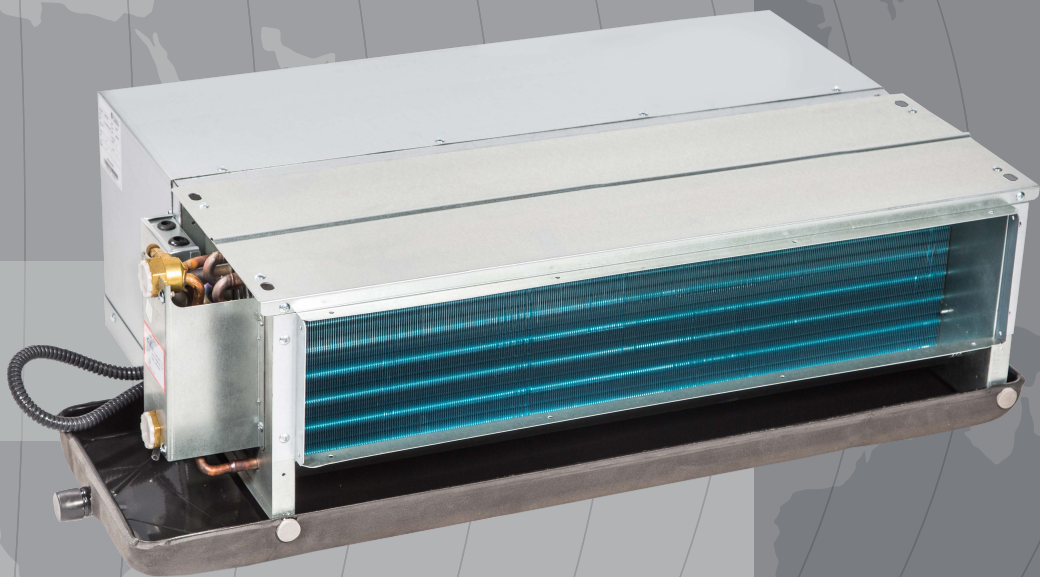


FAN COIL UNIT

Models: FCR200 - 1400E
FCRQ400 - 800B
FCRQ400 - 800C
FCR200 - 1400B
FFM800 - 3000B
FKM500 - 1400A
FWM300 - 800A

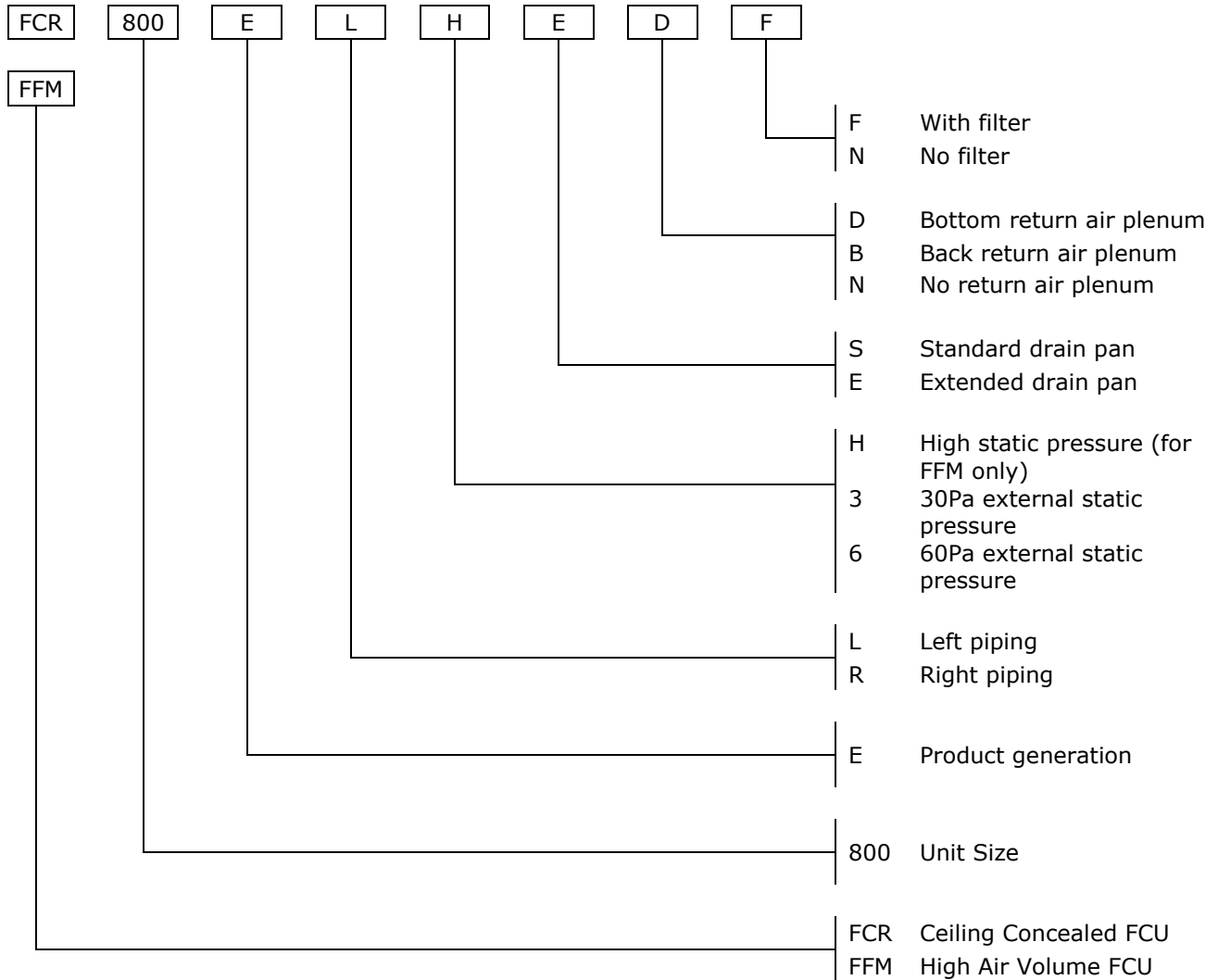


Contents

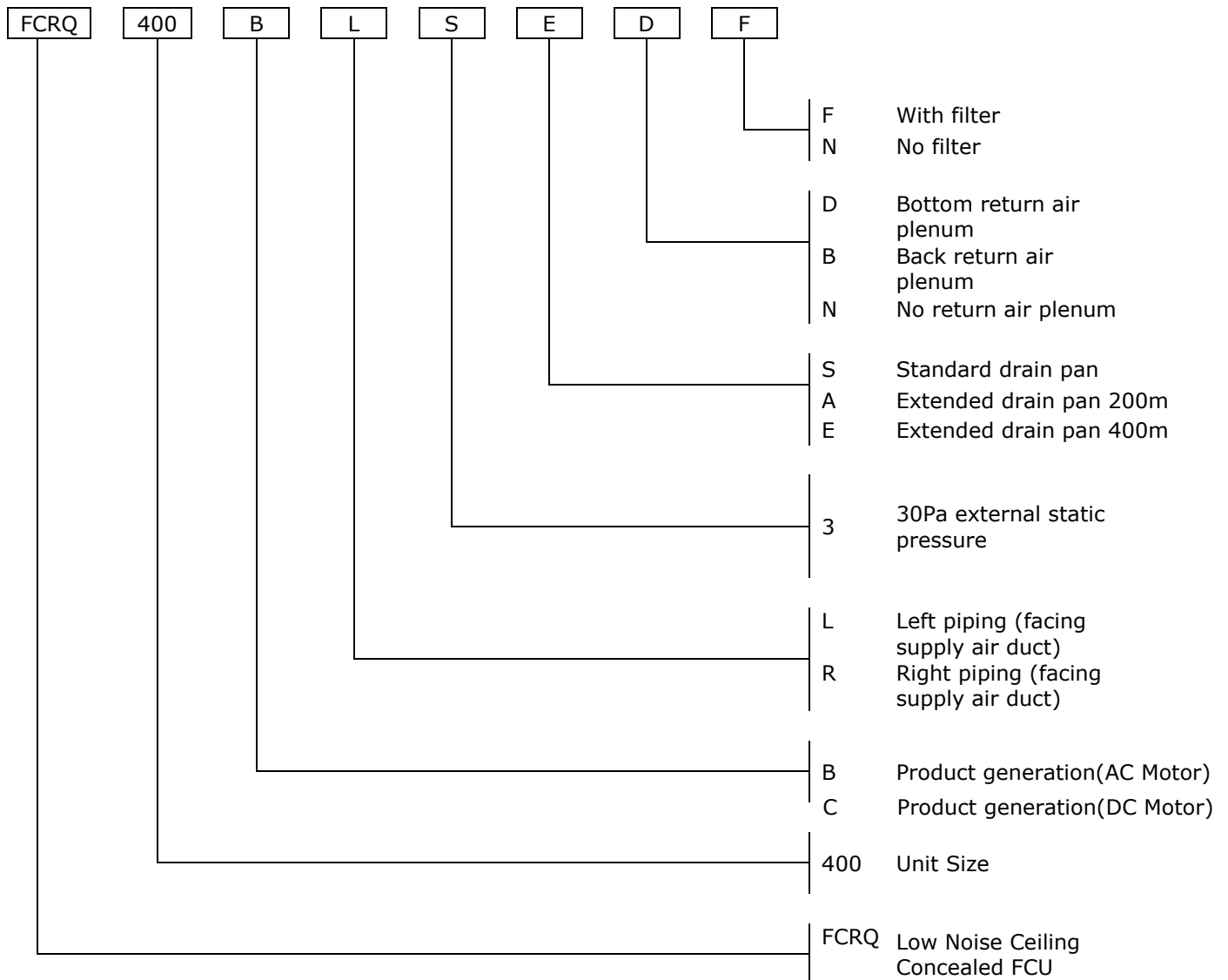
Contents.....	1
Product Nomenclature	2
Features	7
Engineering Specifications	8
Operating Range.....	16
Sound Data.....	17
Sound pressure level	17
Wiring Diagrams.....	25
Installation	28
Servicing and Maintenance	34
Troubleshooting	35

Product Nomenclature

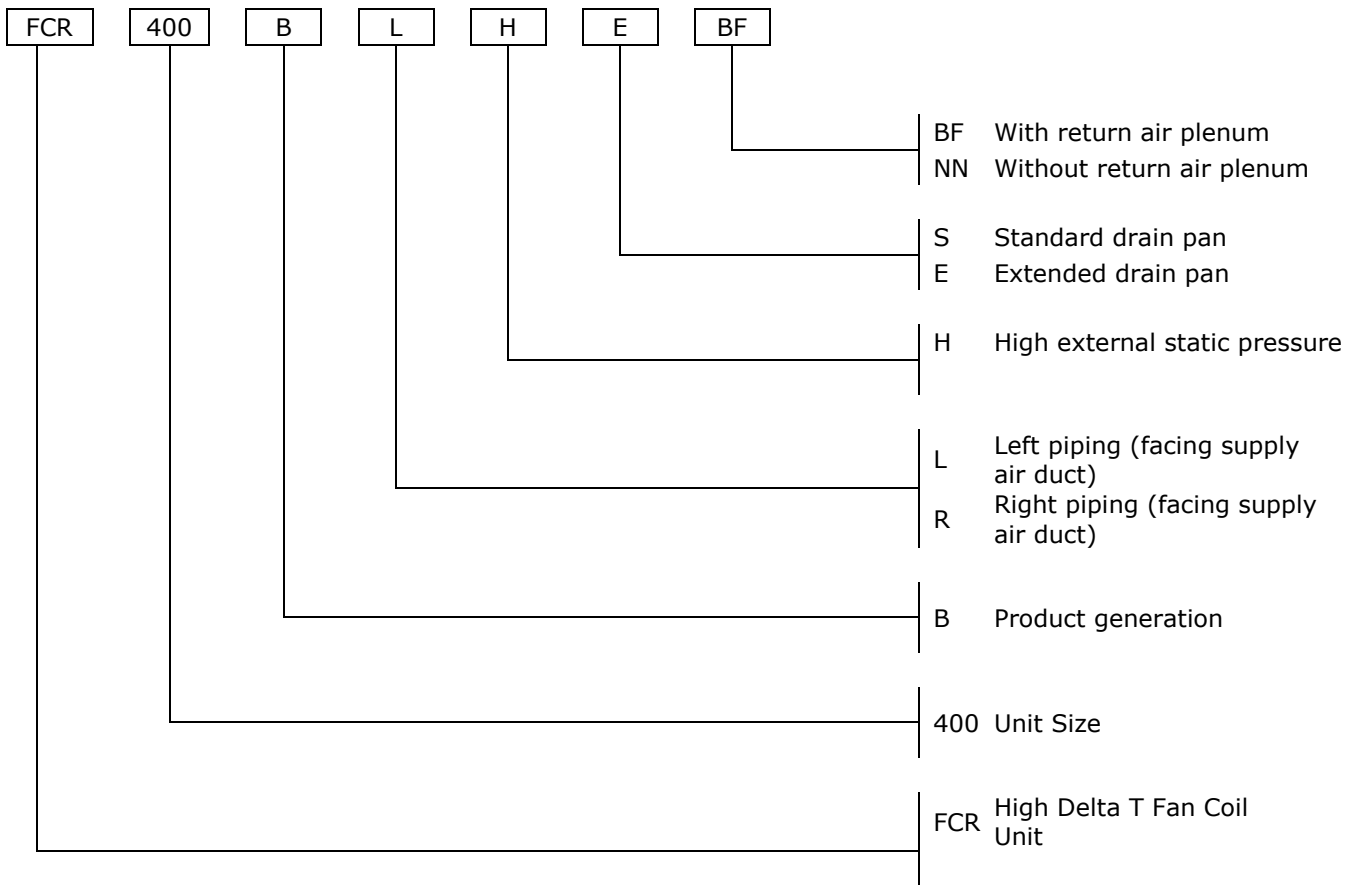
Concealed Type Fan Coil Unit



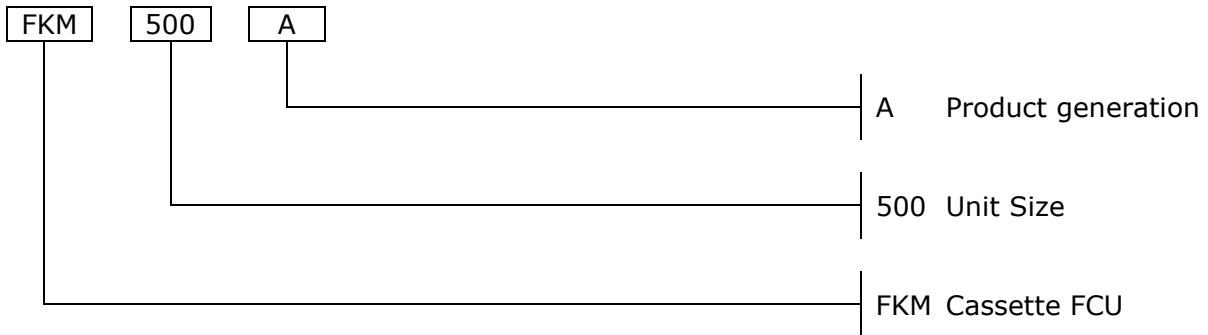
Low Noise Concealed Type Fan Coil Unit



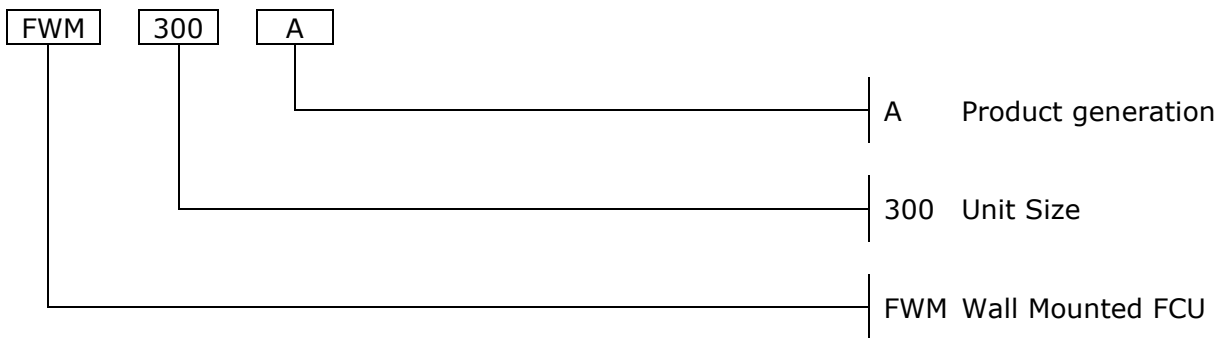
High Delta-T Ceiling Concealed Type Fan Coil Unit



Cassette Type Fan Coil Unit



Wall Mounted Type Fan Coil Unit



Features

Slim and Compact Design

Light and rigid construction due to the compact and strong structural design of the unit. Slim unit design also fulfills the stringent space requirement of today's building design. High Air Volume FCU with the height of only 430mm is most suitable for application that demand for high air flow but with space saving in mind.

High Efficiency Heat Exchanger

High quality copper pipes with slit profile aluminium fins are being transformed into high efficiency heat exchanger through advance design, manufacturing equipment and processes.

Low Noise

Through stringent static and dynamic balancing tests of motors, coupled with high quality thermal and acoustic insulation in the unit, superb low noise performance is achieved.

Multiple ESP Options

Standard fan coil units come with low ESP (0Pa) and high ESP (30Pa and 60Pa) options to suit different applications. High Air Volume FCU comes with Standard ESP (40 Pa) and High ESP (130 Pa) options to add to the product line up.

Simple Installation

Unique design of the fan coil units allow easy on-site modifications of water pipes configuration (left or right). Accessories are also available to ensure trouble-free installation.

Easy Maintenance

The fan coil units are equipped with high quality electrical motor with low noise bearing that do not require lubrication and thus minimum maintenance effort required. Blowers and also motors can be dismantled individually if cleaning of heat exchanger is needed. High efficiency filter provides better filtration than normal filter with longer operational life and easy to clean.





No Leakage

One piece molded drain pan with integral thermal insulation and professional welding skill enable all condensate water to be collected and prevent condensation at the outside of the drain pan.

Superior Product Quality

All fan coil units are manufactured in a ISO9001:2000 and ISO14000:2004 certified manufacturing facility whereby highest products' quality is always top priority. The products' high quality standard has been recognized through successfully obtaining the CE marking certification which in turn comply with the stringent EU requirements.



FCR-E/ FCR-B / FCRQ-B/ FCRQ-C	 A rectangular, silver-colored ceiling-mounted air conditioning unit with a blue heat exchanger visible on the front panel.
FFM	 A rectangular, silver-colored ceiling-mounted air conditioning unit with a black grille on the front panel and a yellow component on the side.
FKM	 A square, silver-colored ceiling-mounted air conditioning unit with a white grille on the front panel.
FWM	 A rectangular, silver-colored wall-mounted air conditioning unit with a digital display on the right side.

Engineering Specifications

General Data - Ceiling Concealed FCU (3 rows Coil) 50/60Hz

Model		FCR	200E	300E	400E	500E	600E	800E	1000E	1200E	1400E
Air Flow	High	CMH	350	520	680	850	1030	1380	1710	2040	2400
		CFM	206	306	400	500	606	812	1006	1200	1412
	Medium	CMH	270	380	510	640	780	1030	1290	1540	1975
		CFM	160	224	300	376	459	606	759	906	1160
	Low	CMH	190	280	340	450	560	740	890	1040	1255
		CFM	112	165	200	265	329	435	524	612	738
Total Cooling Capacity	High	W	2250	3180	4050	4920	5830	8115	9300	11800	13000
	Medium	W	2025	2765	3480	4130	4895	6895	8185	10265	11700
	Low	W	1665	2290	2875	3245	4255	5760	6325	7905	7560
Sensible Cooling Capacity	High	W	1450	2080	2920	3535	4320	5660	6695	7480	9360
	Medium	W	1275	1750	2455	2900	3675	4695	5760	6280	7950
	Low	W	960	1415	1960	2190	2980	3790	4285	4635	5710
External Static Pressure	High	Pa	60								
	Low		30								
Filter	Type	Washable Type									
	Material	Nylon									
	Thickness	8mm									
Fan	Type	Centrifugal Forward Curved Blades									
	Quantity	1	2	2	2	2	3	4	4	4	
	Material	Galvanized Steel									
	Drive	Direct-drive									
Motor	Type	Permanent Split Capacitor with Thermal Overload Protection									
	Insulation Class	Class B									
	Power Supply	V/Ph/Hz	220~240/1/50~60								
	Quantity	1	1	1	1	1	2	2	2	2	
Rated Power Input	at ESP: 60 Pa	W	65	75	90	110	150	178	228	270	340
	at ESP: 30 Pa	W	42	55	65	82	105	148	171	212	253
Cooling Coil	Type	Seamless copper tubes mechanically bonded to aluminium hydrophilic fins and collars									
	Max. Working Pressure	MPa	2								
	Pipe Connection	mm(in)	DN20 (3/4") - Female Threaded								
	Water Flow Rate	l/s	0.11	0.15	0.20	0.25	0.28	0.39	0.44	0.56	0.62
	Water Pressure Drop	kPa	10	25	18	21	30	30	39	28	49
Net Weight	kg	13	17	17	18	20	27	31	34	39	
Dimension	Length	mm	705	805	895	995	1105	1435	1635	1765	1765
	Width	mm	470	470	470	470	470	470	470	490	490
	Height	mm	240	240	240	240	240	240	240	250	300
Sound Pressure Level	at ESP: 60 Pa	dB (A)	42	44	47	47	50	52	54	54	56
	at ESP: 30 Pa	dB (A)	39	41	43	44	46	47	49	51	52
Condensate Drain Size	mm(in)	DN20 (3/4") - Male Threaded									

Note:

- 1) Nominal cooling capacity is based on the following condition:
 - a) Water temperature: 7.0°C (inlet) / 12.0°C (outlet)
 - b) Air entering condition: 27.0°C DB / 19.5°C WB
- 2) Air volume is tested under entering air condition of 20.0°C DB and dry coil condition.
- 3) All the units' airflow value stated is at high speed.
- 4) Sound pressure level is based on 11.5 dB(A) anechoic room background noise.
- 5) The manufacturer reserves the rights to make changes to the above specification without prior notice.

General Data - Low Noise Ceiling Concealed FCU 50/60Hz

Model		FCRQ	400B	500B	600B	800B
Air Flow	High	CMH	680	850	1020	1360
		CFM	400	500	600	800
	Medium	CMH	510	640	780	1030
		CFM	300	376	459	606
	Low	CMH	340	450	560	740
		CFM	200	265	330	435
Total Cooling Capacity	High	W	4020	4850	6010	7950
	Medium	W	3540	4070	5050	6670
	Low	W	2925	3200	4385	5570
Sensible Cooling Capacity	High	W	2970	3485	4455	5475
	Medium	W	2500	2860	3790	4540
	Low	W	1995	2160	3070	3665
External Static Pressure		Pa	30			
Filter	Type		Washable Type			
	Material		Nylon			
	Thickness		8mm			
Fan	Type		Centrifugal Forward Curved Blades			
	Quantity		2	2	2	3
	Material		Galvanized Steel			
	Drive		Direct-drive			
Motor	Type		Permanent Split Capacitor with Thermal Overload Protection			
	Insulation Class		Class B			
	Power Supply	V/Ph/Hz	220~240/1/50~60			
	Quantity		1	1	1	2
Rated Power Input	at ESP: 30 Pa	W	72	85	100	155
Cooling Coil	Type		Seamless Copper Tubes Mechanically Bonded to Aluminium Hydrophilic Fins and Collars			
	Max. Working Pressure	MPa	1.6			
	Pipe Connection	mm(in)	DN20 (3/4") - Female Threaded			
	Water Flow Rate	l/s	0.20	0.24	0.30	0.40
	Water Pressure Drop	kPa	30	30	40	35
Net Weight		kg	17	18	20	26
Dimension	Length	mm	905	985	1185	1465
	Width	mm	490	490	515	515
	Height	mm	250	250	275	275
High Sound Pressure Level	at ESP: 30 Pa (H)	dB (A)	41	43	43	46
Medium Sound Pressure Level	at ESP: 30 Pa (M)	dB (A)	32	35	39	37
Low Sound Pressure Level	at ESP: 30 Pa (L)	dB (A)	23	26	30	28
Condensate Drain Size		mm(in)	DN20 (3/4") - Male Threaded			

Note:

- 1) Nominal cooling capacity is based on the following condition:
 - a) Water temperature: 7.0°C (inlet) / 12.0°C (outlet)
 - b) Air entering condition: 27.0°C DB / 19.5°C WB
- 2) Air volume is tested under entering air condition of 20.0°C DB and dry coil condition.
- 3) All the units' airflow value stated is at high speed.
- 4) Sound pressure level is based on 11.5 dB(A) anechoic room background noise.
- 5) Extended drain pan is optional upon request
- 6) The manufacturer reserves the rights to make changes to the above specification without prior notice.

General Data - Low Noise Ceiling Concealed FCU (DC Motor) 50/60Hz

Model		FCRQ	400C	500C	600C	800C	
Air Flow	High	CMH	680	850	1020	1360	
		CFM	400	500	600	800	
	Medium	CMH	510	640	780	1030	
		CFM	300	376	459	606	
	Low	CMH	340	450	560	740	
		CFM	200	265	330	435	
Total Cooling Capacity	High	W	4020	4850	6010	7950	
	Medium	W	3540	4070	5050	6670	
	Low	W	2925	3200	4385	5570	
Sensible Cooling Capacity	High	W	2970	3485	4455	5475	
	Medium	W	2500	2860	3790	4540	
	Low	W	1995	2160	3070	3665	
External Static Pressure		Pa	30				
Filter	Type		Washable Type				
	Material		Nylon				
	Thickness		8mm				
Fan	Type		Centrifugal Forward Curved Blades				
	Quantity		2	2	2	3	
	Material		Galvanized Steel				
	Drive		Direct-drive				
Motor	Type		Permanent Magnet DC Brushless Motor				
	Insulation Class		Class B				
	Power Supply	V/Ph/Hz	220~240/1/50~60				
	Quantity		1	1	1	2	
Rated Power Input		at ESP: 30 Pa	W	41	61	76	92
Cooling Coil	Type		Seamless Copper Tubes Mechanically Bonded to Aluminium Hydrophilic Fins and Collars				
	Max. Working Pressure	MPa	1.6				
	Pipe Connection	mm(in)	DN20 (3/4") - Female Threaded				
	Water Flow Rate	l/s	0.20	0.24	0.30	0.40	
	Water Pressure Drop	kPa	30	30	40	35	
Net Weight		kg	17	18	20	26	
Dimension	Length	mm	905	985	1185	1465	
	Width	mm	490	490	515	515	
	Height	mm	250	250	275	275	
High Sound Pressure Level	at ESP: 30 Pa (H)	dB (A)	41	43	43	46	
Medium Sound Pressure Level	at ESP: 30 Pa (M)	dB (A)	32	35	39	37	
Low Sound Pressure Level	at ESP: 30 Pa (L)	dB (A)	23	26	30	28	
Condensate Drain Size		mm(in)	DN20 (3/4") - Male Threaded				

Note:

- 1) Nominal cooling capacity is based on the following condition:
 - a) Water temperature: 7.0°C (inlet) / 12.0°C (outlet)
 - b) Air entering condition: 27.0°C DB / 19.5°C WB
- 2) Air volume is tested under entering air condition of 20.0°C DB and dry coil condition.
- 3) All the units' airflow value stated is at high speed.
- 4) Sound pressure level is based on 11.5 dB(A) anechoic room background noise.
- 5) Extended drain pan is optional upon request
- 6) The manufacturer reserves the rights to make changes to the above specification without prior notice.

General Data - High Delta-T Ceiling Concealed FCU (4 rows coil) 50/60Hz

Model		FCR	200B	300B	400B	500B	600B	800B	900B	1000B	1200B	1400B
Air Flow	High	CMH	330	610	760	900	1150	1450	1620	2115	2445	2750
		CFM	194	359	447	529	676	853	953	1244	1438	1618
	Medium	CMH	310	530	710	860	1120	1410	1540	1980	2220	2580
		CFM	182	312	418	506	659	829	906	1165	1300	1518
	Low	CMH	240	330	500	620	770	1100	1200	1470	1570	1870
		CFM	141	194	294	365	453	647	706	865	924	1100
Total Cooling Capacity	High	W	2063	3392	4238	5637	6511	8042	10372	11361	12949	13726
	Medium	W	2000	3200	4100	5500	6400	7900	10100	11000	12400	13300
	Low	W	1784	2532	3475	4722	5353	7072	9036	9593	10534	11450
Sensible Cooling Capacity	High	W	1450	2474	2908	3798	4675	5798	7205	8091	9796	10155
	Medium	W	1400	2300	2800	3700	4600	5700	7000	7800	9300	9800
	Low	W	1204	1708	2262	3036	3657	4925	6043	6525	7534	8070
External Static Pressure		Pa	75									
Filter	Type		Washable Type									
	Material		Nylon									
	Thickness		8mm									
Fan	Type		Centrifugal Forward Curved Blades									
	Quantity		1	2			3			4	3	
	Material		Galvanized Steel									
	Drive		Direct-drive									
Motor	Type		Permanent Split Capacitor with Thermal Overload Protection									
	Insulation Class		Class B									
	Power Supply	V/Ph /Hz	220~240/1/50~60									
	Quantity		1					2				
Rated Power Input		W	65	95	115	133	190	240	270	370	575	615
Cooling Coil	Type		Seamless Copper Tubes Mechanically Bonded to Aluminium Hydrophilic Fins and Collars									
	Max. Working Pressure	Mpa	2									
	Pipe Connection	Mm (in)	DN20 (3/4") - Female Threaded									
	Water Flow Rate	l/s	0.23	0.35	0.43	0.52	0.67	0.83	1.07	1.17	1.32	1.36
	Water Pressure Drop	kPa	14	20	26	13	14	22	27	15	29	18
Net Weight		kg	22	26	30	32	34	46	48	51	55	60
Dimension	Length	mm	660	880	960	1060	1160	1460	1560	1660	1460	1660
	Width	mm	553	553	553	553	553	553	553	553	609	609
	Height	mm	256	256	256	256	256	256	256	256	300	300
Sound Pressure Level	at ESP: 75 Pa	dB (A)	46	47	50	50	51	51	53	55	60	61
Condensate Drain Size		mm (in)	DN20 (3/4") - Male Threaded									

Note:

- 1) Nominal cooling capacity is based on the following condition:
 - a) Water temperature: 5.5°C (inlet) / 14.5°C (outlet)
 - b) Air entering condition: 27.0°C DB / 19.5°C WB
- 2) Air volume is tested under entering air condition of 20.0°C DB and dry coil condition.
- 3) All the units' airflow value stated is at high speed.
- 4) Sound pressure level is based on 11.5 dB(A) anechoic room background noise.
- 5) Extended drain pan is optional upon request
- 6) The manufacturer reserves the rights to make changes to the above specification without prior notice.

General Data - High Air Volume FCU (4 rows coil) 50/60Hz

Model			FFM	800BH			1000BH			1200BH			1600BH			
				High	Med	Low	High	Med	Low	High	Med	Low	High	Med	Low	
Air Flow	High ESP (H)		CMH	1265	1015	815	1510	1215	970	1925	1540	1230	2490	1990	1595	
			CFM	744	597	479	888	715	571	1132	906	724	1465	1171	938	
Total Cooling Capacity	High ESP (H)	130 Pa	W	8290	6640	5300	9870	7900	6310	12040	9630	7700	15930	12750	10200	
Sensible Cooling Capacity			W	6110	4890	3920	7390	5910	4730	8750	6990	5600	11870	9510	7610	
External Static Pressure	Pa		130													
Filter	Type		Washable Type													
	Material		Nylon													
	Thickness		8mm													
Fan	Type		Centrifugal Forward Curved Blades													
	Quantity		1			1			1			2				
	Material		Galvanized Steel													
	Drive		Direct-drive													
Motor	Type		Permanent Split Capacitor with Thermal Overload Protection													
	Insulation Class		Class B													
	Power Supply	V/Ph/Hz	220~240/1/50~60													
	Quantity		1			1			1			1				
Rated Power Input	at ESP: 130 Pa	W	280			370			600			700				
Cooling Coil	Type		Seamless Copper Tubes Mechanically Bonded to Aluminium Hydrophilic Fins and Collars													
	Pipe Connection	mm(in)	DN25 (1") - Male Threaded													
	Water Flow rate	l/s	0.44			0.50			0.66			0.86				
	Water Pressure Drop	kPa	6			14			25			20				
Net Weight			kg	55			55			61			74			
Dimension	Length	mm	860			860			960			1110				
	Width	mm	770			770			770			770				
	Height	mm	430			430			430			430				
Sound Pressure Level			dB (A)	58			58			59			61			
Condensate Drain Size			mm(in)	DN25 (1") - Male Threaded												

Note:

- Nominal cooling capacity is based on the following condition:
 - Water temperature: 7.0°C (inlet) / 12.0°C (outlet)
 - Air entering condition: 27.0°C DB / 19.5°C WB
- Air volume is tested under entering air condition of 20.0°C DB and dry coil condition.
- All the units' airflow value stated is at high speed.
- Sound pressure level is based on 11.5 dB(A) anechoic room background noise.
- Extended drain pan is optional upon request
- The manufacturer reserves the rights to make changes to the above specification without prior notice.

General Data - High Air Volume FCU (4 rows coil) 50/60Hz

Model			FFM	1800BH			2000BH			3000BH		
				High	Med	Low	High	Med	Low	High	Med	Low
Air Flow	High ESP (H)	130 Pa	CMH	2945	2360	1890	3880	3100	2485	5500	4395	3520
			CFM	1732	1388	1112	2282	1824	1462	3235	2585	2071
Total Cooling Capacity	High ESP (H)	130 Pa	W	19110	15290	12220	24260	19390	15530	34410	27510	22010
Sensible Cooling Capacity	High ESP (H)	130 Pa	W	14280	11420	9140	17620	14090	11290	25000	19980	15990
External Static Pressure			Pa	130								
Filter	Type		Washable Type									
	Material		Nylon									
	Thickness		8 mm									
Fan	Type		Centrifugal Forward Curved Blades									
	Quantity		2			2			3			
	Material		Galvanized Steel									
	Drive		Direct-drive									
Motor	Type		Permanent Split Capacitor with Thermal Overload Protection									
	Insulation Class		Class B									
	Power Supply	V/Ph / Hz	220~240/1/50~60									
	Quantity (H)/(S)		2			2			3			
Rated Power Input	at ESP: 130 Pa	W	750			1200			1800			
	Type		220~240/1/50~60									
	Pipe Connection	mm(in)	DN25 (1") - Male Threaded				DN40 (1 1/2") - Male Threaded					
Cooling Coil	Water Flow rate	l/s	1.01			1.25			1.71			
	Water Pressure Drop	kPa	25			35			45			
Net Weight			kg	93			107			140		
Dimension	Length	mm	1260			1560			2010			
	Width	mm	770			770			770			
	Height	mm	430			430			430			
Sound Pressure Level			dB (A)	62			64			66		
Condensate Drain Size			mm(in)	DN25 (1") - Male Threaded								

Note:

- 1) Nominal cooling capacity is based on the following condition:
 - a) Water temperature: 7.0°C (inlet) / 12.0°C (outlet)
 - b) Air entering condition: 27.0°C DB / 19.5°C WB
- 2) Air volume is tested under entering air condition of 20.0°C DB and dry coil condition.
- 3) All the units' airflow value stated is at high speed.
- 4) Sound pressure level is based on 11.5 dB(A) anechoic room background noise.
- 5) Extended drain pan is optional upon request
- 6) The manufacturer reserves the rights to make changes to the above specification without prior notice.

General Data - Ceiling Cassette FCU 50/60Hz

Model		FKM	500A	600A	1000A	1400A
Air Flow	High	CMH	850	1003	1598	2550
		CFM	500	590	940	1500
	Medium	CMH	731	850	1360	2176
		CFM	430	500	800	1280
	Low	CMH	595	714	1156	1836
		CFM	350	420	680	1080
Total Cooling Capacity	High	W	4500	5700	8220	12900
Fan	Type	Centrifugal forward curved blades				
Fan Motor	Type	Low Noise 4-Speed				
Rated Power Input	at ESP: 0 Pa	W	76	90	145	225
Cooling Coil	Type	Seamless copper tube mechanically bonded to aluminum hydrophilic Fin				
	Pipe Connection	mm(in)	DN20 (3/4") - Female Threaded			
	Water Flow Rate	l/s	0.22	0.27	0.40	0.62
	Water Pressure Drop	kPa	16.0	23.8	31.2	40.0
Net Weight		kg	26	35	38	40
Unit Dimension	Length	mm	570	835	835	
	Width	mm	570	835	835	
	Height	mm	260	250	290	
Panel Dimension	Length	mm	650	950		
	Width	mm	650	950		
	Height	mm	55	55		
Sound Pressure Level	at ESP: 0 Pa	dB (A)	45	45	48	50
Condensate Drain Size		mm(in)	DN20 (3/4")			

Note:

- 1) Nominal cooling capacity is based on the following condition:
 - a) Water temperature: 7.0°C (inlet) / 12.0°C (outlet)
 - b) Air entering condition: 27.0°C DB / 19.0°C WB
- 2) Air volume is tested under entering air condition of 20.0°C DB and dry coil condition.
- 3) All the units' airflow value stated is at high speed.
- 4) Sound pressure level is based on 11.5 dB(A) anechoic room background noise.
- 5) Unit is equipped with water pump

General Data - Wall Mounted FCU 50/60Hz

Model		FWM	300A	500A	600A	800A
Air Volume		CMH	510	850	1020	1275
		CFM	300	500	600	750
Total Cooling Capacity		W	2640	4250	5000	7000
Rated Power Input		W	52	76	96	134
Cooling Coil	Type	Aluminium Hydrophilic Fins				
	Piping Connection	mm(in)	DN15 (1/2")- Male Threaded			
	Water Flow Rate	l/s	0.13	0.20	0.25	0.39
	Water Pressure Drop	kPa	30.0	33.6	45.0	28.0
Net Weight		kg	11	15	16	20
Unit Dimension	Depth	mm	300	315		330
	Width	mm	850	970		1100
	Height	mm	198	235		235
Sound Pressure Level		dB(A)	42±3	39±3	40±3	46±3
Condensate Drain Size		mm(in)	DN15 (1/2")			

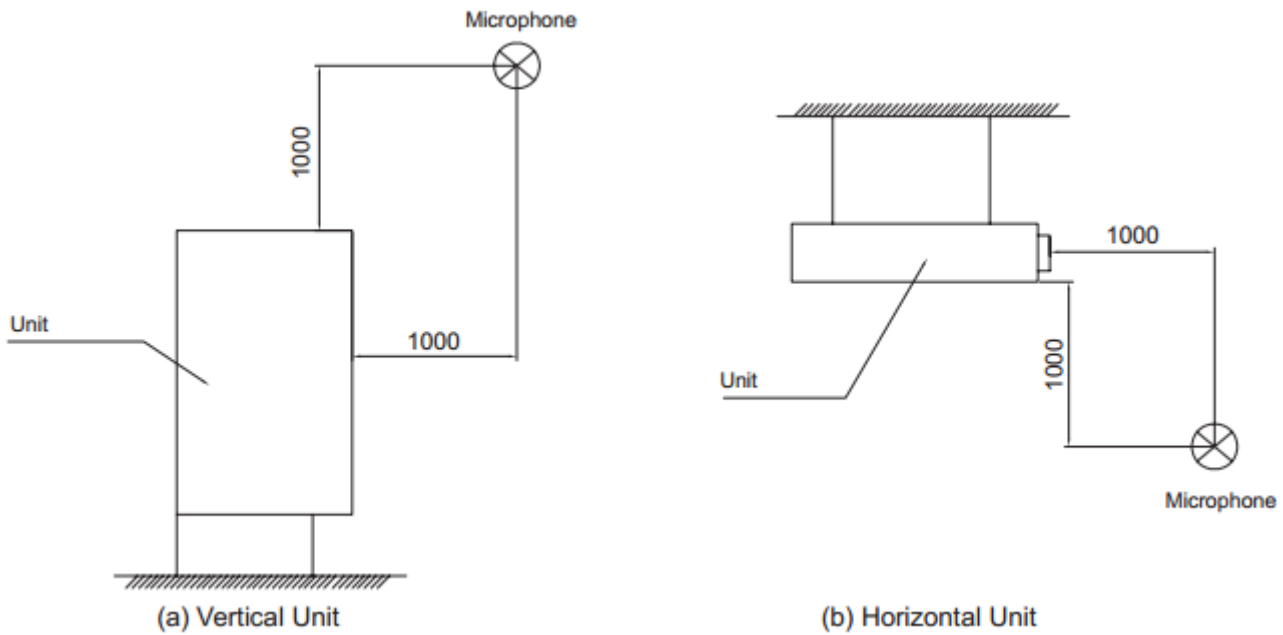
Note:

- 1) Nominal cooling capacity is based on the following condition:
 - a) Water temperature: 7.0°C (inlet) / 12.0°C (outlet)
 - b) Air entering condition: 27.0°C DB / 19.0°C WB
- 2) Air volume is tested under entering air condition of 20.0°C DB and dry coil condition.
- 3) All the units' airflow value stated is at high speed.
- 4) Sound pressure level is based on 11.5 dB(A) anechoic room background noise.
- 5) The manufacturer reserves the rights to make changes to the above specification without prior notice.

Operating Range

Operating Limits	
Maximum water-side pressure	2.0MPa
Minimum entering water temperature	5°C
Maximum entering water temperature	80°C
Minimum air inlet temperature	5°C
Maximum air inlet temperature	43°C
Power supply	220-240V/1Ph/50Hz

Sound Data



Sound pressure level test setup complies to GB/T19232-2003

Sound pressure level

Model: FCR-E

Model	ESP Fan Speed	30Pa 1/1 Octave Sound pressure level (dBA, ref 20μPa)								Overall dB(A)	NC
		63	125	250	500	1K	2K	4K	8K		
		200	High	14	24	33	34	34	29		
200	Medium	13	18	27	28	29	24	16	12	32.0	27
	Low	12	16	23	26	26	22	13	13	29.5	24
	300	High	17	27	36	37	38	33	25	16	40.9
300	Medium	12	21	30	32	32	27	19	13	34.8	31
	Low	12	13	21	23	23	19	14	12	26.8	21
	400	High	19	29	37	39	40	35	27	18	42.9
400	Medium	14	24	32	35	35	31	22	14	38.0	34
	Low	13	17	24	26	35	22	15	12	29.7	24
	500	High	21	32	39	41	35	36	29	20	44.4
500	Medium	14	24	33	35	35	30	23	14	38.0	34
	Low	12	17	25	27	35	24	15	12	30.9	26
	600	High	22	33	41	42	35	38	30	22	46.4
600	Medium	17	27	35	36	35	33	25	17	40.2	36
	Low	13	18	26	29	35	24	17	14	32.3	27
	800	High	23	34	42	43	35	39	32	23	46.5
800	Medium	18	28	36	37	35	34	26	17	41.0	36
	Low	13	19	28	29	35	25	18	13	32.6	27
	1000	High	25	35	44	45	35	41	33	25	49.0
1000	Medium	21	32	40	42	35	37	30	21	45.3	41
	Low	14	22	30	32	35	28	20	13	35.1	31
	1200	High	26	37	46	47	35	43	35	26	50.9
1200	Medium	19	30	38	39	35	35	27	19	42.8	39
	Low	13	21	29	30	35	26	18	12	33.9	30
	1400	High	27	38	47	48	35	43	37	28	51.3
1400	Medium	19	30	38	40	35	36	28	19	43.7	39
	Low	13	21	29	31	35	26	19	14	34.4	30

1. Sound pressure level of FCUs are tested in accordance to GB/T19232-2003 under 11.5 dBA background noise.
2. Microphone position: 1m in front and 1m below the unit.

Model: FCR-E

ESP		60Pa									
Model	Fan Speed	1/1 Octave Sound pressure level (dBA, ref 20μPa)								Overall dB(A)	NC
		63	125	250	500	1K	2K	4K	8K		
200	High	18	28	36	38	39	34	26	18	41.7	38
	Medium	14	22	29	31	31	27	19	13	34.6	30
	Low	12	14	22	24	23	19	13	12	27.0	21
300	High	19	30	39	40	40	36	28	20	43.5	39
	Medium	14	21	29	32	31	28	19	12	34.8	30
	Low	12	15	24	25	25	21	13	12	28.4	23
400	High	23	33	41	43	43	38	31	22	46.3	42
	Medium	14	24	32	34	34	31	23	14	37.9	33
	Low	12	16	24	25	26	21	14	12	29.1	24
500	High	23	33	42	43	44	39	32	22	47.0	43
	Medium	13	23	32	33	34	30	22	14	37.3	33
	Low	12	16	23	26	25	21	14	12	28.9	23
600	High	25	36	44	46	46	42	33	25	49.1	45
	Medium	19	29	38	39	39	35	27	18	42.5	38
	Low	12	20	28	30	30	27	18	13	33.7	28
800	High	28	39	47	48	49	45	37	28	52.0	47
	Medium	19	30	38	39	39	35	26	18	42.3	38
	Low	13	21	30	30	31	27	19	14	34.5	30
1000	High	30	40	48	49	50	46	38	30	53.3	48
	Medium	22	32	40	42	43	38	30	21	45.6	43
	Low	17	28	36	38	38	34	26	17	41.6	37
1200	High	30	41	48	50	51	46	38	29	53.9	50
	Medium	24	34	42	44	44	40	32	24	47.1	43
	Low	18	28	36	39	39	34	27	18	42.3	38
1400	High	32	41	50	52	53	48	40	32	55.6	52
	Medium	25	36	43	45	45	42	34	24	48.8	44
	Low	18	29	36	38	39	35	27	19	42.2	38

1. Sound pressure level of FCUs are tested in accordance to GB/T19232-2003 under 11.5 dBA background noise.
2. Microphone position : 1m in front and 1 m below the unit.

Model: FCRQ-B / FCRQ-C

ESP		30Pa									
Model	Fan Speed	1/1 Octave Sound pressure level (dBA, ref 20μPa)								Overall dB(A)	NC
		63	125	250	500	1K	2K	4K	8K		
400	High	15	25	33	35	36	31	23	14	40.5	34.0
	Medium	6	16	24	27	27	23	14	6	32.0	28.0
	Low	4	8	15	17	17	13	6	3	23.0	15.0
500	High	20	31	38	40	40	35	28	19	42.5	38.5
	Medium	9	19	28	30	30	25	18	9	34.5	29.0
	Low	6	11	19	21	22	17	8	5	26.0	20.0
600	High	20	31	39	40	40	34	26	18	43.0	39.0
	Medium	12	22	30	31	31	27	19	11	39.0	31.0
	Low	9	14	22	25	25	20	13	10	30.0	23.0
800	High	23	34	42	43	43	39	32	23	45.5	42.5
	Medium	14	24	32	34	34	30	22	13	36.5	32.5
	Low	8	14	22	24	24	20	13	8	28.0	21.5

1. Sound pressure level of FCUs are tested in accordance to GB/T19232-2003 under 11.5 dBA background noise.
2. Microphone position : 1m in front and 1 m below the unit.

Model: FFM-BH

ESP		130Pa									
Model	Fan Speed	1/1 Octave Sound pressure level (dBA, ref 20μPa)								Overall dB(A)	NC
		63	125	250	500	1K	2K	4K	8K		
800	High	33	44	52	54	54	50	41	33	57.1	53
	Medium	28	38	47	48	49	45	36	28	51.8	47
	Low	25	35	44	46	46	41	33	25	49.1	45
1000	High	34	45	53	55	55	50	42	34	58.0	54
	Medium	28	39	46	48	49	45	36	28	51.7	47
	Low	20	30	38	40	41	36	28	19	43.7	40
1200	High	34	45	53	54	55	51	43	34	58.2	54
	Medium	29	39	48	49	49	45	37	29	52.4	48
	Low	21	33	40	42	42	37	30	22	45.0	41
1600	High	37	47	54	57	56	53	45	36	60.1	55
	Medium	30	40	49	50	51	46	37	30	54.1	50
	Low	22	33	40	43	44	39	31	22	46.7	43
1800	High	37	48	56	58	58	54	46	36	61.0	57
	Medium	31	41	50	51	52	48	40	31	55.2	51
	Low	22	33	41	44	44	39	31	23	46.9	43
2000	High	39	50	58	59	60	56	47	38	63.2	59
	Medium	33	45	52	53	54	49	42	33	57.0	53
	Low	26	36	45	46	45	42	34	25	49.2	44
3000	High	41	51	60	62	62	58	49	40	65.3	61
	Medium	38	48	57	59	59	54	45	38	61.9	58
	Low	27	38	47	49	49	44	36	27	52.0	47

1. Sound pressure level of FCUs are tested in accordance to GB/T19232-2003 under 11.5 dBA background noise.
2. Microphone position : 1m in front and 1 m below the unit.

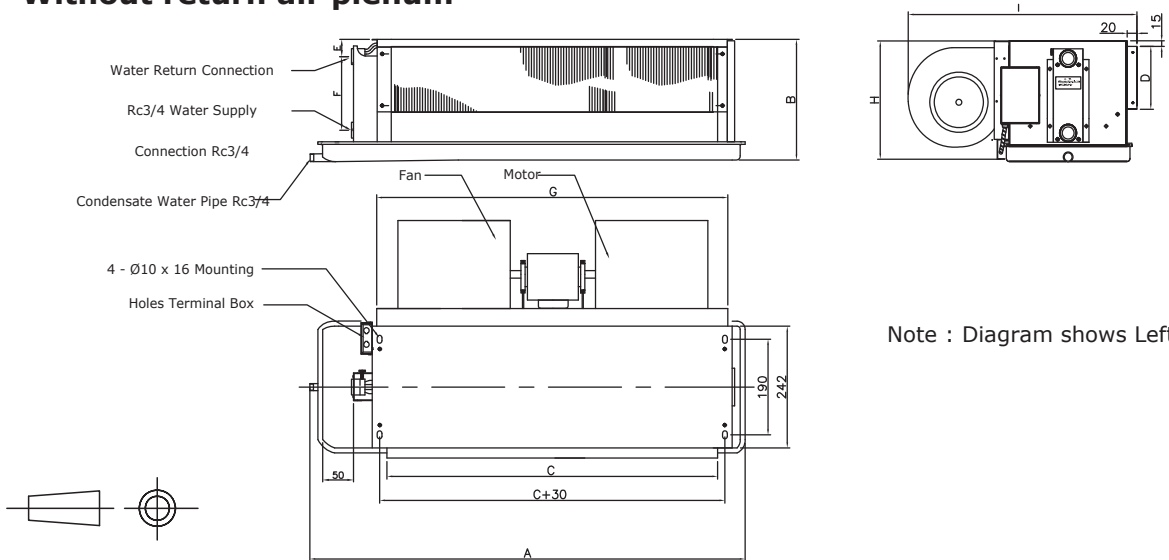
Model: FCR-B

ESP		75Pa									
Model	Fan Speed	1/1 Octave Sound pressure level (dBA, ref 20μPa)								Overall dB(A)	NC
		63	125	250	500	1K	2K	4K	8K		
200	High	40.6	44.8	43.1	42.6	41.5	40.1	34.5	28.9	46.4	41
	Medium	40.1	46.3	43.3	42.3	40.9	37.5	27.7	20.0	45.1	40
	Low	38.1	44.1	41.2	40.0	38.0	34.4	24.2	17.0	42.4	37
300	High	39.3	40.5	45.4	44.0	43.3	40.9	34.6	28.0	47.7	42
	Medium	38.6	40.3	43.9	43.1	42.3	39.7	33.0	26.2	46.6	41
	Low	36.4	37.0	39.9	40.0	38.5	35.2	27.5	19.8	42.7	37
400	High	39.4	43.4	46.7	47.5	45.1	41.9	33.7	25.8	49.5	44
	Medium	39.2	43.0	45.9	46.1	44.4	41.5	32.7	24.4	48.7	43
	Low	35.4	39.5	42.7	43.0	41.1	37.2	28.2	19.3	45.2	40
500	High	42.5	45.9	47.7	47.0	45.4	42.4	35.9	28.6	49.8	44
	Medium	40.2	44.9	47.2	46.8	45.1	41.9	35.0	27.5	49.5	44
	Low	37.2	41.7	44.3	43.6	41.0	37.8	30.1	21.7	45.7	40
600	High	42.6	46.2	50.2	47.7	46.0	42.7	36.5	29.2	50.6	45
	Medium	42.6	46.0	50.0	47.2	46.0	42.2	36	29.0	50.3	45
	Low	39.7	43.0	45.5	43.7	40.5	39.3	31.5	24.6	46.1	40
800	High	42.8	49.4	50.0	48.5	46.7	44.4	37.2	29.0	51.5	45
	Medium	42.8	49.2	49.6	48.2	46.5	44.2	37.0	28.4	51.2	45
	Low	41.2	47.6	48.0	46.8	45.0	42.3	34.7	25.7	49.6	44
900	High	48.1	49.1	51.5	50.1	48.5	46.0	40.8	34.5	53.2	47
	Medium	48.2	48.6	50.8	40.6	47.7	45.3	39.9	33.3	52.5	46
	Low	48.1	46.7	48.3	47.2	44.9	42.1	36.1	28.4	49.7	44
1000	High	43.6	49.1	51.2	51.2	50.2	47.3	41.1	34.1	54.4	49
	Medium	43.1	49.2	50.8	50.8	49.8	46.8	40.5	33.4	54.0	48
	Low	41.1	46.7	48.5	49.6	47.4	44.3	37.5	29.8	51.8	46
1200	High	51.4	57.1	57.4	55.2	56.6	52.5	49.5	44.6	60.3	56
	Medium	50.3	56.0	56.2	54.0	55.2	51.1	48.0	42.8	58.9	55
	Low	47.8	54.1	50.1	49.0	49.0	45.2	40.8	34.0	53.0	48
1400	High	50.5	56.4	59.4	54.5	55.2	51.9	48.7	44.6	59.6	55
	Medium	49.1	55.3	58.7	53.9	54.4	51.1	48	43.7	58.9	54
	Low	44.4	50.1	52.5	49.0	49.0	45.7	42	36.2	53.4	48

1. Sound pressure level of FCUs are tested in accordance to GB/T19232-2003 under 11.5 dBA background noise.
2. Microphone position : 1m in front and 1 m below the unit.

Dimensions

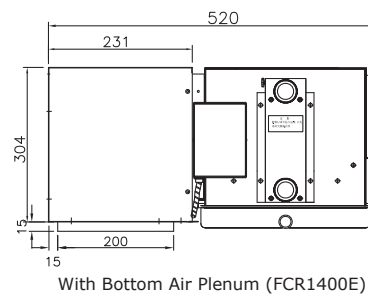
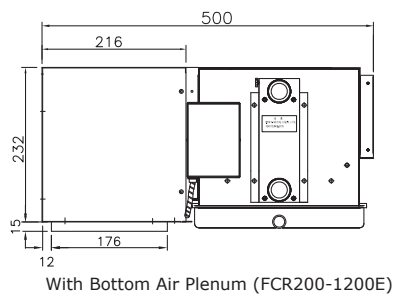
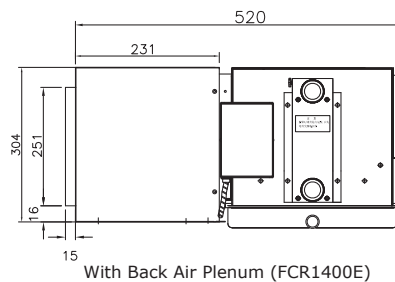
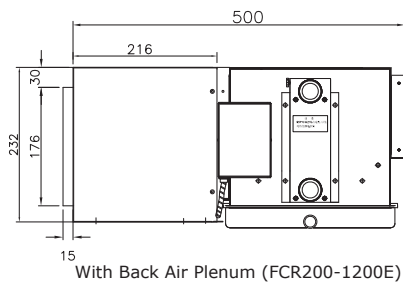
Model : FCR 200 - 1400E Without return air plenum



Dimensions in mm

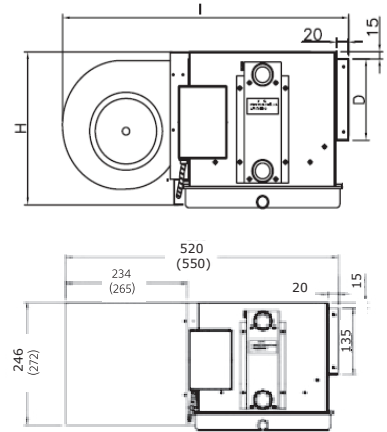
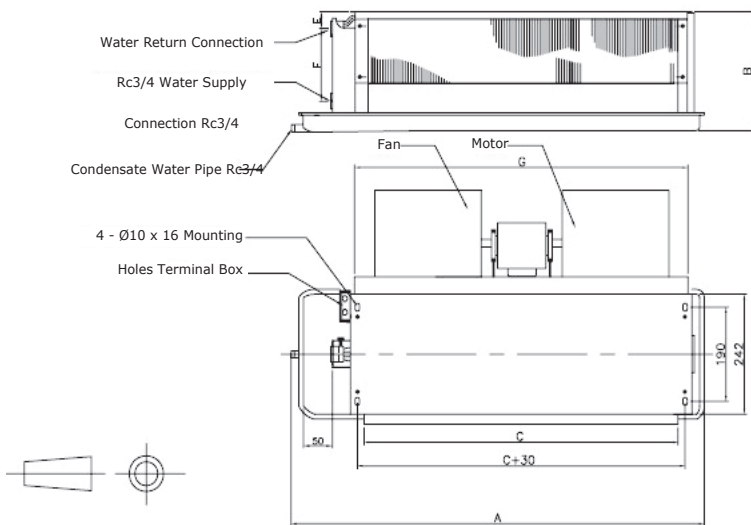
Model	A	B	C	D	E	F	G	H	I	Motor No.	Fan No.
FCR200E	705	240	409	135	20	145	532	235	470	1	1
FCR300E	805	240	590	135	20	145	632	235	470	1	2
FCR400E	895	240	680	135	20	145	722	235	470	1	2
FCR500E	995	240	780	135	20	145	822	235	470	1	2
FCR600E	1105	240	890	135	20	145	932	235	470	1	2
FCR800E	1435	240	1185	135	60	88	1227	235	470	2	3
FCR1000E	1635	240	1380	135	20	145	1422	235	470	2	4
FCR1200E	1765	250	1510	135	60	88	1522	245	490	2	4
FCR1400E	1765	300	1510	177	42	192	1630	300	490	2	4

With return air plenum



FCR	200	300	400	500	600	800	1000	1200	1400
Length	477	577	667	767	877	1172	1267	1367	1466

Model : FCRQ 400 - 800B / FCRQ 400 - 800C

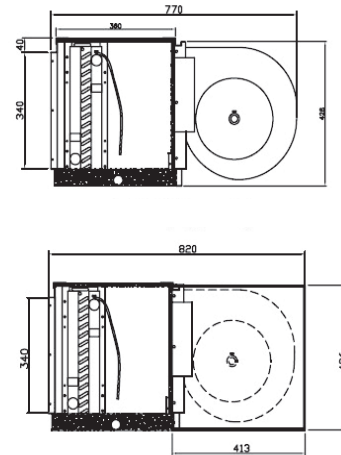
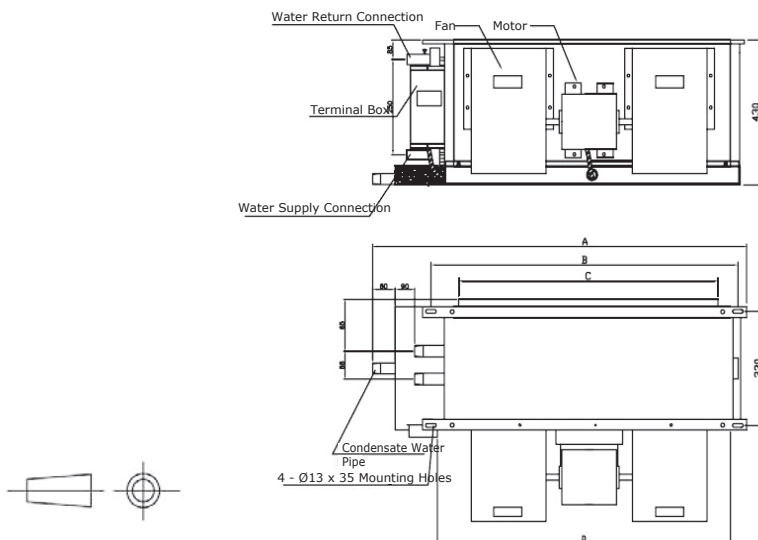


Note : Diagram shows Left Piping

Dimension in mm

Model	A	B	C	D	E	F	G	H	I	Motor No.	Fan No.
FCRQ400B/C	905	250	690	135	54	118	732	245	490	1	2
FCRQ500B/C	985	250	770	135	54	118	812	245	490	1	2
FCRQ600B/C	1185	275	970	135	54	118	1012	270	515	1	2
FCRQ800B/C	1465	275	1215	135	54	118	1257	270	515	2	3

Model : FFM 800 - 3000BH

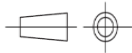
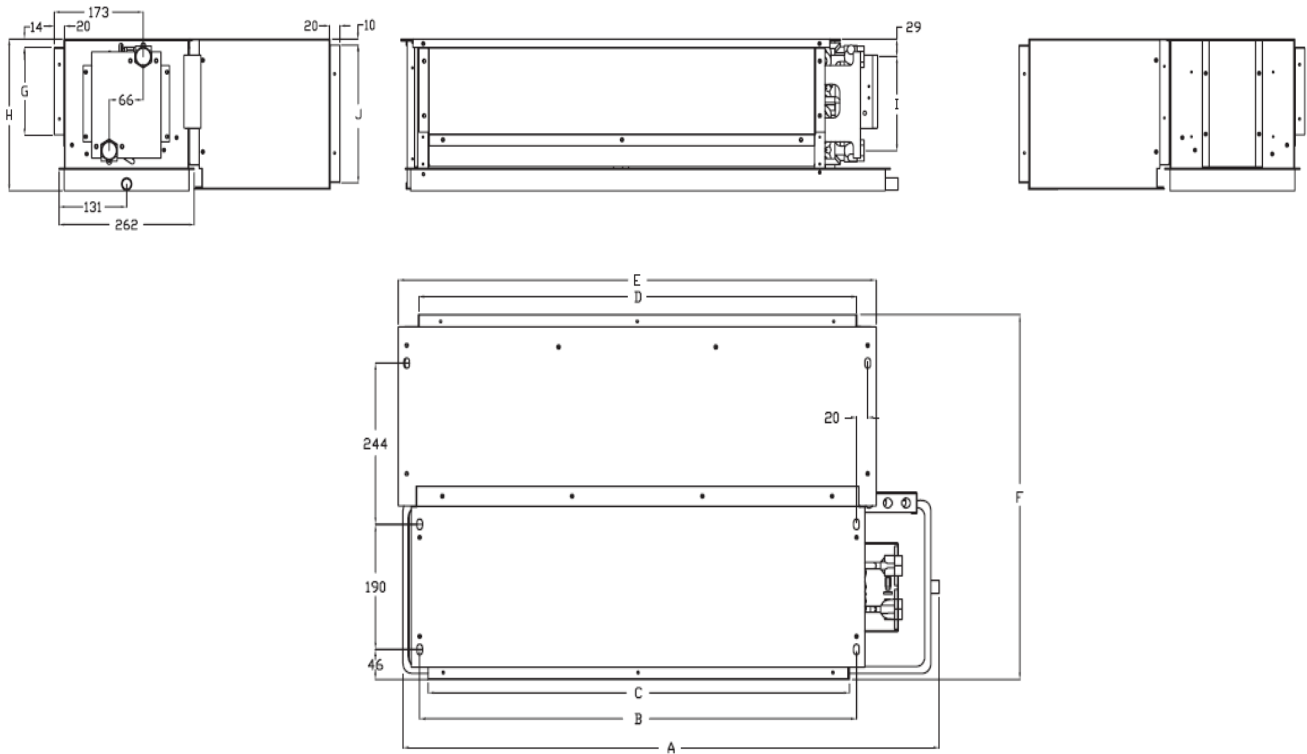


Note : Diagram shows Right Piping

Dimension in mm, inlet/outlet & condensate water pipe in inch

Model	A	B	C	D	Inlet /Outlet	Condensate Water Pipe	Motor No.	Fan No.
FFM800B	860	683	530	590	R1	R1	1	1
FFM1000B	860	683	530	590	R1	R1	1	1
FFM1200B	960	783	630	690	R1	R1	1	1
FFM1600B	1110	953	800	860	R1	R1	1	2
FFM1800B	1260	1083	930	990	R1	R1	2	2
FFM2000B	1560	1403	1250	1310	R1-1/2	R1	2	2
FFM3000B	2010	1853	1700	1760	R1-1/2	R1	3	3

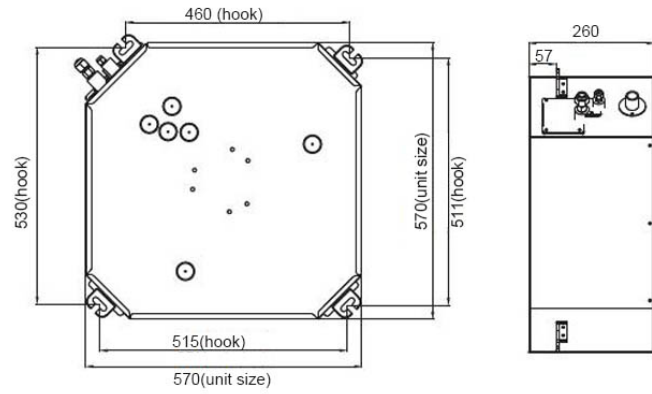
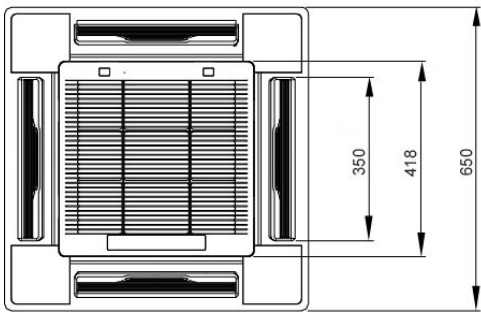
Model : FCR 200 - 1400B



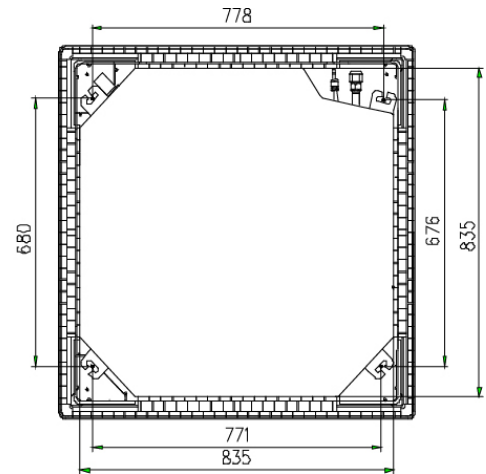
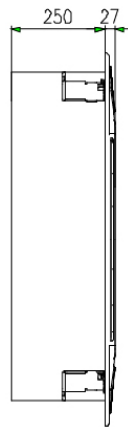
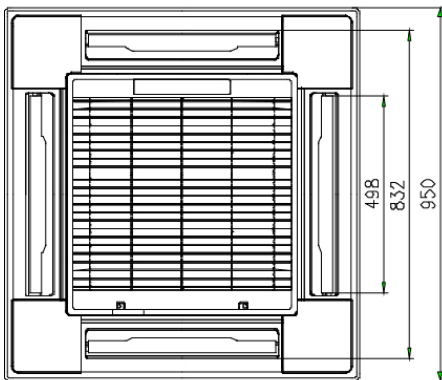
Dimension in mm

Model	A	B	C	D	E	F	G	H	I	J	Motor No.	Fan No.
FCR200B	660	478	448	481	551	553	145	256	155	226	1	1
FCR300B	880	698	668	701	771	553	145	256	155	226	1	2
FCR400B	960	778	748	781	851	553	145	256	155	226	1	2
FCR500B	1060	878	848	881	951	553	145	256	155	226	1	2
FCR600B	1160	978	948	981	1051	553	145	256	155	226	1	2
FCR800B	1460	1228	1198	1231	1301	553	145	256	155	226	2	3
FCR900B	1560	1325	1298	1331	1401	553	145	256	155	226	2	3
FCR1000B	1660	1428	1398	1431	1501	553	145	256	155	226	2	4
FCR1200B	1460	1228	1198	1231	1301	609	197	300	205	282	2	3
FCR1400B	1660	1428	1398	1431	1501	609	197	300	205	282	2	3

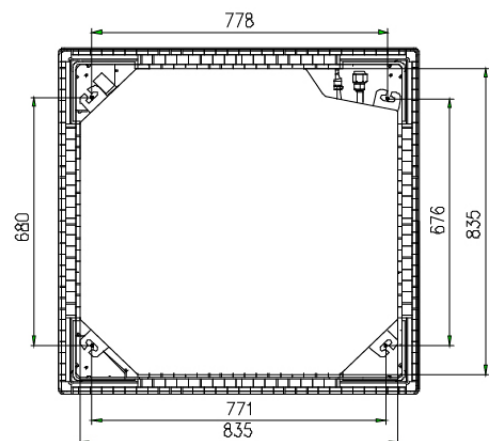
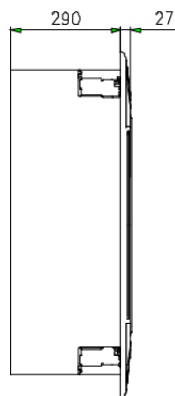
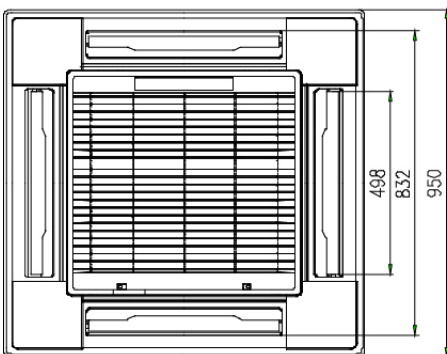
Model: FKM 500



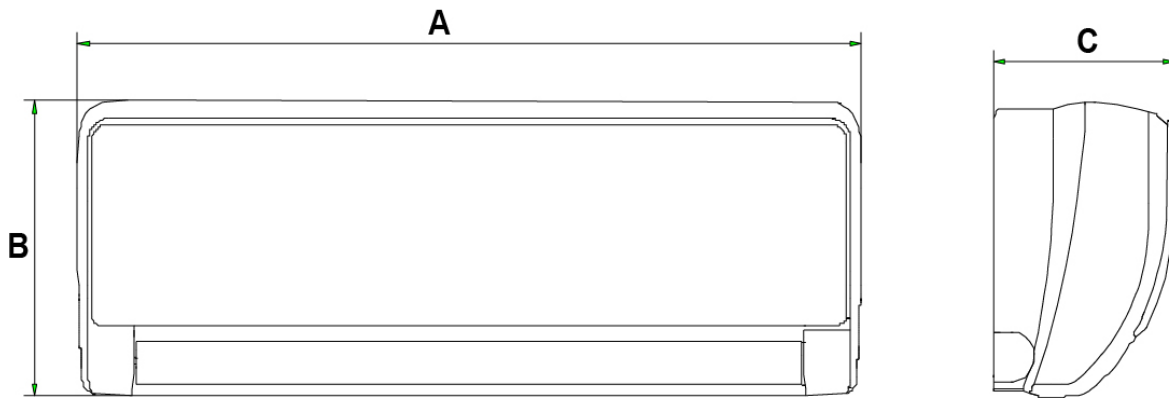
Model: FKM 600 - 1000



Model: FKM 1400



Model: FWM 300 - 1100A

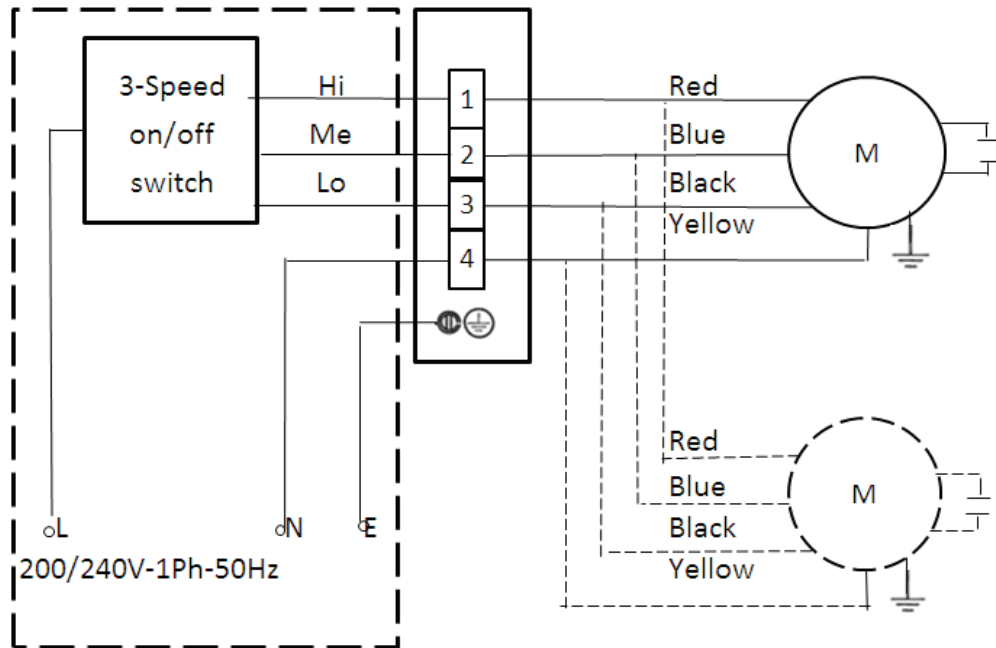


Dimension in mm

Model	A	B	C
FWM300A	850	300	198
FWM500A	970	315	235
FWM600A	970	315	235
FWM1100A	1100	330	235

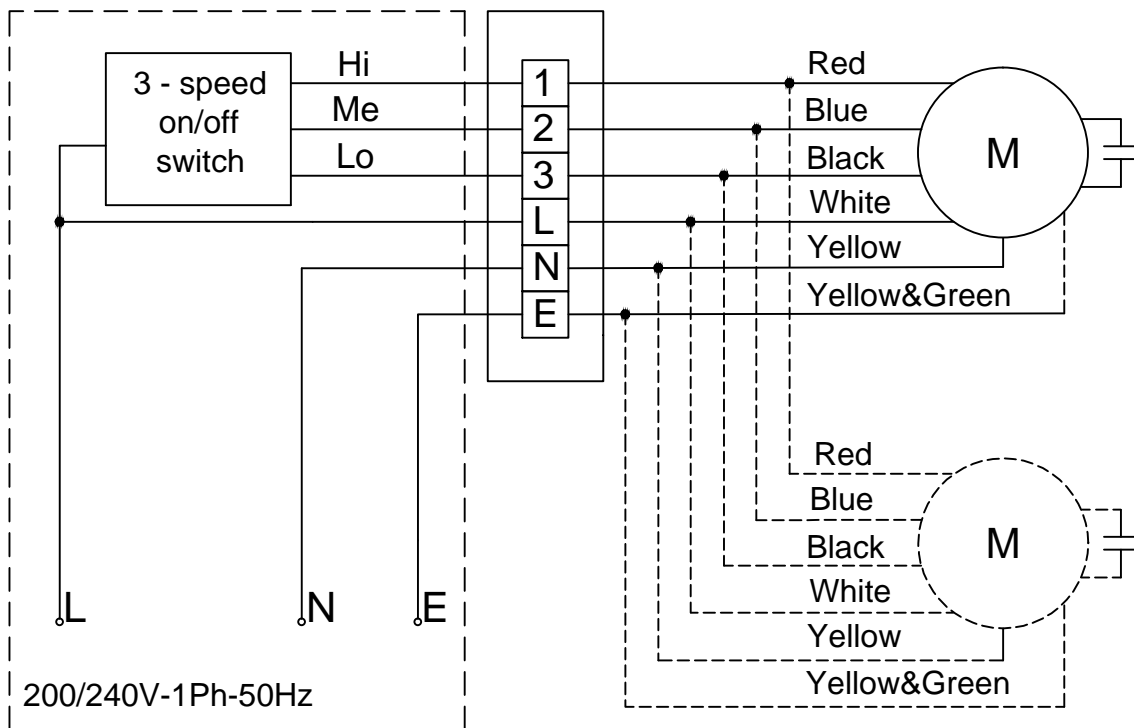
Wiring Diagrams

Model: FCR-E, FCRQ-B



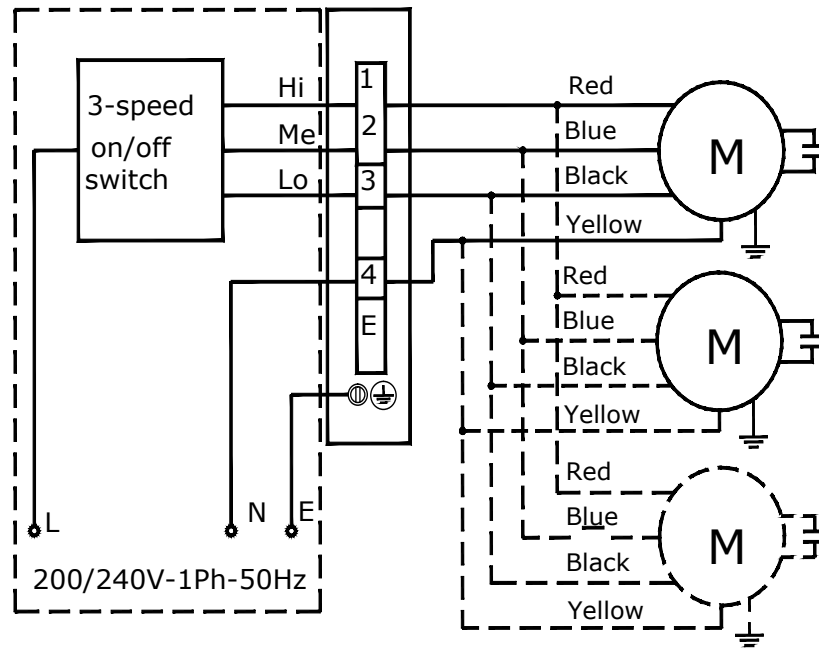
Field supply

Model: FCRQ-C



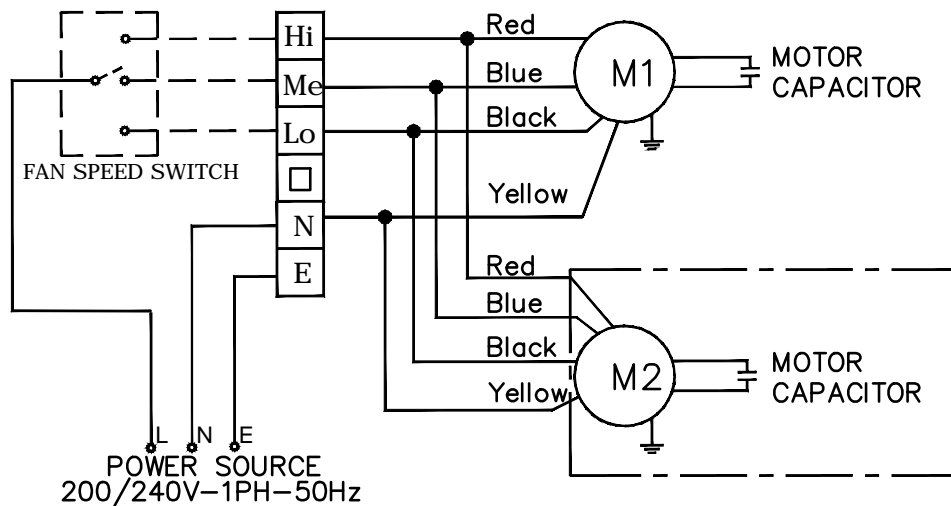
Field supply

Model: FFM-BH



--- Field supply

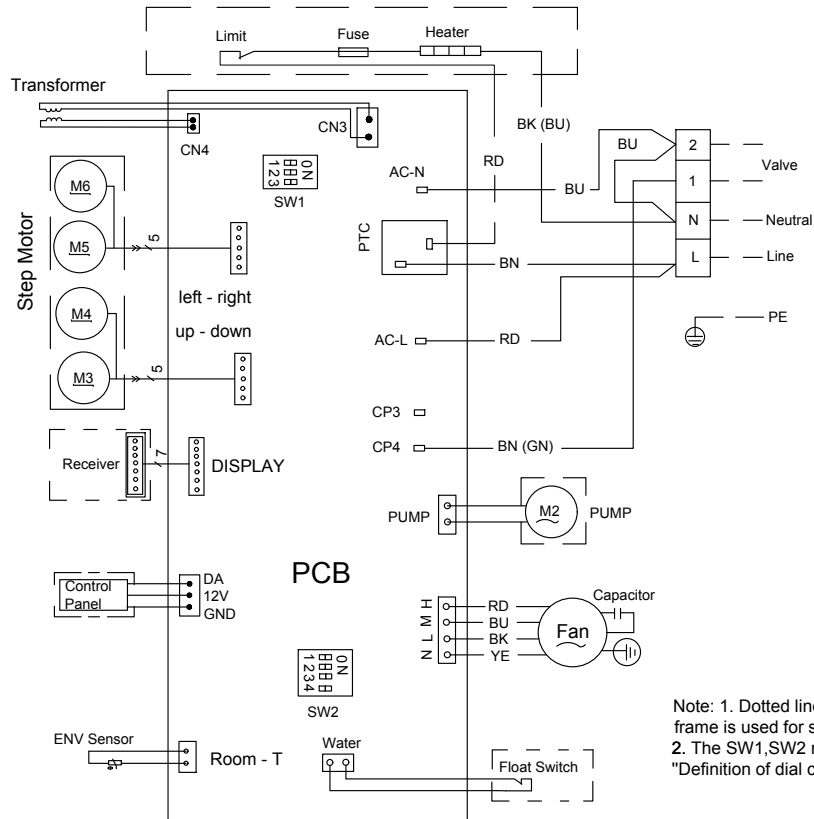
Model : FCR-B



NOTE:
 Hi: High Speed
 Me: Medium Speed
 Lo: Low Speed

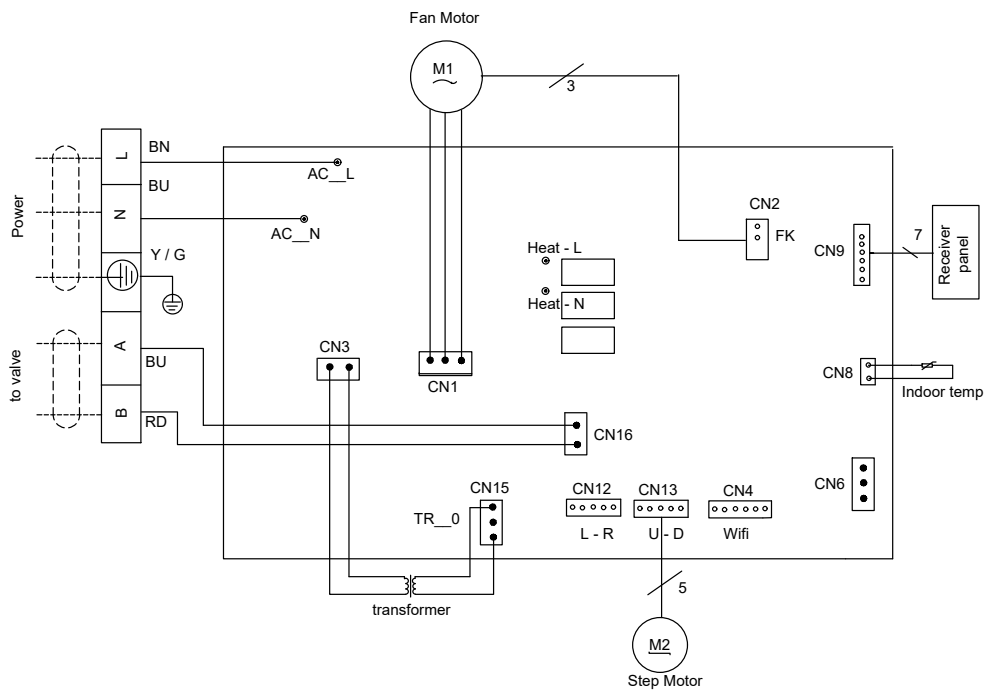
--- Field Wiring

Model : FKM



Note: 1. Dotted line part in the frame is used for some mode;
2. The SW1,SW2 refer to "Definition of dial code switches"

Model : FWM



Note: Dotted line part in the frame may not be used.

Installation

Unit Installation and Maintenance

1. Pre-Installation

Caution: Installation and maintenance should be done by qualified technicians who are familiar with local codes and regulations.

Caution: Sharp edges from the unit and heat exchanger are potential hazard. Handle with extreme care.

The unit needs to be handled with care during transportation and it is prohibited to move the unit by holding on to the blower or blower blade.

The unit is designed to take its own weight. As such, do not transfer the load of duct, water pipes and other accessories to the unit. This may cause the hanger to deform and fail.

Before any installation work starts, the following should be checked:

- a) Chilled water pipes and condensate water drainage pipes must be properly connected and standby for use.
- b) Electrical wiring is properly connected and all terminals are tightened to prevent loose wires.
- c) Sufficient space must be reserved for installation, service and maintenance purposes.
- d) Ensure the hanging rod is capable of supporting the weight of the unit and the position of rods are according to drawing.
- e) Ensure the supply and return duct installed (for units that required ducting) is according to the specification of the unit.

2. Unit Installation

a) Water system

- i) The top connecting pipe is for water outlet and bottom connecting pipe is for water inlet. During installation, do not tighten the pipe with excessive torque to prevent deformation of heat exchanger. Both inlet and outlet pipes should be insulated, connecting threads should be sealed using PTFE tape and sufficient gradient should be maintained for condensate water pipe for proper water drainage.
- ii) It is recommended to use union for connection of unit to the supply and return water pipes and to have isolation valves for each unit to ease servicing work / upgrade of equipment in the future.
- iii) Water piping should be sufficiently supported at proper intervals to cater for the weight of the pipes and also water flowing inside. Consideration for expansion and contraction is a must to prevent leaking and breakage of pipes.
- iv) A manual air vent is located at the water outlet pipe. During commissioning or changing from cooling to heating cycle (or vice versa), the valve must be opened to release air that might be trapped inside the pipe in order to ensure good heat exchange efficiency.

b) Direction of pipes connection

Direction of pipes is determined by facing the supply air side of the unit. If the pipes are located at the left, they are left piping and vice versa. It is important to specify the piping direction during ordering to avoid installation problem at site.

c) Pipes connection

- i) All threaded pipes must be sealed using PTFE tape during connection.
- ii) After leak testing of water pipes, all pipes must be insulated to prevent heat lost / heat gain.
- iii) All valves on the piping system must be located within the area of the drain pan of the unit. If the site condition does not permit that, additional insulation or an additional drain pan should be installed to prevent condensation.
- iv) The drain pan is designed to have gradient to ease the flow of condensate water. To facilitate the proper drainage of condensate water, it is recommended to install the unit at a gradient of 3 ~ 5mm tilting to the drainage pipe.
- v) Condensate water pipe should be insulated to prevent condensation at the outer pipe due to the cool drainage water. It is recommended that the gradient of the pipe should not be less than 1:75 to facilitate the flow of drainage water.

Caution: When connecting water pipes, proper sized tools should be used to avoid damage of pipes or unit.

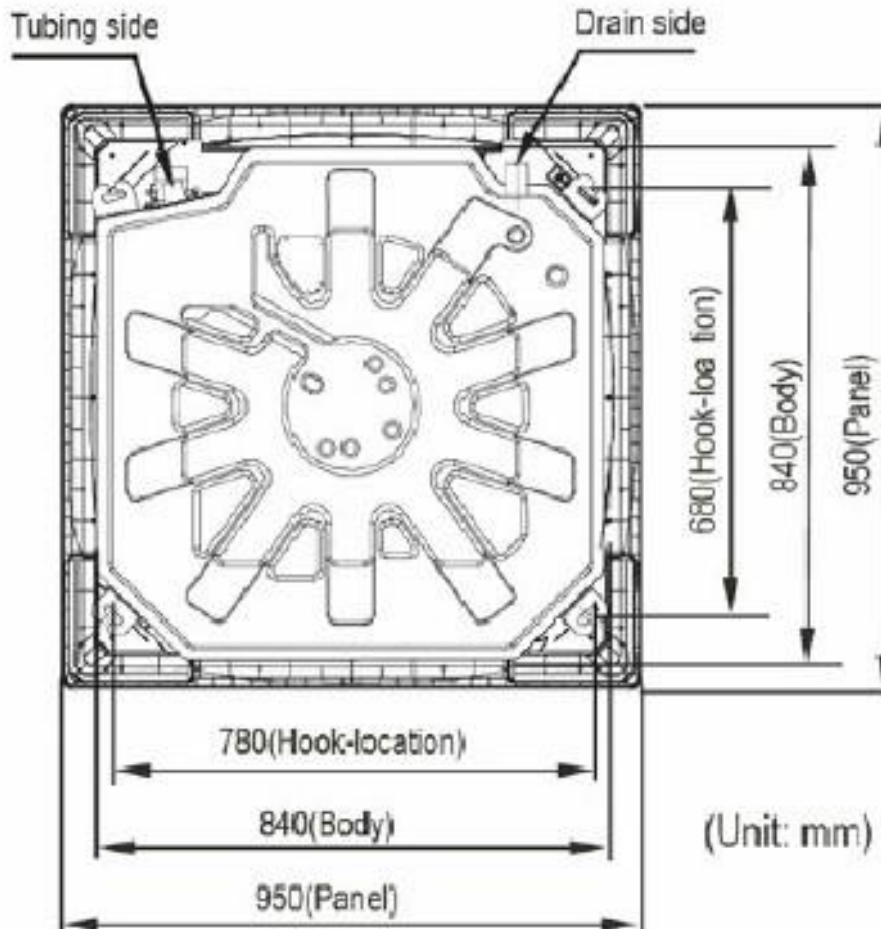
d) Electrical connection

- i) All electrical wiring must be performed by a qualified technician who is certified by the local authorities.
- ii) All electrical wires used for wiring must comply to the local codes and regulations.
- iii) Fluctuation of electricity should be within +/-10% of the rated power supply.
- iv) During installation, wiring should be connected according to the wiring diagram provided by the manufacturer and do not wire all of the three speeds of motor together to a single power source.
- v) Earth wire is provided and it is being connected to the casing of the motor for protection. The unit should be properly GROUNDED to avoid incident of electrical shock.
- vi) Unit of different model should not share a single 3-speed switch, or the motor will not work properly or it will be burnt.

Ceiling Cassette FCU

1. Connection the pipe

- Cut the opening in the false ceiling to allow the fan coil to be inserted.
- Position the tie rods and fix them to the load bearing structures.
- Adjust the height of the unit and keeps it horizontal using a levelling.



- Adjust the position to ensure the gaps between the body and the four sides of ceiling are even. The body's lower part should sink into the ceiling for 10~12 mm. (Refer to Fig.1)
- In general, L is half of the screw length of the installation hook. (Refer to Fig.1)
- Locate the air conditioner firmly by wrenching the nuts after having adjusted the body's position well. (Refer to Figure 2)

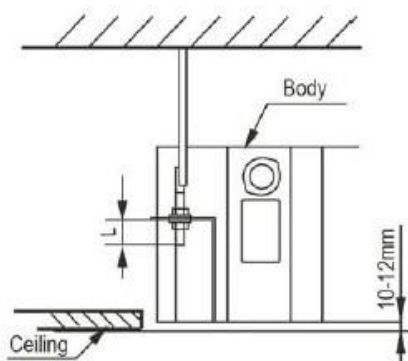


Fig.1

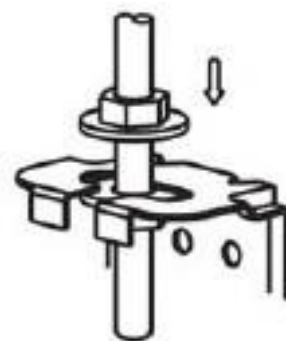
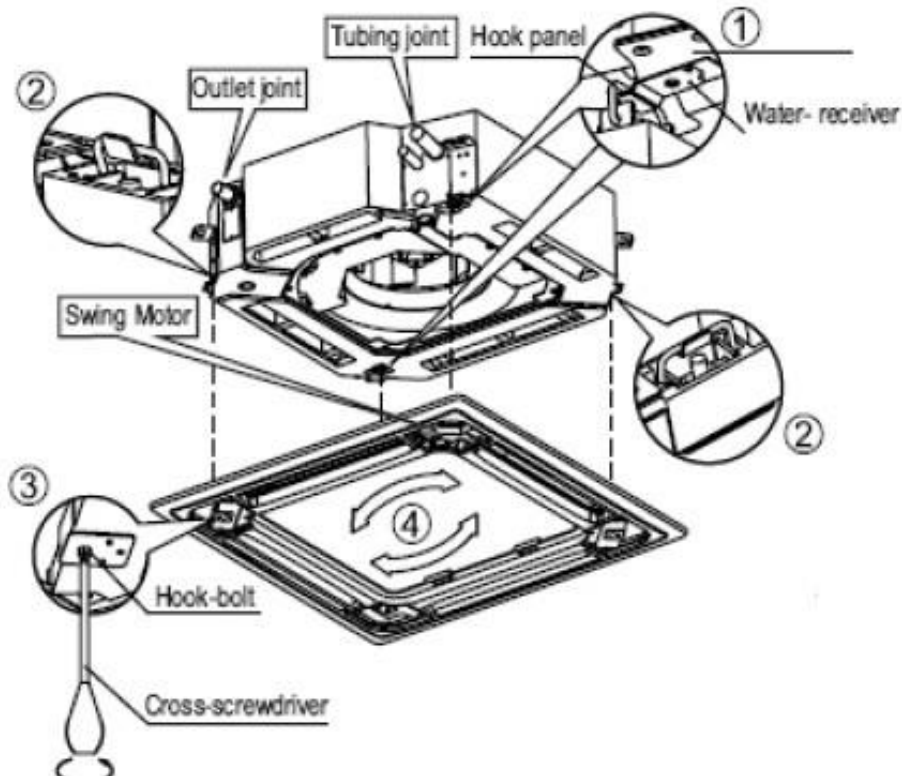
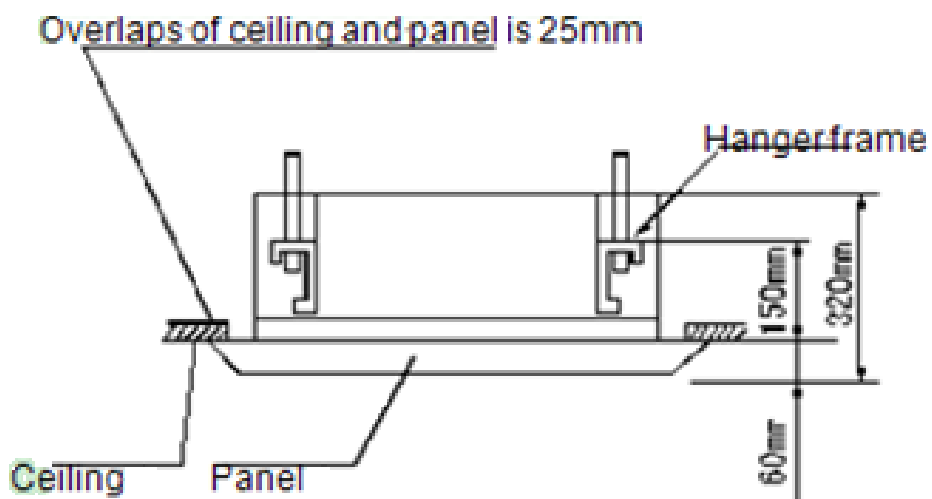


Fig.2

g) Using 4 bolts supplied by the factory to mount the front panel. Make sure there is no gap between the surface and the panel. It may cause the condensate water or air leakage.

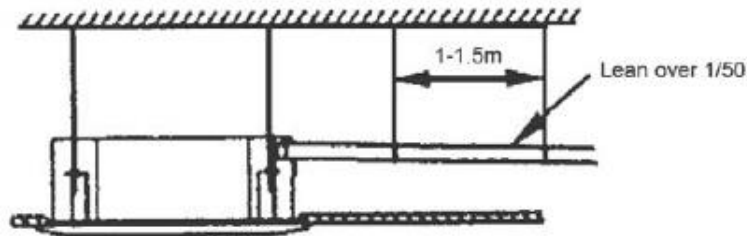


h) Keep the panel & ceiling at the same level and make sure meet the clearance.



2. Drain Pipe Installation

a) The drain must be installed at a degree of over 1/50.



b) One support-point should be set every 1.5m to prevent the drainpipe from yielding. (Refer to Fig.3) or you can tie the drainpipe with connecting pipe to fix it. (Refer to Fig.4)

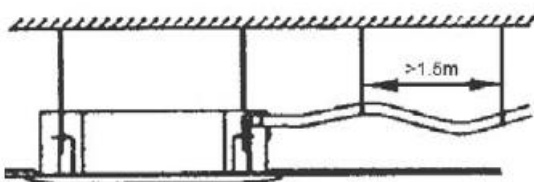


Fig.3

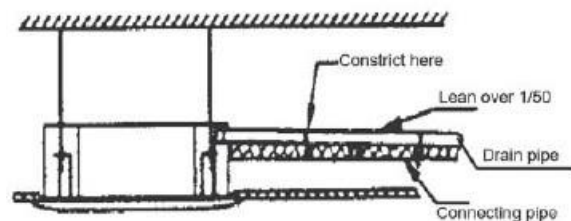
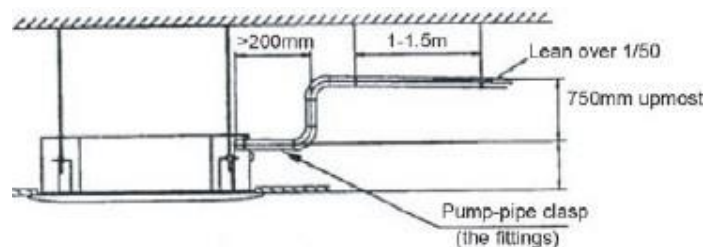


Fig.4

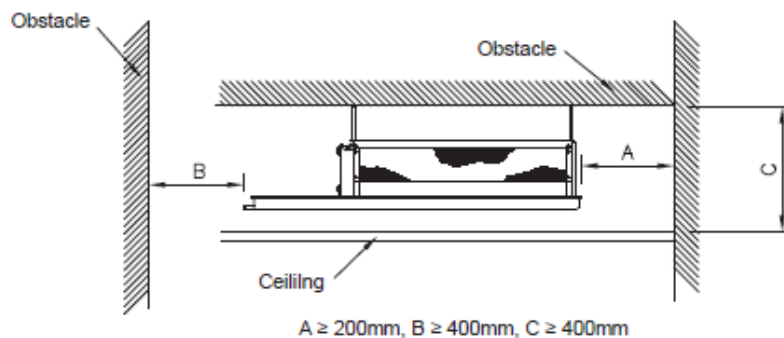
c) If the outlet of the drainpipe is higher than the body's pump joint, the pipe should be arranged as vertically as possible. The lift distance must be not more than 750mm to prevent water overflow when the unit is stop working.

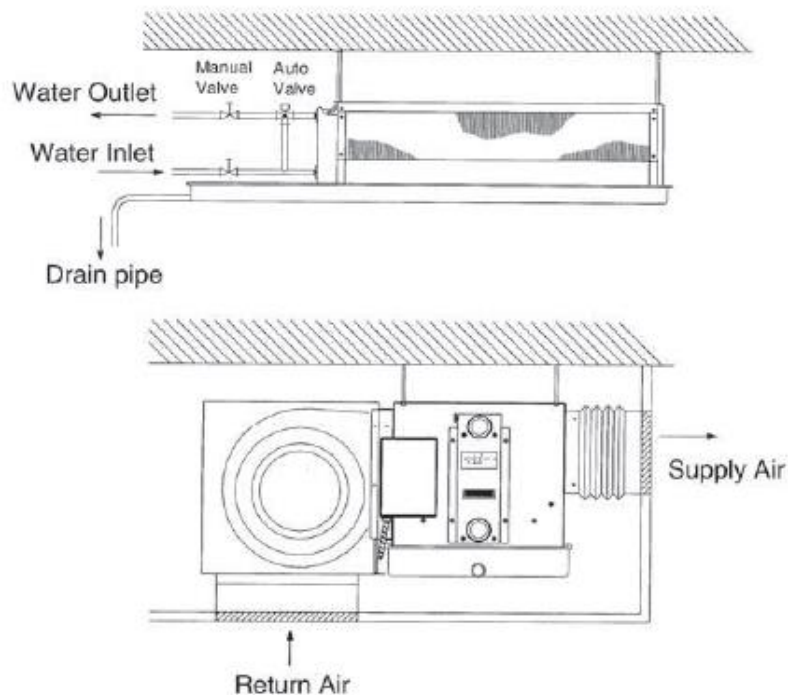


3. Installation Clearance

To ease the maintenance and service works, the unit must be installed in a location where sufficient space is reserved. Please refer to the following diagram for minimum installation clearance:

A typical example of installation:





4. Pressure Test for Water System

In order to ensure the water system is free of leakage, water pressure leak test should be carried out after unit installation. During testing, the air vent can be used to release air trapped inside the water circuit (air trapped inside the heat exchanger will produce excessive noise and will reduce the heat exchange efficiency). After all the trapped air has been released, the air vent should be closed and water pressure to be increased gradually until the pre-defined test pressure. Subsequently, check for water leakage at joints.

Caution: The leak test should not be carried out under freezing condition (lowest temperature $> 0^{\circ}\text{C}$). Otherwise, after pressure test water must be drained out completely and anti-freeze procedure must be adopted to prevent breakage of water pipes due to freezing.

When system is not operated during winter, the water in the system must be drained out completely and anti-freeze procedure must be adopted to prevent breakage of water pipes due to freezing.

5. Pre-Operation Inspection

Before the unit is ready for operation, the following check should be carried out:

- a) Unit has been installed according to manufacturer specifications and the condensate water drainage pipe is not blocked.
- b) Ensure no debris in drain pan, blower and casing.
- c) Unit's power supply and controls are properly connected and unit is properly GROUNDED.
- d) Water piping is properly connected and no leakage found.
- e) Blowers are free to turn and filter properly installed.
- f) All the pipes are insulated, valves are opened and air vent is closed.

Servicing and Maintenance



Warning: Moving parts of unit and electric shock will cause serious injury or fatality to human. Power supply to the unit must be disconnected before carrying out any maintenance work.

1. Dirty filter will increase the air resistance, dirty heat exchanger will reduce the cooling capacity of the unit and blocked drain pan will cause water dripping to the ceiling of the building. In view of that, schedule maintenance should be carried out to clean the filters, heat exchanger and drain pan.
2. It is prohibited to operate the unit without any filter to prevent rapid blockage of heat exchanger by dust and as a result, poor heat transfer. Thus, it is recommended to install filter at return air duct to maintain cleanliness of aluminum fins for better and consistent heat exchange.
3. Water temperature during summer should not be lower than 5°C and not higher than 80°C during winter. The water must be treated and ensure it is clean for optimum performance.
4. It is not recommended to adopt control that allows flowing of cool water through heat exchanger with fan motor idle. This will cause extensive condensation occur not only on heat exchanger but on the surface of casing due to very low air temperature in the unit. If the control do not prevent chilled water flowing through heat exchanger during idling of fan motor, it is recommended to close the water circuit through manual hand valve.
5. When the unit is not going to be used for extended period, the water pipes and heat exchanger should be filled with water to reduce internal corrosion. If the unit is going to be idle throughout the winter, the water pipe should be drained completely and anti-freeze procedure should be adopted to prevent water pipes breakage.

Caution: Unfiltered and untreated water will cause excessive scaling, corrosion and growing of bacteria.

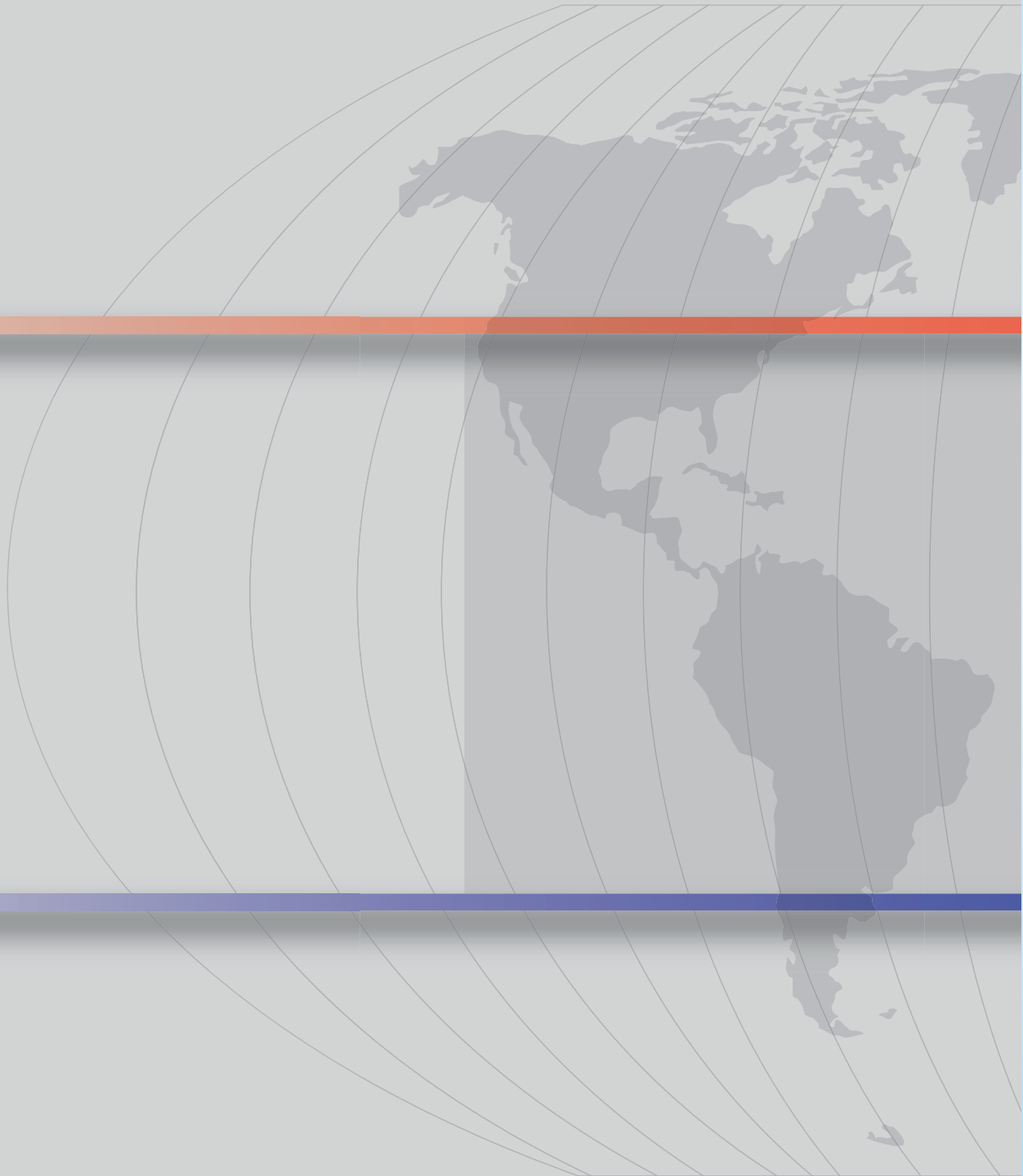
Troubleshooting

Troubleshooting Guide

When any malfunction of the air conditioner unit is noted, immediately switch off the supply to the unit. Check for the following fault conditions and causes for some simple troubleshooting tips.

Fault	Possible Causes
The air conditioner unit does not operate.	Power failure, or the fuse blown and need to be replaced.
	The power plug is disconnected.
	If the fault persist after all these verifications, please contact the air conditioner unit installer.
The air flow is too low.	The air filter is dirty.
	The doors and windows are opened.
	The air suction and discharge are clogged.
	The regulated temperature is not high enough.
Discharge air flow has bad odor.	Odor may be caused by cigarettes, smoke particles, perfume etc. which might have adhered onto the coil.
Condensation on the front air grille of the indoor unit.	This is caused by air humidity after an extended long period of
	The set temperature is too low, increase the temperature setting and operate the unit at high fan speed.
Water flowing out from the air conditioner unit.	Check the condensate evacuation.

If the fault persist, please call your local dealer / service personnel.



A member of FRIMEC International Group