



BOSCH Climate 5000

Modular Air Handling Unit



BOSCH

Invented for life

Introduction to Bosch Thermotechnology

Bosch Thermotechnik GmbH is a leading supplier of resource-efficient heating products and hot water solutions in Europe. In fiscal 2011, the company generated sales of 3.1 billion Euros (68% outside Germany) and employed approx. 13,900 people. Bosch Thermotechnology has strong international and regional brands and manufactures a diversified product range in 21 plants in 11 European, North American and Asian countries. In 2011, Bosch Thermotechnology invested 127 million Euros in research and development, roughly 10.4% more than in the previous year. Intelligent networks and local systems for heating, ventilation, air-conditioning and electricity generation are fundamental technologies for the future building standard, which will generate more energy than is used.

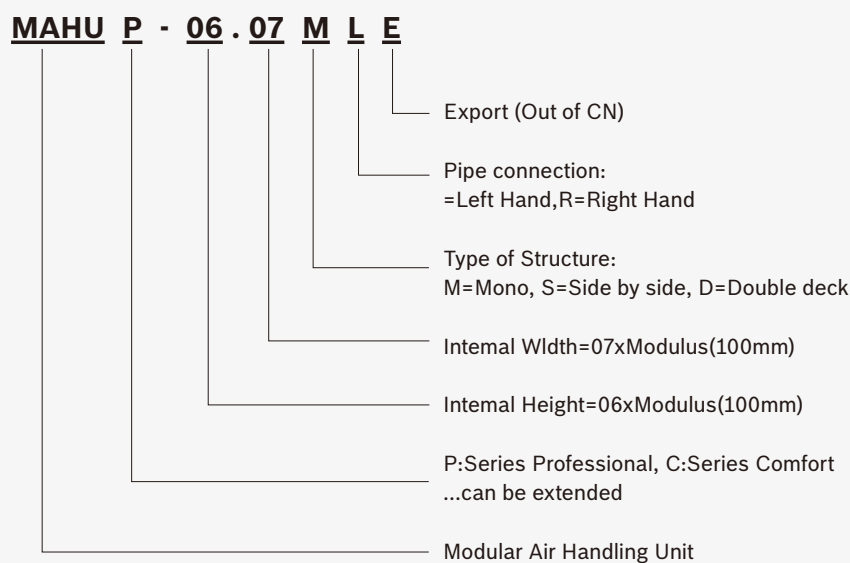
Bosch Thermotechnology (Shandong) Co. Ltd is a division of Bosch Thermotechnology with focus on providing energy efficient cooling, heating and comfort hot water equipment & solutions for commercial and industrial segments.

The division employs approx. 260 people with more than 40 engineers, and has a plant of 80000sqm with state-of-art manufacturing facility and high-demanding quality management system.

A comprehensive range of renewable heat pumps, chillers, fan coil units and air handling units meets almost all kinds of requirement from buildings like office, hospital, hotel, shopping mall or industrial plants.

Bosch Climate 5000 modular air handling unit adopts innovative double skin casing structure combining with Bosch's delicate industrial design and state-of-the-art engineering technologies and meets the customer requirements of different functional section combinations. It is widely used in places like workshop, shopping mall, hotel, office building, airport, theatre, pharmaceutical factory and etc.

Nomenclature



Features

Excellent Industrial Design

Professional German industrial design won 2013 Focus public design awards in Baden - Wuerttemberg International Design Competition.

Casing Structure

Bosch Modular AHU is unique for its innovative double skin casing structure which can meet EN1886. Double skin panels are tightly fixed onto a strong aluminum alloy frame with engineering plastic junctions.

- ▶ Outer Panel: Color Painted Sheet
Inner Panel: Zinc-galvanized Sheet;
Outer and inner panels realize heat insulation by filled Polyurethane Foam (mineral wool as an option).
- ▶ Highly strong aluminum alloy frame with surface oxidizing treatments, good-looking and anticorrosive.



Casing



Interior structure

- ▶ Completely smooth inside, without any screw and welding joint, easy to clean, can be used for Clean Air Conditioning.
- ▶ Panel and frame adopt new closed type sealing strip for sealing without any seams, which ensures good airtightness and cold bridge proof performance of unit.



Frame Structure



Sealing strip

(Options for material of outer panel and inner panel : color painted sheet, zinc-galvanized sheet, stainless steel sheet)

Heat Exchanger and Drain Pan

- ▶ Heat exchanger set on slide can be drawn out at side to perform clean and maintenance work.
- ▶ Seamless copper tube and hydrophilic aluminum fin are combined through mechanical pipe expansion.
- ▶ Drip eliminator can be chosen to prevent the drain water from drifting out, which is also drawable on slide for clean and maintenance.

Outstanding Performance

Mechanical strength: D1 (Maximum relative deflection : $4 \text{ mm} \times \text{m}^{-1}$)

Thermal transmittance class : T2 (Thermal transmittance $U \text{ W} \times \text{m}^{-2} \times \text{K}^{-1}$: $0.5 < U \leq 1.0$)

Thermal bridging class : TB2 (Thermal bridging factor k_b : $0.60 \leq k_b < 0.75$)

Air leakage rate: L1 (Maximum leakage rate f_{400} : 0.15, f_{700} : 0.22)

By-pass air leakage rate: F8 (Maximum leakage rate: 1)

Service Door

- Unique square observation windows made of polycarbonate comply with VDI6022 and reach the UL94V flame retardant class.
- Doorknob uses adjustable bolt, which can be adjusted according to the thickness of panel. PA protective cover effectively prevents the panel from abrasion and reduces the corrosion.



Observation window



Adjustable doorknob



Red doorknob

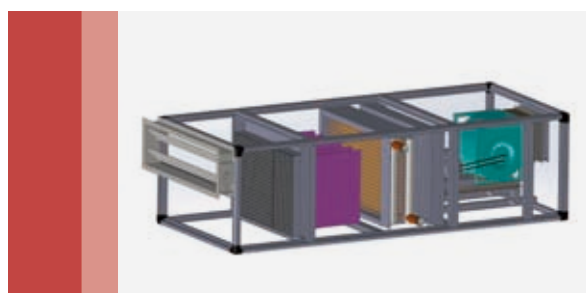


Yellow doorknob

- Red doorknob is equipped inside in order for escape from inside
- Yellow two-step-open doorknob is prepared on the positive pressure segment of the unit, effectively protects the people and unit.

Modulus Design

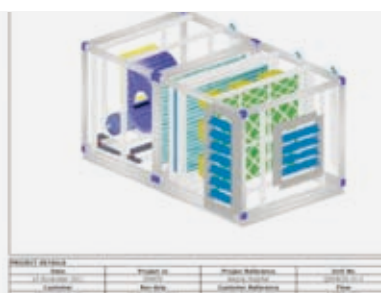
The length, width and height of unit can be in 100mm modulus superposition, which can meet various requirements of customers. Moreover, modulus design contributes to save material to the utmost and makes selection and manufacturing more convenient.



Modular design

Selection Software

Brand new modular air handling unit selection software with rigorous calculation and comprehensive report makes design work more convenient and reliable.



Selection software

Quick Selection

Model	Interior Net Height mm	Interior Net Width mm	Air Flow m ³ /h	Effective Area m ²	Air Flow Calculation m ³ /h				
					2.0m/s	2.25m/s	2.5m/s	2.75m/s	3.0m/s
MAHU-06.07	600	700	2000	0.26	1894	2131	2368	2605	2842
MAHU-06.09	600	900	3500	0.37	2637	2967	3297	3626	3956
MAHU-07.11	700	1100	5000	0.58	4173	4694	5216	5738	6259
MAHU-08.11	800	1100	6000	0.64	4587	5161	5734	6308	6881
MAHU-09.12	900	1200	7000	0.84	6019	6771	7524	8276	9028
MAHU-09.13	900	1300	8000	0.90	6500	7313	8125	8938	9751
MAHU-10.13	1000	1300	9000	0.97	6998	7873	8748	9622	10497
MAHU-10.15	1000	1500	10000	1.15	8294	9331	10368	11404	12441
MAHU-11.17	1100	1700	13000	1.52	10954	12323	13692	15062	16431
MAHU-12.17	1200	1700	15000	1.62	11636	13090	14545	15999	17454
MAHU-14.18	1400	1800	18000	2.12	15237	17142	19047	20951	22856
MAHU-14.20	1400	2000	20000	2.39	17178	19326	21473	23621	25768
MAHU-14.22	1400	2200	23000	2.66	19120	21510	23900	26290	28680
MAHU-16.22	1600	2200	25000	3.03	21843	24573	27304	30034	32765
MAHU-18.22	1800	2200	28000	3.29	23715	26680	29644	32609	35573
MAHU-19.22	1900	2200	30000	3.55	25531	28722	31914	35105	38296
MAHU-20.25	2000	2500	35000	4.09	29419	33096	36774	40451	44128
MAHU-21.25	2100	2500	40000	4.38	31511	35450	39389	43327	47266
MAHU-22.26	2200	2600	45000	4.81	34639	38969	43299	47629	51959
MAHU-23.28	2300	2800	50000	5.55	39940	44933	49926	54918	59911
MAHU-25.28	2500	2800	55000	5.87	42281	47567	52852	58137	63422
MAHU-25.31	2500	3100	60000	6.57	47275	53185	59094	65004	70913
MAHU-25.34	2500	3400	65000	7.12	51270	57679	64088	70497	76906
MAHU-26.34	2600	3400	70000	7.52	54109	60873	67636	74400	81164
MAHU-28.36	2800	3600	75000	8.84	63668	71627	79585	87544	95503
MAHU-28.38	2800	3800	80000	9.38	67550	75994	84438	92882	101326
MAHU-29.40	2900	4000	90000	9.92	71433	80362	89291	98220	107149
MAHU-32.40	3200	4000	100000	11.33	81607	91808	102009	112210	122411

Note: Bosch Climate 5000 MAHU should be selected mainly according to air flow

1. Select coil according to face air speed:

--Cooling coil: max. face air speed is 2.5m/s

--Cooling coil with drip eliminator: max. face air speed is 3m/s

--Heating coil: max. face air speed is 3.5m/s

2. When use rotary wheel or plate heat recovery, select as follows,

--Plate heat recovery: max. face air speed is 4.0m/s, the best face air speed is 3.5m/s

--Rotary wheel heat recovery: max. face air speed is 5.5m/s, the best face air speed is 3.5m/s

Specification-cooling

Model	Air Flow	Fresh Air Condition						Circulating Air Condition					
	(m ³ /h)	4 Rows		6 Rows		8 Rows		4 Rows		6 Rows		8 Rows	
		Total Cooling Capacity kW	Sensible Cooling Capacity kW	Total Cooling Capacity kW	Sensible Cooling Capacity kW	Total Cooling Capacity kW	Sensible Cooling Capacity kW	Total Cooling Capacity kW	Sensible Cooling Capacity kW	Total Cooling Capacity kW	Sensible Cooling Capacity kW	Total Cooling Capacity kW	Sensible Cooling Capacity kW
06.07	2368	33.9	14.6	42.4	18	44.1	18.7	13	9.8	18.5	12.6	21.1	13.8
06.09	3297	44.4	18.7	55	23.4	62.3	26.4	17.9	12.8	26.6	17.8	30	19.6
07.11	4957	70.3	30.2	85.3	36.3	95.7	40.5	28.3	20.2	42.6	28.9	44.9	28.3
08.11	5734	77.3	32.5	100.2	42.5	108.9	45.7	32.3	23	43.6	29.2	49.9	32.9
09.12	7236	102.3	44	127.1	53.9	136.8	57.5	42.1	29.9	57.9	38.8	65.5	41.5
09.13	7814	111.3	46.4	132.8	57.1	146.9	62.5	46	32.8	61.8	42	71.5	45.1
10.13	8748	119.8	51.5	148.6	63.9	164.5	70	49	34.7	67.4	46.1	78.7	51.7
10.15	10368	143.1	60.1	177.1	76.2	192.7	80.9	59.5	43.9	80.9	54.5	93.7	61.1
11.17	13266	175.3	75.4	220.6	94.9	247.8	104.1	84.3	62.1	109.5	71.3	124	78.4
12.17	14545	180.4	73.9	243.6	104.7	272.3	114.4	89.7	65.9	116.5	80.1	132.1	86.1
14.18	18538	255.2	109.7	312	134.2	346.3	145.4	118.1	85.6	152.8	102.6	163.8	105.7
14.20	20900	277	116.3	343.2	147.6	383.4	162.4	136.4	99.1	173.1	115.5	184.2	119
14.22	23261	320.3	137.7	385	165.5	424.7	180	152	110.4	195.5	129.8	205.3	132.5
16.22	26736	352.2	147.9	441.7	189.9	488.7	207.1	173.7	125	222.8	147.6	237.3	153.5
18.22	28509	376.5	161.9	470.4	202.3	520.3	220.2	188.5	135	241.9	157.3	259.1	164.3
19.22	30779	408.5	171.6	507.2	216.3	557.8	236.4	203	145.5	260.4	169.6	278.6	177.3
20.25	36774	481.7	207.1	603.9	257.7	*632.4	*282.2	241.6	172.5	292.7	196.6	321.8	212.1
21.25	39389	519.9	223.6	646.9	276	*670.2	*299.2	260	184.6	309.6	208.1	346.6	228
22.26	41951	571.5	240	680.6	290.8	*713.8	*318.7	286.6	207.5	340.3	221.6	389.7	246.4
23.28	48463	654	281.2	*743.28	*334.5	*821.6	*366.8	334.5	240.2	389.7	253.1	439.3	281.8
25.28	52852	687.1	288.6	*797.0	*359.4	*883.9	*395.0	354.1	253.2	412	279.4	465.1	306.8
25.31	59094	774.1	332.9	*891.1	*401.9	*1036.3	*461.3	390	278.5	467.2	317.1	514.1	339.2
25.34	64088	846	352.8	1063.9	455.3	1183	500.2	423	300.7	513.3	347.5	557.6	367.5
26.34	65862	886	381	1093.3	467.9	1215.7	514.1	453.2	323.1	542.4	355.9	595.2	381.3
28.36	77696	1035	434.5	1289.8	552	1434.1	606.4	533.2	377.5	639.9	426.8	692.4	441.1
28.38	82434	1089	468.4	1368.4	585.7	1521.6	643.4	557.3	410.7	677.2	447.6	743.1	479.3
29.40	89291	1143	480	1482.2	634.4	1648.2	697	589.3	433.7	719.7	485	785.8	518.3
32.40	99889	1306	561.5	1658.2	709.7	1843.8	779.7	673.3	494.2	818.7	547.7	897.7	580

Note:

Fresh Air Condition; entering air temp: 35°C DB/28°C WB, entering water temp: 7°C, temp difference between entering water and leaving water is 5°C;

Circulating Air Condition: entering air temp: 27°C DB/19.5°C WB, entering water temp: 7°C temp, difference between entering water and leaving water is 5°C;

* means the temp difference between entering water and leaving water is more than 5°C in order to control the water pressure drop.

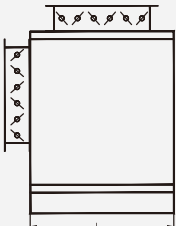
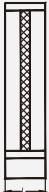
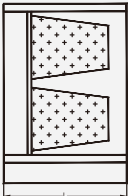
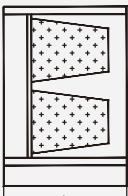
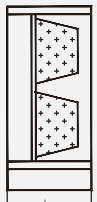
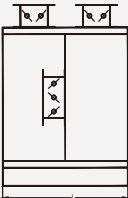
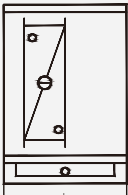
Specification-heatling

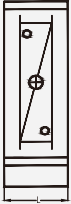
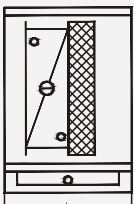
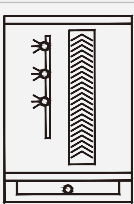
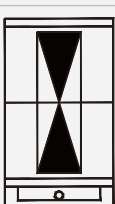
Model	Air Flow (m ³ /h)	60°C Entering Water			70°C Entering Water			80°C Entering Water		
		Total Heating Capacity kW	Water Flow m ³ /h	Water Resistance kPa	Total Heating Capacity kW	Water Flow m ³ /h	Water Resistance kPa	Total Heating Capacity kW	Water Flow m ³ /h	Water Resistance kPa
06.07	2368	13.7	1.2	2.7	21.7	1.9	6	24.6	2.1	7.5
06.09	3297	22	1.9	6.2	30.3	2.6	10.7	34.9	3	13.7
07.11	4957	36.3	3.1	10	46.8	4	15.5	53	4.5	19.3
08.11	5734	39.5	3.4	9.8	55.2	4.7	17.5	65.8	5.6	23.8
09.12	7236	53.9	4.6	12.6	69.2	5.9	19.4	82.8	7.1	26.5
09.13	7814	58.2	5	14.4	74.8	6.4	22.2	89.4	7.7	30.3
10.13	8748	65.6	5.6	15.6	84.2	7.2	24	100.6	8.6	32.7
10.15	10368	78.4	6.7	21.2	92.3	7.9	28.2	119.3	10.2	44
11.17	13266	93.5	8	22.8	118.5	10.2	34.5	140.8	12.1	46.6
12.17	14545	110.4	9.5	27.4	129.3	11.1	36.1	154.3	13.2	49.2
14.18	18538	140.4	12	8.6	165.2	14.2	11.5	197.1	16.9	15.6
14.20	20900	149.2	12.8	9.6	193.1	16.6	15.1	232.1	19.9	20.7
14.22	23261	166.1	14.2	11.6	215	18.4	18.1	258.4	22.1	25
16.22	26736	189.6	16.3	11.6	246.4	21.1	18.2	301.2	25.8	25.9
18.22	28509	202.3	17.3	11.3	262.9	22.5	17.8	316.1	27.1	24.5
19.22	30779	221.7	19	11.6	286.2	24.5	18.1	345	29.6	25
20.25	36774	265.7	22.8	15.9	344.5	29.5	25	413.6	35.5	34.3
21.25	39389	303.3	26	17.8	368.4	31.6	24.9	440.4	37.7	34
22.26	41951	297.1	25.5	15.3	377.2	32.3	23.2	448.5	38.4	31.3
23.28	48463	374.3	32.1	20.6	454.4	38.9	28.8	521.6	44.7	36.7
25.28	52852	386.9	33.2	19.7	506.4	43.4	31.5	604.3	51.8	42.9
25.31	59094	432.6	37.1	24	547.9	47	36.2	652.8	56	49.1
25.34	64088	469.2	40.2	27.6	594.2	50.9	41.7	708	60.7	56.5
26.34	65862	482.2	41.3	26.4	610.7	52.3	39.8	727.5	62.4	53.9
28.36	77696	568.8	48.8	29.5	720.4	61.7	44.5	858.3	73.6	60.4
28.38	82434	603.5	51.7	32.7	764.3	65.5	49.4	910.6	78.1	66.9
29.40	89291	653.7	56	37.6	827.9	71	56.7	986.4	84.5	76.9
32.40	99889	731.3	62.7	36.2	926.1	79.4	54.6	1103	94.6	74.1

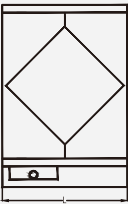
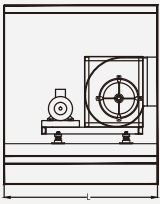
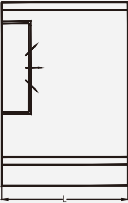
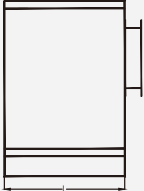
Note:

Circulating Air Condition: entering air temp: 15°C, temp difference between entering and leaving water: 10°C.

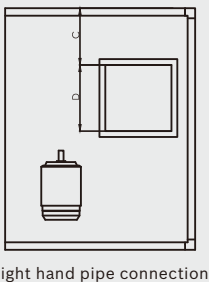
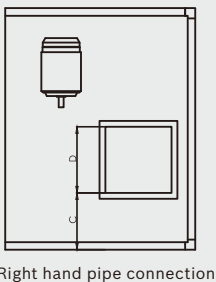
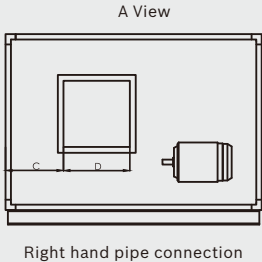
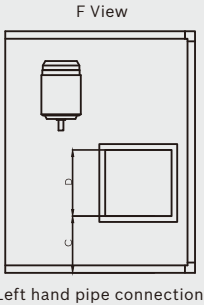
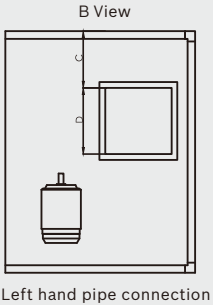
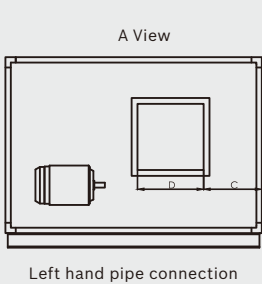
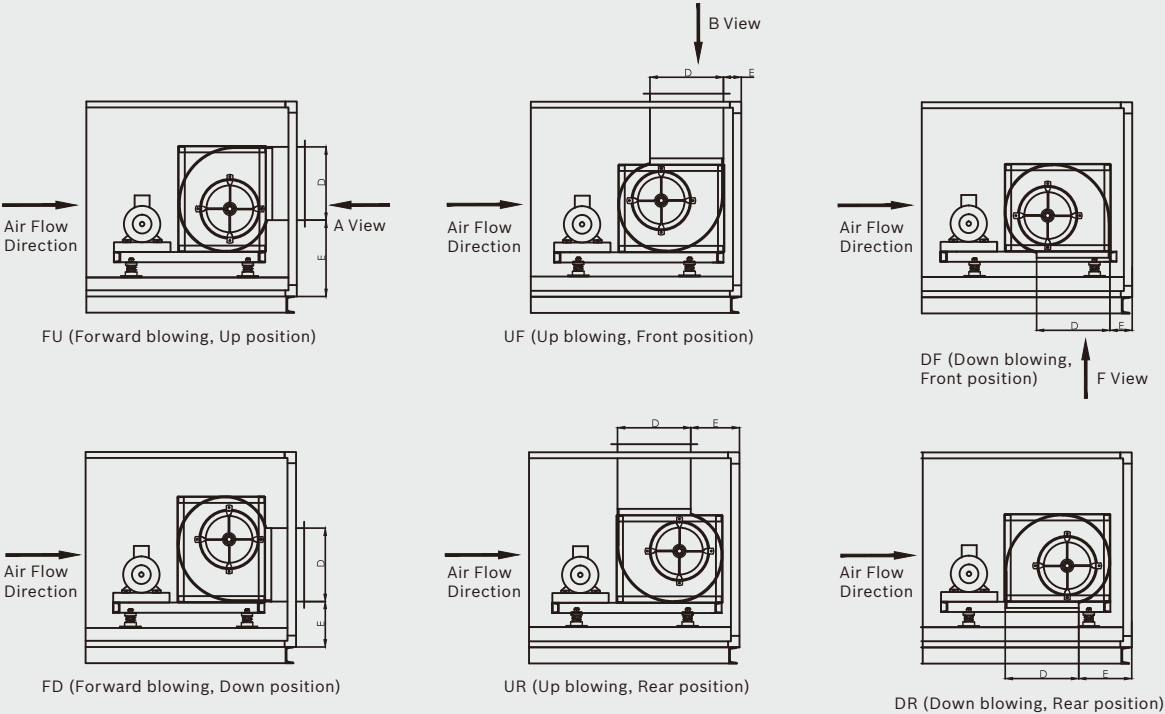
Functional Section

Functional Section	Symbol	Length(1M=100mm)		Remark
Fresh /Recycling Air Mixing Section		Size	L	Fresh /Recycling Air Mixing Section can be used as service section and can be used as primary filtering section when combining with plate filter.
		06.07~12.17	6M	
		14.18~20.25	8M	
		21.25~26.34	10M	
		28.36~32.40	12M	
Plate Filtering Section		1M		Options: G3/G4/G5 Plate filter can be placed in Air Mixing Section
Bag Filtering Section				Options: F5/F6/F7/F8/F9 A service section must be set prior to Bag Filtering Section
Integrated Filtering Section				A service section must be set prior to Integrated Filtering Section
W-type Filtering Section				Options: H10/H11/H12/H13 A service section must be set prior to W-type Filtering Section
Fresh/Recycling/Exhausting Air Mixing Section		Size	L	
		06.07~20.25	12M	
		21.25~26.34	15M	
		28.36~32.40	18M	
Cooling Coil Section		Rows	L	Drip eliminator can be added in Cooling Coil Section without extra section length
		1~6	6M	
		8~12	9M	

Functional Section	Symbol	Length(1M=100mm)		Remark
Heating Coil Section		3M		Without drain pan
Steam Coil Section		3M		Without drain pan
Electric Heating Section		Rows 1~2 3	L 3M 4M	Without drain pan
Wet Film Humidifying Section		Position Set in cooling section Set separately B=the length of cooling coil section, T=the thickness of wet film humidifier	L L (T ≤100mm)(T=100-300) B +0M B +2M 6M 6M	Share drain pan with cooling coil section or use one drain pan separately
Dry Steam Humidifying Section		Set before Fan Motor Section Set after Fan Motor Section	6M 6M	
High-pressure Spraying Section		10M		With drip eliminator
Rotary Wheel Heat Recovery Section				L depends on actual condition

Function Section	Symbol	Length(1M=100mm)		Remark
Plate Type Heat Recovery Section				L depends on actual condition
Fan Motor Section				Refer to fan motor section table for length
Diffusing Section		6M		
Sound Absorbing Section		6M/12M		A service section must be set prior to Sound Absorbing Section
Empty Section		6M		Empty section can be used as service section
Air Outlet Section		Size 06.07~12.17 14.18~20.25 21.25~26.34 28.36~32.40	L 6M 8M 10M 12M	Air outlet can be set at side and top of section

Air Outlet Direction and Flange Dimensions



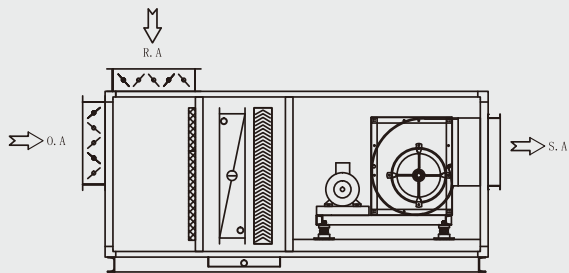
Air Outlet Direction and Flange Dimensions

Model	Fan Motor	C	D	E					
				FU	FD	UF	UR	DF	DR
06.07	180	201	229	329	230	180	224	180	224
06.09	225	232	288	349	229	180	244	180	244
07.11	280	271	361	377	230	180	272	180	272
08.11	280	271	361	377	230	180	272	180	272
09.12	315	295	404	421	253	180	291	180	291
09.13	355	323	453	447	255	180	317	180	317
10.13	355	323	453	447	255	180	317	180	317
10.15	400	355	507	475	254	180	345	180	345
11.17	450	435	569	502	256	180	372	180	372
12.17	450	435	569	502	256	180	372	180	372
14.18	500	475	638	539	267	180	396	180	396
14.20	560	523	715	572	269	180	429	180	429
14.22	560	523	715	572	269	180	429	180	429
16.22	630	579	801	612	270	180	469	180	469
18.22	630	579	801	612	270	180	469	180	469
19.22	630	579	801	612	270	180	469	180	469
20.25	710	643	898	661	270	180	518	180	518
21.25	710	643	1007	552	270	180	409	180	409
22.26	800	715	1007	734	287	180	574	180	574
23.28	800	715	1007	734	287	180	574	180	574
25.28	900	800	1130	811	307	180	631	180	631
25.31	900	980	1130	811	307	180	631	180	631
25.34	900	980	1130	811	307	180	631	180	631
26.34	1000	1080	1267	836	307	180	656	180	656
28.36	1000	1080	1267	836	307	180	656	180	656
28.38	1000	1080	1267	836	307	180	656	180	656
29.40	1100	1180	1415	938	320	180	738	180	738
32.40	1100	1200	1415	938	320	180	738	180	738

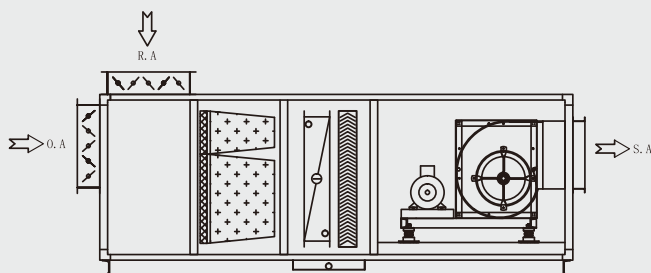
Note:

The data in table above are only for your reference. All installation and connection dimensions are subject to actual dimensions on site.

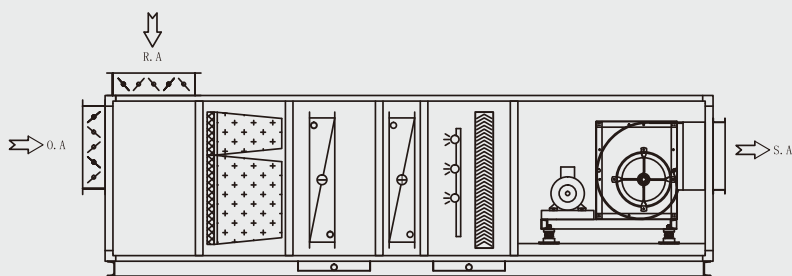
Typical Combination



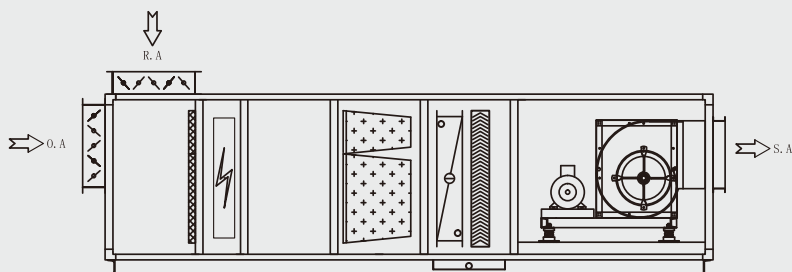
- Fresh air and recycling air mixing section with plate filter
- Cooling coil section with drip eliminator
- Fan motor section



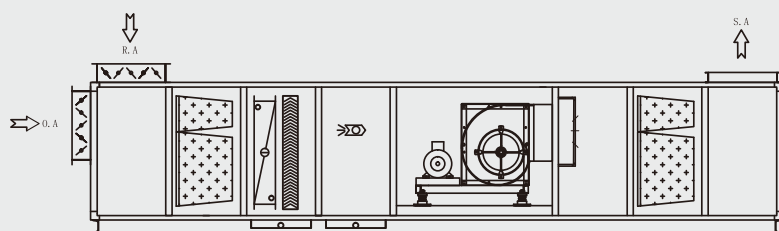
- Fresh air and recycling air mixing section
- Integrated filtering section
- Cooling coil section with drip eliminator
- Fan motor section



- Fresh air and recycling air mixing section / • Integrated filtering section
- Cooling coil section / • Heating coil section
- High pressure spray humidifying section / • Fan motor section



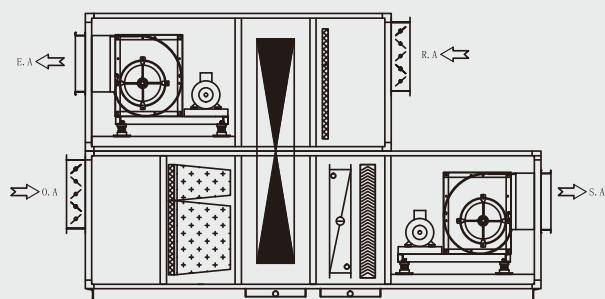
- Fresh air and recycling air mixing section with plate filter
- Electric heating section / • Empty section
- Bag filtering section / • Cooling coil section with drip eliminator
- Fan motor section



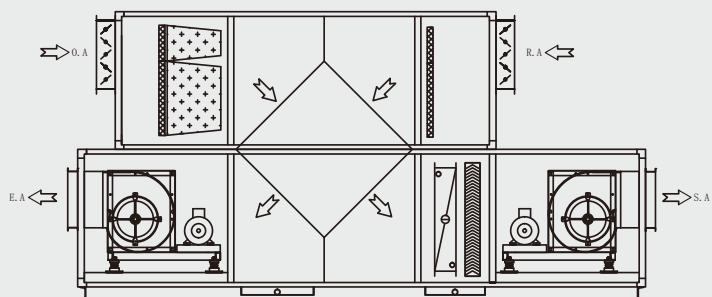
- Fresh air and recycling air mixing section / • Bag filtering section
- Cooling coil section with drip eliminator / • Dry steam humidifying section
- Fan motor section / • Diffusing section / • Bag filtering section / • Air outlet section



- Fresh air and recycling air mixing section / • Bag filtering section
- Cooling coil section with drip eliminator / • Electric heating section / • Empty section
- Dry steam humidifying section / • Fan motor section / • Bag filtering section / • Air outlet section



- Exhausting fan section
- Rotary wheel heat recovery section
- Plate filtering section
- Air inlet section
- Integrated filtering section
- Rotary wheel heat recovery section
- Cooling coil section with drip eliminator
- Supplying fan section



- Integrated filtering section
- Plate type heat recovery section
- Plate filtering section
- Exhausting fan section
- Plate type heat recovery section
- Cooling coil section with drip eliminator
- Supplying fan section

Memo:

Bosch reserves the right to change any specification, design and information without any prior notice for further improvement on quality and performance. 201410A

