Panasonic
ideas for life

NEW VRF FSV SYSTEMS **2012 / 2013**

FSV
Flexi System VRF

EVERY BUILDING MATTERS

FSV_50Hz_catalog_2012.indd 1 12.2.14 1:12:21 PM

PANASONIC AIR CONDITIONING DESIGNED TO CARE FOR YOUR PROJECTS.

With more than 30 years of experience, exporting to more than 120 countries around the world, Panasonic is unquestionably one of the leaders in the air conditioning sector. The company is also a world leader in innovation as it has filed more than 91,539 patents to improve its customers' lives. Moreover, Panasonic is determined to remain at the forefront of its market. In all, the company has produced more than 200 million compressors and its products, particularly residential air conditioners, now hold the No. 1 market share in Japan and other major countries in Asia. You can be assured of the extremely high quality of Panasonic's air conditioners.

This wish to excel has made Panasonic the international leader in air conditioning solutions. The company's industrial capacity and firm commitment to the environment has enabled it to open new avenues of research and to develop innovative technologies to enrich customers' way of life.
Panasonic offers a range of turnkey air conditioning solutions for homes, medium-sized buildings such as offices and restaurants, and large-scale buildings. These offer maximum effectiveness, comply with the strictest environmental standards and meet the most avant-garde construction requirements of our time.

At Panasonic we know what a great responsibility it is to install cooling and heating systems. Because offering you the best solutions in cooling and heating matters.

EVERY BUILDING MATTERS

CONTENTS

02 Introduction

04 Panasonic New FSV Systems
06 2-WAY FSV ME1 Series
20 2-WAY mini-FSV LE1 Series
28 3-WAY FSV MF1 Series

40 FSV Indoor Units
42 Product Range
44 U1 Type / 4-Way Cassette / Semi Concealed Cassette
48 Y1 Type / 4-Way Cassette 60 X 60 / Mini Semi Concealed Cassette
50 L1 Type / 2-Way Cassette
52 D1 Type / 1-Way Cassette / Semi Concealed Slim Cassette
54 F2 Type / Low Silhouette Ducted
58 M1 Type / Slim Low Static Ducted / Concealed Duct
60 E1 Type / High Static Pressure Ducted / Concealed Duct High-static Pressure
62 T1 Type / Ceiling / Floor Ceiling Mounted
64 K1 Type / Wall Mounted
68 P1 Type / Floor Standing
70 R1 Type / Concealed Floor Standing

72 FSV Controllers
74 Individual Control Systems
77 Centralised Control Systems
78 Web Interface Systems
80 P-AIMS
82 T10 Terminals for External Control
83 Interfaces for External Control
84 Serial Interface for 3rd Party External Controller
85 Serial Interface for LonWorks Network
86 Controller External Dimensions

88 VRF Renewal
92 Panasonic Design Support Software

FSV_50Hz_catalog_2012.indd 2-3 12.2.14 1:12:37 PM

New FSV Systems

FSV systems are designed for energy savings, easy installation, and high efficiency. Ever evolving, Panasonic uses advanced technologies to meet the requirements of diverse situations and contribute to the creation of comfortable living spaces.

NEW

2-WAY FSV ME1 Series

Newly designed next generation VRF!

RENEWAL R22 INVERTER

Cooling or Heating Type

- Top class EER = 4.04 / COP = 4.56 (in the case of 8 HP)
- Wide range of systems up to 60 HP
- Longer max piping length (up to 1000 m)
- Increased max number of connectable indoor units (up to 64)
- External static pressure increased to a high 80Pa
- Cooling operatior is possible when outdoor temperature as high as 46˚C
- Extended operating range to provide heating at outdoor temperature as low as -25˚C
- Suitable for renewal projects

Anti-corrosion model is available.

NEW

High COP Setting Series

Enables further energy saving

RENEWAL R22

Cooling or Heating Type

HIGH COP SETTING MODEL

- Wide range of system up to 48 HP
- High COP especially large capacity zone (38 HP=COP:4.08)

2-WAY mini-FSV LE1 Series

INVERTER

For small-scale commercial and residential use

Cooling or Heating Type 1 phase
Cooling or Heating Type 3 phase

Industry Top Class EER/COP

- Applicable to both single and three phase power supplies
- Top-class EER: 4.3 / COP: 4.62 (In case of 4 HP)
- Cooling operation is possible up to 46°C outdoor temperature
- Heating operation is possible when outdoor temperature as low as -20°C
- 9 units connectable to one outdoor unit (in the case of 6 HP)
- Piping length: 120m (Total piping length: 150m)

3-WAY FSV MF1 Series

INVERTER

For simultaneous heating and cooling operation

Cooling and Heating Simultaneous Type

Heat Recovery Type

- COP of 3.94, one of the top class in the industry
  Average cooling and heating value for 8 HP outdoor unit
- Simultaneous cooling or heating operation for up to 40 indoor units
- Realization of the small installation space, top class in the industry
- Rotation operation function and back-up operation function provided

Benefits

Ease of installation
R410A has a higher operating pressure with a lower pressure loss than previous refrigerants. This enables smaller pipe sizes to be used and allows reduced refrigerant charges.

Simple to design
Panasonic recognises that designing, selecting and preparing a professional VRF quotation can be a time consuming and costly process, especially as it is often also a speculative exercise. We have a proprietary design software which is quick and easy to use and produces a full schematic layout of pipework and controls, detailed material listing and performance data.

Easy to control
A wide variety of control options are available to ensure that FSV systems provide the user with flexible degree of control, from simple room controllers to state of the art Building Management System (BMS) control.

Simple to commission
Simple set-up procedures including automatic address setting of connected indoor units enables configuration setting to be made from an outdoor unit or via remote controller.

Accurate capacity control
To ensure that the compressor capacity is matched to building load as accurately and efficiently as possible, Panasonic has designed its range of 2-WAY / 3-WAY FSV systems to operate with DC inverter and high-efficiency fixed speed compressors. The system selects the most efficient compressor to operate by dynamically monitoring the building load and choosing the best compressor combination to run.

Easy to position
The compact design of the FSV outdoor units enables 8 HP to 12 HP to fit into a standard lift and are easy to handle and position when on site. Space-saving and modular in design ensures building appearance can be maintained.

Discharge air temperature control
Panasonic ducted units offer the unique advantage of being able to control discharge air temperature for accurate room temperature control, and to reduce cold drafts at heating operation. This is achieved without any extra controls or wiring to each unit.

Wide selection and connectability
With a selection of 11 indoor model types, FSV systems are the ideal choice for multiple small capacity indoor unit installations, with the ability to connect up to 64 indoor units for 2-way ME1 series and up to 40 indoor unit for 3-way MF1 series.

Easy to maintain
Each system allows the use of prognostic and diagnostic controls routines, from refrigerant charge control to complex fault code diagnostics, all designed to expedite maintenance calls and reduce unit down time.

Lower running and life cycle costs
Panasonic FSV is amongst the most efficient VRF systems in the market. The systems are also designed to make sure that we reduce the running cost of each system by using our unique road map control routine to ensure that the most efficient combination of compressors are running at any one time. Improved defrost sequencing also reduces running cost by defrosting each outdoor coil in turn when conditions allow.

FSV_50Hz_catalog_2012.indd 4-5 12.2.14 1:12:43 PM

INVERTER RENEWAL R22

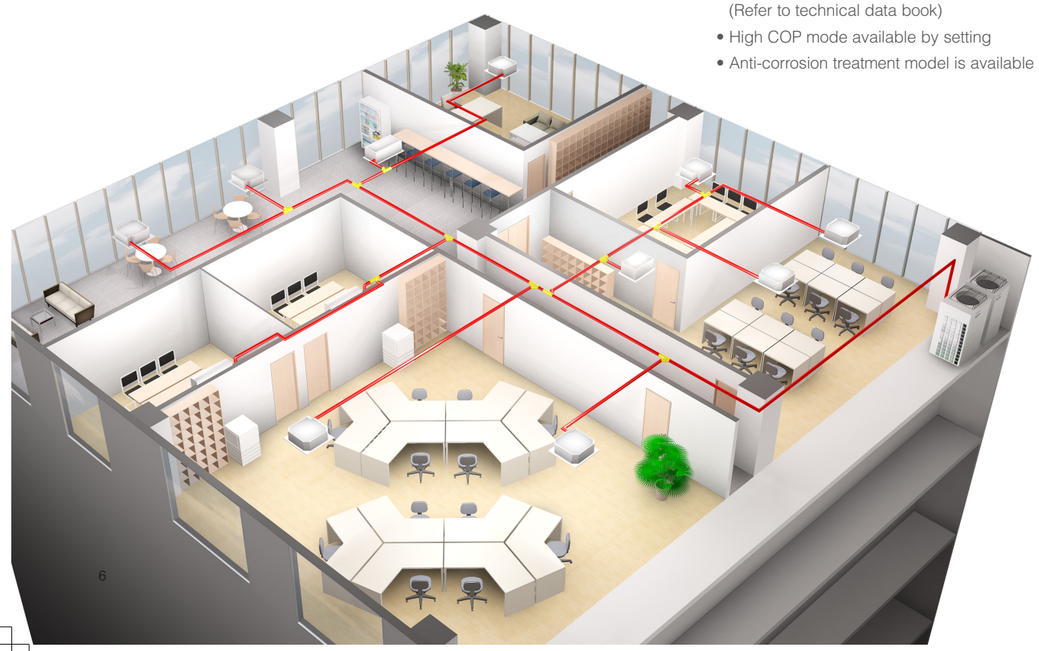
High-efficiency & arge-capacity VRF system

2-WAY FSV ME1 Series

Newly designed next generation VRF!

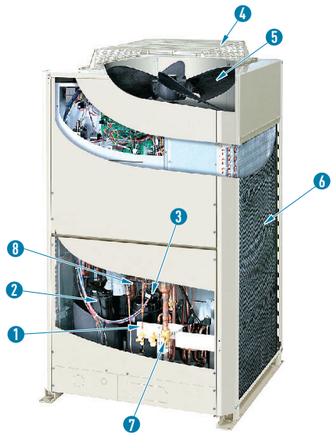
Large-capacity VRF systems with use of R410A with advanced technology.

- Compact casing (8~12 HP)
- Bigger capacity in one casing (max 20P)
- Wider range of system (Max 30 HP)
- Longer Max piping length up to 1000 m
- Increased connectable I_U/O_U cap. ratio up to 200%
- Demand response ready (peak cut)
- Increased Max no. of connectable I_U up to 64 units
- Increased high external static pressure up to 80 Pa
- Extended operating range to provide heating at outdoor temperature as low as -25˚C
- Cooling is possible as high as 46˚C
- Suitable for renewal projects (Refer to technical data book)
- High COP mode available by setting
- Anti-corrosion treatment model is available



Energy-saving concept.

The use of energy saving design for the structure of fans, fan motors, compressors and heat exchangers resulted in high COP value which ranked as one the top class in the industry. In addition, use of highly efficient R410A refrigerant reduces CO2 emission and lowers operating costs.



❶ **Panasonic Inverter compressor**	Large-capacity inverter compressor is now available up to max 10 HP. The inverter compressor is superior in performance with improved partial-load capacity.
❷ **Constant-speed compressor**	A constant-speed, large-capacity scroll compressor has been newly developed. Two compressors can be configured up to 16HP whilst three compressors can be configured up to 20 HP.
❸ **Accumulator**	The accumulator capacity has been increased to maintain compressor reliability because of the increased refrigerant quantity, which required an extended max piping length. Furthermore, the refrigerant pressure loss was reduced, which contributes to an improved operating efficiency.
❹ **Fan guard**	The fan wire guard has been newly designed. This results in a reduced air resistance and ventilation noise.
❺ **High-performance fan with a new shape**	Fan rotational efficiency has been increased as the fan can operate on constant airflow even at high external static pressure.
❻ **Heat exchanger copper tubes, heat exchanger fins**	Fan rotational efficiency has been increased as the fan can operate on constant airflow even at high external static pressure.
❼ **Sub-cooling circuit**	Large capacity outdoor unit utilizes double piping with top grade tubes to improves heat transfer efficiency.
❽ **Oil separator**	Centrifugal separator is used to improves oil separation efficiency and reduce refrigerant pressure loss.

FSV_50Hz_catalog_2012.indd 6-7 12.2.14 1:12:49 PM

High-efficiency & large-capacity VRF system

2-WAY FSV ME1 Series

A large number of indoor units can be connected

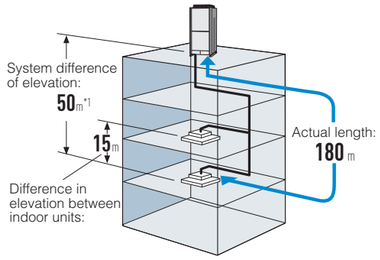
The operation efficiency has been improved using highly efficient R410A refrigerant, new DC inverter compressor, new DC motor and new design of heat exchanger.

Up to 64 Indoor Units Connectable!*

*Maximum number of indoor units depends on outdoor unit capacity.

Increased piping length for greater design flexibility

Adaptable to various building types and sizes
Actual piping length : 180m
Max piping length : 1000m



*1: 40 m if the outdoor unit is below the indoor unit.

Max. total length:1,000m

Connectable indoor/outdoor unit capacity ratio up to 200%

FSV systems attain maximum indoor unit connection capacity of up to 200 % of the unit's connection range, depending on the outdoor and indoor models selected. So for a reasonable investment, FSV systems provide an ideal air conditioning solution for locations where full cooling/heating are not always required.

SYSTEM / HP	8	10	12	14	16	18	20	22	24	26	28	30	32	34
MNcIU : 130%	13	16	19	23	26	29	33	36	40	43	47	50	53	56
MNcIU : 200%	20	25	30	35	40	45	50	55	60	64	64	64	64	64

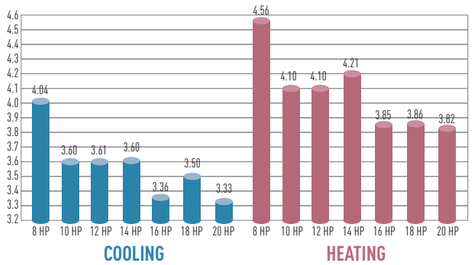
SYSTEM / HP	36	38	40	42	44	46	48	50	52	54	56	58	60
MNcIU : 130%	59	64	64	64	64	64	64	64	64	64	64	64	64
MNcIU : 200%	64	64	64	64	64	64	64	64	64	64	64	64	64

MNcIU : Maximum Number of Connectable Indoor Unit

Note: If more than 100% indoor units are operated with a high load, the units may not perform at the rated capacity. For the details, please consult with an authorized Panasonic dealer.

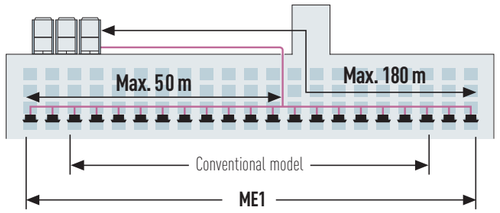
Excellent energy saving

The operation efficiency has been improved using highly efficient R410A refrigerant, new DC inverter compressor, new DC motor and new design of heat exchanger.



Difference between max. and min. length after first branch can be max 50 m.

Up to 64 units can be connected to one system. Flexible piping layout makes it easier to design systems for locations such as train stations, airports, schools and hospitals.



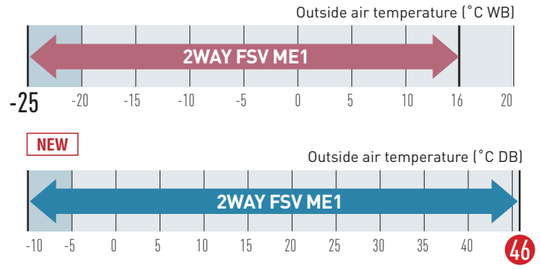
Extended operating range

Heating operation range:

Extended heating operation range enables heating even when outdoor temperature as low as -25˚C. Using a wired remote control, indoor heating temperature range can be set from 16˚C to 30˚C.

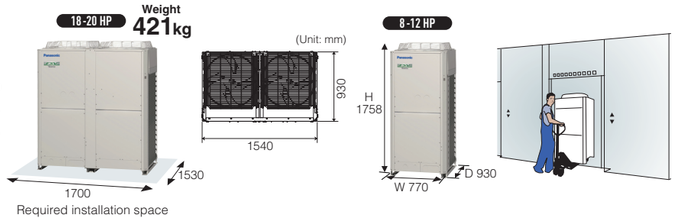
Cooling operation range:

-10˚C DB to +46˚C DB



Compact design

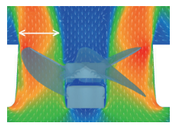
New ME1 series has reduced the installation space required by 1 chassis for sizes up to 20 HP. 8-12 HP are able to fit inside a lift for easy handling at site.



Newly designed fan

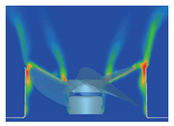
Optimized air flow

Newly designed fan and bell-mouth reduces stress to fan by dispersing fast wind speed. Thus, lower air resistance results in lower energy consumption.



Noise reduction

The turbulent flow (blue part) can be suppressed and the noise can be reduced. Even though the high speed circulation is utilized, the noise level is at same level as usual.



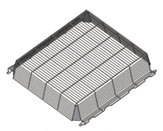
FSV_50Hz_catalog_2012.indd 8-9 12.2.14 1:13:00 PM

High-efficiency & large-capacity VRF system

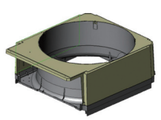
2-WAY FSV ME1 Series

High external static pressure

Customized setting at site allows all models to provide up to 80Pa due to newly designed fan, fan guard, fan motor and casing. The flexible design comes with a air discharge duct to avoid a reduction in performance due to shortcut of air circulation. The new feature allows the outdoor unit to be installed inside verandas on every floor of the building.


Fan Guard

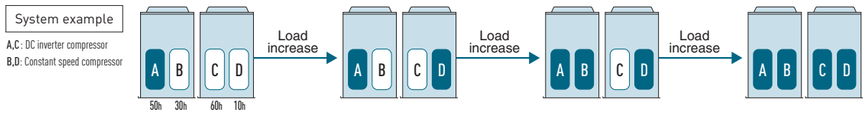
Fan

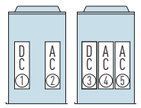

Fan Motor and Casing

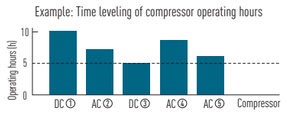
Extended compressor life by uniform compressor operation times

Total run-time of compressors are monitored by a built-in microcomputer, which ensures that operation times of all compressors within the same refrigerant circuit are balanced.

Compressors with histories showing shorter run times are selected first, ensuring equal wear and tear across all units and extended working life for the system.







In case of the above graph, compressor drives from ③→⑤→②→④→①

Automatic backup operation in the case of compressor and outdoor units malfunction

(Except for 8 HP single unit installation)

*Backup operation is adopted for emergency case. If error message is displayed, please contact to a service office.

Demand response

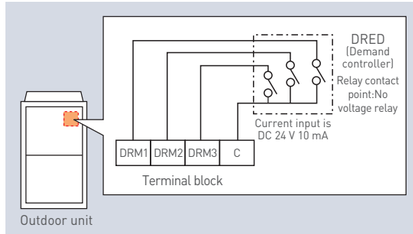
Featuring inverter control technology, FSV systems are demand response ready. With this control, power consumption at times of peak load can be set in three steps to deliver optimum performance. This helps to reduce annual power consumption with minimal loss in comfort.

NEW

Simple demand response with the CZ-CAPDC4

Demand control terminal is available to control 0-50-75-100% of capacities.

* CZ-CAPDC4 is required as an option
* Complies with AS 4755 of Australia

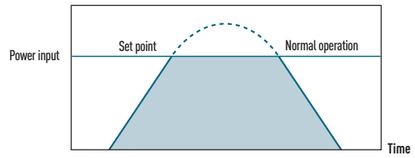


Demand Response Signal	Power Input
DRM 1	0%
DRM 2	50%
DRM 3	75%

Flexible Demand Response with the CZ-CAPDC2*1

Setting is possible as 0% or in the range from 40 to 100% (in steps of 5%). At the time of shipping, setting has been done to the three steps of 0%, 70% and 100%.

*1 Para I/O unit for outdoor unit (CZ-CAPDC2) is required to input the signal.



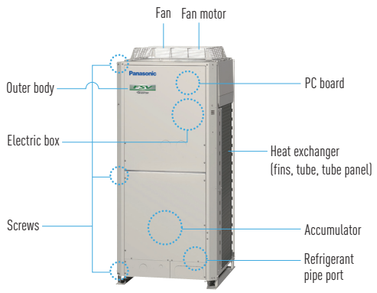
	Power input	
Level 1	100% (Preset)	Possible to change 40-100%
Level 2	70% (Preset)	
Level 3	0% (Always in stop condition)	

Anti-corrosion model available

[On Demand Production]

An anti-corrosion model is available for use in coastal areas and other locations where sea air can easily cause salt damage to outdoor units. As well as the heat exchanger, various other parts are specially treated to provide exceptional durability.

Note: Using this unit does not completely eliminate the possibility of rust developing. For details concerning unit installation and maintenance, please consult with an authorized dealer.



FSV_50Hz_catalog_2012.indd 10-11
12.2.14 1:13:08 PM

2-WAY FSV ME1 Series

HP			8	10	12	14	16	18	20	22	24	26	28
Appearance													
Model name			**U-8ME1H7**	**U-10ME1H7**	**U-12ME1H8**	**U-14ME1H8**	**U-16ME1H8**	**U-18ME1H8**	**U-20ME1H8**	**U-14ME1H8 U-8ME1H7**	**U-14ME1H8 U-10ME1H7**	**U-14ME1H8 U-12ME1H8**	**U-16ME1H8 U-12ME1H8**
Power supply			380/400/415V 3phase/50, 60Hz		380/400/415V 3phase/50Hz								
Capacity	Cooling	kW	22.4	28.0	33.5	40.0	45.0	50.0	56.0	61.5	68.0	73.0	78.5
		BTU/h	76,500	95,600	114,300	136,500	153,600	170,600	191,100	209,900	232,100	249,100	267,900
	Heating	kW	25.0	31.5	37.5	45.0	50.0	56.0	63.0	69.0	76.5	81.5	87.5
		BTU/h	85,300	107,500	128,000	153,600	170,600	191,100	215,000	235,500	261,100	278,200	298,600
EER / COP	Cooling	W/W	4.04	3.60	3.61	3.60	3.36	3.50	3.33	3.75	3.60	3.60	3.47
	Heating	W/W	4.56	4.10	4.10	4.21	3.85	3.86	3.82	4.34	4.09	4.12	3.96
Dimensions	H x W x D	mm	1,758 x 770 x 930	1,758 x 770 x 930	1,758 x 770 x 930	1,758 x 1,000 x 930	1,758 x 1,000 x 930	1,758 x 1,540 x 930	1,758 x 1,540 x 930	1,758 x 1,830 x 930	1,758 x 1,830 x 930	1,758 x 1,830 x 930	1,758 x 1,830 x 930
Net weight		kg	234	234	281	309	309	421	421	543	543	590	590
Electrical ratings	Cooling	Running current A	8.9/8.5/8.2	12.9/12.2/11.8	15.4/14.6/14.1	18.0/17.1/16.5	21.8/20.7/19.9	24.0/22.8/22.0	28.2/26.8/25.8	26.6/25.2/24.3	30.9/29.4/28.3	33.3/31.6/30.5	37.0/35.2/33.9
		Power input kW	5.54	7.78	9.29	11.1	13.4	14.3	16.8	16.4	18.9	20.3	22.6
	Heating	Running current A	8.8/8.4/8.1	12.7/12.1/11.6	15.1/14.4/13.9	17.4/16.5/15.9	21.1/20.1/19.3	24.3/23.1/22.3	27.7/26.3/25.4	25.8/24.5/23.6	30.6/29.1/28	32.5/30.8/29.7	36.2/34.4/33.1
		Power input kW	5.48	7.68	9.15	10.7	13.0	14.5	16.5	15.9	18.7	19.8	22.1
Starting current		A	1/1/1	1/1/1	78/81/85	74/77/80	78/81/85	91/93/96	98/101/103	83/86/88	92/94/96	96/98/101	100/102/105
Air flow rate		m^3/h	8,820	9,180	11,400	12,720	12,720	14,640	16,980	21,480	21,900	24,120	24,120
Refrigerant amount at shipment		kg	6.5	6.8	6.8	8.5	8.5	9.0	9.0	15.0	15.3	15.3	15.3
External static pressure		Pa	80	80	80	80	80	80	80	80	80	80	80
Piping connections	Gas pipe	mm	19.05	22.22	25.40	25.40	28.58	28.58	28.58	28.58	28.58	31.75	31.75
	Liquid pipe	mm	9.52	9.52	12.70	12.70	12.70	15.88	15.88	15.88	15.88	19.05	19.05
	Balance pipe	mm	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35
Ambient temperature operating range			Cooling: -10˚C (DB)~ +46˚C (DB). Heating: -25˚C (WB)~ +20˚C (WB)										
Sound pressure level	Normal mode	dB (A)	56.5	59.0	61.0	62.0	62.0	60.0	63.0	63.0	63.5	64.5	64.5
	Silent mode	dB (A)	53.5	56.0	58.0	59.0	59.0	57.0	60.0	60.0	60.5	61.5	61.5
Sound power level	Normal mode	dB	71.0	73.5	75.5	76.5	76.5	74.5	77.5	77.5	78.0	79.0	79.0

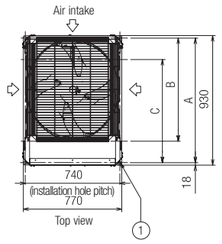
HP			30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
Appearance																		
Model name			**U-16ME1H8 U-14ME1H8**	**U-16ME1H8 U-16ME1H8**	**U-18ME1H8 U-16ME1H8**	**U-20ME1H8 U-16ME1H8**	**U-20ME1H8 U-18ME1H8**	**U-20ME1H8 U-20ME1H8**	**U-16ME1H8 U-14ME1H8 U-12ME1H8**	**U-16ME1H8 U-16ME1H8 U-12ME1H8**	**U-16ME1H8 U-16ME1H8 U-14ME1H8**	**U-16ME1H8 U-16ME1H8 U-16ME1H8**	**U-18ME1H8 U-16ME1H8 U-16ME1H8**	**U-20ME1H8 U-16ME1H8 U-16ME1H8**	**U-20ME1H8 U-18ME1H8 U-16ME1H8**	**U-20ME1H8 U-18ME1H8 U-18ME1H8**	**U-20ME1H8 U-20ME1H8 U-18ME1H8**	**U-20ME1H8 U-20ME1H8 U-20ME1H8**
Power supply			380/400/415V 3phase/50Hz															
Capacity	Cooling	kW	85.0	90.0	96.0	101.0	107.0	113.0	118.0	124.0	130.0	135.0	140.0	145.0	151.0	156.0	162.0	168.0
		BTU/h	290,100	307,200	327,600	344,700	365,200	385,700	402,700	423,200	443,700	460,800	477,800	494,900	515,400	532,400	552,900	573,400
	Heating	kW	95.0	100.0	108.0	113.0	119.0	127.0	132.0	138.0	145.0	150.0	155.0	160.0	169.0	175.0	182.0	189.0
		BTU/h	324,200	341,300	368,600	385,700	406,100	433,400	450,500	471,000	494,900	511,900	529,000	546,100	576,800	597,300	621,200	645,100
EER / COP	Cooling	W/W	3.47	3.35	3.43	3.34	3.44	3.36	3.51	3.43	3.43	3.35	3.41	3.35	3.39	3.44	3.38	3.33
	Heating	W/W	4.03	3.86	3.86	3.83	3.84	3.85	4.04	3.92	3.96	3.86	3.86	3.84	3.85	3.85	3.83	3.81
Dimensions	H x W x D	mm	1,758 x 2,060 x 930	1,758 x 2,060 x 930	1,758 x 2,600 x 930	1,758 x 2,600 x 930	1,758 x 3,140 x 930	1,758 x 3,140 x 930	1,758 x 2,890 x 930	1,758 x 2,890 x 930	1,758 x 3,120 x 930	1,758 x 3,120 x 930	1,758 x 3,660 x 930	1,758 x 3,660 x 930	1,758 x 4,200 x 930	1,758 x 4,740 x 930	1,758 x 4,740 x 930	1,758 x 4,740 x 930
Net weight		kg	618	618	730	730	842	842	899	899	927	927	1039	1039	1151	1263	1263	1263
Electrical ratings	Cooling	Running current A	39.8/37.8/36.5	43.7/41.5/40.0	46.3/44.0/42.4	50.0/47.5/45.8	52.2/49.6/47.8	56.4/53.6/51.7	54.9/52.1/50.3	59.1/56.2/54.2	61.6/58.5/56.4	65.5/62.2/60.0	67.6/64.2/61.9	71.3/67.7/65.3	74.0/70.3/67.7	76.2/72.4/69.8	80.4/76.4/73.6	84.6/80.4/77.5
		Power input kW	24.5	26.9	28.0	30.2	31.1	33.6	33.6	36.2	37.9	40.3	41.1	43.3	44.5	45.4	47.9	50.4
	Heating	Running current A	38.3/36.4/35.1	42.1/40/38.5	46.3/44.0/42.4	48.8/46.4/44.7	52.0/49.4/47.7	55.4/52.6/50.7	53.4/50.8/48.9	57.5/54.6/52.7	59.5/56.5/54.5	63.2/60.1/57.9	66.1/62.8/60.5	68.6/65.2/62.9	73.0/69.3/66.8	76.2/72.4/69.8	79.7/75.8/73	83.3/79.1/76.2
		Power input kW	23.6	25.9	28.0	29.5	31.0	33.0	32.7	35.2	36.6	38.9	40.2	41.7	43.9	45.4	47.5	49.6
Starting current		A	96/98/101	100/102/105	113/114/116	120/122/123	121/123/124	125/127/128	118/119/121	122/122/125	118/119/121	122/122/125	135/134/136	142/142/143	143/144/144	145/146/146	148/149/149	152/153/153
Air flow rate		m^3/h	25,440	25,440	27,360	29,700	31,680	34,020	36,840	36,840	38,160	38,160	40,080	42,420	44,340	46,260	48,600	50,940
Refrigerant amount at shipment		kg	17.0	17.0	17.5	17.5	18.0	18.0	23.8	23.8	25.5	25.5	26.0	26.0	26.5	27.0	27.0	27.0
External static pressure		Pa	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Piping connections	Gas pipe	mm	31.75	31.75	31.75	38.10	38.10	38.10	38.10	38.10	38.10	38.10	38.10	38.10	38.10	38.10	38.10	38.10
	Liquid pipe	mm	19.05	19.05	19.05	19.05	19.05	19.05	19.05	19.05	19.05	19.05	19.05	19.05	19.05	19.05	19.05	19.05
	Balance pipe	mm	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35
Ambient temperature operating range			Cooling: -10˚C (DB)~ +46˚C (DB). Heating: -25˚C (WB)~ +20˚C (WB)															
Sound pressure level	Normal mode	dB (A)	65.0	65.0	64.0	65.5	65.0	66.0	66.5	66.5	67.0	67.0	66.0	67.0	66.5	66.0	67.0	68.0
	Silent mode	dB (A)	62.0	62.0	61.0	62.5	62.0	63.0	63.5	63.5	64.0	64.0	63.0	64.0	63.5	63.0	64.0	65.0
Sound power level	Normal mode	dB	79.5	79.5	78.5	80.0	79.5	80.5	81.0	81.0	81.5	81.5	80.5	81.5	81.0	80.5	81.5	82.5

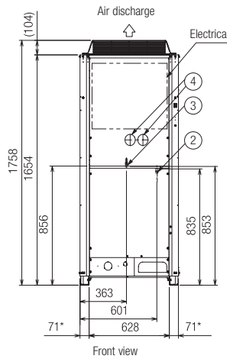
GLOBAL REMARKS	Rated conditions:	Cooling	Heating
	Indoor air temperature	27˚C DB / 19˚C WB	20˚C DB
	Outdoor air temperature	35˚C DB	7˚C DB / 6˚C WB

These specifications subject to change without notice.

8-12 HP

A 894 (installation hole pitch).
The tubing is routed out frpm the front
B 730 (installation hole pitch).
The tubing is routed out frpm the front
C 730 (installation hole pitch).



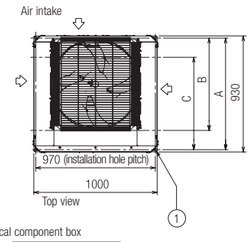


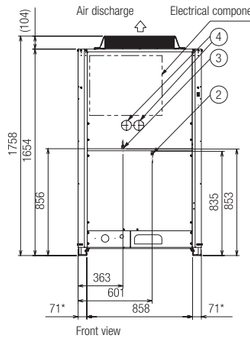
1 Installation holes (8-15x21 elongated holes) anchor bolts M12 or larger.
2 Pressure outlet port (for high pressure: Ø7.94 Scrader-type connection).
3 Pressure outlet port (for low pressure: Ø7.94 Scrader-type connection).
4 Knock-out hole for connecting pressure gauge (optional).
5 Terminal board.
6 Terminal board (for inter-outdoor-unit control wiring).

* Installation fixing bracket, installation side.

14-16 HP

A 894 (installation hole pitch).
The tubing is routed out frpm the front
B 730 (installation hole pitch).
The tubing is routed out frpm the front
C 730 (installation hole pitch).



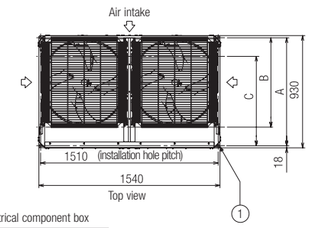


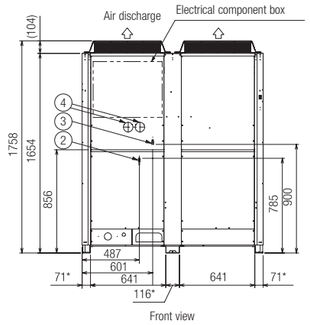
1 Installation holes (8-15x21 elongated holes) anchor bolts M12 or larger.
2 Pressure outlet port (for high pressure: Ø7.94 Scrader-type connection).
3 Pressure outlet port (for low pressure: Ø7.94 Scrader-type connection).
4 Knock-out hole for connecting pressure gauge (optional).
5 Terminal board.
6 Terminal board (for inter-outdoor-unit control wiring).

* Installation fixing bracket, installation side.

18-20 HP

A 894 (installation hole pitch).
The tubing is routed out frpm the front
B 730 (installation hole pitch).
The tubing is routed out frpm the front
C 730 (installation hole pitch).





1 Installation holes (8-15x21 elongated holes) anchor bolts M12 or larger.
2 Pressure outlet port (for high pressure: Ø7.94 Scrader-type connection).
3 Pressure outlet port (for low pressure: Ø7.94 Scrader-type connection).
4 Knock-out hole for connecting pressure gauge (optional).
5 Terminal board.
6 Terminal board (for inter-outdoor-unit control wiring).

* Installation fixing bracket, installation side.

FSV_50Hz_catalog_2012.indd 12-13 12.2.14 1:13:17 PM

2-WAY FSV ME1 Series **HIGH COP SETTING MODEL**

Appearance																				
HP			**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	**36**	**38**	**40**	**42**	**44**	**46**	**48**
Model name			**U-14ME1H8**	**U-16ME1H8**	**U-18ME1H8**	**U-20ME1H8**	**U-14ME1H8 U-8ME1H7**	**U-16ME1H8 U-8ME1H7**	**U-18ME1H8 U-8ME1H7**	**U-16ME1H8 U-16ME1H8**	**U-18ME1H8 U-16ME1H8**	**U-20ME1H8 U-16ME1H8**	**U-20ME1H8 U-18ME1H8**	**U-20ME1H8 U-20ME1H8**	**U-18ME1H8 U-16ME1H8 U-8ME1H7**	**U-16ME1H8 U-16ME1H8 U-16ME1H8**	**U-18ME1H8 U-16ME1H8 U-16ME1H8**	**U-20ME1H8 U-16ME1H8 U-16ME1H8**	**U-20ME1H8 U-18ME1H8 U-16ME1H8**	**U-20ME1H8 U-18ME1H8 U-18ME1H8**	**U-20ME1H8 U-20ME1H8 U-18ME1H8**	**U-20ME1H8 U-20ME1H8 U-20ME1H8**
Power supply			380/400/415V 3phase/50Hz												380/400/415V 3phase/50Hz							
Capacity	Cooling	kW	28.0	33.5	40.0	45.0	50.0	56.0	61.5	68.0	73.0	78.5	85.0	90.0	96.0	101.0	107.0	113.0	118.0	124.0	130.0	135.0
		BTU/h	95,600	114,300	136,500	153,600	170,600	191,100	209,900	232,100	249,100	267,900	290,100	307,200	327,600	344,700	365,200	385,700	402,700	423,200	443,700	460,800
	Heating	kW	31.5	37.5	45.0	50.0	56.0	63.0	69.0	76.5	81.5	87.5	95.0	100.0	108.0	113.0	119.0	127.0	132.0	138.0	145.0	150.0
		BTU/h	107,500	128,000	153,600	170,600	191,100	215,000	235,500	261,100	278,200	298,600	324,200	341,300	368,600	385,700	406,100	433,400	450,500	471,000	494,900	511,900
EER / COP	Cooling	W/W	4.06	4.07	4.01	3.88	4.07	4.06	3.97	4.07	4.01	3.96	3.94	3.88	4.09	4.07	4.08	4.04	3.96	3.97	3.92	3.88
	Heating	W/W	4.45	4.45	4.41	4.39	4.52	4.50	4.39	4.45	4.38	4.42	4.40	4.41	4.54	4.45	4.44	4.47	4.40	4.42	4.41	4.40
Dimensions	H x W x D	mm	1,758 x 1,000 x 930	1,758 x 1,000 x 930	1,758 x 1,540 x 930	1,758 x 1,540 x 930	1,758 x 1,830 x 930	1,758 x 1,830 x 930	1,758 x 2,370 x 930	1,758 x 2,060 x 930	1,780 x 2,600 x 930	1,758 x 2,600 x 930	1,758 x 3,140 x 930	1,758 x 3,140 x 930	1,758 x 3,430 x 930	1,758 x 3,120 x 930	1,758 x 3,660 x 930	1,758 x 3,660 x 930	1,758 x 4,200 x 930	1,758 x 4,740 x 930	1,758 x 4,740 x 930	1,758 x 4,740 x 930
Net weight		kg	309	309	421	421	543	543	655	618	730	730	842	842	964	927	1039	1039	1151	1263	1263	1263
Electrical ratings	Cooling, Running current	A	11.2/10.7/10.3	13.4/12.7/12.2	16.3/15.4/14.9	18.9/17.9/17.3	19.9/18.9/18.2	22.4/21.2/20.5	25.2/23.9/23.0	27.1/25.8/24.8	29.6/28.1/27.1	32.2/30.6/29.5	35.2/33.4/32.2	37.8/35.9/34.6	38.1/36.2/34.9	40.3/38.3/36.9	42.6/40.5/39.0	45.5/43.3/41.7	48.5/46.1/44.4	50.8/48.3/46.5	54.1/51.4/49.5	56.7/53.8/51.9
	Cooling, Power input	kW	6.90	8.23	9.98	11.6	12.3	13.8	15.5	16.7	18.2	19.8	21.6	23.2	23.5	24.8	26.2	28.0	29.8	31.2	33.2	34.8
	Heating, Running current	A	11.5/10.9/10.5	13.7/13/12.5	16.6/15.8/15.2	18.6/17.6/17.0	20.1/19.1/18.4	22.7/21.5/20.8	25.5/24.2/23.3	27.9/26.6/26.5	30.3/28.7/27.7	32.2/30.6/29.5	35.2/33.4/32.2	37/35.1/33.8	38.6/36.7/35.4	41.3/39.2/37.8	43.6/41.4/39.9	46.2/43.9/42.3	48.8/46.4/44.7	50.8/48.3/46.5	53.6/50.9/49.1	55.5/52.8/50.8
	Heating, Power input	kW	7.08	8.43	10.2	11.4	12.4	14.0	15.7	17.2	18.6	19.8	21.6	22.7	23.8	25.4	26.8	28.4	30.0	31.2	32.9	34.1
Starting current		A	74/77/80	78/81/85	89/92/95	95/98/101	83/86/88	87/90/93	98/101/103	92/94/98	103/105/108	109/111/114	112/114/116	114/116/118	112/113/116	105/107/110	116/118/120	122/124/126	125/127/129	128/130/131	130/131/133	133/134/136
Air flow rate		m³/h	12,720	12,720	14,640	16,980	21,540	21,540	23,460	25,440	27,360	29,700	31,620	33,960	36,180	38,160	40,080	42,420	44,340	46,260	48,600	50,940
External static pressure		Pa	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Refrigerant amount at shipment		kg	8.5	8.5	9.0	9.0	15.0	15.0	15.5	17.0	17.5	17.5	18.0	18.0	24.0	25.5	26.0	26.0	26.5	27.0	27.0	27.0
Piping connections	Gas pipe	mm	22.22	25.40	25.40	28.58	28.58	28.58	28.58	28.58	31.75	31.75	31.75	31.75	31.75	38.10	38.10	38.10	38.10	38.10	38.10	38.10
	Liquid pipe	mm	9.52	12.70	12.70	12.70	15.88	15.88	15.88	15.88	19.05	19.05	19.05	19.05	19.05	19.05	19.05	19.05	19.05	19.05	19.05	19.05
	Balance pipe	mm	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35
Ambient temperature operating range			Cooling: -10˚C (DB)~ +43˚C (DB). Heating: -25˚C (WB)~ +20˚C (WB)										Cooling: -10˚C (DB)~ +43˚C (DB). Heating: -25˚C (WB)~ +20˚C (WB)									
Sound pressure level	Normal mode	dBA	62.0	62.0	60.0	63.0	63.0	63.0	61.5	65.0	64.0	65.5	65.0	66.0	64.5	66.5	66.0	67.0	66.5	66.0	67.0	67.5
	Silent mode	dBA	59.0	59.0	57.0	60.0	60.0	60.0	58.5	62.0	61.0	62.5	62.0	63.0	61.5	63.5	63.0	64.0	63.5	63.0	64.0	64.5
Sound power level	Normal mode	dB	76.5	76.5	74.5	77.5	77.5	77.5	76.0	79.5	78.5	80.0	79.5	80.5	79.0	81.0	80.5	81.5	81.0	80.5	81.5	82.0

GLOBAL REMARKS	Rated conditions:	Cooling	Heating
	Indoor air temperature	27˚C DB / 19˚C WB	20˚C DB
	Outdoor air temperature	35˚C DB	7˚C DB / 6˚C WB

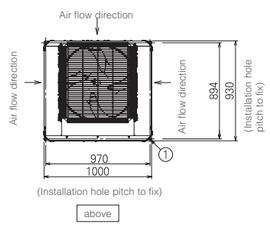
These specifications subject to change without notice.

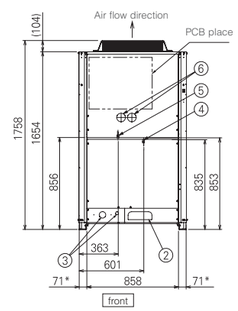
10-12 HP **HIGH COP SETTING**

1 Installation anchoring hole (4-15x21 elongated hole) Anchor bolt: M12 more
2 Refrigerant piping port (front / knockout hole)
3 Electric wiring port (front /Ø60,Ø28 knockout hole conduit connection)
4 Mounting hole for manifold gauge (high-pressure outlet port / Ø7.94 dia connector)
5 Mounting hole for manifold gauge (low-pressure outlet port / Ø7.94 dia connector)
6 Knockout hole to fix manifold gauge (field supply)

Distribution joint kit
For indoor units
• CZ-P160BK2 (Capacity after distribution: 22.4 kW or lower)
• CZ-P680BK2 (Capacity after distribution: Over 22.4 kW to 68.0 kW)
• CZ-P1350BK2 (Capacity agter distribution: Over 68.0 kW to 135.0 kW)
For outdoor units
• CZ-P680PJ2 (Capacity after distribution: 68.0 kW or lower)
• CZ-P1350PJ2 (Capacity after distribution: Over 68.0 kW to 135.0 kW

*Installation surface



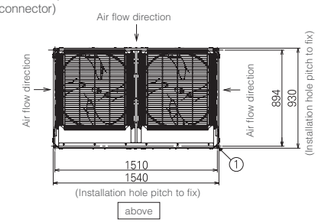


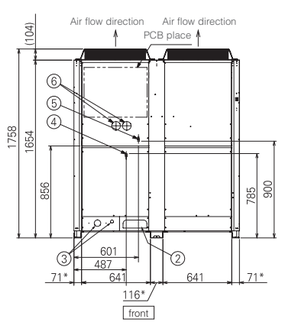
14-16 HP **HIGH COP SETTING**

1 Installation anchoring hole (4-15x21 elongated hole) Anchor bolt: M12 more
2 Refrigerant piping port (front / knockout hole)
3 Electric wiring port (front /Ø60,Ø28 knockout hole conduit connection)
4 Mounting hole for manifold gauge (high-pressure outlet port / Ø7.94 dia connector)
5 Mounting hole for manifold gauge (low-pressure outlet port / Ø7.94 dia connector)
6 Knockout hole to fix manifold gauge (field supply)

Distribution joint kit
For indoor units
• CZ-P160BK2 (Capacity after distribution: 22.4 kW or lower)
• CZ-P680BK2 (Capacity after distribution: Over 22.4 kW to 68.0 kW)
• CZ-P1350BK2 (Capacity agter distribution: Over 68.0 kW to 135.0 kW)
For outdoor units
• CZ-P680PJ2 (Capacity after distribution: 68.0 kW or lower)
• CZ-P1350PJ2 (Capacity after distribution: Over 68.0 kW to 135.0 kW

*Installation surface



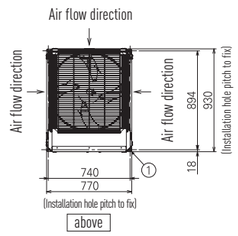


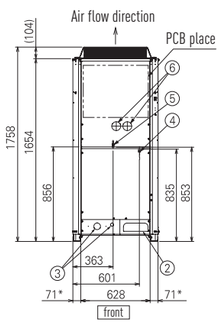
8 HP **Using with 18, 20, 22, 34 HP module**

1 Installation anchoring hole (4-15x21 elongated hole) Anchor bolt: M12 more
2 Refrigerant piping port (front / knockout hole)
3 Electric wiring port (front /Ø60,Ø28 knockout hole conduit connection)
4 Mounting hole for manifold gauge (high-pressure outlet port / Ø7.94 dia connector)
5 Mounting hole for manifold gauge (low-pressure outlet port / Ø7.94 dia connector)
6 Knockout hole to fix manifold gauge (field supply)

Distribution joint kit
For indoor units
• CZ-P160BK2 (Capacity after distribution: 22.4 kW or lower)
• CZ-P680BK2 (Capacity after distribution: Over 22.4 kW to 68.0 kW)
• CZ-P1350BK2 (Capacity agter distribution: Over 68.0 kW to 135.0 kW)
For outdoor units
• CZ-P680PJ2 (Capacity after distribution: 68.0 kW or lower)
• CZ-P1350PJ2 (Capacity after distribution: Over 68.0 kW to 135.0 kW

*Installation surface

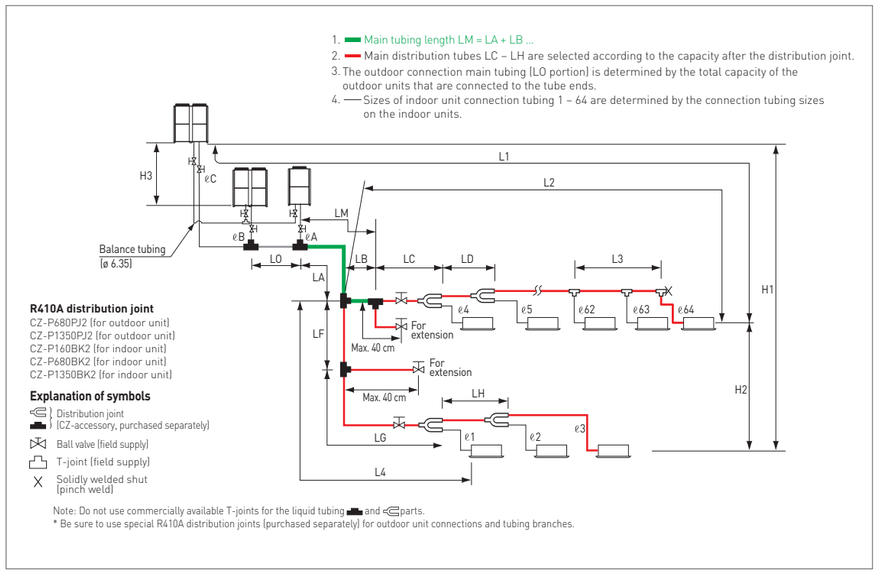




FSV_50Hz_catalog_2012.indd 14-15 12.2.14 1:13:35 PM

Piping design

Select the installation location so that the length and size of refrigerant tubing are within the allowable range shown in the figure below.



Ranges that Apply to Refrigerant Tubing Lengths and to Differences in Installation Heights

Items	Mark	Contents		Length (m)
Allowable tubing length	L1	Max. tubing length	Actual length	≤180
			Equivalent length	≤200
	Δ L (L2 _L4)	Difference between max. length and min. length from the No.1 distribution joint		≤50*5
	LM	Max. length of main tubing (at max. diameter)		<180*3
	ℓ1, ℓ2... ℓ64	Max. length of each distribution tube		≤30
	L1+ ℓ1+ ℓ2... ℓ63+ ℓA+ ℓB+LF+LG+LH	Total max. tubing length including length of each distribution tube (only liquid tubing)		≤1000
	ℓA, ℓB+LO, ℓC+LO	Maximum tubing length from outdoor's 1st distribution joint to each outdoor unit		≤10
Allowable elevation difference	H1	When outdoor unit is installed higher than indoor unit		≤50
		When outdoor unit is installed lower than indoor unit		≤40
	H2	Max. difference between indoor units		≤15*6
	H3	Max. difference between outdoor units		≤4
Allowable length of joint tubing	L3	T-joint tubing (field-supply); Max. tubing length between the first T-joint and solidly welded-shut end point		≤2

L = Length, H = Height
NOTE
1: The outdoor connection main tubing (LO portion) is determined by the total capacity of the outdoor units that are connected to the tube ends.
2: If the longest tubing length (L1) exceeds 90 m (equivalent length), increase the sizes of the main tubes (LM) by 1 rank for gas tubes and liquid tubes. (Use a field supply reducer.) (Select the tube size from the table of main tube sizes on the following page (LA table), and from the table of refrigerant tubing sizes on the bottom-right of this page.)
3: If the longest main tube length (LM) exceeds 50 m, increase the main tube size at the portion before 50 m by 1 rank for the gas tubes. (Use a field supply reducer.) Determine the length less than the limitation of allowable maximum tubing length. (For the portion that exceeds 50 m, set based on the main tube sizes (LA) listed in the table on the following page.)
4: If the size of the existing tubing is already larger than the standard tubing size, it is not necessary to further increase the size.
* If the existing tubing is used, and the amount of on-site refrigerant charge exceeds the value listed below, then change the size of the tubing to reduce the amount of refrigerant.
Total amount of refrigerant for the system with 1 outdoor unit: 50 kg
Total amount of refrigerant for the system with 2 outdoor units: 80 kg
Total amount of refrigerant for the system with 3 outdoor units: 100 kg
5: When the tubing length exceeds 40m, increase a longer liquid or gas tubing by 1 rank.
6: If the tubing length exceeds 500m, the formula is 15 x (2 - all tubing length/500). Determine the length less than the limitation of allowable maximum tubing length.

Necessary Amount of Additional Refrigerant Charge Per Outdoor Unit

U-8ME1H7	U-10ME1H7	U-12ME1H8	U-14ME1H8	U-16ME1H8	U-18ME1H8	U-20ME1H8
5.9 kg	6.6 kg	6.6 kg	7.8 kg	7.8 kg	8.5 kg	8.5 kg

System Limitations

Max. No. allowable connected outdoor units	3*2
Max. capacity allowable connected outdoor units	168 kW (60 hp)
Max. connectable indoor units	64*1
Max. allowable indoor/outdoor capacity ratio	50-200 %*3

*1: In the case of 24 hp (type 68.0 kW) or smaller units, the number is limited by the total capacity of the connected indoor units.
*2: Up to 3 units can be connected if the system has been extended.
*3: It is strongly recommended that you choose the unit so the load can become between 50 and 130 %.

Additional refrigerant charge

Liquid tubing size	Amount of refrigerant charge/m (g/m)
ø6.35	26
ø9.52	56
ø12.7	128
ø15.88	185
ø19.05	259
ø22.22	366
ø25.4	490

Refrigerant tubing (Existing tubing can be used.)

Tubing size (mm)			
Material O		Material 1/2H • H	
ø6.35	t 0.8	ø22.22	t 1.0
ø9.52	t 0.8	ø25.4	t 1.0
ø12.7	t 0.8	ø28.58	t 1.0
ø15.88	t 1.0	ø31.75	t 1.0
ø19.05	t 1.2	ø38.1	over t 1.35
		ø41.28	over t 1.45

FSV_50Hz_catalog_2012.indd 16-17
12.2.14 1:13:47 PM

Refrigerant Branch Pipes (optional accessories) for 2-Way ME1 Series

Optional Distribution Joint Kits

See the installation instructions packaged with the distribution joint kit for the installation procedure.

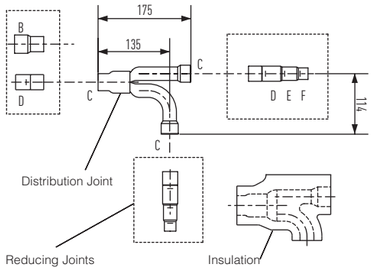
Model name	Cooling capacity after distribution	Remarks
1. CZ-P680PJ2	68.0 kW or less	For outdoor unit
2. CZ-P1350PJ2	168.0 kW or less	For outdoor unit
3. CZ-P160BK2	22.4 kW or less	For indoor unit
4. CZ-P680BK2	68.0 kW or less	For indoor unit
5. CZ-P1350BK2	168.0 kW or less	For indoor unit

Tubing size (with thermal insulation)

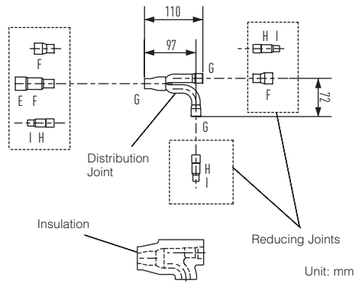
1. CZ-P680PJ2

For outdoor unit (Capacity after distribution joint is 68.0 kW or less.)

GAS TUBING



LIQUID TUBING

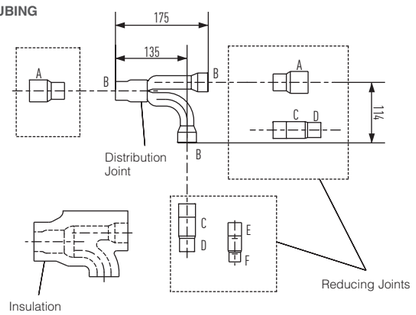


Size of connection point on each part (Shown are inside diameters of tubing)									
Size	Part A	Part B	Part C	Part D	Part E	Part F	Part G	Part H	Part I
Dimension	Ø38.10	Ø31.75	Ø28.58	Ø25.40	Ø22.22	Ø19.05	Ø15.88	Ø12.70	Ø9.52

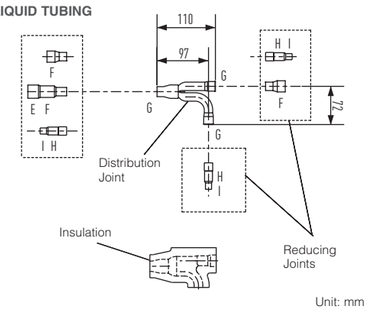
2. CZ-P1350PJ2

For outdoor unit (Capacity after distribution joint is greater than 68.0 kW and no more than 168.0 kW.)

GAS TUBING



LIQUID TUBING

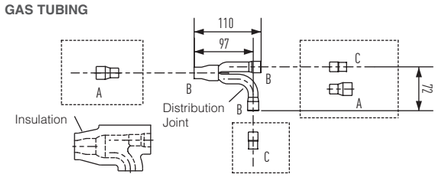


Size of connection point on each part (Shown are inside diameters of tubing)									
Size	Part A	Part B	Part C	Part D	Part E	Part F	Part G	Part H	Part I
Dimension	Ø38.10	Ø31.75	Ø28.58	Ø25.40	Ø22.22	Ø19.05	Ø15.88	Ø12.70	Ø9.52

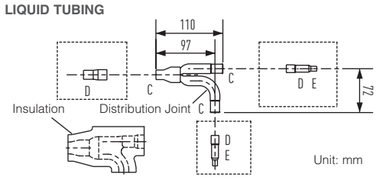
3. CZ-P160BK2

Use: For indoor unit (Capacity after distribution joint is 22.4 kW or less.)

GAS TUBING



LIQUID TUBING

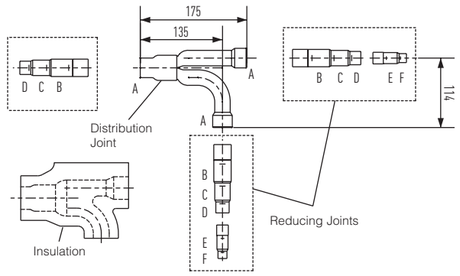


Size of connection point on each part (Shown are inside diameters of tubing)					
Size	Part A	Part B	Part C	Part D	Part E
Dimension	Ø19.05	Ø15.88	Ø12.70	Ø9.52	Ø6.35

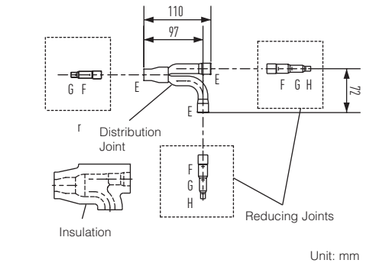
4. CZ-P680BK2

Use: For indoor unit (Capacity after distribution joint is greater than 22.4 kW and no more than 68.0 kW.)

GAS TUBING



LIQUID TUBING

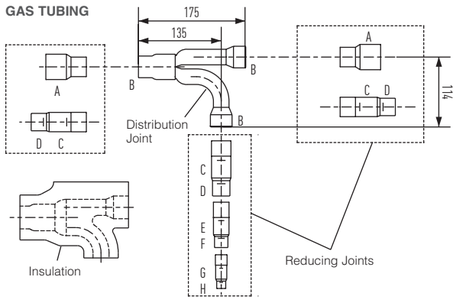


Size of connection point on each part (Shown are inside diameters of tubing)								
Size	Part A	Part B	Part C	Part D	Part E	Part F	Part G	Part H
Dimension	Ø28.58	Ø25.40	Ø22.22	Ø19.05	Ø15.88	Ø12.70	Ø9.52	Ø6.35

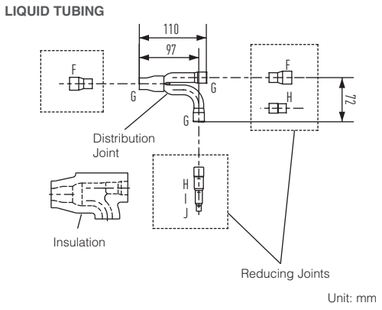
5. CZ-P1350BK2

Use: For indoor unit (Capacity after distribution joint is greater than 68.0 kW and no more than 168.0 kW.)

GAS TUBING



LIQUID TUBING



Size of connection point on each part (Shown are inside diameters of tubing)										
Size	Part A	Part B	Part C	Part D	Part E	Part F	Part G	Part H	Part I	Part J
Dimension	Ø38.10	Ø31.75	Ø28.58	Ø25.40	Ø22.22	Ø19.05	Ø15.88	Ø12.70	Ø9.52	Ø6.35

FSV_50Hz_catalog_2012.indd 18-19 12.2.14 1:13:48 PM

INVERTER

For small-scale commercial and residential use

2-WAY mini-FSV LE1 Series

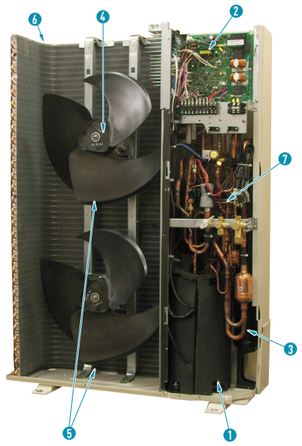
COOLING OR HEATING TYPE 1 PHASE
COOLING OR HEATING TYPE 3-PHASE

Panasonic 2-way mini FSV, the 2-pipe heat pump is specifically designed for the most demanding applications. mini FSV is available in 3 sizes with cooling capacities ranges from 4 HP to 6 HP and connectable up to 9 indoor units (applicable for 6 HP).

- Top-class EER:4.30 / COP:4.62 (In case of 4HP)
- Cooling operation is possible when outdoor temperature as high as 46°C
- Maximum number of connectable indoor units : 4HP:6 5HP:8 6HP:9
- Diversity ratio 50-130%
- DC inverter technology combined with R410A for excellent efficiency
- Piping length:120m (Total piping length:150m)
- System difference of elevation:50m /40m (outdoor UP/DOWN)
- Demand response ready (Peak cut)
- Difference in elevation between indoor units:15m
- Cooling operation is possible when outdoor temperature as low as -10°C
- Heating operation is possible when outdoor temperature as low as -20°C
- Compact outdoor unit 1,330 x 940 x 340 mm
- One ampere starting current
- Full range of indoor units and control options
- Auto restart from outdoor unit

Energy-saving concept.

The use of energy saving design for the structure of fans, fan motors, compressors and heat exchangers resulted in high COP value which ranked as one the top class in the industry. In addition, use of highly efficient R410A refrigerant reduces CO2 emission and lowers operating costs.



1 **Panasonic Inverter Compressor**	Large-capacity inverter compressor has been adopted. The inverter compressor is superior in performance with improved partial-load capacity.
2 **Printed Circuit Board**	The number of PCB was reduced from 3 into 2 pieces to improve maintenance work.
3 **Accumulator**	Bigger accumulator has been adopted to maintain compressor reliability because of the increased refrigerant quantity, which required an extended max piping length. Furthermore, the refrigerant pressure loss was reduced, which contributes to an improved operating efficiency.
4 **DC Fan Motor**	Checking load and outside temperature, the DC motor is controlled for optimum air volume.
5 **Newly designed fan**	The newly designed fan blades have been realized to inhibit air turbulence and to increase efficiency. As fan diameter has been increased to 490mm, the air volume has been increased by 12% whilst maintaining a low sound level.
6 **Heat Exchanger & Copper Tubes**	The heat exchanger size and the copper tube sizes in the heat exchanger have been redesigned to increase efficiency.
7 **Oil Separator**	A new centrifugal separator has been adopted to improves oil separation efficiency and reduce refrigerant pressure loss.

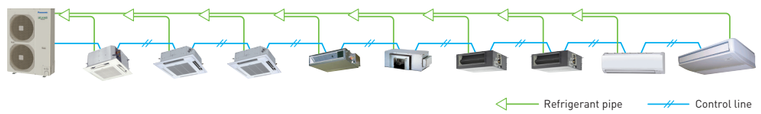
FSV_50Hz_catalog_2012.indd 20-21 12.2.14 1:13:54 PM

2-WAY mini-FSV LE1 Series

System example

An expansion from Panasonic VRF line up, the mini FSV is compatible with the same indoor units and controls as the rest of the FSV range.

4 - 6 HP



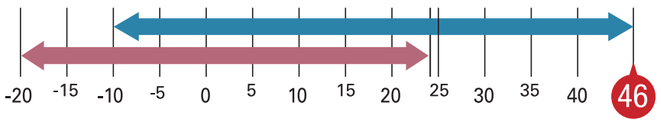
SYSTEM / HP	4 HP	5 HP	6 HP
Connectable Indoor Unit	**6**	**8**	**9**

Wide operating range

- Cooling operation is possible when outdoor temperature as low as -10°C
- Cooling operation is possible when outdoor temperature as high as 46°C
- Heating operation is possible when outdoor temperature as low as -20°C

The remote controller temperature setting offers a range from 16°C to 30°C.

4 - 6 HP



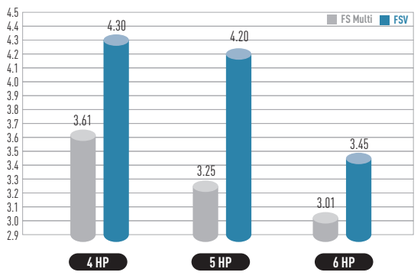
Cooling: -10°C DB ~ 46°C DB
Heating: -20°C WB ~ 24°C WB

* When you specify and design the products, please refer capacity ratio in the data book.

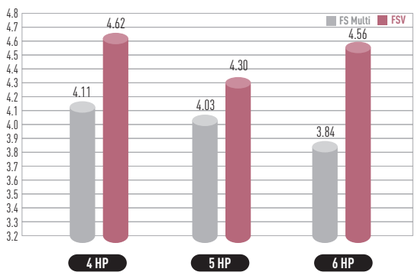
Improved energy saving

The operation efficiency has been improved using highly efficient R410A refrigerant, new DC Inverter compressor, new DC motor and new design of heat exchanger.

Cooling

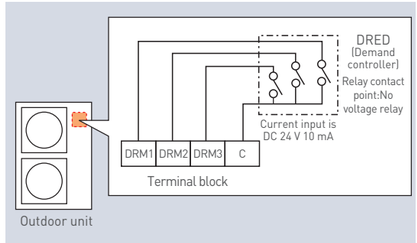


Heating



Demand response

Featuring inverter control technology, FSV systems are demand response ready. With this control, power consumption at times of peak load can be set in three steps to deliver optimum performance. This helps to reduce annual power consumption with minimal loss in comfort.



NEW

Simple demand response with the CZ-CAPDC3

Demand control terminal is available to control 0-50-75-100% of capacities.

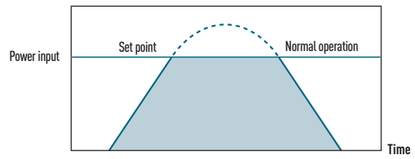
* CZ-CAPDC3 is required as an option
* Complies with AS 4755 of Australia

Demand Response Signal	Power Input
DRM 1	0%
DRM 2	50%
DRM 3	75%

Flexible Demand Response with the CZ-CAPDC2*1

Setting is possible as 0% or in the range from 40 to 100% (in steps of 5%). At the time of shipping, setting has been done to the three steps of 0%, 70% and 100%.

*1 Para I/O unit for outdoor unit (CZ-CAPDC2) is required to input the signal.



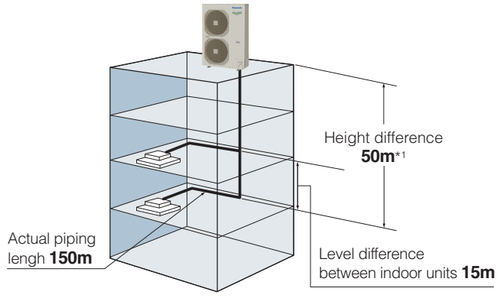
	Power input	
Level 1	100% (Preset)	Possible to change 40-100%
Level 2	70% (Preset)	
Level 3	0% (Always in stop condition)	

FSV_50Hz_catalog_2012.indd 22-23
12.2.14 1:13:57 PM

2-WAY mini-FSV LE1 Series

Increased piping length for greater design flexibility

Adaptable to various building types and sizes
Actual piping length : 120m
(equivalent piping length 140m)
Max. piping length : 150m

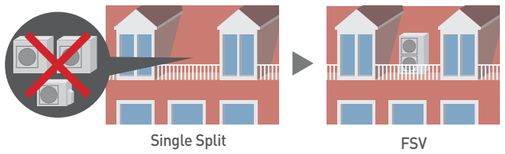


*1: 40 m if the outdoor unit is below the indoor unit.

Max. total length:150m

Compact & flexible design

The slim and lightweight design can be installed in various places.



Quiet mode

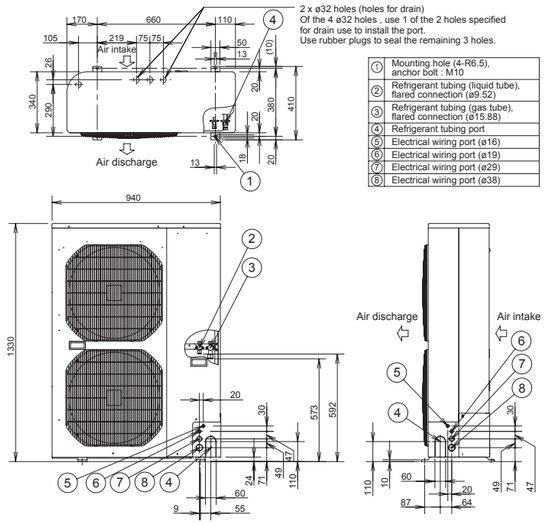
5dB can be reduced by setting.
External input signal is also available.

HP			4 HP		5 HP		6 HP	
Model name			**U-4LE1H4**	**U-4LE1H7**	**U-5LE1H4**	**U-5LE1H7**	**U-6LE1H4**	**U-6LE1H7**
Power supply		(50HZ)	220V/230V/240V/-1phase	380V/400V/415V/-3phase	220V/230V/240V/-1phase	380V/400V/415V/-3phase	220V/230V/240V/-1phase	380V/400V/415V/-3phase
Capacity	Cooling	kW	12.10	12.10	14.00	14.00	15.50	15.50
		BTU/h	41,300	41,300	47,800	47,800	52,900	52,900
	Heating	kW	12.50	12.50	16.00	16.00	18.00	18.00
		BTU/h	42,700	42,700	54,600	54,600	61,400	61,400
EER/COP	Cooling	W/W	4.30	4.30	4.20	4.20	3.45	3.45
	Heating	W/W	4.62	4.62	4.30	4.30	3.95	3.95
Dimensions (H/W/D)		mm	1,330 x 940 x 340 (410*)	1,330 x 940 x 340 (410*)	1,330 x 940 x 340 (410*)	1,330 x 940 x 340 (410*)	1,330 x 940 x 340 (410*)	1,330 x 940 x 340 (410*)
Net weight		kg	104	103	104	103	104	103
Electrical ratings	Cooling	Running current A	13.9/13.3/12.7	4.9/4.7/4.5	16.3/15.6/14.9	5.7/5.4/5.2	21.5/20.5/19.7	7.5/7.1/6.9
		Power input kW	2.81	2.81	3.33	3.33	4.49	4.49
	Heating	Running current A	13.2/12.7/12.1	4.7/4.5/4.3	18.0/17.2/16.5	6.3/6.0/5.8	21.6/20.7/19.8	7.5/7.2/6.9
		Power input kW	2.71	2.71	3.72	3.72	4.56	4.56
Starting current		A	1/1/1	1/1/1	1/1/1	1/1/1	1/1/1	1/1/1
Air flow rate		m^3/min	95	95	104	104	104	104
Refrigerant amount at shipment		kg	R410A 3.50	R410A 3.50	R410A 3.50	R410A 3.50	R410A 3.50	R410A 3.50
Piping connection	Gas pipe	mm	15.88	15.88	15.88	15.88	19.05	19.05
	Liquid pipe	mm	9.52	9.52	9.52	9.52	9.52	9.52
Ambient temperature operating range			Cooling: -10˚CDB~+46˚CDB, Heating: -20˚CDB~+24˚CDB	Cooling: -10˚CDB~+46˚CDB, Heating: -20˚CDB~+24˚CDB	Cooling: -10˚CDB~+46˚CDB, Heating: -20˚CDB~+24˚CDB	Cooling: -10˚CDB~+46˚CDB, Heating: -20˚CDB~+24˚CDB	Cooling: -10˚CDB~+46˚CDB, Heating: -20˚CDB~+24˚CDB	Cooling: -10˚CDB~+46˚CDB, Heating: -20˚CDB~+24˚CDB
Sound pressure level	Normal mode	dB(A)	50/52: Cooling/Heating	52/55: Cooling/Heating	51/53: Cooling/Heating	51/53: Cooling/Heating	52/55: Cooling/Heating	52/55: Cooling/Heating
	Silent mode	dB(A)	47/49: Cooling/Heating	47/49: Cooling/Heating	48/50: Cooling/Heating	48/50: Cooling/Heating	49/52: Cooling/Heating	49/52: Cooling/Heating
Sound power level	Normal mode	dB(A)	68/70: Cooling/Heating	68/70: Cooling/Heating	69/71: Cooling/Heating	69/71: Cooling/Heating	70/73: Cooling/Heating	70/73: Cooling/Heating

GLOBAL REMARKS	Rated conditions:	Cooling	Heating
	Indoor air temperature	27˚C DB / 19˚C WB	20˚C DB
	Outdoor air temperature	35˚C DB	7˚C DB / 6˚C WB

* As a foot print.

Dimensions



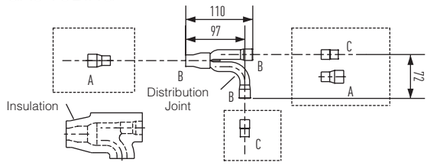
FSV_50Hz_catalog_2012.indd 24-25 12.2.14 1:14:01 PM

Distribution Joint Kits

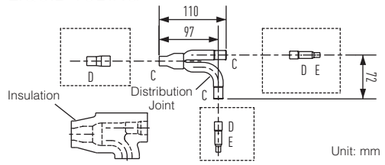
CZ-P160BK2

Use: For indoor unit (Capacity after distribution joint is 20.1 kW or less.)

GAS TUBING



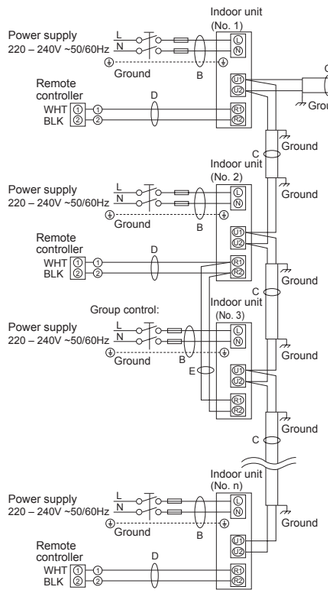
LIQUID TUBING

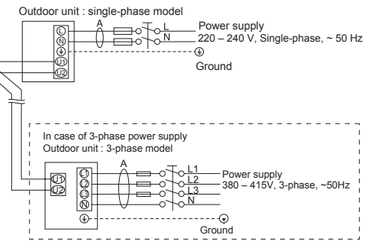


Unit: mm

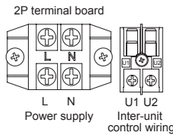
Size of connection point on each part (Shown are inside diameters of tubing)					
Size	Part A	Part B	Part C	Part D	Part E
Dimension	Ø19.05	Ø15.88	Ø12.70	Ø9.52	Ø6.35

Wiring System Diagrams

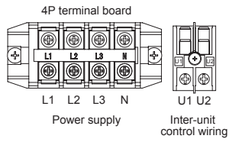




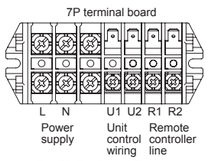
Outdoor unit : single-phase model



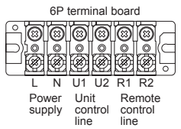
Outdoor unit : 3-phase model



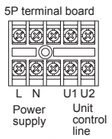
Indoor unit



T1, F1, E1, D1, L1 Types



U1, Y1, M1, P1, R1 Types

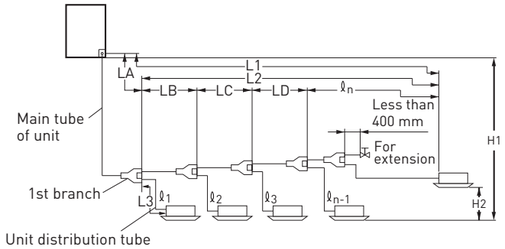


K1 Type

Fig. 2-1

Piping design

Select the installation location so that the length and size of refrigerant tubing are within the allowable range shown in the figure below.



Distribution joint (CZ-P160BK2)
Ball valve (field supply)

Ranges that Apply to Refrigerant Tubing Lengths and to Differences in Installation Heights

Items	Marks	Contents		Length (m)
Allowable tubing length	L1	Max. tubing length	Actual length	120
			Equivalent length	140
	ΔL (L2 – L3)	Difference between max. length and min. length from the No.1 distribution joint		40
	ℓ1, ℓ2...ℓn	Max. length of each distribution tube		30
	ℓ1, ℓ2...ℓn-1+L1	Total max. tubing length including length of each distribution tube (only narrow tubing)		150
Allowable elevation difference	H1	When outdoor unit is installed higher than indoor unit		50
		When outdoor unit is installed lower than indoor unit		40
	H2	Max. difference between indoor units		15

L = Length, H = Height

Tubing Size

Main Tubing Size (LA)

	12.1 kW	14.0 kW	15.5 kW
System kilowatts	12.1	14.0	15.5
Gas tubing (mm)	ø15.88		ø19.05
Liquid tubing (mm)	ø9.52		

Note :If the system consists of only one indoor unit with an outdoor 6HP, the main tube of the unit (LA) should be ø19.05. Convert ø19.05 to ø15.88 using a reducer (field supply) close to the indoor unit and then make the connection.

Main Tubing Size After Distribution (LB, LC...)

Total capacity after distribution	Below kW	7.1	12.1	14.0	15.5
	Over kW	–	7.1		
Tubing size	Gas tubing (mm)	ø12.7	ø15.88		ø19.05
	Liquid tubing (mm)	ø9.52	ø9.52		

Unit: mm, kW = kilowatts

Note :In case the total capacity of connected indoor units exceeds the total capacity of the outdoor units, select the main tubing size for the total capacity of the outdoor units.

System Limitations

Outdoor units	12.1 kW	14.0 kW	15.5 kW
Number of max. connectable indoor units	6	8	9
Max. allowable indoor/ outdoor capacity ratio	50 – 130%		

kW = kilowatts

Indoor Unit Tubing Connection (ℓ1, ℓ2...ℓn–1)

Indoor unite type	22	28	36	45	56	73	90	106	140	160
Gas tubing (mm)	ø12.7					ø15.88				
Liquid tubing (mm)	ø6.35					ø9.52				

Unit: mm

FSV_50Hz_catalog_2012.indd 26-27
12.2.14 1:14:01 PM

INVERTER

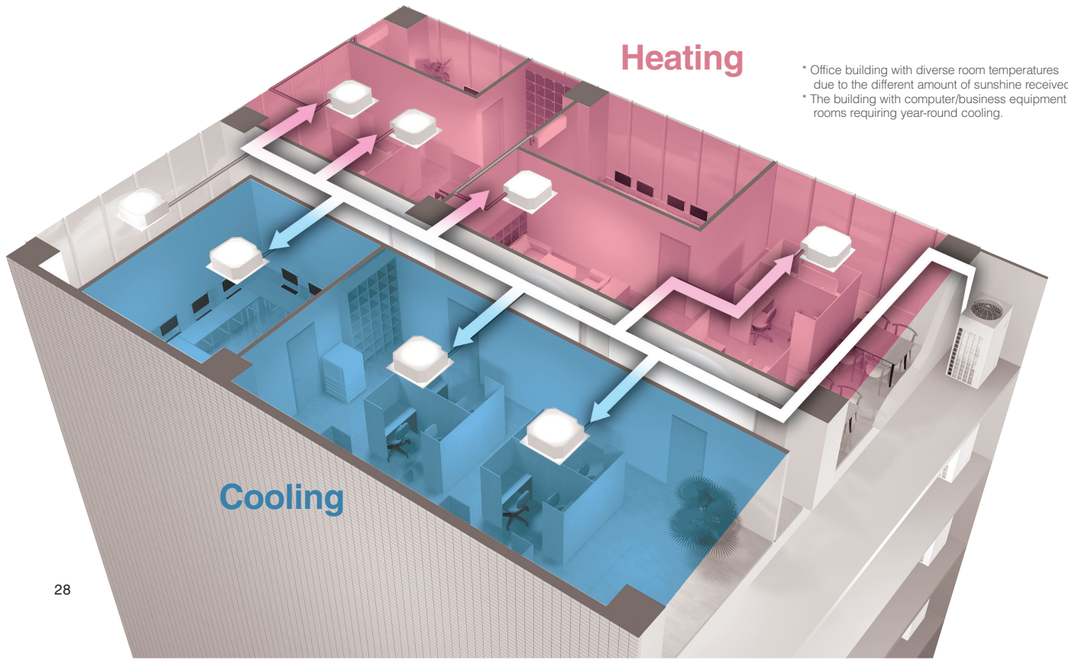
Simultaneous heating and cooling VRF system

3-WAY FSV MF1 Series

Heat Recovery Type

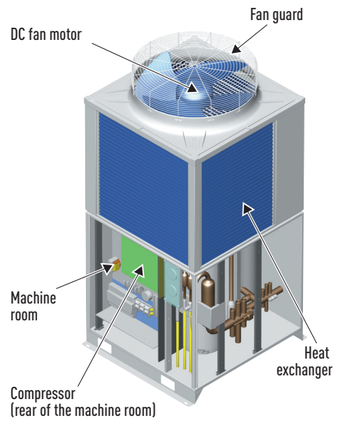
New 3-WAY FSV MF1 series enables simultaneous heating and cooling operation

- Conforms to COP 3.94 as one of the top class in the industry average
- Simultaneous cooling or heating operation for up to 40 indoor units
- Space saving installation - one of the top class in the industry
- Rotation operation function and back-up operation function provided



* Office building with diverse room temperatures due to the different amount of sunshine received.
* The building with computer/business equipment rooms requiring year-round cooling.

The advanced technology



Standardization of outdoor units to one compact casing size	5 types of outdoor units with different capacities have been standardized to one compact casing size. This enables a neat installation finish with superb space saving when rows of units are installed together.
Improved operation efficiency	In addition to the development of a new DC fan motor with high output and high efficiency, the output loss has been reduced by reducing the resistance of the fan guard. This contributes widely to COP increase.
The constant-speed compressor adopts a high-performance internal high-pressure scroll	In comparison with the conventional low-pressure scroll, the oil behaviour is stabilized, COP is improved, and the reliability is also improved.
Improvement of the heat exchanger	Hairpin heat exchangers with a diameter of 7 mm increase heat transfer co-efficient.
Relayout of structural parts	Noise level has been reduced by positioning the compressors in a special machine room at the bottom.
Close side-by-side installation is possible	The mounting fittings for the outdoor unit have been changed to the front and the rear, so that the units can be installed side by side with just 100 mm between units and reduction of the installation space has been realized.

FSV_50Hz_catalog_2012.indd 28-29 12.2.14 1:14:16 PM

Simultaneous heating and cooling VRF system

3-WAY FSV MF1 Series

Fully-automatic simultaneous cooling/heating operation and heat recovery

3-Way MF1 Series enables simultaneous heating and cooling operation by each solenoid valve kit.

CZ-P56HR2
Up to 56 indoor units

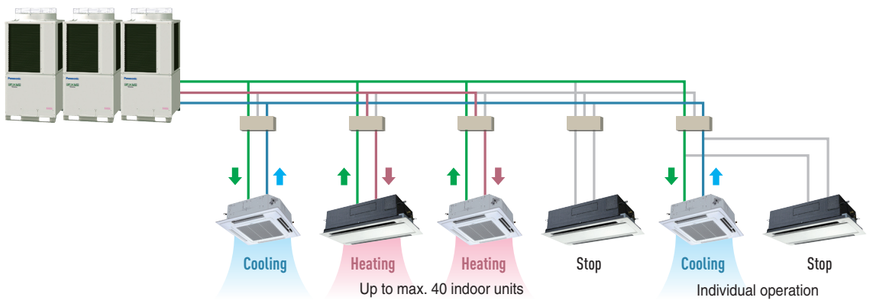
CZ-P160HR2
Up to 160 indoor units

Solenoide valve
controller CZ-CAPE2

Individual control of multiple indoor units with solenoid valve kits

- Any design and layout can be used in a single system.
- Cooling operation is possible up to an outdoor temperature of -10˚C.

System example



Liquid pipe	Discharge pipe	Suction pipe
medium-temperature, medium-pressure liquid pipe	high-temperature, high-pressure gas pipe	low-temperature, low-pressure gas pipe

* When individually controlled with one solenoid valve kit, address setting is required on site.

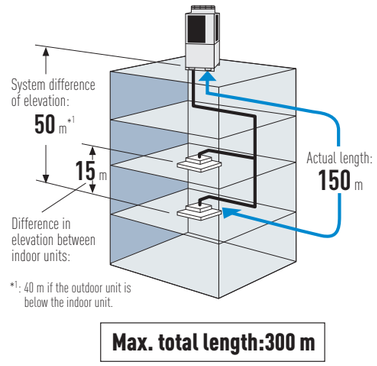
Increased max. number of connectable indoor units

The 3-WAY MF1 series has five DC inverter outdoor units from 8 HP to 16 HP as the basic models, and by combination of up to three units, an air-conditioning capacity of 8 HP to 48 HP can be set according to the user needs.

System (HP)	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
Outdoor units	8	10	12	14	16	10	10	12	14	16	16	16	16	10	10	10	10	10	12	14	16
						8	10	10	10	10	12	14	16	10	10	12	14	16	16	16	16
														14	16	16	16	16	16	16	16
Connectable indoor units	13	16	19	23	26	29	33	36	40	40	40	40	40	40	40	40	40	40	40	40	40

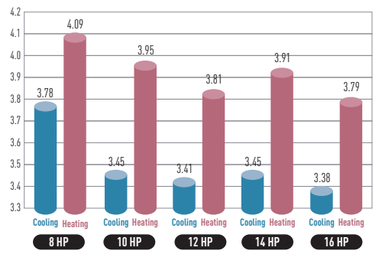
Long piping design

Adaptable to various building types and sizes
Actual piping length : 150m
Max piping length : 300m



Excellent energy saving

The operation efficiency has been improved using highly efficient R410A refrigerant, new DC inverter compressor, new DC motor and new fan guard with low-loss wire guard. In addition, heat exchanger has been redesigned from 3-direction suction to 4-direction suction to efficiently distribute air speed.



Connectable indoor/outdoor unit capacity ratio up to 130%

FSV_50Hz_catalog_2012.indd 30-31 12.2.14 1:14:22 PM

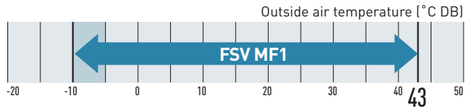
Simultaneous heating and cooling VRF system

3-WAY FSV MF1 Series

Extended operating range

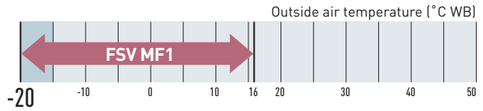
Cooling operation range:

The cooling operation range has been extended to -10˚C by changing the outdoor fan to an inverter type.



Heating operation range:

Stable heating operation even with an outside air temperature of -20˚C
The heating operation range has been extended to -20˚C by use of a compressor with a high-pressure vessel.

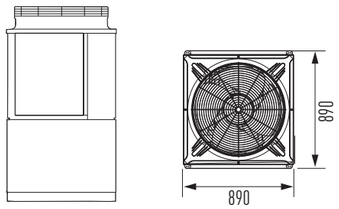


Wide temperature setting range

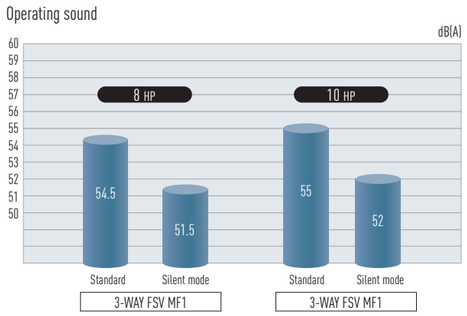
Wired remote control heating temperature setting range is 16 to 30°C

Compactness for superb space saving and low noise level

5 types of outdoor units with different capacities have been standardized to one compact casing size. Uniquely constructed with two-room compartments, the upper room contains heat exchanger while the lower room stores compressors. The benefits is two-fold - superb space saving and low noise level.

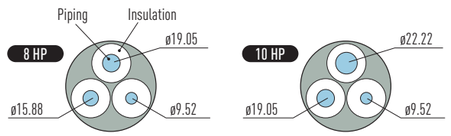


Installation space: 0.79m2
(In case of 16 HP)



Excellent cost saving and realization of smaller piping size

By adoption of R410A with low pressure loss, it became possible to reduce the pipe sizes for discharge, suction and liquid pipes. This makes it possible to aim for reduced piping space, improved workability at the site, and reduction of the piping material costs.



HP	3-WAY FSV MF1		
	Suction pipe	Discharge pipe	Discharge pipe
8	ø19.05	ø15.88	ø9.52
10	ø22.22	ø19.05	ø9.52

Non-stop operation during maintenance

Even when an indoor unit needs maintenance, the other indoor units can be kept operating by setting.
(Not applicable for all situations)

Power suppression control for energy saving (Demand control) *1

The 3-WAY FSV MF1 series has a built-in demand function which uses the inverter characteristics. With this demand function, the power consumption can be set in three steps, and operation*2 at optimum performance is performed according to the setting and the power consumption. This function is useful to reduce the annual power consumption and to save electricity fees while maintaining comfort.

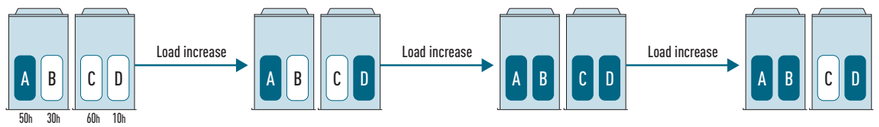
(*1) An outdoor Seri-Para I/O unit is required for demand input.
(*2) Setting is possible as 0% or in the range from 40 to 100% (in steps of 5%). At the time of shipping, setting has been done to the three steps of 0%, 70%, and 100%.

Extended compressor life

The total operation time of the compressors is monitored by a microcomputer, so that there is no unbalance for the operation times of all compressors in the same refrigerant system, and compressors with a shorter operation time are operated with preference.

System example

A,C: DC inverter compressor
B,D: Constant speed compressor



FSV_50Hz_catalog_2012.indd 32-33
12.2.14 1:14:28 PM

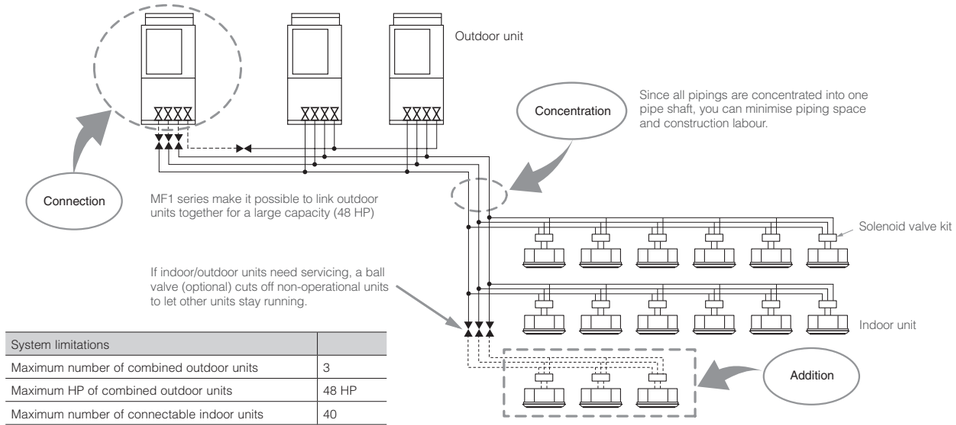
3-WAY FSV MF1 Series

Appearance																								
HP			8	10	12	14	16	18	20	22	24		26	28	30	32	34	36	38	40	42	44	46	48
Model name			**U-8MF1E8**	**U-10MF1E8**	**U-12MF1E8**	**U-14MF1E8**	**U-16MF1E8**	**U-8MF1E8 U-10MF1E8**	**U-10MF1E8 U-10MF1E8**	**U-10MF1E8 U-12MF1E8**	**U-10MF1E8 U-14MF1E8**		**U-10MF1E8 U-16MF1E8**	**U-12MF1E8 U-16MF1E8**	**U-14MF1E8 U-16MF1E8**	**U-16MF1E8 U-16MF1E8**	**U-10MF1E8 U-10MF1E8 U-14MF1E8**	**U-10MF1E8 U-10MF1E8 U-16MF1E8**	**U-10MF1E8 U-12MF1E8 U-16MF1E8**	**U-10MF1E8 U-14MF1E8 U-16MF1E8**	**U-10MF1E8 U-16MF1E8 U-16MF1E8**	**U-12MF1E8 U-16MF1E8 U-16MF1E8**	**U-14MF1E8 U-16MF1E8 U-16MF1E8**	**U-16MF1E8 U-16MF1E8 U-16MF1E8**
Power supply			380/400/415V-3phase/50Hz										380/400/415V-3phase/50Hz											
Capacity	Cooling	kW	22.4	28.0	33.5	40.0	45.0	50.4	56.0	61.5	68.0		73.0	78.5	85.0	90.0	96.0	101.0	107.0	113.0	118.0	124.0	130.0	135.0
		BTU/h	76,400	95,500	114,300	136,500	153,600	172,000	191,100	219,900	232,000		249,100	267,900	290,100	307,100	327,600	344,700	363,400	385,600	402,700	421,400	443,600	460,700
	Heating	kW	25.0	31.5	37.5	45.0	50.0	56.5	63.0	69.0	76.5		81.5	87.5	95.0	100.0	108.0	113.0	119.0	127.0	132.0	138.0	145.0	150.0
		BTU/h	85,300	107,500	128,000	153,600	170,600	192,800	215,000	235,500	261,100		278,100	300,300	324,200	343,000	368,500	385,600	407,800	431,700	450,400	470,900	494,800	511,900
EER / COP	Cooling	W/W	3.78	3.45	3.41	3.45	3.38	3.57	3.46	3.44	3.45		3.41	3.40	3.41	3.38	3.45	3.41	3.42	3.42	3.40	3.41	3.40	3.38
	Heating	W/W	4.09	3.95	3.81	3.91	3.79	4.01	3.96	3.88	3.92		3.84	3.80	3.85	3.79	3.93	3.88	3.84	3.88	3.84	3.81	3.83	3.79
Dimensions	H x W x D	mm	1,887x890x 890(+60)	1,887x890x 890(+60)	1,887x890x 890(+60)	1,887x890x 890(+60)	1,887x890x 890(+60)	1,887x1,880x 890(+60)	1,887x1,880x 890(+60)	1,887x1,880x 890(+60)	1,887x1,880x 890(+60)		1,887x1,880x 890(+60)	1,887x1,880x 890(+60)	1,887x1,880x 890(+60)	1,887x1,880x 890(+60)	1,887x2,870x 890(+60)	1,887x2,870x 890(+60)	1,887x2,870x 890(+60)	1,887x2,870x 890(+60)	1,887x2,870x 890(+60)	1,887x2,870x 890(+60)	1,887x2,870x 890(+60)	1,887x2,870x 890(+60)
Net weight		kg	290	290	290	350	350	580	580	580	630		630	630	680	680	920	920	920	970	970	970	1,020	1,020
Electrical ratings	Cooling	Running current A	10.0/9.5/9.2	13.7/13.0/12.6	16.6/15.7/15.2	20.0/19.0/18.3	23.0/21.8/21.0	23.8/22.6/21.8	27.3/26.0/25.0	30.2/28.7/27.7	33.6/31.9/30.8		36.5/34.7/33.5	39.4/37.5/36.1	43.0/40.8/39.4	45.9/43.6/42.1	47.5/45.1/43.5	50.5/48.0/46.3	53.0/51.0/49.0	57.0/54.0/52.0	60.0/57.0/55.0	63.0/60.0/58.0	66.0/63.0/60.0	69.0/65.0/63.0
		Power input kW	5.93	8.12	9.82	11.6	13.3	14.1	16.2	17.9	19.7		21.4	23.1	24.9	26.6	27.8	29.6	31.3	33.0	34.7	36.4	38.2	39.9
	Heating	Running current A	10.3/9.8/9.4	13.5/12.8/12.3	16.6/15.8/15.2	19.9/18.9/18.2	22.8/21.6/20.9	23.8/22.6/21.8	26.8/25.5/24.6	30.0/28.5/27.5	33.3/31.6/30.5		36.2/34.4/33.1	39.3/37.3/36.0	42.6/40.5/39.0	45.6/43.3/41.7	46.9/44.6/43.0	49.7/47.2/45.5	53.0/50.0/48.0	56.0/54.0/52.0	59.0/56.0/54.0	63.0/59.0/57.0	65.0/62.0/60.0	68.0/65.0/63.0
		Power input kW	6.11	7.97	9.84	11.5	13.2	14.1	15.9	17.8	19.5		21.2	23.0	24.7	26.4	27.5	29.1	31.0	32.7	34.4	36.2	37.9	39.6
Air flow rate		m^3/h	150	160	150	200	220	150+160	160+160	160+180	160+200		160+220	180+220	200+220	220+220	160+160+200	160+160+220	160+180+220	160+200+220	160+220+220	180+220+220	200+220+220	220+220+220
Refrigerant amount at shipment		kg	11.8	11.8	11.8	11.8	11.8	23.6	23.6	23.6	23.6		23.6	23.6	23.6	23.6	35.4	35.4	35.4	36.0	36.0	36.0	36.0	36.0
Piping connections	Suction pipe	mm	Ø19.05	Ø22.22	Ø25.40	Ø25.40	Ø28.58	Ø28.58	Ø28.58	Ø28.58	Ø28.58		Ø31.75	Ø31.75	Ø31.75	Ø31.75	Ø31.75	Ø38.10	Ø38.10	Ø38.10	Ø38.10	Ø38.10	Ø38.10	Ø38.10
	Discharge pipe	mm	Ø15.88	Ø19.05	Ø19.05	Ø22.22	Ø22.22	Ø22.22	Ø22.22	Ø25.40	Ø25.40		Ø25.40	Ø28.58	Ø28.58	Ø28.58	Ø28.58	Ø28.58	Ø31.75	Ø31.75	Ø31.75	Ø31.75	Ø31.75	Ø31.75
	Liquid pipe	mm	Ø9.52	Ø9.52	Ø12.70	Ø12.70	Ø12.70	Ø15.88	Ø15.88	Ø15.88	Ø15.88		Ø19.05	Ø19.05	Ø19.05	Ø19.05	Ø19.05	Ø19.05	Ø19.05	Ø19.05	Ø19.05	Ø19.05	Ø19.05	Ø19.05
	Balance pipe	mm	Ø9.52	Ø9.52	Ø9.52	Ø9.52	Ø9.52	Ø9.52	Ø9.52	Ø9.52	Ø9.52		Ø9.52	Ø9.52	Ø9.52	Ø9.52	Ø9.52	Ø9.52	Ø9.52	Ø9.52	Ø9.52	Ø9.52	Ø9.52	Ø9.52
Ambient temperature operating range			Cooling/Dry: -10˚C~+43˚C (DB). Heating: -20˚C~+15˚C (WB) Simultaneous operation: -10˚C~+43˚C (DB)										Cooling/Dry: -10˚C~+43˚C (DB). Heating: -20˚C~+15˚C (WB) Simultaneous operation: -10˚C~+24˚C (DB)											
Sound pressure level	Normal mode	dBA	54.5	55	56	60	61	58	58	58.5	58		60	60.5	61	61.5	61	61.5	61.5	62	62.5	62.5	63	63.5
	Silent mode	dBA	51.5	52	53	57	58	55	55	55.5	55		57	57.5	58	58.5	58	58.5	58.5	59	59.5	59.5	60	60.5

GLOBAL REMARKS			
	Rated conditions:	Cooling	Heating
	Indoor air temperature	27˚C DB / 19˚C WB	20˚C DB
	Outdoor air temperature	35˚C DB	7˚C DB / 6˚C WB

These specifications subject to change without notice.
* For mixed heating and cooling operation with an outdoor temperature in excess of 24˚C DB, please use 50% or more of the horsepower of the outdoor unit for cooling operation.

System example

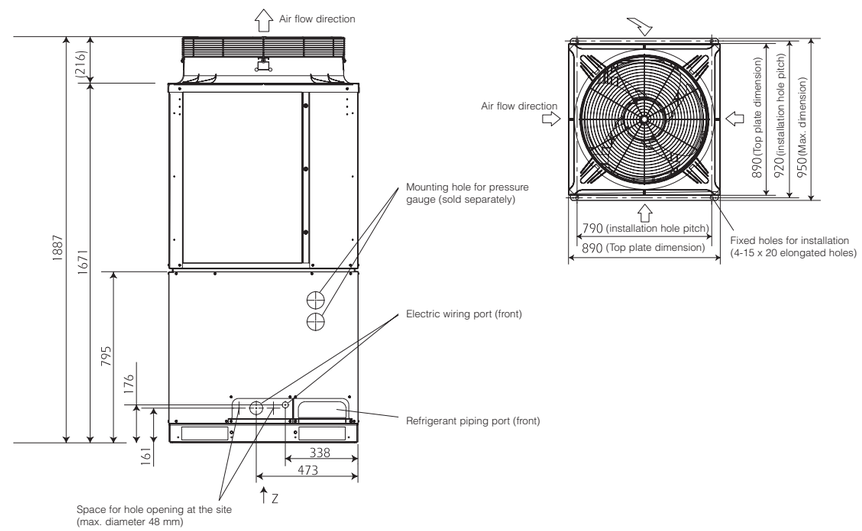


System limitations	
Maximum number of combined outdoor units	3
Maximum HP of combined outdoor units	48 HP
Maximum number of connectable indoor units	40
Indoor/outdoor unit capacity ratio	50-130%
Maximum actual piping length	150 m
Maximum level difference (when outdoor unit is lower)	50 (40) m
Maximum total piping length in one direction	300 m

If your indoor capacity load changes in the future, it's easy to add on both indoor and outdoor units using the same pipings.

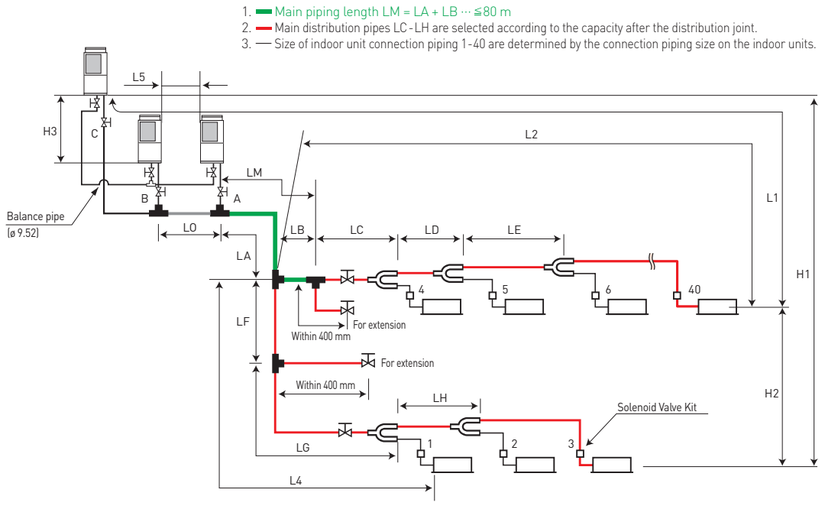
If the additional installment of outdoor and indoor units is expected, the size of refrigerant piping should be decided according to the total capacity after the addition.

Dimensions



FSV_50Hz_catalog_2012.indd 34-35 12.2.14 1:14:30 PM

Piping design



Symbol explanation

Distribution joint (CZ-accessory, option)

: Ball valve (BV, option)

Note: Do not use commercial T-pieces for the liquid pipes of and .

* Be sure to use R410A distribution joints for outdoor unit connections and piping branches.

Ranges that apply to refrigerant piping lengths and to differences in installation heights

Items	Mark	Contents		Length (m)
Allowable piping length	L1	Max. piping length	Actual piping length	≦150
			Equivalent piping length	≦175
	Δ L (L2 - L4)	Difference between the max. length and the min. length from the No.1 distribution joint		≦40
	LM	Max. length of main piping (at max. diameter)		≦80
	1, 2~40	Max. length of each distribution		≦30
	L1+1+2+ ~ 40 +A+B+LF+LG+LH	Total max. piping length including length of each distribution (only narrow tubing)		≦300
	L5	Distance between PC and AD unit		≦10
Allowable elevation difference	H1	When outdoor unit is installed higher than indoor unit		≦50
		When outdoor unit is installed lower than indoor unit		≦40
	H2	Max. difference between indoor units		≦15
	H3	Max. difference between outdoor units		≦4

Note 1: The outdoor connection main piping (LO part) depends on the total capacity of the outdoor units connected to the end.
Note 2: When the main piping length (L1) (equivalent length) exceeds 90 m, increase the size of both the gas and liquid main piping (LM) by 1 step.

System limitations

Max. number of combined outdoor units	3
Max. HP of combined outdoor units	135 kW (48 hp)
Max. number of connectable indoor units	40
Indoor/outdoor unit capacity ratio	50-130%

Additional refrigerant charge

Liquid piping size	Amount of refrigerant charge/m (g/m)
ø6.35	26
ø9.52	56
ø12.7	128
ø15.88	185
ø19.05	259
ø22.22	366

Distribution joint kits

Remarks	Model name	Cooling capacity after distribution
For outdoor unit	1. CZ-P680PH2	68.0 kW or less
	2. CZ-P1350PH2	135.0 kW or less
For indoor unit	3. CZ-P224BH2	22.4 kW or less
	4. CZ-P680BH2	68.0 kW or less
	5. CZ-P1350BH2	135.0 kW or less

Refrigerant piping

Piping size (mm)			
O material		1/2 H, H material	
Outer diameter	Wall thickness	Outer diameter	Wall thickness
ø6.35	t 0.8	ø 25.4	t 1.0
ø9.52	t 0.8	ø 28.58	t 1.0
ø12.7	t 0.8	ø 31.75	t 1.1
ø15.88	t 1.0	ø 38.1	t 1.15
ø19.05	t 1.0	ø 41.28	t 1.20
ø22.22	t 1.15		

Note: When pipe bending is to be performed, the bending radius shall be at least 4 times the outer diameter.
Also, take sufficient care to prevent pipe collapse and damage at the time of bending.

FSV_50Hz_catalog_2012.indd 36-37 12.2.14 1:14:30 PM

Refrigerant Branch Pipes (optional accessories) for 3-Way MF1 Series

Optional Distribution Joint Kits

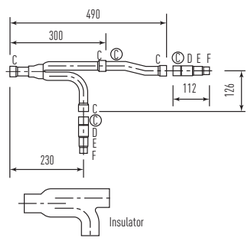
See the installation instructions packaged with the distribution joint kit for the installation procedure.

Model name	capacity after distribution JOINT	Remarks
1. CZ-P680PH2	68.0 kW or less	For outdoor unit
2. CZ-P1350PH2	greater than 68.0 kW and no more than 135.0 kW	For outdoor unit
3. CZ-P224BH2	22.4 kW or less	For indoor unit
4. CZ-P680BH2	greater than 22.4 kW and no more than 68.0 kW	For indoor unit
5. CZ-P1350BH2	greater than 68.0 kW and no more than 135.0 kW	For indoor unit

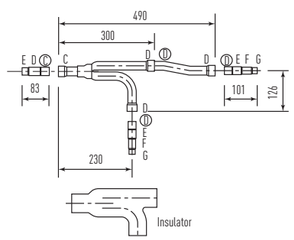
1. CZ-P680PH2

Use: For outdoor unit (Capacity after distribution joint is 68.0 kW or less.)

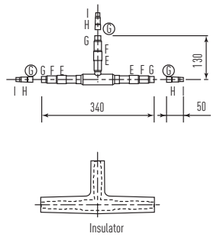
SUCTION PIPE



DISCHARGE PIPE



LIQUID PIPE



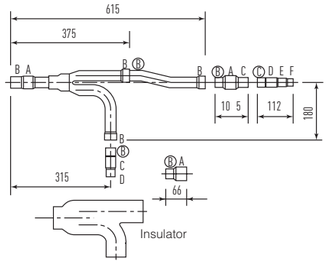
Unit: mm

Dimensions for connections of each part										
Position	A	B	C	D	E	F	G	H	I	J
Dimension	Ø38.10	Ø31.75	Ø28.58	Ø25.40	Ø22.22	Ø19.05	Ø15.88	Ø12.70	Ø9.52	Ø6.35

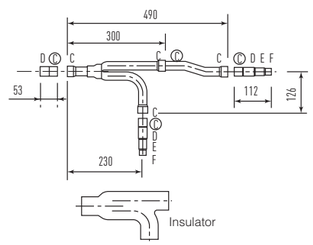
2. CZ-P1350PH2

Use: For outdoor unit (Capacity after distribution joint is greater than 68.0 kW and no more than 135.0 kW.)

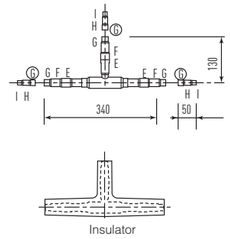
SUCTION PIPE



DISCHARGE PIPE



LIQUID PIPE



Unit: mm

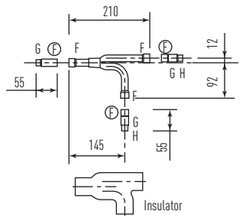
Dimensions for connections of each part										
Position	A	B	C	D	E	F	G	H	I	J
Dimension	Ø38.10	Ø31.75	Ø28.58	Ø25.40	Ø22.22	Ø19.05	Ø15.88	Ø12.70	Ø9.52	Ø6.35

Example: (F below indicates inner diameter. Ⓕ below indicates outer diameter.)

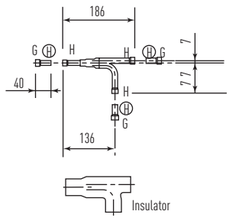
3. CZ-P224BH2.

Use: For indoor unit (Capacity after distribution joint is 22.4 kW or less.)

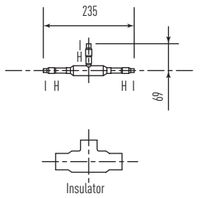
SUCTION PIPE



DISCHARGE PIPE



LIQUID PIPE



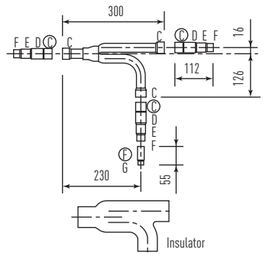
Unit: mm

Dimensions for connections of each part										
Position	A	B	C	D	E	F	G	H	I	J
Dimension	Ø38.10	Ø31.75	Ø28.58	Ø25.40	Ø22.22	Ø19.05	Ø15.88	Ø12.70	Ø9.52	Ø6.35

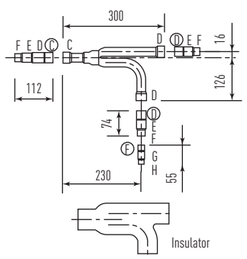
4. CZ-P680BH2.

Use: For indoor unit (Capacity after distribution joint is greater than 22.4 kW and no more than 68.0 kW.)

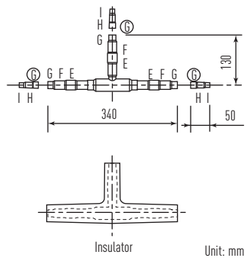
SUCTION PIPE



DISCHARGE PIPE



LIQUID PIPE



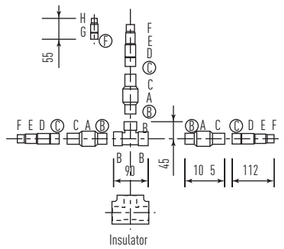
Unit: mm

Dimensions for connections of each part										
Position	A	B	C	D	E	F	G	H	I	J
Dimension	Ø38.10	Ø31.75	Ø28.58	Ø25.40	Ø22.22	Ø19.05	Ø15.88	Ø12.70	Ø9.52	Ø6.35

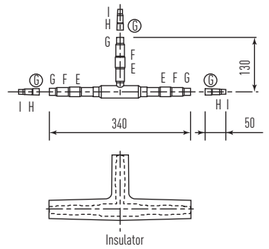
5. CZ-P1350BH2.

Use: For indoor unit (Capacity after distribution joint is greater than 68.0 kW and no more than 135.0 kW.)

SUCTION PIPE / DISCHARGE PIPE



LIQUID PIPE



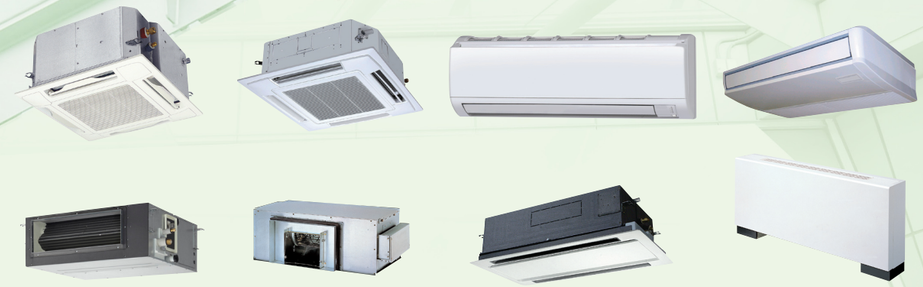
Unit: mm

Dimensions for connections of each part										
Position	A	B	C	D	E	F	G	H	I	J
Dimension	Ø38.10	Ø31.75	Ø28.58	Ø25.40	Ø22.22	Ø19.05	Ø15.88	Ø12.70	Ø9.52	Ø6.35

FSV_50Hz_catalog_2012.indd 38-39 12.2.14 1:14:31 PM

Indoor Units

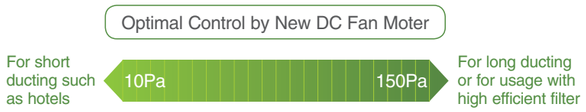
Wide choice of models depending on the indoor requirements



F2 TYPE SLIM LOW SILHOUETTE DUCTED NEW

Variable external static pressure control

Optimal airflow set-up is possible depend on ducting design condition.



* Please refer technical databook for detail.

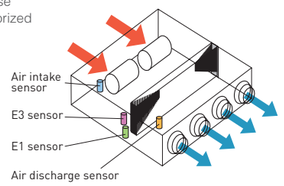
Standardized height of 290 mm for all models

Discharge air temperature control

Able to control discharge air temperature for accurate room temperature control.

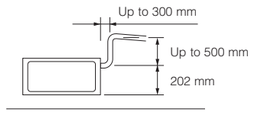
Possible to reduce cold drafts at heating operation.

Before spec-in, please consult with an authorized Panasonic dealer.

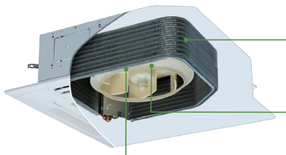


Increased external static pressure

By using booster cable, external static pressure can be increased.



U1 TYPE 4-WAY CASSETTE



New technology for more energy saving

Higher efficiency split fin.

Improved heat transfer coefficient by adopting high efficiency grooved heat exchanger tube.

New DC-Fan motor.

Realized optimum air-flow by a new DC-fan motor with independent control.

High efficiency and silent turbo fan.

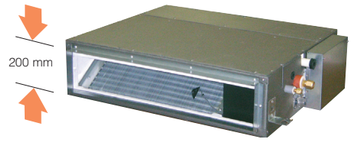
Development of bigger fan chassis and optimized design of airflow path resulted in higher air volume and lower noise level.

Individual flap control.

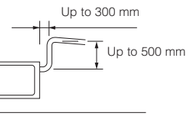
Flexible airflow direction enables 4 flaps to be be individually controlled by setting on wired remote controller.

M1 TYPE SLIM LOW STATIC DUCTED

Ultra-slim profile: 200 mm height for all models



Drain pump with increased power!



K1 TYPE WALL MOUNTED

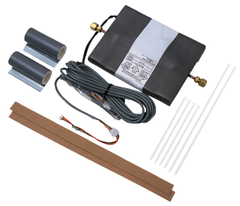
Compact design with flat surface enables seamless match with any types of room interior

External valve

To reduce noise level of external valve. (Optional accessory)

CZ-P56SVK2
(for 22 - 56 type)

CZ-P160SVK2
(for 73 - 106 type)



Washable front panel.

The indoor unit's front panel can be easily removed and washed for easy maintenance.

Anti-mould filters are offered as standard filter.

Remote sensor (CZ-CSRC2)

- This is a remote sensor which can be used with indoor units. Please use it to detect the room temperature when no remote controller sensor or body sensor is used. (connection to a system without a remote controller is possible).
- For joint use with a remote control switch, use the remote control switch as main remote controller.

FSV_50Hz_catalog_2012.indd 40-41 12.2.14 1:14:36 PM

FSV Indoor Units Range

Wide choice of models depending on the indoor requirements

Class	22	28	36	45	56	60	73		90	106	140	160	224	280	Wireless remote control	
Capacity	Cooling/Heating	Cooling/Heating	Cooling/Heating	Cooling/Heating	Cooling/Heating	Cooling/Heating	Cooling/Heating		Cooling/Heating	Cooling/Heating	Cooling/Heating	Cooling/Heating	Cooling/Heating	Cooling/Heating	Type with built-in sensor part	Type with separately installed sensor part
kW / BTU/h	2.2/2.5 7,500/8,500	2.8/3.2 9,600/11,000	3.6/4.2 12,000/14,000	4.5/5.0 15,000/17,000	5.6/6.3 19,000/21,000	6.0/7.1 20,400/24,200	7.3/8.0 25,000/27,000		9.0/10.0 30,000/34,000	10.6/11.4 36,000/39,000	14.0/16.0 47,800/54,600	16.0/18.0 54,600/61,500	22.4/25.0 76,400/85,300	28.0/31.5 95,500/107,500		
Type																Functions
U1 type **4-Way Cassette**	S-22MU1E51 Panel No. CZ-KPU2	S-28MU1E51 Panel No. CZ-KPU2	S-36MU1E51 Panel No. CZ-KPU2	S-45MU1E51 Panel No. CZ-KPU2	S-56MU1E51 Panel No. CZ-KPU2	NEW S-60MU1E51 Panel No. CZ-KPU2	S-73MU1E51 Panel No. CZ-KPU2		NEW S-90MU1E51 Panel No. CZ-KPU2	S-106MU1E51 Panel No. CZ-KPU2	S-140MU1E51 Panel No. CZ-KPU2	S-160MU1E51 Panel No. CZ-KPU2			●	●	self-diagnosing, Auto fan, Mild dry, Auto flap, Auto restart, Air swing, Drain pump
Y1 type **4-Way Cassette 60x60**	S-22MY1E5 Panel No. CZ-KPY2	S-28MY1E5 Panel No. CZ-KPY2	S-36MY1E5 Panel No. CZ-KPY2	S-45MY1E5 Panel No. CZ-KPY2	S-56MY1E5 Panel No. CZ-KPY2										●	●	self-diagnosing, Auto fan, Mild dry, Auto flap, Auto restart, Air swing, Drain pump
L1 type **2-Way Cassette**	S-22ML1E5 Panel No. CZ-02KPL2	S-28ML1E5 Panel No. CZ-02KPL2	S-36ML1E5 Panel No. CZ-02KPL2	S-45ML1E5 Panel No. CZ-02KPL2	S-56ML1E5 Panel No. CZ-02KPL2		S-73ML1E5 Panel No. CZ-03KPL2								●	●	self-diagnosing, Auto fan, Mild dry, Auto flap, Auto restart, Air swing, Drain pump
D1 type **1-Way Cassette**		S-28MD1E5 Panel No. CZ-KPD2	S-36MD1E5 Panel No. CZ-KPD2	S-45MD1E5 Panel No. CZ-KPD2	S-56MD1E5 Panel No. CZ-KPD2		S-73MD1E5 Panel No. CZ-KPD2								●	●	self-diagnosing, Auto fan, Mild dry, Auto flap, Auto restart, Air swing, Drain pump
F2 type **Low Silhouette Ducted**	NEW S-22MF2E5	NEW S-28MF2E5	NEW S-36MF2E5	NEW S-45MF2E5	NEW S-56MF2E5	NEW S-60MF2E5	NEW S-73MF2E5		NEW S-90MF2E5	NEW S-106MF2E5	NEW S-140MF2E5	NEW S-160MF2E5				●	self-diagnosing, Auto fan, Mild dry, Auto restart, Drain pump
M1 type **Slim Low Static Ducted**	S-22MM1E5	S-28MM1E5	S-36MM1E5	S-45MM1E5	S-56MM1E5											●	self-diagnosing, Auto fan, Mild dry, Auto restart, Drain pump
E1 type **High Static Pressure Ducted**							S-73ME1E5			S-106ME1E5	S-140ME1E5		S-224ME1E5	S-280ME1E5		●	self-diagnosing, Auto fan, Mild dry, Auto restart
T1 type **Ceiling**			S-36MT1E5	S-45MT1E5	S-56MT1E5		S-73MT1E5			S-106MT1E5	S-140MT1E5				●	●	self-diagnosing, Auto fan, Mild dry, Auto flap, Auto restart, Air swing
K1 type **Wall Mounted**	S-22MK1E5	S-28MK1E5	S-36MK1E5	S-45MK1E5	S-56MK1E5		S-73MK1E5			S-106MK1E5					●	●	self-diagnosing, Auto fan, Mild dry, Auto flap, Auto restart, Air swing
P1 type **Floor Standing**	S-22MP1E5	S-28MP1E5	S-36MP1E5	S-45MP1E5	S-56MP1E5		S-71MP1E5									●	self-diagnosing, Auto fan, Mild dry, Auto restart
R1 type **Concealed Floor Standing**	S-22MR1E5	S-28MR1E5	S-36MR1E5	S-45MR1E5	S-56MR1E5		S-71MR1E5									●	self-diagnosing, Auto fan, Mild dry, Auto restart

Self-diagnosing function
Automatic fan operation
Mild dry
Intelligent auto flap control
Automatic restart function for power failure
Air swing
Built-in drain pump

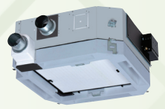
FSV_50Hz_catalog_2012.indd 42-43 12.2.14 1:14:50 PM

U1 TYPE 4-WAY Cassette

Semi concealed cassette

Our best selling U1 Type cassettes are made smaller, slimmer, lighter and comes with a standard 950 x 950mm panel for the entire product range.

AIR INTAKE CHAMBER



Air intake plenum CZ-FDU2
Air intake box CZ-ATU2
Both Air intake plenum and Air intake box are necessary

PANEL

CZ-KPU2

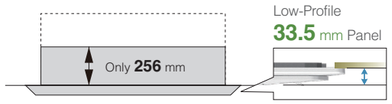
Self-diagnosing Function | Automatic Fan Operation | Mild dry | Intelligent Auto Swing | Automatic Restart Function | Auto Swing (Auto Flap Control) | Built-in Drain Pump

Technical focus

- Compact design
- Reduced sound levels (from previous models)
- DC fan motor for increased efficiency
- Powerful drain pump gives 850 mm lift
- Lightweight design
- Fresh air knockout
- Branch duct connection
- Optional air-intake plenum CZ-FDU2

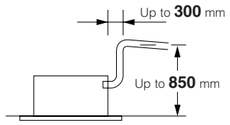
Lighter and Slimmer, Easier Installation

A lightweight unit at 24 kg, the unit is also very slim with a height of only 256 mm, making installation possible even in narrow ceilings. * For 22 - 73 type



Drain pump of about 850 mm from the ceiling surface

The drain height can be increased by approximately 350 mm over the conventional value by using a high-lift drain pump, and long horizontal piping is possible.



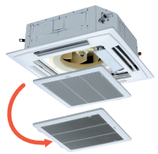
Easy fine adjustment of the body suspension height!

The four corners of the ceiling panel have adopted removable corner pockets.

Even after installation, fine adjustment of the suspension height is possible easily by removing the corner pockets.

Easy to clean suction grill & flap

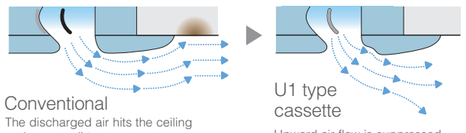
It is easy to remove a washable flap by hand.



A suction grill enables to make 90-degree turns.

Air flow oirected to avoid ceiling marking

The dew condensation and dirt appearing near the discharge ports of the conventional ceiling cassettes have been reduced.



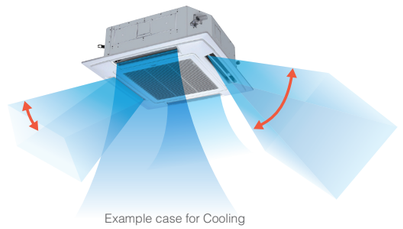
Conventional
The discharged air hits the ceiling and causes dirt.

U1 type cassette
Upward air flow is suppressed.

Individual flap control

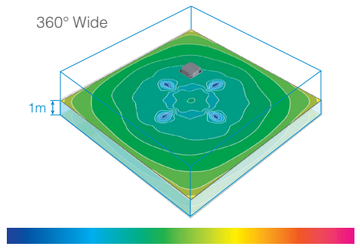
Flexible Air flow direction control by individual flap control is possible. 4 Flaps can be controlled individually by setting on wired timer remote controller. It can make more flexible Air-flow control to be matched to several demands in a room.

* It needs pre-setting for this function at system test-run procedure.



Example case for Cooling

Temperature distribution by thermograph (cooling operation)

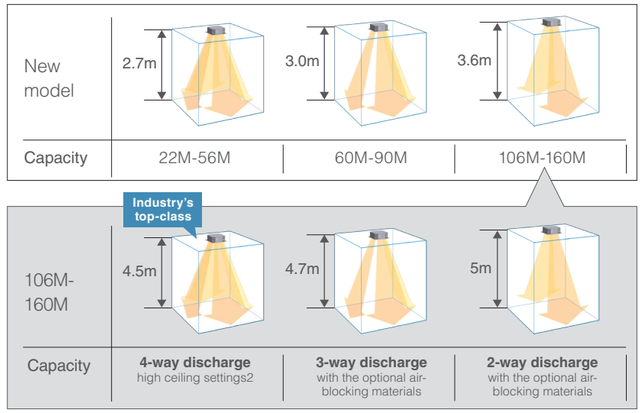


Simulation conditions:
140M 4-way ceiling-mounted cassette type in cooling mode
/ Floor area of 225 m²
/ Ceiling height of 3 m

High-Ceiling Installation (Up to 5 m for 106M and higher models)

The units can be installed in rooms with high ceilings, where they provide ample floor-level heating in the winter. (See ceiling height guidelines below.)

High Ceiling (Factory settings)



Ceiling height guidelines

*1 settings / Indoor unit	4-way discharge				3-way discharge (optional air-blocking materials)	2-way discharge (optional air-blocking materials) *2
	Factory settings 1	High ceiling setting 1	High ceiling setting 2	High ceiling setting 2		
22M-56M	2.7	3.2	3.5	4.2	3.8	4.2
60M-90M	3.0	3.3	3.6	4.2	3.8	4.2
106M-160M	3.6	3.9	4.5	5.0	4.7	5.0

*1 When using the unit in a configuration other than the factory settings, it is necessary to make settings on site to increase airflow.
*2 Use air-blocking materials (CZ-CFU2) to completely block two discharge outlets for 2-way airflow.

FSV_50Hz_catalog_2012.indd 44-45 12.2.14 1:14:57 PM

U1 TYPE 4-WAY Cassette

Model Name			S-22MU1E51	S-28MU1E51	S-36MU1E51	S-45MU1E51	S-56MU1E51		S-60MU1E51	S-73MU1E51	S-90MU1E51	S-106MU1E51	S-140MU1E51	S-160MU1E51
Power source			220/230/240 V, 1 phase - 50Hz									220/230/240 V, 1 phase - 50Hz		
Cooling capacity		kW	2.2	2.8	3.6	4.5	5.6		6.0	7.3	9.0	10.6	14	16
		BTU/h	7,500	9,600	12,000	15,000	19,000		20,400	24,900	30,700	36,000	47,800	54,600
Heating capacity		kW	2.5	3.2	4.2	5.0	6.3		7.10	8.0	10.00	11.4	16.0	18.0
		BTU/h	8,500	11,000	14,000	17,000	21,000		24,200	27,300	34,100	39,000	54,600	61,400
Power input	Cooling	kW	0.030/0.031/0.034	0.030/0.031/0.034	0.030/0.031/0.034	0.033/0.035/0.038	0.039/0.041/0.044		0.035/0.035/0.035	0.040/0.040/0.040	0.040/0.040/0.040	0.100/0.102/0.106	0.109/0.110/0.114	0.117/0.119/0.124
	Heating	kW	0.019/0.019/0.021	0.019/0.019/0.021	0.019/0.019/0.021	0.022/0.023/0.024	0.030/0.031/0.031		0.035/0.035/0.035	0.040/0.040/0.040	0.040/0.040/0.040	0.093/0.094/0.096	0.102/0.102/0.105	0.106/0.107/0.110
Running current	Cooling	A	0.25/0.26/0.26	0.25/0.26/0.26	0.25/0.26/0.26	0.29/0.29/0.29	0.34/0.34/0.34		0.32/0.31/0.30	0.36/0.33/0.32	0.39/0.36/0.35	0.84/0.82/0.82	0.90/0.88/0.88	0.97/0.94/0.94
	Heating	A	0.18/0.18/0.17	0.18/0.18/0.17	0.18/0.18/0.17	0.21/0.21/0.21	0.28/0.28/0.27		0.30/0.30/0.29	0.35/0.32/0.31	0.37/0.34/0.33	0.80/0.77/0.76	0.86/0.83/0.83	0.89/0.86/0.86
Fan	Type		Turbo fan	Turbo fan	Turbo fan	Turbo fan	Turbo fan		Turbo fan	Turbo fan	Turbo fan	Turbo fan	Turbo fan	Turbo fan
	Air flow rate	m^3/h	930	930	930	930	960		1,260	1,320	1,380	1,680	1,980	2,040
	Motor output	kW	0.05	0.05	0.05	0.05	0.05		0.06	0.06	0.06	0.09	0.09	0.09
Sound power level (L/M/H)		dB	38/40/42	38/40/42	38/40/42	38/40/42	38/40/42		53/49/46	54/49/46	55/52/49	44/47/50	45/49/53	47/51/55
Sound pressure level (L/M/H)		dB(A)	27/28/29	27/28/29	27/28/29	27/28/30	27/29/32		36/32/29	37/32/29	38/35/32	32/38/43	33/39/44	34/40/45
Dimensions	H x W x D	mm	256+(33.5) x 840 (950) x 840 (950)									319+(33.5) x 840 (950) x 840 (950)		
Pipe connections	Liquid	inches (mm)	1/4 (Ø6.35)	1/4 (Ø6.35)	1/4 (Ø6.35)	1/4 (Ø6.35)	1/4 (Ø6.35)		3/8 (Ø9.52)	3/8 (Ø9.52)	3/8 (Ø9.52)	3/8 (Ø9.52)	3/8 (Ø9.52)	3/8 (Ø9.52)
	Gas	inches (mm)	1/2 (Ø12.7)	1/2 (Ø12.7)	1/2 (Ø12.7)	1/2 (Ø12.7)	1/2 (Ø12.7)		5/8 (Ø15.88)	5/8 (Ø15.88)	5/8 (Ø15.88)	5/8 (Ø15.88)	5/8 (Ø15.88)	5/8 (Ø15.88)
	Drain piping		VP-25	VP-25	VP-25	VP-25	VP-25		VP-25	VP-25	VP-25	VP-25	VP-25	VP-25
Net weight (Panel)		kg	23 (+4)	23 (+4)	23 (+4)	23 (+4)	23 (+4)		24 (+4)	24 (+4)	24 (+4)	27 (+4)	27 (+4)	27 (+4)

GLOBAL REMARKS	Rated conditions:	Cooling	Heating
	Indoor air temperature	27˚C DB / 19˚C WB	20˚C DB
	Outdoor air temperature	35˚C DB / 24˚C WB	7˚C DB / 6˚C WB

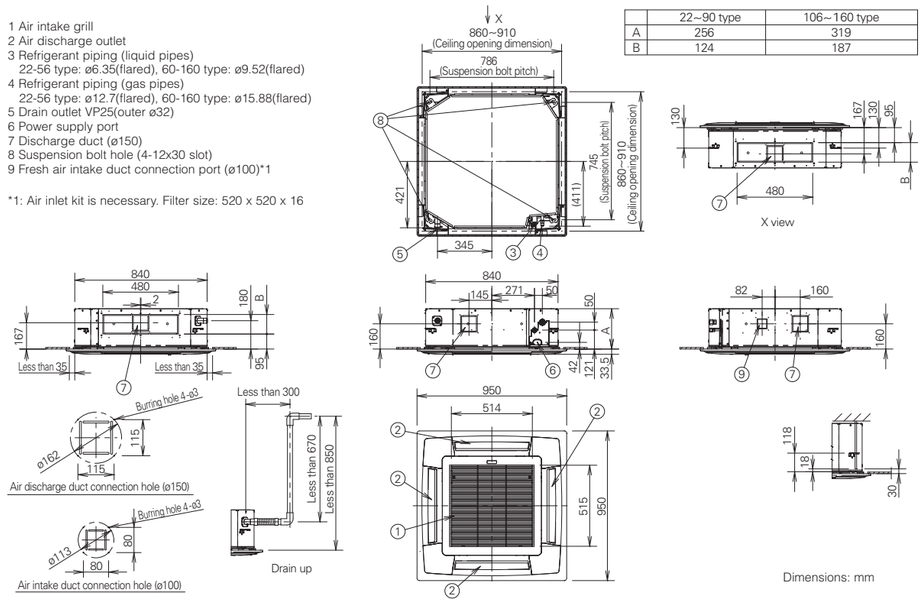
Specifications subject to change without notice.

U1 TYPE 4-WAY CASSETTE Dimensions

1 Air intake grill
2 Air discharge outlet
3 Refrigerant piping (liquid pipes)
  22-56 type: ø6.35(flared), 60-160 type: ø9.52(flared)
4 Refrigerant piping (gas pipes)
  22-56 type: ø12.7(flared), 60-160 type: ø15.88(flared)
5 Drain outlet VP25(outer ø32)
6 Power supply port
7 Discharge duct (ø150)
8 Suspension bolt hole (4-12x30 slot)
9 Fresh air intake duct connection port (ø100)*1

*1: Air inlet kit is necessary. Filter size: 520 x 520 x 16

	22~90 type	106~160 type
A	256	319
B	124	187



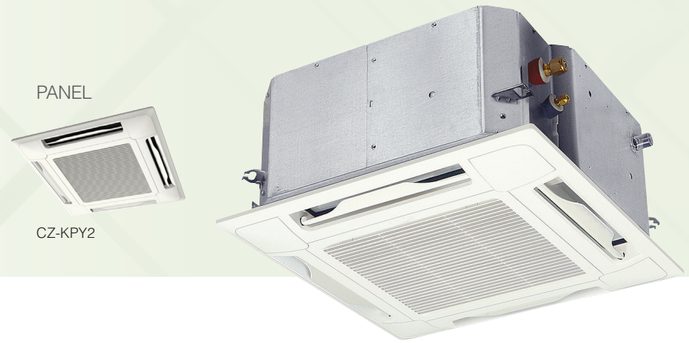
* Adjust the suspension bolt length so that the gap from the lower ceiling surface becomes 30 mm or more (18 mm or more from the lower surface of the body) as shown in the figure. When the suspension bolt length is long, it hits the ceiling panel and installation is not possible.

FSV_50Hz_catalog_2012.indd 46-47 12.2.14 1:15:01 PM

Y1 TYPE 4-WAY Cassette 60X60

mini semi concealed cassette

Designed to fit exactly into a 600 x 600 mm ceiling grid without the need to alter the bar configuration, the Y1 is ideal for small commercial and retrofit applications. In addition, the improvements to efficiency make this one of the most advanced units in the industry.



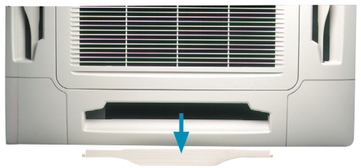
Self-diagnosing Function | Automatic Fan Operation | Mild dry | Intelligent Auto Swing | Automatic Restart Function | Auto Swing (Auto Flap Control) | Built-in Drain Pump

Technical focus

- Mini cassette fits into a 600x600 mm ceiling grid
- Fresh air knock out
- Multidirectional air flow
- Anti-mould and anti-bacteria washable filters
- Powerful drain pump gives 850 mm lift
- Turbo fans and heat exchanger fins with improved design
- DC fan motors with variable speed, new heat exchangers, etc. ensure an efficient power consumption
- Optional air-intake plenum CZ-ATU2

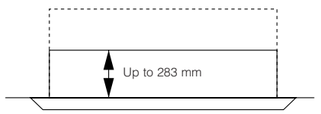
Special designed flap

The flap can be removed easily for washing with water.



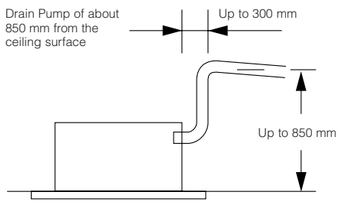
Lighter and slimmer, easier installation

A lightweight unit at 19 kg, the unit is also very slim with a height of only 283 mm, making installation possible even in narrow ceilings.



A drain height of approx. 850 mm from the ceiling surface

The drain height can be increased by approximately 350 mm over the conventional value by using a high-lift drain pump, and long horizontal piping is possible.



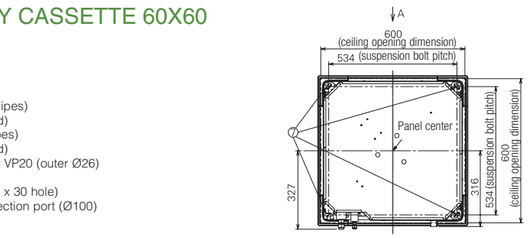
Model Name			S-22MY1E5	S-28MY1E5	S-36MY1E5	S-45MY1E5	S-56MY1E5
Power source			220/230/240 V, 1 phase - 50, 60 Hz				
Cooling capacity		kW	2,2	2,8	3,6	4,7	5,6
		BTU/h	7.500	9.600	12.000	15.000	19.000
Heating capacity		kW	2,5	3,2	4,2	5,0	6,3
		BTU/h	8.500	11.000	14.000	17.000	21.000
Power input	Cooling	kW	0,034/0,031/0,030	0,034/0,031/0,030	0,037/0,034/0,031	0,044/0,040/0,037	0,055/0,049/0,040
	Heating	kW	0,024/0,021/0,020	0,024/0,021/0,020	0,027/0,024/0,021	0,034/0,030/0,027	0,045/0,039/0,030
Running amperes	Cooling	A	0,26/0,23/0,21	0,26/0,23/0,21	0,29/0,26/0,23	0,37/0,33/0,29	0,47/0,42/0,33
	Heating	A	0,24/0,21/0,19	0,24/0,21/0,19	0,27/0,24/0,21	0,35/0,31/0,27	0,45/0,40/0,31
Fan motor	Type		Centrifugal fan	Centrifugal fan	Centrifugal fan	Centrifugal fan	Centrifugal fan
	Airflow rate (H/M/L)	m^3/min	9/8/7	9/8/7	10/9/8	12/11/10	14/13/11
	Output	kW	0,030	0,030	0,030	0,030	0,030
Power sound level (H/M/L)		dB(A)	41/38/36	41/38/36	43/40/37	47/43/39	52/48/44
Sound pressure sound (H/M/L)		dB(A)	30/27/25	30/27/25	32/29/26	36/32/28	41/37/33
Dimensions	H x W x D	mm	283 x 575 (625) x 575 (625)	283 x 575 (625) x 575 (625)	283 x 575 (625) x 575 (625)	283 x 575 (625) x 575 (625)	283 x 575 (625) x 575 (625)
Pipe connections	Liquid	inches (mm)	1/4 (Ø6,35)	1/4 (Ø6,35)	1/4 (Ø6,35)	1/4 (Ø6,35)	1/4 (Ø6,35)
	Gas 410 A	inches (mm)	1/2 (Ø12,7)	1/2 (Ø12,7)	1/2 (Ø12,7)	1/2 (Ø12,7)	1/2 (Ø12,7)
	Drain piping		VP-20	VP-20	VP-20	VP-20	VP-20
Net weight		kg	19 + (2,7)	19 + (2,7)	19 + (2,7)	19 + (2,7)	19 + (2,7)

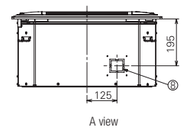
GLOBAL REMARKS	Rated conditions:	Cooling	Heating
	Indoor air temperature	27˚C DB / 19˚C WB	20˚C DB
	Outdoor air temperature	35˚C DB / 24˚C WB	7˚C DB / 6˚C WB

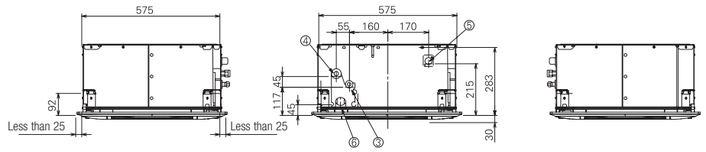
The values in ( ) for external dimensions and Net weight are the values for the optional ceiling panel.
Specifications subject to change without notice.

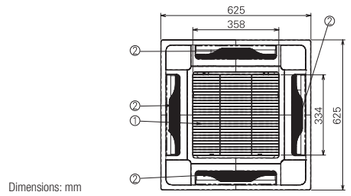
Y1 TYPE 4-WAY CASSETTE 60X60 Dimensions

1 Air intake
2 Discharge outlet
3 Refrigerant piping (liquid pipes)
Size 22 to 56: Ø6.35 (flared)
4 Refrigerant piping (gas pipes)
Size 22 to 56: Ø12.7 (flared)
5 Drain tube connection port VP20 (outer Ø26)
6 Power supply port
7 Suspension bolt hole (4-12 x 30 hole)
8 Fresh air intake duct connection port (Ø100)



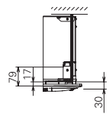






Dimensions: mm

The lenght of the suspension bolts should be selected so that there is a gap of 30 mm or the ceiling (17 mm or more below the lower surface of the main unit), as shown in the figure at right. If the suspension bolts is too long, it will contact the ceiling panel and the unit cannot be installed.



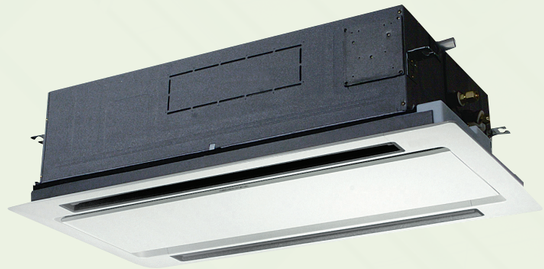
FSV_50Hz_catalog_2012.indd 48-49 12.2.14 1:15:05 PM

L1 TYPE 2-WAY Cassette

Realisation of thin, compact and light units Remarkable size and weight reductions have been achieved by improvement of the design around the fan.

PANEL

CZ-02KPL2
Big size panel (for S-73ML1E5)
CZ-03KPL2

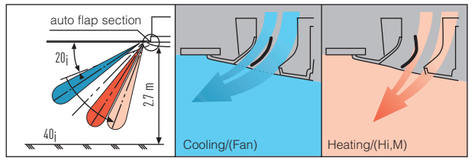


Self-diagnosing Function | Automatic Fan Operation | Mild dry | Intelligent Auto Swing | Automatic Restart Function | Auto Swing (Auto Flap Control) | Built-in Drain Pump

Technical focus

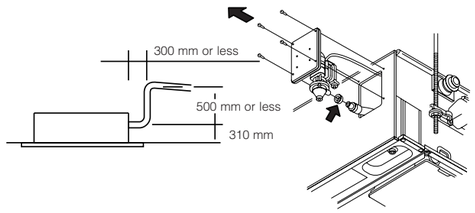
- Airflow and distribution is automatically altered depending on the operational mode of the unit
- Drain up is possible up to 500 mm from the drain port
- Simple maintenance

Airflow and distribution is automatically altered depending on the operational mode of the unit.



Drain up is possible up to 500 mm from the drain port.

Maintenance of the drain pump is possible from two sides, from the left side (piping side) and from the inside of the unit.



Simple maintenance

The drain pan is equipped with site wiring and can be removed. The fan case has a split construction, and the fan motor can be removed easily when the lower case is removed.

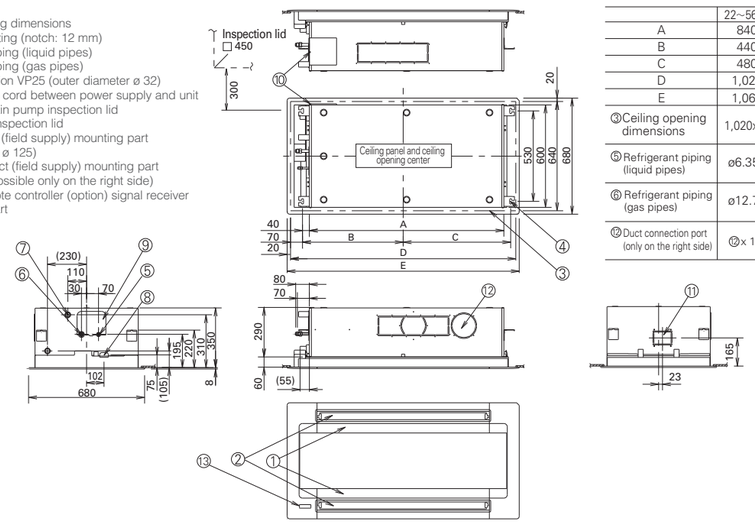
Model Name			S-22ML1E5	S-28ML1E5	S-36ML1E5	S-45ML1E5	S-56ML1E5	S-73ML1E5
Power source			220/230/240V, 1 phase - 50 / 60Hz					
Cooling capacity		kW	2.2	2.8	3.6	4.5	5.6	7.3
		BTU/h	7,500	9,600	12,000	15,000	19,000	25,000
Heating capacity		kW	2.5	3.2	4.2	5.0	6.3	8.0
		BTU/h	8,500	11,000	14,000	17,000	21,000	27,000
Power input	Cooling	kW	0.086/0.090/0.095	0.086/0.092/0.097	0.088/0.093/0.099	0.091/0.097/0.103	0.091/0.097/0.103	0.135/0.145/0.154
	Heating	kW	0.055/0.058/0.062	0.055/0.060/0.064	0.057/0.061/0.066	0.060/0.065/0.070	0.060/0.065/0.070	0.100/0.109/0.117
Running current	Cooling	A	0.45/0.45/0.45	0.44/0.45/0.45	0.44/0.45/0.45	0.45/0.45/0.45	0.45/0.45/0.45	0.64/0.65/0.66
	Heating	A	0.29/0.29/0.30	0.28/0.29/0.30	0.28/0.29/0.30	0.29/0.29/0.30	0.29/0.29/0.30	0.46/0.48/0.49
Fan	Type		Sirocco fan	Sirocco fan	Sirocco fan	Sirocco fan	Sirocco fan	Sirocco fan
	Air flow rate (H/M/L)	m^3/h	480/420/360	540/480/420	580/520/460	660/540/480	660/540/480	1,140/960/840
	Motor output	kW	0.03	0.03	0.03	0.03	0.03	0.05
Sound power level (L/M/H)		dB	35/38/40	37/40/44	39/42/45	40/44/46	40/44/46	44/46/49
Sound pressure level (L/M/H)		dB(A)	24/27/30	26/29/33	28/31/34	29/33/35	29/33/35	33/35/38
Dimensions	H x W x D	mm	350+(8)x840 (1,060) x600 (680)	350+(8)x840 (1,060) x600 (680)	350+(8)x840 (1,060) x600 (680)	350+(8)x840 (1,060) x600 (680)	350+(8)x840 (1,060) x600 (680)	350+(8)x 1,140 (1,360) x600 (680)
Pipe connections	Liquid	inches (mm)	1/4 (Ø6.35)	1/4 (Ø6.35)	1/4 (Ø6.35)	1/4 (Ø6.35)	1/4 (Ø6.35)	3/8 (Ø9.52)
	Gas	inches (mm)	1/2 (Ø12.7)	1/2 (Ø12.7)	1/2 (Ø12.7)	1/2 (Ø12.7)	1/2 (Ø12.7)	5/8 (Ø15.88)
	Drain piping		VP-25	VP-25	VP-25	VP-25	VP-25	VP-25
Net weight		kg	30	30	30	30	30	30

GLOBAL REMARKS	Rated conditions:	Cooling	Heating
	Indoor air temperature	27˚C DB / 19˚C WB	20˚C DB
	Outdoor air temperature	35˚C DB / 24˚C WB	7˚C DB / 6˚C WB

The values in ( ) for external dimensions and Net weight are the values for the optional ceiling panel.
Specifications subject to change without notice.

L1 TYPE 2-WAY CASSETTE Dimensions

1 Air intake
2 Air outlet
3 Ceiling opening dimensions
4 Suspension fitting (notch: 12 mm)
5 Refrigerant piping (liquid pipes)
6 Refrigerant piping (gas pipes)
7 Drain connection VP25 (outer diameter ø 32)
8 Inlet for option cord between power supply and unit
9 Drain pan, drain pump inspection lid
10 Drain pump inspection lid
11 Round flange (field supply) mounting part (fresh air inlet ø 125)
12 Discharge duct (field supply) mounting part (installation possible only on the right side)
13 Wireless remote controller (option) signal receiver installation part



	22~56 type	73 type
A	840	1,140
B	440	590
C	480	630
D	1,020	1,320
E	1,060	1,360
③Ceiling opening dimensions	1,020x640	1,320x640
⑤Refrigerant piping (liquid pipes)	ø6.35	ø9.52
⑥Refrigerant piping (gas pipes)	ø12.7	ø15.88
⑫Duct connection port (only on the right side)	⑫x 1 pc.	⑫x 2 pc.

Dimensions: mm

FSV_50Hz_catalog_2012.indd 50-51 12.2.14 1:15:09 PM

D1 TYPE 1-WAY Cassette

Semi concealed slim cassette

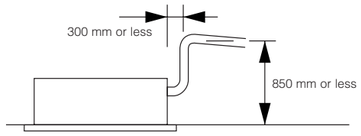
Designed for installation within the ceiling void, the D1 range of slimline 1 way blow cassettes feature quiet yet powerful fan that can reach the floor up 4.2 m from ceiling height.

Self-diagnosing Function | Automatic Fan Operation | Mild dry | Intelligent Auto Swing | Automatic Restart Function | Auto Swing (Auto Flap Control) | Built-in Drain Pump

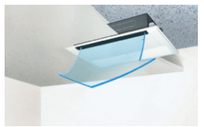
Technical focus

- Ultra-Slim
- Suitable for standard and high ceilings
- Built-in drain pump provides 747 mm lift
- Easy to install and maintain
- Hanging height can be easily adjusted
- Uses a DC fan motor to improve energy-efficiency

Drain height

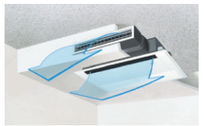


With 3 types of air-blow systems, the units can be used in various ways.



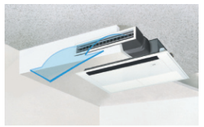
(1) One-direction down-blow system

Powerful one-direction “downblow” system reaches the floor even from high ceilings (up to 4.2 m).



(2) Two-direction ceiling-mounted system

“Down-blow” and “front-blow” systems are combined in a ceiling-mounted unit to blow air over a wide area.



(3) One-direction ceiling-mounted system

This powerful ceiling-mounted “front-blow” system efficiently air-conditions the space in front of the unit.
(Additional accessories required)

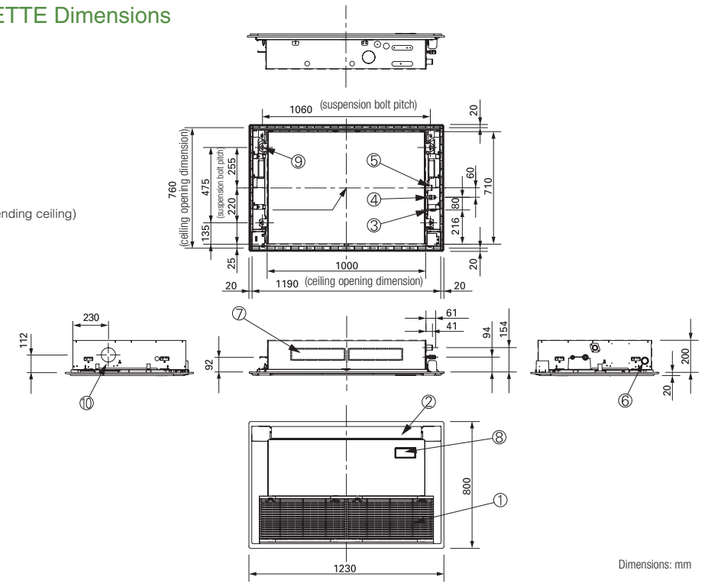
Model Name			S-28MD1E5	S-36MD1E5	S-45MD1E5	S-56MD1E5	S-73MD1E5
Power source			220/230/240 V, 1 phase - 50 / 60 Hz				
Cooling capacity		kW	2.8	3.6	4.5	5.6	7.3
		BTU/h	9,600	12,000	15,000	19,000	25,000
Heating capacity		kW	3.2	4.2	5.0	6.3	8.0
		BTU/h	11,000	14,000	17,000	21,000	27,000
Power input	Cooling	kW	0.050/0.051/0.052	0.050/0.051/0.052	0.050/0.051/0.052	0.058/0.060/0.061	0.086/0.087/0.089
	Heating	kW	0.039/0.040/0.042	0.039/0.040/0.042	0.039/0.040/0.042	0.046/0.048/0.049	0.075/0.076/0.077
Running current	Cooling	A	0.40/0.39/0.39	0.40/0.39/0.39	0.40/0.39/0.39	0.46/0.46/0.46	0.71/0.70/0.69
	Heating	A	0.36/0.35/0.35	0.36/0.35/0.35	0.36/0.35/0.35	0.42/0.41/0.41	0.66/0.65/0.63
Fan	Type		Sirocco fan	Sirocco fan	Sirocco fan	Sirocco fan	Sirocco fan
	Air flow rate (H/M/L)	m^3/h	720/600/540	720/600/540	720/660/600	780/690/600	1,080/900/780
	Motor output	kW	0.05	0.05	0.05	0.05	0.05
Sound power level (L/M/H)		dB	44/45/47	44/45/47	45/46/47	45/47/49	47/51/56
Sound pressure level (L/M/H)		dB(A)	33/34/36	33/34/36	34/35/36	34/36/38	36/40/45
Dimensions	H x W x D	mm	200+(20) x 1,000 (1,230) x 710 (800)	200+(20) x 1,000 (1,230) x 710 (800)	200+(20) x 1,000 (1,230) x 710 (800)	200+(20) x 1,000 (1,230) x 710 (800)	200+(20) x 1,000 (1,230) x 710 (800)
Pipe connections	Liquid	inches (mm)	1/4 (Ø6.35)	1/4 (Ø6.35)	1/4 (Ø6.35)	1/4 (Ø6.35)	3/8 (Ø9.52)
	Gas	inches (mm)	1/2 (Ø12.7)	1/2 (Ø12.7)	1/2 (Ø12.7)	1/2 (Ø12.7)	5/8 (Ø15.88)
	Drain piping		VP-25	VP-25	VP-25	VP-25	VP-25
Net weight		kg	26.5	26.5	26.5	26.5	27.5

GLOBAL REMARKS	Rated conditions:	Cooling	Heating
	Indoor air temperature	27˚C DB / 19˚C WB	20˚C DB
	Outdoor air temperature	35˚C DB / 24˚C WB	7˚C DB / 6˚C WB

The values in ( ) for external dimensions and Net weight are the values for the optional ceiling panel.
Specifications subject to change without notice.

D1 TYPE 1-WAY CASSETTE Dimensions

1 Air intake grille
2 Air outlet
3 Refrigerant piping (liquid pipes)
Size 28 to 56: Ø6.35 (flared)
Size 73: Ø9.52 (flared)
4 Refrigerant piping (gas pipes)
Size 28 to 56: Ø12.7 (flared)
Size 73: Ø15.88 (flared)
5 Drain connection VP25 (outer Ø32)
6 Power supply entry
7 Discharge duct connetcion port (for descending ceiling)
8 Wireless remote control receiver (option)
9 Suspension mounting (4-12 x 30 slot)
10 Fresh air intake (Ø100)



FSV_50Hz_catalog_2012.indd 52-53 12.2.14 1:15:13 PM

F2 TYPE Low Silhouette Ducted NEW

The new F2 type is designed specifically for applications requiring fixed square ducting. The internal filter is equipped as standard.

S-60MF2E5 / S-73MF2E5 / S-90MF2E5

S-106MF2E5 / S-140MF2E5 / S-160MF2E5

S-22MF2E5 / S-28MF2E5 / S-36MF2E5 / S-45MF2E5 / S-56MF2E5

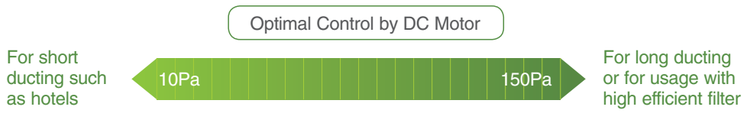
Self-diagnosing Function | Automatic Fan Operation | Mild dry | Automatic Restart Function | Built-in Drain Pump

Technical focus

- Variable external static pressure control
- Industry-leading low sound levels from 25 dB(A)
- Built-in drain pump provides 702 mm lift
- Easy to install and maintain
- Air off sensor avoids cold air dumping
- Configurable air temperature control
- Anti-mould washable filters included

Variable external static pressure control

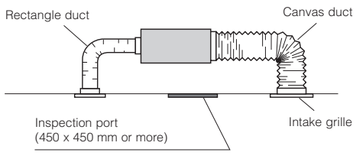
Optimal airflow set-up is possible depend on ducting design condition.



* Please refer technical databook for detail.

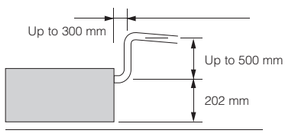
System example

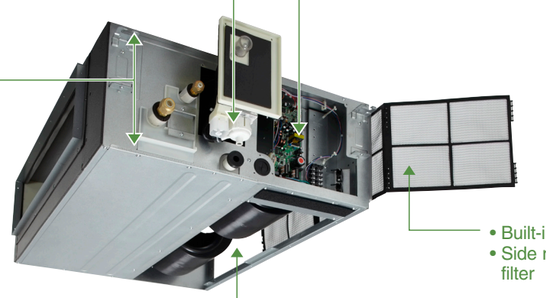
An inspection port (450 mm x 450 mm or more) is required at the lower side of the indoor unit body.



More powerful drain pump

Using a high-lift drain pump, drain piping can be elevated up to 702 mm from the base of the unit.

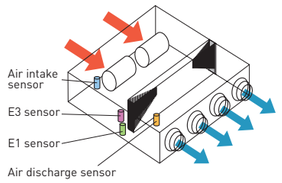


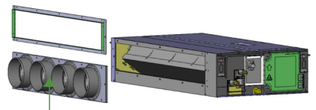


Discharge air temperature control

- Able to control discharge air temperature for accurate room temperature control.
- Possible to reduce cold drafts at heating operation.

Before spec-in, please consult with an authorized Panasonic dealer.





Circle duct flange (option)
CZ-160DAF2 (4 SA outlet)
CZ-90DAF2 (3 SA outlet)
CZ-56DAF2 (2 SA outlet)

FSV_50Hz_catalog_2012.indd 54-55 12.2.14 1:15:19 PM

F2 TYPE Low Silhouette Ducted

Model Name			S-22MF2E5	S-28MF2E5	S-36MF2E5	S-45MF2E5	S-56MF2E5		S-60MF2E5	S-73MF2E5	S-90MF2E5	S-106MF2E5	S-140MF2E5	S-160MF2E5
Power source			220/230/240V, 1 phase - 50/60Hz							220/230/240V, 1 phase - 50/60Hz				
Cooling capacity		kW	2.2	2.8	3.6	4.5	5.6		6.0	7.3	9.0	10.6	14.0	16.0
		BTU/h	7,500	9,600	12,000	15,000	19,000		20,400	25,000	30,000	36,000	47,800	54,600
Heating capacity		kW	2.5	3.2	4.2	5.0	6.3		7.1	8.0	10.0	11.4	16.0	18.0
		BTU/h	8,500	11,000	14,000	17,000	21,000		24,200	27,000	34,000	39,000	54,600	61,500
Power input	Cooling	kW	0.070/0.070/0.070	0.070/0.070/0.070	0.070/0.070/0.070	0.100/0.100/0.100	0.100/0.100/0.100		0.120/0.120/0.120	0.120/0.120/0.120	0.135/0.135/0.135	0.195/0.195/0.195	0.215/0.215/0.215	0.225/0.225/0.225
	Heating	kW	0.070/0.070/0.070	0.070/0.070/0.070	0.070/0.070/0.070	0.100/0.100/0.100	0.100/0.100/0.100		0.120/0.120/0.120	0.120/0.120/0.120	0.135/0.135/0.135	0.200/0.200/0.200	0.210/0.210/0.210	0.225/0.225/0.225
Running amperes	Cooling	A	0.60/0.57/0.56	0.60/0.57/0.56	0.60/0.57/0.56	0.77/0.74/0.71	0.77/0.74/0.71		0.91/0.89/0.87	0.91/0.89/0.87	0.99/0.97/0.95	1.35/1.30/1.27	1.48/1.44/1.39	1.55/1.50/1.47
	Heating	A	0.60/0.57/0.56	0.60/0.57/0.56	0.60/0.57/0.56	0.77/0.74/0.71	0.77/0.74/0.71		0.91/0.89/0.87	0.91/0.89/0.87	0.99/0.97/0.95	1.37/1.34/1.29	1.46/1.42/1.38	1.55/1.50/1.46
Fan motor	Type		Sirocco fan	Sirocco fan	Sirocco fan	Sirocco fan	Sirocco fan		Sirocco fan	Sirocco fan	Sirocco fan	Sirocco fan	Sirocco fan	Sirocco fan
	Airflow rate (H/M/L)	m³/h	840/780/600	840/780/600	840/780/600	960/900/720	960/900/720		1,260/1,140/900	1,260/1,140/900	1,500/1,380/1,140	1,920/1,620/1,320	2,040/1,740/1,380	2,160/1,860/1,500
	Output	kW	0.119	0.119	0.119	0.119	0.119		0.124	0.124	0.124	0.235	0.235	0.235
	External static pressure	Pa	70(10-150)	70(10-150)	70(10-150)	70(10-150)	70(10-150)		70(10-150)	70(10-150)	70(10-150)	100(10-150)	100(10-150)	100(10-150)
Power sound level (H/M/L)		dB(A)	55/51/47	55/51/47	55/51/47	56/54/50	56/54/50		57/54/48	57/54/48	59/56/50	60/56/53	61/57/54	62/58/55
Sound pressure sound (H/M/L)		dB(A)	33/29/25	33/29/25	33/29/25	34/32/28	34/32/28		35/32/26	35/32/26	37/34/28	38/34/31	39/35/32	40/36/33
Dimensions	H x W x D	mm	290x800x700	290x800x700	290x800x700	290x800x700	290x800x700		290x1,000x700	290x1,000x700	290x1,000x700	290x1,400x700	290x1,400x700	290x1,400x700
Pipe connections	Liquid	inches (mm)	1/4 (Ø6.35)	1/4 (Ø6.35)	1/4 (Ø6.35)	1/4 (Ø6.35)	1/4 (Ø6.35)		3/8 (Ø9.52)	3/8 (Ø9.52)	3/8 (Ø9.52)	3/8 (Ø9.52)	3/8 (Ø9.52)	3/8 (Ø9.52)
	Gas 410 A	inches (mm)	1/2 (Ø12.7)	1/2 (Ø12.7)	1/2 (Ø12.7)	1/2 (Ø12.7)	1/2 (Ø12.7)		5/8 (Ø15.88)	5/8 (Ø15.88)	5/8 (Ø15.88)	5/8 (Ø15.88)	5/8 (Ø15.88)	5/8 (Ø15.88)
	Drain piping		VP-25	VP-25	VP-25	VP-25	VP-25		VP-25	VP-25	VP-25	VP-25	VP-25	VP-25
Net weight		kg	29	29	29	29	29		34	34	34	46	46	46

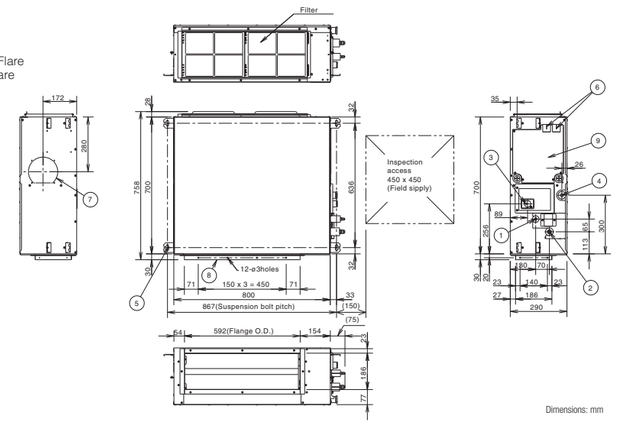
GLOBAL REMARKS	Rated conditions:	Cooling	Heating
	Indoor air temperature	27˚C DB / 19˚C WB	20˚C DB
	Outdoor air temperature	35˚C DB / 24˚C WB	7˚C DB / 6˚C WB

Specifications subject to change without notice.

F2 TYPE LOW SILHOUETTE DUCTED Dimensions

SIZE 22-56 MF2E5

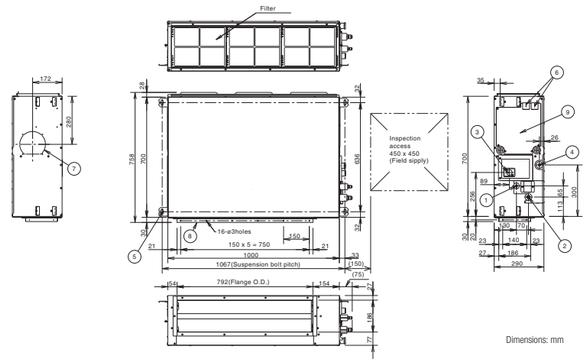
1 Refrigerant tubing joint (liquid tube) Ø6.35 Flare
2 Refrigerant tubing joint (gas tube) Ø12.7 Flare
3 Upper drain port VP25 (O.D. Ø32 mm)
ℓ 200 flexible hose supplied
4 Bottom drain port VP25 (O.D. Ø32 mm)
5 Suspension lug (4-12 × 30 mm)
6 Power supply outlet
7 Fresh air intake port (Ø150 mm)
8 Flange for flexible air outlet duct
9 Electrical component box



Dimensions: mm

SIZE 60-90 MF2E5

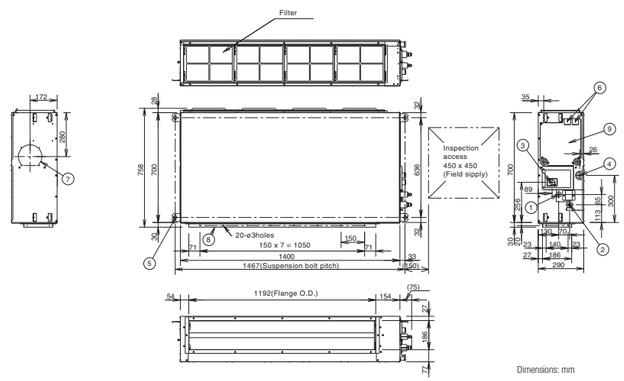
1 Refrigerant tubing joint (liquid tube) Ø9.52 Flare
2 Refrigerant tubing joint (gas tube) Ø15.88 Flare
3 Upper drain port VP25 (O.D. Ø32 mm)
ℓ 200 flexible hose supplied
4 Bottom drain port VP25 (O.D. Ø32 mm)
5 Suspension lug (4-12 × 30 mm)
6 Power supply outlet
7 Fresh air intake port (Ø150 mm)
8 Flange for flexible air outlet duct
9 Electrical component box



Dimensions: mm

SIZE 106-160 MF2E5

1 Refrigerant tubing joint (liquid tube) Ø9.52 Flare
2 Refrigerant tubing joint (gas tube) Ø15.88 Flare
3 Upper drain port VP25 (O.D. Ø32 mm)
ℓ 200 flexible hose supplied
4 Bottom drain port VP25 (O.D. Ø32 mm)
5 Suspension lug (4-12 × 30 mm)
6 Power supply outlet
7 Fresh air intake port (Ø150 mm)
8 Flange for flexible air outlet duct
9 Electrical component box

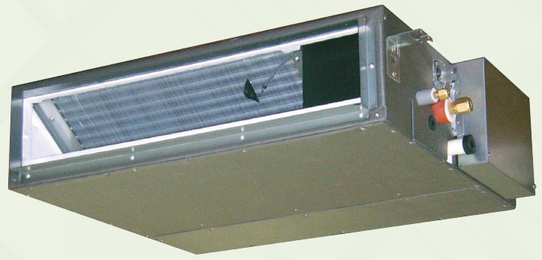


Dimensions: mm

FSV_50Hz_catalog_2012.indd 56-57
12.2.14 1:15:26 PM

M1 TYPE Slim Low Static Ducted
concealed duct

The ultra slim M1 type is one of the leading products of its type in the industry.
With a height of only 200 mm, it provides greater flexibility and adaptability for various applications.
In addition, high efficiency and extreme low noise level make it highly recommended for hotels and small offices.



Self-diagnosing Function | Automatic Fan Operation | Mild dry | Automatic Restart Function | Built-in Drain Pump

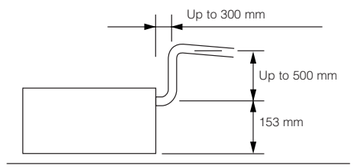
Technical focus

- Ultra-slim profile: 200 mm for all models
- DC fan motor greatly reduces power consumption
- Ideal for hotel application with very narrow false ceilings
- Anti-mould washable filters included
- Easy maintenance and service by external electrical box
- 40 Pa static pressure enables ductwork to be fitted.
- Includes drain pump

Ultra-slim profile for all models

Drain pump with increased power!

By adoption of a high-lift drain pump, the drain piping rise height can be increased to 653 mm from the lower surface of the body.



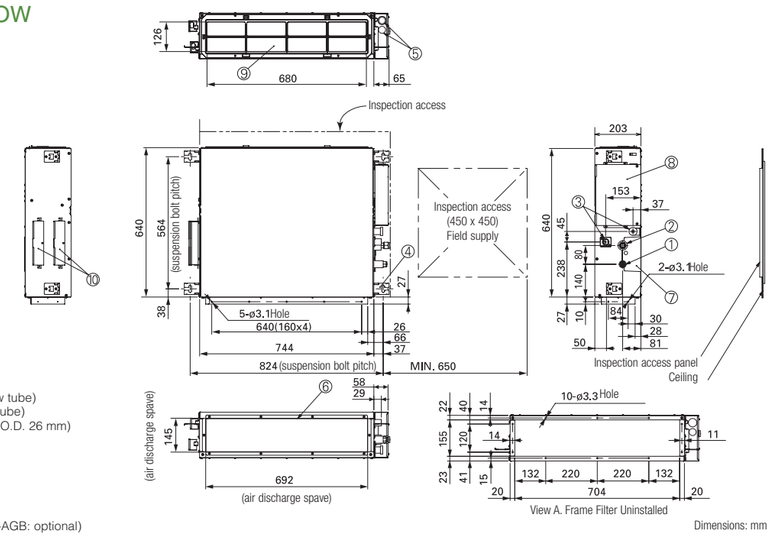
Model Name			S-22MM1E5	S-28MM1E5	S-36MM1E5	S-45MM1E5	S-56MM1E5
Power source			220/230/240 V, 1 phase - 50 / 60 Hz				
Cooling capacity		kW	2.2	2.8	3.6	4.5	5.6
		BTU/h	7,500	9,600	12,000	15,000	19,000
Heating capacity		kW	2.5	3.2	4.2	5.0	6.3
		BTU/h	8,500	11,000	14,000	17,000	21,000
Power input	Cooling	kW	0.036/0.036/0.036	0.040/0.040/0.040	0.042/0.042/0.042	0.049/0.049/0.049	0.064/0.064/0.064
	Heating	kW	0.026/0.026/0.026	0.030/0.030/0.030	0.032/0.032/0.032	0.039/0.039/0.039	0.054/0.054/0.054
Running current	Cooling	A	0.26/0.26/0.26	0.30/0.30/0.30	0.31/0.31/0.31	0.37/0.37/0.37	0.48/0.48/0.48
	Heating	A	0.23/0.23/0.23	0.27/0.27/0.27	0.28/0.28/0.28	0.34/0.34/0.34	0.45/0.45/0.45
Fan	Type		Sirocco fan	Sirocco fan	Sirocco fan	Sirocco fan	Sirocco fan
	Air flow rate (H/M/L)	m^3/h	480/420/360	510/450/390	540/480/420	630/570/480	750/690/600
	Motor output	kW	0.05	0.05	0.05	0.05	0.05
	External static pressure	Pa	10 (30)	15 (30)	15 (40)	15 (40)	15 (40)
Sound power level (L/M/H)		dB	40/42/43	42/44/45	43/45/47	45/47/49	48/50/52
Sound pressure level (L/M/H)		dB(A)	25/27/28 (27/29/30)*	27/29/30 (29/31/32)*	28/30/32 (30/32/34)*	30/32/34 (32/34/36)*	31/33/35 (32/35/37)*
Dimensions	H x W x D	mm	200 x 750 x 640	200 x 750 x 640	200 x 750 x 640	200 x 750 x 640	200 x 750 x 640
Pipe connections	Liquid	inches (mm)	1/4 (Ø6.35)	1/4 (Ø6.35)	1/4 (Ø6.35)	1/4 (Ø6.35)	1/4 (Ø6.35)
	Gas	inches (mm)	1/2 (Ø12.7)	1/2 (Ø12.7)	1/2 (Ø12.7)	1/2 (Ø12.7)	1/2 (Ø12.7)
	Drain piping		VP-20	VP-20	VP-20	VP-20	VP-20
Net weight		kg	19	19	19	19	19

GLOBAL REMARKS	Rated conditions:	Cooling	Heating
	Indoor air temperature	27˚C DB / 19˚C WB	20˚C DB
	Outdoor air temperature	35˚C DB / 24˚C WB	7˚C DB / 6˚C WB

Specifications subject to change without notice.

* With booster cable.

M1 TYPE SLIM LOW STATIC DUCTED Dimensions



1 Refrigerant tubing joint (narrow tube)
2 Refrigerant tubing joint (wide tube)
3 Upper and bottom drain port (O.D. 26 mm)
4 Suspension lug
5 Power supply outlet (2- Ø30)
6 Flange for air intake duct
7 PI cover
8 Electrical component box
9 Frame filter
10 Signal output board (ACC-SG-AGB: optional)

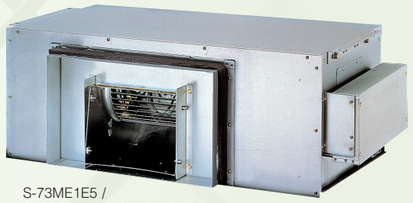
Dimensions: mm

FSV_50Hz_catalog_2012.indd 58-59 12.2.14 1:15:31 PM

E1 TYPE High Static Pressure Ducted

Concealed duct high-static pressure

The E1 range of ducted units offers improved design flexibility for extended duct layouts as a result of their increased external static pressures.



S-73ME1E5 /
S-106ME1E5 / S-140ME1E5

S-224ME1E5 /
S-280ME1E5

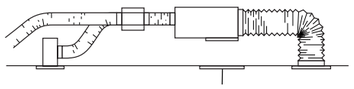
Self-diagnosing Function | Automatic Fan Operation | Mild dry | Automatic Restart Function

Technical focus

- Complete flexibility for ductwork design
- Can be located into a weatherproof housing for external installation
- Discharge air temperature control
- Configurable air temperature control

System example

An inspection port (450 x 450 mm or more) is required at the lower side of the indoor unit body (field supply).



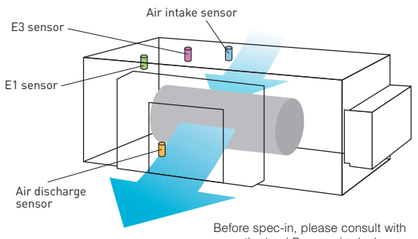
Inspection port (450 x 450 mm or more)

Rap valve kit CZ-P160RVK2 (For heating operation only)

The types 224 and 280 require two rap valve kits for each unit for heating operation. (not required for cooling only design project)
(not required on a 1:1 installation)

Discharge air temperature control

- Able to control discharge air temperature for accurate room temperature control.
- Possible to reduce cold drafts at heating operation.



Before spec-in, please consult with an authorized Panasonic dealer.

Model Name			S-73ME1E5	S-106ME1E5	S-140ME1E5	S-224ME1E5	S-280ME1E5
Power source			220/230/240 V, 1 phase - 50 / 60 Hz				220/230/240 V, 1 phase - 50 Hz
Cooling capacity		kW	7.3	10.6	14.0	22.4	28.0
		BTU/h	25,000	36,000	47,800	76,400	95,500
Heating capacity		kW	8.0	11.4	16.0	25.0	31.5
		BTU/h	27,000	39,000	54,600	85,300	107,500
Power input	Cooling	kW	0.480/0.505/0.530	0.520/0.545/0.570	0.600/0.660/0.710	0.870/0.900/0.930	1.270/1.330/1.390
	Heating	kW	0.480/0.505/0.530	0.520/0.545/0.570	0.600/0.660/0.710	0.870/0.900/0.930	1.270/1.330/1.390
Running current	Cooling	A	2.29/2.30/2.31	2.46/2.46/2.47	2.80/2.90/3.00	4.05/4.06/4.07	6.04/6.06/6.07
	Heating	A	2.29/2.30/2.31	2.46/2.46/2.47	2.80/2.90/3.00	4.05/4.06/4.07	6.04/6.06/6.07
Fan	Type		Sirocco fan	Sirocco fan	Sirocco fan	Sirocco fan	Sirocco fan
	Air flow rate (H/M/L)	m^3/h	1,380/1,320/1,260	1,800/1,680/1,500	2,160/2,100/1,980	3,360/3,190/2,980	4,320/4,200/3,960
	Motor output	kW	0.2	0.2	0.35	0.2	0.4
	External static pressure	Pa	186	176	167	176	216 (235)*
Sound power level (L/M/H)		dB	53/54/55	53/55/56	55/57/58	57/58/59	60/61/62
Sound pressure level (L/M/H)		dB(A)	42/43/44	42/44/45	44/46/47	46/47/48	49/50/51 (50/51/52)*
Dimensions	H x W x D	mm	420 x 1,065 x 620	420 x 1,065 x 620	450 x 1,065 x 620	467 x 1,428 x 1,230	467 x 1,428 x 1,230
Pipe connections	Liquid	inches (mm)	3/8 (Ø9.52)	3/8 (Ø9.52)	3/8 (Ø9.52)	3/8 (Ø9.52)	3/8 (Ø9.52)
	Gas	inches (mm)	5/8 (Ø15.88)	5/8 (Ø15.88)	5/8 (Ø15.88)	3/4 (Ø19.05)	7/8 (Ø2222)
	Drain piping		VP-25	VP-25	VP-25	VP-25	VP-25
Net weight		kg	47	50	54	110	120

GLOBAL REMARKS	Rated conditions:	Cooling	Heating
	Indoor air temperature	27˚C DB / 19˚C WB	20˚C DB
	Outdoor air temperature	35˚C DB / 24˚C WB	7˚C DB / 6˚C WB

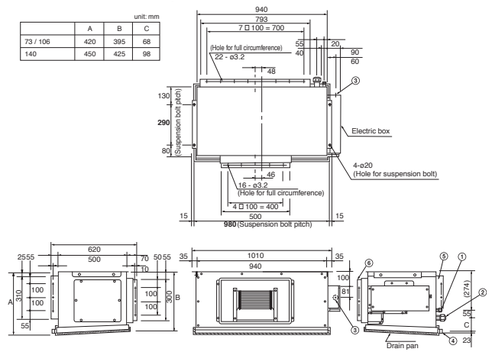
Specifications subject to change without notice.

* With booster cable.

E1 TYPE HIGH STATIC PRESSURE DUCTED Dimensions

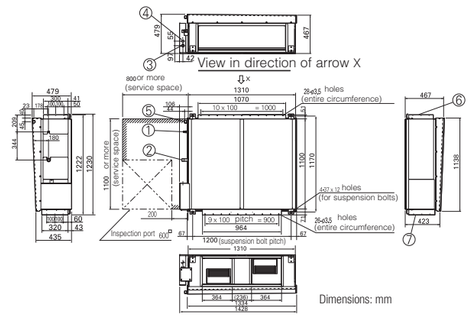
SIZE 73-140

1 Refrigerant liquid line (ø9.52)
2 Refrigerant gas line (ø15.88)
3 Power supply entry
4 Drain connection (20A / VP20)
5 Duct connection for suction
6 Duct connection for discharge



SIZE 224-280

1 Refrigerant piping (liquid pipes) Ø9.52
2 Refrigerant piping (gas pipes)
76 type: Ø19.05, 96 type: Ø22.22
3 Power supply outlet (Ø25 grommet, rubber)
4 Power supply outlet (spare) (Ø30 knock-out)
5 Drain port 25 A, male thread
6 Duct connection for suction
7 Duct connection for discharge



FSV_50Hz_catalog_2012.indd 60-61 12.2.14 1:15:35 PM

T1 TYPE Ceiling

Floor/Ceiling mounted

The T1 type ceiling mounted unit features a DC fan motor for increased efficiency and reduced operating sound levels. All unit have the same height and depth for a uniform appearance in mixed installations.
It also features a fresh air knockout for improved air quality.

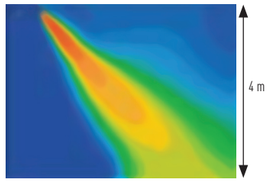
Self-diagnosing Function | Automatic Fan Operation | Mild dry | Intelligent Auto Swing | Automatic Restart Function | Auto Swing (Auto Flap Control)

Technical focus

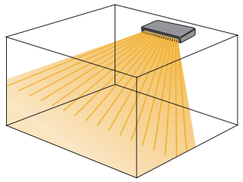
- Low sound levels
- Standardized height of 210 mm for all models
- Large and wide air distribution
- Easy to install and maintain
- Fresh air knockout

Further comfort improvement

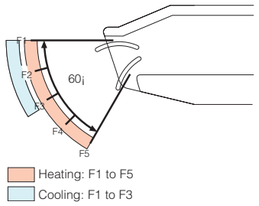
The wide air discharge opening widens the air flow to the left and the right, so that a comfortable temperature is obtained in the entire room. The unpleasant feeling caused when the air flow directly hits the human body is prevented by the “Draft prevention position”, which changes the swing width, so that the degree of comfort is increased.



Further comfort improvement with airflow distribution



Air distribution is automatically altered depending on the operational mode of the unit



Model Name			S-36MT1E5	S-45MT1E5	S-56MT1E5	S-73MT1E5	S-106MT1E5	S-140MT1E5
Power source			220/230/240 V, 1 phase - 50 / 60 Hz					
Cooling capacity		kW	3.6	4.5	5.6	7.3	10.6	14.0
		BTU/h	12,000	15,000	19,000	25,000	36,000	47,800
Heating capacity		kW	4.2	5.0	6.3	8.0	11.4	16.0
		BTU/h	14,000	17,000	21,000	27,000	39,000	54,600
Power input	Cooling	kW	0.028/0.029/0.029	0.028/0.029/0.029	0.031/0.032/0.032	0.043/0.043/0.044	0.073/0.074/0.075	0.085/0.086/0.088
	Heating	kW	0.028/0.029/0.029	0.028/0.028/0.029	0.031/0.031/0.032	0.042/0.042/0.043	0.072/0.073/0.074	0.084/0.085/0.086
Running current	Cooling	A	0.26/0.24/0.23	0.26/0.24/0.23	0.28/0.26/0.24	0.38/0.35/0.33	0.62/0.57/0.53	0.69/0.63/0.60
	Heating	A	0.26/0.24/0.23	0.26/0.24/0.23	0.28/0.26/0.25	0.38/0.35/0.34	0.62/0.57/0.55	0.69/0.63/0.62
Fan	Type		Sirocco fan	Sirocco fan	Sirocco fan	Sirocco fan	Sirocco fan	Sirocco fan
	Air flow rate (H/M/L)	m^3/h	720/600/540	780/660/540	780/660/540	1,100/900/840	1,650/1,380/1,200	1,800/1,560/1,320
	Motor output	kW	0.03	0.03	0.03	0.04	0.08	0.08
Sound power level (L/M/H)		dB	41/43/46	41/44/47	41/44/47	44/47/49	46/49/52	48/51/54
Sound pressure level (L/M/H)		dB(A)	30/32/35	30/33/36	30/33/36	33/36/38	35/38/41	37/40/43
Dimensions	H x W x D	mm	210 x 910 x 680	210 x 910 x 680	210 x 910 x 680	210 x 1,180 x 680	210 x 1,595 x 680	210 x 1,595 x 680
Pipe connections	Liquid	inches (mm)	1/4 (Ø6.35)	1/4 (Ø6.35)	1/4 (Ø6.35)	3/8 (Ø9.52)	3/8 (Ø9.52)	3/8 (Ø9.52)
	Gas	inches (mm)	1/2 (Ø12.7)	1/2 (Ø12.7)	1/2 (Ø12.7)	5/8 (Ø15.88)	5/8 (Ø15.88)	5/8 (Ø15 88)
	Drain piping		VP-20	VP-20	VP-20	VP-20	VP-20	VP-20
Net weight		kg	21	21	21	25	33	33

GLOBAL REMARKS	Rated conditions:	Cooling	Heating
	Indoor air temperature	27˚C DB / 19˚C WB	20˚C DB
	Outdoor air temperature	35˚C DB / 24˚C WB	7˚C DB / 6˚C WB

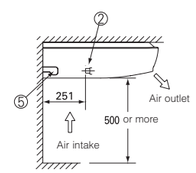
Specifications subject to change without notice.

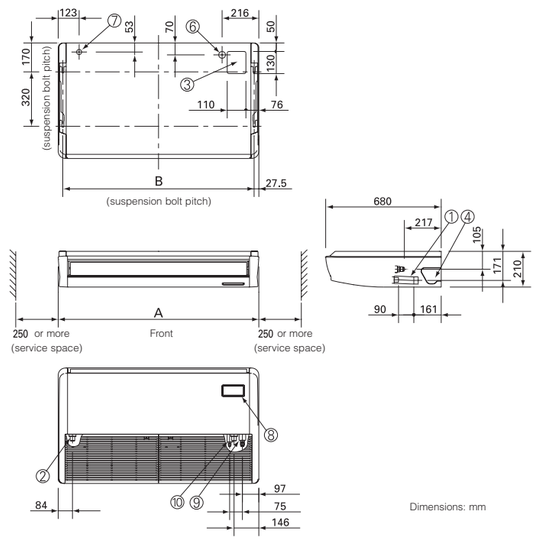
T1 TYPE CEILING Dimensions

1 Drain port VP20 (inner Ø26, hose accessory)
2 Drain for left piping
3 Upper piping outlet port (knock-out hole)
4 Right piping oulet port (knock-out hole)
5 Drain left piping outlet port (knock-out hole)
6 Power supply entry port (knock-out hole Ø40)
7 Remote controller wiring inlet port
8 Wireless remote control receiver mounting part

	28~56 type	73 type	106~140 type
A (body)	910	1,180	1,595
B (suspension bolt pitch)	855	1,125	1,540

9 Refrigerant gas piping
Size 28-56: Ø12.7
Size 73-140: Ø15.88
10 Refrigerant liquid piping
Size 28-56: Ø6.35
Size 73-140: Ø9.52





Dimensions: mm

FSV_50Hz_catalog_2012.indd 62-63 12.2.14 1:15:38 PM

K1 TYPE Wall Mounted

The K1 type wall mounted unit has a stylish smooth panel with a washable front panel. Small, lightweight and low noise level makes it ideal for small offices and other commercial applications.

S-22MK1E5 / S-28MK1E5 / S-36MK1E5

S-45MK1E5 / S-56MK1E5 /
S-73MK1E5 / S-106MK1E5

Self-diagnosing Function | Automatic Fan Operation | Mild dry | Intelligent Auto Swing | Automatic Restart Function | Auto Swing (Auto Flap Control)

Technical focus

- Closed discharge port
- Lighter and smaller units make the installation easy
- Quiet operation
- Smooth and durable design
- Piping outlet in three directions
- Washable front panel
- Air distribution is automatically altered depending on the operational mode of the unit
- Anti-mould washable filters are included

External valve

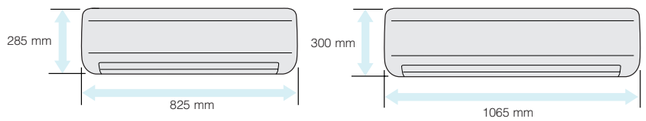
To reduce noise level of external valve.
(Optional accessory)

CZ-P56SVK2 (for 22 - 56 type)
CZ-P160SVK2 (for 73 - 106 type)

Closed discharge port

When the unit is turned off, the flap closes completely to prevent entry of dust into the unit and to keep the equipment clean.

Compact indoor units make the installation easy



Quiet operation

Low operating noise level makes these units ideal for hotels and hospital.

Smooth and durable design

The smooth cover means these units match most modern interiors.
Their compact size enables them to blend in, even in small spaces.

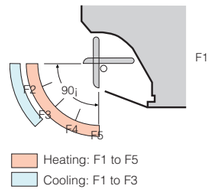
Piping outlet in three directions

Piping outlet is possible in the three directions of rear, right, and left, making the installation work easier.

Washable front panel

The indoor unit's front panel can be easily removed and washed for trouble-free cleaning.

Air distribution is automatically altered depending on the operational mode of the unit



FSV_50Hz_catalog_2012.indd 64-65 12.2.14 1:15:41 PM

K1 TYPE Wall Mounted

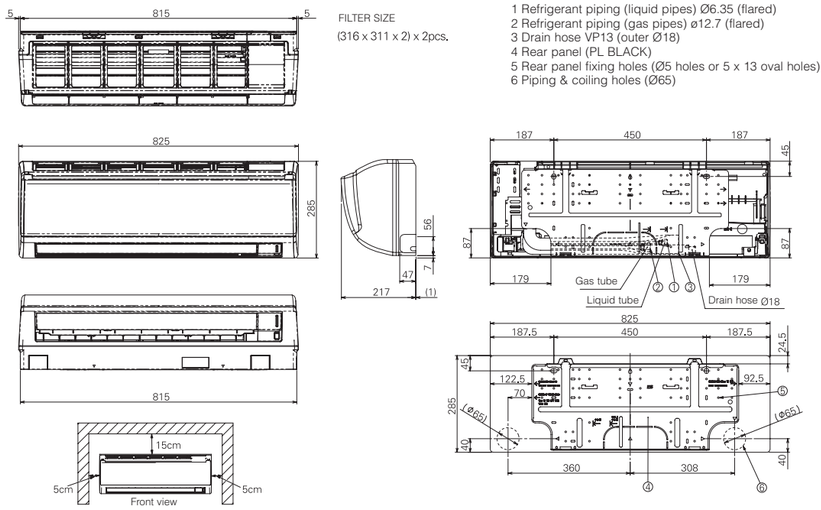
Model Name			S-22MK1E5	S-28MK1E5	S-36MK1E5	S-45MK1E5		S-56MK1E5	S-73MK1E5	S-106MK1E5
Power source			220/230/240 V, 1 phase - 50 / 60 Hz					220/230/240 V, 1 phase - 50 / 60 Hz		
Cooling capacity		kW	2.20	2.80	3.60	4.5		5.6	7.3	10.6
		BTU/h	7,500	9,600	12,000	15,000		19,000	25,000	36,000
Heating capacity		kW	2.50	3.20	4.20	5.0		6.3	8.0	11.4
		BTU/h	8,500	11,000	14,000	17,000		21,000	27,000	39,000
Power input	Cooling	kW	0.018/0.019/0.019	0.018/0.019/0.019	0.021/0.022/0.023	0.020/0.020/0.021		0.029/0.030/0.030	0.056/0.057/0.057	0.059/0.060/0.060
	Heating	kW	0.019/0.019/0.020	0.019/0.019/0.020	0.022/0.023/0.023	0.020/0.020/0.021		0.029/0.030/0.030	0.056/0.057/0.057	0.067/0.068/0.068
Running current	Cooling	A	0.16/0.16/0.16	0.16/0.16/0.16	0.19/0.19/0.20	0.27/0.26/0.23		0.36/0.35/0.32	0.59/0.58/0.52	0.63/0.62/0.55
	Heating	A	0.17/0.17/0.18	0.17/0.17/0.18	0.20/0.20/0.20	0.27/0.26/0.23		0.36/0.35/0.32	0.59/0.58/0.52	0.70/0.70/0.62
Fan	Type		Sirocco fan	Sirocco fan	Sirocco fan	Sirocco fan		Sirocco fan	Sirocco fan	Sirocco fan
	Air flow rate (H/M/L)	m^3/h	540/450/360	540/450/360	600/510/390	720/630/510		840/720/630	1,080/870/690	1,140/990/780
	Motor output	kW	0.047	0.047	0.047	0.047		0.047	0.047	0.047
Sound power level (L/M/H)		dB	39/43/46	39/43/46	40/44/48	41/45/49		51/55/58	51/55/58	53/56/60
Sound pressure level (L/M/H)		dB(A)	28/32/35	28/32/35	29/33/37	30/34/38		32/36/40	40/44/47	42/45/49
Dimensions	H x W x D	mm	285 x 825 x 217	285 x 825 x 217	285 x 825 x 217	300 x 1,065 x 230		300 x 1,065 x 230	300 x 1,065 x 230	300 x 1,065 x 230
Pipe connections	Liquid	inches (mm)	1/4 (Ø6.35)	1/4 (Ø6.35)	1/4 (Ø6.35)	1/4 (Ø6.35)		1/4 (Ø6.35)	3/8 (Ø9.52)	3/8 (Ø9.52)
	Gas	inches (mm)	1/2 (Ø12.7)	1/2 (Ø12.7)	1/2 (Ø12.7)	1/2 (Ø12.7)		1/2 (Ø12.7)	5/8 (Ø15.88)	5/8 (Ø15.88)
	Drain piping		VP-13	VP-13	VP-13	VP-13		VP-13	VP-13	VP-13
Net weight		kg	10	10	10	13		13	14.5	14.5

GLOBAL REMARKS	Rated conditions:	Cooling	Heating
	Indoor air temperature	27˚C DB / 19˚C WB	20˚C DB
	Outdoor air temperature	35˚C DB / 24˚C WB	7˚C DB / 6˚C WB

Specifications subject to change without notice.

K1 TYPE WALL MOUNTED Dimensions

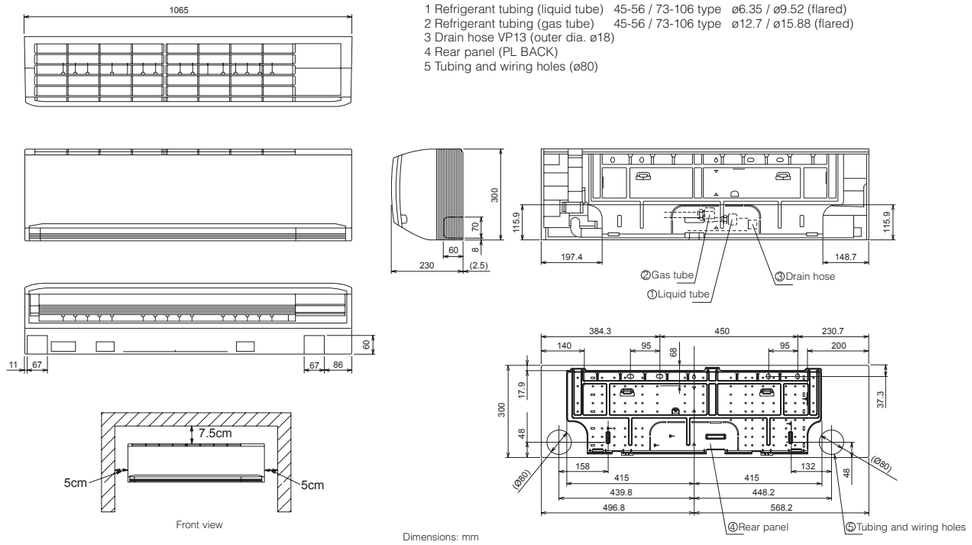
S-22MK1E5 / S-28MK1E5 / S-36MK1E5



FILTER SIZE
(316 x 311 x 2) x 2pcs.

1 Refrigerant piping (liquid pipes) Ø6.35 (flared)
2 Refrigerant piping (gas pipes) ø12.7 (flared)
3 Drain hose VP13 (outer Ø18)
4 Rear panel (PL BLACK)
5 Rear panel fixing holes (Ø5 holes or 5 x 13 oval holes)
6 Piping & coiling holes (Ø65)

S-45MK1E5 / 56MK1E5 / 73MK1E5 / 106MK1E5



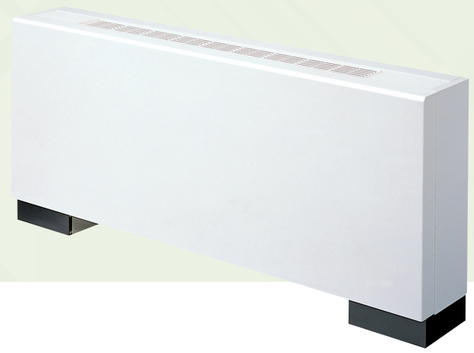
1 Refrigerant tubing (liquid tube) 45-56 / 73-106 type ø6.35 / ø9.52 (flared)
2 Refrigerant tubing (gas tube) 45-56 / 73-106 type ø12.7 / ø15.88 (flared)
3 Drain hose VP13 (outer dia. ø18)
4 Rear panel (PL BACK)
5 Tubing and wiring holes (ø80)

Dimensions: mm

FSV_50Hz_catalog_2012.indd 66-67 12.2.14 1:15:44 PM

P1 TYPE Floor Standing

The compact floor standing P1 units are the ideal solution for providing perimeter air conditioning. The standard wired controller can be incorporated into the body of the unit.



Self-diagnosing Function

Automatic Fan Operation

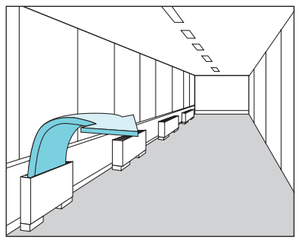
Mild dry

Automatic Restart Function

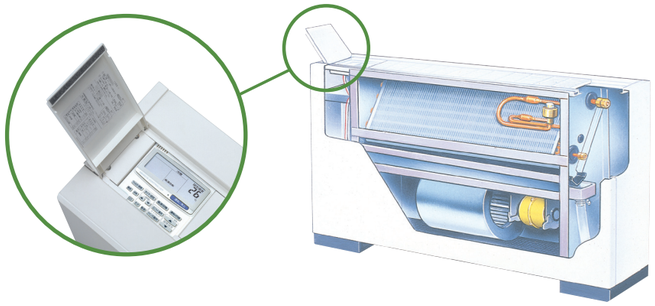
Technical focus

- Pipes can be connected to either side of the unit from the bottom or rear
- Easy to install
- Front panel opens fully for easy maintenance
- Removable air discharge grille gives flexible air flow

Effective perimeter handling



A standard wired remote control can be installed in the body



Model Name			S-22MP1E5	S-28MP1E5	S-36MP1E5	S-45MP1E5	S-56MP1E5	S-71MP1E5
Power source			220/230/240 V, 1 phase - 50 / 60 Hz					
Cooling capacity		kW	2.2	2.8	3.6	4.5	5.6	7.1
		BTU/h	7,500	9,600	12,000	15,000	19,000	24,000
Heating capacity		kW	2.5	3.2	4.2	5.0	6.3	8.0
		BTU/h	8,500	11,000	14,000	17,000	21,000	27,000
Power input	Cooling	kW	0.051/0.056/0.061	0.051/0.056/0.061	0.079/0.085/0.091	0.116/0.126/0.136	0.116/0.126/0.136	0.150/0.160/0.170
	Heating	kW	0.036/0.040/0.045	0.036/0.040/0.045	0.064/0.070/0.076	0.079/0.091/0.101	0.079/0.091/0.101	0.110/0.120/0.130
Running current	Cooling	A	0.24/0.25/0.26	0.24/0.25/0.26	0.37/0.38/0.39	0.54/0.56/0.58	0.54/0.56/0.58	0.70/0.72/0.73
	Heating	A	0.17/0.18/0.19	0.17/0.18/0.19	0.30/0.31/0.32	0.37/0.41/0.43	0.37/0.41/0.43	0.52/0.54/0.56
Fan	Type		Sirocco fan	Sirocco fan	Sirocco fan	Sirocco fan	Sirocco fan	Sirocco fan
	Air flow rate (H/M/L)	m^3/h	420/360/300	420/360/300	540/420/360	720/540/480	900/780/660	1,020/840/720
	Motor output	kW	0.01	0.01	0.02	0.02	0.03	0.06
Sound power level (L/M/H)		dB	39/41/44	39/41/44	40/46/50	42/46/49	42/47/50	46/49/52
Sound pressure level (L/M/H)		dB(A)	28/30/33	28/30/33	29/35/39	31/35/38	31/36/39	35/38/41
Dimensions	H x W x D	mm	615 x 1,065 x 230	615 x 1,065 x 230	615 x 1,065 x 230	615 x 1,380 x 230	615 x 1,380 x 230	615 x 1,380 x 230
Pipe connections	Liquid	inches (mm)	1/4 (Ø6.35)	1/4 (Ø6.35)	1/4 (Ø6.35)	1/4 (Ø6.35)	1/4 (Ø6.35)	3/8 (Ø9.52)
	Gas	inches (mm)	1/2 (Ø12.7)	1/2 (Ø12.7)	1/2 (Ø12.7)	1/2 (Ø12.7)	1/2 (Ø12.7)	5/8 (Ø15.88)
	Drain piping		VP-20	VP-20	VP-20	VP-20	VP-20	VP-20
Net weight		kg	29	29	29	39	39	39

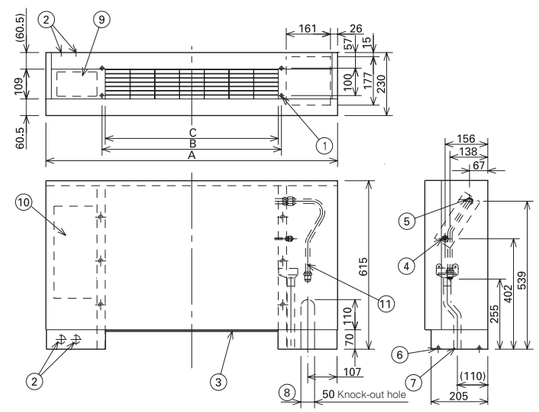
GLOBAL REMARKS	Rated conditions:	Cooling	Heating
	Indoor air temperature	27˚C DB / 19˚C WB	20˚C DB
	Outdoor air temperature	35˚C DB / 24˚C WB	7˚C DB / 6˚C WB

Specifications subject to change without notice.

P1 TYPE FLOOR STANDING Dimensions

1 4 x Ø12 holes (for floor fixing)
2 Power supply outlet
3 Air filter
4 Refrigerant piping (liquid pipes)
5 Refrigerant piping (gas pipes)
6 Level adjustment bolt
7 Drain outlet VP20 (with vinyl hose)
8 Refrigerant piping connection port (bottom or rear)
9 Operation switch (remote controller RCS-SH80AG) mounting part
10 Electric equipment box
11 Accessory copper pipe for gas pipe connection

Indoor unit	A	B	C	Liquid pipes	Gas pipes
22 to 36 type	1,065	665	632	Ø6.35	Ø12.7
45 type	1,380	980	947		
56 type					
71 type				Ø9.52	Ø15.88

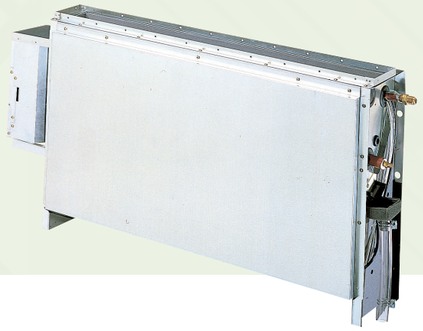


Dimensions: mm

FSV_50Hz_catalog_2012.indd 68-69 12.2.14 1:15:47 PM

R1 TYPE Concealed Floor Standing

At just 229 mm deep, the R1 unit can be easily concealed in perimeter areas to provide powerful and effective air conditioning.



Self-diagnosing Function

Automatic Fan Operation

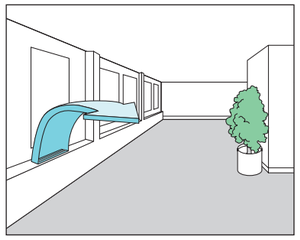
Mild dry

Automatic Restart Function

Technical focus

- Chassis unit for discrete installation
- Complete with removable filters
- Pipes can be connected to either side of the unit from the bottom or rear
- Easy to install

Perimeter air conditioning with high interior quality



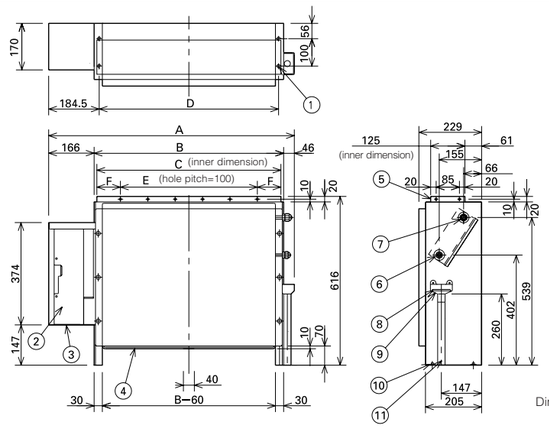
Model Name			S-22MR1E5	S-28MR1E5	S-36MR1E5	S-45MR1E5	S-56MR1E5	S-71MR1E5
Power source			220/230/240 V. 1 phase - 50. 60 Hz					
Cooling capacity		kW	2.2	2.8	3.6	4.5	5.6	7.1
		BTU/h	7,500	9,600	12,000	15,000	19,000	24,000
Heating capacity		kW	2.5	3.2	4.2	5.0	6.3	8.0
		BTU/h	8,500	11,000	14,000	17,000	21,000	27,000
Power input	Cooling	kW	0.051/0.056/0.061	0.051/0.056/0.061	0.079/0.085/0.091	0.116/0.126/0.136	0.116/0.126/0.136	0.150/0.160/0.170
	Heating	kW	0.036/0.040/0.045	0.036/0.040/0.045	0.064/0.070/0.076	0.079/0.091/0.101	0.079/0.091/0.101	0.110/0.120/0.130
Running current	Cooling	A	0.24/0.25/0.26	0.24/0.25/0.26	0.37/0.38/0.39	0.54/0.56/0.58	0.54/0.56/0.58	0.70/0.72/0.73
	Heating	A	0.17/0.18/0.19	0.17/0.18/0.19	0.30/0.31/0.32	0.37/0.41/0.43	0.37/0.41/0.43	0.52/0.54/0.56
Fan	Type		Sirocco fan	Sirocco fan	Sirocco fan	Sirocco fan	Sirocco fan	Sirocco fan
	Air flow rate (H/M/L)	m^3/h	420/360/300	420/360/300	540/420/360	720/540/480	900/780/660	1,020/840/720
	Motor output	kW	0.01	0.01	0.02	0.02	0.03	0.06
Sound power level (L/M/H)		dB	39/41/44	39/41/44	40/46/50	42/46/49	42/46/49	46/49/52
Sound pressure level (L/M/H)		dB(A)	28/30/33	28/30/33	29/35/39	31/35/38	31/36/39	35/38/41
Dimensions	H x W x D	mm	616 x 904 x 229	616 x 904 x 229	616 x 904 x 229	616 x 1,219 x 229	616 x 1,219 x 229	616 x 1,219 x 229
Pipe connections	Liquid	inches (mm)	1/4 (Ø6.35)	1/4 (Ø6.35)	1/4 (Ø6.35)	1/4 (Ø6.35)	1/4 (Ø6.35)	3/8 (Ø9.52)
	Gas 410 A	inches (mm)	1/2 (Ø12.7)	1/2 (Ø12.7)	1/2 (Ø12.7)	1/2 (Ø12.7)	1/2 (Ø12.7)	5/8 (Ø15.88)
	Drain piping		VP-20	VP-20	VP-20	VP-20	VP-20	VP-20
Net weight		kg	21	21	21	28	28	28

GLOBAL REMARKS	Rated conditions:	Cooling	Heating
	Indoor air temperature	27˚C DB / 19˚C WB	20˚C DB
	Outdoor air temperature	35˚C DB / 24˚C WB	7˚C DB / 6˚C WB

Specifications subject to change without notice.

R1 TYPE CONCEALED FLOOR STANDING Dimensions

1 4 x Ø12 holes (for floor fixing)
2 Electric equipment box
3 Power supply outlet
4 Air filter
5 Discharge duct connection flange
6 Refrigerant connection outlet (liquid pipes)
7 Refrigerant connection outlet (gas pipes)
8 Drain filter
9 Drain pan
10 Level adjustment bolt
11 Drain outlet VP20 (with vinyl hose)



Dimensions: mm

Indoor unit	A	B	C	D	E	F	Liquid pipes	Gas pipes
22 to 36 type	904	692	672	665	500	86	Ø6.35	Ø12.7
45 type	1,219	1,007	1,002	980	900	51		
56 type								
71 type							Ø9.52	Ø15.88

FSV_50Hz_catalog_2012.indd 70-71 12.2.14 1:15:50 PM

FSV Controllers

A wide variety of control options to meet the requirements of different applications.

OPERATION SYSTEM	INDIVIDUAL CONTROL SYSTEMS				TIMER OPERATION		CENTRALIZED CONTROL SYSTEMS				
Requirements	Normal operation	Operation from anywhere in the room	Quick and easy operation		Daily and weekly program		Operation with various function from center station	Only ON/OFF operation from center station	Simplified load distribution ratio (LDR) for each tenant Touch screen panel	BMS System PC Base	Connection with 3rd Party Controller
External appearance				NEW						P-AIMS Basic Software CZ-CSWKC2	Seri-Para I /O unit for outdoor unit CZ-CAPDC2
Type, model name	Timer Remote Controller (Wired)	Wireless Remote Controller	Simplified Remote Controller	Backlit remote controller	Schedule Timer		System Controller	ON/OFF Controller	Intelligent Controller	Optional software CZ-CSWAC2 for Load distribution CZ-CSWWC2 for Web application CZ-CSWGC2 for Object layout display CZ-CSWBC2 for BAC net software interface *PC required (field supply)	Local adaptor for ON/OFF control CZ-CAPC2
	CZ-RTC2	CZ-RWSU2 CZ-RWSC2 CZ-RWSY2 CZ-RWST2 CZ-RWSL2 CZ-RWSK2	CZ-RE2C2	CZ-RELC2	CZ-ESWC2		CZ-64ESMC2	CZ-ANC2	CZ-256ESMC2 (CZ-CFUNC2)		MINI Seri-Para I/O Unit CZ-CAPBC2
Built-in Thermostat	●	●	●		—		—	—	—		
Number of indoor units which can be controlled	1 group, 8 units	1 group, 8 units	1 group, 8 units		64 groups, max. 64 units		64 groups, max. 64 units	16 groups, max. 64 units	64 units x 4 systems, max. 256 units		
Use limitations	· Up to 2 controllers can be connected per group.	· Up to 2 controllers can be connected per group.	· Up to 2 controllers can be connected per group.		· Required power supply from the system controller · When there is no system controller, connection is possible to the T10 terminal of an indoor unit.		· Up to 10 controllers, can be connected to one system. · Main unit/sub unit (1 main unit + 1 sub unit) connection is possible. · Use without remote controller is possible.	· Up to 8 controllers (4 main units + 4 sub units) can be connected to one system. · Use without remote controller is impossible.	· A communication adaptor (CZ-CFUNC2) must be installed for three or more systems.		Communication Adaptor CZ-CFUNC2
Function ON/OFF	●	●	●		—		●	●	●		
Mode setting	●	●	●		—		●	—	●		
Fan speed setting	●	●	●		—		●	—	●		
Temperature setting	●	●	●		—		●	—	●		
Air flow direction	●	●	●		—		●1	—	●1		
Permit/Prohibit switching	—	—	—		—		●	●	●		
Weekly program	●	—	—		●		—	—	●		

Web Interface Systems

CZ-CWEBC2
*PC required (field supply)

LonWorks Interface

CZ-CLNC2

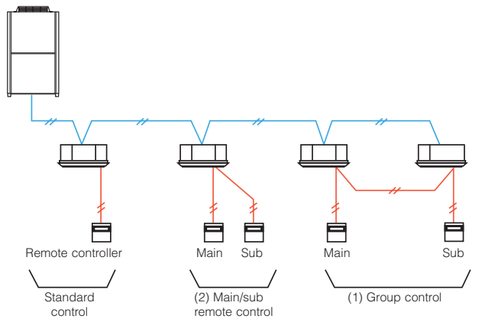
1. Setting is not possible when a remote control unit is present. (Use the remote control for setting.)
All specifications subject to change without notice.

FSV_50Hz_catalog_2012.indd 72-73 12.2.14 1:15:55 PM

Individual Control Systems

Control contents	Part name, model No.	Quantity
Standard Control • Control of the various operations of the indoor unit by wired or wireless remote controller. • Cooling or heating mode of the outdoor unit is decided by the first priority of the remote controller. • Switching between remote controller sensor and body sensor is possible.	Timer remote controller CZ-RTC2 Simplified remote controller CZ-RE2C2 Wireless remote controller CZ-RWSY2 / CZ-RWSU2 / CZ-RWSL2 / CZ-RWSC2 / CZ-RWSK2 / CZ-RWST2	1 unit each
(1) Group control • Batch remote control on all indoor units. • Operation of all indoor cells in the same mode. • Up to 8 units can be connected. • The sensor is the body sensor, and thermostat ON/OFF setting in regard to the temperature set by the remote controller is possible for each indoor unit.	Timer remote controller CZ-RTC2	1 unit
(2) Main/sub remote control • Max 2 remote controllers per indoor unit. (Main remote controller can be connected) • The button pressed last has priority. • Timer setting is possible even with the sub remote controller.	Main or sub Timer remote controller CZ-RTC2 Simplified remote controller CZ-RE2C2 Wireless remote controller CZ-RWSY2 / CZ-RWSU2 / CZ-RWSL2 / CZ-RWSC2 / CZ-RWSK2 / CZ-RWST2	As required

SYSTEM EXAMPLE FSV



Timer remote controller (CZ-RTC2)

Dimensions
H 120 x W 120 x D 16 mm

Basic remote controller ON/OFF
- Operation mode changeover (Cooling, Heating, Dry, Auto, Fan).
- Temperature setting (Cooling/Dry: 18-30 deg Heating: 16-30 deg).
- Fan speed setting H/ M/ L and Auto.
- Air flow direction adjustment.

Time Function 24 hours real time clock
- Day of the week indicator.

Weekly Programme Function
- A maximum of 6 settings/day and 42 settings/week can be programmed.

Outing Function
- This function can prevent the room temperature from dropping or rising when the occupants are out for a long time.

Sleeping Function
- This function controls the room temperature for comfortable sleeping.

Max. 8 indoor units can be controlled from one remote controller

Remote control by main remote controller and sub controller is possible

Max. 2 remote controllers (main remote controller and sub controller) can be installed for one indoor unit.

Wireless remote controller

Y1 type
CZ-RWSY2

U1 type
CZ-RWSU2

L1 type
CZ-RWSL2

K1 type
CZ-RWSK2

T1 / D1 Type
CZ-RWST2

For all indoor units
CZ-RWSC2

Remote control by main remote controller and sub controller is possible
- Max. 2 remote controllers (main remote controller and sub controller) can be installed for one indoor unit.

When CZ-RWSC2 is used, wireless control becomes possible for all indoor units
- When a separate receiver is set up in a different room, control from that room also becomes possible.
- Automatic operation by means of the emergency operation button is possible even when the remote controller has been lost or the batteries have been exhausted.

In addition, there are other functions such as temperature setting, operation switching, wind direction/fan speed setting, etc

Ventilation independent operation is possible
When commercial ventilation fans or heat-exchange ventilation fans have been installed, they can be operated with this remote control (interlocked operation with the indoor unit or independent ventilation ON/OFF).

Simplified remote controller (CZ-RE2C2)

Dimensions
H 120 x W 70 x D 16 mm

A remote controller with simple functions and basic operation
- Suitable for open rooms or hotels where detailed functions are not required.
- ON/OFF, operation mode switching, temperature setting, wind velocity switching, wind direction setting, alarm display, and remote controller self-diagnosis can be performed.
- Batch group control for up to 8 indoor units.
- Remote control by main remote controller and sub controller is possible with a simplified remote controller or a wired remote controller (up to two units).

NEW Backlit remote controller [CZ-RELC2]

Dimensions
H 120 x W 70 x D 16 mm

Backlit remote controller with simple and friendly operation
- LCD backlight display.
- ON/OFF, operation mode switching, temperature setting, wind velocity switching, wind direction setting, alarm display, and remote controller self diagnosis can be performed.
- Built-in temp sensor.
- Batch group control for up to 8 indoor units.
- Remote control by main remote controller and sub controller is possible with a simplified remote controller or a wired remote controller (up to two units).

Outing Function
- This function can prevent the room temperature from dropping or rising when the occupants are out for a long time.

FSV_50Hz_catalog_2012.indd 74-75 12.2.14 1:15:58 PM

System controller (CZ-64ESMC2)

Dimensions
160 x W 160 x D 21 + 69
(embedding dimension mm)

Power supply: AC 220 to 240 V
I/O part: Remote input (effective voltage: DC 24 V): All ON/All OFF Remote output (voltage-free contact): All ON/All OFF (external Power supply within DC 30 V, max 1 A)
Total wiring length : 1 km

Individual control is possible for max 64 groups, 64 indoor units.

- Control of 64 indoor units divided into 4 zones. (One zone can have up to 16 groups, and one group can have up to 8 units.)
- Control is possible for ON/OFF, operation mode, fan speed, air flow direction (only when used without a remote controller), operation monitoring, alarm monitoring, ventilation, remote controller local operation prohibition, etc.

Individual	All operations are possible also from the remote controller. However, the contents will be changed to the contents of the controller operated last.
Central 1	The remote controller cannot be used for ON/OFF. (All other operations are possible from the remote controller.)
Central 3	The remote controller cannot be used for mode change or temperature setting change. (All other operations are possible from the remote controller.)
Central 4	The remote controller cannot be used for operation mode change. (All other operations are possible from the remote controller.)

- Joint use with a remote controller, an intelligent controller, a schedule timer, etc. is possible

(The maximum number of connectable system controllers is 10, including other central controllers on the same circuit.)
(In case of joint use with a wireless remote controller, there are limitations for the control mode. Please use only with "Individual" and "Central 1".)

- Control of systems without a remote controller and of main/sub systems (a total of up to 2 units) is possible

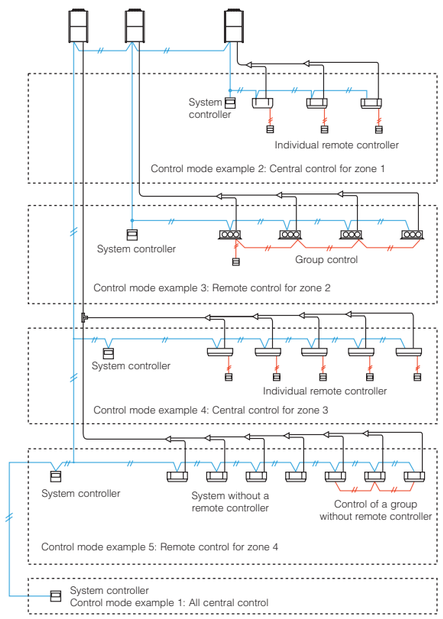
- A control mode corresponding to the use condition can be selected from 10 patterns

A : Operation mode: Central control mode or remote control mode can be selected
Central control mode: The system controller is used as centralised control device. (Setting from a remote controller can be prohibited by prohibiting local operation from the system controller.)
Remote control mode: The system controller is used as a remote controller. (Setting from the system controller can be prohibited by prohibiting local operation from another central control unit.)

B : Controlled unit number mode: All mode or zone 1, 2, 3, 4 mode can be selected
All mode: All, zone, or group unit can be selected.
Zone 1, 2, 3, 4 mode: Setting is possible only for the indoor units of zone 1, 2, 3, or 4.

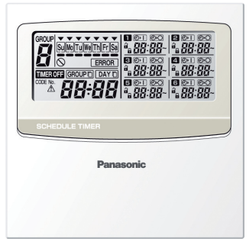
Connection example

		A Operation mode	
		Central control mode	**Remote control mode**
B Controlled unit number mode	All mode	All central control Example 1	All remote control
	Zone 1 mode	Zone 1 central control Example 2	Zone 1 remote control
	Zone 2 mode	Zone 2 central control	Zone 2 remote control Example 3
	Zone 3 mode	Zone 3 central control Example 4	Zone 3 remote control
	Zone 4 mode	Zone 4 central control	Zone 4 remote control Example 5



Centralised Control Systems

Schedule timer (CZ-ESWC2)



Dimensions
H 120 x W 120 x D 16 mm

Up to 64 groups (max 64 indoor units) can be controlled divided into 8 timer groups

- Six program operations (Operation/Stop/ Local permission/ Local prohibition) per day can be set in a program for one week

· Only operation or stop, remote controller local permission or remote controller local prohibition, and their respective combinations are possible. (Operation + local permission, stop + local prohibition, only local permission, etc.)
· Local prohibition and the combination of the three items of temperature setting, mode change, and operation/stop can be set at the time of installation.

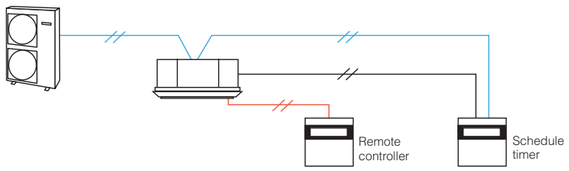
- A function for pausing the timer in case of national holidays has been added, and timer operation also can be stopped for a long time

· By setting holidays or operation stop within one week, the timer can be paused just for that week.
· All timer settings can be stopped with the timer "ON/OFF effective" button. (Return to timer operation is made by pressing the button again.)

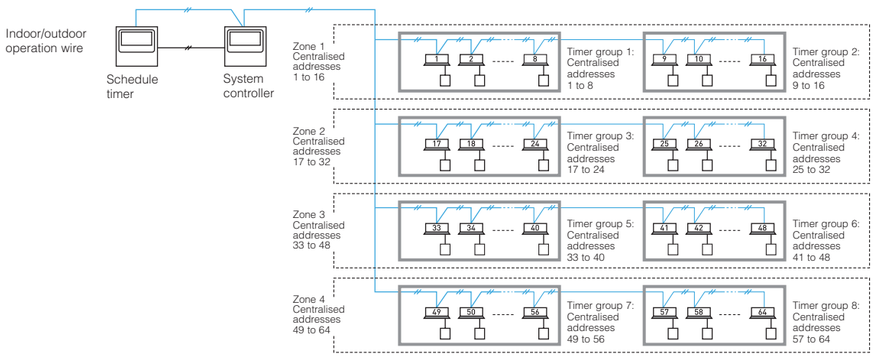
The power supply for the schedule timer is taken from one of the following.
1. Control circuit board (T10) of a nearby indoor unit (power supply wiring length: within 200m from the indoor unit).
2. System controller (power supply wiring length: within 100 m from the indoor unit).

When the power supply for the schedule timer is taken from the control circuit board of the indoor unit, that indoor unit cannot be used with other control devices using the T10 terminal.
As operation mode and temperature settings are not possible with the schedule timer, it must be used together with a remote controller, a system controller, an intelligent controller, etc. Also, as it does not have an address setting function, the control function of a system controller etc. must be used for address setting.

Connection example 1 (POWER SUPPLY FROM THE INDOOR UNIT)

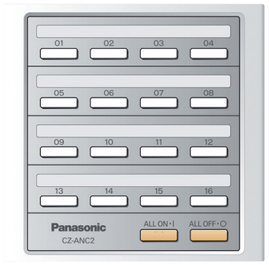


Connection example 2 (POWER SUPPLY FROM THE CENTRAL CONTROLLER)



FSV_50Hz_catalog_2012.indd 76-77
12.2.14 1:15:58 PM

ON/OFF controller (CZ-ANC2)



Dimensions
H 121 x W 122 x D 14 + 52
(embedding dimension mm)

- 16 groups of indoor units can be controlled.
- Collective control and individual group (unit) control can also be performed.
- Up to 8 ON/OFF controller (4 main, 4 sub) can be installed in one link system.
- The operation status can be determined immediately.

Note: As operation mode and temperature settings are not possible with the ON/OFF controller, it must be used together with a remote controller, a system controller etc.

Power supply: AC 220 to 240 V
I/O part: Remote input (effective voltage: within DC 240 V): All ON/OFF
Remoteaoutput (allowable voltage: within DC 30 V): All ON,
All alarm

Web Interface Systems

Web Interface (CZ-CWEBC2)

(Dimensions: H 248 x W 185 x D 80 mm)

AC 100 to 240 V (50/60Hz), 17 W (separate power supply)

Functions

- Access and operation by Web browser
- Icon display
- Language codes available in English, French, German, Italian, Portguese, Spanish
- Individual control possible (max. 64 indoor units) ON/OFF operation mode, set temperature, fan speed, Flap set, timer on/off alarm code monitoring, prohibit Remote Control
- Zone control *

*Power supply

- All Units control
- Alarm Log
- Mail Sent Log
- Program Timer set 50 daily timers with 50 actions each day, 50 weekly timers 50 weekly timers, 1 holiday timer, 5 special day timers, for each tenant
- Prohibit Remote Control set
- IP ADRESS could be changed via Internet

Note: It is recommended to install a remote controller or a system controller on site to enable local control if it network experience a problem.

Easy to set to every room by recognizable icon and user-friendly remote control window

If any of the indoor units is selected, the remote control window shown will be displayed for detailed setting modifications.

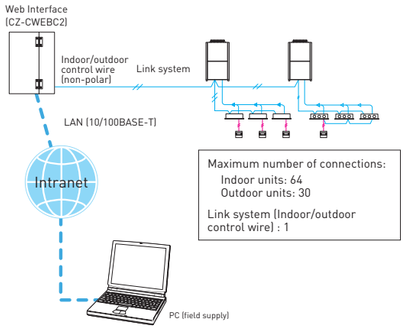
Easy to manage and monitor each tenant use *

Each floor or tenant, otherwise each zone can be displayed and controlled. All unit statuses can also be displayed on one screen.

Program Timer set

50 daily timers with 50 actions each day, 50 weekly timers, holiday timer, 5 special day timers, for each tenant

* Web interface system not applicable for load distribution.



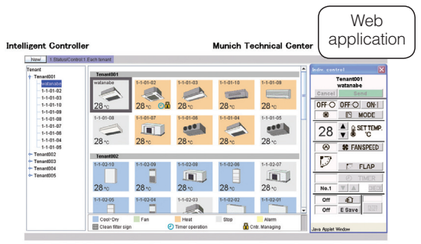
* Required when more than 129 indoor units are connected

Intelligent controller (CZ-256ESMC2)

Dimensions
H 240 x W 280 x D 138 mm
Power supply AC 100 to 240 V (50 Hz), 20 W (separate power supply)
I/O part Remote in put (voltage-free contact): All ON/OFF
Remote output (voltage-free contact): All ON, All alarm
(external power supply within DC 30 V, 0.5 A)
Total wiring length: 1 km for each system
Only for embedding in the panel

- Max 256 indoor units (4 systems x 64 units) can be controlled. In case of three or more systems (more than 129 units), a communication adapter CZ-CFUNC2 must be installed on the outside
- Operation is possible as batch, in zone units, in tenant and in group units
- ON/OFF, operation mode setting, temperature setting, for fan speed setting, air flow direction setting (when used without a remote controller), and remote controller local operation prohibition (prohibition 1, 2, 3, 4) can be done
- A system without a remote controller is possible. Joint use with a remote controller or a system controller is also possible
- Use of a schedule timer and holiday setting also can be done
- Proportional distribution of the air conditioning energy is possible. Including csv-file export via CF-card (supplementary accessory)
- NEW function: Pulse signal input from electric/gas consumption meter

In case of joint use with a wireless remote control system, there are limitations for the control mode. Please use only with "Permission" and "Prohibition 1".

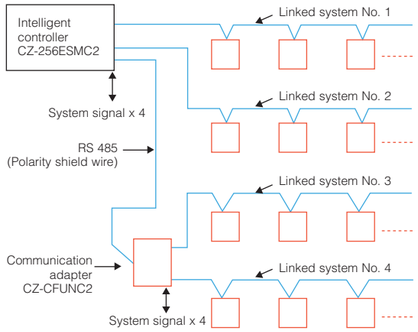


- Limitation contents for prohibited operation

Prohibition means limitation of the operation contents from the remote controller. It is also possible to change the prohibition items.

Limitation contents
(Limitations can be user defined)

Individual	There is no limitation for the operation of the remote controller. However, the contents will be changed to the contents of the controller operated last. (Last-pressed priority.)
Prohibition 1	The remote controller cannot be used for ON/OFF. (All other operations are possible from the remote controller.)
Prohibition 2	The remote controller cannot be used for ON/OFF, operation mode change and temperature setting. (All other operations are possible from the remote controller.)
Prohibition 3	The remote controller cannot be used for operation mode change and temperature setting. (All other operations are possible from the remote controller.)
Prohibition 4	The remote controller cannot be used for operation mode change. (All other operations are possible from the remote controller.)



Display sample Max. 4 links can be connected for the indoor/outdoor operation line = Max. 64 indoor units x 4 (256 units)
Max. 30 outdoor units x 4 (120 units)

Communication adaptor (CZ-CFUNC2)

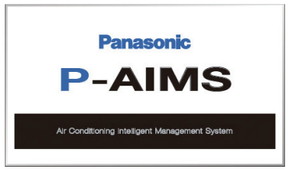
* Required when more than 129 indoor units are connected.

FSV_50Hz_catalog_2012.indd 78-79 12.2.14 1:16:01 PM

Panasonic total air conditioning management system
P-AIMS

P-AIMS Basic software / CZ-CSWKC2

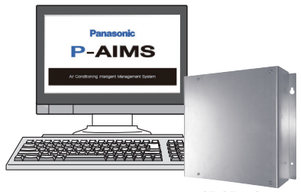
Up to 1024 indoor units can be controlled by one PC



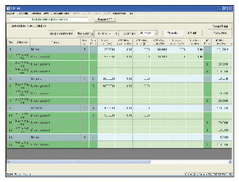
Functions of basic software

- Standard remote control for all indoor units
- Many timer schedule programs can be set on the calender
- Detailed information display for alarms
- CSV file output with alarm history, operating status.
- Automatic data backup to HDD

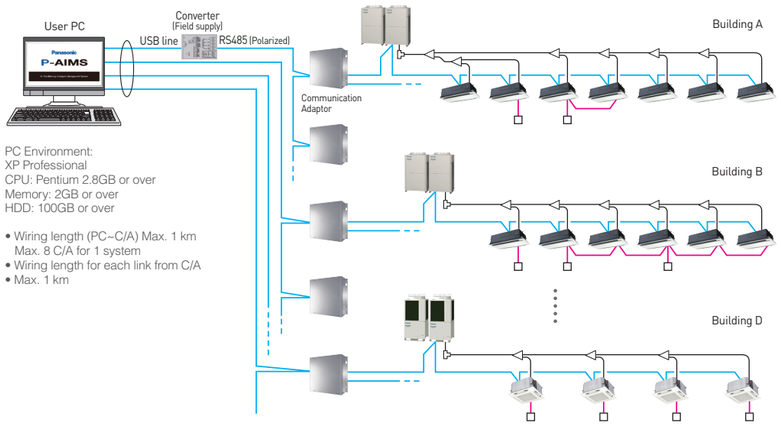
With 4 upgrade packages the basic software can be upgraded to suit individual requirements



CZ-CFUNC2



The P-AIMS is ideal for large areas/buildings such as shopping centers, universities and office buildings.
Up to eight Communication Adaptors (C/A) can be connected to a P-AIMS to enable control of 1024 indoor units with one “P-AIMS” PC.



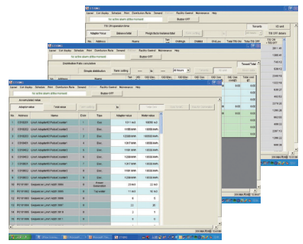
PC Environment:
XP Professional
CPU: Pentium 2.8GB or over
Memory: 2GB or over
HDD: 100GB or over

- Wiring length (PC~C/A) Max. 1 km
  Max. 8 C/A for 1 system
- Wiring length for each link from C/A
- Max. 1 km

P-AIMS optional software CZ-CSWAC2 for Load distribution

Load distribution calculation for each tenant

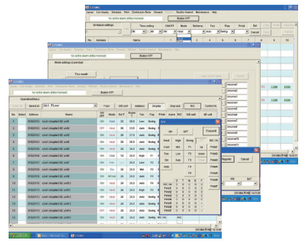
- Air-conditioner load distribution ratio is calculated for each unit (tenant) with used energy consumption data (m3, kWh).
- Calculated data is stored with CSV type file.
- Data of last 365 days is stored



P-AIMS optional software CZ-CSWWC2 for Web application

Web access & control from remote station

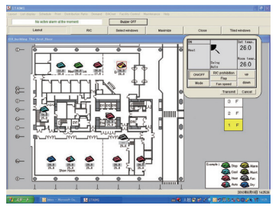
- Accessing P-AIMS software from remote PC.
- You can monitor/operate FSV systems by using Web browser (Inernet Explorer).



P-AIMS optional software CZ-CSWGC2 for Object layout display

Whole system can be controlled visually

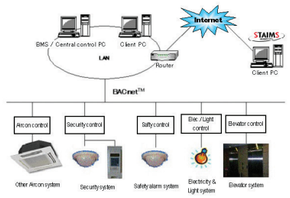
- Operating status monitor is available on the layout display.
- Object’s layout and indoor unit’s location can be checked at once.
- Each unit can be controlled by virtual remote controller on the display.
- Max 4 layout screens are shown at once.



P-AIMS optional software CZ-CSWBC2 for BACnet software interface

Connectable to BMS system

- Can communicate with other equipment by BACnet protocol.
- FSV systems can be controlled by both BMS and P-AIMS.
- Max 255 indoor units can be connected to 1 PC (that has P-AIMS basic & BACnet software).



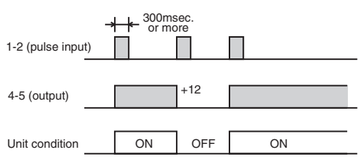
FSV_50Hz_catalog_2012.indd 80-81 12.2.14 1:16:10 PM

T10 Terminal for External Control (Digital Connection)

Connecting an FSV indoor unit to an external device is easy.
The T10 Terminal featured in the electronic circuit board of all indoor units enables digital connection to external devices.

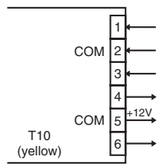
1. T10 Terminal Specification (T10:CN061 at indoor unit PCB)

• Control items: 1. Start/stop input
2. Remote controller prohibit input
3. Start signal output
4. Alarm signal output



NOTE: The wire length from indoor unit to the Relay must be within 2.0m.
Pulse signal changeable to static with JP cutting. (Refer to JP001)

• Example of wiring



Condition

1. 1-2 (Pulse input): Unit ON/OFF condition switching with a pulse signal. (1 pulse signal: shortage status more than 300msec.or more)
2. 2-3 (Static input): Open/ Operation with Remote is permitted.(Normal condition) Close/ Remote controller is prohibited.
3. 4-5 (Static output): 12V output during the unit ON. / No output at OFF.
4. 5-6 (Static output): 12V output when some errors occur / No output at normal.

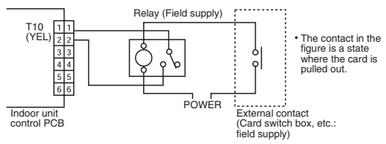
2. Usage Example

Forced OFF control

• Condition

1-2 (Static input): Close/ Operation with Remote is permitted. (Normal condition) Open/ Unit is forcibly OFF and Remote controller operation is prohibited.

• Example of wiring



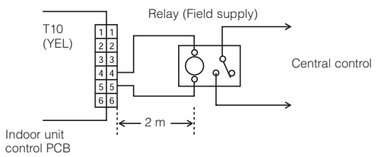
NOTE: The wire length from indoor unit to the Relay must be within 2.0m

Operation ON/OFF signal output

• Condition

4-5 (Static output): 12V output during the unit ON / No output at OFF

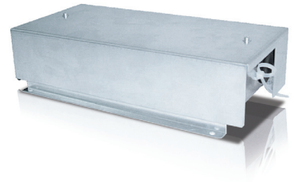
• Example of wiring



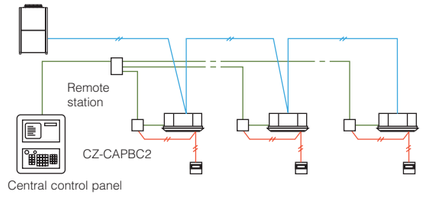
NOTE: The wire length from indoor unit to the Relay must be within 2.0m
Pulse signal changeable to static with JP cutting. (Refer to JP001)

Interfaces for External Control (Digital Connection)

MINI Seri-Para I/O Unit (CZ-CAPBC2)

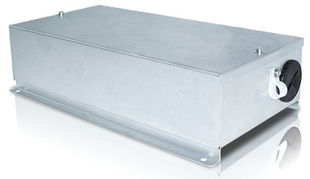


System example



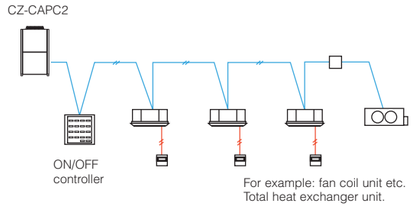
• Control and status monitoring is possible for individual indoor unit (1 group).
• In addition to operation and stop, there is a digital input function for air speed and operation mode.
• Temperature setting and measuring of the indoor suction temperature can be performed from central monitoring.
• The analog input for temperature setting is 0 to 10 V, or 0 to 140 Ohm.
• Power is supplied from the T10 terminal of the indoor units.
• Separate power supply also is possible (in case of suction temperature measuring).

Local adaptor for ON/OFF control (CZ-CAPC2)



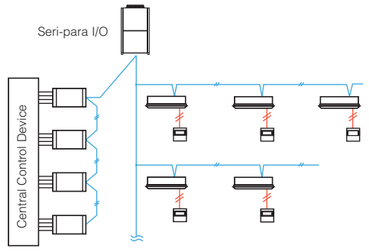
• Control and status monitoring is possible for individual indoor unit (or any external electrical device up to 250 V AC, 10 A) by contact signal.

System example



Seri-Para I /O unit for outdoor unit (CZ-CAPDC2)

System example



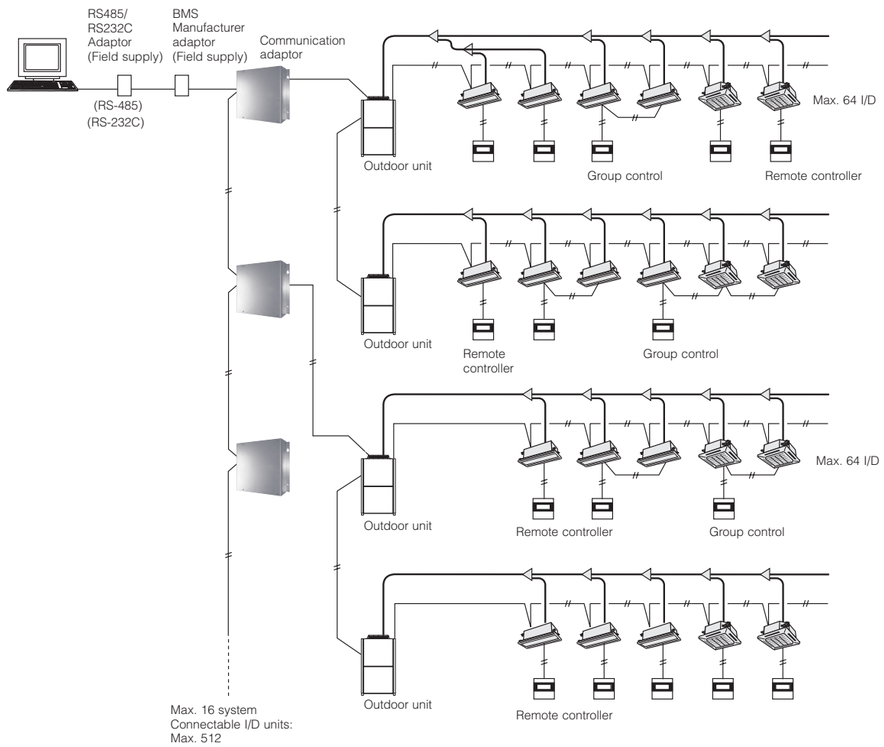
Dimensions	H 80 x W 290 x D 260 mm
Power supply	Single phase 100/200 V (50/60 Hz), 18 W
Input	Batch operation/Batch stop (non-voltage contact/DC 24 V, pulse signal). Cooling/Heating (non-voltage contact/static signal). Demand 1/2 (non-voltage contact/static signal) (Local stop by switching)
Output	Operation output (non-voltage contact). Alarm output (non-voltage contact)
Wiring length	Indoor/Outdoor operation lines: Total length 1 km. Digital signal: 100 m or shorter

• This unit can control up to 4 outdoor units.
• From the centre control device, mode changing and batch operation/batch stop are possible.
• Required for demand control.

FSV_50Hz_catalog_2012.indd 82-83 12.2.14 1:16:17 PM

Serial Interface for 3rd Party External Controller

Example of 3rd party BMS connection with CZ-CFUNC2
(For the detail pleace consult to authorized dealer)



Functions via communication adaptor [CZ-CFunC2]	
A/C unit settings	Unit ON/OFF
	Mode-change
	Room temperature setting
	Fan speed setting
	Flap setting
	Central control setting
	Filter-sign clear
	Alarm reset
A/C unit status	Unit ON/OFF status
	Operation mode
	Setting temperature
	Fan speed status
	Flap status
	Central control setting
	Filter-sign situation
	Correct/incorrect status
	Alarm code

Communication adaptor (CZ-CFUNC2)

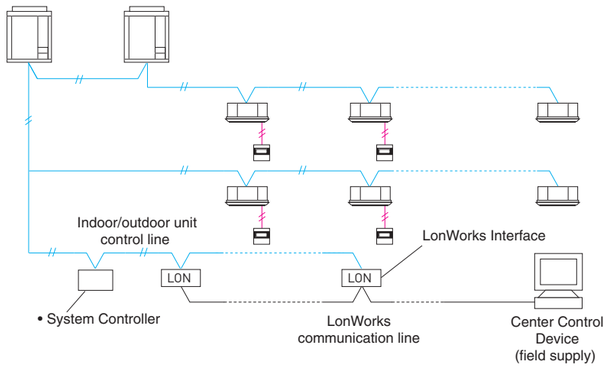
Up to 128 indoor units can be connected to one Communication Adaptor.

Serial Interface for LonWorks Network

LonWorks Interface (CZ-CLNC2)

- This interface is a communications converter for connecting LonWorks to the control network of FSV.
- From the host connected to LonWorks, basic settings and status monitoring is possible for up to 16 groups of A/C units.

System example



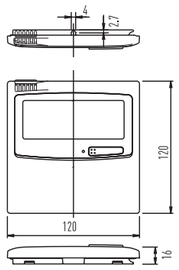
Functions

A/C unit settings from the LonWorks communicator	Settings for each group of indoor units	Start/stop
		Temp. setting
		Operation mode
		Option 1 settings(*)
		Option 2 settings(*)
	Settings for all units	Emergency stop
A/C unit status notifications made to the LonWorks communicator		Start/stop
		Temp setting
		Operation mode
		Option 1 settings(*)
		Option 2 settings(*)
		Alarm status
		Indoor units with active alarms
		Room temp.
		A/C unit status
Configuration properties		Transmission intervals settings
		Minimum time secured for transmission

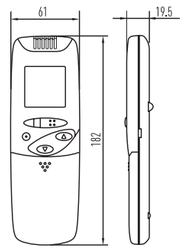
FSV_50Hz_catalog_2012.indd 84-85 12.2.14 1:16:18 PM

FSV Controller External Dimensions

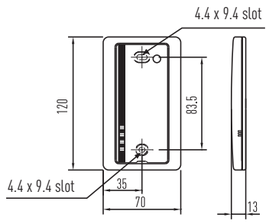
TIMER REMOTE CONTROLLER
(CZ-RTC2)



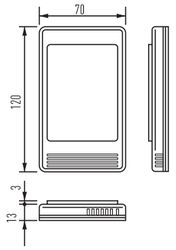
WIRELESS REMOTE
CONTROLLER



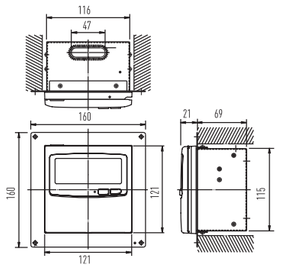
SEPARATE RECEIVER FOR
WIRELESS REMOTE CONTROLLER
(CZ-RWSC2)



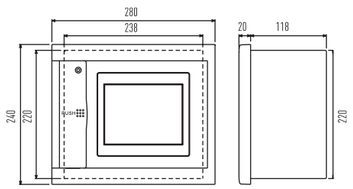
SIMPLIFIED REMOTE
CONTROLLER
(CZ-RE2C2)
REMOTE SENSOR
(CZ-CSRC2)



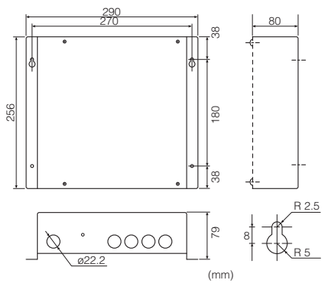
SYSTEM CONTROLLER
(CZ-64ESMC2)



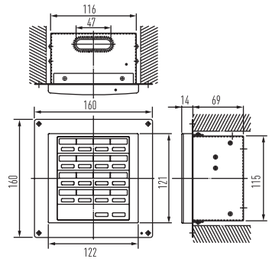
INTELLIGENT CONTROLLER
(CZ-256ESMC2)



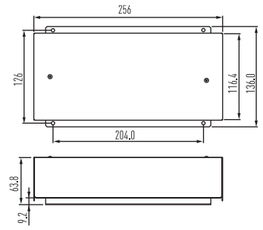
COMMUNICATION ADAPTER
(CZ-CFUNC2)



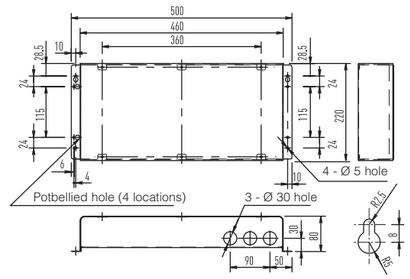
ON/OFF CONTROLLER
(CZ-ANC2)



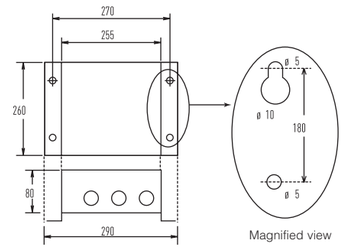
SERI-PARA I/O UNIT FOR EACH
INDOOR UNIT
(CZ-CAPBC2)



LONWORKS INTERFACE
(CZ-CLNC2)



SERI-PARA I /O UNIT FOR OUTDOOR UNIT
(CZ-CAPDC2)



Detail of the potbellied hole

FSV_50Hz_catalog_2012.indd 86-87 12.2.14 1:16:19 PM

VRF Renewal for ME1 Series

An important drive to further reduce the potential damage to our ozone

RENEWAL R22

R22 is a HCFC and classified as an ozone depleting substance banned under the Montreal Protocol.
R22 will be phased out in stages. Effective 1 Jan 2010, the use of Virgin (new) R22 refrigerant will be banned within European Community.

Panasonic takes proactive action to switch to R410A refrigerant

Recognizing consumers' anxiety and financial difficulties to adapt to the new R22 regulations, Panasonic developed a new cost-effective and simple solution to switch to R410A refrigerant.

What is Panasonic VRF Renewal?

Panasonic VRF Renewal enables reuse of good quality existing R22 pipe work to be installed with new high efficiency R410A system.

What's so unique about Panasonic's solution?

By enabling reuse of existing R22 piping, consumers gets to save substantially from reduced installation cost and without limitation to other manufacturers equipments.

Ozone Depletion Potential		
R22	HCFCs	0.055
R410A	HFC	0
R407C	HFC	0

R22 - The reduction of Chlorine critical for a cleaner future

Before renewing piping, be sure to contact an authorized Panasonic dealer for advice.

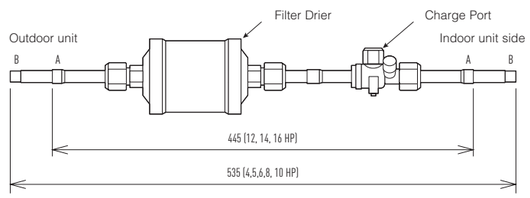
VRF Renewal

Panasonic's Renewal system allows a completely new VRF system, indoor and outdoor units, to be installed using the existing systems pipe work. Panasonic's advanced technology enables the system to work with previously installed pipe work by managing the working pressure within the system down to R22 (3.3 bar) levels. This ensures the system works safely and efficiently without loss of capacity.
The new equipment has potential to increase COP/EER by using state of the art inverter compressor and heat exchanger technology.
Having contacted your Panasonic supplier regarding pipe work restrictions and gained approval to use the Panasonic Renewal System there are three main tests that have to be carried out to ensure that the system can be used effectively.
Firstly a thorough inspection of the pipe work must be carried out and any damage must be repaired.
Secondly an oil test has to be carried out to ensure that the system has not been subject to a compressor burnout during its lifetime.
Lastly a VRF Renewal Kit (CZ-SLK2) has to be installed within the pipe work to ensure that the system is cleaned of any oil residue.

VRF Renewal Kit (CZ-SLK2) and Sight Glass

The following shows an overview of the VRF Renewal Kit (CZ-SLK2) that is required when existing tubing is reused. If the exact tube length and tube size of the existing tubing are uncertain, attach a sight glass in accordance with the figure below. It will be used for checking the amount of additional refrigerant charge (calculating the amount in Judgment 4 see page 84).

VRF Renewal Kit: CZ-SLK2



Unit: mm

Attaching the Filter Drier Kit and sight glass

- To adjust the limited pressure level into 3.3 MPa, special setting is necessary at site.
- A filter Drier shall be attached to the liquid tubing of each outdoor unit.
- High-Pressure switches shall be attached to both the liquid and the gas tubings of each outdoor unit.
- Do not need to remove Filter Drier Kit after a test run is performed as it can be retained for normal operation.
- When attaching Filter Drier Kit, be extra careful with regards to installation location and orientation of the filter drier and ball valve. Any mistakes will complicates maintenance work.
- Termal insulation material (field supply: heat resistance of 80ºC or higher and thickness of 10 mm or greater) shall be applied to the Filter Drier Kit.
- The filter drier of the Filter Drier Kit may need to be replaced depending on the condition of the existing unit. Use a Danfoss DMB 164 as the replacement filter drier (field supply).

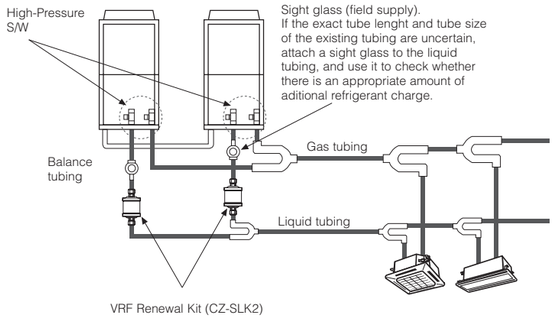
Connecting tube dimensions (Inch mm)

A Ø 1/2 (12.7) (12,14,16 HP)
B Ø 3/8 (9.52) (8,10 HP)

Note: If the tube size does not match that of the existing tubing, use a reducer (field supply) to adjust the tube diameter.

Sight glass (field supply)

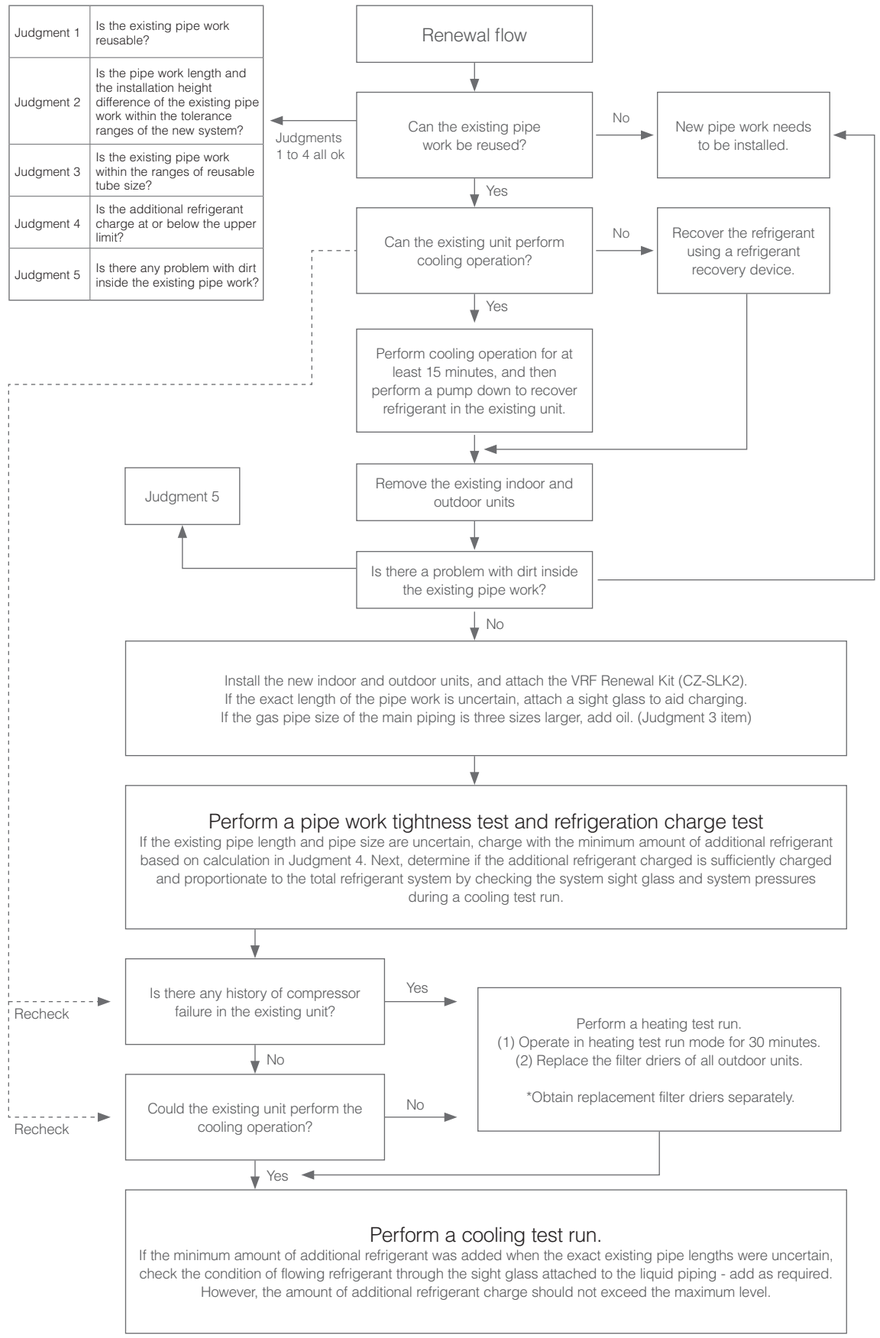
If the exact tube length and tube size of the existing tubing are uncertain, attach a sight glass to the liquid tubing, and use it to check whether there is an appropriate amount of additional refrigerant charge.



FSV_50Hz_catalog_2012.indd 88-89 12.2.14 1:16:21 PM

Procedure for VRF Renewal

Judgment 1	Is the existing pipe work reusable?
Judgment 2	Is the pipe work length and the installation height difference of the existing pipe work within the tolerance ranges of the new system?
Judgment 3	Is the existing pipe work within the ranges of reusable tube size?
Judgment 4	Is the additional refrigerant charge at or below the upper limit?
Judgment 5	Is there any problem with dirt inside the existing pipe work?



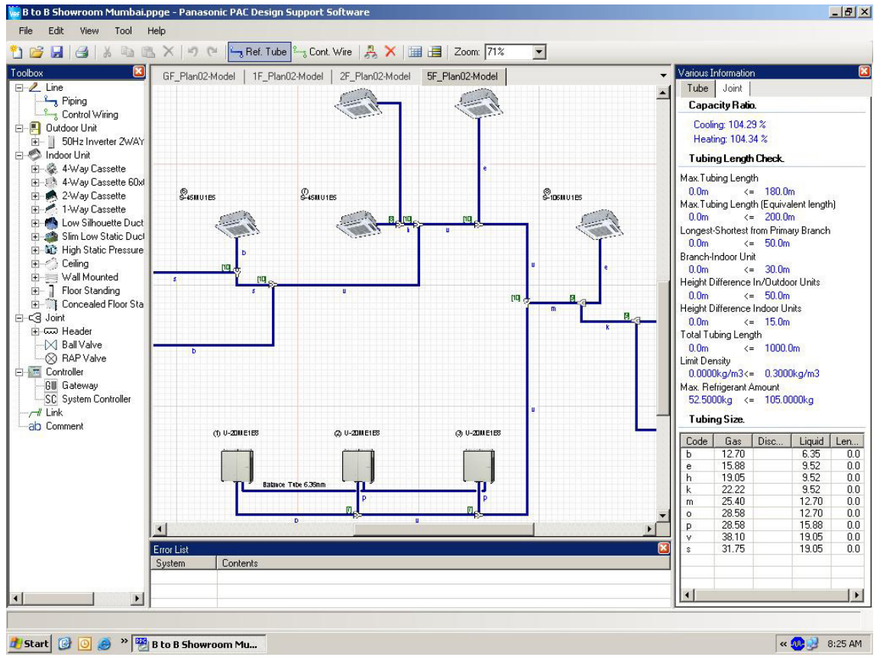
NOTES

FSV_50Hz_catalog_2012.indd 90-91 12.2.14 1:16:22 PM

Panasonic Design Support Software for FSV

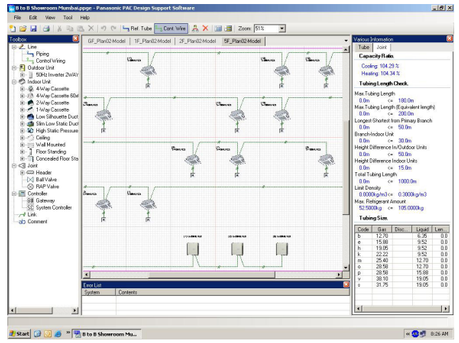
Panasonic proprietary Design Support Software for FSV gives architects, consultants or end users the advantages to calculate cooling / heating loads and produce information of actual design conditions.

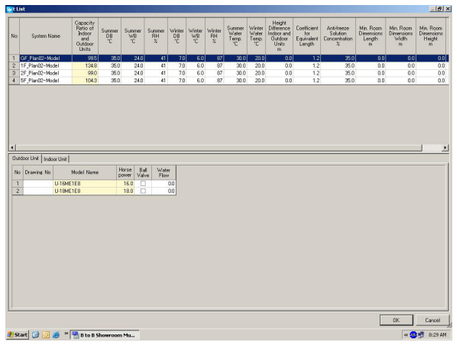
This advanced software is designed to be customizable to make any selections and design processes in a quick and easy way. The design software utilises system wizards and import tools to enable both simple and complex systems to be created. In addition, the system will allow outdoor and indoor units to be dragged and dropped on an interactive desktop. This allows users to create everything from realistic floor plans with detailed piping and wiring schematics to send out with quotations, through to installation guidance drawings.

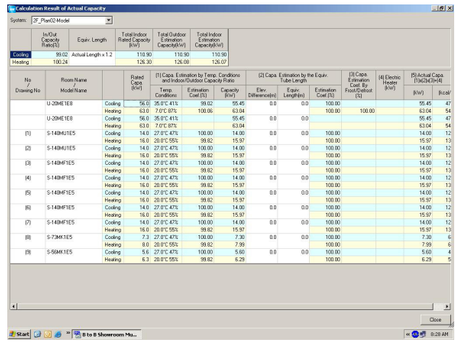


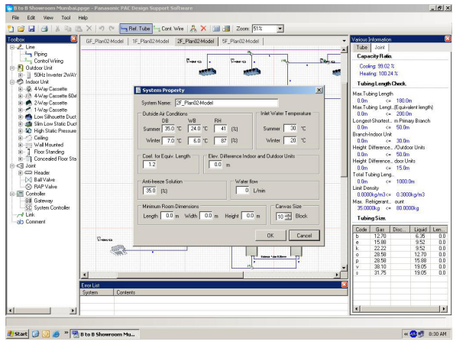
The Panasonic VRF Designer system software can be used for all Panasonic FSV.

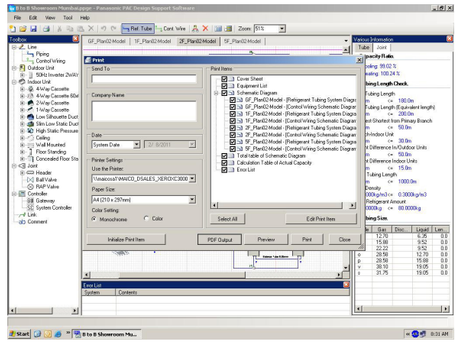
Features include
- Actual capacity calculation
- Auto calculation of refrigerant charged amount
- Auto piping (inc. joint kit selection) and wiring features
- Detailed wiring and piping diagram
- Auto CAD (DXF) export











FSV_50Hz_catalog_2012.indd 92-93 12.2.14 1:16:23 PM

NOTES

NOTES

FSV_50Hz_catalog_2012.indd 94-95 12.2.14 1:16:23 PM

‘eco ideas’ Declaration

eco ideas

Connecting with the earth The Panasonic Group strives to be a Green Innovation Company with a global perspective.

‘eco ideas’ for Lifestyles

We will promote lifestyles with virtually zero CO_2 emissions all throughout the world

‘eco ideas’ for Business-styles

We will create and pursue a business-style whichmakes the best use of resources and energy

⚠ Do not add or replace refrigerant other than the specified type. Manufacturer is not responsible for the damage and deterioration in safety due to usage of other refrigerant.

Panasonic®

FSV-ASIA-2012