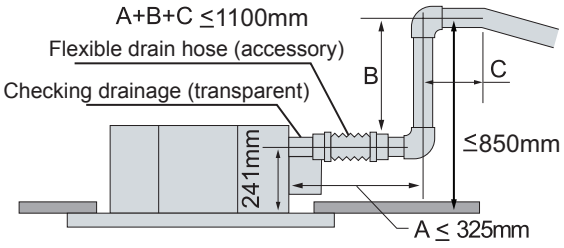
  A: refrigerant pipe connection.

  B: drain pipe connection.



- Adoption of Drain-up Mechanism with High-lift Pump

  These indoor units come equipped with a High-lift DC drain-up mechanism as standard. High-lift pump makes it possible to raise the drain pipe straight up, up to 850mm from the false ceiling surface.



- Easier Height Adjustment

  Unit height easily adjustable from each corner: each of the 4 corners of the air panel includes access for easy adjustment of the height of the unit without having to remove the panel.

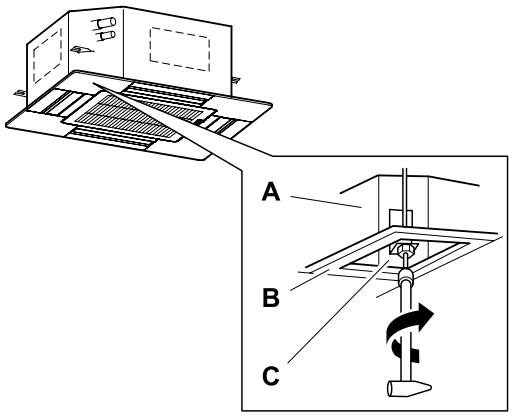
  A: unit cabinet.

  B: air panel.

  C: access for height adjustment.

NOTE

The unit can be precisely lined up with the ceiling -arrow- by moving the structure up or down using the set screws accessible on the four corners.



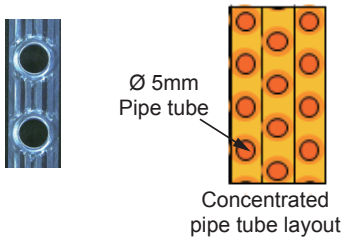
2.7.2 Functional features

◆ Improvement of Energy-Saving

The energy-saving is improved by developed the a high performance heat exchanger, the high efficient turbo fan, the DC drain pump and motion sensor are adopted.

Adopting High Performance Heat Exchanger

High performance & high efficiency heat exchanger (Ø5 mm pipe tubes + advanced design fins)



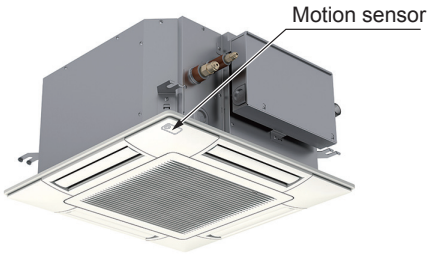
DC Drain Pump

Lower electrical power drain pump with DC motor is adopted.

Improvement of Energy-Saving Operation by Adopting Motion Sensor

The motion sensor function can adjust the setting temperature according to the human activity and it controls the air flow volume and the air flow direction.

The energy-saving is improved by combining the motion sensor function and the individual operating function comparing with the standard operation.



◆ Louver structure

Is adopted a structured silky flow louver that softens the discomfort by temperature irregularity and cold draft

◆ Flexibility of Installation to High Ceiling

The air flow volume “HIGH 2” is added which is larger than “HIGH”

◆ Drain Pan

Adopting the Antibacterial Agent and Larger Diameter of Drain Plug which inhibit the generation of slime, and the maintainability is improved.

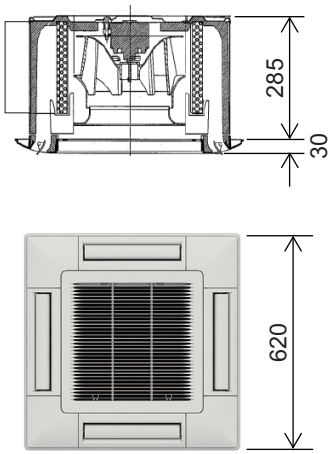
◆ Low Noise (Top-class Sound Pressure Level) and High Efficient Turbo Fan

The adoption of the high efficiency turbo-fan and the improvement of 3D twisted blade of turbo-fan and air outlet, the fan efficiency is improved and the low noise performance is achieved.

The low sound pressure level, at low speed, is achieved through the use of a DC motor for the fan and a vibration-proof structure on the turbo fan shaft. Both parts protect the turbo fan from generating and emitting abnormal noise.

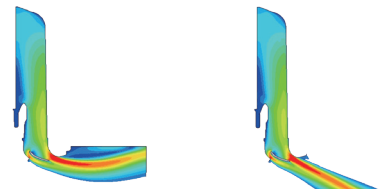
◆ Highly Compact Size

Compact RCIM-4 way cassete and their panel has been design for a reducied sizes that allow the installation into a narrow space.

Dimensions		
Indoor Unit	Width & Depth	570
	Height	269
	from Ceiling Side	285
Air Panel	Width & Depth	620
	Height	41
	from Ceiling Side	30
Dimensional Drawing		

◆ New Design & High Specification Air Panel

- Simple and Stylish design
- 4-way individual louver
- Full closed
- The panel, simple and stylish design, has 4 way individual louver setting. The renewed design of the panel louvres and the shape of air outlets improves the Coanda effect, resulting in better comfort for the users, since direct incidence of cold air flow is avoided.



Improved coanda effect

Old

Horizontal air outlet flow

◆ Wide Range Air Flow Volume Setting

The air flow volume 4 taps setting is adopted a in order to have a more comfortable installations.

RCIM
4 Taps
HIGH 2(*)
HIGH
MED
LOW

(*) Available through the PC-ARFP(1)E or PC-AWR remote control switch without additional setting.

2.7.3 Maintenance benefits

RCIM-(0.4-2.5)FSN4E - 4-way cassette (compact) adopted a easy maintenance adopting the antibacterial agent of drain pan

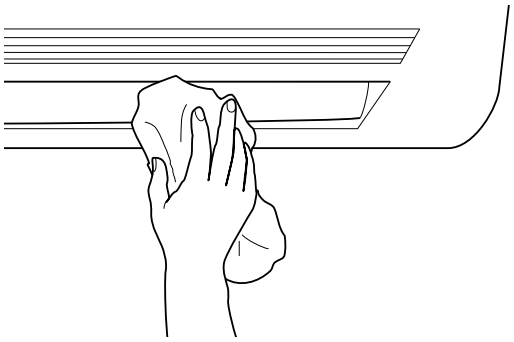
The silver ions antibacterial agent is newly adopted in the drain pan, and it inhibits generation of mold or bacterium which is the cause of slime. The antibacterial agent (cased) is fixed in the drain pan.
(Exchangeable, term of validity is 10,000 hours of the cooling operation (Approx. 5 years))



Easy cleaning

The even distribution of air is guaranteed thanks to the design of the wide supply louvers that also prevent dirt from accumulating on the surface of the ceiling, avoiding unpleasant stains on the air outlets.

The flat surface of the louvers is stain-resistant and very easy to clean.



RCIM Stain-Resistance Louver

Cleaning of the louvres has become easier thanks to the adoption of a design without non-woven fabric at the rear side.

Dirt and smudge adhered to the louvre can be easily wiped off.

Simple maintenance

You do not have to remove the entire air inlet panel to check the drainage system or carry out an emergency drain. Simply open the air inlet grille.

Mould protection

The condensate drain pan has mould protection, which is applied during the manufacturing process.

NOTE

The mould protection lasts for approximately one to two years. An additional mould protection product must be applied after this time.

2.8 RCD - 2-way cassette

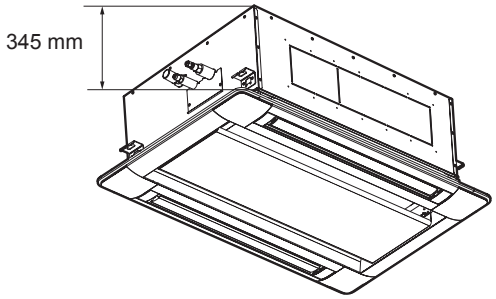


NOTE

HITACHI recommends PC-ARFP(1)E remote control (sold separately as an option)) in order to obtain the maximum RCD-(0.8-6.0)FSN3 performance.

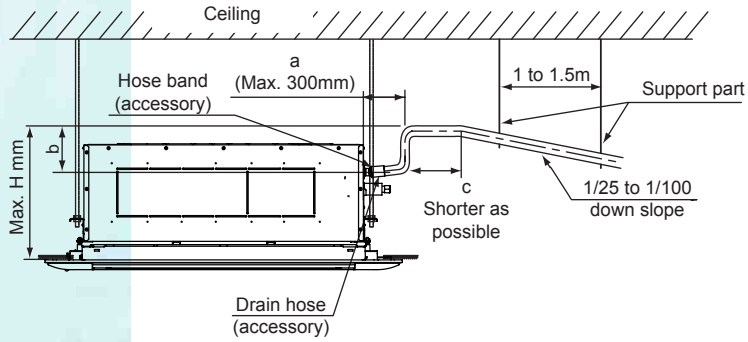
2.8.1 Installation advantages

- The 2-way version of ceiling cassette is also suitable for installation behind false ceilings with narrow spaces.



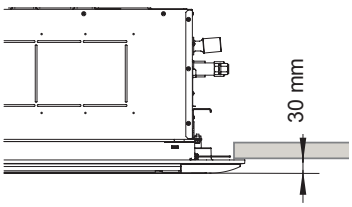
- Improvement of Drain Pump

  High-lift DC drain pump makes it possible to raise the drain pipe straight up, up to 850mm from the false ceiling surface.

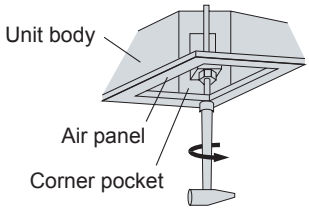


Max. Lift Height (H)	850
Max. Length (a+b+c)	1100

- Perfect adaptation of the air panels in any ceiling. The panels protrude by just 30 mm to blend in perfectly with the ceiling. Furthermore, an additional space is provided to adapt to panel ceilings



- Easier Height Adjustment. The unit height can be adjusted from 4 corner pockets, with the air panel attached to the unit. Height adjustment from the corner pockets is suitable for fine adjustment. To keep the unit level, avoid significant height adjustment.



2.8.2 Functional features

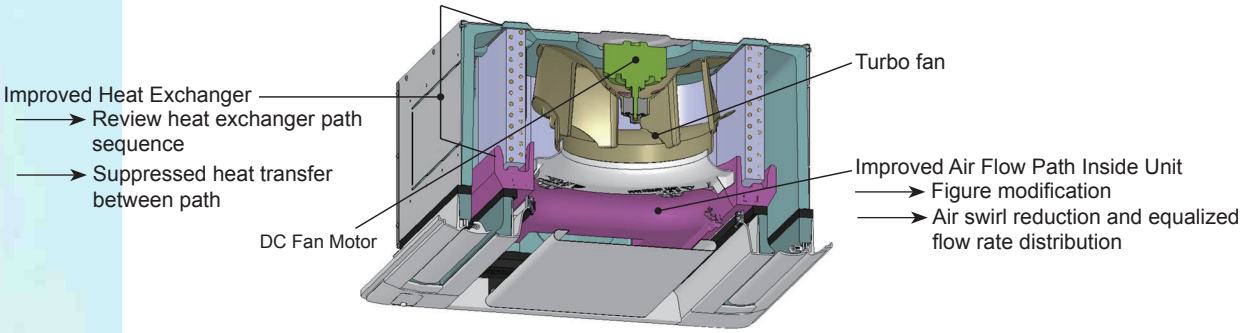
◆ Improvement of Energy-Saving

The high performance heat exchanger and reduction of airflow loss, high efficient turbo fan & DC fan motor are adopted. Additionally the energy-saving is improved by adopting the motion sensor.

The energy-saving is improved by the development of the heat exchanger and reducing of airflow loss and the turbo fan, and adopting the motion sensor.

The motion sensor function can adjust the setting temperature according to the human activity and it controls the air flow volume and the air flow direction.

The energy-saving is improved by combining the motion sensor function and the individual operating function comparing with the standard operation.

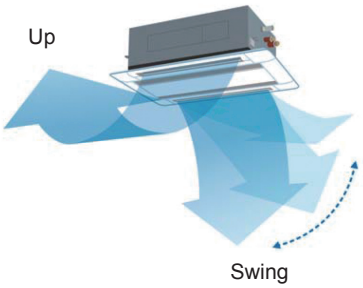


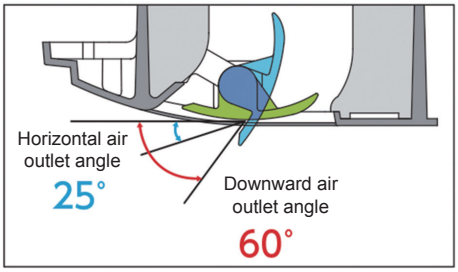
◆ High Performance and brand design Air Panel

Simple stylish design yet applicable for air inlet flat grille. Can be used as shutter at the time of OFF the operation.

◆ 2-way Individual Louver

Adjustable the angle of 2 louvers individually by newly equipped individual louver setting function.





◆ Wide Range Air Flow Volume Setting

The air flow volume 4 taps setting is adopted a in order to have a more comfortable installations.

RCD
4 Taps
HIGH 2(*)
HIGH
MED
LOW

(*) Available through the PC-ARFP(1)E or PC-AWR remote control switch without additional setting

◆ Flexibility of Installation to High Ceiling

The air flow volume “HIGH 2” is added which is larger than “HIGH”.

◆ Low Noise (Top-class Sound Pressure Level)

A developed high efficiency turbo-fan is adopted. The fan efficiency is improved and the low noise performance is achieved.

Model	Sound pressure level			
	Standard operation dB(A)			
	High 2	High	Medium	Low
RCD-0.8FSN3	30	29	28	27
RCD-1.0FSN3	31	29	28	27
RCD-1.5FSN3	37	34	31	30
RCD-2.0FSN3	39	36	33	30
RCD-2.5FSN3	42	39	36	33
RCD-3.0FSN3	45	42	38	33
RCD-4.0FSN3	43	40	37	34
RCD-5.0FSN3	47	44	41	35
RCD-6.0FSN3	48	45	42	39

◆ RCD - 2-way cassette (compact) adopted a easy maintenance adopting antibacterial agent of drain pan

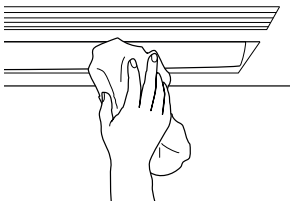
Adopting the antibacterial agent and larger diameter of drain plug which inhibit the generation of slime, and the maintainability is improved.

The silver ions antibacterial agent is newly adopted in the drain pan, and it inhibits generation of mold or bacterium which is the cause of slime. The antibacterial agent (cased) is fixed in the drain pan.
(Exchangeable, term of validity is 10,000 hours of the cooling operation (Approx. 5 years)).

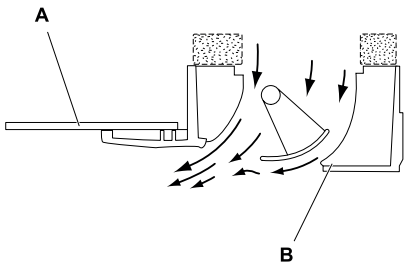


◆ Easy cleaning and maintenance

The flat surface of the air panel louvers (sold separately as an option)) is stain-resistant and very easy to clean.



The air inlet panel grille is designed to prevent the entry of dust or dirt. Furthermore, the air outlet flow is designed to prevent dirt from accumulating on the ceiling -A- and on the air outlet panel -B-.



◆ Air quality improvement filters

Optional filters can be installed to improve the air quality:

- Long-lasting anti-bacteria filters.
- Deodorising filters.

These filters are especially recommended in places where the presence of bacteria must particularly be controlled, such as in hospitals, clinics, etc.

The optional anti-bacteria filter can control the most common types of bacteria and prevent them from spreading thanks to its organic and inorganic agents.

The optional deodorising filter can effectively eliminate tobacco or body odours thanks to a special chemical fibre. This filter is reusable. When the deodorising effect decreases, simply expose it to sunlight for one day for it to recover its efficiency.

2.9 RPC - Ceiling type

RPC-(1.5-6.0)FSN3

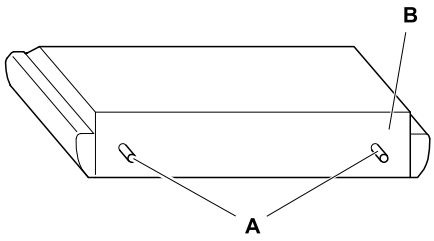


2.9.1 Installation advantages

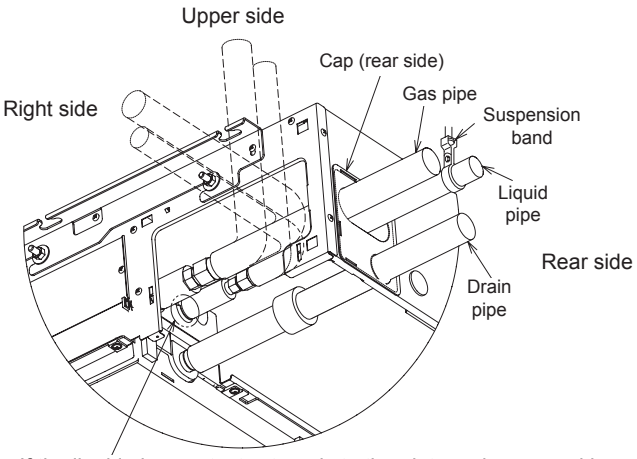
Versatile installation: to increase installation and positioning options, a second valve has been added for easier drain system installation.

A: drain pipes

B: rear side

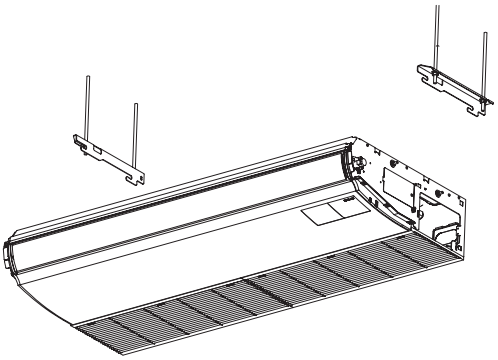


The piping connection for the RPC-FSN3 series can be performed from 3 directions: Rear, right and upper side.

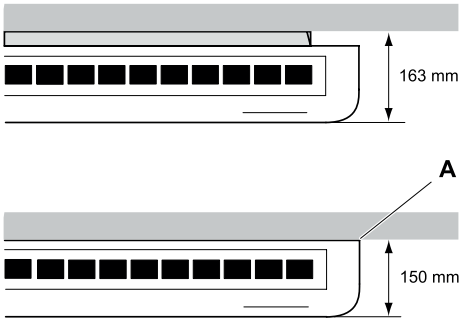


If the liquid pipe contacts strongly to the plate, noise caused by refrigerant flowing may increase. Suspend the local liquid pipe by suspension band to prevent dangling.

The hanging of the unit for the RPC-FSN3 series can do with suspension brackets or directly to the suspension bolt.



Adjustable mounting brackets: the adjustable mounting brackets make unit height adjustment easier so that it sits flush to the ceiling -A-.



2.9.2 Functional features for RPC-FSN3 series

◆ Improvement of Energy-Saving

High efficiency is achieved due to the improved design performace of the fan runner, fan motor and the heat exchanger.

Improvement of Energy-Saving Operation by Motion Sensor

The motion sensor function can adjust the setting temperature according to the human activity, and it controls the air flow volume and the air flow direction.

The energy-saving is improved by combining the motion sensor function and the individual operating function comparing with the standard operation.

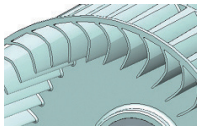


◆ Fan Runner with a high efficiency and Low Noise

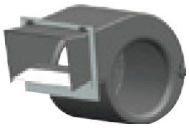
The fan runner is designed improving shapes of L-shaped fins and air outlet, the fan efficiency is improved and the low noise performance is achieved.



Fan Runner



L-Shaped Fin



Fan Casing

Air Outlet Diffuser

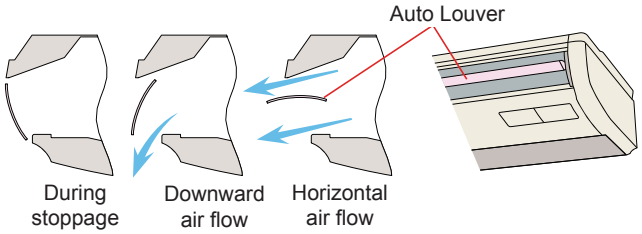
◆ Louver Design

Design with a 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.

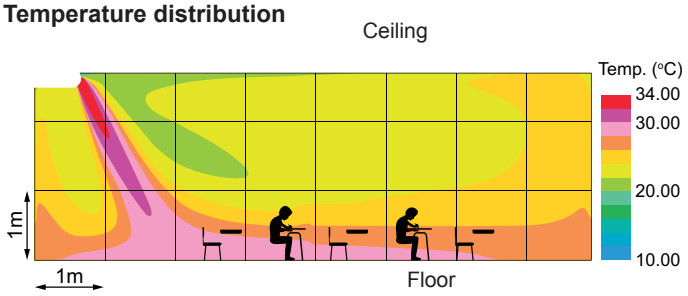
◆ Adopting Amenity Auto Louver

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



The comfortable heating air is widespread to whole room, mainly around floor, during the heating operation.

Temperature distribution



◆ Flexibility of Installation to High Ceiling

The 4 steps air flow volume setting function is adopted. As a result, high speed mode setting by the remote control switch is not required in the case of high ceiling.

RPC
4 Taps
HIGH 2 (*)
HIGH
MED
LOW

(*) Available through the PC-ARFP(1)E or PC-AWR remote control switch without additional setting

- Supported Ceiling Height

High Speed Mode (C5)	Air Flow Volume Mode	(1.5- 3.0)HP	(4.0-6.0)HP
Standard (00)	HIGH 2	3.5m	4.3m

Additionally, the “High Speed Mode (C5)” setting allows to fix different airflow volumes for each fan speed, making use of the five different airflow volume modes (HH2, HH1, Hi, Me and Lo) handled internally by the 4-way cassette units.

The High Speed Mode is selected thought the optional functions C5 from the remote control switch. If the High Speed Mode (C5) is set as High Speed 2 (setting 02) , the air flow volume of “HIGH 2” and “HIGH” will be equaled as shown in the table, because the air flow volume, “HIGH 2” and “HIGH” are used as “HH2” in high speed 2 setting.

High Speed Mode (C5)	Air flow volume mode selected by remote controller			
	HIGH 2	HIGH	MED	LOW
Standard (00)	HH2	Hi	Me	Lo
High Speed 1 (01)	HH2	HH1	Hi	Me
High Speed 2 (02)	HH2	HH2	HH1	Hi

In the case of using the optional filter (except the long life filter), the high speed mode setting is required.

◆ Optional Receiver Kit (sold separately as an option)

By using the wired remote control switch together, it can be connected to the motion sensor kit.

Optional receiver Kit (PC-ALHP1) allows the use of the wireless remote control switch (PC-AWR). “HIGH 2” control is available from the wireless remote control switch (PC-AWR).

Adopting the motion sensor kit (SOR-NEP) allow that the air conditioning saves capacity automatically depending on a situation and detecting amount of human activity. In addition, the operation can be stopped automatically if the absent situation continues for more than 30 minutes *1). The motion sensor allows maintaining the comfortable indoor environment and eliminating the unnecessary operation*2).

NOTE

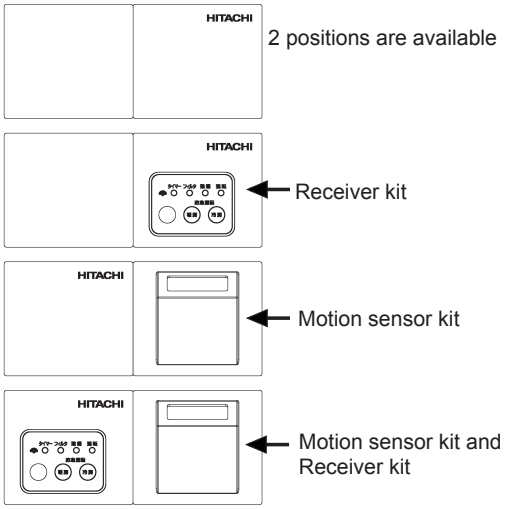
**1):The default setting is “30 minutes”. However, the setting is changeable.*

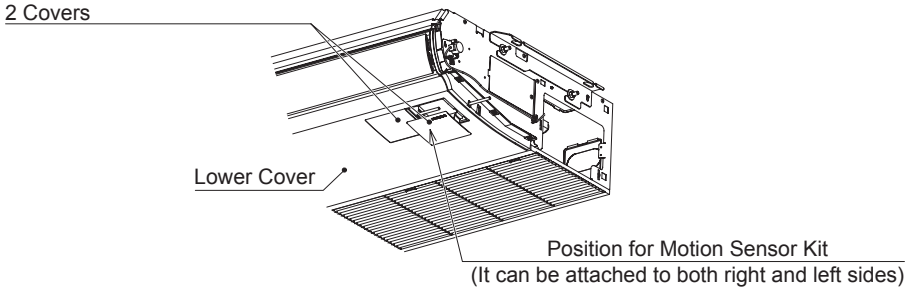
**2):The default setting is “Running Operation”. However, “Automatic Stop” can be selected by setting from the remote control switch.*

To use the wired remote control switch together with wireless remote control switch, the wired remote control shall be connected to the motion sensor kit. The motion sensor can be set and controlled only from the wired remote control switch.

Combination of Receiver Kit and Motion Sensor kit



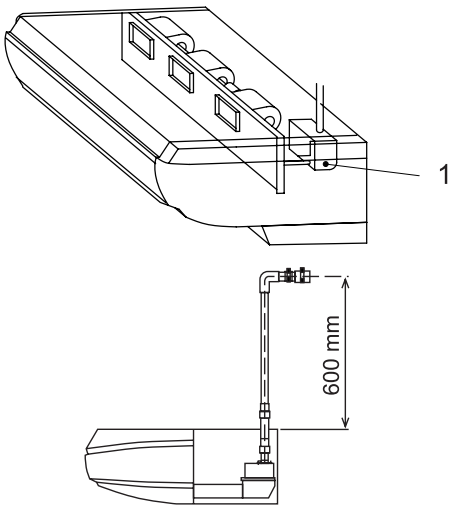




◆ Drain-up mechanism for RPC-FSN3 (optional part sold separately model DUPC-(63/71/160)K1)

The drain-up kit (1) allow to lift the drain-up to 600 mm from the upper side of the indoor unit

The silver ions antibacterial agent is newly adopted in the drain pan, and it inhibits generation of mold or bacterium which is the cause of slime. The antibacterial agent (cased) is fixed in the drain pan (Exchangeable, term of validity is 10,000 hours of the cooling operation (Approx 5 years)).

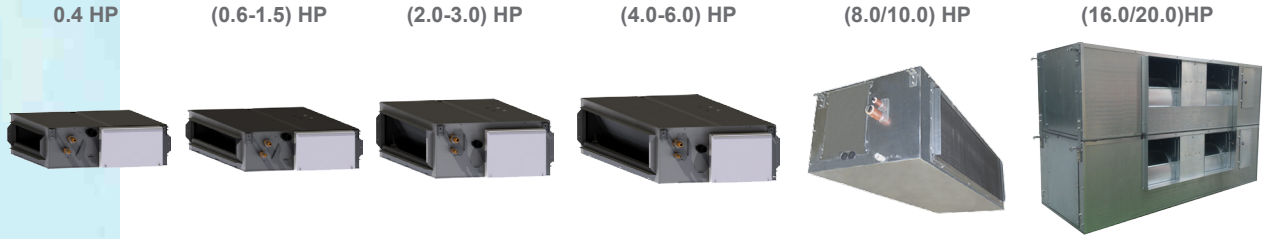


NOTE

For Drain-up Mechanism, the piping work shall be performed from upper side only. When it is installed, the service space shall be maintained more than 300mm between the upper surface and the ceiling.

2.10 RPI - Indoor ducted unit

2.10.1 Installation advantages



◆ RPI-FSN5E

The concept of RPI-FSN5E series, designed with latest technology generation of DC-Fan Motor which provides:

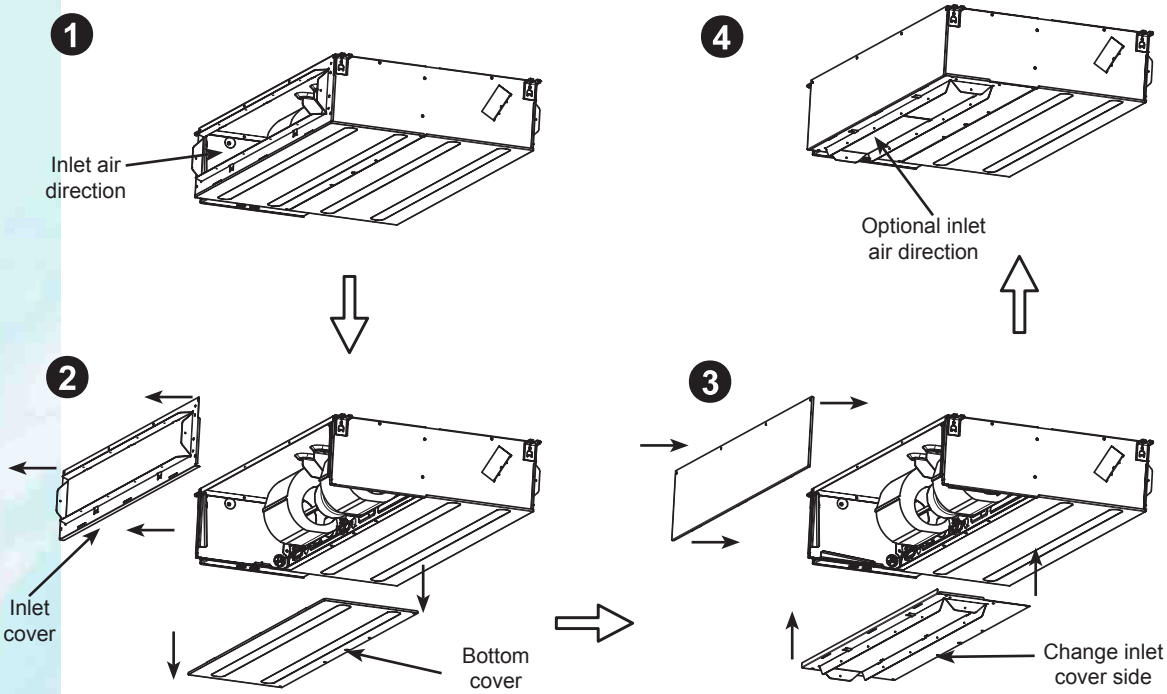
- Low Power Consumption. Efficiency Improvement.

  One of the main benefits of the DC-Motors, against the conventional AC-Motors, is the Low Input Power Consumption. As a result, the Efficiency of the full system is improved as well.
- More Flexibility

  Wide fan speeds distribution, available very Low External Static Pressure (No Duct installation also available depending in each particular case).
- Compatible with latest Remote Control Switch (PC-ARFP(1)E) which allows getting an additional High Fan Speed (“Hi 2”) providing additional adaptability of the unit in those installations where could be required (very useful for ducted installations in case of Low External Static Pressure and High Air Volume).
- Feedback “rpm” control

  Intelligent DC-Fan Motor Control which keeps always the Air Volume constant giving the best comfort to the customer even when the Air Filter is capped by dust or in those installations where there is a dumper system which makes External Static Pressure variations.

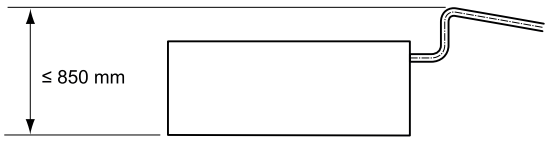
◆ RPI-(2.0-6.0)FSN5E



For RPI-(2.0-6.0)FSN5E units, Air inlet direction could be modified by changing inlet cover direction as shown in the diagram.

For RPI-(0.4-1.5)FSN5E units the air inlet direction can be modified by adding and optional accessory specifically designed for this purpose (sold separately as an option).

◆ Drain pump



All RPI-FSN5E units are supplied with a drain pump.
RPI-(0.4-3.0)FSN5E models include a drain pump with DC motor, while RPI-(4.0-6.0)FSN5E models are fitted with an AC drain pump.

In cooling and dry mode the pump is running permanently, and it allows the draining of condensed water up to 850 mm above the unit.

◆ RPI-(8.0/10.0)FSN3E-f - RPI-(16.0/20.0)FSN3PE-f

The RPI-(8.0/10.0)FSN3E-f and RPI-(16.0/20.0)FSN3PE-f models are manufactured by using a non- flammable insulations. This non-flammable material is made of long ceramic fibres bonded with an organic binder and finished with aluminium film layer which provides excellent thermal properties.

The non-flammable insulating material is certificated with a grade of Flammability Class “M0” (based on French standard NF P 92-507: 2004) or equivalent “A1” (based on European standard EN 13501-1 +1: 2009).

The other data and specifications for these units are common with the models RPI-(8.0/10.0)FSN3E - RPI-(16.0/20.0) FSN3PE.

RPI-(8.0/10.0)FSN3E(-f)

RPI-(8.0/10.0)FSN3E(-f) units have been designed to be as compact as possible to improve installation work.

The result is units with a profile that is 52 mm less than the units of the previous model, maintaining the other measurements. As a result, they are easier to house and install in false ceilings (from 475 mm in height to 423 x 1592 x 600 mm).

RPI-(16.0/20.0)FSN3PE(-f)

These units has the following benefits for the installer:

- Improved unit hanging (one compact unit set).
- Easy Duct installation (pre-mounted inlet and outlet Duct Frames onto the unit).
- One Remote control and simply wiring work (units inter-connected factory supplied).
- No need DX-Interface installation (simply refrigerant pipes connection throw Multi Kit).

2.10.2 Functional features

◆ RPI-(0.4-6.0)FSN5E - Indoor ducted unit

- Silent running

  The innovative ventilation unit that combines an optimised design with the use of materials for a significant reduction in operating noise. The HITACHI RPI units are among the most silent in the market.

  The following table shows the sound pressure level of the different models.

Sound pressure level				
Model	External Static Pressure	Standard operation dB(A)		
		High	Medium	Low
RPI-0.4FSN5E	SP-00	31	29	27
RPI-0.6FSN5E	SP-00	32	30	27
RPI-0.8FSN5E	SP-00	33	31	29
RPI-1.0FSN5E	SP-00	33	31	29
RPI-1.5FSN5E	SP-00	34	31	29
RPI-2.0FSN5E	SP-02	29	29	27
RPI-2.5FSN5E	SP-02	30	30	28
RPI-3.0FSN5E	SP-02	31	31	29
RPI-4.0FSN5E	SP-00	37	35	32
RPI-5.0FSN5E	SP-01	38	35	33
RPI-6.0FSN5E	SP-01	39	36	33
RPI-8.0FSN3E(-f)	--	54	54	51
RPI-10.0FSN3E(-f)	--	55	55	52
RPI-16.0FSN3PE(-f)	--	56	--	53
RPI-20.0FSN3PE(-f)	--	57	--	54

- Fan speed optimization at each static pressure level on RPI-(0.4-6.0)FSN5E models.

  For RPI units, function C5 is used to change the static pressure.

C5 setting condition	
00	Standard static pressure (factory set)
01	High static pressure
02	Low static pressure

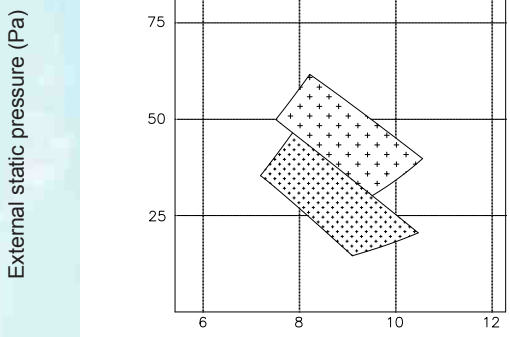
  Series RPI-(0.4-1.5)FSN5E has been designed with a DC-Fan motor.

  The intelligent DC-Fan Motor control which keeps always the Air Volume constant giving the best comfort to the customer even when the Air Filter is capped by dust or in those installations where there is any dumper system which makes External Static Pressure variations.

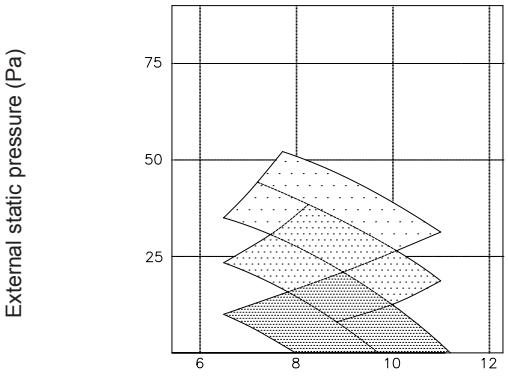
Higher flexibility in the site

- Fan Speeds have been improved by better distribution at lower External Static Pressure area.
- Remote Control Switch PC-ARFP(1)E and PC-AWR allows getting an additional High Fan Speed ("HIGH 2" in PC-ARFP(1)E screen and "Hi2" in PC-AWR screen) which provides additional adaptability of the unit in those installations with Low External Static Pressure and high Air Volume requirement.
- A low ESP Working Range area is available for this series.
- A silent "Low" Fan Speed is adopted which allows working with very short ducts or without duct.

Example of RPI-1.5 working range before



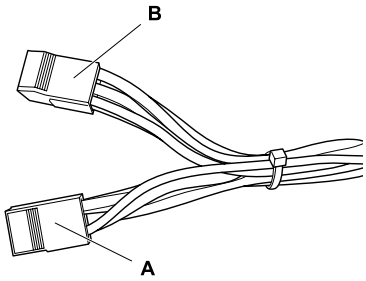
Example of RPI-1.5 working range improvement



- **Simple adjustment of static pressure on RPI-(8.0/10.0)FSN3E(-f) and RPI-(16.0/20.0)FSN3PE(-f) models**

  The fan motor in RPI-(8.0/10.0)FSN3E(-f) and RPI-(16.0/20.0) FSN3PE(-f) units can be configured in two different ways:

  - A: connector CN24 LSP (Low Static Pressure) (factory supplied setting).
  - B: connector CN25 HSP (High Static Pressure).



  The LSP configuration enables the unit to run in low-demand mode. It is used in installations with short ventilation ducts. The HSP configuration enables the unit to run at a high static pressure with the same airflow. This configuration is suitable in installations with long ventilation ducts.

  To keep the unit operation noise level as low as possible, it is extremely important to adapt the unit to the type of ventilation ducts available.

  The fan motor in the unit is fitted with a dual power connector in the electrical box. Fitters can set the most appropriate static pressure during unit installation.

  The fan motor in the unit is factory-supplied set to work at low static pressure. If the unit is built into an installation with long ventilation ducts, the unit must be adapted to work at a high static pressure. To do so, simply replace the motor power connector identified as CN24 (factory-connected for operation at low static pressure, LSP) with the high-pressure connector CN25 (operation at high static pressure, HSP).

⚠ CAUTION

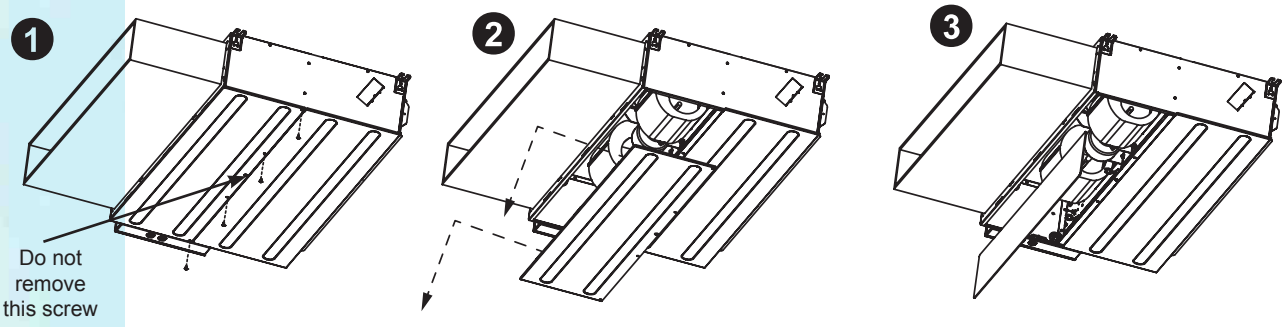
Perform the connection with the same settings in both units that make up models RPI-(16.0/20.0)FSN3E(-f); otherwise malfunction may occur, causing damage to the units.

2.10.3 Maintenance benefits

◆ Filter maintenance

The location of the air filter has been studied so that the air ducts do not have to be removed or additional access hatches provided.

Simply remove the 4 screws from the cover and then take the filter out.

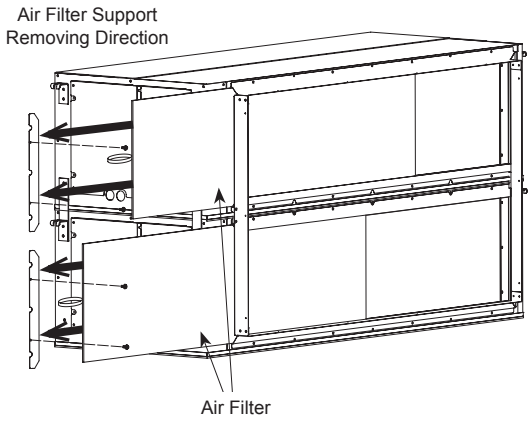


- For RPI-FSN3PE models

  Filter maintenance could be performed from right or left side of the unit.

  Remove filter support (x2 screws / each support) and pull out the filter from the handle.

  In those installations where the servicing space is narrow, the filter could be bent (in three pieces) when pulling it out.

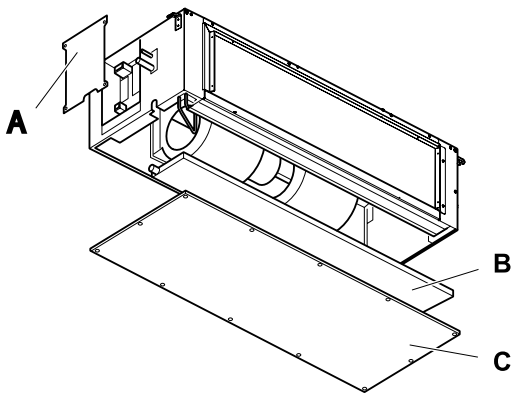


◆ Maintenance of unit RPI-(8.0/10.0)FSN3E(-f)

One of the aspects considered in the design of the unit is its easy access for maintenance operations. The main aim is to be able to carry out normal operations on the main components without having to uninstall the unit.

The main access is provided from the base of unit -C-, which can be easily separated without the need for any more space. From here, the following unit parts can be reached: fan motor, evaporator, drain pan -B- and the entire refrigerant circuit, all of which are secured to the main unit structure.

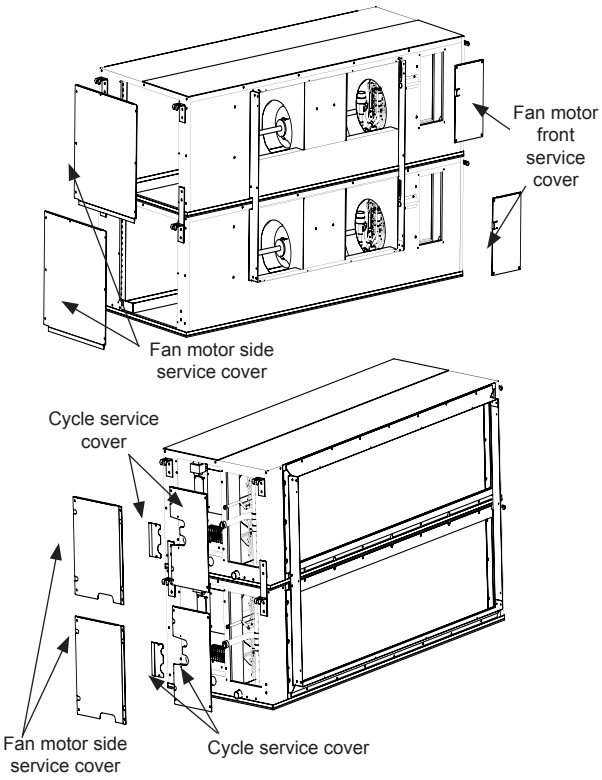
There is a cover -A- for electrical maintenance that is located on one side of the unit, which can be separated without affecting its connection.



◆ Maintenance of unit RPI-(16.0/20.0)FSN3PE(-f)

The design of the RPI-(16.0/20.0)FSN3PE(-f) makes easy the servicing works:

- A right side servicing of the motor is available (be aware that servicing space of the motor side shall be min. 1200 mm).
- The left side cycle access is available (for servicing and maintenance of drain pan, flow switch, thermistors).
- The filter (split in three parts) has a right or left access and servicing.



2.11 RPIM(-DU) - Indoor ducted unit - compact

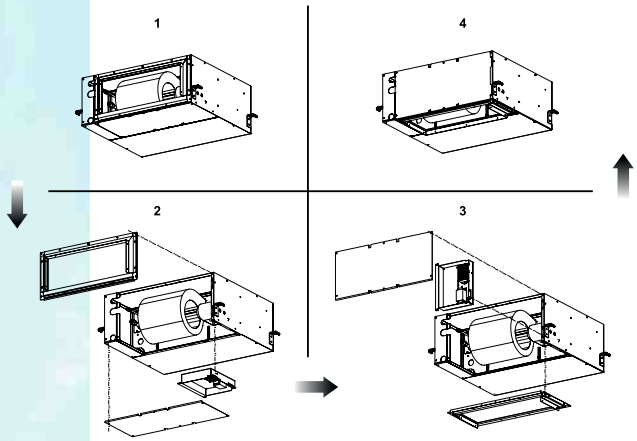
2.11.1 Installation advantages



- Sound Level improvement

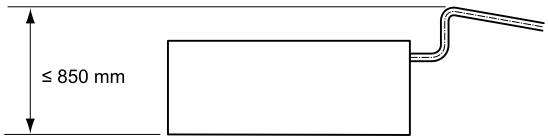
	RPIM-0.6FSN4E(-DU) (Hotel type)		
Fan Speed	Hi	Me	Lo
Sound Pressure Level (dB(A))	28	28	25

- Change in position of the air inlet on RPIM -(0.6-1.5) FSN4E(-DU) models: the position of the air inlet and, therefore, its direction can be modified by changing the position of the rear cover, as shown in the illustrations.



1 Initial position of the air inlet (factory-supplied).
2 Remove the front and rear covers and the electrical box from the unit.
3 Switch the position of the front and rear covers. Change the position of the electrical box on the unit as indicated in the illustration.
4 Final position of the air inlet.

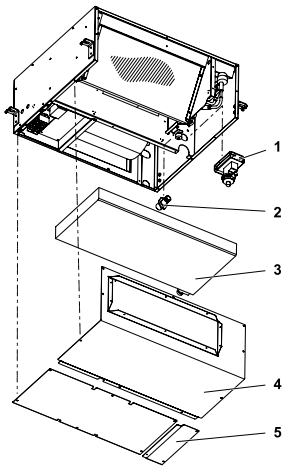
- The RPIM-(0.6-1.5) FSN4E-DU units are equipped with a drain pump to force condensates up to 850 mm in height in relation to the unit. The pump is automatically enabled when the accumulated water level is too high.



NOTE

The drain pump kit (DU-M1E) is available for connections with the RPIM-(0.6-1.5)FSN4E units for installations where condensate evacuation conditions are unfavourable or for installations where it was not considered previously.

1 Drain pump.
2 Drain pipe.
3 Drain pan.
4 Rear cover.
5 Fan cover.



Series RPIM-(0.6-1.5)FSN4E has been designed with a DC-Fan motor.

The intelligent DC-Fan Motor control which keeps always the Air Volume constant giving the best comfort to the customer even when the Air Filter is capped by dust or in those installations where there is any dumper system which makes External Static Pressure variations.

2.11.2 Functional features

Sound level improvement

A lowest sound is achieved due to a design of the “Low” fan speed, and better fan speed distribution , mainly important in site with very short duct

	RPIM-FSN4E (Hotel type)(SP-00)		
	Fan speed		
Unit power (HP)	High	Medium	Low
0.6	28	28	25
0.8	29	29	27
1.0	29	29	27
1.5	30	30	28

Expanded combinability

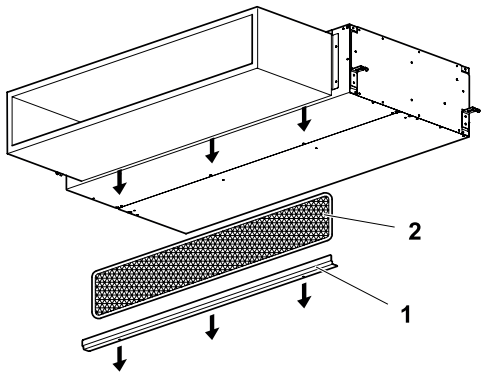
For RPIM-0.8FSN4E is added DSW for special 0.6HP setting that can be used with SET FREE MINI series 3. With this Dip switch setting the air flow of the unit is modified to be adjusted to 0.6 HP capacity.

2.11.3 Maintenance benefits

◆ Filter maintenance

The location of the air filter has been studied so that the air ducts do not have to be removed or additional access hatches provided.

Simply remove the set screws from the bar -1- (RPIM units: 2 screws, RPI units: 3 screws) and remote it to pull the filter downwards.



2.12 RPK - Wall type

Renewed design of 2.0 to 4.0HP units unified with the existing design of 0.4 to 1.5HP units..



RPK-0.4FSN4M
RPK-0.6FSN4M
RPK-0.8FSN4M
RPK-1.0FSN4M

RPK-0.4FSNH4M
RPK-0.6FSNH4M
RPK-0.8FSNH4M
RPK-1.0FSNH4M



RPK-1.5FSN4M

RPK-1.5FSNH4M



RPK-2.0FSN4M
RPK-2.5FSN4M
RPK-3.0FSN4M
RPK-4.0FSN4M

2.12.1 Installation advantages

With the design of RPK-(2.0-4.0)FSN4M is achieved a lightweight and compact design.

Model	Weight (kg)			Sizes [mm] (HxWxD)		
	New model	Current model	Ratio	New model	Current model	Ratio
RPK-2.0FSN4M	**14.5**	17	85%	**300x1100x260**	333x1150x245	W: 96% H: 90%
RPK-(2.5-4.0)FSN4M	**15**	17	83%	**300x1100x260**	333x1150x245	

All range of RPK-FSN(H)4M series is offering a compact design and reduced weight to allow easy installation

Model	Weight (kg)	Sizes [mm] (HxWxD)
RPK-0.4FSN(H)4M	9	300x790x230
RPK-(0.6-1.0)FSN(H)4M	10	300x790x230
RPK-1.5FSN(H)4M	11	300x900x230
RPK-2.0FSN4M	14.5	300x1100x260
RPK-(2.5-4.0)FSN4M	15	300x1100x260

◆ **Expanded combinability**

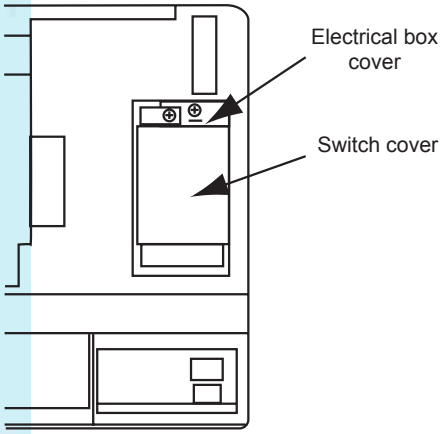
For the RPK-0.8FSN4M is added DSW for special 0.6HP setting that can be used with SET FREE MINI series 2. With this Dip switch setting (by switching DSW2-2# ON) the air flow of the unit is modified to be adjusted to 0.6 HP capacity.

◆ Workability

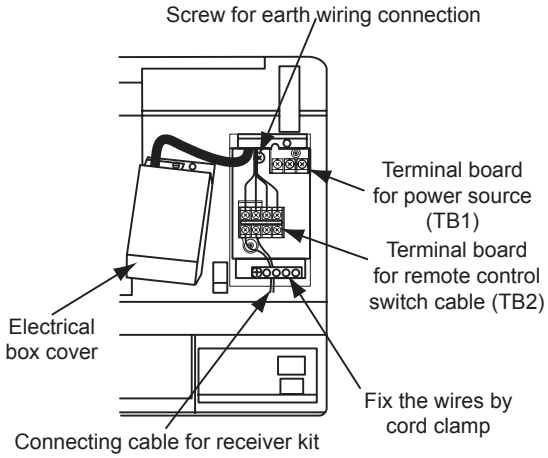
The RPK series are designed for a easy workability during the installation process. The wiring work and dip switch setting can be performed without removing the front panel.

1 Access to terminal board

a. Position of electrical box cover. The figure below shows that the front panel is removed. The electrical box cover can be opened without removing the front panel.

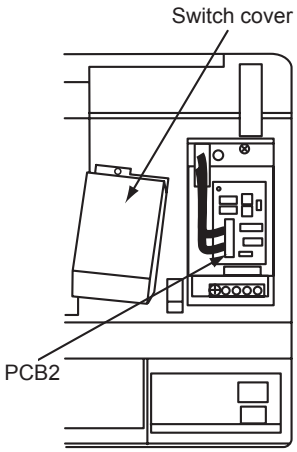


b. Open the electrical box cover and perform the field electrical wiring work. Close the electrical box cover after the electrical wiring work is completed.

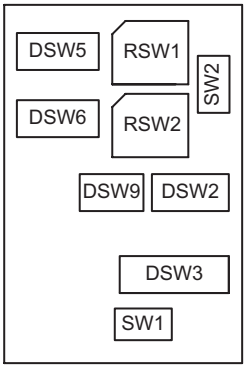


2 Access to DIP switches

Open the switch cover.



The positions of DIP switches on PCB2 are shown in the figure below.



After the DIP switches are set, attach the switch cover again.

2.12.2 Functional features

◆ Adoption of 4 levels of Air Flow Volume

The 4 steps of air flow volume setting function is adopted. As a result, high speed mode setting by the remote control switch is not required in the case of high ceiling.

RPK
HIGH 2 (*)
HIGH
MED
LOW

(*) Available through the PC-ARFP(1)E or PC-AWR remote control switch without additional setting

Additionally, the “High Speed Mode (C5)” setting allows to fix different airflow volumes for each fan speed, making use of

the five different airflow volume modes (HH2, HH1, Hi, Me and Lo) handled internally by the 4-way cassette units.

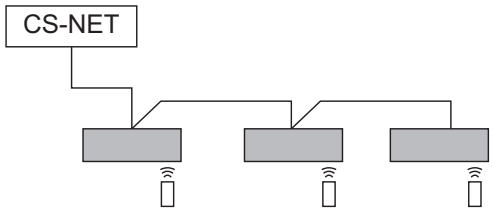
The High Speed Mode is selected thought the optional functions C5 from the remote control switch. If the High Speed Mode (C5) is set as High Speed 2 (setting 02) , the air flow volume of “HIGH 2” and “HIGH” will be equaled as shown in the table, because the air flow volume, “HIGH 2” and “HIGH” are used as “HH2” in high speed 2 setting.

High Speed Mode (C5)	Air flow volume mode selected by remote controller			
	HIGH 2	HIGH	MED	LOW
Standard (00)	HH2	Hi	Me	Lo
High Speed 1 (01)	HH2	HH1	Hi	Me
High Speed 2 (02)	HH2	HH2	HH1	Hi

In the case of using the optional filter (except the long life filter), the high speed mode setting is required.

◆ Improvement for Centralized Control

The wired remote control switch is NOT required at the centralized control when each indoor unit is controlled by each wireless remote control switch.



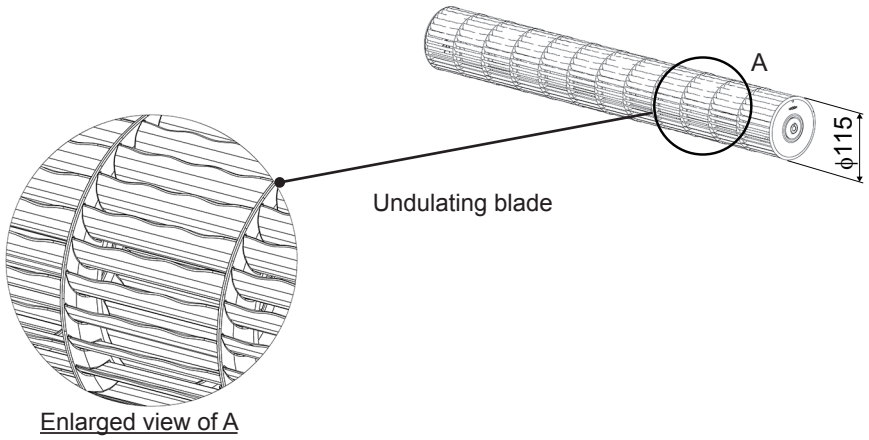
Wired remote control switch is NOT required.

◆ Sound level improvement

The design of the models RPK-(2.0-4.0)FSN4M achieve an improvement the sound pressure data, accomplishing a reduction in all 4 speed taps.

Model	Sound pressure level - Standard operation dB(A)							
	High 2		High		Med		Low	
	New	Current	New	Current	New	Current	New	Current
RPK-2.0FSN4M	**40**	42	**37**	40	**34**	38	**31**	33
RPK-2.5FSN4M	**45**	49	**42**	43	**38**	40	**35**	36
RPK-3.0FSN4M	**47**	49	**44**	43	**40**	40	**35**	36
RPK-4.0FSN4M	**51**	51	**48**	49	**44**	46	**39**	40

These noise reduction is achieved adopting a large diameter fan with undulating blades has been adopted in 2.0 to 4.0HP units, improving air flow performance.



Enlarged view of A

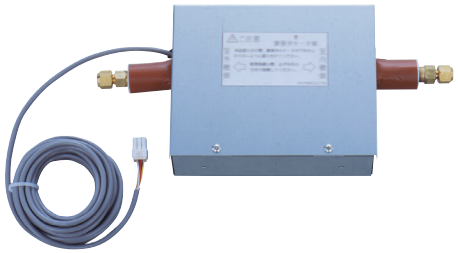
◆ Electronic Expansion valve Kit (EV-1.5N1) for a more silent operation on RPK-(0.4-1.5)FSNH4M

The flow of refrigerant circulating through the expansion valve is, due to the nature of its operation, responsible for some of the level of sound emissions of the indoor units. The operating noise is occasionally produced, particularly during unit start-up, when the number of indoor units running varies or when heating mode is activated at very low outdoor temperatures.

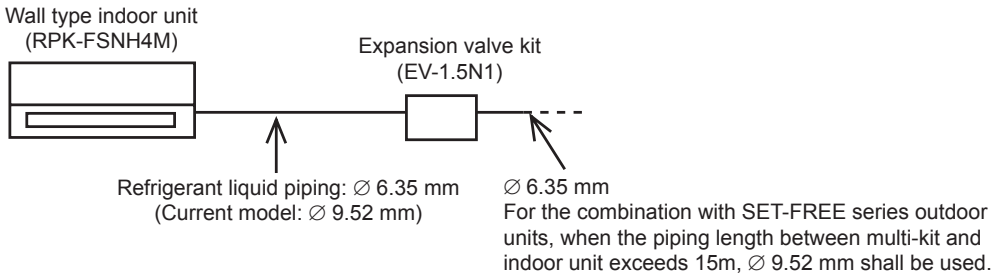
The RPK-(0.4-1.5)FSNH4M units are not fitted with the electronic expansion valve on the inside, although this can be installed independently in the surrounding area, at a sufficient distance from the unit to eliminate the disturbance. The unit is not affected by the factors described above and, therefore, its operation is more silent.

In places where a low noise level is required or desired, e.g. in hotel rooms where the noise of the refrigerant flow may be bothersome, the RPK-(0.4-1.5)FSNH4M units provide a simple, effective solution while offering the necessary flexibility for a noise-free installation.

The expansion valve can be installed, for example, in the false ceiling or in a different room to that of the indoor unit. The valve is supplied in kit form, with the necessary connections for the refrigerant pipes.



The wall type indoor unit without expansion valve adopts the refrigerant liquid piping size ø6.35 which is same as the standard wall type indoor unit. For the combination with SET-FREE series outdoor units, the restriction for total piping length between indoor unit and expansion valve kit has been changed as well as the calculation for additional refrigerant charge quantity.



For using RPK-FSNH4M (Wall Type indoor units without expansion valve) and expansion valve kit, the installation work shall be performed with followings:

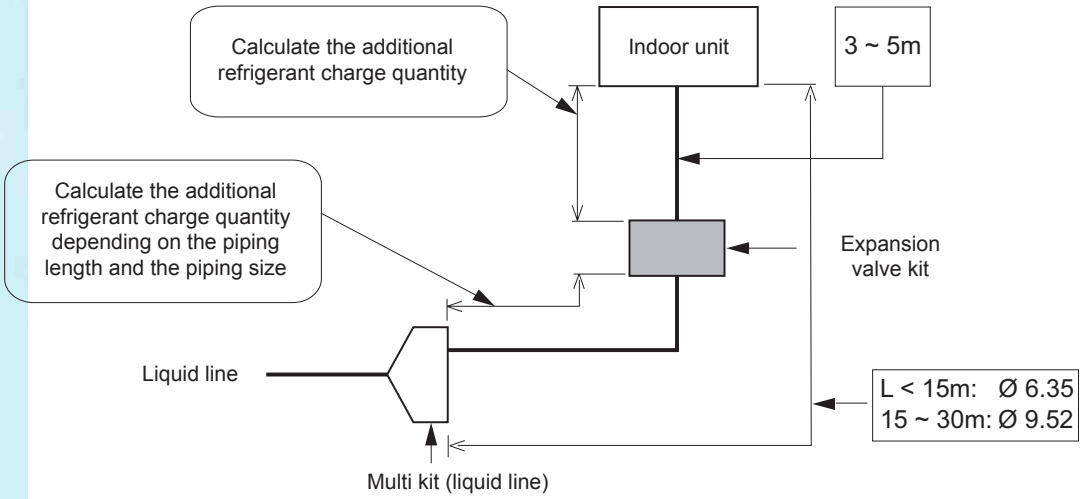
1 For RPK-FSNH4M (Wall Type indoor units without expansion valve), the total piping length between expansion valve kit and indoor unit is restricted as shown in the table below.

2 For SET-FREE series outdoor units, the appropriate refrigerant quantity is required to be additionally charged depending on the piping length and the piping size. When the additional refrigerant charge quantity at connected liquid pipe is calculated, calculate the following additional refrigerant quantity each.

   * Quantity for Liquid Pipe between Multi-kit and Expansion Valve Kit.

   * Quantity between Indoor Unit and Expansion Valve Kit.

   Total Additional Refrigerant Charge Quantity = Additional Refrigerant Charge Quantity between Multi Kit and Expansion Valve Kit + Additional Refrigerant Charge Quantity between Indoor Unit and Expansion Valve Kit.

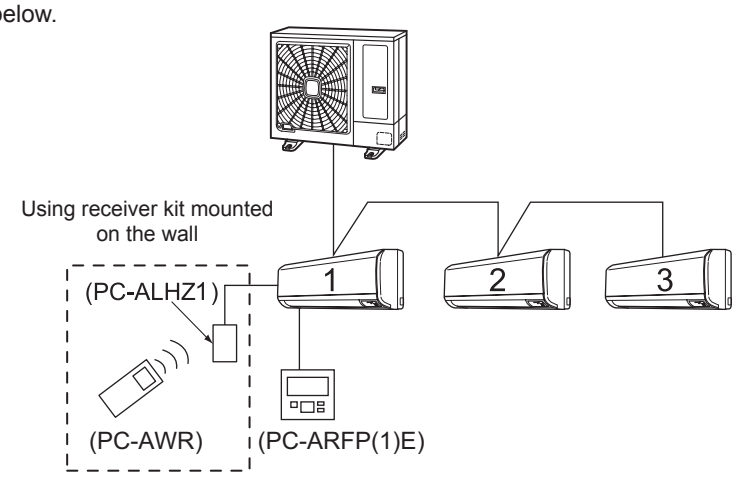


NOTE

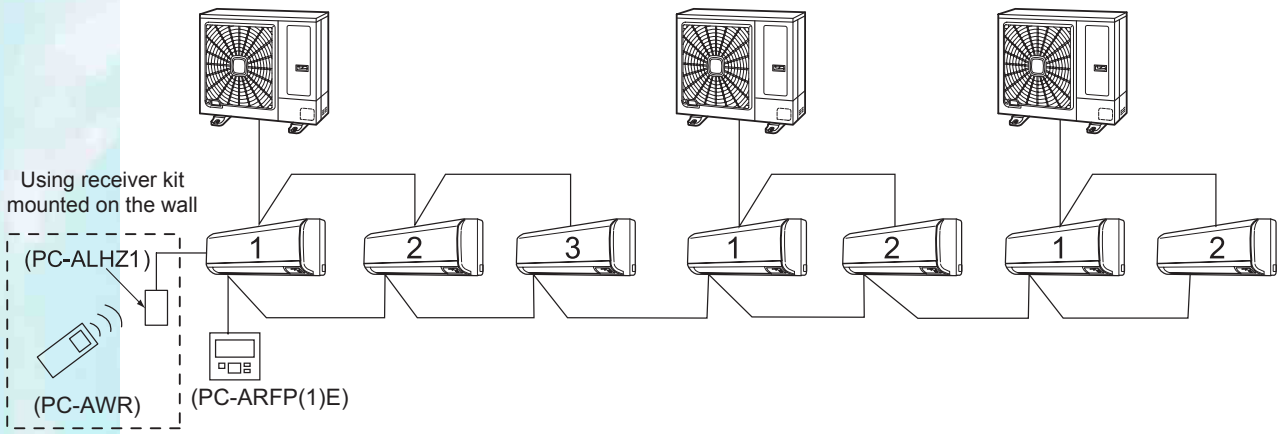
Refer to the "Expansion Valve Kit" Installation and Operation Manual for proper installation.

2.12.3 Using one single remote control switch (wire or wireless)

UTOPIA IVX systems comprising several indoor units (up to 4 indoor units) in simultaneous operation setting can be controlled from a single wire remote control switch (PC-ARFP(1)E) or wireless remote control (PC-AWR) using a wall-mounted receiver kit (PC-ALHZ1), without the need to link up the indoor units with dedicated remote control relay wiring, as shown in the figure below.



Aslo a different system groups can also be controlled from a single wire remote control switch (PC-ARFP(1)E) or wireless remote control (PC-AWR) using a wall-mounted receiver kit (PC-ALHZ1). In such case, all the indoor units must be linked up with dedicated remote control relay wiring, and operation settings must be changed to individual operation (Not available in the UTOPIA ES series).



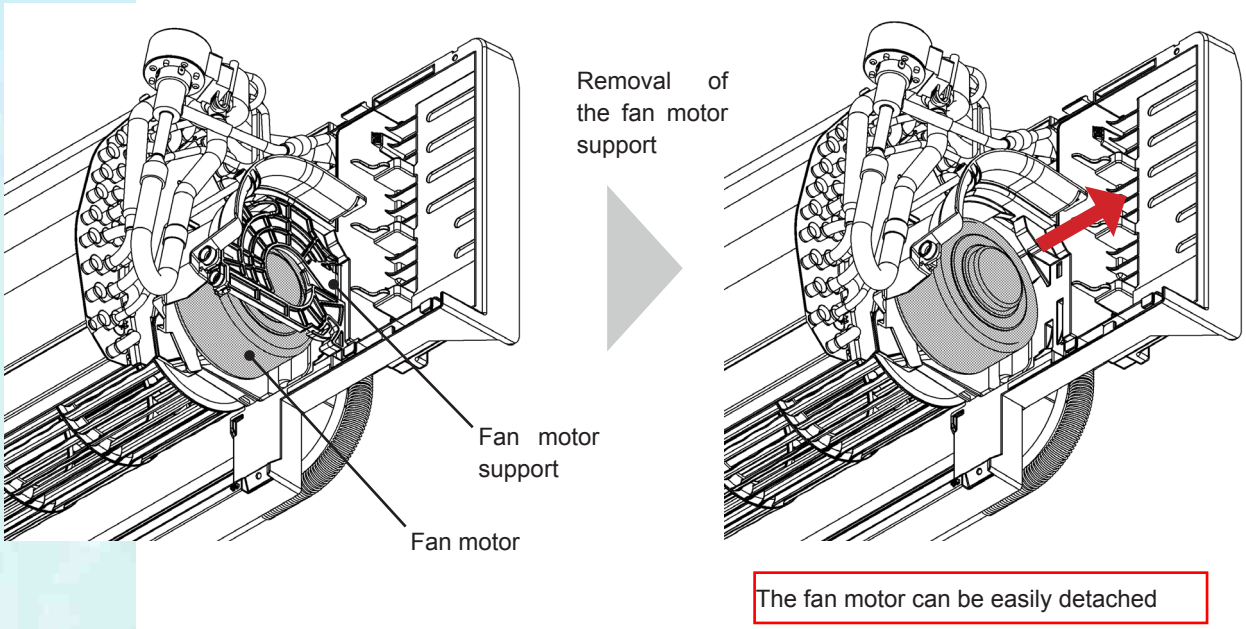
NOTE

- *Some indoor unit series have introduced the possibility of using four (4) fan speed steps (HIGH 2, HIGH, MED and LOW). "HIGH 2" is not indicated and cannot be selected if the connected remote control switch is not compatible with this feature. HITACHI recommends the use of PC-ARFP(1)E or PC-AWR (in combination with the wall-mounted receiver) remote control switch in order to enjoy the complete set of features.*
- ***Special remark regarding the indication of "HIGH 2" fan speed***

  In case that the central control unit being used does not provide support for the "HIGH 2" fan speed, "HIGH" will be indicated even though actual operation is carried out in "HIGH 2" fan speed.

2.12.4 Maintenance benefits

With the design of the RPK-(2.0-4.0)FSM4M it is improved serviceability due to the fan motor can be replaced without removing the heat exchanger.

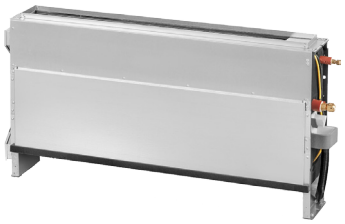


2.13 RPF - Floor type, RPFI - Floor concealed type

RPF-FSN2E



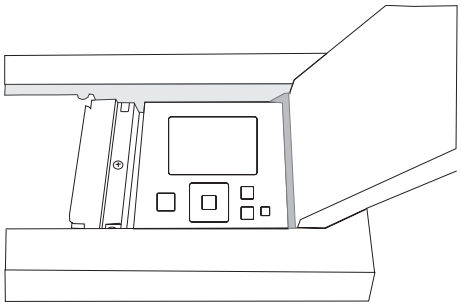
RPFI-1.0FSN2E



2.13.1 Installation advantages

Thanks to its compact design with a depth of just 220 mm, the RPF(I) units can be installed along the wall to take up the least possible amount of floor space.

The RPF unit measures just 630 mm in height, making it ideal for air conditioning the perimeter of the room.

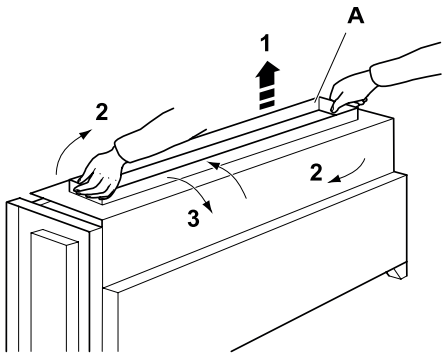


- Remote control built into the unit (RPF)

  The remote control can be installed below the plastic cover, as shown in the illustration.

- Compact design

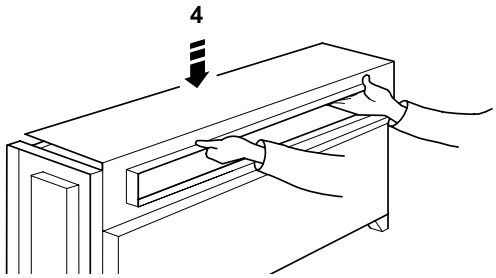
  The RPFI indoor units are normally installed underneath windows, without altering the inside of the room. Their compact design, measuring 620 mm in height and 220 mm in depth, means that they can be installed in limited spaces inside buildings.



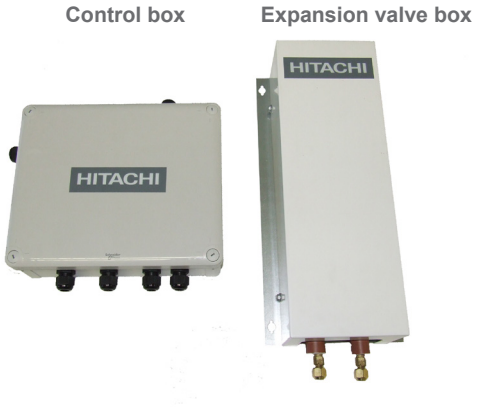
- Change in the air outlet direction (RPFI)

  The air outlet direction of the unit can be modified to adapt it to installation requirements, as shown in the illustration.

  1 Lift air outlet -A-.
  2 Turn the air outlet on itself until it is opposite its initial position.
  3 Tilt the air outlet so that the nozzle is facing forwards.
  4 Refit air outlet -A-.



2.14 DX-Interface Series 2



The DX-Interface series 2 is used to allow the connection of third-party manufacturer units to HITACHI outdoor units, which enables the control of their direct expansion coil (for R410a) following HITACHI control logic. Typical applications are air handling units (AHU), air curtains and units similar to standard indoor units (standard indoor units understood as cooling/heating indoor air treatment units for room conditioning).

Thermistors are supplied with the DX-Interface series 2 to be installed into the unit to be controlled (two thermistors for air: inlet and outlet of the dx-coil ; and two for piping: liquid pipe and gas pipe). The connection of the thermistors must be done on site. The correct installation of thermistors must be ensured for proper operation and thermodynamic control of the DX-Interface series 2. Additionally, extension wiring of up to 5 m is supplied for each thermistor.

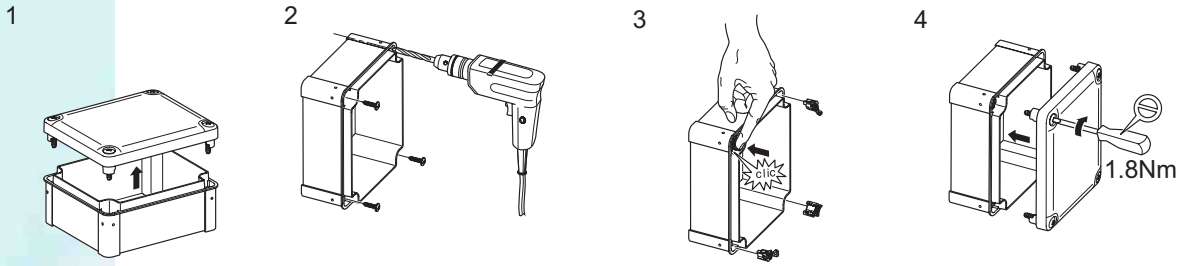
The DX-Interface Series 2 consists of a Control Box including the PCB and all the electronic components, as well as an Expansion Valve Box, which contains the expansion device. Both items are supplied as a set.

2.14.1 Installation facilities

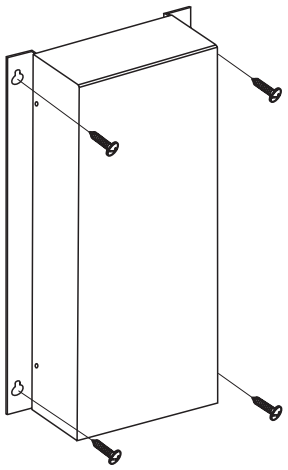
Thermistors are supplied into the DX-Interface kit to be installed into the unit to be controlled (two thermistors for air –inlet and outlet of the dx-coil- and two for piping – liquid pipe and gas pipe-). The connections of the thermistors must be done in the field. Correct thermistors installation must be guaranteed for a proper DX-Interface sensing and thermodynamic control.

The installation of the control box must be done through the 4 openings located on the corner of the casing.

Once installed it is necessary to place the 4 feets supplied with the control box into the corners in order to fix the cover.



On the other hand the expansion valve boxes have been designed to be installed directly from the front side.



◆ Installation outdoor

DX-Interface, both control boxes and expansion valve terminal boxes, are designed to allow the installation outdoors, by using special ABS material casings (temperatures allowed up to 650ºC IEC 695-2-1) with sealed covers that guarantee an IP66 between the casing and the cover.

NOTE

This IP grade could be reduced due to the product modifications for this specific application.

◆ Safe Wires Installation

In order to keep as high as possible the insulation, packing clamps have been used in both casings, providing an easy and safe installation of the external wiring.

◆ Easy Piping Installation

Expansion valves pipes are designed for the use flare nuts unions, as most of HITACHI indoor units, which makes the installation fast and easy.

◆ Inverter control for non-HITACHI Indoor Units by Inlet air, outlet air and duty signal

Once the expansion valve kit has been installed, the connected unit is controlled based on HITACHI inverter high performance control.

DX-Interface series 2 has been designed offering to the user up to three different operation modes depending the capacity control to be performed (inlet temperature, outlet temperature or duty control (incremental reference duty control or absolute reference duty control)).

DX-Interface series 2 will be fully compatible with CSNET WEB and with CSNET MANAGER, (but with some functional limitations).

◆ Compatible with SET FREE and UTOPIA systems

DX-Interface series 2 can be either connected to UTOPIA systems for single connections or to SET FREE systems in case of multiple installations. Thanks to HITACHI System Free technology, the same DX-Interface series 2 model is connectable to both systems, making easier the installation design.

◆ DX-Interface serie 2 - Optional Functions

Specific functions have been implemented in the DX-Interface series 2, making it suitable for different installation requirements.

In addition, the DX-Interface series 2 and HITACHI outdoor units offer different input/output signals allowing the installer to embed it in any air conditioning / ventilation system.

◆ Improvements resulting in enhanced control of system capacity and faster response

In the case of single combination of DX-Interface series 2 with dedicated UTOPIA RAS-XH(V)NP(1)E, control accuracy is improved thanks to a more direct command of compressor frequency and faster response is obtained.

◆ Capacity control modes

The capacity control mode means the kind of control the DX-Interface series 2 performs in order to adapt the system performance to the cooling and heating load required by the user.

The control of capacity demand can be done by Inlet Air Temperature, Outlet Air Temperature, Incremental reference duty control and Absolute reference duty control, depending the application and outdoor unit used.

- **Inlet air temperature control**

The purpose of the inlet air temperature control is to keep the indoor ambient (room or area) close to the set temperature. Capacity demand based on the difference of temperature between indoor air (inlet air of the DX-Coil) and setting temperature.

The control is done based on the inlet temperature to the dx-coil. This kind of control is suitable for close installations where the inlet temperature to the dx-coil comes from the same room to be conditioned, looking for the whole room conditioning [Application example: Indoor Units].

(*) In the case of Air Handling Units, it is not indoor air which is considered as “air inlet”, but the air right before the DX-Coil section.

- **Outlet air temperature control**

The purpose of the outlet air temperature controls is to supply air at a constant temperature, close to the set value. Capacity demand based on the difference of temperature between the DX Coil discharge air temperature and the set temperature.

It makes the discharge temperature (temperature at the outlet of the DX-coil) same than the setting temperature. This kind of control is focused in controlling the discharge temperature of the system [Application example: Air Handling Units].

- **Duty signal**

Duty control must be understood as a demand control, which signal is provided by an external input. This control mode provides a method to request capacity for each individual DX-Interface series 2.

In the case of single combination of DX-Interface series 2 with a dedicated UTOPIA RAS-XH(V)NP(1)E, a more direct control loop is established between duty signal and compressor frequency.

However, protections and other cycle conditions may have priority over duty demand signal.

The system capacity is fixed by an external input, which can be either a free voltage signal (0~10V or 0~5V - Internal 47kΩ pull-down resistor) or a current signal (4~20 mA - Internal 100Ω load impedance).

The duty signal, generated externally and supplied to the DX-Interface series 2, must be inherent to the real condition and target of the space to be conditioned [Application example: Air Handling Units, Air Curtains].

The DX-Interfaces series 2 are provided with two Duty control modes:

- Incremental reference duty control
- Absolute Reference duty control

Both of which can be set by means of DSW1 pin 5.

- **Incremental reference duty control:**

  When duty signal is in the middle of its range, the control understands that the system capacity shall not be changed.

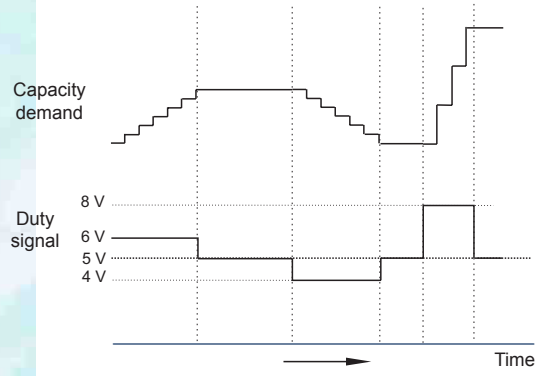
  When duty signal is higher than the middle of its range, it is understood that there is an increase of demand.

  When duty signal is lower than the middle of its range, it is understood that there is a decrease of demand.

  Additionally, the duty signal determines how fast compressor frequency (Hz) needs to be raised or lowered and, in consequence, the rate for increase or decrease of system capacity.

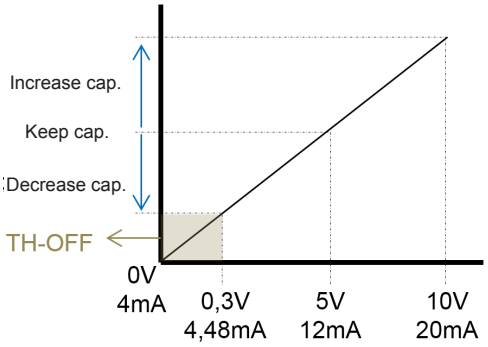
  The greater the divergence of the duty signal from the middle of its range is, the faster system capacity has to be increased or decreased.

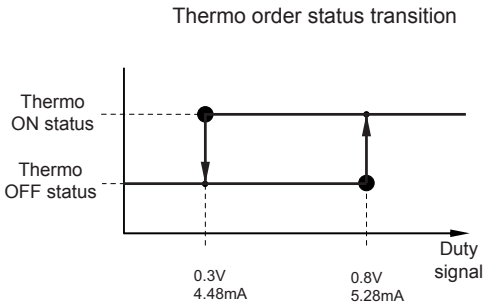
Example: Duty signal 0~10V / Middle of the range = 5 V



Duty	Incremental Target Hz
≤ 15 %	-10
15% < Duty ≤ 25 %	-6
25% < Duty ≤ 35 %	-4
35% < Duty ≤ 45 %	-2
45% < Duty ≤ 55 %	--
55% < Duty ≤ 65 %	+2
65% < Duty ≤ 75 %	+4
75% < Duty ≤ 85 %	+6
85% < Duty ≤ 95 %	+8
≥ 95%	+10

Note: The duty signal range is internally divided in 10 proportional steps of control once it has been received by the DX-Interface series 2.





NOTE

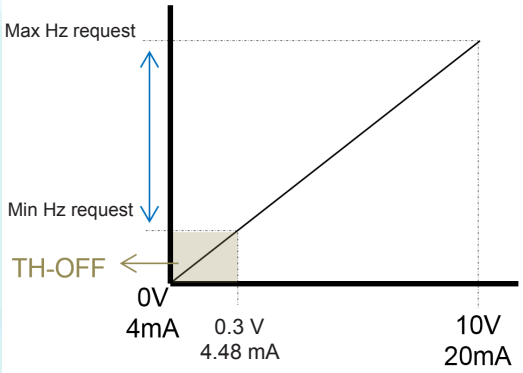
- *The compressor frequency is updated every minute.*
- *Thermo Off: 3 % of the maximum duty signal.*
- *Thermo On: 8 % of the maximum duty signal.*

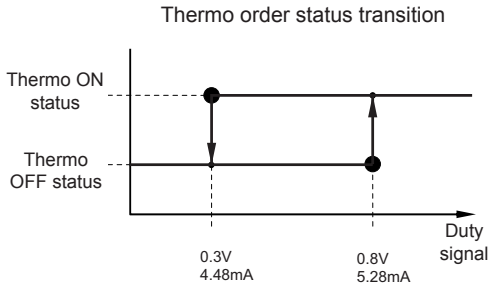
- **Absolute Reference duty control mode**

The capacity requested to the outdoor unit follows the level stated by duty signal, in discrete steps. The control requests the maximum capacity when the duty signal is set to maximum, and likewise, the control requests thermo OFF condition with a barely minimum capacity when the duty signal is lowered to a minimum.

In parallel, and thanks to HITACHI expansion valve control logics, the system becomes adapted within every compressor discrete step to the real demand, resulting in a huge quantity of control steps.

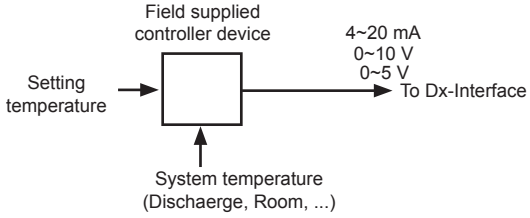
The capacity requested to the Outdoor Unit follows the level stated by duty signal, in discrete steps. When the duty signal is set to maximum, the control requests maximum capacity; likewise, when the duty signal is lowered to the minimum, the control requests thermo OFF condition just under minimum capacity.





NOTE

- *The generation of Duty signal must be based on a significant condition of the system to be controlled, in order to ensure the proper control of the system. (i.e., discharge temperature against a set temperature, as shown in the figure below)*



- *Thermo Off: 3 % of the maximum duty signal:*
- *Thermo On: 8 % of the maximum duty signal.*
- *Consider that the available frequency range may vary depending on the outdoor units capacity. Depending on the units and its working condition it is possible that max. Hz are reacted with a signal lightly below 10V / 20mA.*

◆ Expanded working range on Air Handling Units (AHU) applications

The working range for combination of DX-Interface series 2 with the outdoor units RAS-XH(V)NP(1)E is expanded in Air Handling Units (AHU) applications.

In case of cooling mode the DX-Interface series 2 can work with indoor unit temperatures from 10ºC to 26ºC (Wet Bulb), equivalent to 15ºC to 35ºC (Dry Bulb) in cooling.

On the other hand, in case of heating operation the inlet air temperature range is also modified, allowing minimum inlet air temperatures to the heat exchanger of 5ºC (DB).

◆ Extended range of compatible Heat Exchangers, allowing now larger internal volumes

Up to 10.73 dm^3 of Heat Exchanger volume can be installed in single combination (1 Outdoor Unit RAS-XH(V)NP(1)E series + 1 DX-Interface series 2).

DX-Interface series 2	
Model	Heat Exchanger maximum internal volume (dm^3) (1)
EXV-2.0E2	1.64
EXV-2.5E2	1.83
EXV-3.0E2	2.89
EXV-4.0E2	4.56
EXV-5.0E2	4.56
EXV-6.0E2	5.11
EXV-8.0E2	6.93
EXV-10.0E2	10.73

(1) Check the limits of piping length vs HEX volume.

◆ Improved functionalities for control by outlet air temperature

- **Extended range of setting for control by outlet air temperature**

  When applied to a system focused on discharge temperature, a more suitable temperature setting range is available. When is set the temperature control method in the remote control, automatically the temperature range of the setting allowed is changed to the values shown in the table:

	Control by inlet temperature	Control by outlet temperature
Cooling mode	19ºC ~ 30ºC (DB)	14ºC ~ 27ºC (DB)
Heating mode	17ºC ~ 30ºC (DB)	19ºC ~ 40ºC (DB)

- **Adjustable Thermo-Off temperature by means of "offset" parameter**

  All heat exchangers (HEX) designs have a ΔT between Tin and Tout temperatures. When capacity demand keeps going down in inverter systems, there is a limit where the system operates at a minimum frequency (minimum system capacity), in spite of demand being lower than system capacity at the barely minimum working status. In these operation conditions, and depending on HEX characteristics, it may occur that the outlet temperature becomes lower than setting temperature in cooling mode or higher in heating mode.

  Optional function allows to adjust this difference of temperatures to more favourable conditions. This setting allows to select the maximum Tout offset temperature (against Tsetting), assuming that setting temperature will not be achieved under certain circumstances.

◆ Extended lineup for applications up to 50 HP

Up to 5 units of DX-Interfaces series 2 can work as a group in the same indoor unit or device with heat exchanger, equivalent to a total power of 50 HP and a maximum heat exchanger volume of 53.65 dm^3.

NOTE

To get to this maximum power and volume, the heat exchanger has to be split into five sections of 10.73 dm^3 and a 10 HP DX-Interface series 2 has to be connected to each module.

◆ Advanced functions for multiple DX-Interface series 2 installation

Up to 5 DX-Interfaces series 2 can work as a group with the same indoor unit or device with heat exchanger.

- **Inlet and outlet air temperatures shared for a group of DX-Interfaces series 2 from one DX-Interface series 2 configured as group controller**

  When several DX-Interfaces series 2 are working with the same indoor unit or device with heat exchanger (HEX), one of them is set as group controller. Then, the air thermistors (THM1 and THM2) only need to be connected to this DX-Interface series 2 (information is shared through the remote controller transmission wiring).

  With this option, installation procedure becomes simplified and less time-consuming.

- **Improvement in defrosting procedure of DX-Interfaces series 2 working as a group, avoiding drop of heating capacity**

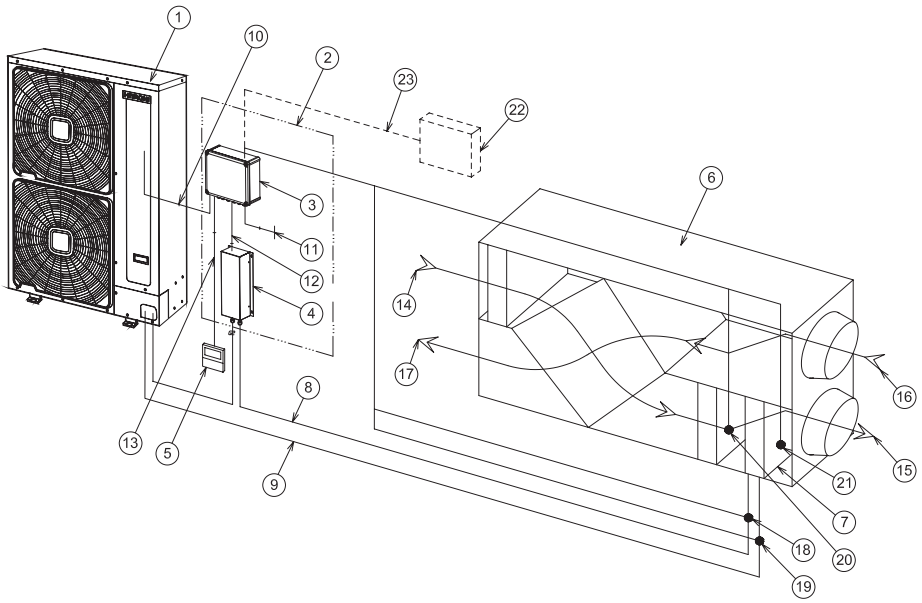
  The defrost operation of Outdoor Units connected to DX-Interface series 2 working as a group is timed in order to limit the effect of heating capacity drop caused by simultaneous defrost. This offers more stable capacity and better comfort from the application.

  The time for the beginning of defrosting operation of each OU is established according to the total number of DX-Interface series 2 and the individual need for defrost of each OU, assuring secure operation of each unit.

  This functionality will only have effect when using the special outdoor unit RAS-XH(V)NP(1)E.

◆ Advanced Optional Functions

- EC Fan or Tap Fan: The control of tap fans and EC fans is possible from the Dx-Interface.
- Defrost signal: Output signal get from the Dx-Interface when the system is in defrost mode.
- Fan operation during defrost: During defrost operation three different fan speed settings are possible: fan speed kept as set, fan speed reduced to low speed and fan stoppage.
- Thermo-on / thermo-off by an external input instead of typical control logic.
- Operation delay: Once the system is turned on, the unit is kept in off during an specific time. Useful for applications where the Dx-Interface is focused on comfort and not room conditioning.
- Thermistor selection: Option to select between inlet thermistor, external thermistor or remote controller thermistor to perform the cycle control (Only if demand control is based on inlet temperature).
- Fan Stoppage delay: Once the system is switched off, the unit keeps running for a suitable period of time, to for example, perform the air renovation once the activity is conclude.
- CO_2 sensor: By the action of an ON/OFF CO_2 sensor, the Dx-Interface switches the fan speed to high while the CO_2 concentration exceeds the sensor detection threshold.
- Remote temperature thermistor THM-R2AE (7E299907) is available for the DX-Interface Series 2 (EXV-(2.0-10.0)E2). When connecting the remote temperature thermistor to the THM4 socket on the DX-Interface PCB1, it is automatically recognized and activated by the system control.



Item	Description	Item	Description
1	HITACHI outdoor unit	13	Remote controller communication
2	DX-Interface EXV-(2.0-10.0)E2	14	Outdoor air (AHU applications)
3	Control box	15	Supply air (AHU applications)
4	Expansion valve box	16	Return air (AHU applications)
5	Remote controller (sold separately as an option)	17	Exhaust air (AHU applications)
6	Unit or device with heat exchanger	18	Liquid pipe thermistor (THM3, PCB1)
7	DX- heat exchanger	19	Gas pipe thermistor (THM5, PCB1)
8	Liquid line	20	Inlet DX-coil thermistor (THM1, PCB1)
9	Gas line	21	Outlet DX-coil thermistor (THM2, PCB1)
10	Outdoor - Indoor communication	22	Field supplied controller (Optional)
11	Power supply	23	Duty signal (0~10V, 0~5V, 4~20 mA) (Optional)
12	Expansion valve control communication		

⚠ CAUTION

Check the limits of piping length vs HEX volume.

- *The installation distance between the DX-interface and the device with heat exchanger must be the shortest possible.*
- *Keep the distance between the unit or device with heat exchanger and the expansion valve box for the piping length up to 5 m. Also the elevation difference between the unit or device with heat exchanger and the expansion valve box must be no more than 2 m.*
- *Make sure that the installation distance between the control box and the unit or device with heat exchanger is short enough that the thermistors sensing are not distorted.*
- *The thermistor cable should never be installed in the same ducting as power or control cables.*

◆ DX-Interface series 2 applications and control mode

The following table summarizes system features for the applications with DX-Interface series 2.

Application		System		
		UTOPIA (IVX , RASC and ES)	UTOPIA DX RAS-XH(V)NP(1)E	SET FREE (5)
Air curtain	Combinability	Single	-	Multi (6)
	Control type	Outlet air temperature control	-	Inlet air temperature control
	Air curtain Capacity	2 - 10 HP	-	2 - 10 HP
	Accuracy control level	●●●●○	-	●●●○○ (1)
Duct (≤ 10% Fresh Air)	Combinability	Single	Modular	Multi (6)
	Control type	Inlet air temperature control	Inlet air temperature control	Inlet air temperature control
	Duct Capacity	2 - 10 HP	12 - 50 HP (2)(3)	2 - 10 HP
	Accuracy control level	●●●●●	●●●●●	●●●○○ (1)
Air handling unit (AHU)	Combinability	-	Single or Modular	-
	Control type	-	Outlet air temperature control or duty signal	-
	UTA Capacity	-	4 - 50 HP (3)(4)	-
	Accuracy control level	-	●●●●●	-

NOTE

- *(1) System control focuses on cycle conditions and performance, not inlet air temperature condition only.*
- *(2) The power range is obtained by the combination of 3 HP to 10 HP outdoor unit models (RAS-(XH(V)NP(1)E series).*
- *(3) In order to ensure balanced working conditions for outdoor units, it is necessary to consider the same capacity outdoor units for a same group.*
- *(4) The power range is obtained by the combination of 4 HP to 10 HP outdoor unit models (RAS-(XH(V)NP(1)E series).*
- *(5) 1-1 combination with SET FREE series is not allowed.*
- *(6)*

	DX-Interface series 2 ratio capacity	
	≤ 30 %	30 ~ 100 %
Total connection ratio capacity against Outdoor Unit Capacity (%)	50 ~ 130 %	50 ~ 100 %

In case DX-Interface series 2 ratio is less than 30 % of the outdoor units capacity, the total connection ratio against Outdoor Unit Capacity is 50 ~ 130%, Otherwise, total connection ratio is limited to 50 ~ 100%.

◆ Thermo-ON/OFF Control Options

The DX-Interface series 2 makes it possible to perform thermo-ON / thermo-OFF control in three different ways.

- **Standard thermo-ON / thermo-OFF control (Default setting)**

  Suitable for installations controlled by suction or discharge temperature.

  The thermo-ON / thermo-OFF logic is operated from the difference between the reference temperature sensor and the set temperature on the remote controller or central controller.

- **By an external input**

  The thermo-ON / thermo-OFF control can be driven externally by an input signal connected to the CN3 socket of the PCB1 of the DX-Interface series 2.

  Setting note: DIP Switch 1 – Pin 6 of DX-Interface series 2 PCB2 (small PCB) must be switched on (PCB2-DSW1#6 switched ON). Once the DSW has been set on the PCB, the “i1” input of CN3 is automatically set for thermo-ON / thermo-OFF control. The setting of the “i2” input is kept as set on the remote controller.

  Please refer to the Service Manual of HITACHI Indoor Units for further information about the setting and connection of the auxiliary inputs to CN3 socket.

- **By the duty signal**

  For systems controlled by a duty signal, it is possible to force thermo-OFF from the duty signal itself. When the duty signal reaches the minimum value of its range (0 V or 4 mA), the system switches to thermo-OFF condition. The duty value must become higher than 8% of its range in order to switch back to thermo-ON condition.

  Note: No additional setting is required once the demand control setting has been set as Duty control.

◆ Thermo ON/OFF in capacity control mode by air outlet

All HEX designs have a ΔT between Tin and Tout temperatures. When capacity demand keeps going down in inverter systems, there is a limit where the system operates at a minimum frequency (minimum system capacity), in spite of demand being lower than system capacity at the barely minimum working status. In these operation conditions, and depending on HEX characteristics, it may occur that the outlet temperature becomes lower than setting temperature (in cooling mode).

A optional function allows to adjust this difference of temperatures to more favourable conditions. The setting of these optional function (E1) can be done through the remote control, accepting several values:

Optional Function E1	
Value	Thermo ON/OFF offset parameter (when system operates at minimum capacity (min compressor Hz))
00	0
01	2
02	4

This setting allows to select the maximum Tout offset temperature (against Tsetting), assuming that setting temperature will not be achieved under certain circumstances. By doing so, in the same conditions the system can achieve a room temperature higher than setting temperature (in cooling mode), while avoiding the occurrence of cold draft. A function based on the same principle is available for Heating mode, avoiding an excessively high Tout.

E1 selection criterium in cooling mode:

E1 = 0: No deviation from setting temperature (Default)

E1 = 1: Deviation of up to 2 ºC more than setting temperature is allowed

E1 = 2: Deviation of up to 4 ºC more than setting temperature is allowed

Example (Cooling mode)		
	Typical installation	Thanks to E1=1
Correction value (A)	--	2
T set	25	25
Tin	27	27
ΔT at minimum frequency	10	10
Tout	17	27
Thermo status	ON	OFF
Over cooling temperature	**8**	**-2**

E1 selection criterium in heating mode:

E1 = 0: No deviation from setting temperature (Default)

E1 = 1: Deviation of up to 2 ºC less than setting temperature is allowed

E1 = 2: Deviation of up to 4 ºC less than setting temperature is allowed

NOTE

Considerations for DX-Interface series 2 installation.

These demand control options require specific considerations:

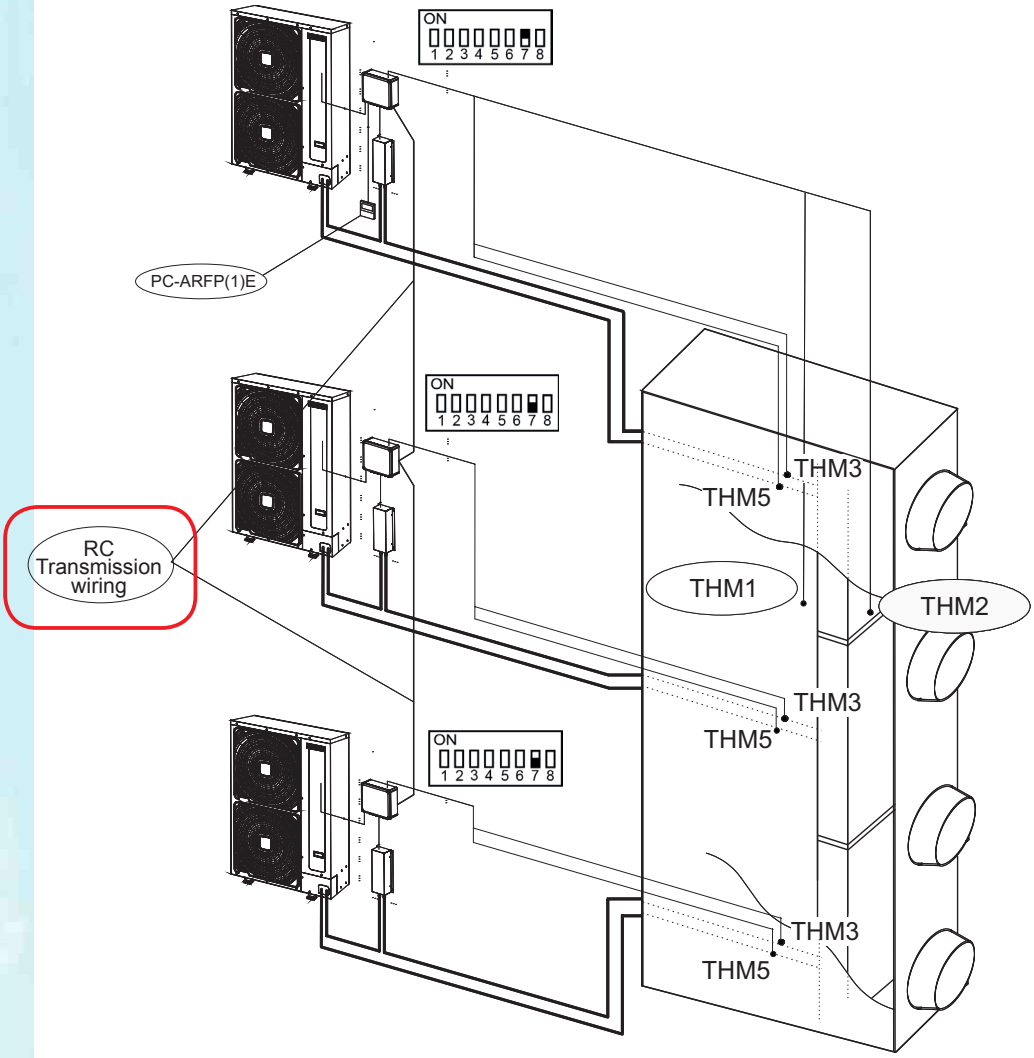
- **Inlet temperature control:** *The system operates as a standard indoor unit whenever the device connected to the DX-Interface series 2 respects design requirements.*
- **Duty control and outlet air control:** *Control is possible because the system is able to cope with the changes in demand and operation conditions, but then system accuracy limitations must be taken into consideration. The adjustment of demand might not be guaranteed in all cases, depending on several aspects of the operation conditions (indoor and outdoor air condition, system actions to ensure unit reliability, desired gap between inlet and outlet...).*

◆ Mutiple DX-Interface series 2 installation

Up to 5 DX-Interface series 2 working with the same indoor unit or device with heat exchanger (HEX) can be installed. Such installation setting is restricted to certain applications, and by the installation of the dedicated IVX Premium RAS-XH(V)NP(1)E. This configuration is not allowed for other outdoor units.

Installation considerations:

- One unit of DX-Interface series 2 is to be set as a group controller, while all the other group members are slave (PCB2, DSW1, pin 7).
- Air thermistors (THM1 and THM2) are only connected to the DX-Interface series 2 set as group controller. However, every DX-Inteface needs to be connected to its own own pipe thermistors (THM3 and THM5).
- One remote controller PC-ARFP(1)E has to be installed in the DX-Interface series 2 set as group controller and all DX-Interfaces series 2 must be linked through the remote control transmission wiring.
- Outdoor units must be of the same capacity. It is recommended to split the heat exchanger in as many parts as DX-Interface s series 2 are used in the air stream direction, ensuring that all the HEX sections have equivalent inlet air flow and temperature conditions.



Improvement of the defrost procedure

The defrost operation of outdoor unit connected to a DX-Interface series 2 working as a group is timed in order to avoid concurrent operation and limit the effect of a drop in heating capacity. This results in more stable capacity and better comfort for the application.

The beginning of defrosting operation of each OU is established according to the total number of DX-Interfaces series 2 and the individual need for defrost of each OU, so that secure operation can be guaranteed for each OU. In addition, simultaneous defrost is limited in order to obtain a better comfort.

The simultaneous defrost control is established according to the total number of DX-Interfaces series 2 working with the same unit or device with heat exchanger (HEX):

Number of DX-Interfaces series 2	Number of concurrent defrost
2 or 3	only 1 DX-Interface series 2 can defrost
4 or 5	up to 2 DX-Interfaces series 2 can defrost at the same time

2.15 KPI and KPI Active series 4E - Ventilation systems

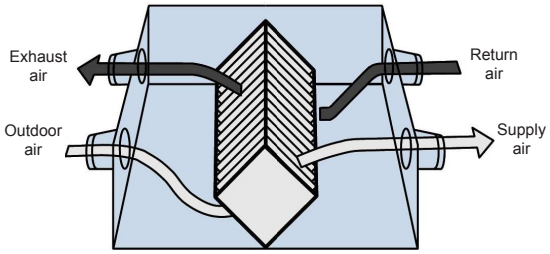


The parts forming the range of complementary systems are designed to be added to the installation and improve the performance of aspects such as the power consumption, efficiency and quality of the air conditioning.

A KPI is a ventilation unit designed to renew the air from a room or area taking out the exhaust air and supplying fresh outdoor air, increasing then the indoor air quality. To reduce the effect of supplying outdoor air in a conditioned room where a big temperature gap exists between indoors and outdoors, the KPI exchanges sensible and latent heat between inlet and outlet air streams, approaching supply air conditions to indoor conditions. The result is an indoor air renovation with a significant reduction of the air conditioning system load that would be necessary to compensate the outdoor air supply.

NOTE

- *The sensible heat exchange effect is that the hottest air stream temperature is reduced, while the coldest one is increased.*
- *The latent heat exchange effect is the transmission of vapor (humidity) from the wettest air stream to the other.*



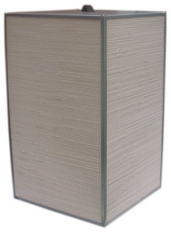
The main benefit of a KPI unit versus other ventilation systems is the free conditioning of fresh air, reducing the air conditioning system demand.

Moreover, the Active KPI, based in a KPI structure, includes an additional air treatment stage before supply air (SA) section. This section includes a direct expansion valve coil, what makes possible the adaptation of the supply air to indoor air conditions, avoiding the inconvenient effect of air supply at a different temperature. Active KPI units have been prepared for the combination with both UTOPIA and SET FREE systems.

4E Energy Recovery and Active KPI is fully compatible with the same central control and interfaces of the rest of indoor units. The installation is also possible with previous versions, but with some functional limitations.

In air conditioning installations where comfort and healthiness of the supplied air must be guaranteed, the transfer of latent heat (humidity) between it and the exhaust air must be avoided. The KPI units include the cellulose energy exchanger that transfers sensible and latent heat between the supplied air and the exhaust air. The sensible heat exchange effect is that the hottest air stream temperature is reduced, while the coldest one is increased.

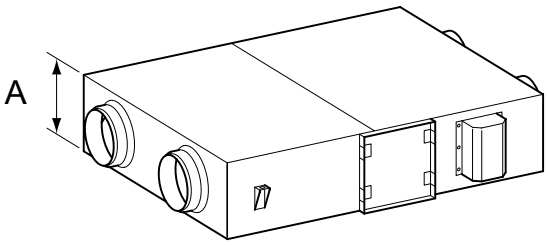
Energy recovery exchanger
(used also in KPI active units)



◆ Compact units

- KPI units were designed to optimise their weight and height and, as a result, making their transport and handling easier. Furthermore, they involve less installation space requirements and can be easily installed in a suspended ceiling like any other indoor unit.

Model	A
252	270
502	330
802 / 1002	385
1502 / 2002	525



◆ Easy to install

The HITACHI KPI units are safe and easy to install. They are fitted with four attachment hooks for direct installation and a flange to seal the duct connection to the unit.

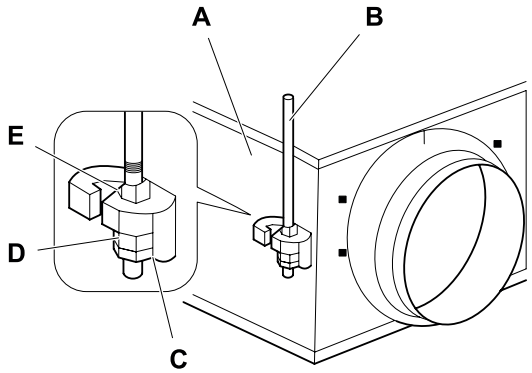
A: KPI unit.

B: sling bolt.

C: rubber insulation.

D: washer.

E: lock nut.



◆ Energy Recovery series vertical installation

Vertical installation is allowed for Energy Recovery series units. The unit should be properly fixed to avoid its movement once installed. Must be guaranteed that any liquid can't flow into the unit.

Even though vertical installation is allow, transportation must follow handling instructions to avoid the damage of any component.

Vertical installation is not allowed in case of Active KPI.

◆ Operation flexibility with heat and/or humidity exchangers

The KPI units are available in a wide range of models, with air flow rates from 250 to 1650 m^3/h. They provide the appropriate air flow rate in any type of installation in line with demand.

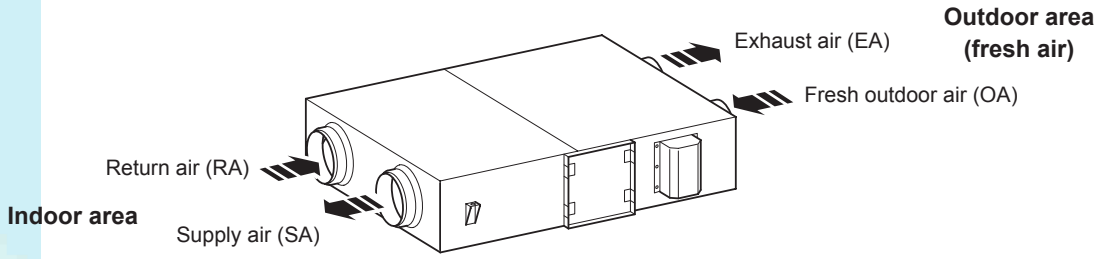
The cellulose energy exchanger transfers sensible and latent heat between the supplied air and the exhaust air.



NOTE

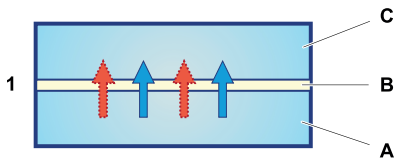
- *The sensible heat exchange effect is that the hottest air stream temperature is reduced, while the coldest one is increased.*
- *The latent heat exchange effect is the transmission of vapor (humidity) from the wettest air stream to the other.*

KPI units are fitted with a highly efficient exchanger to supply fresh air to indoor areas.



Energy recovery exchanger (KPI energy recovery units and KPI active units)

Sensible and latent heat transfer from outdoor air to extracted air in the summer and vice versa in the winter.



1: winter operating.

2: summer operating.

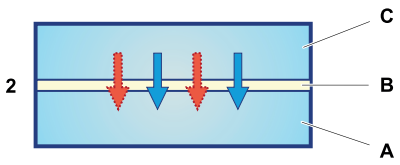
A: exhaust air.

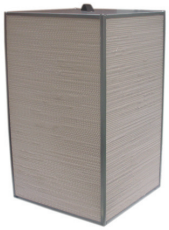
B: heat exchanger.

C: supply air.

D: humidity transfer.

E: heat transfer.

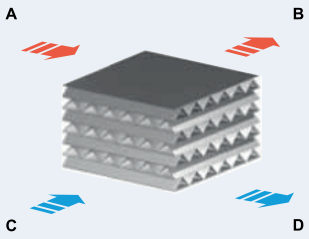






The responsible part of the exchange between both streams is the heat exchanger. The heat exchanger is a cross-flow sheet made of ultra-thin celluloid material (Energy Recovery) that allows an energy exchange temperature and humidity by crossing both streams. The air streams are never mixed.

Example of operation in cooling mode

A: outdoor air Temperature: 32 °C. Relative humidity: 70%. Absolute humidity: 0.0465 kgw/kga. Enthalpy: 86.2 kJ/kg.	B: exhaust air	
C: return air Temperature: 26 °C. Relative humidity: 50%. Absolute humidity: 0.0105 kgw/kga. Enthalpy: 52.9 kJ/kg.	D: supply air Temperature: 27.5 °C. Relative humidity: 63%. Absolute humidity: 0.0145 kgw/kga. Enthalpy: 64.7 kJ/kg.	
kgw: kg of steam kga: kg of dry air		

◆ Active KPI discharge temperature control

The Active KPI is able to adapt the supply air temperature to desired discharge temperature.

Even though the KPI improves the air supply conditions, supply temperature will always be a combination of indoor and outdoor air temperatures. Active KPI supplies this additional temperature gap, making possible the control of the discharge air temperature.

◆ Harmonized fans ErP regulation

KPI-4E series are totally compliance with all the efficiency and documentation requirements included in the regulation 1253/2014 (ErP Lot6, ventilation part). Such regulation is part of the general Ecodesign Directive 2009/125/EC.

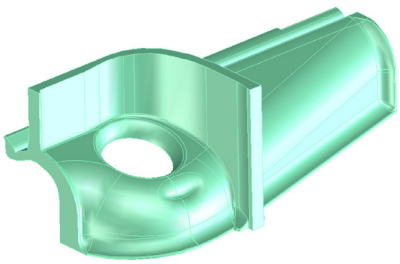
The Ecodesign Directive (EU directive for energy related products) has developed specific efficiency and documentation requirements for Ventilation Units (VU), dividing them in Residential Ventilation Units (RVU) and Non-Residential Ventilation Units (NRVU) depending if maximum air flow is below 250 m^3/h (RVU) or over 250 m^3/h (NRVU). KPI-4E series whole line-up is classified then as NRVU, with specific requirements about design and temperature exchange efficiency and others, but without energy labelling requirements.

KPI-4E series has been designed to already comply with the temperature exchange efficiencies and structure design basics fixed by the regulation.

◆ Noise reduction

The effect of an internal structure design is reducing the air flow resistance and so the flow noise through the unit, combined with the application of highly efficient EC fan motors, make possible a reduction of the noise sensed below the unit and at the air discharge section.

The internal structure, done by Expanded PolyStyrene (EPS), in addition with the reduction of the unit weight, makes possible an aerodynamic design reducing the air flow resistance, and consequently the air flow noise inside the unit, which is emitted around it and around the discharge air section.



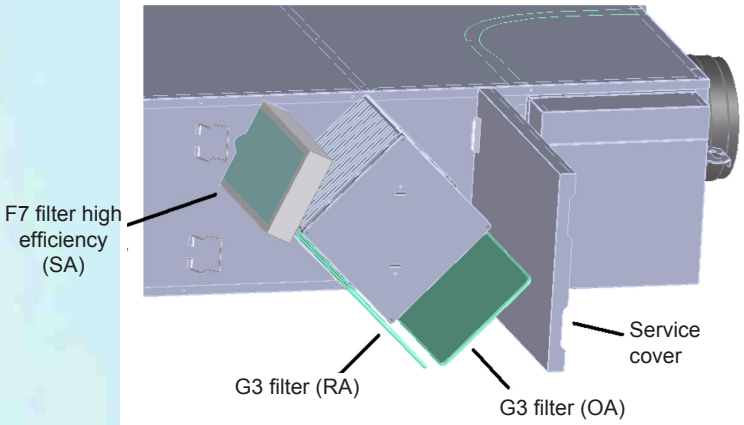
◆ EC fans: Reduced fan power input

KPI and KPI Active series are equipped with high efficient EC fan motors. Main benefit of using this kind of motors is a direct power consumption reduction, meaning a reduction of the specific fan power input of the unit, one of the main aspects considered in the European regulation for ventilation installations.

◆ High-efficiency filter accessory

When analysing indoor air quality control and air renovations by the supply of outdoor air, the filtering of the fresh air is a key point to consider when the installation is being designed. Besides, depending room final application (office, theatre, hospital…) a minimum filtering level must be guaranteed to cover the building regulations.

KPI and Active KPI series are factory supplied with two G3 air filters, one for inlet air and other for outlet air. Moreover, as accessory, a high efficiency air filter classified as F7 (based on EN779) is available for installations where an additional filtration section is necessary to ensure a high quality air indoors, reducing the effects of external pollution. This filter is placed easily into the unit by the main service cover, being the last treatment section (after the heat exchanger and the fan motor) of the inlet air stream.



	Model description	Code
KPI-252E4E	HEF-252	70552201
KPI-502(E/X)4E	HEF-502	70552202
KPI-802(E/X)4E	HEF-802	70552203
KPI-1002(E/X)4E	HEF-1002	70552204
KPI-1502E4E	HEF-1502	70552205
KPI-2002E4E	HEF-2002	70552206

NOTE

- *G3: Gravimetric efficiency up to 90%.*
- *F7: Dust-Spot efficiency up to 90%.*
- *Filter classification based on EN779.*

◆ Insulations classified as M1

Some countries (i.e. France) consider the air conditioning ducted installations as “building components”, forcing the elements that compose it, including the unit itself, to follow the same quality requirements. In these requirements are included the fire resistance, avoiding the unit promote the fire spread between rooms.

For this reason, all the internal and external insulations used in KPI and KPI Active series are certified as M1 (UNE-23327 Spain / NF P 92-501 France), fulfilling the ducted installation materials requirements.

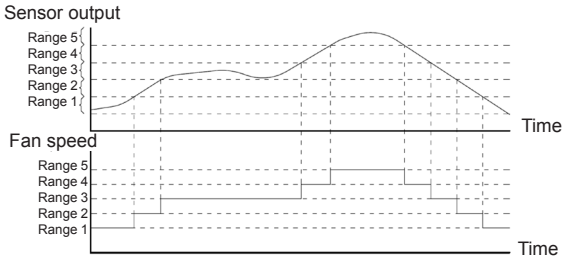
◆ Automatic ventilation by CO_2 sensor

The concentration of CO_2 in a room is one of the main aspects considered for indoor air quality classification. This fact has been considered into several regulations, which classify the indoor air quality and fix the air renovations based on CO_2 concentration.

This concept is fully integrated in the KPI and KPI Active series, offering to the user two options to control the fan performance following CO_2 concentration levels.

Automatic fan speed

For CO_2 sensors with a proportional output (0~10V and 4~20mA output signals are accepted). The fan speed is automatically adjusted by the sensor output, ensuring always a high indoor air quality without any action by the user.

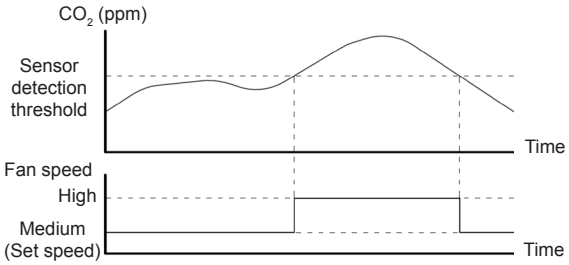


NOTE

Power supply for sensors (24V DC) is available from KPI PCB, with a maximum total power output for both sensors of 6 W.

High concentration control

For on/off CO_2 sensors. KPI unit will work at set fan speed, but when the CO_2 concentration overpasses the detection threshold of the sensor, the KPI will start working at its maximum fan speed, helping to reduce the CO_2 levels. Once the sensor signal is turned off the set fan speed is recovered.



◆ Suitable fan pressure setting

KPI and KPI Active series have been designed to be suitable in any installation. This concept covers several types of installations, including the ones where the KPI is supplying more than one area, what makes possible the KPI to be installed either in short duct installations or in large duct installations, and yet the KPI must cover the installation air renovations requirements.

KPI and KPI Active range have been designed offering an easy and fast setting of the fan pressure level through its PCB, making possible the selection based on installation real requirements. This can be translated as a guarantee that the ventilation flow rate is achieved at the same time that no additional air flow is used, what means lower noise levels emitted through the duct and a lower power consumption.

◆ Electric-heater installation

Energy recovery series and Active KPI series' heat exchanger element is made by a special celluloid material, similar to paper. In case the unit works with very low outdoor air temperatures, the heat exchanger element could be damaged decreasing significantly its exchange efficiency. For this reason the installation of an additional electrical heater (field supplied) in the OA section before the unit is recommended in installations where outdoor air temperatures below -5ºC are possible. Furthermore, the installation of this electric heater in OA section could be also recommended where higher discharge air temperatures are required.

Electric heater power supply doesn't have to be done from the KPI Active electrical box, and its installation and protections must follow electrical heater manufacturer recommendations. Besides, a control signal is available from the KPI electrical box to control the switching on and off of this electric heater. By the sensing of the outdoor air, the control signal will be turned on when outdoor air temperature becomes below -5ºC, and will be automatically turned off when outdoor air temperature exceeds -5ºC, avoiding the installation of additional sensing devices into the electric heater element. Moreover, once the KPI is set for the electric heater application through the remote controller, the stoppage of the unit will be automatically delayed for three minutes once the remote controller is switched off. During this time the unit will work at its minimum fan speed, cooling down the electrical heater element avoiding the ducts damage by the remainder heat.

NOTE

An additional air inlet thermistor (THM4) (sold separately as an option) must be installed before the electrical heater, in order to measure the temperature of the outdoor air to be heated.

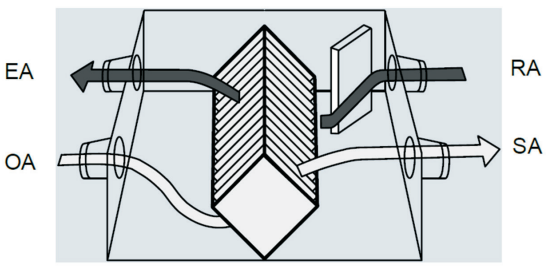
◆ Three different ventilation modes

KPI and KPI active series have been designed to offer to the user the maximum comfort at the same time the indoor air quality is improved by the renovation of the indoor air. Three different ventilation modes are available, so that the user can choose the ventilation mode of the system.

Forced energy recovery

The exchange between inlet and outlet air streams is always performed, without any incidence of the outdoor air condition. By this ventilation mode the inlet air will always be an average of the indoors and outdoors conditions.

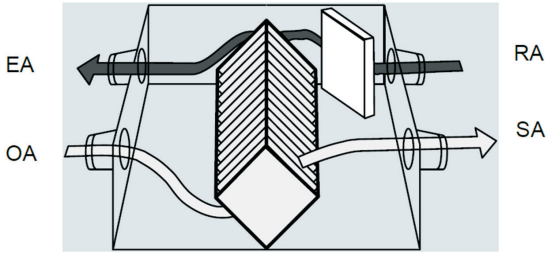
SA: supply air.
EA. exhaust air.
RA: return air.
OA: outdoor air.



Forced free ventilation

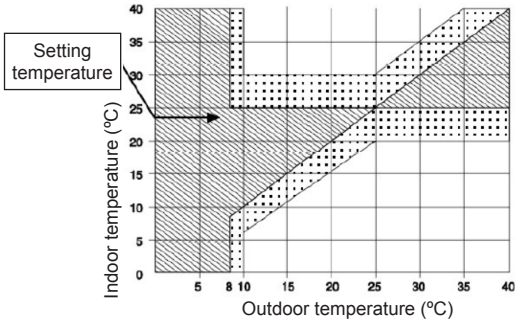
The damper is fixed open, what means the heat exchanger element is bypassed and no exchange is performed between inlet and outlet air streams. The air from outdoors is directly supplied to indoors.

SA: supply air.
EA. exhaust air.
RA: return air.
OA: outdoor air.



Automatic ventilation (factory setting)

An advanced temperature control is performed deciding automatically if the damper must be closed or open, based on indoor and outdoor temperatures and the setting temperature of the remote controller. The target is to achieve the maximum efficiency during the ventilation.



Total heat exchanger ventilation mode area

Normal ventilation mode area

Fuzzy area
It is total heat exchanger ventilation. In the case the temperature is in this area at running start; the previous status is kept in the case the temperature moves to this area.

◆ Un-balancing of the ventilation for room pressurization

KPI unit works with two air streams: fresh air coming from outdoors and, on the hand, the indoor air to be renewed. As default setting the unit will supply the same quantity of air that it extracts, so the areas (if there is more than one) under the effect of the KPI will be balanced.

Depending the activities of the areas could be interesting to cause an over-pressure/depression in one of them, i.e. to avoid the smoke and smells to be transferred from one area to another. KPI offers the possibility to un-balance the two air-streams by the setting of the remote controller:

Remote control speed	Normal operation		Supply fan set		Exhaust fan set	
	Outdoor air fan (supply air)	Return air fan (exhaust air)	Outdoor air fan (supply air)	Return air fan (exhaust air)	Outdoor air fan (supply air)	Return air fan (exhaust air)
High	High	High	High	High	High	High
Medium	Medium	Medium	High	Medium	Medium	High
Low	Low	Low	Medium	Low	Low	Medium
			Prevent smoke and contamination to enter into the room and compensate the effect of auxiliary extraction devices.		Helps to evacuate smoke and contamination from the room.	

◆ Fan stoppage delay function

Even though the ventilation system works for the whole day, while the installation is full of people doing any activity the indoor air won't be as fresh as it would be in case the facility is empty. This means that at the end of the day some pollution could remain in the air. If the ventilation system is stopped at the end of the activity, the remaining pollution wouldn't be extracted and the indoor air won't be completely fresh at the starting of the next day.

KPI series offer to the user the option to delay the stoppage of the unit, keeping the unit switched on when the conditioning/ventilation system is switched off during a specific time. In case of KPI active, during this time the unit will work as an energy recovery ventilation unit (outdoor unit compressor off, without any cooling/heating load to save energy).

The result will be a completely fresh air of high quality at the starting of the next activity.

◆ Sound attenuator accessory

For installations where a reduction of the sound level is required, it is offered a sound attenuator to be connected directly on the unit duct adapter. An average reduction of 5 dB(A) is obtained in the discharge section (sound attenuation level in the field may vary depending on real installation specifications).

KPI unit	Sound attenuator model	Code	
KPI-502(E/X)4E	SLT-30-200-L600	70550200	
KPI-802(E/X)4E	SLT-30-250-L600	70550201	
KPI-1002(E/X)4E	SLT-30-300-L600	70550202	
KPI-1502(E/H)4E	SLT-30-355-L600	70550203	
KPI-2002(E/H)4E			

NOTE

Sound attenuator accessory is not available for KPI-252E4E model.

2.15.1 Active KPI

◆ Combinability

Active KPI units have been prepared for the combination with both UTOPIA and SET FREE systems.

	CAPACITIES (kW) [5]		Equivalent HP Capacity	COMBINABILITY	
	Cooling [1]	Heating [2]		UTOPIA [3]	SET FREE [4]
KPI-502X4E	5.3 (1.8)	6.9 (2.1)	1.5 HP	–	√
KPI-802X4E	7.9 (2.9)	9.8 (3.5)	2.0 HP	2 HP	√
KPI-1002X4E	10.8 (3.7)	12.9 (4.4)	2.5 HP	2.5 HP	√

NOTE

[1] Cooling capacity is based on the following conditions: OA= 35ºC DB / 24ºC WB; IA= 27ºC DB / 19ºC WB with the unit working at its nominal air flow (high speed).

Figure between brackets represents the capacity contribution of the heat exchanger element.

[2] Heating capacity is based on the following conditions: OA= 7ºC DB / 6ºC WB; IA= 20ºC DB / 14ºC WB with the unit working at its nominal air flow (high speed).

Figure between brackets represents the capacity contribution of the heat exchanger element.

[3] Only the single combination is allowed, with RAS-(2/2.5)HVNP(1) series.

In case of connecting the KPI-802X4E and KPI-1002X4E with RAS-(2/2.5)HVNP(1) outdoor units the capacity would be reduced as follows:

	CAPACITIES (kW) [5]	
	Cooling	Heating
KPI-802X4E	7.4 (2.9)	9.1 (3.5)
KPI-1002X4E	9.7 (3.7)	11.4 (4.4)

[4] Allowed SET FREE series installation: FS(V)N(Y)3E, FSXNSE and FSXNPE.

For installations into SF systems, standard indications and selection methods used for SF outdoor units must be followed considering the Active KPI as a standard indoor unit of the equivalent HP capacity. The total capacity of installed Active KPIs can never exceed the 30% of the total system capacity.

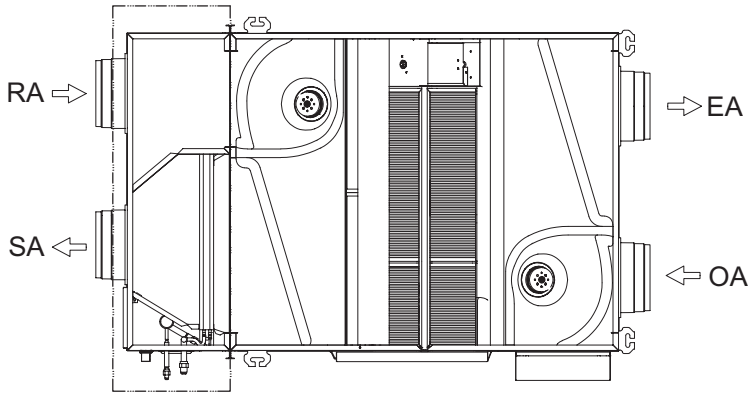
For further information about SF selection method, please refer to SET FREE Technical Catalogue.

[5] Actual system performance may vary depending on the specific installation conditions.

◆ Control Specification

Active KPI capacity demand control

Active KPI demand control is based on the control of the discharge air temperature. Set temperature on the remote controller or equivalent centralized controller will be understood by the control as the desired discharge temperature.



The capacity demand is adjusted by the continuous sensing of T_x and T_{out} temperatures. In case T_x becomes close to set temperature, the control could decide to stop the heat pump, saving energy and achieving the heat demand just by the effect of the heat exchanger element. Must be considered that return air (RA) is not supplied again to the room. It is extracted from indoors and replaced by fresh air (from OA to SA), changing typical considerations of conditioning indoor units.

It could be possible that due to refrigerant cycle limitations, T_x temperature, setting temperature and the whole system working conditions, "T_{out}" cannot be adjusted to match the setting temperature. In this case, by the continuous sensing of "T_{out}", the unit will cycle on/off in order to match as much as possible the setting temperature. During this on/off cycling the ventilation is never stopped in order to guarantee the air renovations.

2.16 Econofresh air renewal unit



The air in the rooms must be renewed to reduce the levels of CO_2 and to eliminate unpleasant smells, smoke and pollution; however, air renewal has the downside of an increased energy consumption.

The Econofresh is an easy-to-install smart accessory, which does not only supply a flow of fresh new air into the room while keeping the correct indoor temperature, but also provides natural cooling for increased energy saving (reducing the energy consumption).

The Econofresh unit efficiently manages air renewal in the room, in cooling as well as in heating mode. It is easy to install and it allows installers and designers to do without additional ventilation installations or additional refrigeration systems. This is possible because it is connected directly to the return duct of the RPI-(4.0/5.0/6.0)FSN5E unit.

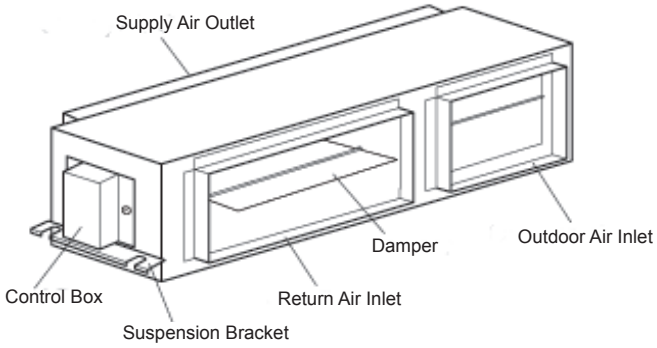
This system allows the inflow of fresh air into the room through the indoor unit, even when the thermostat is switched off (Thermo-OFF). Depending on the supply air and outlet air temperatures, the Econofresh works like an intelligent system, permanently controlling the air flow by modifying the position of the damper.

The Econofresh air renewal unit effectively increases the installation performance when the outdoor temperature is lower than the room temperature (in cooling mode), allowing the inlet of fresh air and cooling to the set temperature without activating the outdoor unit. For example, it can supply up to 100% of fresh air and is able to provide “natural cooling” through a damper when the outdoor temperature is lower than the set indoor temperature (in cooling mode), leading to significant energy savings particularly in spring and autumn.

The Econofresh can operate with CO_2 or enthalpy sensors to control the air quality in the room.

◆ System description & structure

The Econofresh is equipped with an outdoor air damper control mechanism, and the system provides various operation modes, such as free cooling, all fresh, in cooling and heating mode.



NOTE

The Econofresh unit can only be installed in combination with the RPI-(4.0/5.0/6.0)FSN5E units.

◆ Easy setting by 7-segments display

Most of the settings and optional functions are configurable through the control box PCB. The control box is equipped with a newly developed PCB, which includes four 7-segments display and three push buttons, making easier the setting during the installation.

◆ Range of accessories

All indoor units have a range of accessories for easier installation, operating and maintenance.

These accessories are designed to adapt the unit to the type of installation that the air conditioning system needs and to improve its performance, considering the quality parameters required.

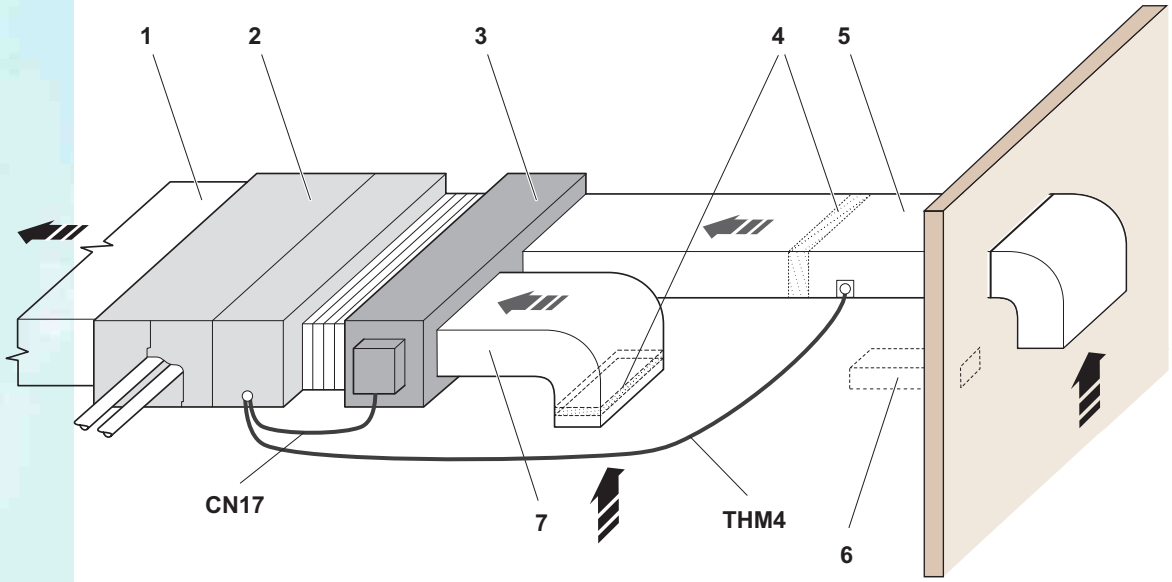
The range of accessories includes:
- Remote controls for the handling and management of the installation's operation.
- Panels to provide cassette-type indoor units with air outlet and distribution mechanisms.
- Filters to absorb dust and odours.
- Branch pipes (pipe kit and multikits), distributors and manifolds to effectively complete the installation.

The Econofresh kit is an easy-to-install intelligent accessory. It renews the air in the room and saves energy.

No cooling cycle is required. It is connected directly to the return duct of the RPI-(4.0/5.0/6.0)FSN5E unit.



◆ Econofresh air renewal unit system



1 Supply air duct.
2 RPI-(4.0/5.0/6.0)FSN5E indoor unit.
3 Econofresh
4 Return air filter (field supplied)
5 Fresh air inlet duct from the outside (field supplied)
6 Pressure relief damper (field supplied), connected if necessary to the outside or to another place with atmospheric pressure
7 Return air inlet duct from the inside (field supplied)

THM4 Thermistor cable

CN17 AS motor cable

The Econofresh kit can supply up to 100% of fresh air and is able to provide "natural cooling" through a damper when the outdoor temperature is lower than the set indoor temperature.

The system not only supplies fresh air and keeps the room at the correct temperature, it also provides natural cooling for increased energy savings.

NOTE

RPI units are supplied with standard Air Filter at the suction side. This air filter need to be removed, adding a Return air filter (field supplied) in the supply air duct from outside and return air duct front inside.

◆ Damper control

A micro-computer controls the angle of the damper according to air temperatures to adjust the fresh air flow, thus keeping the room temperature constant with excellent comfort.

◆ Selectable minimum damper opening

The minimum opening for fresh outdoor air damper is selectable through the remote control switch (d7 setting of the optional remote control functions). This allows to establish a minimum air volume renewal in the room.

◆ Standard and All Fresh process mode

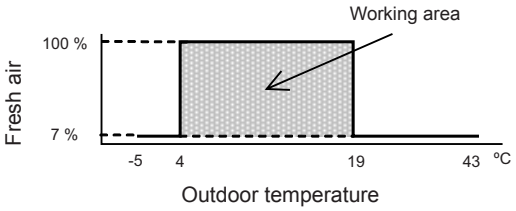
Two different process modes are selectable:

Standard process

- **Standard process in cooling mode**

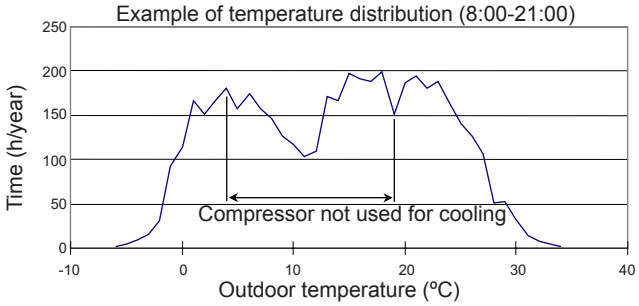
  In case that the outdoor ambient temperature is lower than 19 ºC, the compressor stops and the indoor temperature is cooled down with an intake of outdoor fresh cold air controlled by the damper.

  The minimum guaranteed fresh air intake can be set through d7 setting (7% or more of the total outlet air).



- Cooling economizer

  An energy saving control is adopted which uses fresh cold air from the outdoor for cooling the intermediate seasons. The compressor is not used during this control, which results in outstanding energy saving.



- 3 different economizer cooling controls

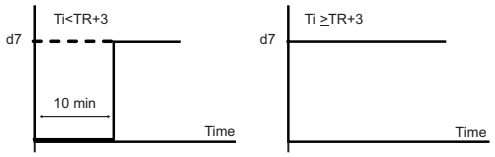
  In order to optimise the energy saving, Econofresh can manage 3 types of control: normal cooling, outdoor air cooling or fan cooling. Each type is managed according to the outdoor air temperature.

- Comfort control

  When Thermo OFF is requested, Econofresh compares temperatures in order to offer a good comfort in the room. Econofresh control compares the setting temperature (set in the remote control) and the inlet air temperature in the Indoor Unit, and requests Thermo ON under certain conditions, in order to achieve the requested room temperature as soon as possible.

- **Standard process in heating mode**

  Depending on the temperature of indoor air return, the damper remains either opened for a minimum guaranteed intake of fresh air, or fully closed during 10 minutes. After this time, the damper is opened for a minimum guaranteed intake of fresh air intake; this opening can be set through d7 setting (7% or more of the total outlet air).



◆ All Fresh process in cooling and heating mode

This operation mode is very useful for buildings with many tenants, or for public buildings.

Basically, the damper is fully opened (100% fresh air) when activated through the corresponding optional setting of the remote control (E1).

The following parameters are controlled by the All Fresh process in an independent fashion:

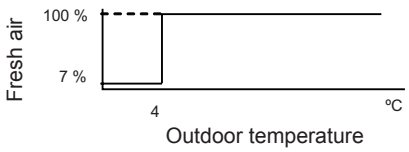
- Thermo ON/OFF status
- Damper opening
- Fan speed

Thermo ON/OFF status

The general principle is that the compressor remains stopped when the outdoor ambient temperature is lower than 17ºC in cooling mode and higher than 24ºC in heating mode.

Damper opening

The damper is set to be either fully open or closed to the minimum opening to ensure an intake of fresh air (7% or more of the total outlet air, as fixed by d7 setting).



Additionally, the damper is closed to the minimum opening to ensure an intake of fresh air, under certain temperature combinations.

Fan speed

The fan speed is adjusted one tap lower when the air outlet temperature...

- rises higher than 20ºC in cooling mode
- drops lower than 30ºC in heating mode

In the above cases, the fan speed is changed from high to medium, or from medium to low.

The fan speed is adjusted back to fan setting tap when air outlet temperature returns to the following ranges:

- 15ºC or lower in cooling mode
- 35ºC or higher in heating mode

Draft prevention control

Additionally, while All Fresh process is activated, the Econofresh control keeps monitoring and comparing several temperature parameters. The damper may be closed to the minimum opening to ensure the intake of fresh air under certain circumstances, and in order to avoid discomfort and unwanted changes to room temperature due to inlet outdoor air conditions.

This function is active in case that the outdoor ambient temperature is:

- 5 degrees higher than the setting temperature in cooling thermo-OFF
- 5 degrees lower than the setting temperature in heating thermo-OFF

◆ Econofresh enthalpy and CO_2 gas sensors

Econofresh enthalpy sensor (field-supplied)

This function provides precise control of the air quality, mixing the outdoor air and return air inflow as determined by an entalphy sensor installed outside, at the “outdoor air” inlet.

The sensor is connected to the input signal port CN3 (pins 1-2), and it is necessary to set the enthalpy sensor mode through remote control switch settings (optional control function E2).

- The arrangement of the switch shall be:
- OFF: to activate free cooling
- ON: to activate mechanical cooling (Thermo ON)

Econofresh CO_2 gas sensor (field-supplied)

The system controls the concentration of CO_2 gas by means of the CO_2 gas sensor installed in the room.

The sensor is connected to the input signal port CN3 (pins1-2), and it is necessary to set the CO_2 Gas sensor through remote control switch settings (optional control function E4).

- The arrangement of the switch shall be:
  - ON: to increase the intake of outdoor air
  - OFF: to decrease the intake of outdoor air

NOTE

- *The enthalpy sensor and CO_2 gas sensor cannot be installed together.*
- *The enthalpy sensor and CO_2 gas sensor have no effect on the Econofresh operation when the All Fresh process is activated.*

3. General data

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3.1 General data

◆ Indoor units general considerations

The nominal cooling and heating capacities indicated refer to the outdoor units operating with the indoor units at 100% of their capacity and are based on the EN14511 standard, with the operating conditions indicated in the table:

NOTE

- *The cooling and heating capacity of the indoor units is different in the UTOPIA IVX, Centrifugal VRF and SET-FREE systems.*
- *In the case of UTOPIA (IVX and Centrifugal VRF), the nominal capacity shown in the following tables corresponds to combinations of 1 indoor unit with 1 outdoor unit, provided that such combination is allowed.*

◆ Operation conditions

		Cooling	Heating
Indoor air inlet temperature	DB	27.0 ºC	20.0 ºC
	WB	19.0 ºC	—
Outdoor air inlet temperature	DB	35.0 ºC	7.0 ºC
	WB	—	6.0 ºC
DB: dry bulb; WB: wet bulb Pipe length: 7.5 m; pipe height: 0 m.			

Power supply: 230 V.

The sound pressure level has been measured in an anechoic chamber under the following conditions:

RCI(M), RCD indoor units: 1.5 m below the unit.

RPI(M) indoor units: 1.5 m below the unit (without ceiling under the unit), applying suction duct 1 m. and discharge duct 2m.

RPC and RPK indoor units: 1 m below the unit, 1 m from the discharge louvre.

RPF(I): 1 m from floor level, 1 m from the front surface of the unit.

NOTE

Reflected sound must be considered when installing the unit in the field. Because of it the sound pressure load measured in on installation could be higher than the specification

In the tests for RCI, RCIM and RCD units were carried out in combination with their respective panels as indicated in chapter 1.

Sound power level was measured in a reverberant room, in accordance with the EN12102 standard. Used environment conditions are the same as specified in EN14511 for performance test.

3.1.1 RCI-FSN4 - 4-way cassette

RCI-(1.0-2.5)FSN4

MODEL			RCI-1.0FSN4	RCI-1.5FSN4	RCI-2.0FSN4	RCI-2.5FSN4
Power supply			1~ 230V 50Hz			
Nominal cooling capacity (UTOPIA)		kW	2.5	3.6	5.0	5.6
Nominal heating capacity (UTOPIA)		kW	2.8	4.0	5.6	6.3
Nominal cooling capacity (SET-FREE)		kW	2.8	4.0	5.6	7.1
Nominal heating capacity (SET-FREE)		kW	3.2	4.8	6.3	8.5
Air flow	Speed (Hi2/Hi/Me/Lo)	m^3/min	15 / 13 / 11 / 9	21 / 17 / 14 / 11	22 / 17 / 14 / 11	27 / 23 / 18 / 14
Fan motor type (output)		W	57	57	57	57
Sound pressure level	Speed (Hi2/Hi/Me/Lo)	dB(A)	33 / 30 / 28 / 27	35 / 31 / 30 / 27	37 / 32 / 30 / 27	42 / 36 / 32 / 28
Sound power level		dB(A)	52	53	55	56
Outer dimensions	Height	mm	248	248	248	248
	Width	mm	840	840	840	840
	Depth	mm	840	840	840	840
Net weight		kg	20	21	21	22
Refrigerant			R410A (factory-charged corrosion-proof nitrogen)			
Refrigerant pipe connection			Flare nuts			
Refrigerant pipe size	Liquid	mm (in)	Ø 6.35 (1/4)	Ø 6.35 (1/4)	Ø 6.35 (1/4)	Ø 9.52 (3/8)
	Gas	mm (in)	Ø 12.7 (1/2)	Ø 12.7 (1/2)	Ø 12.7 (1/2)	Ø 15.88 (5/8)
Condensate drain connection		mm	Ø 32 (1)	Ø 32 (1)	Ø 32 (1)	Ø 32 (1)
Maximum electricity demand		A	5	5	5	5
Packaging volume		m^3	0.26	0.26	0.26	0.26
Adaptable air panel model			P-N23NA2			
Colour (Munsell code)			Neutral white (4.56Y8.85/0.38)			
Outer dimensions	Height	mm	40	40	40	40
	Width	mm	950	950	950	950
	Depth	mm	950	950	950	950
Net weight		kg	6.5	6.5	6.5	6.5
Packaging volume		m^3	0.10	0.10	0.10	0.10
Remote control			PC-ARFP(1)E - PC-AWR			

(1) Outer diameter (VP25).

The data obtained is based on the operating conditions described at the beginning of this chapter.

RCI-(3.0-6.0)FSN4

MODEL			RCI-3.0FSN4	RCI-4.0FSN4	RCI-5.0FSN4	RCI-6.0FSN4
Power supply			1~ 230V 50Hz			
Nominal cooling capacity (UTOPIA)		kW	7.1	10.0	12.5	14.0
Nominal heating capacity (UTOPIA)		kW	8.0	11.2	14.0	16.0
Nominal cooling capacity (SET-FREE)		kW	8.0	11.2	14.0	16.0
Nominal heating capacity (SET-FREE)		kW	9.0	12.5	16.0	18.0
Air flow	Speed (Hi2/Hi/Me/Lo)	m^3/min	27 / 23 / 18 / 14	37 / 31 / 24 / 20	37 / 33 / 26 / 21	37 / 35 / 28 / 22
Fan motor type (output)		W	57	127	127	127
Sound pressure level	Speed (Hi2/Hi/Me/Lo)	dB(A)	42 / 36 / 32 / 28	48 / 43 / 39 / 33	48 / 45 / 40 / 35	48 / 46 / 41 / 37
Sound power level		dB(A)	57	64	64	65
Outer dimensions	Height	mm	298	298	298	298
	Width	mm	840	840	840	840
	Depth	mm	840	840	840	840
Net weight		kg	26	26	26	26
Refrigerant			R410A (factory-charged corrosion-proof nitrogen)			
Refrigerant pipe connection			Flare nuts			
Refrigerant pipe size	Liquid	mm (in)	Ø 9.52 (3/8)	Ø 9.52 (3/8)	Ø 9.52 (3/8)	Ø 9.52 (3/8)
	Gas	mm (in)	Ø 15.88 (5/8)	Ø 15.88 (5/8)	Ø 15.88 (5/8)	Ø 15.88 (5/8)
Condensate drain connection		mm	Ø 32 (1)	Ø 32 (1)	Ø 32 (1)	Ø 32 (1)
Maximum current		A	5	5	5	5
Packaging volume		m^3	0.31	0.31	0.31	0.31
Adaptable air panel model			P-N23NA2			
Colour (Munsell code)			Neutral white (4.56Y8.85/0.38)			
Outer dimensions	Height	mm	40	40	40	40
	Width	mm	950	950	950	950
	Depth	mm	950	950	950	950
Net weight		kg	6.5	6.5	6.5	6.5
Packaging volume		m^3	0.10	0.10	0.10	0.10
Remote control			PC-ARFP(1)E - PC-AWR			

(1) Outer diameter (VP25).

The data obtained is based on the operating conditions described at the beginning of this chapter.

3.1.2 RCIM-FSN4E - 4-way cassette (compact)

RCIM-(0.4-1.0)FSN4E

MODEL			RCIM-0.4FSN4E	RCIM-0.6FSN4E	RCIM-0.8FSN4E	RCIM-1.0FSN4E
Power supply			1~ 230V 50Hz			
Nominal cooling capacity (UTOPIA)		kW	-	-	2	2.5
Nominal heating capacity (UTOPIA)		kW	-	-	2.2	2.8
Nominal cooling capacity (SET FREE)		kW	1.1	1.7	2.2	2.8
Nominal heating capacity (SET FREE)		kW	1.3	1.9	2.5	3.2
Air flow	Speed (Hi2/Hi/Me/Lo)	m^3/min	8.5/7.8/6.9/6.0	10/8.5/7.5/6	11/9.5/8/6	12/10/8.5/6
Fan motor type (output)		W	57	57	57	57
Sound pressure level	Speed (Hi2/Hi/Me/Lo)	dB(A)	29/27/25/24.5	34/30/28/24.5	36/33/29/24.5	38/34/30/24.5
Sound power level		dB(A)	43	47	50	51
Outer dimensions	Height	mm	285	285	285	285
	Width	mm	570	570	570	570
	Depth	mm	570	570	570	570
Net weight		kg	16	16	16	16
Refrigerant			R410A (factory-charged corrosion-proof nitrogen)			
Refrigerant pipe connection			Flare nuts			
Refrigerant pipe size	Liquid	mm (in)	Ø 6.35 (1/4)	Ø 6.35 (1/4)	Ø 6.35 (1/4)	Ø 6.35 (1/4)
	Gas	mm (in)	Ø 12.7 (1/2)	Ø 12.7 (1/2)	Ø 12.7 (1/2)	Ø 12.7 (1/2)
Condensate drain connection		mm	Ø 32 (1)	Ø 32 (1)	Ø 32 (1)	Ø 32 (1)
Maximum electricity demand		A	5	5	5	5
Packaging volume		m^3	0.13	0.13	0.13	0.13
Adaptable air panel model			P-AP56NAM (without Motion Sensor)			
Colour (Munsell code)			Neutral white (4.56Y8.85/0.38)			
Outer dimensions	Height	mm	30	30	30	30
	Width	mm	620	620	620	620
	Depth	mm	620	620	620	620
Net weight		kg	2.5	2.5	2.5	2.5
Packaging volume		m^3	0.07	0.07	0.07	0.07
Remote control			PC-ARFP(1)E - PC-AWR			

(1) Outer diameter(VP25).

The data obtained is based on the operating conditions described at the beginning of this chapter.

RCIM-(1.5-2.5)FSN4E

MODEL			RCIM-1.5FSN4E	RCIM-2.0FSN4E	RCIM-2.5FSN4E
Power supply			1~ 230V 50Hz		
Nominal cooling capacity (UTOPIA)		kW	3.6	5.0	5.6
Nominal heating capacity (UTOPIA)		kW	4.0	5.6	6.3
Nominal cooling capacity (SET FREE)		kW	4.0	5.6	7.1
Nominal heating capacity (SET FREE)		kW	4.8	6.3	8.5
Air flow	Speed (Hi2/Hi/Me/Lo)	m^3/min	13/11/9.5/7	15/12/10/8	16/14/12/10
Fan motor type (output)		W	57	57	57
Sound pressure level	Speed (Hi2/Hi/Me/Lo)	dB(A)	41/37/33/27.5	45/39/35/31	47/43/39/35
Sound power level		dB(A)	54	56	60
Outer dimensions	Height	mm	285	285	285
	Width	mm	570	570	570
	Depth	mm	570	570	570
Net weight		kg	16	17	17
Refrigerant			R410A (factory-charged corrosion-proof nitrogen)		
Refrigerant pipe connection			Flare nuts		
Refrigerant pipe size	Liquid	mm (in)	Ø 6.35 (1/4)	Ø 6.35 (1/4)	Ø 9.52 (3/8)
	Gas	mm (in)	Ø 12.7 (1/2)	Ø 12.7 (1/2)	Ø 15.88 (5/8)
Condensate drain connection		mm	Ø 32 (1)	Ø 32 (1)	Ø 32 (1)
Maximum electricity demand		A	5	5	5
Packaging volume		m^3	0.13	0.13	0.13
Adaptable air panel model			P-AP56NAM (with out Motion Sensor)		
Colour (Munsell code)			Neutral white (4.56Y8.85/0.38)		
Outer dimensions	Height	mm	30	30	30
	Width	mm	620	620	620
	Depth	mm	620	620	620
Net weight		kg	2.5	2.5	2.5
Packaging volume		m^3	0.07	0.07	0.07
Remote control			PC-ARFP(1)E - PC-AWR		

(1) Outer diameter(VP25).

The data obtained is based on the operating conditions described at the beginning of this chapter.

3.1.3 RCD-FSN3 - 2-way cassette

RCD-(0.8-2.0)FSN3

MODEL			RCD-0.8FSN3	RCD-1.0FSN3	RCD-1.5FSN3	RCD-2.0FSN3
Power supply			1~ 230V 50Hz			
Nominal cooling capacity (UTOPIA)		kW	2.0	2.5	3.6	5.0
Nominal heating capacity (UTOPIA)		kW	2.2	2.8	4.0	5.6
Nominal cooling capacity (SET FREE)		kW	2.2	2.8	4.0	5.6
Nominal heating capacity (SET FREE)		kW	2.5	3.2	4.8	6.3
Air flow	Speed (Hi/Me/Lo)	m^3/min	10/9/7.5/6.5	11/9.5/8.5/7	15/13/11.5/10	16.5/14.5/12.5/10.5
Fan motor type (output)		W	57	57	57	57
Sound pressure level	Speed (Hi2/Hi/Me/Lo)	dB(A)	30/29/28/27	31/29/28/27	37/34/31/30	39/36/33/30
Sound power level	Speed (Hi2/Hi/Me/Lo)	dB(A)	45/44/43/42	48/46/45/44	51/49/47/46	52/51/49/47
Outer dimensions	Height	mm	345	345	345	345
	Width	mm	860	860	860	860
	Depth	mm	630	630	630	630
Net weight		Kg	23	23	25	25
Refrigerant			R410A (factory-charged corrosion-proof nitrogen)			
Refrigerant pipe connection			Flare nuts			
Refrigerant pipe size	Liquid	mm (in)	Ø 6.35 (1/4)	Ø 6.35 (1/4)	Ø 6.35 (1/4)	Ø 6.35 (1/4)
	Gas	mm (in)	Ø 12.7 (1/2)	Ø 12.7 (1/2)	Ø 12.7 (1/2)	Ø 12.7 (1/2)
Condensate drain connection		mm	Ø 32 (1)	Ø 32 (1)	Ø 32 (1)	Ø 32 (1)
Maximum electricity demand		A	5	5	5	5
Packaging volume		m^3	0.24	0.24	0.24	0.24
Adaptable air panel model			P-AP90DNA (without Motion Sensor)			
Colour (Munsell code)			Neutral white (4.56Y8.85/0.38)			
Outer dimensions	Height	mm	30	30	30	30
	Width	mm	1100	1100	1100	1100
	Depth	mm	710	710	710	710
Net weight		kg	7.5	7.5	7.5	7.5
Packaging volume		m^3	0.13	0.13	0.13	0.13
Remote control			PC-ARFP(1)E - PC-AWR			

(1) Outer diameter (VP25).

The data obtained is based on the operating conditions described at the beginning of this chapter.

RCD-(2.5-6.0)FSN3

MODEL			RCD-2.5FSN3	RCD-3.0FSN3	RCD-4.0FSN3	RCD-5.0FSN3	RCD-6.0FSN3
Power supply			1~ 230V 50Hz				
Nominal cooling capacity (UTOPIA)		kW	5.6	7.1	10.0	12.5	14.0
Nominal heating capacity (UTOPIA)		kW	6.3	8.0	11.2	14.0	16.0
Nominal cooling capacity (SET-FREE)		kW	7.1	8.0	11.2	14.0	16.0
Nominal heating capacity (SET-FREE)		kW	8.5	9.0	12.5	16.0	18.0
Air flow	Speed (Hi/Me/Lo)	m^3/min	18.5/16.5/14.5/12.5	21/18.5/16/12.5	30/26.5/23/20	35/31/27/21	37/32.5/28.5/24
Fan motor type (output)		W	57	57	57x2	57x2	57x2
Sound pressure level	Speed (Hi2/Hi/Me/Lo)	dB(A)	42/39/36/33	45/42/38/33	43/40/37/34	47/44/41/35	48/45/42/38
Sound power level	Speed (Hi2/Hi/Me/Lo)	dB(A)	55/52/51/49	58/55/52/49	57/55/52/50	60/55/52/50	61/59/56/53
Outer dimensions	Height	mm	345	345	345	345	345
	Width	Mm	860	860	1420	1420	1420
	Depth	Mm	630	630	630	630	630
Net weight		Kg	25	25	39	39	39
Refrigerant			R410A (factory-charged corrosion-proof nitrogen)				
Refrigerant pipe connection			Flare nuts				
Refrigerant pipe size	Liquid	mm (in)	Ø 9.52 (3/8)	Ø 9.52 (3/8)	Ø 9.52 (3/8)	Ø 9.52 (3/8)	Ø 9.52 (3/8)
	Gas	mm (in)	Ø 15.88 (5/8)	Ø 15.88 (5/8)	Ø 15.88 (5/8)	Ø 15.88 (5/8)	Ø 15.88 (5/8)
Condensate drain connection		mm	Ø 32 (1)	Ø 32 (1)	Ø 32 (1)	Ø 32 (1)	Ø 32 (1)
Maximum electricity demand		A	5	5	5	5	5
Packaging volume		m^3	0.24	0.24	0.36	0.36	0.36
Adaptable air panel model			P-AP90DNA (without Motion Sensor)		P-AP160DNA (without Motion Sensor)		
Colour (Munsell code)			Neutral white (4.56Y8.85/0.38)				
Outer dimensions	Height	mm	30	30	30	30	30
	Width	mm	1100	1100	1660	1660	1660
	Depth	mm	710	710	710	710	710
Net weight		kg	7.5	7.5	10.5	10.5	10.5
Packaging volume		m^3	0.13	0.13	0.20	0.20	0.20
Remote control			PC-ARFP(1)E - PC-AWR				

(1) Outer diameter (VP25).

The data obtained is based on the operating conditions described at the beginning of this chapter.

3.1.4 RPC-FSN3 - Ceiling type

RPC-(1.5-3.0)FSN3

MODEL			RPC-1.5FSN3	RPC-2.0FSN3	RPC-2.5FSN3	RPC-3.0FSN3
Power supply			1~ 230V 50Hz			
Nominal cooling capacity (UTOPIA)		kW	3.6	5.0	5.6	7.1
Nominal heating capacity (UTOPIA)		kW	4.0	5.6	6.3	8.0
Nominal cooling capacity (SET-FREE)		kW	4.0	5.6	7.1	8.0
Nominal heating capacity (SET-FREE)		kW	4.8	6.3	8.5	9.0
Air flow	Speed (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
Fan motor type (output)		W	50	50	80	80
Sound pressure level	Speed (Hi2/Hi/Me/Lo)	dB(A)	37/35/31/28	38/35/31/28	38/35/31/28	40/37/33/29
Sound power level	Speed (Hi2/Hi/Me/Lo)	dB(A)	53/50/46/43	54/50/46/43	54/50/47/44	56/52/48/44
Outer dimensions	Height	mm	235	235	235	235
	Width	mm	960	960	1270	1270
	Depth	mm	690	690	690	690
Net weight		kg	26	27	35	35
Refrigerant			R410A (factory-charged corrosion-proof nitrogen)			
Refrigerant pipe connection				Flare nuts		
Refrigerant pipe size	Liquid	mm (in)	Ø 6.35 (1/4)	Ø 6.35 (1/4)	Ø 9.52 (3/8)	Ø 9.52 (3/8)
	Gas	mm (in)	Ø 12.7 (1/2)	Ø 15.88 (5/8)	Ø 15.88 (5/8)	Ø 15.88 (5/8)
Condensate drain connection		mm	Ø 25 (1)	Ø 25 (1)	Ø 25 (1)	Ø 25 (1)
Maximum electricity demand		A	5	5	5	5
Packaging volume		m^3	0.23	0.23	0.31	0.31
Colour (Munsell code)			Neutral white (4.56Y8.85/0.38)			
Remote control			PC-ARFP(1)E - PC-AWR			

(1) Outer diameter (VP20).

The data obtained is based on the operating conditions described at the beginning of this chapter.

RPC-(4.0-6.0)FSN3

MODEL			RPC-4.0FSN3	RPC-5.0FSN3	RPC-6.0FSN3
Power supply			1~ 230V 50Hz		
Nominal cooling capacity (UTOPIA)		kW	10.0	12.5	14.0
Nominal heating capacity (UTOPIA)		kW	11.2	14.0	16.0
Nominal cooling capacity (SET-FREE)		kW	11.2	14.0	16.0
Nominal heating capacity (SET-FREE)		kW	12.5	16.0	18.0
Air flow	Speed (Hi2/Hi/Me/Lo)	m^3/min	30/26.5/22/17	35/31/25.5/20	37/32.5/27/21
Fan motor type (output)		W	160	160	160
Sound pressure level	Speed (Hi2/Hi/Me/Lo)	dB(A)	44/42/37/32	48/45/41/35	49/47/42/36
Sound power level	Speed (Hi2/Hi/Me/Lo)	dB(A)	60/57/52/47	64/60/56/50	65/62/57/51
Outer dimensions	Height	mm	235	235	235
	Width	mm	1580	1580	1580
	Depth	mm	690	690	690
Net weight		kg	41	41	41
Refrigerant			R410A (factory-charged corrosion-proof nitrogen)		
Refrigerant pipe connection			Flare nuts		
Refrigerant pipe size	Liquid	mm (in)	Ø 9.52 (3/8)	Ø 9.52 (3/8)	Ø 9.52 (3/8)
	Gas	mm (in)	Ø 15.88 (5/8)	Ø 15.88 (5/8)	Ø 15.88 (5/8)
Condensate drain connection		mm	Ø 25 (1)	Ø 25 (1)	Ø 25 (1)
Maximum electricity demand		A	5	5	5
Packaging volume		m^3	0.38	0.38	0.38
Colour (Munsell code)			Neutral white (4.56Y8.85/0.38)		
Remote control			PC-ARFP(1)E - PC-AWR		

(1) Outer diameter (VP20).

The data obtained is based on the operating conditions described at the beginning of this chapter.

3.1.5 RPI-FSN5 - Indoor ducted unit

RPI-(0.4-1.5)FSN5E

MODEL			RPI-0.4FSN5E	RPI-0.6FSN5E	RPI-0.8FSN5E	RPI-1.0FSN5E	RPI-1.5FSN5E
Power supply			1~ 230V 50Hz				
Nominal cooling capacity (UTOPIA)		kW	-	-	2.0	2.5	3.6
Nominal heating capacity (UTOPIA)		kW	-	-	2.2	2.8	4.0
Nominal cooling capacity (SET-FREE)		kW	1.1	1.7	2.2	2.8	4.0
Nominal heating capacity (SET-FREE)		kW	1.3	1.9	2.5	3.2	4.8
Air flow (SP-00)(2)	Speed (Hi/Me/Lo)	m^3/min	6,4/5.9/5.6 (SP00)(2)	7.0/6.2/5.5 (SP00)(2)	8/7.2/6.3 (SP00)(2)	8/7.2/6.3 (SP00)(2)	10/9/8 (SP00)(2)
External static pressure	Nom.(3) (min.-max.)	Pa	25 (0-30)	20 (0-30)	32 (0–50)	32 (0–50)	27 (0–50)
Fan motor type (output)		W	60	60	60	60	60
Sound pressure level (SP-00)(2)	Speed (Hi/Me/Lo)	dB(A)	31/29/27	32/30/27	33/31/29	33/31/29	34/31/29
Sound power level (SP-00)(2)	Speed (Hi)	dB(A)	50	50	52	52	53
Outer dimensions	Height	mm	197	197	197	197	197
	Width	mm	700	1084	1084	1084	1084
	Depth	mm	600	600	600	600	600
Net weight		kg	18	29	29	29	30
Refrigerant			R410A (factory-charged corrosion-proof nitrogen)				
Refrigerant pipe connection			Flare nuts				
Refrigerant pipe size	Liquid	mm (in)	Ø 6.35 (1/4)	Ø 6.35 (1/4)	Ø 6.35 (1/4)	Ø 6.35 (1/4)	Ø 6.35 (1/4)
	Gas	mm (in)	Ø 12.7 (1/2)	Ø 12.7 (1/2)	Ø 12.7 (1/2)	Ø 12.7 (1/2)	Ø 12.7 (1/2)
Condensate drain connection		mm	Ø 32 (1)	Ø 32 (1)	Ø 32 (1)	Ø 32 (1)	Ø 32 (1)
Maximum electricity demand		A	5	5	5	5	5
Packaging volume		m^3	0.13	0.18	0.18	0.18	0.18
Factory supplied accessories			Air filter, drain pump				
Remote control			PC-ARFP(1)E - PC-AWR				

(1) Outer diameter (VP25).

(2) SP: external static pressure (setting throw Optional Functions “C5” in the remote control: 01=High external static pressure, 00=Standard and 02=Low external static pressure).

(3) Nom.: external static pressure at nominal air flow volume.

The data obtained is based on the operating conditions described at the beginning of this chapter.

RPI-(2.0-3.0)FSN5E

MODEL			RPI-2.0FSN5E	RPI-2.5FSN5E	RPI-3.0FSN5E
Power supply			1~ 230V 50Hz		
Nominal cooling capacity (UTOPIA)		kW	5.0	5.6	7.1
Nominal heating capacity (UTOPIA)		kW	5.6	6.3	8.0
Nominal cooling capacity (SET-FREE)		kW	5.6	7.1	8.0
Nominal heating capacity (SET-FREE)		kW	6.3	8.5	9.0
Air flow (SP-02)(2)	Speed (Hi/Me/Lo)	m^3/min	16/12.5/10 (SP02)(2)	19/16/13 (SP02)(2)	22/19/16 (SP02)(2)
External static pressure	Nom. (min.-max.)	Pa	30 (0-120)	30 (0-125)	30 (0-125)
Fan motor type (output)		W	60	150	150
Sound pressure level (SP-02)(2)	Speed (Hi/Me/Lo)	dB(A)	29/29/27	30/30/28	31/31/29
Sound power level (SP-02)(2)	Speed (Hi)	dB(A)	55	56	57
Outer dimensions	Height	mm	275	275	275
	Width	mm	1084	1084	1084
	Depth	mm	600	600	600
Net weight		kg	35	36	36
Refrigerant			R410A (factory-charged corrosion-proof nitrogen)		
Refrigerant pipe connection			Flare nuts		
Refrigerant pipe size	Liquid	mm (in)	Ø 6.35 (1/4)	Ø 9.52 (3/8)	Ø 9.52 (3/8)
	Gas	mm (in)	Ø 15.88 (5/8)	Ø 15.88 (5/8)	Ø 15.88 (5/8)
Condensate drain connection		mm	Ø 32 (1)	Ø 32 (1)	Ø 32 (1)
Maximum electricity demand		A	5	5	5
Packaging volume		m^3	0.25	0.25	0.25
Factory supplied accessories			Air filter, drain pump		
Remote control			PC-ARFP(1)E - PC-AWR		

(1) Outer diameter (VP25).

(2) SP: external static pressure (setting throw Optional Functions “C5” in the remote control: 01=High external static pressure, 00=Standard and 02=Low external static pressure).

The data obtained is based on the operating conditions described at the beginning of this chapter.

RPI-(4.0-6.0)FSN5E

MODEL			RPI-4.0FSN5E	RPI-5.0FSN5E	RPI-6.0FSN5E
Power supply			1~ 230V 50Hz		
Nominal cooling capacity (UTOPIA)		kW	10.0	12.5	14.0
Nominal heating capacity (UTOPIA)		kW	11.2	14.0	16.0
Nominal cooling capacity (SET-FREE)		kW	11.2	14.0	16.0
Nominal heating capacity (SET-FREE)		kW	12.5	16.0	18.0
Air flow (SP-00)(2)	Speed (Hi/Me/Lo)	m^3/min	30/28/25 (SP00)(2)	35/32/29 (SP00)(2)	36/33/30 (SP00)(2)
External static pressure	Nom. (min.-max.)	Pa	45 (0-120)	50 (0-140)	50 (0-140)
Fan motor type (output)		W	250	250	250
Sound pressure level	Speed (Hi/Me/Lo)	dB(A)	37/35/32 (SP-00)(2)	38/35/33 (SP-01)(2)	39/36/33 (SP-01)(2)
Sound power level	Speed (Hi)	dB(A)	62 (SP-00)(2)	65 (SP-01)(2)	66 (SP-01)(2)
Outer dimensions	Height	mm	275	275	275
	Width	mm	1474	1474	1474
	Depth	mm	600	600	600
Net weight		kg	48	48	48
Refrigerant			R410A (factory-charged corrosion-proof nitrogen)		
Refrigerant pipe connection			Flare nuts		
Refrigerant pipe size	Liquid	mm (in)	Ø 9.52 (3/8)	Ø 9.52 (3/8)	Ø 9.52 (3/8)
	Gas	mm (in)	Ø 15.88 (5/8)	Ø 15.88 (5/8)	Ø 15.88 (5/8)
Condensate drain connection		mm	Ø 32 (1)	Ø 32 (1)	Ø 32 (1)
Maximum electricity demand		A	5	5	5
Packaging volume		m^3	0.33	0.33	0.33
Factory supplied accessories			Air filter, drain pump		
Remote control			PC-ARFP(1)E - PC-AWR		

(1) Outer diameter (VP25).

(2) SP: external static pressure (setting throw Optional Functions “C5” in the remote control: 01=High external static pressure, 00=Standard and 02=Low external static pressure).

The data obtained is based on the operating conditions described at the beginning of this chapter.

RPI-(8.0/10.0)FSN3E(-f)

MODEL			RPI-8.0FSN3E(-f)	RPI-10.0FSN3E(-f)
Power supply			1~ 230V 50Hz	
Nominal cooling capacity (UTOPIA) (*)		kW	20.0	25.0
Nominal heating capacity (UTOPIA) (*)		kW	22.4	28.0
Nominal cooling capacity (SET-FREE)		kW	22.4	28.0
Nominal heating capacity (SET-FREE)		kW	25.0	31.0
Air flow (HSP)(2)	Speed (Hi/Me/Lo)	m^3/min	66/66/60	75/75/68.5
Air flow (LSP)(3)	Speed (Hi/Me/Lo)	m^3/min	66/66/59.5	75/75/67.6
Static pressure (HSP)(2)		Pa	220/220/180	220/220/180
Static pressure (LSP)(3)		Pa	180/180/140	180/180/140
Fan motor type (output)		W	1065	1065
Sound pressure level	Speed (Hi/Me/Lo)	dB(A)	54/54/51	55/55/52
Sound power level		dB(A)	77	78
Outer dimensions	Height	mm	423	423
	Width	mm	1592	1592
	Depth	mm	600	600
Net weight		kg	85	87
Refrigerant			R410A (factory-charged corrosion-proof nitrogen)	
Refrigerant pipe connection			Welded connection	
Refrigerant pipe size	Liquid	mm (in)	Ø 9.52 (3/8)	Ø 9.52 (3/8)
	Gas	mm (in)	Ø 19.05 (3/4) (4)	Ø 22.2 (7/8) (4)
Condensate drain connection		mm	Ø 25 (1)	Ø 25 (1)
Maximum electricity demand		A	10	10
Packaging volume		m^3	0.68	0.68
Remote control			PC-ARFP(1)E - PC-AWR	

(1) Outer diameter (VP20).

(2) HSP: high static pressure.

(3) LSP: low static pressure; predetermined setting.

(4) Indoor unit supplied with a reduction for systems with UTOPIA IVX (8/10HP) outdoor unit.

The data obtained is based on the operating conditions described at the beginning of this chapter.

NOTE

(*) Nominal capacity in 1 indoor unit combination with UTOPIA IVX Premium and IVX Standard RAS-(8/10)HNPE and RAS-(8/10)HNCE.

RPI-(16.0/20.0)FSN3PE(-f)

MODEL			RPI-16.0FSN3PE(-f)	RPI-20.0FSN3PE(-f)
Power supply			1~ 230V 50Hz	
Nominal cooling capacity (SET-FREE)		kW	45.0	56.0
Nominal heating capacity (SET-FREE)		kW	50.0	63.0
Airflow (HSP)(2)	Speed (Hi/Lo)	m^3/min	132/120	150/137
Airflow (LSP)(3)	Speed (Hi/Lo)	m^3/min	132/119	150/135
Static pressure (HSP)(2)		Pa	220/180	220/180
Static pressure (LSP)(3)		Pa	180/140	180/140
Fan motor type (output)		W	2 x 1065	2 x 1065
Sound pressure level	Speed (Hi/Lo)	dB(A)	56/53	57/54
Sound power level		dB(A)	79	80
Outer dimensions	Height	mm	846	846
	Width	mm	1592	1592
	Depth	mm	600	600
Net weight		kg	171	175
Refrigerant			R410A (factory-charged corrosion-proof nitrogen)	
Refrigerant pipe connection			Welded connection	
Refrigerant pipe size	Liquid	mm (in)	2 x Ø 9.52 (3/8)	2 x Ø 9.52 (3/8)
	Gas	mm (in)	2 x Ø 19.05 (3/4)	2 x Ø 22.2 (7/8)
Condensation drain connection		mm	2 x Ø 25 (1)	2 x Ø 25 (1)
Maximum electricity demand		A	16.2	17.7
Volume of packaging		m^3	0.81	0.81
Remote control (required; sold separately)			PC-ARFP(1)E - PC-AWR	
Multi-Kit (required; sold separately)			1 x E162SN3	1 x E242SN3

(1) Outer diameter (VP20).

(2) HSP: high static pressure.

(3) LSP: low static pressure; predetermined setting.

3.1.6 RPIM - Indoor ducted unit

RPIM-(0.6-1.5)FSN4E (-DU)

MODEL			RPIM-0.6FSN4E (-DU)	RPIM-0.8FSN4E (-DU)	RPIM-1.0FSN4E (-DU)	RPIM-1.5FSN4E (-DU)
Power supply			1~ 230V 50Hz			
Nominal cooling capacity (UTOPIA)		kW	-	2.0	2.5	3.6
Nominal heating capacity (UTOPIA)		kW	-	2.2	2.8	4.0
Nominal cooling capacity (SET FREE)		kW	1.7	2.2	2.8	4.0
Nominal heating capacity (SET FREE)		kW	1.9	2.5	3.2	4.8
Air flow (SP-00)(2)	Speed (Hi/Me/Lo)	m^3/min	7/6.2/5.5	8/6.8/5.5	8/6.8/5.5	10/9/8
External static pressure	Nom.(3) (min.-max.)	Pa	20 (0-35)	32 (0–50)	32 (0–50)	27 (0–58)
Fan motor type (output)		W	60	60	60	60
Sound pressure level (SP-02)(2)	Speed (Hi/Me/Lo)	dB(A)	28/28/25	29/29/27	29/29/27	30/30/28
Sound power level (SP-02)(2)	Speed (Hi)	dB(A)	49	50	50	51
Outer dimensions	Height	mm	275	275	275	275
	Width	mm	702	702	702	702
	Depth	mm	600	600	600	600
Net weight		kg	26	26	26	26
Refrigerant			R410A (factory-charged corrosion-proof nitrogen)			
Refrigerant pipe connection			Flare nuts			
Refrigerant pipe size	Liquid	mm (in)	Ø 6.35 (1/4)	Ø 6.35 (1/4)	Ø 6.35 (1/4)	Ø 6.35 (1/4)
	Gas	mm (in)	Ø 12.7 (1/2)	Ø 12.7 (1/2)	Ø 12.7 (1/2)	Ø 12.7 (1/2)
Condensate drain connection		mm	Ø 25 (1)	Ø 25 (1)	Ø 25 (1)	Ø 25 (1)
Maximum electricity demand		A	5	5	5	5
Packaging volume		m^3	0.17	0.17	0.17	0.17
Factory supplied accessories			Air filter (drain pump -DU models only)			
Remote control			PC-ARFP(1)E - PC-AWR			

(1) Outer diameter (VP20). For -DU models Ø 32 (VP25)-

(2) SP: static pressure (setting throw Optional Functions “C5” in the remote control: 01=High external static pressure. 00=Standard and 02=Low external static pressure).

(3) Nom.: external static pressure at nominal air flow volume.

The data obtained is based on the operating conditions described at the beginning of this chapter.

3.1.7 RPK - Wall type

RPK-(0.4-1.5)FSN(H)4M

MODEL			RPK-0.4FSN(H)4M	RPK-0.6FSN(H)4M	RPK-0.8FSN(H)4M	RPK-1.0FSN(H)4M	RPK-1.5FSN(H)4M
Power supply			1~ 230V 50Hz				
Nominal cooling capacity (UTOPIA)		kW	-	-	2.0	2.5	3.6
Nominal heating capacity (UTOPIA)		kW	-	-	2.2	2.8	4.0
Nominal cooling capacity (SET FREE)		kW	1.1	1.7	2.2	2.8	4.0
Nominal heating capacity (SET FREE)		kW	1.3	1.9	2.5	3.2	4.8
Air flow	Speed (Hi2/Hi/Me/Lo)	m^3/min	7.5/7.3/6.7/6.0	8/7.5/7/6.0	10/8/7/6.5	10/8/7/6.5	14/11/9/7.5
Fan motor type (output)		W	38	38	38	38	38
Sound pressure level	Speed (Hi2/Hi/Me/Lo)	dB(A)	32/31/30/29	35/32/31/29	39/35/32/30	39/35/32/30	46/40/36/33
Sound power level	Speed (Hi2/Hi/Me/Lo)	dB(A)	49/48/46/45	49/48/46/45	53/49/47/45	53/49/47/45	58/54/50/47
Outer dimensions	Height	mm	300	300	300	300	300
	Width	mm	790	790	790	790	900
	Depth	mm	230	230	230	230	230
Net weight		kg	9	10	10	10	11
Refrigerant			R410A (factory-charged corrosion-proof nitrogen)				
Refrigerant pipe connection			Flare nuts				
Refrigerant pipe size	Liquid	mm (in)	Ø 6.35 (1/4)	Ø 6.35 (1/4)	Ø 6.35 (1/4)	Ø 6.35 (1/4)	Ø 6.35 (1/4)
	Gas	mm (in)	Ø 12.7 (1/2)	Ø 12.7 (1/2)	Ø 12.7 (1/2)	Ø 12.7 (1/2)	Ø 12.7 (1/2)
Condensate drain connection		mm	Ø 20 (1)	Ø 20 (1)	Ø 20 (1)	Ø 20 (1)	Ø 20 (1)
Maximum electricity demand		A	5	5	5	5	5
Packaging volume		m^3	0.09	0.09	0.09	0.09	0.11
Colour (Munsell code)			White (7.3G8.3/.02)				
Remote control			PC-ARFP(1)E / PC-AWR (*)				

The data obtained is based on the operating conditions described at the beginning of this chapter.

(1) Outer diameter (VP16).

(*) IR receiver is included on indoor units as standard (see chapter "Dimensional and structural drawings").

RPK-(2.0-4.0)FSN4M

MODEL			RPK-2.0FSN4M	RPK-2.5FSN4M	RPK-3.0FSN4M	RPK-4.0FSN4M
Power supply			1~ 230V 50Hz			
Nominal cooling capacity (UTOPIA)		kW	5.0	5.6	7.1	10.0
Nominal heating capacity (UTOPIA)		kW	5.6	6.3	8.0	11.2
Nominal cooling capacity (SET FREE)		kW	5.6	7.1	8.0	11.2
Nominal heating capacity (SET FREE)		kW	6.3	8.5	9.0	12.5
Air flow	Speed (Hi2/Hi/Me/Lo)	m^3/min	14.5/13/11/9.5	18.5/16.5/14/12	20/17.5/15.5/12.5	23/20/17.5/14.5
Fan motor type (output)		W	38	38	38	38
Sound pressure level	Speed (Hi2/Hi/Me/Lo)	dB(A)	40/37/34/31	45/42/38/35	47/44/40/35	51/48/44/39
Sound power level	Speed (Hi2/Hi/Me/Lo)	dB(A)	55/53/50/47	60/58/54/51	63/60/56/51	65/34/60/54
Outer dimensions	Height	mm	300	300	300	300
	Width	mm	1100	1100	1100	1100
	Depth	mm	260	260	260	260
Net weight		kg	14.5	15	15	15
Refrigerant			R410A (factory-charged corrosion-proof nitrogen)			
Refrigerant pipe connection			Flare nuts			
Refrigerant pipe size	Liquid	mm (in)	Ø 6.35 (1/4)	Ø 9.52 (3/8)	Ø 9.52 (3/8)	Ø 9.52 (3/8)
	Gas	mm (in)	Ø 12.7 (1/2)	Ø 15.88 (5/8)	Ø 15.88 (5/8)	Ø 15.88 (5/8)
Condensate drain connection		mm	Ø 20 (1)	Ø 20 (1)	Ø 20 (1)	Ø 20 (1)
Maximum electricity demand		A	5	5	5	5
Packaging volume		m^3	0.14	0.14	0.14	0.14
Colour (Munsell code)			White (7.3G8.3/.02)			
Remote control			W / PC-AWR (*)			

The data obtained is based on the operating conditions described at the beginning of this chapter.

(1) Outer diameter (VP16).

(*) IR receiver is included on indoor units as standard (see chapter "Dimensional and structural drawings").

3.1.8 RPF - Floor type and RPFI - Floor concealed type

RPF-(1.0-2.5)FSN2E

MODEL			RPF-1.0FSN2E	RPF-1.5FSN2E	RPF-2.0FSN2E	RPF-2.5FSN2E
Power supply			1~ 230V 50Hz			
Nominal cooling capacity (UTOPIA)		kW	2.5	3.6	5.0	5.6
Nominal heating capacity (UTOPIA)		kW	2.8	4.0	5.6	6.3
Nominal cooling capacity (SET FREE)		kW	2.8	4.0	5.6	7.1
Nominal heating capacity (SET FREE)		kW	3.2	4.8	6.3	8.5
Air flow	Speed (Hi/Me/Lo)	m^3/min	8.5/7/6	12/10/9	16/14/11	16/14/11
Fan motor type (output)		W	20	28	45	45
Sound pressure level	Speed (Hi/Me/Lo)	dB(A)	35/32/29	38/35/31	39/36/32	42/38/34
Sound power level		dB(A)	57	60	60	60
Outer dimensions	Height	mm	630	630	630	630
	Width	mm	1045	1170	1420	1420
	Depth	mm	220	220	220	220
Net weight		kg	25	28	33	34
Refrigerant			R410A (factory-charged corrosion-proof nitrogen)			
Refrigerant pipe connection			Flare nuts			
Refrigerant pipe size	Liquid	mm (in)	Ø 6.35 (1/4)	Ø 6.35 (1/4)	Ø 6.35 (1/4)	Ø 9.52 (3/8)
	Gas	mm (in)	Ø 12.7 (1/2)	Ø 12.7 (1/2)	Ø 15.88 (5/8)	Ø 15.88 (5/8)
Condensate drain connection		mm	Ø 18.5 (1)	Ø 18.5 (1)	Ø 18.5 (1)	Ø 18.5 (1)
Maximum electricity demand		A	5	5	5	5
Packaging volume		m^3	0.22	0.24	0.29	0.29
Colour (Munsell code)			Spring white (4.1Y8.5/0.7)			
Remote control			PC-ARFP(1)E - PC-AWR			

(1) Outer diameter.

The data obtained is based on the operating conditions described at the beginning of this chapter.

RPFI-(1.0-2.5)FSN2E

MODEL			RPFI-1.0FSN2E	RPFI-1.5FSN2E	RPFI-2.0FSN2E	RPFI-2.5FSN2E
Power supply			1~ 230V 50Hz			
Nominal cooling capacity (UTOPIA)		kW	2.5	3.6	5.0	5.6
Nominal heating capacity (UTOPIA)		kW	2.8	4.0	5.6	6.3
Nominal cooling capacity (SET FREE)		kW	2.8	4.0	5.6	7.1
Nominal heating capacity (SET FREE)		kW	3.2	4.8	6.3	8.5
Air flow	Speed (Hi/Me/Lo)	m^3/min	8.5/7/6	12/10/9	16/14/11	16/14/11
Fan motor type (output)		W	20	28	45	45
Sound pressure level	Speed (Hi/Me/Lo)	dB(A)	35/32/29	38/35/31	39/36/32	42/38/34
Sound power level		dB(A)	57	60	60	60
Outer dimensions	Height	mm	620	620	620	620
	Width	mm	848	973	1223	1223
	Depth	mm	220	220	220	220
Net weight		kg	19	23	27	28
Refrigerant			R410A (factory-charged corrosion-proof nitrogen)			
Refrigerant pipe connection			Flare nuts			
Refrigerant pipe size	Liquid	mm (in)	Ø 6.35 (1/4)	Ø 6.35 (1/4)	Ø 6.35 (1/4)	Ø 9.52 (3/8)
	Gas	mm (in)	Ø 12.7 (1/2)	Ø 12.7 (1/2)	Ø 15.88 (5/8)	Ø 15.88 (5/8)
Condensate drain connection		mm	Ø 18.5 (1)	Ø 18.5 (1)	Ø 18.5 (1)	Ø 18.5 (1)
Maximum electricity demand		A	5	5	5	5
Packaging volume		m^3	0.22	0.23	0.25	0.25
Colour (Munsell code)			Spring white (4.1Y8.5/0.7)			
Remote control			PC-ARFP(1)E - PC-AWR			

(1) Outer diameter.

The data obtained is based on the operating conditions described at the beginning of this chapter.

3.1.9 KPI Units

◆ Considerations

The sound pressure level has been measured in an anechoic chamber under the following conditions:

1.5 m below the unit (with no ceiling below the unit, using a sound-insulated duct).

Suction duct 1 m away and discharge duct 2 m away.

Power supply: 230 V.

NOTE

Data obtained in an anechoic chamber and, therefore, the sound indicated must be taken into account when installing the unit.

◆ KPI Energy recovery series

KPI-(252–802)E4E

MODEL			KPI-252E4E	KPI-502E4E	KPI-802E4E
Electrical power supply			1~ 230V 50Hz		
Air flow rate	Hi/Me/Lo	m^3/h	250/208/180	500/411/360	800/650/540
Static pressure (1)	Hi/Me/Lo	Pa	55/35/30	80/55/42	90/60/40
Maximum external pressure (nom. air flow)		Pa	240	217	120
Heat Exchanger Element			Air to Air cross flow - Celluloid material		
Temperature exchange efficiency (2)	Hi/Me/Lo	%	74/77/79	73/74/76	76/78/79
Enthalpy exchange efficiency for heating	High	%	66	65	65
Enthalpy exchange efficiency for cooling	High	%	60	61	62
Sound pressure level (3)	Hi/Me/Lo	dB(A)	28/27/25	33/31/30	35/34/33
Sound power level	High	dB(A)	43	51	54
External dimensions	Height	mm	270	330	385
	Width		900	1130	1210
	Depth		750	920	1015
Net weight		kg	34	46	51
Duct Connection diameter		mm	Ø 160	Ø 200	Ø 250
Nominal power input	Hi/Me/Lo	W	48/32/25	110/69/52	243/148/92
Specific Fan Power input (SFP)	High	$W/(m^3/s)$	408	514	762
Maximum current	High	A	4.0	4.0	4.0
Fan — Quantity		-	2	2	2
Fan — Type		-	EC Fan		
Working Range (4)			-20°C (DB) ~ 46°C (DB)		
Supplied Air Filter classification (acc. EN779) (5)			G3	G3	G3
Remote controller (sold separately as an option))			PC-ARFP(1)E		

NOTE

- *(1) Default fan pressure setting.*
- *(2) Measured according to EN 308.*
- *(3) Sound pressure level has been measured in an anechoic chamber, with the measuring point 1.5 m below the center of the unit, with no ceiling under the unit and using a sound insulated duct Reflected sound must be considered when installing the unit in the field. Because of it the sound pressure level measured in an installation could be higher than the specification.*
- *(4) The installation of an electric heater and additional air inlet thermistor THM4 (optional accessory installed before the electrical heater) is necessary when temperature becomes lower to -5ºC(DB).*
- *(5) High efficiency filter classified as F7 (acc.EN779) is available as accessory.*

KPI-(1002–2002)E4E

MODEL				KPI-1002E4E	KPI-1502E4E	KPI-2002E4E
Electrical power supply				1~ 230V 50Hz		
Air flow rate		Hi/Me/Lo	m^3/h	1000/800/620	1150/945/735	1650/1200/975
Static pressure (1)		Hi/Me/Lo	Pa	95/65/40	228/155/90	282/145/95
Maximum external pressure (nom. air flow)			Pa	190	530	458
Heat Exchanger Element				Air to Air cross flow - Celluloid material		
Temperature exchange efficiency (2)		Hi/Me/Lo	%	76/78/81	75.4/77.7/79.8	75.4/78.3/79.7
Enthalpy exchange efficiency for heating		High	%	68	68	66.5
Enthalpy exchange efficiency for cooling		High	%	62	62.5	61.5
Sound pressure level (3)		Hi/Me/Lo	dB(A)	37/34/32	39/37/35	40/39/36
Sound power level		High	dB(A)	55	56	57
External dimensions		Height	mm	385	525	525
		Width		1600	1800	1800
		Depth		1295	1130	1430
Net weight			kg	79	97	106
Duct Connection diameter			mm	Ø 300	Ø 355	Ø 355
Nominal power input		Hi/Me/Lo	W	261/154/83	496/318/190	694/305/192
Specific Fan Power input (SFP)		High	$W/(m^3/s)$	545	763	690
Maximum current		High	A	8.0	8.0	8.0
Fan	Quantity		-	2	2	2
	Type		-	EC Fan		
Working Range (4)				-20°C (DB) ~ 46°C (DB)		
Supplied Air Filter classification (acc. EN779) (5)				G3	G3	G3
Remote controller (sold separately as an option)				PC-ARFP(1)E		

NOTE

- *(1) Default fan pressure setting.*
- *(2) Measured according to EN 308.*
- *(3) Sound pressure level has been measured in an anechoic chamber, with the measuring point 1.5 m below the center of the unit, with no ceiling under the unit and using a sound insulated duct Reflected sound must be considered when installing the unit in the field. Because of it the sound pressure level measured in an installation could be higher than the specification.*
- *(4) The installation of an electric heater and additional air inlet thermistor THM4 (optional accessory installed before the electrical heater) is necessary when temperature becomes lower to -5ºC(DB).*
- *(5) High efficiency filter classified as F7 (acc.EN779) is available as accessory.*

◆ KPI Active series

KPI-(502-1002)X4E

MODEL			KPI-502X4E	KPI-802X4E	KPI-1002X4E
Electrical power supply			1~ 230V 50Hz		
Nominal cooling capacity (1)		kW	5.32 (1.81)	7.96 (2.94)	10.83 (3.73)
Nominal heating capacity (1)		kW	6.92 (2.12)	9.79 (3.49)	12.93 (4.43)
Air flow rate	Hi/Me/Lo	m^3/h	500/450/400	800/700/590	1000/820/740
Static pressure (2)	Hi/Me/Lo	Pa	90/72/58	110/80/57	170/105/80
Maximum external pressure (nom. air flow)		Pa	218	110	170
Heat Exchanger element		-	Air to air cross flow - Paper material		
Temperature exchange efficiency (3)	Hi/Me/Lo	%	73/74/76	76/78/79	76/78/79
Enthalpy exchange efficiency for heating	High	%	65	65	68
Enthalpy exchange efficiency for cooling	High	%	61	62	62
Sound pressure level (4)	Hi/Me/Lo	dB(A)	32/30/29	34/33/32	36/33/31
Sound Power Level	High	dB(A)	50	53	54
External dimensions	Height	mm	330	385	385
	Width		1435	1513	1904
	Depth		920	1015	1295
Net weight		kg	62	69	100
Duct Connection diameter		mm	Ø 200	Ø 250	Ø 300
Refrigerant		-	R410		
Refrigerant piping connection		-	Flare nuts		
Size	Liquid piping	mm (in.)	Ø 6.35 1/4	Ø 6.35 1/4	Ø 9.52 3/8
	Gas piping	mm (in.)	Ø 12.7 1/2	Ø 15.88 5/8	Ø 15.88 5/8
Condensate drain connection		mm	Ø 32	Ø 32	Ø 32
Nominal power input	Hi/Me/Lo	W	111/85/56	255/161/108	357/198/150
Specific Fan Power input (SFP)	High	$W/(m^3/s)$	518	793	586
Maximum current	High	A	4.0	4.0	8.0
Fan	Quantity	-	2	2	2
	Type	-	EC Fan		
Working Range (5)			-20ºC (DB) ~ 40ºC(DB)		
Supplied air filter classification (ecc EN779) (6)			G3	G3	G3
Remote control (sold separately as an option)			PC-ARFP(1)E		

NOTE

- *(1) The nominal cooling and heating capacity is the combined capacity of the outdoor and indoor units of the system and is based on Standard EN14511, with the following operating conditions:*

	Cooling	Heating
Indoor Air Inlet Temperature	27ºC DB / 19ºC WB	20ºC DB / 14 ºC WB
Outdoor Air Inlet Temperature	35ºC DB / 24ºC WB	7ºC DB / 6ºC WB

  Pipe length: 7.5m; Pipe height: 0 m
  Active KPI unit working at its nominal air flow.
  Value between brackets represents the capacity of the Heat Recovery element.
- *(2) Default fan pressure setting.*
- *(3) Measured according to EN 308.*
- *(4) Sound pressure level has been measured in an anechoic chamber, with the measuring point 1.5 m below the center of the unit, with no ceiling under the unit and using a sound insulated duct. Reflected sound must be considered when installing the unit in the field. Because of it, the sound pressure level measured in an installation could be higher than the specification.*
- *(5) The installation of an electric heater and additional air inlet thermistor THM4 (optional accessory installed before the electrical heater) is necessary when temperature becomes lower to -5ºC (DB). Cooling and heating performance may vary depending on working conditions because of control protections.*
- *(6)High efficiency filter classified as F7 (acc. EN779) is available as accessory.*

3.1.10 Econofresh kit

MODEL			EF-456N1E
Combination indoor unit model			RPI-(4.0/5.0/6.0)FSN5E
Outer dimensions	Height	mm	254
	Width	mm	1491+59
	Depth	mm	270
Number of damper motors			1
Net weight		kg	13.7
Standard accessories			Fresh outdoor air inlet thermistor
Packaging volume		m^3	0.14
Remote control		-	PC-ARFP(1)E

3.1.11 DX-Interface

			DX-Interface models							
			EXV-2.0E2	EXV-2.5E2	EXV-3.0E2	EXV-4.0E2	EXV-5.0E2	EXV-6.0E2	EXV-8.0E2	EXV-10.0E2
Control Box										
Casing colour			Natural Grey (Munsell 1.0Y8.5/0.5)							
Dimensions	Height	mm	291							
	Width	mm	341							
	Depth	mm	127							
Weight		kg	3.0							
Maximum fan current		A	3.5							
Power supply			1~ 230V 50Hz							
Expansion valves										
Casing colour			White (RAL-9016)							
Dimensions	Height	mm	431							
	Width	mm	199							
	Depth	mm	103							
Weight		kg	2.0	2.7					4.5	
Piping connection		mm	Ø 6.35	Ø 9.52						
Accessories										
Remote controller			PC-ARFP(1)E							
Centralized remote control			Central controllers are only compatible when the system is in control by Inlet temperature							

3.1.12 Adjusted capacities of indoor units

Unit whose capacity can be set one step lower thought the dsw setting, the capacity are shown in the following table:

Power (HP)		0.6 (*)	1.3 (**)	1.8 (**)	2.3 (**)
Variable capacity thought DWS		0.8 → 0.6	1.5 → 1.3	2.0 → 1.8	2.5 → 2.3
Nominal cooling capacity (UTOPIA and CENTRIFUGAL series)	kW	-	3.2	4.5	5.3
Nominal heating capacity (UTOPIA and CENTRIFUGAL series)	kW	-	3.6	5.0	6.0
Nominal cooling capacity (SET-FREE series)	kW	1.7	3.8	5.2	6.7
Nominal heating capacity (SET-FREE series)	kW	1.9	4.2	5.6	7.5

(*) Capacity available only for RCIM-FSN4E, RPI-FSN5E, RPIM-FSN4E with DSW9 setting and for RPK-FSN(H)4M with DSW2 setting.

(**) Capacity available with DSW3 setting.

3.2 Component data

3.2.1 RCI-FSN4 - 4-way cassette

RCI-(1.0-2.5)FSN4

MODEL		RCI-1.0FSN4	RCI-1.5FSN4	RCI-2.0FSN4	RCI-2.5FSN4
Heat exchanger					
Type		Multi-Pass Cross Finned Tube			
Tube material		Copper Tube			
Outer diameter	mm	5	5	5	5
Rows of tubes		2	2	2	3
Number of tubes in the coil		20	28	28	42
Fin material		Aluminium			
Fin pitch	mm	1.3	1.3	1.3	1.3
Maximum operating pressure	MPa	4.15	4.15	4.15	4.15
Total front area	m^2	0.29	0.41	0.41	0.41
Number of coils per unit		1	1	1	1
Fan					
Fan type		Multi-blade turbo fan			
Fans per unit		1	1	1	1
Outer diameter	mm	490	490	490	490
Motor					
Shell		Drip-Proof Type Enclosure			
Starting		DC Motor			
Quantity		1	1	1	1
Insulation class		E	E	E	E

RCI-(3.0-6.0)FSN4

MODEL		RCI-3.0FSN4	RCI-4.0FSN4	RCI-5.0FSN4	RCI-6.0FSN4
Heat exchanger					
Type		Multi-Pass Cross Finned Tube			
Tube material		Copper Tube			
Outer diameter	mm	5	5	5	5
Rows of tubes		3	3	3	3
Number of tubes in the coil		54	54	54	54
Fin material		Aluminium			
Fin pitch	mm	1.3	1.3	1.3	1.3
Maximum operating pressure	MPa	4.15	4.15	4.15	4.15
Total front area	m^2	0.52	0.52	0.52	0.52
Number of coils per unit		1	1	1	1
Fan					
Fan type		Multi-blade turbo fan			
Fans per unit		1	1	1	1
Outer diameter	mm	490	490	490	490
Motor					
Shell		Drip-Proof Type Enclosure			
Starting		DC Motor			
Quantity		1	1	1	1
Insulation class		E	E	E	E

3.2.2 RCIM-FSN4E - 4-way cassette (compact)

RCIM-(0.4-2.5)FSN4E

MODEL		RCIM-0.4FSN4E	RCIM-0.6FSN4E	RCIM-0.8FSN4E	RCIM-1.0FSN4E	RCIM-1.5FSN4E	RCIM-2.0FSN4E	RCIM-2.5FSN4E
Heat exchanger								
Type		Multi-pass cross finned tube						
Tube material		Copper						
Outer diameter	mm	5	5	5	5	5	5	5
Rows of tubes		1	2	2	2	2	3	3
Number of tubes in the coil		14	20	20	28	28	42	42
Fin material		Aluminium						
Fin pitch	mm	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Maximum operating pressure	MPa	4.15	4.15	4.15	4.15	4.15	4.15	4.15
Total front area	m^2	0.19	0.19	0.19	0.19	0.19	0.19	0.19
Number of coils per unit		1	1	1	1	1	1	1
Fan								
Fan type		Multi-blade centrifugal fan						
Fans per unit		1	1	1	1	1	1	1
Outer diameter	mm	318	318	318	318	318	318	318
Motor								
Shell		Drip-proof type enclosure						
Starting		DC Motor						
Quantity		1	1	1	1	1	1	1
Insulation class		E	E	E	E	E	E	E

3.2.3 RCD-FSN3 - 2-way cassette

RCD-(0.8-1.5)FSN3

MODEL		RCD-0.8FSN3	RCD-1.0FSN3	RCD-1.5FSN3	RCD-2.0FSN3
Heat exchanger					
Type		Multi-Pass Cross Finned Tube			
Tube material		Copper			
Outer diameter	mm	7	7	7	7
Rows of tubes		1	1	2	2
Number of tubes in the coil		10	10	24	24
Fin material		Aluminium			
Fin pitch	Mm	1.8	1.8	1.6	1.6
Maximum operating pressure	MPa	4.15	4.15	4.15	4.15
Total front area	m^2	0.30	0.30	0.36	0.36
Number of coils per unit		1	1	1	1
Fan					
Fan type		Multi-Blade Centrifugal Fan			
Fans per unit		1	1	1	1
Outer diameter	mm	360	360	360	360
Motor					
Shell		Drip-proof type enclosure			
Starting		DC Motor			
Quantity		1	1	1	1
Insulation class		E	E	E	E

RCD-(2.5-6.0)FSN3

MODEL		RCD-2.5FSN3	RCD-3.0FSN3	RCD-4.0FSN3	RCD-5.0FSN3	RCD-6.0FSN3
Heat exchanger						
Type		Multi-pass finned tube				
Tube material		Copper				
Outer diameter	mm	7	7	7	7	7
Rows of tubes		2	2	2	2	2
Number of tubes in the coil		24	24	24	24	24
Fin material		Aluminium				
Fin pitch	mm	1.6	1.6	1.6	1.6	1.6
Maximum operating pressure	MPa	4.15	4.15	4.15	4.15	4.15
Total front area	m^2	0.36	0.36	0.63	0.63	0.63
Number of coils per unit		1	1	1	1	1
Fan						
Fan type		Multi-Blade Centrifugal Fan				
Fans per unit		1	1	2	2	2
Outer diameter	mm	360	360	360	360	360
Motor						
Shell		Drip-proof type enclosure				
Starting		DC Motor				
Quantity		1	1	2	2	2
Insulation class		E	E	E	E	E

3.2.4 RPC-FSN3 - Ceiling type

RPC-(1.5-3.0)FSN3

MODEL		RPC-1.5FSN3	RPC-2.0FSN3	RPC-2.5FSN3	RPC-3.0FSN3
Heat exchanger					
Type		Multi-pass finned tube			
Tube material		Copper			
Outer diameter	mm	7	7	7	7
Rows of tubes		2	3	3	3
Number of tubes in the coil		14	20	20	20
Fin material		Aluminium			
Fin pitch	mm	1.6	1.8	1.8	1.8
Maximum operating pressure	MPa	4.15	4.15	4.15	4.15
Total front area	m^2	0.20	0.20	0.29	0.29
Number of coils per unit		1	1	1	1
Fan					
Fan type		Centrifugal			
Fans per unit		2	2	3	2
Outer diameter	mm	155	155	155	155
Motor					
Shell		Drip-proof type enclosure			
Starting		DC motor			
Quantity		1	1	1	1
Insulation class		E	E	E	E

RPC-(4.0-6.0)FSN3

MODEL		RPC-4.0FSN3	RPC-5.0FSN3	RPC-6.0FSN3
Heat exchanger				
Type		Multi-pass finned tube		
Tube material		Copper		
Outer diameter	mm	7	7	7
Rows of tubes		3	3	3
Number of tubes in the coil		20	20	20
Fin material		Aluminium		
Fin pitch	mm	1.6	1.6	1.6
Maximum operating pressure	MPa	4.15	4.15	4.15
Total front area	m^2	0.38	0.38	0.38
Number of coils per unit		1	1	1
Fan				
Fan type		Centrifugal		
Fans per unit		4	4	4
Outer diameter	mm	155	155	155
Motor				
Shell		Drip-proof type enclosure		
Starting		DC motor		
Quantity		1	1	1
Insulation class		E	E	E

3.2.5 RPI - Indoor ducted unit

RPI-(0.4-1.5)FSN5E

MODEL		RPI-0.4FSN5E	RPI-0.6FSN5E	RPI-0.8FSN5E	RPI-1.0FSN5E	RPI-1.5FSN5E
Heat exchanger						
Type		Multi-pass finned tube				
Tube material		Copper				
Outer diameter	mm	7	7	7	7	7
Rows of tubes		2	2	2	2	3
Number of tubes in the coil		16	16	16	16	24
Fin material		Aluminium				
Fin pitch	mm	1.8	1.8	1.8	1.8	1.8
Maximum operating pressure	MPa	4.15	4.15	4.15	4.15	4.15
Total front area	m^2	0.075	0.14	0.14	0.14	0.14
Number of coils per unit		1	1	1	1	1
Fan						
Fan type		Multi-blade centrifugal fan				
Fans per unit		1	2	2	2	2
Outer diameter	mm	136	136	136	136	136
Motor						
Shell		Splash-proof				
Starting		Direct current control				
Quantity		1	1	1	1	1
Insulation class		E	E	E	E	E

RPI-(2.0-3.0)FSN5E

MODEL		RPI-2.0FSN5E	RPI-2.5FSN5E	RPI-3.0FSN5E
Heat exchanger				
Type		Multi-pass finned tube		
Tube material		Copper		
Outer diameter	mm	7	7	7
Rows of tubes		2	3	3
Number of tubes in the coil		24	36	36
Fin material		Aluminium		
Fin pitch	mm	1.8	1.8	1.8
Maximum operating pressure	MPa	4.15	4.15	4.15
Total front area	m^2	0.21	0.21	0.21
Number of coils per unit		1	1	1
Fan				
Fan type		Multi-blade centrifugal fan		
Fans per unit		2	2	2
Outer diameter	mm	180	180	180
Motor				
Shell		Splash-proof		
Starting		Direct current control		
Quantity		1	1	1
Insulation class		E	E	E

RPI-(4.0-6.0)FSN5E

MODEL		RPI-4.0FSN5E	RPI-5.0FSN5E	RPI-6.0FSN5E
Heat exchanger				
Type		Multi-pass finned tube		
Tube material		Copper		
Outer diameter	mm	7	7	7
Rows of tubes		4	4	4
Number of tubes in the coils		36	48	48
Fin material		Aluminium		
Fin pitch	mm	1.8	1.8	1.8
Maximum operating pressure	MPa	4.15	4.15	4.15
Total front area	m^2	0.30	0.30	0.30
Number of coils per unit		1	1	1
Fan				
Fan type		Multi-blade centrifugal fan		
Fans per unit		2	2	2
Outer diameter	mm	180	180	180
Motor				
Shell		Splash-proof		
Starting		Direct current control		
Quantity		1	1	1
Insulation class		E	E	E

RPI-(8.0/10.0)FSN3E(-f)

MODEL		RPI-8.0FSN3E(-f)	RPI-10.0FSN3E(-f)
Heat exchanger			
Type		Multi-pass finned tube	
Tube material		Copper	
Outer diameter	mm	7	7
Rows of tubes		3	4
Number of tubes in the coil		60	80
Fin material		Aluminium	
Fin pitch	mm	1.8	1.8
Maximum operating pressure	MPa	4.15	4.15
Total front area	m^2	0.57	0.57
Number of coils per unit		1	1
Fan			
Fan type		Multi-blade centrifugal fan	
Fans per unit		2	2
Outer diameter	mm	240	240
Motor			
Shell		Drip-proof type enclosure	
Starting		Permanent split capacitor	
Quantity		1	1
Insulation class		F	F

RPI-(16.0/20.0)FSN3PE(-f)

MODEL		RPI-16.0FSN3PE(-f)	RPI-20.0FSN3PE(-f)
Heat exchanger			
Type		Multi-pass finned tube	
Tube material		Copper	
Outer diameter	mm	7	7
Rows of tubes		3	4
Number of tubes in the coil		60+60	80+80
Fin material		Aluminium with anti-corrosive coating treatment	
Fin pitch	mm	1.8	1.8
Maximum operating pressure	MPa	4.15	4.15
Total front area	m^2	0.57+0.57	0.57+0.57
Number of coils per unit		2	2
Fan			
Fan type		Multi-blade centrifugal fan	
Fans per unit		2+2	2+2
Outer diameter	mm	240	240
Motor			
Shell		Drip-proof type enclosure	
Starting		Permanent split capacitor	
Quantity		1+1	1+1
Insulation class		F	F

3.2.6 RPIM - Indoor ducted unit

RPIM-(0.6-1.5)FSN4E (-DU)

MODEL		RPIM-0.6FSN4E (-DU)	RPIM-0.8FSN4E (-DU)	RPIM-1.0FSN4E (-DU)	RPIM-1.5FSN4E (-DU)
Heat exchanger					
Type		Multi-pass finned tube			
Tube material		Copper			
Outer diameter	mm	7	7	7	7
Rows of tubes		2	2	2	3
Number of tubes in the coil		24	24	24	36
Fin material		Aluminium			
Fin pitch	mm	1.8	1.8	1.8	1.8
Maximum operating pressure	MPa	4.15	4.15	4.15	4.15
Total front area	m^2	0.12	0.12	0.12	0.12
Number of coils per unit		1	1	1	1
Fan					
Fan type		Multi-blade centrifugal fan			
Fans per unit		1	1	1	1
Outer diameter	mm	185	185	185	185
Motor					
Shell		Splash-proof			
Starting		Direct current control			
Quantity		1	1	1	1
Insulation class		E	E	E	E

3.2.7 RPK - Wall type

RPK-(0.4-1.5)FSN(H)4M

MODEL		RPK-0.4FSN(H)4M	RPK-0.6FSN(H)4M	RPK-0.8FSN(H)4M	RPK-1.0FSN(H)4M	RPK-1.5FSN(H)4M
Heat exchanger						
Type		Multi-pass finned tube				
Tube material		Copper				
Outer diameter	mm	7	7	7	7	7
Rows of tubes		2	2	2	2	2
Number of tubes in the coil		18	34	34	34	34
Fin material		Aluminium				
Fin pitch	mm	1.25	1.25	1.25	1.25	1.25
Maximum operating pressure	MPa	4.15	4.15	4.15	4.15	4.15
Total front area	m^2	0.20	0.20	0.20	0.20	0.24
Number of coils per unit		1	1	1	1	1
Fan						
Fan type		Multi-blade centrifugal				
Fans per unit		1	1	1	1	1
Outer diameter	mm	115	115	115	115	115
Motor						
Shell		Drip-proof type enclosure				
Starting		Direct current control				
Quantity		1	1	1	1	1
Insulation class		E	E	E	E	E

RPK-(2.0-4.0)FSN4M

MODEL		RPK-2.0FSN4M	RPK-2.5FSN4M	RPK-3.0FSN4M	RPK-4.0FSN4M
Heat exchanger					
Type		Multi-pass finned tube			
Tube material		Copper			
Outer diameter	mm	7	7	7	7
Rows of tubes		3	3	3	3
Number of tubes in the coil		40	56	46	56
Fin material		Aluminium			
Fin pitch	mm	front: 1.25 / back: 1.4	front: 1.25 / back: 1.4	front: 1.25 / back: 1.4	front: 1.25 / back: 1.4
Maximum operating pressure	MPa	4.15	4.15	4.15	4.15
Total front area	m^2	0.31	0.31	0.31	0.31
Number of coils per unit		1	1	1	1
Fan					
Fan type		Multi-blade centrifugal			
Fans per unit		1	1	1	1
Outer diameter	mm	115	115	115	115
Motor					
Shell			Drip-proof type enclosure		
Starting			Direct current control		
Quantity		1	1	1	1
Insulation class		E	E	E	E

3.2.8 RPF - Floor type and RPFI - Floor concealed type

RPF-(1.0-2.5)FSN2E

MODEL		RPF-1.0FSN2E	RPF-1.5FSN2E	RPF-2.0FSN2E	RPF-2.5FSN2E
Heat exchanger					
Type		Multi-pass finned tube			
Tube material		Copper			
Outer diameter	mm	7	7	7	7
Rows of tubes		2	2	2	3
Number of tubes in the coil		24	24	24	36
Fin material		Aluminium			
Fin pitch	mm	1.8	1.8	1.8	1.8
Maximum operating pressure	MPa	4.15	4.15	4.15	4.15
Total front area	m^2	0.13	0.16	0.22	0.22
Number of coils per unit		1	1	1	1
Fan					
Fan type		Multi-blade centrifugal fan			
Fans per unit		1	2	2	2
Outer diameter	mm	136	136	136	136
Motor					
Shell		Splash-proof			
Starting		Permanent split capacitor			
Quantity		1	1	1	1
Insulation class		B	B	B	B

RPFI-(1.0-2.5)FSN2E

MODEL		RPFI-1.0FSN2E	RPFI-1.5FSN2E	RPFI-2.0FSN2E	RPFI-2.5FSN2E
Heat exchanger					
Type		Multi-pass finned tube			
Tube material		Copper			
Outer diameter	mm	7	7	7	7
Rows of tubes		2	2	2	3
Number of tubes in the coils		24	24	24	36
Fin material		Aluminium			
Fin pitch	mm	1.8	1.8	1.8	1.8
Maximum operating pressure	MPa	4.15	4.15	4.15	4.15
Total front area	m^2	0.13	0.16	0.22	0.22
Number of coils per unit		1	1	1	1
Fan					
Fan type		Multi-blade centrifugal fan			
Fans per unit		1	2	2	2
Outer diameter	mm	136	136	136	136
Motor					
Shell		Splash-proof			
Starting		Permanent split capacitor			
Quantity		1	1	1	1
Insulation class		B	B	B	B

3.2.9 KPI Units

◆ KPI Energy recovery series

KPI-(252–2002)E4E

MODEL		KPI-252E4E	KPI-502E4E	KPI-802E4E	KPI-1002E4E	KPI-1502E4E	KPI-2002E4E
Fan							
Fan type		EC Fan					
Fans per unit		2	2	2	2	2	2
Outer diameter	mm	133	220	220	310	310	310
Motor							
Shell		Splash-proof					
Starting		Soft start					
Quantity		2	2	2	2	2	2
Insulation class		B	B	B	B	B	B
Filter							
Filter class		G3					
Efficiency	%	90					

◆ KPI Active series

KPI-(502-1002)X4E

MODEL		KPI-502X4E	KPI-802X4E	KPI-1002X4E
Fan				
Fan type		EC Fan		
Fans per unit		2	2	2
Outer diameter	mm	220	220	310
Motor				
Shell		Splash-proof		
Starting		Soft start		
Quantity		2		
Insulation class		B		
Filter				
Filter class		G3		
Efficiency	%	90		
Heat exchanger				
Type		Multi-pass finned tube		
Tube material		Copper		
Outer diameter	mm	7	7	7
Rows of tubes		2	2	2
Number of tubes in the coils		26	32	32
Fin material		Aluminium		
Fin pitch	mm			
Maximum operating pressure	MPa	4.15	4.15	4.15
Total front area	m^2	0.12	0.16	0.19
Number of coils per unit		1	1	1

3.3 Electrical data

3.3.1 Considerations

Key:

- U: power supply.
- PH: phase. f: frequency.
- IPT: total input power.
- RNC: operating current.
- MC: maximum current.

NOTE

The specifications given in the following tables are subject to change without prior notice.

3.3.2 RCI - 4-way cassette

Model	Main unit power supply			Applicable voltage		Fan motor				
	U (V)	PH	f (Hz)	Max. U (V)	Min. U (V)	IPT (kW)	RNC (A)	Max. IPT (kW)	MC (A) Operation	MC (A) Protection fuse
RCI-1.0FSN4	230	1	50	253	207	0.03	0.2	0.09	0.9	5.0
RCI-1.5FSN4						0.03	0.4	0.09	0.9	5.0
RCI-2.0FSN4						0.04	0.4	0.09	0.9	5.0
RCI-2.5FSN4						0.07	0.7	0.09	0.9	5.0
RCI-3.0FSN4						0.07	0.7	0.09	0.9	5.0
RCI-4.0FSN4						0.13	1.2	0.21	1.8	5.0
RCI-5.0FSN4						0.13	1.2	0.21	1.8	5.0
RCI-6.0FSN4						0.13	1.2	0.21	1.8	5.0

3.3.3 RCIM - 4-way cassette (compact)

Model	Main unit power supply			Applicable voltage		Fan motor				
	U (V)	PH	f (Hz)	Max. U (V)	Min. U (V)	IPT (kW)	RNC (A)	Max. IPT (kW)	MC (A) Operation	MC (A) Protection fuse
RCIM-0.4FSN4E	230	1	50	253	207	0.05	0.25	0.08	0.4	5.0
RCIM-0.6FSN4E						0.05	0.25	0.08	0.4	5.0
RCIM-0.8FSN4E						0.05	0.25	0.09	0.5	5.0
RCIM-1.0FSN4E						0.06	0.30	0.10	0.5	5.0
RCIM-1.5FSN4E						0.07	0.35	0.11	0.6	5.0
RCIM-2.0FSN4E						0.10	0.51	0.13	0.7	5.0
RCIM-2.5FSN4E						0.11	0.56	0.15	0.8	5.0

3.3.4 RCD - 2-way cassette

Model	Main unit power supply			Applicable voltage		Fan motor				
	U (V)	PH	f (Hz)	Max. U (V)	Min. U (V)	IPT (kW)	RNC (A)	Max. IPT (kW)	MC (A) Operation	MC (A) Protection fuse
RCD-0.8FSN3	230	1	50	253	207	0.03	0.13	0.05	0.6	5.0
RCD-1.0FSN3						0.03	0.14	0.06	0.6	5.0
RCD-1.5FSN3						0.05	0.23	0.08	0.8	5.0
RCD-2.0FSN3						0.06	0.29	0.09	0.9	5.0
RCD-2.5FSN3						0.07	0.37	0.10	1.0	5.0
RCD-3.0FSN3						0.09	0.48	0.12	1.1	5.0
RCD-4.0FSN3						0.11	0.55	0.14	1.1	5.0
RCD-5.0FSN3						0.13	0..68	0.16	1.3	5.0
RCD-6.0FSN3						0.15	0.76	0.18	1.4	5.0

3.3.5 RPC - Ceiling type

Model	Main unit power supply			Applicable voltage		Fan motor				
	U (V)	PH	f (Hz)	Max. U (V)	Min. U (V)	IPT (kW)	RNC (A)	Max. IPT (kW)	MC (A) Operation	MC (A) Protection fuse
RPC-1.5FSN3	230	1	50	253	207	0.04	0.2	0.12	0.7	5.0
RPC-2.0FSN3						0.05	0.3	0.12	0.8	5.0
RPC-2.5FSN3						0.05	0.3	0.15	0.8	5.0
RPC-3.0FSN3						0.06	0.3	0.15	0.9	5.0
RPC-4.0FSN3						0.10	0.5	0.41	1.2	5.0
RPC-5.0FSN3						0.16	0.8	0.41	1.6	5.0
RPC-6.0FSN3						0.19	1.0	0.41	1.7	5.0

3.3.6 RPI - Indoor ducted unit

Model	Main unit power supply			Applicable voltage		Fan motor				
	U (V)	PH	f (Hz)	Max. U (V)	Min. U (V)	IPT (kW)	RNC (A)	Max. IPT (kW)	MC (A) Operation	MC (A) Protection fuse
RPI-0.4FSN5E	230	1	50	253	207	0.03	0.3	0.04	0.4	5.0
RPI-0.6FSN5E						0.03	0.3	0.04	0.4	5.0
RPI-0.8FSN5E						0.03	0.3	0.04	0.4	5.0
RPI-1.0FSN5E						0.03	0.3	0.04	0.4	5.0
RPI-1.5FSN5E						0.04	0.4	0.05	0.5	5.0
RPI-2.0FSN5E						0.04	0.4	0.10	1.0	5.0
RPI-2.5FSN5E						0.08	0.7	0.14	1.3	5.0
RPI-3.0FSN5E						0.11	0.9	0.20	1.7	5.0
RPI-4.0FSN5E						0.16	1.3	0.20	1.7	5.0
RPI-5.0FSN5E						0.20	1.7	0.27	2.3	5.0
RPI-6.0FSN5E						0.22	1.8	0.28	2.3	5.0
RPI-8.0FSN3E(-f)						0.97	4.5	1.75	10.0	10.0
RPI-10.0FSN3E(-f)						1.06	4.8	1.91	10.0	10.0
RPI-16.0FSN3PE(-f)						1.94	9.0	3.50	16.2	16.2
RPI-20.0FSN3PE(-f)						2.12	9.6	3.82	17.7	17.7

3.3.7 RPIM - Indoor ducted unit

Model	Main unit power supply			Applicable voltage		Fan motor				
	U (V)	PH	f (Hz)	Max. U (V)	Min. U (V)	IPT (kW)	RNC (A)	Max. IPT (kW)	MC (A) Operation	MC (A) Protection fuse
RPIM-0.6FSN4E (-DU)	230	1	50	253	207	0.02	0.2	0.03	0.3	5.0
RPIM-0.8FSN4E (-DU)						0.02	0.2	0.03	0.3	5.0
RPIM-1.0FSN4E (-DU)						0.02	0.2	0.03	0.3	5.0
RPIM-1.5FSN4E (-DU)						0.03	0.3	0.04	0.4	5.0

3.3.8 RPK - Wall type

Model	Main unit power supply			Applicable voltage		Fan motor				
	U (V)	PH	f (Hz)	Max. U (V)	Min. U (V)	IPT (kW)	RNC (A)	Max. IPT (kW)	MC (A) Operation	MC (A) Protection fuse
RPK-0.4FSN(H)4M	230	1	50	253	207	0.02	0.2	0.03	0.2	5.0
RPK-0.6FSN(H)4M						0.02	0.2	0.03	0.2	5.0
RPK-0.8FSN(H)4M						0.02	0.2	0.03	0.2	5.0
RPK-1.0FSN(H)4M						0.02	0.2	0.03	0.2	5.0
RPK-1.5FSN(H)4M						0.05	0.4	0.06	0.4	5.0
RPK-2.0FSN4M						0.03	0.2	0.06	0.3	5.0
RPK-2.5FSN4M						0.05	0.4	0.08	0.5	5.0
RPK-3.0FSN4M						0.06	0.4	0.09	0.6	5.0
RPK-4.0FSN4M						0.06	0.6	0.10	0.7	5.0

3.3.9 RPF(I) - Floor type

Model	Main unit power supply			Applicable voltage		Fan motor				
	U (V)	PH	f (Hz)	Max. U (V)	Min. U (V)	IPT (kW)	RNC (A)	Max. IPT (kW)	MC (A) Operation	MC (A) Protection fuse
RPF(I)-1.0FSN2E	230	1	50	253	207	0.04	0.2	0.05	0.3	5.0
RPF(I)-1.5FSN2E						0.05	0.2	0.07	0.3	5.0
RPF(I)-2.0FSN2E						0.09	0.4	0.12	0.6	5.0
RPF(I)-2.5FSN2E						0.09	0.4	0.12	0.6	5.0

3.3.10 KPI energy

Model	Main unit power supply			Applicable voltage		Fan motor			
	U (V)	PH	f (Hz)	Max. U (V)	Min. U (V)	IPT (kW)	RNC (A)	Max. IPT (kW)	MC (A)
KPI-252E4E	230	1	50	253	207	0.05	0.39	0.10	4.0
KPI-502E4E						0.12	0.88	0.20	4.0
KPI-802E4E						0.24	1.82	0.27	4.0
KPI-1002E4E						0.26	1.85	0.35	8.0
KPI-1502E4E						0.46	2.11	0.58	8.0
KPI-2002E4E						0.67	3.04	0.81	8.0
KPI-502X4E						0.13	1.06	0.20	4.0
KPI-802X4E						0.26	2.01	0.27	4.0
KPI-1002X4E						0.36	2.68	0.36	8.0

4. System selection procedure

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4.1 System selection procedure

In the outdoor unit technical documentation there is detailed the selection procedure of the indoor units and outdoor unit.

Bearing in mind the building layout, the planned location of the indoor units and the air flow distribution, always select units that provide the most efficiency, performance and comfort.

Plan a location to install the units that allow for easy maintenance and operating tasks and for the installing of refrigerant pipes.

Appropriate selection of indoor units and nominal capacity.

The pre-selected capacity of the different indoor units need to be the immediately higher in all the units, in order to apply a safety factor considering the different correction factors existing, which will reduce the capacity.

Select the outdoor unit and the most suitable indoor-outdoor unit combination according to design conditions. To do so, consult the Technical Catalogue for the corresponding outdoor unit series (UTOPIA or SET FREE).

The selection procedure is divided into two main parts: cooling and heating, in line with the specific requirements of each installation.

It also necessary to selection the indoor units according to the different indoor unit characteristics described in the following chapter.

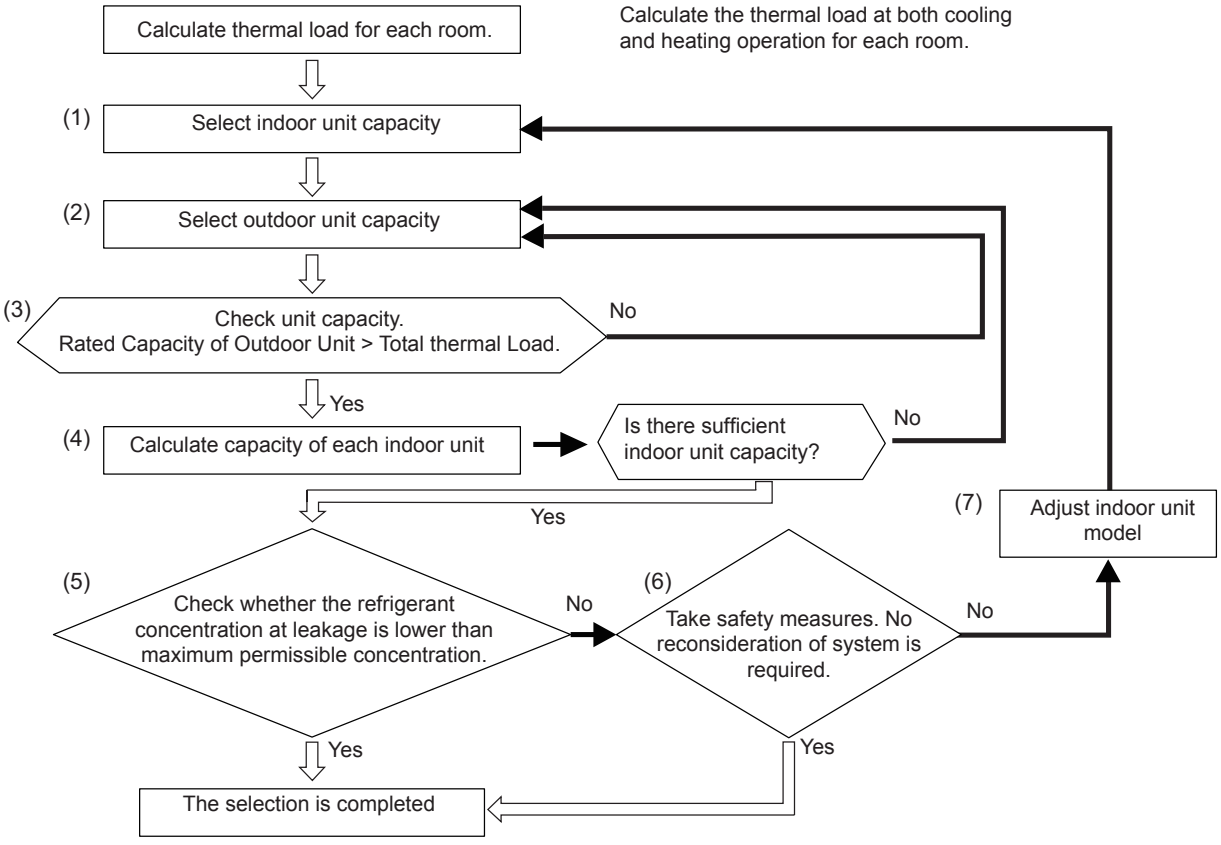
NOTE

- *For the setting temperature at the heating operation in RPI, RCD and RCI indoor unit type, consider the temperature irregularity between the floor and the ceiling surface. The temperature around the ceiling surface normally becomes 2ºC higher than the floor surface during the heating operation.*
- *For selecting indoor unit capacity, if the sensible heating load is considered, consider the sensible heat correction factor (SHF)*

Indoor unit sensible heating capacity = Indoor units capacity x SHF factor

Brief description of the system selection procedure

The procedure for system selection follows the flowchart below.



A detailed explanation of each of the steps is provided as follows.

(1) Selecting indoor unit capacity.

Set a tentative model of indoor unit for each room, making sure that its capacity complies with the following rule::

Nominal capacity of the indoor unit > Estimated load for the corresponding room

Then, sum up each the nominal capacity of all the indoor units (The calculation for both cooling and heating operation is required).

Total nominal capacity of the indoor units = ∑ Nominal capacity of each indoor unit

NOTE

In case that the room temperature used to calculate the estimate load of the rooms differs from the rated temperatures for each operation mode (27 ºC DB / 19 ºC WB for cooling, 20 ºC DB for heating), it is advisable to carry out a rough calculation to check whether the capacity of the selected indoor units is sufficient..

Indoor unit capacity = Nominal capacity of each indoor unit x Correction factor (room temperature)

Correction factor according to room temperature: select the outdoor unit capacity at the estimated load from the “Cooling / Heating capacity tables”.

Correction Factor (room temperature) = Outdoor unit capacity at estimated load at room temperature / Nominal outdoor unit capacity

(2) Selecting outdoor unit capacity.

Establish the desired connection ratio based on the total combined capacity of the indoor units and set a tentative outdoor unit capacity according to the total nominal capacity of the indoor units calculated in step (1).

Outdoor unit capacity at estimated load: Check the temperatures used for the estimation of load when calculating the capacity of the outdoor unit. In case that the room temperature or the outdoor air temperature are different from those used for the calculation of nominal capacity (room temperature: 27 ºC DB / 19 ºC WB for cooling, 20 ºC DB for heating; outdoor air temperature: 35 ºC DB for cooling, 7 ºC DB / 6 ºC WB for heating), then select the outdoor unit capacity at the estimated load (considering the room temperature and outdoor air temperature) from the “Cooling / Heating capacity tables” in the technical documentation of the outdoor unit.

Then, calculate the maximum capacity of the outdoor unit considering the correction factors depending on piping length, height difference and altitude, as well as the defrosting correction factor (for heating operation).

The calculation for both cooling and heating operation is required.

Corrected Outdoor unit capacity = Outdoor unit capacity at estimated load x Correction factors (piping length and height difference, altitude correction factor, defrosting correction factor (for heating operation))

(3) Checking outdoor unit capacity.

Compare the outdoor unit capacity obtained in step (2) with the total nominal capacity of the indoor units obtained in step (1), making sure that the following is true.

Corrected Outdoor Unit capacity > Total thermal load (the total sum of the thermal load of all the rooms)

(4) Calculating the capacity of each indoor unit.

Recalculate indoor unit capacity as follow (The calculation for both cooling and heating operation is required).

Real indoor unit capacity for each room = Capacity of the system (obtained in step 2) × (Nominal capacity of the indoor unit / Total nominal capacity of the indoor units of the installed indoor units(obtained in step 2))

Confirm that the real indoor unit capacity for each room is sufficient to cover the thermal load required for the corresponding room:

Indoor Unit real capacity > Load for concerned room (*)

(*) Indoor unit real capacity is calculated with all indoor units working at full capacity. Maximum indoor unit capacity is up to nominal capacity when total load doesn’t exceed outdoor unit capacity.

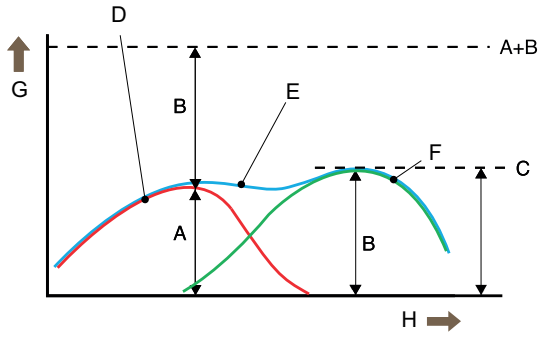
In case that outdoor unit capacity is either too small to cover the thermal load required for one or more of the rooms or too large to cover the thermal load required in each and all of the rooms, then recalculate it in step (2) after selecting an outdoor unit with increased or decreased capacity, as appropriate.

In case that is a significant lack or excess of capacity in a given room persists even after having recalculated outdoor unit requirements, it is advisable to select another indoor unit model for that room.

Different load areas

In some buildings or installations the load can be split in a different areas and each area don't required the maximum load simultaneous. For example in a typical building with a morning peak heat load on the east area, and in the afternoon a peak occurs on the west area. In this cases the outdoor units to be selected only need to cover the maximum simultaneous load for the entire building.

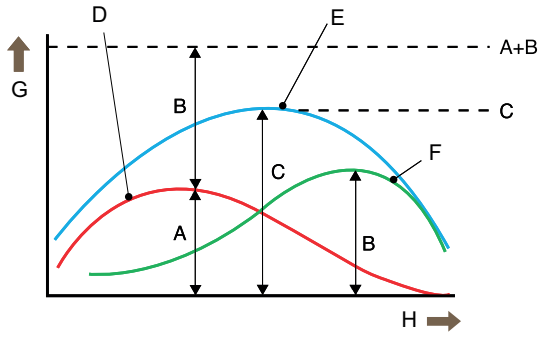
- The following diagram shown a installation where the maximum simultaneous load occur in the wester area (B = C)



A: morning peak heat load in the eastern area
B: evening peak heat load in the western area
C: maximum simultaneous load for the entire building
D: eastern area load
E: total load
F: western area load
G: load
H: time

The selected outdoor units need to cover the load in the western area (B) and the indoor units need to cover the load of each western rooms as well as the indoor units in easter rooms need to cover load of each room (at the temperatures used for calculate the estimate load of the rooms).

- The following diagram shown a installation where the maximum simultaneous load for entire building occur when there are load simultaneous in both area (but are not the maximum of each area).



A: morning peak heat load in the eastern area
B: evening peak heat load in the western area
C: maximum simultaneous load for the entire building
D: eastern area load
E: total load
F: western area load
G: load
H: time

In these case the selected outdoor units need to cover the maximum simultaneous load for the entire building (C) and the indoor units maximum capacity need to cover the maximum load of each room (at the temperatures used for calculate the estimate load of the rooms).

NOTE

In case that the total indoor unit capacity exceeds the capacity of the outdoor unit, the discharge temperature in heating operation may drop and cause discomfort when outdoor air temperature is low or piping length is long, or when all the indoor units are operated simultaneously. Therefore, the installation should be designed making sure that the "cooling/heating" capacity of the indoor units calculated from the "cooling/heating" capacity for the system is greater than the required heating load.

(5) Checking the concentration of refrigerant in the event of refrigerant leakage < Permissible concentration of refrigerant

(6) Taking safety measures (Reconsideration of system is not required.)

(7) Correction of indoor unit model if the outcome of both (5) and (6) is negative.

4.2 Sensible heat correction factor (SHF)

Sensible heat factor of the indoor units for each fan speed (High 2, High, Medium, Low), according to the JIS B8616 Standard.

Indoor unit model	Sensible heat factor (SHF)			
	High 2	High	Medium	Low
RCI-1.0FSN4	0.86	0.85	0.81	0.80
RCI-1.5FSN4	0.89	0.83	0.80	0.71
RCI-2.0FSN4	0.89	0.78	0.71	0.67
RCI-2.5FSN4	0.87	0.81	0.73	0.67
RCI-3.0FSN4	0.81	0.76	0.67	0.64
RCI-4.0FSN4	0.77	0.71	0.68	0.65
RCI-5.0FSN4	0.72	0.69	0.65	0.62
RCI-6.0FSN4	0.69	0.68	0.64	0.61
RCIM-0.4FSN4E	0.96	0.94	0.92	0.90
RCIM-0.6FSN4E	0.94	0.92	0.90	0.89
RCIM-0.8FSN4E	0.87	0.86	0.85	0.84
RCIM-1.0FSN4E	0.83	0.82	0.81	0.80
RCIM-1.5FSN4E	0.74	0.73	0.73	0.72
RCIM-2.0FSN4E	0.71	0.71	0.71	0.70
RCIM-2.5FSN4E	0.68	0.70	0.70	0.70
RCD-0.8FSN3	0.93	0.87	0.82	0.78
RCD-1.0FSN3	0.86	0.81	0.77	0.73
RCD-1.5FSN3	0.84	0.79	0.76	0.72
RCD-2.0FSN3	0.75	0.72	0.69	0.66
RCD-2.5FSN3	0.73	0.69	0.67	0.65
RCD-3.0FSN3	0.74	0.70	0.67	0.64
RCD-4.0FSN3	0.74	0.70	0.68	0.65
RCD-5.0FSN3	0.73	0.69	0.67	0.64
RCD-6.0FSN3	0.71	0.68	0.66	0.64
RPC-1,5FSN3	0.86	0.81	0.76	0.70
RPC-2.0FSN3	0.73	0.69	0.68	0.66
RPC-2.5FSN3	0.73	0.69	0.68	0.65
RPC-3.0FSN3	0.75	0.72	0.68	0.66
RPC-4.0FSN3	0.77	0.74	0.71	0.67
RPC-5.0FSN3	0.71	0.68	0.67	0.63
RPC-6.0FSN3	0.69	0.66	0.63	0.60

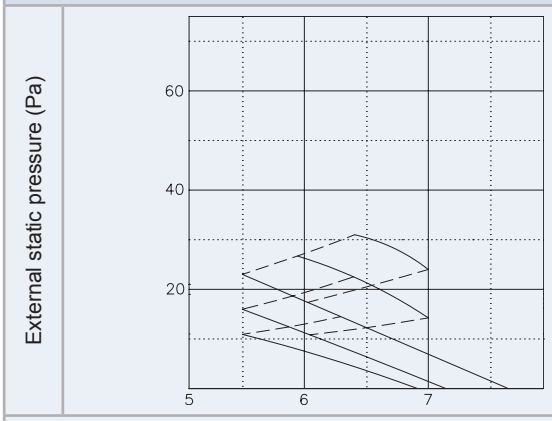
Indoor unit model	Sensible heat factor (SHF)			
	High 2	High	Medium	Low
RPI-0.4FSN5E	-	0.83	0.76	0.70
RPI-0.6FSN5E	-	0.81	0.75	0.69
RPI-0.8FSN5E	-	0.81	0.75	0.69
RPI-1.0FSN5E	-	0.81	0.75	0.69
RPI-1.5FSN5E	-	0.73	0.69	0.65
RPI-2.0FSN5E	-	0.76	0.75	0.74
RPI-2.5FSN5E	-	0.76	0.74	0.72
RPI-3.0FSN5E	-	0.75	0.71	0.67
RPI-4.0FSN5E	-	0.73	0.71	0.65
RPI-5.0FSN5E	-	0.72	0.68	0.64
RPI-6.0FSN5E	-	0.72	0.69	0.67
RPI-8.0FSN3E(-f)	-	0.77	0.77	0.70
RPI-10.0FSN3E(-f)	-	0.79	0.79	0.72
RPI-16.0FSN3PE(-f)	-	0.77	-	0.70
RPI-20.0FSN3PE(-f)	-	0.79	-	0.72
RPIM-0.6FSN4E(-DU)	-	0.81	0.75	0.69
RPIM-0.8FSN4E(-DU)	-	0.81	0.75	0.69
RPIM-1.0FSN4E(-DU)	-	0.81	0.75	0.69
RPIM-1.5FSN4E(-DU)	-	0.71	0.68	0.64
RPK-0.4FSN(H)4M	0.92	0.83	0.77	0.73
RPK-0.6FSN(H)4M	0.90	0.81	0.75	0.72
RPK-0.8FSN(H)4M	0.90	0.81	0.75	0.72
RPK-1.0FSN(H)4M	0.78	0.70	0.66	0.65
RPK-1.5FSN(H)4M	0.82	0.73	0.69	0.66
RPK-2.0FSN4M	0.71	0.69	0.66	0.65
RPK-2.5FSN4M	0.73	0.70	0.67	0.65
RPK-3.0FSN4M	0.72	0.69	0.67	0.64
RPK-4.0FSN4M	0.67	0.66	0.65	0.65
RPF(I)-1.0FSN2E	-	0.73	0.69	0.65
RPF(I)-1.5FSN2E	-	0.73	0.69	0.65
RPF(I)-2.0FSN2E	-	0.73	0.69	0.65
RPF(I)-2.5FSN2E	-	0.73	0.69	0.65
KPI-502X4E	-	0.69	0.60	0.56
KPI-802X4E	-	0.70	0.64	0.62
KPI-1002X4E	-	0.73	0.67	0.65

4.3 RPI Fan performance

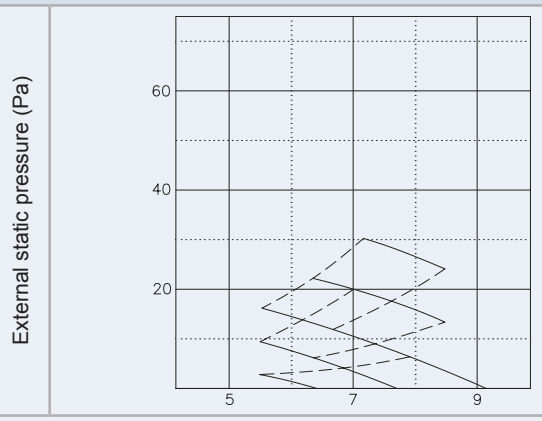
⚠ CAUTION

- *Make sure SP-02 is selected on the remote control for RPI-(0.4-6.0)FSN5E units in the case of short duct installations. To configure SP-02, refer the optional functions C5->"02", low static pressure option. Make sure the low static pressure option (LSP) is selected for RPI (8.0/10.0)FSN3E(-f) units.*
- *Ensure a minimal resistance is maintained in the duct, as shown in the fan performance graphs. Starting the unit with a duct that is too short causes it to operate outside its accepted operating range.*

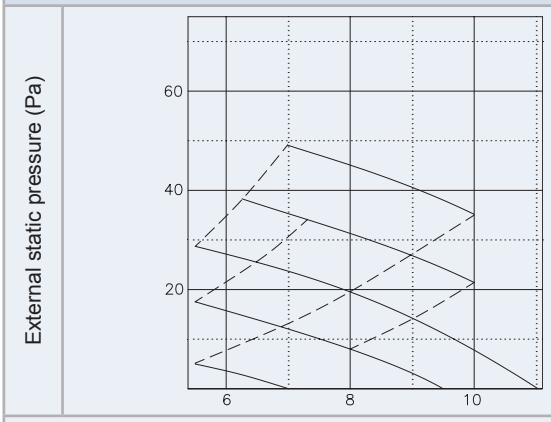
RPI-0.4FSN5E



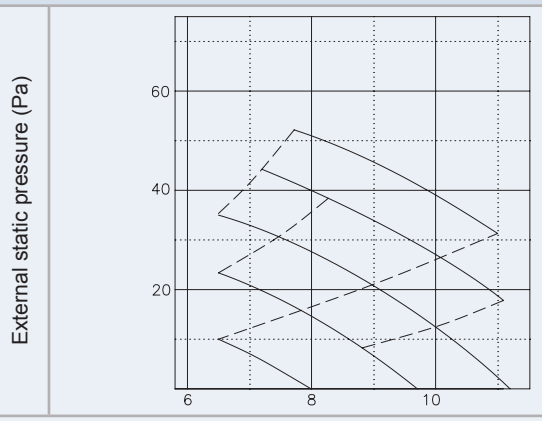
RPI-0.6FSN5E



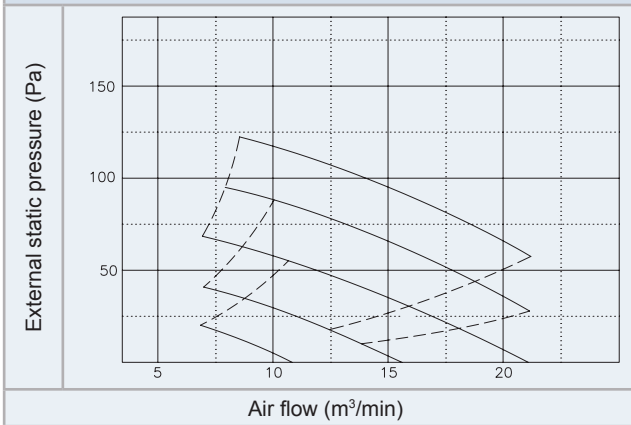
RPI-(0.8-1.0)FSN5E



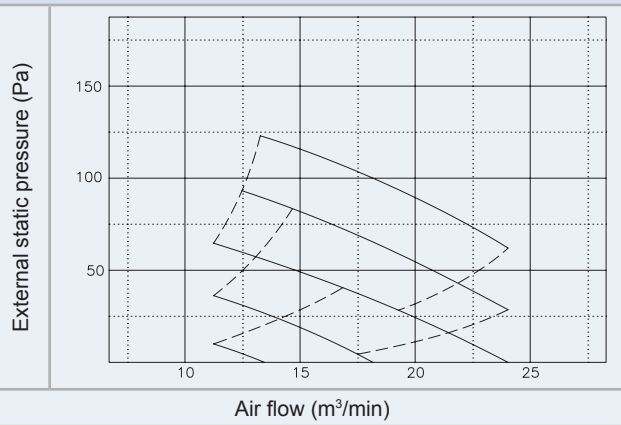
RPI-1.5FSN5E



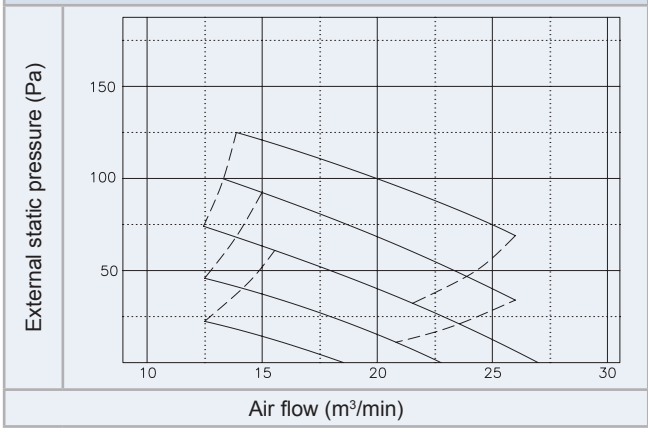
RPI-2.0FSN5E



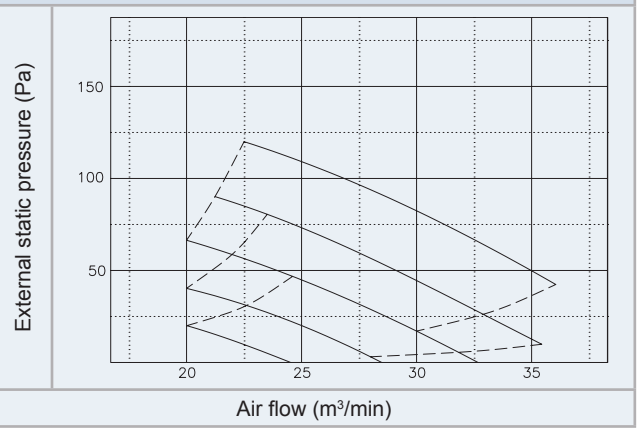
RPI-2.5FSN5E



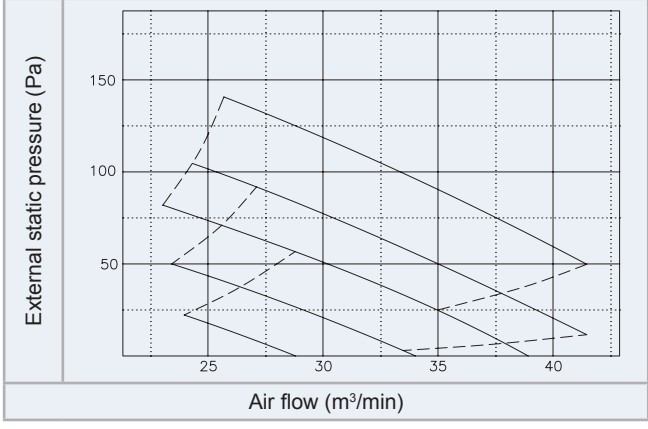
RPI-3.0FSN5E



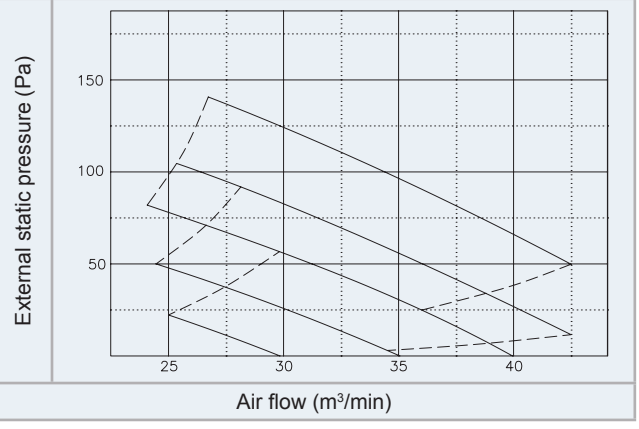
RPI-4.0FSN5E



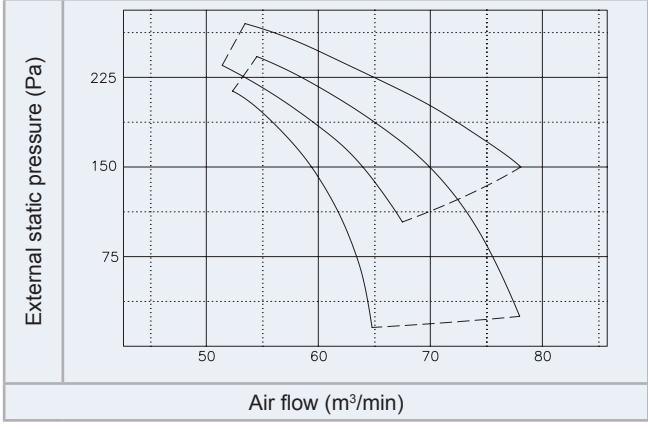
RPI-5.0FSN5E



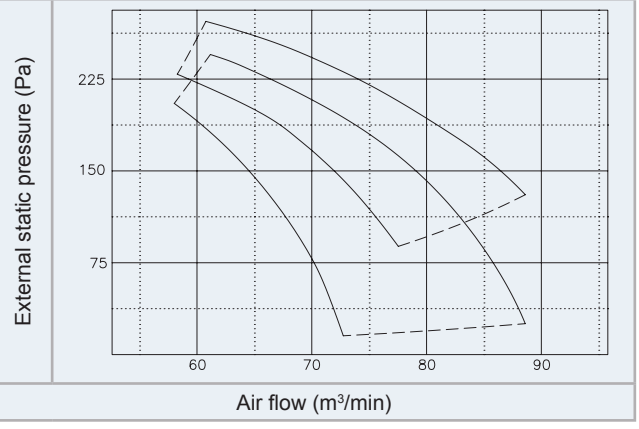
RPI-6.0FSN5E



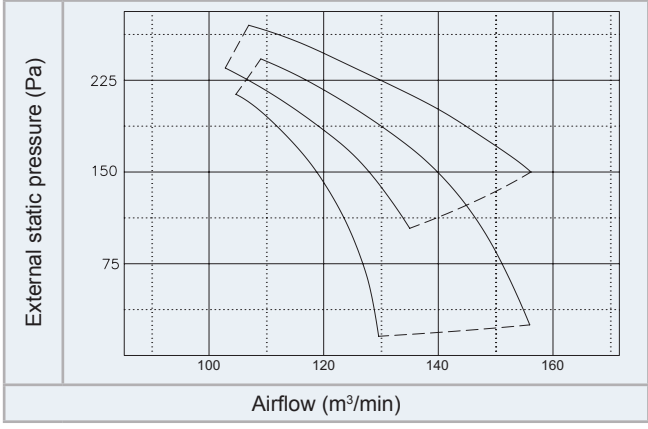
RPI-8.0FSN3E(-f)



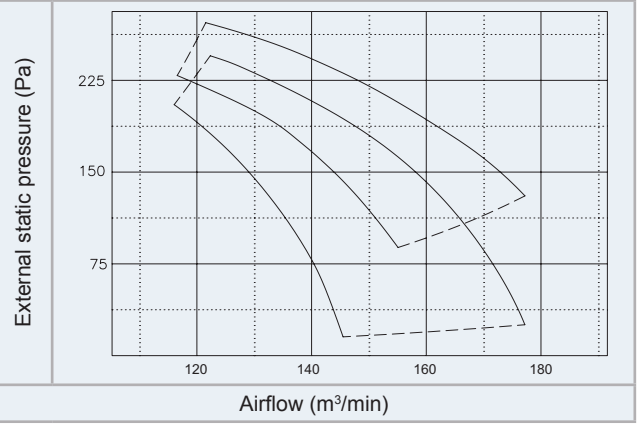
RPI-10.0FSN3E(-f)



RPI-16.0FSN3PE(-f)



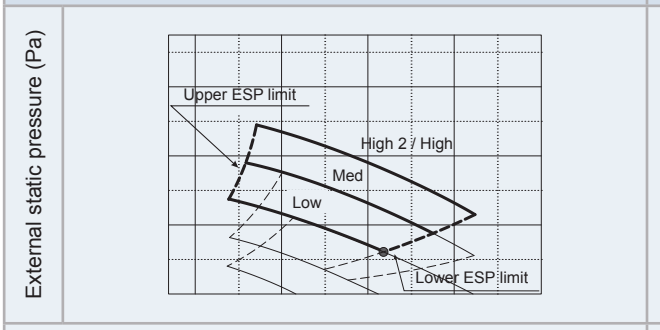
RPI-20.0FSN3PE(-f)



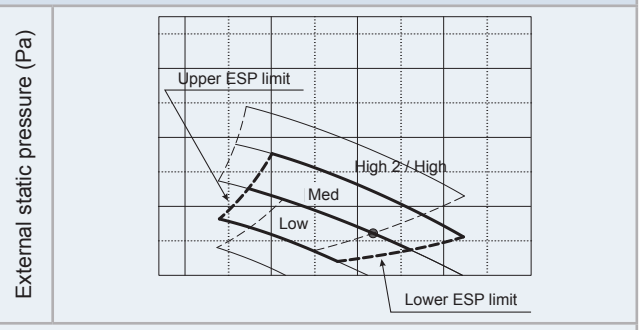
◆ Fan speed availability according to the selected external static pressure RPI-(0.4-6.0)FSN5E

According to the selected of External Static Pressure configuration (through the optional function C5) the fan speed available in the Remote Control Switch are the ones show as example in the following pictures.

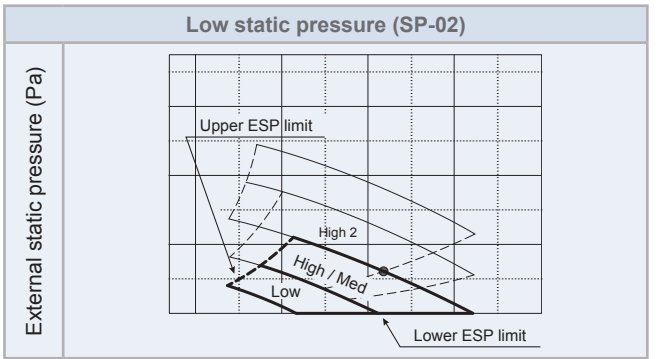
High static pressure (SP-01)



Standard static pressure (SP-00)



Low static pressure (SP-02)



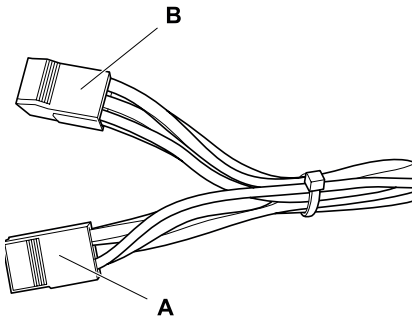
NOTE

- *"High 2" speed available only with PC-ARFP(1)E remote control switch.*
- *Factory setting C5 = 00.*

◆ Fan speed availability according to the static pressure setting (RPI-(8.0/10.0)FSN3E(-f), RPI-(16.0/20.0)FSN3PE)-(f)

The fan motor in RPI-(8.0/10.0)FSN3E(-f) and RPI-(16.0/20.0)FSN3PE(-f) units can be configured in two different ways:

- A: connector CN24 LSP (Low Static Pressure);
- B: connector CN25 HSP (High Static Pressure). (factory supplied).



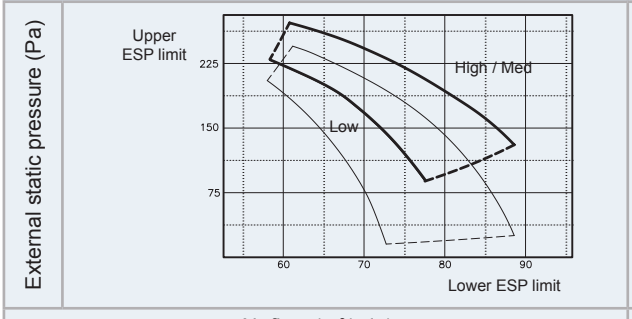
CAUTION

Perform the connection with the same settings in both units that make up models RPI-(16.0/20.0)FSN3E(-f); otherwise malfunction may occur, causing damage to the units.

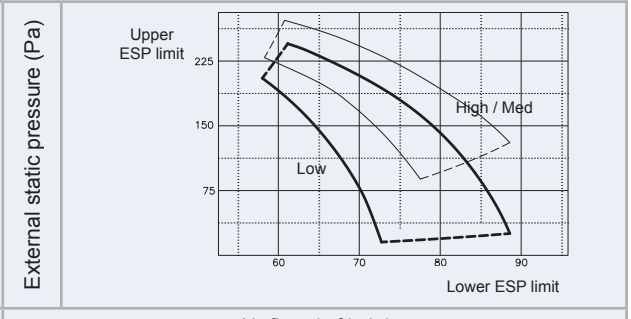
According to the Static Pressure setting (connector CN24 LSP (Low Static Pressure) or CN25 HSP (High Static Pressure)) the fan speed available in the Remote Control Switch are the ones show as example in the following pictures.

- Example for RPI-(8.0/10.0)FSN3E(-f):

Static pressure setting HSP

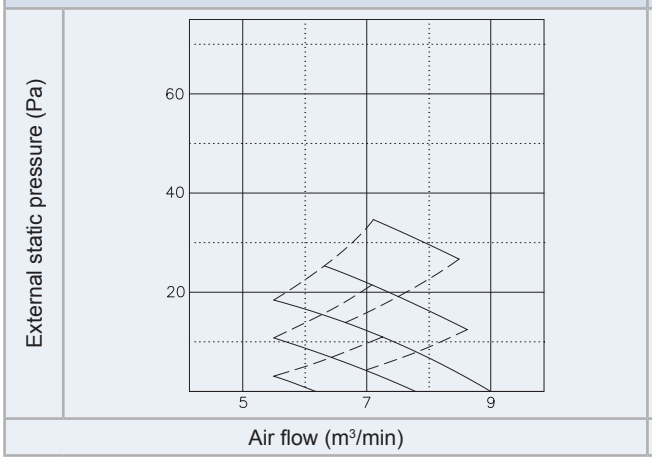


Static pressure setting LSP

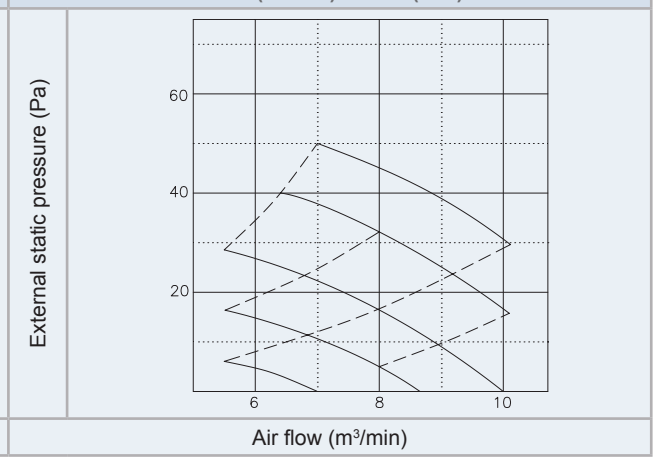


4.4 RPIM Fan performance

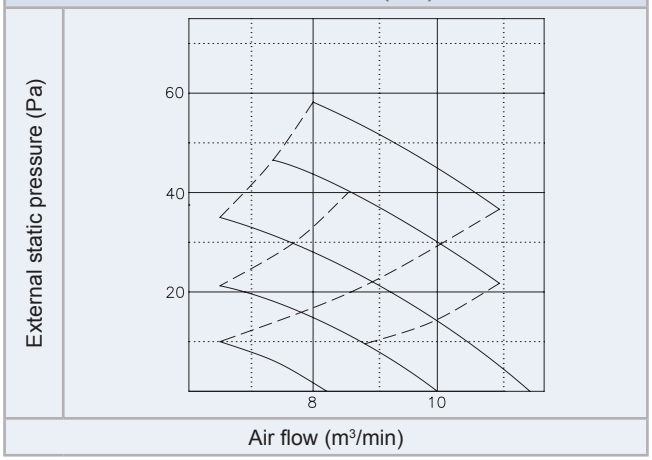
RPIM-0.6FSN4E



RPIM-(0.8-1.0)FSN4E (-DU)



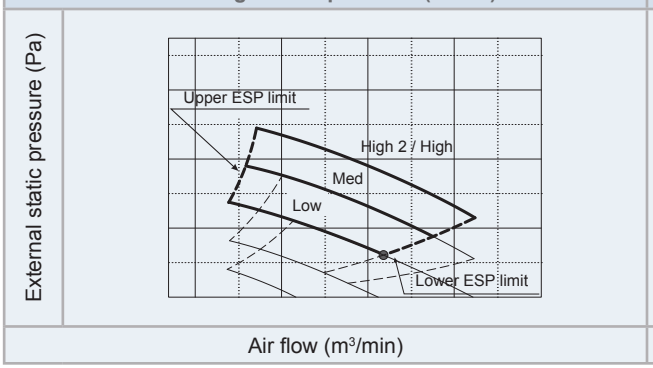
RPIM-1.5FSN4E (-DU)



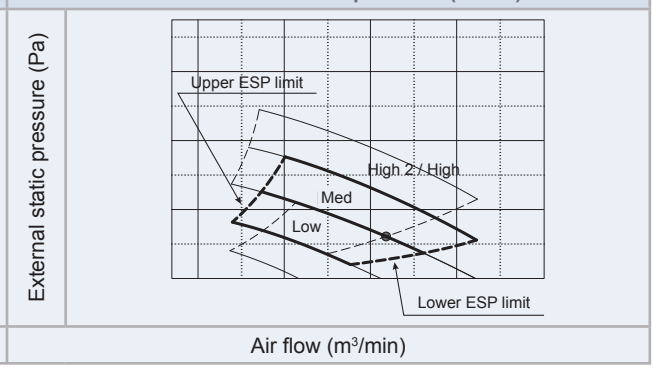
◆ **Fan speed availability according to the selected external static pressure RPIM-(0.8-1.5)FSN4E**

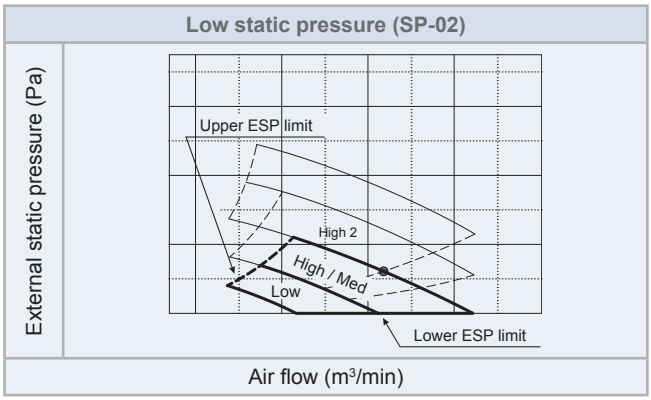
According to the selected of External Static Pressure configuration (through the optional function C5) the fan speed available in the Remote Control Switch are the ones show as example in the following pictures.

High static pressure (SP-01)



Standard static pressure (SP-00)





NOTE

- *"High 2" speed available only with PC-ARFP(1)E remote control switch.*
- *Factory setting C5 = 00.*

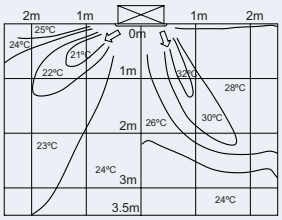
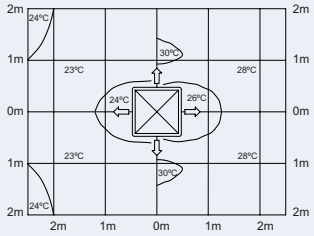
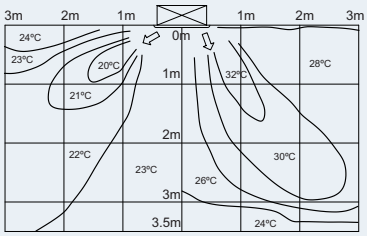
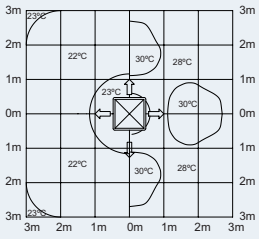
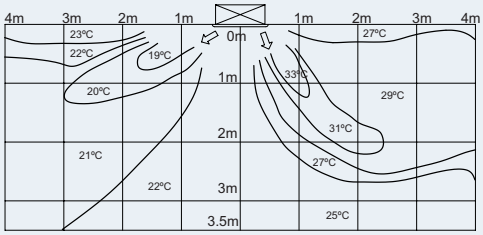
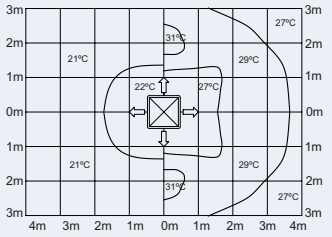
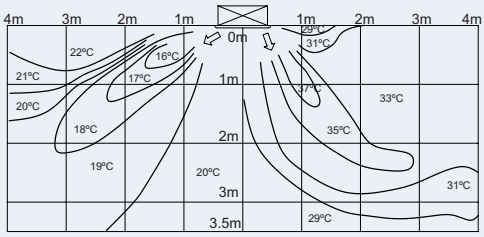
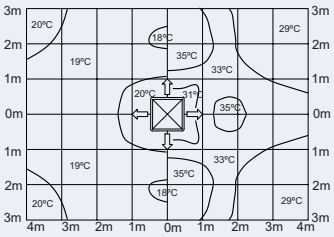
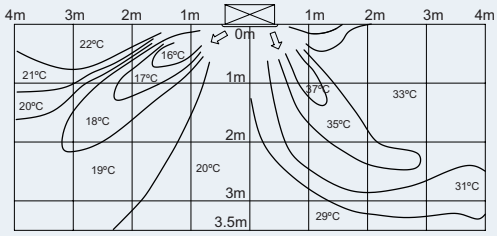
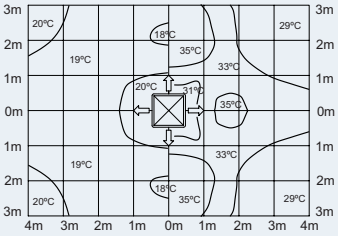
4.5 Temperature distribution diagrams

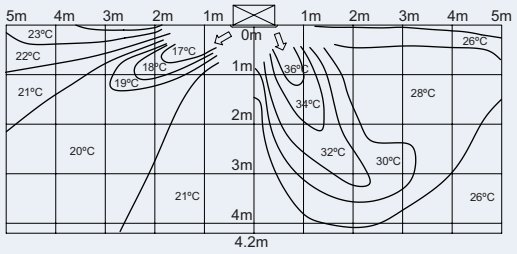
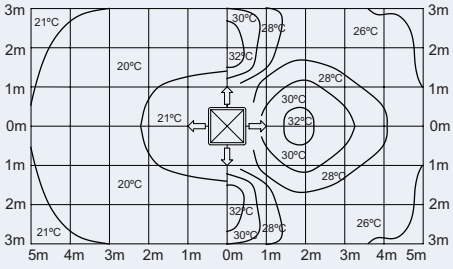
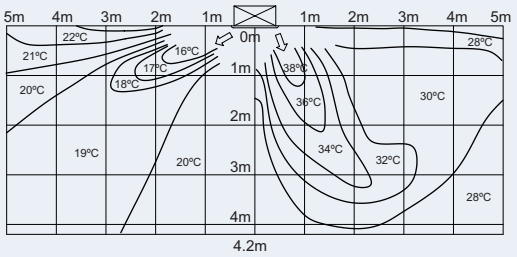
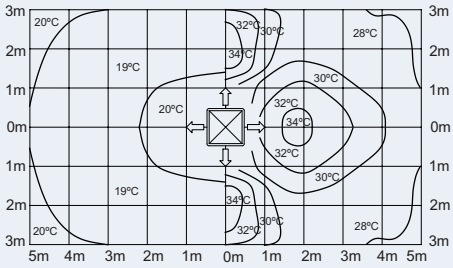
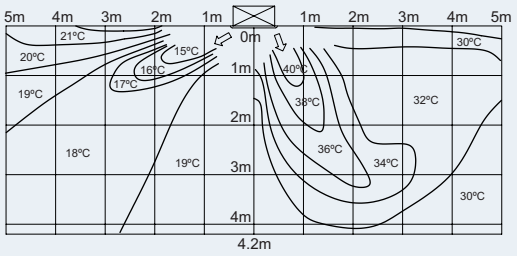
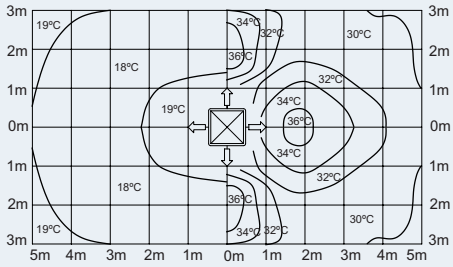
The air is discharged almost symmetrically. The illustrations show obstacle-free air distribution.

Figures in this chapter shown a calculated temperature distributions near the centre of the air outlet and in case where added a load proportional to cooling or heating capacity onto the wall and floor under the conditions JIS standard.

The values do not necessarily math the wind speed distribution. They vary depending on air temperature, wall and floor size and temperature, ceiling height, louver position, obstacles, etc.

4.5.1 RCI-(1.0-6.0)FSN4 - 4-way cassette

Model	Temperature distribution diagram			
	Vertical temperature distribution		Horizontal temperature distribution (Height: 1.2 m)	
	Cooling (Indoor temperature: 27 °C dry bulb / 19 °C wet bulb)	Heating (Indoor temperature: 20 °C dry bulb)	Cooling (Indoor temperature: 27 °C dry bulb / 19 °C wet bulb)	Heating (Indoor temperature: 20 °C dry bulb)
RCI-(1.0)FSN4 Air projection distance: 2.7 m (at air speed: 0.3 m/s)				
RCI-(1.5)FSN4 Air projection distance: 2.7 m (at air speed: 0.3 m/s)				
RCI-2.0FSN4 Air projection distance: 2.7 m (at air speed: 0.3 m/s)				
RCI-2.5FSN4 Air projection distance: 2.7 m (at air speed: 0.3 m/s)				
RCI-3.0FSN4 Air projection distance: 3.2 m (at air speed: 0.3 m/s)				

Model	Temperature distribution diagram			
	Vertical temperature distribution		Horizontal temperature distribution (Height: 1.2 m)	
	Cooling (Indoor temperature: 27 °C dry bulb / 19 °C wet bulb)	Heating (Indoor temperature: 20 °C dry bulb)	Cooling (Indoor temperature: 27 °C dry bulb / 19 °C wet bulb)	Heating (Indoor temperature: 20 °C dry bulb)
RCI-4.0FSN4 Air projection distance: 3.2 m (at air speed: 0.3 m/s)				
RCI-5.0FSN4 Air projection distance: 3.2 m (at air speed: 0.3 m/s)				
RCI-6.0FSN4 Air projection distance: 3.2 m (at air speed: 0.3 m/s)				

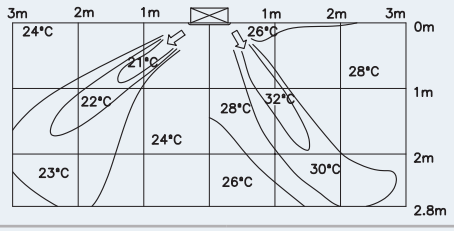
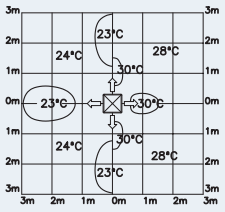
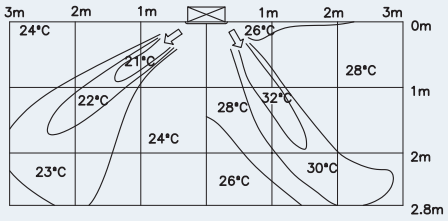
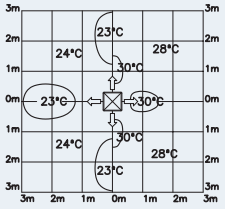
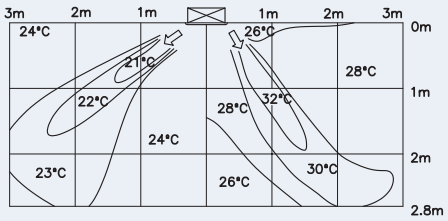
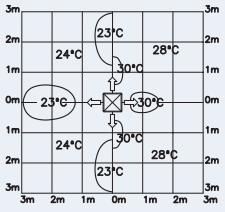
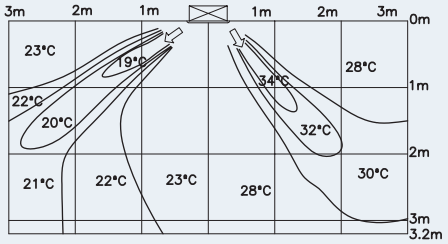
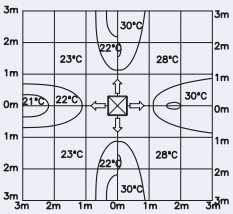
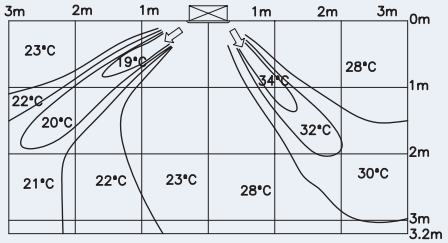
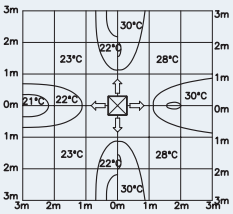
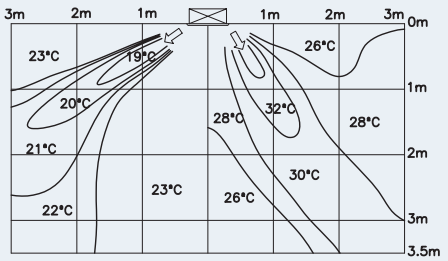
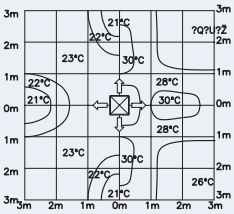
NOTE

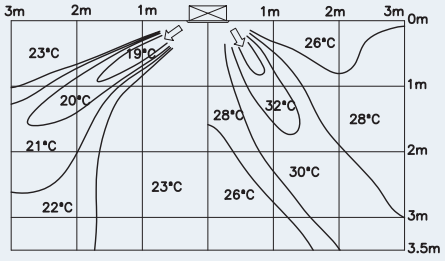
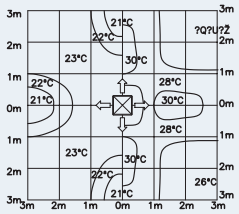
Louver angle test:

- *cooling 25°*
- *heating 60°*

Indoor unit set at High2 speed

4.5.2 RCIM (0.4-2.5)FSN4E - 4-way cassette (compact)

Model	Temperature distribution diagram			
	Vertical temperature distribution		Horizontal temperature distribution (Height: 1.2 m)	
	Cooling (Indoor temperature: 27 °C dry bulb / 19 °C wet bulb)	Heating (Indoor temperature: 20 °C dry bulb)	Cooling (Indoor temperature: 27 °C dry bulb / 19 °C wet bulb)	Heating (Indoor temperature: 20 °C dry bulb)
RCIM-0.4FSN4E Air projection distance: 2.8 m (at air speed: 0.3 m/s)				
RCIM-0.6FSN4E Air projection distance: 2.8 m (at air speed: 0.3 m/s)				
RCIM-0.8FSN4E Air projection distance: 2.8 m (at air speed: 0.3 m/s)				
RCIM-1.0FSN4E Air projection distance: 3.2 m (at air speed: 0.3 m/s)				
RCIM-1.5FSN4E Air projection distance: 3.2 m (at air speed: 0.3 m/s)				
RCIM-2.0FSN4E Air projection distance: 3.5 m (at air speed: 0.3 m/s)				

Model	Temperature distribution diagram			
	Vertical temperature distribution		Horizontal temperature distribution (Height: 1.2 m)	
	Cooling (Indoor temperature: 27 °C dry bulb / 19 °C wet bulb)	Heating (Indoor temperature: 20 °C dry bulb)	Cooling (Indoor temperature: 27 °C dry bulb / 19 °C wet bulb)	Heating (Indoor temperature: 20 °C dry bulb)
RCIM-2.5FSN4E Air projection distance: 3.5 m (at air speed: 0.3 m/s)				

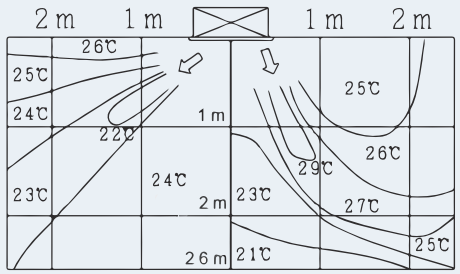
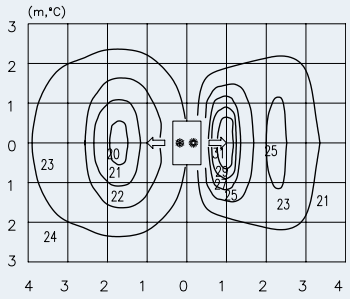
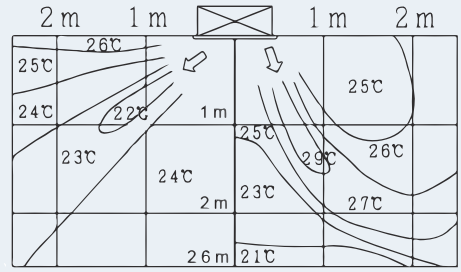
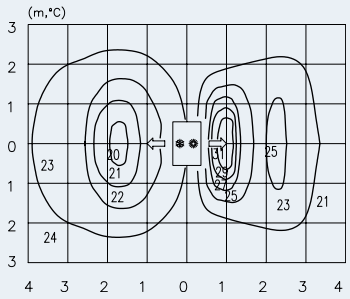
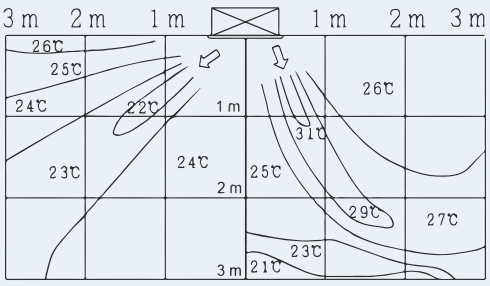
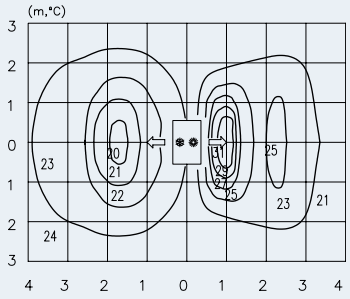
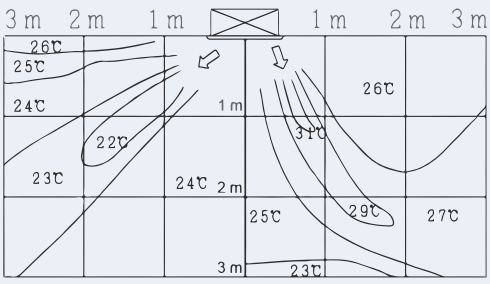
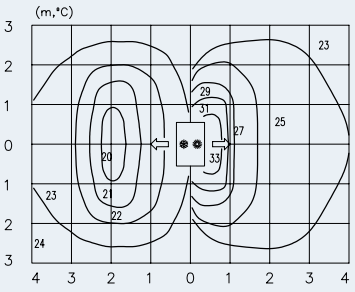
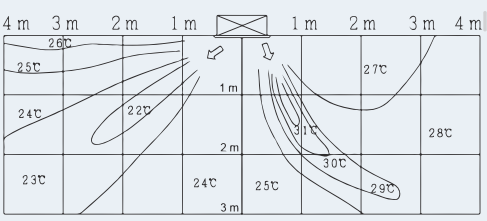
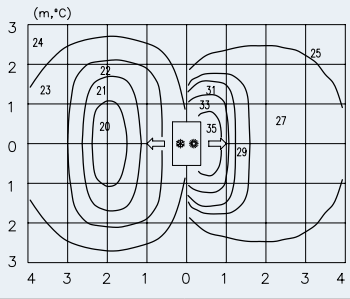
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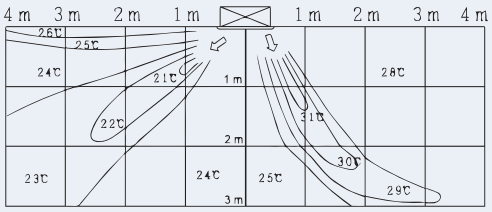
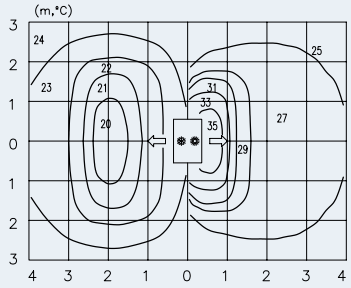
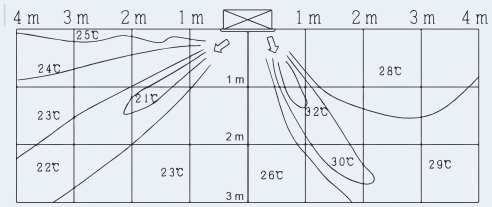
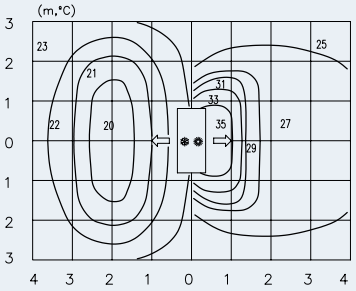
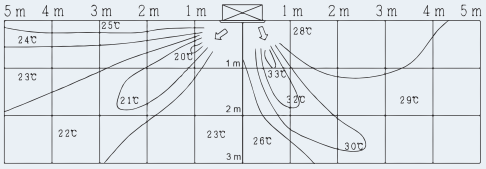
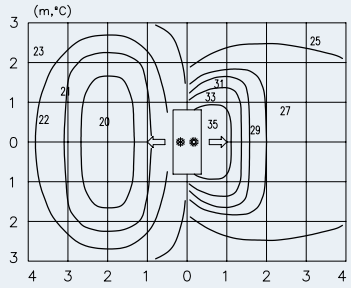
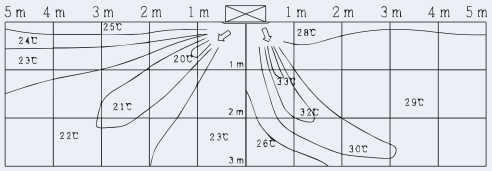
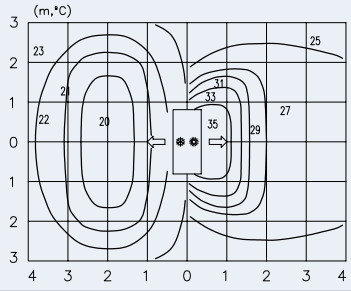
Louver angle test:

- *cooling 35°*
- *heating 60°*

Indoor unit set at High2 speed

4.5.3 RCD-(0.8-6.0)FSN3 - 2-way cassette

Model	Temperature distribution diagram			
	Vertical temperature distribution		Horizontal temperature distribution (Height: 1.2 m)	
	Cooling (Indoor temperature: 27 °C dry bulb / 19 °C wet bulb)	Heating (Indoor temperature: 20 °C dry bulb)	Cooling (Indoor temperature: 27 °C dry bulb / 19 °C wet bulb)	Heating (Indoor temperature: 20 °C dry bulb)
RCD-0.8FSN3 Air projection distance: 2.6 m (at air speed: 0.3 m/s)				
RCD-1.0FSN3 Air projection distance: 2.6 m (at air speed: 0.3 m/s)				
RCD-1.5FSN3 Air projection distance: 3.0 m (at air speed: 0.3 m/s)				
RCD-2.0FSN3 Air projection distance: 3.0 m (at air speed: 0.3 m/s)				
RCD-2.5FSN3 Air projection distance: 3.0 m (at air speed: 0.3 m/s)				

Model	Temperature distribution diagram			
	Vertical temperature distribution		Horizontal temperature distribution (Height: 1.2 m)	
	Cooling (Indoor temperature: 27 °C dry bulb / 19 °C wet bulb)	Heating (Indoor temperature: 20 °C dry bulb)	Cooling (Indoor temperature: 27 °C dry bulb / 19 °C wet bulb)	Heating (Indoor temperature: 20 °C dry bulb)
RCD-3.0FSN3 Air projection distance: 3.0 m (at air speed: 0.3 m/s)				
RCD-4.0FSN3 Air projection distance: 3.5 m (at air speed: 0.3 m/s)				
RCD-5.0FSN3 Air projection distance: 3.0 m (at air speed: 0.3 m/s)				
RCD-6.0FSN3 Air projection distance: 3.0 m (at air speed: 0.3 m/s)				

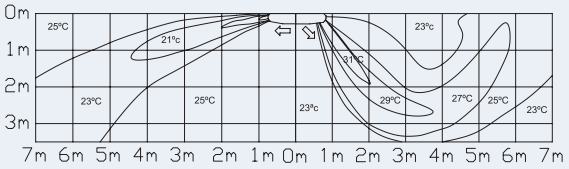
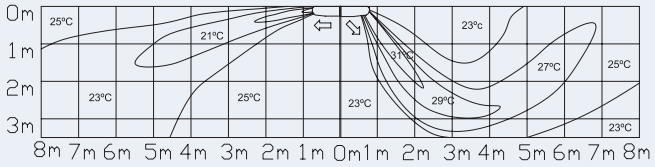
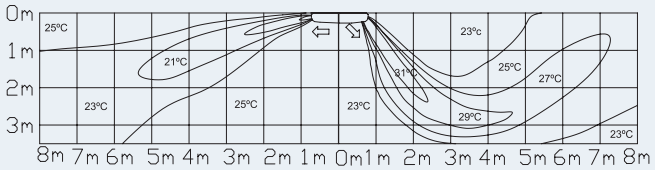
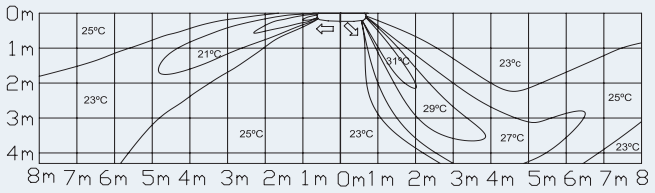
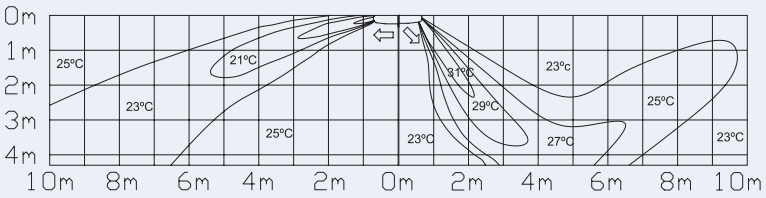
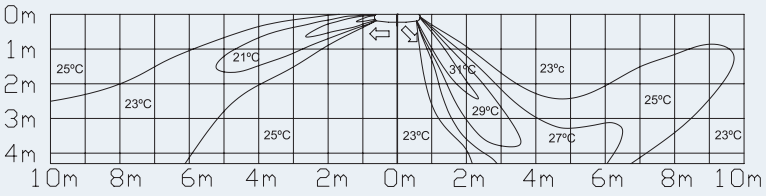
NOTE

Louver angle test:

- *cooling 35°*
- *heating 60°*

Indoor unit set at High2 speed

4.5.4 RPC-(1.5-6.0)FSN3 - Ceiling type

Temperature distribution diagram		
Model	Vertical temperature distribution	
	Cooling (Indoor temperature: 27 °C dry bulb / 19 °C wet bulb)	Heating (Indoor temperature: 20 °C dry bulb)
RPC-(1.5/2.0)FSN3 Air projection distance: 4.5 m (at air speed: 0.3 m/s)		
RPC-2.5FSN3 Air projection distance: 4,8 m (at air speed: 0.3 m/s)		
RPC-3.0FSN3 Air projection distance: 5.3 m (at air speed: 0.3 m/s)		
RPC-4.0FSN3 Air projection distance: 6.4 m (at air speed: 0.3 m/s)		
RPC-5.0FSN3 Air projection distance: 7.5 m (at air speed: 0.3 m/s)		
RPC-6.0FSN3 Air projection distance: 8.0 m (at air speed: 0.3 m/s)		

NOTE

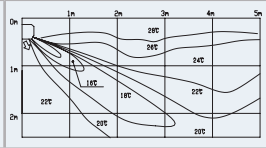
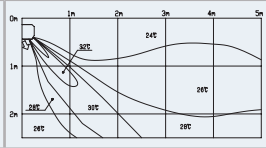
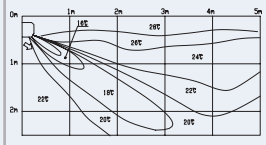
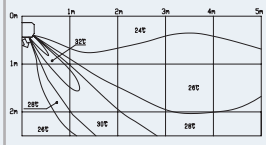
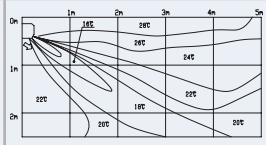
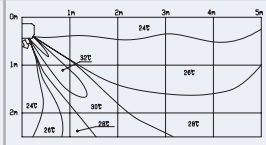
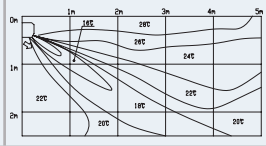
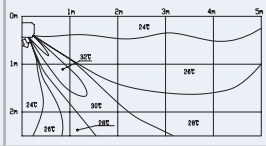
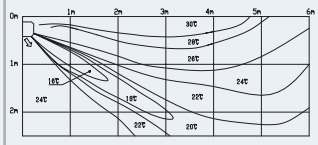
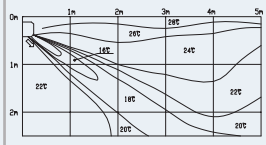
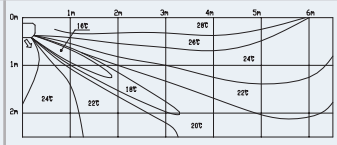
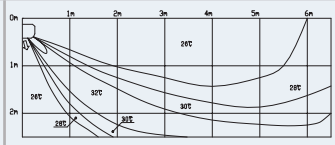
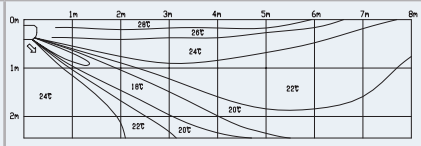
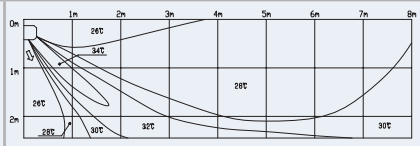
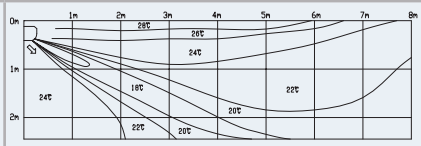
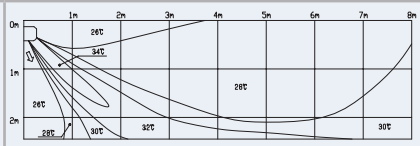
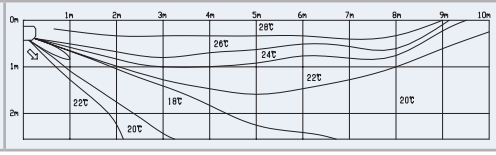
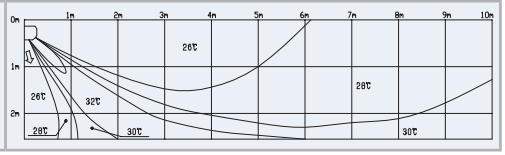
Louver angle test:

- *cooling 10°*
- *heating 35°*

Indoor unit set at High2 speed

4.5.5 RPK-(0.4-4.0)FSN(H)4M - Wall type

Standard at ceiling Height 2,4 m (at High speed)

Model	Temperature distribution diagram Vertical temperature distribution Cooling (Indoor temperature: 27 °C dry bulb / 19 °C wet bulb)	Heating (Indoor temperature: 20 °C dry bulb)
RPK-0.4FSN(H)4M Air projection distance: 2.7 m (at air speed: 0.3 m/s)		
RPK-0.6FSN(H)4M Air projection distance: 3.0 m (at air speed: 0.3 m/s)		
RPK-0.8FSN(H)4M Air projection distance: 3.5 m (at air speed: 0.3 m/s)		
RPK-1.0FSN(H)4M Air projection distance: 3.5 m (at air speed: 0.3 m/s)		
RPK-1.5FSN(H)4M Air projection distance: 4.5 m (at air speed: 0.3 m/s)		
RPK-2.0FSN4M Air projection distance: 4.7 m (at air speed: 0.3 m/s)		
RPK-2.5FSN4M Air projection distance: 6.0 m (at air speed: 0.3 m/s)		
RPK-3.0FSN4M Air projection distance: 6.0 m (at air speed: 0.3 m/s)		
RPK-4.0FSN4M Air projection distance: 6.5 m (at air speed: 0.3 m/s)		

NOTE

Louver angle test:

- *cooling 30°*
- *heating 55°*

Indoor unit set at High2 speed

4.6 Selection procedure for KPI

4.6.1 Selection guide

There are two methods for calculating the appropriate unit:

1 Area method.
2 Occupant method.

Local legislation regarding the certification of the end results must be checked.

This is a quick method for calculating ventilation requirements. Remember that the result is only approximate.

The air in the room must be renewed to reduce the CO_2 index in it and eliminate any unpleasant smells, smoke and pollution. In short, the room must be ventilated to provide its occupants with higher comfort levels.

The first point of the analysis consists of determining the type of activity to take place in the room: an office is not the same as a restaurant. The volume of the room in question must then be calculated.

Method 1: area method

This method is based on areas and on the quantity of air changes.

$$Volume\ V\ (m^3) = A \times B \times C$$

A x B: area of the room (m^2).

C: ceiling height (m).

Consult the table below to ascertain the number of air changes required, depending on the type of room.

NOTE

This table is not standard to all countries, although the layout will be similar. Consult the specific regulations in force in each country.

Required changes per hour	
Cathedral	0
Modern church (low ceiling)	1-2
Schools	2-3
Offices	3-4
Bars	4-6
Hospitals	5-6
Restaurants	5-6
Laboratories	6-8
Discos	10-12
Kitchens	10-15
Laundries	20-30

The flow of air to be changed is calculated using the following formula:

$$Air\ flow\ C\ (m^3/h) = V \times N$$

V: volume of the room (m^3).

N: number of air changes.

Considering an average height of 3 m, the appropriate KPI unit must be selected according to the fan performance curves (Air flow / External static pressure).

Method 2: occupant method

Air flow (m^3) C = 20 x (*A* x *B*)/*D*

A x *B*: area of the room (m^2).

20: constant.

D: area occupied by each person (m^2); this area is limited to 10.

4.6.2 Calculation of heat exchanger efficiency

The following process describes the way total efficiency of the KPI unit heat exchanger is obtained and the way of calculating the supply air temperature.

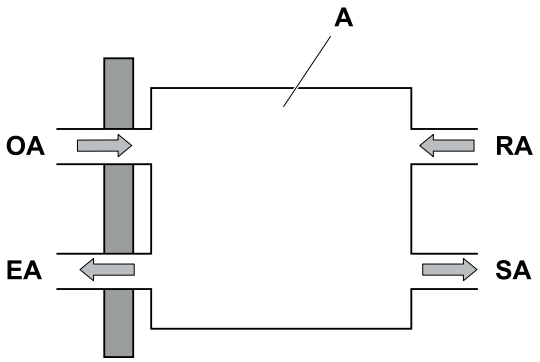
A: heat exchanger.

OA: fresh outdoor air.

EA: exhaust air.

SA: supply air.

RA: return air.



Nominal temperature exchange conditions				
Location	Indoor (RA)		Outdoor (OA)	
Temperature (°C)	Dry bulb	Wet bulb	Dry bulb	Wet bulb
Cooling (kW)	27±1	20±2	35±1	29±2
Heating (kW)	20±1	14±2	5±1	2±2

The supply and exhaust air flow volume is the same.

The equations used for the necessary parameters to calculate the operating conditions of the KPI unit are given below. It is first necessary to balance energy.

Temperature exchange efficiency (sensible exchange efficiency):

$\eta t = t(OA)-t(SA) / t(OA)-t(RA)$ x 100 (%)

Humidity exchange efficiency (latent exchange efficiency):

$\eta x = x(OA)-x(SA) / x(OA)-x(RA) = x\ 100\ (\%)$

Total heat exchange efficiency (enthalpy exchanger efficiency):

$\eta i = (i(OA)-i(SA)) / i(OA)-i(RA)$ x 100 (%)

The supply air temperature can be deduced by using the temperature exchange efficiency, according to the following formula:

$t(SA) = t(OA)-\eta t(t(OA)-t(RA))$

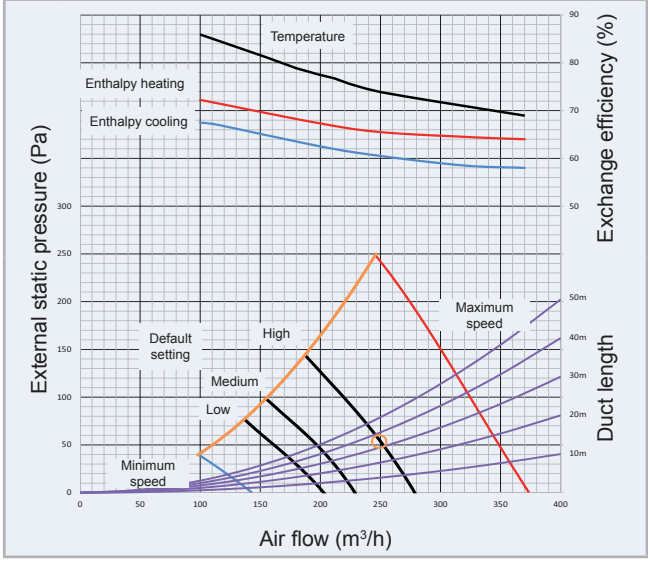
NOTE

- *ηt can be obtained from the graphs in Chapters "KPI-(252-2002)E4E units" or "KPI-(502-1002)X4E units".*
- *The temperature exchange efficiency is obtained by determining the air flow required.*
- *Temperature **t** is expressed in °C DB (dry bulb).*
- *Humidity **x** is expressed in kg_w / kg_a.*
- *Enthalpy **i** is expressed in kJ / kg.*

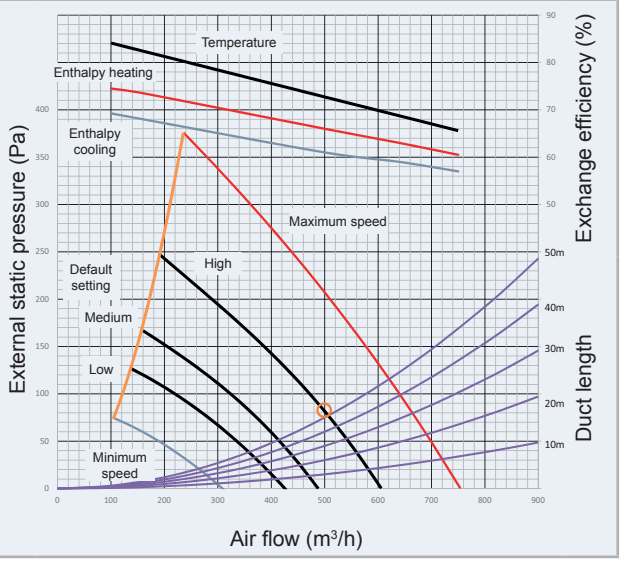
4.6.3 KPI energy

◆ KPI-(252-2002)E4E units

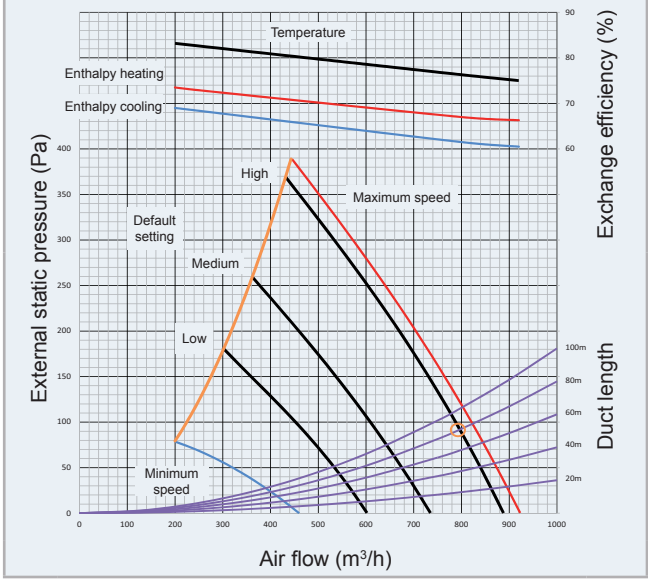
KPI-252E4E



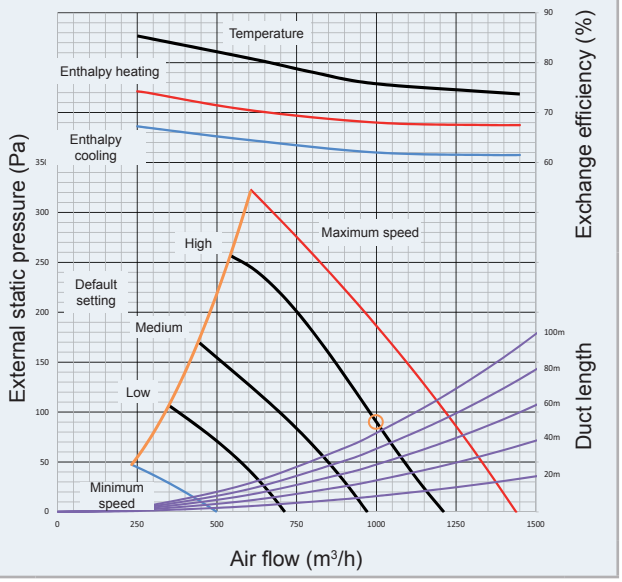
KPI-502E4E



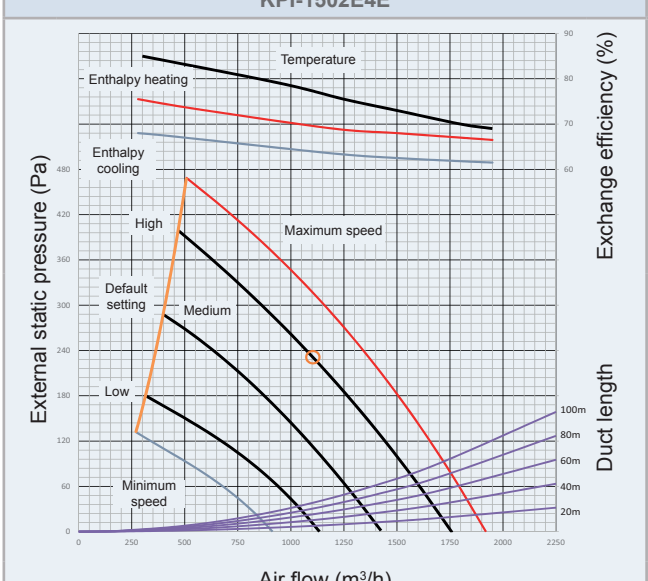
KPI-802E4E



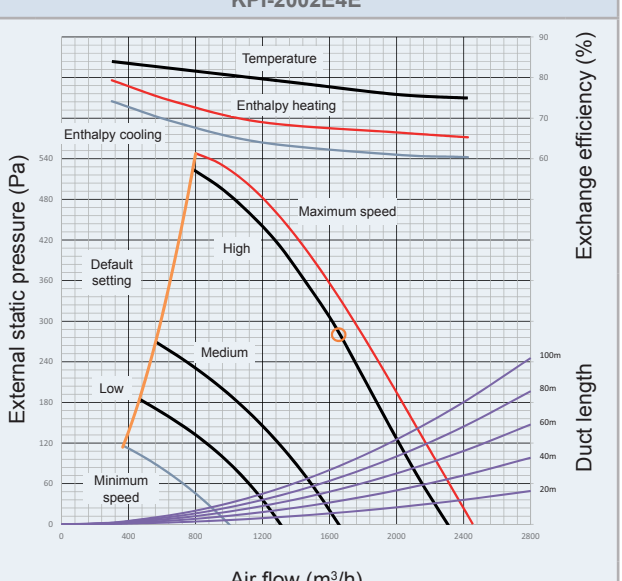
KPI-1002E4E



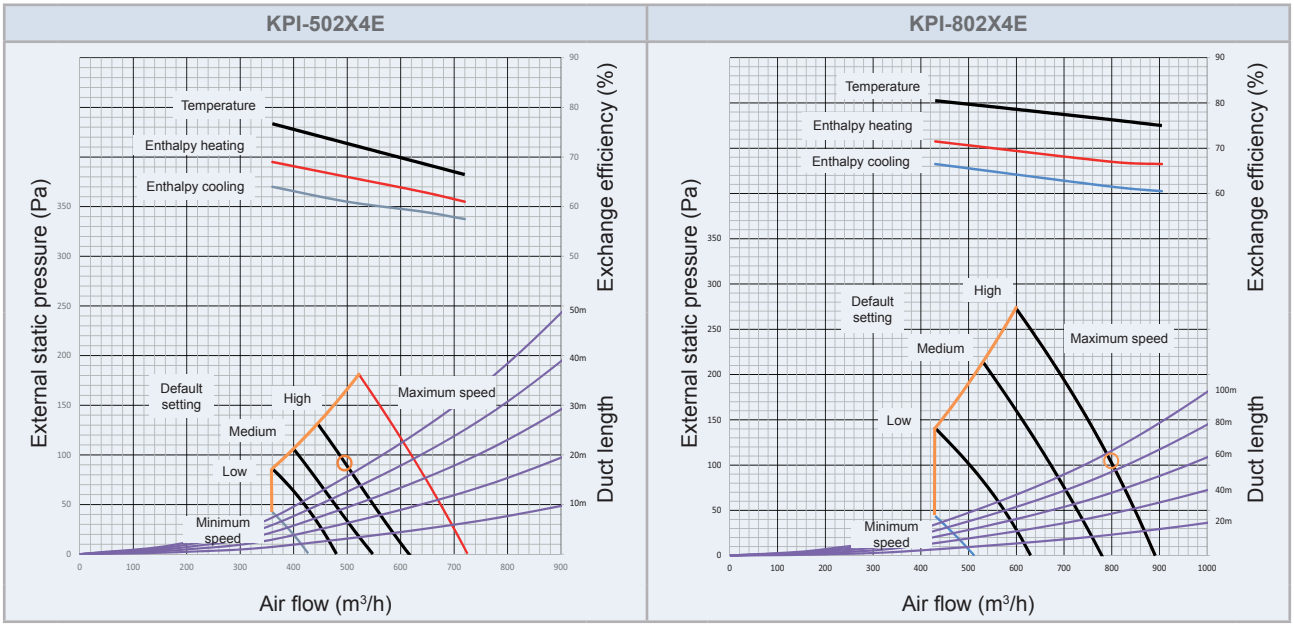
KPI-1502E4E

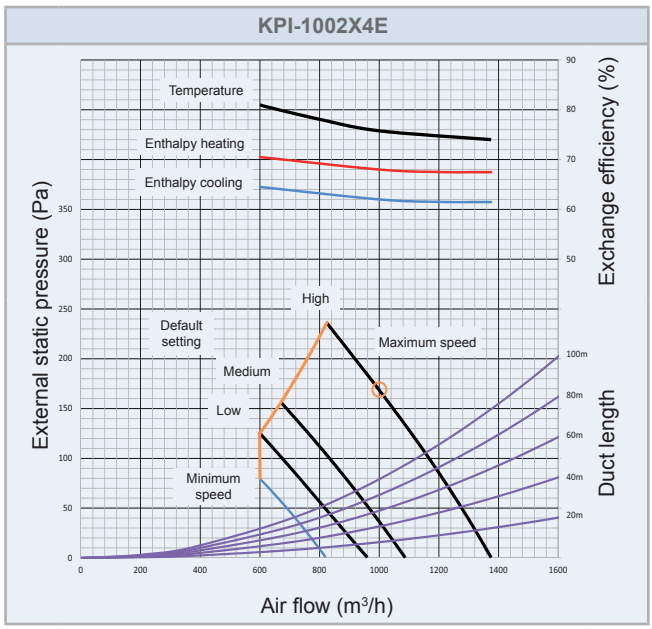


KPI-2002E4E

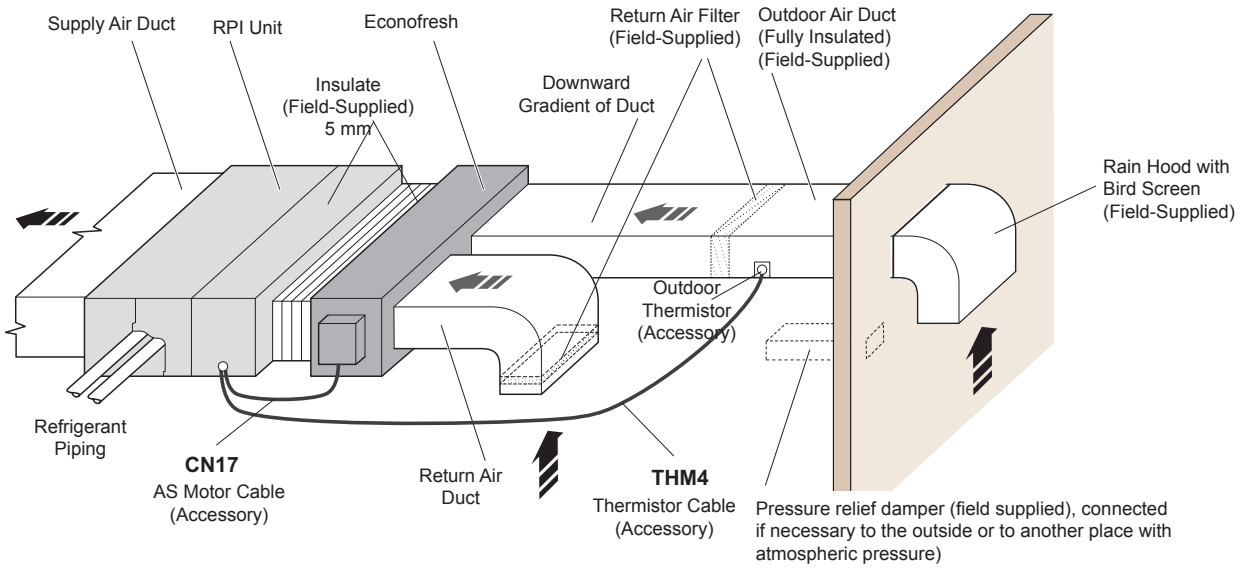


◆ KPI-(502-1002)X4E units





4.7 Selection procedure for Econofresh



NOTE

- *RPI units are supplied with standard Air Filter at the suction side. This air filter need to be removed, adding a Return air filter (field supplied) in the supply air duct from outside and return air duct front inside.*
- *The Econofresh unit can only be installed in combination with the RPI-(4.0/5.0/6.0)FSN5E units.*

The following procedure explains the method for calculating the different parameters to be taken into account for the installation of Econofresh, and its advantages in a natural cooling system and for the renewal of air in the room.

The first factor to be taken into consideration is the existence of a loss of pressure in the ducts, which is different for each installation.

4.7.1 Ducting arrangement

This unit has been designed for positive introduction of outdoor air for free cooling and other controls. Check to ensure that the following points have been designed or arranged beforehand:

1 Pressure Relief Damper

Provide a pressure relief damper when the building has a closed, airtight structure, since positive pressure is going to be created inside the building during the free cooling or all-fresh operation.

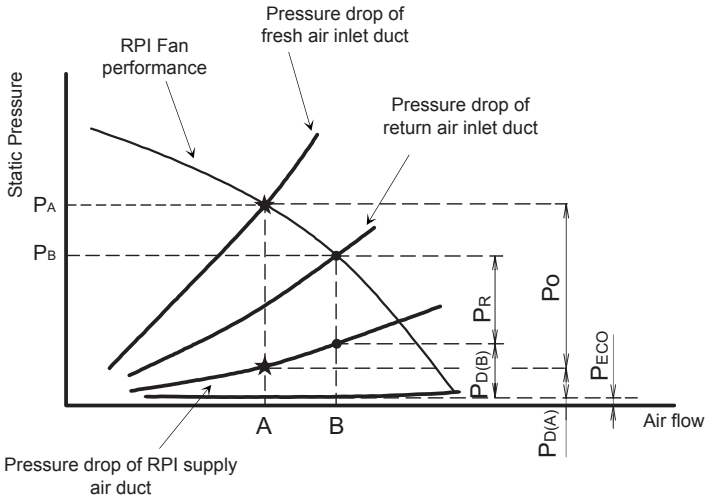
2 Outdoor Air Filter

Provide a field-supplied outdoor air filter for the outdoor air duct.

3 Resistance of Outdoor Air Duct

In order to protect against a shortage of outdoor air intake or an excessive intake of outdoor air, which may reduce the capacity of free cooling or produce an uncomfortable change of supply air during free cooling operation, keep the resistance of the outdoor air duct within the following guide range:

½ PR < PO < 4 x PR



Balance of Air Flow and Resistance of each Duct.

The pressure loss graphs of the ducts must be included in the fan performance chart of the RPI unit. The static pressure generates a performance curve for 0% fresh air airflow rate [B] and for 100% fresh air airflow rate [A] (natural cooling system). The high static pressure calculation for each case is as follows:

$$P_A = P_O + P_{D(A)} + P_{ECO}$$

$$P_B = P_R + P_{D(B)} + P_{ECO}$$

NOTE

A : air flow supplied when the fresh outdoor air damper is fully opened (return air damper is fully closed)

B : air flow supplied when the fresh outdoor air damper is fully closed (return air damper is fully opened)

P_D : pressure loss due to the supply air duct (air discharge duct)

P_O : pressure loss due to the fresh outdoor air duct, considering supply air volume by design conditions (including the air filter)

P_R : pressure loss due to the return air duct, considering supply air volume by design conditions (including the air filter)

P_{ECO} : pressure level of the Econofresh

◆ **Example:**

$P_{D(A)}$: 2 mmH_2O $P_{D(B)}$: 3.5 mmH_2O;

P_O : 14 mmH_2O;

P_R : 6.5 mmH_2O;

P_{ECO} : 2 mmH_2O;

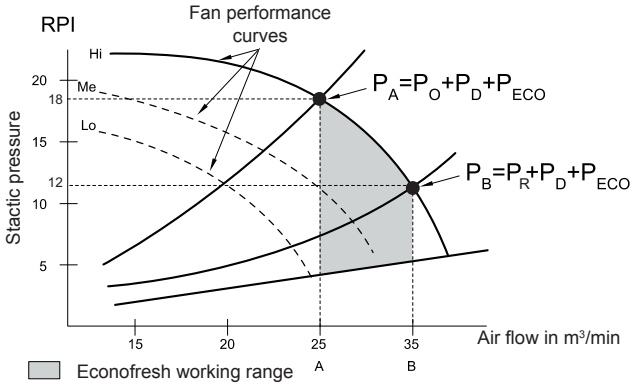
PA = 14 + 2 + 2 = 18 mmH_2O

PB= 6.5 + 3.5 + 2 = 12 mmH_2O

The result of this calculation is an air flow of:

35 m^3/min for (B) (non fresh air flow) and
25 m^3/min for (A) (100% fresh air flow).

The calculation of the energy saving for 25 m^3/min (free cooling mode) is shown in the next chapter.



NOTE

- *The balance between the outdoor air volume and the return air volume depends on the arrangement of the ducts.*
- *Air filters in ducts increase the pressure loss.*
- *Ducting arrangement must comply with local regulations.*

◆ Considerations for duct installation

1 Ducting Connection

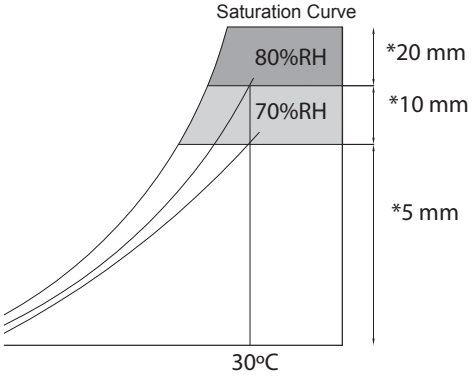
Pre-drilled duct flanges are provided at the supply, return and outdoor air intake connections. It is recommended to install a flexible duct connection to minimize noise and the transmission of vibration (between the indoor units and Econofresh).
The duct shall have a downward gradient in order to prevent the entry of dirt or water from the outside.

2 Insulation

All ducts should be insulated.

- Especially the outdoor air duct, which is used to let the cold outdoor air flow in, must be sufficiently insulated.
- The lowest temperature of the outdoor air entering the flow of the outdoor air duct is the lowest temperature that can be achieved in heating operation in that installation.

In the case of using the unit under the following condition, perform additional insulation (*) or set up a drain pan underneath the unit.



Ambient temperature around the unit

4.7.2 Maximum capacity of the Free Cooling system (Economizer)

The determination of maximum capacity in free cooling is determined with the following formula.

The factors in the formula are:

maximum outdoor air flow rate (V_{OMAX}),
indoor temperature (T_I),
outdoor temperature (T_O)

And they are arranged as:

$$Q_{SHmax} = V_{OMAX} \cdot (1–ß) \cdot (T_I - T_O) \cdot 0.02$$

Example:

β = 0.2 bypass factor for RPI
V_{OMAX} = 25 m³/min
T_I = 25 °C
T_O = 15 °C

$$\boldsymbol{Q_{SHmax} = 4\ kW}$$

This is the maximum capacity permitted by the Econofresh to reduce energy supply per hour under these conditions.

4.7.3 Outdoor cooling mode (All-Fresh)

The Econofresh can also operate in outdoor cooling mode (All-Fresh). To select this mode, use the additional function E_1, configured on the remote control.

The All-fresh mode enables the Econofresh to operate, just supplying fresh air from outdoors. To do so, the damper remains fully open while the indoor unit is running.

If the outdoor cooling mode is used permanently, it causes a drop in air flow rate. Therefore, the cooling capacity must be calculated by using the minimum air flow rate (Point A in the graphic in the *"4.7.1 Ducting arrangement"* section).

The minimum opening of the outdoor air damper (adjustable with d7 optional function of the remote control switch) is always applied whenever the control system does not request a full opening.

4.8 Selection procedure for DX-interface

Units to be connected to the DX-Interface series 2 must satisfy the following requirements.

	Allowed Heat exchanger Capacity (kW) (1)				Heat Exchanger Inner Volume (dm^3) (2)			Recommended Heat Exchanger Air flow (m^3/min)	
DX-Code	Mode	Min	Nom	Max	Min	Max	Max (2) (Only UTOPIA RAS-XH(V)NP(1)E)	Min	Max
EXV-2.0E2	Cooling	4.0	5.0	5.6	0.57	1.16	1.64	8.0	21.0
	Heating	4.5	5.6	7.1					
EXV-2.5E2	Cooling	4.8	6.0	6.3	0.89	1.35	1.83	11.5	26.0
	Heating	5.6	7.0	7.1					
EXV-3.0E2	Cooling	5.7	7.1	8.0	1.03	1.57	2.89	12.5	30.0
	Heating	6.4	8.0	9.0					
EXV-4.0E2	Cooling	8.0	10.0	11.2	1.51	2.37	4.56	20.0	36.0
	Heating	9.0	11.2	12.5					
EXV-5.0E2	Cooling	10.0	12.5	14.0	1.92	2.37	4.56	23.0	41.5
	Heating	11.2	14.0	16.0					
EXV-6.0E2	Cooling	11.2	14.0	16.0	1.92	2.92	5.11	25.0	42.5
	Heating	12.8	16.0	18.0					
EXV-8.0E2	Cooling	16.0	20.0	22.4	2.92	3.89	6.93	59.0	78.0
	Heating	17.9	22.4	25.0					
EXV-10.0E2	Cooling	20.0	25.0	28.0	3.89	4.76	10.73	68.0	89.0
	Heating	22.4	28.0	31.5					

(1) Cooling and heating capacity data are based on the following indoor and outdoor temperature conditions, according to the EN14511 standard.

Operation conditions		Cooling	Heating
Indoor air inlet temperature	DB	27.0ºC	20.0ºC
	WB	19.0ºC	-
Outdoor air inlet temperature	DB	35.0ºC	7.0ºC
	WB	-	6.0ºC

DB: dry bulb; WB: wet bulb

Pipe length: 7.5 m; pipe height: 0 m.

(2) Check the limits of piping length vs HEX volume.

NOTE

1 Check that the unit or device connected to the DX heat exchanger allows the desired operation mode, and use it exclusively in the proper mode.

2 Please refer to the Installation Manual and the Technical Catalogue of the connected units and devices, to make sure that installation conditions are within the allowed ranges.

4.8.1 Cycle design evaporating and condensing temperatures

Please make sure that the Heat Exchanger element to be connected to the DX-Interface series 2 satisfies the following installation and design requirements. Failure to satisfy any of the items below may cause unappropriated system response, malfunction of any of the system components, and/or damage to the components.

- The design pressure of the system is 4.15 MPa. The compression strength of the pipes must exceed 12.45 MPa (3 times the design pressure)
- The inner volume of the heat exchanger piping must be within the limits specified in the technical documentation of each DX-Interface series 2. Please make sure the design of the heat exchanger as well as the refrigerant charge follow such limitations.
- The capacity of the heat exchanger must meet the specified nominal capacity of each DX-Interface series 2 under the following temperature conditions. Failure to ensure heat exchanger capacity may lead to system malfunction.

Design temperatures	Heating	Design temperatures	Cooling
Air temperature:	DX-interface HEX (T_{in}): 20ºC(DB) Outdoor: 7ºC(DB)/6ºC(WB)	Air temperature:	DX-Interface HEX (T_{in}): 27ºC(DB)/19ºC(WB) Outdoor: 35ºC(DB)
Condensing Temperature:	40ºC ~ 45ºC	Evaporation Temperature:	6ºC
Subcooling Temperature:	3ºC	Superheating Temperature:	5ºC

4.8.2 DX-Interface series 2 applications and control mode

The following table summarizes system features for the applications with DX-Interface series 2.

Application		System		
		UTOPIA (IVX, RASC and ES)	UTOPIA DX RAS-XH(V)NP(1)E	SET FREE [5]
Air curtain	Combinability	Single	-	Multi [6]
	Control type	Outlet air temperature control	-	Inlet air temperature control
	Air curtain Capacity	2 - 10 HP	-	2 - 10 HP
	Accuracy control level	●●●●○	-	●●●○○ [1]
Duct (≤ 10% Fresh Air)	Combinability	Single	Modular	Multi [6]
	Control type	Inlet air temperature control	Inlet air temperature control	Inlet air temperature control
	Duct Capacity	2 - 10 HP	12 - 50 HP [2][3]	2 - 10 HP
	Accuracy control level	●●●●●	●●●●●	●●●○○ [1]
Air handling unit (AHU)	Combinability	-	Single or Modular	-
	Control type	-	Outlet air temperature control or duty signal	-
	Capacity	-	4 - 50 HP [3][4]	-
	Accuracy control level	-	●●●●●	-

NOTE

[1] System control focuses on cycle conditions and performance, not inlet air temperature condition only.

[2] The power range is obtained by the combination of 3 HP to 10 HP outdoor unit models (RAS-(XH(V)NP(1)E series).

[3] In order to ensure balanced working conditions for outdoor units, it is necessary to consider the same capacity outdoor units for a same group.

[4] The power range is obtained by the combination of 4 HP to 10 HP outdoor unit models (RAS-(XH(V)NP(1)E series).

[5] 1-1 combination with SET FREE series is not allowed.

[6]

	DX-Interface series 2 ratio capacity	
	≤ 30 %	30 ~ 100 %
Total connection ratio capacity against Outdoor Unit Capacity (%)	50 ~ 130 %	50 ~ 100 %

In case DX-Interface series 2 ratio is less than 30 % of the outdoor units capacity, the total connection ratio against Outdoor Unit Capacity is 50 ~ 130%, Otherwise, total connection ratio is limited to 50 ~ 100%.

4.9 Communication network compatibility

H-LINK and H-LINK II communication networks are combined with their remote controls in line with the following examples.

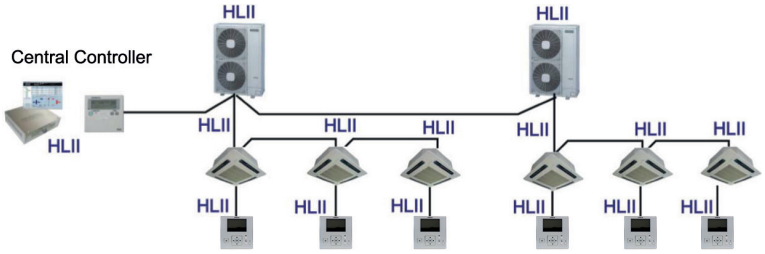
- The new H-LINK II communication network system provides for remote control connection, from the PC-P2HTE model and later models.
- HITACHI has a range of individual, centralised or computer-aided remote control systems that can be used with the System Free units. Consult the corresponding technical documentation for controls.

NOTE

- *Several functions are not available in certain Indoor Unit / Remote Control combinations.*
- *Refer to Remote Control Installation and Operation Manual and Controllers Technical Catalogue for detailed functions.*

◆ Examples of different H-LINK and H-LINK II systems

Example 1. System with outdoor and indoor units, remote control and H-LINK II communication network

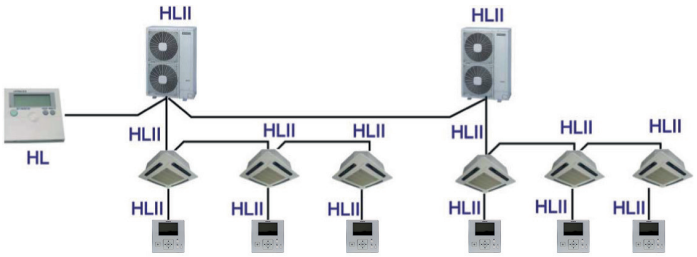


NOTE

HLII: H-LINK II.

Refrigerant cycle number range	0-63
Indoor unit number range	0-63
Maximum number of indoor units	160
Maximum number of units (*)	200
(*) Units = indoor units + outdoor units + centralised control.	

Example 2. System with outdoor and indoor units, H-LINK II remote control and H-LINK central control

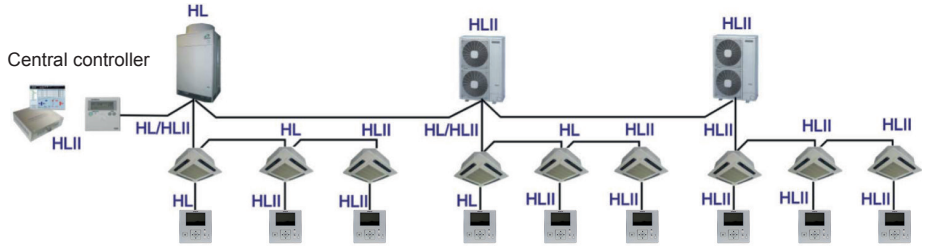


NOTE

- *HL: H-LINK.*
- *HLII: H-LINK II.*

Refrigerant cycle number range	0-15
Indoor unit number range	0-15
Maximum number of indoor units	128
Maximum number of units (*)	145
(*) Units = indoor units + outdoor units + centralised control.	

Example 3. System with outdoor and indoor units, H-LINK remote controls and H-LINK II central control

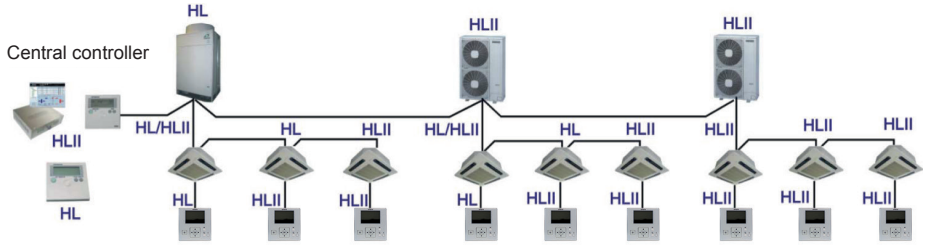


Combination of units	1	2		3
Refrigerant cycle number range	0-15	0-15		0-63
Indoor unit number range	0-15	0-15	0-63	0-63
Maximum number of indoor units	128			
Maximum number of units (*)	145			
(*) Units = indoor units + outdoor units + centralised control.				

NOTE

- *HL: H-LINK*
- *HLII: H-LINK II*

Example 4. System with outdoor and indoor units, H-LINK and H-LINK II remote controls and H-LINK central control

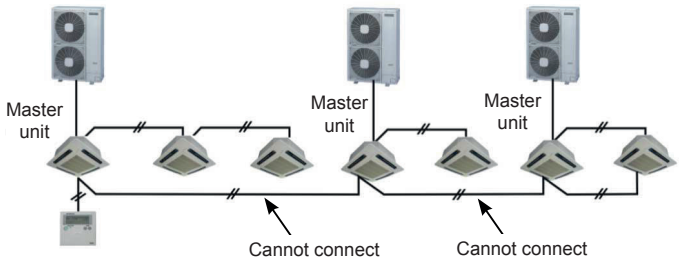


NOTE

- *HL: H-LINK*
- *HLII: H-LINK II*

Refrigerant cycle number range	0-15
Indoor unit number range	0-15
Maximum number of indoor units	128
Maximum number of units (*)	145
(*) Units = indoor units + outdoor units + centralised control.	

The following connections are not possible:



Different indoor units from different systems cannot be connected using the same remote control when the option to not use the remote control operating cable has been selected.

All optional units connected to CN3 may only be used on the main unit using the connected remote control.

5. Acoustic characteristic curves

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Sound pressure level

The sound pressure level has been measured in an anechoic chamber under the following conditions:

1 Distance of the unit from the measuring point:

a. RCI(M), RCD indoor units: 1.5 m below the unit.

b. RPI(M) indoor units: 1.5 m below the unit (without ceiling under the unit), applying suction duct 1 m. and discharge duct 2m.

c. RPC and RPK indoor units: 1 m below the unit, 1 m from the discharge louver.

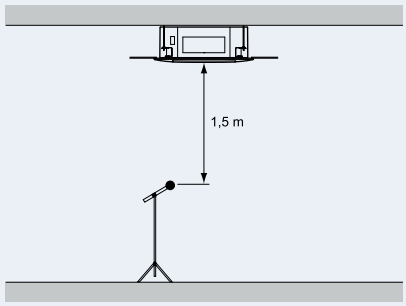
d. RPF and RPFI indoor units: 1 m from floor level, 1 m from the front surface of the unit.

e. Additional KPI system: 1.5 m below the unit (with no ceiling below the unit), duct sound insulated.

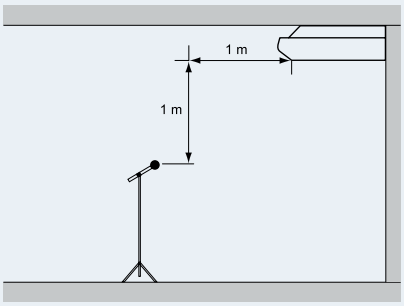
2 Power supply: 230V 50Hz.

Sound pressure level measuring positions

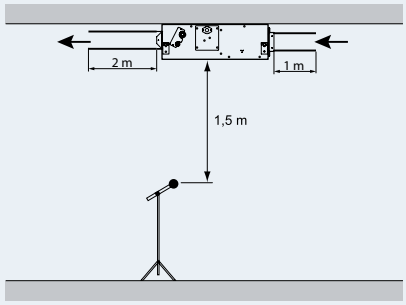
RCI, RCIM, RCD



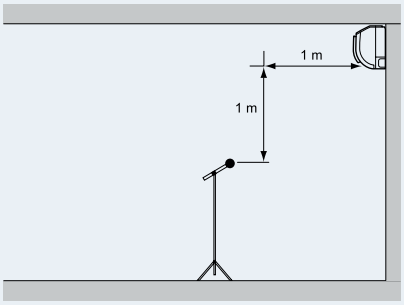
RPC



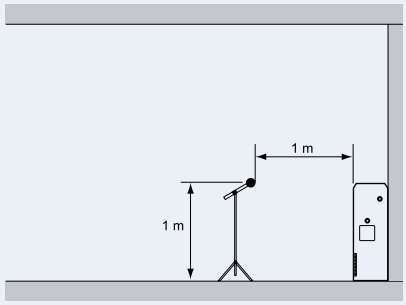
RPI, RPIM



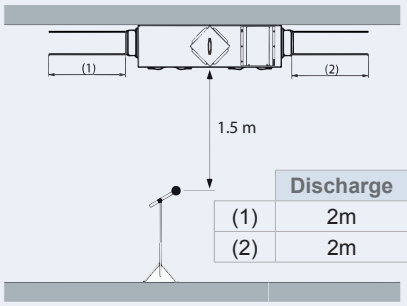
RPK



RPF, RPFI



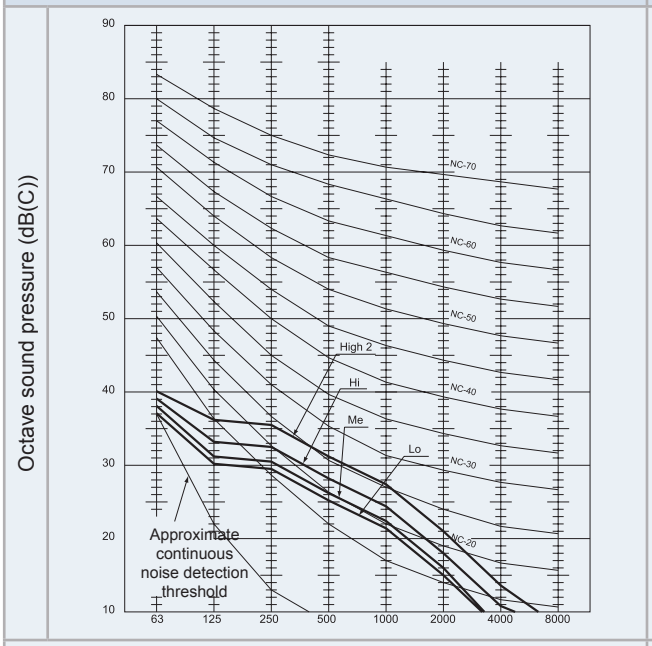
KPI



	Discharge	Suction
(1)	2m	1m
(2)	2m	1m

5.1 RCI-(1.0-6.0)FSN4 - 4-way cassette

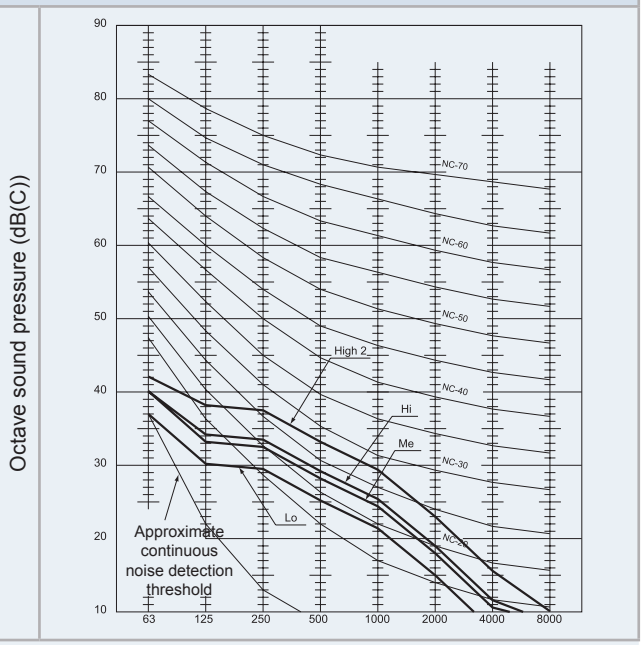
RCI-1.0FSN4



Frequency (Hz)

Fan motor speed: High2/high/med/low: 33/30/28/27 dB(A)

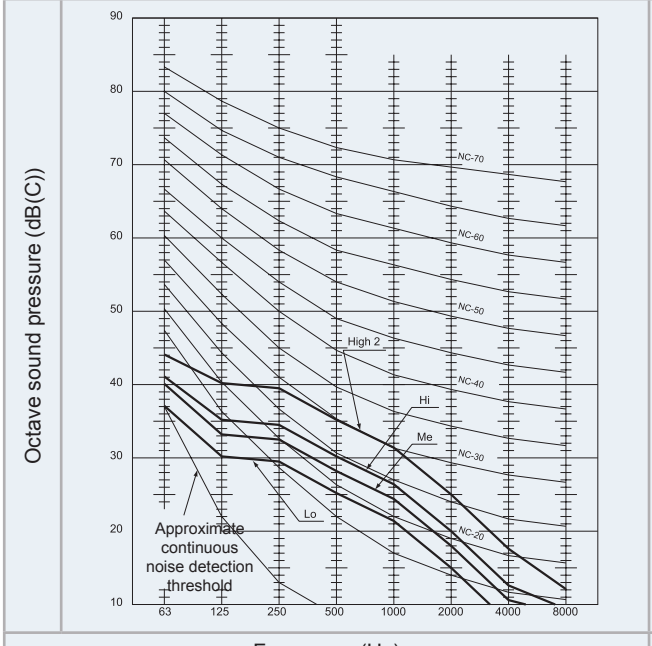
RCI-1.5FSN4



Frequency (Hz)

Fan motor speed: High2/high/med/low: 35/31/30/27 dB(A)

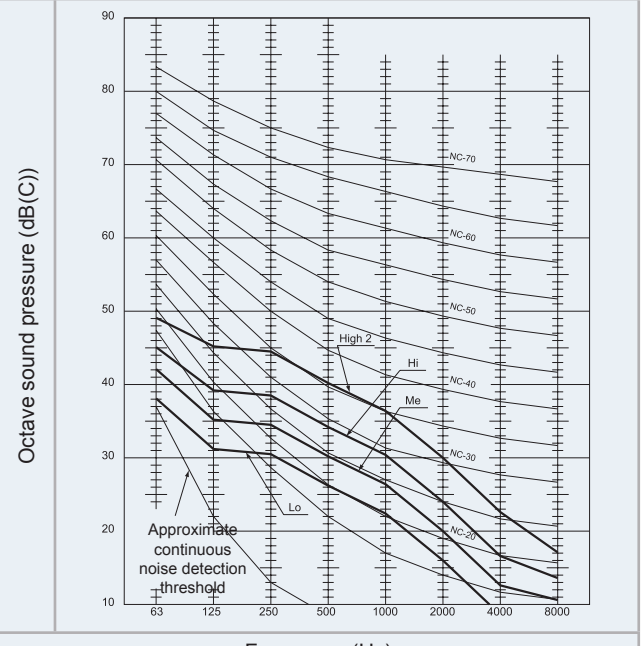
RCI-2.0FSN4



Frequency (Hz)

Fan motor speed: High2/high/med/low: 37/32/30/27 dB(A)

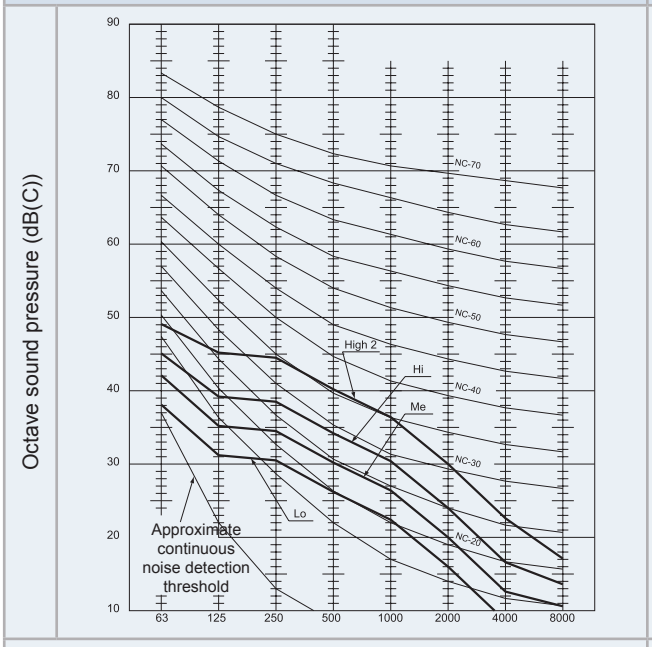
RCI-2.5FSN4



Frequency (Hz)

Fan motor speed: High2/high/med/low: 42/36/32/28 dB(A)

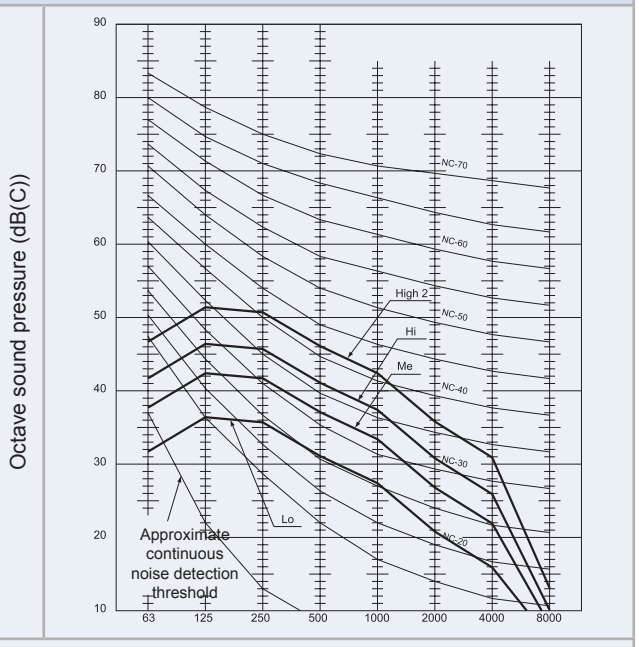
RCI-3.0FSN4



Frequency (Hz)

Fan motor speed: High2/high/med/low: 42/36/32/28 dB(A)

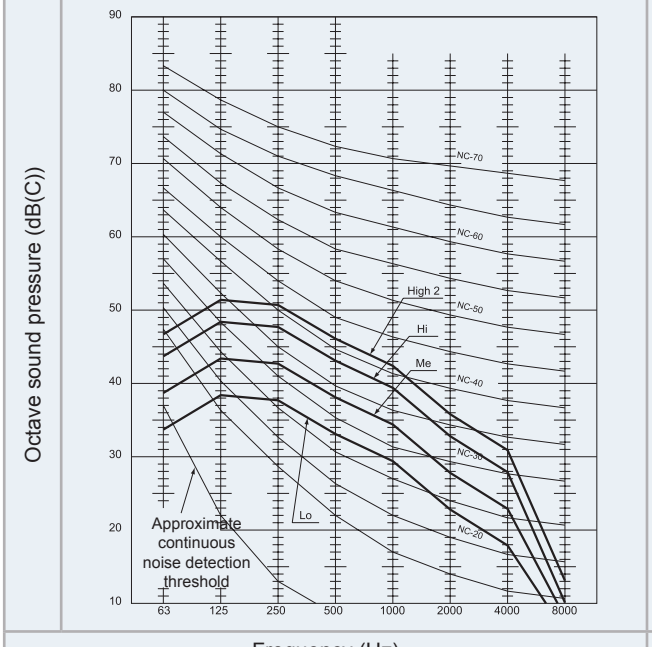
RCI-4.0FSN4



Frequency (Hz)

Fan motor speed: High2/high/med/low: 48/43/39/33 dB(A)

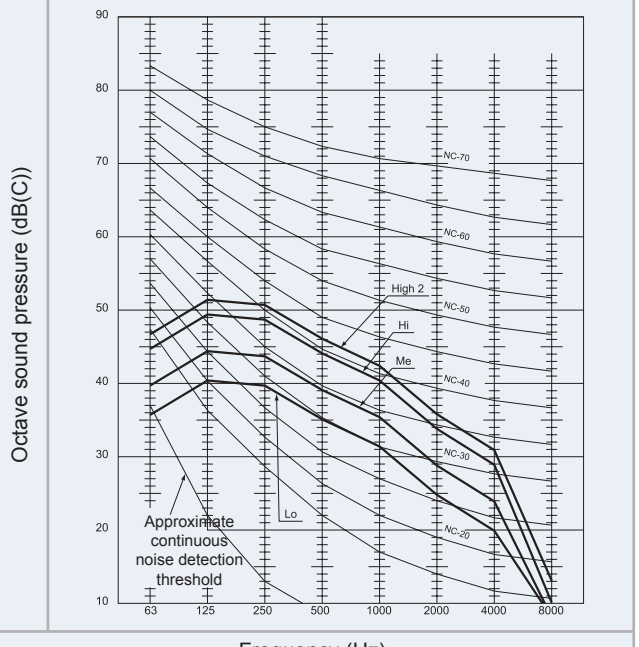
RCI-5.0FSN4



Frequency (Hz)

Fan motor speed: High2/high/med/low: 48/45/40/35 dB(A)

RCI-6.0FSN4

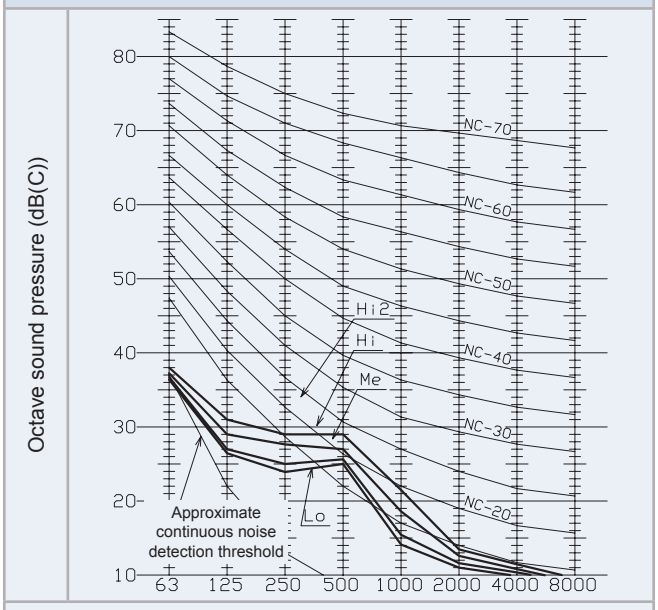


Frequency (Hz)

Fan motor speed: High2/high/med/low: 48/46/41/37 dB(A)

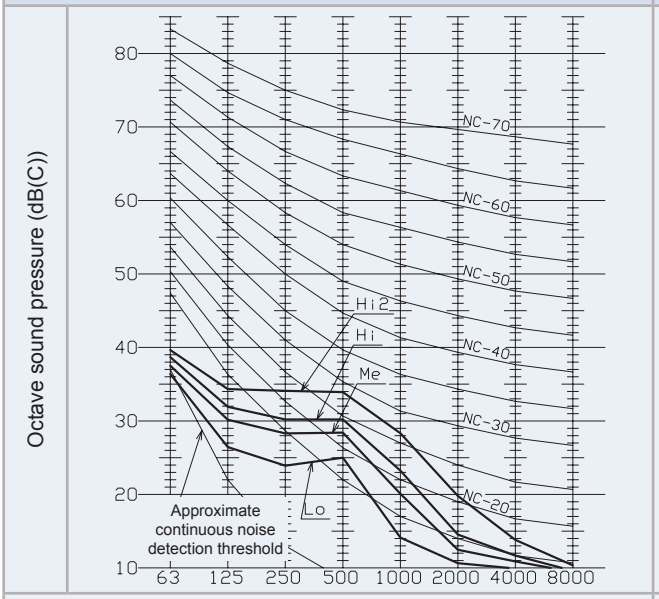
5.2 RCIM-(0.4-2.5)FSN4E - 4-way cassette (compact)

RCIM-0.4FSN4E



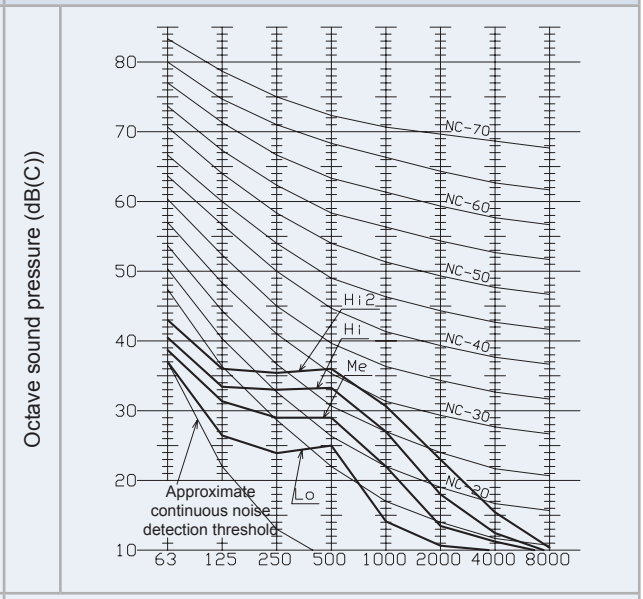
Fan motor speed: High2/high/medium/low; 29/27/25/24.5 dB(A)

RCIM-0.6FSN4E



Fan motor speed: High2/high/medium/low; 34/30/28/24.5 dB(A)

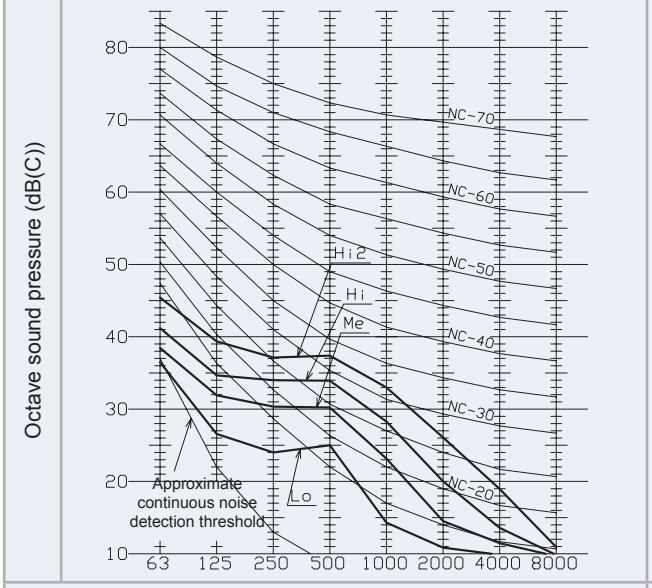
RCIM-0.8FSN4E



Fan motor speed: High2/high/medium/low; 36/33/29 /24.5 dB(A)

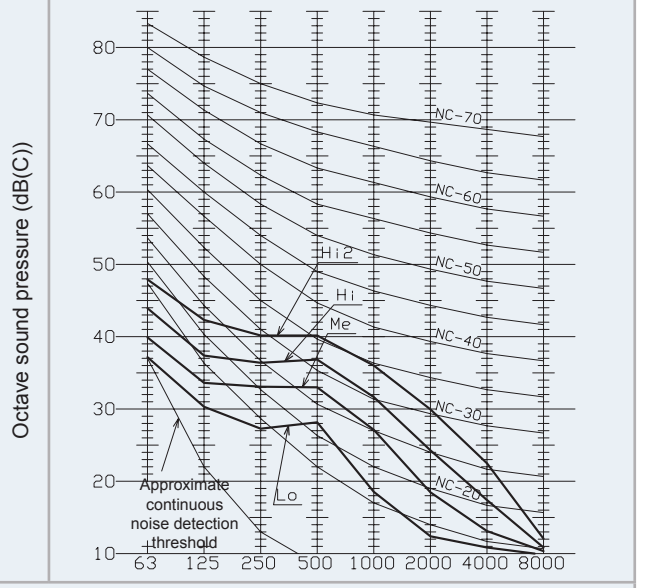
5

RCIM-1.0FSN4E



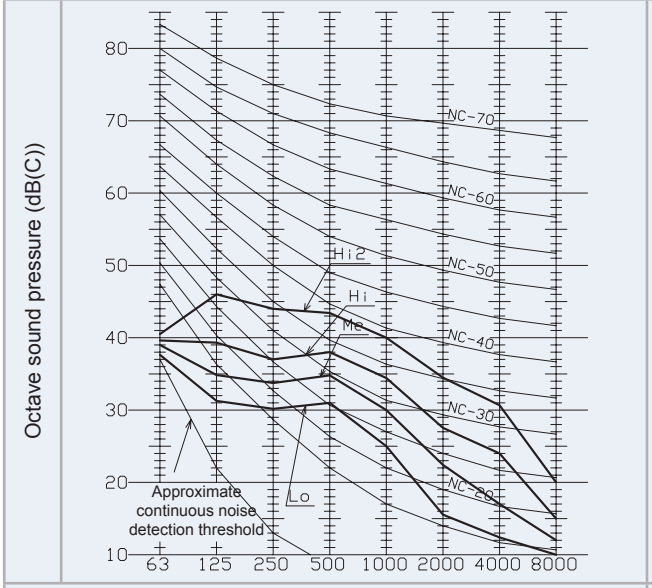
Fan motor speed: High2/high/medium/low; 38/34/30/24.5 dB(A)

RCIM-1.5FSN4E



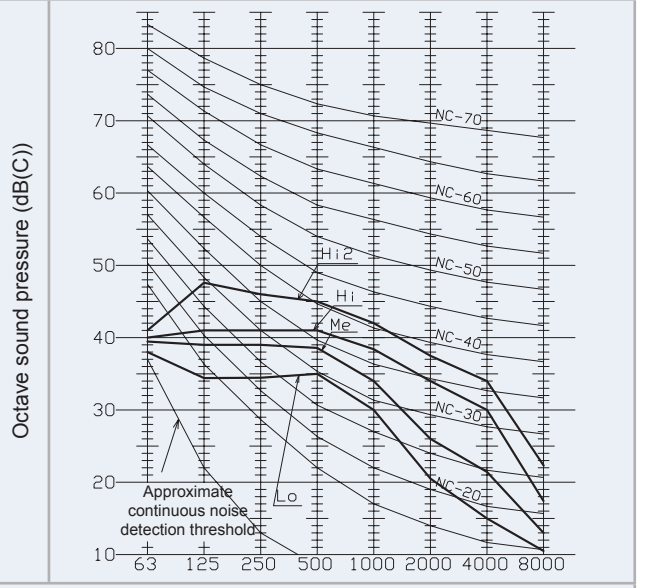
Fan motor speed: High2/high/medium/low; 41/37/33/27.5 dB(A)

RCIM-2.0FSN4E



Fan motor speed: High2/high/medium/low; 45/39/35/31 dB(A)

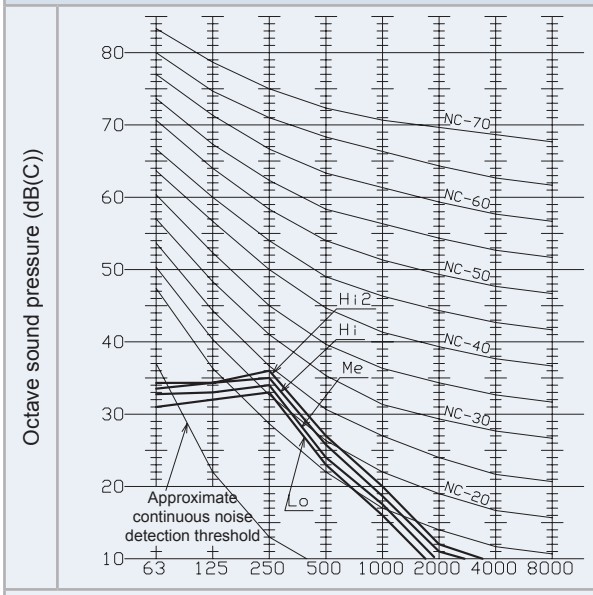
RCIM-2.5FSN4E



Fan motor speed: High2/high/medium/low; 47/43/39/35 dB(A)

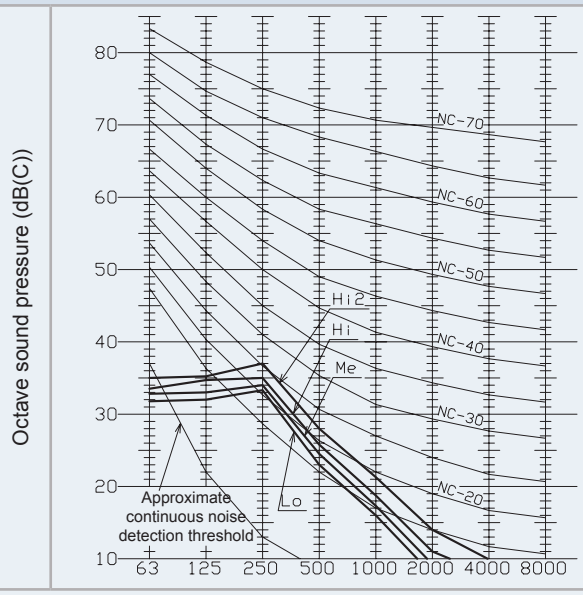
5.3 RCD-(0.8-6.0)FSN3 - 2-way cassette

RCD-0.8FSN3



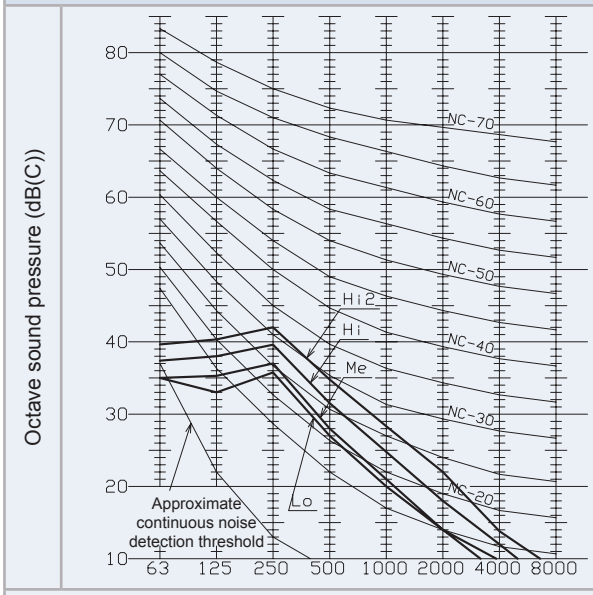
Fan motor speed: high2/high/medium/low; 30/29/28/27 dB(A)

RCD-1.0FSN3



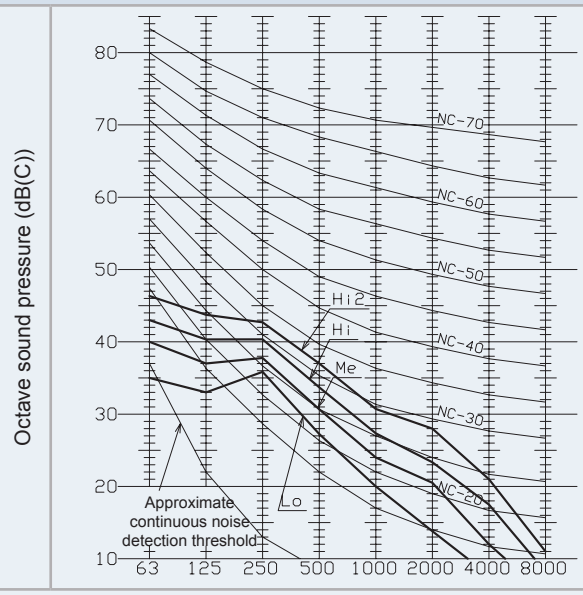
Fan motor speed: high2/high/medium/low; 31/29/28/27 dB(A)

RCD-1.5FSN3



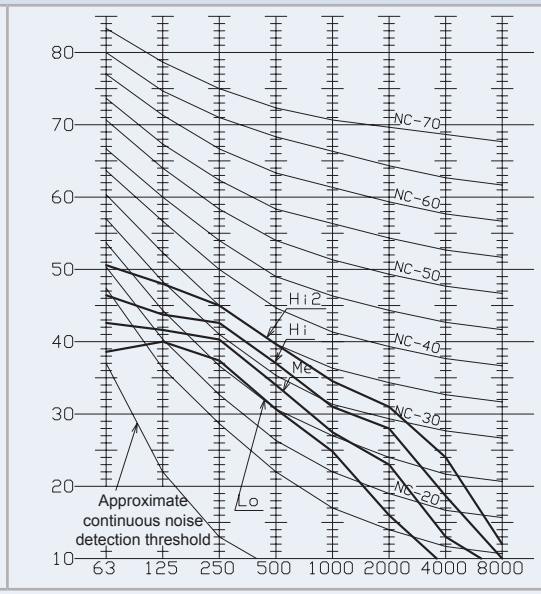
Fan motor speed: high2/high/medium/low; 37/34/31/30 dB(A)

RCD-2.0FSN3



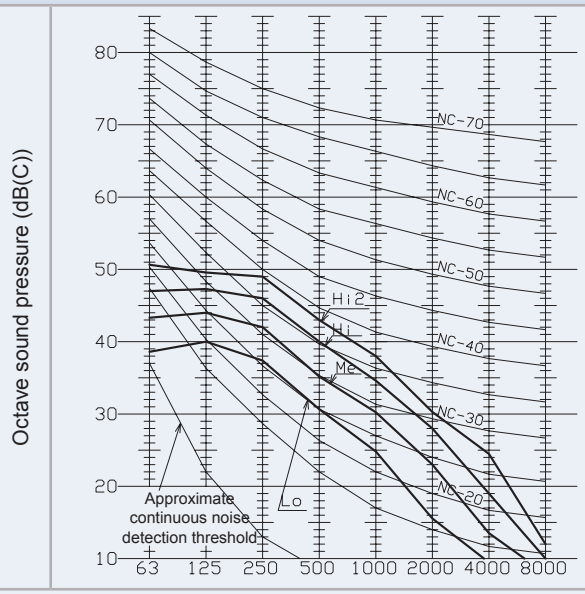
Fan motor speed: high2/high/medium/low; 39/36/33/30 dB(A)

RCD-2.5FSN3



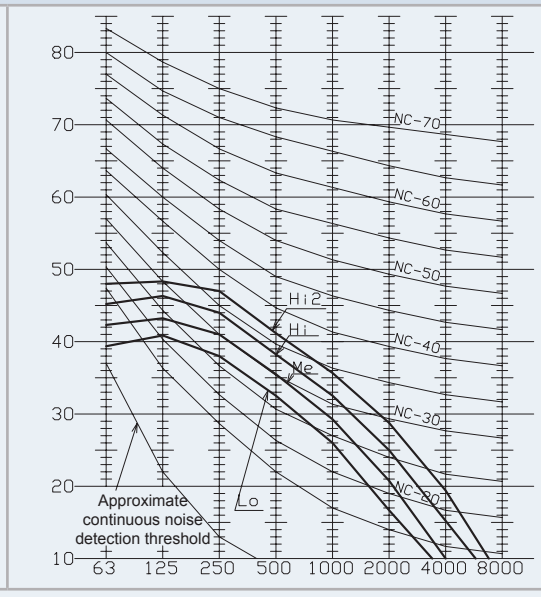
Fan motor speed: high2/high/medium/low; 42/39/36/33 dB(A)

RCD-3.0FSN3



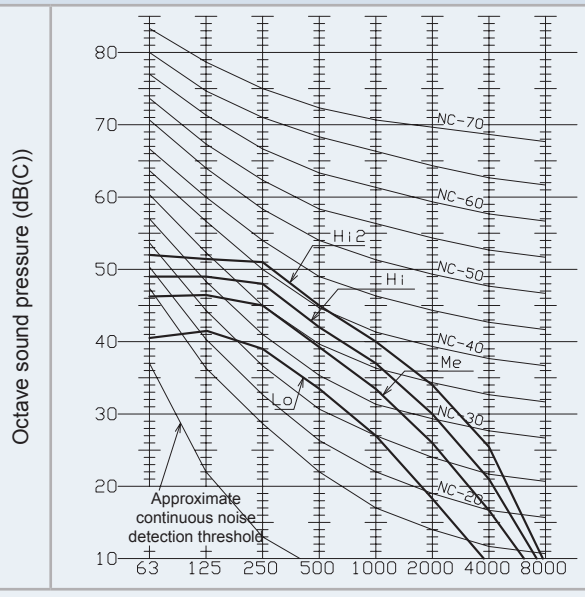
Fan motor speed: high2/high/medium/low; 45/42/38/33 dB(A)

RCD-4.0FSN3



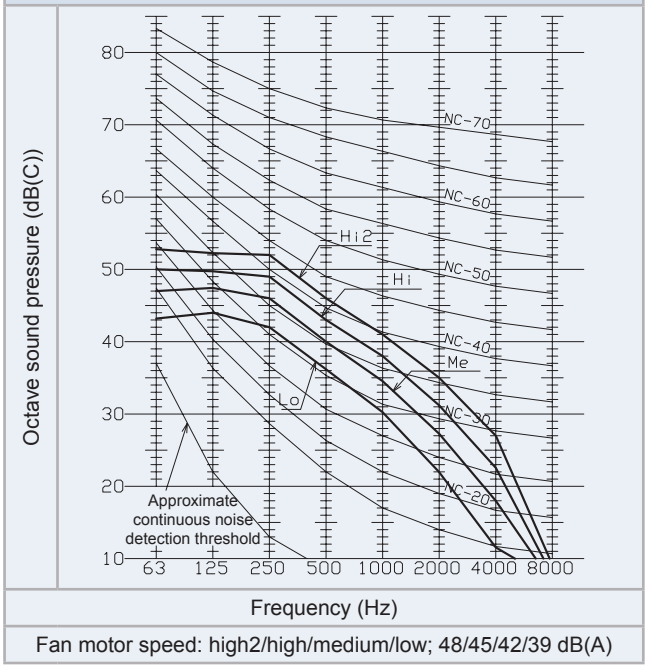
Fan motor speed: high2/high/medium/low; 43/40/37/34 dB(A)

RCD-5.0FSN3



Fan motor speed: high2/high/medium/low; 47/44/41/35 dB(A)

RCD-6.0FSN3

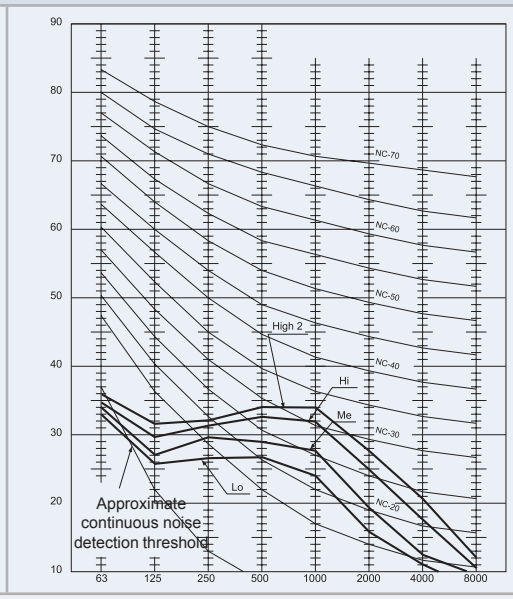


Fan motor speed: high2/high/medium/low; 48/45/42/39 dB(A)

5

5.4 RPC-(1.5-6.0)FSN3 - Ceiling type

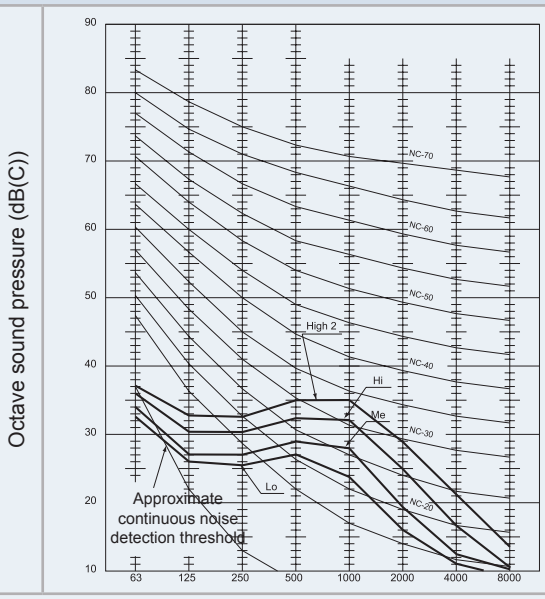
RPC-1.5FSN3



Frequency (Hz)

Fan motor speed: High2/High/Medium/Low; 37/35/31/28 dB(A)

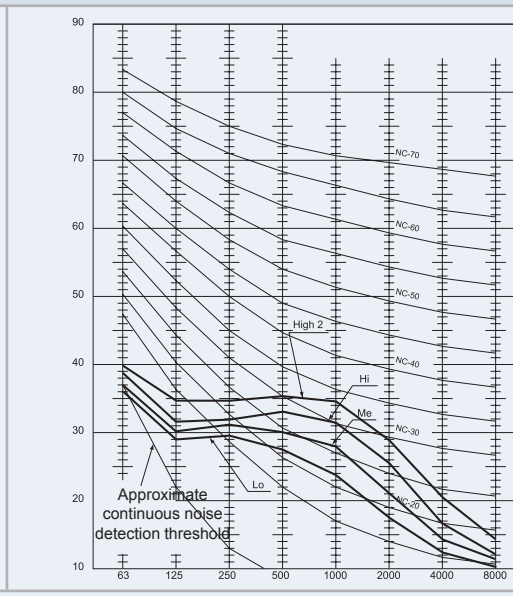
RPC-2.0FSN3



Frequency (Hz)

Fan motor speed: High2/High/Medium/Low; 38/35/31/28 dB(A)

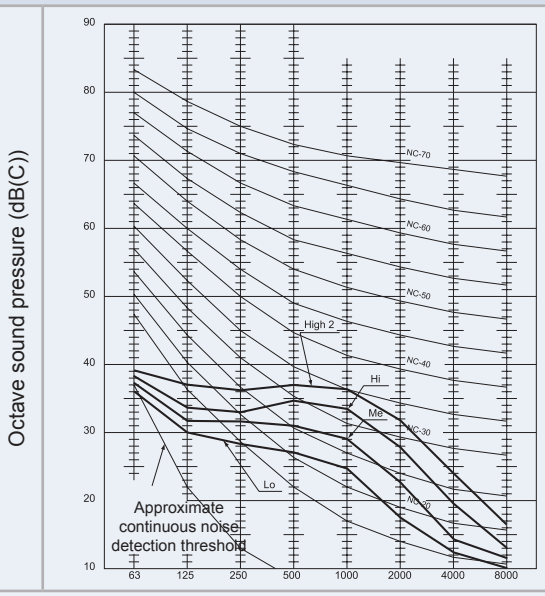
RPC-2.5FSN3



Frequency (Hz)

Fan motor speed: High2/High/Medium/Low; 38/35/31/28 dB(A)

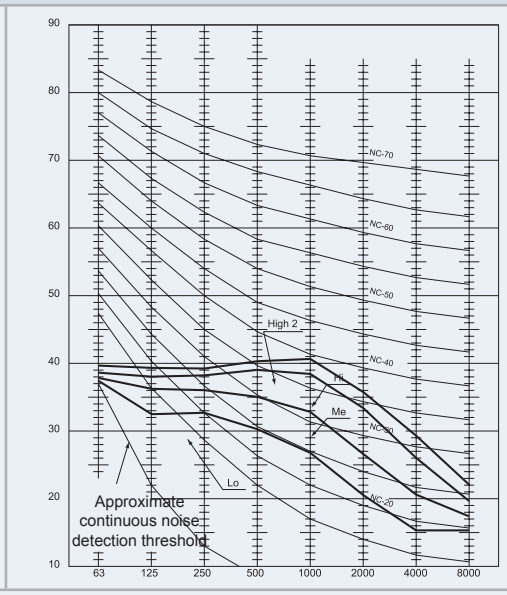
RPC-3.0FSN3



Frequency (Hz)

Fan motor speed: High2/High/Medium/Low; 40/37/33/29 dB(A)

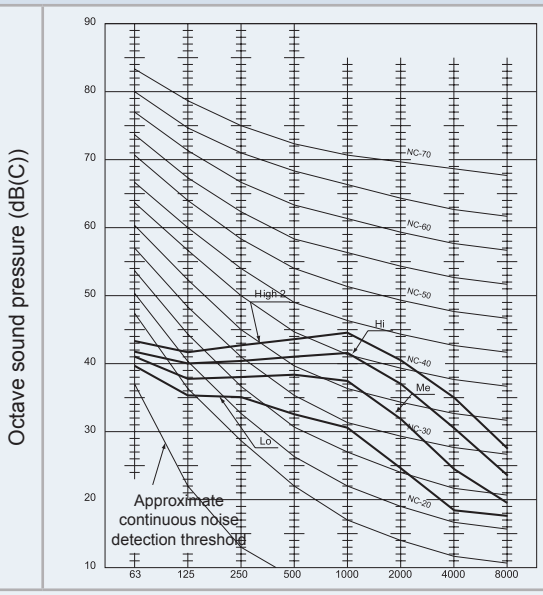
RPC-4.0FSN3



Frequency (Hz)

Fan motor speed: High2/High/Medium/Low; 44/42/37/32 dB(A)

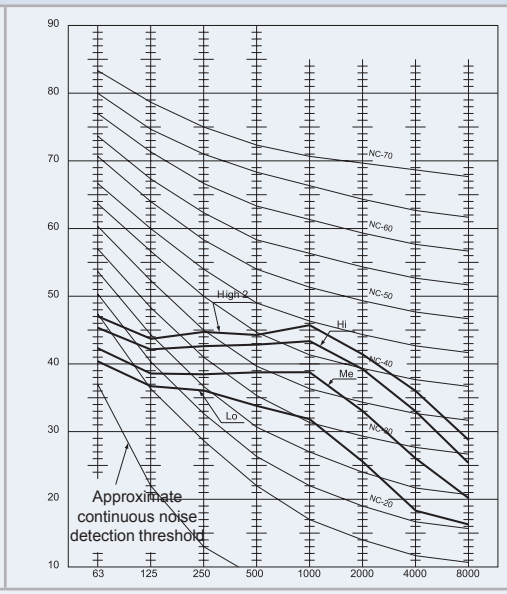
RPC-5.0FSN3



Frequency (Hz)

Fan motor speed: High2/High/Medium/Low; 48/45/41/35 dB(A)

RPC-6.0FSN3



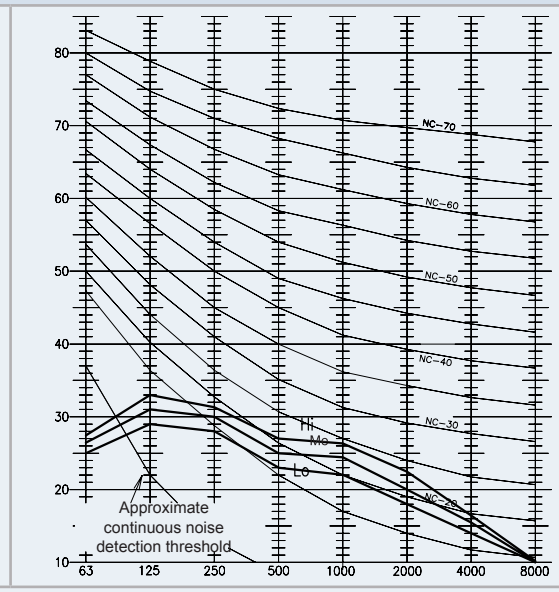
Frequency (Hz)

Fan motor speed: High2/High/Medium/Low; 49/47/42/36 dB(A)

5

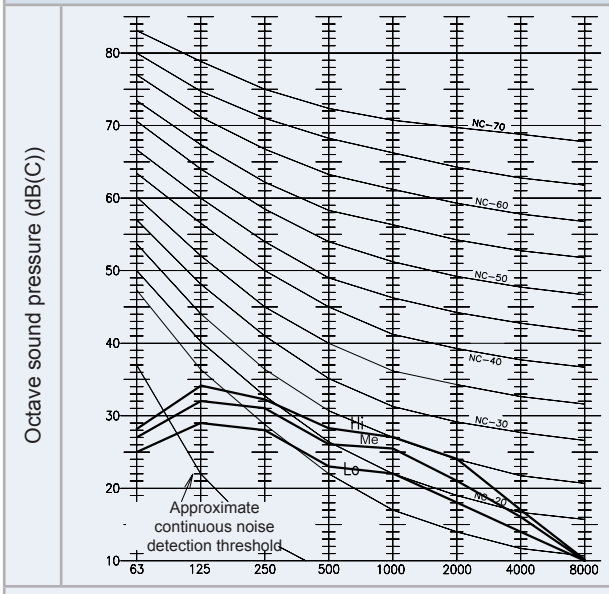
5.5 RPI-(0.4-20.0)FSN(3/5)(P)E(-f) - Indoor ducted unit

RPI-0.4FSN5E



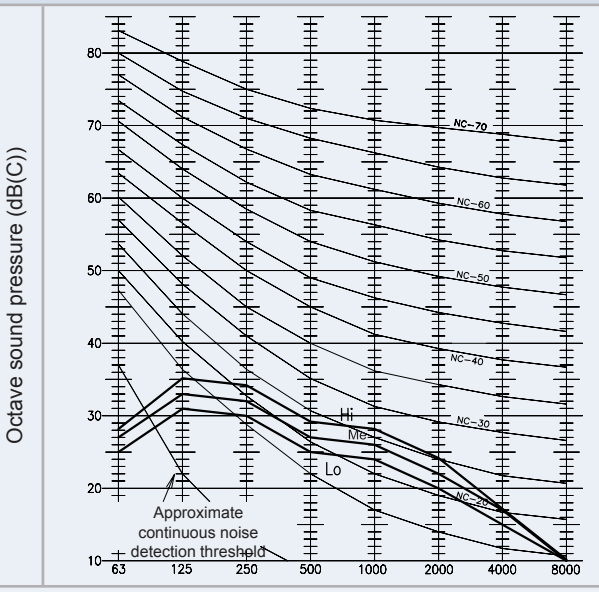
Fan motor speed: high/medium/low; 31/29/27 dB(A) (SP-00)

RPI-0.6FSN5E



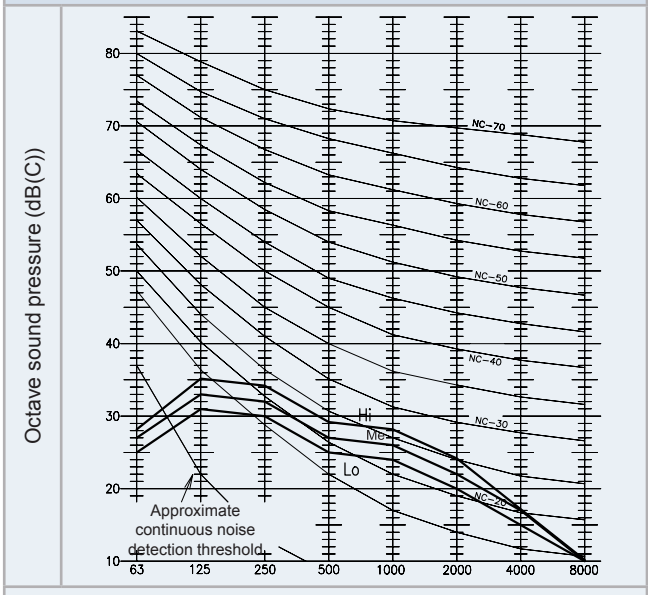
Fan motor speed: high/medium/low; 32/30/27 dB(A) (SP-00)

RPI-0.8FSN5E



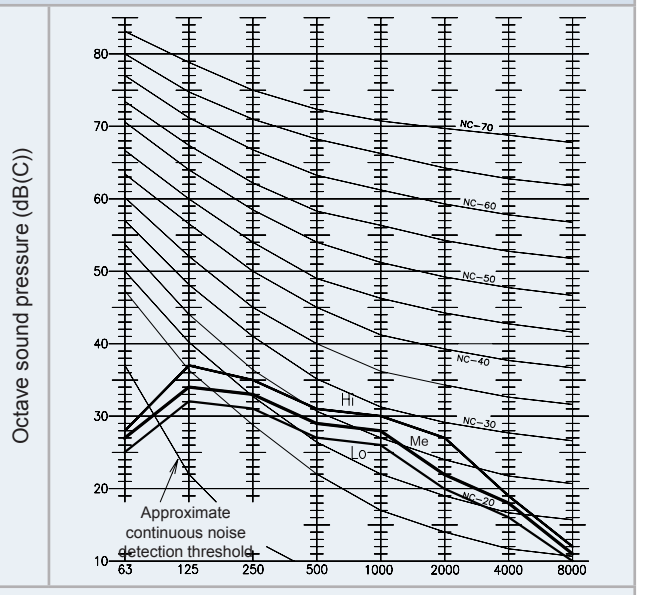
Fan motor speed: high/medium/low; 33/31/29 dB(A) (SP-00)

RPI-1.0FSN5E



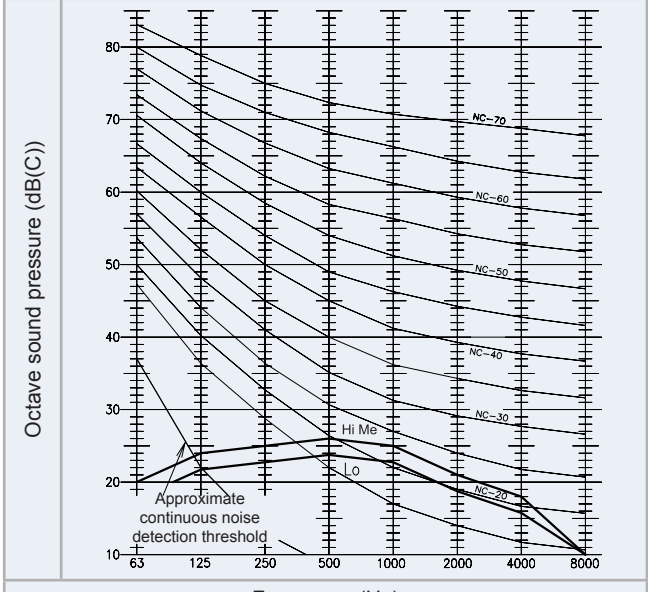
Fan motor speed: high/medium/low; 33/31/29 dB(A) (SP-00)

RPI-1.5FSN5E



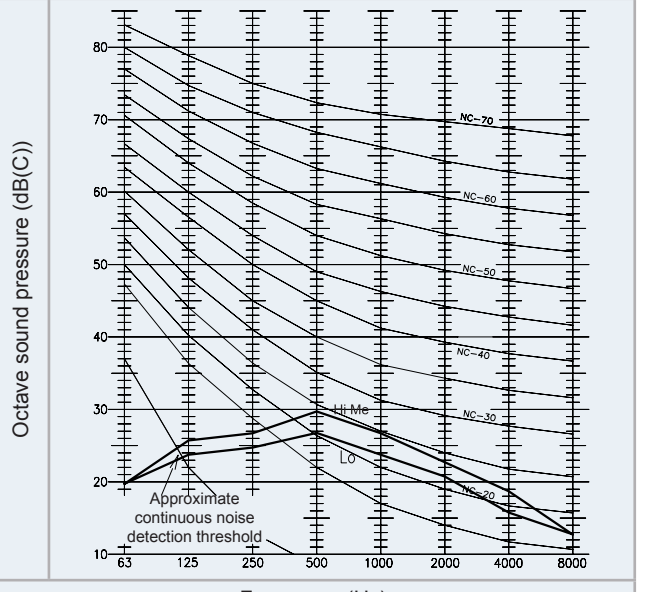
Fan motor speed:high/medium/low; 34/31/29 dB(A) (SP-00)

RPI-2.0FSN5E



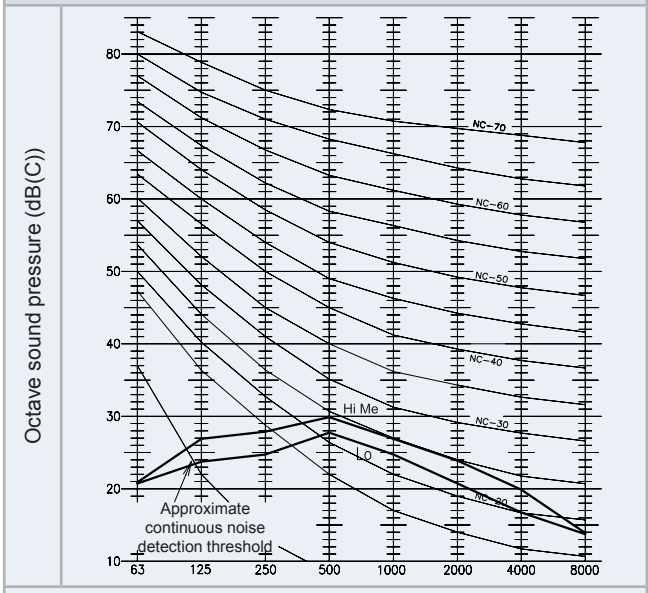
Fan motor speed: high/medium/low; 29/29/27 dB(A)(SP-02)

RPI-2.5FSN5E



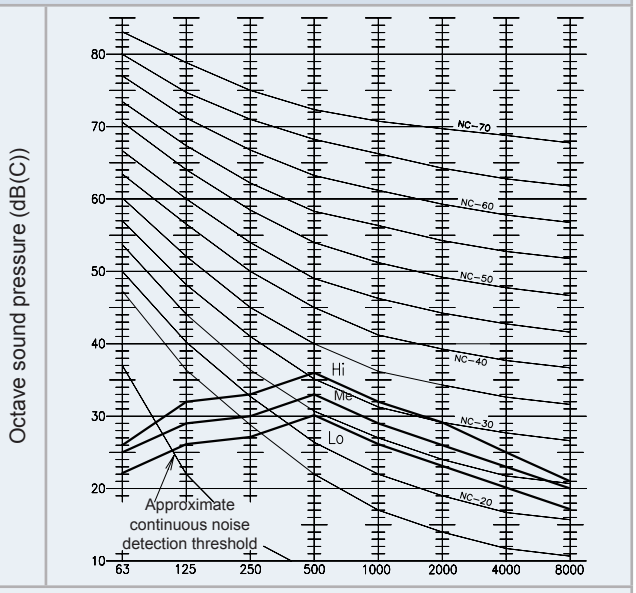
Fan motor speed: high/medium/low; 30/30/28 dB(A) (SP-02)

RPI-3.0FSN5E



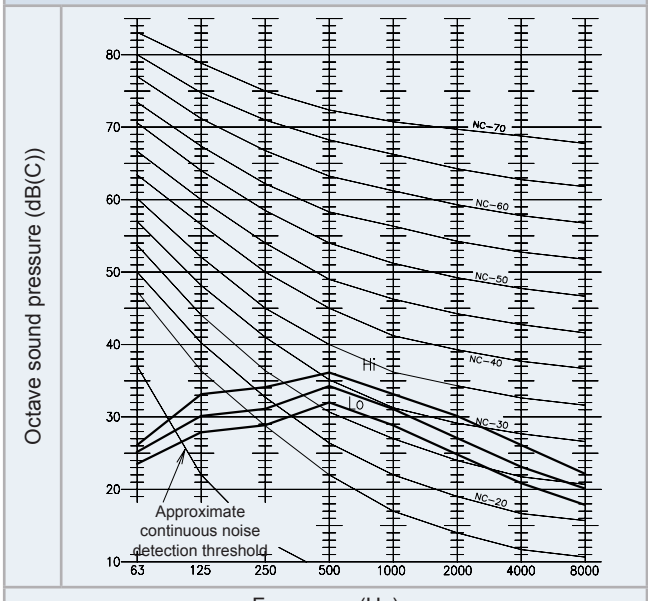
Fan motor speed: high/medium/low; 31/31/29 dB(A) (SP-02)

RPI-4.0FSN5E



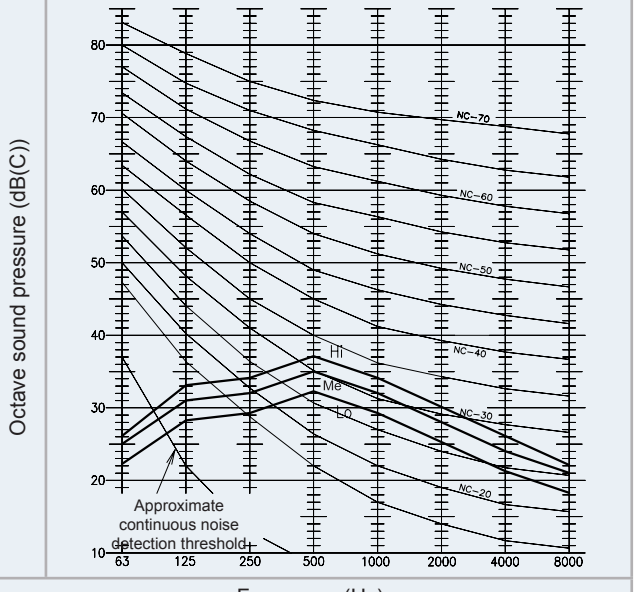
Fan motor speed: high/medium/low; 37/35/32 dB(A) (SP-00)

RPI-5.0FSN5E



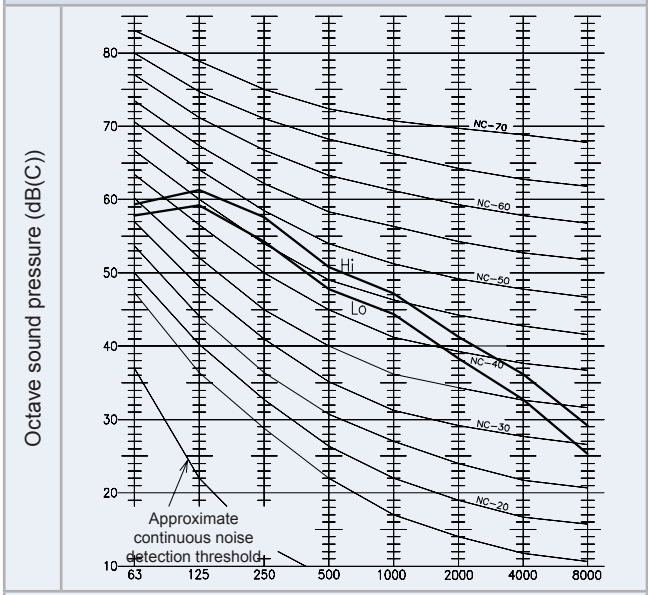
Fan motor speed: high/medium/low; 38/35/33 dB(A) (SP-01)

RPI-6.0FSN5E



Fan motor speed: high/medium/low; 39/36/33 dB(A) (SP-01)

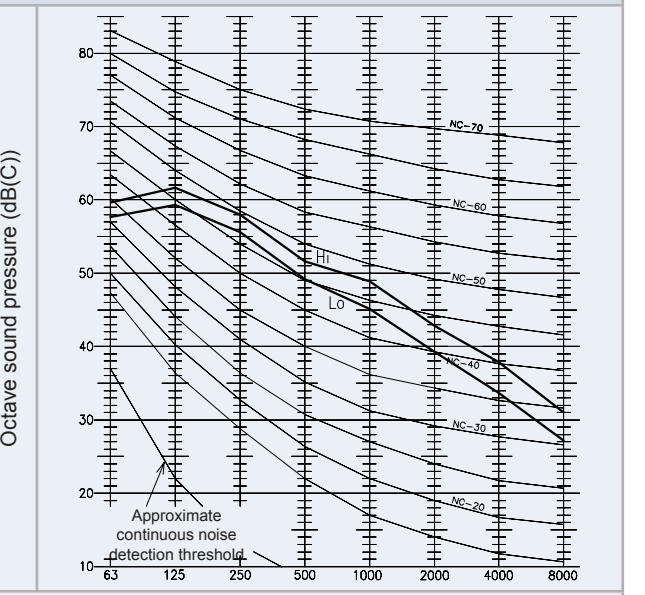
RPI-8.0FSN3E(-f)



Frequency (Hz)

Fan motor speed: high/low; 54/51 dB(A)

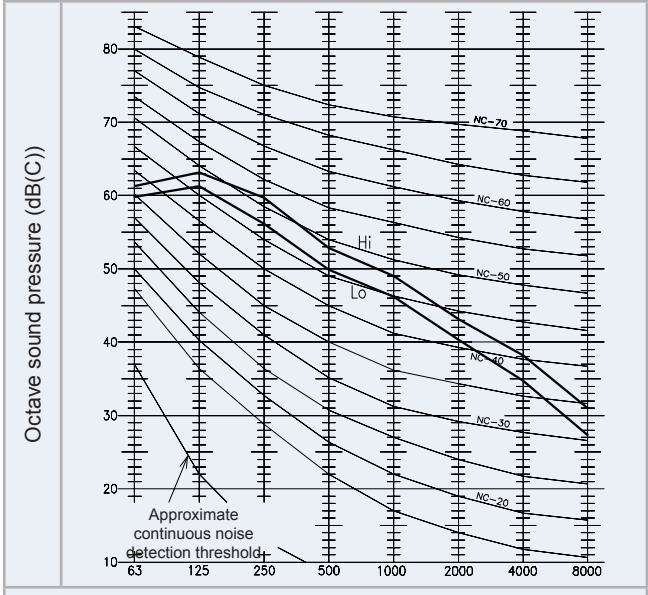
RPI-10.0FSN3E(-f)



Frequency (Hz)

Fan motor speed: high/low; 55/52 dB(A)

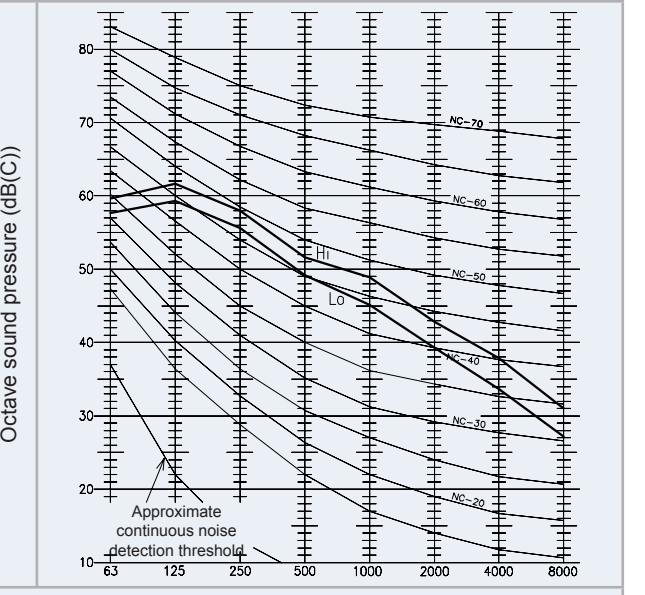
RPI-16.0FSN3PE(-f)



Frequency (Hz)

Fan motor speed: high/low; 56/53 dB(A)

RPI-20.0FSN3PE(-f)

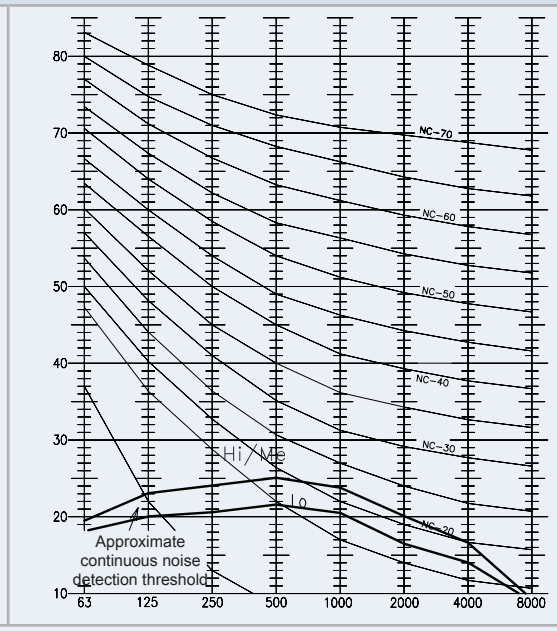


Frequency (Hz)

Fan motor speed: high/low; 57/54 dB(A)

5.6 RPIM-(0.6-1.5)FSN4E(-DU) - Indoor ducted unit

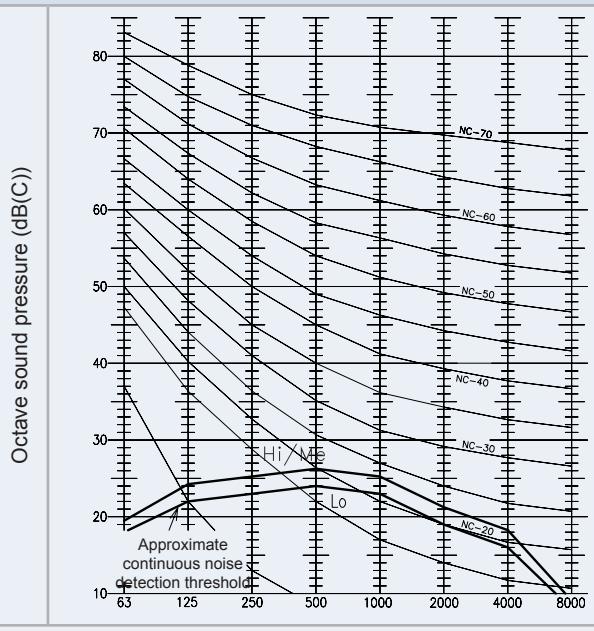
RPIM-0.6FSN4E(-DU)



Frequency (Hz)

Fan motor speed: high/medium/low; 28/28/25 dB(A) (SP-02)

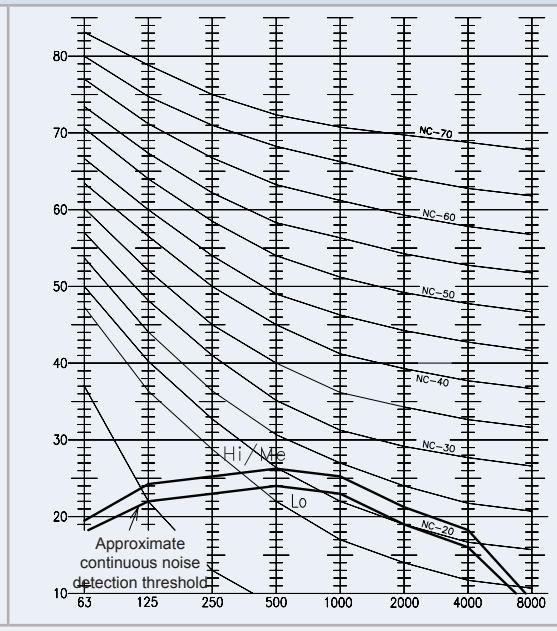
RPIM-0.8FSN4E(-DU)



Frequency (Hz)

Fan motor speed: high/medium/low; 29/29/27 dB(A) (SP-02)

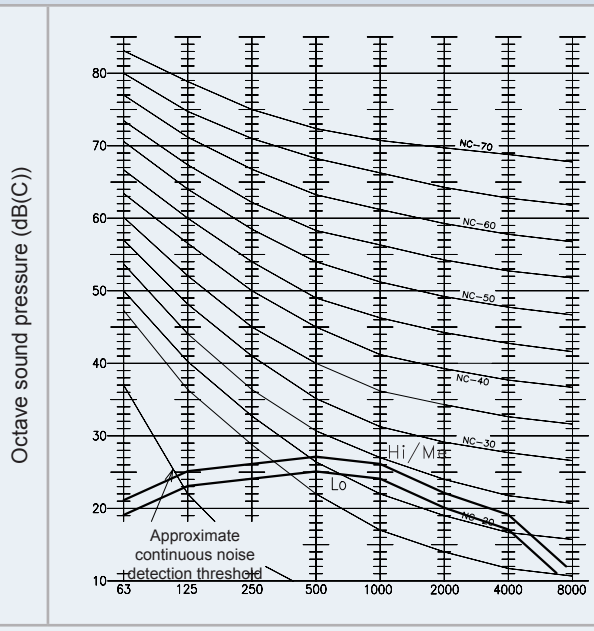
RPIM-1.0FSN4E(-DU)



Frequency (Hz)

Fan motor speed: high/medium/low; 29/29/27 dB(A) (SP-02)

RPIM-1.5FSN4E (-DU)

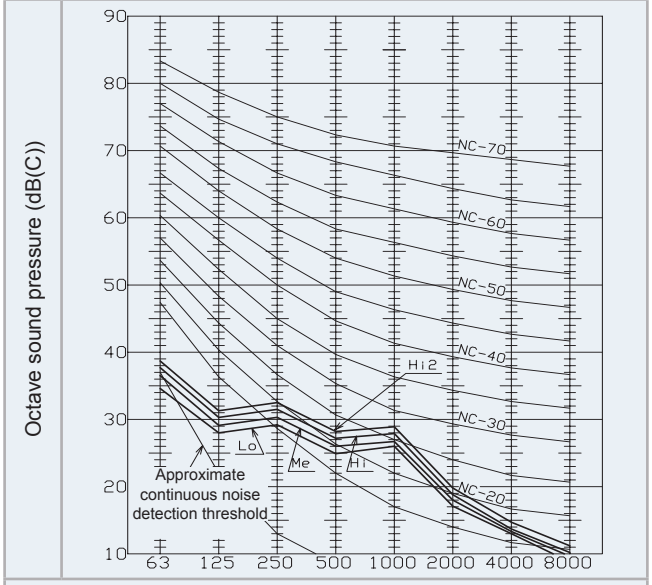


Frequency (Hz)

Fan motor speed: high/medium/low; 30/30/28 dB(A) (SP-02)

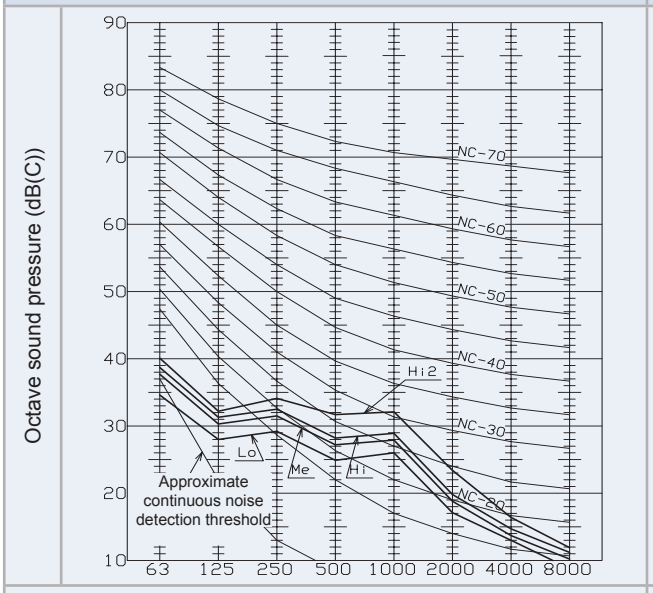
5.7 RPK-(0.4-4.0)FSN(H)4M - Wall type

RPK-0.4FSN4M



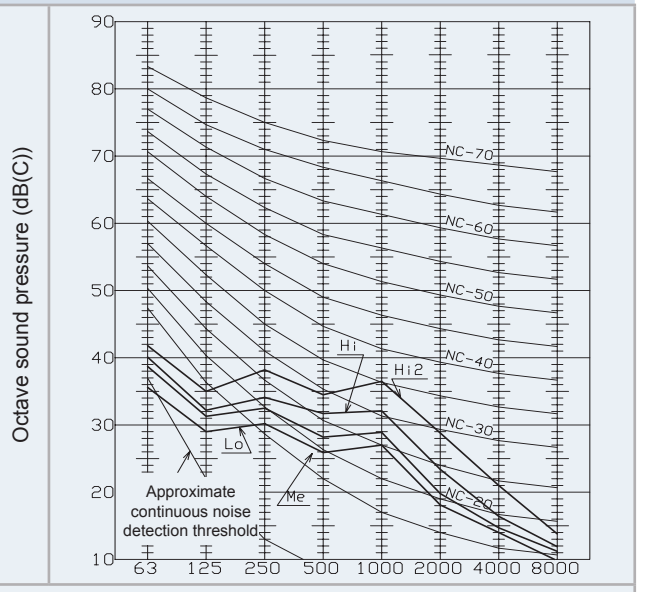
Fan motor speed: High2/High/Medium/Low; 32/31/30/29 dB(A)

RPK-0.6FSN4M



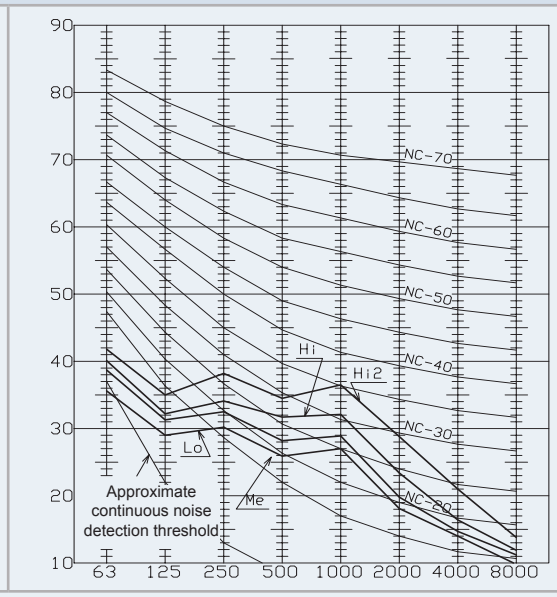
Fan motor speed: High2/High/Medium/Low; 35/32/31/29 dB(A)

RPK-0.8FSN4M



Fan motor speed: High2/High/Medium/Low; 39/35/32/30 dB(A)

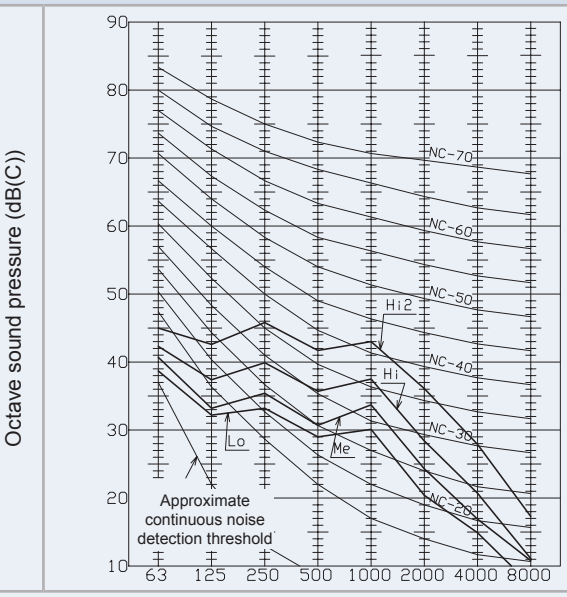
RPK-1.0FSN4M



Frequency (Hz)

Fan motor speed: High2/High/Medium/Low; 39/35/32/30 dB(A)

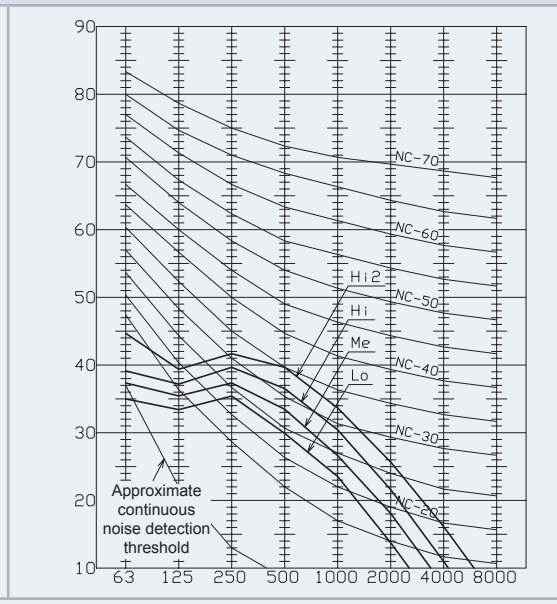
RPK-1.5FSN4M



Frequency (Hz)

Fan motor speed: High2/High/Medium/Low; 46/40/36/33 dB(A)

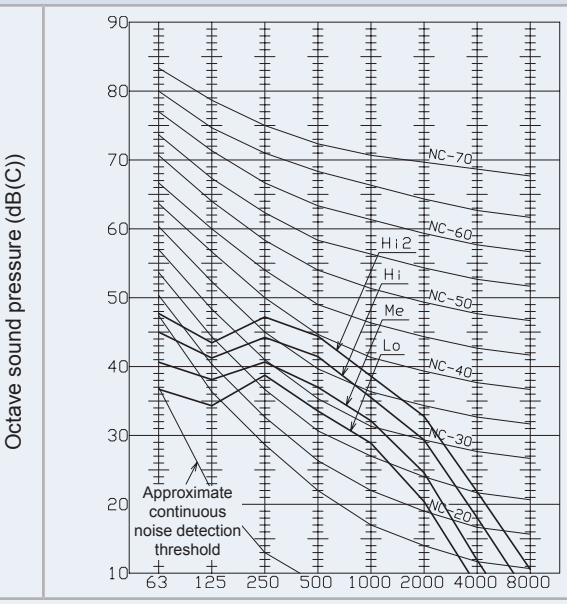
RPK-2.0FSN4M



Frequency (Hz)

Fan motor speed: High2/High/Medium/Low; 40/37/34/31 dB(A)

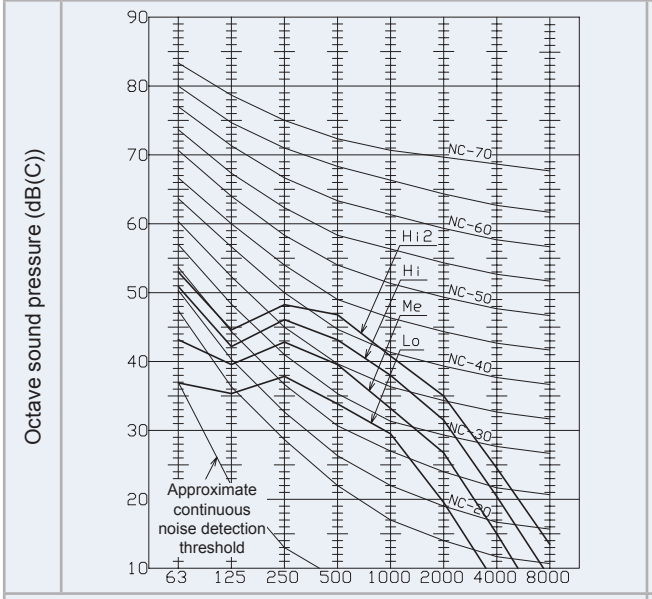
RPK-2.5FSN4M



Frequency (Hz)

Fan motor speed: High2/High/Medium/Low; 45/42/38/35 dB(A)

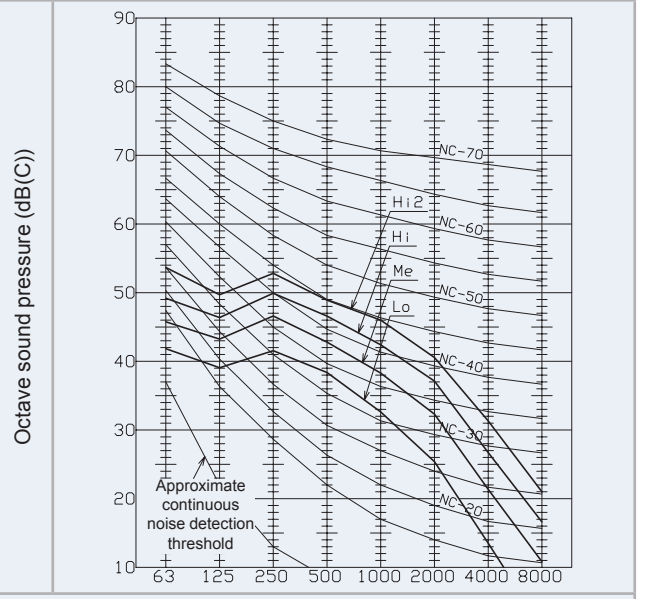
RPK-3.0FSN4M



Frequency (Hz)

Fan motor speed: High2/High/Medium/Low; 47/44/40/35 dB(A)

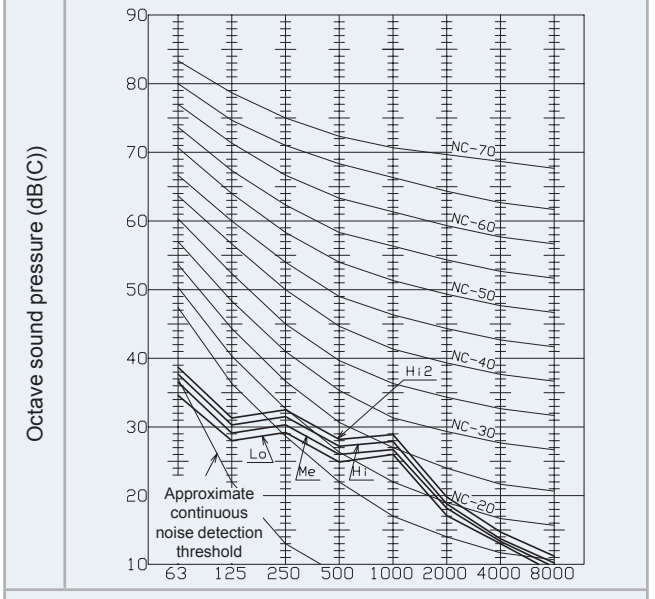
RPK-4.0FSN4M



Frequency (Hz)

Fan motor speed: High2/High/Medium/Low; 51/48/44/39 dB(A)

RPK-0.4FSNH4M
with EV-1.5N1 (sold separately as an option)

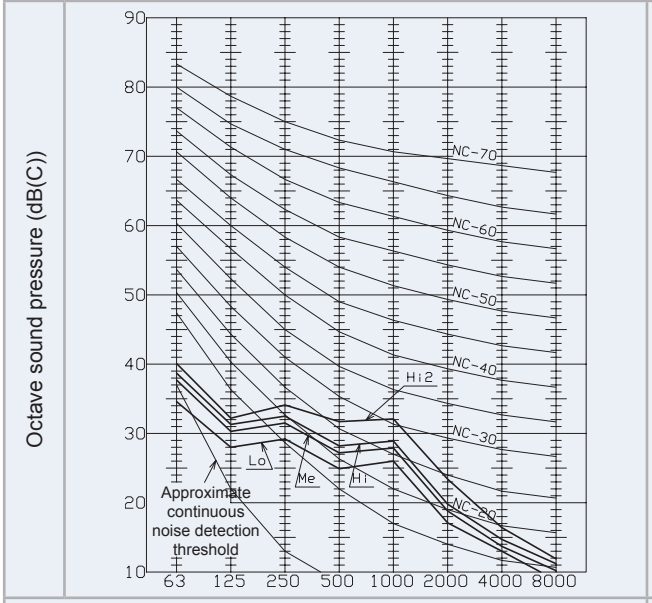


Frequency (Hz)

Fan motor speed: High2/High/Medium/Low; 32/31/30/29 dB(A)

5

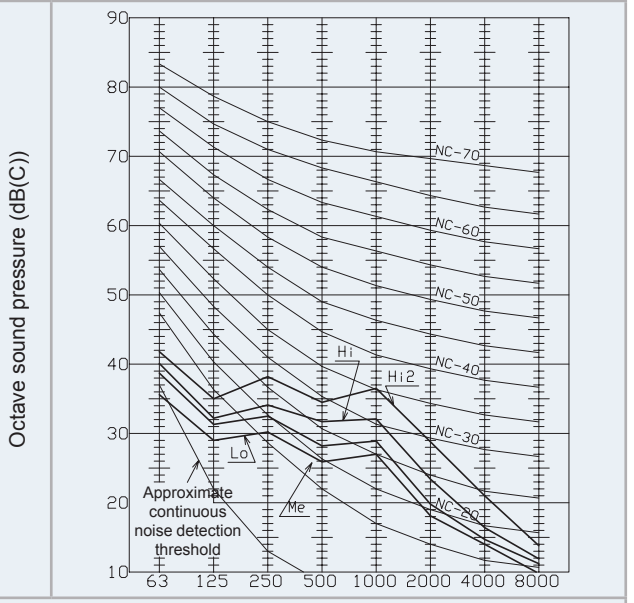
RPK-0.6FSNH4M
with EV-1.5N1 (sold separately as an option)



Frequency (Hz)

Fan motor speed: High2/High/Medium/Low; 35/32/31/29 dB(A)

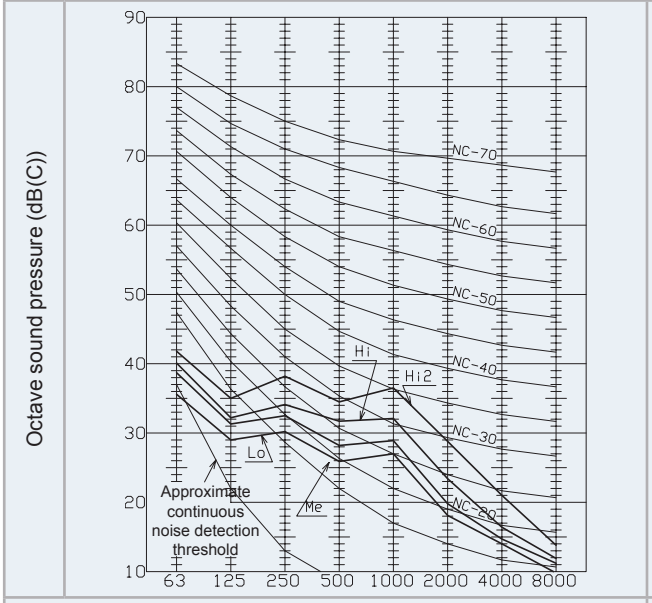
RPK-0.8FSNH4M
with EV-1.5N1 (sold separately as an option)



Frequency (Hz)

Fan motor speed: High2/High/Medium/Low; 39/35/32/30 dB(A)

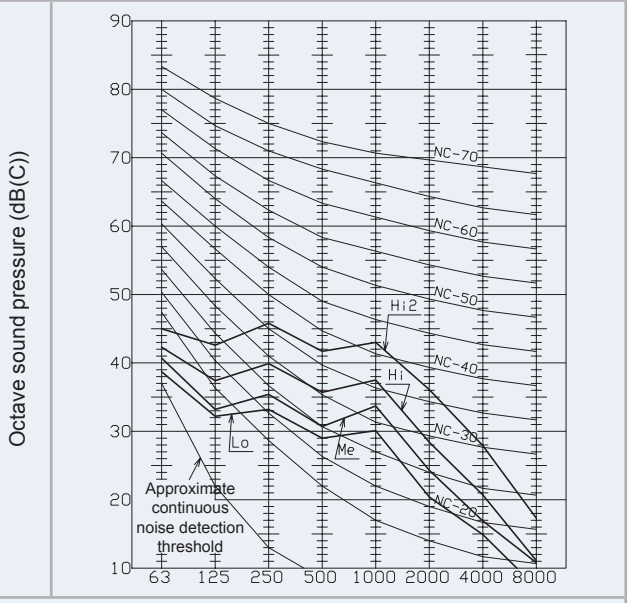
RPK-1.0FSNH4M
with EV-1.5N1 (sold separately as an option)



Frequency (Hz)

Fan motor speed: High2/High/Medium/Low; 39/35/32/30 dB(A)

RPK-1.5FSNH4M
with EV-1.5N1 (sold separately as an option)

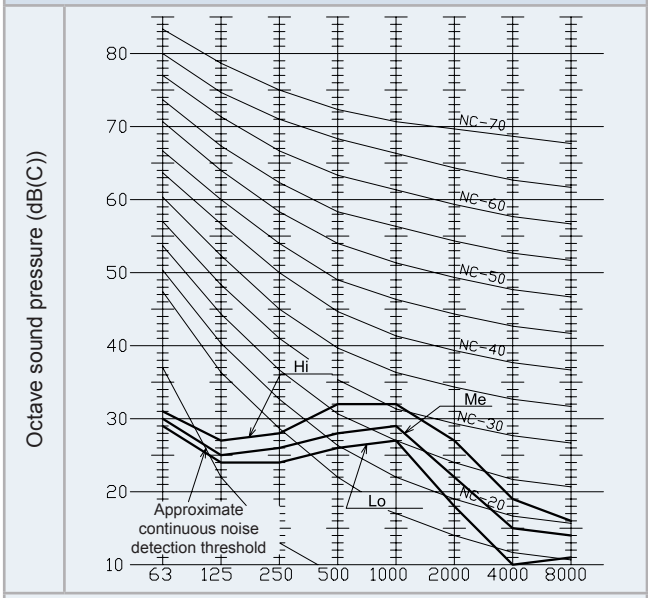


Frequency (Hz)

Fan motor speed: High2/High/Medium/Low; 46/40/36/33 dB(A)

5.8 RPF-(1.0-2.5)FSN2E - Floor type

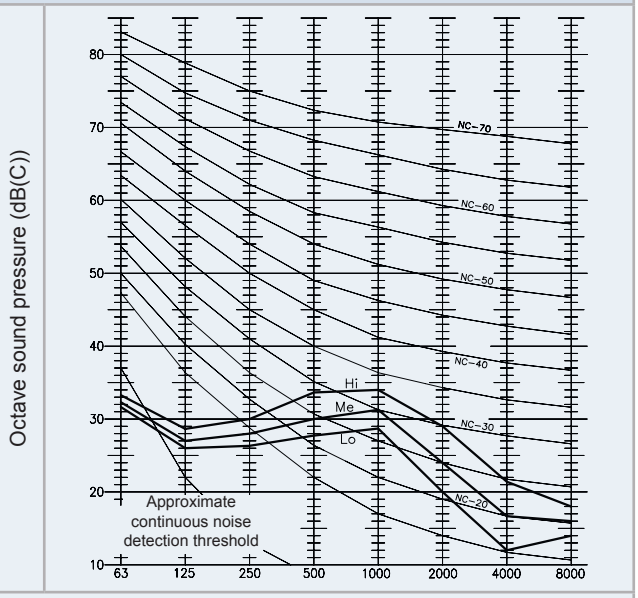
RPF-1.0FSN2E



Frequency (Hz)

Fan motor speed: high/medium/low; 35/32/29 dB(A)

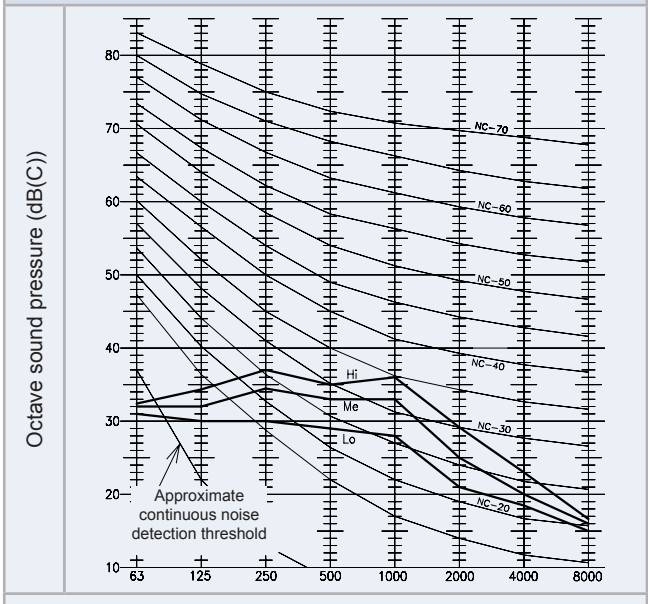
RPF-1.5FSN2E



Frequency (Hz)

Fan motor speed: high/medium/low; 38/35/31 dB(A)

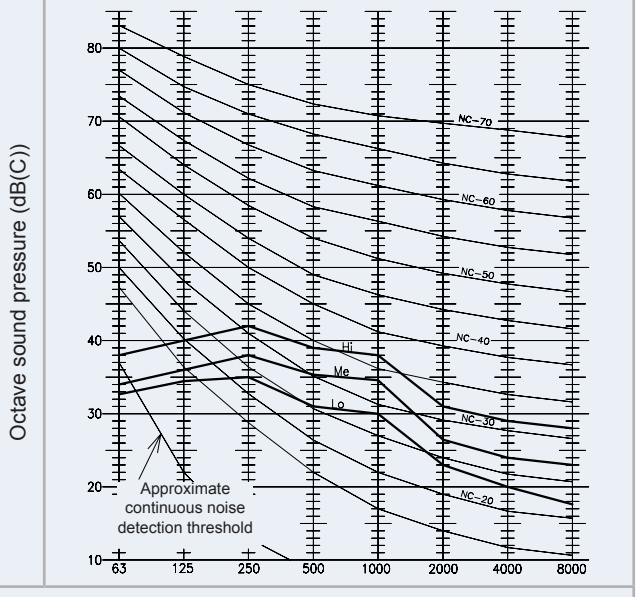
RPF-2.0FSN2E



Frequency (Hz)

Fan motor speed: high/medium/low; 39/36/32 dB(A)

RPF-2.5FSN2E

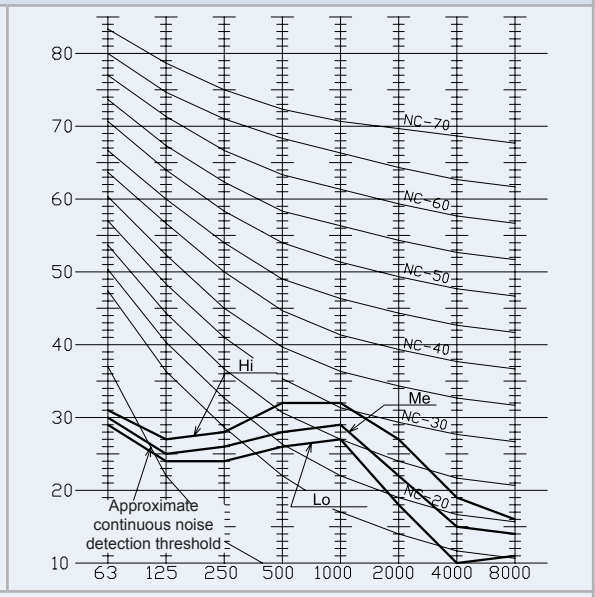


Frequency (Hz)

Fan motor speed: high/medium/low; 42/38/34 dB(A)

5.9 RPFI-(1.0-2.5)FSN2E - Floor concealed type

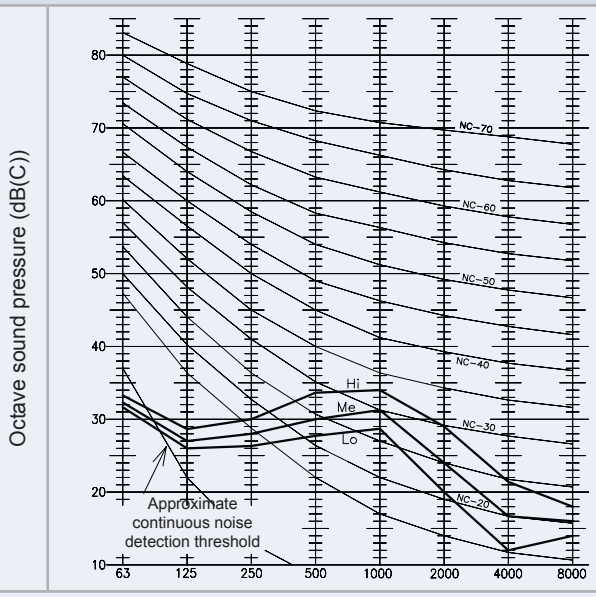
RPFI-1.0FSN2E



Frequency (Hz)

Fan motor speed: high/medium/low; 35/32/29 dB(A)

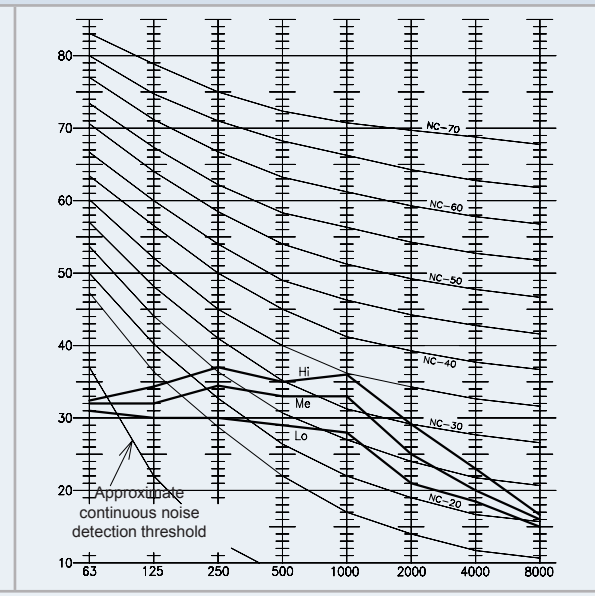
RPFI-1.5FSN2E



Frequency (Hz)

Fan motor speed: high/medium/low; 38/35/31 dB(A)

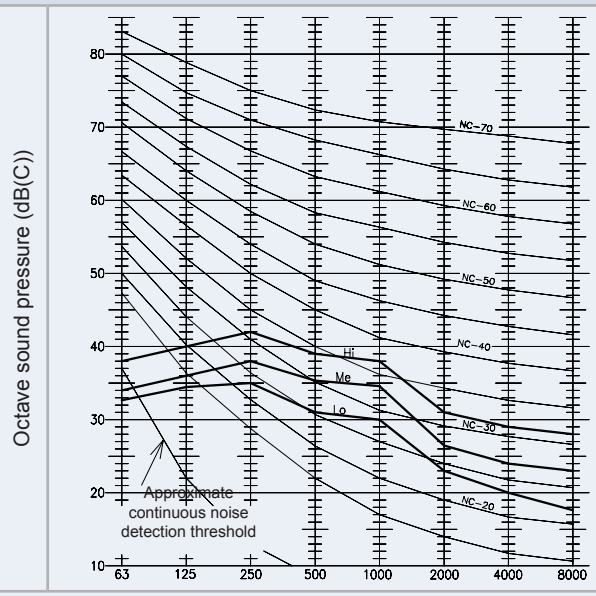
RPFI-2.0FSN2E



Frequency (Hz)

Fan motor speed: high/medium/low; 39/36/32 dB(A)

RPFI-2.5FSN2E



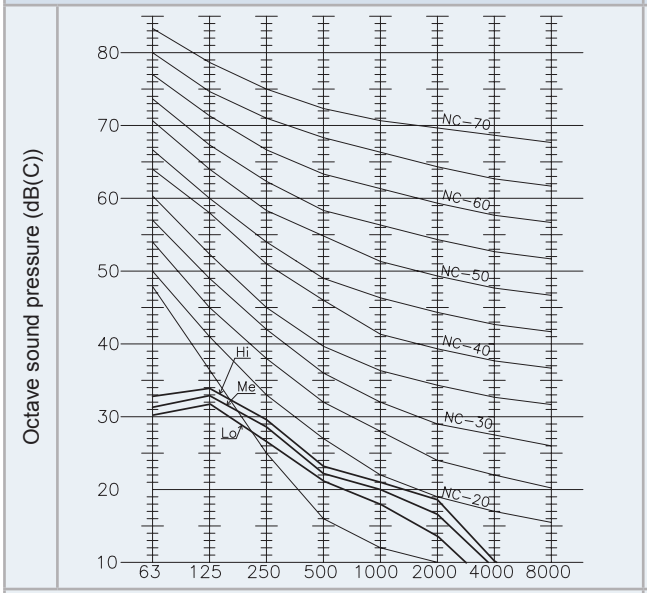
Frequency (Hz)

Fan motor speed: high/medium/low; 42/38/34 dB(A)

5.10 KPI

5.10.1 KPI energy recovery series

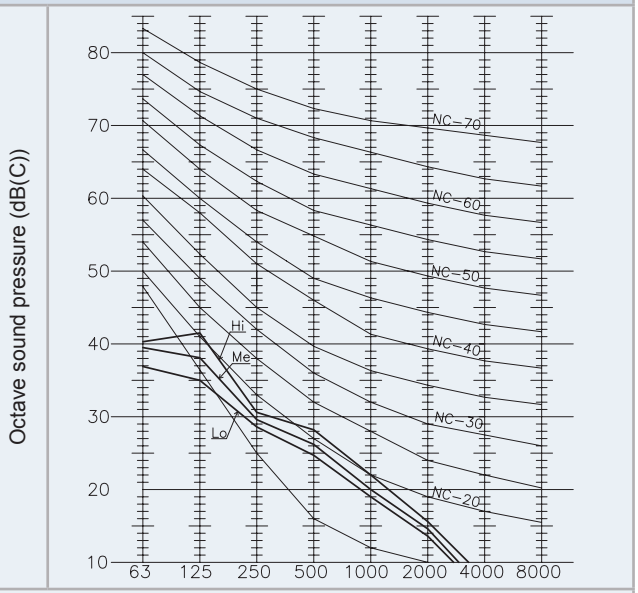
KPI-252E4E



Frequency (Hz)

Fan motor speed: high/medium/low; 27/26/24 dB(A)

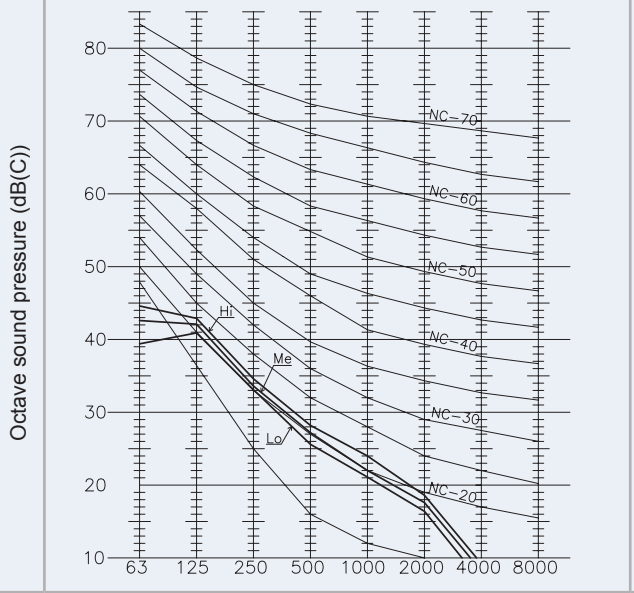
KPI-502E4E



Frequency (Hz)

Fan motor speed: high/medium/low; 30/28/27 dB(A)

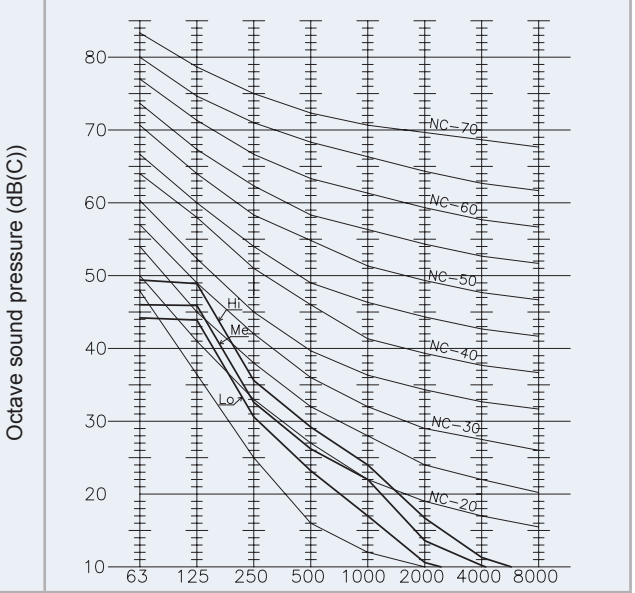
KPI-802E4E



Frequency (Hz)

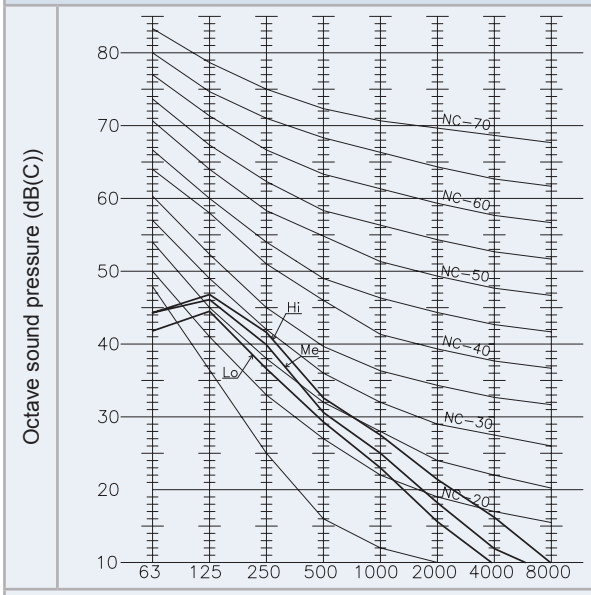
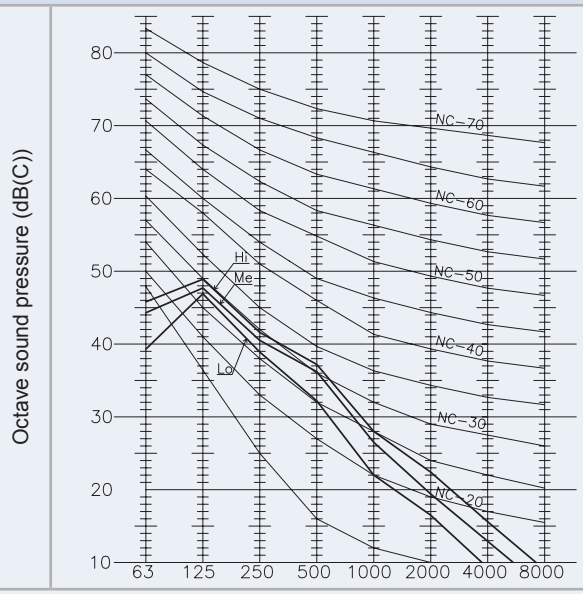
Fan motor speed: high/medium/low; 32/31/30 dB(A)

KPI-1002E4E



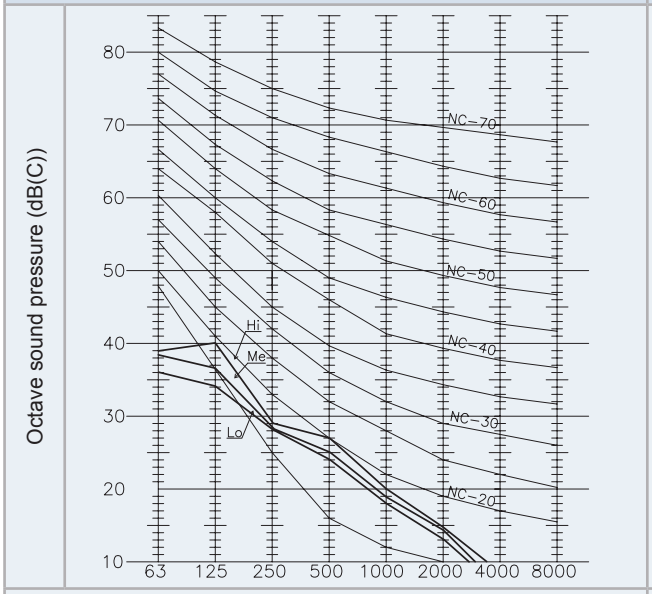
Frequency (Hz)

Fan motor speed: high/medium/low; 35/32/30 dB(A)

KPI-1502E4E	KPI-2002E4E
	
Frequency (Hz)	Frequency (Hz)
Fan motor speed: high/medium/low; 37/35/33 dB(A)	Fan motor speed: high/medium/low; 39/38/35 dB(A)

5.10.2 KPI Active series

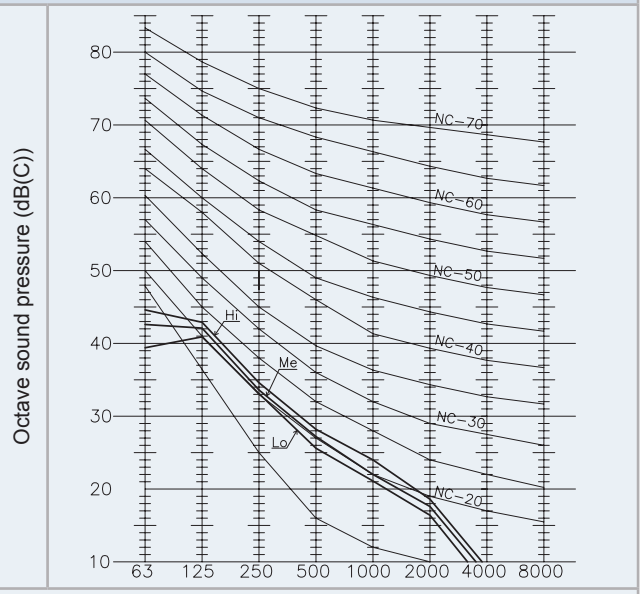
KPI-502X4E



Frequency (Hz)

Fan motor speed: high/medium/low; 29/27/26 dB(A)

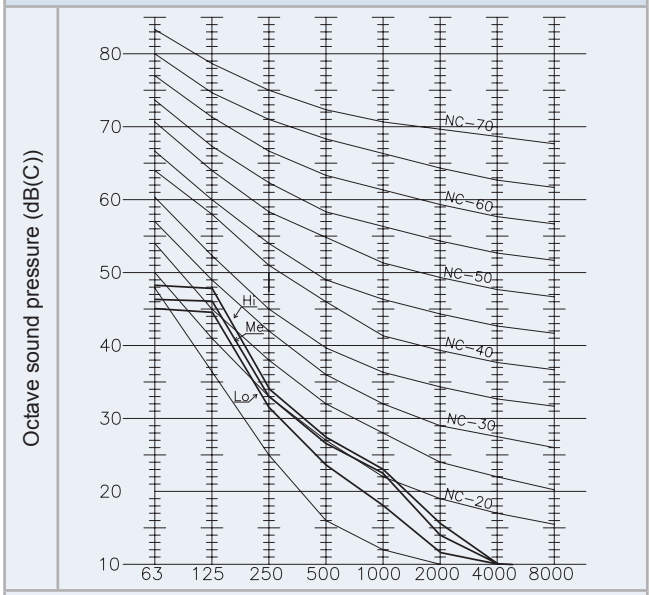
KPI-802X4E



Frequency (Hz)

Fan motor speed: high/medium/low; 31/30/29 dB(A)

KPI-1002X4E



Frequency (Hz)

Fan motor speed: high/medium/low; 34/33/31 dB(A)

6. Working range

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6.1 Working range

6.1.1 Power supply

Operating voltage

Between 90 and 110% of the nominal voltage.

Start-up voltage

Over 85% of the nominal voltage.

6.1.2 Temperature range

The following table indicates the temperature range.

Mode		Cooling	Heating
Indoor temperature	Min.	21ºC DB / 15ºC WB	15ºC DB
	Max.	32ºC DB / 23ºC WB(*)	27ºC DB
Outdoor temperature	Min.	-5ºC DB(*)	-10ºC WB(*)
	Max.	46ºC DB(*)	15ºC WB(*)

(*) The temperature may vary according to the outdoor unit. Consult the Technical Catalogue for outdoor units belonging to the systems UTOPIA or SET-FREE.

NOTE

- *DB: dry bulb; WB: wet bulb*
- *In the case of light cooling load and low temperature suction air of the outdoor unit (lower than 10ºC), the operation may stop by thermo-OFF to prevent of the indoor unit frost formation.*

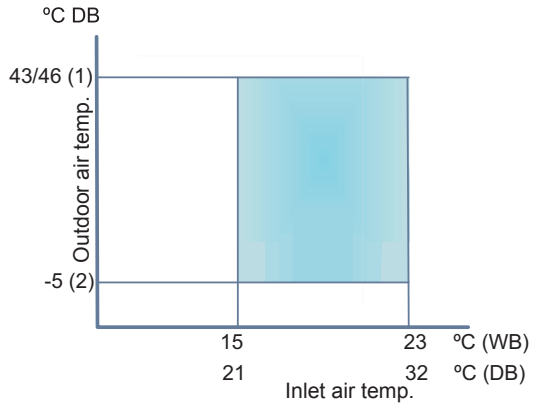
6.1.3 Relative Humidity limit

Lower that 80%

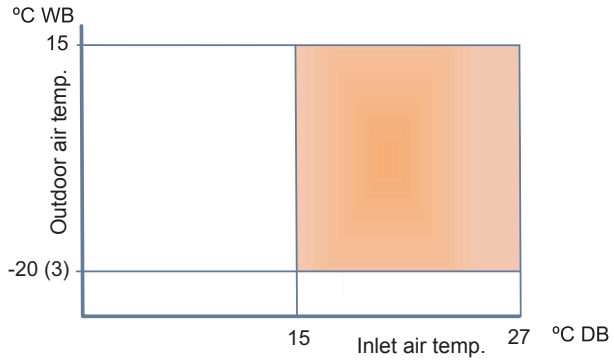
6.1.4 DX Interface working range

◆ **For combinations with the UTOPIA and SET FREE series, the working range is as follows**

Cooling



Heating



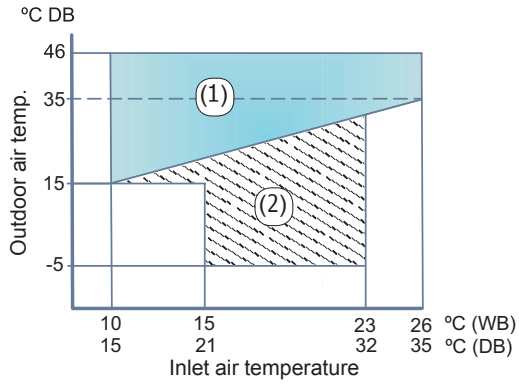
NOTE

- *The temperatures may vary according to the outdoor unit. Consult the Technical Catalogue for outdoor units belonging to the systems UTOPIA or SET-FREE.*
- *(1) UTOPIA IVX (P/C) and SET FREE MINI: 46ºC (DB); SET FREE modular and SET FREE side Flow : 43ºC (DB)*
- *(2) SET FREE MINI in cooling mode: outdoor air temp up to - 15ºC (DB)*
- *(3) SET FREE side flow: -12ºC (WB)*
- *DB: dry bulb; WB: wet bulb*
- *Inlet air temperature is the point just before the Dx-Coil*
- *The working ranges shown apply under the conditions and restrictions of use described for this product. For any item not covered in this documentation, please refer to the DX-Coil Indoor Units technical documentation.*

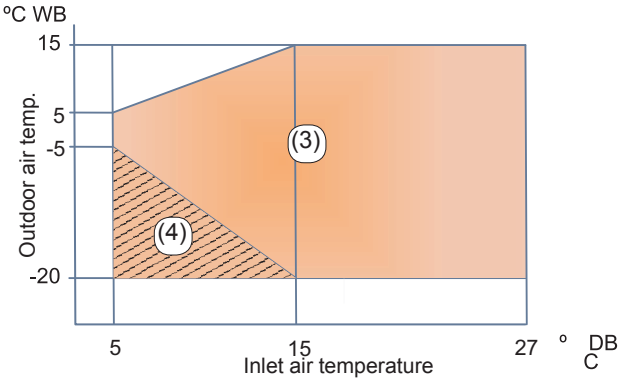
◆ **Working range in applications with Air Handling Units (AHU)**

The general working range has been extended in applications with Air Handling Units (AHU) as shown below, for the combination of DX-Interface Series 2 with the new outdoor units of the RAS-XH(V)NP(1)E series, focused on application in Air Handling Units (AHU).

Cooling



Heating



NOTE

- *(1) Air Handling unit in cooling mode in Toutdoor air ≥ Tinlet air working condition only.*
- *(2) Standard working range operation is allowed.*
- *(3) Air Handling unit in heating mode in Toutdoor air ≤ Tinlet air working condition only.*
- *(4) Minimum setting temperature (19ºC) is not guaranteed in extreme working conditions. Outlet air might require additional treatment with a heating stage after DX-Coil in order to achieve comfort conditions.*
- *The working ranges shown apply under the conditions and restrictions of use described for this product. For any item not covered in this documentation, please refer to the Air Handling Unit Technical Documentations.*

7. General dimensions

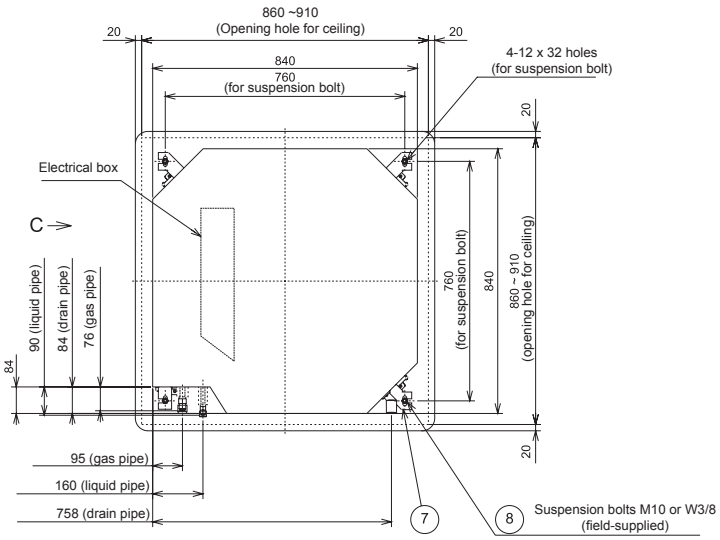
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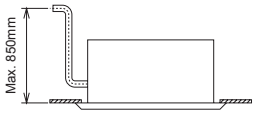
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7.2.12 Econofresh kit 231

7.1 Dimensions

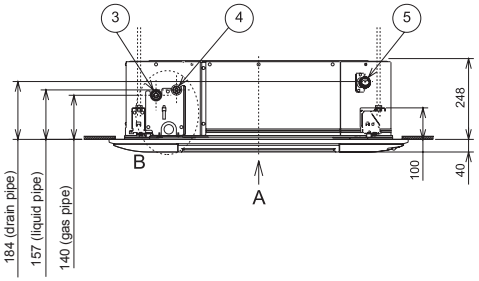
7.1.1 RCI-(1.0-6.0)FSN4 - 4 way cassette

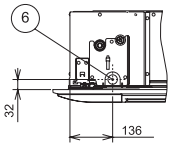
◆ RCI-(1.0-2.5)FSN4 with panel P-N23NA2



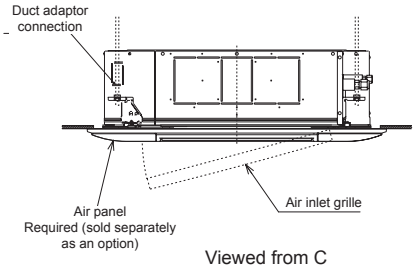


Lifting drain piping

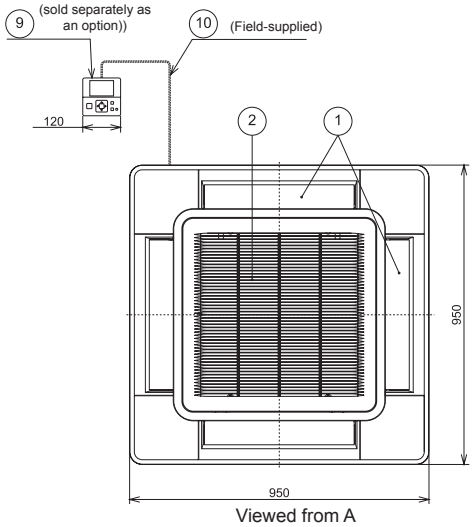




Viewed from B



Viewed from C



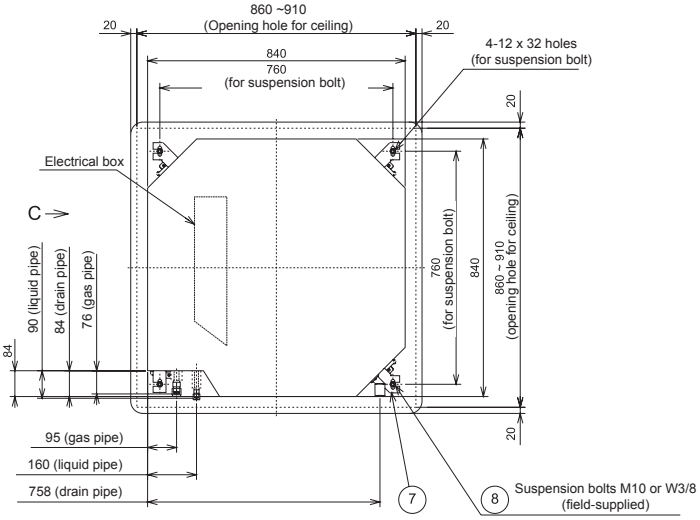
Viewed from A

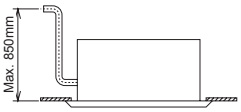
Nº	Description	Remarks
1	Air outlet	4-way
2	Air inlet	
3	Refrigerant connection (gas)	Flare nut, (1.0/1.5/2.0): ø12.7, (2.5): ø15.88
4	Refrigerant connection (liquid)	Flare nut, (1.0/1.5/2.0): ø6.35, (2.5): ø9.52
5	Drain connection	ø32 (VP25)
6	Wiring hole	Die cut hole ø30
7	Unit suspension bracket	(4x) M10 or W3/8
8	Unit suspension bolt	(4x) M10 or W3/8
9	Remote Control Switch	Sold separately as an option (recommended PC-ARFP(1)E)
10	Shielded Twist-Pair Cable	For Remote Control Switch

NOTE

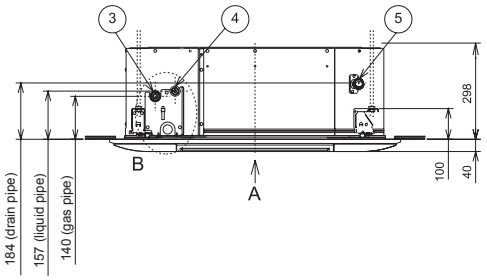
Distance between the wall and panel edge must be min. 1500mm to prevent short circuiting of the air flow.
All measurements are in mm.

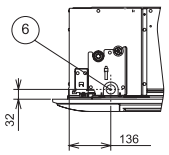
◆ RCI-(3.0-6.0)FSN4 with panel P-N23NA2



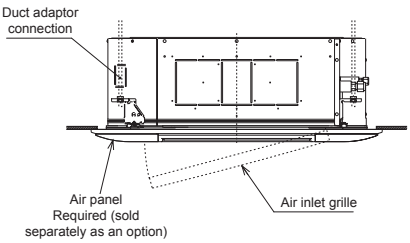


Lifting drain piping

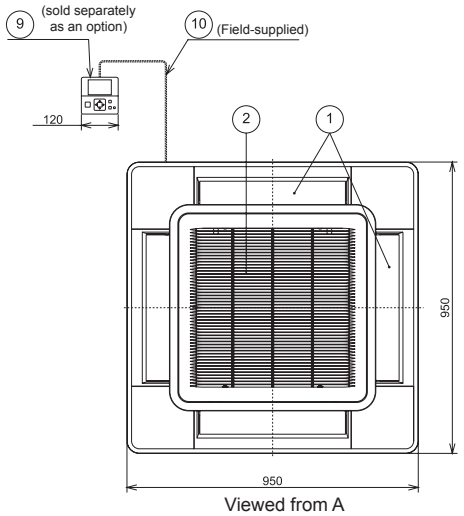




Viewed from B



Viewed from C



Viewed from A

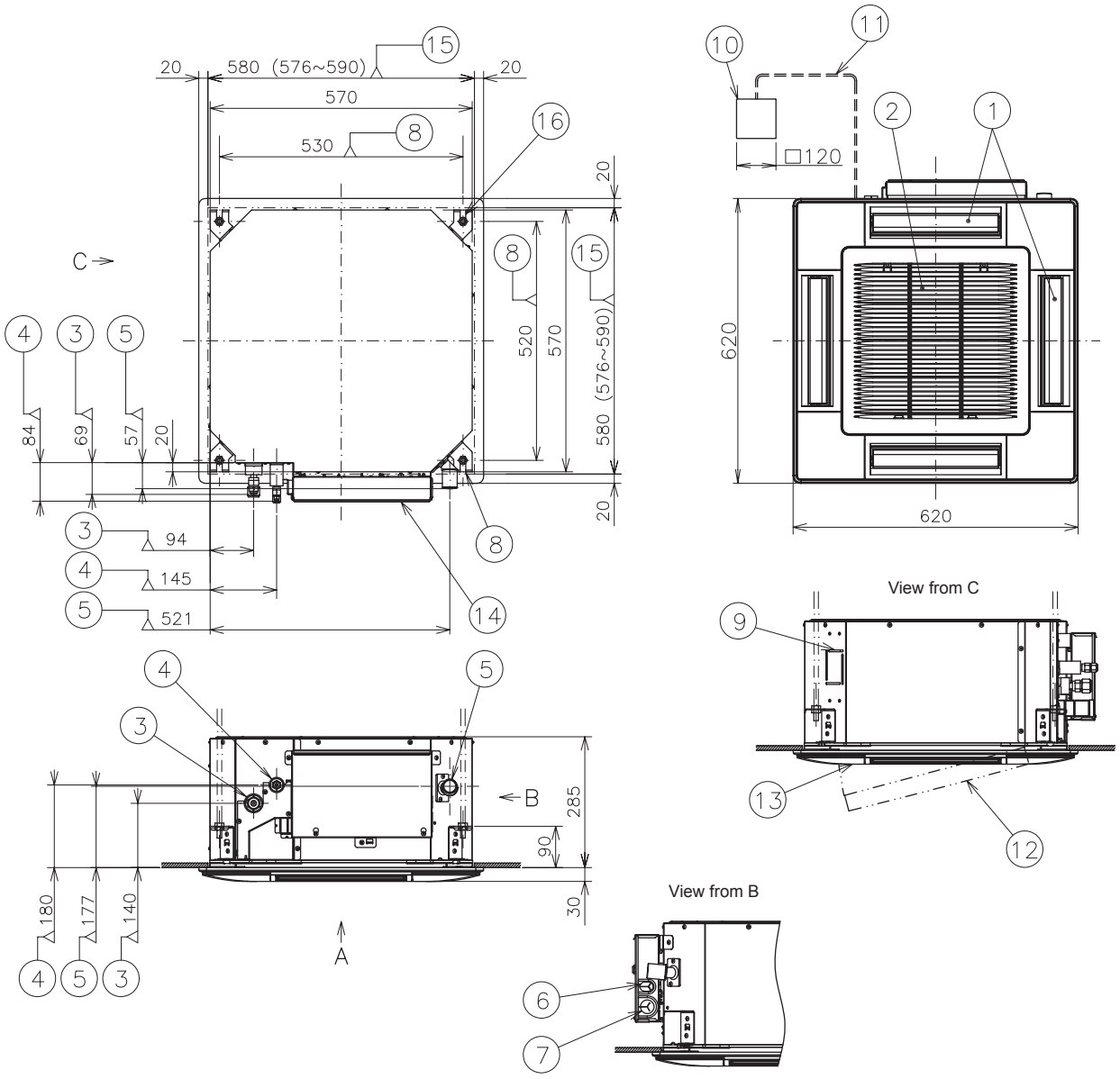
Nº	Description	Remarks
1	Air outlet	4-way
2	Air inlet	
3	Refrigerant connection (gas)	Flare nut. ø15,88
4	Refrigerant connection (liquid)	Flare nut. ø9.52
5	Drain connection	ø32 (VP25)
6	Wiring hole	Die cut hole. ø30
7	Unit suspension bracket	(4x) M10 or W3/8
8	Unit suspension bolt	(4x) M10 or W3/8
9	Remote Control Switch	Sold separately as an option) (recommended PC-ARFP(1)E)
10	Shielded Twist-Pair Cable	For Remote Control Switch

NOTE

Distance between the wall and panel edge must be min. 1500mm to prevent short circuiting of the air flow.
All measurements are in mm.

7.1.2 RCIM-(0.4-2.5)FSN4E - 4-way cassette (compact)

◆ RCIM-(0.4-2.5)FSN4E with panel P-AP56NAM



Nº	Description	Remarks
1	Air outlet	4-way
2	Air inlet	
3	Refrigerant connection (gas line)	Flare nut, (0.4/0.6/0.8/1.0/1.5/2.0 HP): ø12.7, (2.5 HP): ø15.88
4	Refrigerant connection (liquid line)	Flare nut, (0.4/0.6/0.8/1.0/1.5/2.0 HP): ø6.35, (2.5 HP): ø9.52
5	Drain connection	ø32 (VP25)
6	Wiring hole for air panel and motion sensor cables	ø20
7	Wiring hole for the cables for power source, communication, controller, optional wire controller	ø30
8	Unit suspension bolt	(4x) M10 or W3/8 (field supplied)
9	Fresh air intake position (Duct adapter connection)	100 x 100 knockout hole
10	Wired Remote Control Switch	Sold separately as an option
11	Shielded Twist-Pair Cable	For Remote Control Switch (field supplied)
12	Air inlet grille	
13	Air panel	Sold separately as an option (Required)
14	Electrical control box	
15	Opening hole for ceiling	
16	Hole for suspension bolt	4 - 12

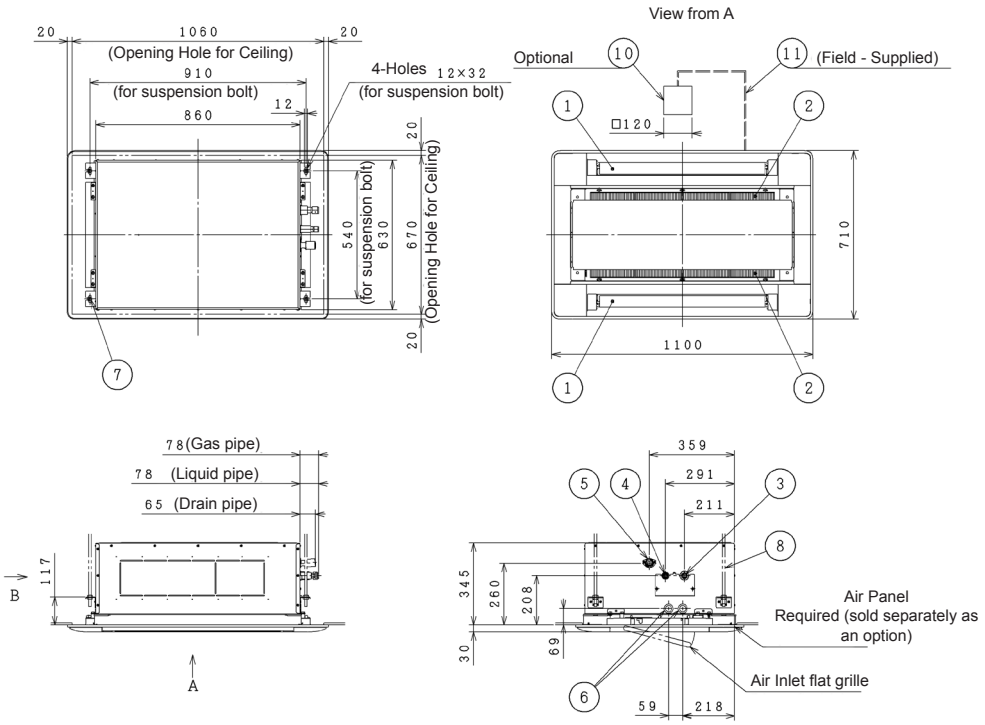
NOTE

Distance between the wall and panel edge must be a min.1500mm to prevent short circuiting.

All measurements are in mm.

7.1.3 RCD-(0.8-6.0)FSN3 - 2-way cassette

◆ RCD-(0.8-3.0)FSN3 - with Air panel P-AP90DNA



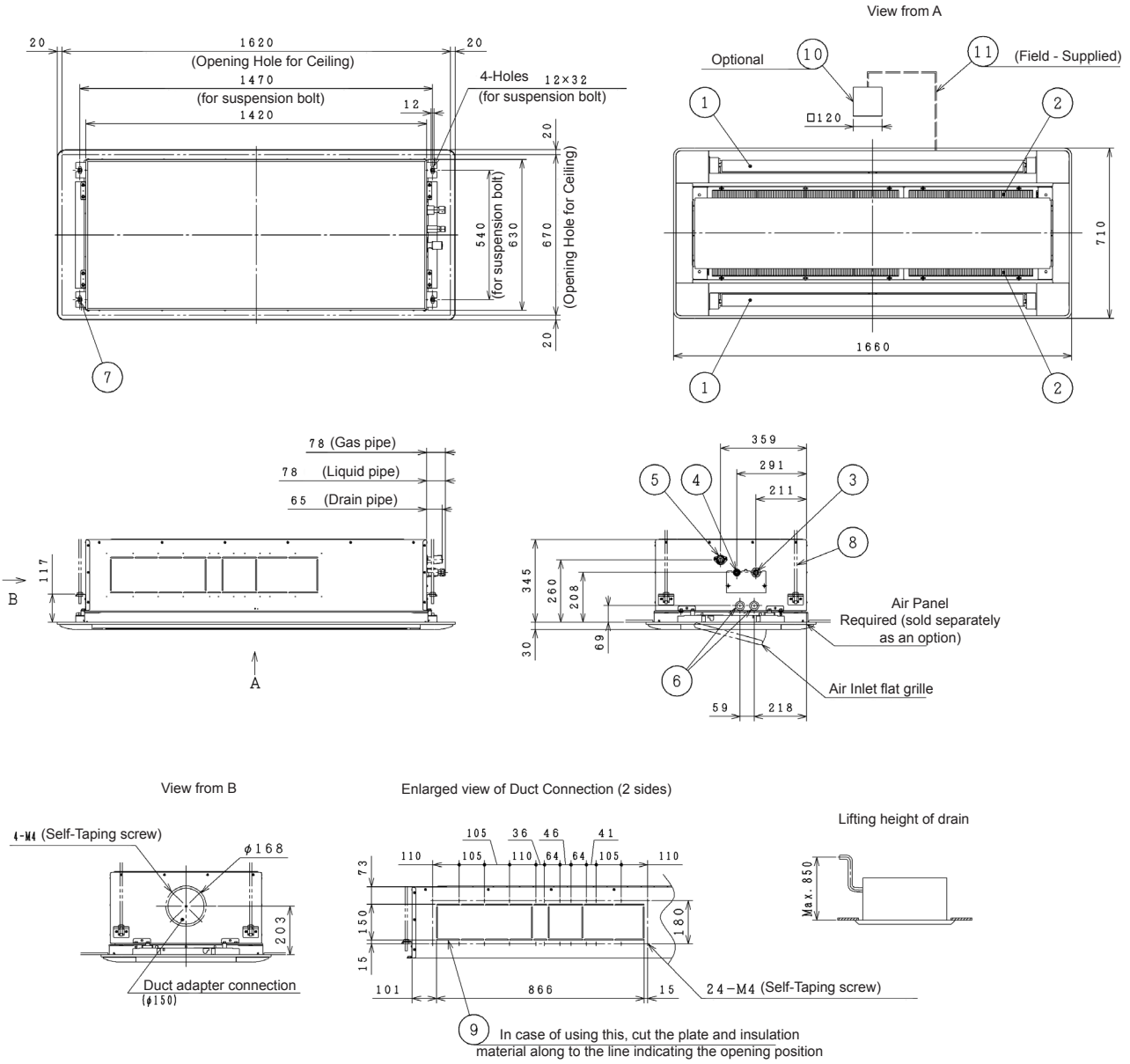
Dimension / HP	a	b
0.8	12.7	6.35
1.0	12.7	6.35
1.5	12.7	6.35
2.0	12.7	6.35
2.5	15.88	9.52
3.0	15.88	9.52

Number	Description	Remarks
1	Air Outlet	2-Way
2	Air Inlet	
3	Refrigerant Gas Pipe Connection	with øa Flare Nut
4	Refrigerant Liquid Pipe Connection	with øb Flare Nut
5	Drain Pipe Connection	VP25
6	Wiring Hole	ø26 Hole
7	Suspension Bracket	
8	Suspension Bolt	4-M10 or W3/8
9	Supply Duct Connection	2-150 x 610
10	Remote Control Switch (PC-ARFP(1)E)	Sold separately as an option
11	Shielded Twist-Pair Cable for PC-ARFP(1)E	Min 0.75mm². Field-Supplied

NOTE

Distance between the wall and panel edge must be a min.1500mm to prevent short circuiting.
All measurements are in mm.

◆ RCD-(4.0/6.0)FSN3 with Air panel P-AP160DNA



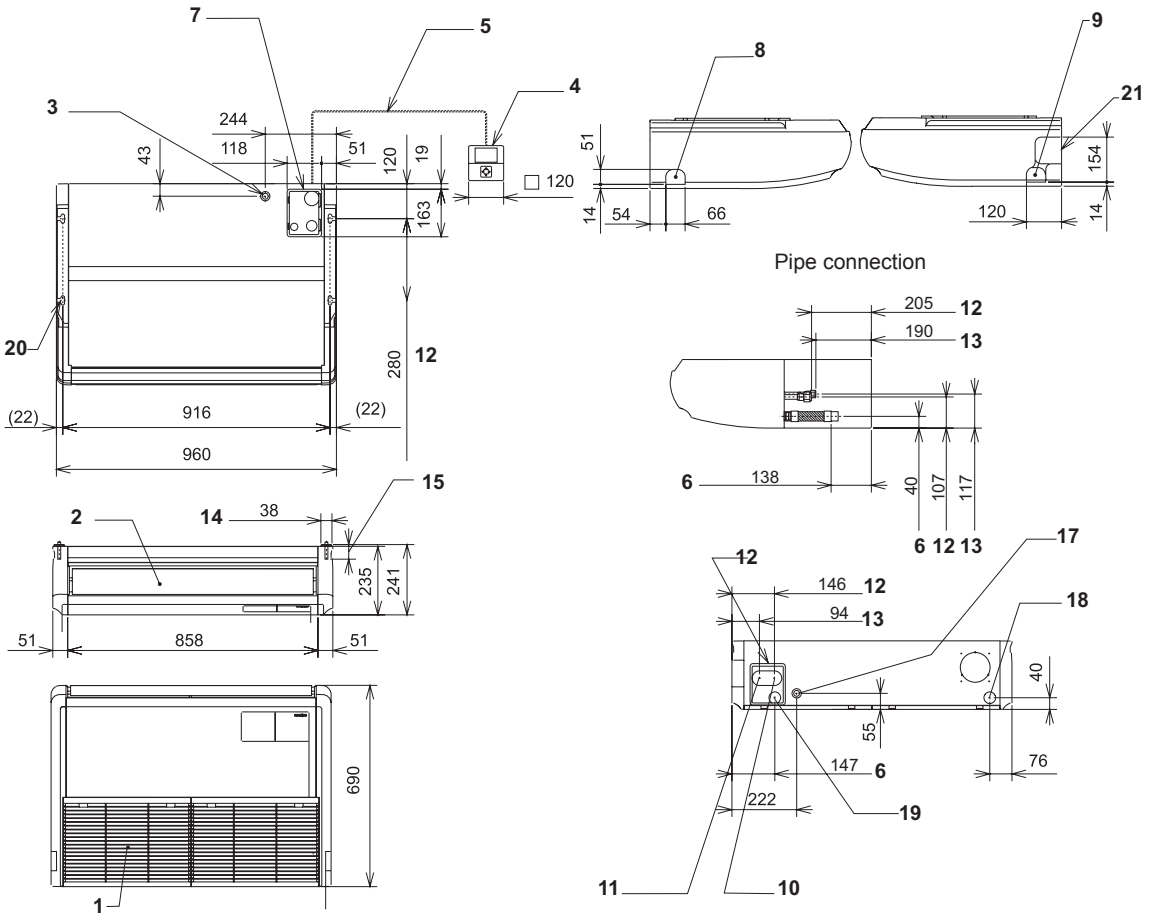
Number	Description	Remarks
1	Air Outlet	2-Way
2	Air Inlet	
3	Refrigerant Gas Pipe Connection	with ø15.88 Flare Nut
4	Refrigerant Liquid Pipe Connection	with ø9.52 Flare Nut
5	Drain Pipe Connection	VP25
6	Wiring Hole	ø26 Hole
7	Suspension Bracket	
8	Suspension Bolt	4-M10 or W3/8
9	Supply Duct Connection	2-150 x 866
10	Remote Control Switch (PC-ARFP(1)E)	Sold separately as an option
11	Shielded Twist-Pair Cable for PC-ARFP(1)E	Min 0.75mm². Field-Supplied

NOTE

Distance between the wall and panel edge must be a min.1500mm to prevent short circuiting.
All measurements are in mm.

7.1.4 RPC-(1.5-6.0)FSN3 - Ceiling type

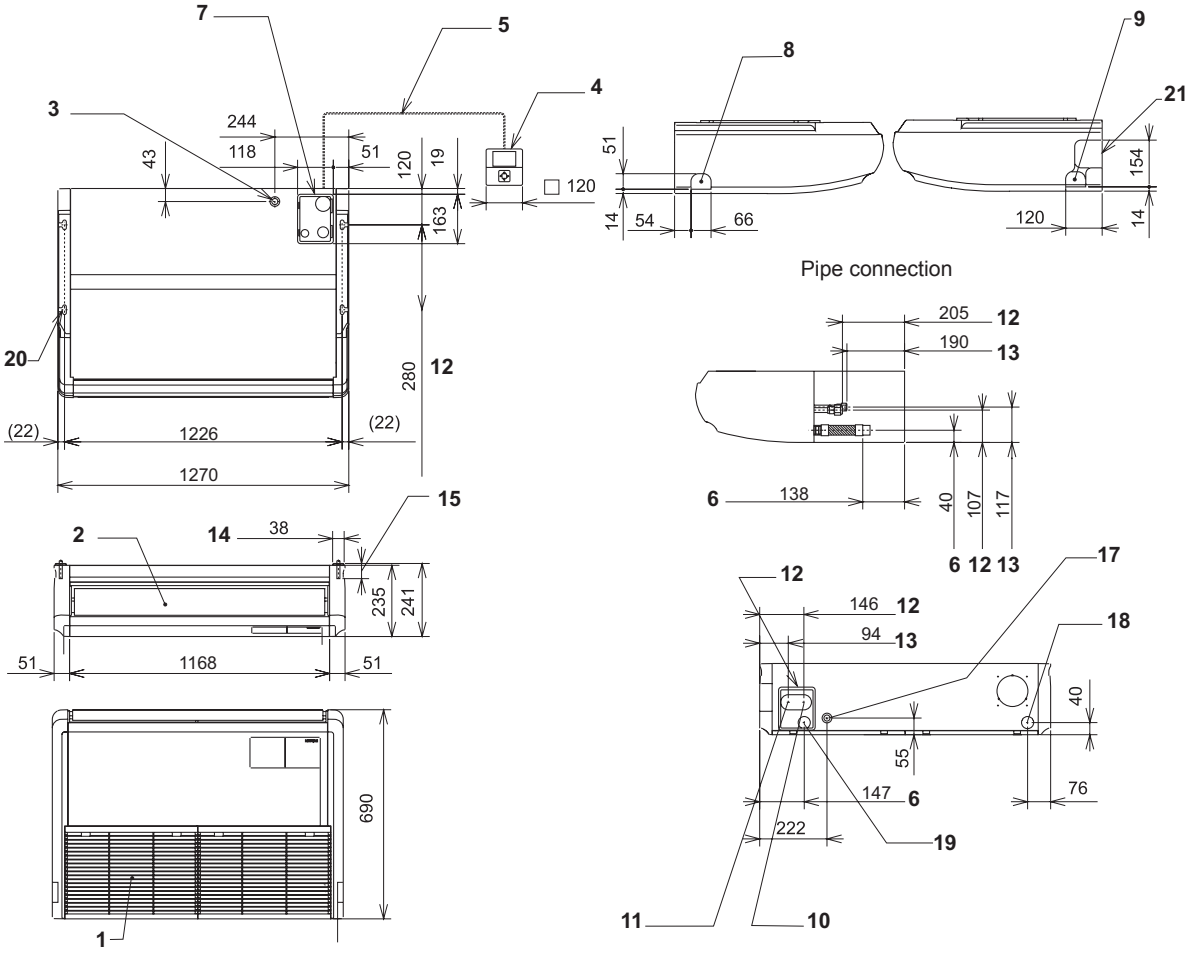
◆ RPC-(1.5/2.0)FSN3 - Ceiling type



Number	Description	Remarks
1	Air inlet	
2	Air outlet	
3	Cable connection hole of upper side	
4	Remote Control Switch PC-ARFP(1)E	Sold separately as an option
5	Twist Pair Cable	Min 0.75 mm² (Field Supplied)
6	Drain Pipe	
7	Pipe through cover of upper side	
8	Connection hole of left side drain pipe	(Knockout-hole)
9	Connection hole of right side drain pipe	(Knockout-hole)
10	Refrigerant connection (liquid)	Flare nut ø6.35
11	Refrigerant connection (gas)	RPC-1.5FSN3: Flare nut ø12.7/RPC-2.0FSN3: Flare nut ø15.88
12	Gas pipe	
13	Liquid pipe	
14	Unit suspension bracket	
15	Suspension bolt length	Max 50 mm²
16	Pipe through cover of rear side	
17	Cable connecting hole of rear side	
18	Drain pipe connecting hole	(VP20) In case of left side drain
19	Drain pipe connecting hole	(VP20) In case of right side drain
20	For suspension bolt	4-12 x 32 holes
21	Pipe through cover of right side	

All measurements are in mm.

◆ RPC-(2.5-3.0)FSN3 - Ceiling type

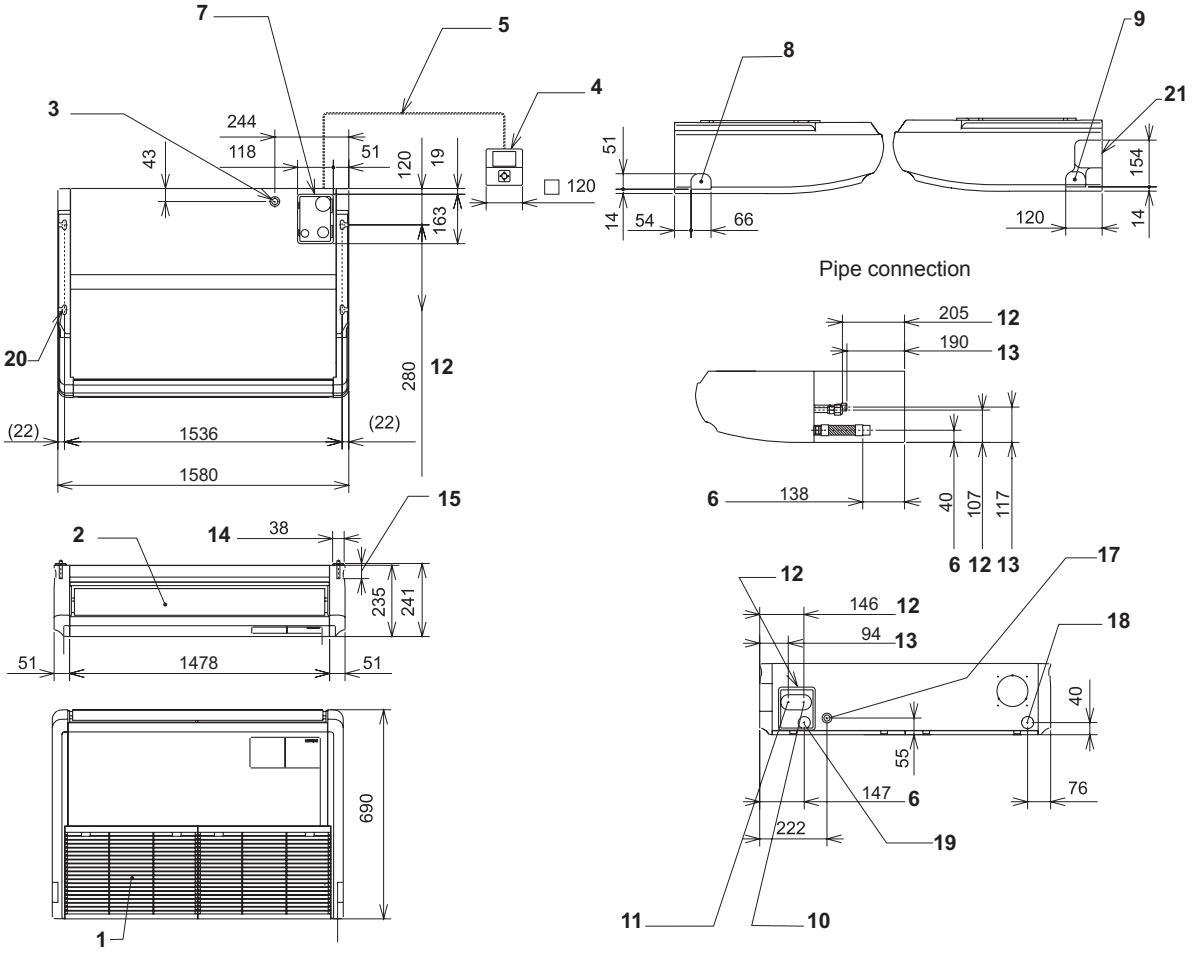


Number	Description	Remarks
1	Air inlet	
2	Air outlet	
3	Cable connection hole of upper side	
4	Remote Control Switch PC-ARFP(1)E	Sold separately as an option
5	Twist Pair Cable	Min 0.75 mm² (Field Supplied)
6	Drain Pipe	
7	Pipe through cover of upper side	
8	Connection hole of left side drain pipe	(Knockout-hole)
9	Connection hole of right side drain pipe	(Knockout-hole)
10	Refrigerant connection (gas line)	Flare nut ø6.35
11	Refrigerant connection (liquid line)	RPC-1.5FSN3: Flare nut ø12.7 RPC-2.0FSN3: Flare nut ø15.88
12	Gas pipe	
13	Liquid pipe	
14	Unit suspension bracket	
15	Suspension bolt length	Max 50 mm²
16	Pipe through cover of rear side	
17	Cable connecting hole of rear side	
18	Drain pipe connecting hole	(VP20) In case of left side drain
19	Drain pipe connecting hole	(VP20) In case of right side drain
20	For suspension bolt	4-12 x 32 holes
21	Pipe through cover of right side	

NOTE

All measurements are in mm.

◆ RPC-(4.0/5.0/6.0)FSN3 - Ceiling type



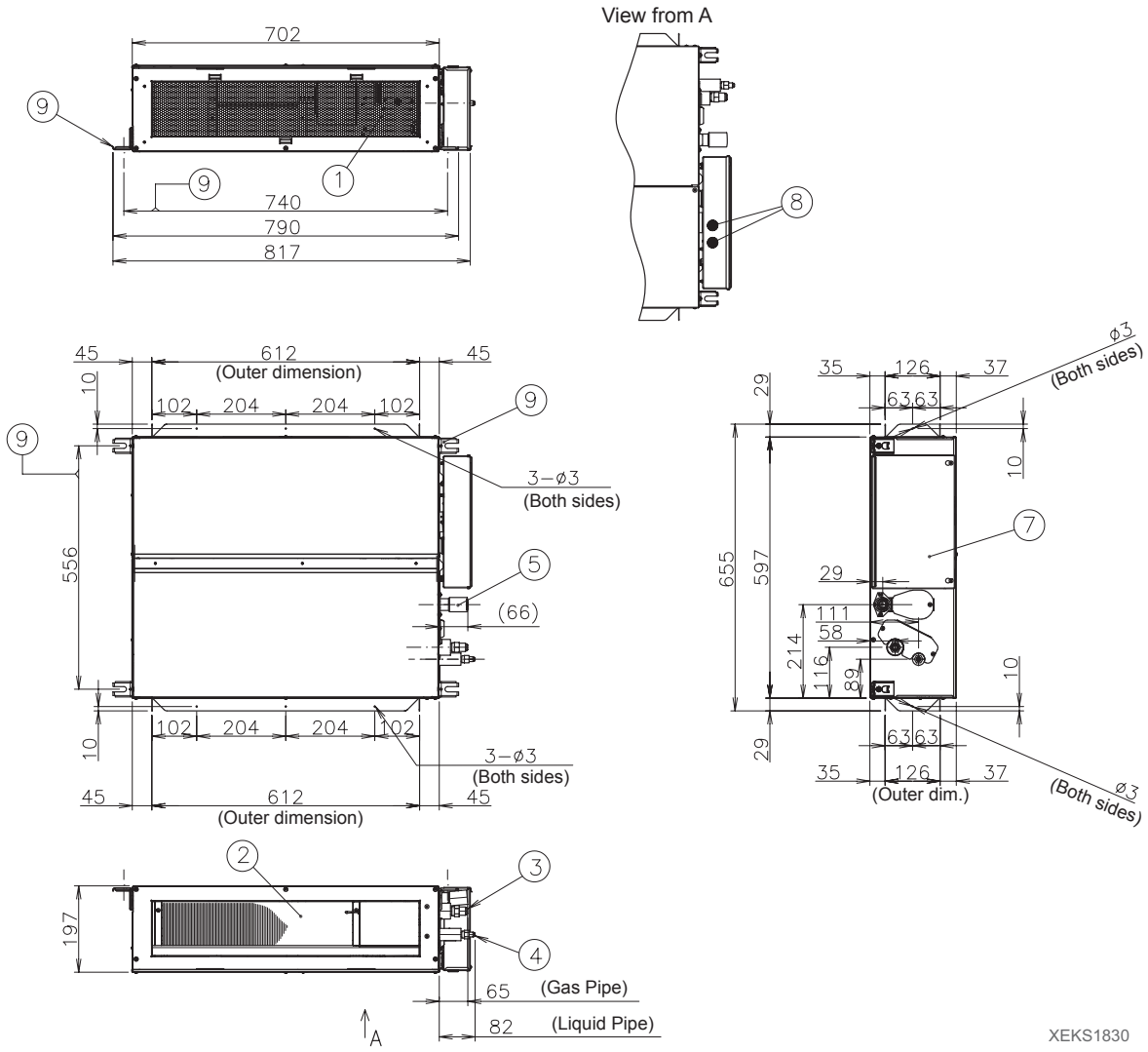
Number	Description	Remarks
1	Air inlet	
2	Air outlet	
3	Cable connection hole of upper side	
4	Remote Control Switch PC-ARFP(1)E	(Optional)
5	Twist Pair Cable	Min 0.75 mm² (Field Supplied)
6	Drain Pipe	
7	Pipe through cover of upper side	
8	Connection hole of left side drain pipe	(Knockout-hole)
9	Connection hole of right side drain pipe	(Knockout-hole)
10	Refrigerant connection (gas line)	Flare nut ø6.35
11	Refrigerant connection (liquid line)	RPC-1.5FSN3: Flare nut ø12.7 RPC-2.0FSN3: Flare nut ø15.88
12	Gas pipe	
13	Liquid pipe	
14	Unit suspension bracket	
15	Suspension bolt length	Max 50 mm²
16	Pipe through cover of rear side	
17	Cable connecting hole of rear side	
18	Drain pipe connecting hole	(VP20) In case of left side drain
19	Drain pipe connecting hole	(VP20) In case of right side drain
20	For suspension bolt	4-12 x 32 holes
21	Pipe through cover of right side	

NOTE

All measurements are in mm.

7.1.5 RPI-(0.4-10.0)FSN(3/5)E - Indoor ducted unit

◆ RPI-0.4-FSN5E - Indoor ducted unit

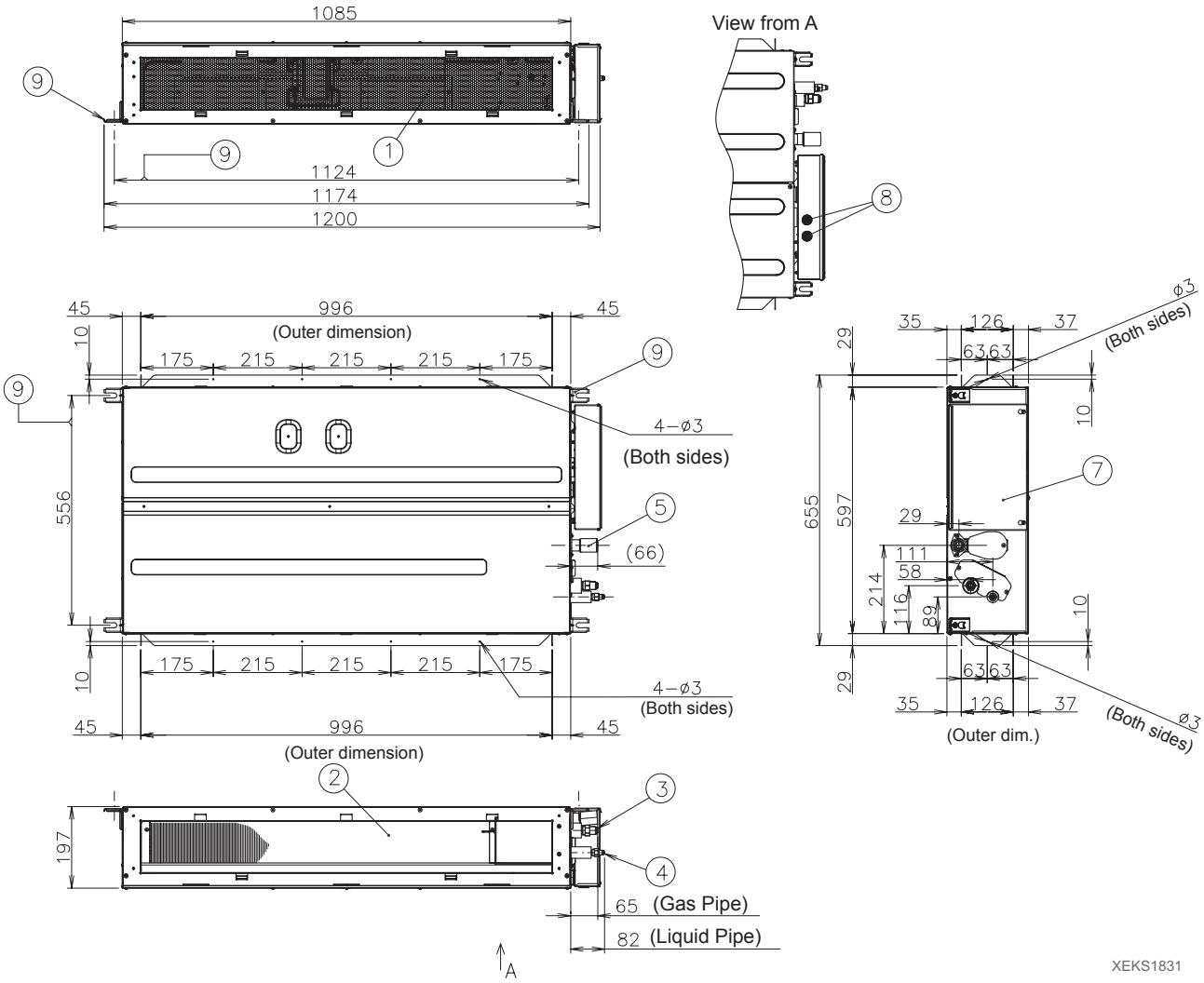


Number	Description	Remarks
1	Air inlet	
2	Air outlet	
3	Refrigerant connection (gas line)	Flare nut. ø12.7
4	Refrigerant connection (liquid line)	Flare nut. ø6.35
5	Condensate drain piping	ø32 (inner diameter)
7	Electrical box	
8	Wiring connections	
9	Suspension brackets	(4 locations)

NOTE

All measurements are in mm.

◆ RPI-(0.6-1.5)FSN5E - Indoor ducted unit

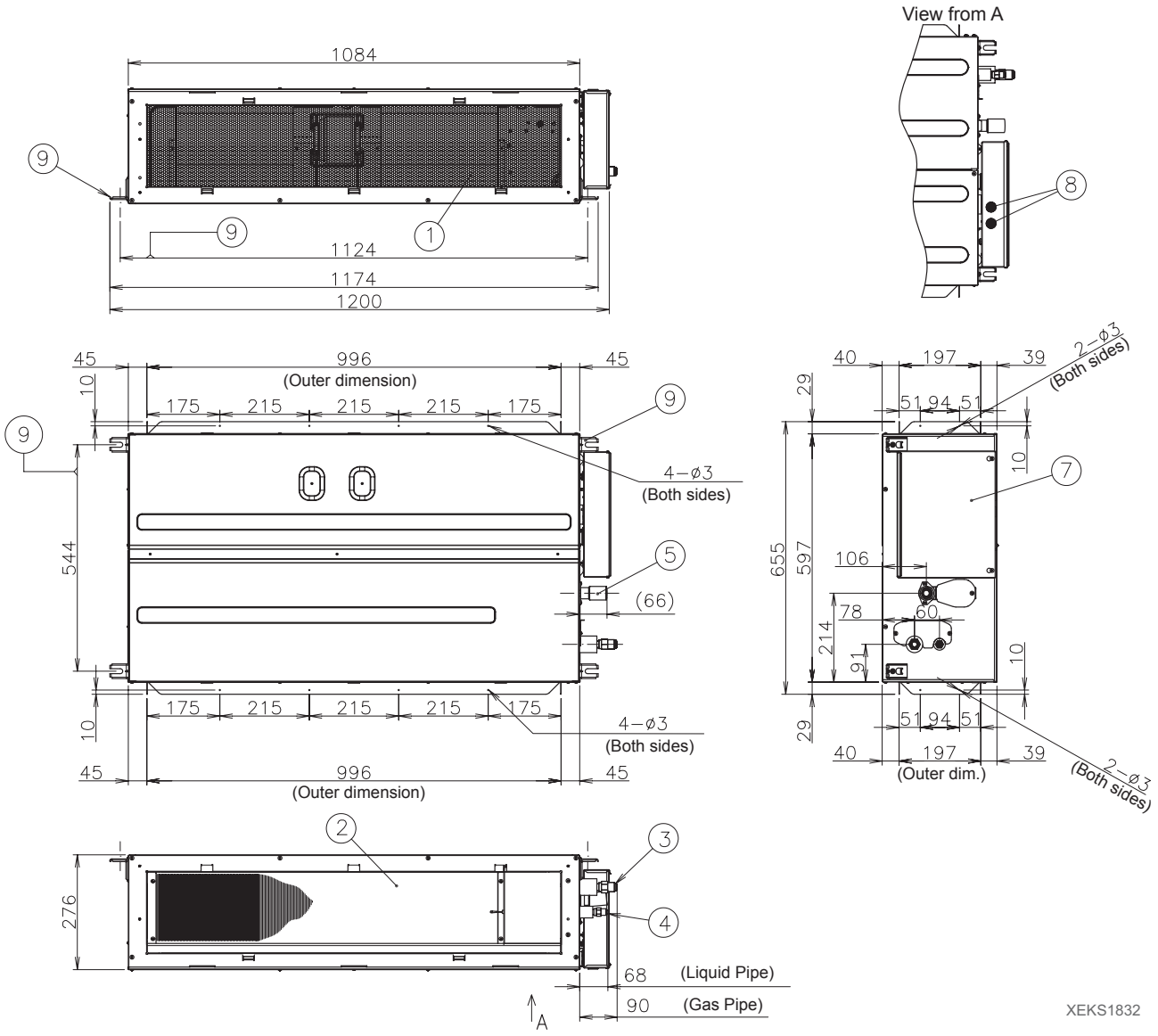


Number	Description	Remarks
1	Air inlet	
2	Air outlet	
3	Refrigerant connection (gas line)	Flare nut. ø12.7
4	Refrigerant connection (liquid line)	Flare nut. ø6.35
5	Condensate drain piping	ø32 (inner diameter)
7	Electrical box	
8	Wiring connections	
9	Suspension brackets	(4 locations)

NOTE

All measurements are in mm.

◆ RPI-(2.0-3.0)FSN5E - Indoor ducted unit

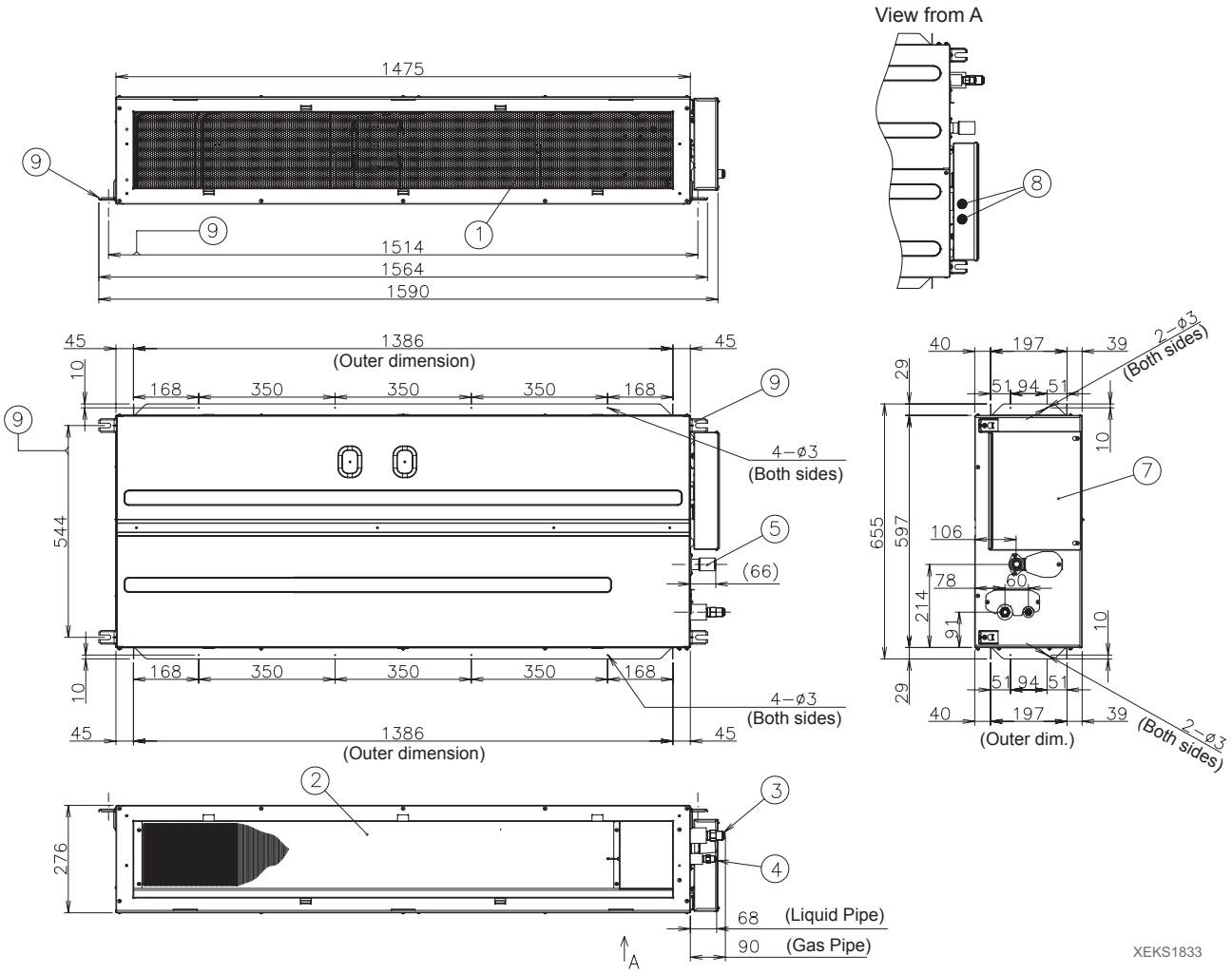


Number	Description	Remarks
1	Air inlet	
2	Air outlet	
3	Refrigerant connection (gas line)	Flare nut. ø15.88
4	Refrigerant connection (liquid line)	Flare nut. ø6.35 (RPI-2.0FSN5E) / ø9.52 (RPI-(2.5/3.0)FSN5E)
5	Condensate drain piping	ø32 (inner diameter)
7	Electrical box	
8	Wiring connections	
9	Suspension brackets	(4 locations)

NOTE

All measurements are in mm.

◆ RPI-(4.0-6.0)FSN5E - Indoor ducted unit

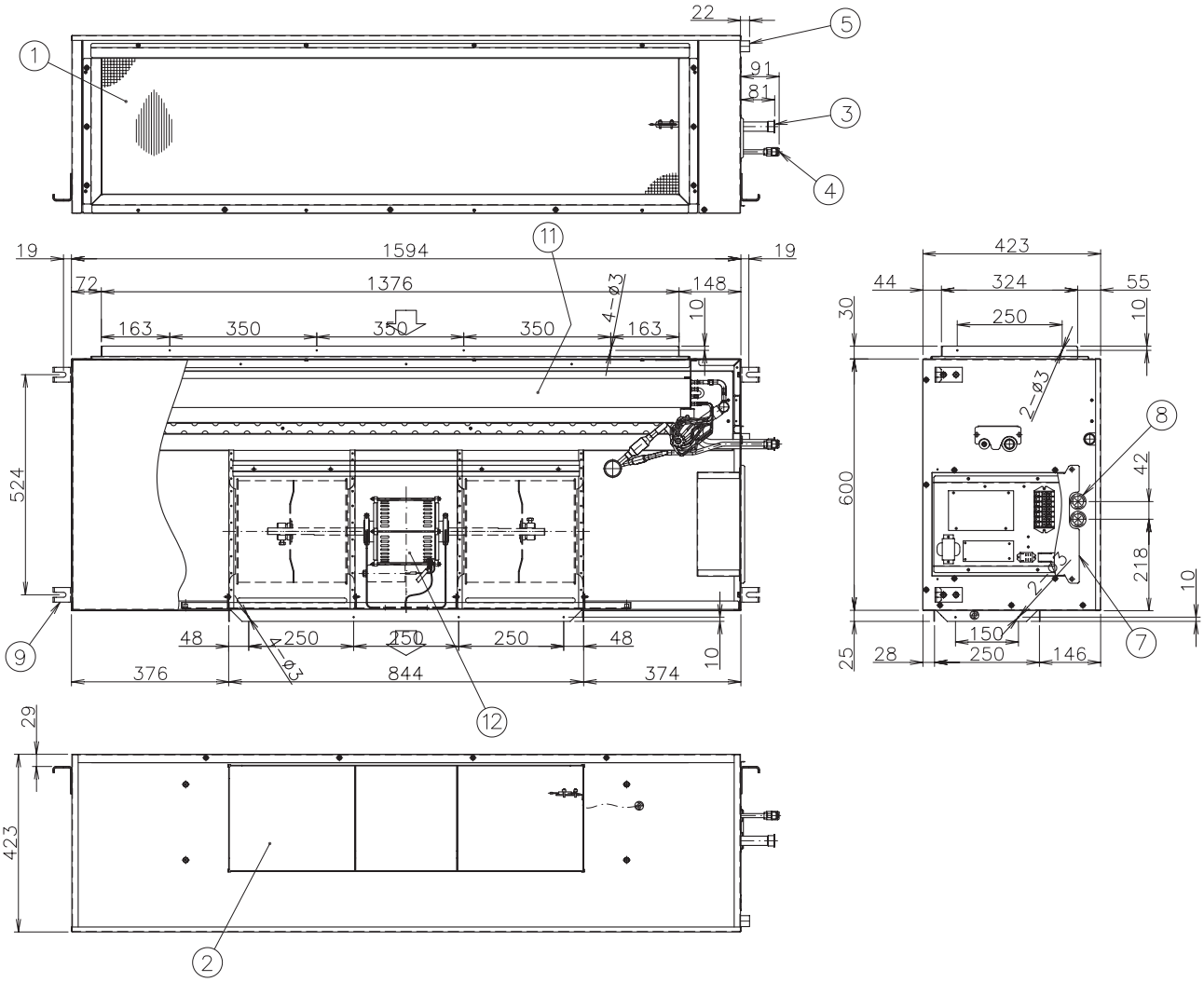


Number	Description	Remarks
1	Air inlet	
2	Air outlet	
3	Refrigerant connection (gas line)	Flare nut. ø15.88
4	Refrigerant connection (liquid line)	Flare nut. ø9.52
5	Condensate drain piping	ø32 (inner diameter)
7	Electrical box	
8	Wiring connections	
9	Suspension brackets	(4 locations)

NOTE

All measurements are in mm.

◆ RPI-(8.0/10.0)FSN3E(-f) - Indoor ducted unit

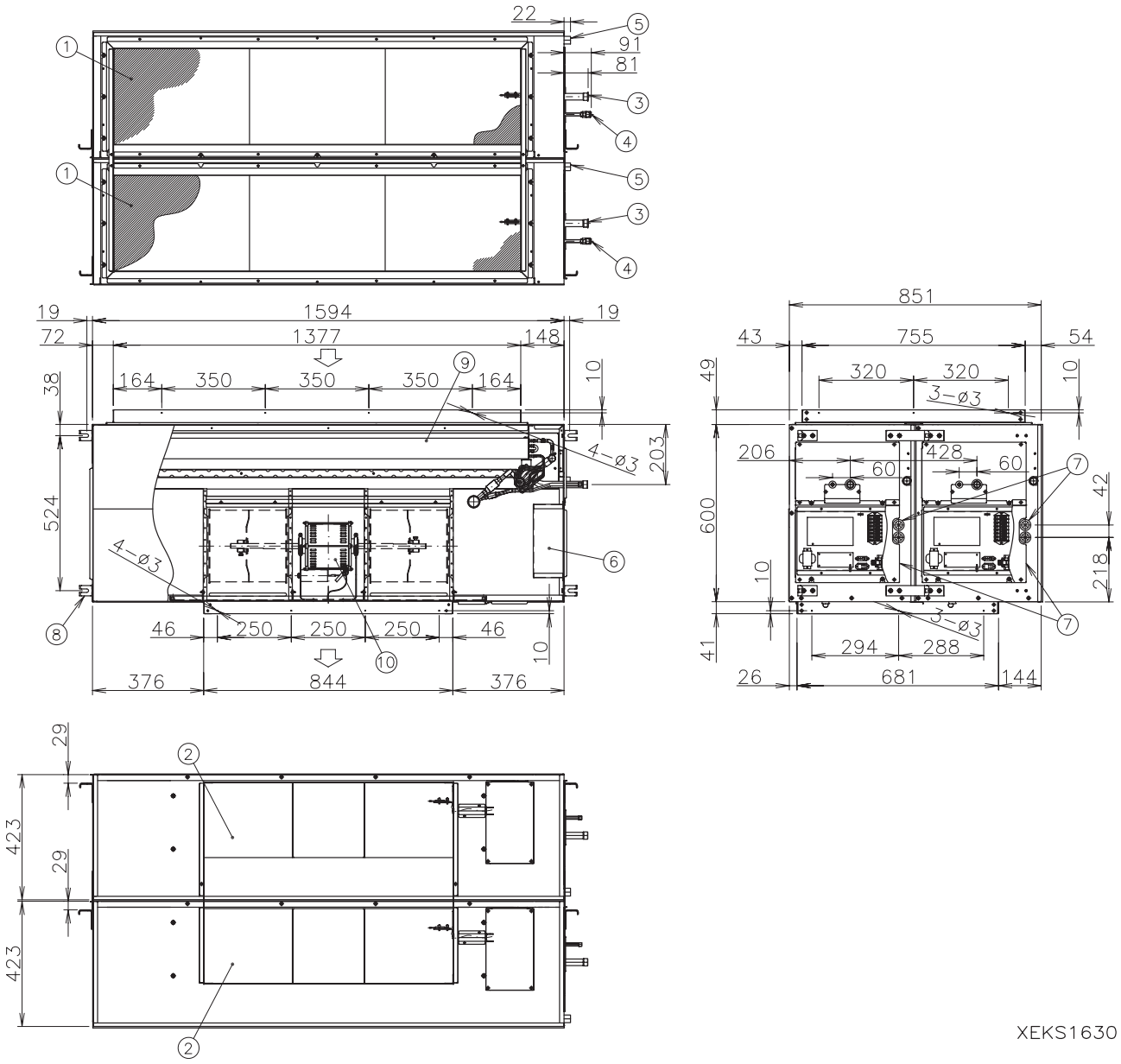


Number	Description	Remarks
1	Air inlet	
2	Air outlet	
3	Refrigerant connection (gas line)	ø19.05 RPI-(8.0), ø22.2 RPI-(10.0)
4	Refrigerant connection (liquid line)	Flare nut. ø9.52 RPI-(8.0/10.0)
5	Drain connection	ø25 (outer diameter)
7	Electrical box	
8	Wiring hole	
9	Unit suspension bracket	(4x)
11	Heat Exchanger	
12	Fan motor	

NOTE

All measurements are in mm.

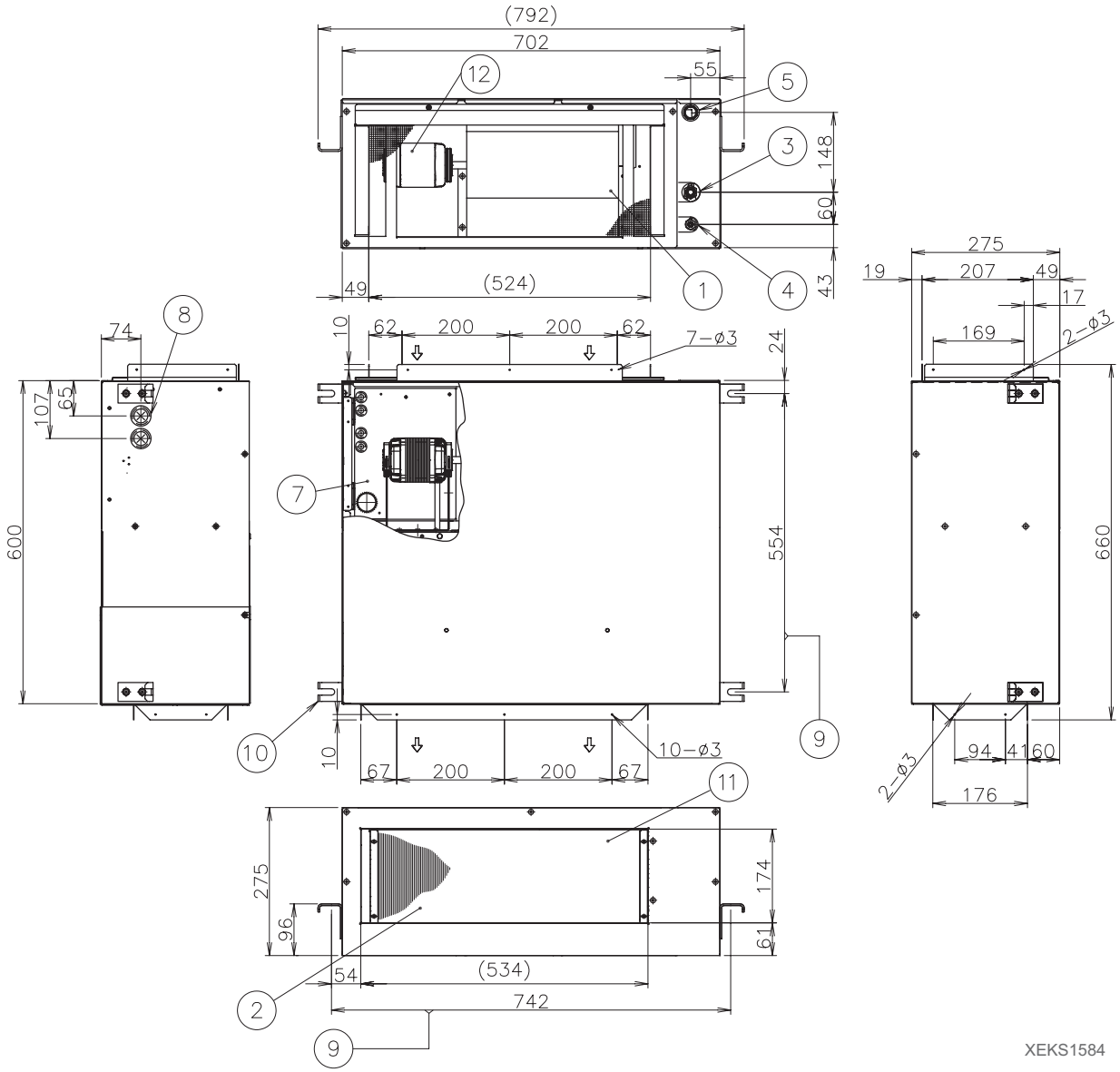
◆ RPI-(16.0/20.0)FSN3PE(-f) - Indoor ducted unit



Number	Description	Remarks
1	Air inlet	
2	Air outlet	
3	Refrigerant connection (gas line)	ø19.05 RPI-(16.0), ø22.2 RPI-(20.0)
4	Refrigerant connection (liquid line)	Flare nut. ø9.52 RPI-(16.0/20.0)
5	Drain connection	ø25 (outer diameter)
6	Electrical box	
7	Wiring Connection	ø25x4
8	Unit suspension bracket	(8 Locations)
9	Heat Exchanger	
10	Fan motor	

All measurements are in mm.

7.1.6 RPIM-(0.6-1.5)FSN4E(-DU) - Indoor ducted unit



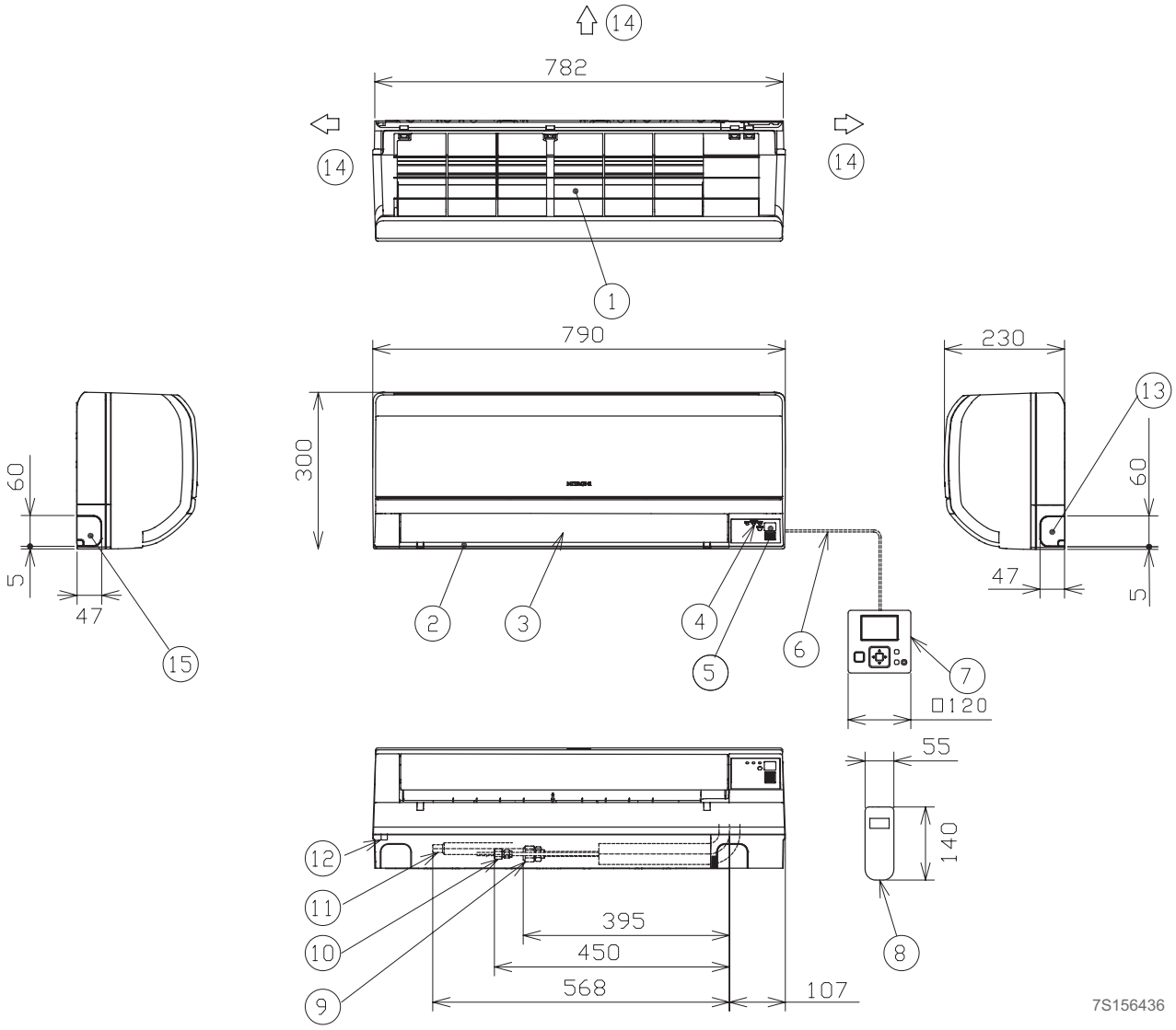
Number	Description	Remarks
1	Air inlet	
2	Air outlet	
3	Refrigerant connection (gas line)	Flare nut. ø12.7
4	Refrigerant connection (liquid line)	Flare nut. ø6.35
5	Drain connection	ø32 (outer diameter)
7	Electrical box	
8	Wiring hole	
9	Unit suspension bolt	(4x) M10 or W3/8
10	Unit suspension bracket	(4x) 12x35 (holes)
11	Heat Exchanger	
12	Fan motor	

NOTE

All measurements are in mm.

7.1.7 RPK-(0.4-4.0)FSN4M / RPK-(0.4/1.5)FSNH4M with expansion valve kit EV-1.5N1- Wall type

◆ **RPK-(0.4-1.0)FSN(H)4M - Wall type**

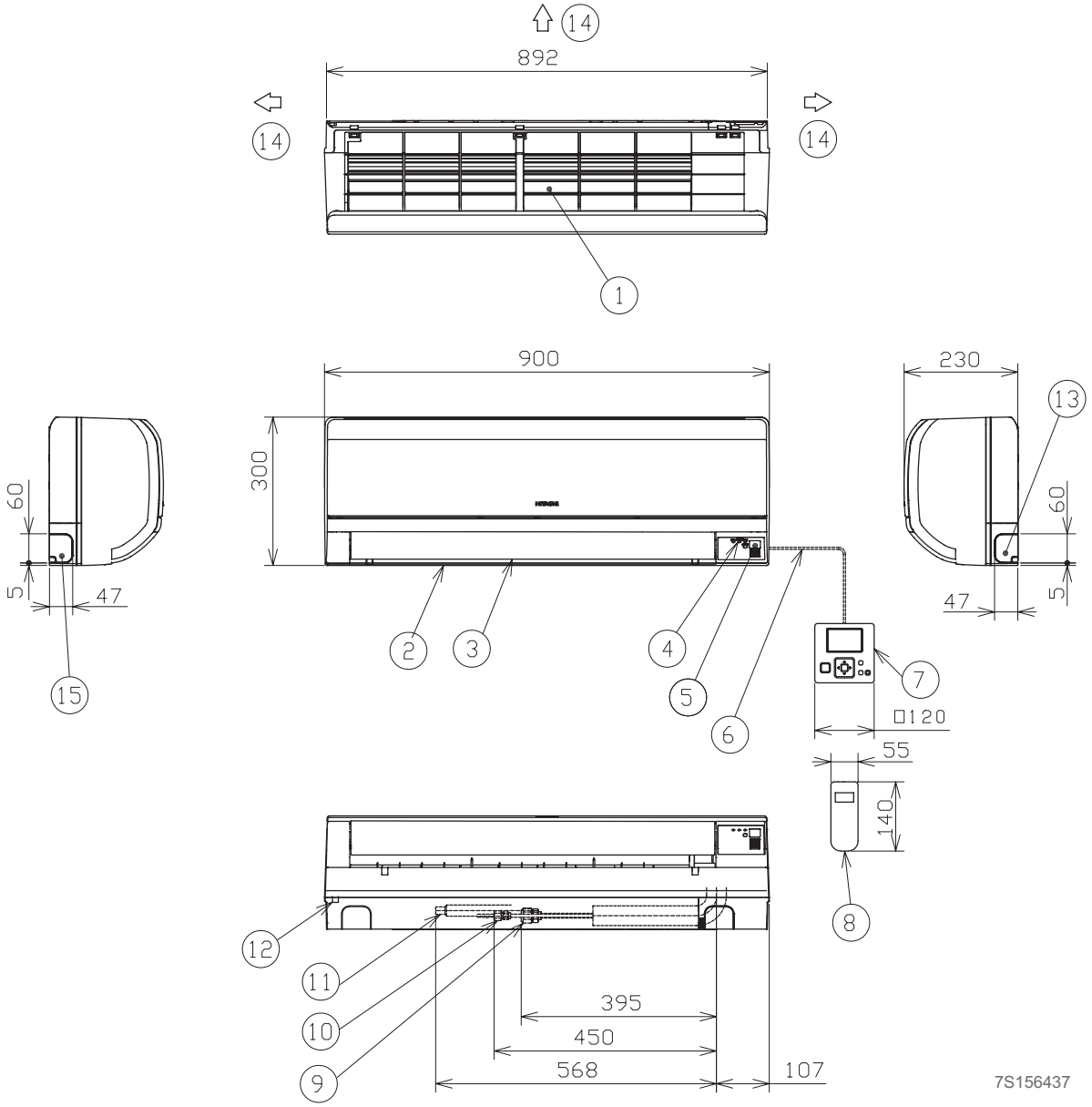


Number	Description	Number	Description
1	Air Inlet	10	Refrigerant connection (liquid line) (6.35 mm)
2	Air Outlet	11	Drain Pipe Connection (VP16)
3	Auto lover	12	Drain Pipe Connection (left side)
4	Display part	13	Wiring and piping hole (right side)
5	IR receiver part (included on indoor units as standard)	14	Piping installation: back side, right side, bottom side, or left side
6	Twisted pair cable (0.75 mm²) (field supplied)		
7	Wired remote control switch (sold separately)	15	Wiring and piping hole (left side)
8	Wireless remote control switch (sold separately)		
9	Refrigerant connection (gas line) (12.7 mm)		

NOTE

All measurements are in mm.

◆ RPK-1.5FSN(H)4M - Wall type

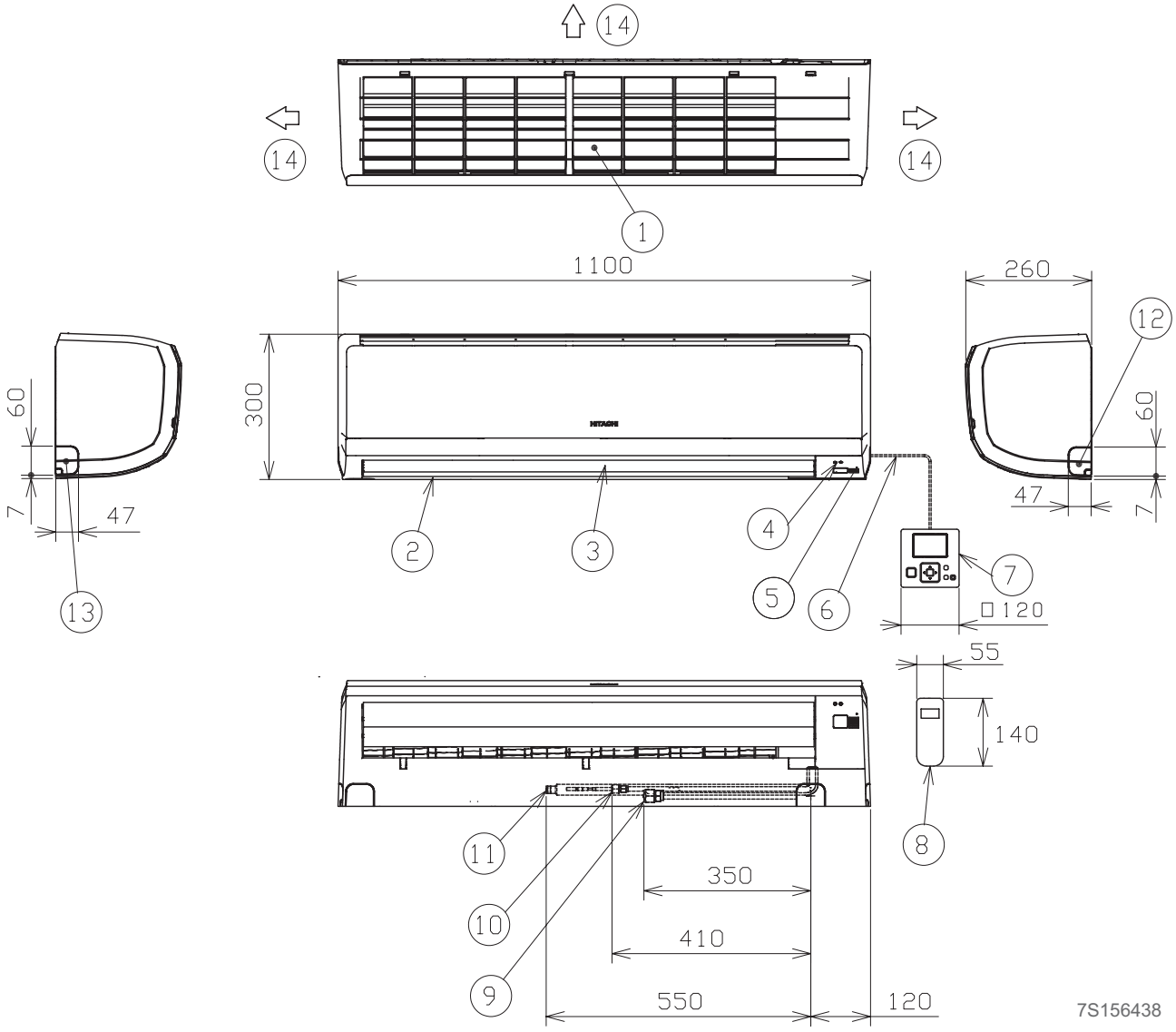


Number	Description	Number	Description
1	Air Inlet	10	Refrigerant connection (liquid line) (6.35 mm)
2	Air Outlet	11	Drain Pipe Connection (VP16)
3	Auto lover	12	Drain Pipe Connection (left side)
4	Display part	13	Wiring and piping hole (right side)
5	IR receiver part (included on indoor units as standard)	14	Piping installation: back side, right side, bottom side, or left side
6	Twisted pair cable (0.75 mm^2) (field supplied)		
7	Wired remote control switch (sold separately)	15	Wiring and piping hole (left side)
8	Wireless remote control switch (sold separately)		
9	Refrigerant connection (gas line) (12.7 mm)		

NOTE

All measurements are in mm.

◆ RPK-(2.0-4.0)FSN4M - Wall type

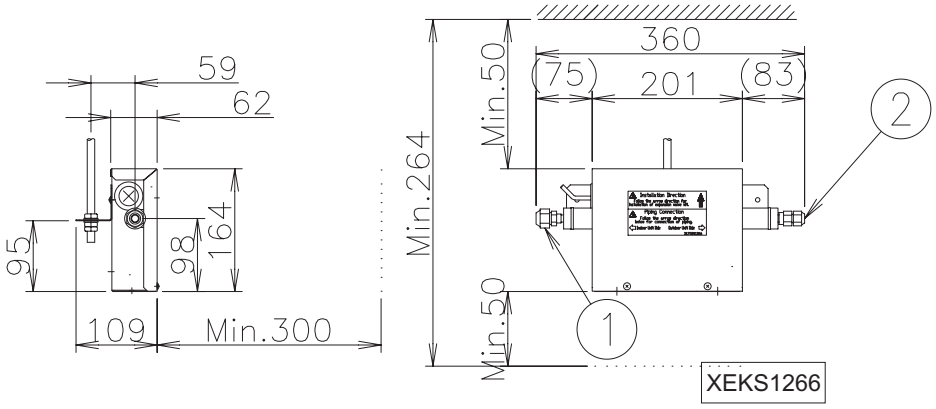


Number	Description	Number	Description
1	Air Inlet	10	Refrigerant connection (liquid line) (2 HP: 6.35 mm / 2.5~4.0HP: 9.52 mm)
2	Air Outlet	11	Drain Pipe Connection (VP16)
3	Auto lover	12	Wiring and piping hole (right side)
4	Display part	13	Wiring and piping hole (left side)
5	IR receiver part (included on indoor units as standard)	14	Piping installation: back side, right side, bottom side, or left side
6	Twisted pair cable (0.75 mm^2) (field supplied)		
7	Wired remote control switch (sold separately)		
8	Wireless remote control switch (sold separately)		
9	Refrigerant connection (gas line) (2HP: 12.7 mm / 2.5~4.0HP: 15.88 mm)		

NOTE

All measurements are in mm.

◆ Expansion valve kit EV-1.5N1



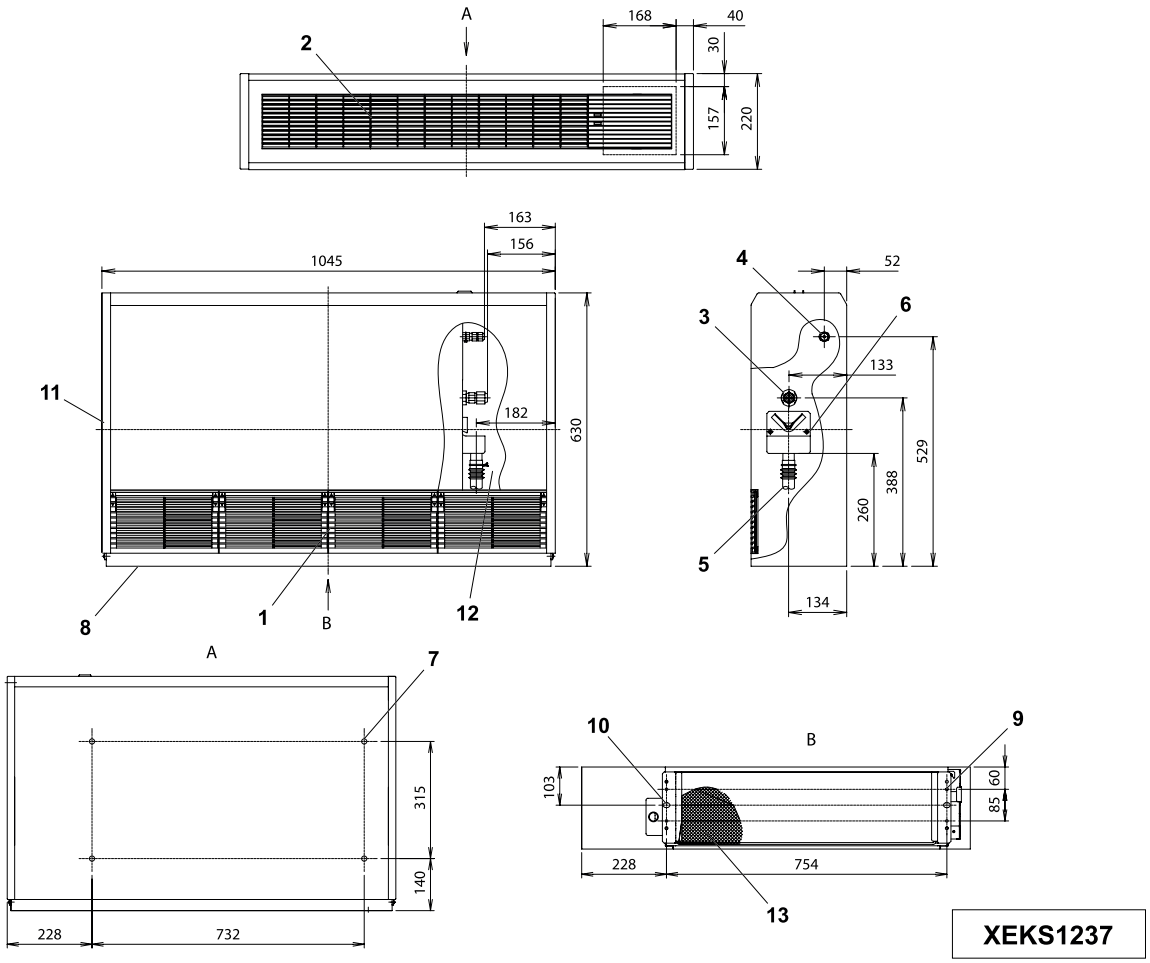
Number	Description	Remarks
1	Refrigerant liquid pipe connection (indoor unit side)	With ø9.52 flare nut
2	Refrigerant liquid pipe connection (outdoor unit side)	With ø6.35 flare nut

NOTE

All measurements are in mm.

7.1.8 RPF-(1.0-2.5)FSN2E - Floor type

◆ RPF-1.0FSN2E - Floor type

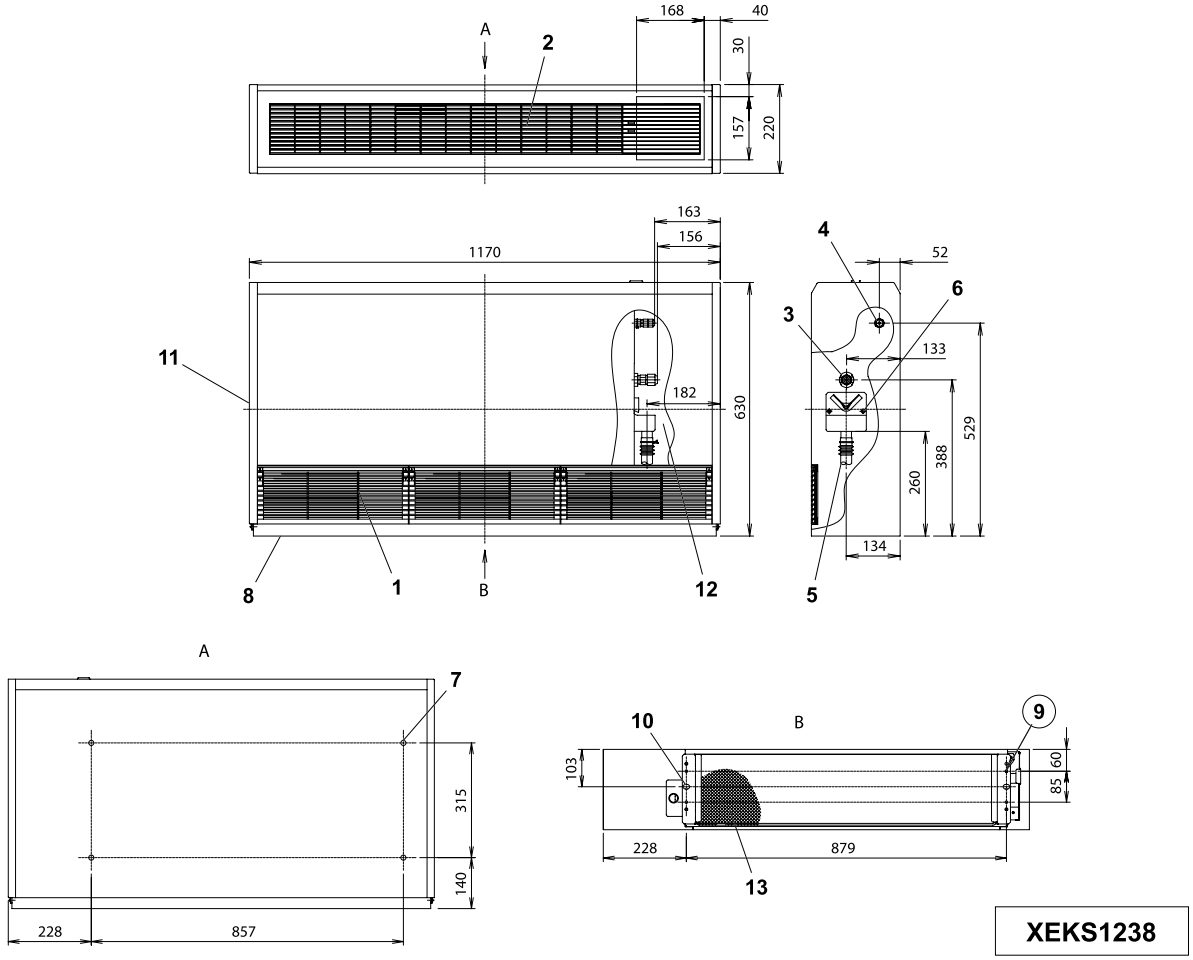


Number	Description	Remarks
1	Air inlet	
2	Air outlet	
3	Refrigerant connection (gas line)	Flare nut. ø12.7
4	Refrigerant connection (liquid line)	Flare nut. ø6.35
5	Drain connection	
6	Drain pan	
7	Holes to fix the unit to the wall	(4x) ø14 (behind)
8	Adjusting screw	For the installation
9	Holes to fix the unit to the floor	(4x) ø7, bolts for wood (4x) M5
10	Holes to fix the unit to the floor	(2x) ø12.5x18, bolts (2x) M8
11	Wiring hole	Left-hand side
12	Space for pipe connection	Right-hand side
13	Filter	

NOTE

All measurements are in mm.

◆ RPF-1.5FSN2E - Floor type

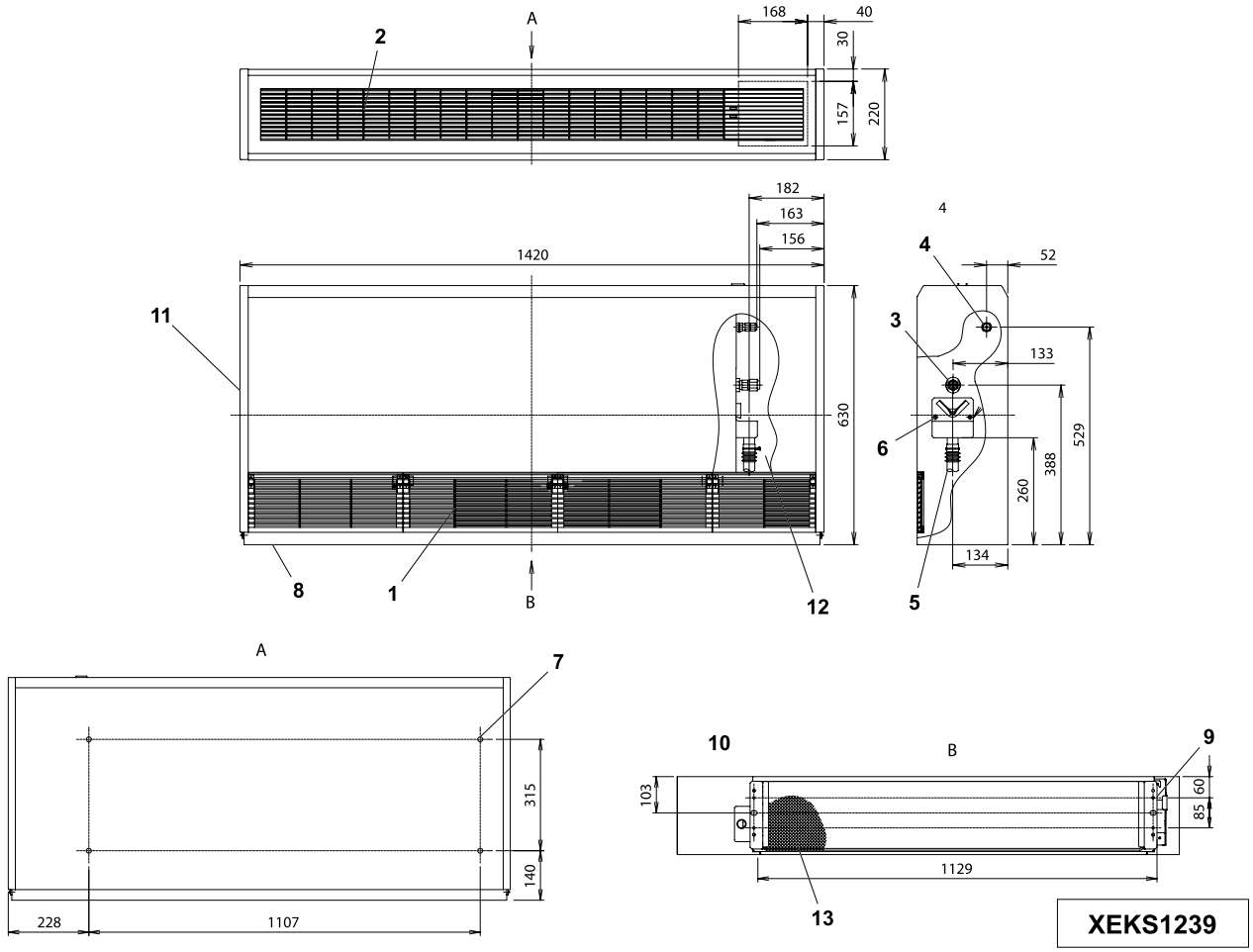


Number	Description	Remarks
1	Air inlet	
2	Air outlet	
3	Refrigerant connection (gas line)	Flare nut. ø12.7
4	Refrigerant connection (liquid line)	Flare nut. ø6.35
5	Drain connection	
6	Drain pan	
7	Holes to fix the unit to the wall	(4x) ø14 (behind)
8	Adjusting screw	For the installation
9	Holes to fix the unit to the floor	(4x) ø7, bolts for wood (4x) M5
10	Holes to fix the unit to the floor	(2x) ø12.5x18, bolts (2x) M8
11	Wiring hole	Left-hand side
12	Space for pipe connection	Right-hand side
13	Filter	

NOTE

All measurements are in mm.

◆ RPF-(2.0/2.5)FSN2E - Floor type



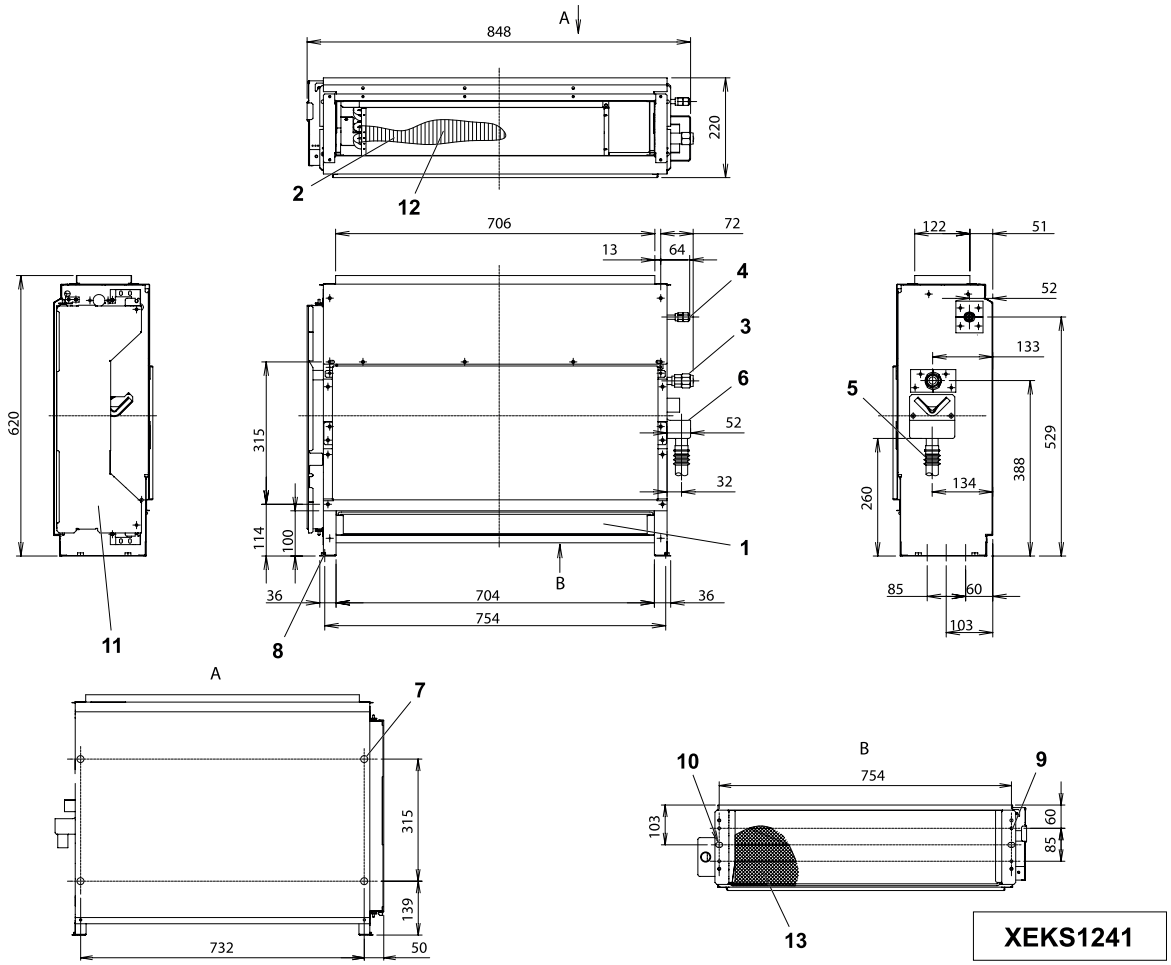
Number	Description	Remarks
1	Air inlet	
2	Air outlet	
3	Refrigerant connection (gas line)	Flare nut. ø15.88
4	Refrigerant connection (liquid line)	Flare nut. ø6.35 RPF-(2.0), ø9.52 RPF-(2.5)
5	Drain connection	
6	Drain pan	
7	Holes to fix the unit to the wall	(4x) ø14 (behind)
8	Adjusting screw	For the installation
9	Holes to fix the unit to the floor	(4x) ø7, bolts for wood (4x) M5
10	Holes to fix the unit to the floor	(2x) ø12.5x18, bolts (2x) M8
11	Wiring hole	Left-hand side
12	Space for pipe connection	Right-hand side
13	Filter	

NOTE

All measurements are in mm.

7.1.9 RPFI-(1.0-2.5)FSN2E - Floor concealed type

◆ RPFI-1.0FSN2E - Floor concealed type

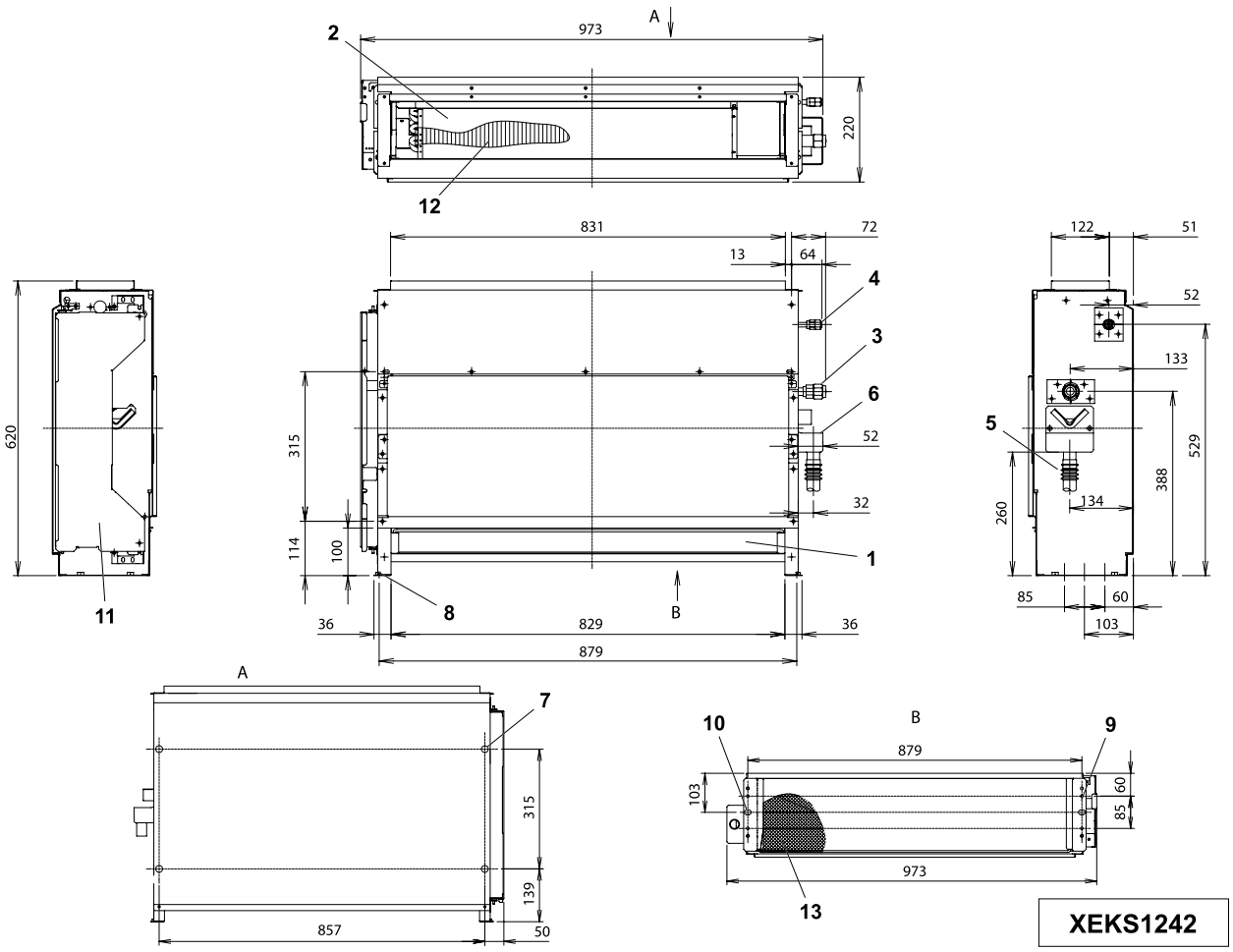


Number	Description	Remarks
1	Air inlet	
2	Air outlet	
3	Refrigerant connection (gas line)	Flare nut. ø12.7
4	Refrigerant connection (liquid line)	Flare nut. ø6.35
5	Drain connection	
6	Drain pan	
7	Holes to fix the unit to the wall	(4x) ø14 (behind)
8	Adjusting screw	For the installation
9	Holes to fix the unit to the floor	(4x) ø7, bolts for wood (4x) M5
10	Holes to fix the unit to the floor	(2x) ø12.5x18, bolts (2x) M8
11	Electrical box	
12	Evaporator	
13	Filter	

NOTE

All measurements are in mm.

◆ RPFI-1.5FSN2E - Floor concealed type

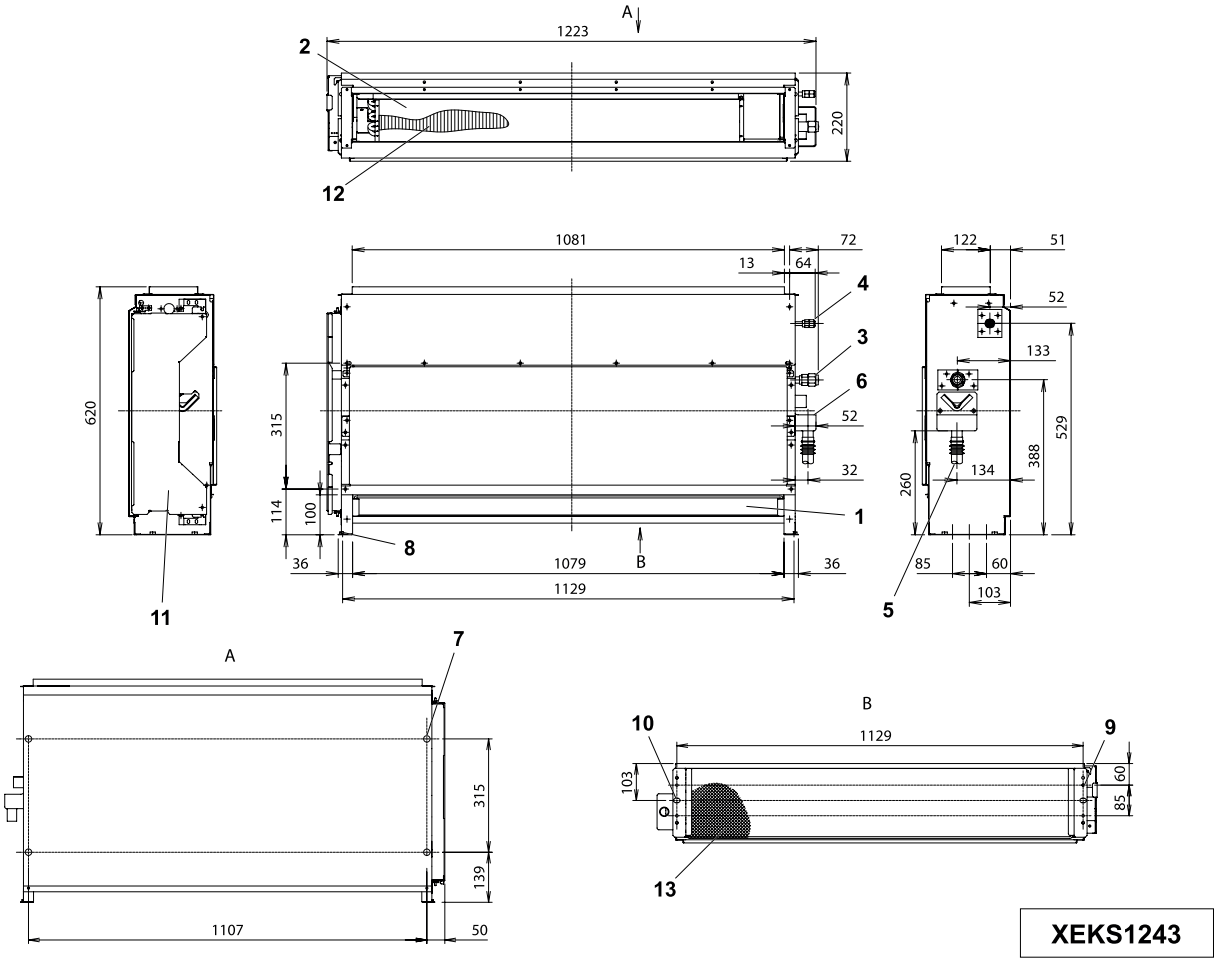


Number	Description	Remarks
1	Air inlet	
2	Air outlet	
3	Refrigerant connection (gas line)	Flare nut. ø12.7
4	Refrigerant connection (liquid line)	Flare nut. ø6.35
5	Drain connection	
6	Drain pan	
7	Holes to fix the unit to the wall	(4x) ø14 (behind)
8	Adjusting screw	For the installation
9	Holes to fix the unit to the floor	(4x) ø7, bolts for wood (4x) M5
10	Holes to fix the unit to the floor	(2x) ø12.5x18, bolts (2x) M8
11	Electrical box	
12	Evaporator	
13	Filter	

NOTE

All measurements are in mm.

◆ RPFI-(2.0/2.5)FSN2E - Floor concealed type



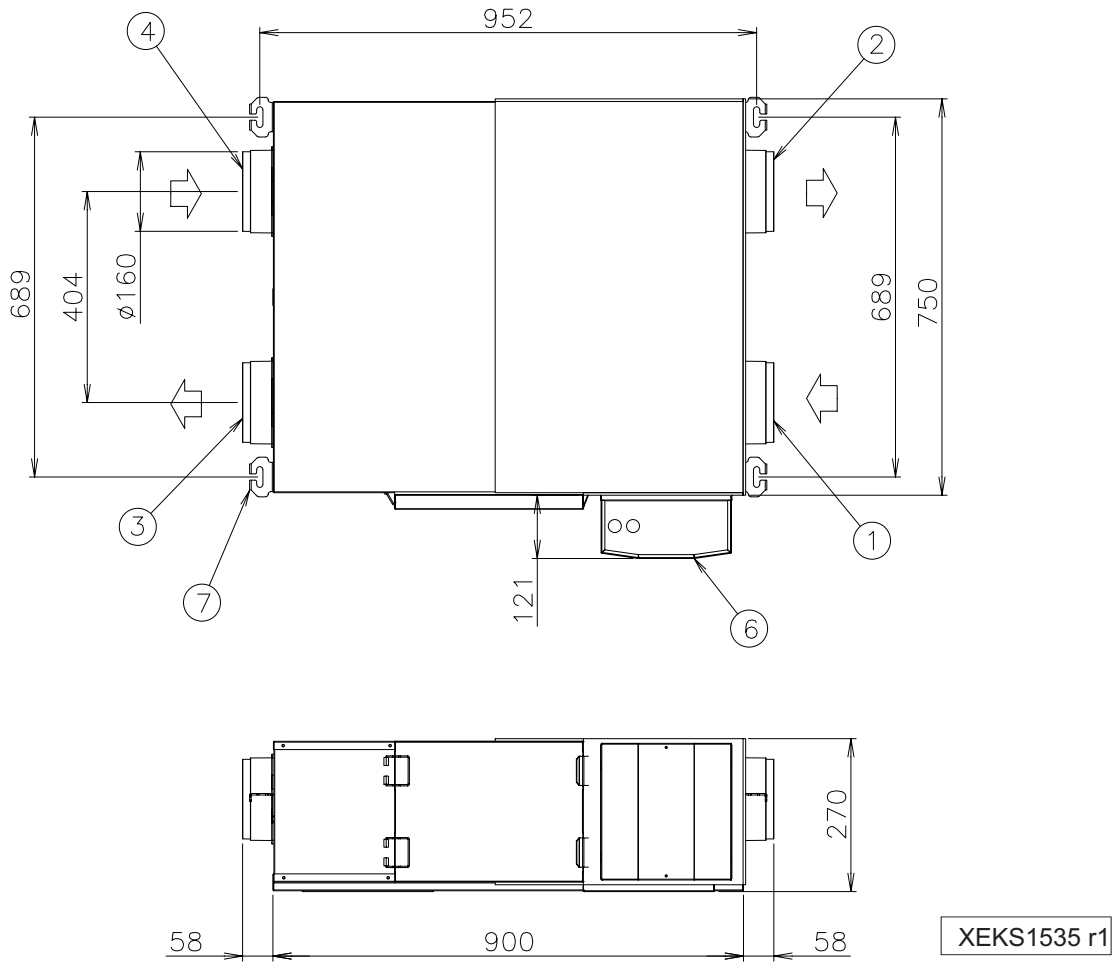
Number	Description	Remarks
1	Air inlet	
2	Air outlet	
3	Refrigerant connection (gas line)	Flare nut. ø15.88
4	Refrigerant connection (liquid line)	Flare nut. ø6.35 RPFI-(2.0), ø9.52 RPFI-(2.5)
5	Drain connection	
6	Drain pan	
7	Holes to fix the unit to the wall	(4x) ø14 (behind)
8	Adjusting screw	For the installation
9	Holes to fix the unit to the floor	(4x) ø7, bolts for wood (4x) M5
10	Holes to fix the unit to the floor	(2x) ø12.5x18, bolts (2x) M8
11	Electrical box	
12	Evaporator	
13	Filter	

NOTE

All measurements are in mm.

7.1.10 KPI-(252-2002)(E/X)4E - Energy recovery and active energy recovery ventilation units

◆ **KPI-252E4E - Energy recovery unit**

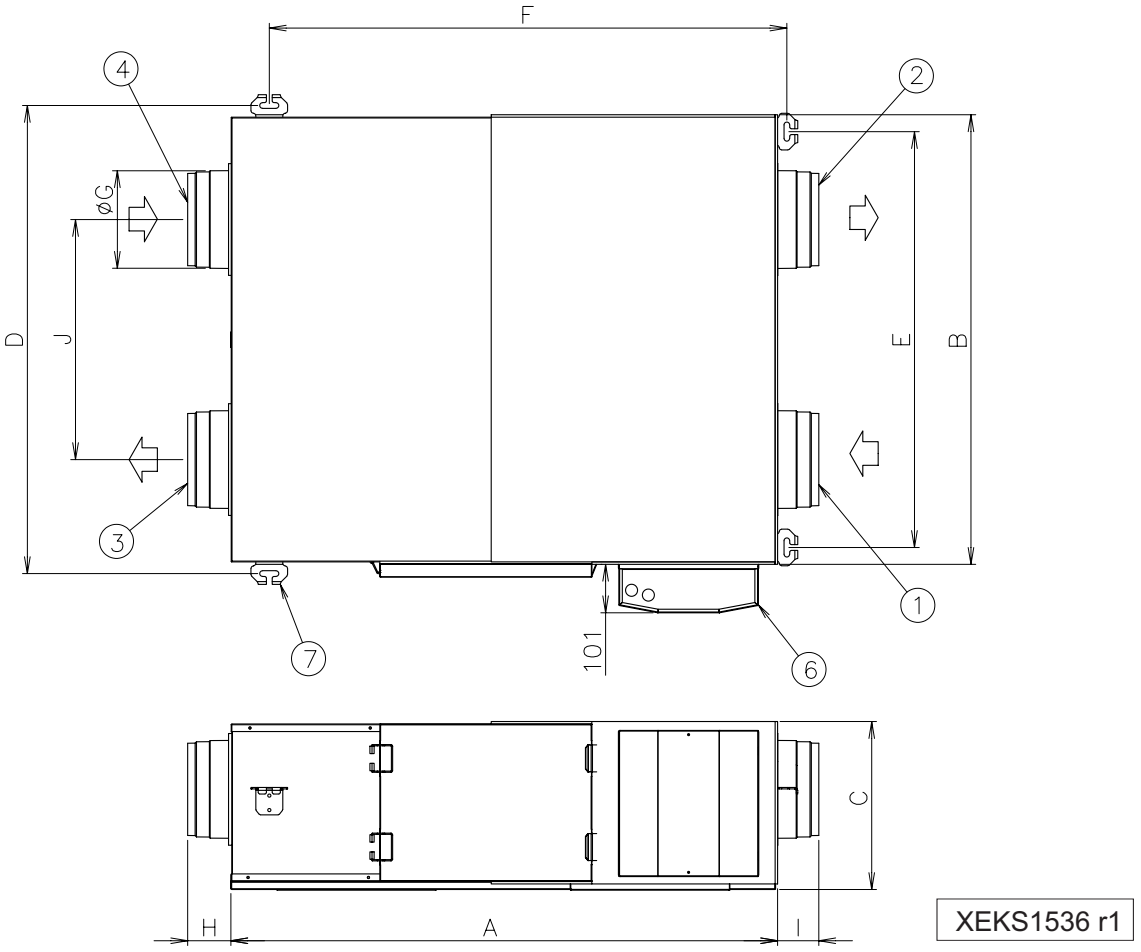


Number	Description	Remarks
1	Outdoor air	Fresh air inlet from outdoors
2	Exhaust air	Exhaust air outlet to outdoors
3	Air supply	Fresh air to the room
4	Return air	Exhaust air from the room
6	Electrical box	
7	Unit suspension bracket	(4x)

NOTE

All measurements are in mm.

◆ KPI-(502-802)E4E - Energy recovery unit



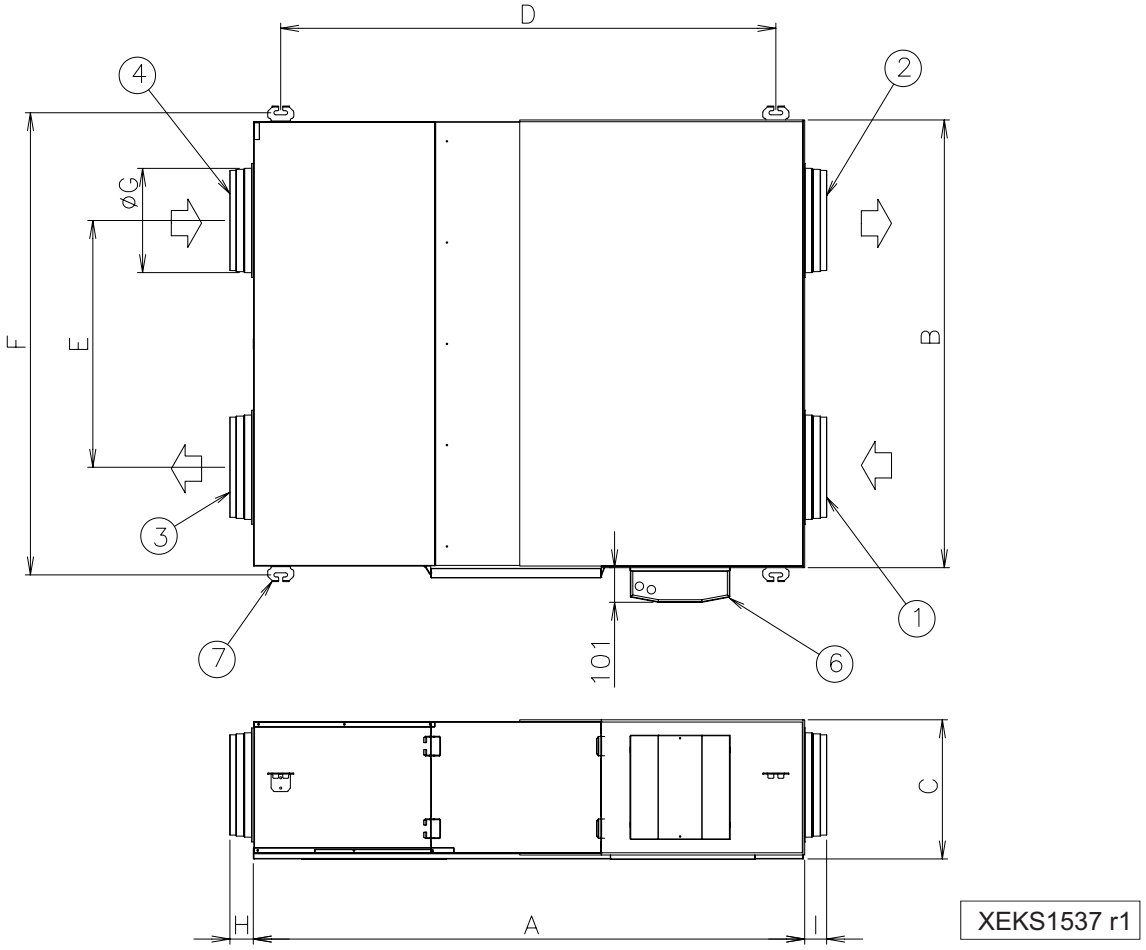
Number	Description	Remarks
1	Outdoor air	Fresh air inlet from outdoors
2	Exhaust air	Exhaust air outlet to outdoors
3	Air supply	Fresh air to the room
4	Return air	Exhaust air from the room
6	Electrical box	
7	Unit suspension bracket	(4x)

Models	A	B	C	D	E	F	G	H	I	J
KPI-502E4E	1130	920	330	972	864	1075	200	90	85	499
KPI-802E4E	1210	1015	385	1066	954	1165	250	90	85	589

NOTE

All measurements are in mm.

◆ KPI-(1002-2002)E4E - Energy recovery unit



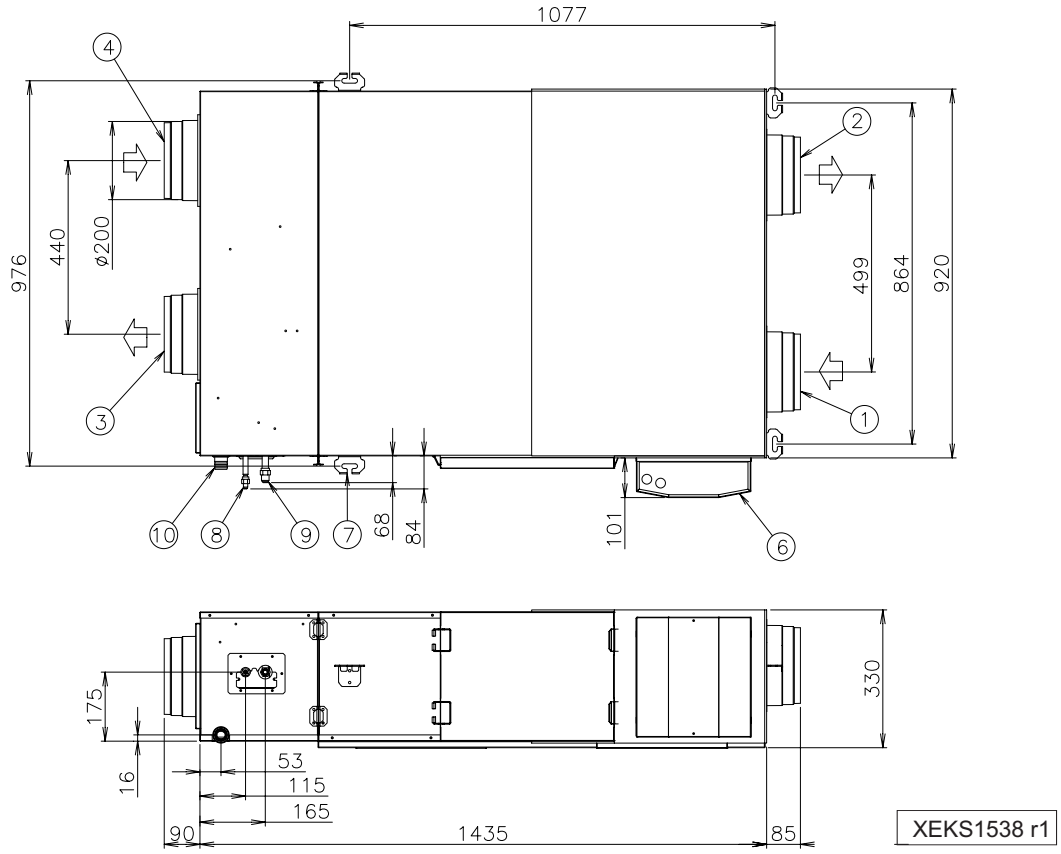
Number	Description	Remarks
1	Outdoor air	Fresh air inlet from outdoors
2	Exhaust air	Exhaust air outlet to outdoors
3	Air supply	Fresh air to the room
4	Return air	Exhaust air from the room
6	Electrical box	
7	Unit suspension bracket	(4x)

Models	A	B	C	D	E	F	G	H	I
KPI-1002E4E	1600	1295	385	1442	719	1346	300	68	64
KPI-1502E4E	1800	1130	525	1622	623	1180	355	90	85
KPI-2002E4E	1800	1430	525	1622	921	1480	355	90	85

NOTE

All measurements are in mm.

◆ KPI-502X4E - Active energy recovery ventilation units

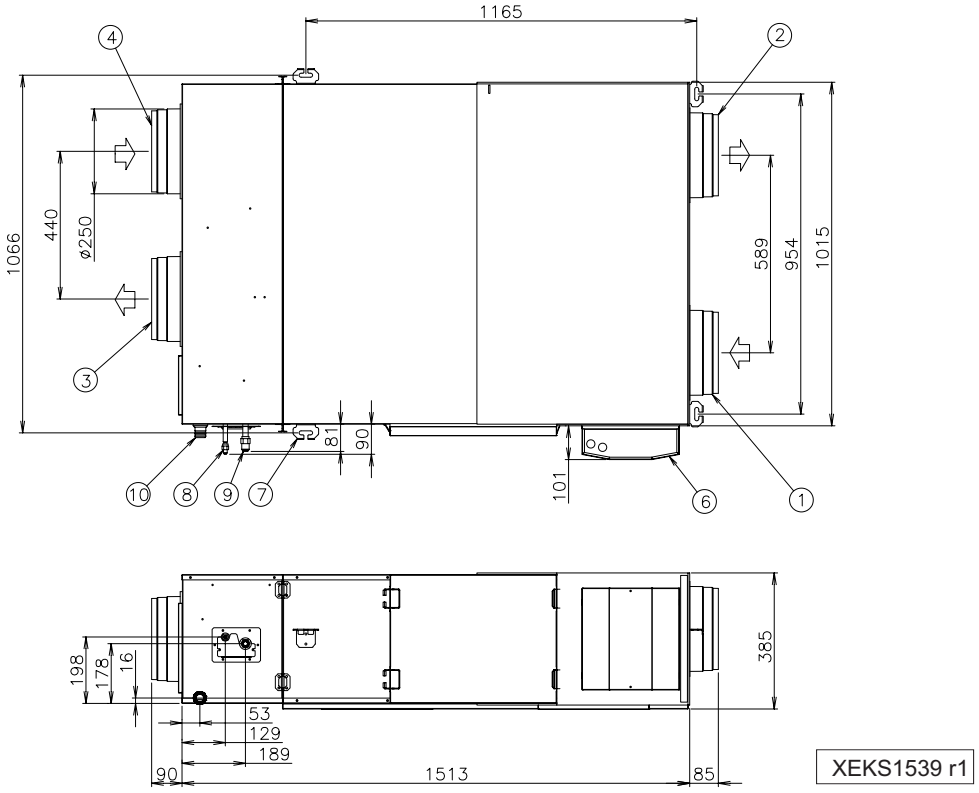


Number	Description	Remarks
1	Outdoor air	Fresh air inlet from outdoors
2	Exhaust air	Exhaust air outlet to outdoors
3	Air supply	Fresh air to the room
4	Return air	Exhaust air from the room
6	Electrical box	
7	Unit suspension bracket	(4x)

NOTE

All measurements are in mm.

◆ KPI-802X4E - Active energy recovery ventilation units

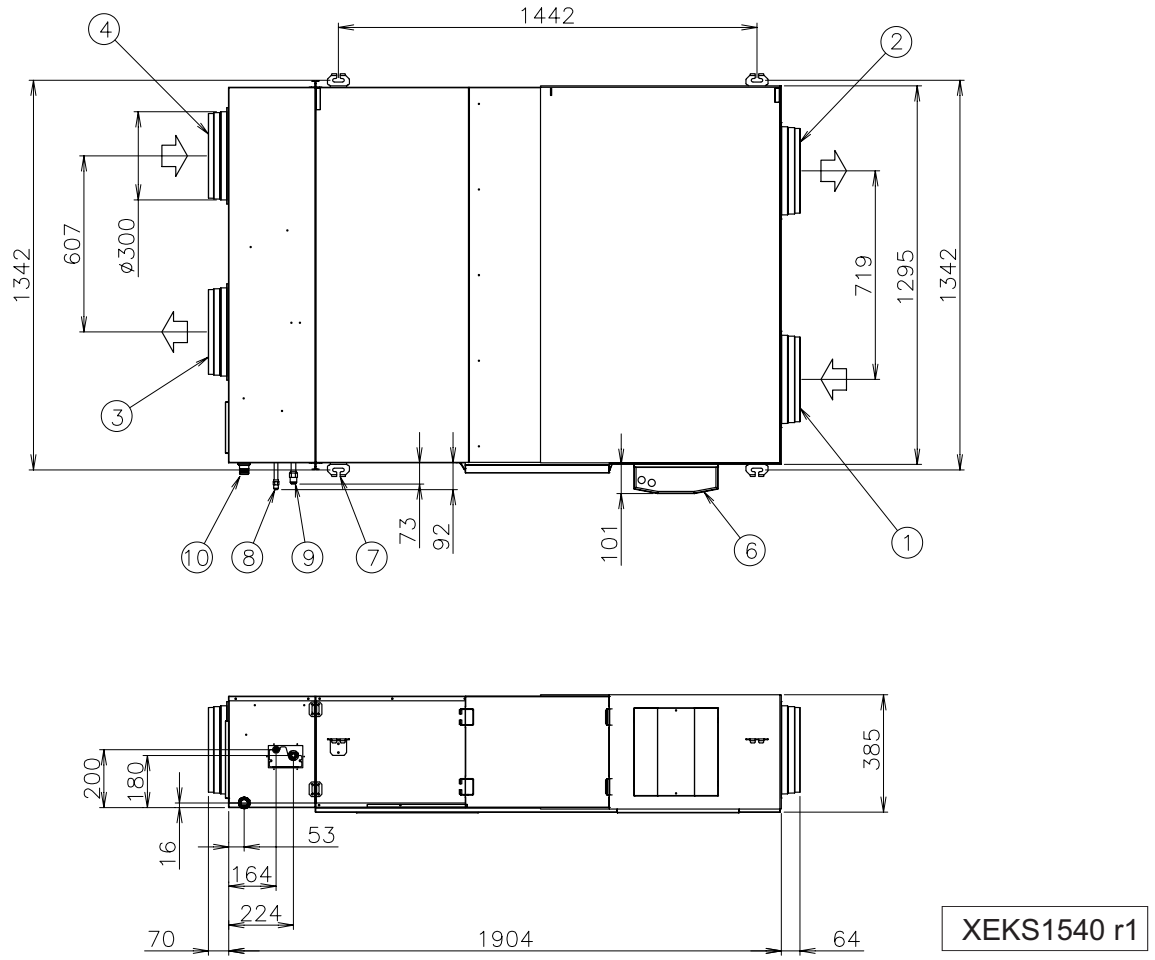


Number	Description	Remarks
1	Outdoor air	Fresh air inlet from outdoors
2	Exhaust air	Exhaust air outlet to outdoors
3	Air supply	Fresh air to the room
4	Return air	Exhaust air from the room
6	Electrical box	
7	Unit suspension bracket	(4x)

NOTE

All measurements are in mm.

◆ KPI-1002X4E - Active energy recovery ventilation units

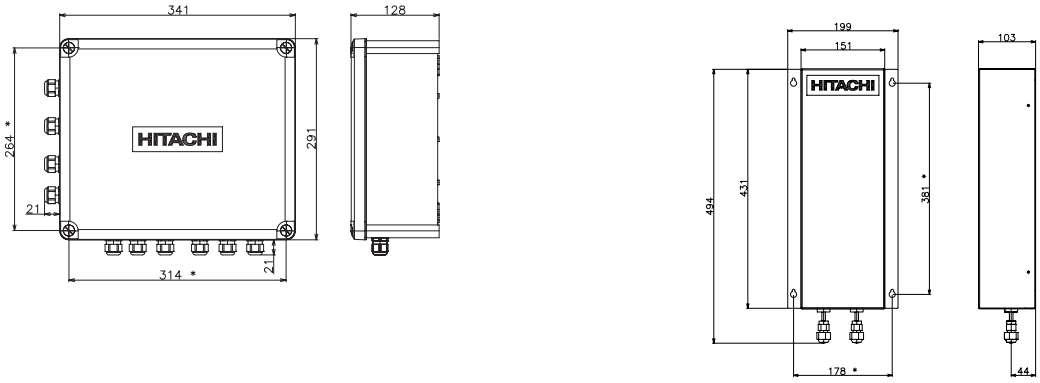


Number	Description	Remarks
1	Outdoor air	Fresh air inlet from outdoors
2	Exhaust air	Exhaust air outlet to outdoors
3	Air supply	Fresh air to the room
4	Return air	Exhaust air from the room
6	Electrical box	
7	Unit suspension bracket	(4x)

NOTE

All measurements are in mm.

7.1.11 DX-Interface

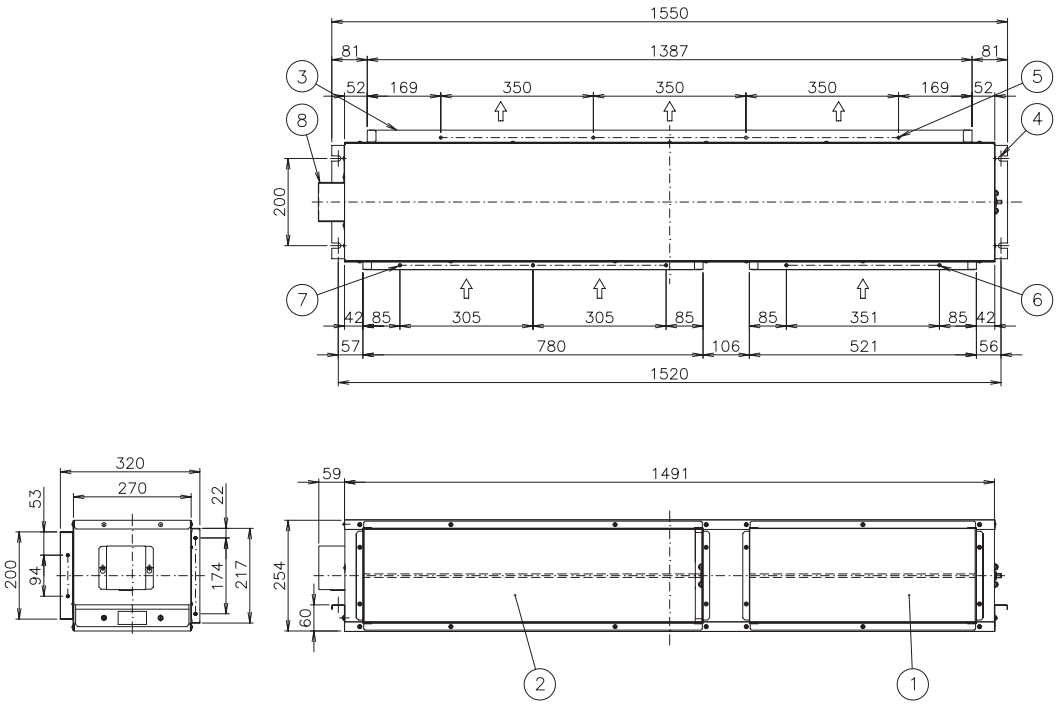


(*) For installation.

All measurements are in mm.

7.1.12 Econofresh Kit

◆ Econofresh kit EF-456N1E



All measurements are in mm.

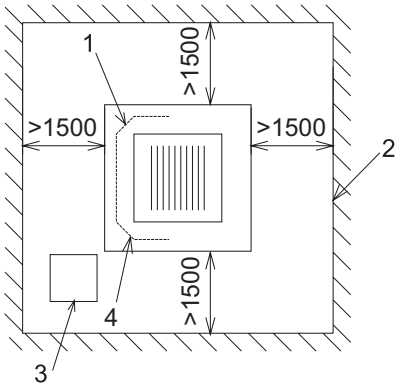
Number	Description	Remarks
1	Air inlet	Outdoor air
2	Air inlet	Return air
3	Air outlet	
4	Holes for suspension bolt	(4x) ø12
5	Holes for unit connection	(12x) ø7
6	Holes for outdoor duct connection	(8x) ø7
7	Holes for return duct connection	(10x) ø7
8	Cover protection for motor	

7.2 Operation and service space

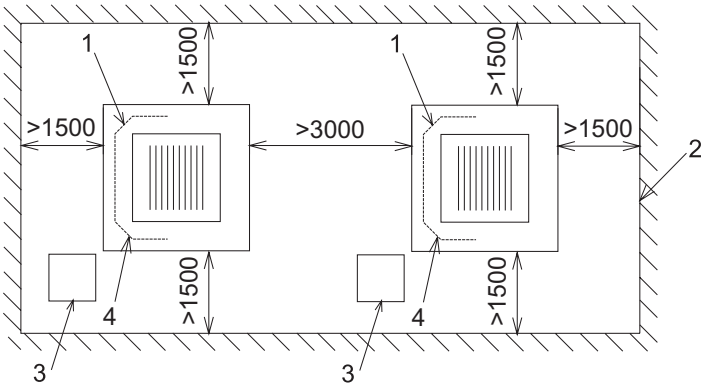
7.2.1 RCI-(1.0-6.0)FSN4 - 4-way cassette

◆ Operation space

Single installation



Combined installation



NOTE

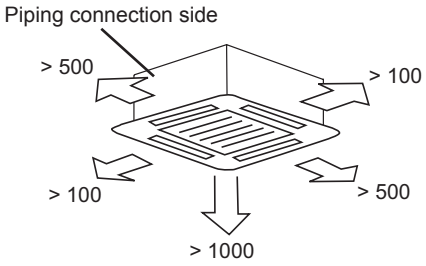
1 Drain piping connection.

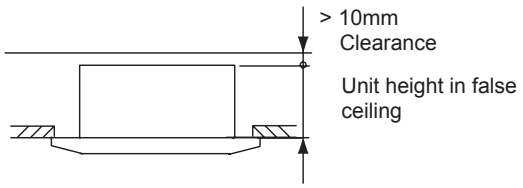
2 Walls close to the unit.

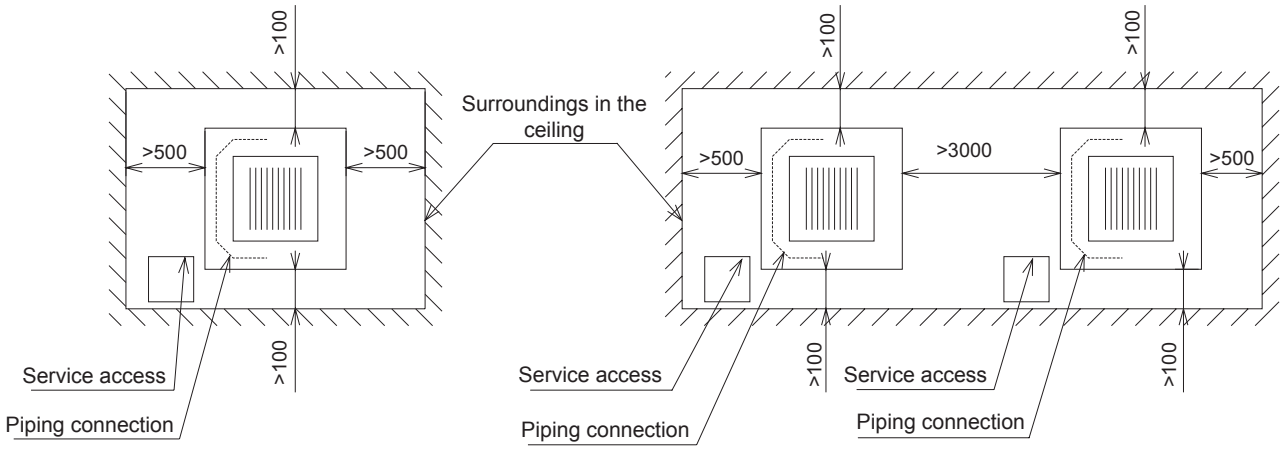
3 Service access door for unit inspection and maintenance access.

4 Piping connection.

◆ Service space







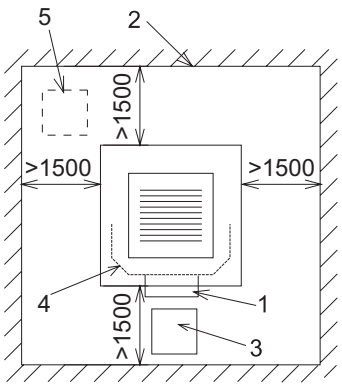
NOTE

All measurements are in mm.

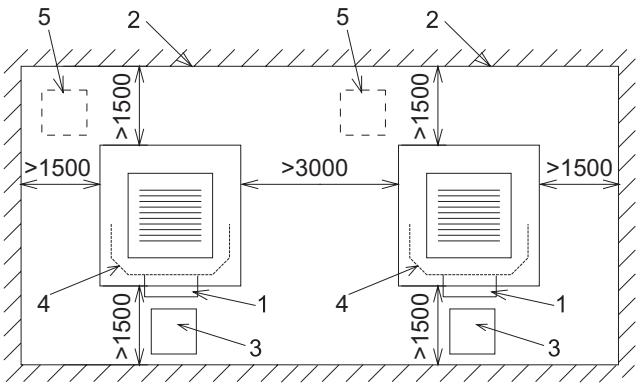
7.2.2 RCIM-(0.4-2.5)FSN4E - 4-way cassette

◆ Operation space

Single installation



Combined installation



NOTE

1 Electrical box.

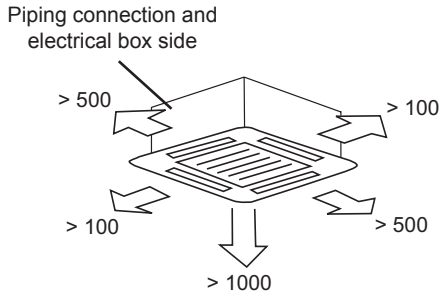
2 Walls close to the unit.

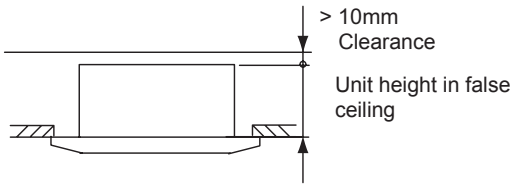
3 Service access door for unit inspection and maintenance access.

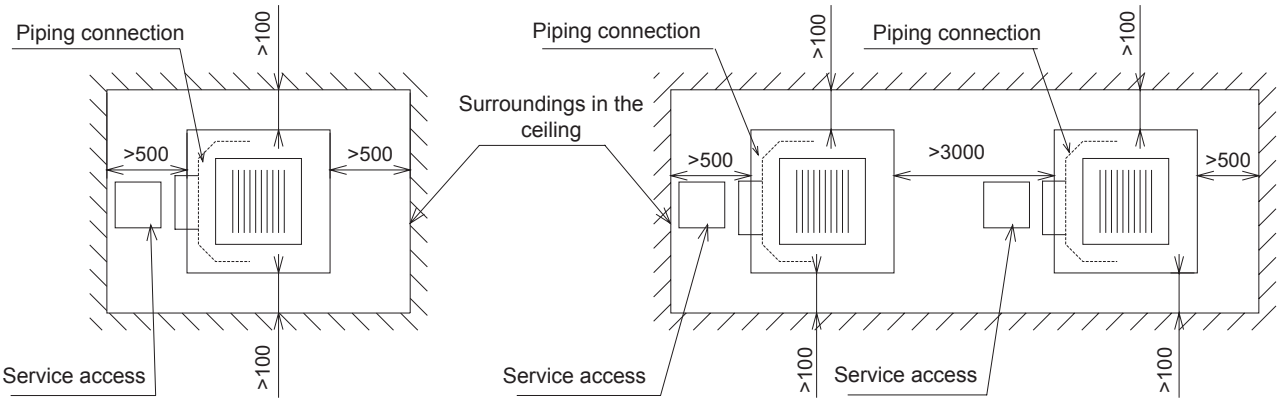
4 Piping connection.

5 Access door for duct adapter (Sold separately as an option)

◆ Service space







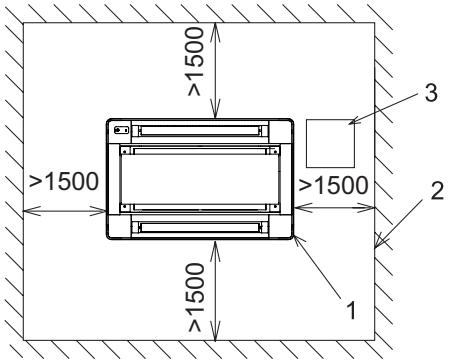
NOTE

All measurements are in mm.

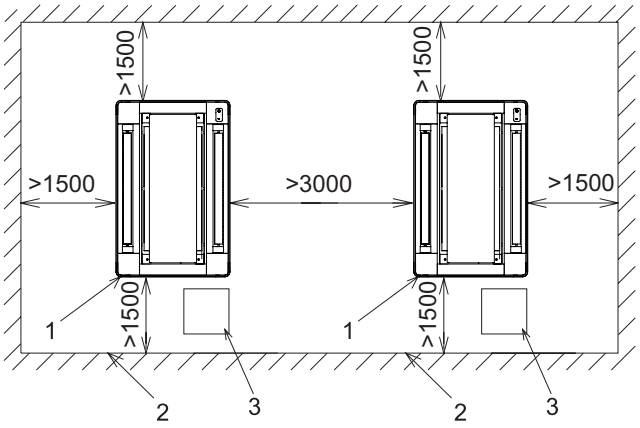
7.2.3 RCD-(0.8-6.0)FSN3 - 2-way cassette

◆ Operation space

Single installation



Combined installation



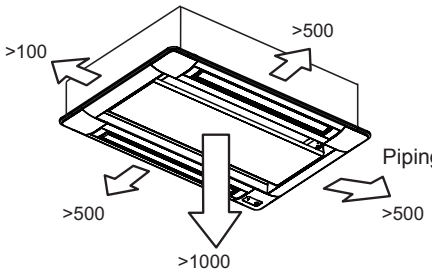
NOTE

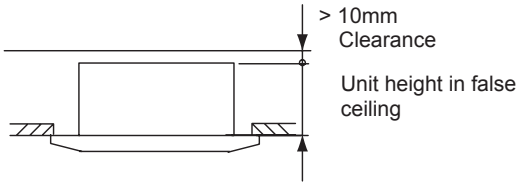
1 Piping connection.

2 Walls close to the unit.

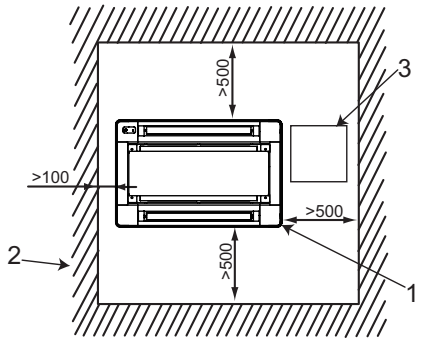
3 Service access door for unit inspection and maintenance access.

◆ Service space

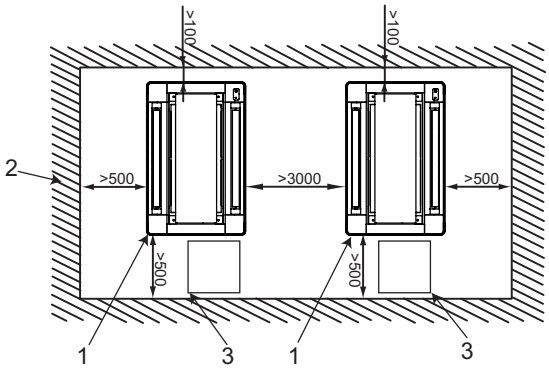




Single installation



Combined installation



NOTE

All measurements are in mm.

1 Piping connection.

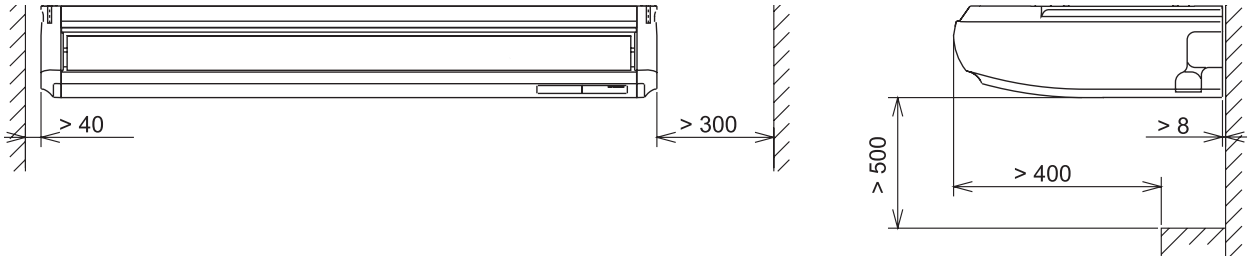
2 Walls close to the unit.

3 Service access door for unit inspection and maintenance access.

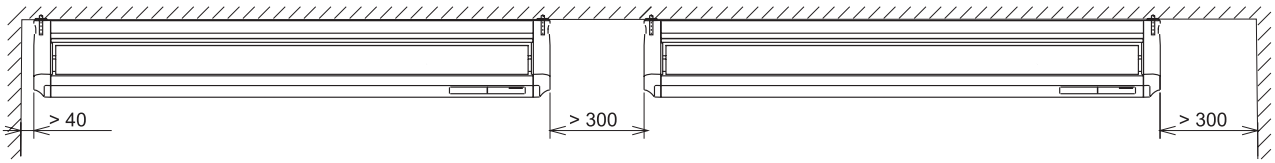
7.2.4 RPC-(1.5-6.0)FSN3 - Ceiling type

◆ Operation and service space

Single installation



Combined installation

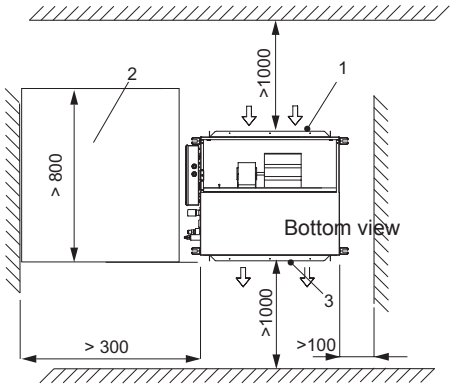


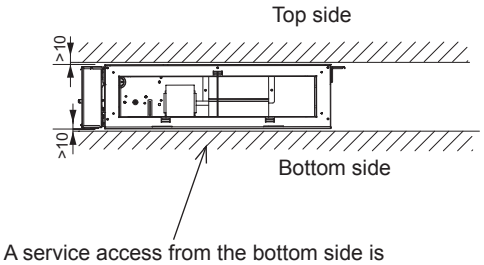
NOTE

All measurements are in mm.

7.2.5 RPI-(0.4-20.0)FSN(3/5)E - Indoor ducted unit

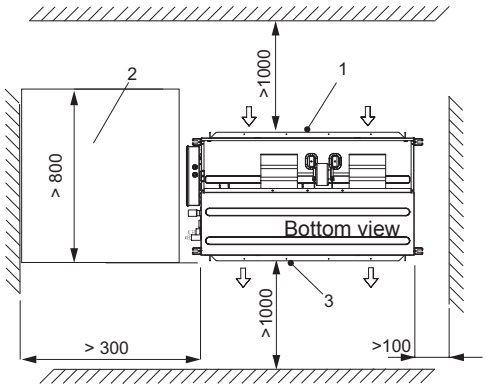
◆ RPI-0.4FSN5E

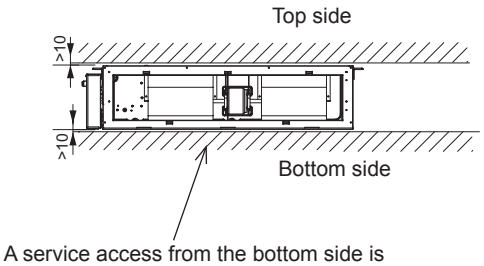




A service access from the bottom side is required for servicing and maintenance.

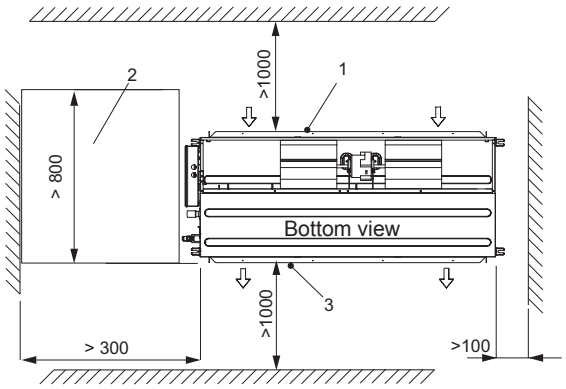
◆ RPI-(0.6-1.5)FSN5E

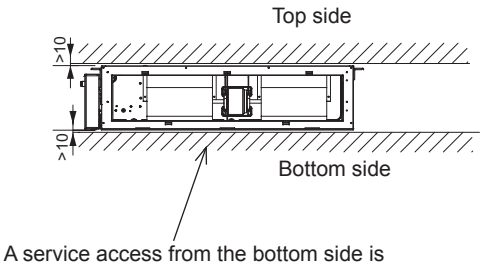




A service access from the bottom side is required for servicing and maintenance.

◆ RPI-(2.0-3.0)FSN5E





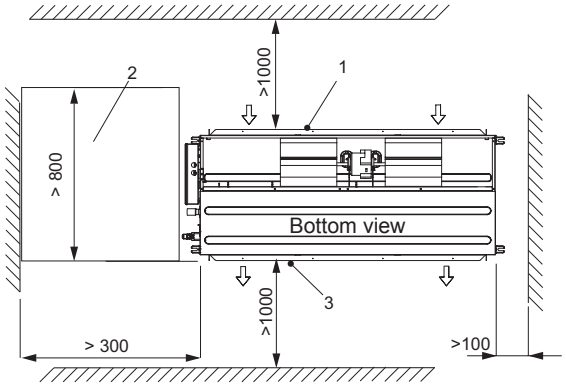
A service access from the bottom side is required for servicing and maintenance.

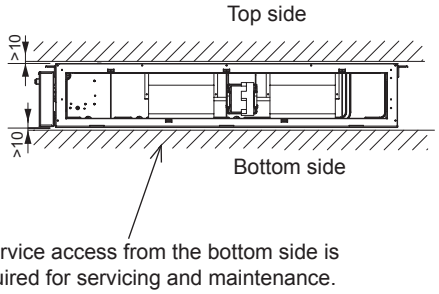
NOTE

1 Rear
2 Service access door for unit inspection and maintenance access
3 Front
4 Service access door for fan motor servicing

All measurements are in mm.

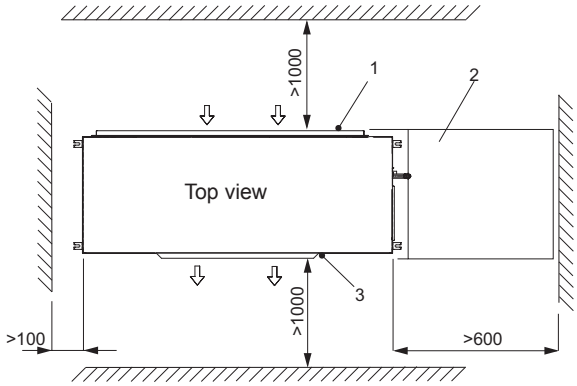
◆ RPI-(4.0-6.0)FSN5E

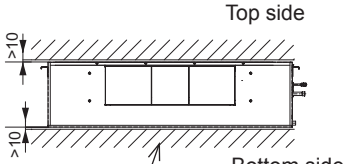




A service access from the bottom side is required for servicing and maintenance.

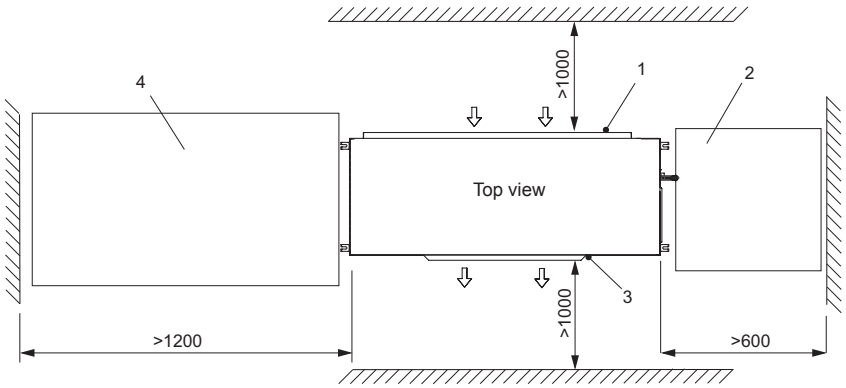
◆ RPI-(8.0/10.0)FSN3E(-f) - Indoor ducted unit (Operation and service space)

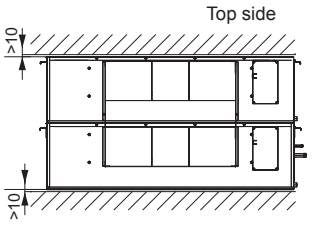




A service access from the bottom side is required for servicing and maintenance (in order to reach the filter, fan motor, etc.).

◆ RPI-(16.0/20.0)FSN3PE(-f) - Indoor ducted unit (Operation and service space)





7

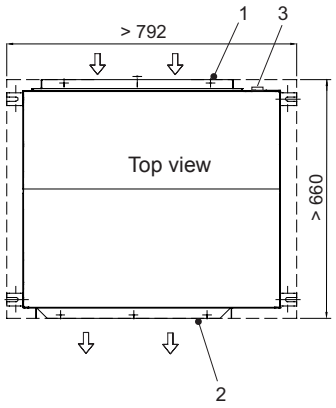
NOTE

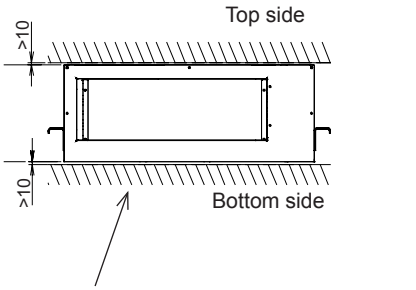
1 Rear
2 Service access door for unit inspection and maintenance access
3 Front
4 Service access door for fan motor servicing

All measurements are in mm.

7.2.6 RPIM-(0.6-1.5)FSN4E(-DU) - Indoor ducted unit

◆ Operation and service space





A service access from the bottom side is required for servicing and maintenance (in order to reach the electrical box, filter, fan motor, etc.).

NOTE

1 Rear

2 Front

3 Refrigerant pipes and draining pipe

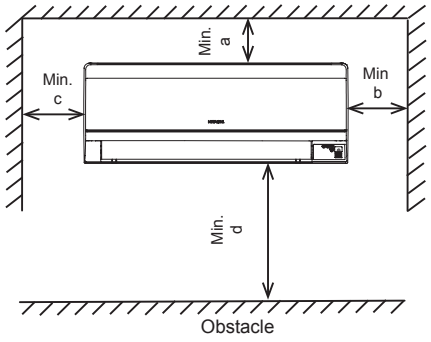
All measurements are in mm.

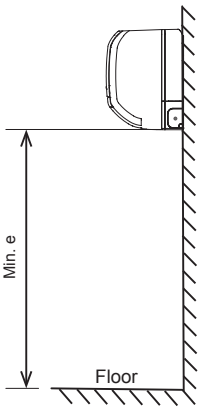
7.2.7 RPK-(0.4-4.0)FSN(H)4M - Wall type

◆ Operation and service space

HP	a	b	c	d	e
0.4-1.5	150	100	100	1000	2300
2.0-4.0	100	200	100	1000	2300

Unit: mm

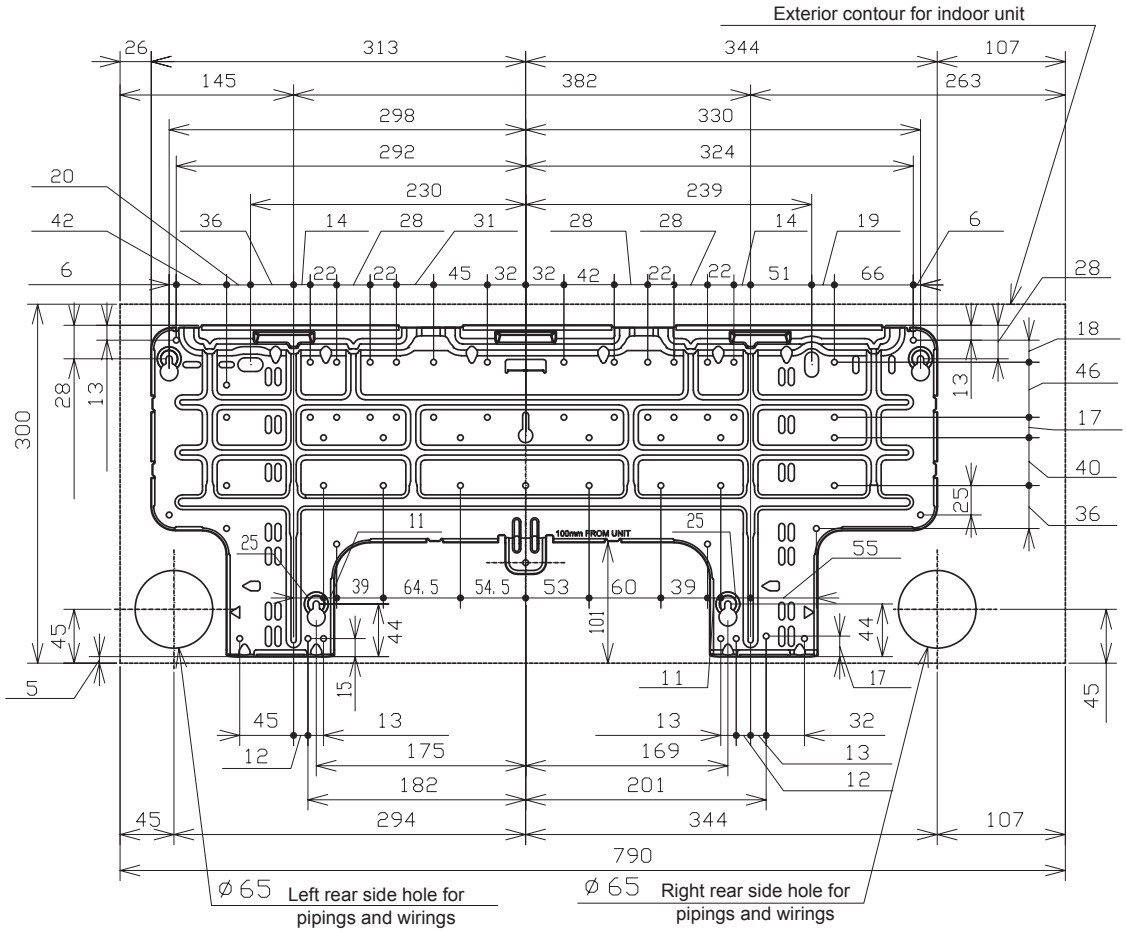




NOTE

b : for servicing electrical parts
c : for servicing bearing
e : for rooms with a high ceiling

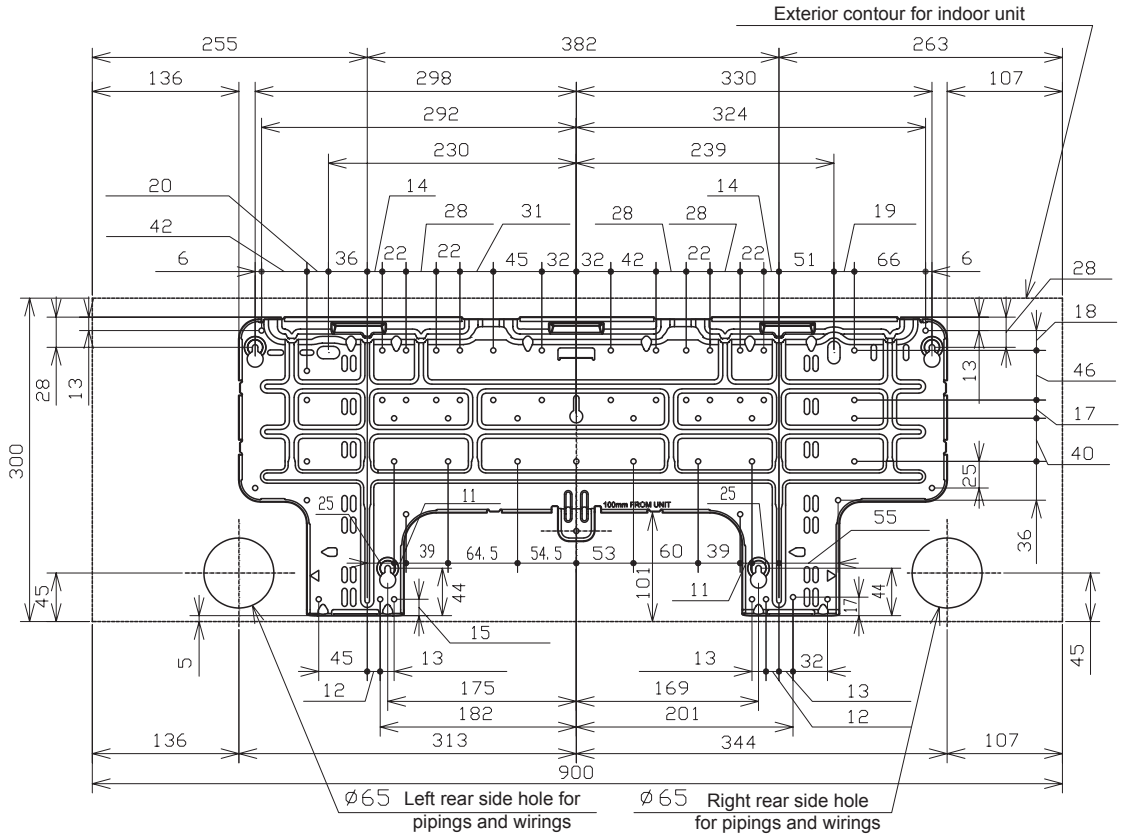
Unit suspension bracket - RPK-(0.4-1.0)FSN(H)4M



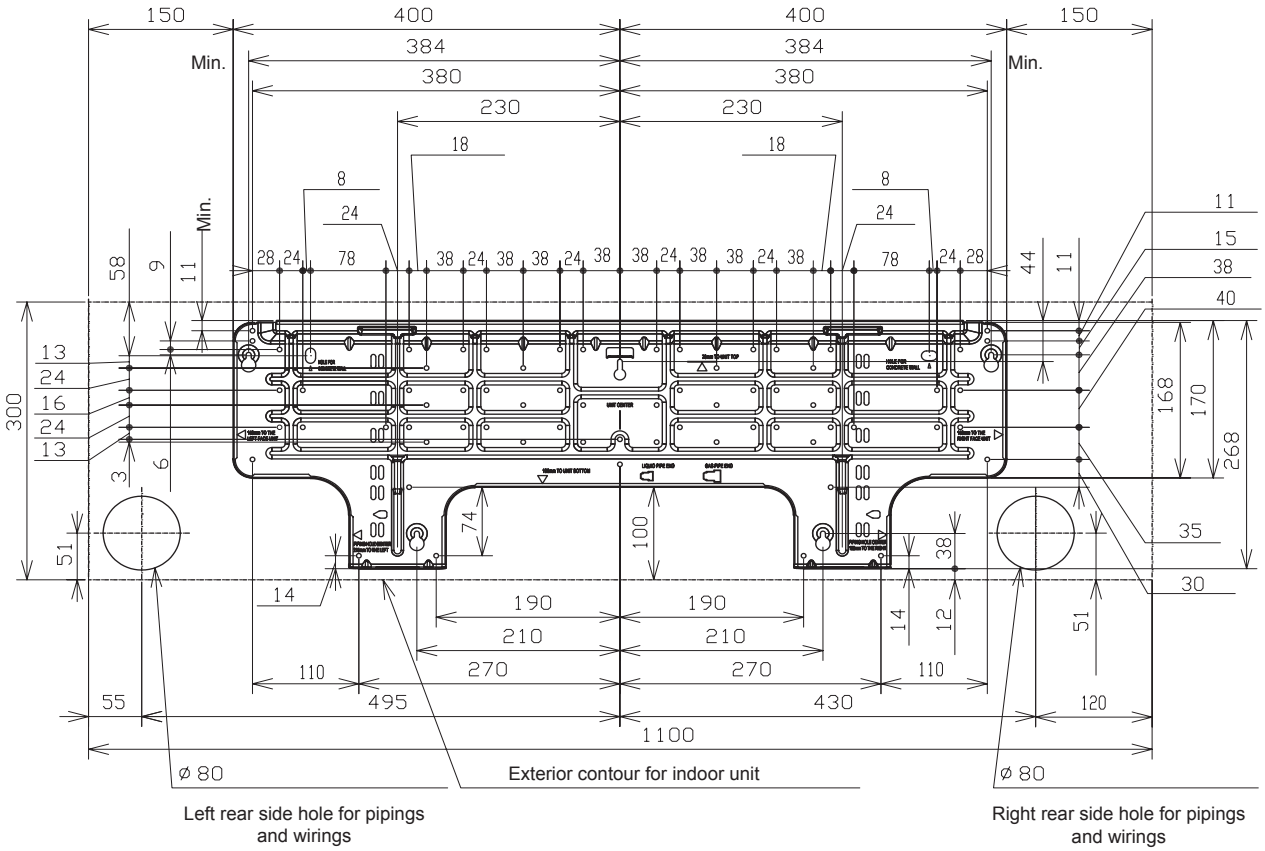
NOTE

All measurements are in mm.

Unit suspension bracket - RPK-1.5FSN(H)4M



Unit suspension bracket - RPK-(2.0-4.0)FSN(H)4M



NOTE

All measurements are in mm.

NOTE

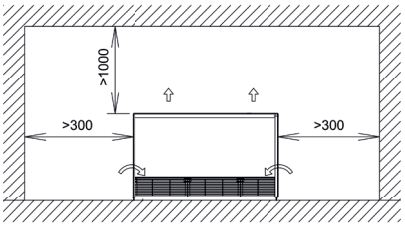
The suspension bracket for RPK has different types of fixing hole, to be used depending on the characteristics of the wall.

: For gypsum boards (4 positions), using board anchors (field supplied)

: For concrete walls (2 positions)

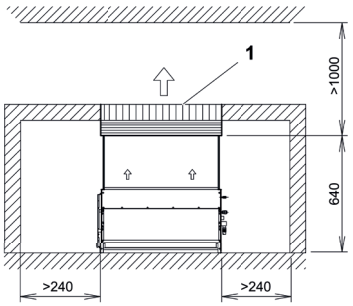
: Additional holes (multiple positions), for other types of wall, to be used according to the requirements of the installation

7.2.8 RPF-(1.0-2.5)FSN2E - Floor type

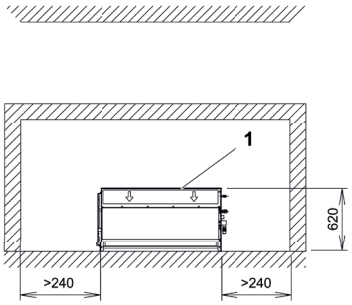


7.2.9 RPFI-(1.0-2.5)FSN2E - Floor concealed type

1 Vertical air outlet.



1 Horizontal air outlet.

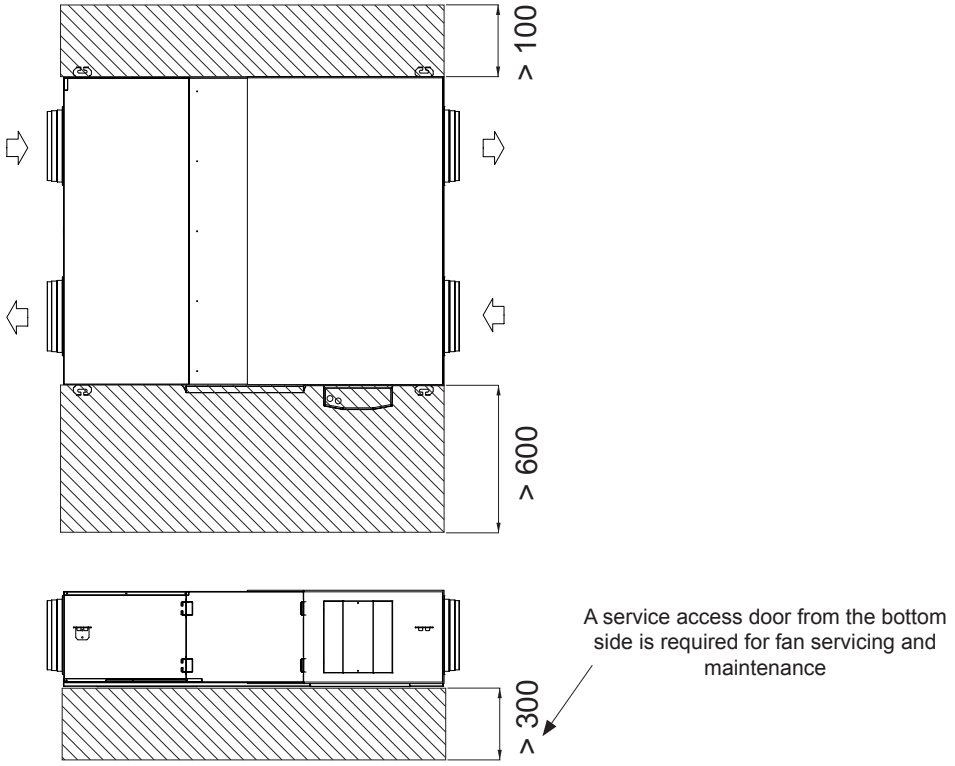


NOTE

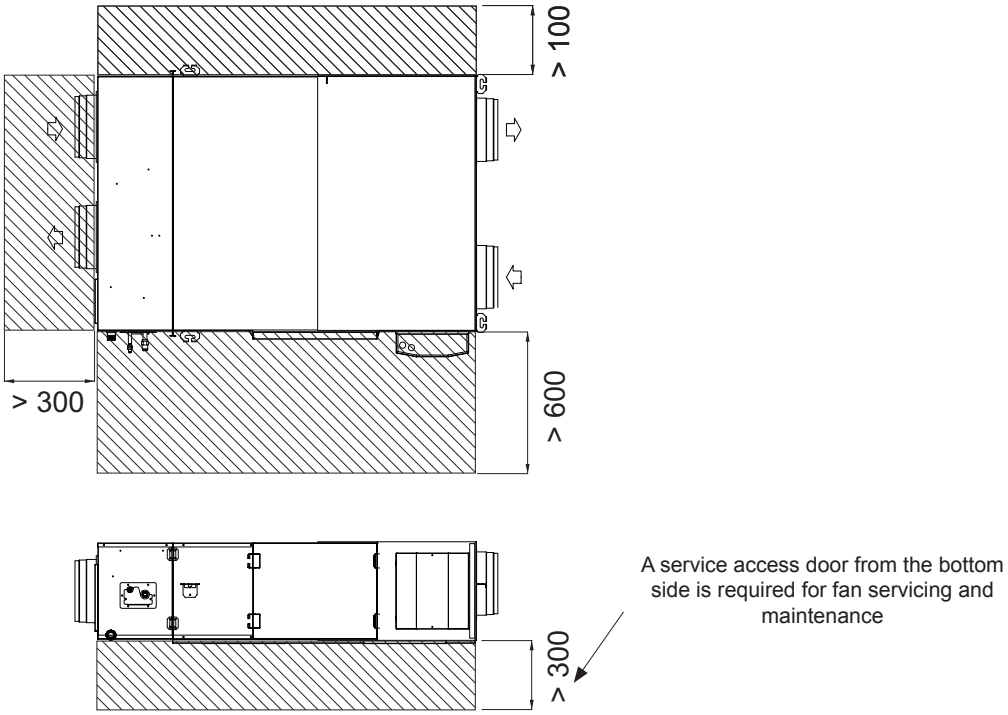
All measurements are in mm.

7.2.10 KPI-(252-2002)(E/X)4E - Energy recovery and active energy recovery ventilation units

KPI-(252-2002)E4E - Energy recovery ventilation units



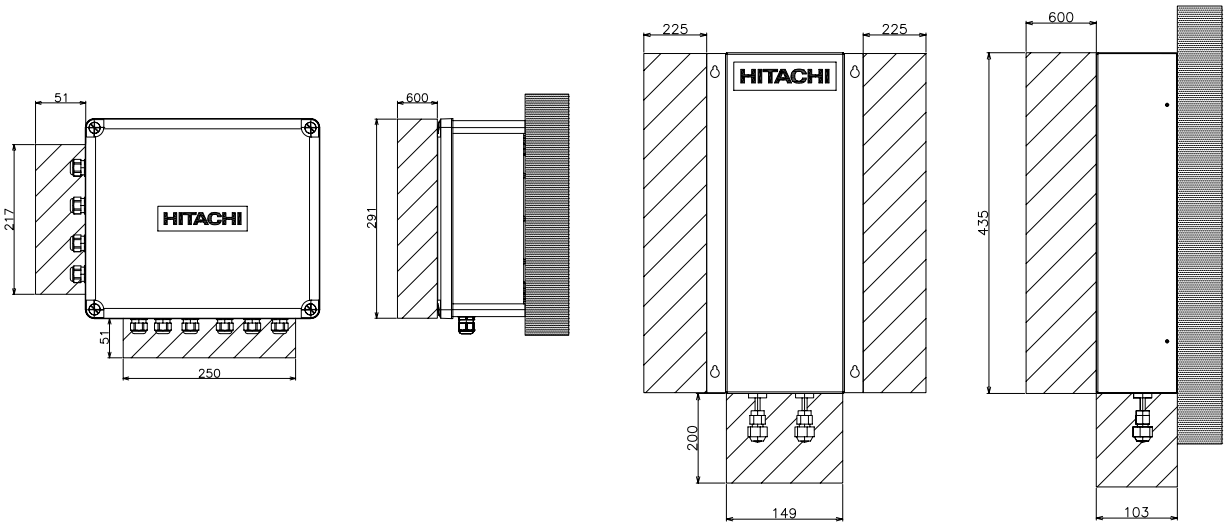
KPI-(502-1002)X4E - Active energy recovery ventilation units



NOTE

All measurements are in mm.

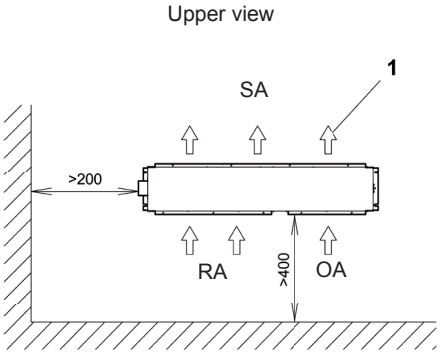
7.2.11 DX-Interface



NOTE

All measurements are in mm.

7.2.12 Econofresh kit



NOTE

1 Air flow direction.
SA: Suction air (RPI suction)
RA: Retruns air (from the room)
OA: Outlet air

All measurements are in mm.

8. Refrigerant cycle

Index

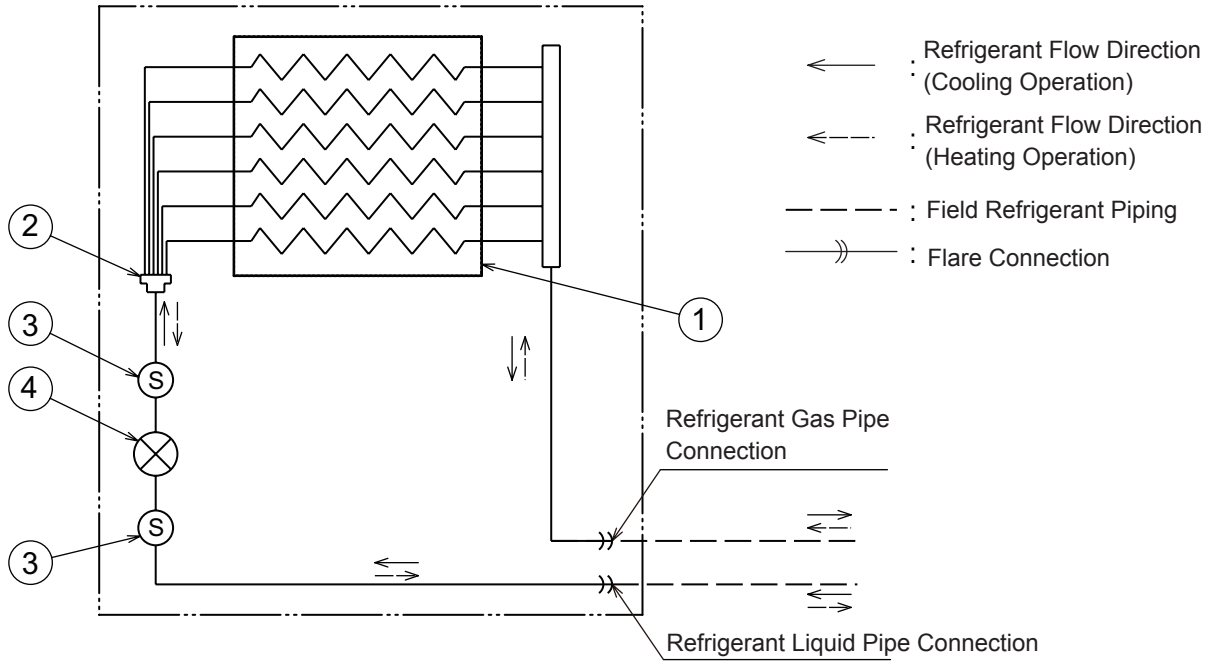
8.1 Indoor Unit 234

8.2 Example of IVX combination 235

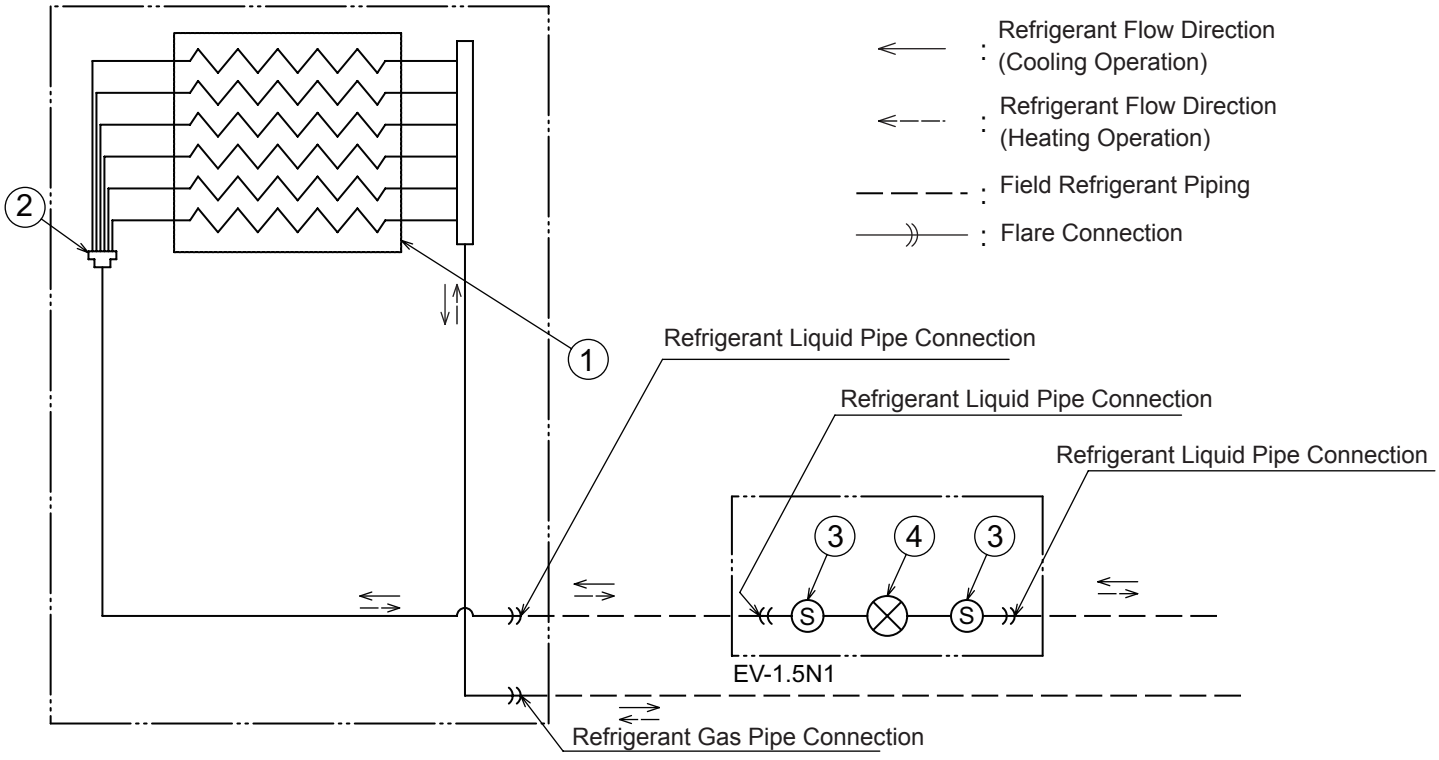
8.3 Example of SET FREE combination 236

8.1 Indoor Unit

All except RPK-FSNH4M



RPK-FSNH4M only



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

8.2 Example of IVX combination

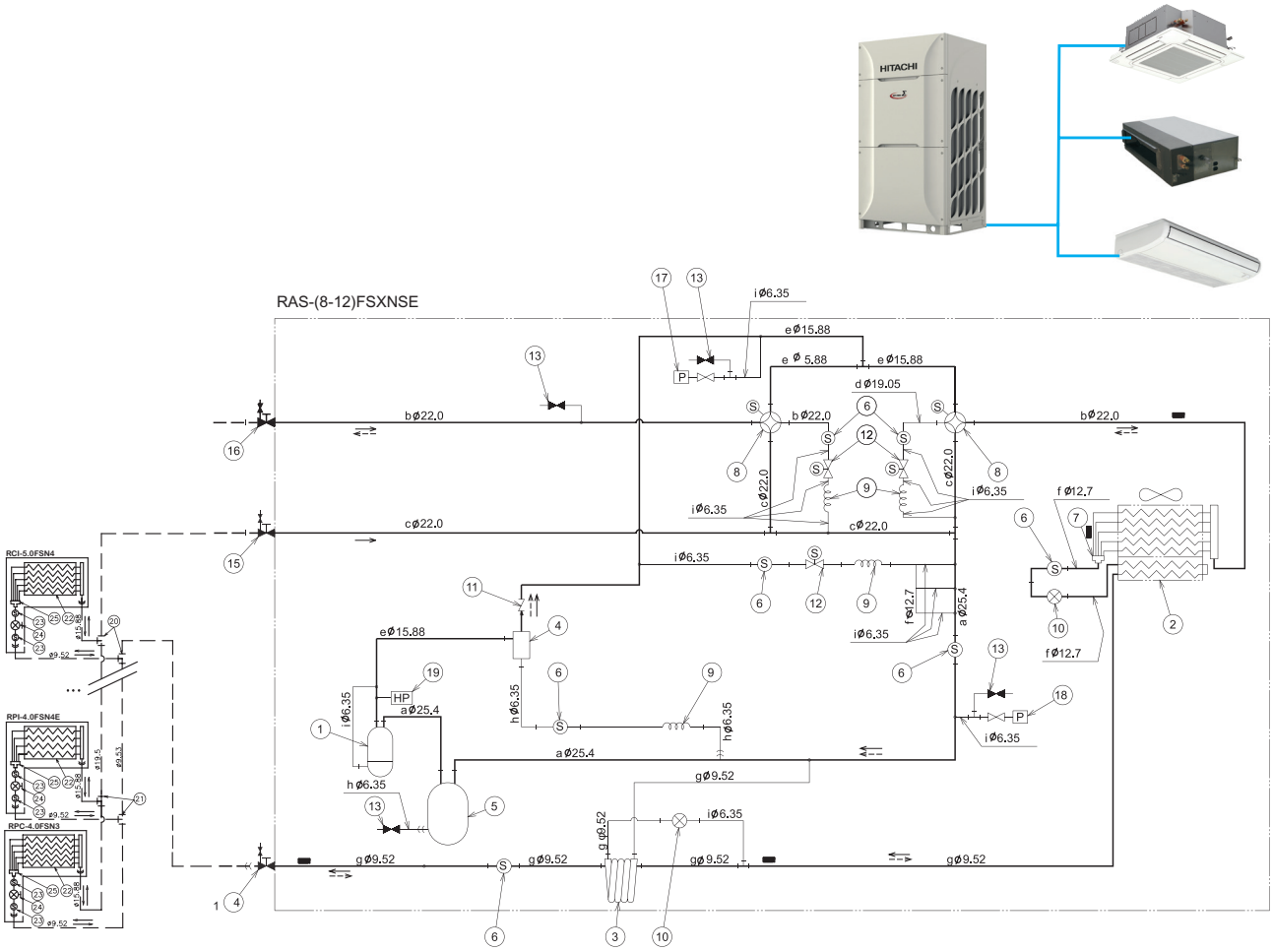


⟶	⟵	·····	⟩⟨	‖	⊣	R410A	4.15 MPa
Refrigerant flow for cooling	Refrigerant flow for heating	Installation refrigeration pipe	Connection by flare nut	Connection by flange	Connection by welding	Gas refrigerant	Leakage test pressure

Nº	Part name	Nº	Part name	Nº	Part name
1	Compressor	9	Distributor	17	Pressure switch for control
2	Heat exchanger	10	Check joint	18	Multikit (Liquid line)
3	Accumulator	11	High pressure switch for protection	19	Multikit (Gas line)
4	Receiver	12	Sensor for refrigerant pressure	20	Indoor exchanger
5	Micro-computer control expansion valve	13	Stop valve for gas line	21	Strainer
6	Reversing valve	14	Stop valve for liquid line	22	Electronic expansion valve
7	Solenoid valve for gas bypass	15	Check valve	23	Distributor
8	Strainer	16	Silencer		

Mark	Part name
A	Gas line refrigerant piping connection
B	Liquid line refrigerant piping connection
C	Outdoor unit
D	Ambient thermistor
E	Discharge gas thermistor
F	Pipe thermistor

8.3 Example of SET FREE combination



→	<-------	----------				R410A	4.15 MPa
Refrigerant flow for cooling	Refrigerant flow for heating	Installation refrigeration pipe	Connection by flare nut	Connection by flange	Connection by welding	Gas refrigerant	Leakage test pressure

Nº	Part name	Nº	Part name	Nº	Part name
1	Compressor	10	Micro computer control expansion valve	19	High pressure switch for protection
2	Heat exchanger	11	Check valve	20	Multikit
3	Double tube type heat exchanger	12	Solenoid valve	21	Multikit
4	Oil separator	13	Check joint	22	Indoor exchanger
5	Accumulator	14	Stop valve for liquid line	23	Filter
6	Strainer	15	Stop valve for gas (low) line	24	Expansion valve
7	Distributor	16	Stop valve for gas (high/low) line	25	Distributor
8	Reversing valve	17	Sensor for refrigerant pressure (high pressure sensor)		
9	Capillary tube	18	Sensor for refrigerant pressure (low pressure sensor)		

9. Piping work and refrigerant charge

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9.1 Refrigerant

9.1.1 Refrigerant charge

DANGER

Use the specified non-flammable refrigerant (R410A) to the outdoor unit in the refrigerant cycle. Do not charge the unit with materials other than R410A, such as hydrocarbon refrigerants (propane, etc.), oxygen, flammable gases (acetylene, etc.) or poisonous gases when installing, maintaining and moving the unit. Contamination of these are extremely dangerous and may cause an explosion, a fire, and an injury.

NOTE

For matters relating to the refrigerant charge in the installation, consult the technical documentation corresponding to the outdoor units of the UTOPIA or SET-FREE systems.

9.2 Refrigerant piping selection

◆ Pipe size selection

As a general rule, select the pipe size in line with the following instructions:

1 Between the outdoor unit and the branch pipe (Multi-kit): select the same pipe connection size as for the outdoor unit.

2 Between the branch pipe (Multi-kit) and the indoor unit: select the same pipe connection size as for the indoor unit.

NOTE

Consult the corresponding technical documentation for outdoor units from the UTOPIA or SET FREE series for gas refrigerant pipe selection.

CAUTION

- *Do not use refrigerant pipe sizes other than those indicated in the corresponding technical documentation for outdoor units. The diameter of the refrigerant pipes depends directly on the power of the outdoor unit.*
- *If larger diameter refrigerant pipes are used instead the one specified, the circuit lubrication oil tends to separate from the gas carrying it. The compressor will be seriously damaged due to a lack of lubrication.*
- *If smaller diameter refrigerant pipes are used instead the one specified, the gas or liquid refrigerant will have serious difficulties in circulating. System performance will be affected. The compressor will run under more severe conditions than foreseen and will be damaged in a short space of time.*

◆ Selection of the Multi-kit or distributor

NOTE

- *Pipe connection size on outdoor units, indoor units and the Multi-kit or distributor vary according to the system. Consult the technical documentation for the UTOPIA or SET FREE series.*
- *The sizes of the indoor and outdoor units are different. Adjust the flare adapter (accessory) to the indoor pipe connection.*

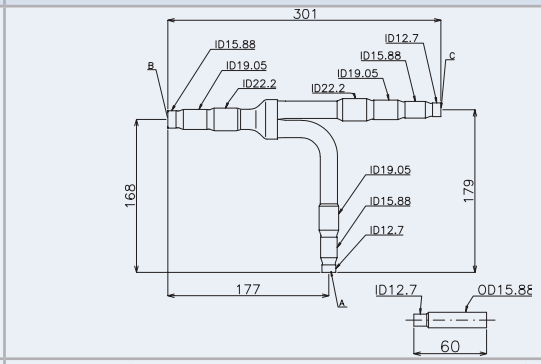
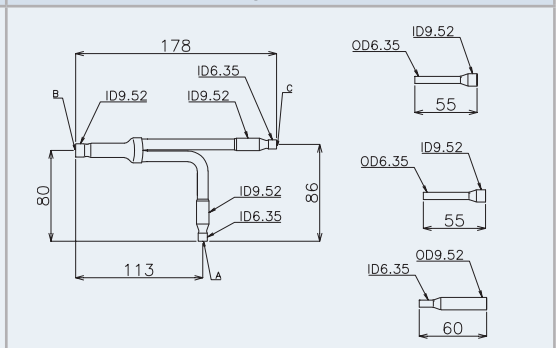
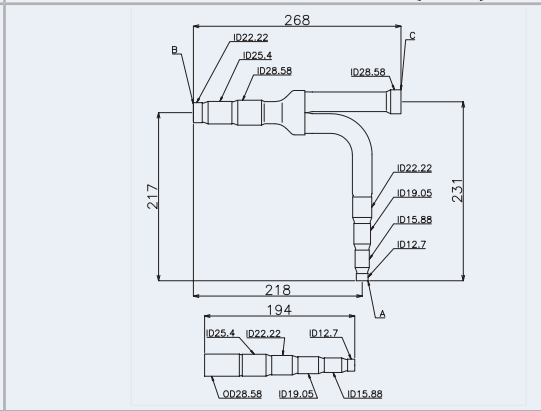
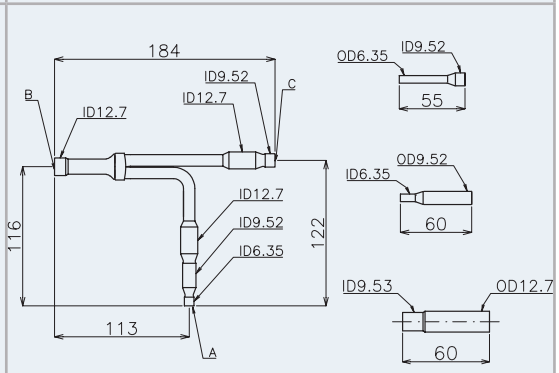
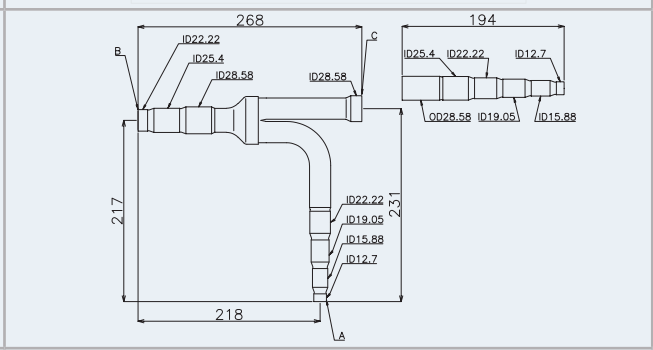
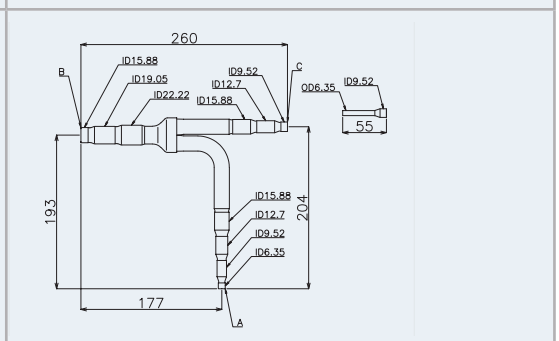
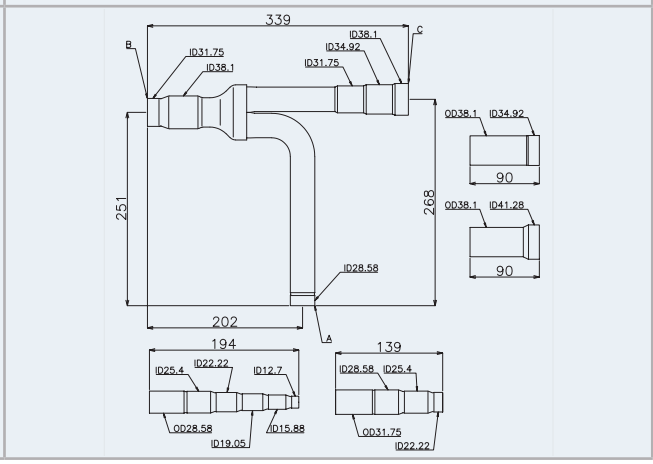
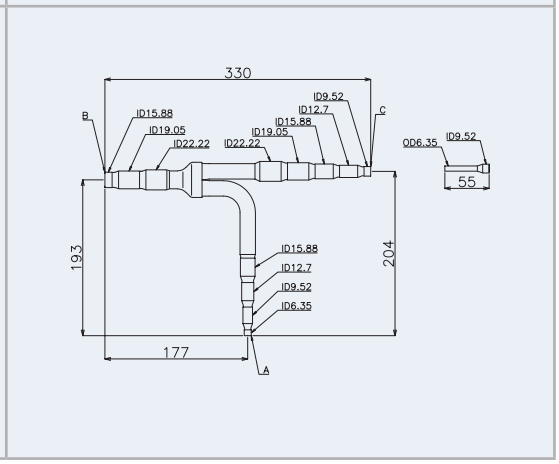
9.3 Multikits and distributors

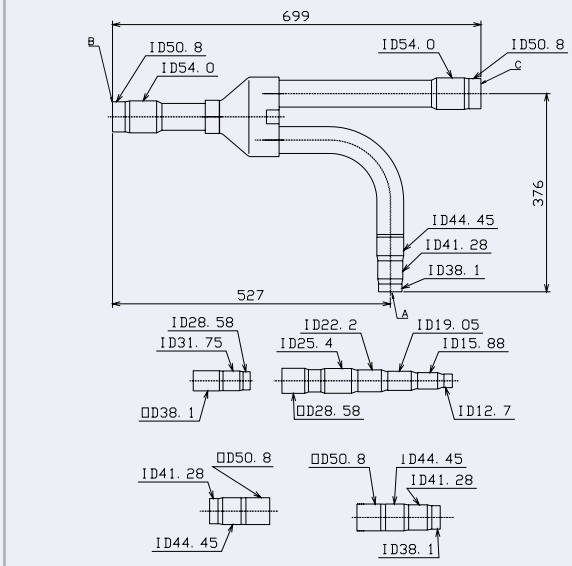
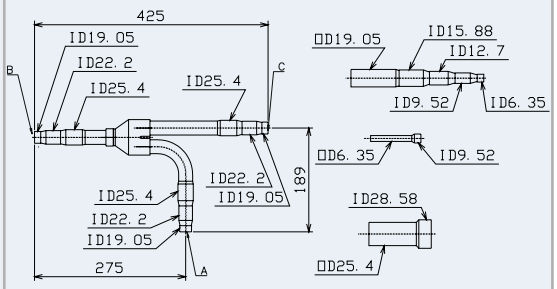
NOTE

- *All measurements are in mm.*
- *ID: Inner Diameter*
- *OD: Outer diameter*

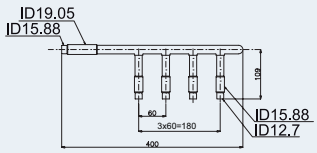
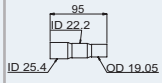
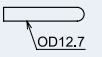
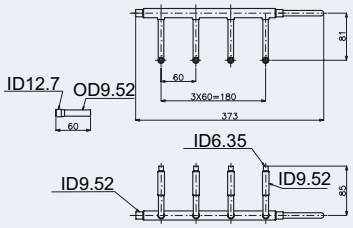
A	To indoor unit
B	To outdoor unit
C	To main piping

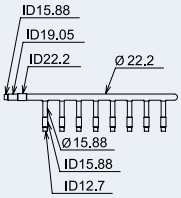
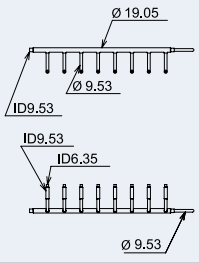
9.3.1 For Heat Pump system (2 pipes) - Line branch

Model	Gas line	Liquid line
E-102SN4		
E-162SN4		
E-242SN3		
E-302SN3		

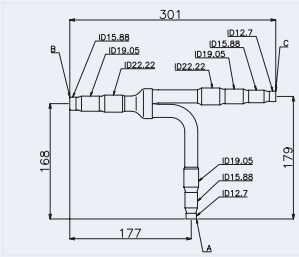
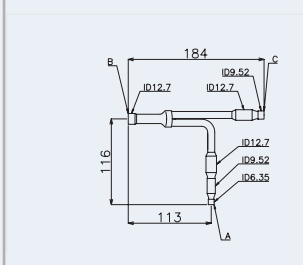
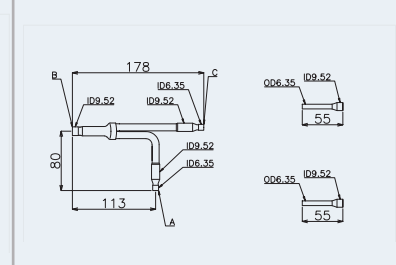
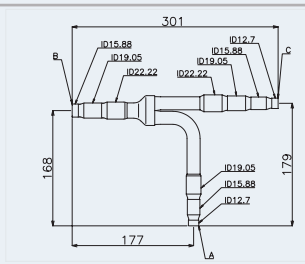
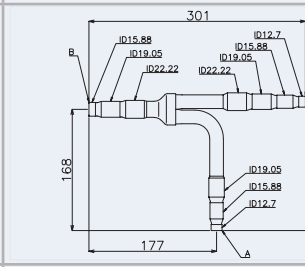
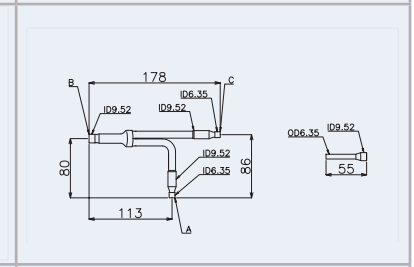
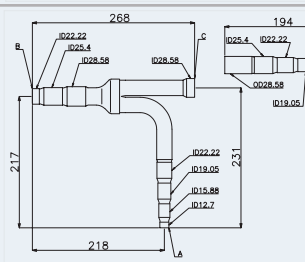
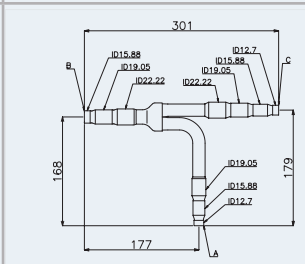
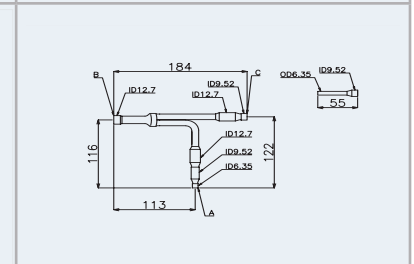
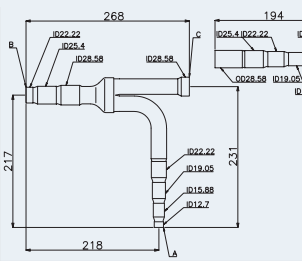
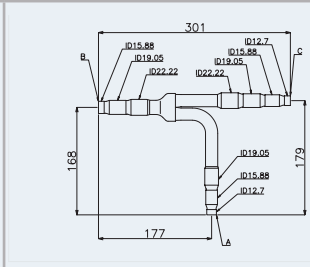
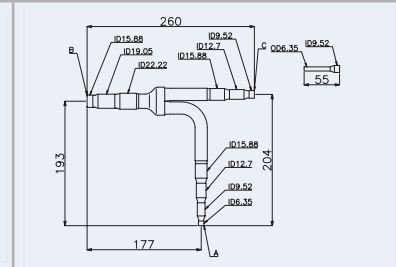
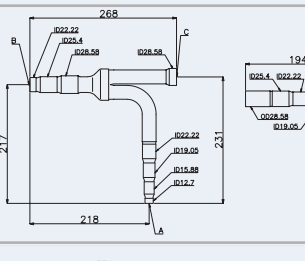
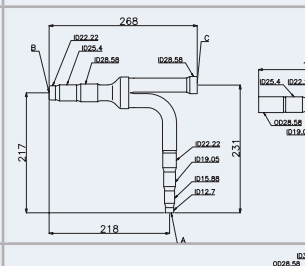
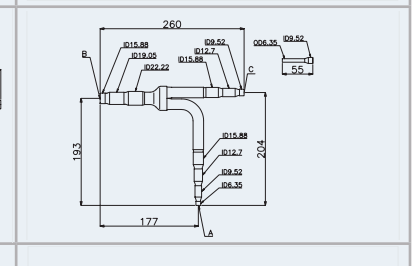
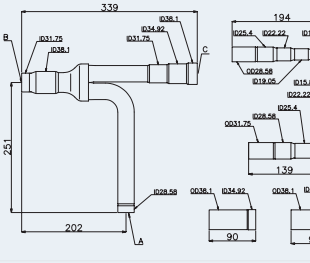
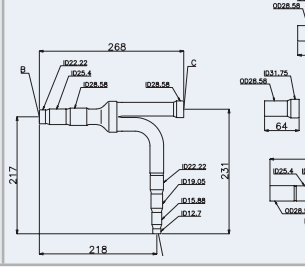
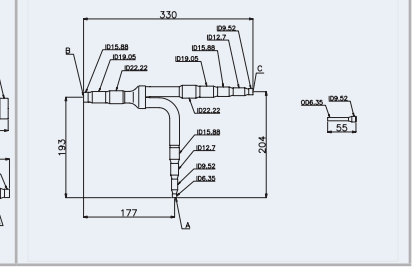
Model	Gas line	Liquid line
MW-NP2682A3		

9.3.2 For Heat Pump system (2 pipes) - Header branch

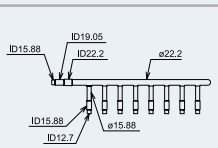
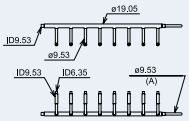
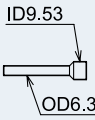
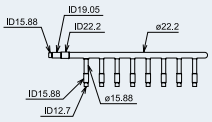
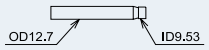
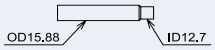
MH-84AN1					
Gas line	Expander for the gas line	Shut-off pipe for the gas line	Liquid line	Expander for the liquid line	Shut-off pipe for the liquid line
		 Quantity: 2		 Quantity: 4	 Quantity: 2

MH-108AN					
Gas line	Expander for the gas line	Shut-off pipe for the gas line	Liquid line	Expander for the liquid line	Shut-off pipe for the liquid line
	 Quantity: 2	 Quantity: 6		 Quantity: 8	 Quantity: 6

9.3.3 For Heat recovery system (3 pipes) - Line Branch

Model	Gas line	High/low pressure gas line	Liquid line
E-52XN3			
E-102XN3			
E-162XN3			
E-202XN3			
E-242XN3			
E-322XN3			

9.3.4 For Heat recovery system (3 pipes) - Header branch

MH-108XN					
Gas line	Expander for the gas line	Shut-off pipe for the gas line	Liquid line	Expander for the liquid line	Shut-off pipe for the liquid line
Low pressure					
	 Quantity: 2 (for end of multi-kit connection)	 Quantity: 6	 (A): For closing	 Quantity: 10 2: For end of multi-kit connection. 8: For unit piping connection.	 Quantity: 6
High pressure					
	 Quantity: 8 (for end of multi-kit connection  Quantity: 1 (for end of multi-kit connection)	 Quantity: 6			

9.4 Copper pipes, sizes, connection and insulation

9.4.1 Copper pipes and sizes

⚠ CAUTION

- *The copper pipe used in the refrigeration installations is different to the copper pipe used in installations carrying domestic or heating water.*
- *The copper pipe for refrigeration installations is especially treated for outdoors and indoors. The interior surface finish makes it easier for the gas refrigerant to circulate and withstands the action of the lubricant oil applied to outdoor equipment.*
- *Do not use hand saws, circular saws, abrasive grinders or other tools that generate shavings.*
- *Strictly follow national or local regulations regarding occupational health and safety. Wear appropriate means of protection during cutting or welding operations and installation (gloves, eye protection, etc).*

Prepare the copper pipes provided by the supplier.

Select the pipe with the appropriate diameter and thickness. Use the table below to select the most appropriate pipe:

Nominal diameter		Thickness mm	Recommended supply type
mm	inches		
Ø6.35	1/4	0.80	Coil (Soft)
Ø9.52	3/8	0.80	Coil (Soft)
Ø12.70	1/2	0.80	Coil (Soft)
Ø15.88	5/8	1.00	Coil (Soft)
Ø19.05	3/4	1.00	Coil (Soft)
Ø22.22	7/8	1.00	Coil (Soft)
Ø25.4	1	1.00	Straight lengths (half hard)
Ø28.58	1 1/8	1.00	Straight lengths (half hard)
Ø31.75	1 1/4	1.10	Straight lengths (half hard)
Ø38.1	1 1/2	1.35	Straight lengths (half hard)
Ø41.3	1 5/8	1.45	Straight lengths (half hard)
Ø44.45	1 3/4	1.55	Straight lengths (half hard)
Ø50.8	2	1.78	Straight lengths (half hard)

Always use clean copper pipes with no signs of knocks or cracks. Make sure there is no dust or dampness on the inside. Before you install the pipes, clean the inside with oxygen-free nitrogen gas to eliminate any remains of dust or other substances.

NOTE

- *If copper pipe is used for piping bigger than Ø19.05, flaring work can not be performed. If necessary, use a joint adapter.*

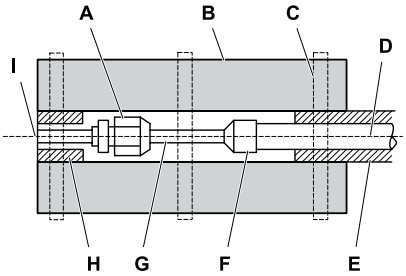
9.4.2 Pipe connection

End of refrigerant pipe protected correctly.

Keep the ends of the pipes covered while other installation work is being carried out to avoid the entry of dampness or dirt.

Fix the connecting pipe as shown in the figure. Use field supplied insulations.

- A. Flare nut on the indoor unit
- B. Insulation material for insulation of the connection with the indoor unit (field supplied)
- C. Part to be fixed with brackets, plastic bands or adhesive tape (field supplied)
- D. Refrigerant pipe of the installation
- E. Insulation of the installation (field supplied)
- F. Brazing
- G. Flares made after attaching the flare nut to the connecting pipe in the Multikit package
- H. Insulation attached to the indoor unit
- I. Indoor unit side



NOTE

- *Contamination caused by moisture and oil in the pipes reduces the overall performance and lifetime of the system. To avoid this, make sure that all copper piping is clean and dry internally, blowing oxygen-free nitrogen through the pipes.*
- *Where polyethylene foam insulation is used, the thickness of the insulation layer shall be at least 10 mm for the liquid pipe and at least 15~20 mm for the gas pipe.*
- *Foam insulation shall be installed after the surface temperature of the pipe has cooled down to room temperature; otherwise the insulation material may melt.*

CAUTION

- *If the ends of the piping system are open after finishing the installation work, securely attach caps or vinyl bags to the ends of the piping to prevent moisture or dust entering*
- *Cap the end of the pipe when the pipe is to be inserted through a hole (in walls, roofs, etc)..*

Correct



- *Do not place pipes directly on the ground without a cap or vinyl tape covering the end, as shown in the figure.*

Incorrect



- *If the installation of piping cannot be completed within the day, the ends of the piping shall be sealed by soldering, and the pipes charged with oxygen-free nitrogen using an access device such as a Schrader valve, in order to avoid contamination by moisture and foreign bodies.*
- *Do not use insulation material containing NH3 (ammonium), as it can damage the copper material of the pipes and cause subsequent leakage.*
- *Where the installer provides their own branch pipes, these must be insulated appropriately in accordance with environmental conditions in order to avoid a decrease of capacity and dew condensation on the surface of the pipes due to low pressure.*

9.4.3 Insulation of the multikits and/or branches

Attach insulation package with the Multikit to each branch (field-supplied or package with each one depending on model) using vinyl tape. Also attach insulation to field-supplied piping to prevent capacity decrease due to ambient air conditions and dewing on pipe surface caused by low pressure.

NOTE

When polyethylene foam is applied, a thickness of 10 mm for the liquid piping and from 15 mm to 20 mm for the gas piping is recommended.

CAUTION

Perform insulation work after the surface temperature decreases to the room temperature, If not, the insulation material may melt.

9.5 Precautions in the event of gas refrigerant leaks

DANGER

The installers and those responsible for installation design must strictly abide by local and national regulations and local codes relating to safety requirements in the event of gas refrigerant leaks.

9.5.1 Maximum permitted hydrofluorocarbon (HFC) concentration

The gas refrigerant R410A included in the units is non-combustible and non-toxic.

DANGER

In the event of a leak, the gas spreads around the room and displaces the air, which could cause suffocation.

According to Standard EN378-1, the maximum permitted concentration of HFC R410A gas in the air is 0.44 kg/m^3. Therefore, effective measures must be adopted to maintain the concentration of R410A gas in the air below 0.44 kg/m^3 in the event of a leak.

9.5.2 Calculation of the concentration of gas refrigerant

1 Calculate the total quantity of refrigerant *R* (kg) charged in the system. To do so, connect all indoor units in the rooms in which air conditioning is to be provided.
2 Calculate the volume *V* (m^3) of each room.
3 Calculate the refrigerant *C* (kg/m^3) concentration in the room according to the following formula:

$$C = R / V$$

R: total quantity of refrigerant charged (kg).

V: volume of the room (m^3).

C: gas refrigerant concentration (≤ 0.44 kg/m^3 for R410A gas).

9.5.3 Countermeasures in the event of gas refrigerant leaks

The room must have the following characteristics should there be a gas refrigerant leak:

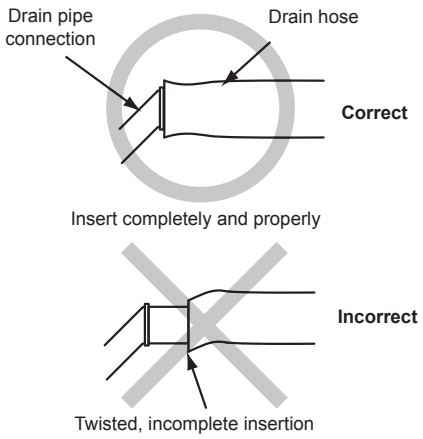
1 Opening with no outside shutter for fresh air circulation around the room.
2 Opening with no door to a size of 0.15% or above of the floor area.
3 A fan with a capacity of at least 0.4 m^3/minute per ton of Japanese refrigeration (= volume moved by the compressor / 5.7 m^3/h) or above, connected to a gas sensor in the air conditioning system that uses gas refrigerant. (Refer to outdoor unit technical catalogue)

DANGER

Pay special attention to places such as basements and similar where the gas refrigerant may lie and settle, as it is heavier than air.

9.6 General remarks for drain pipe connection

- The drain piping work and the attachment of insulations must be completed before starting the refrigerant piping work.
- Refer to the Installation and Operation Manual corresponding to the indoor units for the details regarding the installation of the drain pipe, such as the position of the connectors.
- Arrange a polyvinyl chloride (PVC) pipe with the proper outer diameter according to the details in the Installation and Operation Manual.
- Fasten the tubing to the drain hose with an adhesive and a clamp, following the steps below.
  - Make sure that the surface of the connection end of the drain pipe is clean, and apply the PVC adhesive.
  - Insert the drain hose completely into the connection end of the drain pipe. Water leakage may occur if it is not inserted properly, or if it is bent or twisted.
  - Attach the hose clamp on top of the section of drain hose inserted into the connection part of the drain pipe. The hose clamp shall be at least 20 mm away from the end of the drain hose.
  - Tighten the hose clamp and make sure that the distance from the screw to the end of the hose clamp is approximately 28 mm.



DANGER

- ***Do not connect the drain piping of the indoor unit into a drainage trench where corrosive gases occur. Otherwise, poisonous gases might flow into the room leading to poisoning.***
- ***Do not connect condensate drainage with sanitary or sewer lines or sewage or any other condensate piping.***
- ***Install the drain piping in accordance with national and local codes.***

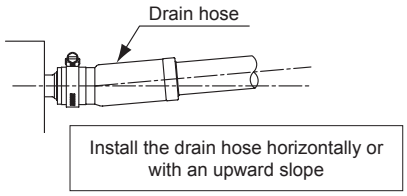
CAUTION

If the clearance between the drain pipe connection and the drain hose is excessive, then add a sealing material between both parts in order to make them fit and avoid deformation of the drain hose.

NOTE

- *It is possible to connect the drain hose and the drain pipe without adhesive, if future relocation is intended. In that case, attach the hose clamp to the vinyl tape on the drain hose.*
- *Use the designated drain hose and hose clamp only. The use of other parts may cause water leakage.*
- *Do not bend or twist the drain hose, or use an already bent or twisted drain hose. It may cause water leakage.*
- *Do not apply an excessive force to the drain pipe connection. It may cause damage.*
- *Insulate the drain pipe after connecting the drain hose.*

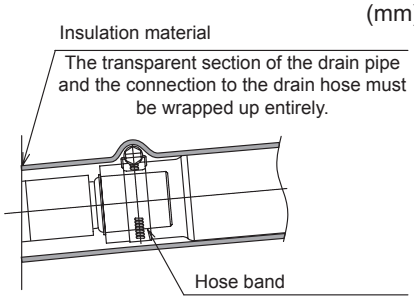
- Install the drain pipe, taking the following points into account:
  - The drain pipe must be installed with a downward slope of 1/25 to 1/100, as shown in the figure below.
  - Support parts must be installed at intervals of 1 m to 1.5 m, in order to avoid bending of the drain pipe.
  - The drain hose must by installed horizontally or with a slight upward, to prevent the formation of air pockets inside it. If air pockets appear inside the drain hose, the drain water will flow back into the unit, causing abnormal noise and leakage in the room when unit operation is stopped.



- In case of raising the drain pipe, it shall be installed according to the dimensions detailed in the corresponding Installation and Operation manual.

• Connect the drain pipe and the drain hose with gaskets, and then cover those completely with an insulation material. Dew condensation may occur as a result of improper insulation.

(mm)

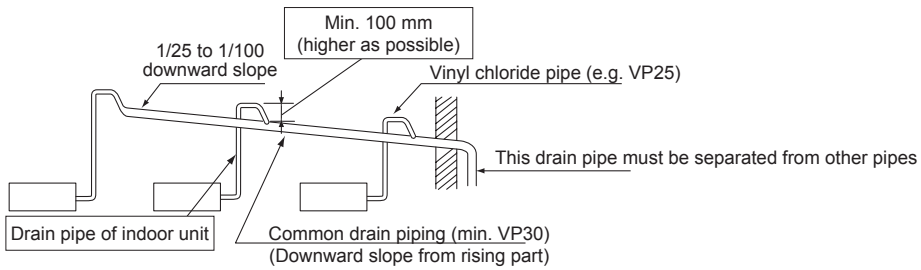


NOTE

Pay attention to the thickness of the insulation material being used. If it is too thick, it might not be possible to install the piping in the unit.

• When install the common drain pipe, taking the following points into account:
  - The common drain pipe must be installed with a downward slope, to make sure that it is lower than the rising part of each drain pipe from an indoor unit.
  - When several indoor units are connected to the common drain pipe, the connection of each of the indoor units must be at a position higher than that of the common pipe.
  - The size of the common drain pipe must be large enough according to the number and capacity of the installed indoor units, being at least VP30 (nominal diameter 30 mm, outer diameter: 38 mm)

Example of a system with drain-up mechanism



  - Drain piping requires insulation if the drain is installed in a location where condensation forming outside the drain pipe may drop and cause damage. The insulation material for the drain pipe must be selected to ensure vapour sealing and to prevent condensation.
  - A drain trap should be installed next to each indoor unit. This trap must be designed to good practice and be checked with water (charged) and tested for correct flow.
  - The drain pipe and the refrigerant pipe must not be tied or clamped together.

NOTE

• *The drain pipe must not have any upward slope or rising section. Otherwise, drain water may flow back into the units, causing water leakage when the operation of the units is stopped.*

• After performing drain piping and electrical wiring work, check to ensure that water flows smoothly.

9.7 DX-Interface refrigerant charge and piping length limits

DX-Interface refrigerant charge calculation and limits of piping length vs HEX volume is described in the following procedure, that only applies to 1 to 1 system with UTOPIA IVX RAS-XH(V)NP(1)E series and DX-Interface series 2. For any other system the standard calculation procedure applies. Refer to the technical documentation of each system for further information.

The amount of refrigerant to be added to the system must be calculated according to pipe length and the volume of the heat exchanger (HEX), as well as the relation between these.

The following calculation procedure is applied only for 1-to-1 systems with UTOPIA IVX RAS-XH(V)NP(1)E series.

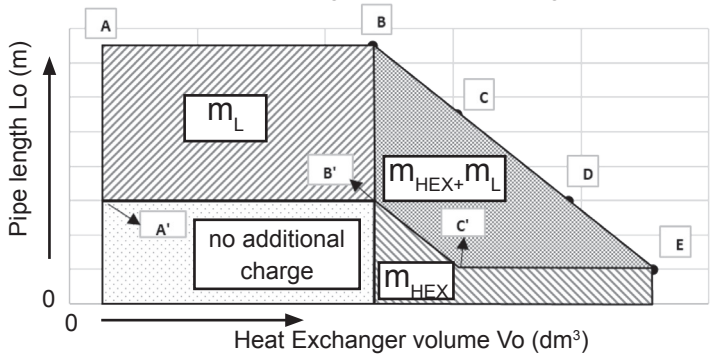
Total amount of refrigerant charge: **MTotal= mL+mHEX**

Whereas charge due to increased pipe length is calculated as follows: **mL=(L-L0)*α**

And charge due to the volume of the heat exchanger (HEX) is calculated as follows: **mHEX=(VHEX-V0)*β**

There are different areas defined according to the length of piping and the volume of the heat exchanger (HEX), as shown in the following graphic. Depending on the area, it may be necessary to calculate mL, mHEX or both.

Heat exchanger (HEX) & pipe length



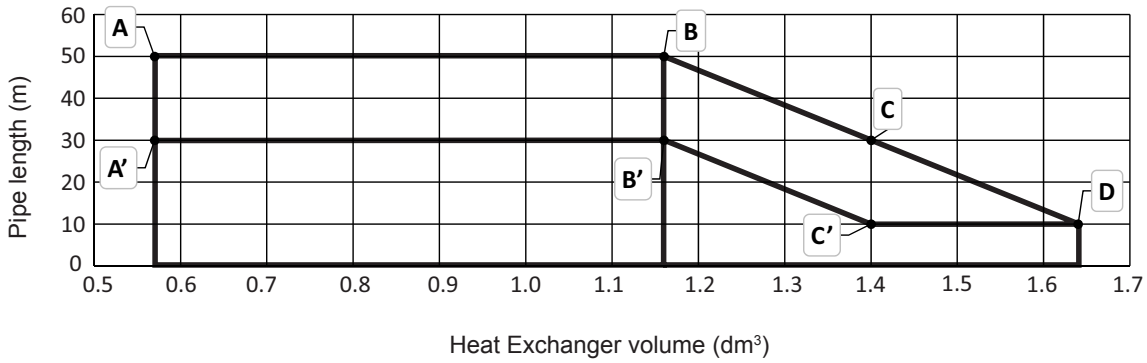
The heat exchanger expansion volume is restricted to certain applications. For those applications where it is not allowed, standard volume and piping restrictions apply.

Each DX-Interface series 2 model has its own graphic, as shown in the following page.

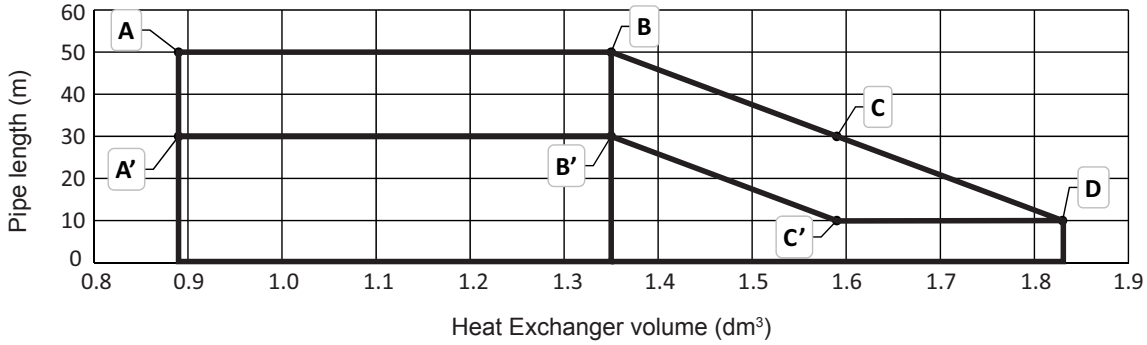
◆ Table of values for area boundaries

Concept		DX-Interface HP							
		2 HP	2.5 HP	3 HP	4 HP	5 HP	6 HP	8 HP	10 HP
A	HEX Volume [dm³]	0.57	0.89	1.03	1.51	1.92	1.92	2.92	3.89
	Pipe length [m]	50	50	50	75	75	75	100	100
A'	HEX Volume [dm³]	0.57	0.89	1.03	1.51	1.92	1.92	2.92	3.89
	Pipe length [m]	30	30	30	30	30	30	30	30
B	HEX Volume [dm³]	1.16	1.35	1.57	2.37	2.37	2.92	3.89	4.76
	Pipe length [m]	50	50	50	75	75	75	100	100
B'	HEX Volume [dm³]	1.16	1.35	1.57	2.37	2.37	2.92	3.89	4.76
	Pipe length [m]	30	30	30	30	30	30	30	30
C	HEX Volume [dm³]	1.4	1.59	2.23	3.03	3.03	3.58	4.55	6.06
	Pipe length [m]	30	30	30	55	55	55	80	80
C'	HEX Volume [dm³]	1.4	1.59	2.23	3.03	3.03	3.58	4.55	6.06
	Pipe length [m]	10	10	10	10	10	10	10	10
D	HEX Volume [dm³]	1.64	1.83	2.89	3.9	3.9	4.45	6.27	9.43
	Pipe length [m]	10	10	10	30	30	30	30	30
E	HEX Volume [dm³]	-	-	-	4.56	4.56	5.11	6.93	10.73
	Pipe length [m]	-	-	-	10	10	10	10	10
α	-	0.03	0.03	0.04	0.06	0.06	0.06	0.06	0.12
β	-	1.26							
L_0 [m]	-	30m if HEX Volume ≤ $V_{B'}$ Interpolation with points $V_{B'}$ & $V_{C'}$ if $V_{B'}$ < HEX Volume < $V_{C'}$ 10m if HEX Volume ≥ $V_{C'}$							
V_0 [dm³]	-	1.16	1.35	1.57	2.37	2.37	2.92	3.89	4.76

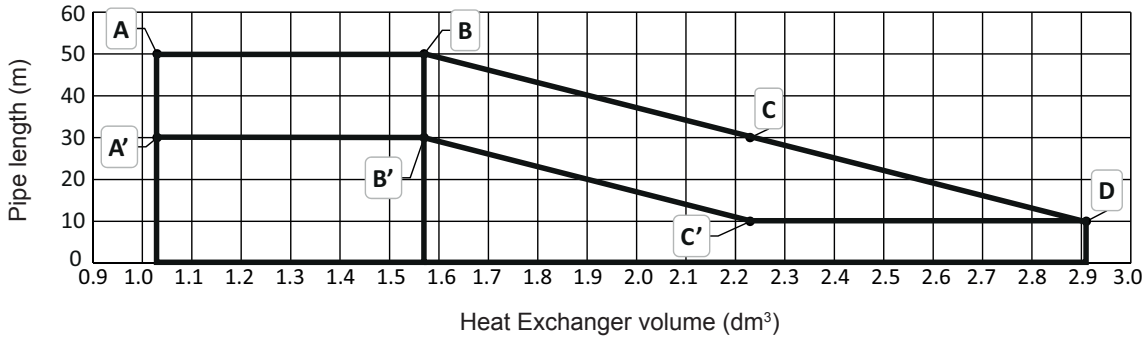
2 HP


Pipe length (m)
60
50
40
30
20
10
0
A
A'
B
B'
C
C'
D
0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7
Heat Exchanger volume (dm3)

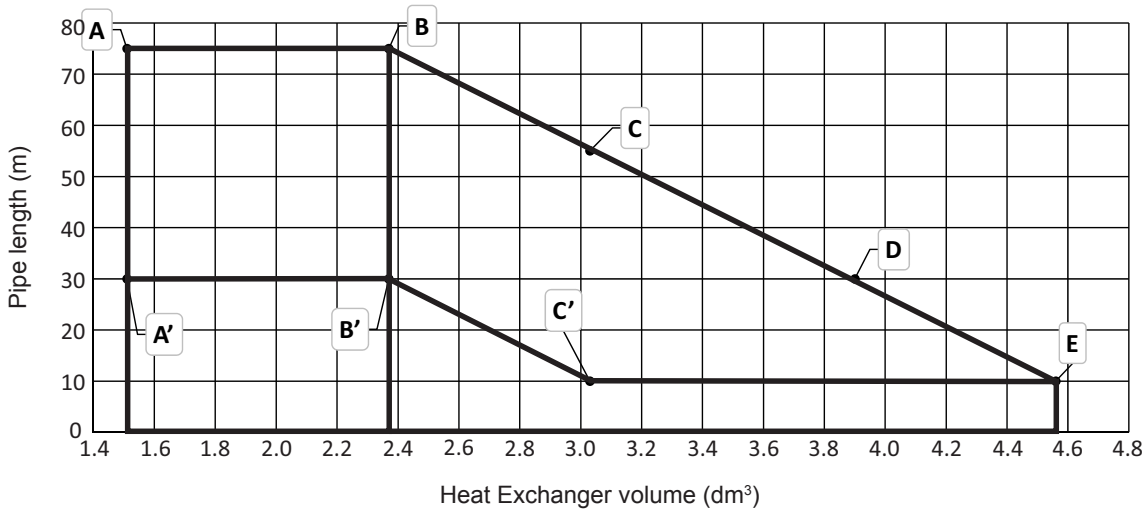
2.5 HP


Pipe length (m)
60
50
40
30
20
10
0
A
A'
B
B'
C
C'
D
0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9
Heat Exchanger volume (dm3)

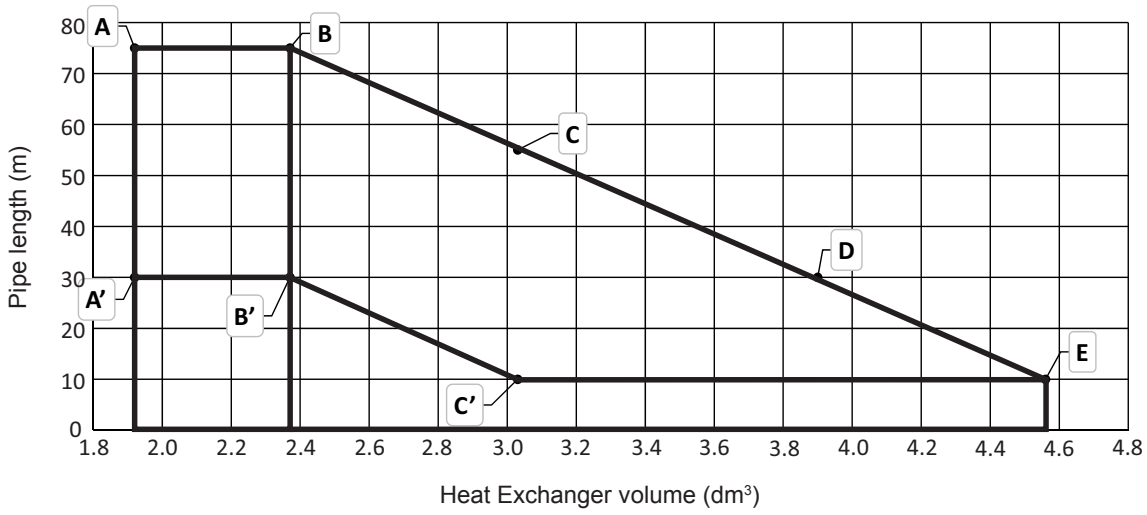
3 HP


Pipe length (m)
60
50
40
30
20
10
0
A
A'
B
B'
C
C'
D
0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3.0
Heat Exchanger volume (dm3)

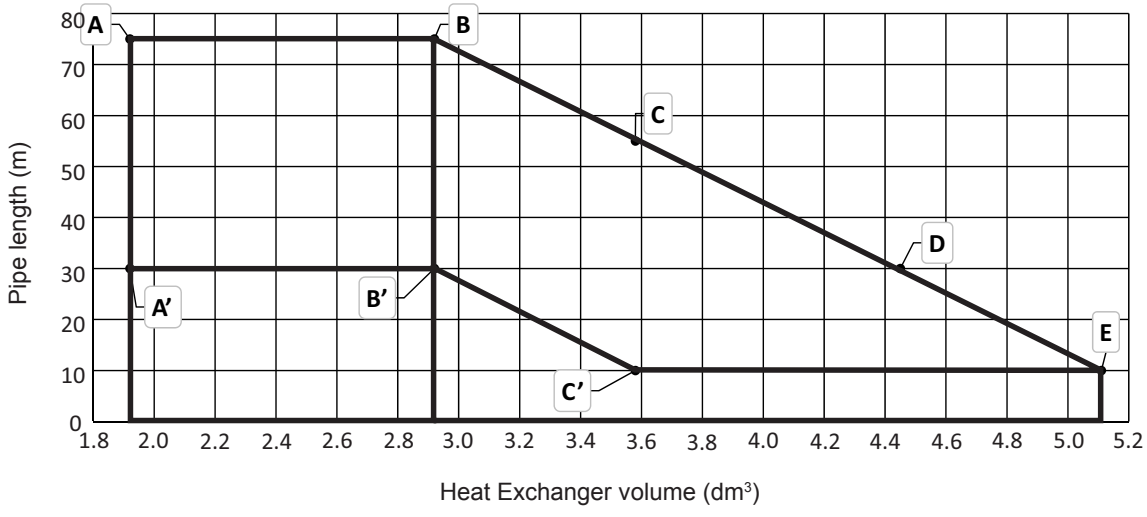
4 HP


Pipe length (m)
Heat Exchanger volume (dm³)
A
B
C
D
E
A'
B'
C'

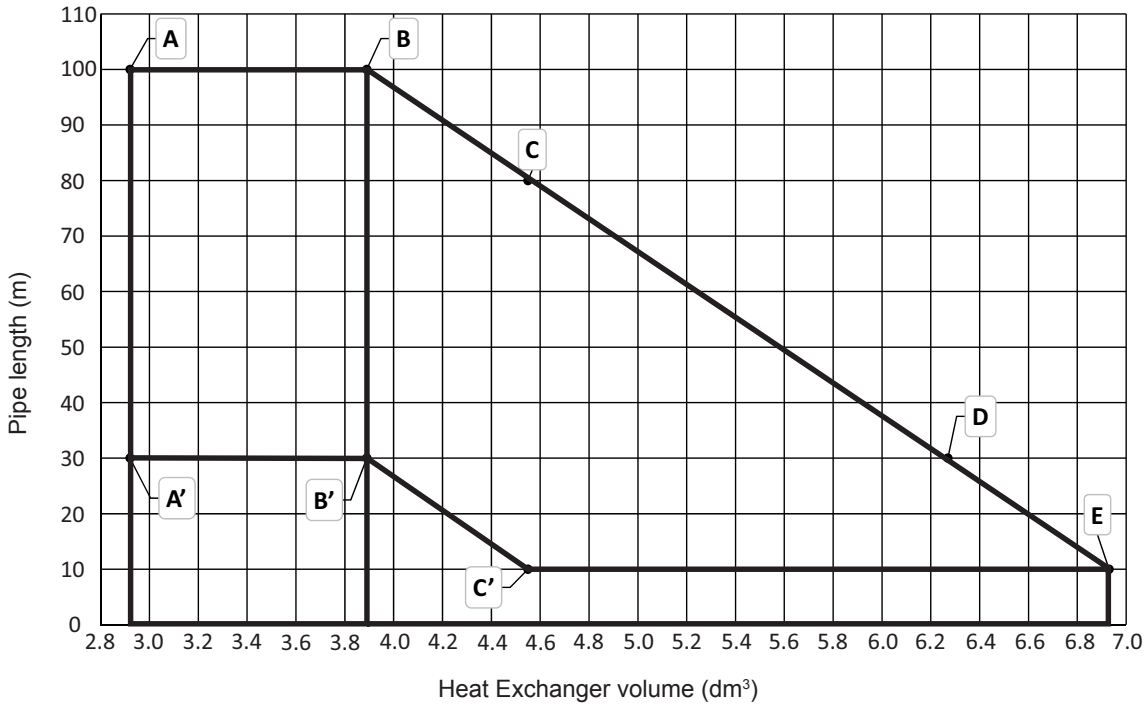
5 HP


Pipe length (m)
Heat Exchanger volume (dm³)
A
B
C
D
E
A'
B'
C'

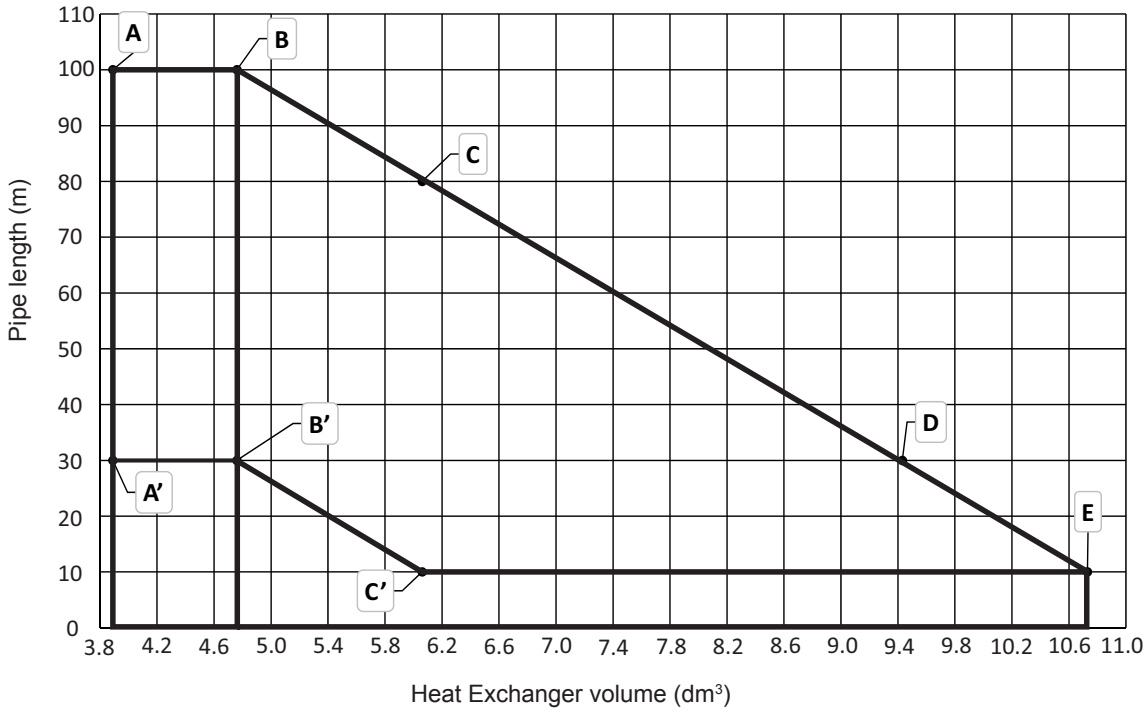
6 HP


Pipe length (m)
Heat Exchanger volume (dm³)
A
B
C
D
E
A'
B'
C'

8 HP


Pipe length (m)
110
100
90
80
70
60
50
40
30
20
10
0
A
B
C
D
E
A'
B'
C'
2.8 3.0 3.2 3.4 3.6 3.8 4.0 4.2 4.4 4.6 4.8 5.0 5.2 5.4 5.6 5.8 6.0 6.2 6.4 6.6 6.8 7.0
Heat Exchanger volume (dm³)

10 HP


Pipe length (m)
110
100
90
80
70
60
50
40
30
20
10
0
A
B
C
D
E
A'
B'
C'
3.8 4.2 4.6 5.0 5.4 5.8 6.2 6.6 7.0 7.4 7.8 8.2 8.6 9.0 9.4 9.8 10.2 10.6 11.0
Heat Exchanger volume (dm³)

10. Electrical and control settings

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10.1 General instructions

DANGER

- ***Make sure to install an ELB (Earth Leakage Breaker) and a CB (circuit breaker) or fuse as protection devices to properly protect all the units in the installation, in accordance with local or national safety regulations.***
- ***Should these protection devices (ELB, CB) activate repeatedly, stop the system immediately and contact your service contractor.***

CAUTION

- *Turn off the main power switch on the indoor and outdoor unit prior to any wiring work or regular inspections.*
- *Make sure the indoor and outdoor fan have come to a complete standstill before carrying out any wiring work or regular inspections.*
- *Protect wires, drain pipe and electric parts, etc. from rodents and insects, as they could bite unprotected parts and even cause a fire.*
- *Prevent wires from touching the gas refrigerant pipes, metal edges, printed circuit boards (PCB), electrical box or electrical parts on the inside of the unit as the wires could be damaged and even cause a fire or an electrical shock.*
- *Secure the wires firmly inside the indoor unit using plastic ties.*

NOTE

Secure the rubber bushes with adhesive when the outdoor unit ducts are not used.

1 Make sure the electric components supplied by the fitter (main power switches, circuit breakers, wires, connectors and connection terminals) have been selected correctly in line with the electrical data.

2 Local or national regulations must be followed at all times during the preliminary work to prepare the electric power line for the equipment.

NOTE

For further information, consult the current regulations in the country where the unit is to be installed.

3 Check that the voltage is within the margin.

4 Check the electric power line capacity for the unit. Where the voltage capacity is too low, it will not be possible to start the system due to the drop in voltage.

5 Check that the earth cable is correctly connected.

10.2 DIP switches settings and functions

10.2.1 Considerations

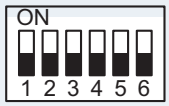
CAUTION

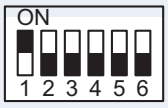
Disconnect the power supply before modifying the DIP switch settings. Otherwise the new settings will not be valid.

NOTE

The "■" mark indicates the position of the DIP switches. The figures show the position of the DIP switch once the position has been set.

◆ **Example of setting (DSW(5/6) - RSW (1/2))**

Example of system setting with a value of: 5	
DSWx	RSWx
	

Example of system setting with a value of: 16	
DSWx	RSWx
	

10.2.2 Indoor units

◆ **SW1 (RCI-FSN4, RPC-FSN3 and RPK-FSN(H)4M only)**

No settings are required. Factory setting:



◆ **SW2 (RPK-(0.4-4.0)FSN(H)4M only)**

Factory setting	Wired remote control
Wired / Wireless 	Wired / Wireless 

NOTE

In case of using the wired remote control, a receiver kit PC-ALHZ1 or if there is installed a HARC-BXE (A/B), set the SW2 to "Wired".

◆ **DSW2: optional function setting (RPK-FSN(H)4M only)**

Factory setting	Special lower capacity setting (0.6HP) [1]	Distinguish of indoor units using wireless remote control [2]
		

NOTE

- *[1] Only available for RPK-0.8FSN4M unit. 0.8 HP Indoor Units set to a lower capacity (0.6 HP) can only be used in combination with SET FREE mini series 3 (RAS-(4-6)FS(V)N(Y)3E) and SET FREE FSXN series.*
- *[2] In order to identify one indoor unit with its own wireless remote control, set DSW2 pin3 , DWS9 pin 1 and set the wireless remote control at "a" "b" "c" "d" mode.*

	Indoor unit A	Indoor unit B	Indoor unit C	Indoor unit D
DSW2-3	OFF	ON	OFF	ON
DSW9-1	OFF	OFF	ON	OM

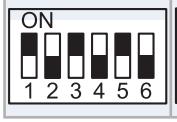
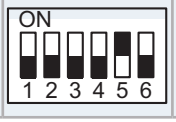
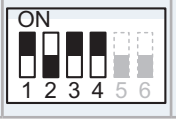
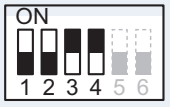
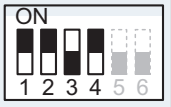
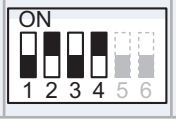
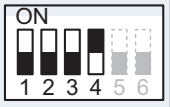
For more information, please refer to the corresponding Installation and Operation Manual.

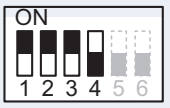
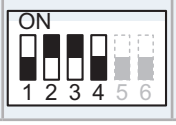
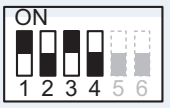
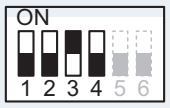
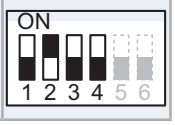
- *When using a wireless remote controller, no additional receivers are required for individual operation.*
- *For simultaneous operation it is required:*
  Option 1: PC-ARFP(1)E remote control (sold separately as an option).
  Option 2: In the case of wireless operation with PC-AWR, PC-ALHZ1 receiver kit is necessary (both sold separately as an option (Required).
  In both options change SW2 to wired setting.

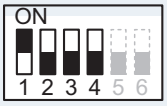
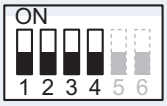
◆ DSW3: capacity code setting

No settings are required. This DIP switch with 4 or 6 switches (depending on Indoor Units) is used to set the capacity code corresponding to the power of the indoor unit.

Indoor Unit capacity 1.5 HP, 2 HP and 2.5 HP can be set to a lower capacity (1.3 HP, 1.8 HP and 2.3 HP) using the DIP switch.

Power (HP)						
0.4	0.6	0.8	1.0	1.3(*)	1.5	1.8(*)
						

Power (HP)				
2.0	2.3(*)	2.5	3.0	4.0
				

Power (HP)			
5.0	6.0	8.0	10.0
			

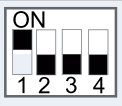
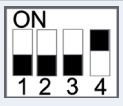
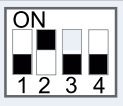
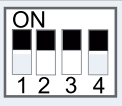
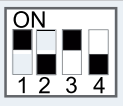
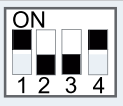
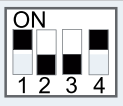
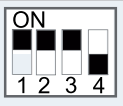
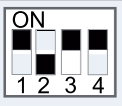
	Power (HP)	
	16.0	20.0
PCB1 (Upper Ebox)		
PCB2 (Lower Ebox)		

NOTE

- *(*) Capacity available with DSW3 setting.*
- *In those model with switch number 5 and 6 (shown in grey color), both switches are not used (except 0.4 and 0.6 HP models).*

◆ DSW4: unit model code setting

No settings are required. This DIP switch is used to set the model code corresponding to the type of indoor unit. Follow the instructions given in the Service Manual.

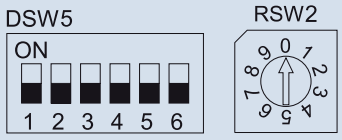
Unit model								
RCI-FSN4	RCIM-FSN4E	RCD-FSN3	RPC-FSN3	RPI-FSN5E	RPI-FSN3E(-f)	RPI-FSN3PE(-f)	RPIM-FSN4E	RPF(I)-FSN2E
								

NOTE

DSW4 Not assembled in the RPK-FSN(H)4M models.

◆ DSW5 and RSW(1/2): refrigerant cycle number setting

It is required to change factory default setting, with a value of up to 63. In the same refrigerant cycle, set the same refrigerant cycle number for the outdoor unit and the indoor unit.

DIP switch and rotary switch (Factory setting)		Indoor unit model
	**DSW5 RSW1** **Refrigerant cycle number setting**	RPI-(0.4-1.5)FSN5E
		RPI-(2.0-3.0)FSN5E
		RPK-(0.4-4.0)FSN(H)4M
	**DSW5 RSW2** **Refrigerant cycle number setting**	RCD-(0.8-6.0)FSN3
		RCI-(1.0-6.0)FSN4
		RCIM-(0.4-2.5)FSN4E
		RPC-(1.5-6.0)FSN3
		RPF(I)-(1.0-2.5)FSN2E
		RPI-(4.0-6.0)FSN5E
		RPI-(8.0-10.0)FSN3E (-f)
		RPI-(16.0/20.0)FSN3PE(-f)
		RPIM-(0.6-1.5)FSN4E(-DU)

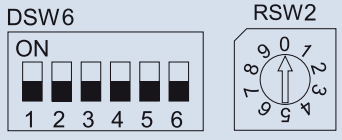
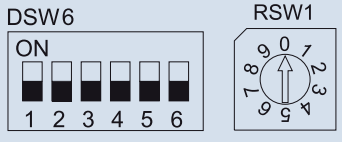
NOTE

RPI-(16.0/20.0)FSN3PE(-f): Set both modules to same cycle number.

◆ DSW6 and RSW(1/2): Unit number setting

It is strongly recommended to change factory default setting, with any value from 0 up to 63. The address number must be unique for each unit (in the same refrigerant cycle).

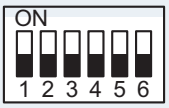
- All indoor units except RPI-(16.0/20.0)FSN3PE(-f):

DIP switch and rotary switch (Factory setting)		Indoor unit model
	**DSW6 RSW2** **Unit number setting**	RPI-(0.4-1.5)FSN5E
		RPI-(2.0-3.0)FSN5E
		RPK-(0.4-4.0)FSN(H)4M
	**DSW6 RSW1** **Unit number setting**	RCD-(0.8-6.0)FSN3
		RCI-(1.0-6.0)FSN4
		RCIM-(0.4-2.5)FSN4E
		RPC-(1.5-6.0)FSN3
		RPF(I)-(1.0-2.5)FSN2E
		RPI-(4.0-6.0)FSN5E
		RPI-(8.0-10.0)FSN3E (-f)
		RPI-(16.0/20.0)FSN3PE(-f)
		RPIM-(0.6-1.5)FSN4E(-DU)

NOTE

It is recommended to assign a number from "1"

- RPI-(16.0/20.0)FSN3PE(-f) only:
  No setting is required.

DSW6	RSW1	
	PCB1 (Upper E-box)	PCB2 (Lower E-box)
		

NOTE

- *When further connecting indoor units, make sure to set a number other than one or two for each indoor unit.*

◆ DSW7: fuse recovery

No settings are required.

	All models
Factory setting	
In case of applying high voltage to the terminal 1-2 of TB (Transmitting wires), the fuse on the PCB is cut. In such a case, firstly correct the wiring to TB and then turn ON switch 1 (as showing in the figure).	

NOTE

DSW7 Not assembled in the RPC-FSN3 models.

◆ DSW8

No settings are required.

	Only: RCD-FSN3, RPI(0.4-1.5)FSN5E, RPIM(0.8–1.5)FSN4E, RPI-(8.0/10.0)FSN3E(-f), RPI-(16.0/20.0)FSN3PE(-f)
Factory setting	

◆ DSW9

	Only for RPI-(2.0-6.0)FSN5E	Only for RCI-FSN4, RPK-FSN(H)4M [2]	Only for RCIM-FSN4E RPI(M)-(0.6–1.5)FSN4E
Factory setting	 (No settings are required)	 (No settings are required)	
Special 0.6 HP capacity setting [1]	Not used	Not used	

NOTE

- *[1] Only available for RCIM-0.8FSN4E and RPIM-0.8FSN4E units. 0.8 HP Indoor Units set to a lower capacity (0.6 HP) can only be used in combination with SET FREE MINI series 3 (RAS-(4-6)FS(V)N(Y)3E).*
- *[2] In order to identify one indoor unit (RPK-FSN(H)4M) with its own wireless remote control, set DSW2 pin3, DWS9 pin 1 and the wireless remote control at "a" "b" "c" "d" mode.*

	Indoor unit A	Indoor unit B	Indoor unit C	Indoor unit D
DSW2-3	OFF	ON	OFF	ON
DSW9-1	OFF	OFF	ON	ON

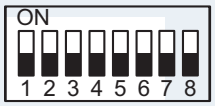
For more information, please refer to the corresponding Installation and Operation Manual.

10.2.3 KPI units

◆ PCB1 settings

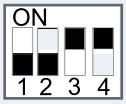
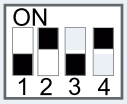
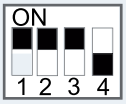
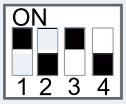
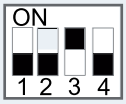
DSW1 and DSW2

No settings are required.

DSW1	DSW2
All units	All units
	

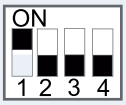
DSW3: capacity code setting

No setting is required, due to setting before shipment. This dip switch is utilized for setting the capacity code.

DSW3					
KPI-252	KPI-502	KPI-802	KPI-1002	KPI-1502	KPI-2002
					

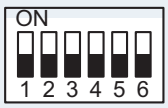
DSW4: unit model code setting

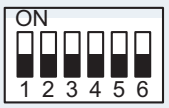
No settings are required. This DIP switch is used to set the model code corresponding to the type of indoor unit. Follow the instructions given in the Service Manual.

DSW4	
KPI (E4E)	Active KPI (X4E)
	

DSW5 and RSW2: refrigerant cycle number setting

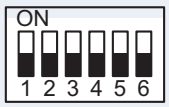
It is required to change factory default setting, with a value of up to 63. In the same refrigerant cycle, set the same refrigerant cycle number for the outdoor unit, indoor unit and KPI unit.

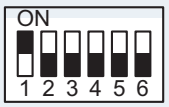
Factory setting	
DSW5	RSW2
	

Example of system setting with a value of: 5	
DSW5	RSW2
	

DSW6 and RSW1: Unit number setting

It is required to change factory default setting, with any value from 0 up to 63. The number allocated to each KPI unit must be set as standard. Follow the instructions given in the Service Manual.

Factory setting	
DSW6	RSW1
	

Example of system setting with a value of: 16	
DSW6	RSW1
	

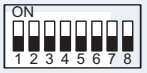
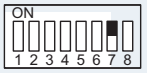
DSW7: fuse recovery

No settings are required.

	All models (Except RPK-(0.8-1.5)FSN(H)4M)
Factory setting	
In case of applying high voltage to the terminal 1-2 of TB (Transmitting wires), the fuse on the PCB is cut. In such a case, firstly correct the wiring to TB and then turn ON switch 1 (as showing beside).	

◆ PCB2 settings

DSW1: Optional functions

Factory setting	
Pin 7: Common operation of remote control switch	

⚠ CAUTION

If there is an indoor unit connected in the same RCS line as DX-Interface EXV-(2.0-10.0)E2 or KPI-(E/H/X)3E, then pin 7 must be ON to disable the power supply to RCS line. If there is no indoor unit connected to the same RCS line but there are more than one DX-Interface EXV-(2.0-10.0)E2 or KPI-(E/H/X)3E, then only one DX-Interface EXV-(2.0-10.0)E2 or KPI-(E/H/X)3E should have pin 7 OFF while all other units must have pin 7 set to ON. Failure to perform this setting correctly will result in bad communication and can even cause physical damage to the PCB.

DSW2: End resistance

In case that only KPI units are connected in the same HLINK (no outdoor unit connected in the same HLINK) set pin1 ON. Other case, no setting is required for DSW2.

All units


10.2.4 Econofresh Kit

Dip Switch setting shall be performed at RPI PCB's.

⚠ CAUTION

Turn OFF all power sources before setting the dip switches. Without turning OFF, the contents of setting would be invalid

		RPI Dip Switch Factory Setting	RPI+Econofresh Kit installation Dip Switch Setting
RPI-(4.0/5.0/6.0)FSN5E	DSW4		

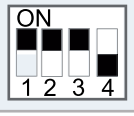
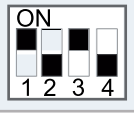
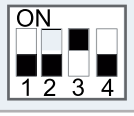
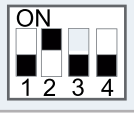
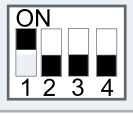
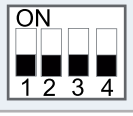
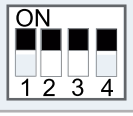
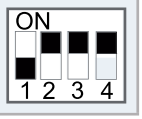
Mark of "■" indicates the position of dip switches.

10.2.5 DX-Interface settings

◆ PCB1 settings

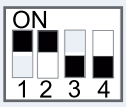
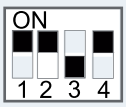
DSW3: capacity code setting

No settings are required. This DIP switch is used to set the capacity code corresponding to the DX-Interface power (HP).

HP	2.0	2.5	3.0	4.0	5.0	6.0	8.0	10.0
Factory setting								

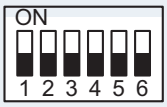
DSW4: unit model code setting and optional setting

No settings are required.

Factory setting	
Enabled EC fan motor alarm by tachometer input (Set pin 4 to ON position)	

DSW5 and RSW2: refrigerant cycle number setting

It is required to change factory default setting, with a value of up to 63. In the same refrigerant cycle, set the same refrigerant cycle number for the outdoor unit and DX-Interface.

Factory setting	
DSW5	RSW2
	

DSW6 and RSW1: Unit number setting

It is required to change factory default setting, with any value from 0 up to 63. The number allocated to each KPI unit must be set as standard. The setting must be done so that it does not overlap the setting of other indoor units in the same refrigerant cycle. If the setting is not done manually, the automatic address function is enabled instead.

Factory setting	
DSW6	RSW1
	

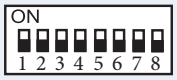
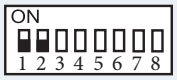
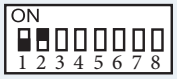
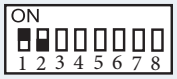
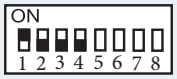
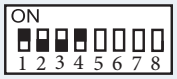
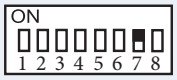
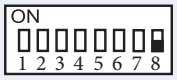
DSW7: fuse recovery

No settings are required.

Factory setting	
In case of applying high voltage to the control terminal 1-2 of TB2 (Transmitting wires)(position 17–18), the fuse on the PCB is cut. In such a case, firstly correct the wiring to TB and then turn ON switch 1.	

◆ PCB2 settings

DSW1: Optional functions

Factory setting		
Pins 1 and 2: Capacity control setting	**Discharge air control (Control by outlet temperature)**	
	Indoor air control (Control by inlet temperature)	
	External duty control (*1)	
Pins 3 and 4: Duty signal setting (*1)	**4~20 mA (Internal 100Ω load impedance)**	
	0~10 V (Internal 47kΩ pull-down resistor)	
	0~5 V (Internal 47kΩ pull-down resistor)	
Pin 5: Duty mode selection (*2)		
Pin 6: Thermo ON/OFF external input enabled (*3)		
Pin 7: Group controller (*4)		
Pin 8: Not used		

NOTE

- *(*1): If external duty control is selected (pins 1-2), then check the proper selection for the duty signal (pins 3-4).*
- *(*2): If external duty control is selected (pins 1-2-3-4), then turn pin 5 OFF for absolute reference or ON for incremental reference*
- *(*3): The thermo ON/OFF control can be driven externally by an input signal connected to the CN3 socket of the PCB1. The pin 6 of DSW1 in PCB2 must be switched on, and then the "i1" input of CN3 is automatically set for thermo ON/OFF control. The setting of "i2" input is kept as set on the remote controller.*
- *(*4) Pin 7: ON: group controller OFF: individual controller*
- *Please refer to the Service Manual of HITACHI Indoor Units for further information about the setting and connection of the auxiliary inputs.*

DSW2: End resistance

No setting is required.

All units


10.3 Setting of remote control switch for RPI-(16.0/20.0)FSN3PE(-f)

This unit is factory set with the Optional function: Output 2 = 02 “Alarm Signal” activated.

Indication	Output signal	Application	Port
02	Alarm signal	When an alarm occurs in one of the modules, the alarm signal generated in that module becomes the stop signal for the other one.	CN7

⚠ CAUTION

Make sure that this configuration is set after installing / wiring the indoor unit. If not, set this Optional Function as indicated above.

10.4 Outdoor and indoor units wiring

⚠ CAUTION

- *An incorrect connection of the power line or the service line cables may lead to breakdown of the printed circuit board (PCB).*
- *Wiring shall not touch gas refrigerant pipes, metal edges, printed circuit boards or electrical parts inside the unit, at it could be damaged, leading to failure and even the occurrence of fire.*
- *Wiring shall be protected from rodents and insects, as they could bite unprotected parts leading to failure and even the occurrence of fire.*
- *Wiring inside indoor units shall be secured firmly using plastic ties.*
- *All the installed equipment and wiring must be in line with the applicable local regulations, codes and standards and with international codes.*

◆ General instructions to bear in mind when connecting the shared wiring between the outdoor and indoor units

6 Units are installed together in groups belonging to the same cooling cycle. Refrigerant pipes and control wiring are also connected in groups to the units belonging to the same cooling cycle.

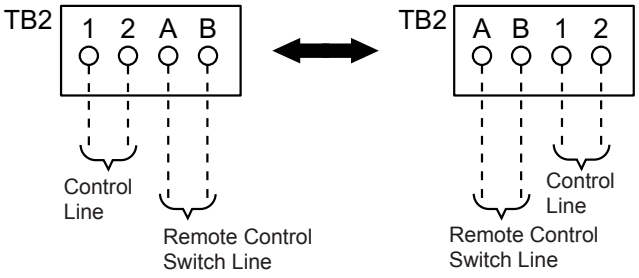
7 A 2-core shielded twisted pair cable or shielded pair cable with a cross-section of over 0.75 mm2 (equivalent to KPEV-S) shall be used for communications between the outdoor and the indoor unit and between the indoor units; in case that the length of control wiring exceeds 300 m, an optional signal amplifier supplied by HITACHI (sold separately) shall be attached.

8 All the electric components supplied on site (main power switches, circuit breakers, wiring, connectors and connection terminals) must have been selected correctly in line with the electrical data provided in the corresponding chapter of this manual, and must comply with the applicable local regulations, codes and standards, which might be stricter than the suggested specifications in this manual.

9 Connect the wiring of the indoor and outdoor units as shown in the figure. Rubber bushes shall be secured with adhesive when the outdoor unit ducts are not used.

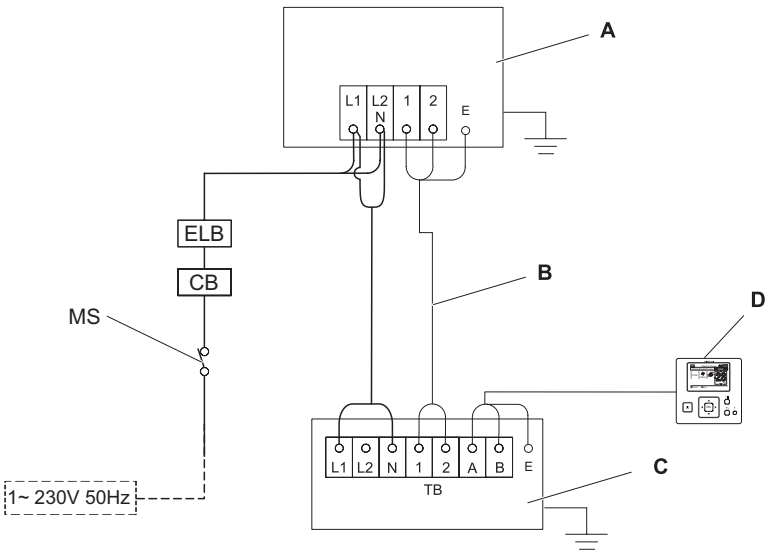
NOTE

- *Depending on the Indoor Unit series the terminal position for Control Line and Remote Control can differ:*



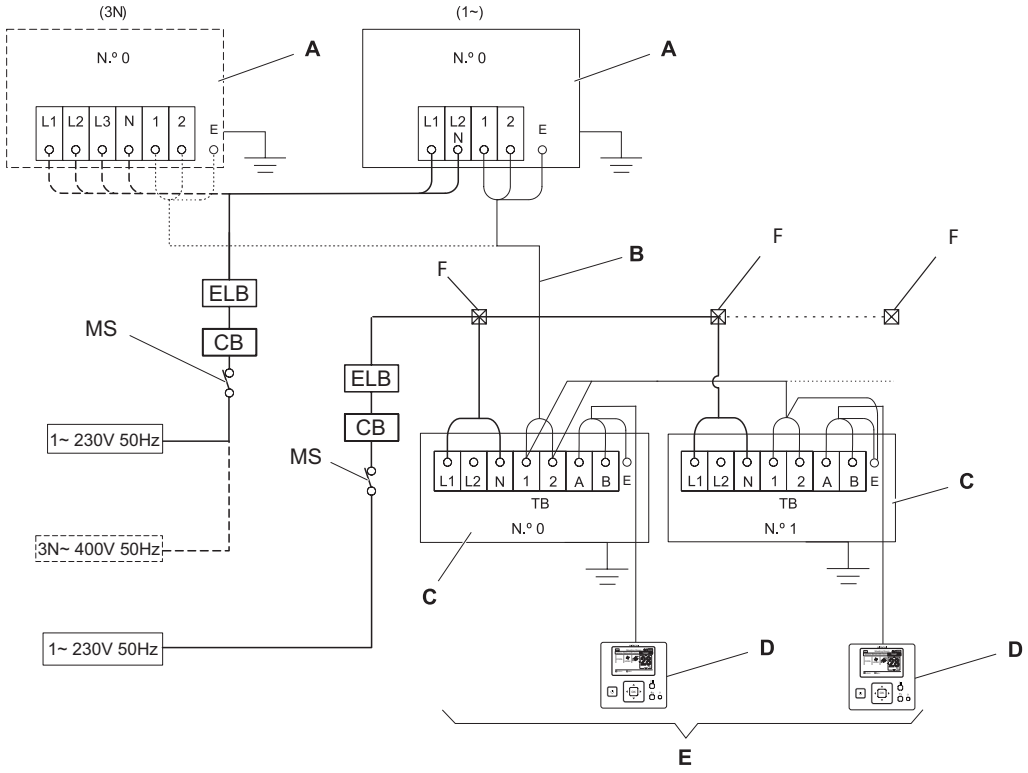
10.4.1 Outdoor and Indoor units layouts for UTOPIA

◆ **Connection diagram of the UTOPIA Series: outdoor unit and single indoor units powered by a shared line**



A	Outdoor unit
B	Transmission wiring H-LINK (shielded twisted pair cable or shielded pair cable), 5 Vdc non-polarity (Field supplied)
C	Indoor units (max 1 indoor unit)
D	Remote control
MS	Main switch (Field supplied, follow the local regulations)
CB	Circuit breaker or/and fuse (Field supplied, follow the local regulations)
ELB	Earth leakage circuit breaker (Field supplied, follow the local regulations)

◆ Connection diagram of the UTOPIA Series: outdoor unit and indoor units powered by independent lines



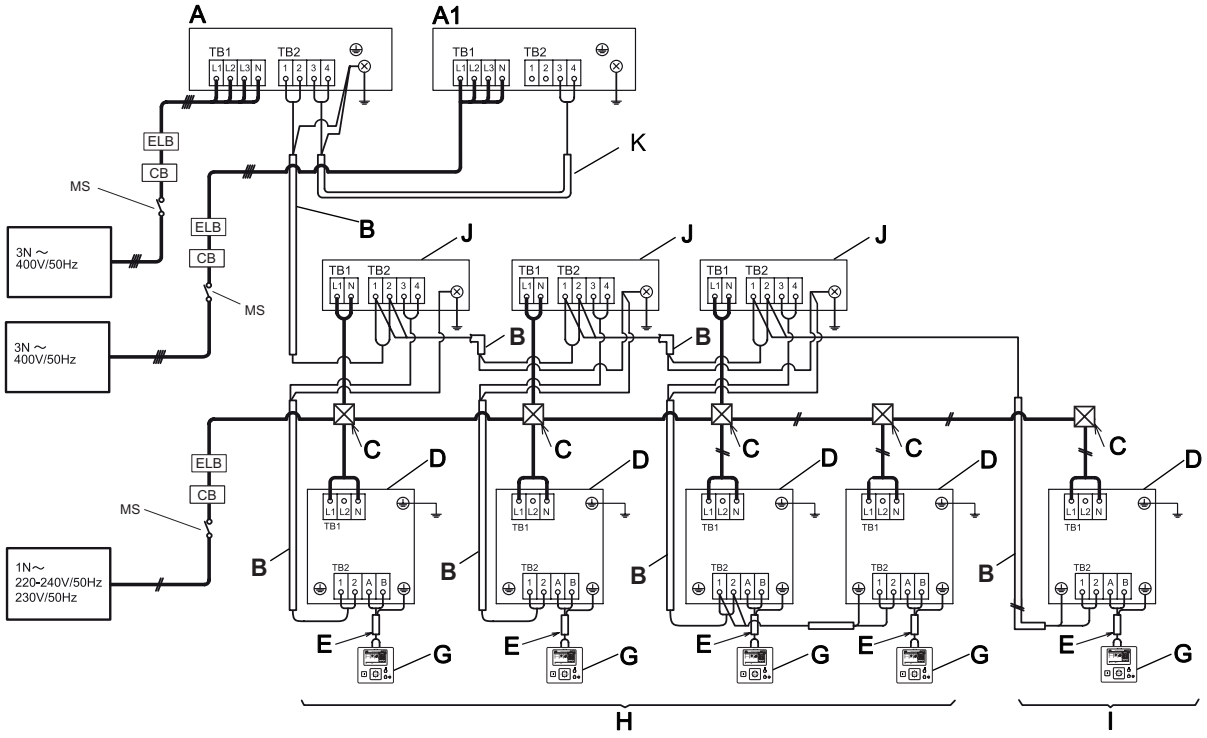
A	Outdoor unit number 0 (3N or 1~)
B	Transmission wiring H-LINK (shielded twisted pair cable or shielded pair cable), 5 Vdc non-polarity (Field supplied)
C	Indoor units
D	Remote control
E	The maximum number of indoor units according to outdoor unit combinability
F	Pull box
MS	Main switch (Field supplied, follow the local regulations)
CB	Circuit breaker or/and fuse (Field supplied, follow the local regulations)
ELB	Earth leakage circuit breaker (Field supplied, follow the local regulations)

NOTE

This connection diagram is an example for individual operation.

10.4.2 Outdoor and Indoor units layouts for SET FREE

◆ Connection diagram of SET FREE Modular FSXN(S/P)E Series: outdoor unit and indoor units powered by independent lines

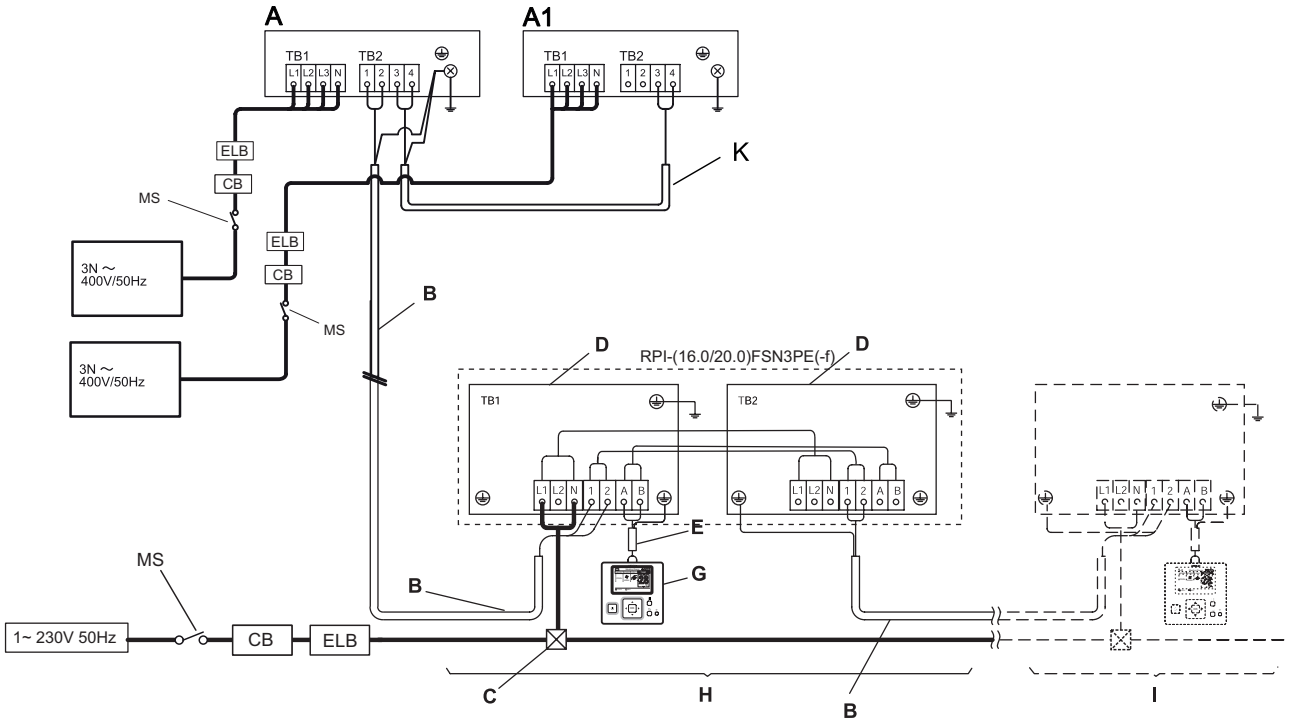


A	Main outdoor unit
A1	Secondary outdoor unit
B	Transmission wiring H-LINK (shielded twisted pair cable or shielded pair cable), 5 Vdc non-polarity (Field supplied)
C	Distribution box (field-supplied)
D	Indoor units
E	Remote controller operation wiring (shielded twisted pair cable or shielded pair cable) (field-supplied)
G	Remote control
H	Indoor unit system Number 0
I	Indoor unit system Number 1
J	CH unit
K	Transmission wire between A and A1
MS	Main switch (Field supplied, follow the local regulations)
CB	Circuit breaker or/and fuse (Field supplied, follow the local regulations)
ELB	Earth leakage circuit breaker (Field supplied, follow the local regulations)

NOTE

This connection diagram is an example for heat recovery system.

10.4.3 Connection diagram of SET FREE and RPI-(16.0/20.0)FSN3PE(-f) Indoor Unit



A	Main SET FREE outdoor unit
A1	Secondary SET FREE outdoor unit
B	Transmission wiring H-LINK (shielded twisted pair cable or shielded pair cable), 5 Vdc non-polarity (Field supplied)
C	Distribution box (Field supplied).
D	Indoor Unit terminal boards (TB1,TB2)
E	Remote controller operation wiring (shielded twisted pair cable or shielded pair cable) (field-supplied)
G	Remote control
H	Indoor unit RPI-(16.0/20.0)FSN3PE(-f)
I	Other Indoor unit system
K	Transmission wire between outdoor units (A and A1 in the example)
MS	Main switch (Field supplied, follow the local regulations)
CB	Circuit breaker or/and fuse (Field supplied, follow the local regulations)
ELB	Earth leakage circuit breaker (Field supplied, follow the local regulations)

10.5 Power circuit sizing

⚠ CAUTION

Check to ensure that the field supplied electrical components (mains power switches, circuit breakers, wires, connectors and wire terminals) have been properly selected according to the electrical data indicated in this chapter and that they comply with the applicable national and local codes. If necessary, contact your local authority in regard to standards, rules, regulations, etc.

10.5.1 Minimum requirements of the wiring size and protection devices

Use wires which are not lighter than the polychloroprene sheathed flexible cord with code designation 60245 IEC 57.

Model	Power supply	Size of the power supply cable EN60 335-1	Size of the transmission cable EN60 335-1	CB (A)	ELB
					Number of poles / A / mA
0.4-6.0 HP Indoor units	1~ 230V 50Hz or 1~ 220-240V 50Hz (depending on the model)	2x0.75 mm^2+GND	2x 0.75 mm^2	5	2 /40 /30
RPI-(8.0/10.0)FSN3E(-f)		2x1.5 mm^2+GND		10	
RPI-16.0FSN3PE(-f)		2x4.0 mm^2+GND		20	
RPI-20.0FSN3PE(-f)				20	

⚠ CAUTION

- *If the installation is already equipped with an Earth Leakage Breaker (ELB), ensure that its rated current is large enough to hold the current of the units.*
- *Indicated wire and CB sizes are for the protection of a the power supply circuit of a single indoor unit. When connecting several indoor units to the same power supply line, select the wire and CB sizes according to the total current (MC Operation) in the power supply line. A CB with a slightly larger size than the calculated value must be selected in order to prevent its activation during normal operation in extreme system conditions (such as voltage drop or high temperatures).*

NOTE

- *CB: Circuit breaker; ELB: Earth leakage breaker*
- *Electric fuses can be used instead of magnetic Circuit Breakers (CB). In that case, select fuses with similar rated values as the CB.*
- *The Earth Leakage Breaker (ELB) mentioned on this document is also commonly known as Residual Current Device (RCD) or Residual Current Circuit Breaker (RCCB).*
- *The Circuit Breakers (CB) are also known as Thermal-Magnetic Circuit Breakers or just Magnetic Circuit Breakers (MCB).*

10.6 DX-Interface electrical wiring

- Connect the electrical wires between the indoor unit and the outdoor unit, as shown in the next diagram.
- Follow the local codes and regulations when performing the electrical wiring.
- Use shielded wires for intermediate wiring to protect the units from noise obstacle at length of less than 300 m and size in compliance with local codes.
- In the event that a conduit tube for field-wiring is not used, fix rubber bushes to the panel with adhesive.
- All the field wiring and equipment must comply with local and international codes.
- When a cable gland is not used, it must be sealed properly in order to ensure the correct control box sealing.

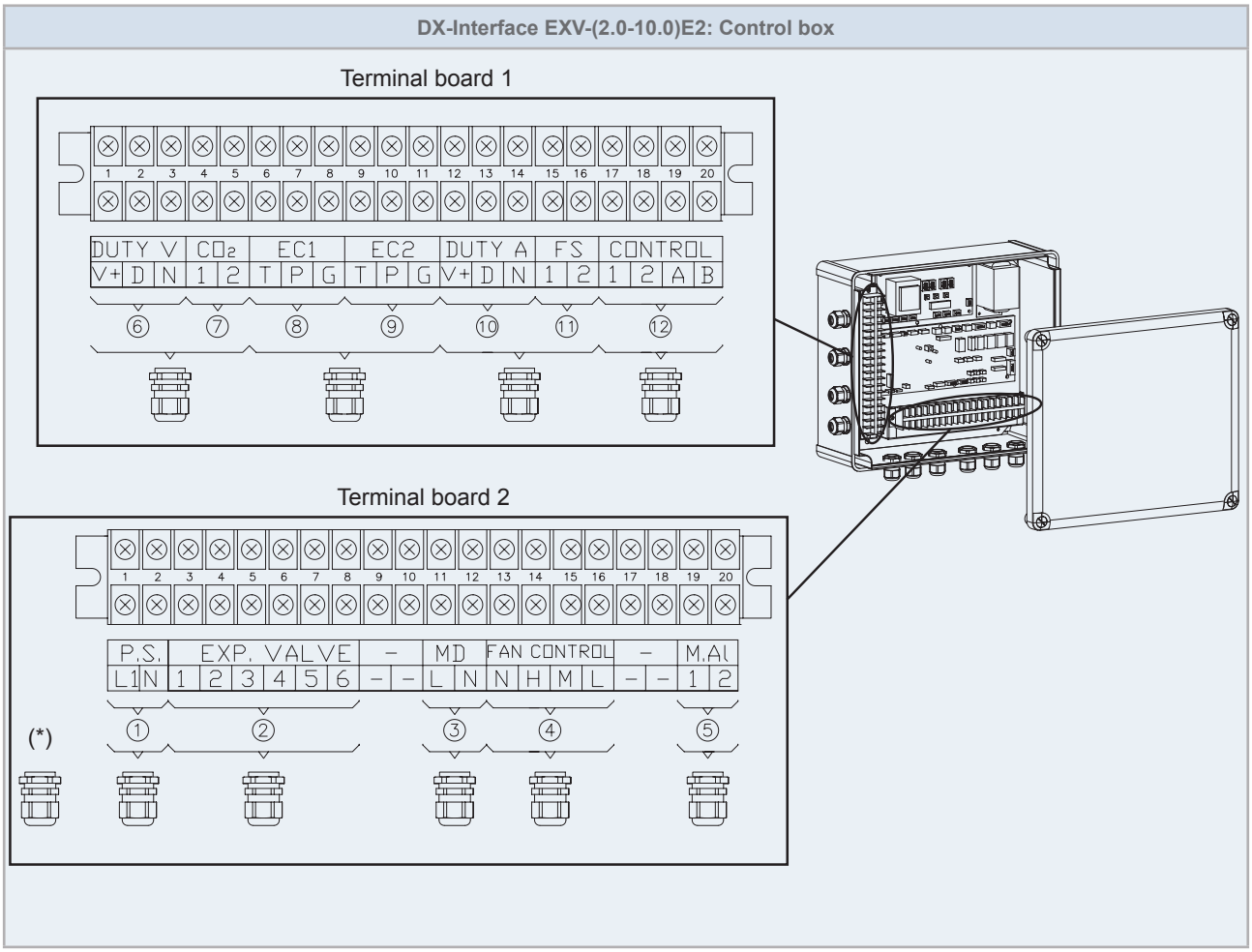
⚠ CAUTION

Pay attention to the connection of the operating line. Incorrect connection may cause PCB failure.

NOTE

Packing gland diameter specification: 6.0 mm (min) to 12.0 mm (max). If needed, install additional tube insulation or wind with insulation tape around the wire to make the wire thicker.

10.6.1 Control box terminal board

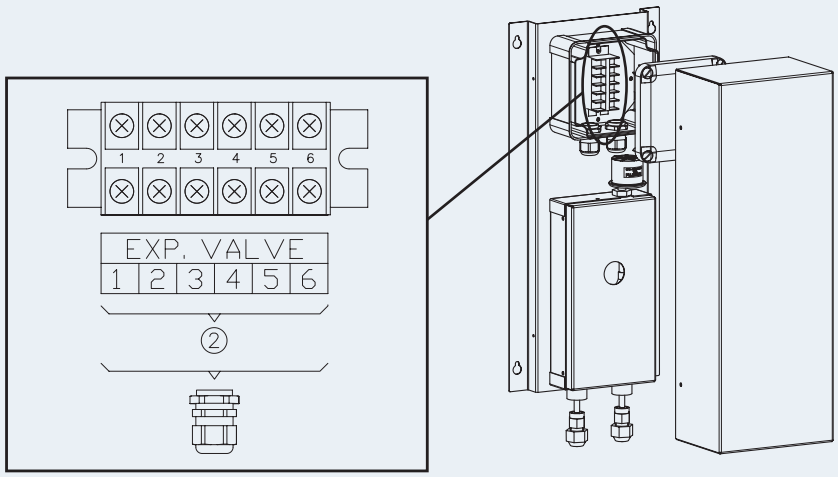


NOTE

(*): Packing gland for thermistor installation.

10.6.2 Expansion valve box terminal board

DX-Interface EXV-(2.0-10.0)E2: Expansion valve box



10.6.3 Terminal board connections and remarks

◆ Control box

Terminal board 1

Mark	Item	Name	Description	Wire and maximum current specification (EN60335-1)
⑥	1	V+	**DUTY V: Duty control by voltage (0~10V) (0~5V) (optional):** V+: Output power to device (+24Vdc)	Wire section: 3x0,5 mm² **NOTE** *Maximum power by 24Vdc output: 3 W*
	2	D	D: Voltage input (0~10V) (0~5V)	
	3	N	N: GND	
⑦	4	1	**CO_2 signal (optional):** Free contact: By closing the signal, the fan speed is set to High mode.	Wire section: 2x0,5 mm²
	5	2		
⑧	6	T	**EC1: PWM Output control for EC FAN 1 (optional):** T: Tach input signal (Hz)	Wire section: 3x0,5 mm²(1)
	7	P	P: PWM output signal (0-100%)	
	8	G	G: GND	
⑨	9	T	**EC2: PWM Output control for EC FAN 2 (optional):** T: Tach input signal (Hz)	Wire section: 3x0,5 mm²(1)
	10	P	P: PWM output signal (0-100%)	
	11	G	G: GND	
⑩	12	V+	**DUTY A: Duty control by current (4~20mA) (optional):** V+: Output power to device (+24Vdc)	Wire section: 3x0,5 mm² **NOTE** *Maximum power by 24Vdc output: 3 W*
	13	D	D: Current input (4~20 mA)	
	14	N	N: GND	
⑪	15	1	**FS: Float switch (optional):** Free contact between terminals 1(15) and 2(16)	Wire section: 2x0,5 mm²
	16	2		
⑫	17	1	**CONTROL: H-LINK and remote controller communication (Necessary):** The H-LINK transmission between outdoor unit and indoor unit is 2 wired to terminals 1-2.	Wire section: 2x0,5mm²
	18	2		
	19	A	The Remote controller must be connected between pins A and B (non polarity)	Wire section: 2x0,5 mm²
	20	B		

NOTE

(1): If fan wiring length is higher than 3 m, use shielded wires in compliance with local codes.

Terminal board 2

Mark	Item	Name	Description	Wire and maximum current specification (EN60335-1)
①	1	L1	**P.S.: Power supply (necessary):** The mains power supply connection (230Vac) is wired to terminals L1 and N.	1~ 230V 50Hz, Max current. 5A Wire section: 3x0,75 mm²
	2	N		
②	3	1	**EXP. VALVE: Expansion valve connection (necessary):** Link to expansion valve assembly. Number links from 1 to 6 must match in e-box terminal board and expansion valve terminal board	Wire section: 6x0,5 mm²
	4	2		
	5	3		
	6	4		
	7	5		
	8	6		
-	9	-	Not used	-
	10	-		
③	11	L	**MD: Motor Drain discharge (optional):** A drain water pump (field supplied) can be connected to DX-kit interface	1~ 230V 50Hz Max current: 1A (output) Wire section: 2x0,75 mm²
	12	N		
④	13	N	**FAN CONTROL: Fan tap speed control by HITACHI remote controller (optional):** N-Neutral phase connection (common)	Maximum current allowed: 3,5A Wire section: 4x0,75 mm²(1)
	14	H	H: High fan speed signal	
	15	M	M: Medium fan speed signal	
	16	L	L: Low fan speed signal	
-	17	-	Not used	-
	18	-		
⑤	19	1	**M. AL: Motor alarm signal:** Alarm input signal can be used for alarm link between the DX-Interface interface and the unit connected. If the jumper between terminal 1 (19) and 2 (20) is open, unit will be switched to alarm condition. Connect again to restart the system	Wire section: 2x0,75 mm²(2)
	20	2		

NOTE

- *(1): Locked rotor amperage (LRA) must be lower than 8 A.*
- *(2): Alarm signal with high power 1~ 230V 50Hz: In case of M. AI, connection is not necessary; the harness jumper provided inside the DX-Interface must be used.*

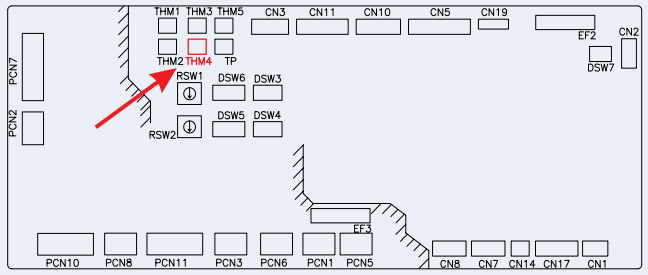
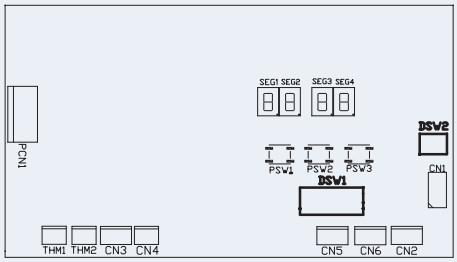
◆ Expansion valve box

Mark	Item	Name	Description	Wire and maximum current specification (EN60335-1)
②	1	1	Control connection (necessary): Link to control assembly. Number links from 1 to 6 must match in expansion valve terminal board and control terminal board 2 in the control box.	Wire section: 6x0,5 mm²
	2	2		
	3	3		
	4	4		
	5	5		
	6	6		

10.6.4 Remote temperature thermistor (THM-R2AE) for DX-Interface

The remote temperature thermistor THM-R2AE (7E299907) is available for the DX-Interface Series 2 (EXV-(2.0-10.0)E2).

When the remote temperature thermistor is connected to the THM4 socket on PCB1 of the DX-Interface series 2, it is automatically recognized and activated by the system control.

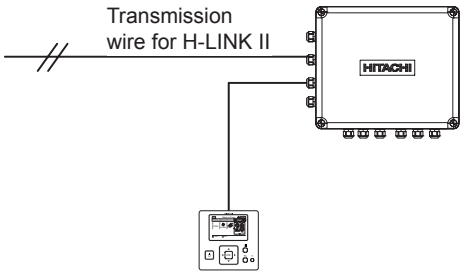
DX-Interface EXV-(2.0-10.0)E2: Control box	
PCB1	PCB2
	

When the remote temperature thermistor is active, the system control can operate in different control temperatures according to the C8 setting in optional remote control functions.

Setting value	Without THM-R2AE thermistor		With THM-R2AE thermistor	
00	Air inlet thermistor	Tin	Remote temperature thermistor	THM-R2AE
01	Air temperature control using the remote control thermistor	RCS	Air temperature control using the remote control thermistor	RCS
02	Air temperature control using the average value of the air inlet thermistor and the remote control thermistor	(Tin+RCS)/2	Air temperature control using the average value of the remote temperature thermistor and the remote control thermistor	(THMR2AE+RCS)/2

10.6.5 Installation of the remote controller (PC-ARFP(1)E)

A dedicated remote controller (PC-ARFP(1)E) must be connected to the DX-Interface series 2. Only this remote control model (PC-ARFP(1)E) can be used and only one remote control can be connected to the DX-Interface series 2.



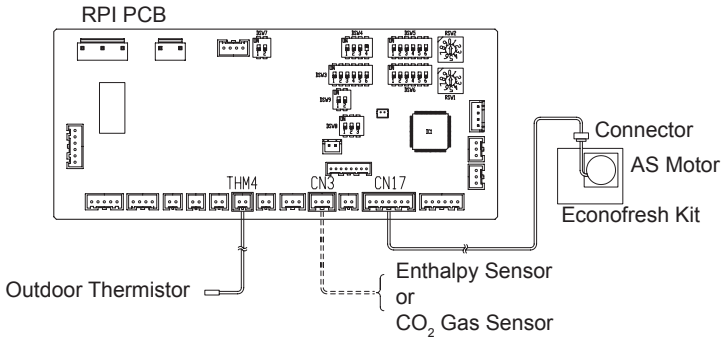
NOTE

Central controllers are only compatible when the system is in control by Inlet temperature.

10.7 Econofresh electrical wiring connection

The electrical wiring connection, on the RPI indoor unit PCB, for a system with Econofresh unit is shown below.

Mount the outdoor thermistor (THM4) at a position near the outdoor air inlet. Pay attention to the position of the thermistor where the direct sunshine is not radiated or rain water is not touched.



DANGER

- ***Turn OFF the main power switch to the unit and wait for more than 3 minutes before electrical wiring work or a periodical check is performed.***
- ***Check to ensure that the indoor unit's fan has stopped before electrical wiring work or a periodical check is performed.***
- ***Protect the wires, electrical parts, etc. from rats or other small animals. If not protected, rats may gnaw at unprotected parts and at the worst, a fire will occur.***

CAUTION

Wrap the accessory packing around the wires, and plug the wiring connection hole with the seal material to protect the products from any condensate water or insects.

10.7.1 Input signal ports

The system has eight optional input signals programmed into the PCB using connector CN3 on the RPI indoor unit and using the remote control. Connector CN3 has two ports for configuring the optional input signals.

When on the PCB of RPI unit, DSW6 is set for connect the Econofresh, CN3 terminals 1 and 2 are locked for "Enthalpy sensor" or "CO_2 sensor".

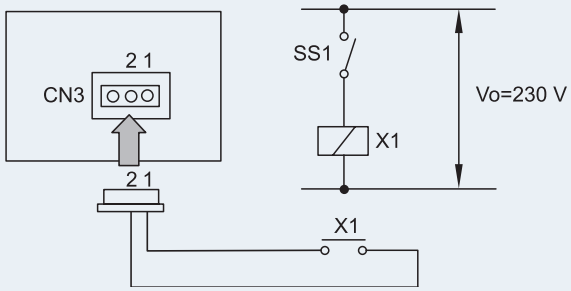
The outdoor cooling function E1, all Fresh Operation, no requires CN3 connector setting.

10.7.2 Optional sensor connection

When installing the field-supplied sensors, select and connect the sensors as follows.

1 The type of the sensor should be of ON/OFF switching type.
2 The switch rating should be DC12V.
3 Connect the wires to #1 and #2 of CN3 on the RPI PCB.
4 Lead the wires through the connecting hole for the control circuit.

Indication		Port setting on the RPI indoor unit PCB	Remarks	Outlet
Inlet	, /	CN3 1-2	1 2 3	Contact (Optional Sensor (DC12V, 1 to 2mA))

Field-supplied connections


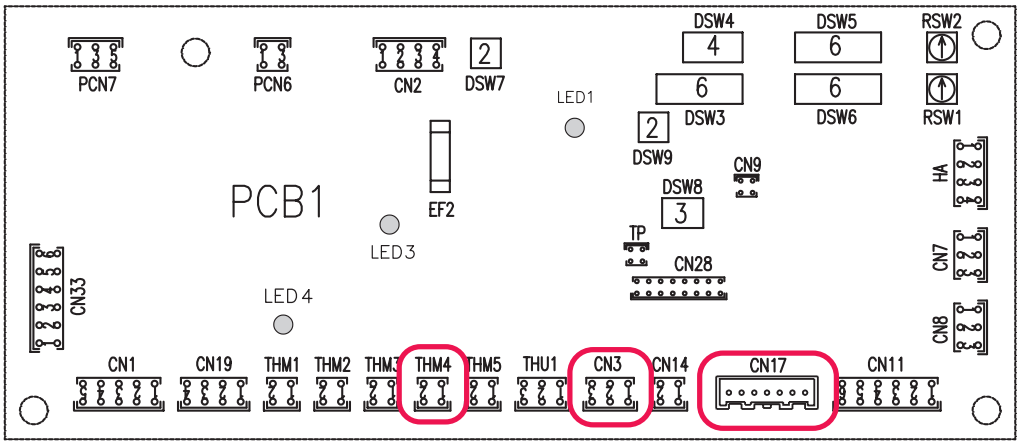
Component		Manufacturer or specifications	Remarks
Auxiliary relay (X1)		Reduced power relay model OMRON: MY1F or equivalent	Voltage between the relay terminals 12 Vdc, 75 mA
Contact (SS1) (x1) (example)		Manual type	Voltage between the contactor terminals 230 V, 5 mA
3-pin connector cable		Optional part PCC-1A (capable of connecting the connector (JST XHP-3)	Five cables with connectors in one group
Cable (control)	Voltage: 12 Vdc	0.5 mm^2	
Cable (power)	Voltage: 230 V	2.0 mm^2	

Connectors CN3 is factory-set with the following optional functions.

	Connector no.	Connector terminal	Factory settings function	Remarks
Inlet	CN3	1–2	03	Function: Remote unit On/Off
		2–3	06	Cancellation of commands from the remote control after a forced stoppage

(*) If the Econofresh is connected, CN3 terminals 1 and 2 are locked for the enthalpy sensor or the CO_2 sensor. Insure that inlet signal is set, for CN3 (pin1-2), at 03 function (remote unit ON/OFF).

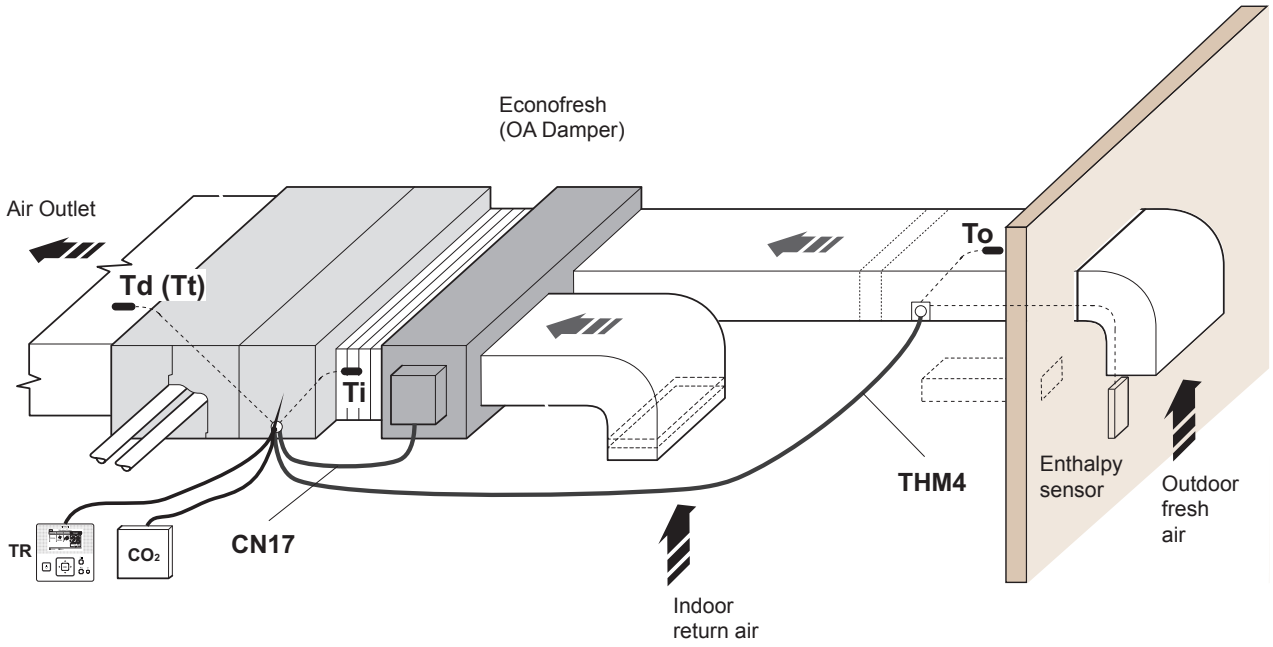
10.7.3 RPI-(4-6.0)FSN5E Printed circuit board details



Connector indication	
THM4	Remote thermistor (Econofresh thermistor)
CN3	Enthalpy Sensor or CO_2 Gas Sensor for Econofresh
CN17	Econofresh connection for AS motor

10.7.4 Sensors position

The figure below shows an example of system configuration



NOTE

- *To: Outdoor fresh air temperature*
- *Ti: Indoor return air temperature*
- *TR: Remote control switch setting temperature*
- *Td: Air outlet temperature*
- *Tt: Target air outlet temperature*
- *CO_2: CO_2 gas sensor*
- *Enthalpy: Enthalpy sensor*
- *OA Damper: Outdoor air damper*

10.8 Motion Sensor control conditions

NOTE

1 The motion sensor detects the human activity. However, if someone is in a room with a bit motion, the motion sensor may detect as absence.

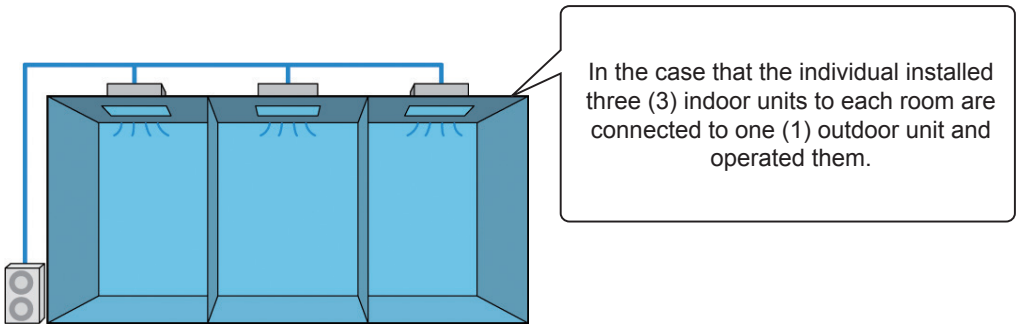
2 The motion sensor may detect as human activity, if the indoor unit with the motion sensor is installed near a moving object which is different temperature against atmosphere.

3 The motion sensor may detect as absence in the case that the indoor unit with the motion sensor is installed to a high ceiling (higher than 4 m) even if someone is in a room.

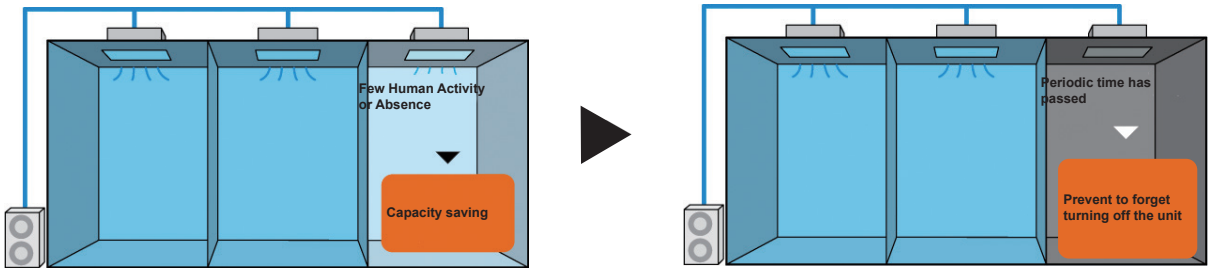
4 The motion sensor may detect as absence and the operation may be stopped in the case of staying for long time with a bit motion.

5 In the case that the indoor units are operated by 2 remote control switches, the motion sensor setting is available only from the main remote control switch.

At normal operation



At motion sensor activated



In a specific room, the air flow volume and the air flow direction are adjusted when the human activity becomes few in the period of time.

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

10.8.1 Motion sensor setting through PC-ARFP(1)E Remote Control switch

The motion sensor setting is easy by the remote control switch. The indication of “Motion sensor is activated” is displayed on the remote control switch LCD during controlling the motion sensor.

1 **Sensor**

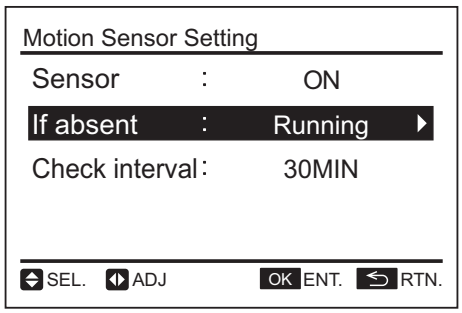
- ON: The operating control function by the motion sensor is activated.
- OFF: The operating control function by the motion sensor is not activated.

2 **If absent**

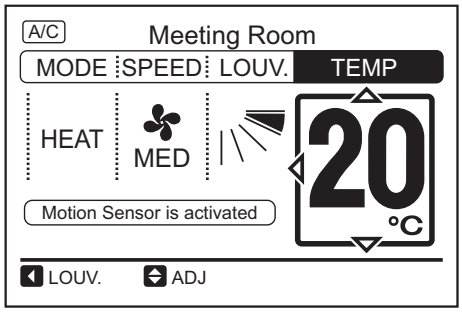
- Stop: The operation is stopped by the remote control switch when all the indoor units with motion sensor detect absence which are connected with same remote control switch.
- Stand-by: The operation mode is the fan operation at “Slo” speed.
- Running: the operation continues with the same heating capacity even if absence is detected. (Default setting)

3 **Check interval**

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



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



NOTE

If the function “Prohibiting operation by remote control switch” is used from the centralized controller, select the command “Running” or “Stand-by” in “If absent” at the motion sensor control setting. If “Stop” is selected, the motion sensor control can not be performed correctly as follows.

- *In the case that “Stop” is selected in the motion sensor control setting and “Prohibiting operation by remote control switch” (for all items) is set by the centralized controller, the operation will not be stopped even if the motion sensor control function changes to the stoppage condition.*
- *In the case that “Stop” is selected in the motion sensor control setting and “Prohibiting operation by remote control switch” (for part of items) is set by the centralized controller, the indoor unit operation can not be restarted from the centralized controller although the operation can be stopped under the stoppage condition by the motion sensor control function.*

◆ **Outdoor unit model compatible with motion sensor**

UTOPIA	IVX Premium / Standard series	
	RASC series	
SET FREE	FSN2 series	from ROM number P3852
	FSXN series	from ROM number P3817
	FSXNH(E) series	
	FSXN1E series	
	FSN3 series	
	FSXNSE series	
	FSXNPE series	

10.8.2 Descriptions of Motion Sensor Control Condition

Motion sensor setting in the remote control is [ON]	→	Standard operation	Counter for judgement of absence →	Motion sensor mode 1	Counter for judgement of absence →	Motion sensor mode 2	Counter for judgement of absence →	Motion sensor mode 3

When detection conditions for absence are no longer given, the mode changes as follows:

Mode 1 ---> Standard operation

Mode 2 ---> Standard operation

Mode 3 ---> Standard operation (if not changed to “stop operation” when “If Absent” is set as STOP)

Condition					Adjustment to Indoor unit values		
					Temperature setting (1) (2)	Fan speed setting (2)	Air flow direction
Standard operation					Setting temperature	Setting fan speed	Setting air flow direction
MODE 1					1ºC adjusting	Setting fan speed -1 (Min: Low)	Horizontal
MODE 2					2ºC adjusting	Setting fan speed -1 (Min: Low)	Horizontal
MODE 3 and MENU “If Absent” on remote control switch	“If Absent” set as: Running				2ºC adjusting	Setting fan speed -1 (Min: Low)	Horizontal
	“If Absent” set as: Standby (3)				Forced Thermo-OFF	Slo	Horizontal
	“If Absent” set as: Stop	Simultaneous operation	All Indoor Units with motion sensor	When not all indoor units are ABSENT	All indoor units: 2ºC adjusting	Setting fan speed -1 (Min: Low)	Horizontal
				When all indoor units are ABSENT (4)	All indoor units stop operation		
			Not All Indoor Units with motion sensor (5)		All indoor units: 2ºC adjusting	Setting fan speed -1 (Min: Low)	Horizontal
		Individual operation (each unit has its own PC-ARFP(1)E remote control)			Each indoor “Forces Thermo-OFF” according to their individual detection status. All indoor units stop operation when all the indoor units are in Thermo-OFF		
		Individual operation (1 remote control controlling several indoor units thought a RC transmission wiring connection between units)	When not all Indoor units are ABSENT	Those indoor units are ABSENT	Forced Thermo-OFF	Slo	Horizontal
				Those indoor units are no ABSENT	2ºC adjusting	Setting air flow volume-1 (Min: Low)	Horizontal
			When all indoor units are ABSENT (6)		All indoor units stop operation		

NOTE

- *(1) The correction value of indoor unit setting temperature is not applied to room temperature control (It is transmitted to the outdoor unit and applied for capacity control only). The adjustment of temperature consists in the addition of 1 or 2ºC in cooling operation mode and the subtraction of 1 or 2ºC in heating operation mode.*
- *(2) When automatic cooling/heating is selected, the actual operation mode follows the table above. Therefore, the correction value of indoor unit setting temperature is also applied in automatic cooling/heating.*
- *(3) Standby mode is skipped in simultaneous operation and kept in Mode 2 because units perform batch operation. This means that if one IU with motion sensor entered in mode 3 (Standby), then the other units with motion sensor would be set to this mode regardless of their operation status. This would not be acceptable when persons are present in the room.*
- *(4) When all IU with motion sensor connected to the relevant remote control do not detect any presence and enter in motion sensor Mode 3 (if absent->Stop), all units stop operating after a time [Check interval] has passed from the last detection by any of the units. After operation stops in this manner, it will not restart until ON is set in the PC-ARFP(1)E remote control, even if presence is detected. Check interval: The units stop after a time has passed from the last motion detection by any of the units. This time can be set in PC-ARFP(1)E by [Check interval setting] as: 30, 60, 90, 120 and 180 min.*
- *(5) In case that one or more units without motion sensor are in simultaneous operation, the units will keep operating regardless of their operation status. Both Standby and Stop modes are skipped in this situation.*
- *(6) When all IU with motion sensor connected to the relevant remote control do not detect any presence and enter in motion sensor Mode 3 (if absent->Stop), all units stop operating after a time [Check interval] has passed from the last detection of any of the units. After operation stops in this manner, it will not restart until ON is set in the PC-ARFP(1)E remote control, even if presence is detected. In Individual operation, if IU with and without motion sensor are mixed together, the IU without motion sensor also stop when the IU with motion sensor are stopped.*
- *The PC-ARFP(1)E remote control switch forces the stop of operation when all the indoor units with motion sensor switch to "MODE 3". Once the operation is stopped by the remote control switch, it will not restart even if presence is detected. Indoor units with and without motion sensor can be mixed together.*
- *The Indoor units in "stop operation" remain in that status until ON is set in PC-ARFP(1)E remote controller.*

10.8.3 Detecting Area for Human Activity

RCI-FSN4

- Detecting Angle: Approx 123°

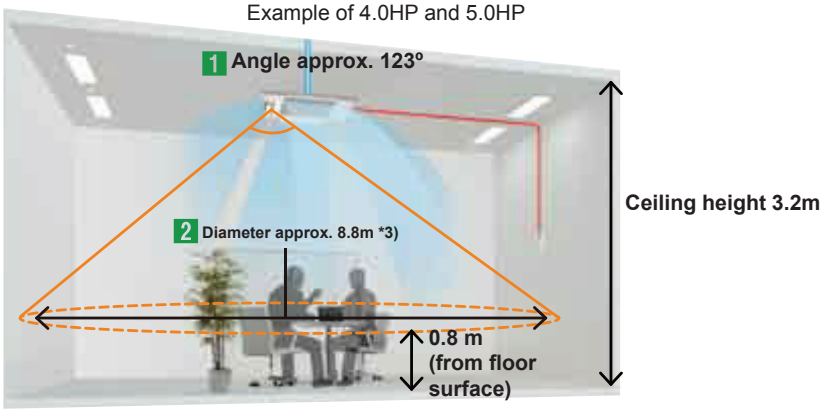
RCI-(1.0-3.0)FSN4	RCI-(4.0-6.0)FSN4
Detecting diameter: approx. 7 m (3) (0.8m…height from floor surface)	Detecting diameter: approx. 8.8 m (3) (0.8m…height from floor surface)

NOTE

(3): The detecting area becomes smaller if the human motion is few such as stretching on a chair etc. The detecting diameter will be changed to approximately 6.0 m.

Detecting area

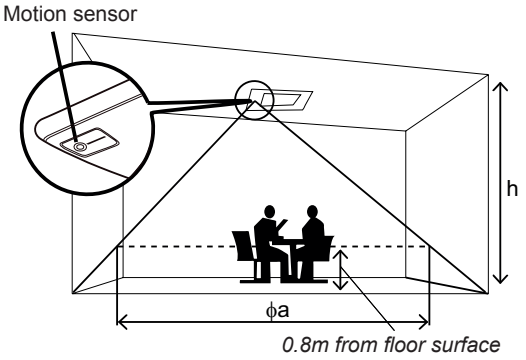
Example of 4.0HP and 5.0HP



In the case of the ceiling height is 3.2m

RCIM-FSN4E

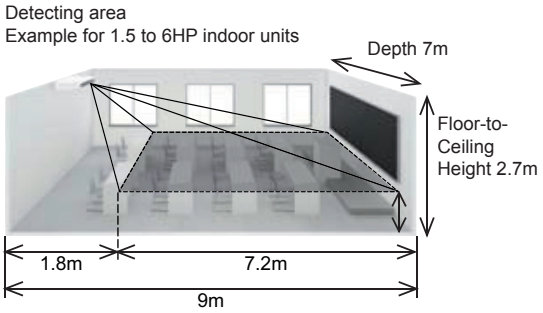
The sensing area for the motion sensor is shown in the figure below when applying the motion sensor with the air panel:



Installation height of indoor unit: h (m)	2.7	3.2
Sensing area for motion sensor: Ø a (m)	Approx. 5.0	Approx. 7.0

RPC-FSN3

Detecting Diameter: Approx. 7.0m x 7.2m (0.8m…height from floor surface) The motion sensor may not detect the human activity at the space just under the indoor unit (1.8m x 7.0m).



10.8.4 Restrictions on the Connection of Motion Sensor and Indoor Units

1 Connection of Indoor Unit Supporting Motion Sensor

There are some restrictions on the use of the motion sensor depending on the connection of indoor units as shown in the table below.

○: Connectable ×: Not Connectable △: Connectable (with Restriction)

Outdoor unit series	Connection of indoor unit		Motion sensor	Remarks
DC Inverter UTOPIA	Single		○	Transmission wire is required even when the indoor unit is in simultaneous operation.
	Multiple operation (Individual Operation)		○	
	Multiple operation (Simultaneous Operation)	with transmission Wire	△ *1)~*3)	
		without transmission Wire	×	
SET-FREE	Individual Operation		○	

**1): A motion sensor is required for each indoor unit.*
**2): "Stand-by" cannot be set when in "If Absent" setting.*
**3): An Indoor unit with a motion sensor cannot be used together with an indoor unit without a motion sensor.*

2 Combination of Indoor Unit and Outdoor Unit Supporting Motion Sensor

The motion sensor can be used only when the following indoor and outdoor units are used together.

INDOOR UNITS	RCI-FSN4 Using Motion Sensor Kit (PS-MSK2) (sold separately as an option)	Using wire remote control PC-ARFP(1)E (Required, sold separately as an option)
	RCIM-FSN4E Using Motion Sensor Kit (SOR-NEC) (sold separately as an option)	
	RPC-FSN3 Using Motion Sensor Kit (SOR-NEP) (sold separately as an option)	
	RPI-(0.4-3.0)FSN5E Using Motion Sensor Kit (SOR-MSK) (sold separately as an option)	
UTOPIA	IVX Premium / Standard series	From first production
SET FREE	FSN2 series	from ROM number P3852
	FSXN series	from ROM number P3817
	FSXNH(E) series	from ROM number P3880
	FSXN1E and FSN3E series	from ROM number P3880
	FSXNSE	From first production
	FSNXPE	From first production

10.8.5 Restrictions on the Connection of Motion Sensor and Remote Control Switch

1 Connection of Remote Control Switch Supporting Motion Sensor

There are some restrictions on the use of the motion sensor depending on the connection of remote control switch as shown in the table below.

○: Connectable △: Connectable (with Restriction)

Connected Remote Control Switch	Motion Sensor
PC-ARFP(1)E x 1	○
PC-ARFP(1)E x 2	△ *2)
PC-ARFP(1)E x 1 and Receiver Kit x 1 *1)	△ *3)

**1): The motion sensor cannot be used without PC-ARFP(1)E.*

**2): Setting and operation is possible only from the main remote control switch.*

**3): Set PC-ARFP(1)E as a main remote control switch and the receiver kit as a sub remote control switch. Setting and operation is possible only from PC- ARFP(1)E.*

2 Connecting Multiple Indoor Units to One Remote Control Switch

When connecting multiple indoor units to one remote control switch, there are some restrictions on the use of the motion sensor as shown below.

○: Connectable ×: Not Connectable △: Connectable (with Restriction)

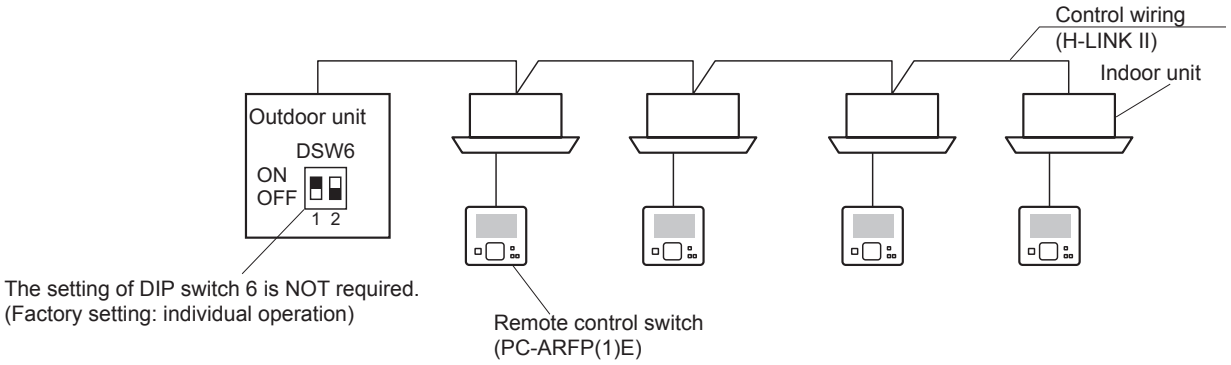
Connected Indoor Units	Outdoor Unit Operation	Motion Sensor
Indoor Unit with Motion Sensor *1)	DC Inverter UTOPIA (Individual Operation), SET-FREE (Multiple Operation)	△ *2)
	DC Inverter UTOPIA (Simultaneous Operation)	△ *2)
Combination of Indoor Unit with Motion Sensor and Indoor Unit without Motion Sensor *1)	DC Inverter UTOPIA (Individual Operation), SET-FREE (Multiple Operation)	△ *3)
	DC Inverter UTOPIA (Simultaneous Operation)	×

**1): Indoor Units with Motion Sensor: RCI-(1.0-6.0)FSN4 (with Motion Sensor Kit* PS-MSK2*), RCIM-FSN4E (with Motion Sensor Kit SOR-NEC) and RPC-(1.5-6.0)FSN3 (with Motion Sensor Kit SOR-NEP) and RCD-(0.8-6.0)FSN3 (with Motion Sensor Kit SOR-NED).*
**2): If "If Absent" setting is set to "Stop," the operation will stop only when motion sensors of all the connected indoor units detect absence.*
**3): If "If Absent" setting is set to "Stop," the indoor unit without a motion sensor will stop when the indoor unit with a motion sensor stops. To allow continued operation of the indoor unit without a motion sensor, connect a remote control switch to each indoor unit.*

10.9 System Control

10.9.1 Individual Operation

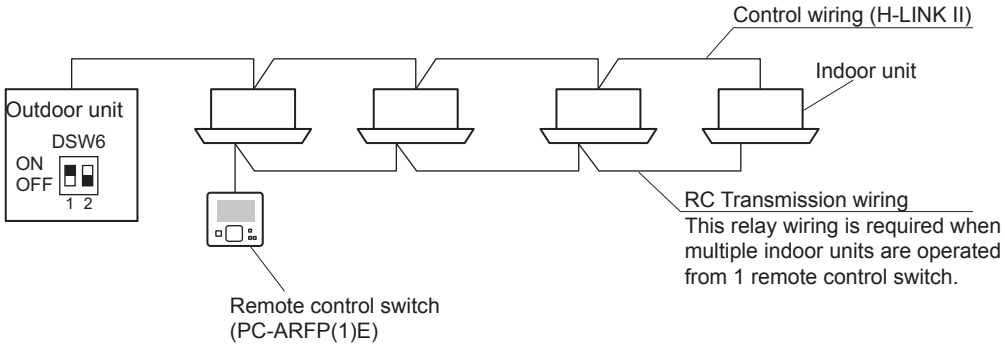
Example of installation with a wired controller for each indoor unit in individual operation settings.



◆ Individual thermo ON/OFF operation

Single Wired Controller for an Individual Operation Setting

Example of installation with a single wired controller for multiple indoor units in individual thermo ON/OFF operation settings.



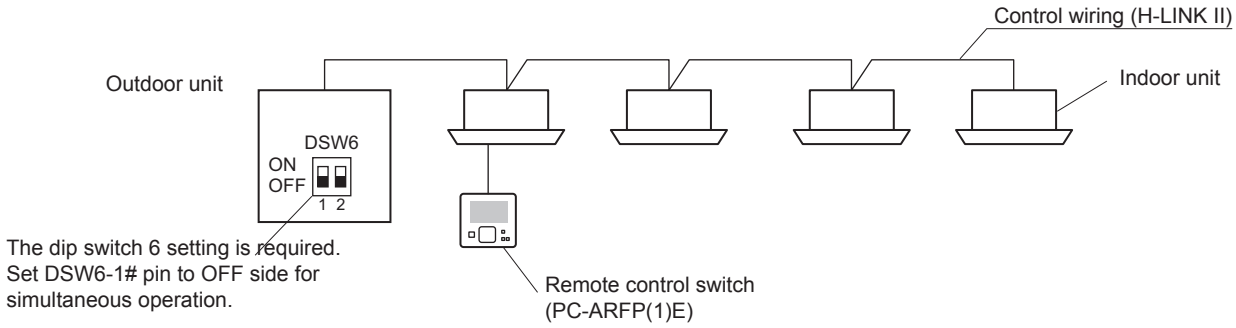
Control Method		by each remote control switch
Operation Method		by one group
ON/OFF	Available	
Setting of Operation Mode	Available	Cooling and heating can not be operated simultaneously.
Room Temperature Setting	Available	
Fan Speed Setting	Available	
Timer Setting	Available	
ON/OFF by Timer Control	Available	
Operation Indication	Available	
Alarm Indication	Available	
Self-Checking	Available	
Test Mode	Available	
Individual Louver Setting	Available	Only for RCI-FSN4 and RCIM-FSN4E series with PC-ARFP(1)E
Motion Sensor Setting	Available	Only for: RCI-FSN4 + PS-MSK2 + PC-ARFP(1)E RCIM-FSN4E + SOR-NEC + PC-ARFP(1)E RPC-FSN3 + SOR-NEP + PC-ARFP(1)E RCD-FSN3 + SOR-NED + PC-ARFP(1)E RPI-(0.4-3.0)FSN5E + SOR-MSK + PC-ARFP(1)E

10.9.2 Simultaneous Operation

No need for remote control relay wiring in UTOPIA IVX systems in simultaneous operation

In the case of systems comprising several indoor units (up to 4 indoor units of FSN2 series or later model types), the indoor units set to simultaneous operation can be controlled from a single remote controller, without the need to link them up with dedicated remote control relay wiring.

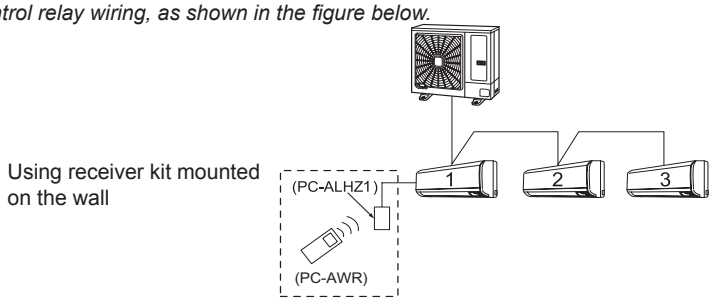
The indoor units must be H-LINK II compatible models



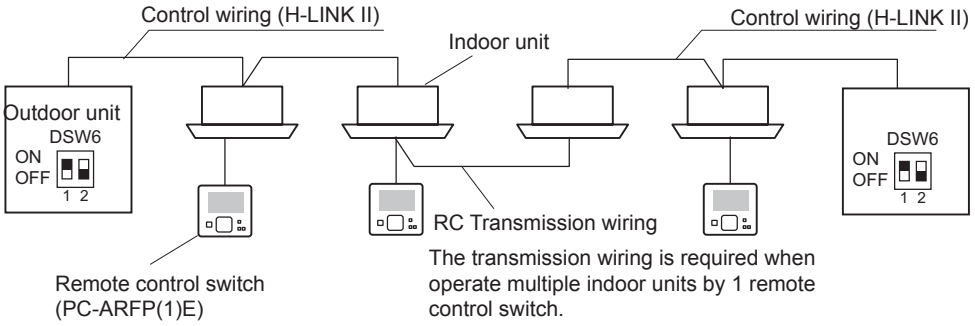
Control Method	by one optional Remote Control Switch	
Operation Method	by one group	
ON/OFF	Available	
Setting of Operation Mode	Available	Cooling and heating can not be operated simultaneously
Room Temperature Setting	Available	
Fan Speed Setting	Available	
Timer Setting	Available	
ON/OFF by Timer Control	Available	
Operation Indication	Available	
Alarm Indication	Available	
Self-Checking	Available	
Test Mode	Available	
Individual Louver Setting	Available	Only for RCI-FSN4 series with PC-ARFP(1)E
Motion Sensor Setting	Available	Only for: RCI-FSN4 + PS-MSK2 + PC-ARFP(1)E RCIM-FSN4E + SOR-NEC + PC-ARFP(1)E RPC-FSN3 + SOR-NEP + PC-ARFP(1)E RCD-FSN3 + SOR-NED + PC-ARFP(1)E RPI-(0.4-3.0)FSN5E + SOR-MSK + PC-ARFP(1)E

NOTE

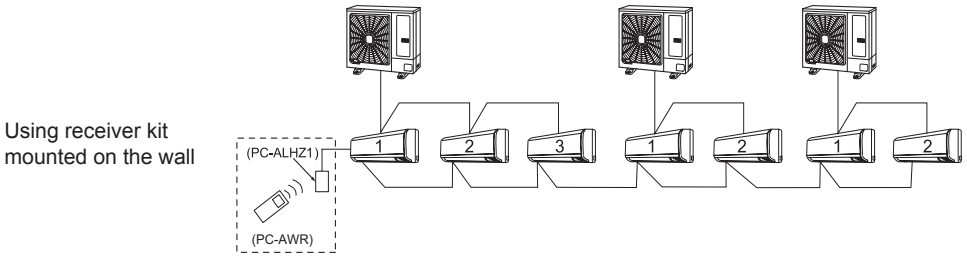
- *UTOPIA IVX systems comprising several indoor units (up to 4 indoor units) in simultaneous operation setting can be controlled from a single wireless remote control (PC-AWR) using a wall-mounted receiver kit (PC-ALHZ1), without the need to link up the indoor units with dedicated remote control relay wiring, as shown in the figure below.*



10.9.3 Different Refrigerant Cycles control

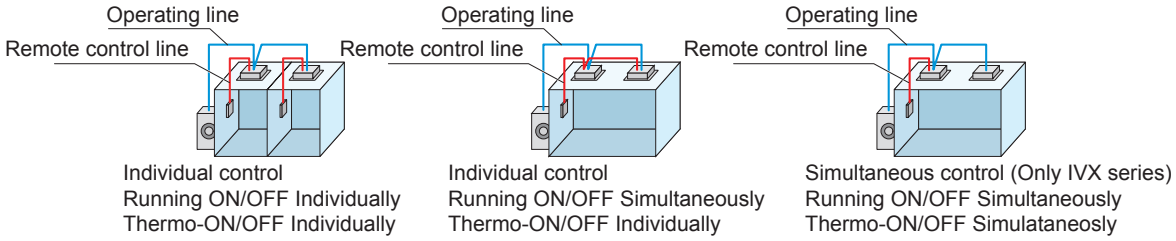


- *Different system groups can also be controlled from a single wireless remote control (PC-AWR) using a wall-mounted receiver kit (PC-ALHZ1). In such case, all the indoor units must be linked up with dedicated remote control relay wiring, and operation settings must be changed to individual operation (Not available in the UTOPIA ES series).*

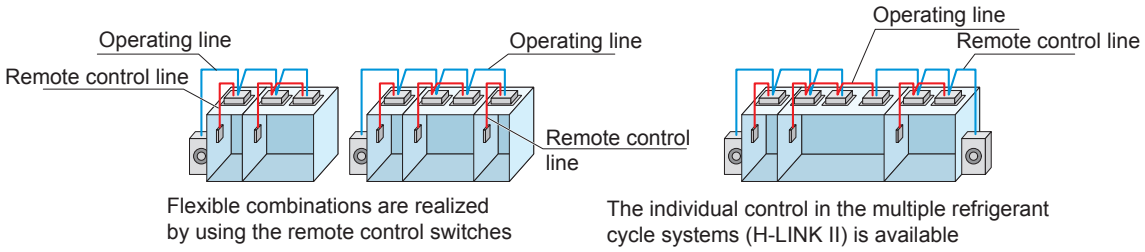


10.9.4 Wiring Examples

Basic combinations (example in the case of twin combination)



Flexible combinations for individual operation (Combination example by using individual operation function)



11. Optional functions

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11.1 Main optional functions on indoor units

The following table provides information on the optional functions available on indoor units. Consult the Service Manual for further information.

Optional function	Explanation	RCI(M)	RCD	RPC	RPI(M)	RPK	RPF(I)	Econofresh kit
Remote on/off	This function controls the remote starting and stopping of the system. This optional function is extremely practical in hotels and office buildings to control the indoor units from the building management system.	●	●	●	●	●	●	●
Cancellation of commands from the remote control after a forced stoppage	This function stops the indoor unit and cancels the commands from the remote control while it is enabled.	●	●	●	●	●	●	●
Operating mode setting for cooling or heating	This function remotely controls operating mode changes.	●	●	●	●	●	●	●
Control by room thermostat supplied by the fitter	This function manages the unit through an external thermostat. This function helps reduce problems caused by the stratification of air layers at different temperatures in the room.	●	●	●	●	●	●	⊗
Control by remote temperature sensor	Instead of using the information from the supply air thermistor on the indoor unit as a reference value for control purposes, the average value between this and the remote temperature sensor is used.	●	●	●	●	●	●	⊗
Signal capture	This function enables the unit to provide information to enable the necessary systems.	●	●	●	●	●	●	●
Automatic operating when the electricity supply is restored	This function stores the settings of the unit in the event of a cut in the electric power supply. The unit re-starts when the electricity supply is restored.	●	●	●	●	●	●	●
Start-up function after a cut in the electricity supply.	This function stores the settings of the unit in the event of a cut in the electric power supply. The unit re-starts when the electricity supply is restored if it was running before the cut in supply.	●	●	●	●	●	●	●
Optional sensor connection	This function activates the connection for an enthalpy sensor or a CO_2 concentration sensor (optional).	⊗	⊗	⊗	⊗	⊗	⊗	●

● Available.

⊗ Not available.

11.2 Main optional functions on KPI

Optional function	Explanation	
Thermo-off input	Thermo-off control will be drove by an input signal, not considering Tx temperature.	
Defrost setting	It is possible to set the fan performance of the unit while the system is in defrost condition:	Fan stoppage: ventilation is stopped
		Fan at lowest speed: for installations where minimum ventilation rate must be kept
		Fan speed kept: ventilation rate is not affected during the defrost time
	NOTE *During the defrost time, for those installations where the ventilation rate is kept (or reduced), even though when the unit is set in heating mode it will supply cold air. The installation of an auxiliary device to compensate the effect of defrost during this time is possible in SA section. From the Active KPI e-box an output signal is available, which will be turned on during the defrost time.*	
Filter sign	After a suitable number of hours of operation a servicing sign will be showed on the remote controller or the centralised system advising the filters cleaning or replacement.	
Remote on/off	It is possible to control the switching on and off of the unit by an external input.	
Remote heat/cool	Setting of the mode operation is possible by an external input	
Operation delay	Considering the Active KPI as a ventilation unit, could be useful to delay the starting of the unit to the starting of the A/C system. This setting of this time is available by the remote controller.	
Electric heater application	The installation of an electric heater before the unit in OA section is necessary for installations working with outdoor temperature below -5 ºC. Besides of having a control signal for this electric-heater control available from the KPI PCB, the unit stoppage will be delayed for three minutes after the switching off of the remote controller to cold down the heater element avoiding the installation damage by the remaining heat. **NOTE** *An additional air inlet thermistor (THM4) (optional accessory) must be installed before the electrical heater, in order to measure the temperature of the outdoor air to be heated.*	
Fan stoppage delay	It is possible to set the time for which the Active KPI will remain operating when the system has been switched off. With this function it is possible to complete the air renovation of the installation, removing the remaining pollution and contamination. The installation will be completely fresh for the next starting of the activity. During this time the heat pump will be off to save energy.	
CO_2 sensor	Fan performance control is possible by the output of a CO_2 sensor. Both sensors, all on/off and proportional output sensors are accepted. In case of on/off sensors, the fans will work at their highest speed when the signal was turned on to help reducing the CO_2 concentration on the air. On the other hand, by proportional output sensors (0~10V or 4~20mA output) the fan speed will be automatically adjusted by the CO_2 concentration, what will help to keep low the CO_2 concentration on the air with the minimum possible energy input.	
Fan high at starting	By the Remote Controller setting, it is possible to choose between three different ventilation modes:	Automatic ventilation: The damper is driven by the KPI control, selecting if the damper must be open or closed looking for the highest efficiency based on the set temperature and indoors and outdoors temperatures.
		Forced exchange: The damper is always closed, so the exchange between inlet and outlet air streams is always performed.
		Bypass ventilation: The damper is always opened, what means that the heat exchanger is bypassed and the exchange between inlet and outlet air streams is never performed. (This option is not able in case of Active KPI units)
Un-balanced ventilation	It is possible to set the fan speeds individually, promoting a room pressurization to avoid the smoke and pollution transfer from one room to another:	Normal operation: Both fans working at same air flow, so the air flow rate supply is the same one than extracted.
		Supply fan set: Supply fan rate is increased one step while exhaust fan keeps running at set air flow.
		Exhaust fan set: Exhaust fan rate is increased one step while supply fan keeps running at set air flow

11.3 Main optional functions on DX-Interface series 2

Optional function	Explanation
EC Fan or Tap Fan	The control of tap fans and EC fans is possible from the DX-Interface series 2.
Defrost signal	Output signal get from the DX-Interface when the system is in defrost mode.
Fan operation during defrost	During defrost operation three different fan speed settings are possible: fan speed kept as set, fan speed reduced to low speed and fan stoppage.
Thermo-on / thermo-off by an external input	Instead of typical control logic.
Operation delay	Once the system is turned on, the unit is kept in off during an specific time. Useful for applications where the DX-Interface is focused in comfort and not room conditioning
Thermistor selection	Option to select between inlet thermistor, external thermistor or remote controller thermistor to perform the cycle control (as inlet temperature) (Only if demand control is based on inlet temperature).
Fan Stoppage delay	Once the system is switched off, the unit keeps running for a suitable period of time, to for example, perform the air renovation once the activity is conclude.
CO_2 sensor	By the action of an ON/OFF or a duty signal (0~10V / 4~20mA) CO_2 sensor, the fan speed is controlled by the DX-Interface while the CO_2 concentration exceeds the sensor detection threshold..

11.3.1 DX-Interface series 2 - Input / Output signals

Input signal	Available from DX-Interface series 2
01	Control using the field-supplied room thermostat (cooling).
02	Control using the field-supplied room thermostat (heating).
03	Function 1 - remote ON/OFF of the unit (by contact).
04	Function 2 - turns unit ON (by pulse).
05	Function 2 - turns unit OFF (by pulse).
06	Cancellation of commands from remote control switch after forced stoppage.
07	Setting of the cooling mode or the heating mode.

Output signal	Available from DX-Interface series 2
01	Operation signal.
02	Alarm signal.
03	Cooling signal.
04	Thermo-ON signal.
05	Heating signal.
06	Defrost signal.

Input signal	Available from Outdoor unit
01	Control using the field-supplied room thermostat (cooling).
02	Control using the field-supplied room thermostat (heating).
03	Function 1 – remote ON/OFF of the unit (by contact).
04	Function 2 - turns unit ON (by pulse).
05	Function 2 - turns unit OFF (by pulse).
06	Cancellation of commands from remote control switch after forced stoppage.
07	Setting of the cooling mode or the heating mode.

Output signal	Available from Outdoor unit
01	Operation signal.
02	Alarm signal.
03	Cooling signal.
04	Thermo-ON signal.
05	Heating signal.
06	Defrost signal.

11.3.2 Thermo - On / Off control option

With DX-Interface series 2 it is possible to perform the thermo-On/thermo-Off control by three different ways.

Type	Description
Standard thermo-On / thermo-Off control (Default setting)	Suitable for installations controlled by suction or discharge temperature. The thermo-On / thermo-Off logic is decided based on the difference between the inlet temperature to the coil and the set temperature on the remote controller or central controller.
By an external input	The thermo-On / thermo-Off control can be driven externally by an input signal connected to the CN3 socket of the PCB1 of the DX-Interface. Setting note: DIP Switch 1 – Pin 6 of DX-Interface PCB2 (small PCB) must be switched on (PCB2- DSW1#6 switched ON). Once the PCB DSW has been set, the input “i1” of CN3 is automatically set for thermo-On / thermo-Off control. The setting of input “i2” is kept as set on the remote controller. Please refer to HITACHI Indoor Units Service Manual for further information about the setting and connection of the auxiliary inputs to CN3 socket.
By the duty signal	For systems controlled by a duty signal it is possible to force the thermo-Off by the duty signal itself. When the duty signal becomes the minimum of its range (0 V or 4 mA) the system will be switched to thermo-Off condition. To be switched to thermo-on condition the duty must become higher than the 8% of its range. Setting note: No additional setting is required once the demand control setting has been set as Duty control.

11.4 Optional remote control functions

Element	Optional function	Individual setting	Settings	Setting conditions	Description
b1	Heating temperature compensation Models: RCI-FSN4 RCIM-FSN4E RCD-FSN3 RPC-FSN3 RPI-FSN5E RPI-FSN3E(P)E(-f) RPIM-FSN4E(-DU) RPK-FSN(H)4M	O	00	Normal (Factory setting) (Setting Temperature + 4ºC)	This function is used to adjust the difference of temperature between the setting temperature of the remote control switch and the inlet air temperature of the indoor unit. This is useful when the inlet air thermistor is not placed inside the indoor unit or due to uneven Heat Load.
			01	No compensation (Setting Temperature)	
			02	Setting Temperature + 2ºC	
			03	Setting Temperature + 3ºC	
			04	Setting Temperature + 1ºC	
	Heating temperature compensation Models: RPF(I)-FSN2E	O	00	RPF(I)-FSN2E: Normal (Factory setting) (Setting Temperature + 2ºC)	
			01	No compensation (Setting Temperature)	
			02	Setting Temperature + 2ºC	
b2	Circulator function at heating Thermo-OFF	O	00	Not activated function (Factory setting)	This function means that the fan unit remains running after the air conditioning system has stopped to prevent the air in the room from stratifying.
			01	Activated function	
b3	Forced compressor operation for at least three minutes through C7 setting	O	00	Not activated function (Factory setting) (C7 setting possible)	This function is used to allow the setting of C7: protect the compressor, preventing it from being started or stopped for periods of less than 3 minutes.
			01	Activated function (C7 setting not possible)	
b4	Change the filter cleaning period.	O	00	Standard (1200 h)	This function is used to modify the period during which the remote control indicates the air filter replacement. For RPK-FSN(H)4M models Factory-Setting is b4=00: Standard setting 200 h.
			01	100 hours	
			02	1200 hours (factory setting)	
			03	2500 hours	
			04	No indication	
b5	Fixing of operation mode	X	00	Not activated function (factory setting)	Once the unit operating mode has been selected, this function prevents it from being modified from the remote control.
			01	Activated function	
b6	Fixing of setting temperature	X	00	Not activated function (factory setting)	Once the unit temperature has been selected, this function prevents it from being modified from the remote control.
			01	Activated function	
b7	Fixing of operation as exclusive cooling mode only	X	00	Not activated function (factory setting)	This function is available to use cooling mode only and to prevent heating mode from being enabled.
			01	Activated function	
b8	Automatic COOL/HEAT operation	X	00	Not activated function (factory setting)	This function allows the automatic change from the cooling to the heating mode for the units with the same refrigerant cycle.
			01	Activated function	

Element	Optional function	Individual setting	Settings	Setting conditions	Description
b9	Fixing of fan speed	X	00	Not activated function (factory setting)	Once the unit fan speed has been selected, this function prevents it from being modified from the remote control.
			01	Activated function	
bA	Not available	X	"- -" permanent	Not available	–
bb	Cooling temperature compensation due to uneven load	X	00	Standard setting. No compensation (factory setting)	This function decrease the temperature and it is used to obtain longer cooling periods.
			01	It decrease the setting temperature -1ºC	
			02	It decrease the setting temperature -2ºC	
bC	Not available	–	00	Not available Use at 00 conditions	–
			01		
bd	Not available	–	00	Not available Use at 00 conditions	–
			01		
bE	Not available	–	00	Not available Use at 00 conditions	–
			01		
C1	Not available	–	00	Not available Use at 00 conditions	–
			01		
C2	Not available	–	"- -" permanent	Not available	–
C3	Not available	O	00	Not available Use at 00 conditions	–
			01		
C4	Drain pump operation in heating mode	O	00	Not activated function (factory setting)	This function is used to activate the drain pump in heating mode.
			01	Activated function	
C5	Static pressure selection Models RPI-FSN5E RPIM-FSN4E(-DU) RPI-FSN3(P)E(-f)	O	00	Standard static pressure (factory setting)	This function is used to change the static pressure of the RPI units from the remote control.
			01	High static pressure	
			02	Low static pressure	
	Increasing fan speed Models RCI-FSN4 RCIM-FSN4E RCD-FSN3 RPC-FSN3 RPK-FSN(H)4M RPF(I)-FSN2E	O	00	Standard (factory setting)	This function is used to change the indoor units fan speed installed in high ceilings.
			01	Hi Speed 1(1)	
			02	Hi Speed 2(1)	
C6	Hi speed at heating Thermo-OFF	O	00	Not activated function (factory setting)	This function is used to increase the fan speed when the thermostat reaches the set temperature in heating using function C5.
			01	Activated function	
C7	Cancellation of the forced compressor operation for at least 3 minutes	O	00	Not activated function (factory setting)	Function available depending on the settings in b3.
			01	Activated function (compressor are not forced 3 minutes operation)	

Element	Optional function	Individual setting	Settings	Setting conditions	Description
C8 (2)	Selection of the thermistor of remote control switch (3)	O	00	Not available (Air inlet thermistor) (factory setting)	This function determines the thermistor to control the air temperature
			01	Air temperature control using the remote control thermistor	
			02	Air temperature control using the average value of the air inlet thermistor and the remote control thermistor (Air inlet+Remote Control)/2	
	Remote Sensor selection when is connected (4) Models RPF(I)-FSN2E	O	00, 01, 02	Air temperature control using Remote Sensor (factory setting C8=00)	
	Remote Sensor selection when is connected (4) Models RCI-FSN4 RCIM-FSN4E RCD-FSN3 RPC-FSN3 RPI-FSN5E RPI-FSN3E(P)E(-f) RPIM-FSN4E(-DU) RPK-FSN(H)4M		00, 02	Air temperature control using the average value of the air inlet thermistor and the remote sensor (factory setting C8=00) (Air inlet+Remote Sensor)/2	
			01	Air temperature control using Remote Sensor	
C9	Not available	–	"- -" permanent	Not available	–
CA	Not available	–	"- -" permanent	Not available	–
Cb	Selection of forced stoppage logic	X	00	Forced stoppage input: A contact (factory setting)	This function determines the logic operation for the forced stoppage contacts.
			01	Forced stoppage input: B contact	
CC	Not available	–	00	Not available Use at 00 conditions	–
			01		–
Cd	Fan operation status in cooling thermo-off For models RPI-FSN3E(P)E and RCD-FSN3 Not available	O	00	Not actived function C8 setting = 00,01,02 Air flow volume: Low (factory setting)	Fan stop operation in thermo-off conditions when using the additional remote temperature sensor THM-R2AE (connected to THM4) or PC-ARFP(1)E temperature sensor
			01	Actived funtion Only C8 setting 01 is recommended	

Element	Optional function	Individual setting	Settings	Setting conditions	Description
CE	Fan operation status in heating thermo-OFF conditions	O	00	Not activated function C8 setting = 00,01,02 Air flow volume: Low (factory setting)	Indoor unit will use the PC.ARFPE(3) Remote Control temperature sensor to monitor the room temperature when fan is stopped (heating thermo-OFF fan stop sequence) Control by Remote Temperature Sensor not permitted.
			01	C8 setting 00: Not permitted	
				If C8 setting 01: fan operation stop (5) C8 setting 02: Not recommended.	
CF	Modification of Louver Swing Range Models: RCI-FSN4 RCIM-FSN4E RCD-FSN3 RPC-FSN3 RPK-FSN(H)4M	O	00	Standard (7 steps operation) (factory setting)	This function adjusts the angle of the air outlet louver.
			01	Cold draft prevention (5 steps) (6) (Lower 2 steps cut off)	
			02	High ceilings (5 steps) (6) (Higher 2 steps cut off)	
d1	Power supply ON/OFF 1 (Automatic Operation when Power Supply is ON)	O	00	Not activated function (factory setting)	This function stores the unit settings in the event of a power cut. The unit is restarted when the power is re-established.
			01	Activated function	
d2	Not available	X	"- -" permanent	Not available	–
d3	Power supply ON/OFF 2 (Restarting Function After Power Failure)	O	00	Not activated function (factory setting)	This function is used to restart the unit after a power cut taking more than 2 seconds.
			01	Activated function	
d4	Prevention of drop of discharge temperature in cooling Models, RCIM-FSN4E RPI-FSN5E RPI-FSN3E(P)E(-f) RPIM-FSN4E(-DU) RPK-FSN(H)4M RPF(I)-FSN2E	O	00	Not activated function (factory setting)	This function changes the cooling operating conditions to avoid cold draughts.
			01	Activated function	
	Not available Models RCD-FSN3 RPI-(0.4-3.0)FSN5E RCI-FSN4 RPC-FSN3	O	00	Not available Use at 00 conditions	–
			01		
d5	Prevention of decrease of heating discharge air temperature	O	00	Not activated function (factory setting)	This function prevents a drop in the air temperature by decreasing the fan speed, apart from the settings on the remote control.
			01	Activated function	
d6	Room temperature control for energy saving	O	00	Not activated function (factory setting)	This function saves energy when the outdoor temperature is lower than the air conditioning load.
			01	Activated function	

Element	Optional function	Individual setting	Settings	Setting conditions	Description
d7	Econofresh: OA Damper minimum opening	O	00	6º (factory setting)	This function is used to set the fresh outdoor air damper minimum opening selection.
			01	12º	
			02	18º	
			03	24º	
			04	30º	
			05	36º	
			06	42º	
			07	48º	
E1	KPI: ventilation mode	O	00	Automatic ventilation (factory setting)	This function is used to set the unit ventilation mode with energy recovery.
			01	Ventilation with total heat exchanger	
			02	Ventilation with bypass (no total heat exchange)	
	Econofresh cooling mode		00	Standard Process (factory setting)	This function allows to the outdoor air damper to be opened in All Fresh Operation mode. This mode able to fully open the outdoor air damper (according to the control system)
			01/02	All-fresh	
E2	KPI: Increasing air supply volume	O	00	Not activated function (factory setting)	This function is used to increase the air supply pressure in the room.
			01	Activated function	
	Econofresh enthalpy sensor		00	Not activated function (factory setting)	This function selects the enthalpy sensor input.
			01	Activated function	
E3	Not available	O	00	Not available Use at 00 conditions	–
			01		
E4	KPI: Pre-cooling / pre-heating period	O	00	Standard (factory setting)	This function delays the unit start-up with energy recovery
			01	30 minutes	
			02	60 minutes	
	Econofresh: CO_2 sensor		00	Standard (factory setting)	This function selects the CO_2 gas sensor input.
			01/02	CO_2 sensor (required setting E1=00)	
E5	Not available	O	00	Not available Use at 00 conditions	–
			01		
E6	Indoor fan operation time after cooling operation stoppage	O	00	Not activated function (factory setting)	This function prevents the condensation accumulation in the unit by keeping the fan running after it is switched off.
			01	60 minutes	
			02	120 minutes	
E7	Not available	O	00	Not available Use at 00 conditions	–
			01		
E8	Fan operation control at heating thermo-OFF conditions	O	00	Fan operation to Low	THM-R2AE[4] Remote temperature sensor (connected to the THM4 port on the IU PCB) is required. This function stops the fan to prevent cold draughts.
			01	Fan stop in thermo-OFF condition. [5] (C8=01)	

Element	Optional function	Individual setting	Settings	Setting conditions	Description
E9	Intermittent fan operation in heating stop Not available for models: RPF(I)-FSN2E	O	00	Not activated function (factory setting)	In case that the indoor unit is stopped (in SW OFF), under certain conditions the fan operation at Slo speed is performed for 3 minutes after 30 minutes of stoppage.
			01	Activated function	
EA	Not available	O	00	Not available Use at 00 conditions	–
			01		
Eb	Fan operation control at cooling Thermo-OFF	O	00	Not activated function (factory setting)	This function decreases the unit fan speed to reduce the spreading of smells and humidity.
			01	Low	
			02	Slow	
EC	Forced Thermo ON when stopping in cooling operation	O	00	Not activated function (factory setting)	This function is used to force Thermo ON during 6 minutes when stopping in cooling operation.
			01	Available	
Ed	Not available	O	00	Not available Use at 00 conditions	–
			01		
EE	Control in “Automatic” indoor fan speed mode	O	00	Not activated function	This function limits the indoor fan speed when room temperature is close to setting temperature.
			01	Activated function	
EF	Control in “Automatic” indoor fan speed mode (supporting High 2) Models RCI-FSN4 RCIM-FSN4E RCD-FSN3 RPC-FSN3 RPI-FSN5E RPI-FSN3E(P)E(-f) RPIM-FSN4E(-DU) RPK-FSN(H)4M	O	00	Not activated function	This function limits the indoor fan speed when room temperature is close to setting temperature, allowing to reach High 2 speed.
			01	Activated function	
F0	Not available	-	“- -” permanent	Not available	–
F1	Automatic OFF timer setting Models RCI-FSN4 RPC-FSN3 RPK-FSN3M RPI-FSN5E RPIM-FSN4E(-DU) RCD-FSN3 RCIM-FSN4E RPI-FSN3(P)E	X	00	Not activated function (Factory setting)	This function is used to set the automatic timer to switch off when the unit has been started by remote control. (Do not set the functions "0C"-"0F" when two remote control switches are used in the same remote control group)
			01	1 h	
			02	2 h	
			03	3 h	
			04-24	(04-24) h	
			0A	30 min	
			0B	90 min	
			0C	40 min	
			0D	45 min	
			0E	50 min	
			0F	55 min	
	Automatic OFF timer setting Models RPF(I)-FSN2E	X	00	Not activated function (Factory setting)	This function is used to set the automatic timer to switch off when the unit has been started by remote control.
			01	1 h	
			02	2 h	
			03	3 h	
			04-24	(04-24) h	
			0A	30 min	
			0B	90 min	

Element	Optional function	Individual setting	Settings	Setting conditions	Description
F2	Remote control main-sub setting	X	00	Main (Master Remote Control) (Factory setting)	This function is used when two remote controls are installed in a system.
			01	Sub (Slave Remote Control)	
F3	Automatic reset of setting temperature(7)	X	00	Not activated function (Factory setting)	This function releases the fixed temperature setting after a certain time to limit unit operations and save energy.
			01	Activated function	
F4	Automatic reset time	X	00	30 minutes (factory setting)	This function is used to set the automatic reset time with the temperature setting
			01	15 minutes	
			02	60 minutes	
			03	90 minutes	
F5	Automatic reset temperature for cooling	X	19	19°C	This function is used to set automatic temperature reset in FAN/COOL/DRY modes.
			20	20°C	
			21	24°C	
			⋮	⋮	
			24	24°C	
			25	25°C (factory setting)	
			26	26ºC	
			⋮	⋮	
			28	28ºC	
			29	29ºC	
			30	30ºC	
F6	Automatic reset temperature for heating Heating Automatic Return Temperature	X	17	17ºC	This function is used to set automatic temperature release in HEAT mode.
			18	18ºC	
			⋮	⋮	
			20	20ºC	
			21	21ºC (factory setting)	
			25	25ºC	
			⋮	⋮	
			28	28ºC	
			29	29ºC	
			30	30ºC	
F7	Prevention of operation stoppage due to Remote Control operating error	X	00	Not activated function (factory setting)	Operation is stopped by pressing the run/stop switch for 3 seconds.
			01	Activated function	
F8	Lock function for operation mode selection	X	00	Not activated function	This function is used to prevent changes to the operating mode.
			01	Activated function (factory setting)	
F9	Lock function for temperature setting	X	00	Not activated function	This function is used to prevent changes to the temperature setting.
			01	Activated function (factory setting)	
FA	Lock function for fan speed selection	X	00	Not activated function	This function is used to prevent changes to the fan speed.
			01	Activated function (factory setting)	
Fb	Lock function for swing louver operation	X	00	Not activated function	This function is used to prevent changes to automatic louver operations.
			01	Activated function (factory setting)	

Element	Optional function	Individual setting	Settings	Setting conditions	Description
FC	Lower limit of setting temperature for cooling (Minimum value of setting temperature allowed in cooling)	X	00	Not actived funtion 19ºC (Standard) (factory setting)	This function is used to define a lower temperature setting limit for FAN/COOL/DRY modes.
			01	+1ºC - Lower limit 20ºC	
			02	+2ºC - Lower limit 21ºC	
			03	+3ºC Lower limit 22ºC	
			⋮	⋮	
			08	+8ºC - Lower limit 27ºC	
			09	+9ºC - Lower limit 28ºC	
			10	+10ºC - Lower limit 29ºC	
Fd	Upper limit of setting temperature for heating	X	00	Not actived fuction 30ºC (Standard) (factory setting)	This function is used to define an upper temperature setting limit for HEAT mode. Models: RPF(I)-)FSN2E up to 20ºC (FC=10)
			01	-1ºC - Upper limit 29ºC	
			02	-2ºC - Upper limit 28ºC	
			03	-3ºC - Upper limit (27~20)ºC	
			⋮	⋮	
			10	-10ºC - Upper limit 20ºC	
			11	-11ºC - Upper limit 19ºC	
			12	-12ºC - Upper limit 18ºC	
FE	Not available	–	00	Not available Use at 00 conditions	–
			01		
			02		
FF	Lock function for ON/ OFF timer	O	00	Not activated function	This function is used to prevent changes to ON/OFF timer operation Models: RPF(I)-FSN3E Not available, use at 00 conditions
			01	Activated function (factory setting)	
H1	Not available	–	00	Not available Use at 00 conditions	–
			01		
H2	Indication of hot start (No Indication of Operation Limitation)	O	00	Display	This function is used to display or hide the automatic control indication. Models: RPF(I)-FSN2E Not available, use at 00 conditions
			01	Hide	
H3	Not available	–	00	Not available Use at 00 conditions	–
			01		
			02		

Element	Optional function	Individual setting	Settings	Setting conditions	Description
H4	Not available	–	00	Not available Use at 00 conditions	–
			01		
	KPI: Operating modes for the ventilation unit with energy recovery	O	00	Air conditioning only (factory setting)	This function is only available for the ventilation unit with energy recovery.
			01	Ventilation only	
			02	Air conditioning + ventilation	
J1	Room temperature indication (2)	O	00	Not activated function (factory setting)	Models: RPF(I)-FSN2E Not available, use at 00 conditions
			01	Activated function	
J2	Not available	–	"- -" permanent	Not available	–
J3	Run indicator colour	–	00	Green (factory setting)	–
			01	Red	
J4	Control prohibit through the remote control	X	00	Standard (factory setting) Stop and restart	This function allows to define the possibility to stop and/or restart an indoor unit when there is remote control prohibition from a central control device and that indoor unit is in operation. Models: RPF(I)-FSN2E Not available, use at 00 conditions
			01	Complete prohibition	
			02	Allow stop only	
J5	Not available	–	00	Not available (Use as 00 conditions)	–
			01		
J6	Not available	–	00	Not available (Use as 00 conditions)	–
			01		
J7	Enabling of louvre steps 6 and 7 in dry	O	00	Not activated function (factory setting)	–
			01	Activated function	
J8	Eco-operation (8)	X	00	Not activated function (factory setting)	Models: RPF(I)-FSN2E Not available, use at 00 conditions
			01	Activated function	
J9	Not available	–	00	Not available (Use as 00 conditions)	–
			01		
JA	Display accumulated time of compressor operation	X	00	Disable (factory setting)	Models: RPF(I)-FSN2E Not available, use at 00 conditions
			01	Enable	
Jb	Display automatic fan speed	X	00	Displayed (factory setting)	Models: RPF(I)-FSN2E Not available, use at 00 conditions
			01	Not displayed	
K1	Not available	–	00 01	Not available (Use as 00 conditions)	–
K2	Not available	–	00 01	Not available (Use as 00 conditions)	–
K3	Not available	–	00 01	Not available (Use as 00 conditions)	–

Element	Optional function	Individual setting	Settings	Setting conditions	Description
K4	Not available	–	00 01 02 03	Not available (Use as 00 conditions)	–
K5	Human sensor detection level when Motion Sensor Kit is installed	X	00	Standard (factory setting)	Models: RPF(I)-FSN2E Not available, use at 00 conditions
			01	High	
			02	Low	

NOTE

- *O: allows for individual setting.*
- *X: the setting is made for all outdoor units.*
- *–: not used.*
- *(1)*

	Fan speed setting on Remote Controller			
C5	High 2	High	Medium	Low
0	Hi2	Hi	Me	Lo
1	Hi2	Hi1	Hi	Me
2	Hi2	Hi2	Hi1	Hi

- *(2) When J1 is set as activated function, the room temperature indication is the sensor value set at "C8".*
- *(3) The Remote Control Switch shall be installed in a proper place for the correct detection of room temperature by its temperature sensor*
- *(4) The Remote Sensor shall be installed in a proper place for the correct detection of room temperature.*
- *(5) In case that automatic louver is set, the louver will keep operating in both thermo-ON and thermo-OFF condition.*
- *(6) 00 standard (7-step operation); 01 draft prevention (cannot be set to the lower two steps); 02 High ceilings (cannot be set the upper two steps).*
- *(7) In case that the set temperature is changed and kept within the set time at "F4", the temperature is automatically changed to "F5" and "F6". In case that the set temperature is out of range at "F5" and "F6", it is applied within upper and lower limit for the set temperature.*
- *(8) When the unit is restarted by the remote control switch, the temperature automatically changes to the setting temperature of "F5" or "F6".*

NOTE

- *On modifying the "CF" (air outlet louver angle change) setting, restore the power supply or allow the automatic louver to make a full cycle in automatic mode to apply the optional setting.*
- *The changes to the optional function settings must be done after 3 minutes have passed after startup.*
- *It is recommended to keep track of the changes made to optional function settings, for further reference.*
- *The optional settings are different according to the indoor and outdoor unit models. Check to ensure that the unit has the optional setting or not.*
- *The listed optional functions are valid for the following models:*

Indoor Unit series	With software number (or above)
RCD-FSN3	P-4514
RCI-FSN4	P-4510
RCIM-FSN4E	P-4623
RPC-FSN3	P-4510
RPF(I)-FSN2E	P-4566
RPI-(0.4-3.0)FSN5E	P-4621
RPI-(4.0-6.0)FSN5E	P-4571
RPI-FSN3E(P)E(-f)	P-4526
RPIM-FSN4E	P-4571
RPK-FSN(3/4)M	P-4622

- *The optional functions with "X" mark at the individual setting column can change the condition only when "All Rooms" is set.*
- *The following optional functions are disable when RPI Unit when Econofresh are installed: b7, bA, bd, bE, C1, C2, C3, C9, CA, Cd, CF, d6, E3, E5, E7, E9, EA, FE, FF, H1, H3, H4, J2, J4, J7, J8, J9, JA, JB, K1, K2, K3, K4, K5.*

◆ Input and Output Number Display and Connectors

Input number display	Port	Factory setting	
Input/Output indication		Setting item	Indication
Input 1	CN3 1-2	Remote ON/OFF 1 (Level)	03
Input 2	CN3 2-3	Prohibiting Remote Control after Manual Stoppage	06
Output 1	CN7 1-2	Operation	01
Output 2	CN7 1-3	Alarm	02
Output 3	CN8 1-2	Thermo-ON for Heating	06

◆ Input and Output Settings and Display Codes

Indication	Input	Output
00	Not set	Not set
01	Room Thermostat (for Cooling)	Operation
02	Room Thermostat (for Heating)	Alarm
03	Remote ON/OFF 1 (Level)	Cooling
04	Remote ON/OFF 2 (Operation)	Thermo-ON for Cooling
05	Remote ON/OFF 2 (Stoppage)	Heating
06	Forbidding Remote Control after Manual Stoppage	Thermo-ON for Heating
07	Remote Cooling / Heating Change	Total Heat Exchanger
08	Not used	Not used

NOTE

After at least 3 minutes from the power ON, change the optional setting.

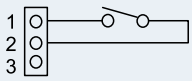
11.5 Econofresh signal control logic

11.5.1 Econofresh enthalpy sensor – E2

The signal opens and closes the air inlet and the outlet damper, mixing the outdoor air and the return air of the Econofresh. This function is based on the air quality parameters that provide precise control of the air quality.

Connect the cables in the connector CN3. Only contacts 1 and 2 of CN3 can be used for connection.

The signal has the following control logic:

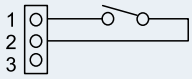
Connector	Contact number	X1	Damper
CN3	1, 2  	ON	— (to activate free cooling)
		OFF	Enabled (to activate mechanical cooling Thermo ON)

11.5.2 CO_2 gas sensor – E4

This signal controls the inlet of outdoor air according to the concentration of CO_2 inside the room.

Connect the cables in the connector CN3. Only contacts 1 and 2 of CN3 can be used for connection.

The signal has the following control logic:

Connector	Contact number	X1	Damper
CN3	1, 2  	ON	— (for increasing the outdoor air)
		OFF	Enabled (for decreasing the outdoor air)

11.5.3 Compatibilities between optional signals

The following table shows the compatibility between the different optional signals:

	PC-ARFPE optional functions	Room thermostat	Remote control thermistor	Remote thermistor	Wireless remote control	Outdoor cooling mode	Enthalpy sensor	CO_2 sensor
Room thermostat	–		–	–	–	–	–	–
Remote control thermistor	C8	–		–	–	O	O	O
Remote thermistor	–	–	–		–	–	–	–
Wireless remote control	–	–	–	–		O	O	O
Outdoor cooling mode	E1	–	O	–	O		–	–
Enthalpy sensor	E2	–	O	–	O	–		–
CO_2 sensor	E4	–	O	–	O	–	–	

Not available: –
Available: O

11.6 Optional functions in the PSC-A64S central control

Element	Optional function	Option	Settings	Description
A	Operating mode setting	Setting “not displayed”	Available	This function eliminates the possibility of modifying the operating mode. The same optional function must be selected on the remote control. This option also affects the settings made with the PSC-5S.
			Not available	
b	Temperature setting	Setting “not displayed”	Available	This function eliminates the possibility of modifying the temperature setting. The same optional function must be selected on the remote control. This option also affects the settings made with the PSC-5S.
			Not available	
c	Cooling only setting	Setting “not displayed”	Available	The same optional function must be selected on the remote control. This option also affects the settings made with the PSC-5S.
			Not available	
d	Fan speed setting	Setting “not displayed”	Available	The same optional function must be selected on the remote control. This option also affects the settings made with the PSC-5S.
			Not available	
E	Automatic cooling/heating operation	Setting “not displayed”	Available	This function automatically switches from cooling to heating. This function cannot be used if it is not available on the remote control.
			Not available	

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CE

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ER-0198/1996 GA-1999/0044

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JQA-1084 EC97J1107

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ISO 9001 of Malaysia, for its Quality Management accordance with the standard.
ISO 14001 of Malaysia, for its Environmental Management systems accordance with the standard.

HITACHI participates in the Eurovent Certification Programme; the certified data of certified models are listed in the Eurovent Certification Online Directory (www.eurovent-certification.com).

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