



Service Manual

Commercial Air Conditioners

Concealed Ceiling Type FCU



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Engineering Data

1. Product Introduction

1.1 Product Lineup

Section one --- countries and areas expect the European Union

50Hz (without the return air box) Standard, 3-row-pipes



Series	Model	Product Code	Cooling Capacity (kW/Ton)	Heating Capacity (kW/Ton)	Power Supply	Picture
G Series FCU	FP-34WA/G-K	EM51002750 EM51002070	1.85/0.53	3.05/0.87	220-240V 50HZ	
	FP-51WA/G-K	EM51002140 EM51002790	2.8/0.8	4.22/1.2		
	FP-68WA/G-K	EM51002830 EM51002580	3.6/1.02	5.5/1.56		
	FP-85WA/G-K	EM51002210 EM51002870	4.5/1.28	7/1.99		
	FP-102WA/G-K	EM51002590 EM51002470	5.5/1.56	8.9/2.53		
	FP-136WA/G-K	EM51002630 EM51002490	7.35/2.09	12.1/3.44		
	FP-170WA/G-K	EM51002510 EM51002670	9.2/2.62	15.1/4.29		
	FP-204WA/G-K	EM51002710 EM51002100	11/3.13	18/5.12		
G Series FCU	FP-34WAH/G-K	EM51002180 EM51002760	1.85/0.53	3.05/0.87	220-240V 50HZ	
	FP-51WAH/G-K	EM51002800 EM51002200	2.8/0.8	4.22/1.2		
	FP-68WAH/G-K	EM51002840 EM51002240	3.6/1.02	5.5/1.56		
	FP-85WAH/G-K	EM51002880 EM51002560	4.5/1.28	7/1.99		
	FP-102WAH/G-K	EM51002170 EM51002600	5.5/1.56	8.9/2.53		
	FP-136WAH/G-K	EM51002260 EM51002640	7.35/2.09	12.1/3.44		
	FP-170WAH/G-K	EM51002680 EM51002220	9.2/2.62	15.1/4.29		

Engineering Data

	FP-204WAH/G-K	EM51002720 EM51002530	11/3.13	18/5.12		
G Series FCU	FP-34WAS/G-K	EM51002080 EM51002780	2.25/0.64	3.6/1.02	220-240V 50HZ	
	FP-51WAS/G-K	EM51002820 EM51002110	3.3/0.94	5.9/1.68		
	FP-68WAS/G-K	EM51002230 EM51002860	4.3/1.22	7.3/2.08		
	FP-85WAS/G-K	EM51002900 EM51002190	5/1.42	8.05/2.29		
	FP-102WAS/G-K	EM51002480 EM51002600	6.3/1.79	10.1/2.87		
	FP-136WAS/G-K	EM51002250 EM51002660	8.2/2.33	13.2/3.75		
	FP-170WAS/G-K	EM51002700 EM51002520	9.8/2.79	15.8/4.49		
	FP-204WAS/G-K	EM51002550 EM51002740	11.25/3.2	18.6/5.29		
G Series FCU	FP-34WAHS/G-K	EM51002770 EM51002130	2.25/0.64	3.6/1.02	220-240V 50HZ	
	FP-51WAHS/G-K	EM51002150 EM51002810	3.3/0.94	5.9/1.68		
	FP-68WAHS/G-K	EM51002120 EM51002850	4.3/1.22	7.3/2.08		
	FP-85WAHS/G-K	EM51002570 EM51002890	5/1.42	8.05/2.29		
	FP-102WAHS/G-K	EM51002610 EM51002160	6.3/1.79	10.1/2.87		
	FP-136WAHS/G-K	EM51002650 EM51002500	8.2/2.33	13.2/3.75		
	FP-170WAHS/G-K	EM51002090 EM51002690	9.8/2.79	15.8/4.49		
	FP-204WAHS/G-K	EM51002730 EM51002540	11.25/3.2	18.6/5.29		

Note: 1Ton = 12000Btu/h = 3.517kW

50Hz (without the return air box), standard, 3+1 or 4-row-pipes

Series	Model	Product Code	Cooling Capacity (kW/Ton)	Heating Capacity (kW/Ton)	Power Supply	Picture
3+1 Series FCU	FP-34WAT-R	EM51000790 EM51001030	2.30/0.65	2.10/0.60	220-240V 50HZ	
	FP-51WAT-R	EM51000800 EM51001040	3.60/1.02	3.35/0.95		
	FP-68WAT-R	EM51000810 EM51001050	4.35/1.24	4.00/1.14		
	FP-85WAT-R	EM51000820 EM51001060	5.40/1.54	4.60/1.31		
	FP-102WAT-R	EM51000830 EM51001070	6.70/1.91	5.35/1.52		
	FP-136WAT-R	EM51000840 EM51001080	8.10/2.30	7.00/1.99		
	FP-170WAT-R	EM51000850 EM51001090	10.35/2.94	8.30/2.36		
	FP-204WAT-R	EM51000860 EM51001100	11.00/3.13	8.95/2.54		
4 Series FCU	FP-34WAF-R	EM51000710 EM51001110	2.60/0.74	4.30/1.22	220-240V 50HZ	
	FP-51WAF-R	EM51000720 EM51001120	4.00/1.14	6.50/1.85		
	FP-68WAF-R	EM51000730 EM51001130	4.70/1.34	7.30/2.08		
	FP-85WAF-R	EM51000740 EM51001140	5.60/2.13	8.60/2.45		
	FP-102WAF-R	EM51000750 EM51001150	7.50/2.13	10.50/2.99		
	FP-136WAF-R	EM51000760 EM51001160	9.20/2.62	14.50/4.12		
	FP-170WAF-R	EM51000770 EM51001170	11.00/3.13	18.00/5.12		
	FP-204WAF-R	EM51000780 EM51001180	12.20/3.47	20.00/5.69		

Note: 1Ton = 12000Btu/h = 3.517kW



60HZ (without the return air box), standard

Series	Model	Product Code	Cooling capacity (kW/Ton)	Heating capacity (kW/Ton)	Power supply	Pictures
G	FP-34WA/G-D	EM51002350 EM51003310	1.9/0.54	3.05/0.87	208-230V 60HZ	
	FP-51WA/G-D	EM51002390 EM51003390	3/0.85	5/1.42		
	FP-68WA/G-D	EM51003430 EM51003440	3.6/1.02	5.9/1.68		
	FP-85WA/G-D	EM51003530 EM51002450	4.7/1.34	7.7/2.19		
	FP-102WA/G-D	EM51002920 EM51002910	5.7/1.62	9.35/2.66		
	FP-136WA/G-D	EM51003020 EM51003010	7.35/2.09	12.1/3.44		
	FP-170WA/G-D	EM51003120 EM51002300	9.5/2.7	15.8/4.49		
	FP-204WA/G-D	EM51002340 EM51003200	11.5/3.27	18.8/5.35		
G	FP-34WAH/G-D	EM51003340 EM51002360	1.9/0.54	3.05/0.87	208-230V 60HZ	
	FP-51WAH/G-D	EM51002400 EM51003400	3/0.85	5/1.42		
	FP-68WAH/G-D	EM51003480 EM51003470	3.6/1.02	5.9/1.68		
	FP-85WAH/G-D	EM51002460 EM51003560	4.7/1.34	7.7/2.19		
	FP-102WAH/G-D	EM51002960 EM51002950	5.7/1.62	9.35/2.66		
	FP-136WAH/G-D	EM51003050 EM51002290	7.35/2.09	12.1/3.44		
	FP-170WAH/G-D	EM51002310 EM51003150	9.5/2.7	15.8/4.49		
	FP-204WAH/G-D	EM51003240 EM51003230	11.5/3.27	18.8/5.35		

60HZ (without the return air box), 3-row-pipes

Series	Model	Product Code	Cooling capacity (kW/Ton)	Heating capacity (kW/Ton)	Power supply	Pictures
G	FP-34WAS/G-D	EM51003380 EM51002380	2.25/0.64	3.7/1.05	208-230V 60HZ	
	FP-51WAS/G-D	EM51002420 EM51003420	3.3/0.94	5.4/1.54		
	FP-68WAS/G-D	EM51003520 EM51002440	4.4/1.25	7.35/2.09		
	FP-85WAS/G-D	EM51003620 EM51003610	5.2/1.48	8.5/2.42		
	FP-102WAS/G-D	EM51003000 EM51002280	6.6/1.88	10.65/3.03		
	FP-136WAS/G-D	EM51003110 EM51003100	8.3/2.36	13.5/3.84		
	FP-170WAS/G-D	EM51002330 EM51003190	10.2/2.9	17/4.83		
	FP-204WAS/G-D	EM51003300 EM51003290	12.2/3.47	20/5.69		
G	FP-34WAHS/G-D	EM51002370 EM51003370	2.25/0.64	3.7/1.05	208-230V 60HZ	
	FP-51WAHS/G-D	EM51003410 EM51002410	3.3/0.94	5.4/1.54		
	FP-68WAHS/G-D	EM51002430 EM51003510	4.4/1.25	7.35/2.09		
	FP-85WAHS/G-D	EM51003600 EM51003590	5.2/1.48	8.5/2.42		
	FP-102WAHS/G-D	EM51002270 EM51002990	6.6/1.88	10.65/3.03		
	FP-136WAHS/G-D	EM51003090 EM51003080	8.3/2.35	13.5/3.84		
	FP-170WAHS/G-D	EM51003180 EM51002320	10.2/2.9	17/4.83		
	FP-204WAHS/G-D	EM51003280 EM51003270	12.2/3.47	20/5.69		




60Hz (without the return air box), 3+1 or 4-row-pipes

Series	Model	Product Code	Cooling Capacity (kW/Ton)	Heating Capacity (kW/Ton)	Power Supply	Picture
3+1 Series FCU	FP-34WAT-R	EM51000790 EM51001030	2.35/0.67	2.15/0.61	208~230V 60HZ	
	FP-51WAT-R	EM51000800 EM51001040	3.80/1.08	3.40/0.97		
	FP-68WAT-R	EM51000810 EM51001050	4.40/1.25	4.10/1.17		
	FP-85WAT-R	EM51000820 EM51001060	5.60/1.59	4.70/1.34		
	FP-102WAT-R	EM51000830 EM51001070	6.80/1.93	5.60/1.59		
	FP-136WAT-R	EM51000840 EM51001080	8.20/2.33	7.20/2.05		
	FP-170WAT-R	EM51000850 EM51001090	10.50/2.99	8.40/2.39		
	FP-204WAT-R	EM51000860 EM51001100	11.20/3.18	9.10/2.59		
4 Series FCU	FP-34WAF-R	EM51000710 EM51001110	2.65/0.75	4.35/1.24	208~230V 60HZ	
	FP-51WAF-R	EM51000720 EM51001120	4.08/1.16	6.55/1.86		
	FP-68WAF-R	EM51000730 EM51001130	4.80/1.36	7.40/2.10		
	FP-85WAF-R	EM51000740 EM51001140	5.80/ 1.65	8.80/2.50		
	FP-102WAF-R	EM51000750 EM51001150	7.60/2.16	11.50/3.27		
	FP-136WAF-R	EM51000760 EM51001160	9.30/2.64	14.70/4.18		
	FP-170WAF-R	EM51000770 EM51001170	11.20/3.18	18.20/5.17		
	FP-204WAF-R	EM51000780 EM51001180	12.50/3.55	20.80/5.91		

Note:1Ton =12000Btu/h = 3.517kW


Section two --- countries and areas within the European Union


50HZ (with the return air box), standard, 3-row pipes

Series	Model	Product Code	Cooling capacity (kW/Ton)	Heating capacity (kW/Ton)	Power supply	Pictures
G	FP-34WA/GHL-K	EM51003330 EM51003320	1.75/0.5	2.2/0.63	220-240V 50HZ	
	FP-51WA/GHL-K	EM51003980 EM51003970	2.9/0.82	3.4/0.97		
	FP-68WA/GHL-K	EM51003460 EM51003450	3.4/0.97	4.2/1.19		
	FP-85WA/GHL-K	EM51003550 EM51003540	4.3/1.22	4.7/1.34		
	FP-102WA/GHL-K	EM51002940 EM51002930	4.9/1.39	6/1.71		
	FP-136WA/GHL-K	EM51003040 EM51003030	6.7/1.91	8/2.27		
	FP-170WA/GHL-K	EM51003140 EM51003130	7/1.99	9/2.56		
	FP-204WA/GHL-K	EM51003220 EM51003210	10/2.84	11.9/3.38		
G	FP-34WAH/GHL-K	EM51003360 EM51003350	2/0.57	2.3/0.65	220-240V 50HZ	
	FP-51WAH/GHL-K	EM51003950 EM51003960	3.1/0.88	3.5/1		
	FP-68WAH/GHL-K	EM51003500 EM51003490	3.55/1.01	4.5/1.28		
	FP-85WAH/GHL-K	EM51003580 EM51003570	4.5/1.28	4.9/1.39		
	FP-102WAH/GHL-K	EM51002980 EM51002970	5.2/1.48	6.3/1.79		
	FP-136WAH/GHL-K	EM51003070 EM51003060	6.9/1.96	8.2/2.33		
	FP-170WAH/GHL-K	EM51003170 EM51003160	7.2/2.04	9.2/2.61		
	FP-204WAH/GHL-K	EM51003260 EM51003250	10.2/2.9	12/3.4		
G	FP-34WAS/GHL-K	EM51003820 EM51003810	2.1/0.6	2.4/0.68	220-240V 50HZ	
	FP-51WAS/GHL-K	EM51003930 EM51003940	3.2/0.91	3.7/1.05		
	FP-68WAS/GHL-K	EM51003860 EM51003850	4.1/1.17	4.8/1.36		
	FP-85WAS/GHL-K	EM51003900 EM51003890	4.8/1.36	5.5/1.56		

	FP-102WAS/GHL-K	EM51003660 EM51003650	5.9/1.67	6.6/1.88		
	FP-136WAS/GHL-K	EM51003700 EM51003690	7.6/2.16	8.9/2.53		
	FP-170WAS/GHL-K	EM51003740 EM51003730	8.8/2.5	10.2/2.89		
	FP-204WAS/GHL-K	EM51003780 EM51003770	10.4/2.96	12.1/3.43		
G	FP-34WAHS/GHL-K	EM51003800 EM51003790	2.5/0.71	2.8/0.8	220-240V 50HZ	
	FP-51WAHS/GHL-K	EM51003910 EM51003920	3.3/0.94	3.8/1.08		
	FP-68WAHS/GHL-K	EM51003840 EM51003830	4.2/1.19	5.1/1.45		
	FP-85WAHS/GHL-K	EM51003880 EM51003870	4.9/1.39	5.7/1.62		
	FP-102WAHS/GHL-K	EM51003640 EM51003630	6.1/1.73	6.9/1.96		
	FP-136WAHS/GHL-K	EM51003680 EM51003670	7.8/2.22	9 /2.55		
	FP-170WAHS/GHL-K	EM51003720 EM51003710	9/2.56	10.9/3.1		
	FP-204WAHS/GHL-K	EM51003760 EM51003750	10.5/2.99	12.4/3.53		

50Hz (with the return air box), 3+1 or 4-row-pipes

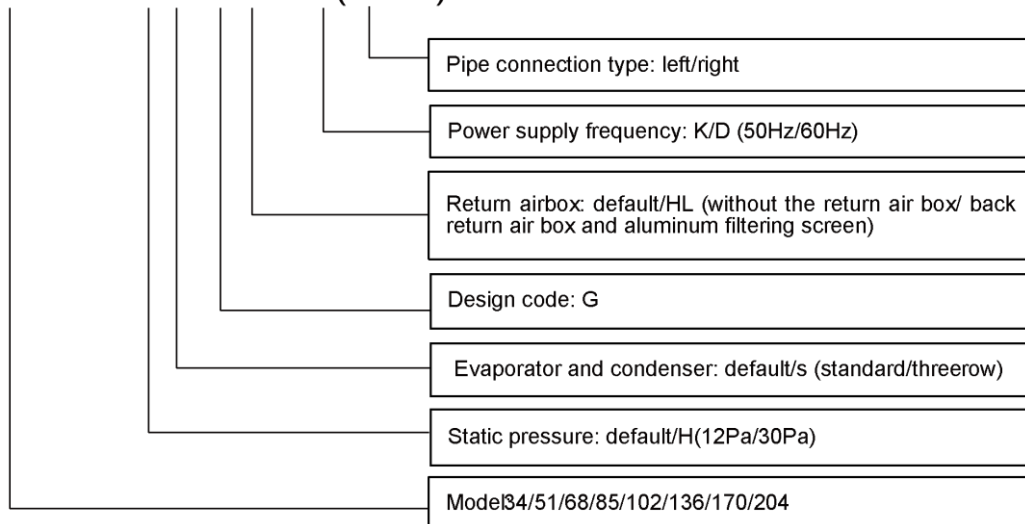
Series	Model	Product Code	Cooling Capacity (kW/Ton)	Heating Capacity (kW/Ton)	Power Supply	Picture
3+1 Series FCU	FP-34WAHT/BHL-K	EM51004030 EM51004080	2.45/0.70	3.40/0.97	220-240V 50HZ	
	FP-51WAHT/BHL-K	EM51004300 EM51004290	3.70/1.05	4.70/1.34		
	FP-68WAHT/BHL-K	EM51004340 EM51004330	4.55/1.29	5.70/1.62		
	FP-85WAHT/BHL-K	EM51004380 EM51004370	5.40/1.54	6.35/1.81		
	FP-102WAHT/BHL-K	EM51004120 EM51004110	6.35/1.81	7.55/2.15		
	FP-136WAHT/BHL-K	EM51004160 EM51004150	8.30/2.36	9.90/2.81		
	FP-170WAHT/BHL-K	EM51004200 EM51004190	10.00/2.84	11.50/3.27		

	FP-204WAHT/BHL-K	EM51004240 EM51004230	10.2/2.90	11.90/3.38		
4 Series FCU	FP-34WAHF/BHL-K	EM51004260 EM51004250	2.65/0.75	3.15/0.90	220-240V 50HZ	
	FP-51WAHF/BHL-K	EM51004280 EM51004270	3.80/1.08	4.40/1.25		
	FP-68WAHF/BHL-K	EM51004320 EM51004310	5.00/1.42	5.45/1.55		
	FP-85WAHF/BHL-K	EM51004360 EM51004350	5.70/1.62	6.15/1.75		
	FP-102WAHF/BHL-K	EM51004100 EM51004090	7.10/2.02	7.30/2.08		
	FP-136WAHF/BHL-K	EM51004140 EM51004130	8.90/2.53	9.50/2.70		
	FP-170WAHF/BHL-K	EM51004180 EM51004170	11.00/3.13	12.30/3.50		
	FP-204WAHF/BHL-K	EM51004220 EM51004210	11.20/3.18	13.00/3.70		

Note:1Ton =12000Btu/h = 3.517kW

1.2 Nomenclature

FP -34WAHS/GHL -K(Left)



1.3 Product Features

1.3.1 Features

FCU is the most widely used terminal unit of the air conditioning system, used for supplying cooling (hot) water, with the air flow below 2500m³/h and the external static pressure less than 100Pa. For cooling, enthalpy loss of the air generally is 15.9kJ/kg. For hot water under 60℃, the heating capacity is 1.5 times of the cooling capacity.

As the terminal unit of the central air conditioning system, it is widely used in public areas with the following main features:

- a. Three speeds are selectable for the air flow. According to the set point of the room temperature, the water system can be controlled by the hot/cool water automatic regulating valve so that temperature for each room can be controlled separately for meeting different requirements. Where no one is inside the room, it can be turned off manually or by the timing function, which will lower the operation cost of the whole system.
- b. The zone control is available based on direction, height, utilization and service time, which can avoid unreasonable conceptualized control of the large-sized duct system.
- c. Compact structure, flexible arrangement, and easy installation will save installation space and facilitate indoor decoration.

There are various structures with the same air flow and cooling capacity for different room structure, different decoration and duct arrangement.

(1) Plastic Fan

- a. Light-weighted, which will lead to increased air flow driven by the same motor.
- b. Good compatibility of the angle of the blades and the cavity of the volute, which will lead to silent operation.
- c. CFD designed flow and angle of fan blades, for high operation efficiency
- d. The volute is divided into the upper and lower parts, which will facilitate disassembly.

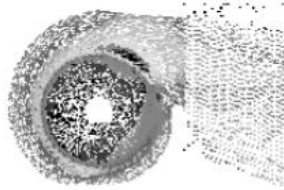


(2) CFD Designed Fan

- a. Optimized flow structure
- b. Evenly distributed air flow and low flow noise
- c. less eddy flow
- d. Novel style and advanced structure
- e. Decreased height, saving installation space
- f. Low noise and three fan speeds
- g. High-quality material and strict processing control for guaranteeing quality and service life of the whole unit.
- h. Die formed drain pan with the entirely pressured and pasted insulation, generating no

condensate

- i. Optimized location of the exhaust and drain valves, for better heat exchanging effect and preventing from frost cracks in winter.



(3) High-efficiency copper tubes

The copper tubes are made of pure red copper with female threads on the inner wall. There are also raised teeth at the inner wall, used for increasing turbulent flows and damaging the boundary layer of water for better heat exchanging capacity.



(4) The Cooler with the Interchangeable Left/Right Structure

During installation, the left-type and right-type structure can be selected flexibly as steps stated below:

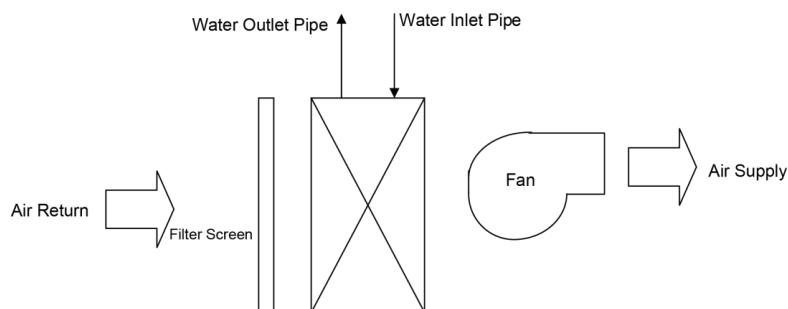
- Step 1: Remove the centrifugal fan, cover plate and screws of the electric box.
- Step 2: Move the side plate at the air outlet to the other side.
- Step 3: Rotate the fan assembly and the cover plate for 180° and then fix them.
- Step 4: Remove the electric box to the other side and then fix it..



1.: Cover plate; 2. Centrifugal fan; 3. Side plate at the air outlet
 Left-type Unit Right-type Unit

1.4 Working Principle

The cool (hot) water goes in the fan coil and makes heat exchanging with the indoor circulated air (outdoor air), to realize cooling(heating), dehumidifying, filtrating or purifying. The processed air will be supplied to indoor directly or by air duct.



1.5 Technical Data

1.5.1 Data at Nominal Conditions

Section one --- countries and areas except the European Union

(1) 50Hz (without the return air box), standard, 3-row pipes

Standard Type (G Series)

Type			Concealed ceiling type	FP-34WA/ G-K	FP-51WA/ G-K	FP-68WA/ G-K	FP-85WA/ G-K	FP-102WA/ G-K	FP-136WA/ G-K	FP-170WA/ G-K	FP-204WA/ G-K
Item											
Performance	Airflow	Hi	m ³ /h	340	510	680	850	1020	1360	1700	2040
		Mid		248	393	510	638	788	1095	1275	1575
		Low		213	263	340	425	525	730	850	1050
	Cooling capacity	Hi	W	1850	2800	3600	4500	5500	7350	9200	11000
	Heating capacity	Hi	W	3050	4620	5940	7400	9000	12100	15100	18100
	Flow rate		m ³ /h	0.33	0.52	0.63	0.77	0.92	1.31	1.52	1.92
	Water resistance		kPa	15	30	23	25	35	40	46	40
	Noise	12pa	dB(A)	34.5	35	40	40.5	44	45	46	49
		30Pa		36	37	41	42	45.5	46	47.5	51
	External static pressure		Pa	12Pa for the standard type (with no diffuser and filter); 30Pa for the high ESP type							
Coil	Type		Copper, high-efficiency louvered fins								
	Pressure		≤1.6MPa								
Motor	Type		Class B, capacitor start								
	Quantity	/	1				2				
	Power supply		220-240V ~ 50Hz								
	Protection class		IP20								
Input power	12pa	W	37	52	62	76	96	134	152	189	
	30Pa	W	44	59	72	87	108	156	174	212	
Power lines		mm ²	0.5×3								
Protection class			I								
Fan	Type		Front-forward multi-vane low-noise centrifugal fan								
	Quantity	/	1	2				3	4		
Connection pipe		Inlet water	Rc3/4(inner thread)								
		Outlet water	Rc3/4(inner thread)								
		Condensate	Rc3/4(outer thread)								
Weight	Without return air box	kg	11.2	13	14.3	15.5	16.6	23	26.2	28	
Outline dimensions	Width	mm	680	800	900	1000	1080	1380	1520	1620	
	Depth	mm	490	460	490	490	490	490	490	490	
	Height	mm	235	235	235	235	235	235	235	235	
Thermostat (optional)		Mechanical	Z54352A1								
		Digit	WK-110PA0								
		Deluxe digit	WK-010PA-K								

Notes:

- a) The left and right modes can be switched over on site. The correction coefficient for both cooling and heating is 0.9.
- b) Nominal cooling conditions: (27/19.5℃) indoor dry/wet bulb temperature, (7/12℃) entering and leaving water temperature. Nominal heating conditions: 21℃ indoor dry bulb temperature, 60℃ entering water temperature.
- c) The noise is tested under the semi-anechoic chamber and the actual value will change under different environments.

Three-row type

Model		Concealed ceiling type	FP-34WA	FP-51WA	FP-68WA	FP-85WA	FP-102W	FP-136W	FP-170W	FP-204W	
			S/G-K	S/G-K	S/G-K	S/G-K	AS/G-K	AS/G-K	AS/G-K	AS/G-K	
Item											
	Performance	Air flow	Hi	340	510	680	850	1020	1360	1700	2040
Mid			248	394	495	638	788	1095	1275	1575	
Low			173	263	330	425	525	730	850	1050	
Cooling capacity		Hi	W	2250	3300	4300	5000	6300	8200	9800	11250
Heating capacity		Hi	W	3600	5300	6930	8050	10100	13200	15800	18600
Water flow		m ³ /h	0.4	0.57	0.76	0.88	0.99	1.41	1.68	1.95	
Water resistance		kPa	20	21	22	30	35	40	33	40	
Noise		12pa	dB(A)	34.5	37	38.5	41	44	45	46.5	50
		30Pa		36	38	41	43	46	47	47.5	51.5
External static pressure		Pa	12Pa for the standard type (with no diffuser and filter); 30Pa for the high ESP type								
Coil	Type		Copper, high-efficiency louvered fins								
	Pressure		≤1.6MPa								
Motor	Type		Class B, capacitor start								
	Quantity	/	1				2				
	Power supply		220V ~ 50Hz								
	Protection class		IP20								
Input power	12pa	W	37	52	62	76	96	134	152	189	
	30Pa	W	44	59	72	87	108	156	174	212	
Power lines		mm ²	0.5x3								
Protection class		I									
Fan	Type		Front-forward multi-vane low-noise centrifugal fan								
	Quantity	/	1	2			3	4			
Connection pipe		Inlet water	Rc3/4(inner thread)								
		Outlet water	Rc3/4(inner thread)								
		Condensate	Rc3/4(outer thread)								
Weight	Without the return air box	kg	11.6	13.4	14.7	16	17.4	24	26.6	28.5	
Outline dimensions	Width	mm	680	800	900	1000	1080	1380	1520	1620	
	Depth	mm	490	460	490	490	490	490	490	490	
	Height	mm	235	235	235	235	235	235	235	235	
Thermostat (optional)		Mechanical	Z54352A1								
		Digit	WK-110PA0								
		Deluxe digit	WK-010PA-K								

Notes:

- a) The left and right modes can be switched over on site. The correction coefficient for both cooling and heating is 0.9.
- b) Nominal cooling conditions: (27/19.5℃) indoor dry/wet bulb temperature, (7/12℃) entering and leaving water temperature. Nominal heating conditions: 21℃ indoor dry bulb temperature, 60℃ entering water temperature.
- c) The noise is tested under the semi-anechoic chamber and the actual value will change under different environments.

50Hz (without the return air box), 4-row pipes

Type Item		Concealed ceiling type	FP-34WA	FP-51WA	FP-68WA	FP-85WA	FP-102W	FP-136W	FP-170W	FP-204W	
			F-R	F-R	F-R	F-R	AF-R	AF-R	AF-R	AF-R	
Performance	Airflow	Hi	m ³ /h	340	510	680	850	1020	1360	1700	2040
		Mid		248	393	510	638	788	1095	1275	1575
		Low		213	263	340	425	525	730	850	1050
	Cooling capacity	Hi	W	2600	4000	4700	5600	7500	9200	11000	12200
	Heating capacity	Hi	W	4300	6500	7300	8600	10500	14500	18000	20000
	Flow rate		m ³ /h	0.464	0.729	0.893	0.981	1.318	1.615	2.042	2.229
	Water resistance		kPa	3.713	8.943	14.54	18.79	35.75	19.06	29.01	35.41
	Noise	30Pa		40	42	44	46	47	48	50	52
	External static pressure		Pa	30pa							
Coil	Type		Copper, high-efficiency louvered fins								
	Pressure		≤1.6MPa								
Motor	Type		Class B, capacitor start								
	Quantity	/	1				2				
	Power supply		220-240V ~ 50Hz								
	Protection class		IP20								
	Input power	30Pa	W	43	59	70	84	105	151	174	206
Power lines		mm ²	0.5x3								
Protection class		I									
Fan	Type		Front-forward multi-vane low-noise centrifugal fan								
	Quantity	/	1	2			3	4			
Connection pipe		Inlet water	Rc3/4(inner thread)								
		Outlet water	Rc3/4(inner thread)								
		Condensate	Rc3/4(outer thread)								
Weight	Without return air box	kg	14.4	17.2	19.2	20.5	23.2	34.2	37.5	37.5	
Thermostat (optional)		Mechanical	Z54352A1								
		Digit	WK-110PA0								
		Digital (deluxe)	WK-010PA-K								

Notes:

- a) The left and right modes can be switched over on site. The correction coefficient for both cooling and heating is 0.9.
- b) Nominal cooling conditions: (27/19.5℃) indoor dry/wet bulb temperature, (7/12℃) entering

and leaving water temperature. Nominal heating conditions: 21 °C indoor dry bulb temperature, 60 °C entering water temperature.

- c) The noise is tested under the semi-anechoic chamber and the actual value will change under different environments.

50Hz (without the return air box), 3+1-row pipes

Type Item		Concealed ceiling type	FP-34WA	FP-51WA	FP-68WA	FP-85WA	FP-102W	FP-136W	FP-170W	FP-204	
			T-R	T-R	T-R	T-R	AT-R	AT-R	AT-R	WAT-R	
Performance	Airflow	Hi	m ³ /h	340	510	680	850	1020	1360	1700	2040
		Mid		248	393	510	638	788	1095	1275	1575
		Low		213	263	340	425	525	730	850	1050
	Cooling capacity	Hi	W	2300	3600	4350	5400	6700	8100	10350	11000
	Heating capacity	Hi	W	2100	3350	4000	4600	5350	7000	8300	8950
	Flow rate		m ³ /h	0.446	0.697	0.808	0.98	1.171	1.45	1.747	1.964
	Water resistance		kPa	5.83	13.50	19.86	30.81	51.67	17.20	25.24	29.34
	Noise	30Pa		40	42	44	46	47	48	50	52
	External static pressure		Pa	30pa							
Coil	Type		Copper, high-efficiency louvered fins								
	Pressure		≤1.6MPa								
Motor	Type		Class B, capacitor start								
	Quantity	/	1				2				
	Power supply		220-240V ~ 50Hz								
	Protection class		IP20								
	Input power 30Pa	W	43	59	70	84	105	151	174	206	
Power lines		mm ²	0.5×3								
Protection class		I									
Fan	Type		Front-forward multi-vane low-noise centrifugal fan								
	Quantity	/	1	2			3	4			
Connection pipe		Inlet water	Rc3/4(inner thread)								
		Outlet water	Rc3/4(inner thread)								
		Condensate	Rc3/4(outer thread)								
Weight	Without return air box	kg	14.4	17.2	19.2	20.5	23.2	34.2	37.5	37.5	
Thermostat (optional)		Mechanical	Z54352A1								
		Digit	WK-110PA0								
		Deluxe digit	WK-010PA-K								

Notes:

- The left and right modes can be switched over on site. The correction coefficient for both cooling and heating is 0.9.
- Nominal cooling conditions: (27/19.5 °C) indoor dry/wet bulb temperature, (7/12 °C) entering and leaving water temperature. Nominal heating conditions: 21 °C indoor dry bulb temperature, 60 °C entering water temperature.
- The noise is tested under the semi-anechoic chamber and the actual value will change under different environments.

(2) 60Hz (without the return air box), standard, 3-row pipes

Horizontal concealed FCU— (G series, 208-230VAC 60Hz)

Model		Unit	FP-34WA/	FP-51WA/	FP-68WA/	FP-85WA/	FP-102WA/	FP-136WA/	FP-170WA/	FP-204WA/	
Item			G-D	G-D	G-D	G-D	G-D	G-D	G-D	G-D	
Performance	Air flow	High	m³/h	340	510	680	850	1020	1360	1700	2040
		Medium		248	394	495	638	788	1095	1275	1575
		Low		173	263	330	425	525	730	850	1050
	Cooling capacity	High	W	1900	3000	3600	4700	5700	7350	9500	11500
	Heating capacity	High	W	3050	5000	5900	7700	9350	12100	15800	18800
	Water flow		m³/h	0.33	0.52	0.62	0.81	0.98	1.27	1.64	1.98
	Water resistance		kPa	15	30	23	25	35	40	36	40
	Noise	12pa	dB(A)	34.5	38	40	43	45	46	48	50
		30Pa		36	39	42	46	47.5	48	50	52
	ESP		Pa	12Pa for the standard type (with no diffuser and filter); 30Pa for the high ESP type							
Coils	Type		Copper tube with louvered fins								
	Working pressure		≤1.6MPa								
Motor	Type		Class B insulation, capacitor start								
	Quantity	Piece	1				2				
	Power supply		208-230VAC 60Hz								
	Protection class		IP20								
Input power	12pa	W	36	57	70	104	105	164	180	228	
	30Pa	W	49	58	74	105	123	165	221	273	
Power lines		mm2xpiece	0.5x3								
Anti electric shock class		I									
Fan	Type		Forward multi-vane low-noise centrifugal fan								
	Quantity	piece	1	2				3	4		
Connection pipe	Inlet		Rc3/4(inner thread)								
	Outlet		Rc3/4(inner thread)								
	Condensate		Rc3/4(outer thread)								
Net weight		kg	11.2	13	14.3	15.5	16.6	23	26.2	28	
Outline dimensions	Width	mm	680	800	900	1000	1080	1380	1520	1620	
	Depth	mm	490	460	490	490	490	490	490	490	
	Height	mm	235	235	235	235	235	235	235	235	
Thermostat (optional)	Mechanical		Z54352A1								
	Digital		WK-110PA0								
	Digital (deluxe)		WK-010PA-K								

Notes:

- The left and right modes can be switched over on site. The correction coefficient for both cooling and heating is 0.9.
- Nominal cooling conditions: (27/19.5℃) indoor dry/wet bulb temperature, (7/12℃) entering and leaving water temperature. Nominal heating conditions: 21℃ indoor dry bulb temperature, 60℃ entering water temperature.
- The noise is tested under the semi-anechoic chamber and the actual value will change under different environments.

Horizontal concealed three-row-pipe FCU— (G series, 208-230VAC 60Hz)

Model			Unit	FP-34WA	FP-51WA	FP-68WA	FP-85WA	FP-102W	FP-136W	FP-170W	FP-204W
Item				S/G-D	S/G-D	S/G-D	S/G-D	AS/G-D	AS/G-D	AS/G-D	AS/G-D
Performance	Air flow	High	m ³ /h	340	510	680	850	1020	1360	1700	2040
		Medium		248	394	495	638	788	1095	1275	1575
		Low		173	263	330	425	525	730	850	1050
	Cooling capacity	High-speed	W	2250	3300	4400	5200	6600	8300	10200	12200
		Heating capacity	High-speed	W	3700	5400	7350	8500	10650	13500	17000
	Water flow		m ³ /h	0.39	0.57	0.76	0.90	1.14	1.43	1.76	2.10
	Water resistance		kPa	20	21	22	30	35	40	33	40
	Noise	12pa	dB(A)	35	39	41	43	46	46	48	50
		30Pa		38	40	44	46	48	49	50	52
ESP		Pa	12Pa for the standard type (with no diffuser and filter); 30Pa for the high ESP								
Coils	Type		Copper tube with louvered fins								
	Working pressure		≤1.6MPa								
Motor	Type		Class B insulation, capacitor start								
	Quantity	Piece	1				2				
	Power lines		208-230VAC 60Hz								
	Protection class		IP20								
Input power	12pa	W	36	63	70	104	114	182	180	228	
	30Pa	W	49	64	74	105	123	183	221	273	
Power lines		mm ² xpiece	0.5x3								
Anti electric shock class		I									
Fan	Model		Forward multi-vane low-noise centrifugal fan								
	Quantity	piece	1	2			3	4			
Connection pipe	Inlet		Rc3/4(inner thread)								
	Outlet		Rc3/4(inner thread)								
	Condensate		Rc3/4(outer thread)								
Net weight		kg	11.6	13.4	14.7	16	17.4	24	26.6	28.5	
Outline dimensions	Width	mm	680	800	900	1000	1080	1380	1520	1620	
	Depth	mm	490	460	490	490	490	490	490	490	
	Height	mm	235	235	235	235	235	235	235	235	
Thermostat (optional)	Mechanical		Z54352A1								
	Digital		WK-110PA0								
	Digital (deluxe)		WK-010PA-K								

Notes:

- a) The left and right modes can be switched over on site. The correction coefficient for both cooling and heating is 0.9.
- b) Nominal cooling conditions: (27/19.5℃) indoor dry/wet bulb temperature, (7/12℃) entering and leaving water temperature. Nominal heating conditions: 21℃ indoor dry bulb temperature, 60℃ entering water temperature.
- c) The noise is tested under the semi-anechoic chamber and the actual value will change under different environments.

(3) 60 Hz (Without the return air box), 4-row pipes

Type Item		Concealed ceiling type	FP-34WAF	FP-51WAF	FP-68WAF	FP-85WAF	FP-102WA	FP-136WA	FP-170WA	FP-204W	
			-R	-R	-R	-R	F-R	F-R	F-R	AF-R	
Performance	Airflow	Hi	m ³ /h	340	590	690	820	1040	1490	1850	2160
		Mid		248	393	510	638	788	1095	1275	1575
		Low		213	263	340	425	525	730	850	1050
	Cooling capacity	Hi	W	2650	4080	4800	5800	7600	9300	11200	12500
	Heating capacity	Hi	W	4350	6550	7400	8800	11500	14700	18200	20800
	Flow rate		m ³ /h	0.464	0.729	0.893	0.981	1.318	1.615	2.042	2.229
	Water resistance		kPa	8	9	18	21	41	21	32	34
	Noise	30Pa		40	42	44	46	47	48	50	52
	External static pressure		Pa	30pa							
Coil	Type		Copper, high-efficiency louvered fins								
	Pressure		≤1.6MPa								
Motor	Type		Class B, capacitor start								
	Quantity	/	1				2				
	Power supply		220-240V ~ 50Hz								
	Protection class		IP20								
	Input power 30Pa	W	49	80	82	103	140	192	217	277	
Power lines		mm ²	0.5×3								
Protection class		I									
Fan	Type		Front-forward multi-vane low-noise centrifugal fan								
	Quantity	/	1	2			3	4			
Connection pipe		Inlet water	Rc3/4(inner thread)								
		Outlet water	Rc3/4(inner thread)								
		Condensate	Rc3/4(outer thread)								
Weight	Without return air box	kg	14.4	17.2	19.2	20.5	23.2	34.2	37.5	37.5	
Thermostat (optional)		Mechanical	Z54352A1								
		Digit	WK-110PA0								
		Deluxe digit	WK-010PA-K								

(4) 60 Hz (Without the return air box), 3+1-row pipes

Type Item		Concealed ceiling type	FP-34WAT	FP-51WAT	FP-68WAT	FP-85WAT	FP-102WA	FP-136WA	FP-170WA	FP-204WA	
			-R	-R	-R	-R	T-R	T-R	T-R	T-R	
Performance	Airflow	Hi	360	630	690	890	1040	1490	1850	2160	
		Mid	248	393	510	638	788	1095	1275	1575	
		Low	213	263	340	425	525	730	850	1050	
	Cooling capacity	Hi	W	2350	3800	4400	5600	6800	8200	10500	11200
	Heating capacity	Hi	W	2150	3400	4100	4700	5600	7200	8400	9100
	Flow rate		m ³ /h	0.446	0.697	0.808	0.98	1.171	1.45	1.747	1.964
	Water resistance		kPa	8	15	24	35	56	17	32	31
	Noise	30Pa		40	42	44	46	47	48	50	52
	External static pressure		Pa	30pa							
Coil	Type		Copper, high-efficiency louvered fins								
	Pressure		≤1.6MPa								
Motor	Type		Class B, capacitor start								
	Quantity	/	1				2				
	Power supply		220-240V ~ 50Hz								
	Protection class		IP20								
	Input power 30Pa	W	49	80	82	112	140	192	217	277	
Power lines		mm ²	0.5×3								
Protection class		I									
Fan	Type		Front-forward multi-vane low-noise centrifugal fan								
	Quantity	/	1	2			3	4			
Connection pipe		Inlet water	Rc3/4(inner thread)								
		Outlet water	Rc3/4(inner thread)								
		Condensate	Rc3/4(outer thread)								
Weight	Without return air box	kg	14.4	17.2	19.2	20.5	23.2	34.2	37.5	37.5	
Thermostat (optional)		Mechanical	Z54352A1								
		Digit	WK-110PA0								
		Deluxe digit	WK-010PA-K								

Section two --- countries and areas within the European Union

Horizontal concealed FCU, standard (G series, 220~240VAC, 50Hz, EU)

Model		Unit	FP-34WA/	FP-51WA/	FP-68WA/	FP-85WA/	FP-102WA/	FP-136WA/	FP-170WA/	FP-204WA/	
			GHL-K	GHL-K	GHL-K	GHL-K	/GHL-K	/GHL-K	/GHL-K	/GHL-K	
Performance	Air flow	High	m³/h	370	570	720	870	1020	1360	1600	1900
		Medium		260	400	504	610	788	1095	1120	1330
		Low		180	280	353	426	525	730	784	931
	Cooling	High	W	1750	2900	3400	4300	4900	6700	7000	10000
	Heating	High	W	2200	3400	4200	4700	6000	8000	9000	18900
	Water flow		m³/h	0.30	0.50	0.59	0.74	0.84	1.15	1.21	1.72
	Water resistance		kPa	15	30	23	25	35	40	36	40
	Noise		dB(A)	37	38	40.5	44	46	46	47	50.5
	External static pressure		Pa	0Pa							
Coils	Type		Copper tube and louvered fins								
	Working pressure		≤1.6MPa								
Motor	Type		Class B insulation, capacitor start								
	Quantity	piece	1				2				
	Power lines		220-240V ~ 50Hz								
	Protection class		IP20								
Input power		W	35	54	66	84	101	150	154	198	
Power lines		mm²xpiece	0.5x3								
Anti electric shock class		I									
Fan	Type		Forward multiple-vane low-noise centrifugal fan								
	Quantity	piece	1	2				3	4		
Connection pipe		inlet	Rc3/4(inner thread)								
		outlet	Rc3/4(inner thread)								
		condensate	Rc3/4(outer thread)								
Net weight		kg	14.5	17	18.9	20.8	21.9	31.5	34.1	38	
Outline dimensions	Width	mm	680	800	900	1000	1080	1380	1520	1620	
	Depth	mm	520	520	520	520	520	520	520	520	
	Height	mm	235	235	235	235	235	235	235	235	
Thermostat (optional)		Mechanical	Z54352A1								
		Digital	WK-110PA0								
		Digital (deluxe)	WK-010PA-K								

Notes:

- The left and right modes can be switched over on site. The correction coefficient for both cooling and heating is 0.9.
- Nominal cooling conditions: (27/19.5℃) indoor dry/wet bulb temperature, (7/12℃) entering and leaving water temperature. Nominal heating conditions: 20℃ indoor dry bulb temperature, 45℃ entering water temperature and 40℃ leaving water temperature.
- The noise is tested under the semi-anechoic chamber and the actual value will change under different environments.

Horizontal concealed FCU, standard (G series, 220~240VAC, 50Hz, EU)

Model		Unit	FP-34WA	FP-51WA	FP-68WA	FP-85WA	FP-102WA	FP-136WA	FP-170WA	FP-204WA	
Item			H/GHL-K	H/GHL-K	H/GHL-K	H/GHL-K	H/GHL-K	H/GHL-K	H/GHL-K	H/GHL-K	H/GHL-K
Performance	Air flow	High	m ³ /h	450	590	750	930	1100	1400	1700	2000
		Medium	m ³ /h	315	413	525	651	770	980	1190	1400
		Low	m ³ /h	220	290	367	455	539	686	833	980
	Cooling capacity	High	W	2000	3100	3550	4500	5200	6900	7200	10200
	Heating capacity	High	W	2300	3500	4500	4900	6300	8200	9200	12000
	Water flow		m ³ /h	0.34	0.53	0.61	0.78	0.90	1.19	1.24	1.76
	Water resistance		kPa	15	30	23	25	35	40	36	40
	Noise		dB(A)	39	39	41	46	49	48	49	52
External static pressure		Pa	0Pa								
Coils	Type		Copper tube and louvered fins								
	Working pressure		≤1.6MPa								
Motor	Type		Class B insulation, capacitor start								
	Quantity	piece	1				2				
	Power supply		220-240VAC 50Hz								
	Protection class		IP20								
Input power		W	48	57	72	90	111	152	185	222	
Power lines		mm ² ×piece	0.5×3								
Anti electric shock class		I									
Fan	Type		Forward multiple-vane low-noise centrifugal fan								
	Quantity	piece	1	2			3	4			
Connection pipe		Inlet	Rc3/4(inner thread)								
		Outlet	Rc3/4(inner thread)								
		Condensate	Rc3/4(outer thread)								
Net weight		kg	14.5	17	18.9	20.8	21.9	31.5	34.1	38	
Outline dimensions	Width	mm	680	800	900	1000	1080	1380	1520	1620	
	Depth	mm	520	520	520	520	520	520	520	520	
	Height	mm	235	235	235	235	235	235	235	235	
Thermostat (optional)		Mechanical	Z54352A1								
		Digital	WK-110PA0								
		Digital (deluxe)	WK-010PA-K								

Notes:

- The left and right modes can be switched over on site. The correction coefficient for both cooling and heating is 0.9.
- Nominal cooling conditions: (27/19℃) indoor dry/wet bulb temperature, (7/12℃) entering and leaving water temperature. Nominal heating conditions: 20℃ indoor dry bulb temperature, 45℃ entering water temperature and 40℃ leaving water temperature.
- The noise is tested under the semi-anechoic chamber and the actual value will change under different environments.

Horizontal concealed FCU, 3-row-pipes (G series, 220~240VAC, 50Hz, EU)

Model		Unit	FP-34WAS/	FP-51WAS/	FP-68WAS/	FP-85WAS/	FP-102WA	FP-136WA	FP-170WA	FP-204WA		
Item			GHL-K	GHL-K	GHL-K	GHL-K	S/GHL-K	S/GHL-K	S/GHL-K	S/GHL-K		
Performance	Air flow	High	m ³ /h	370	570	720	870	1020	1360	1600	1900	
		Mediu		260	400	504	610	788	1095	1120	1330	
		Low		180	280	353	426	525	730	784	931	
	Cooling capacity	High	W	2100	3200	4100	4800	5900	7600	8800	10400	
	Heating capacity	High	W	2400	3700	4800	5500	6600	8900	10200	12100	
	Water flow		m ³ /h	0.36	0.55	0.71	0.83	1.02	1.31	1.52	1.79	
	Water resistance		kPa	20	21	22	30	35	40	33	40	
	Noise		dB(A)	37	39	40.5	44	48	47	48	50.5	
	External static pressure		Pa	0Pa								
Coils	Type		Copper tube and louvered fins									
	Working pressure		≤1.6MPa									
Motor	Type		Class B insulation, capacitor start									
	Quantity	piece	1					2				
	Power supply		220-240V ~ 50Hz									
	Protection class		IP20									
Input power	W		35	58	66	78	102	161	150	192		
Power lines	mm ² ×piece		0.5×3									
Anti-electric shock class		I										
Fan	Type		Forward multiple-vane low noise centrifugal fan									
	Quantity	Piece	1	2				3	4			
Connection pipe	Inlet		Rc3/4(inner thread)									
	Outlet		Rc3/4(inner thread)									
	Condensate		Rc3/4(outer thread)									
Net weight	kg		14.9	17.4	19.3	21.3	22.7	30.9	34.5	38		
Outline dimensions	Width	mm	680	800	900	1000	1080	1380	1520	1620		
	Depth	mm	520	520	520	520	520	520	520	520		
	Height	mm	235	235	235	235	235	235	235	235		
Thermostat (optional)	Mechanical		Z54352A1									
	Digital		WK-110PA0									
	Digital (Deluxe)		WK-010PA-K									

Notes:

- The left and right modes can be switched over on site. The correction coefficient for both cooling and heating is 0.9.
- Nominal cooling conditions: (27/19℃) indoor dry/wet bulb temperature, (7/12℃) entering and leaving water temperature. Nominal heating conditions: 20℃ indoor dry bulb temperature, 45℃ entering water temperature and 40℃ leaving water temperature.
- The noise is tested under the semi-anechoic chamber and the actual value will change under different environments.

Horizontal concealed FCU, 3-row-pipe (G series, 220~240VAC, 50Hz, EU)

Model Item		Unit	FP-34WAH	FP-51WAH	FP-68WAH	FP-85WAH	FP-102WAH	FP-136WA	FP-170WA	FP-204WA	
			S/GHL-K	S/GHL-K	S/GHL-K	S/GHL-K	S/GHL-K	HS/GHL-K	HS/GHL-K	HS/GHL-K	
Performance	Air flow	High	m ³ /h	450	590	750	930	1100	1400	1700	2000
		Medium	m ³ /h	315	413	525	651	770	980	1190	1400
		Low	m ³ /h	220	290	367	455	539	686	833	980
	Cooling capacity	High	W	2500	3300	4200	4900	6100	7800	9000	10500
	Heating capacity	High	W	2800	3800	5100	5700	6900	9000	10900	12400
	Water flow		m ³ /h	0.43	0.57	0.72	0.84	1.05	1.34	1.55	1.81
	Water resistance		kPa	20	21	22	30	35	40	33	40
	Noise		dB(A)	39	40	42	46	49	49	49	52
	External static pressure		Pa	0Pa							
Coils	Type		Copper tube with louvered fins								
	Working pressure		≤1.6MPa								
Motor	Type		Class B insulation, capacitor start								
	Quantity	piece	1				2				
	Power supply		220-240VAC 50Hz								
	Protection class		IP20								
Input power		W	46	57	72	83	108	164	185	221	
Power lines		mm ² xpieces	0.5x3								
Anti electric shock class		I									
Fan	Type		Forward multi-vane low-noise centrifugal fan								
	Quantity	↑	1	2			3	4			
Connection pipe	Inlet		Rc3/4(inner thread)								
	Outlet		Rc3/4(inner thread)								
	Condensate		Rc3/4(outer thread)								
Net weight		kg	14.9	17.4	19.3	21.3	22.7	30.9	34.5	38	
Outline dimensions	Width	mm	680	800	900	1000	1080	1380	1520	1620	
	Depth	mm	520	520	520	520	520	520	520	520	
	Height	mm	235	235	235	235	235	235	235	235	
Thermostat (optional)	Mechanical		Z54352A1								
	Digital		WK-110PA0								
	Digital (Deluxe)		WK-010PA-K								

Notes:

- The left and right modes can be switched over on site. The correction coefficient for both cooling and heating is 0.9.
- Nominal cooling conditions: (27/19℃) indoor dry/wet bulb temperature, (7/12℃) entering and leaving water temperature. Nominal heating conditions: 20℃ indoor dry bulb temperature, 45℃ entering water temperature and 40℃ leaving water temperature.
- The noise is tested under the semi-anechoic chamber and the actual value will change under different environments.

50Hz (with the return air box), 4-row pipes

Type Item			Concealed ceiling type	FP-34WA HF/BHL-K	FP-51WA HF/BHL-K	FP-68WA HF/BHL-K	FP-85WA HF/BHL-K	FP-102W AHF/BHL-K	FP-136W AHF/BHL-K	FP-170W AHF/BHL-K	FP-34WA HF/BHL-K	
Performance	Airflow	Hi	m ³ /h	340	510	680	850	1020	1360	1700	2040	
		Mid		248	393	510	638	788	1095	1275	1575	
		Low		213	263	340	425	525	730	850	1050	
	Cooling capacity	Hi	W	2600	4000	4700	5600	7500	9200	11000	12200	
	Heating capacity	Hi	W	4300	6500	7300	8600	10500	14500	18000	20000	
	Flow rate			m ³ /h	0.464	0.729	0.893	0.981	1.318	1.615	2.042	2.229
	Water resistance			kPa	3.713	8.943	14.54	18.79	35.75	19.06	29.01	35.41
	Noise	30Pa			40	42	44	46	47	48	50	52
External static pressure			Pa	30pa								
Coil	Type		Copper, high-efficiency louvered fins									
	Pressure		≤1.6MPa									
Motor	Type		Class B, capacitor start									
	Quantity	/	1					2				
	Power supply		220-240V ~ 50Hz									
	Protection class		IP20									
	Input power 30Pa	W	43	59	70	84	105	151	174	206		
Power lines		mm ²	0.5x3									
Protection class		I										
Fan	Type		Front-forward multi-vane low-noise centrifugal fan									
	Quantity	/	1	2				3	4			
Connection pipe		Inlet water	Rc3/4(inner thread)									
		Outlet water	Rc3/4(inner thread)									
		Condensate	Rc3/4(outer thread)									
Weight	Without return air box	kg	14.4	17.2	19.2	20.5	23.2	34.2	37.5	37.5		
Thermostat (optional)		Mechanical	Z54352A1									
		Digit	WK-110PA0									
		Deluxe digit	WK-010PA-K									

50Hz (with the return air box), 3+1-row pipes

Item		Type		Concealed ceiling type	FP-34WA	FP-51WA	FP-68WA	FP-85WA	FP-102W	FP-136W	FP-170W	FP-204W
					HT/BHL-K	HT/BHL-K	HT/BHL-K	HT/BHL-K	AHT/BHL-K	AHT/BHL-K	AHT/BHL-K	AHT/BHL-K
Performance	Airflow	Hi	m ³ /h	340	510	680	850	1020	1360	1700	2040	
		Mid		248	393	510	638	788	1095	1275	1575	
		Low		213	263	340	425	525	730	850	1050	
	Cooling capacity	Hi	W	2300	3600	4350	5400	6700	8100	10350	11000	
	Heating capacity	Hi	W	2100	3350	4000	4600	5350	7000	8300	8950	
	Flow rate			m ³ /h	0.446	0.697	0.808	0.98	1.171	1.45	1.747	1.964
	Water resistance			kPa	5.83	13.50	19.86	30.81	51.67	17.20	25.24	29.34
	Noise	30Pa			40	42	44	46	47	48	50	52
	External static pressure			Pa	30pa							
Coil	Type			Copper, high-efficiency louvered fins								
	Pressure			≤1.6MPa								
Motor	Type			Class B, capacitor start								
	Quantity	/		1				2				
	Power supply			220-240V ~ 50Hz								
	Protection class			IP20								
	Input power	30Pa	W	43	59	70	84	105	151	174	206	
Power lines		mm ²		0.5×3								
Protection class			I									
Fan	Type			Front-forward multi-vane low-noise centrifugal fan								
	Quantity	/		1	2			3	4			
Connection pipe		Inlet water		Rc3/4(inner thread)								
		Outlet water		Rc3/4(inner thread)								
		Condensate		Rc3/4(outer thread)								
Weight	Without return air box	kg	14.4	17.2	19.2	20.5	23.2	34.2	37.5	37.5		
Thermostat (optional)		Mechanical		Z54352A1								
		Digit		WK-110PA0								
		Deluxe digit		WK-010PA-K								

1.5.2 Temperature at Nominal Conditions

Item	Water Side		Air Side	
	Entering water temperature (℃)	Leaving water temperature (℃)	DB Temperature (℃)	WB Temperature (℃)
Cooling	7	12	27	19.5
Heating	60	-	21	-

1.5.3 Operation Range

Item	Water Side	Air Side
	Leaving water temperature (℃)	Environment DB Temperature (℃)
Cooling	>5	16 ~ 40
Heating	<80	10 ~ 35

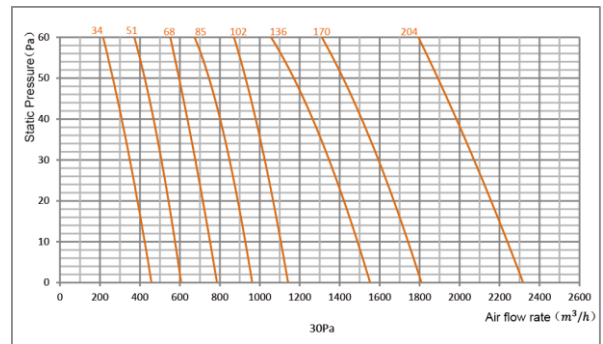
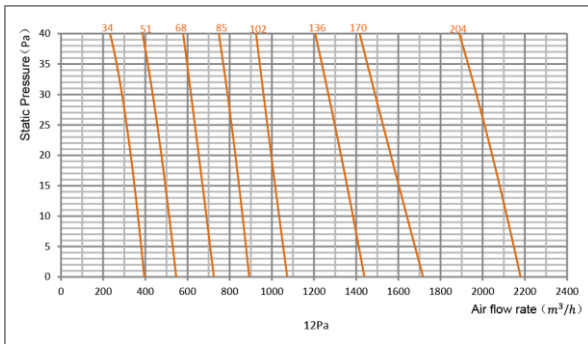
Note: when conditions are out of the range, please contact GREE.

1.5.4 Electric Data

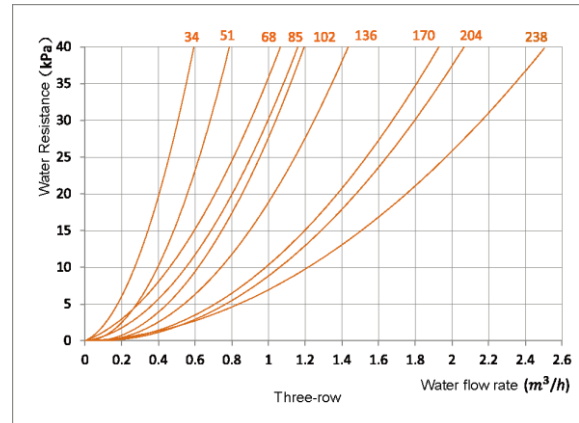
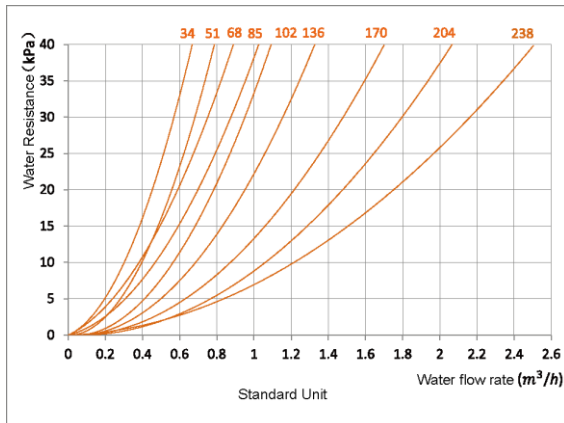
Model	Power Supply	Fan Quantity
FP-34	220-240 1 Ph 50Hz	1
FP-51	220-240 1 Ph 50Hz	2
FP-68	220-240V 1 Ph 50Hz	2
FP-85	220-240V 1 Ph 50Hz	2
FP-102	220-240 1 Ph 50Hz	2
FP-136	220-240 1 Ph 50Hz	3
FP-170	220-240 1 Ph 50Hz	4
FP-204	220-240 1 Ph 50Hz	4

1.5.5 Capacity Correction

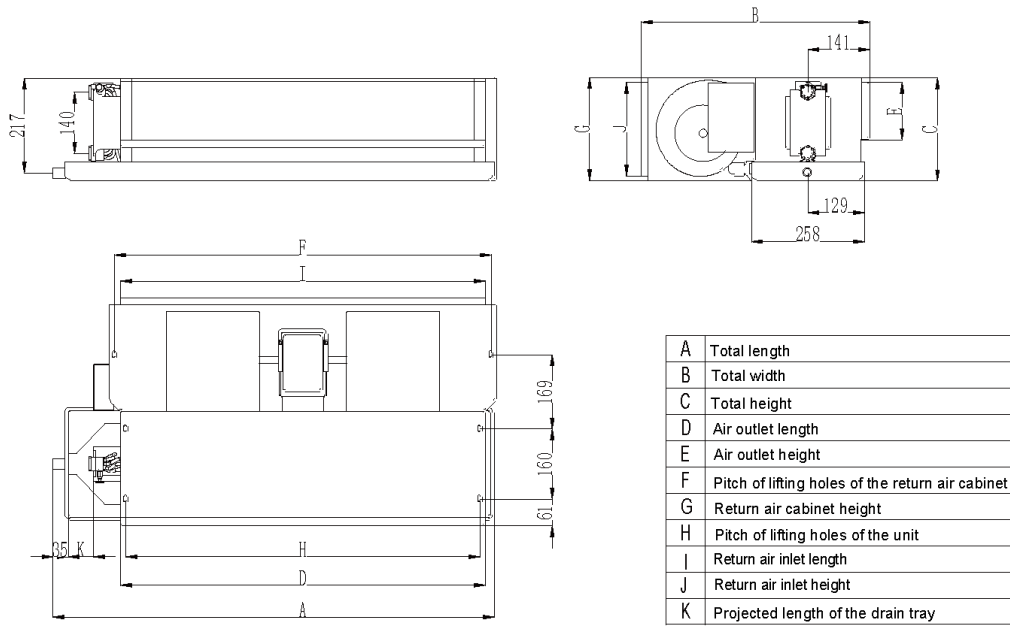
Air Flow Rate and External Static Pressure Curve



Water Flow Rate and Water Resistance Pressure Curve



2. Dimensions of the Unit

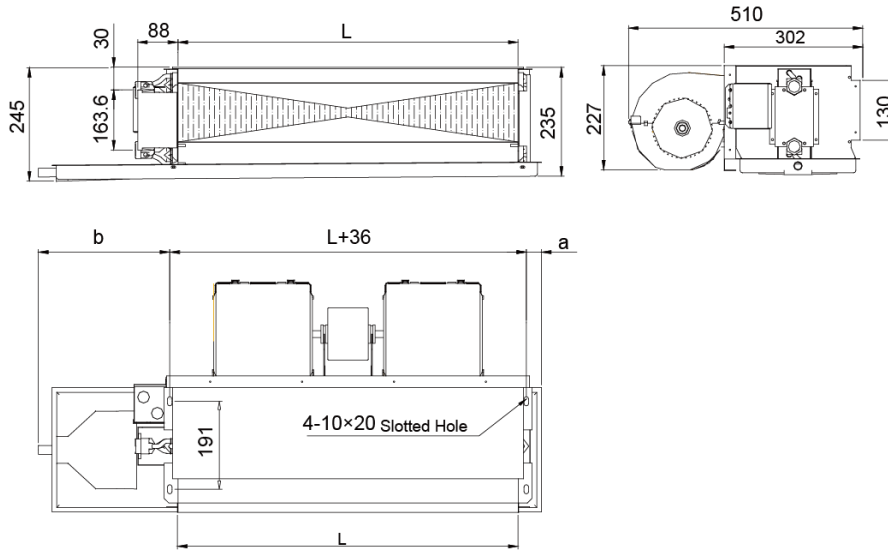


Standard, 3-row pipes

Model Legend	FP-34	FP-51	FP-68	FP-85	FP-102	FP-136	FP-170	FP-204	FP-238
A	680	800	900	1000	1080	1380	1520	1620	1820
B	520	520	520	520	520	520	520	520	520
C	235	235	235	235	235	235	235	235	276
D	512	632	732	832	912	1212	1352	1452	1652
E	132	132	132	132	132	132	132	132	194
F	512	682	782	882	962	1262	1402	1502	1652
G	235	235	235	235	235	235	235	235	276
H	486	606	706	806	886	1186	1326	1426	1626
I	512	632	732	832	912	1212	1352	1452	1652
J	214	214	214	214	214	214	214	214	255
K	57	57	57	57	57	57	57	57	57

K for the extended drain tray is 300mm.

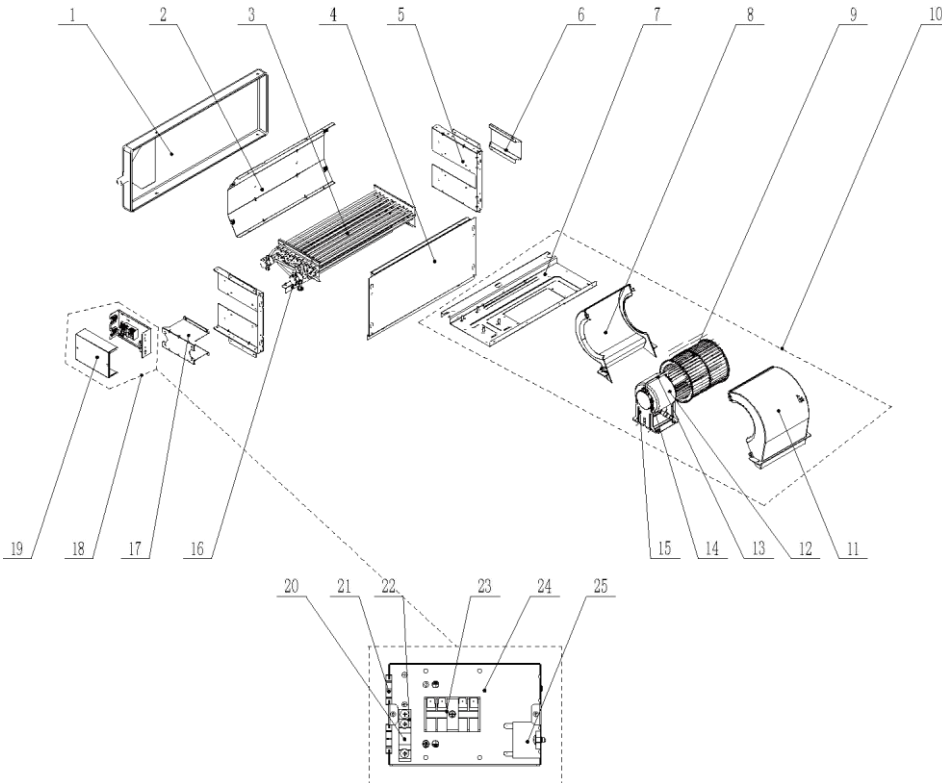
Standard, 3+1 or 4-row-pipes



F-T Series	L	a	b	F-T Series	L	a	b
FP-34WAF(T)-R	490	45	310	FP-102WAF(T)-R	980	45	310
FP-51WAF(T)-R	620	45	310	FP-136WAF(T)-R	1400	75	250
FP-68WAF(T)-R	740	45	310	FP-170WAF(T)-R	1500	75	310
FP-85WAF(T)-R	820	45	310	FP-204WAF(T)-R	1500	75	310

3. Explosive Views and Part Lists

FP-34WA(H)/G、FP-34WA(H)S/G Explosive Views:



FP-34WA(H)/G Part Lists:

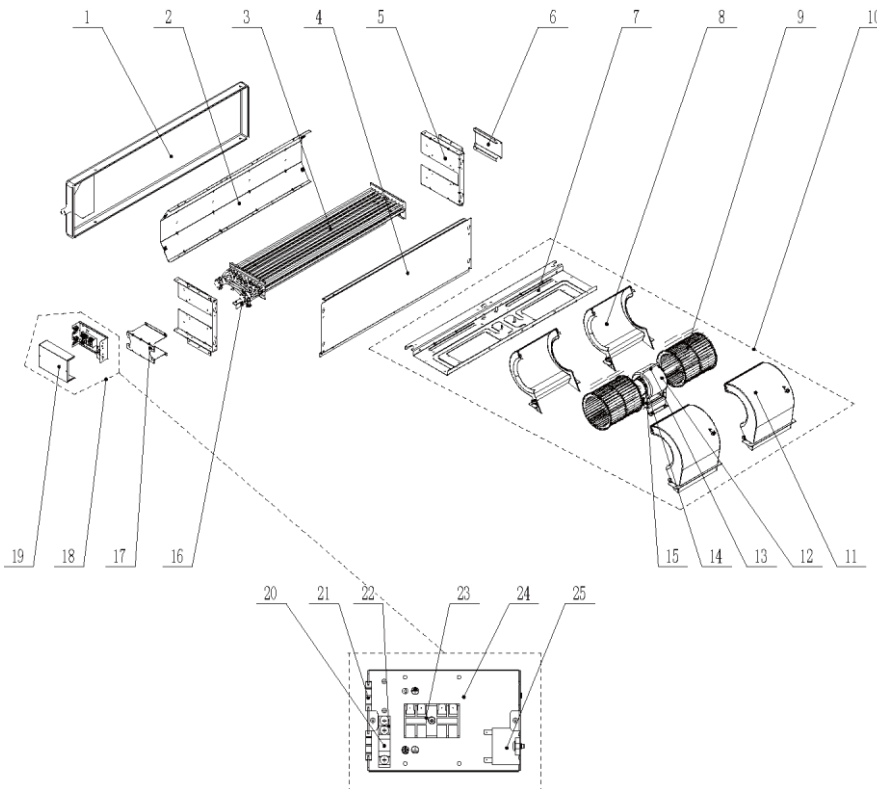
No	Name	Code	Quantity
1	Water Tray Assy	81211150017	1
2	Base Plate	02225200066	1
3	Surface-Cooler Assy	01126000766/01126000767	1
4	Cover Plate Sub-Assy	01265200190	1
5	End-Plate	02226001407	2
6	Surface Cooler Cover Sheet	01496000327	1
7	Motor Retaining Plate	01845200033	1
8	Propeller Housing(Lower)	26906000024	1
9	Centrifugal Fan	10456000102	1
10	Centrifugal fan assy	01396001421	1
11	Propeller Housing(Upper)	26906000023	1
12	Fan Motor	150195264/15707301	1
13	Hoop	70819521	4
14	Bar Clasp	70819522	1
15	Motor Support	01806000437	1
16	Side Plate of the Air Outlet	02226001530	1
17	Divided (collective) water joint support	01846000179	1
18	Electric Box Assy	01396001537	1
19	Electric Box Cover Plate	01426000259	1
20	Wire Clamp	71010003	1
21	Cable Cross Loop	26900000008	2
22	Insulation Gasket	70410503	1
23	Terminal Board	4201026502	1
24	Electric Base Plate	01426000258	1
25	Capacitor CBB61	33010089	1

FP-34WA(H)S/G Part Lists:

No	Name	Code	Quantity
1	Water Tray Assy	81211150017	1
2	Base Plate	02225200066	1
3	Surface-Cooler Assy	01126000741/01126000768	1
4	Cover Plate Sub-Assy	01265200190	1
5	End-Plate	02226001407	2
6	Surface Cooler Cover Sheet	01496000327	1
7	Motor Retaining Plate	01845200033	1
8	Propeller Housing(Lower)	26906000024	1
9	Centrifugal Fan	10456000102	1
10	Centrifugal fan assy	01396001421	1
11	Propeller Housing(Upper)	26906000023	1
12	Fan Motor	150195264/15707301	1
13	Hoop	70819521	4
14	Bar Clasp	70819522	1
15	Motor Support	01806000437	1

16	Side Plate of the Air Outlet	02226001530	1
17	Divided (collective) water joint support	01846000179	1
18	Electric Box Assy	01396001449/01396001537	1
19	Electric Box Cover Plate	01426000259	1
20	Wire Clamp	71010003	1
21	Cable Cross Loop	26900000008	2
22	Insulation Gasket	70410503	1
23	Terminal Board	4201026502	1
24	Electric Base Plate	01426000258	1
25	Capacitor CBB61	33000064/33010089	1

FP-51WA(H)/G 、 FP-68WA(H)/G 、 FP-85WA(H)/G 、 FP-102WA(H)/G 、 FP-51WA(H)/S/G 、 FP-68WA(H)/S/G 、 FP-85WA(H)/S/G 、 FP-102WA(H)/S/G Explosive Views:



FP-51WA(H)/G Part Lists:

No	Name	Code	Quantity
1	Water Tray Assy	81211150018	1
2	Base Plate	02225200067	1
3	Surface-Cooler Assy	01126000769/01126000770	1
4	Cover Plate Sub-Assy	01265200191	1
5	End-Plate	02226001407	2
6	Surface Cooler Cover Sheet	01496000327	1
7	Motor Retaining Plate	01845200034	1
8	Propeller Housing(Lower)	26905200019	2
9	Centrifugal Fan	10425200003	2
10	Centrifugal fan assy	01396001422	1
11	Propeller Housing(Upper)	26905200018	2

Engineering Data

12	Fan Motor	15707302/157073021	1
13	Hoop	70819521	1
14	Bar Clasp	70818025	4
15	Motor Support	01805200144	1
16	Side Plate of the Air Outlet	02225200064	1
17	Divided (collective) water joint support	01846000179	1
18	Electric Box Assy	01396001540 /01396001541	1
19	Electric Box Cover Plate	01426000259	1
20	Wire Clamp	71010003	1
21	Cable Cross Loop	26900000008	2
22	Insulation Gasket	70410503	1
23	Terminal Board	4201026502	1
24	Electric Base Plate	01426000258	1
25	Capacitor CBB61	33010089 /33010089	1

FP-68WA(H)/G Part Lists:

No	Name	Code	Quantity
1	Water Tray Assy	81211150010	1
2	Base Plate	02226001409	1
3	Surface-Cooler Assy	01126000754/01126000775	1
4	Cover Plate Sub-Assy	02226001410	1
5	End-Plate	02226001407	2
6	Surface Cooler Cover Sheet	01496000327	1
7	Motor Retaining Plate	01846000180	1
8	Propeller Housing(Lower)	26906000024	1
9	Centrifugal Fan	10456000102	1
10	Centrifugal fan assy	15406002335	1
11	Propeller Housing(Upper)	26906000023	1
12	Fan Motor	15019523/15019523	1
13	Hoop	70819521	4
14	Bar Clasp	70819522	1
15	Motor Support	01806000437	1
16	Side Plate of the Air Outlet	01376000082	1
17	Divided (collective) water joint support	01846000179	1
18	Electric Box Assy	01396001546/01396001547	1
19	Electric Box Cover Plate	01426000259	1
20	Wire Clamp	71010003	1
21	Cable Cross Loop	26900000008	1
22	Insulation Gasket	70410503	1
23	Terminal Board	4201026502	1
24	Electric Base Plate	01426000258	1
25	Capacitor CBB61	33010025/33010026	1

FP-85WA(H)/G Part Lists:

No	Name	Code	Quantity
1	Water Tray Assy	81211150010	1
2	Base Plate	02226001409	1
3	Surface-Cooler Assy	01126000754/01126000775	1
4	Cover Plate Sub-Assy	02226001410	1
5	End-Plate	02226001407	1
6	Surface Cooler Cover Sheet	01496000327	1
7	Motor Retaining Plate	01846000180	1
8	Propeller Housing(Lower)	26906000024	1
9	Centrifugal Fan	10456000102	1
10	Centrifugal fan assy	15406002335	1
11	Propeller Housing(Upper)	26906000023	1
12	Fan Motor	15019523/15019523	1
13	Hoop	70819521	4
14	Bar Clasp	70819522	1
15	Motor Support	1806000437	1
16	Side Plate of the Air Outlet	01376000082	1
17	Divided (collective) water joint support	1846000179	1
18	Electric Box Assy	01396001546/01396001547	1
19	Electric Box Cover Plate	1426000259	1
20	Wire Clamp	71010003	1
21	Cable Cross Loop	26900000008	1
22	Insulation Gasket	70410503	1
23	Terminal Board	4201026502	1
24	Electric Base Plate	1426000258	1
25	Capacitor CBB61	33010025/33010026	1

FP-102WA(H)/G Part Lists:

No	Name	Code	Quantity
1	Water Tray Assy	81211150011	1
2	Base Plate	02226001420	1
3	Surface-Cooler Assy	01126000753/01126000755	1
4	Cover Plate Sub-Assy	01266000151	1
5	End-Plate	02226001407	2
6	Surface Cooler Cover Sheet	01496000327	1
7	Motor Retaining Plate	01846000186	1
8	Propeller Housing(Lower)	26906000024	2
9	Centrifugal Fan	10456000102	2
10	Centrifugal fan assy	15406002260	1
11	Propeller Housing(Upper)	26906000023	2
12	Fan Motor	157073024	1
13	Hoop	70819521	4
14	Bar Clasp	70819522	1

15	Motor Support	01806000437	1
16	Side Plate of the Air Outlet	02226001483	1
17	Divided (collective) water joint support	01846000179	1
18	Electric Box Assy	01396001522/01396001523	1
19	Electric Box Cover Plate	01426000259	1
20	Wire Clamp	71010003	1
21	Cable Cross Loop	26900000008	1
22	Insulation Gasket	70410503	1
23	Terminal Board	4201026502	1
24	Electric Base Plate	01426000258	1
25	Capacitor CBB61	34004000000201/33010027	1

FP-51WA(H)S/G Part Lists:

No	Name	Code	Quantity
1	Water Tray Assy	81211150018	1
2	Base Plate	02225200067	1
3	Surface-Cooler Assy	01126000748/01126000771	1
4	Cover Plate Sub-Assy	01265200191	1
5	End-Plate	02226001407	2
6	Surface Cooler Cover Sheet	01496000327	1
7	Motor Retaining Plate	01845200034	1
8	Propeller Housing(Lower)	26905200019	2
9	Centrifugal Fan	10425200003	2
10	Centrifugal fan assy	01396001422	1
11	Propeller Housing(Upper)	26905200018	2
12	Fan Motor	15707302/157073021	1
13	Hoop	70819521	1
14	Bar Clasp	70818025	4
15	Motor Support	01805200144	1
16	Side Plate of the Air Outlet	02225200064	1
17	Divided (collective) water joint support	01846000179	1
18	Electric Box Assy	01396001481/01396001542	1
19	Electric Box Cover Plate	01426000259	1
20	Wire Clamp	71010003	1
21	Cable Cross Loop	26900000008	2
22	Insulation Gasket	70410503	1
23	Terminal Board	4201026502	1
24	Electric Base Plate	01426000258	1
25	Capacitor CBB61	340040000002/33000064	1

FP-68WA(H)S/G Part Lists:

No	Name	Code	Quantity
1	Water Tray Assy	81211150010	1
2	Base Plate	02226001409	1
3	Surface-Cooler Assy	01126000656/01126000776	1
4	Cover Plate Sub-Assy	02226001410	1
5	End-Plate	02226001407	1
6	Surface Cooler Cover Sheet	01496000327	1
7	Motor Retaining Plate	01846000180	1
8	Propeller Housing(Lower)	26906000024	1
9	Centrifugal Fan	10456000102	1
10	Centrifugal fan assy	15406002254/15406002336	1
11	Propeller Housing(Upper)	26906000023	1
12	Fan Motor	157073022/15019523	1
13	Hoop	70819521	4
14	Bar Clasp	70819522	1
15	Motor Support	01806000437	1
16	Side Plate of the Air Outlet	01376000082	1
17	Divided (collective) water joint support	01846000179	1
18	Electric Box Assy	01396001329/01396001548	1
19	Electric Box Cover Plate	01426000259	1
20	Wire Clamp	71010003	1
21	Cable Cross Loop	26900000008	1
22	Insulation Gasket	70410503	1
23	Terminal Board	4201026502	1
24	Electric Base Plate	01426000258	1
25	Capacitor CBB61	33010026/33010027	1

FP-85WA(H)S/G Part Lists:

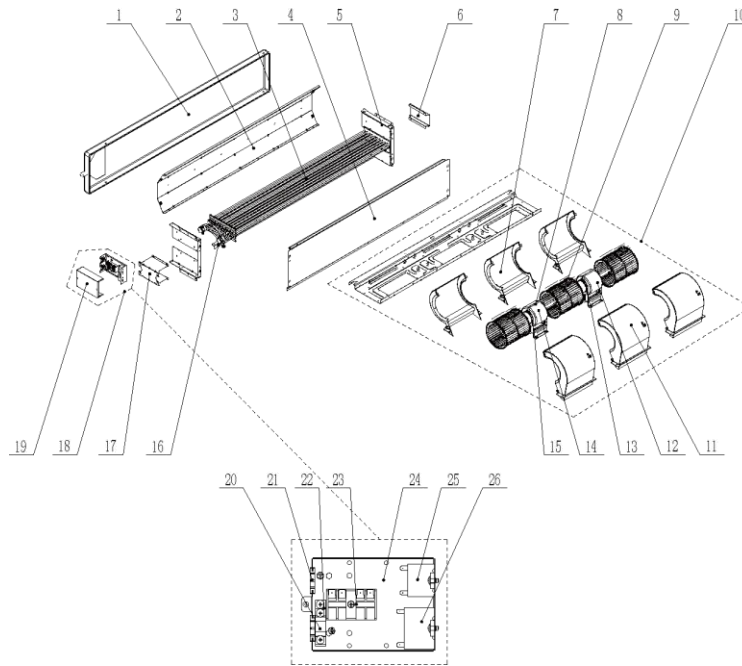
No	Name	Code	Quantity
1	Water Tray Assy	81211150010	1
2	Base Plate	02226001409	1
3	Surface-Cooler Assy	01126000656/01126000776	1
4	Cover Plate Sub-Assy	02226001410	1
5	End-Plate	02226001407	1
6	Surface Cooler Cover Sheet	01496000327	1
7	Motor Retaining Plate	01846000180	1
8	Propeller Housing(Lower)	26906000024	1
9	Centrifugal Fan	10456000102	1
10	Centrifugal fan assy	15406002254/15406002336	1
11	Propeller Housing(Upper)	26906000023	1
12	Fan Motor	157073022/15019523	1
13	Hoop	70819521	4
14	Bar Clasp	70819522	1

15	Motor Support	1806000437	1
16	Side Plate of the Air Outlet	1376000082	1
17	Divided (collective) water joint support	1846000179	1
18	Electric Box Assy	01396001329/01396001548	1
19	Electric Box Cover Plate	1426000259	1
20	Wire Clamp	71010003	1
21	Cable Cross Loop	26900000008	1
22	Insulation Gasket	70410503	1
23	Terminal Board	4201026502	1
24	Electric Base Plate	1426000258	1
25	Capacitor CBB61	33010026/33010027	1

FP-102WA(H)S/G Part Lists:

No	Name	Code	Quantity
1	Water Tray Assy	81211150011	1
2	Base Plate	02226001420	1
3	Surface-Cooler Assy	01126000657/01126000756	1
4	Cover Plate Sub-Assy	01266000151	1
5	End-Plate	02226001407	2
6	Surface Cooler Cover Sheet	01496000327	1
7	Motor Retaining Plate	01846000186	1
8	Propeller Housing(Lower)	26906000024	2
9	Centrifugal Fan	10456000102	2
10	Centrifugal fan assy	15406002260	1
11	Propeller Housing(Upper)	26906000023	2
12	Fan Motor	157073024	1
13	Hoop	70819521	4
14	Bar Clasp	70819522	1
15	Motor Support	01806000437	1
16	Side Plate of the Air Outlet	02226001483	1
17	Divided (collective) water joint support	01846000179	1
18	Electric Box Assy	01396001329/01396001524	1
19	Electric Box Cover Plate	01426000259	1
20	Wire Clamp	71010003	1
21	Cable Cross Loop	26900000008	1
22	Insulation Gasket	70410503	1
23	Terminal Board	4201026502	1
24	Electric Base Plate	01426000258	1
25	Capacitor CBB61	33010026/33010027	1

FP-136WA(H)/G、FP-136WA(H)S/G Explosive Views:



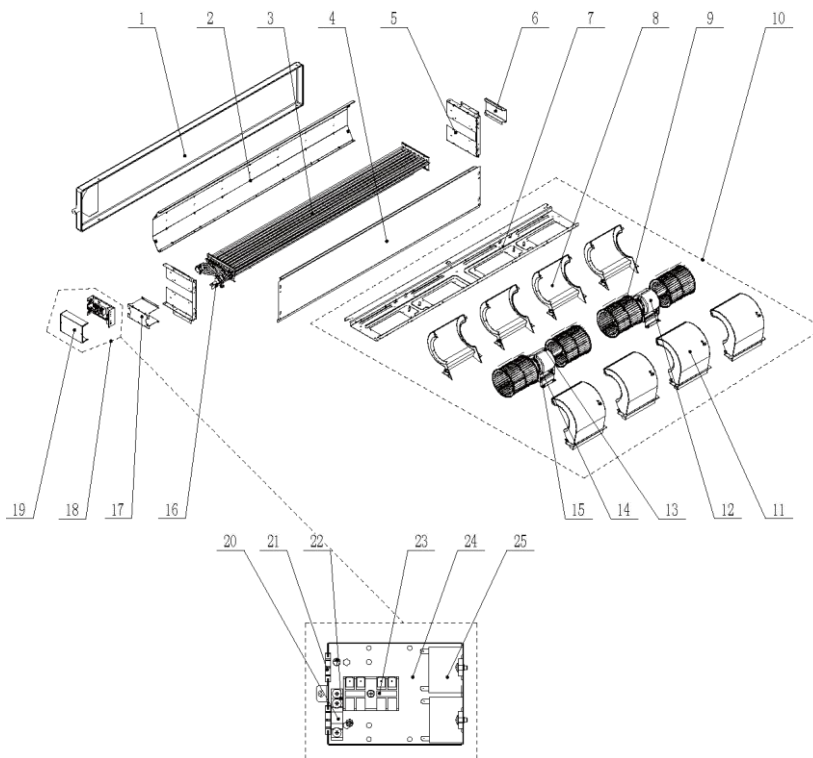
FP-136WA(H)/G Part Lists:

No	Name	Code	Quantity
1	Water Tray Assy	01286000681	1
2	Base Plate	02226001581	1
3	Surface-Cooler Assy	01126000757/01126000758	1
4	Cover Plate Sub-Assy	01266000201	1
5	End-Plate	02226001407	1
6	Surface Cooler Cover Sheet	01496000327	1
7	Propeller Housing(Lower)	01846000203	1
8	Hoop	26906000024	1
9	Centrifugal Fan	10456000102	1
10	Centrifugal fan assy	15406002320	1
11	Propeller Housing(Upper)	26906000023	1
12	Fan Motor	157073022/15707301	1
13	Bar Clasp	70819521	4
14	Fan Motor	70819522	1
15	Motor Support	01806000437	1
16	Side Plate of the Air Outlet	02226001580	1
17	Divided (collective) water joint support	01846000179	1
18	Electric Box Assy	01396001525/01396001533	1
19	Electric Box Cover Plate	01426000259	1
20	Wire Clamp	71010003	1
21	Cable Cross Loop	26900000008	1
22	Insulation Gasket	70410503	1
23	Terminal Board	4201026502	1
24	Electric Base Plate	01426000258	1
25	Capacitor CBB61	340040000002/34004000000202	1
26	Capacitor	33010020/33010025	1

FP-136WA(H)S/G Part Lists:

No	Name	Code	Quantity
1	Water Tray Assy	1286000681	1
2	Base Plate	02226001581	1
3	Surface-Cooler Assy	01126000747/01126000759	1
4	Cover Plate Sub-Assy	01266000201	1
5	End-Plate	02226001407	1
6	Surface Cooler Cover Sheet	01496000327	1
7	Propeller Housing(Lower)	01846000203	1
8	Hoop	26906000024	1
9	Centrifugal Fan	10456000102	1
10	Centrifugal fan assy	15406002320	1
11	Propeller Housing(Upper)	26906000023	1
12	Fan Motor	157073022/15707301	1
13	Bar Clasp	70819521	4
14	Fan Motor	70819522	1
15	Motor Support	01806000437	1
16	Side Plate of the Air Outlet	02226001580	1
17	Divided (collective) water joint support	01846000179	1
18	Electric Box Assy	01396001480/01396001526	1
19	Electric Box Cover Plate	01426000259	1
20	Wire Clamp	71010003	1
21	Cable Cross Loop	26900000008	1
22	Insulation Gasket	70410503	1
23	Terminal Board	4201026502	1
24	Electric Base Plate	01426000258	1
25	Capacitor CBB61	33010025/33010027	1
26	Capacitor	340040000002/33010025	1

FP-170WA(H)/G、FP-204WA(H)/G、FP-238WA(H)/G、FP-170WA(H)S/G、FP-204WA(H)S/G、FP-238WA(H)S/G Explosive Views:



FP-170WA(H)/G Part Lists:

No	Name	Code	Quantity
1	Water Tray Assy	81211150021	1
2	Base Plate	02226001479	1
3	Surface-Cooler Assy	01126000760/01126000761	1
4	Cover Plate Sub-Assy	01266000176	1
5	End-Plate	02226001407	2
6	Surface Cooler Cover Sheet	01496000327	1
7	Motor Retaining Plate	01846000191	1
8	Propeller Housing(Lower)	26906000024	4
9	Centrifugal Fan	10456000102	4
10	Centrifugal fan assy	15406002345	1
11	Propeller Housing(Upper)	26906000023	4
12	Fan Motor	157073022/15019523	2
13	Hoop	70819521	2
14	Bar Clasp	70819522	8
15	Motor Support	01806000437	2
16	Side Plate of the Air Outlet	01376000091	1
17	Divided (collective) water joint support	01846000179	1
18	Electric Box Assy	01396001528	1
19	Electric Box Cover Plate	01426000259	1
20	Wire Clamp	71010003	1
21	Cable Cross Loop	26900000008	2
22	Insulation Gasket	70410503	1

23	Terminal Board	4201026502	1
24	Electric Base Plate	01426000258	1
25	Capacitor CBB61	33010026/33010027	2

FP-204WA(H)/G Part Lists:

No	Name	Code	Quantity
1	Water Tray Assy	81211150030	1
2	Base Plate	02226001590	1
3	Surface-Cooler Assy	01155200024/01126000765	1
4	Cover Plate Sub-Assy	01265200194	1
5	End-Plate	02226001407	2
6	Surface Cooler Cover Sheet	01496000327	1
7	Motor Retaining Plate	01265200194	1
8	Propeller Housing(Lower)	26906000024	4
9	Centrifugal Fan	10456000102	4
10	Centrifugal fan assy	15406002329	1
11	Propeller Housing(Upper)	26906000023	4
12	Fan Motor	157073024	2
13	Hoop	70819521	2
14	Bar Clasp	70819522	8
15	Motor Support	01806000437	2
16	Side Plate of the Air Outlet	02226001589	1
17	Divided (collective) water joint support	01846000179	1
18	Electric Box Assy	01396001531/01396001532	1
19	Electric Box Cover Plate	01426000259	1
20	Wire Clamp	71010003	1
21	Cable Cross Loop	26900000008	2
22	Insulation Gasket	70410503	1
23	Terminal Board	4201026502	1
24	Electric Base Plate	01426000258	1
25	Capacitor CBB61	33010026/33010010	2

FP-170WA(H)/S/G Part Lists:

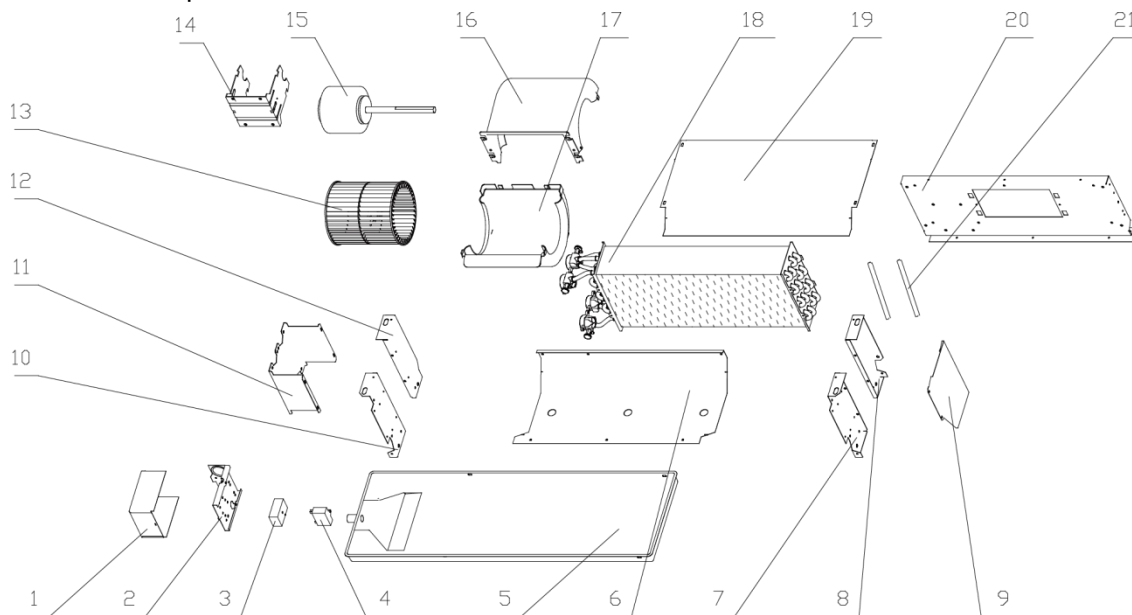
No	Name	Code	Quantity
1	Water Tray Assy	81211150021	1
2	Base Plate	02226001479	1
3	Surface-Cooler Assy	01126000750/01126000762	1
4	Cover Plate Sub-Assy	01266000176	1
5	End-Plate	02226001407	2
6	Surface Cooler Cover Sheet	01496000327	1
7	Motor Retaining Plate	01846000191	1
8	Propeller Housing(Lower)	26906000024	4
9	Centrifugal Fan	10456000102	4
10	Centrifugal fan assy	15406002345	1
11	Propeller Housing(Upper)	26906000023	4

12	Fan Motor	157073022/15019523	2
13	Hoop	70819521	2
14	Bar Clasp	70819522	8
15	Motor Support	01806000437	2
16	Side Plate of the Air Outlet	01376000091	1
17	Divided (collective) water joint support	01846000179	1
18	Electric Box Assy	01396001528	1
19	Electric Box Cover Plate	01426000259	1
20	Wire Clamp	71010003	1
21	Cable Cross Loop	26900000008	2
22	Insulation Gasket	70410503	1
23	Terminal Board	4201026502	1
24	Electric Base Plate	01426000258	1
25	Capacitor CBB61	33010026/33010027	2

FP-204WA(H)S/G Part Lists:

No	Name	Code	Quantity
1	Water Tray Assy	81211150030	1
2	Base Plate	02226001590	1
3	Surface-Cooler Assy	01155200024/01126000765	1
4	Cover Plate Sub-Assy	01265200194	1
5	End-Plate	02226001407	2
6	Surface Cooler Cover Sheet	01496000327	1
7	Motor Retaining Plate	01265200194	1
8	Propeller Housing(Lower)	26906000024	4
9	Centrifugal Fan	10456000102	4
10	Centrifugal fan assy	15406002329	1
11	Propeller Housing(Upper)	26906000023	4
12	Fan Motor	157073024	2
13	Hoop	70819521	2
14	Bar Clasp	70819522	8
15	Motor Support	01806000437	2
16	Side Plate of the Air Outlet	02226001589	1
17	Divided (collective) water joint support	01846000179	1
18	Electric Box Assy	01396001531/01396001532	1
19	Electric Box Cover Plate	01426000259	1
20	Wire Clamp	71010003	1
21	Cable Cross Loop	26900000008	2
22	Insulation Gasket	70410503	1
23	Terminal Board	4201026502	1
24	Electric Base Plate	01426000258	1
25	Capacitor CBB61	33010026/33010010	2

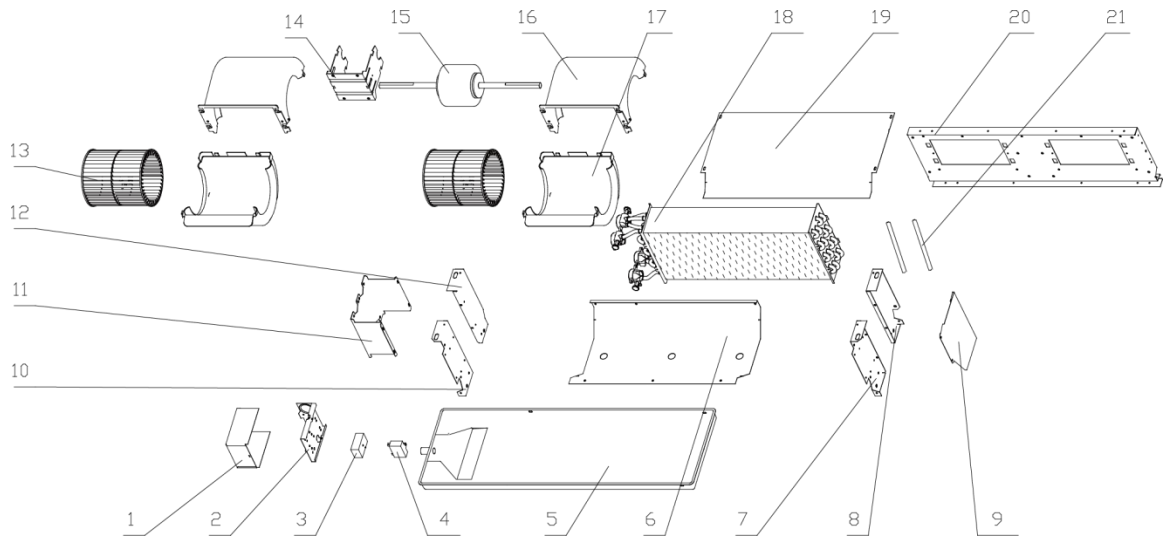
FP-34WAT-R Explosive Views:



FP-34WAT-R Part Lists:

No	Name	Code	Quantity
1	Electric Box Cover Plate	01419521	1
2	Electric Base Plate Sub-assy	01287301	1
3	Terminal Board	420001000003	1
4	Capacitor CBB61	3301074716	1
5	Water Tray Assy	12418810	1
6	Base Plate	02226579	1
7	Right terminal plate 2	0149643001	1
8	Right terminal plate 1	01496429	1
9	Surface Cooler Cover Sheet	01496426	1
10	Left terminal plate 2	0149642801	1
11	Water Faucet fixed Plate	01846365	1
12	Left terminal plate 1	01496427	1
13	Centrifugal fan	10319051	1
14	Supporter	01719521	1
15	Fan Motor	1570730104	1
16	Front Volute Casing	22202030	1
17	Rear Volute Casing	22202029	1
18	Surface-Cooler Assy	01106026	1
19	Cover Plate Assy	01266332	1
20	Motor Retaining Plate	01729530	1
21	Air-bleeding Hose	76710060	1

FP-51WAT-R、FP-68WAT-R、FP-85WAT-R、FP-102WAT-R Explosive Views:



FP-51WAT-R Part Lists:

No	Name	Code	Quantity
1	Electric Box Cover Plate	01419521	1
2	Electric Base Plate Sub-assy	01287301	1
3	Terminal Board	420001000003	1
4	Capacitor CBB61S	3301074702	1
5	Water Tray Assy	12418811	1
6	Base Plate	02226589	1
7	Right terminal plate 2	0149643001	1
8	Right terminal plate 1	01496429	1
9	Surface Cooler Cover Sheet	01496426	1
10	Left terminal plate 2	0149642801	1
11	Water Faucet fixed Plate	01846365	1
12	Left terminal plate 1	01496427	1
13	Centrifugal fan	10319051	2
14	Supporter	01719521	1
15	Fan Motor	1570730216	1
16	Front Volute Casing	22202030	2
17	Rear Volute Casing	22202029	2
18	Surface-Cooler Assy	0110602601	1
19	Cover Plate Assy	0126633201	1
20	Motor Retaining Plate	01729529	1
21	Air-bleeding Hose	76710060	1

FP-68WAT-R Part Lists:

No	Name	Code	Quantity
1	Electric Box Cover Plate	01419521	1
2	Electric Base Plate Sub-assy	01287301	1
3	Terminal Board	420001000003	1
4	Capacitor CBB61S	3301074702	1

5	Water Tray Assy	12418813	1
6	Base Plate	02226588	1
7	Right terminal plate 2	0149643001	1
8	Right terminal plate 1	01496429	1
9	Surface Cooler Cover Sheet	01496426	1
10	Left terminal plate 2	0149642801	1
11	Water Faucet fixed Plate	01846365	1
12	Left terminal plate 1	01496427	1
13	Centrifugal fan	10319051	2
14	Supporter	01719521	1
15	Fan Motor	1570730216	1
16	Front Volute Casing	22202030	2
17	Rear Volute Casing	22202029	2
18	Surface-Cooler Assy	0110602602	1
19	Cover Plate Assy	0126633202	1
20	Motor Retaining Plate	01729527	1
21	Air-bleeding Hose	76710060	1

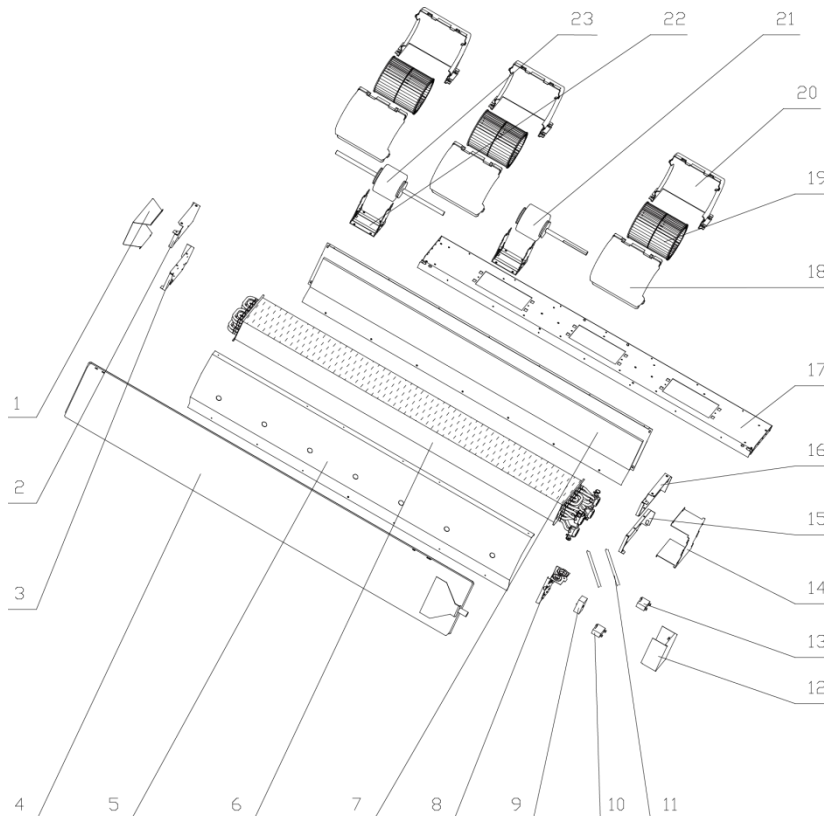
FP-85WAT-R Part Lists:

No	Name	Code	Quantity
1	Electric Box Cover Plate	01419521	1
2	Electric Base Plate Sub-assy	01287301	1
3	Terminal Board	420001000003	1
4	Capacitor CBB61	3301074710	1
5	Water Tray Assy	12418814	1
6	Base Plate	02226587	1
7	Right terminal plate 2	0149643001	1
8	Right terminal plate 1	01496429	1
9	Surface Cooler Cover Sheet	01496426	1
10	Left terminal plate 2	0149642801	1
11	Water Faucet fixed Plate	01846365	1
12	Left terminal plate 1	01496427	1
13	Centrifugal fan	10319051	2
14	Supporter	01719521	1
15	Fan Motor	1570730220	1
16	Front Volute Casing	22202030	2
17	Rear Volute Casing	22202029	2
18	Surface-Cooler Assy	0110602603	1
19	Cover Plate Assy	0126633203	1
20	Motor Retaining Plate	01729526	1
21	Air-bleeding Hose	76710060	1

FP-102WAT-R Part Lists:

No	Name	Code	Quantity
1	Electric Box Cover Plate	01419521	1
2	Electric Base Plate Sub-assy	01287301	1
3	Terminal Board	420001000003	1
4	Capacitor CBB61S	3301074705	1
5	Water Tray Assy	12418815	1
6	Base Plate	02226597	1
7	Right terminal plate 2	0149643001	1
8	Right terminal plate 1	01496429	1
9	Surface Cooler Cover Sheet	01496426	1
10	Left terminal plate 2	0149642801	1
11	Water Faucet fixed Plate	01846365	1
12	Left terminal plate 1	01496427	1
13	Centrifugal fan	10319051	2
14	Supporter	01719521	1
15	Fan Motor	1570730220	1
16	Front Volute Casing	22202030	2
17	Rear Volute Casing	22202029	2
18	Surface-Cooler Assy	0110602604	1
19	Cover Plate Assy	0126633204	1
20	Motor Retaining Plate	01729525	1
21	Air-bleeding Hose	76710060	1

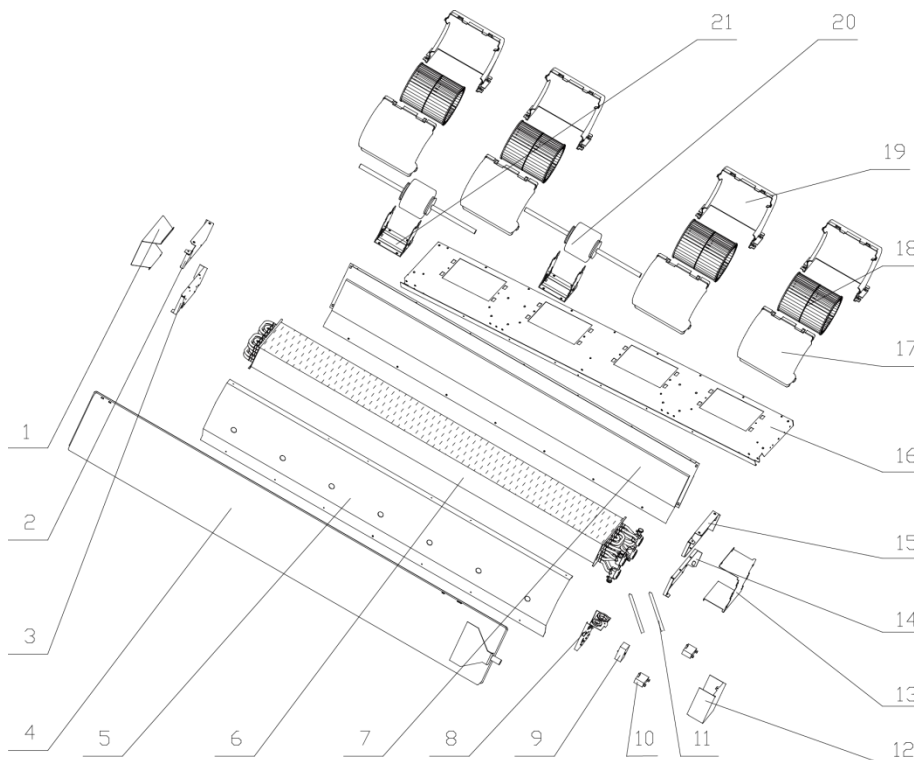
FP-136WAT-R Explosive Views:



FP-136WAT-R Part Lists:

No	Name	Code	Quantity
1	Surface Cooler Cover Sheet	0149642601	1
2	Right End-Plate Sub-Assy 1	01496440	1
3	Right End-Plate Sub-Assy 2	0149643901	1
4	Water Tray Assy	12418817	1
5	Base Plate	02226586	1
6	Surface-Cooler Assy	01106025	1
7	Cover Plate Assy	0126633205	1
8	Electric Base Plate Sub-assy	01287301	1
9	Terminal Board	420001000003	1
10	Capacitor CBB61S	3301074704	1
11	Air-bleeding Hose	76710060	2
12	Electric Box Cover Plate	01419521	1
13	Capacitor CBB61S	3301074701	1
14	Water Faucet fixed Plate	01846365	1
15	Left End-Plate Sub-Assy 2	0149644101	1
16	Left End-Plate Sub-Assy 1	01496442	1
17	Motor Retaining Plate	01749521	1
18	Rear Volute Casing	22202029	3
19	Centrifugal fan	10319051	3
20	Front Volute Casing	22202030	3
21	Fan Motor	1570730105	1
22	Supporter	01719521	2
23	Fan Motor	1570730220	1

FP-170WAT-R、FP-204WAT-R Explosive Views:



FP-170WAT-R Part Lists:

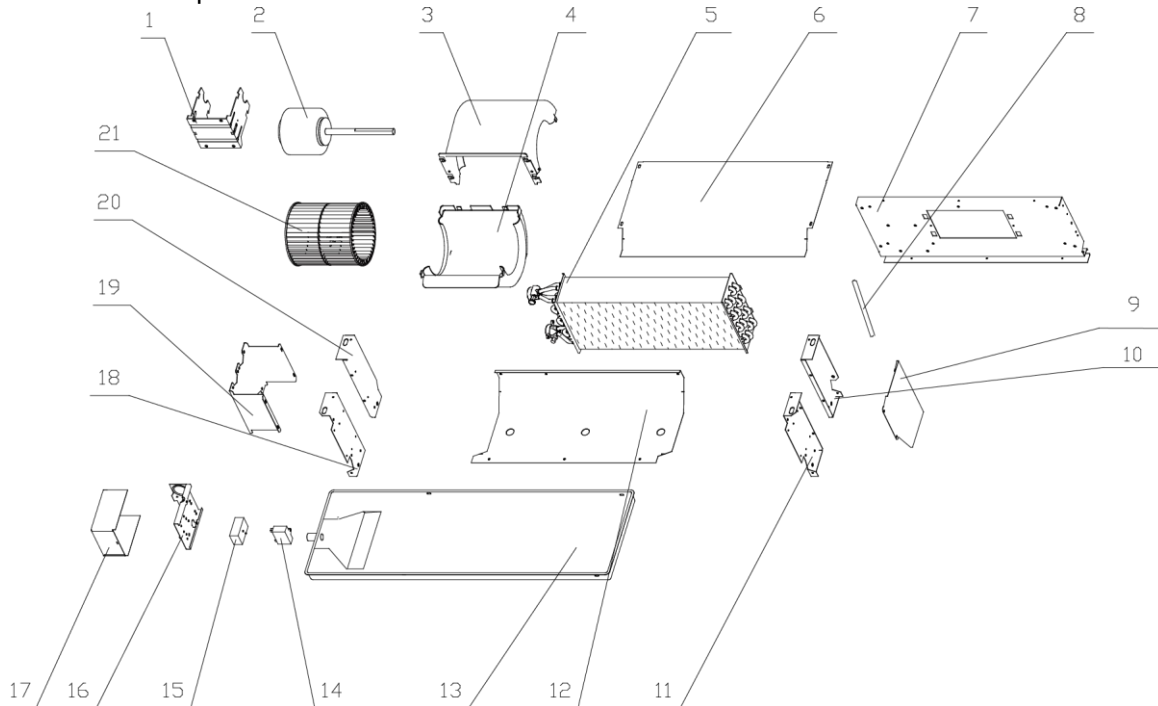
No	Name	Code	Quantity
1	Surface Cooler Cover Sheet	0149642601	1
2	Right End-Plate Sub-Assy 1	01496440	1
3	Right End-Plate Sub-Assy 2	0149643901	1
4	Water Tray Assy	12418818	1
5	Base Plate	02226585	1
6	Surface-Cooler Assy	0110602501	1
7	Cover Plate Assy	0126633206	1
8	Electric Base Plate Sub-assy	01287301	1
9	Terminal Board	420001000003	1
10	Capacitor CBB61S	3301074702	1
11	Air-bleeding Hose	76710060	2
12	Electric Box Cover Plate	01419521	1
13	Water Faucet fixed Plate	01846365	1
14	Left End-Plate Sub-Assy 2	0149644101	1
15	Left End-Plate Sub-Assy 1	01496442	1
16	Motor Retaining Plate	01729522	1
17	Rear Volute Casing	22202029	4
18	Centrifugal fan	10319051	4
19	Front Volute Casing	22202030	4
20	Fan Motor	1570730220	2
21	Supporter	01719521	2

FP-204WAT-R Part Lists:

No	Name	Code	Quantity
1	Surface Cooler Cover Sheet	0149642601	1
2	Right End-Plate Sub-Assy 1	01496440	1
3	Right End-Plate Sub-Assy 2	0149643901	1
4	Water Tray Assy	12418818	1
5	Base Plate	02226585	1
6	Surface-Cooler Assy	0110602501	1
7	Cover Plate Assy	0126633206	1
8	Electric Base Plate Sub-assy	01426319	1
9	Terminal Board	420001000003	1
10	Capacitor CBB61S	3301074705	1
11	Air-bleeding Hose	76710060	2
12	Supporter	01719521	2
13	Water Faucet fixed Plate	01846365	1
14	Left End-Plate Sub-Assy 2	0149644101	1
15	Left End-Plate Sub-Assy 1	01496442	1
16	Motor Retaining Plate	01729522	1
17	Rear Volute Casing	22202029	4
18	Centrifugal fan	10319051	4
19	Front Volute Casing	22202030	4

20	Fan Motor	1570730220	2
21	/	/	/

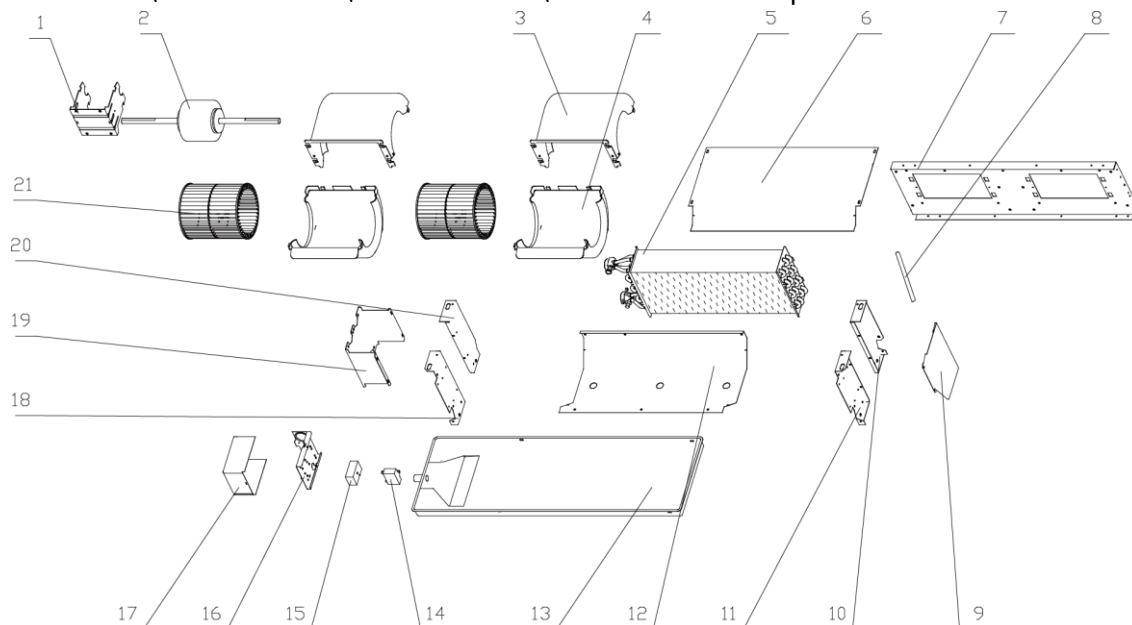
FP-34WAF-R Explosive Views:



FP-34WAF-R Part Lists:

No	Name	Code	Quantity
1	Supporter	01719521	1
2	Fan Motor	1570730104	1
3	Rear Volute Casing	22202029	1
4	Front Volute Casing	22202030	1
5	Surface-Cooler Assy	01126395	1
6	Cover Plate Assy	01266332	1
7	Motor Retaining Plate	01729530	1
8	Air-bleeding Hose	76710060	1
9	Surface Cooler Cover Sheet	01496426	1
10	Right terminal plate 2	01496430	1
11	Right terminal plate 1	01496429	1
12	Base Plate	02226579	1
13	Water Tray Assy	12418810	1
14	Capacitor CBB61	3301074716	1
15	Terminal Board	420001000003	1
16	Electric Base Plate Sub-assy	01287301	1
17	Electric Box Cover Plate	01419521	1
18	Left terminal plate 2	01496428	1
19	Water Faucet fixed Plate	01847703	1
20	Left terminal plate 1	01496427	1
21	Centrifugal fan	10319051	1

FP-51WAF-R、FP-68WAF-R、FP-85WAF-R、FP-102WAF-R Explosive Views:



FP-51WAF-R Part Lists:

No	Name	Code	Quantity
1	Supporter	01719521	1
2	Fan Motor	1570730216	1
3	Rear Volute Casing	22202029	2
4	Front Volute Casing	22202030	2
5	Surface-Cooler Assy	01126395	1
6	Cover Plate Assy	01266332	1
7	Motor Retaining Plate	01729529	1
8	Air-bleeding Hose	76710060	1
9	Surface Cooler Cover Sheet	01496426	1
10	Right terminal plate 2	01496430	1
11	Right terminal plate 1	01496429	1
12	Base Plate	02226589	1
13	Water Tray Assy	12418811	1
14	Capacitor CBB61S	3301074702	1
15	Terminal Board	420001000003	1
16	Electric Base Plate Sub-assy	01287301	1
17	Electric Box Cover Plate	01419521	1
18	Left terminal plate 2	01496428	1
19	Water Faucet fixed Plate	01847703	1
20	Left terminal plate 1	01496427	1
21	Centrifugal fan	10319051	2

FP-68WAF-R Part Lists:

No	Name	Code	Quantity
1	Supporter	01719521	1
2	Fan Motor	1570730216	1
3	Rear Volute Casing	22202029	2
4	Front Volute Casing	22202030	2
5	Surface-Cooler Assy	01126395	1
6	Cover Plate Assy	01266332	1
7	Motor Retaining Plate	01729527	1
8	Air-bleeding Hose	76710060	1
9	Surface Cooler Cover Sheet	01496426	1
10	Right terminal plate 2	01496430	1
11	Right terminal plate 1	01496429	1
12	Base Plate	02226588	1
13	Water Tray Assy	12418813	1
14	Capacitor CBB61S	3301074702	1
15	Terminal Board	420001000003	1
16	Electric Base Plate Sub-assy	01287301	1
17	Electric Box Cover Plate	01419521	1
18	Left terminal plate 2	01496428	1
19	Water Faucet fixed Plate	01847703	1
20	Left terminal plate 1	01496427	1
21	Centrifugal fan	10319051	2

FP-85WAF-R Part Lists:

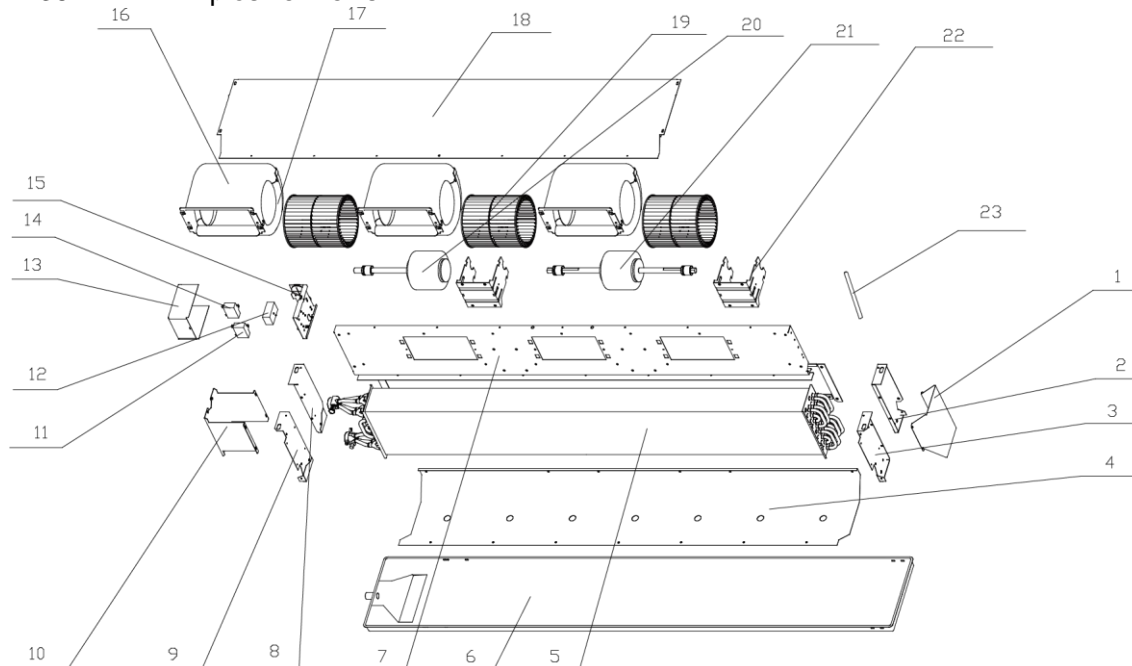
No	Name	Code	Quantity
1	Supporter	01719521	1
2	Fan Motor	1570730217	1
3	Rear Volute Casing	22202029	2
4	Front Volute Casing	22202030	2
5	Surface-Cooler Assy	01126395	1
6	Cover Plate Assy	01266332	1
7	Motor Retaining Plate	01729526	1
8	Air-bleeding Hose	76710060	1
9	Surface Cooler Cover Sheet	01496426	1
10	Right terminal plate 2	01496430	1
11	Right terminal plate 1	01496429	1
12	Base Plate	02226587	1
13	Water Tray Assy	12418814	1
14	Capacitor CBB61	3301074710	1
15	Terminal Board	420001000003	1
16	Electric Base Plate Sub-assy	01287301	1
17	Electric Box Cover Plate	01419521	1
18	Left terminal plate 2	01496428	1
19	Water Faucet fixed Plate	01847703	1

20	Left terminal plate 1	01496427	1
21	Centrifugal fan	10319051	2

FP-102WAF-R Part Lists:

No	Name	Code	Quantity
1	Supporter	01719521	1
2	Fan Motor	1570730220	1
3	Rear Volute Casing	22202029	2
4	Front Volute Casing	22202030	2
5	Surface-Cooler Assy	01126395	1
6	Cover Plate Assy	01266332	1
7	Motor Retaining Plate	01729525	1
8	Air-bleeding Hose	76710060	1
9	Surface Cooler Cover Sheet	01496426	1
10	Right terminal plate 2	01496430	1
11	Right terminal plate 1	01496429	1
12	Base Plate	02226597	1
13	Water Tray Assy	12418815	1
14	Capacitor CBB61S	3301074705	1
15	Terminal Board	420001000003	1
16	Electric Base Plate Sub-assy	01287301	1
17	Electric Box Cover Plate	01419521	1
18	Left terminal plate 2	01496428	1
19	Water Faucet fixed Plate	01847703	1
20	Left terminal plate 1	01496427	1
21	Centrifugal fan	10319051	2

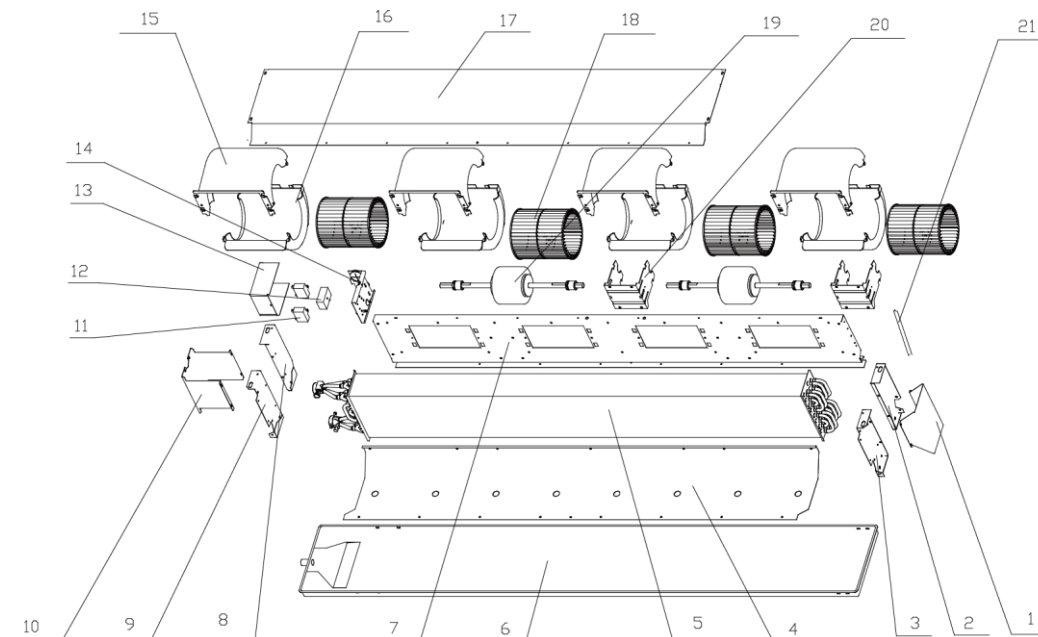
FP-136 WAF-R Explosive Views:



FP-136WAF-R Part Lists:

No	Name	Code	Quantity
1	Surface Cooler Cover Sheet	0149642601	1
2	Right End-Plate Sub-Assy 1	01496440	1
3	Right End-Plate Sub-Assy 2	01496439	1
4	Base Plate	02226586	1
5	Surface-Cooler Assy	01126140	1
6	Water Tray Assy	12418817	1
7	Motor Retaining Plate	01749521	1
8	Left End-Plate Sub-Assy 1	01496442	1
9	Left End-Plate Sub-Assy 2	01496441	1
10	Water Faucet fixed Plate	0184770301	1
11	Capacitor CBB61S	3301074704	1
12	Terminal Board	420001000003	1
13	Electric Box Cover Plate	01419521	1
14	Capacitor CBB61S	3301074701	1
15	Electric Base Plate Sub-assy	01287301	1
16	Rear Volute Casing	22202029	3
17	Front Volute Casing	22202030	3
18	Cover Plate Assy	0126633205	1
19	Centrifugal fan	10319051	3
20	Fan Motor	1570730105	1
21	Fan Motor	1570730220	2
22	Supporter	01719521	2
23	Air-bleeding Hose	76710060	1

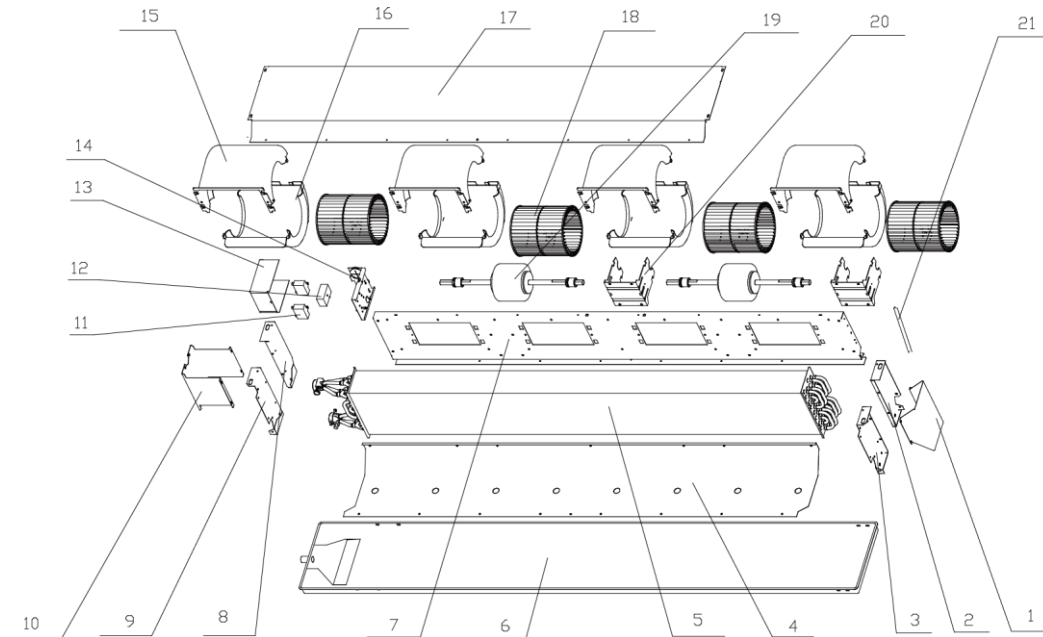
FP-170 WAF-R Explosive Views:



FP-170 WAF-R Part Lists:

No	Name	Code	Quantity
1	Surface Cooler Cover Sheet	0149642601	1
2	Right End-Plate Sub-Assy 1	01496440	1
3	Right End-Plate Sub-Assy 2	01496439	1
4	Base Plate	02226585	1
5	Surface-Cooler Assy	01126140	1
6	Water Tray Assy	12418818	1
7	Motor Retaining Plate	01729522	1
8	Left End-Plate Sub-Assy 1	01496442	1
9	Left End-Plate Sub-Assy 2	01496441	1
10	Water Faucet fixed Plate	0184770301	1
11	Capacitor CBB61S	3301074702	1
12	Terminal Board	420001000003	1
13	Electric Box Cover Plate	01419521	1
14	Electric Base Plate Sub-assy	01287301	1
13	Rear Volute Casing	22202029	4
16	Front Volute Casing	22202030	4
17	Cover Plate Assy	0126633206	1
18	Centrifugal fan	10319051	4
29	Fan Motor	1570730220	4
20	Supporter	01719521	2
21	Air-bleeding Hose	76710060	1

FP-204 WAF-R Explosive Views:



FP-204 WAF-R Part Lists:

No	Name	Code	Quantity
1	Surface Cooler Cover Sheet	0149642601	1
2	Right End-Plate Sub-Assy 1	01496440	1
3	Right End-Plate Sub-Assy 2	01496439	1
4	Base Plate	02226585	1
5	Surface-Cooler Assy	0112614001	1
6	Water Tray Assy	12418818	1
7	Motor Retaining Plate	01729522	1
8	Left End-Plate Sub-Assy 1	01496442	1
9	Left End-Plate Sub-Assy 2	01496441	1
10	Water Faucet fixed Plate	0184770301	1
11	Capacitor CBB61S	3301074705	1
12	Terminal Board	420001000003	1
13	Electric Box Cover	01426320	1
14	Electric Base Plate Sub-assy	01426319	1
13	Rear Volute Casing	22202029	4
16	Front Volute Casing	22202030	4
17	Cover Plate Assy	0126633206	1
18	Centrifugal fan	10319051	4
29	Fan Motor	1570730220	4
20	Supporter	01719521	2
21	Air-bleeding Hose	76710060	1

4. Scope of Supply

S: Standard; O: Prepared by the user; P: Purchased by the User

Scope of supply	Quantity	Unit	Type
Concealed ceiling FCU	1	Set	S
Thermostat	1	Piece	P
Motorized water valve	1	Piece	P/O
Delivery attached documentation	1	Set	S

Design & Selection

1. Selection Principle

1.1 Selection Steps

- (1) Select the unit type based on the air flow, cooling capacity and heating capacity.
- (2) Select the unit model based on the indoor cold/heat load, inlet air temperature, entering water temperature and related data sheet. The cooling/heating capacity of the selected unit should be or larger than the indoor cold/heat load.
- (3) Take consideration of noise of the building.
- (4) According to the allowable noise level of the corresponding building (see the next page for more details), check if the selected unit can meet the noise requirement)
- (5) Take hydraulic calculation to the duct system and then select the proper static pressure

1.2 Allowable Noise Level for Buildings

Type of Buildings	A-weighted Sound Level (dBA)
Recording studio, broadcast studio, dubbing room	20~25
Concert hall, theatre, television studio	25~30
Cinema, lecture theatre, meeting room	30~35
Office room, design office, reading room,	35~40
Restaurant, banquet hall, gym, hotel	40~50
Waiting room, shopping center	45~55
Cleaning room, office room with mechanical appliance	55~65

It is cited from Practical Design Manual of Heating Air Conditioning. If undesirable; reselect the unit with lower noise.

1.3 Example for Selection

For a room of some hotel, the sensible heat cooling load is 3180W, and all heat cooling load is 4090W, the inlet air dry bulb temperature is 27°C, the inlet air wet bulb temperature is 19.5°C, the air flow is 600m³/h, and the entering water temperature is 7°C. Based on these conditions, select a proper FCU. See the following figure for the connection diagram of the FCU.

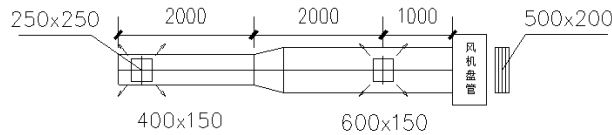


Figure 1 Connection Diagram of the FCU

Step 1: select the unit type based on the air flow, cooling capacity and heating capacity.

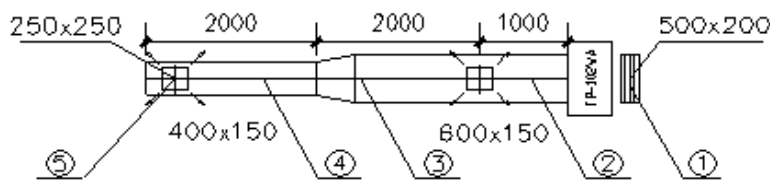
- a. Select the unit model based on the average cooling load.
- b. Select the cooling capacity at the high air flow to meet the average cooling load.
- c. Based on the inlet air 27℃/DB and 19.5℃ and entering water temperature 7℃, select from the data sheet get a cooling capacity equal to larger than the cooling load.
- d. When the cooling capacity is selected based on the medium or low speed air flow, then at specific or load peak, use the high-speed for meeting the load demand.
- e. For the model selected based on the cooling capacity, when the entering water temperature is 60℃, the water flow is the same as that for cooling and the heating capacity can meet the heat load demand.
- f. For the selected FP-85 based on the cooling capacity, the data sheet shows that its sensible heat cooling capacity is 4160W, the water flow is 0.21L/s, water resistance is 30kPa, and the air flow is 850m³/h.
- g. When the entering water temperature is 60℃, the heating capacity is 700W, which meets the load demand.

Step 2: Check the building noise

- a. According to the table in Section 1.2, the allowable noise for the hotel is 40~50dB (A). The design noise of the FP-85 is 42dBA and 44dBA for the FP-102, both of which can meet the noise requirement.

Step 3: Select the external static pressure

- a. Distribute the air flow for each duct and number them as shown in the figure below



- b. Based on the air flow and size of the duct in the figure above, calculate the duct resistance in accordance with the table below.

No.	Air flow (m ³ /h)	Duct width (mm)	Duct height (mm)	Duct length (m)	v(m/s)	ΔP_y (Pa)	ξ	ΔP_j (Pa)	$\Delta P_y + \Delta P_j$ (Pa)	Remarks
1	1020	800	200	0	2.83	0	3	5.64	5.64	Diffuser
2	1020	600	150	1	3.15	0.52	0.21	1.25	1.77	Supply air duct
3	510	600	150	2	1.57	0.3	0.1	0.15	0.45	
4	510	600	150	2	1.57	0.3	0	0	0.3	
5	510	250	250	0	2.27	0	1.28	3.95	3.95	Dissufer
Total				5		1.12		10.99	12.11	

According to the calculation results, the sum of the on-way resistance and the local resistance is:

$$P_L + P_J = 12.11Pa$$

The dynamic pressure of the diffuser is:

$$P_d = \frac{1}{2} \rho v^2 = \frac{1}{2} \times 1.2 \times 2.27^2 = 3.09Pa$$

For FP-102WA, based on the air flow of 1020m³/h and the outlet side of 820mm*130mm, the air speed at the air outlet is 4.95m/s.

The dynamic pressure is:

$$P_{dy} = \frac{1}{2} \rho v^2 = \frac{1}{2} \times 1.2 \times 2.66^2 = 4.24Pa$$

The required total external pressure is:

$$P_{yy} = 1.2(P_L + P_J + P_d) = 1.2 \times (12.11 + 3.09) = 18.24Pa$$

The required external static pressure is:

$$P_{yy} = 1.2(P_L + P_J + P_d - P_{dy}) = 1.2 \times (12.11 + 3.09 - 4.24) = 13.2Pa$$

The designed external static pressure is 12Pa, which is approach to the required external static pressure 13.2Pa. Therefore, the selection result is satisfactory.

When selecting units, the practice is to match the design sensible heat load with the required sensible load. In most cases, there is enough latent heat for the coils to meet the design requirement.

(1) Power Lines

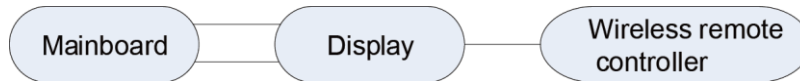
Model	Power Supply	Sectional Area (mm ²)
FP-*WA/G-K FP-*WAH/G-K FP-*WAS/G-K FP-*WAHS/G-K	220-240VAC 1Ph 50Hz	1
FP-*WA/G-D FP-*WAH/G-D FP-*WAS/G-D FP-*WAHS/G-D	208-230VAC 1Ph 60Hz	1
FP-*WA/GHL-K FP-*WAH/GHL-K FP-*WAS/GHL-K FP-*WAHS/GHL-K	220-240VAC 1Ph 50Hz	1

Note: “*” indicates the air flow between 34~204.

Unit Control

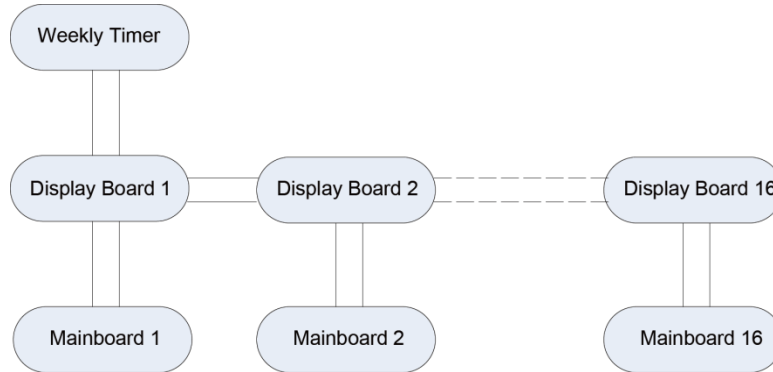
1. Control logic

(1) For the independent control system, the logic is showed as below:



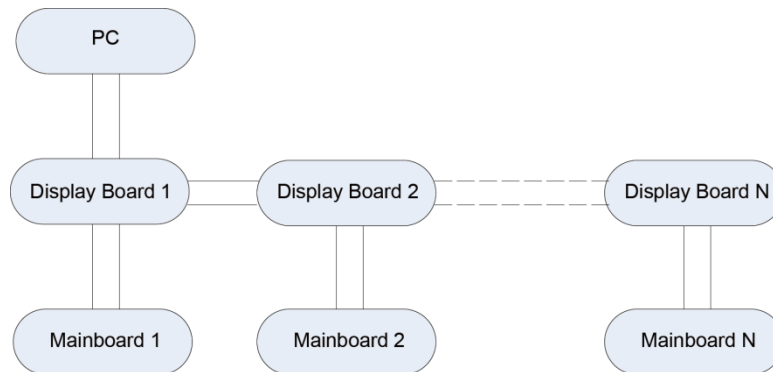
(2) AC connected with weekly timer

The control system is made up of one weekly timer and 16 units, one weekly time could control max. 16 units, and independently control the on/off time of every unit. The logic is showed as below:



2. AC connected with PC (long distance monitoring)

Long distance monitoring system could control max. 255 units and independently control the operation mode, fan speed, on/off of the unit, the control logic is as below:



3. AC control principle sketch

Following components could be controlled by the FCU: water pump (cassette type), water valve, fan, swing fan (cassette, horizontal exposed, vertical exposed), auxiliary electric heater and water overflow protection signal. The communication data between mainboard and display board is 485, the display board could be controlled by wireless remote controller.

Note: the concealed ceiling FCU is excluded in above information.

Unit Installation

1. Preparation before Installation

1.1 Tools

(1) General electric tools

◆ Hand-held electric drill

Usage: it is used for drilling holes at metals, wood or plastics etc.



◆ Cutter

Usage: the fiber-reinforced sheet wheel can cut the round or special shaped steel pipes, cast iron pipes, channel steel, and flat steel etc.



◆ Grinding machine

Usage: the fiber-reinforced line-shaped wheel can grind metal pieces and cut sectional materials. Before welding, a groove should be made, and fins and burrs of the work piece should be removed. Equipped with the diamond cut sheet, it can cut the non-metallic materials, like ceramic tiles, stones etc. Equipped with the special wheel, it can be used for cutting glass. Equipped with the wire brush, it can be used for de-rusting. Equipped with the rubber pad and sand paper, it can be used for polishing.



◆ Electric Hammer

Usage: equipped with the rigid alloy drilling bit, it is used for holes and grooves drilling and dabbing at the concrete, the stone, bricks etc.



◆ Percussion drill

Usage: there are two operating statuses for the percussion drill. Under the slow mode, with the auger bit, it can be used as the electric drill. Under the slew and percussion state, with the rigid alloy impact bit, it can be used to drill holes at the bricks, concrete and ceramic tiles.



(2) Specific electric tools

◆ Hand-held electric shears



Usage: it is used to cut the metal sheets, especially for edge and angle trimming.

◆ Rivet gun



Usage: it is used for self-plugging rivets at different structures, especially for single-side riveting of the leak-proof structure.

(3) Mostly used tools

Pipe pliers, screw drivers, rubber pads, rubber hammers, scissors, spanners, level bars, measuring tape, angle square, glue guns, brushes, ladders, pulleys etc.

1.2 Materials

◆ Pipes

The condensate pipe is generally the U-PVC pipe, connected with the special glue. Besides, PP-R pipes, PP-C pipes and galvanized steel pipes also are selectable, which all are with thread connectors.



◆ Sheets

Sheets are main materials for ducts, including the galvanized steel sheets, mild steel sheets, and aluminum sheets etc.

◆ Galvanized sheets



The galvanized sheet steel is made the general steel sheet Q195 or Q235A coated with zinc. Generally it is 0.5~1.5mm thick. No paint is required as its coating is corrosion-proof. It is widely used for the duct system under the moisture environment without acid mist.

See the table for the thickness of the galvanized steel sheets, unless there is special requirement on the thickness.

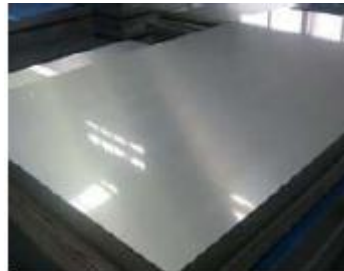
Diameter of the round duct or the larger side of the rectangular duct (mm)	Thickness (mm)	
	General duct	Return/exhaust duct
$\delta \leq 320$	0.5	0.6
$320 < \delta \leq 450$	0.6	0.75
$450 < \delta \leq 630$	0.6	0.75
$630 < \delta \leq 1000$	0.75	1.0
$1000 < \delta \leq 1250$	1.0	1.2
$1250 < \delta \leq 2000$	1.0	As designed
$2000 < \delta \leq 4000$	1.2	As designed

◆ Mild steel sheets



It is the cold or hot rolled Q235-B(GB700-1988) steel sheet. It is of excellent plasticity and processability. It can be easily welded, but it is likely to rust. Therefore, paint is required for corrosion protection.

◆ Stainless steel plate



The stainless steel sheet contains chlorine, nickel, and copper. It is high-temperature resistant and corrosion-proof. Its surface is white. As alloying elements contained in the stainless steel sheet are different, so corrosion resistance to different mediums varies. It can be widely used for the duct system under the corrosive chemical environment.

◆ Aluminum plate



It is classified into the pure aluminum plate and the aluminum alloy. Its specific weight is small. There is an aluminum oxide film covered at the surface. It is of excellent plasticity and acid resistance, but it is vulnerable to be corroded by alkalis and salts. It is generally used for the ventilation ducts under the acid environment. As the aluminum plate is quite soft, it would not generate sparks upon collision. Therefore, it is mostly used for the ventilation duct with explosion-proof requirements.

1.3 Drain Hose



Transparent drain hose should be selected so that it is able to clearly see the flow status. Length of the drain hose is generally about 150mm. The hose should be connected to the unit and the drain pipe by the pipe clamps for further maintenance but not by glue. Besides, the drain house should be anti-shock.

1.4 Insulation

The insulation is used for thermal insulation. The mostly used insulation is loose fiber and porous material. For FCU, the mostly used insulation is PEF and foam rubber.

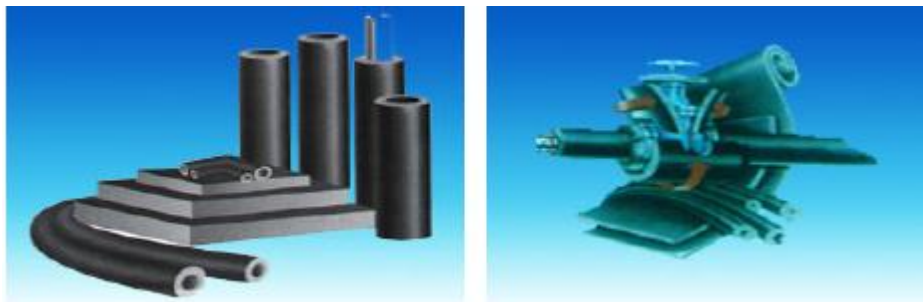
◆ PEF foam plastic

Using the advanced foaming technology, it is soft, light-weighted, fire-proof, and corrosion-proof. It can be widely applicable to insulation for buildings, cold storages, air conditionings and low-temperature pipes. Its operation is easy and simple.



◆ Foam Rubber

It is mainly made of buna-n rubber and PVC. It is a high-foaming closed-cell elastic body, with small density, low thermal conductivity coefficient, good weatherability, shock-absorbed, noise-absorbing, flame-retardant and water-proof. Besides, its temperature range is wide, and no pollutant would be generated during production and use. It is an environment friendly product.



Condensate pipe	Insulation thickness	Materials
Various diameter sizes	≥ 15	B1 or above nonflammable rubber foam pipe
The thickness should be enlarged when it is used under moisture environment.		

(1) Hangers and Supporters

- a. Hanger: M8 or M10
- b. Channel steel: #14 or above
- c. Angle steel: 30mm×30mm×3mm or above
- d. Round steel: above Φ10mm



(2) Power lines

Type and size of the power lines should meet relative design regulations. When there is no specific regulation, the minimal sectional area of the conduct cores under different laying mode should refer to the user's manual of the FCU.



(3) Anti-corrosion materials

The commonly used anti-corrosion materials include paint, resin and asphalt etc.

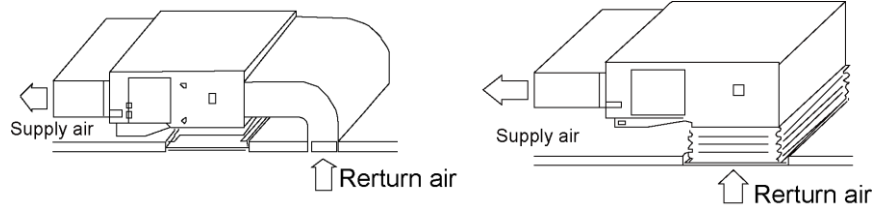
2. Installation

2.1 Precautions for Installation

- (1) The unit should be installed in accordance with instructions covered in the user's manual and make sure enough maintenance space is reserved around the unit. The air inlet and outlet should be far away from obstacles, so that air flow can go through everywhere of the room. When the heat exchanging room is too small, it would lead to decreased capacity.

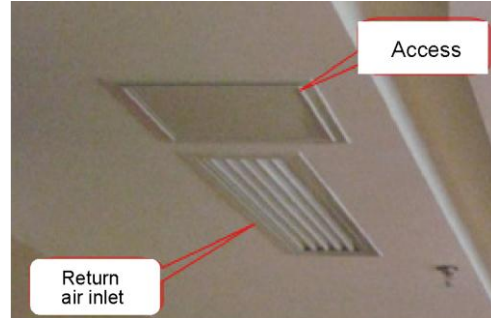
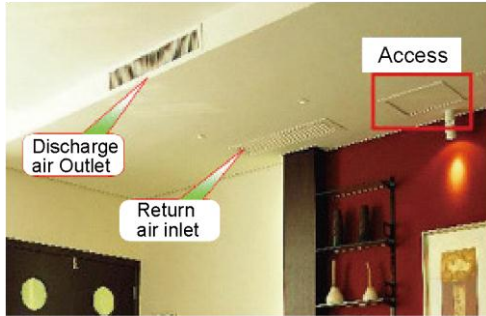


- (2) The unit should be installed where no smog, corrosive and inflammable gases are present, otherwise the unit would fail to run normally or its service life would be shortened.
- (3) The supply air outlets, return air inlets, ducts and diffusers should be arranged properly so that the supply air flow will be even and smooth. For where there is high requirement on noise, back return air should be adopted rather than downward return air, like offices, guest rooms of the hotels, wards of hospitals. Insulation can be used for ducts to reduce noise.



Back Return Air (Recommended) Downward Return Air

(4) An access no less than 300*400 must be reserved at the same side with the electric box.



- ◆ During installation of the hanger bolts, check if the installation location can withstand four times weight of the unit. If not, reinforce it.
 - ◆ During installation, the unit should be kept horizontally. The hanger should not bear the weight of ducts, water pipes and others. Besides, check its security periodically.
- (5) Valves should be equipped at the inlet and outlet. During installation, do protection against dust for the unit.

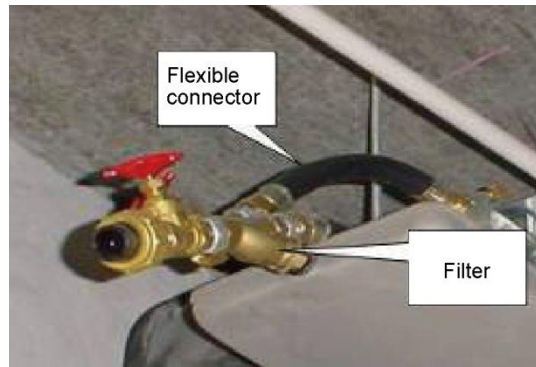


Equip valves at the inlet and outlet.



Cover the unit with the plastic bag during installation.

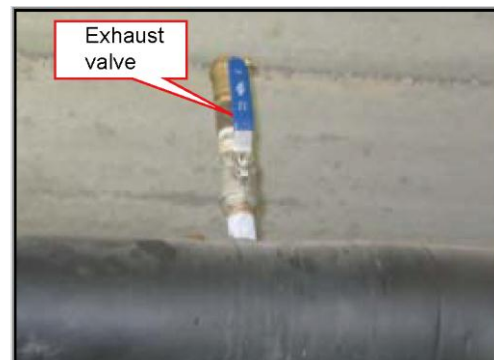
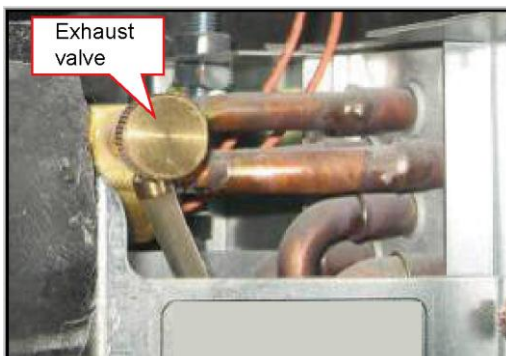
(6) The flexible connectors or the movable joints should be used for connection of the water inlet and outlet pipes. Moreover, the water filters should be installed at the water inlet pipe.



- (7) Teflon tape should be used for connection of the inlet and outlet pipes. No leak is allowed.
- (8) Pipes should be insulated to prevent from generating condensate.

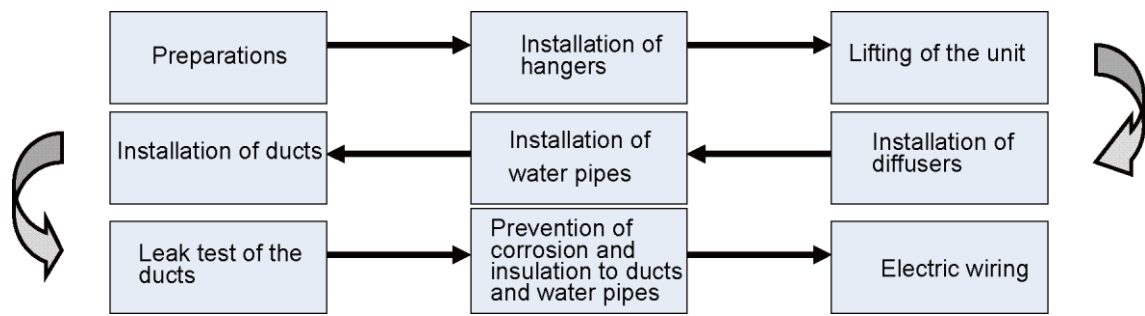


- (9) The condensate pipe should not be blocked with a grade of slope no less than 5%.
- (10) A filter should be installed at the return air inlet and cleaned periodically so as to not affect the heat exchanging efficiency.
- (11) For initial operation, open the exhaust valve at the return water pipe to expel air inside coils. Then, close it until water flows out.



- (12) Temperature of the cold water should not be lower than 5℃ and not higher than 70℃ for hot water. Water should be clean. The unit should be entirely maintained every 2~3 years. Water scale inside coils should be removed by chemical method so as to guarantee the heat exchanging performance.
- (13) The air outlet and the duct should be connected with the flexible connector and shall not bear the weight of valves, pipes and other devices.
- (14) Wiring arrangement should be performed in accordance with the safety standards for electric devices and local relative regulations. Special electric circuits should be used. When capacity of the electric circuits is poor or electric operation is improper, it would lead to electric shocks or fire hazards etc.
- (15) The earth leakage circuit breaker should be installed for each installation location. The unit should be grounded; otherwise it would lead to electric shocks.

2.2 Installation Steps

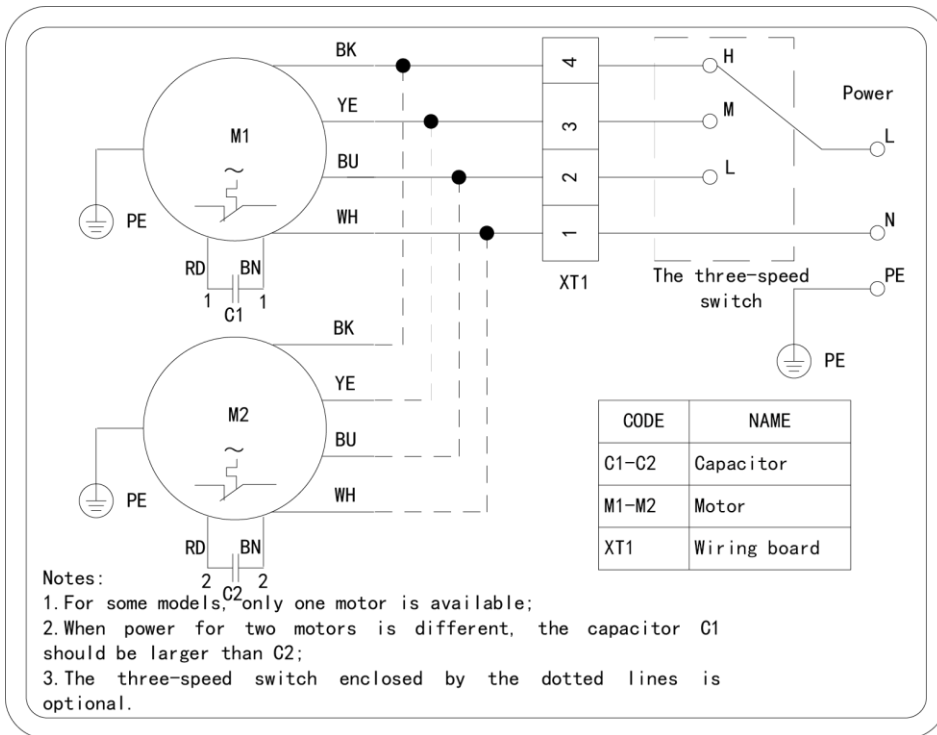


Test Operation & Troubleshooting & Maintenance

1. Error List

No	Symptoms	Possible Causes	Corrective Measures
1	The unit does not run.	There is no power supply.	Repower the unit when power supply is
		The power plug is loosened.	Tighten the power plug.
		The motor is burnt out.	Replace the motor and check for the wiring
2	There is abnormal noise.	The volute or blade is deformed, or the volute contacts the blade.	Replace the volute or the blade.
		The air filter is clogged.	Clean the filter.
		There are foreign matters at the inlet/outlet or inside the duct.	Remove foreign matters.
		There is abnormal noise from the motor.	Replace the motor.
		The fastening screws are loosened.	Tighten them.
3	The airflow rate is too low.	The air filter is clogged.	Clean the air filter.
		There are foreign matters at the return	Clear foreign matters.
		The duct resistance exceeds the design value.	Lower the duct resistance or reselect the unit.
4	The cooling or heating effect is poor.	The air filter is clogged.	Clean the air filter.
		The dampers are not opened.	Open the dampers.
		The fins are clogged or damaged.	Clean or repair fins.
		The entering water temperature cooling is too high and too low for cooling.	Adjust the entering water temperature.
5	Water leaks.	The condensate pipe is clogged.	Clean the drain pipe.
		The unit is not installed as required.	Adjust the unit and let the unit keep a certain inclination degree.
		The environmental air humidity is too high.	Do humidification and do not let the high-temperature and high-humidity air
		The fan stops but cold water is supplied continuously.	Close the water dampers or run the unit.
		The discharge valve is not tightened.	Tighten the discharge valve.

2. Electric Diagrams



The wiring diagrams as shown above are just for reference. Those struck to the main body of the unit always prevail for repair and maintenance.

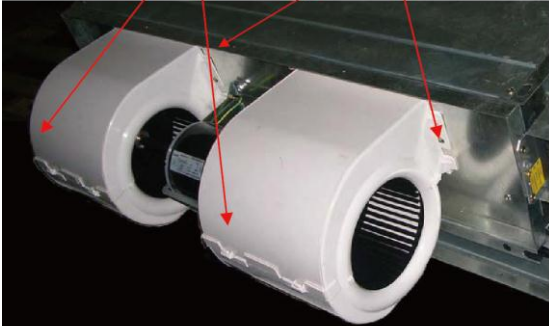


WARNING

Electric wiring and piping for the FCU should be done by the qualified servicemen.

3. Replacement of Key Parts

3.1 Replacement of the Motor

Steps	Graphical Representation
<p>① Remove the rear volute casing.</p> <ul style="list-style-type: none"> ● Press the rear volute casing to release the locks. (see Fig.1) ● Take out the rear volute casing downwards. 	<p>Locks (2 per each volute casing)</p> <p>Tapping screws (2 per each volute casing)</p>  <p>Fig. 1</p>

- ② Remove the fan blades
- Loosen the fixing screws with a special Allen screwdriver or spanner from the notch (see Fig.2)
 - Drag the fan blades out.
- ③ Remove the front volute casing
- Loosen the fixing screws (see Fig.1)
 - Take out the front volute casing.

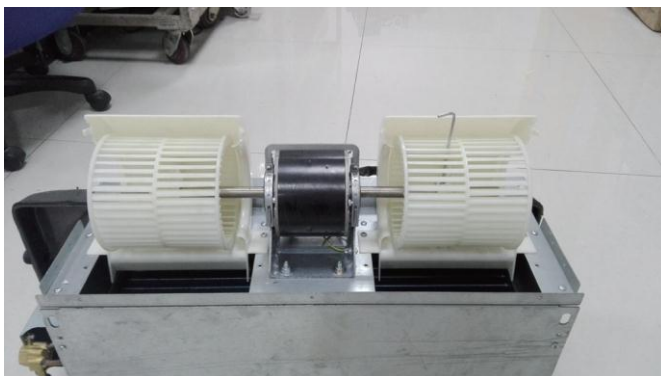


Fig.2

- ④ Remove the motor
- Loosen the fixing screws on the motor and remove the clamping band and the hoop (see Fig.3)
 - Loosen the grounding screws and disconnect the ground wire.
 - Loosen the screws on the electric box and remove the cover plate of it.
 - Remove the connecting inserter of motor from the terminal board of the electric box and the capacitor.
 - Cut the tie wire, disconnect the connection wire, and take out the motor.

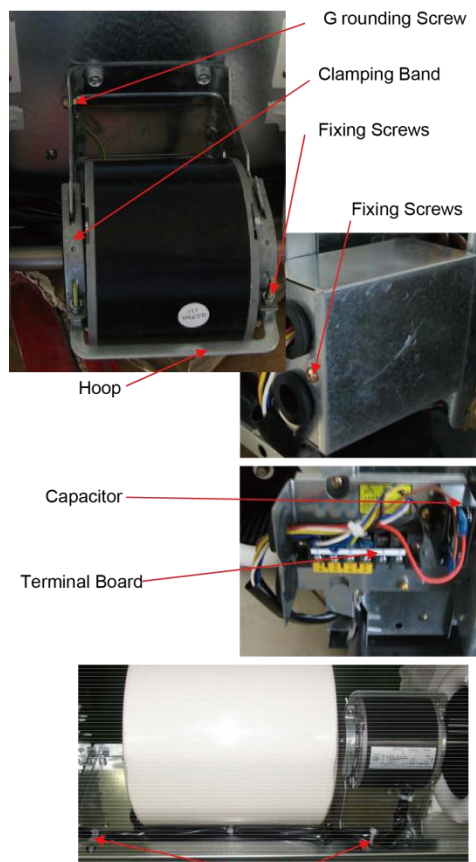
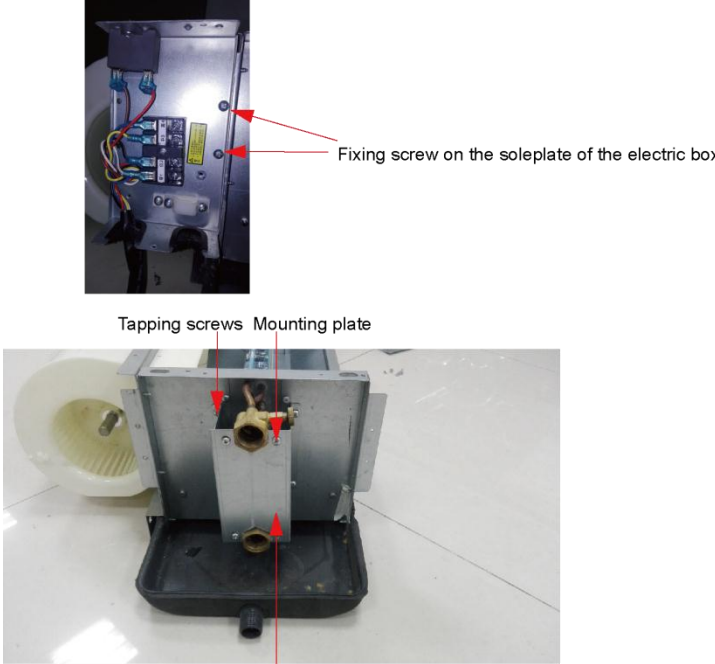
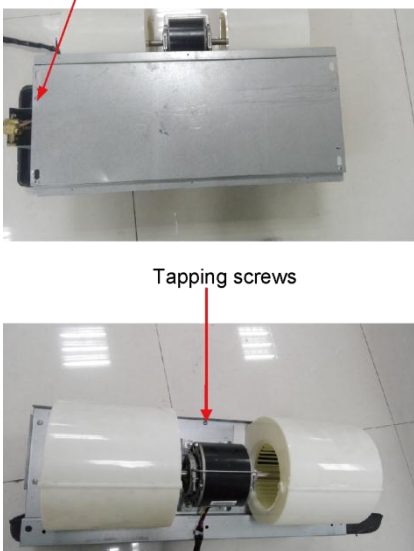


Fig.3

3.2 Replacement of the Cooler

Steps	Graphical Representation
<p>① Remove the mounted plate of the liquid distributor</p> <ul style="list-style-type: none"> ● Take out the cove plate of the electric box (see Fig 3) ● Loosen one fixing screw on the soleplate of the electric box (see Fig.4) ● Turn the soleplate of the electric box. ● Loosen fixing screws on the mounted plate. ● Loosen tapping screws on the mounted plate ● Take out the mounted plate 	 <p style="text-align: center;">Fig.4</p>
<p>② Remove the cover plate</p> <ul style="list-style-type: none"> ● Loosen the tapping screws on the cover plate and other relative components (see Fig.5). ● Take out the cover plate. 	 <p style="text-align: center;">Fig 5</p>

③ Remove the cooler.

- Loosen the tapping screws on the side plate (see Fig.6)
- Loosen the tapping screws on the end sides
- Take out the end plates
- Take out the cooler upwards.



Tapping screws (total 14 pieces)



Fig.6



GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI

Add: West Jinji Rd, Qianshan, Zhuhai, Guangdong, China, 519070

Tel: (+86-756) 8522218 Fax: (+86-756) 8669426

E-mail: gree@gree.com.cn www.gree.com

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