Neoclima

Technical Manual
Fan Coil Unit

(Wall-mounted Type)

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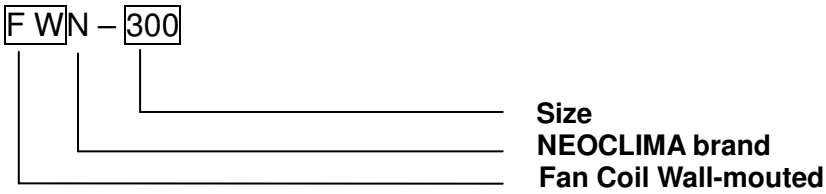
Part 1 General description

1 Nomenclature



2 Unit appearance

Model	Unit Appearance
FWN300	
FWN350	
FWN450	
FWN550	
FWN700	

Part 2. Unit

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1.Feature

The fan coil units mainly consist of centrifugal fan, coil heat exchanger, etc., they are the terminal devices of central air conditioning system, which are widely used in buildings with multi-rooms or industrial and household air conditioning occasions, for example: hotels, restaurants, factories, hospitals, exhibition halls, markets and office buildings, etc. These units can meet many requirements, like cooling, dehumidification and heating, etc., and make a clean, quiet and comfortable working and living environment.

Compared with other types of fan coil units, the wall-mounted type has the following advantages: it can be mounted on any location of indoor wall and will not occupy extra space; it's easy for installation and maintenance, and can perfectly match with indoor decoration. The wall-mounted type fan coil units:

Application occasions:

Small-size supermarkets, restaurants, office buildings, meeting rooms, villa living rooms and family living rooms, etc., and it is also suitable for old building air conditioning betterment projects, which decreases pipes and saves much cost.

Features:

◇It can be mounted on any location of indoor wall and will not occupy extra space, which makes it very suitable for family and public places use;

◇Excellent quality: The units adopt superb components to ensure its quality. The strict test during manufacturing process and 100% ex-factory test guarantee the reliable quality.

◇Beautiful appearance and low noise: Resin type skin with thin and beautiful appearance; new turbine blade makes operation quiet and with low noise.

◇Special heat isolation design, excellent heat isolation effect, and the casing will not get condensing water;

◇Long-term air filter adopted, its cleaning period is 1/2 of the normal filter, which make maintenance easier;

◇Plastic drip tray, adopts innovative foam-PS combination technology, the plastic surface thickness reaches 1mm. These features make the drip tray structure firmer and also avoid leakage;

◇The unit reserve central control function, which can combine several independent units into a central-controlled system by concentrator.

◇Safe and reliable, long-term lifetime: Each fan coil unit is conducted by leakage test with pressure; the inlet/outlet pipes (copper head) adopt forging brass structure to ensure its reliability.

◇High EER: The unit design is customized and adopts high efficiency heat exchanger, which makes a perfect combination of large air flow volume, low noise fan and motor, in order to enhance heat transfer ability and make the unit EER more superior.

◇The unit reserve auto-restart function;

◇The unit adopts brand new diversified micro-pc control system, and with remote controller;

◇The unit is equipped with failure auto-check function. If it gets failure, the light will blink and failure code will display on the wired controller, which makes troubleshooting easier.

Function Introduction

Type	Item	FWN-***				
		300	350	450	550	700
Protect	Sensor failure alarm	●	●	●	●	●
	Failure code display function	●	●	●	●	●
Comfort	Cooling	●	●	●	●	●
	Heating	●	●	●	●	●
	3-Speed	●	●	●	●	●
	Adjustable ESP	—	—	—	—	—
	Auto-restart(Optional)	●	●	●	●	●
	Timing ON/OFF	●	●	●	●	●
Control	Time display	●	●	●	●	●
	Operation mode display	●	●	●	●	●
	Fan speed display	●	●	●	●	●
	Timing ON/OFF display	●	●	●	●	●
	Wind angle display	●	●	●	●	●
	Sleeping mode display	●	●	●	●	●
Operation	Auto operation	●	●	●	●	●
	Dehumidification operation	●	●	●	●	●
	Ventilation mode	●	●	●	●	●
	Long-distance control function	●	●	●	●	●
Health	Washable air filter	●	●	●	●	●
	Fresh air interface	—	—	—	—	—
Installation	Left/right drainage	●	●	●	●	●
	Left/right pipe connection	●	●	●	●	●
	Down/back air suction	—	—	—	—	—
	Installation indicating board	—	—	—	—	—

Remarks:● Stands for “YES” – Stands for “NO”

2.Specfication

Model			FWN300	FWN350
Air Volume	Hi Speed	CFM	300	400
		m^3/h	510	680
	Medium Speed	CFM	225	300
		m^3/h	383	510
	Low Speed	CFM	150	200
		m^3/h	255	340
Cooling Capacity	Hi Speed	W	2712	3618
	Medium Speed	W	2305	3075
	Low Speed	W	1763	2352
Heating Capacity	Hi Speed	W	4070	5418
	Medium Speed	W	3460	4605
	Low Speed	W	2646	3522
Noise Level		dB(A)	39/35/31	41/37/33
Fan Motor	Fan Quantity		1	1
	Motor Quantity		1	1
	Power Input	W	52	62
Water Flow Volume		kg/h	610	800
Hydraulic Resistance		kPa	18	22
Max. Working pressure		MPa	1.6	1.6
Dimension(W×D×H)	Net	mm	880x280x196	1095x312x195
	Packing	mm	935x350x270	1175x375x270
Net/Gross Weight		kg	11/13	15/17
Inlet/Outlet Water Pipe			R3/4″ (DN20)	R3/4″ (DN20)
Drain Pipe			(DN20)	(DN20)
Stuffing Quantity(20/40/40H)			320/656/732	240/496/558

Note:

1. Cooling working condition: inlet air DB temperature is 27℃, WB temperature is 19.5℃, inlet water temperature is 7℃, outlet water temperature is 12℃;
2. Heating working condition: inlet air DB temperature is 21℃, inlet water temperature is 60℃;
3. The parameter of water flow volume, water resistance and noise in the above chart is in high-level air speed condition;
4. Above published parameter may change due to products performance improvement. NEOCLIMA reserve the right to better product design without prior notice. Everything should subject to the figure on nameplate.

Model			FWN450	FWN550	FWN700
Air Volume	Hi Speed	CFM	500	600	800
		m^3/h	850	1020	1360
	Medium Speed	CFM	375	450	600
		m^3/h	638	765	1020
	Low Speed	CFM	250	300	400
		m^3/h	425	510	680
Cooling Capacity	Hi Speed	W	4514	5406	7210
	Medium Speed	W	3837	4595	6129
	Low Speed	W	2934	3514	4687
Heating Capacity	Hi Speed	W	6767	8155	10807
	Medium Speed	W	5752	6898	9186
	Low Speed	W	4399	5275	7025
Noise Level		dB(A)	43/39/35	45/41/37	46/42/38
Fan Motor	Fan Quantity		1	1	1
	Motor Quantity		1	1	1
	Power Input	W	76	96	134
Water Flow Volume		kg/h	950	1080	1390
Hydraulic Resistance		kPa	25	30	27
Max. Working pressure		MPa	1.6	1.6	1.6
Dimension(W×D×H)	Net	mm	1095x312x195	1095x312x195	1310x322x240
	Packing	mm	1175x375x270	1175x375x270	1420x440x380
Net/Gross Weight		kg	16/18	16/18	20/23
Inlet/Outlet Water Pipe			R3/4″ (DN20)	R3/4″ (DN20)	R3/4″ (DN20)
Drain Pipe			(DN20)	(DN20)	(DN20)
Stuffing Quantity(20/40/40H)			240/496/558	240/496/558	129/264/307

Note:

1. Cooling working condition: inlet air DB temperature is 27℃, WB temperature is 19.5℃, inlet water temperature is 7℃, outlet water temperature is 12℃;
2. Heating working condition: inlet air DB temperature is 21℃, inlet water temperature is 60℃;
3. The parameter of water flow volume, water resistance and noise in the above chart is in high-level air speed condition;
4. Above published parameter may change due to products performance improvement. NEOCLIMA reserve the right to better product design without prior notice. Everything should subject to the figure on nameplate.

3 Capacity amendment

3.1 Table of variable working condition performance for cooling capacity

Table of variable working condition performance parameter under cooling mode

Unit: W

Air inlet temperature℃			26℃ DB/18. 7℃ WB						27℃ DB/19℃ WB					
Water inlet temperature ℃			5		7		9		5		7		9	
Model	Water flow (kg/h)	Water pressure drop (kPa)	TH	SH	TH	SH	TH	SH	TH	SH	TH	SH	TH	SH
FWN300	300	3.5	1906	1445	1686	1355	1445	1184	1947	1525	1776	1435	1495	1254
	400	5.9	2181	1628	1919	1507	1648	1316	2241	1718	1980	1588	1708	1397
	500	8.7	2575	1750	2273	1609	1961	1398	2635	1831	2333	1690	2022	1499
	600	12	2854	1811	2540	1660	2186	1437	2925	1902	2570	1751	2257	1528
FWN350	430	8.1	2549	1932	2254	1811	1932	1583	2603	2039	2375	1918	1999	1677
	550	11.5	2914	2176	2565	2014	2202	1759	2995	2296	2646	2122	2283	1867
	650	15.5	3440	2338	3037	2150	2620	1868	3521	2446	3118	2258	2701	2002
	750	20	3807	2417	3389	2214	2916	1917	3902	2538	3429	2336	3011	2039
FWN450	600	18	3184	2413	2815	2262	2413	1977	3251	2547	2966	2396	2497	2095
	700	24	3639	2717	3203	2516	2750	2197	3740	2868	3304	2650	2851	2331
	800	30	4296	2920	3793	2685	3272	2333	4397	3054	3893	2819	3373	2500
	900	37	4750	3015	4228	2762	3638	2392	4868	3167	4278	2914	3756	2543
FWN550	750	21.5	3817	2893	3375	2712	2893	2371	3897	3054	3556	2873	2993	2511
	850	26.8	4361	3256	3839	3015	3296	2633	4482	3437	3959	3175	3417	2794
	950	32.7	5138	3492	4536	3211	3914	2790	5258	3653	4656	3372	4034	2990
	1050	39	5688	3611	5063	3308	4357	2864	5830	3792	5124	3490	4498	3046
FWN700	900	14.8	5644	4278	4991	4011	4278	3506	5763	4516	5258	4248	4426	3713
	1100	21	6450	4815	5677	4458	4874	3894	6628	5082	5855	4696	5053	4131
	1300	28	7611	5173	6719	4757	5798	4133	7790	5411	6898	4995	5976	4430
	1500	36	8402	5333	7478	4886	6436	4231	8611	5601	7568	5154	6644	4499

variable working condition performance parameter table (continued)

Unit: W

Air inlet temperature ℃			27℃ DB/19. 5℃ WB						28℃ DB/22℃ WB					
Water inlet temperature ℃			5		7		9		5		7		9	
Model	Water flow (kg/h)	Water pressure drop (kPa)	TH	SH	TH	SH	TH	SH	TH	SH	TH	SH	TH	SH
FWN300	300	3.5	2017	1495	1786	1385	1645	1380	2528	1874	2288	1774	2067	1532
	400	5.9	2321	1678	2060	1548	1794	1467	2904	2099	2643	1985	2382	1722
	500	8.7	2756	1810	2434	1660	2123	1574	3410	2240	3128	2133	2816	1850
	600	12	3026	1882	2712	1710	2369	1604	3795	2361	3461	2182	3097	1926
FWN350	430	8.1	2697	1999	2388	1851	2199	1845	3381	2506	3059	2371	2764	2049
	550	11.5	3102	2243	2753	2068	2397	1960	3881	2806	3532	2653	3183	2301
	650	15.5	3682	2419	3252	2217	2836	2102	4555	2993	4179	2849	3763	2472
	750	20	4037	2511	3618	2282	3161	2140	5063	3149	4617	2911	4131	2570
FWN450	600	18	3368	2497	2983	2313	2747	2304	4223	3131	3821	2962	3452	2559
	700	24	3874	2801	3438	2583	2994	2448	4847	3504	4411	3313	3975	2873
	800	30	4598	3021	4061	2769	3542	2625	5689	3737	5219	3558	4699	3087
	900	37	5036	3133	4514	2847	3944	2671	6316	3929	5760	3632	5154	3206
FWN550	750	21.5	4038	2993	3576	2772	3293	2762	5063	3753	4580	3551	4139	3068
	850	26.8	4643	3356	4120	3095	3587	2933	5808	4199	5286	3971	4763	3443
	950	32.7	5499	3613	4857	3312	4236	3140	6804	4470	6242	4256	5620	3692
	1050	39	6031	3752	5406	3409	4723	3198	7564	4706	6899	4350	6173	3840
FWN700	900	14.8	5971	4426	5288	4100	4869	4085	7486	5550	6773	5251	6120	4537
	1100	21	6866	4964	6093	4577	5305	4338	8590	6210	7817	5872	7044	5092
	1300	28	8146	5352	7195	4906	6275	4651	10079	6621	9246	6304	8325	5469
	1500	36	8909	5542	7985	5035	6976	4724	11173	6950	10190	6426	9117	5672

3.2 Table of variable working condition performance for heating capacity

Table of variable working condition performance parameter under heating mode

Unit: W

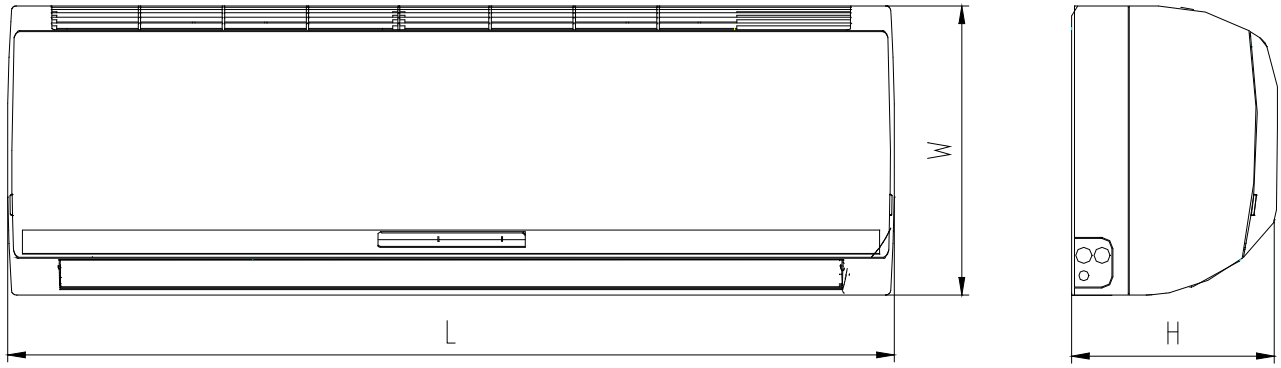
Air inlet temperature ℃			18℃ DB						20℃ DB					
Water inlet temperature ℃			40	45	50	60	70	80	40	45	50	60	70	80
Model	Water flow (kg/h)	Water pressure drop (kPa)												
FWN300	300	3.5	1882	2308	2744	3594	4445	5306	1712	2148	2563	3424	4285	5136
	400	5.9	2021	2479	2947	3862	4788	5703	1841	2298	2756	3681	4596	5522
	500	8.7	2182	2682	3171	4161	5161	6140	1990	2480	2980	3980	4959	5959
	600	12	2297	2831	3344	4380	5427	6474	2094	2607	3141	4177	5224	6271
FWN350	430	8.1	2508	3075	3656	4790	5924	7072	2282	2863	3415	4563	5711	6845
	550	11.5	2694	3303	3927	5146	6380	7599	2453	3062	3672	4905	6125	7358
	650	15.5	2850	3504	4143	5436	6743	8022	2600	3240	3893	5200	6479	7786
	750	20	3057	3768	4451	5830	7224	8618	2787	3470	4181	5560	6954	8347
FWN450	600	18	3135	3844	4570	5987	7404	8839	2852	3578	4269	5704	7138	8556
	700	24	3366	4128	4907	6431	7972	9496	3065	3827	4588	6130	7653	9195
	800	30	3632	4465	5280	6928	8594	10224	3313	4129	4961	6627	8257	9923
	900	37	3819	4707	5559	7282	9023	10763	3481	4334	5222	6945	8685	10426
FWN550	750	21.5	3762	4612	5483	7183	8883	10605	3422	4293	5122	6843	8564	10265
	850	26.8	4038	4952	5887	7715	9564	11392	3677	4591	5505	7354	9182	11031
	950	32.7	4302	5288	6253	8205	10177	12107	3924	4889	5875	7848	9778	11751
	1050	39	4579	5644	6667	8733	10820	12907	4175	5197	6262	8328	10415	12503
FWN700	900	14.8	5260	6449	7668	10045	12423	14830	4785	6003	7162	9570	11977	14355
	1100	21	5648	6927	8235	10791	13378	15934	5143	6421	7700	10286	12842	15429
	1300	28	6095	7492	8860	11624	14419	17154	5560	6927	8324	11119	13854	16649
	1500	36	7889	9319	12206	15124	18042	5835	7264	8753	11641	14558	17476	5567

Table of c variable working condition performance parameter under heating mode (continued)

Unit: W

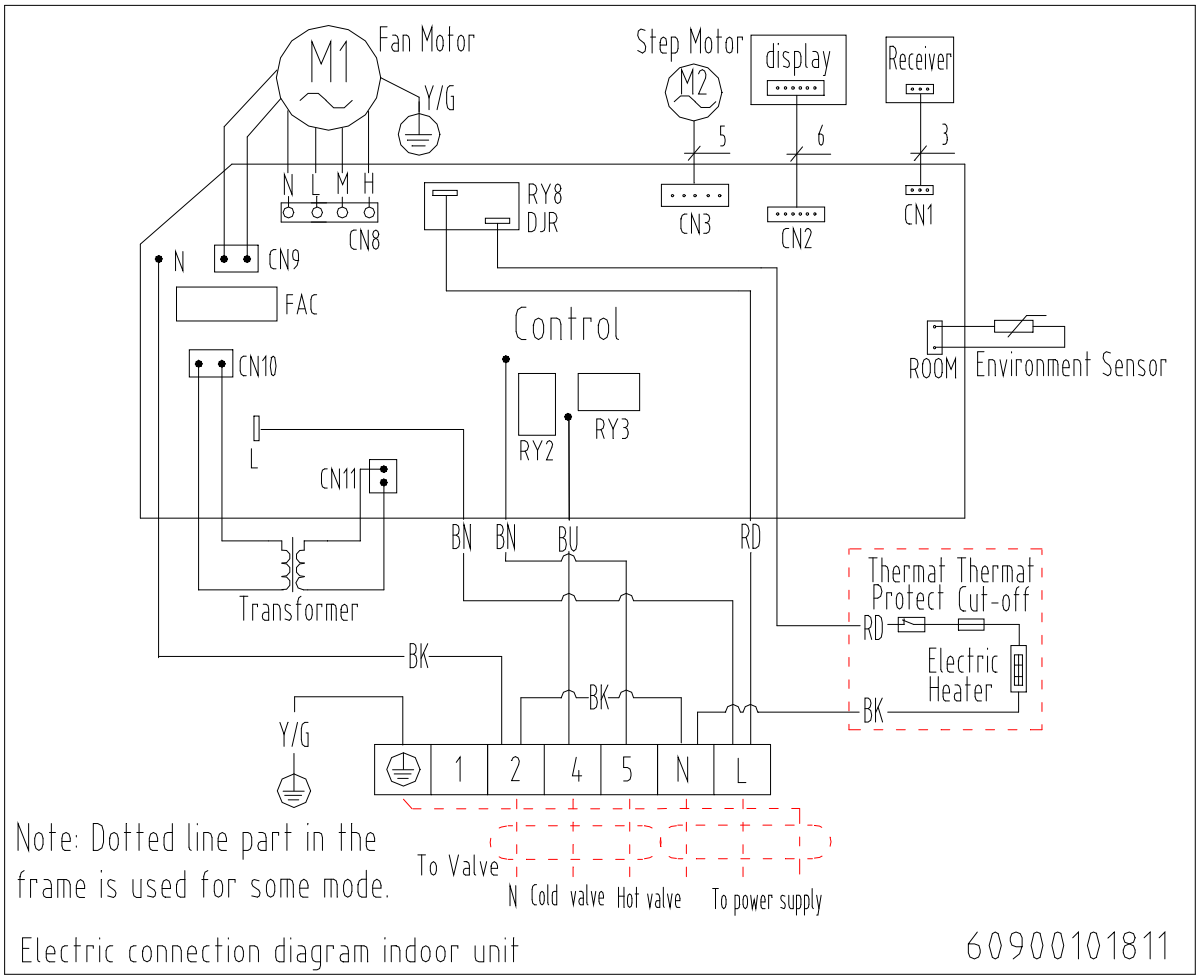
Air inlet temperature ℃			21℃ DB						22℃ DB					
Water inlet temperature ℃			40	45	50	60	70	80	40	45	50	60	70	80
Model	Water flow (kg/h)	Water pressure drop (kPa)												
FWN300	300	3.5	1638	2052	2478	3339	4200	5040	1542	1957	2393	3254	4105	4955
	400	5.9	1745	2213	2670	3596	4511	5437	1649	2117	2575	3490	4415	5330
	500	8.7	1884	2384	2873	3863	4863	5842	1788	2277	2778	3767	4757	5757
	600	12	1998	2510	3034	4070	5117	6164	1880	2404	2916	3963	5010	6068
FWN350	430	8.1	2182	2735	3302	4450	5598	6718	2055	2608	3189	4337	5470	6604
	550	11.5	2325	2949	3559	4792	6011	7245	2198	2821	3431	4650	5884	7103
	650	15.5	2461	3114	3754	5047	6354	7633	2336	2975	3629	4922	6215	7522
	750	20	2659	3342	4039	5418	6812	8205	2503	3200	3882	5276	6669	8077
FWN450	600	18	2728	3419	4127	5562	6997	8396	2568	3259	3986	5420	6837	8254
	700	24	2905	3685	4447	5988	7512	9053	2746	3525	4287	5811	7352	8876
	800	30	3136	3969	4784	6432	8098	9728	2977	3792	4625	6273	7920	9586
	900	37	3321	4174	5044	6767	8508	10248	3126	3996	4849	6589	8330	10088
FWN550	750	21.5	3273	4102	4952	6673	8394	10073	3081	3910	4782	6503	8203	9903
	850	26.8	3486	4421	5335	7184	9012	10861	3294	4230	5144	6971	8821	10648
	950	32.7	3714	4700	5666	7617	9589	11520	3525	4490	5477	7428	9380	11352
	1050	39	3983	5005	6049	8115	10202	12290	3749	4792	5815	7902	9989	12098
FWN700	900	14.8	4577	5736	6925	9332	11739	14087	4309	5468	6687	9094	11472	13849
	1100	21	4875	6183	7462	10048	12605	15191	4608	5916	7194	9751	12337	14894
	1300	28	5262	6660	8027	10792	13587	16322	4995	6362	7760	10524	13289	16084
	1500	36	6996	8455	11343	14261	17178	5240	6699	8128	11045	13963	16910	16910

4. Demension



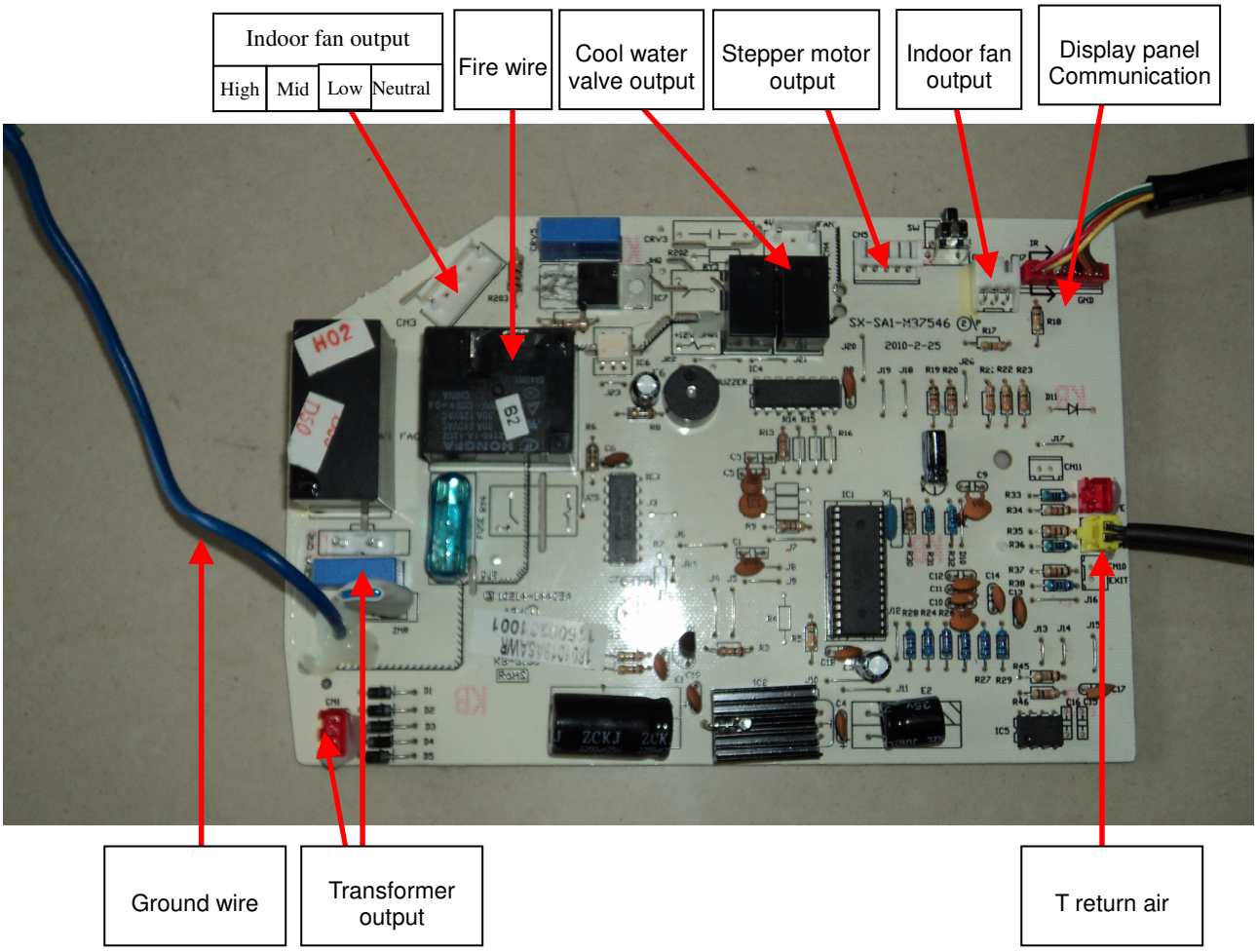
Model / Item	FWN300	FWN350	FWN450	FWN550	FWN700
L	880	1095	1095	1095	1310
W	280	312	312	312	322
H	196	195	195	195	240

5. Electrical wiring and connection

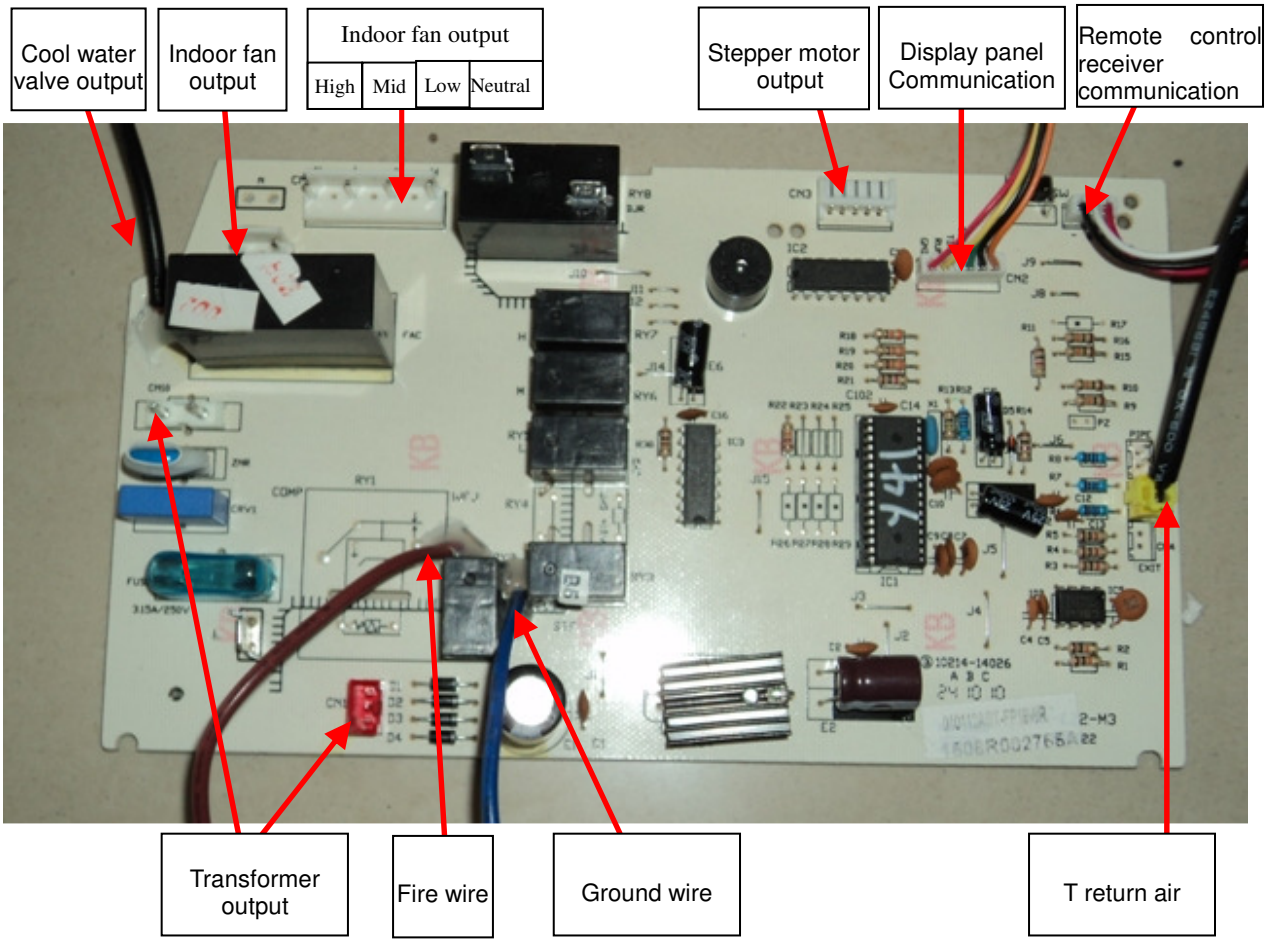


Control Board (PCB Board) Internal Wiring Diagram

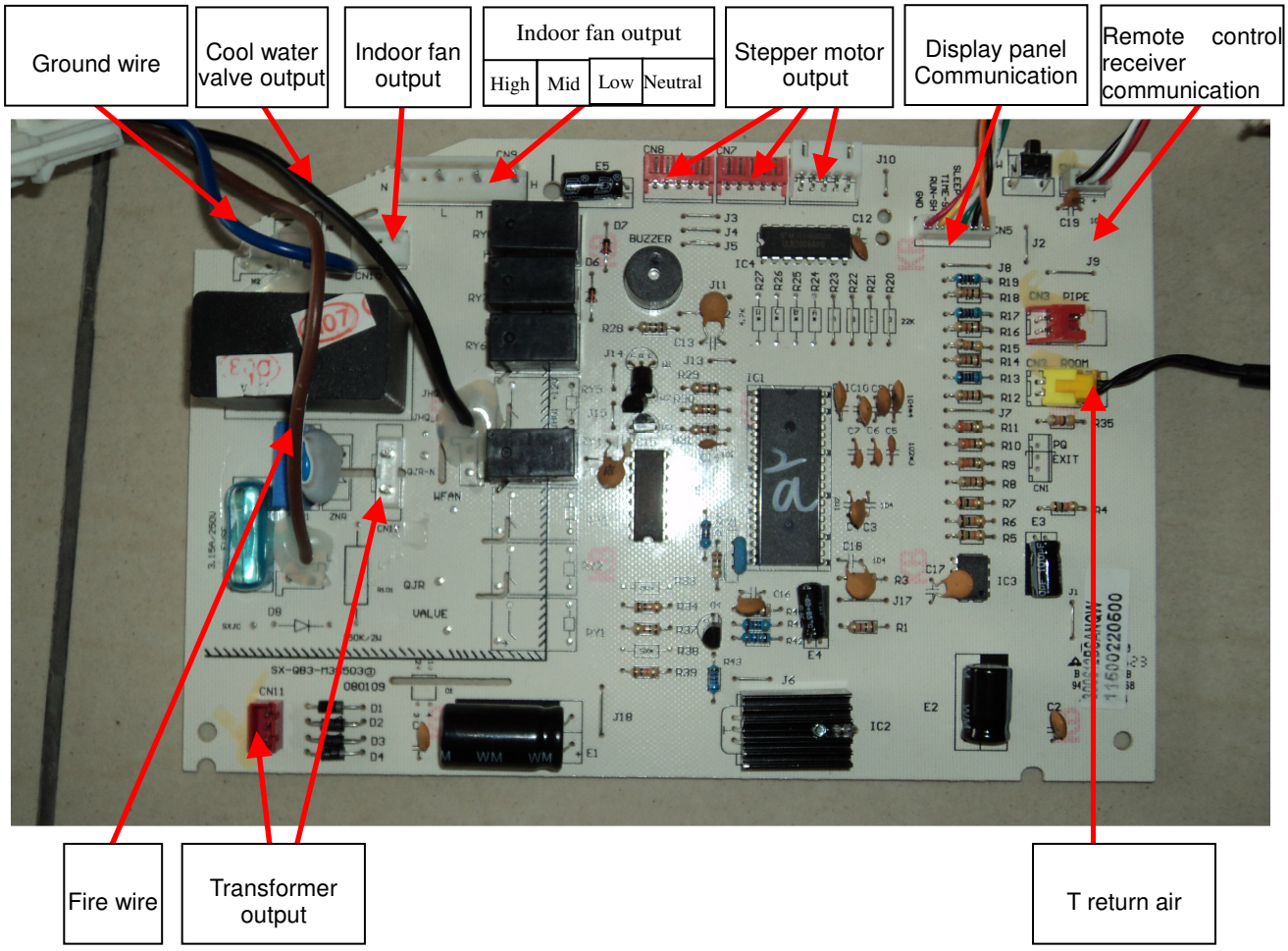
Control Board AFC-51W Controller Assembly Port/Socket Instruction



Control Board SX-BGFP(18) Controller Assembly(with electrical heating) Port/Socket Instruction



Control Board AFC-136W Controller Assembly Port/Socket Instruction



6. Installation

6.1 Preparation and equipments before installation

Preparation before construction

Material requirements and main equipment:

a. The fan coils should be applied with the ex-factory qualified certification or quality authentication file.

b. The structure, installation, outlet direction and the inlet water position of fan coil should accord with the designed installation requirements.

c. The specifications and models of the main and accessorial materials adopted for equipment installation should accord with design requirements and have ex-factory qualified certification.

d. Necessary tools: electrical hammer, electrical hand drill, adjustable spanner, socket spanner, pipe wrench, hammer, bench vice, screw tap, mantle fiber board, level bar, plummet, hand pump, pressure table, steam welding tool, etc.

Operation

a. Operation procedure: pre-check → preparation before construction → motor checking and trial operation → heat exchanger water pressure checking → hanger make → fan coil installation → tubing → check

b. Conduct electrified test checking on each fan coil unit, make sure there is no rub in mechanical part and no electricity leakage in electric part.

c. Conduct water pressure test on each fan coil unit, the testing working condition should be 1.5 times of the standard condition, make sure there is no leakage after 2~3min when the pressure is fixed.

d. The cooling/heating refrigerant water pipe should be connected with the fan coil units with steel pipe or copper pipe, which should be kept straight. To avoid damaging the copper pipe, use wrench to clamp the hexagon joint while fastening the pipe. It is better to connect the condensing pipe with transparent hose by flexible connection method, and the length of transparent hose should be less than 300mm. Fasten the hose with hose clamps to avoid leakage, and ensure the gradient accurate and condensing water flowing to target position unblocked, and also ensure there is no water accumulated in the drain pan.

e. The fan coil units should be connected with the cooling/heating refrigerant pipe after the duct system is purged, in case of the heating exchanger being blocked.

Quality standard

Guaranteed items

a. The installation of fan coil units should be balanced and firm.

Checking method: measured with level bar and plummet.

b. The connection between fan coil units and inlet/outlet water pipes should avoid any leakage, and the gradient of condensing water pipe should meet to water drainage requirement.

Checking method: measured with ruler, inspection and checking test records.

6.2 Unit installation

Notices of Unit Installation

◇The installation location should keep away from direct solar radiation and cooling/heating sources;

◇There must be enough space reserved for easier installation, maintenance and filter disassembly;

◇Choose a better installation location to make the air distribution reasonable, and it should fully cover blind space;

◇When connect the inlet and outlet water pipes, it's better to use raw material to seal the connection joints;

◇The inlet/outlet water pipes should be conducted heat reservation, and add valve;

◇The condensing water inlet should be installed with filter, in case of being blocked;

◇Before wiring, check the voltage and phase number of power supply, and ensure they meet the unit requirement; the difference of voltage better not exceed 10% of rated voltage;

◇The water used by the unit should meet: cold water temperature should be no lower than 6℃ (avoid defrost), hot water no higher than 60℃, and the water should be clean;

◇The installation location should keep away from place with much dust and oil mist, in case it causes heat exchanger performance drop, electric shock and unit damage made by corrosive plastic, etc;

◇The installation location should be keep away from the TV and radio with more than 1 meter, in case it disturb them;

Installation Location Selection

The fan coil unit should be mounted on solid wall, and the height better be 1.8~2m. The unit should be kept away from the ceiling and walls on 2 sides with 10~15cm, which will make ventilation easier.

The installation location should keep away from direct solar radiation, and the air outlet cannot face to people; besides, the condensing water drainage issue should be taken into consideration.

Unit Installation

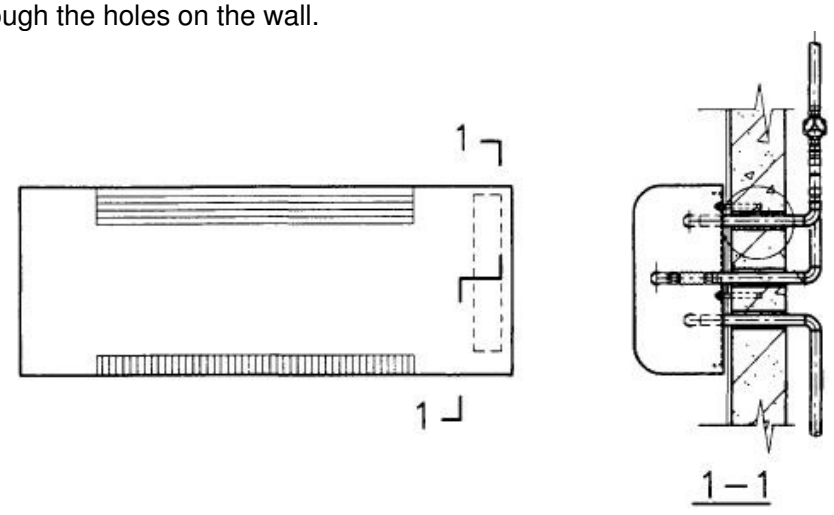
Take off the hanging plate of indoor unit and hold it horizontally on target position of the wall. Find out the arrow indication on 4 corners of the plate, and mark the holes positions, and then use electric drill to make holes on the marked positions; fill in bilge anchor bolts, and access through the holes in the plate with wood screw, and then screw into the bilge anchor bolts to fasten the hanging plate.

The next step is to drill holes through the wall, and the holes are used for the duct pipe of the fan coil unit. The positions of the holes should be decided by the circle gap on the installation plate. While drilling holes, drill a circle of smaller holes around the gap, and then use tool to make the real hole, which can be more accurate and time-saving. The positions of holes should be slightly incline from inside to outside, which makes it easier for condensing water drainage.

According to different installation location, the water discharge ways of duct connection have the following types: discharge from back left side, discharge from back right side, discharge from bottom right side, discharge from bottom left side, etc.

After the duct led out, put heat preservation pipe on the coupling hose, and then pack up at around 10mm position inside the case. The pack-up should stop when it reaches to the hose joints, and the rest should be done when the joints put together.

After all the above operation done, hang the unit on the hanging plate and make the discharge duct access through the holes on the wall.



6.3 Electrical connection precaution

Warning	Installation of electric items must be carried out by qualified, professional technicians. An isolated circuitry should be fixed with whole-pole disconnection devices, which is with at least 3mm gap of touch point. . Power supply and indoor to outdoor connection should use special cable. Providing the necessity of installation or replacement, the professional technician of service store appointed by manufacturer must be required, while self-operation by users is prohibited.
	In case of any electric shock accident, the creepage protection devices /power supply on-off and breaker must be required with power supply.
	Machine must be earthed surely. If not, it'll be probably caused creepage.
	The power cord shall consist wires of 227IEC53(RVV) type specified in GB5023 or those of equivalent grades or above . Secure the wires with fixtures, so that the terminals will not easily dislodge under external forces. Incorrect connection or fixing may cause a fire or other hazards. The internal and external connecting cable shall consist wires of 245IEC57(YZW) type specified in GB5013 or those of equivalent grades or above.
Notice	The earth line is neither allowed to connect to gas pipe, water pipe or circuitry of telephone or lighting rod, nor to the earth line of other devices.
Others	●Please connect the power cord according to the instructions of the circuit diagram. ●Securely and firmly connect the wires to the terminal holder with cable fixtures, to prevent the external forces from acting on the wires and causing dangers.

6.4 Check and Pressure Test of Unit

Check Installation Condition

◇Check and make sure the installation and wiring of fan coil unit meet the instruction requirements;

◇Check and make sure the air switch, line paths of power supply and different cords meet the requirements, and also check if the earth wiring is reliable;

◇Check and make sure the air outlet and the water pipe is clean and purged.

Pressure Test and Water-adding of Unit

Make a plan before fan coil AC system pressure test, and select a suitable pressure test pump. During the pressure test process, write down the test records carefully and monitor the changes of system pressure at all times. The testing pressure should be ≤1 MPa.

● **Notices**

a. It's necessary to turn on the air discharge valve on the water collector before adding water to the coil, and close the valve after the air inside coil completely discharged.

b.Pressure test condition: temperature is above 5℃, or set with anti-freezing measurement.

c.During water pressure test, level up the pressure section by section, and the process should be slow and even; after the water pump stops operation and water pressure becomes stable, check carefully if the connecting joints is leaked.

d.When add water into the system, stratified adding water, stratified discharging air and stratified test is necessary.

e.Check and confirm there is no leakage with the system duct pipeline, and then conduct heat preservation treatment to the pipeline according to the design scheme.

Follow the 2 principles while making system pressure test scheme: water should flow from low to high; the water-adding should be done layer by layer. It's necessary to follow the above points, or it will damage the structure of fan coil unit and system pipeline.

Operation of the unit

●Before initial operation, please remove foreign matters in the water tray, plastics and around the fan coil and check if the installation points of the water pipes and the cables are correct;

●Before initial operation, the water inlet and outlet valves of the unit shall be closed first and the pipe system of the cooling water be cleaned before opening the valves;

●During the initial operation, the ventilation valve on the water return pipe shall be opened to exhaust the air from the fan coil and the pipeline.

1. Power on and open the inlet/outlet water valve, the water temperature should be adjusted to cooling mode;
2. Switch to “Ventilation”(high speed) mode and observe if there is strong wind blowing indoor and if there is abnormal sound with the unit;
3. Switch on “Swing” function, and check if the ventilation bar swings normally;
4. Switch on “Cooling” mode, and observe if the unit normally blowing cool wind and discharging water;
5. Press other buttons on the remote controller and check if the unit operates normally;
6. After the above operation and confirm the unit operates normally, press “ON/OFF” button and stop trial operation;
7. At the installation site, provide users training like “notices of operation and maintenance”, etc.

6.5 Daily maintenance

Clean the air filter

Precautions for filter screen cleaning

◇Before cleaning the air filter screen, first start the unit and cut the power , for fans running at high speed may cause injure;

◇Never clean the AC with water, or short circuits or electric shocks may occur.

Cleaning of the filter screen

◇To avoid undermining the operation effect of the air conditioner, please clean the air filter screen on a timely manner, once a month is recommended ;

◇ A vacuum cleaner may be used to remove the dust on the filter screen, or cleanse it with water;

◇When the air filter screen is dirty, submerge it into water of 45℃ temperature or lower and contains neutral detergent, then rinse it with clear water.

◇Install the filter screen only after allowing it dry in the air, otherwise electric shocks or other hazards may occur;

◇Never leave it exposed to the sun.

Maintenance during daily operation of the unit

◇Frequently inspect and clean the filter screen for the returned air. A dirty or blocked filter screen may result in declined cooling and heating capacity of the unit;

◇Check the power cables for tightness from time to time, to avoid damages to the electrical devices. A loosened connection may even cause fire hazard;

◇During the initial stage of the operation of the unit, the water filter shall be cleaned weekly, and once per 1-2 month after 1month.

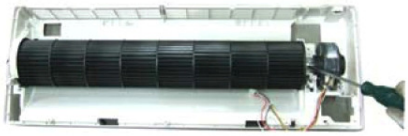
◇When the unit is not to be used during: Summer, the coil shall be filled with water to avoid rusting; winter, the water shall be thoroughly discharged to avoid cracking.

6.5 Unit Disassembly and Notices

Caution: Please turn the unit off and unplug the power before maintenance

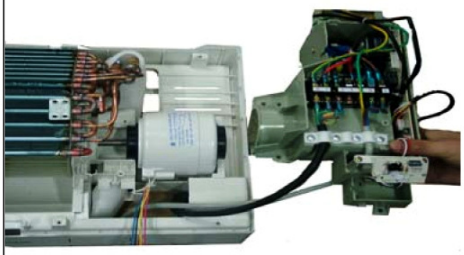
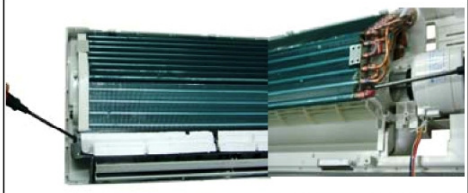
Disassembly Method and Notices of, FWN-300

No.	Part	Operation Process	Remark
1	Panel	1) Turn off the air-conditioner and cut off the power supply; 2) Tear the adhesive tape sticking to the panel;	
		3) Hold the handles at both sides of the panel and push upward to have it slip out; 4) Grasp the both sides of the panel and push upward; 5) Turn the upper board by 90°and unload it from the connecting pole carefully;	
		6) Take out the filter from the right and left side.	
		7) Screw off the bolts on the electrical box cover and unload the box cover;	
		8) Screw off the 5 bolts (for 1Hp AC) or 8 bolts (for 1.5Hp AC) on the medium frame; 9) Hold the both sides of the medium frame and open it gently 10)Turn up the medium frame by about 90°; 11)Offload the medium frame once hearing the crack sound;	
2	Electrical component	1) Do No."1" and "2" firstly, offload the water drainage soft tube; 2) Offload the water draining tank from chassis and take out the electrical components.	
3	Water draining tank	1) Do No. "1" firstly; 2) Pull out all tie-in connecting with PCB and the temperature sensor, etc.; 3) Screw off the screws and bolts as indicated in the picture. Untie the outdoor unit's interconnection cord and	

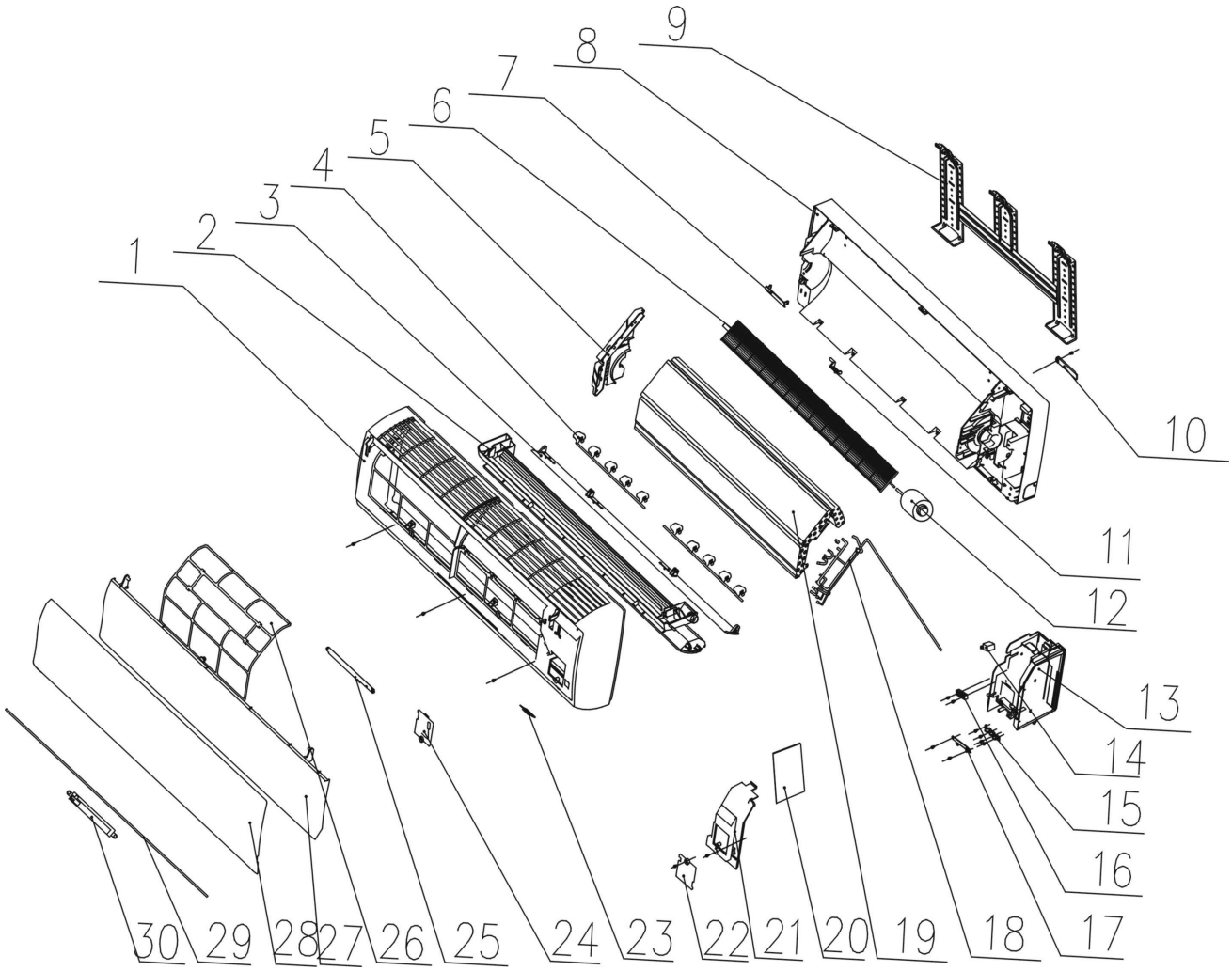
		power supply cord from the terminal of the electrical box. 4) If the main PCB board is loosed by chance, remove it away;	
4	Evaporator	1) Do No.”1” , “2” and “3” firstly; 2) Offload the connecting pipe; 3) Offload the tube clip at the rear; 4) Screw off the bolts at the right and left side; 5) Lift up the evaporator, and draw it out from the indoor unit;	
5	Indoor fan Fan motor	1) Screw off one bolt from the motor cover, and remove the motor cover; 2) Offload the motor from the fan; 3) Offload the fan from bearing;	 

Disassembly and Notices of FWN-350, FWN-450, FWN-550

No.	Part	Operation Process	Remark
1	Front panel	1) Turn off the air-conditioner and cut off the power supply; 2) Remove the adhesive tape sticking to the panel. 3) Hold the handles at both sides of the panel and push upward to have it slip out; 4) Grasp the both sides of the panel and push upward; 5) Turn the upper board by 90°and unload it from the connecting pole carefully; 6) Take out the filter from the right and left side. 7) Screw off the bolts on the electrical box cover and unload the box cover; 8) Screw off the six bolts on the medium frame; 9) Hold the both sides of the medium frame and open it gently; 10)Turn up the medium frame by about 90°; 11)Offload the medium frame once hearing the crack sound;	
2	Water draining tank	1) Do No.”1” and “2” firstly, offload the water draining soft tube; 2) Offload the water draining tank from the chassis and take out the electrical components.	

3	Electrical component	1) Do No. “1” firstly; 2) Pull out all tie-in connecting with PCB and the temperature sensor, etc.; 3) Screws off the screws and bolts at the three positions indicated in the picture. Untie the outdoor unit’s interconnection cord and power supply cord from the terminal of the electrical box. 4) If the main PCB board is loosed by chance, remove it away;	
4	Evaporator	1) Do No.”1” , “2” and “3” firstly; 2) Offload the connecting pipe; 3) Offload the tube clip at the rear; 4) Screw off the bolts at the right and left side; 5) Lift up the evaporator, and draw it out from the indoor unit;	
5	Indoor fan and fan motor	1) Offload the motor from the indoor fan; 2) Offload the indoor fan from bearing;	

7. Explode view



N0.	Part Name	Quantity	Unit
1	Medium frame	1	Set
2	Air-vent holder	1	Pc
3	Horizontal air-blade	1	Pc
4	Vertical air-blade	10	Pcs
5	Left plastic-crutch for evaporator	1	Set
6	Through-flow fan	1	Pc
7	Cover of chassis	2	Pcs
8	Chassis	1	Pc
9	Mounting plate	1	Pc
10	Pipe clamp	1	Pc
11	Slip block	3	Pcs
12	Indoor fan motor	1	Pc
13	Electric controller box	1	Pcs
14	Transformer	1	Pc
15	Wire clamp	1	Pc
16	Terminal board	1	Pc
17	Signal receiver holder for remote controller	1	Pc
18	Evaporator tubing assembly	1	Set
19	Evaporator	1	Set
20	Main PCB	1	Pc
21	Cover of electric controller box	1	Pc
22	Top cover of electric controller box	1	Pc
23	Receiver window for remote controller	1	Pc
24	Cover of medium frame	1	Pc
25	Indication lamp holder	1	Pc
26	Filter	N	Pc
27	Panel scaleboard	1	Pc
28	Panel	1	Pc
29	Panel ornamental	1	Pc
30	Display board	1	Pc

Part 3 Product selection

1. Precautions of product selection.....30

2. Methods of product selection.....31

1. Precautions of product selection

a. At given airflow and temperature of a fan coil unit, when water supply changes, so does the cooling capacity. Based on statistics of the performance of some products, when water supply temperature is 7□ at 80% water supply, the cooling capacity is about 92% of the original level, indicating slow effect of the water supply change to cooling capacity.

b. At given temperature difference between water supply and water return of a fan coil , the cooling capacity decreases with as the water supply temperature increases. According to statistics, if water supply temperature is increased by 1□, the cooling capacity will decrease by about 10%, the higher the water temperature is , the greater decrease the cooling capacity will suffer, with lowered humidity capacity.

c. At given water supply condition, when the airflow of a fan coil changes, so do its cooling capacity and enthalpy difference of air treatment, which usually increases as cooling capacity decreases, without much change in power consumption of unit cooling capacity.

d. When the temperature difference between inlet and outlet water of a fan coil increases, the water flow will decrease, so will the heat transfer coefficient of the heat exchange coil. The heat transferring temperature will also change, as a result, the cooling capacity of a fan coil increases as the temperature difference between supply and return water increases. According to statistics, when water supply temperature is at 7□ , and the temperature difference between supply and return water has increased from 5□ to 7□, the cooling capacity may decrease about17%..
The water supply, water supply temperature, temperature difference between supply and return water , water flow and inlet air temperature and humidity interact with on another, with the performance of the fan coil changed by the variation of any one of them.

e. When a fan coil runs at standard condition, the final point of air treatment depends on the enthalpy difference of air treatment and the cooling capacity is related to the humidity load of the room, in that the greater the heat-humidity ratio, the smaller the cooling capacity is , as shown in Figure 1. So, the air treatment enthalpy difference of the fan coil can be determined by heat-humidity ratio curve, final point parameters of air treatment and air parameters , and then the cooling capacity of the fan coil can be calculated based on the air treatment enthalpy of the room at different heat-humidity ratio...

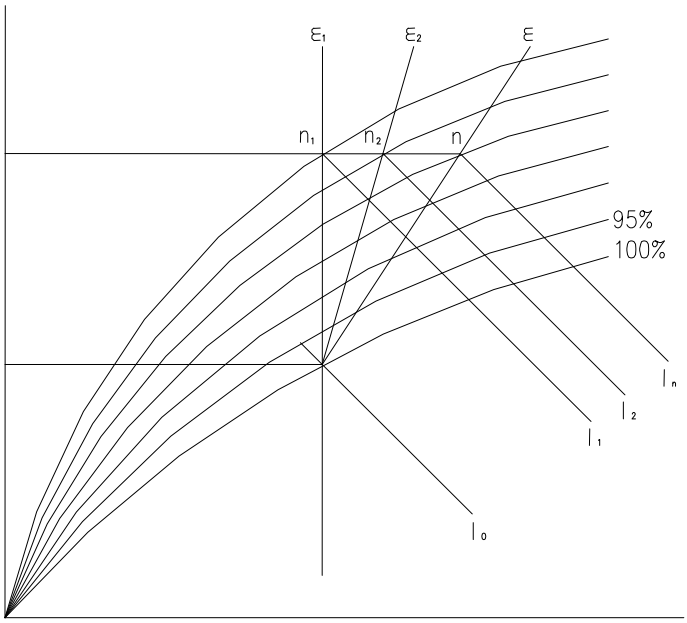


Table 1 Air treatment temperature process of a fan coil

2. Methods of product selection

Enthalpy difference correction

Make corrections based m-the ratio between the enthalpy difference during actual operation and that at standard condition, and calculate the actual cooling capacity of the fan coil, then select the correct fan coil based on actual cooling capacity.

Q`=QH· (⊿m/⊿H)=mQH

where: Q` —— Actual cooling capacity of a fan coil（W）.

QH—— Rated cooling capacity at of a fan coil at standard condition（W）.

⊿m —— Actual air treatment enthalpy difference of a fan coil（W/kg）

⊿H——Air treatment enthalpy difference of a fan coil at standard condition（W/kg）

m —— Correction coefficient

Airflow based type selection

Select a fan coil based on the air conditioning flow calculated by the cooling load of air conditioning and the actual air treatment enthalpy difference of the fan coil.

G=Q/⊿m· (W)

where: G——Air conditioning flow kg/h

Besides, when the water supply temperature, temperature difference of supply and return water, water supply and inlet air temperature are different than those of the standard condition, further correction is required based on the information.

Part 4 Trouble shooting

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2. Main functions of the unit 33

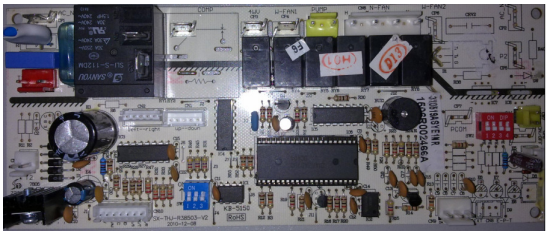
3. Poor efficiency explanation 38

4.Electric components malfunction inspection 38

5. DIP setting and failure code.....39

6.Failure analysis.....39

1. Electrical system main components

Appellation	Figuration and inner configuration	Instruction
PCB		Function: Via program to control the relay, make every components on/off according to temperature and pressure variety, so to realize automatic control
Capacitor		Induce the single-phase motor produce gyre magnetic field, connect with the accessory winding, and participate in the operation.

2. Main functions of the unit

2.1 Automatic operation

When AUTO mode is selected on the remote control, the air conditioner will automatically select between cooling, dehumidifying and heating modes based on indoor temperature and then operate under the selected mode;

1.If TA≥27□, the cooling mode will be activated with the air conditioner operating at set airflow and set temperature of 24□ under cooling mode;

2.20□< TA < 27□, the dehumidifying mode will be activated with the air conditioner operating at set airflow and set temperature of 24□ under dehumidifying mode;

3.If TA≤20□, the heating mode will be activated with the air conditioner operating at set airflow and set temperature of 24□ under heating mode (a cool-only unit will operate under feeding mode);

4.There are timing, sleeping, power fail memory, temperature sensing (reserved) functions under this mode;

5.The mode , once selected, will not change as the indoor temperature varies, however, by turning off and then on the unit or switching the mode, the operation mode can be reselected.

2.2 Cooling operation

The temperature setting is determined by the remote control with temperature controlled in the range of 16□ - 32□.The temperature setting can be adjusted using the “TEMPERATURE+” and “TEMPERATURE-” buttons. Depressing “Speed Selection” button allows selecting between “AUTO”, “High Speed”, “Middle Speed” and “Low Speed” modes. Under this mode, the heating electrical valve will be always closed, with other actions as follows:

1.When TA - TS≥1□, the cooling valve will open and the indoor fan will operate at set speed;

2.When TA = TS, the previous status will remain;

3.When TA - TS≤-1□, the cooling valve will close and the indoor fan will operate at low speed;

4.When TA - TS≤-2□,the indoor fan will close.

The low speed operation of the indoor fan will be activated 40 seconds after 5 minutes, if TA - TS≤-2□ the indoor fan will remain stopped for 5minutes before reactivate low speed operation for 40 seconds; otherwise, the related cooling operation will be controlled according to indoor temperature（TA）and set temperature（TS）.

5.Automatic air speed control:

When TA - TS≥1℃, the cooling electric valve will open and the fan will operate at high speed;

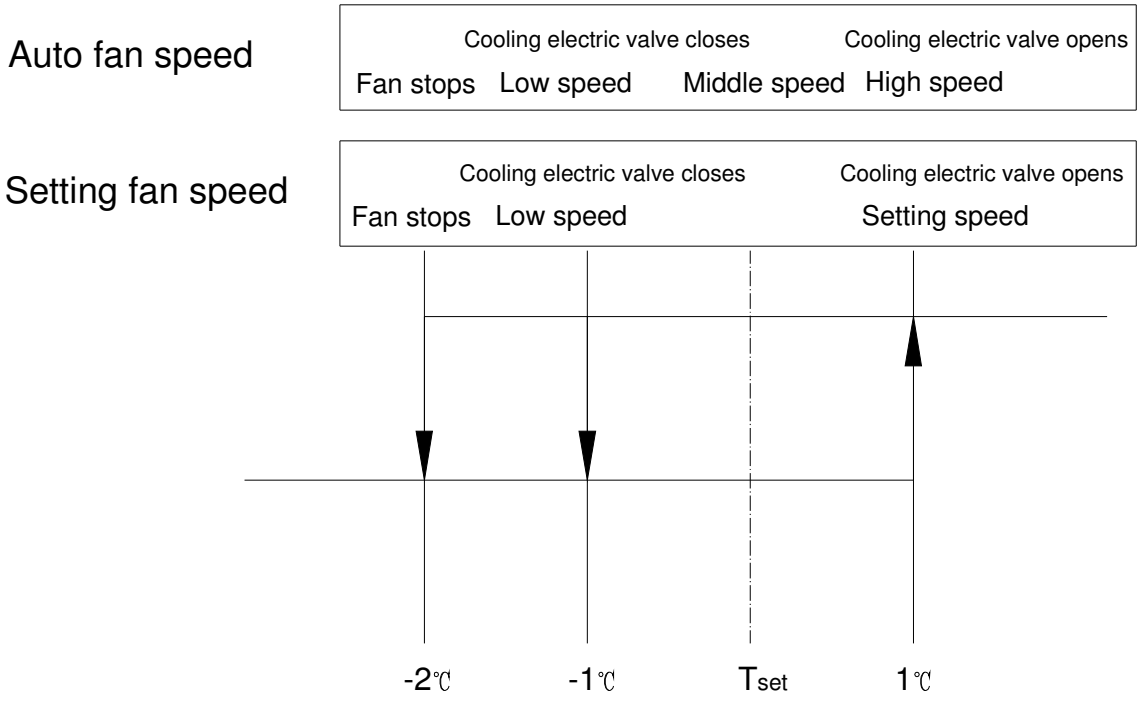
When TA = TS, the indoor fan will operate at middle speed;

When TA - TS≤-1℃, the cooling electric valve will open and the fan will operate at low speed;

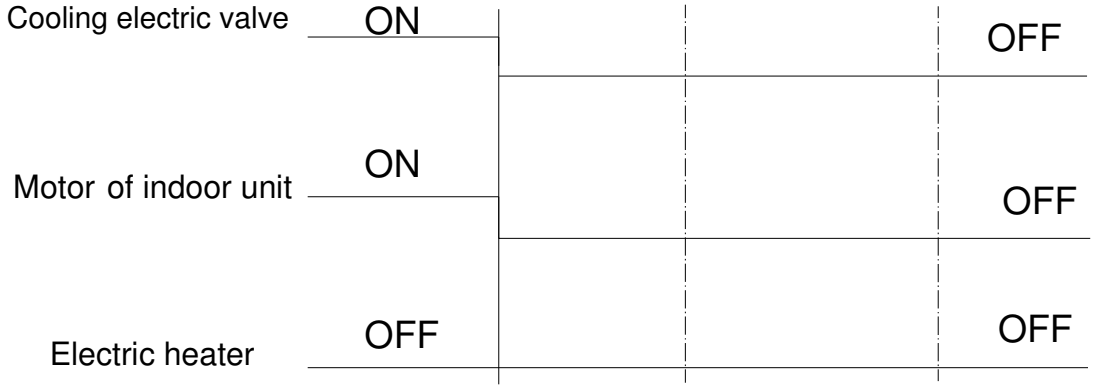
When TA - TS≤-2℃,the indoor fan will close. The logic control map is as shown in the figure.

The low speed operation of the indoor fan will be activated 40 seconds after 5 minutes, if TA - TS≤-2℃is

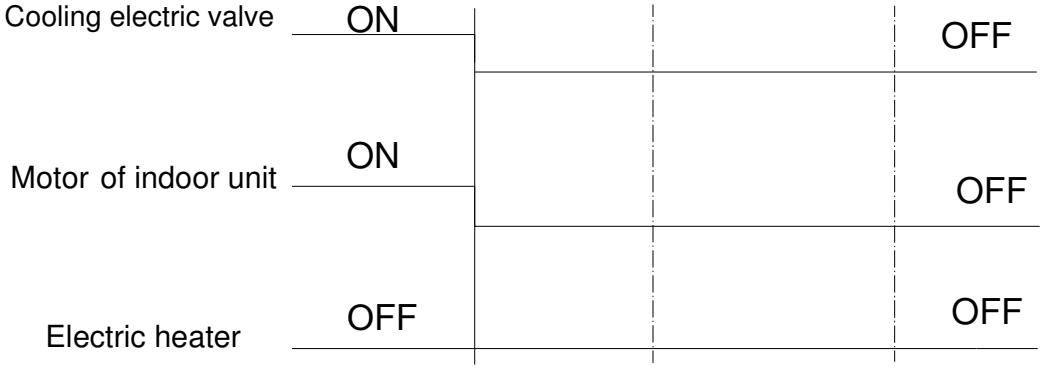
still satisfied ,the indoor fan will remain stopped for 5minutes before reactivate low speed operation for 40 seconds; otherwise, the related cooling operation will be controlled according to indoor temperature（TA） and set temperature（TS）.
There is a 2 minutes delay from high speed to low speed to avoid speed fluctuation.



6.When cooling is forced open, the cooling valve and indoor fan will open with the electric heater remain off. The logic control map is as shown in the following figure.



7.When cooling is forced open, the cooling electric valve and indoor fan will close immediately. The logic control map is as shown in the following figure.



8.There are timing, sleeping, power fail memory, temperature sensing (reserved) functions under this

mode;

2.3 Dehumidifying operation

1.Under dehumidifying mode , the water drainage pump will always open , with temperature controlled in the range of 16□ - 32□ and other actions as follows:

(1) When TA ≥ TS+2□, the cooling electric valve will open and the indoor fan will operate at set speed;

(2) When TS ≤ TA < TS+2□, the cooling valve will open and the indoor fan will be turned on for 10 minutes and off for 6 minutes and run at low air speed;

(3)When TA＜TS, the cooling electric valve will close and the indoor fan will stop operating 10 seconds after the valve is closed

The low speed operation of the indoor fan will be activated 40 seconds after 5 minutes, if TA - TS≤-2℃ the indoor fan will remain stopped for 5minutes before reactivate low speed operation for 40 seconds; otherwise, the related cooling operation will be controlled according to indoor temperature（TA）and set temperature（TS）.

2.Automatic air speed control:

When TA - TS≥2℃, the cooling electric valve will open and the fan will operate at high speed;

When TS ≤ TA < TS+2℃, the indoor fan will be turned on for 10 minutes and off for 6 minutes and run at low air speed;

When TA＜TS, the cooling electric valve will close and the indoor fan will stop operating 10 seconds after the valve is closed.

The low speed operation of the indoor fan will be activated 40 seconds after 5 minutes, if TA - TS≤-2℃ the indoor fan will remain stopped for 5minutes before reactivate low speed operation for 40 seconds; otherwise, the related cooling operation will be controlled according to indoor temperature（TA）and set temperature（TS）.

3. When the unit is forced off by depressing the override button, the cooling electric valve and the indoor fan will close simultaneously.

4. There are timing, sleeping, power fail memory, temperature sensing (reserved) functions under this mode.

2.4 Ventilation operation

Under ventilation mode, the indoor fan will operate at set speed and high, middle and low speed can be set using the remote control. There are timing and power fail memory functions in this mode .

2.5 Heating operation

The temperature setting is determined by the remote control with temperature controlled in the range of 16℃-32℃.The temperature setting can be adjusted using the “TEMPERATURE+” and “TEMPERATURE-” buttons. Depressing “Speed Selection” button allows selecting between “AUTO”, “High Speed”, “Middle Speed” and “Low Speed” modes; other actions are as follows:

1.When TA-TS≤-2℃, the cooling electric valve will open and the indoor fan will operate at set speed , with the auxiliary electric heater turned on;

2.When TA-TS≤-1℃, the cooling electric valve will open and the indoor fan will operate at set speed , with auxiliary electric heater turned on when using single electric heater;

3.When TA=TS, the cooling electric valve will remain previous status, with auxiliary electric heater turned off;

4.When TA-TS≥1℃, the cooling electric valve will close and the indoor fan will operate at low speed , with auxiliary electric heater turned off when using single electric heater;

5.When TA-TS≥2℃, the indoor fan will be turned off 30 seconds after the cooling electric valve is closed.

The low speed operation of the indoor fan will be activated 40 seconds after 5 minutes, if TA-TS≥2℃the indoor fan will remain stopped for 5minutes before reactivate low speed operation for 40 seconds; otherwise, the related heating operation will be controlled according to indoor temperature（TA）and set temperature（TS）.

6.Automatic air speed control:

When TA-TS≤-2℃, the auxiliary electric heater will be turned on;

When TA-TS≤-1℃, the cooling electric valve will open and the indoor fan will operate at high speed , with electric heater turned on when using single electric heater;

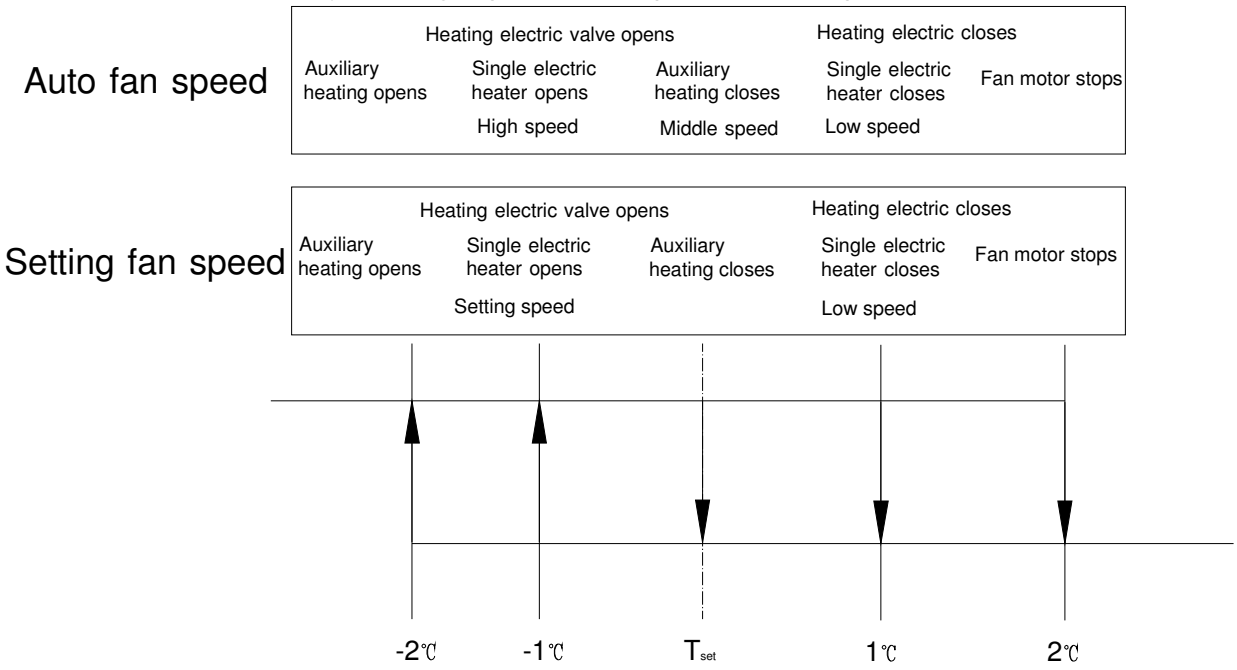
When TA=TS, the indoor fan will operate at middle speed , with the auxiliary electric heater turned off;

When TA-TS≥1℃, the cooling electric valve will close and the indoor fan will operate at low speed , with electric heater turned off when using single electric heater;

When TA-TS≥2℃, the indoor fan will be turned off. The logic control map is as shown in Figure 5.

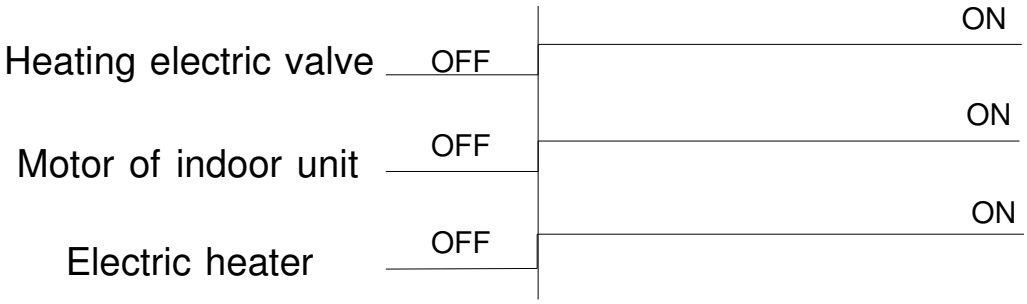
The low speed operation of the indoor fan will be activated 40 seconds after 5 minutes, if TA-TS≥2□ is satisfied ,the indoor fan will remain stopped for 5minutes before reactivate low speed operation for 40 seconds; otherwise, the related heating operation will be controlled according to indoor temperature（TA） and set temperature（TS）.

There is a 2 minutes delay from high speed to low speed to avoid speed fluctuation.



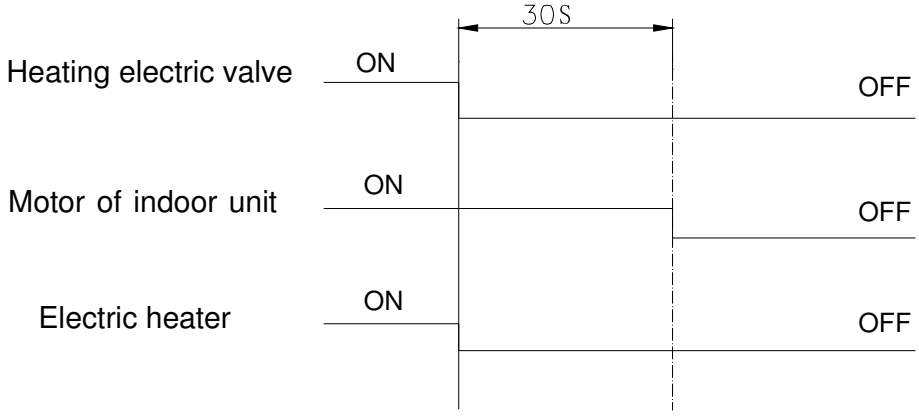
(Figure5)

7.When the unit is turned on under heating mode, the cooling valve and indoor fan will open with the electric heating performed by the control unit. The logic control map is as shown in Figure 6.



(Figure6)

8.When the unit is turned off under heating mode , the cooling valve and indoor fan will close with the indoor fan switched to low speed operation and then turned off 30 seconds after the electric heating is turned off. The logic control map is as shown in the Figure 7.



(Figure7)

9.There are timing, sleeping, power fail memory, temperature sensing (reserved) functions under this

mode.

2.6 Swing control

The stepping speed switch behavior is 4ms/step, and normal swing speed is 16ms/step;
The full open degree is 120°;
The swing angle range in cooling mode is 40°;
The swing angle range in heating mode is 45°;

During cooling swing, the initial position is backswing 20°after full open, and the ending position is the same as full open position;
During heating swing, the initial position is backswing 10°after full open, and the ending position is backswing 55° after full open;

2.7 Timing

The longest timed duration is 24h with the increment being 0.5h when the duration is within 10h and 1h when the duration is 10 h or above. As for single timing method, mode change will not cancel the timing function. After the timing is set , the timing indicator will light.

Timed OFF

Timed OFF is only possible when the air conditioner is in operation. The timing range is 0.5-24h and the unit will be automatically turned off after the time is up.

Timed ON

Timed ON is only possible when the air conditioner is off. The timing range is 0.5-24h and the unit will be automatically turned on after the time is up.

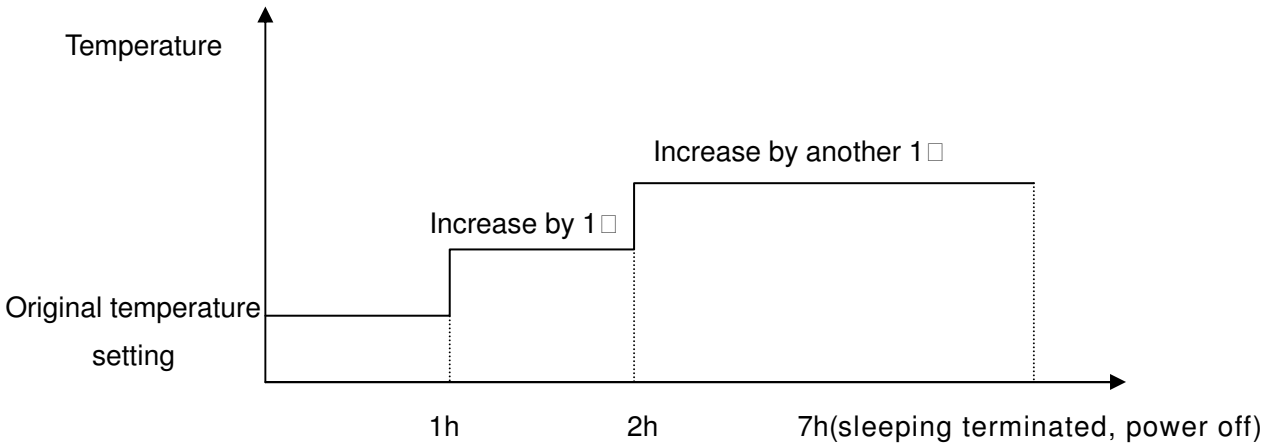
When the unit is turned ON/OFF after the timing is set, the original timing and sleeping functions will be automatically canceled.

2.8 Sleeping

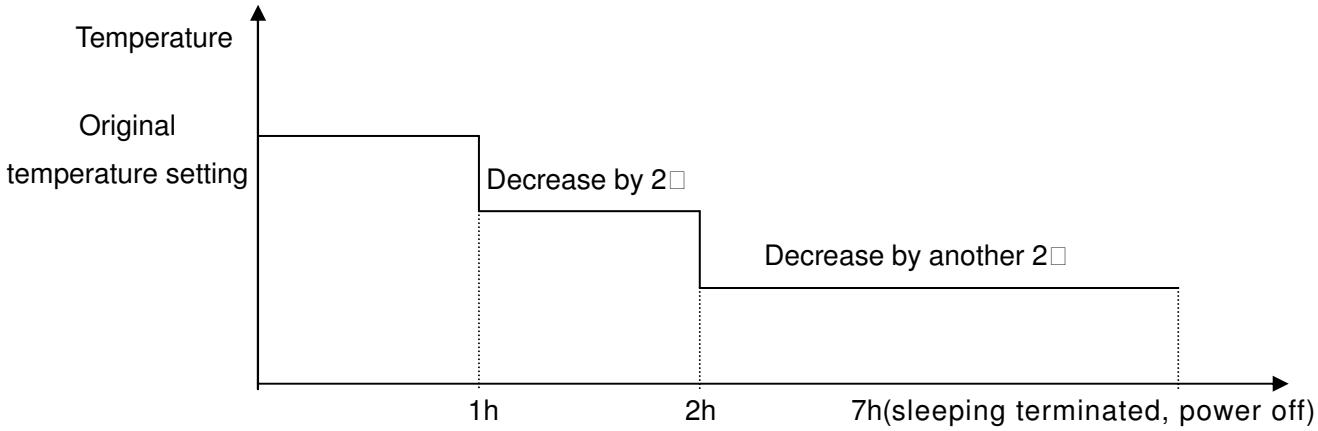
The sleeping function is effective under AUTO, cooling, dehumidifying, heating modes. After the sleeping function is activated, the indoor fan will operate at low air speed and the sleeping indicator will light;

After the sleeping mode is activated by depressing “sleeping” button, the temperature setting will automatically increase by 1□ after 1h under cooling mode, or automatically decrease by 2□ after 1h under heating mode. After another 1h, the temperature will increase by another1□ under cooling mode or decrease by another2□ under heating mode. The unit will be turned off after sleeping for 7h. After sleeping is activated, the mode switching will be effective but after that the sleeping function will be canceled; if the “Temperature+” is depressed, the air conditioner will operate at “new temperature setting + correction temperature”. In sleeping status, when “Sleeping” button or mode selection button is depressed, or the unit is turned off, the sleeping will be canceled and the sleeping operation will be terminated.

Sleeping under cooling mode:



Sleeping under heating mode:



3. Poor efficiency explanation

During the process of using air conditioner, some phenomenon seems to be malfunction but actually not. Thus when cooling effect does not achieve to your expectation, the following factors have to be ruled out

Phenomenon	Causing explanation
Power voltage is too low, causing AC uneasy to start and shut down after starting, or fuse be burned out etc.	It is not malfunction, need to find out the causing, if the causing is the electricity net voltage is too low, user should load a power manostat to keep voltage between 220V-380V for AC normally running
Select high wind speed but indoor temperature still at high side, air flow from the air outlet is too weak.	It is because air filter is too dirty or blocked making cooling capacity fail to be brought by air flow, causing cooling capacity inadequate. Take out filter and wash, the problem will be solved.
Select high wind speed, the vibration and sound of unit are severe.	Fan runs at high speed, severe vibration and sound of unit is normal phenomenon
Improper installation will lead to indoor temperature uneven or bad cooling effect.	It is necessary to adjust AC installation position

4.Electric components malfunction inspection

No	Component name	Inspection methods
1	Control board	1. Check if any connection part of PCB loosen or drop off, printed tinsel and components have any burn, fade, breaking off or aging phenomenon, all joints exist short circuit phenomenon etc. 2. Test the circuit board system in the term of voltage, pulse on, resistance variation, by using testing meter. 3. Judge the output and input is normal or not according to electric principle diagram
2	Motor	1. No burning trace apparently 2. Using multi-meter ohm phase, there is correct resistance value among windings (single phase compressor refers to specification, three phase compressor resistance approximately equal), resistance of winding should be infinite.

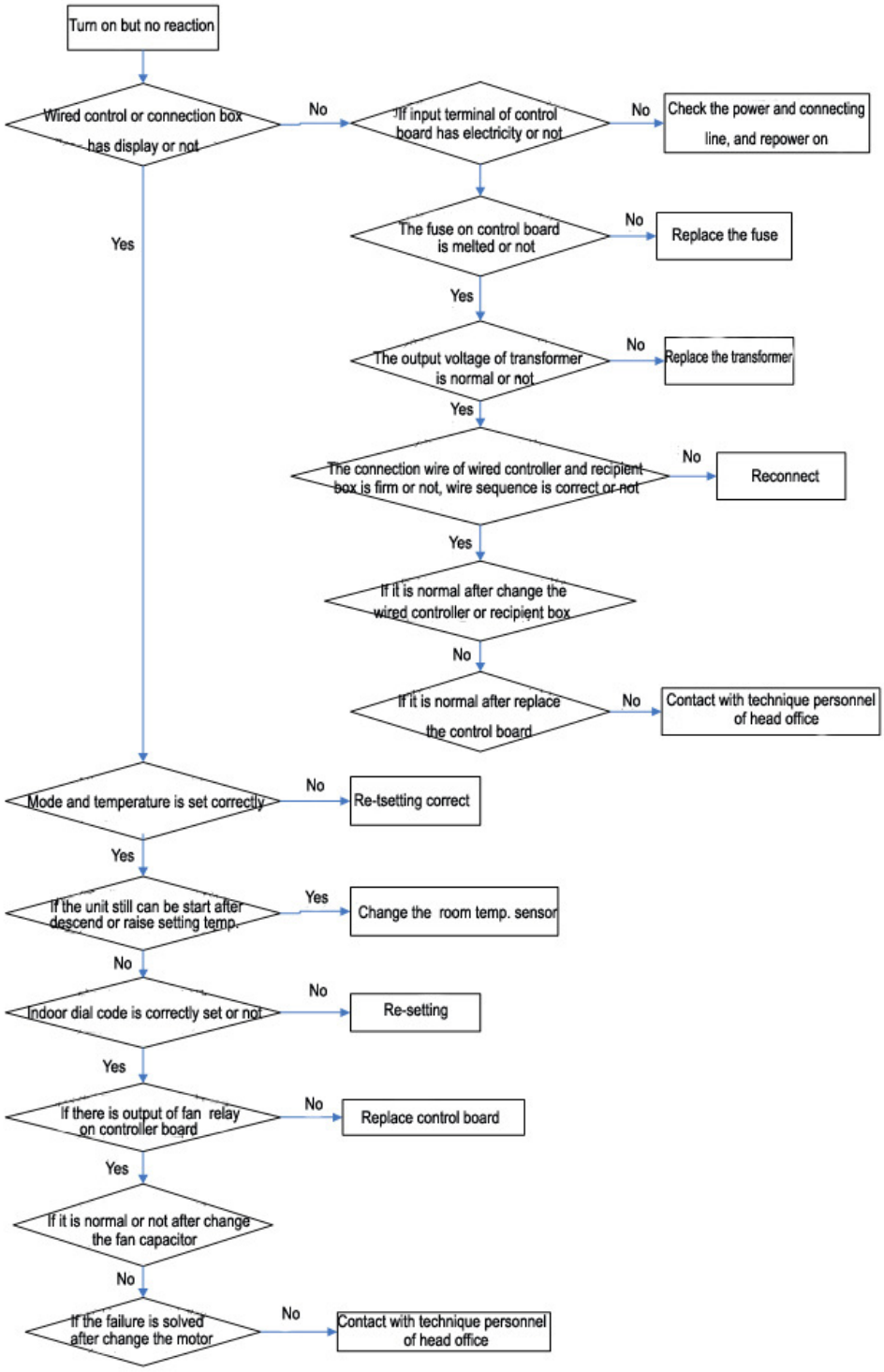
5. Filure code

When the air conditioner is faulty, the timing light of the controller's light panel will display relevant trouble codes according to various troubles.

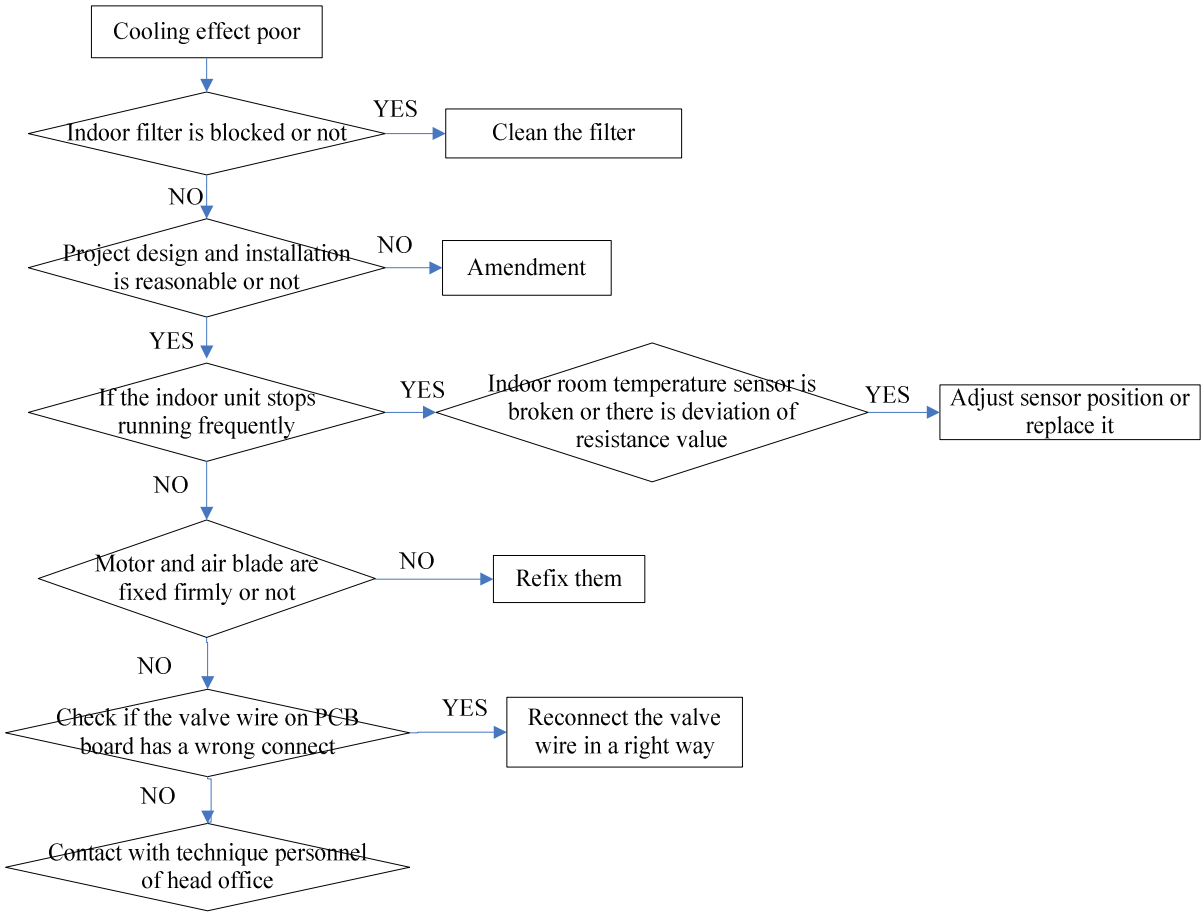
Failure cause	Display method 2	Display priority	Phenomenon
Environment temperature sensor fault	E5	1	Stop

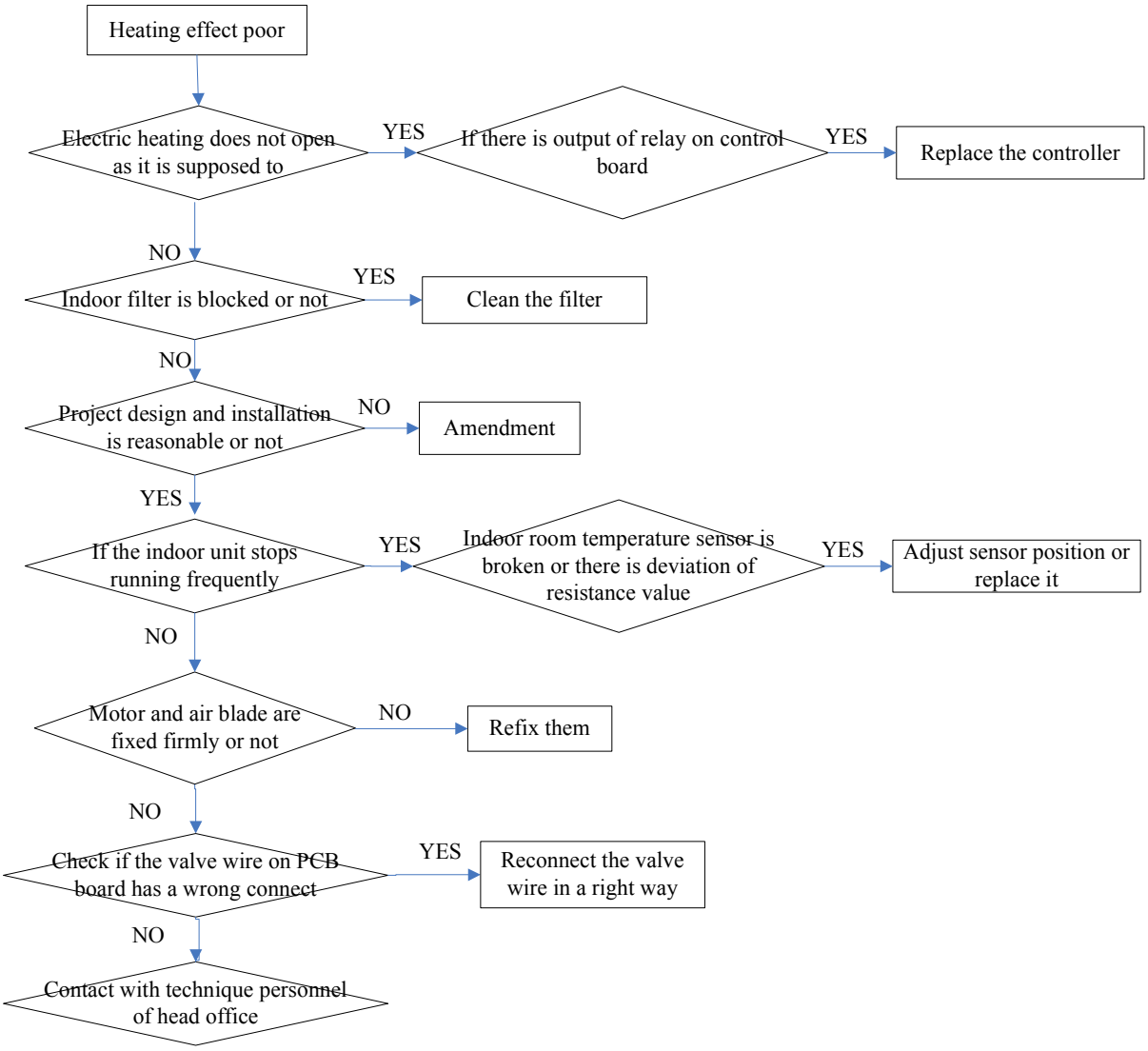
6.Failure analysis

No action after Power-on

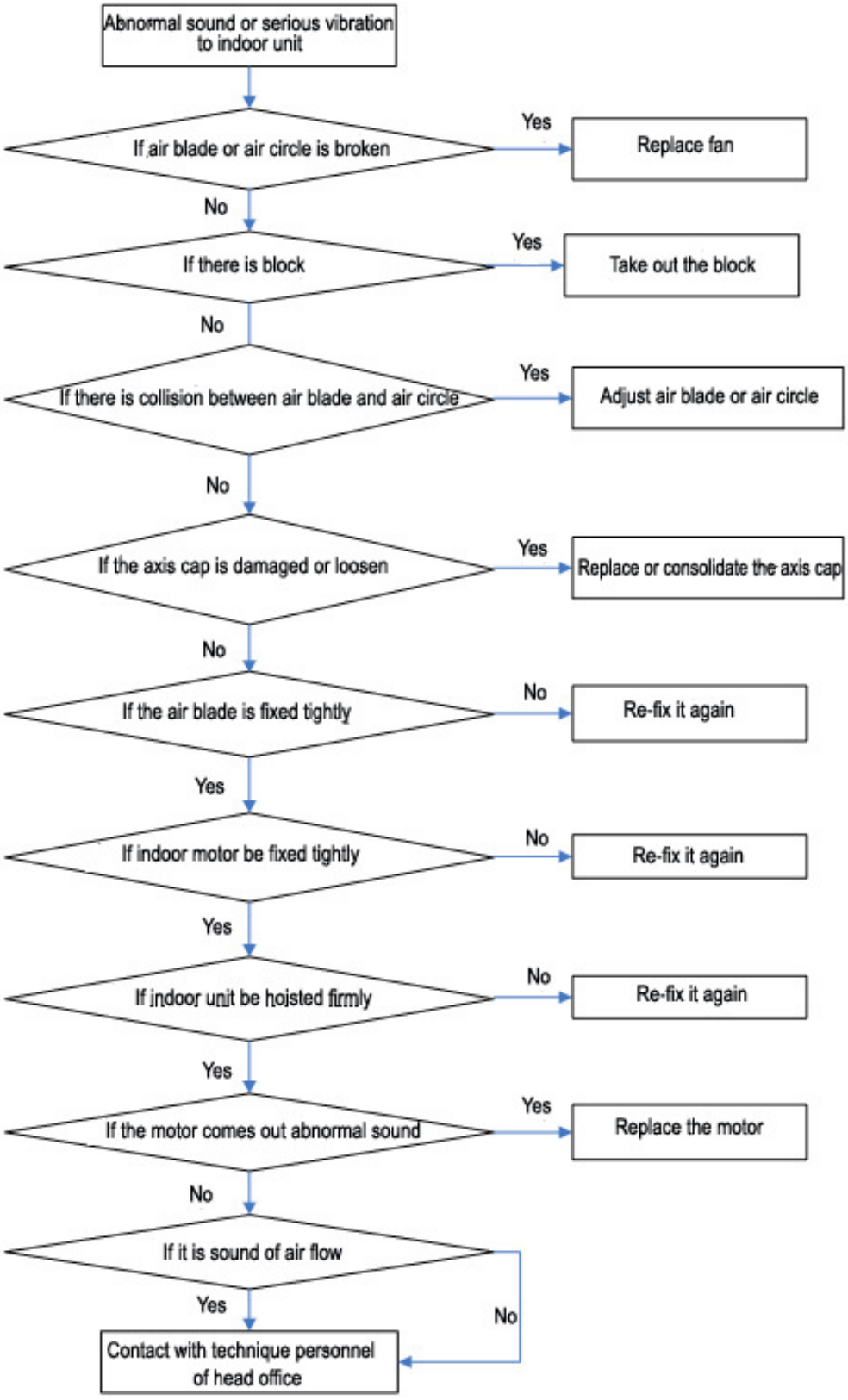


Poor Performance during Unit Operation

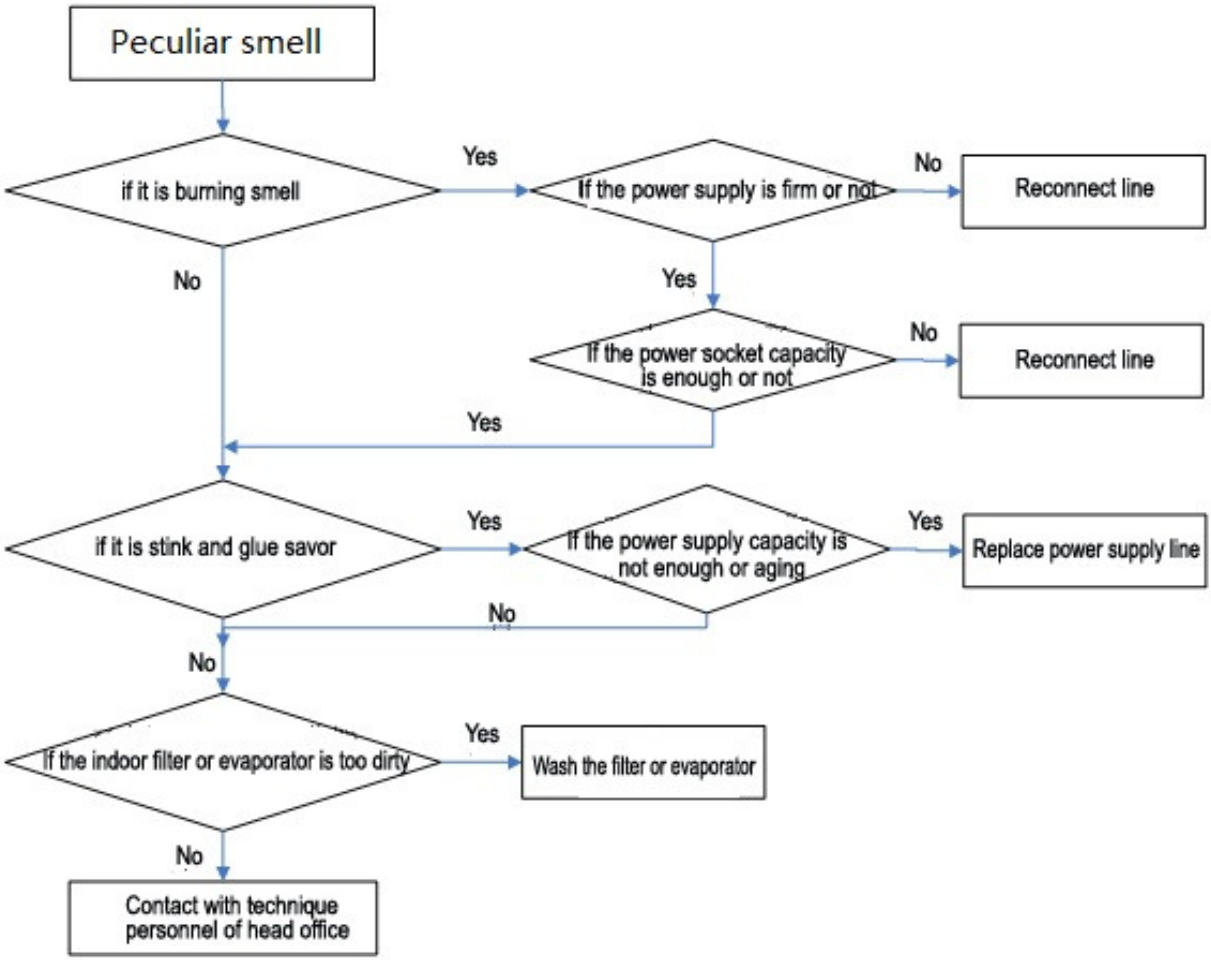



Heating effect poor
Electric heating does not open as it is supposed to
YES
If there is output of relay on control board
YES
Replace the controller
NO
Indoor filter is blocked or not
YES
Clean the filter
NO
Project design and installation is reasonable or not
NO
Amendment
YES
If the indoor unit stops running frequently
YES
Indoor room temperature sensor is broken or there is deviation of resistance value
YES
Adjust sensor position or replace it
NO
Motor and air blade are fixed firmly or not
NO
Refix them
NO
Check if the valve wire on PCB board has a wrong connect
YES
Reconnect the valve wire in a right way
NO
Contact with technique personnel of head office

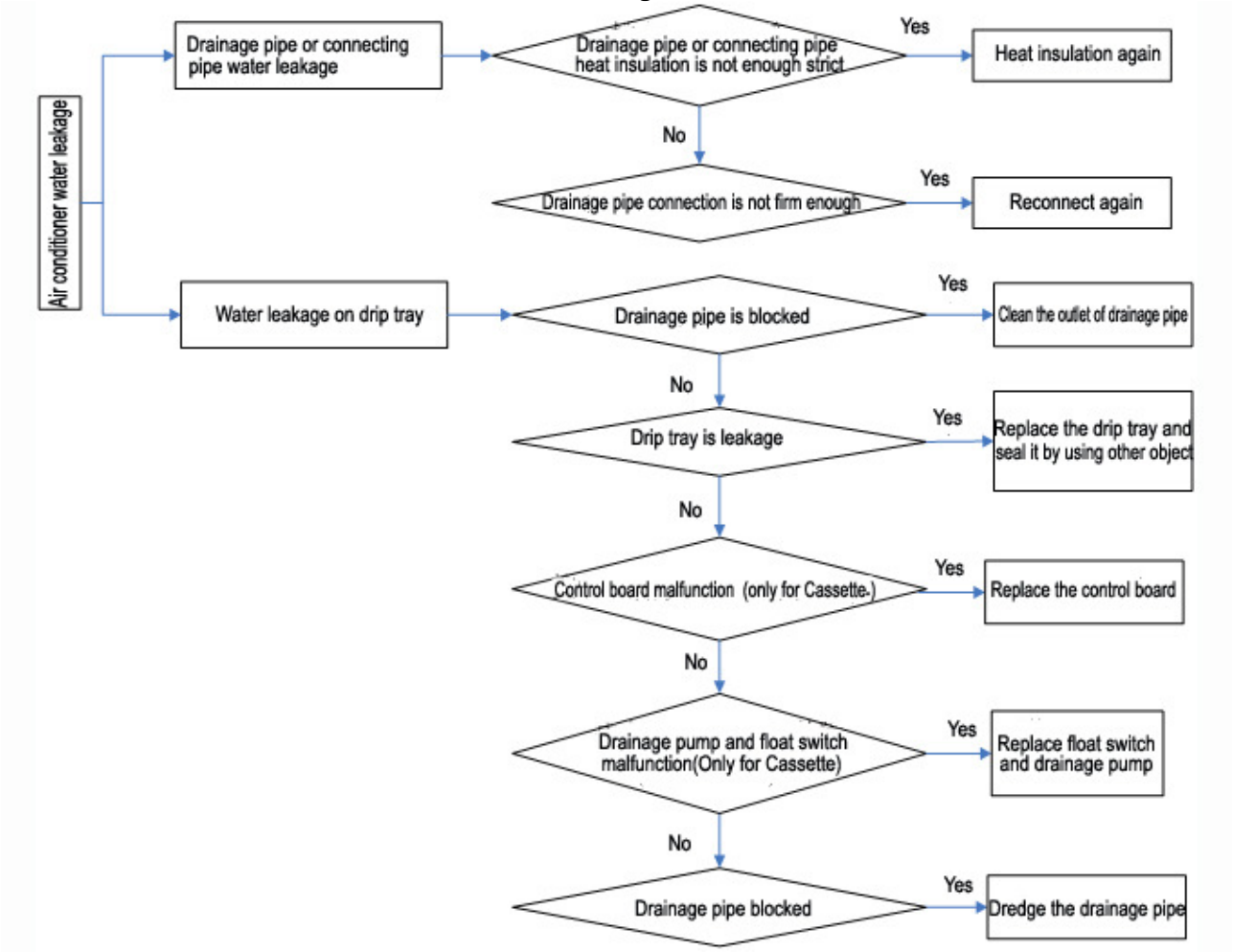
Abnormal Sound or Much Vibration of Unit



Peculiar Smell of Unit



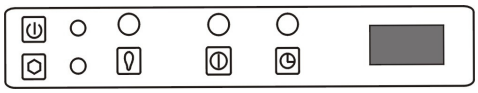
Water Leakage of Unit



Part 5 Controller

1.General information

Remote controller, display panel

Remote controller	Display panel
	
Standard	Standard

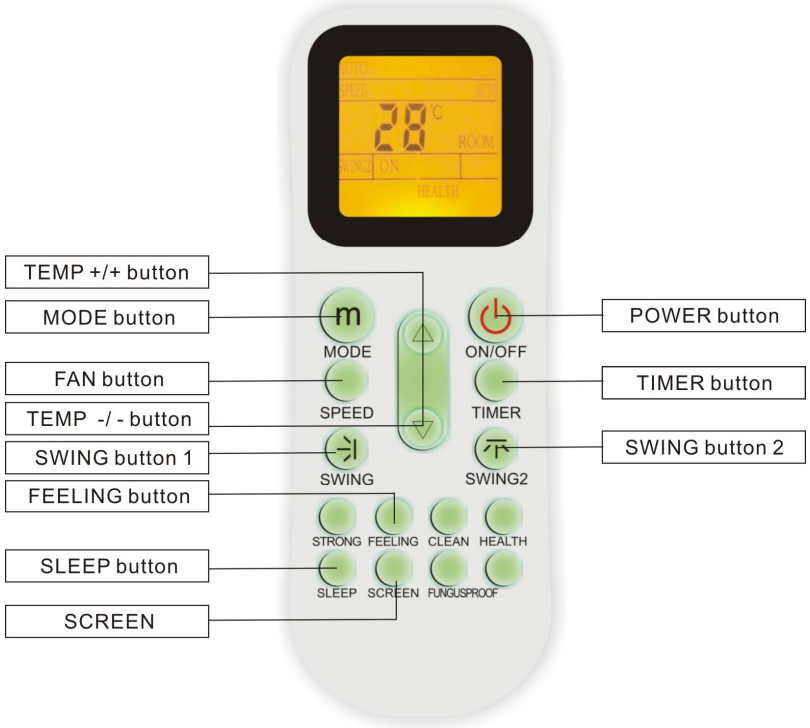
2 Remote controller

2.1 Basic condition of remote controller

Name	Figure	Basic condition for operation
Remote controller		1.Power source Use 2 pcs No 7 batteries,working voltage:2.0V-5.0V; 2. Signal frequency:infrared frequency 38kHz; 3. Remote distance:max working distance is7m.
		Key operation introduction: Temperature setting range 16℃-32℃;

2.2 Function

Remote conntroller: K series



POWER button: Switch the unit ON/OFF.

MODE button: Select mode , push the button one time, then the operation modes will change in turn as Auto-Cooling-Dehumidify-Heating

TEMP + button and **TEMP - button**: Temperature adjustment range: 16~32

FAN button: Change the fan speed will change in turn as: Low-Medium-High-Auto

SWING button 1: Press this button for the first time when operation, it will start the up and down swing function. Push the button for the second time, cancel the swing function.
SWING button 2: Press this button for the first time when operation, it will start the right and left swing function. Push the button for the second time, cancel the swing function.

Feeing button: Press this button for setting the feeling function.The LCD shows the actual room temperature when the function set and it shows the setting temperature when the function cancelled.The function is invalid when the appliance at the fan mode.

TIMER/CLOCK button:
Clock Setting: Normally display the clock set currently (display 12:00 for the first electrifying or resetting). When press the button for 5 seconds, the time display zone will flicker, then press【+】 and 【-】 button and to adjust hour that uses 12-hour clock including “A.M.” and “P.M.” time; press the button again to complete the setting.
Timer setting: Press the button to set TIMER ON/OFF , press the button then “ON” will flicker on the display screen. then press【+】 and 【-】 button and to adjust hour that uses 12-hour clock including “A.M.” and “P.M.” time; press the button again to complete the setting. The “OFF” setting is the same methods.
Remark: When setting functions such as mode, temperature, air port and air velocity, display screen displays all presetting parameters and remains constant; after reaching presetting time, air conditioner will automatically start as per presetting state.
After setting timing ON and OFF function, pressing button of 【Timer/Clock】can cancel timing setting.
SLEEP button:
1. Press the button to the sleeping indicator light of indoor unit flashes on;
2. After the setting of sleeping mode,the cooling operation enables the set temperature to increase 1℃ after 1 hour and another 1℃ auto matically after 1hour.
3. After the setting of sleeping mode,the heating operation enables the set temperature to drop 2℃ after 1 hour and another 2℃ auto matically after 1hour.
4. The air condition runs in sleeping mode for 7hours and stops automatically.

Remark:Press the mode or ON/OFF button,the remote controller clears sleeping mode away.

SCREEN button:Press the button to let the LCD display working or not by pressing the button.