General Catalogue

AIR HANDLING UNIT - ZK Series

ACHIEVE YOUR VISION

CHILLER
FAN COIL
ICE TERMAL STORAGE SYSTEM
CHU & AHU
BOILER

AFRA
HVAC SYSTEM

1 . Introduction

ZK assembly series is one of our products. There are four types, including purified type, commercial type, low-temperature type and outdoor type to be used in various fields such as micro-electronic, biological medicine, weaving, chemical plants, precision equipment, tobacco industry, food industry, scientific research, department store, hotel, exhibition hall, airport, office building, mines etc to meet different requirements.

Purified type: stainless steel or galvanized Steel sheets are used as lining plates and the filters and connections are specially treated.

Commercial type: to be used in the factories and commercial buildings

Low temperature type: used with ice preservation and low-temperature refrigeration. Providing a larger cooling capacity per unit. Special measures for heat preservation and anti-cold bridge.

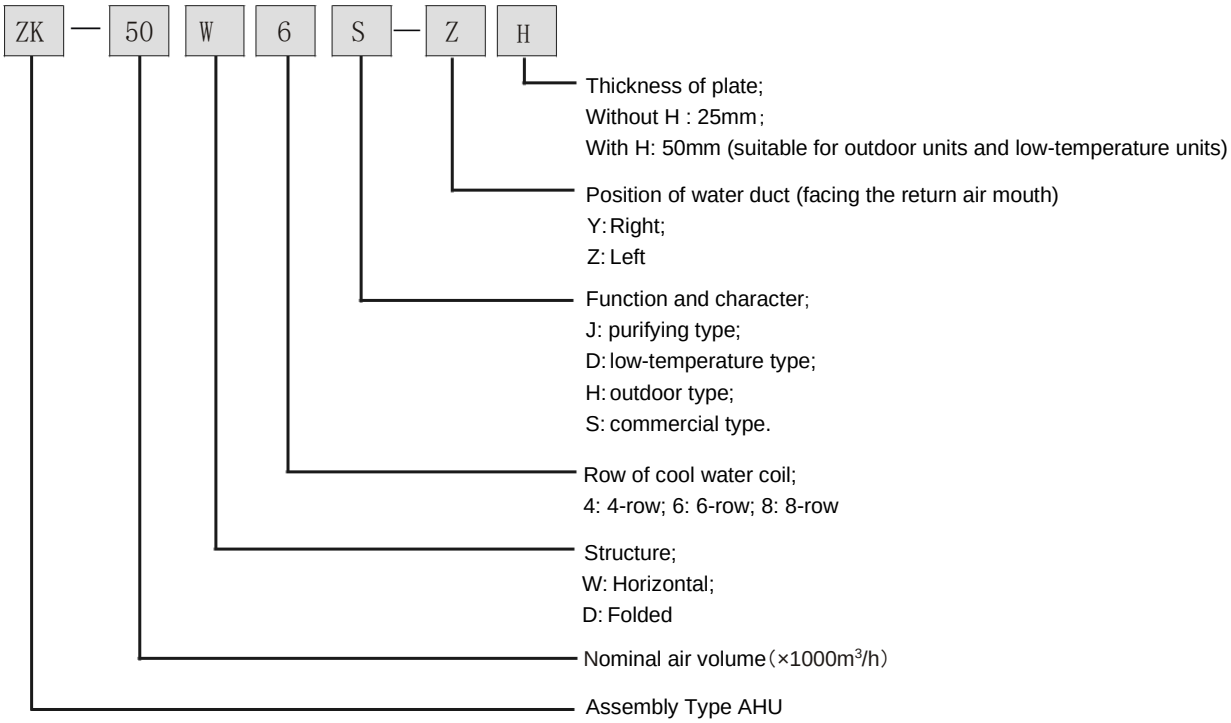
Outdoor type: to be used in the open in all weathers. Anti-rust, water-proof and snow-proof measures are applied.

ZK series AHU are designed as frame structure are used for this type of AHU to guarantee the quality. The positive pressure door is fixed from inside to outside, but the negative pressure door is fixed from outside to inside, therefore when running, the sealing of the AHU is guaranteed. The structure of AHU is simple and easy to be dismantled. It can be installed in the narrow space. The overlapping structure is suitable for the air volume of less than 30000 m³ per hour, thus saving the room space and reducing the cost.

The unit provides variant function section to meet different requirements through the combination. For example: units with heat recovery section used in the biological labs can provide cost saving; the combination of high-efficiency filtering section, multi-layer filtering section and spraying cleaning filtering section used in the tobacco industry can provide outstanding filter; in the weaving industry, cold water spraying section, filtering and heat-moisture treatment can be applied. For small-scale purifying system, constant temperature and humidity purifying units with direct evaporation is applicable. All the above-mentioned function section can be designed to customers' preference. This is not included in this manual.

We can also provide convert frequency device or VS magnet speed-regulating motors, if required. Auto control system can be added, DDC outlet can be provided with LON work which can be connected with building auto system or industry control bus.

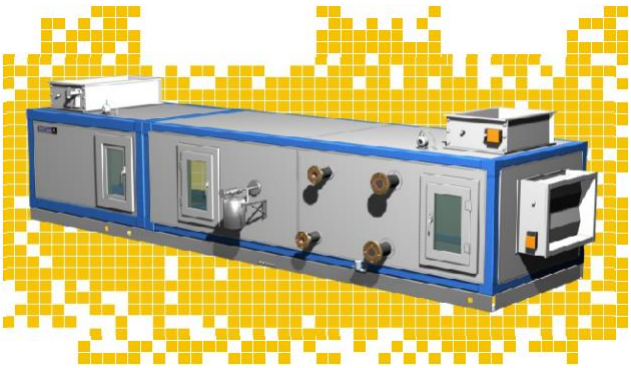
2 . Symbol Explanation



For example: ZK-50W6S-Z represents commercial assembly type AHU, 50000m³/h air volume, horizontal structure, water duct at left side, 6-row, plate thickness of 25mm

3 . Characteristics

Mixing Section: supplied with new air and return air adjusting valve. Users can adjust the ratio of new air and return air to their preference. Electric control device is optional.



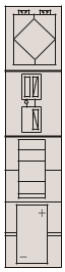
Air Exhausting, Return Air and New Air Regulating Section: suitable to the double-fan unit; air exhausting valve and new air valve are installed on the top; and a return air regulating valve is inside. Electric control device is optional.

Plate-type Filtering Section: the section is equipped with non-weaving plate-type filter of international-standard dimension and material. The filter can be one-off paper plate filter or aluminum-alloy plate filter (the filtering material can be cleaned or replaced)

Initial-efficiency and Medium-efficiency Filter Section: may equipped with the common dimension non-weaving multi-bag filter. The filter can guarantee large dust volume and smooth pressure variation. Users can select suitable filters to meet different requirements. Pressure difference indicating meter is optional. Users may change or replace the filter according to the value of the resistance.

High-efficiency Self-cleaning Tube-Filter Section: This section adopts the impulse blowing anti-dust tube-filter widely used in the tobacco industry. The filter element is rigid tube. This kind of filter can provide long service time and high-efficiency filtering. The pressure difference warning switch can give the indication of dust-cleaning or automatically start dust cleaning.

Heating Section and Radiating Section: The heat exchanger adopts red copper tube and aluminum cover. All the water ducts and collector are galvanized. Red copper duct is optional. The condensed water tray is made of stainless steel.



Heat Recovery Section: wheel-exchanger (with moisture-absorption layer or without moisture-absorption layer) is optional. Exhausting air and return air flow over the wheel conversely, providing high efficiency. This is used in the high-temperature air exhausting system. The plate-type heat exchanger doesn't need driving equipment, consuming no power and heat medium is not necessary. For heat medium exchanger, there are no crossing contamination of exhausting air and new air. The accessory pump and coil can be common products. For hot tube exchanger, no additional energy is required of in result of non-driving component design, and the heat exchange is reversible. This kind of exchanger can provide high-efficiency heat exchange even when the temperature difference between cold air and hot air is not evident.

Spraying Section: two types available: single-row spraying and double-row spraying. The internal box is made of stainless steel. The front and rear dash plate is made of aluminum alloy or glass fiber reinforced plastics. The nozzle is FL nylon nuzzle, with high performance of atomization. The spraying pipe can be made of stainless steel if required.

Humidifying Section: Humidifier such as dry vapor humidifier, electrode humidifier, high-pressure spraying humidifier, membrane humidifier, electric heating humidifier or other type of humidifier is optional. And, corresponding auto control device is available for the auto humidifying.

Noise-elimination Section: this section can be used for the noise elimination of return air and air blowing. The plate muffler is made of ultra-thin centrifugal glass wool and holed plate, providing high performance, high-temperature proof, anti-moisture and anti-dust. The muffler can also provide flow regulating function to a certain extent. Cavity type muffler is suitable for the purifying units.

Fan Section: This section is applicable to the return air fan and air blowing fan. Imported or domestic high-efficiency double-inlet centrifugal fan is adopted for this section. The blades can be front-pitching or rear-pitching. The fan can provide low-noise running. The fan and motor is set in the same special-designed chassis. There is a new rubber shock absorber at the bottom. The motor is installed on the track, and the tightness can be adjusted by the strap. The outlet mouth is connected to the box body with a soft tie-in. Convert frequency device or VS magnet speed-regulating motors can be used for the motor. Fan type and motor power shall be decided by the customers to their actual requirements.

Middle Section: Used with other sections for the maintenance or installation of the unit.

4 . Air Volume Form for ZK Assembly Type AHU

Variant blowing speed is available for the same unit, as follows

Type	Width (B) mm	Height (H) mm	blowing speed of the radiator(m/s)								
			1.50	2.00	2.50	2.70	3.00	3.50	4.00	4.50	5.00
			corresponding air flow(m^3/h)								
ZK-02	750	850	1210	1610	2010	2170	2410	2810	3220	3620	4020
ZK-04	1100	1025	2460	3280	4100	4430	4920	5740	6560	7380	8200
ZK-05	1275	1025	3020	4020	5030	5430	6040	7040	8050	9050	10060
ZK-06	1450	1025	3610	4820	6020	6500	7220	8430	9630	10840	12040
ZK-08	1450	1200	4830	6440	8050	8690	9660	11270	12880	14490	16100
ZK-10	1450	1375	6030	8040	10050	10850	12060	14070	16080	18090	20100
ZK-15	1800	1550	9030	12040	15050	16250	18060	21070	24080	27090	30100
ZK-20	1975	1900	12080	16110	20140	21750	24170	28200	32220	36250	40280
ZK-25	2150	1900	14780	19700	24630	26600	29560	34480	39410	44330	49260
ZK-30	2150	2250	17730	23640	29550	31910	35460	41370	47280	53190	59100
ZK-40	2675	2425	24220	32300	40370	43600	48440	56520	64590	72670	80740
ZK-50	2850	2775	30160	40220	50270	54290	60320	70380	80430	90490	100540
ZK-60	3200	2950	36560	48750	60940	65820	73130	85320	97500	109690	121880
ZK-80	3550	3475	48260	64350	80440	86880	96530	112620	128700	144790	160880
ZK-100	5000	3125	60280	80380	100470	108510	120560	140660	160750	180850	200940
ZK-120	5000	3650	73240	96530	120660	130310	144790	168920	193060	217190	241320
ZK-140	5350	3825	84150	112200	140250	151470	168300	196350	224400	252450	280500
ZK-160	5700	4000	93820	125090	156360	168870	187630	218900	250180	281450	312720

Description:

1.50~2.50m/s: Cooling range without dash plate

2.70m/s: Max blowing speed of vertical flow radiating section

2.70~3.50m/s: Cooling range with standard dash plate
Special dash plate is required if exceeding 3.5m/s

4.00~5.00m/s: Range of heating, ventilation and air exhausting

5 . Section Weight Form of ZK Assembly Type AHU

Unit: kg

Type	ZK-02	ZK-04	ZK-05	ZK-06	ZK-08	ZK-10	ZK-15	ZK-20	ZK-25	ZK-30	ZK-40	ZK-50	ZK-60	ZK-80	ZK-100	ZK-120	ZK-140	ZK-160
level in/out air section	38	52	55	90	98	105	165	190	250	272	378	420	535	698	720	782	915	1020
Vertical in/out air section	56	76	85	120	130	172	245	335	360	395	505	620	762	872	965	1080	1142	1206
Mixing section	58	79	90	102	110	135	165	238	250	326	378	488	535	702	720	763	915	968
Air Exhausting, Return Air and New Air Regulating Section	125	168	185	192	212	305	365	525	665	730	832	920	1175	1535	1596	1682	2012	2128
Plate-type filtering section	31	42	46	62	86	102	125	155	205	216	255	280	315	376	422	460	485	510
Initial-efficiency filtering section	72	96	105	122	151	172	208	250	308	325	382	420	465	550	620	675	715	755
Middle-efficiency filtering section	106	130	142	162	196	218	255	315	362	396	465	510	563	666	755	820	868	920
High-efficiency tube filtering section	750	1010	1150	1250	1300	1410	1650	1890	1980	2160	2500	2760	3100	3450	4050	4300	4550	4950
steam, hot wate and electric heating section	115	160	195	220	255	290	350	410	480	530	720	850	930	1295	1520	1750	2105	2380
radiating section	156	220	260	320	356	420	525	650	785	875	1205	1480	1675	2230	2650	3065	3510	4285
spraying section Single row	480	650	750	830	880	1020	1110	1230	1320	1450	1680	1830	2050	2310	2830	3050	3310	3620
spraying section Double row	675	950	1035	1200	1280	1460	1560	1750	1920	2120	2530	2810	3120	3480	4320	4650	5050	5380
steam humidifying section	60	82	88	95	108	122	150	170	192	215	236	262	295	336	370	395	420	468
Noise -elimination section	195	262	285	310	420	475	650	760	890	1050	1185	1320	1425	1650	1875	2110	2265	2380
fan section	220	350	370	420	516	618	820	1050	1182	1480	1870	2280	2685	3550	3860	4520	5310	6250
Imiddle section	78	105	115	126	132	142	170	196	205	225	260	288	315	360	420	446	472	510

6 . Dimension Form for Function Section of ZK Assembly Type AHU

Unit: mm

Symbol																		
Type	unit section size B×H	level in/out air section	Vertical in/out air section	Mixing section	Air Exhausting, Return Air and New Air Regulating Section	Plate-type filtering section	Initial-efficiency filtering section	Middle-efficiency filtering section	High-efficiency tube filtering section	steam, hot wate and electric heating section	radiating section	heat recovery	spraying section		steam humidifying section	Noise-elimination section	Fan section	Middle section
													Single row	Double row				
ZK-02	750×850	350	525	350	1050	175	525	700	3150	525	700	the section length is decided by the type of heat recovery system, new air volume and heat recovery efficiency.	1400	2100		1000	1050	700
ZK-04	1100×1025	350	525	525	1050												1225	
ZK-05	1275×1025	350	525	525	1050												1225	
ZK-06	1450×1025	525	525	525	1050												1400	
ZK-08	1450×1200	525	700	525	1050												1400	
ZK-10	1450×1375	525	700	525	1400												1575	
ZK-15	1800×1550	525	700	700	1400												1750	
ZK-20	1975×1900	700	875	700	1750												1925	
ZK-25	2150×1900	700	875	875	1750												1925	
ZK-30	2150×2250	700	1050	875	1750												2100	
ZK-40	2675×2425	875	1050	875	2100												2450	
ZK-50	2850×2775	875	1225	1050	2100												2625	
ZK-60	3200×2950	1050	1225	1050	2100												2975	
ZK-80	3550×3475	1225	1575	1225	2450												3325	
ZK-100	5000×3125	875	1225	1050	2100												2625	
ZK-120	5000×3650	1050	1225	1050	2100												2975	
ZK-140	5350×3825	1050	1400	1050	2100												3150	
ZK-160	5700×4000	1225	1575	1225	2450												3325	

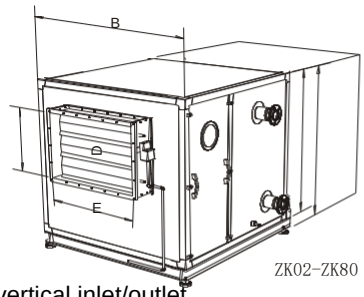
7 . Parameter Form of ZK Assembly Type AHU

Type				ZK-02	ZK-04	ZK-05	ZK-06	ZK-08	ZK-10	ZK-15	ZK-20	ZK-25	ZK-30	ZK-40	ZK-50	ZK-60	ZK-80	ZK-100	ZK-120	ZK-140	ZK-160
main technical parameter	unit section size B×H			750×850	1100×1025	1275×1025	1450×1025	1450×1200	1450×1375	1800×1550	1975×1900	2150×1900	2150×2250	2675×2425	2850×2775	3200×2950	3550×3475	5000×3125	5000×3650	5350×3825	5700×4000
	Air volume(m^3/h)			2000	4000	5000	6000	8000	10000	15000	20000	25000	30000	40000	50000	60000	80000	100000	120000	140000	160000
	Cooling capacity (kW)	inlet working condition		27℃DB/19.5℃WB																	
		4-rows		11.15	22.3	27.88	33.4	44.6	55.76	83.64	111.5	139.4	167.3	223.2	278.7	334.5	445.8	557.3	668.6	780.2	891.5
		6-rows		14.5	29.2	36.2	43.4	58.3	72.5	108.7	145	181.2	217.5	290.5	362.3	435.2	579.8	714.6	869.68	1004.6	1160.32
		8-rows		17.6	35.5	44.53	53.22	71.13	89.41	133.58	178.18	221.08	265.33	355.87	445.2	534.23	707.5	889.78	1063.42	1245.66	1416.29
	Heating capacity (kW)	inlet working condition		15℃DB																	
		Hot water	4-rows	16.12	31.78	38.87	49.35	62.32	88.56	118.95	167.68	207.83	269.22	322.65	386.72	463.18	615.62	802.87	946.21	1078.82	1238.61
			6-rows	23.38	46.12	56.82	71.42	91.26	127.78	172.67	243.3	301.51	391.26	468.93	560.34	671.61	892.31	1165.18	1372.2	1564.31	1797.22
		Steam	8-rows	19.83	39.25	48.82	61.02	77.65	109.75	147.95	207.25	256.32	332.4	397.82	479.15	572.32	758.67	997.28	1172.35	1337.92	1541.76
	* Wind pressure(Pa)			800	750	850	750	750	850	850	950	1000	1050	950	1000	830	750	1000	830	900	750
	* Motor power(kW)			1.5	2.2	3	3	4	5.5	7.5	11	15	18.5	22	30	30	37	2×30	2×30	2×37	2×37
	*fan rational speed(Rpm)			1876	1810	1726	1538	1260	1190	1014	899	847	769	627	578	474	396	578	474	486	396
	* Noise dB(A)			61	62	63	65	66	68	73	78	79	81	83	84	85	86	87	88	89	90
Initial-efficiency filtering section	first resistance(Pa)			50 (bag type) , 75 (plate type)																	
	End resistance(Pa)			100 (bag type) , 150 (plate type)																	
	count efficiency(%)			20≤E < 80 (grain way≥5.0 μ m)																	
Middle-efficiency filtering section	first resistance(Pa)			75																	
	End resistance(Pa)			150																	
	count efficiency(%)			20≤E < 70 (grain way≥1.0 μ m)																	
High-efficiency filtering section	first resistance(Pa)			160																	
	operation resistance(Pa)			400~600																	
	count efficiency(%)			99≤E < 99.92 (5 μ m≥grain way≥0.5 μ m)																	
Humidifying section	Humidifying volume(kg/h)			10	15	18	22	29	38	50	65	75	90	120	150	180	240	300	360	420	480
	dry steam inlet(mm)			15					20						32		40	2-32			2-40
	Condensate outlet(mm)			15					20						32		40	2-32			2-40
radiating section	4-rows	Water flux(T/h)		1.92	3.83	4.79	5.74	7.67	9.59	14.38	19.17	23.97	28.77	38.38	47.93	57.52	76.66	95.83	114.9	134.2	153.3
		Water ristance(kPa)		1.8	3.87	5.12	7.48	8.85	15.12	20.19	25.85	26.72	25.81	29.15	26.12	28.68	38.97	29.39	30.71	31.27	33.27
	6-rows	Water flux(T/h)		2.49	5.02	6.22	7.46	10.02	12.47	18.69	24.93	31.16	37.4	49.96	62.3	74.84	99.71	122.9	149.6	172.8	199.5
		Water ristance(kPa)		3.96	5.43	8.37	10.83	12.36	21.42	28.37	35.86	39.41	43.2	46.17	41.37	46.21	50.47	49.56	51.19	52.34	57.52
	8-rows	Water flux(T/h)		3.03	6.12	7.66	9.15	12.23	15.4	22.97	30.64	38.02	45.63	61.2	76.56	91.87	121.7	153.1	182.9	214.2	243.6
		Water ristance(kPa)		2.62	4.02	6.43	8.82	10.17	19.5	32.81	38.27	43.87	46.28	49.86	37.19	42.45	46.12	44.81	45.97	46.27	51.67
	Dia. of in/out water duct(mm)			32	40	40	50	50	70	70	80	80	2-70	2-80	2-80	2-100	4-80	4-80	4-100	4-100	6-100
	Dia. of condensate duct(mm)			25	25	25	32	32	32	32	32	32	32	40	40	40	40	40	40	40	40
	temperature of in/out water(℃)			7/12																	
heating section	Water flux(T/h)	2-rows		1.48	2.37	2.62	3.27	4.21	5.21	11.12	14.27	20.89	26.12	29.67	33.17	38.42	48.92	60.31	71.15	79.69	93.13
		4-rows		2.84	4.56	5.02	6.25	8.07	9.87	21.08	27.24	39.67	53.98	56.38	64.71	74.76	92.17	117.74	137.82	153.87	178.42
	Water ristance(kPa)			0.015																	
	Dia. of in/out water duct(mm)			32	32	32	40	40	50	50	70	70	2-50	2-70	2-70	2-80	4-70	4--70	4-80	4-80	6-80
	water speed(m/s)			1																	
	hot water temperature(℃)			60																	
	steam pressure(MPa/℃)			0.1MPa (meter pressure) /120℃																	
	Dia. of steam duct(mm)			25	25	25	25	32	32	40	40	50	50	2-40	2-50	2-50	4-40	4--50	4-50	4-70	4-70
return air fan section				Usually, the return air volume is 80% of blowing air volume; the total pressure of return air fan is 50% of that of blowing air fan. If customers require other option, it must be specified in the contract. The section length shall be decided by the actual conditions.																	

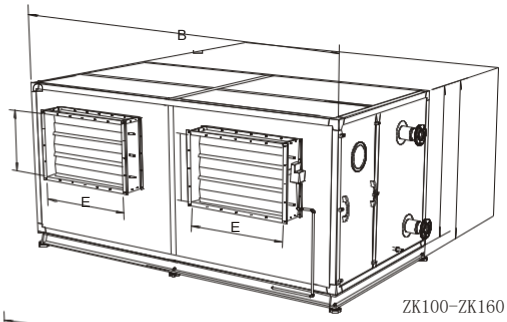
INote: values marked with * are references. Fan and motor shall be applicable to the actual condtions.

8 Dimension Form for Inlet/Outlet of ZK Assembly Type AHU

size of level inlet/outlet

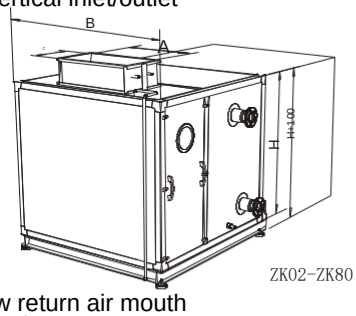


ZK02-ZK80

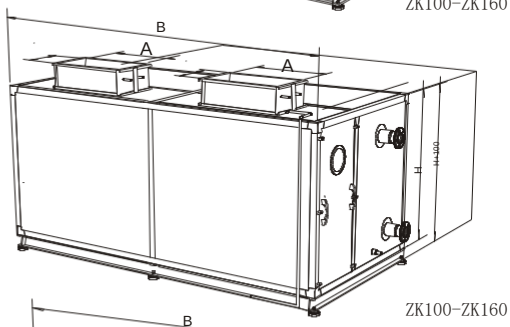


ZK100-ZK160

size of vertical inlet/outlet

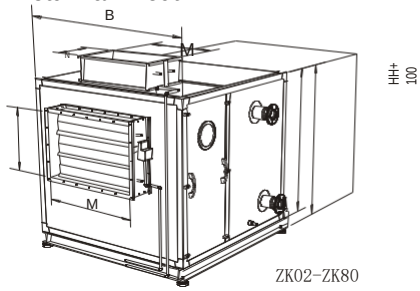


ZK02-ZK80

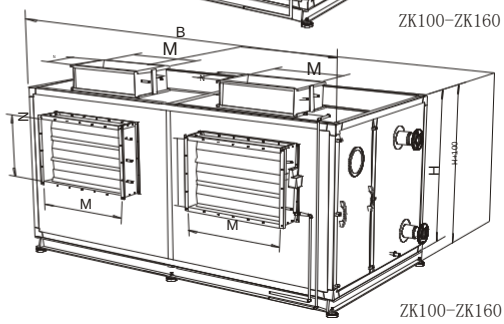


ZK100-ZK160

size of new return air mouth



ZK02-ZK80



ZK100-ZK160

Unit: mm

Type	unit section size	size of level inlet/outlet	size of vertical inlet/outlet	size of mixing inlet	
				size of return air mouth	size of fresh air vent
	B× H	E× D	A × C	M × N	M × N
ZK-02	750×850	400×345	400×345	500×175	500×175
ZK-04	1100×1025	630×345	630×345	400×345	400×345
ZK-05	1275×1025	800×345	800×345	500×345	500×345
ZK-06	1450×1025	630×510	1000×345	630×345	630×345
ZK-08	1450×1200	800×510	800×510	800×345	800×345
ZK-10	1450×1375	800×675	1000×510	1000×345	1000×345
ZK-15	1800×1550	1250×675	1500×510	1000×510	1000×510
ZK-20	1975×1900	1250×840	1500×675	1250×510	1250×510
ZK-25	2150×1900	1250×1005	1800×675	1250×675	1250×675
ZK-30	2150×2250	1500×1005	1600×840	1250×675	1250×675
ZK-40	2675×2425	1500×1170	2000×840	1600×675	1600×675
ZK-50	2850×2775	1600×1335	2000×1005	1500×840	1500×840
ZK-60	3200×2950	1600×1500	2000×1170	1800×840	1800×840
ZK-80	3550×3475	2000×1665	2200×1335	1800×1005	1800×1005
ZK-100	5000×3125	2-1600×1335	2-2000×1005	2-1500×840	2-1500×840
ZK-120	5000×3650	2-1600×1500	2-2000×1170	2-1800×840	2-1800×840
ZK-140	5350×3825	2-1800×1500	2-2000×1170	2-1800×840	2-1800×840
ZK-160	5700×4000	2-2000×1665	2-2200×1335	2-1800×1005	2-1800×1005

Note: the inlet/outlet size in the form is just for reference in design.

9 Resistance Form for Function Section of ZK Ass embly Type AHU

Unit：Pa

Type		ZK-02	ZK-04	ZK-05	ZK-06	ZK-08	ZK-10	ZK-15	ZK-20	ZK-25	ZK-30	ZK-40	ZK-50	ZK-60	ZK-80	ZK-100	ZK-120	ZK-140	ZK-160
level in/out air section		10	10	10	10	10	10	10	10	10	12	12	12	12	12	12	13	13	13
vertical in/out air section		10	10	10	10	10	10	10	12	12	13	13	13	13	15	15	15	15	15
mixing section		10	10	12	12	12	13	13	13	13	15	15	15	15	15	16	16	16	16
Air Exhausting, Return Air and New Air Regulating Section		25	25	25	25	28	28	28	28	30	30	30	32	32	33	33	35	35	35
Plate-type filtering section	first resistance(Pa)	75																	
	End resistance(Pa)	150																	
Initial-efficiency filtering section	first resistance(Pa)	50																	
	End resistance(Pa)	100																	
Middle-efficiency filtering section	first resistance(Pa)	75																	
	End resistance(Pa)	150																	
High-efficiency tube filtering section	first resistance(Pa)	160																	
	Operation resistance(Pa)	400~600																	
steam heating		30																	
electric heating		25																	
hot water heating	2-rows	40																	
	4-rows	75																	
radiating section	4-rows	90																	
	6-rows	128																	
	8-rows	165																	
dash plate		48																	
Spraying section	Single row	60	63	65	65	63	60	65	65	65	68	65	62	62	68	68	70	70	70
	Double row	71	75	75	75	73	71	75	75	73	78	75	73	73	75	75	78	78	78
steam humidifying section		20																	
noise-elimination section		35																	
middle section		10																	

Note: 1,Data in the form are resistance passing radiator under rated air volume (blowing speed 2.5m/s)

2,The resistance is of 75% when the blowing speed is 2.0m/s passing radiator under rated air volume.

3,The resistance is of 130% when the blowing speed is 1.3m/s passing radiator under rated air volume.

10 Combination Reference and Dimension Reference for ZK Assembly Type AHU

Unit：mm

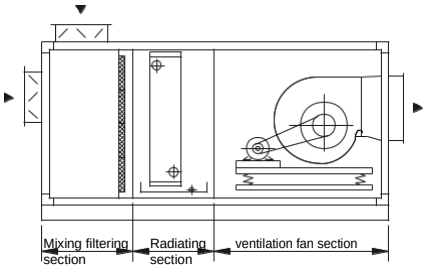
Type			ZK-02	ZK-04	ZK-05	ZK-06	ZK-08	ZK-10	ZK-15	ZK-20	ZK-25	ZK-30	ZK-40	ZK-50	ZK-60	ZK-80	ZK-100	ZK-120	ZK-140	ZK-160
combination mode	section size B×H		750×850	1100×1025	1275×1025	1450×1025	1450×1200	1450×1375	1800×1550	1975×1900	2150×1900	2150×2250	2675×2425	2850×2775	3200×2950	3550×3475	5000×3125	5000×3650	5350×3825	5700×4000
	W1	L	2275	2625	2625	2800	2800	2975	3325	3500	3500	3850	4200	4550	4900	5425	4550	4900	5075	5425
	W2		3150	3500	3500	3675	3675	3850	4200	4375	4375	4725	5075	5425	5775	6300	5425	5775	5950	6300
	W3		5600	5950	5950	6300	6300	6650	7000	7350	7350	7875	8400	8750	9275	9975	8750	9275	9450	9975
	W4		5425	5775	5775	6125	6125	6825	7175	7875	7875	8225	9275	9625	10325	11375	9625	10325	10675	11375
	W5		6300	6650	6650	7000	7350	7700	8225	8575	8750	9450	9975	10325	10850	11550	10325	10850	11025	11550
	W6		4550	4900	4900	5075	5075	5250	5600	5775	5775	6125	6475	6825	7175	7700	6825	7175	7350	7700
	W7		5075	5425	5425	5950	6125	6475	7000	7700	7700	8225	9275	9800	10675	11900	9800	10675	11200	11900
	W8		7000	7350	7350	7525	7700	7875	8225	8575	8575	9100	9450	9975	10325	11200	9975	10325	10675	11200

Note: 1,B refers to width of units, H to height and L to length

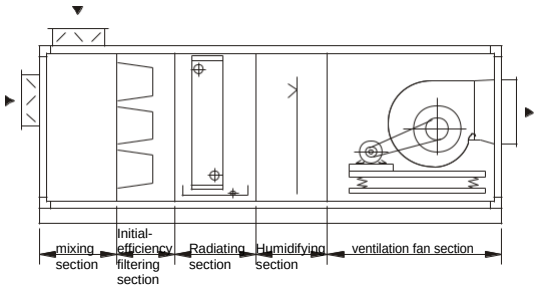
2,All be combination modes above are just for reference.

3,Heat recovery in W7 mode is calculated to new air volume 30%. Heat recovery mode is wheel heat recovery.

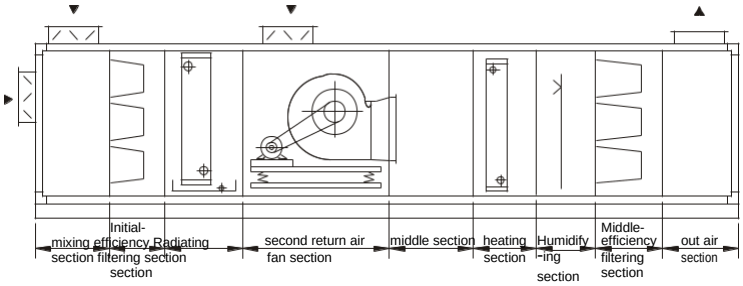
4,We could also provide specially designed combination mode if required. Please contact 800-828-2022 for details.



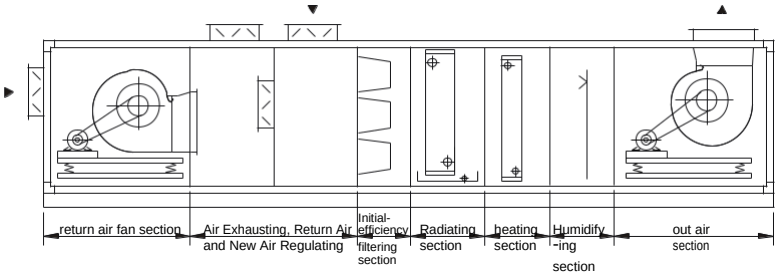
Combination mode W1



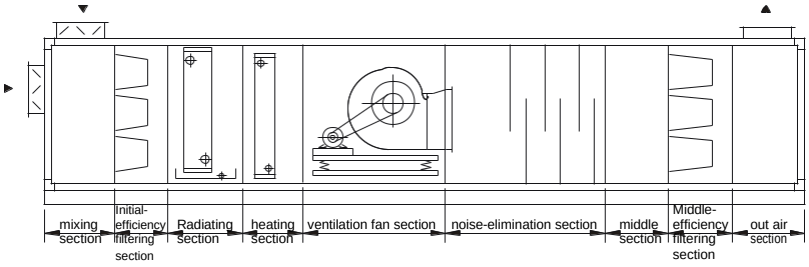
Combination mode W2



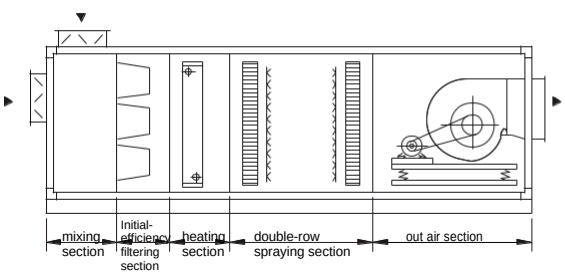
Combination mode W3



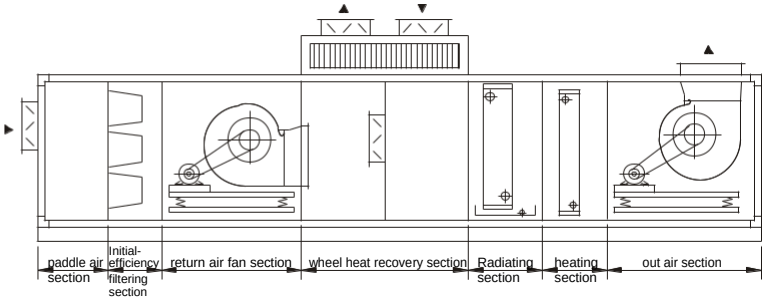
Combination mode W4



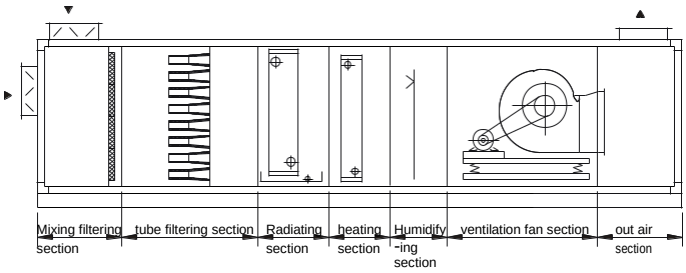
Combination mode W5



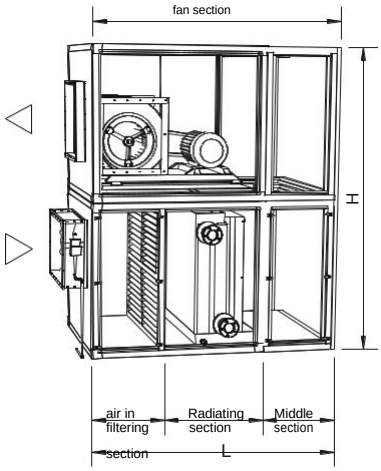
Combination mode W6



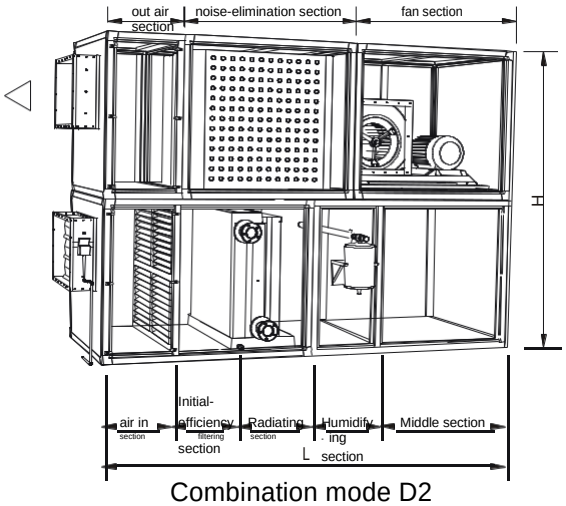
Combination mode W7



Combination mode W8



Combination mode D1



Combination mode D2

Folded Type Assembly AHU

Dimension form Unit : mm

Type	Air volume m^3/h	combination mode		
		section size B×H	D1	D2
			L	
ZK-02	2000	750×1600	1400	2800
ZK-04	4000	1100×1950	1400	2975
ZK-05	5000	1450×1950	1400	2975
ZK-06	6000	1450×1950	1400	3150
ZK-08	8000	1450×2300	1575	3675
ZK-10	10000	1450×2650	1750	3850
ZK-15	15000	1800×3000	1750	4200
ZK-20	20000	1975×3700	1925	4550
ZK-25	25000	2150×3700	2100	4725
ZK-30	30000	2150×4400	2275	5075

Note: 1,B refers to the width of unit, H to height and L to length

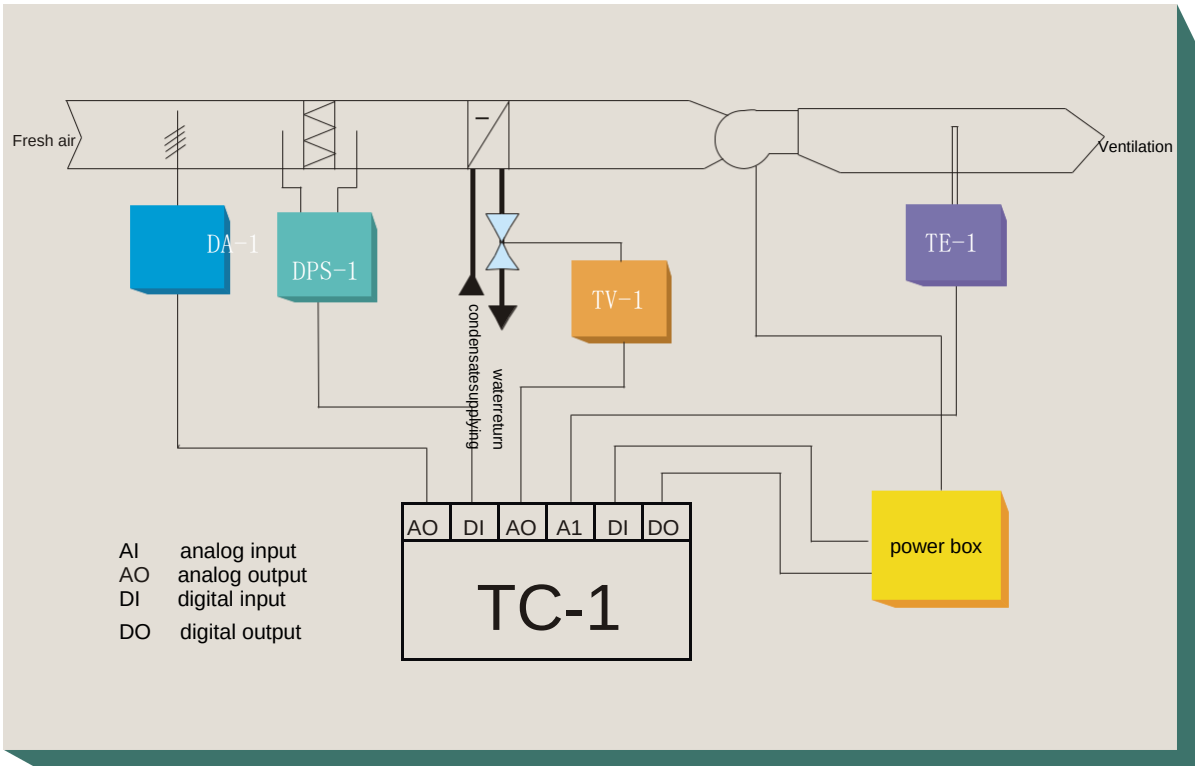
2,All be combination modes above are just for reference.

3,We could also provide specially designed combination mode if required.

11 Schematic Diagram for the Auto-control of ZK Assembly Type AHU

(I) Control of New Air Treatment Unit

(2-row, single cold water coil)

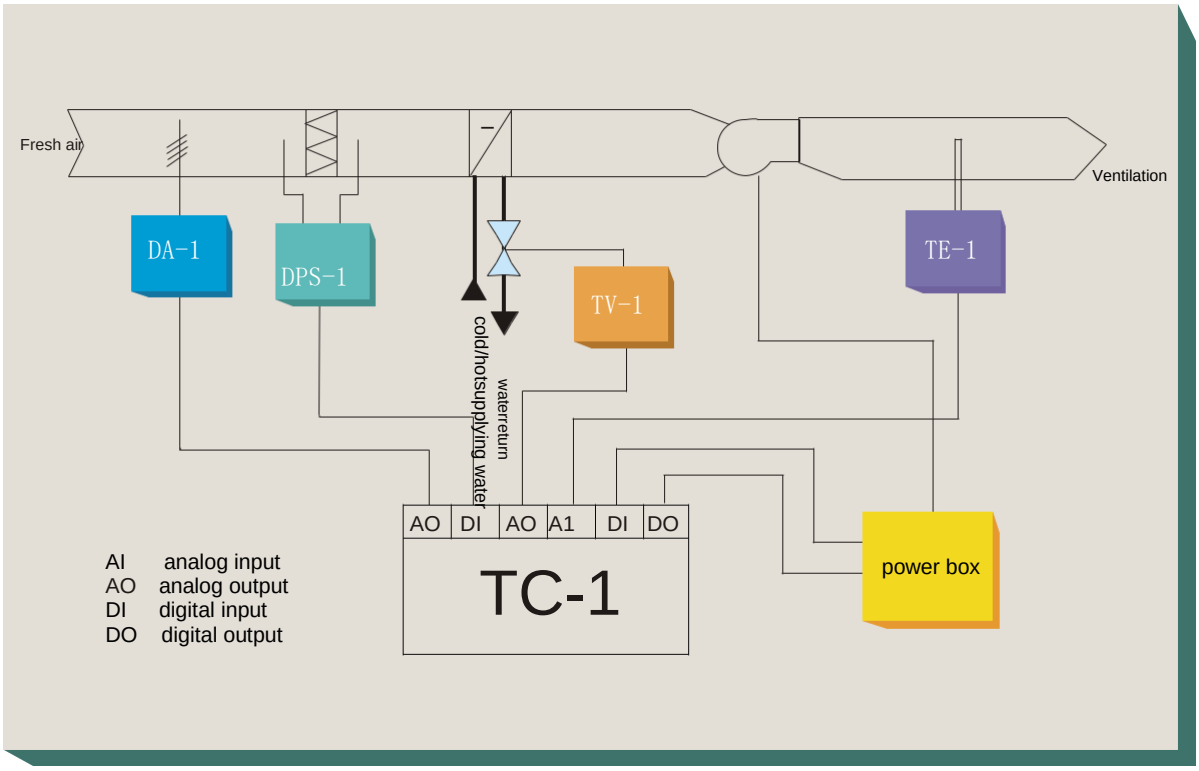


Working Description of Control System:

- The control system comprises of LCD display screen, electric regulating valve and temperature sensor which is installed in the ventilation duct.
- Controller TC-1 compares the temperature tested from the Temperature Sensor TE-1 with the set value. And then TC-1 send signals to control cold water electric valve according to the comparison result. If the measured value exceed set vale, open the valve TV-1, or else close it.
- New air valve executor DA-1 is interlocked with ventilation fan. New air valve will start/close when ventilation fan starts/closes.
- Pressure difference switch DPS-1 checks the pressure difference at two sides of the filter. It will give warning if the measured value exceeds the set one.
- Parameters can be input or changed directly in the LCD screen of the controller.
- Frequency converting device is optional for the adjustment of fan, thus providing energy-saving and low-noise running.

(II) Control of New Air Treatment Unit

(2-row, cold/hot water coil)

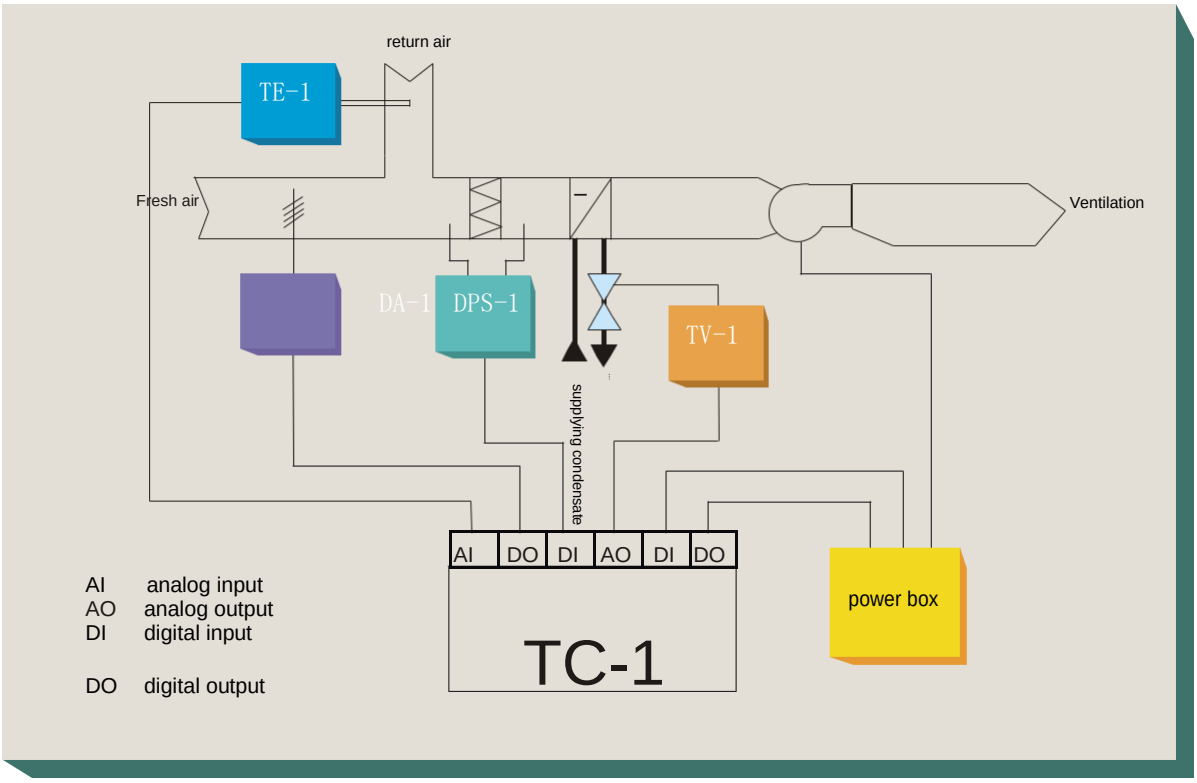


Working Description of Control System:

- The control system comprises of LCD display screen, electric regulating valve and temperature sensor which is installed in the ventilation duct.
- Controller TC-1 compares the temperature tested from the Temperature Sensor TE-1 with the set value. And then TC-1 send signals to control cold water electric valve according to the comparison result. In summer, if the measured value exceeds the set one, increase the openness of cold water valve TV-1; if the measured value is lower, decrease the openness of TV-1. In winter, if the measured value is lower than the set temperature, increase the openness of hot water valve TV-1; or else, decrease the openness of TV-1. Winter/summer adjustment can also be done manually or automatically.
- New air valve executor DA-1 is interlocked with ventilation fan. New air valve will start/close when ventilation fan starts/closes.
- Pressure difference switch DPS-1 checks the pressure difference at two sides of the filter. It will give warning if the measured value exceeds the set one.
- Parameters can be input or changed directly in the LCD screen of the controller.
- Frequency converting device is optional for the adjustment of fan, thus providing energy-saving and low-noise running.

(III) Control of Air Treatment Unit

(2-row, single cold water coil)

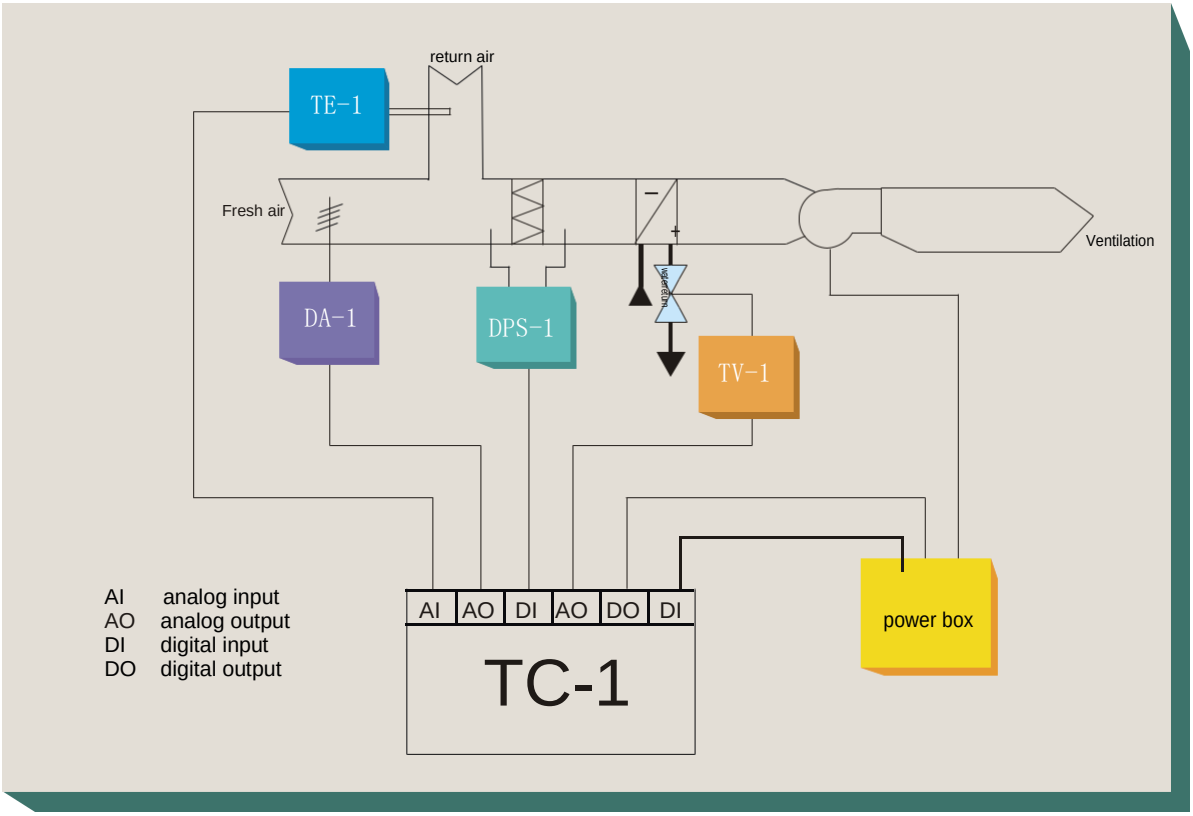


Working Description of Control System:

- The control system comprises of LCD display screen, electric regulating valve and temperature sensor which is installed in the ventilation duct.
- Controller TC-1 compares the temperature tested from the Temperature Sensor TE-1 with the set value. And then TC-1 send signals to control cold water electric valve according to the comparison result. If the measured value exceed set vale, open the valve TV-1, or else close it.
- New air valve executor DA-1 is interlocked with ventilation fan. New air valve will start/close when ventilation fan starts/closes.
- Pressure difference switch DPS-1 checks the pressure difference at two sides of the filter. It will give warning if the measured value exceeds the set one.
- Parameters can be input or changed directly in the LCD screen of the controller.
- Frequency converting device is optional for the adjustment of fan, thus providing energy-saving and low-noise running.

(IV) Control of Air Treatment Unit

(2-row, cold/hot water coil)



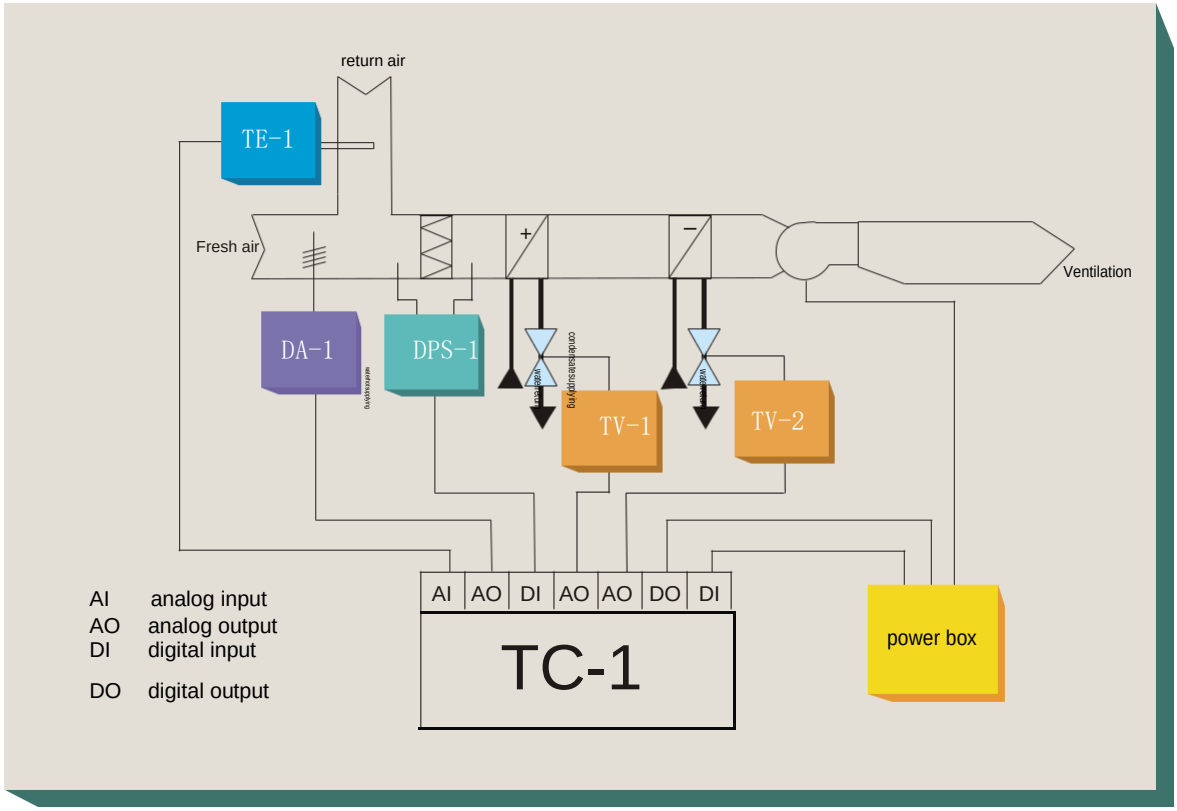
Working Description of Control System:

- The control system comprises of LCD display screen, electric regulating valve and temperature sensor which is installed in the ventilation duct.
- Controller TC-1 compares the temperature tested from the Temperature Sensor TE-1 with the set value. And then TC-1 send signals to control cold water electric valve according to the comparison result. In summer, if the measured value exceeds the set one, increase the openness of cold water valve TV-1; if the measured value is lower, decrease the openness of TV-1. In winter, if the measured value is lower than the set temperature, increase the openness of hot water valve TV-2; or else, decrease the openness of TV-2. Winter/summer adjustment can also be done manually or automatically.

  New air valve executor DA-1 is interlocked with ventilation fan. New air valve will start/close when ventilation fan starts/closes.
- Pressure difference switch DPS-1 checks the pressure difference at two sides of the filter. It will give warning if the measured value exceeds the set one.
- Parameters can be input or changed directly in the LCD screen of the controller.
- Frequency converting device is optional for the adjustment of fan, thus providing energy-saving and low-noise running.

(V) Control of Air Treatment Unit

(4-row, cold/hot water coil independently)

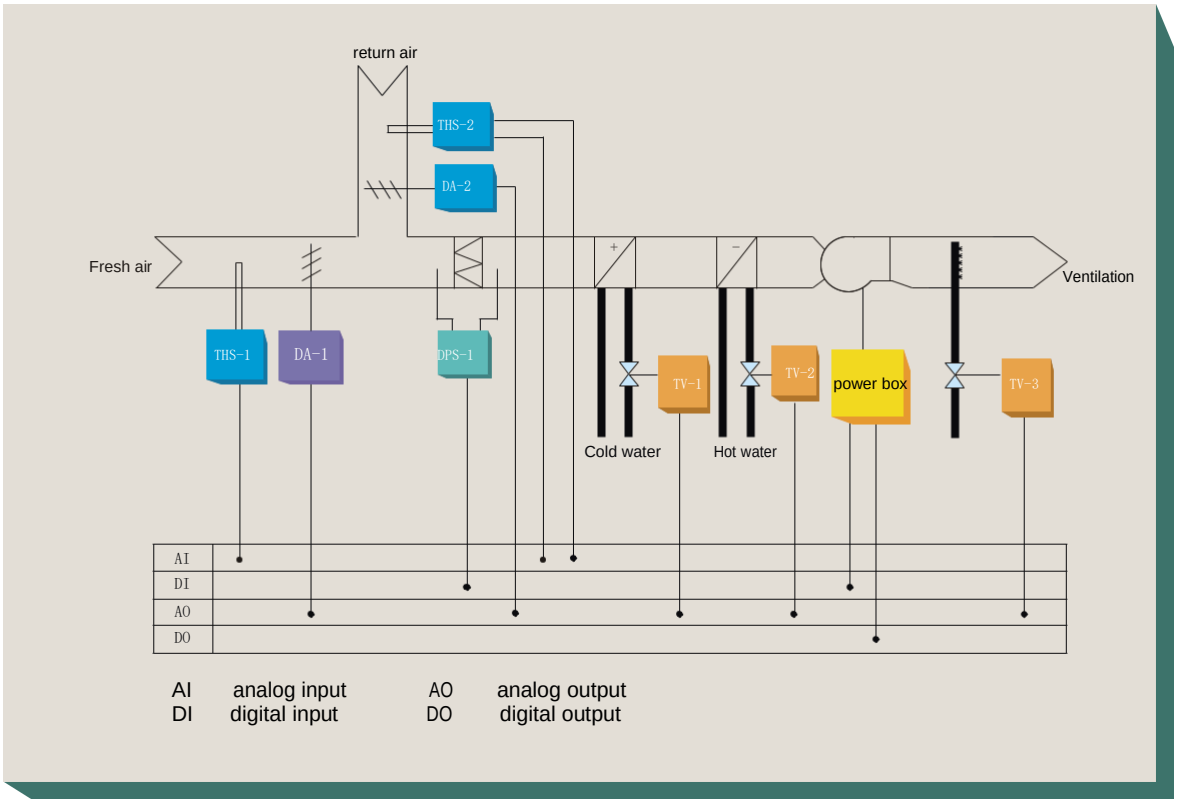


Working Description of Control System:

- The control system comprises of LCD display screen, electric regulating valve and temperature sensor which is installed in the ventilation duct.
- Controller TC-1 compares the temperature tested from the Temperature Sensor TE-1 with the set value. And then TC-1 send signals to control cold water electric valve according to the comparison result. In summer, if the measured value exceeds the set one, increase the openness of cold water valve TV-2; if the measured value is lower, decrease the openness of TV-2. In winter, if the measured value is lower than the set temperature, increase the openness of hot water valve TV-1; or else, decrease the openness of TV-1.
- New air valve executor DA-1 is interlocked with ventilation fan. New air valve will start/close when ventilation fan starts/closes.
- Pressure difference switch DPS-1 checks the pressure difference at two sides of the filter. It will give warning if the measured value exceeds the set one.
- Parameters can be input or changed directly in the LCD screen of the controller.
- Frequency converting device is optional for the adjustment of fan, thus providing energy-saving and low-noise running.

(VI)Control of Air Treatment Unit (temperature and humidity control)

(4-row, cold water and hot water coil imdependently)

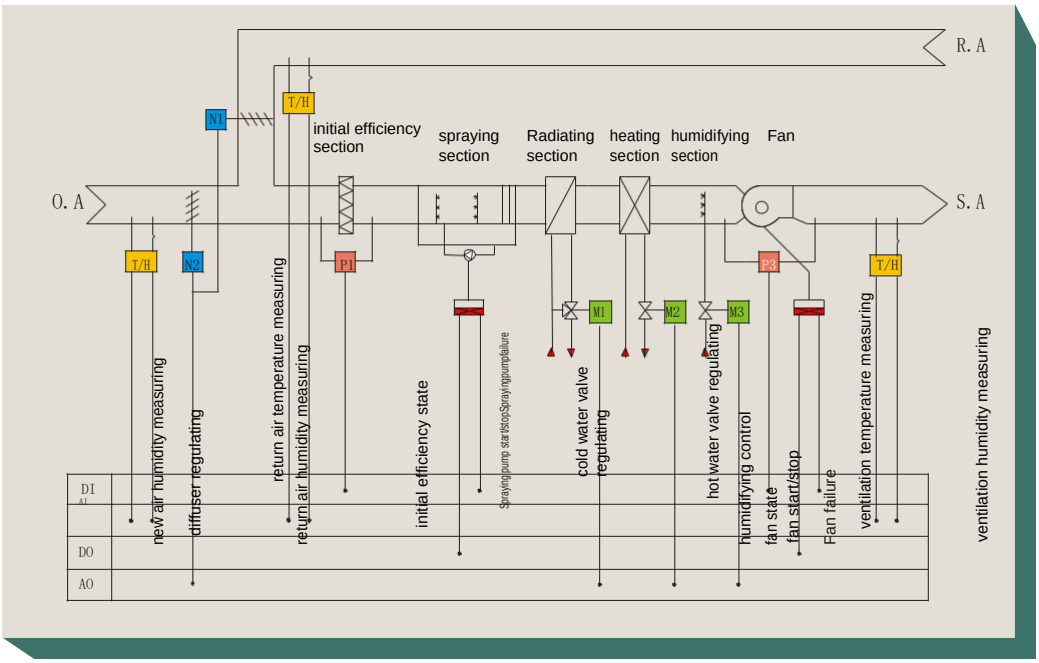


Working Description of Control System:

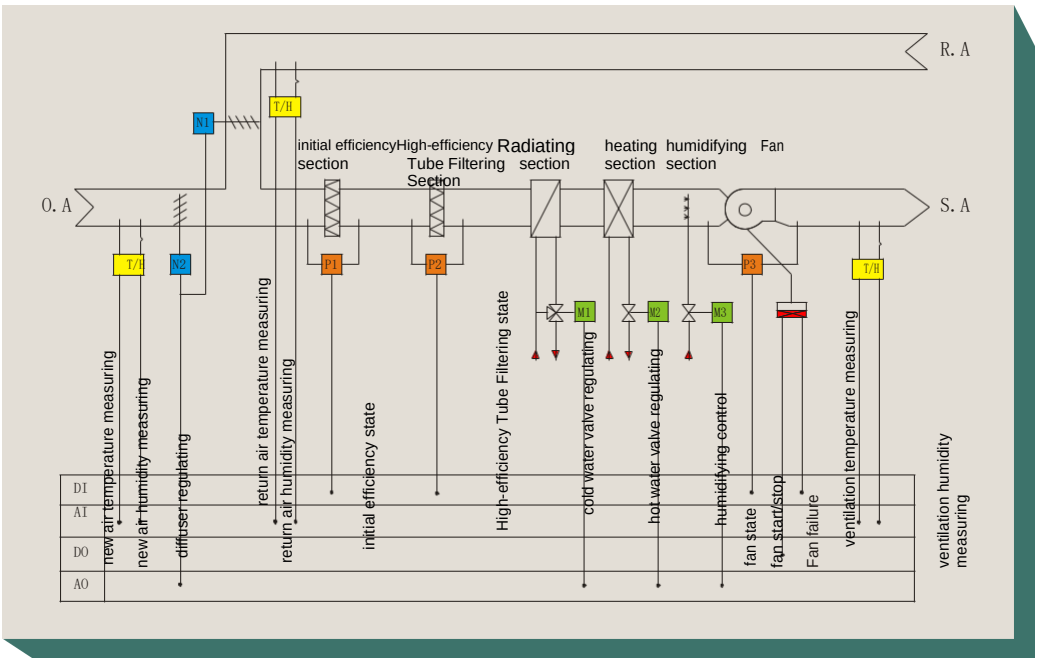
- The control system comprises of site controller DDC, electric regulating valve and temperature and humidity sensor which is installed in the new return air duct.
- Temperature control: DDC compares the temperature tested from the Temperature and humidity sensor THS-2 with the set value. And then DDC send signals to control cold electric regulating valve according to the comparison result. In summer, if the measured value exceeds the set one, increase the openness of cold water valve TV-1; if the measured value is lower, decrease the openness of TV-1. In winter, if the measured value is lower than the set temperature, increase the openness of hot water valve TV-2; or else, decrease the openness of TV-2.
- Humidity control: DDC compares the humidity tested from the Temperature and humidity sensor THS-2 with the set value. And then DDC send signals to control cold electric regulating valve according to the comparison result. If the electric valve TV-3 is totally off and the humidity is still too high, the cooling and dehumidifying will be executed to ensure the humidity within normal range.
- Measure the humidity and temperature of new return air by THS-1 and then send signal to control the openness ratio of DA-1, DA-2. This can adjust the ratio of new air and return air, providing energy-saving and bettering the air condition in the room.
- New air valve executor DA-1 is interlocked with ventilation fan. New air valve will start/close when ventilation fan starts/closes.
- Pressure difference switch DPS-1 checks the pressure difference at two sides of the filter. It will give warning if the measured value exceeds the set one.
- System parameter, circulate mode and process curve etc.s can show directly on the controller

Auto-control System for Assembly Type AHU in Cigarette Factory

(I) Control System Drawing



Air Conditioning System with Spraying Section



Air Conditioning System with High-efficiency Tube

(II) Operation Principle of Auto-control System

1,Conversion of working conditions: All parameters for control procedure and air conditioning have already been built in DDC before operation (these parameters can be changed by skilled technicians on debug or in later operation). DDC divides the whole working conditions into five sections. The conversion of working condition shall be based on the wet ball temperature, the end location of new air valve, return air valve and cold/hot water valve.

2,Temperature and humidity control: Variable point is adopted to regulate the temperature and humidity in the room. DDC receives the value of temperature and humidity from the dry ball and wet ball installed indoor and then control the executors according to the planed working conditions. DDC regulates humidity by controlling openness of the steam humidifying valve, three-way cold water valve, spraying temperature and new return air valve.

3,Frequency converter can change air in a high speed, raise the system stability and provide high energy-saving in low loading.

4,Isolation and humidifying of new air, return air and spraying section shall be fully used to stabilize system and save energy.

(III) Composing of Auto-control System

1,Sensor, transmitter, state measuring conversion; humidity sensor, filter, pressure difference sensor, pressure transmitter.

2, Electric executor, frequency converter, power control cabinet and others kinds of components of system: air valve, spraying system, pump, valves, steam valve, ventilation fan, frequency converter and motor control cabinets etc.

3,Site controller, control center compromised of all kinds of meters; DDC system or PLC system, regulating meters, communication equipments and auxiliary equipments.

4,Industry control net compromised of upper-level computers from central room, site controller, meters and executors. Industrial computers, communication equipments,

(IV) Characteristics of Auto-control System

1,Multiple working conditions suitable for all-year operation.

2,High speed of air change (10/h)

3,Separate control of temperature and humidity.

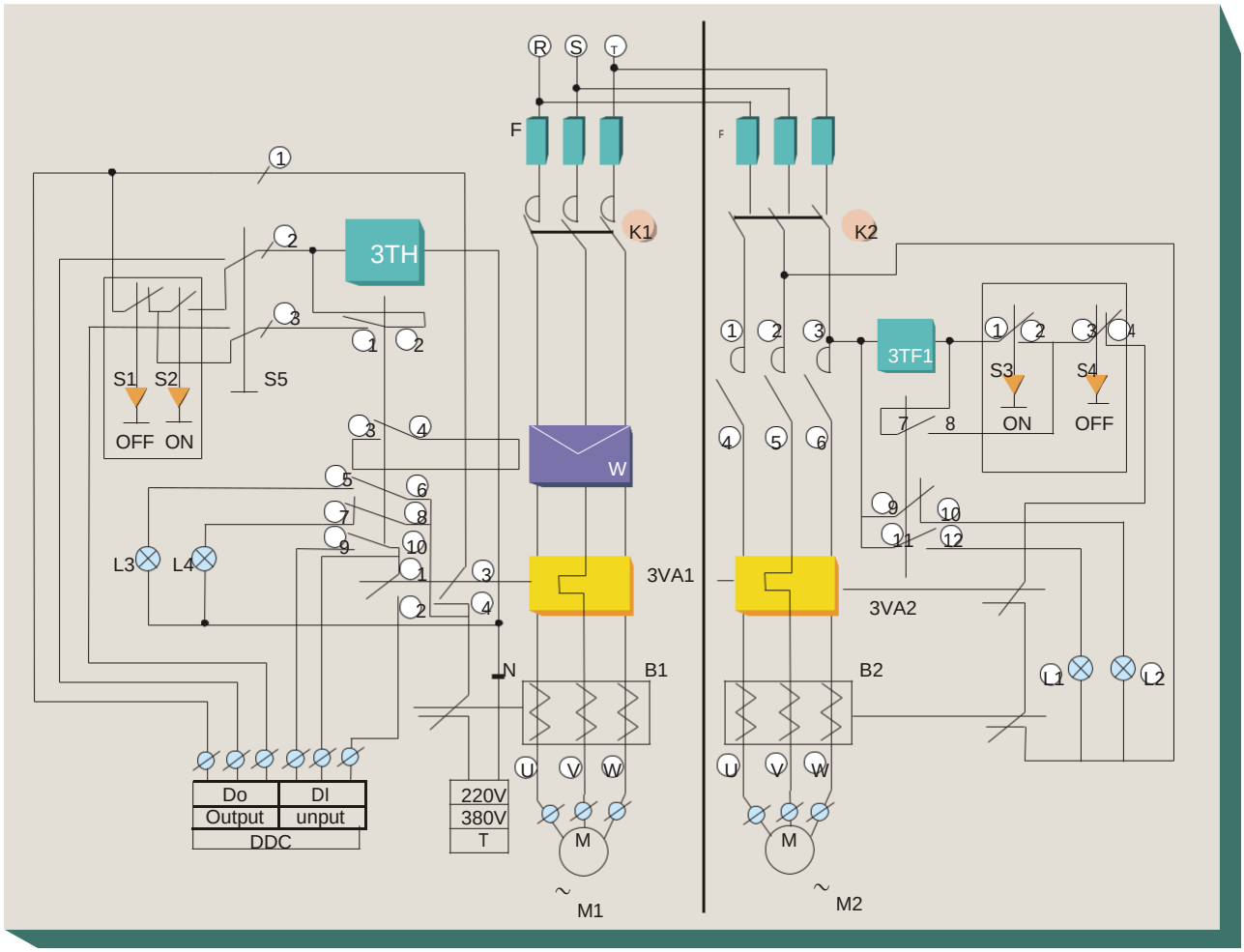
4,System warning and warning for equipment hardware.

5,Screen display; switch of manual operation and auto operation.

6,DDC/PLC site control.

7,The upper-level computer conducts real-time monitoring: inspection, configuration and query of parameters

12 Wiring Connection for ZK Assembly Type AHU



M1 ———— ventilation fan

K1, K2 ———— air switch

W ———— Starter:
1、star-delta
2、reactance pressure reducing
3、soft start

S3, S4 ———— return air start/stop button

B1、B2 ———— open-phase protection

3TF ———— Contactor

T ———— isolation transforming box

M2 ———— ventilation fan

F ———— Fuse

S1, S2 ———— ventilation start/stop button

S5 ———— switch button of manual operation and auto operation

3TH ———— Cut-off

3VA1、3VA2 ———— thermal relay

L1、L2 ———— return air start/stop button

L3、L4 ———— ventilation start/stop button

13 Installation, Operation and Maintenance

(I) Installation

1,A certain space shall be preserved around the unit, especially at one side of the inspection door and water duct, to be used for maintenance.

2,The unit shall be placed on a flat concrete step or a flat platform with a waterstone base. The height of the platform shall be over 120mm and shall ensure the necessary installation of U pipe. The width and length of the platform shall be 100mm larger than the width and length of the unit. Barrel-drain or floor drain is necessary around the platform for the drainage of sewage.

3,Sealing strips shall be attached to the joint parts of each section after installation. The strips shall be placed in right locations. Sealing glue water may be applied if necessary.

4,Pay attention to the left-right direction during the installation.

5,Remove the internal sundries after installation. Check the lubricating conditions of the rotating components, and whether the regulating valves, ducts and spraying nozzle work normal.

6,Drainage valve and air exhausting valve shall be installed on the inlet/outlet duct outside the unit. When supplying water, open the air exhausting valve to release air. On completion, close the air exhausting valve. During cleaning and maintenance, drain the remaining water through the drainage valve.

7,When connected to unit duct, the external duct shall be removed of dirt and dust to avoid jams of heat exchange. When connecting to the unit duct, please handle softly to avoid damaging the heat exchanger.

8,Valves and filtering devices shall be installed on the duct connecting the inlet/outlet duct to avoid jams. The weight of outside duct and valves shall be supported separately from the unit.

9,Water lock shall be set up on the condensed water duct for the normal drainage of condensed water.

10,If the exchange medium is water, the inlet is at the lower side while outlet at higher side. And if the medium is steam, the inlet is at higher side and outlet at lower side.

11,The power supply is 380V, 50Hz. Connect the unit to the power supply after checking the voltage. After connection, start the motor and check the rotating direction of the fan. And if it rotates normally, connect it completely. The motor shall be connected to the power supply with protection device and the shell of the motor shall be earthed. Pressure decreasing start device shall be applied if the motor power ≥ 15kw.

(II) Operation and Maintenance

ZK Assembly Type AHU

1,The unit shall be managed by skilled technicians. During operation, the technician shall check the working conditions regularly. The unit can continue its running only after the problem is solved.

2,Before starting the unit, supply water and power first, and then check each function section. Start fan first, then start heat exchanger, electric heating, humidifier; For close, close the electric heater first, then humidifier and fan.

3,The water medium used in the heat exchanger shall be soft water. 2-3 years after running, the exchanger must be removed of inside furring with appropriate chemicals. Use compressed air or water to clean the wing of the exchanger regularly.

4,Fan must not be started when the ventilation regulating valve and return air regulating valve is closed. And the ventilation regulating valve and return air regulating valve must not be closed if the fan is running.

5,In winter, if the unit shall stop for maintenance, it is important to keep the hot water in the heat exchanger running uninterruptedly. Close the new air valve to avoid the crack of the exchanger duct. Certain anti-freezing measures shall be applied.

6,The air filter shall be cleaned or replaced regularly according to its actual environment.

7,Water used in spraying section shall be changed regularly. Check if the filtering mesh, spraying nozzle is jammed or damaged. Replace them if necessary.

8,The holed-plate of muffler shall be cleaned by compressed air regularly to ensure its performance.

9,Check the soft joint regularly and change it if necessary.

10,Check the tightness of the driving belt and adjust it in time to ensure the ventilation air volume.

11,The lubricating parts shall be added lubricants regularly.

12,Check the safety conditions of electric appliances and keep them well earthed. Remove all potential dangers.

AFRA
HVAC SYSTEM

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