Midea M-thermal

Heat Pump Water Heater

Technical Manual

LRSJF-V120/SN1-610

LRSJF-V140/SN1-610

Outdoor unit

SMK-120/CSD80GN1

SMK-140/CSD80GN1

Indoor unit

LSX-300XP/D15B11

Water tank

TMK-01

Solar kit

Midea reserves the right to discontinue, or change at any time, specifications or designs without notices and without incurring obligations.

Part 1
System Outline

1. Measurements

Outdoor units

Model name	Dimension (mm)	Net/Gross weight (kg)	Power supply
LRSJF-V120/SN1-610	Width: 900 Height: 1327 Depth:348	89/101	380V～415V-50Hz 3 Ph
LRSJF-V140/SN1-610			

Hydraulic indoor unit

SMK-120/CSD80GN1	Width: 900 Height:500 Depth:375	63/75	380V～415V-50Hz 3 Ph
SMK-140/CSD80GN1			

Solar kit

TMK-01	Width: 810 Height: 310 Depth:295	8/10	220V～240V-50Hz 1 ph

Water Tank

Model name	Dimension (mm)	Net/Gross weight (kg)	Packing Dimension W×D×H
LSX-300XP/D15B11	Φ580×1800	75//84	620×1960×635

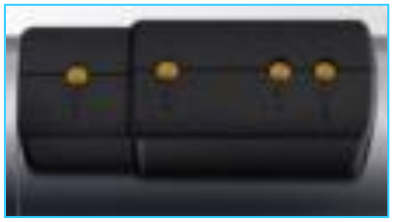
2. External Appearance

LRSJF-V120/SN1-610

LRSJF-V140/SN1-610

SMK-120/CSD80GN1 SMK-140/CSD80GN1

TMK-01



LSX-300XP/D15B11

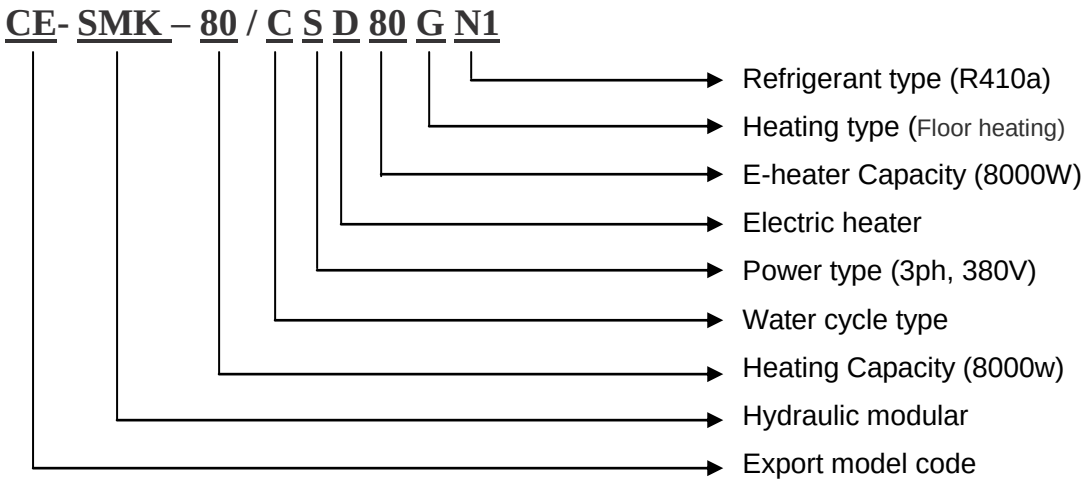
3. Nomenclature

Outdoor unit

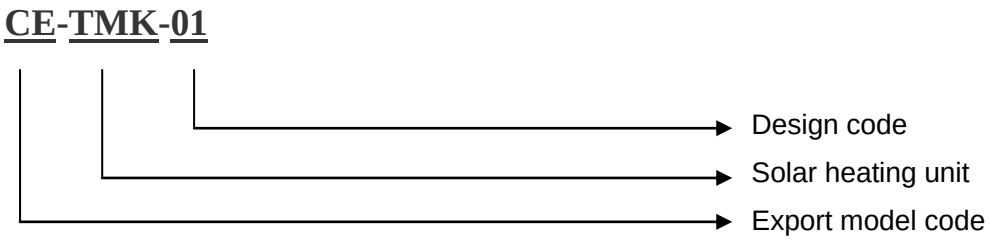
CE-L RSJF-V120/SN1- 610

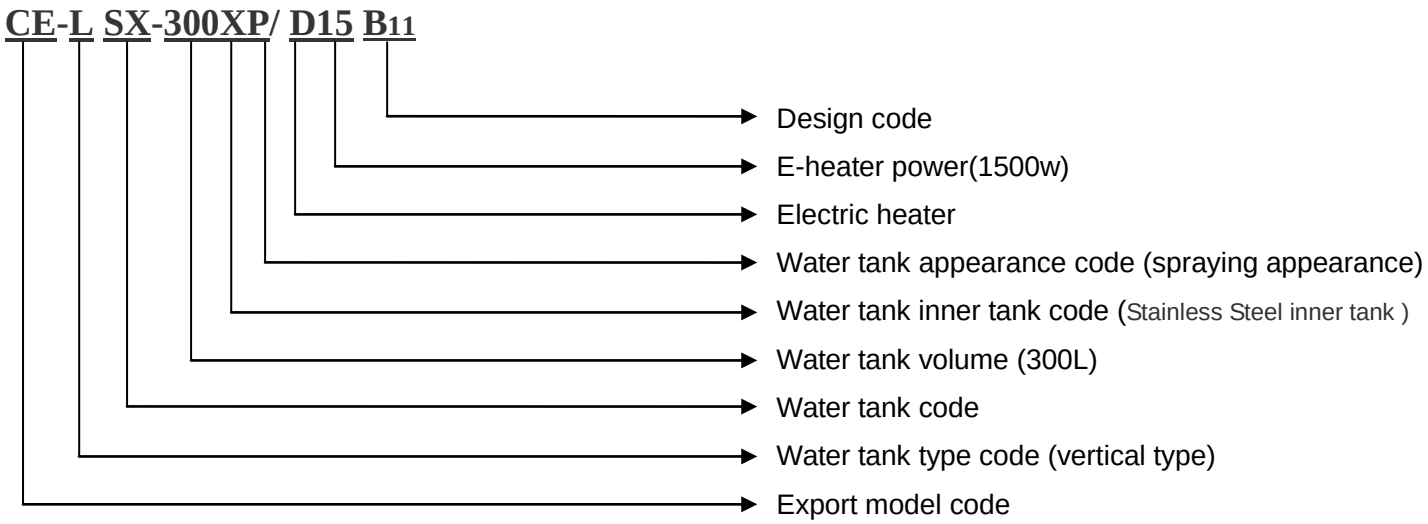
- 610 → Design code
- SN1 → Refrigerant type (R410a)
- V120 → 380-415V~ 3phase 50Hz
- RSJF → Heating Capacity (12000W)
- -V120 → Compressor type (DC inverter compressor)
- RSJF → Split type
- RSJF → Midea Heat Pump water heater
- L → Heating and cooling mode (Omit for heating)
- CE → Export model code

Indoor unit



Solar kit





4. Features

4.1 Safety

a. Realize isolation between water and electricity. No electric shock problem, more safety.

b. No fuel tubes and storage, no potential danger from oil leakage, fire, explosion etc. Five operating mode:

1). Space cooling

2). Space heating

3). Water heating

4). Space cooling + water heating

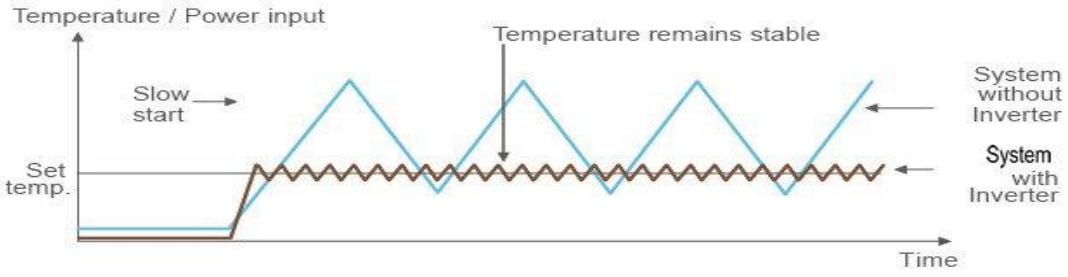
5). Space heating + water heating

4.2 Environmental friendly.

a. R410a refrigerant;

b. No discharge of poisonous gas;

4.3 DC inverter system.



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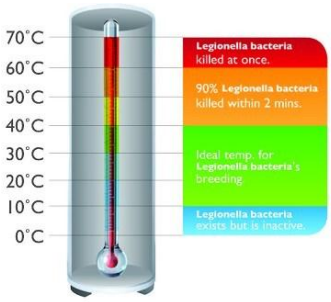
4.4 Automatic weekly anti-legionella function



4.5 Easy operation and automatic control.

The system can be controlled simply through the wire controller.

4.6 High efficiency and energy-saving.

The unit adopts heat pump principle, which absorbs heat from outdoor air and produce heat water, thermal efficiency for water heating be up to 4.3.

4.7 All the weather the system can run.

Within the temperature range from -20 to 43˚C, it will not be affected by night, overcast sky, rain and snow.

4.8 Convenient installation and maintenance

The quadrate type can be easily installed in a corner of the verandah even if it's very narrow.

4.9 Total Heating Solution

When floor heating is conducted in a new house, warm air spreads gently across the house, making it comfortable and enabling the use of broad space without necessitating radiators or FCU.

4.10 Comfort System

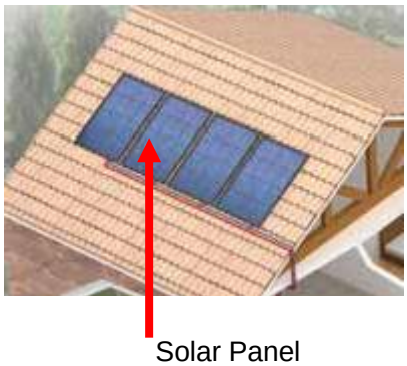
When floor heating is applied, warm air spreads gently across the house, making it comfortable. The system can help blood circulation and metabolism, further boosting our health.

The installation of M-Thermal will eliminate oil or gas tank, making the household surrounding neat and safe, enabling the use of more space, and avoiding refueling.

4.11 Reduce CO_2 emission

When the system is connected to solar panels, CO2 can be reduced more sharply.

In addition, M-thermal can significantly cut CO_2 emission when being connected to solar thermal panel a completely pure energy source.



Solar Panel

4.12 CE approval

5. Specifications

5.1 Specifications of outdoor units

DC Inverter outdoor unit			LRSJF-V120/SN1-610	LRSJF-V140/SN1-610
Power supply		Ph-V-Hz	3-380～415-50	3-380～415-50
Max. current		A	9	9
Heating	Capacity	kW	12	14
	COP	kW/kW	4.17	4.13
	Ambient Temp.	℃	-20～43	-20～43
Cooling	Capacity	kW	8.8	8.8
	COP	kW/kW	2.22	2.28
	Ambient Temp.	℃	15～43	15～43
Unit	Dimension (W×H×D)	mm	900×1327×320	900×1327×320
	Packing (W×H×D)	mm	1016×1456×435	1016×1456×435
	Net/gross weight	kg	89/101	89/101
Noise level		dB(A)	58	58
Refrigerant	type/quantity	kg	R410a/2.7kg	R410a/2.7kg
	system pressure	MPa	4.4/2.6	4.4/2.6
Refrigerant pipe	Liquid side	mm	Φ9.52	Φ9.52
	Gas side	mm	Φ16	Φ16
	Max. length	m	50	50
	Max. difference between outdoor unit and indoor unit	m	15	15
Compressor	Model		TNB306FPNMC	TNB306FPNMC
	Type		Rotary	Rotary
	Brand		Mitsubishi	Mitsubishi
	Capacity	kW	9.88	9.88
	Input	w	3010	3010
	Locked rotor current	A	45	45
	Rate current	A	9.3	9.3
	Crankcase	W	30	30
Fan motor	Brand		Panasonic	Panasonic
	Model		WZDK100-38G（×2）	WZDK100-38G（×2）
	Type		DC MOTOR	DC MOTOR
	Input	w	100*2	100*2
	Output	w	110*2	110*2
	Speed	r/min	800	800
Outdoor coil	Number of rows		2	2
	Tube pitch(a)x row pitch(b)	mm	25.4/22	25.4/22
	Tube dia. and type	mm	7.94(female screw)	7.94(female screw)
	Fin space	mm	1.7	1.6
	Fin type (code)		Hydrophilic aluminum	Hydrophilic aluminum
	Coil length x height		1276*870	1276*870
	Number of circuits		7	7
Loading Quantity	20'/40'/40H	Pcs	28/58/58	28/58/58

5.2 Specifications of Hydraulic indoor unit

Hydraulic indoor unit			SMK-120/CSD80GN1	SMK-140/CSD80GN1
Power supply		Ph-V-Hz	3-380～415-50	3-380～415-50
Function	Types		Heating &Cooling	Heating &Cooling
	Space Heating	℃	15～55	15～55
	Space Cooling	℃	7～22	7～22
	Sanitary Hot Water	℃	35～60	35～60
	Max. current	A	13.8	13.8
Noise level		dB(A)	32	32
Unit	Dimension (W×H×D)	mm	900×500×375	900×500×375
	Packing (W×H×D)	mm	1110×610×510	1110×610×510
	Net/gross weight	kg	63/75	63/75
E-heater	Size	kW	4	4
	Quantity		1	1
	specification	Ph-V	3-400	3-400
E-heater(standby)	Size	kW	4	4
	Quantity		1	1
	specification	Ph-V	3-400	3-400
Water pipeline	Water inlet pipe	mm	DN32	DN32
	Water outlet pipe	mm	DN32	DN32
Loading Quantity	20'/40'/40H	Pcs	66/138/184	66/138/184

The testing Condition:

1. Heating: Outdoor temp. 7/6˚C(DB/WB), inlet water temp. 30˚C, outlet water temp. 35˚C.

2. Cooling: Outdoor temp. 35/24˚C(DB/WB), inlet water temp. 12˚C, outlet water temp. 7˚C.

5.3 Specifications of water tank and solar kit

Sanitary hot water tank			LSX-300XP/D15B11
Power supply		Ph-V-Hz	1-220～240-50
Storage size		L	300
Max. water output temp.		℃	60
Dimension (D×H)		mm	Φ580×1800
Packing (W×H×D)		mm	670×1885×670
Net//gross weight		kg	80/91
E-heater	specification	kW	1.5
	Quantity		1
	Power supply	Ph-V	1-220～240-50
Tank material			SUS304
Water pipeline	Water inlet pipe	mm	DN20
	Water outlet pipe	mm	DN20
	PT valve joint	MPa	DN20
Solar kit			**TMK-01**
Power supply		Ph-V-Hz	1-220～240-50
Dimension (W×H×D)		mm	810×310×295
Packing (W×H×D)		mm	830×340×315
Net weight		kg	8/10
solar coils	OD+T	mm*mm	¢22*0.8
	Length	m	11
	Material		SUS316L
	Inlet pipe	mm	DN20
	Outlet pipe	mm	DN20
Loading Quantity	20'/40'/40H	Pcs	300/624/728

6. Performance data

6.1 Heating performance data of 14kw model

LWE[℃]	25			32			40			43			50		
Tamb [℃]	HC[W]	PI[W]	COP	HC[W]	PI[W]	COP	HC[W]	PI[W]	COP	HC[W]	PI[W]	COP	HC[W]	PI[W]	COP
-20	4850	1725	2.81	3511	1887	1.53	/	/	/	/	/	/	/	/	/
-10	6943.5	2471	2.81	6426	2758	2.33	5476	3094	1.77	5120	3220	1.59	/	/	/
-5	10555	3586	2.94	8935	3327	2.69	7804	3722	2.1	7391	3883	1.9	/	/	/
0	9138	3662	2.5	11254	4115	2.73	10101	4353	2.32	9317	4274	2.18	/	/	/
2/1	12614	3835	3.29	13017	4244	3.07	10882	4410	2.47	9922	4369	2.27	/	/	/
7/6	15601	3851	4.05	14871	4251	3.5	13036	4472	2.92	11897	4410	2.7	6531	3293	1.98
15/12	17258	3629	4.76	17077	4046	4.22	14503	4003	3.62	13969	4205	3.32	7162	2676	2.68
25/17	13570	2331	5.82	14152	2640	5.36	11336	2573	4.41	7696	2288	3.36	6299	2029	3.1
35/24	/	/	/	/	/	/	13060	2769	4.72	10902	2530	4.31	6059	1781	3.4

6.2 Cooling performance data of 14kw model

LWE[℃]	10			15			20		
Tamb [℃]	CC[W]	PI[W]	EER	CC[W]	PI[W]	EER	CC[W]	PI[W]	EER
15	4120	1289	3.2	/	/	/	/	/	/
20	5122	1378	3.72	11441	2980	3.84	/	/	/
25	5584	1450	3.85	12009	3217	3.73	14153	3587	3.95
30	5468	1608	3.41	11349	3504	3.24	13596	3504	3.88
35	5463	2110	2.59	10264	3836	2.68	12326	4272	2.89
43	5922	3259	1.82	7357	3365	2.19	8853	3450	2.57

Remark:

CC= cooling capacity PI = power input HC = heating capacity

6.3 Heating performance data of 12kw model

LWE[℃]	25			32			40			43			50		
Tamb [℃]	HC[W]	PI[W]	COP	HC[W]	PI[W]	COP	HC[W]	PI[W]	COP	HC[W]	PI[W]	COP	HC[W]	PI[W]	COP
-20	2883	1749	1.65	2453	1891	1.30	/	/	/	/	/	/	/	/	/
-10	7090	2481	2.86	6656	2772	2.40	5514	3107	1.77	4721	3230	1.46	/	/	/
-5	9652	3030	3.19	9234	3344	2.76	8498	3750	2.27	7819	3908	2.00	/	/	/
0	5662	2951	1.92	10921	3949	2.77	10277	4363	2.36	9267	4311	2.15	6433	3578	1.80
2/1	11208	3388	3.31	10601	3641	2.91	9432	3768	2.50	9177	4030	2.28	8272	4078	2.03
7/6	14824	3677	4.03	14241	4049	3.52	11589	3978	2.91	11257	4171	2.70	5731	3015	1.90
15/12	17436	3682	4.74	17029	4100	4.15	14311	4056	3.53	13508	4226	3.20	6872	2618	2.62
25/17	13181	2133	6.18	13412	2436	5.51	11683	2457	4.75	10320	2365	4.36	6299	2029	3.10
35/24	/	/	/	/	/	/	11683	2432	4.80	9770	2333	4.19	6748	2031	3.32

6.4 Cooling performance data of 12kw model

LWE[℃]	10			15			20		
Tamb [℃]	CC[W]	PI[W]	EER	CC[W]	PI[W]	EER	CC[W]	PI[W]	EER
15	4199	1308	3.21	/	/	/	/	/	/
20	6960	1781	3.91	9973	2732	3.65	/	/	/
25	7908	2355	3.36	11272	2969	3.8	12878	3018	4.27
30	7752	3064	2.53	10532	3253	3.24	12453	3322	3.75
35	10252	3629	2.82	12494	3753	3.33	15884	4233	3.75
40	7039	2812	2.5	9537	3550	2.69	11506	3663	3.14
43	5814	3251	1.79	7237	3350	2.16	8693	3445	2.52

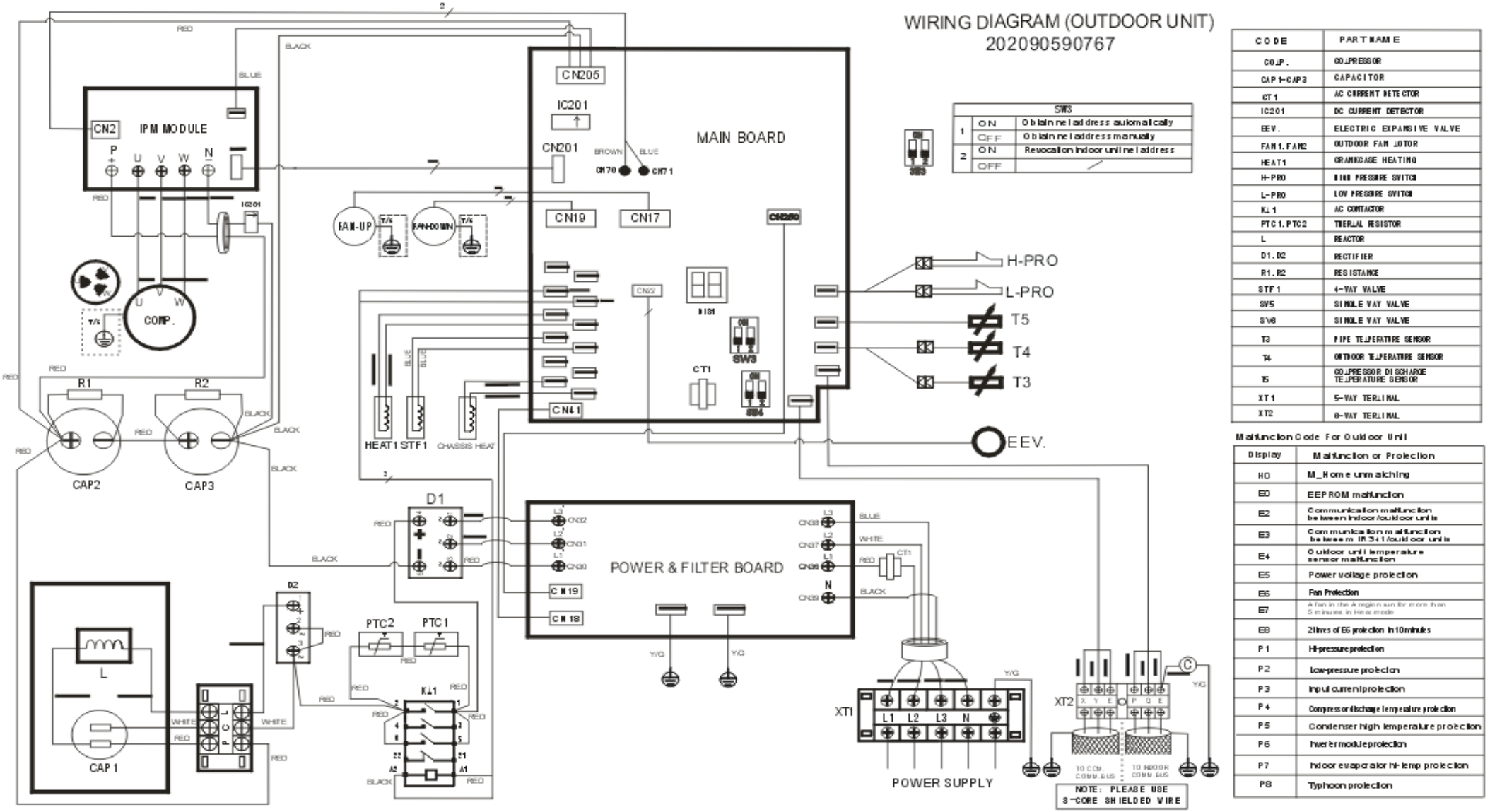
Remark:

CC= cooling capacity PI = power input HC = heating capacity

7. Wiring Diagrams

7.1 Outdoor units wiring diagram

Model:CE-LRSJF-V120/SN1-610 CE-LRSJF-V140/SN1-610



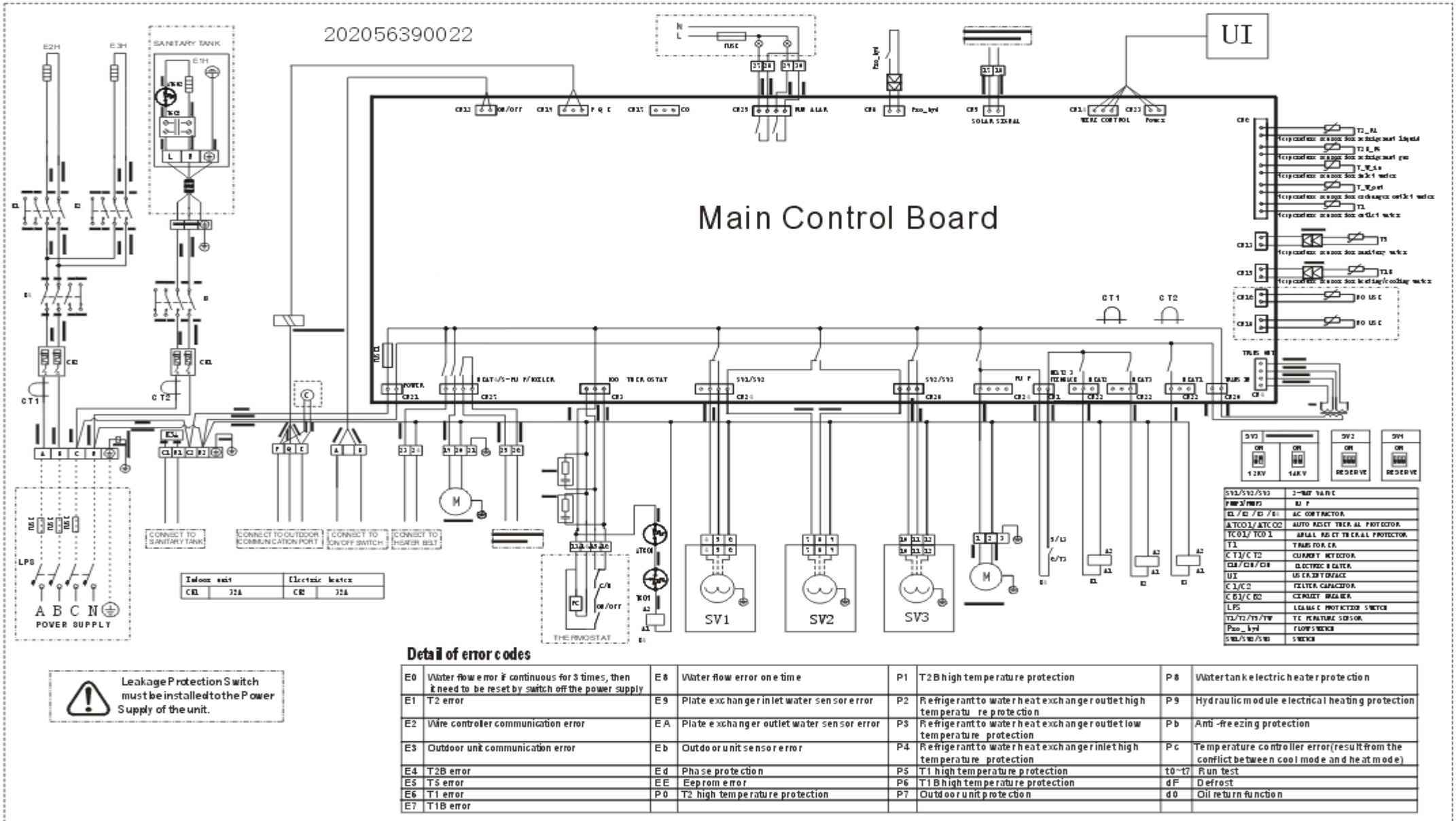
CODE	PART NAME
COMP.	COMPRESSOR
CAP1-CAP3	CAPACITOR
CT1	AC CURRENT DETECTOR
IC201	DC CURRENT DETECTOR
EEV.	ELECTRIC EXPANSIVE VALVE
FAN1.FAN2	OUTDOOR FAN MOTOR
HEAT1	CRANKCASE HEATING
H-PRO	HIGH PRESSURE SWITCH
L-PRO	LOW PRESSURE SWITCH
K41	AC CONTACTOR
PTC1.PTC2	THERMAL RESISTOR
L	REACTOR
D1.D2	RECTIFIER
R1.R2	RESISTANCE
STF1	4-WAY VALVE
SV5	SINGLE WAY VALVE
SV8	SINGLE WAY VALVE
T3	PIPE TEMPERATURE SENSOR
T4	OUTDOOR TEMPERATURE SENSOR
T5	COMPRESSOR DISCHARGE TEMPERATURE SENSOR
XT1	5-WAY TERMINAL
XT2	6-WAY TERMINAL

Malfunction Code For Ouldoor Unit

Display	Malfunction or Protection
H0	IM_Home unmatching
E0	EEPROM malfunction
E2	Communication malfunction between indoor/outdoor units
E3	Communication malfunction between IPM and outdoor units
E4	Outdoor unit temperature sensor malfunction
E5	Power voltage protection
E6	Fan Protection
E7	A fan in the A region run for more than 5 minutes in heat mode
E8	2times of E6 protection in 10minutes
P1	Hi-pressure protection
P2	Low-pressure protection
P3	Input current protection
P4	Compressor discharge temperature protection
P5	Condenser high temperature protection
P6	Inverter module protection
P7	Indoor evaporator hi-temp protection
P8	Typhoon protection

7.2Hydraulic indoor units wiring diagram

Model :SMK-120/CSD80GN1 SMK-140/CSD80GN1



Leakage Protection Switch must be installed to the Power Supply of the unit.

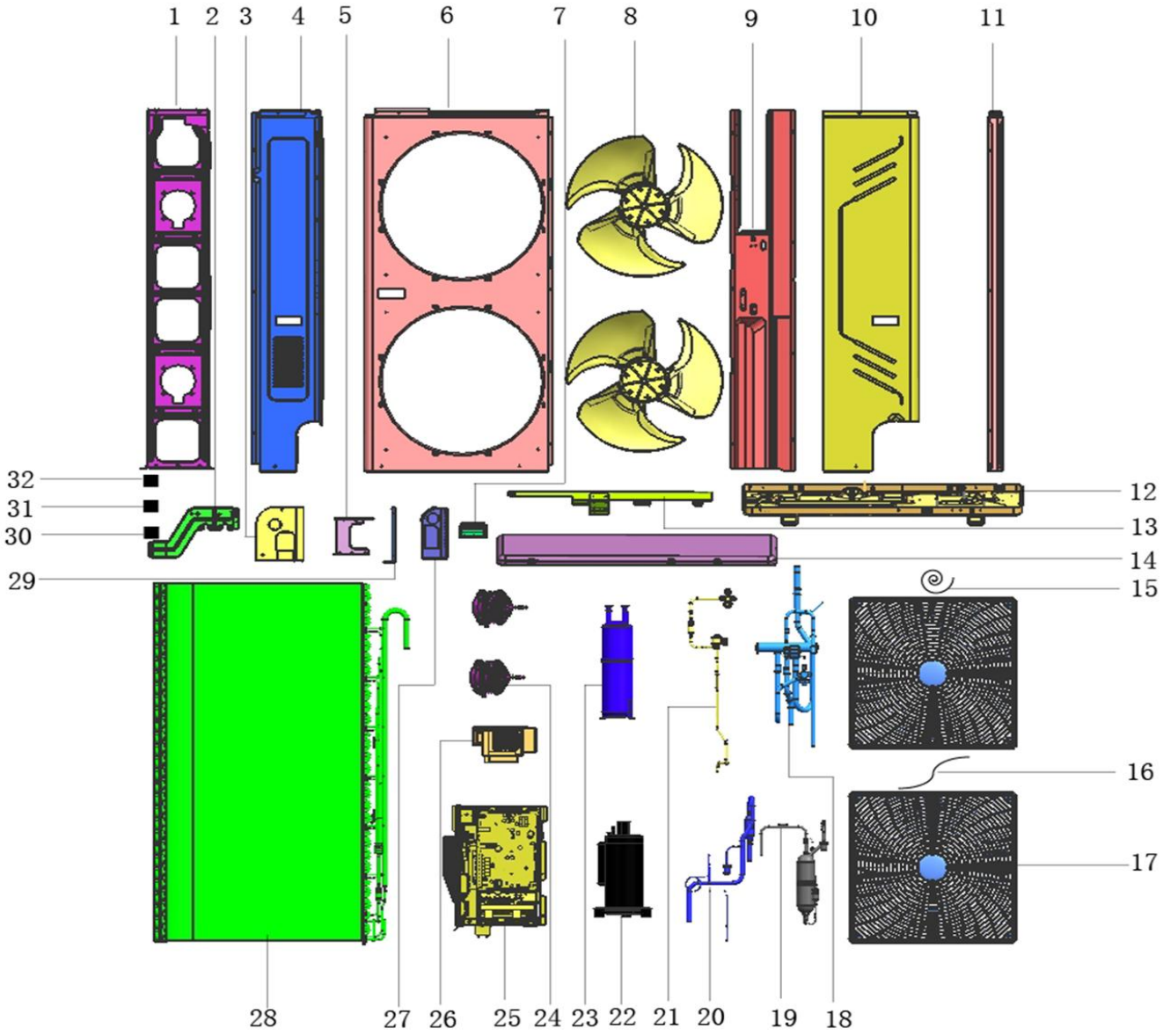
Detail of error codes

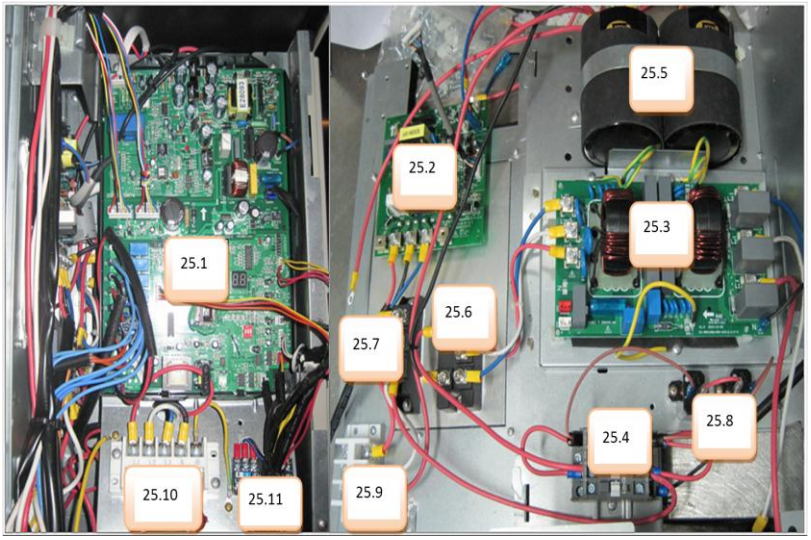
E0	Water flow error if continuous for 3 times, then it need to be reset by switch off the power supply	E8	Water flow error one time	P1	T2B high temperature protection	P8	Water tank electric heater protection
E1	T2 error	E9	Plate exchanger inlet water sensor error	P2	Refrigerant to water heat exchanger outlet high temperatu re protection	P9	Hydraulic module electrical heating protection
E2	Wire controller communication error	EA	Plate exchanger outlet water sensor error	P3	Refrigerant to water heat exchanger outlet low temperature protection	Pb	Anti -freezing protection
E3	Outdoor unit communication error	Eb	Outdoor unit sensor error	P4	Refrigerant to water heat exchanger inlet high temperature protection	Pc	Temperature controller error(result from the conflict between cool mode and heat mode)
E4	T2B error	Ed	Phase protection	P5	T1 high temperature protection	t0~t7	Run test
E5	TS error	EE	Eeprom error	P6	T1B high temperature protection	dF	Defrost
E6	T1 error	P0	T2 high temperature protection	P7	Outdoor unit protection	d0	Oil return function
E7	T1B error						

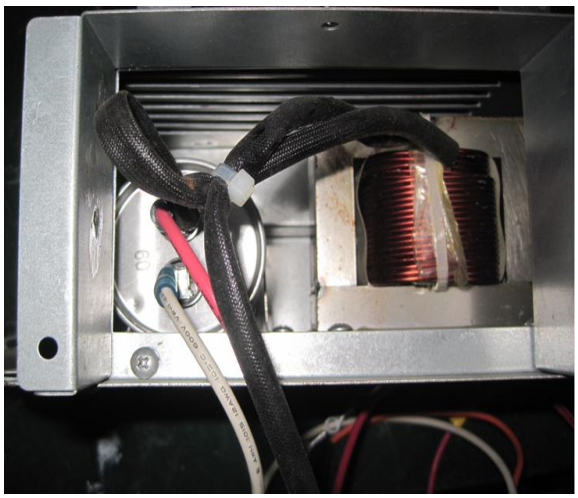
8. Exploded View

8.1 Exploded view of outdoor units

Model: CE-LRSJF-V120/SN1-610 CE-LRSJF-V140/SN1-610



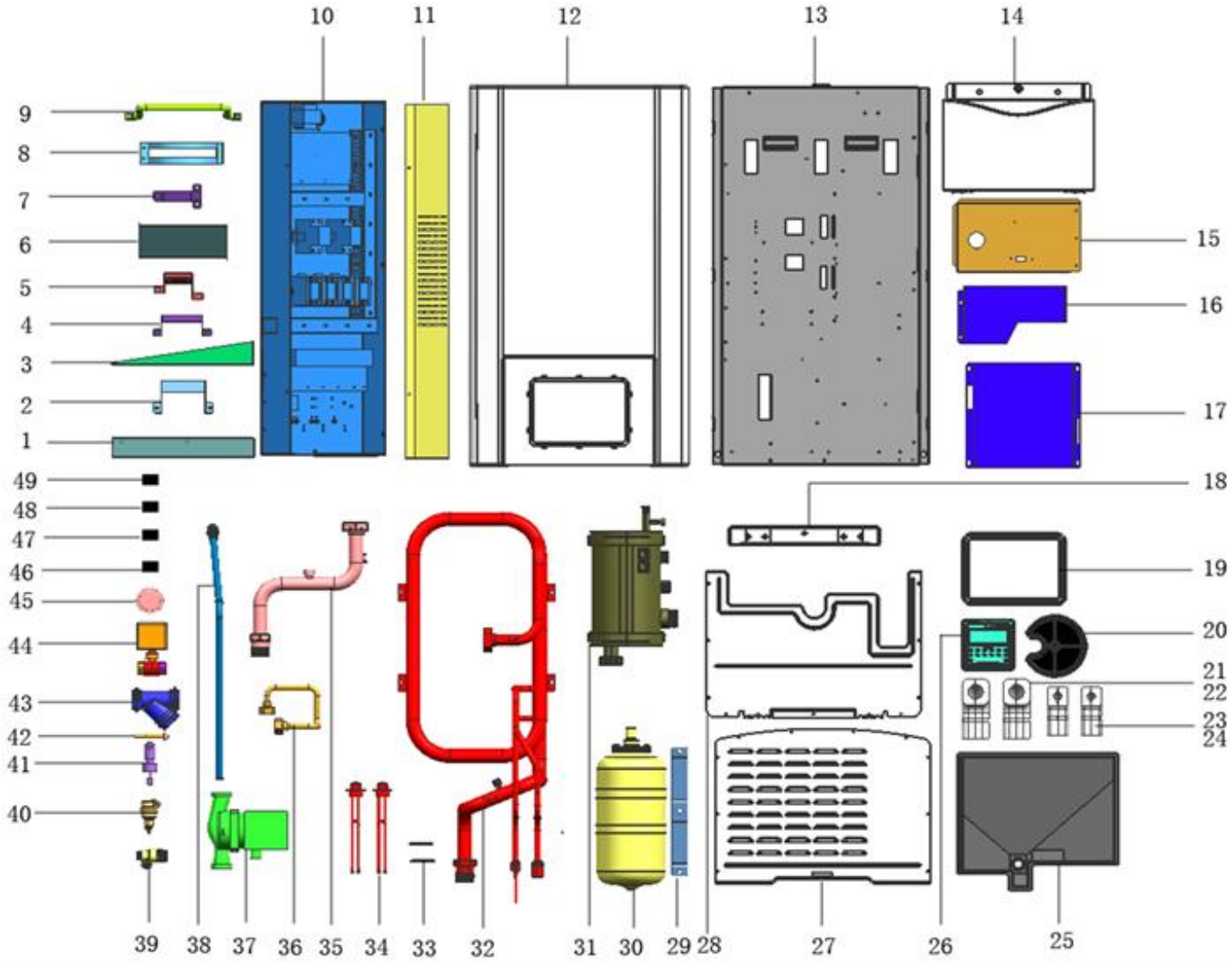


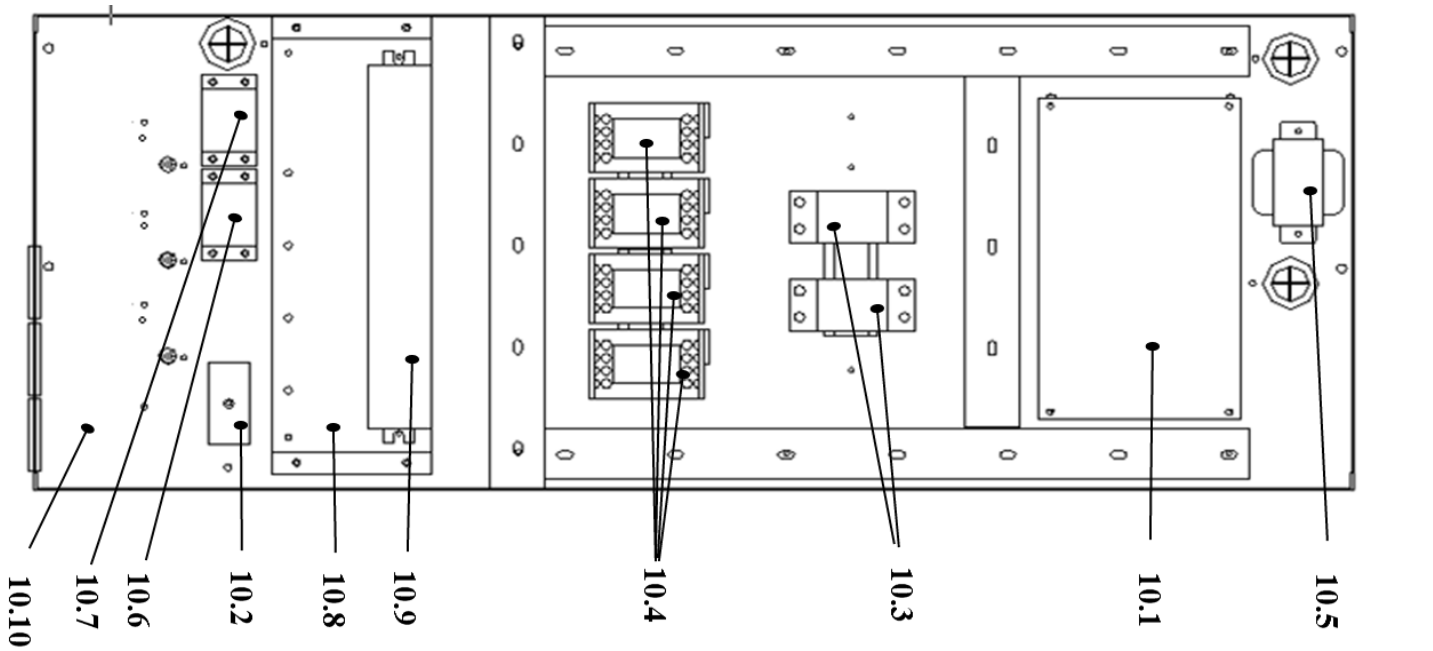


No.	Part Name	Quantity	BOM code
1	Motor bracket assembly	1	201295190080
2	Valve mounting plate	1	201295190083
3	Cover before the tube	1	201295190086
4	Right rear side	1	201295190081
5	Installation of gas-liquid separator plate	1	201295190079
6	Front Panel	1	201295190088
7	Handle	3	201195190001
8	Axial fan	2	201100300524
9	Partition components	1	201295190094
10	Right front side components	1	201295190082
11	Left rear support	1	201295190084
12	Base	1	201295190174
13	Layering fence	1	201295190076
14	Cover parts	1	201295190089
15	Compressor electric heater	1	202403100155
16	Electric heater	1	202403101687
17	Net	2	201195190163
18	Four-way valve parts	1	201695190355
19	Discharge pipe ass'y	1	201695190460
20	Suction pipe ass'y	1	201690590359
21	Electronic expansion valve ass'y	1	201690590595
22	Compressor	1	201401500270
23	Gas-liquid separator	1	201601100084
24	DC Motor	2	202400300216
25	E-part box ass'y	1	203390590094
25.1	Main control board ass'y	1	201390590073
25.2	Inverter module	1	201319902223
25.3	outdoor unit power supply board	1	201395190184
25.4	AC contactor	1	202300850054
25.5	Aluminum electrolytic capacitor	2	202300300109
25.6	Three phase bridge	1	202300500348
25.7	Single-phase bridge	1	202300500910
25.8	Resistance	2	202300130008
25.9	Wire joint	1	202301450115
25.10	Wire joint	1	202301450133
25.11	Six Terminal Block	1	202301400242
26	Electrical inductance Ass'y	1	203395100212
26.1	Compressor capacitor	1	202401090058
26.2	inductance	1	202301000927
27	After the tube cover	1	201295190085
28	Condenser ass'y	1	201595190036
29	Transport to strengthen board	1	201295190078
30	Discharge temp sensor ass'y	1	202301300124
31	room temp sensor ass'y	1	202301300197
32	Outdoor coil temp sensor ass'y	1	202301300438

8.2 Exploded view of hydraulic indoor units

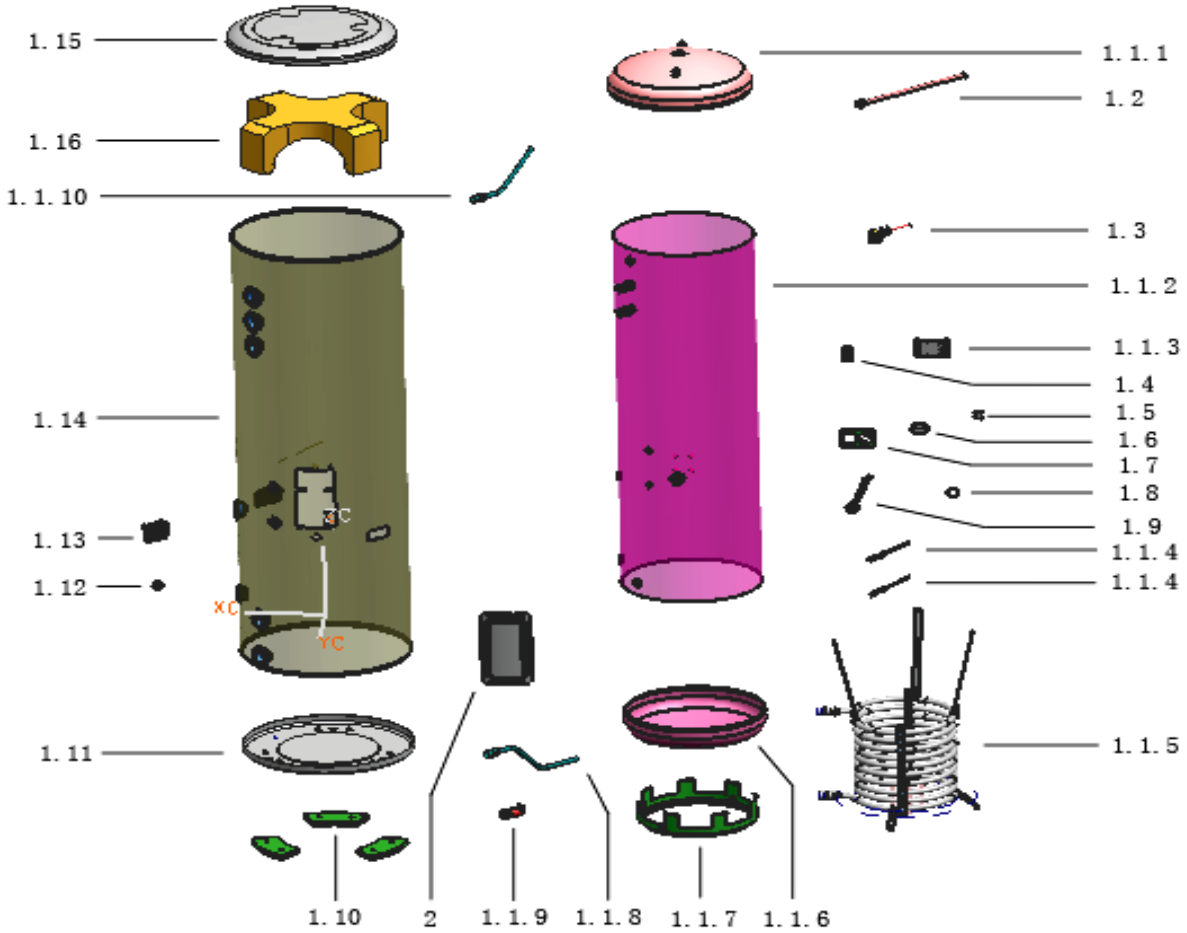
Model :SMK-120/CSD80GN1 SMK-140/CSD80GN1

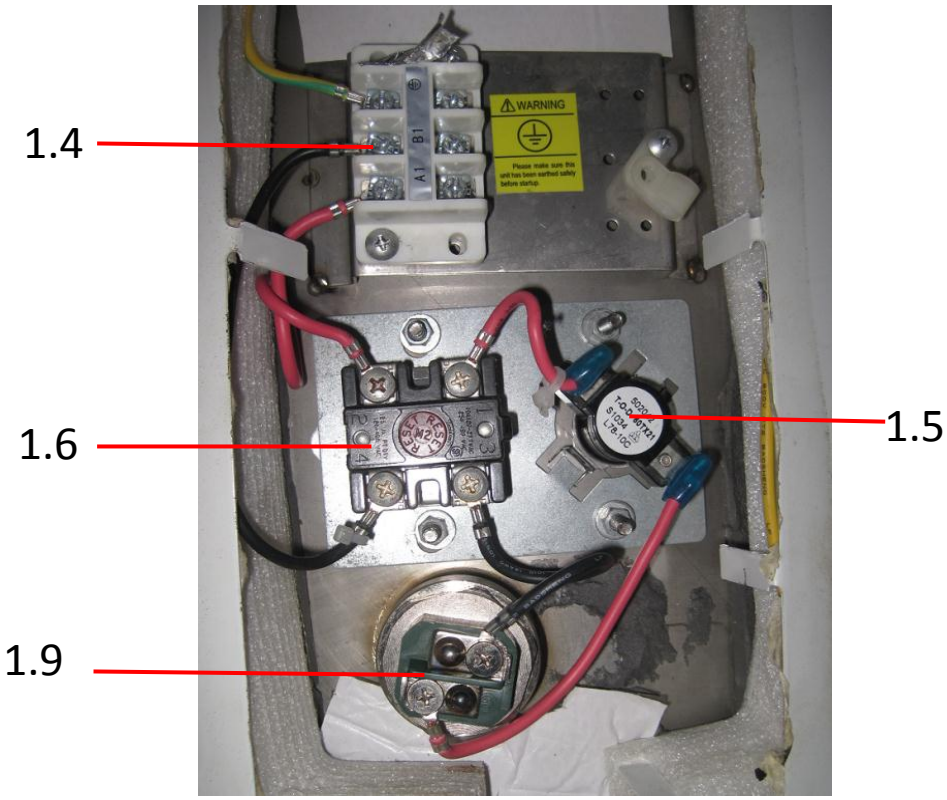


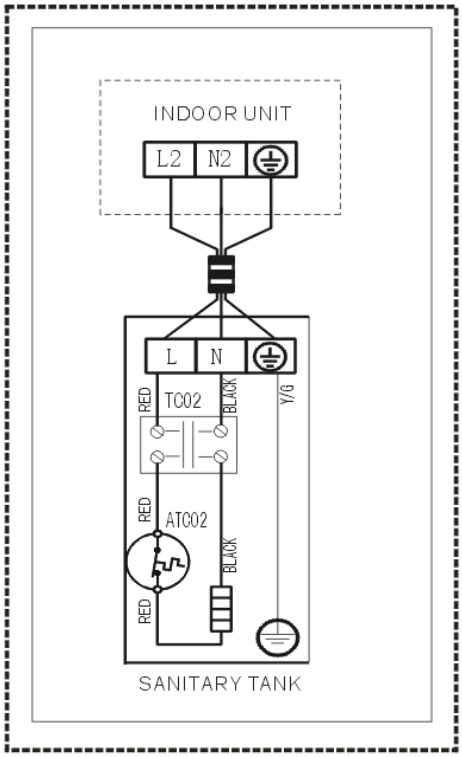


No.	Part Name	Quantity	BOM code	No.	Part Name	Quantity	BOM code
1	Electronic control box mounting plate 2	1	201256390012	21	Right foam refrigerant pipe	2	202256390004
2	Pump mounting plate	1	201256390014	22	Left foam refrigerant pipe	2	202256390005
3	1 electronic control box mounting plate	1	201256390013	23	Right out of the bubble pipe	2	202256390002
4	Refrigerant pipe fixed plate	1	201256390008	24	Left out of the bubble pipe	2	202256390003
5	Fixed plate inlet	1	201256390009	25	Water tray components	1	202256390001
6	Pump Bracket 2	1	201256390004	26	Hydraulic module wired remote	1	203355100567
7	Outlet pipe fixed plate	1	201256390010	27	Roof	1	201256390033
8	Expansion tank clamp	1	201290490010	28	Bottom	1	201256390034
9	Handle	1	201256390011	29	Mounting Bracket	1	201256390017
10	E-part box ass'y	1	203356390006	30	Expansion Tank	1	201601300552
10.1	Main controller ass'y	1	201356390008	31	Small water tank	1	201256390006
10.2	Wire joint, 6p	1	202301400219	32	Casing components	1	201756390001
10.3	32A MCB	2	202301620210	33	Shaft	2	201256390035
10.4	AC contactor	4	202300850054	34	Electric heater	2	202403101682
10.5	Transformer	1	202300900109	35	Outlet pipe components	1	201656390016
10.6	Wire joint, 5p	1	202301450039	36	Expansion Tank take over the components	1	201656390014
10.7	Wire joint	1	202301450133	37	Drain Pump	1	202400600085
10.8	Electronic control box terminal strip bracket	1	201256390001	38	Connect hose	1	201119900833
10.9	Thirty Terminal Block	1	202301400244	39	Safety valve	1	201604100106
10.10	E-part box ass'y	1	201256390036	40	Exhaust valve	1	201601601296
11	Electronic control box cover	1	201256390003	41	Target Flow Switch	1	202301800869
12	Front Panel	1	201256390031	42	Expansion bolt assembly	5	202501100838
13	Rear	1	201256300023	43	Electric valve	3	201601601255
14	Flip	1	201256390032	44	Y Type filter	1	201695700020
15	Wired remote support	1	201256390018	45	Hydraulic meter	1	201800100005
16	Pump bracket	1	201256390015	46	Temp sensor	1	202301300311
17	Small water tank fixed plate	1	201256390016	47	Pipe temperature sensor assemblies	1	202301300494
18	Decorative plates	1	201156390003	48	Temp sensor ass'y	1	202301300495
19	Decorative ring	1	201156390004	49	Thermostat components	1	202456390020
20	Electric heating cover	1	201156390002				

8.3 Exploded view of water tank

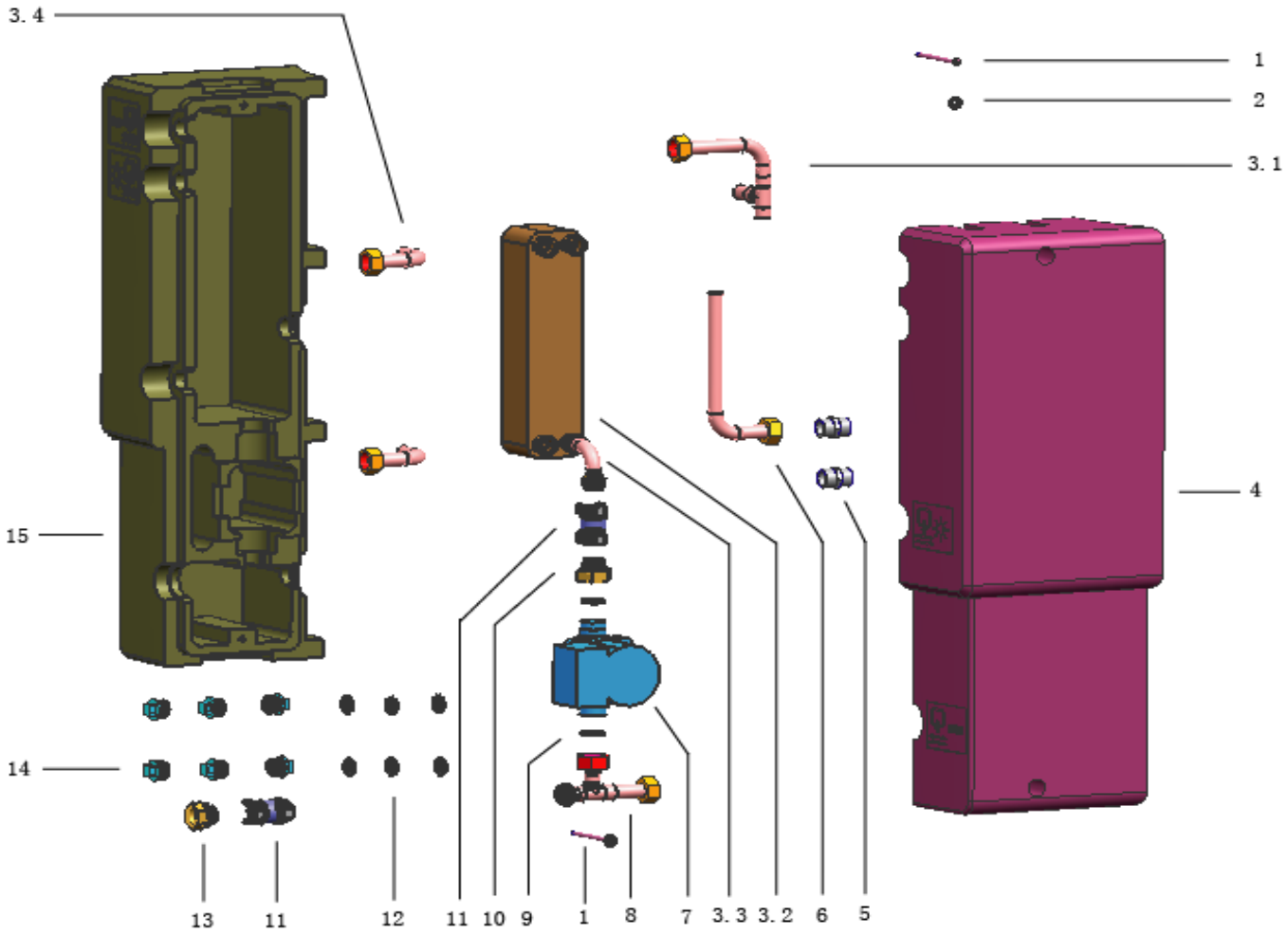






No.	Part Name	Quantity	BOM code
1	Water tank foam components	1	201256190027
1.1	Liner welded components	1	201256190023
1.1.1	Head on liner	1	201256100529
1.1.2	Inner barrel body	1	P0000805371
1.1.3	Terminal Block Bracket	1	201256190025
1.1.4	Temperature control components Ⅱ	2	P0000613681
1.1.5	Solar coil assembly	1	201256190019
1.1.6	Under the head liner	1	201256190024
1.1.7	Interior support frame	1	201290590109
1.1.8	Inlet components	1	P0000613631
1.1.9	Drainage fittings	1	201290590138
1.1.10	Outlet pipe components	1	P0000613665
1.2	Magnesium anode	1	202990590003
1.3	TP relief valve	1	201601601206
1.4	Three Terminal Block	1	202301400246
1.5	Thermometer	1	202301600046
1.6	Temp sensor	1	202301610028
1.7	Stator of temp. sensor	1	201290590034
1.8	seal ring of radiation pipe	1	202790590001
1.9	Electric heating pipe water	1	202403100092
1.10	Plastic foot	3	201190500293
1.11	Tank bottom	1	P0000805356
1.12	Coil rubber too	1	202790500510
1.13	Water tank handle	2	201156100038
1.14	Shell	1	P0000805335
1.15	Tank cover	1	P0000805345
1.16	Top foam liner	1	202256190001
2	Heater Cover	1	201256190015
3	Wiring nameplate	1	202056190049

8.4 Exploded view of solar kit



No.	Part Name	Quantity	BOM code
1	Cross Recess Head Screw	2	202500300859
2	washers	2	202502100091
3	plate exchanger ass'y	1	201756390002
3.1	plate exchanger outlet pipe ass'y	1	201656390002
3.2	plate exchanger	1	201700101111
3.3	plate exchanger inlet pipe ass'y	1	201656390005
3.4	plate exchanger inlet/outlet pipe	2	201656390001
4	right foam	1	202656390002
5	adapter	2	201600401064
6	connecting pipe	1	201656390004
7	Shield pump ass'y	1	202400600073
8	pump connecting tube components	1	201656390010
9	seal ring	2	202795700050
10	non-return valve joint II	1	201656390008
11	non-return valve	2	201656390007
12	seal ring	6	202790500050
13	non-return valve joint IV	1	201656390009
14	Seal Stopper	6	201170390002
15	left foam	1	202656390001

Part 2 Installation

1. Outdoor unit installation

1.1 Precaution

1) Ensure that all Local, National and International regulations are satisfied.

2) Read the ”Installation manual” carefully before Installation.

3) The precautions described below include the important items regarding safety. Observe them without fail.

4) After the installation work, perform a trial operation to check for any problem.

4) Follow the Owner’s Manual to explain how to use and maintain the unit to the customer.

5) Turn off the main power supply switch (or breaker) before the unit maintenance.

6) Ask the customer to keep the Installation Manual together with the Owner’s Manual.

7) Some tools as follow table should be prepared before installation:

1	Philips screw driver	12	Hexagonal wrench
2	Hole core drill(65mm)	13	Pipe flaring tool
3	Spanner	14	Pipe bender
4	Pipe cutter	15	Level vial
5	Knife	16	Metal saw
6	Reamer	17	Manifold gauge (Charge hose:R410A special requirement)
7	Gas leak detector	18	Vacuum pump (Charge hose:R410A special requirement)
8	Tape measure	19	Torque wrench 1/4(17mm)16N•m (1.6kgf•m), 3/8(22mm)42N•m (4.2kgf•m), 1/2(26mm)55N•m (5.5kgf•m) 5/8(15.9mm)120N•m(12.0kgf•m)
9	Thermometer	20	Copper pipe gauge adjusting projection margin

10	Mega-tester	21	Vacuum pump adapter
11	Electro circuit tester		

1.2 Accessory

Please check whether the following fittings are of full scopes. If there are some spare fittings , please restore them carefully.

Installation Fittings	Name	Shape	Quantity
	Outdoor unit installation manual		1
	Outdoor unit owner's manual		1

1.3 Installation place

Please keep away from the following place, or malfunction of the machine may be caused:

1) There is combustible gas leakage.

2) There is much oil (including engine oil) ingredient.

3) There is salty air surrounding (near the coast)

4) There is caustic gas (the sulfide, for example) existing in the air (near a hot spring)

5) A place the heat air expelled out from the outdoor unit can reach

your neighbor’s window.

6) A place where the drain water may make problems.

7) A place that the noise interferes your neighbors everyday life.

8) A place that is exposed to a strong wind.

9) A place that is too weak to bear the weight of the unit.

10) A place that block a passage.

11) Uneven place.

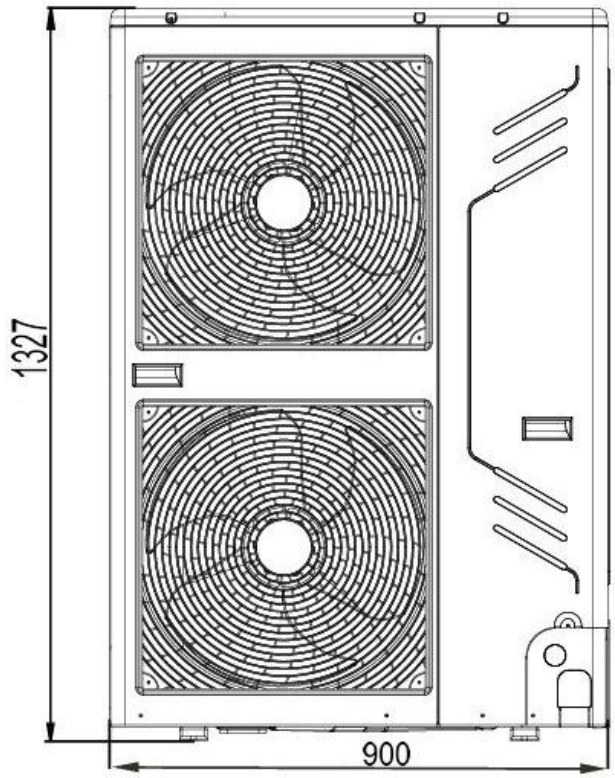
12) Insufficient ventilation place.

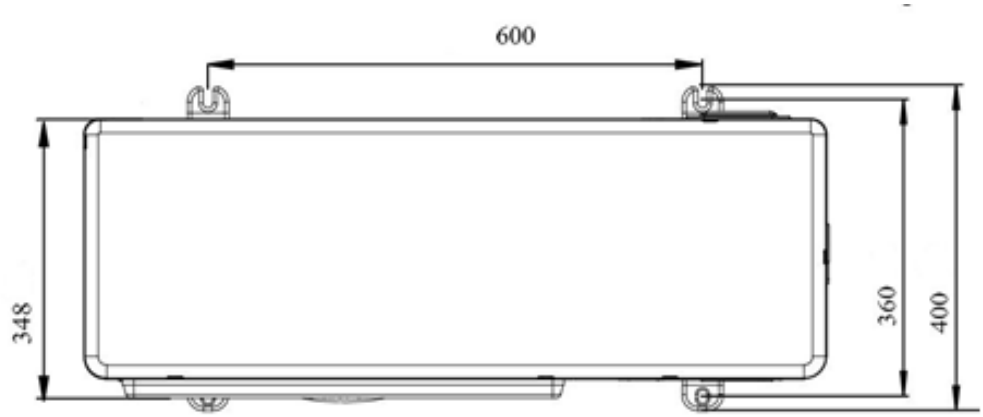
13) Near a private power station or high frequency equipment.

Caution:

- When an outdoor unit is installed in a place that is always exposed to a strong wind like a coast or on a high storey of a building, secure a normal fan operation by using a duct or a wind shield.
- When the outdoor unit is installed in an elevated position be sure to secure its feet.
- Keep indoor unit, outdoor unit, power supply wiring and transmission wiring at least 1 meter away from televisions and radios. This is to prevent image interference and noise in those electrical appliances. (Noise may be generated depending on the conditions under which the electric wave is generated, even if 1 meter is kept.)
- The insulation of the metal parts of the building and the heater pump should comply with the regulation of National Electric Standard.

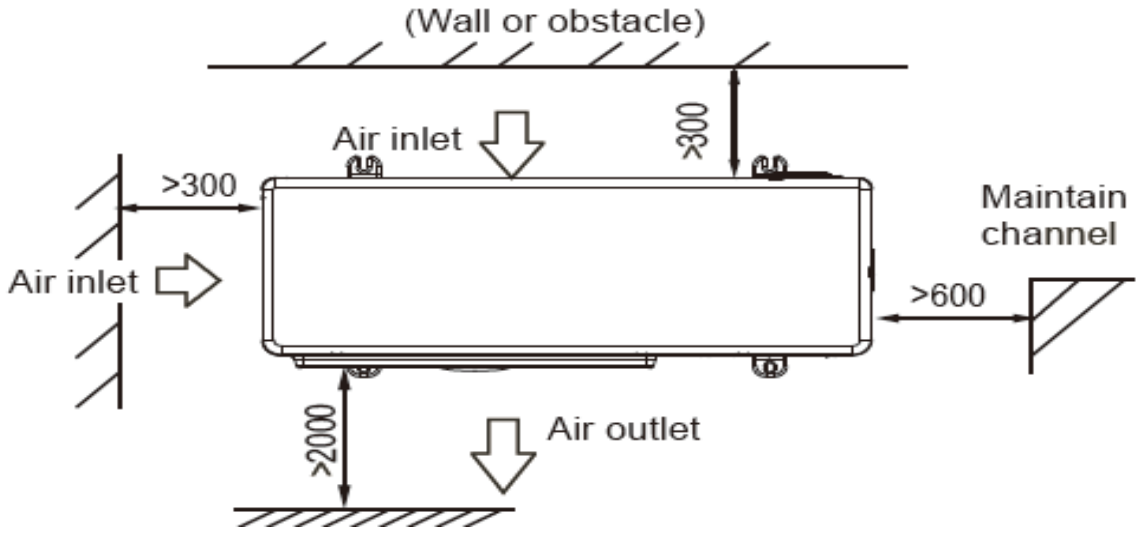
1.4 Dimensions of the outdoor unit



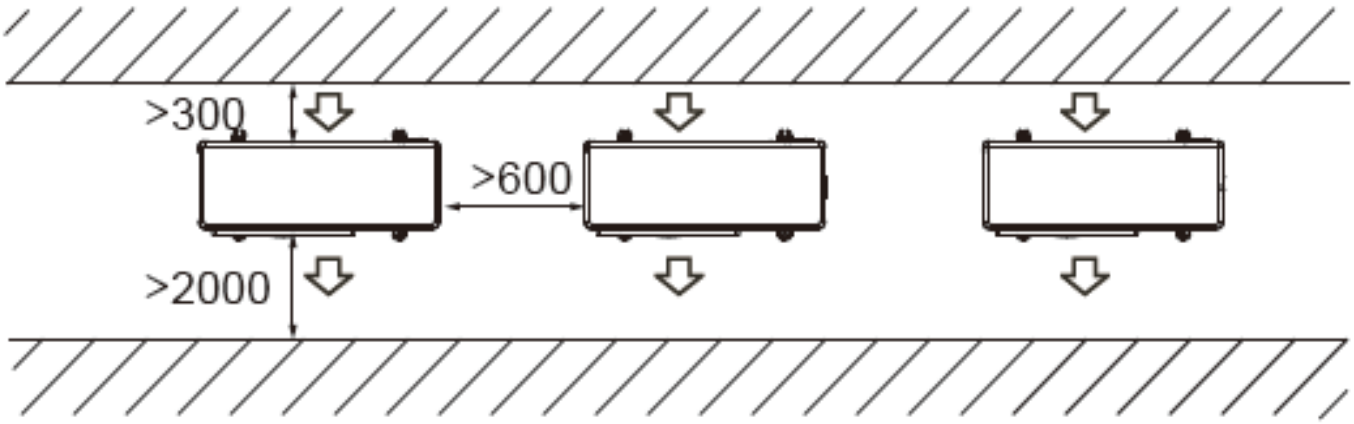


1.5 Installation space

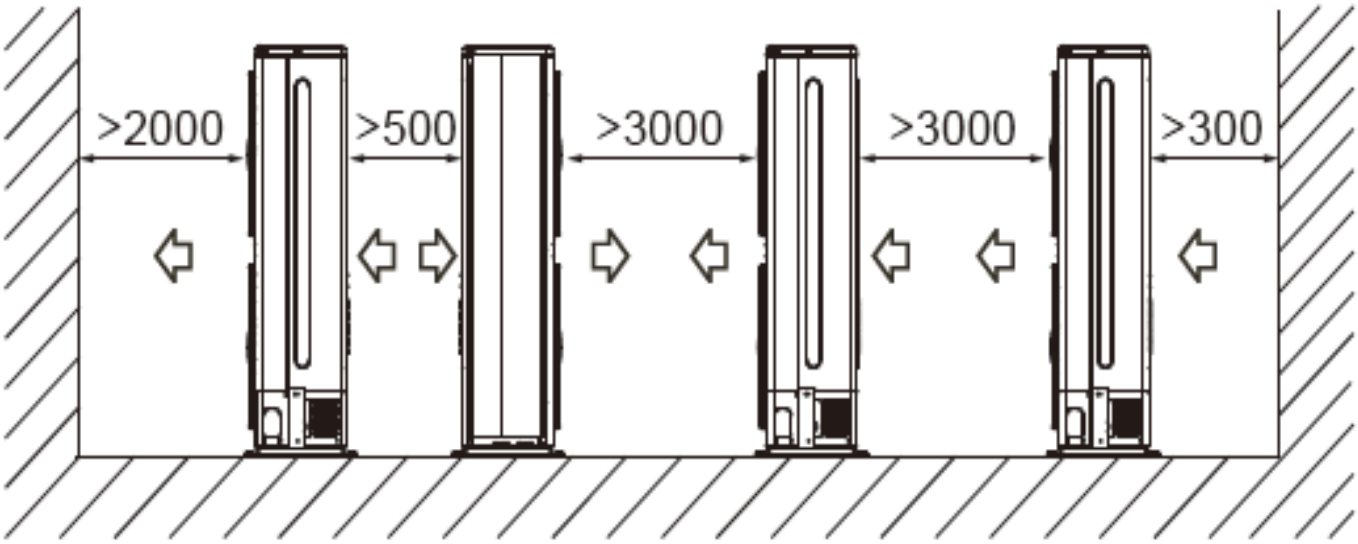
1) Single unit installation



2) Parallel connect the two units or above



3) Parallel connect the front with rear sides



1.6 Moving and installation

1) Since the gravity center of the unit is not at its physical center, so please be careful when lifting it with a sling.

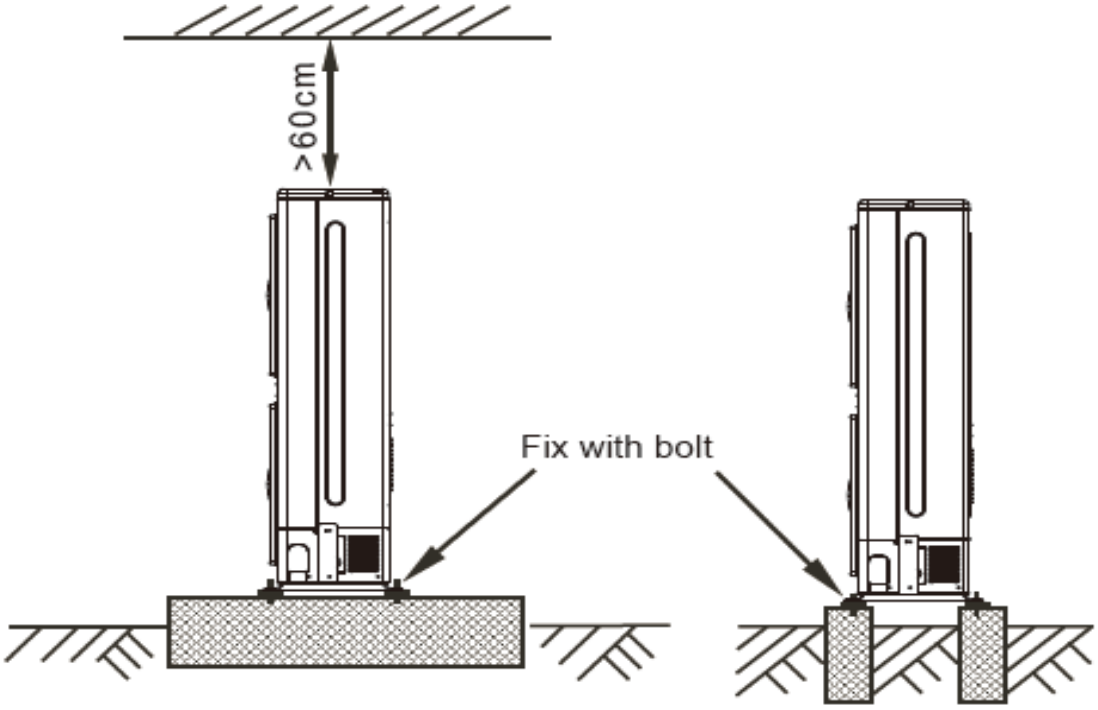
2) Never hold the inlet of the outdoor unit to prevent it from deforming.

3) Do not touch the fan with hands or other objects.

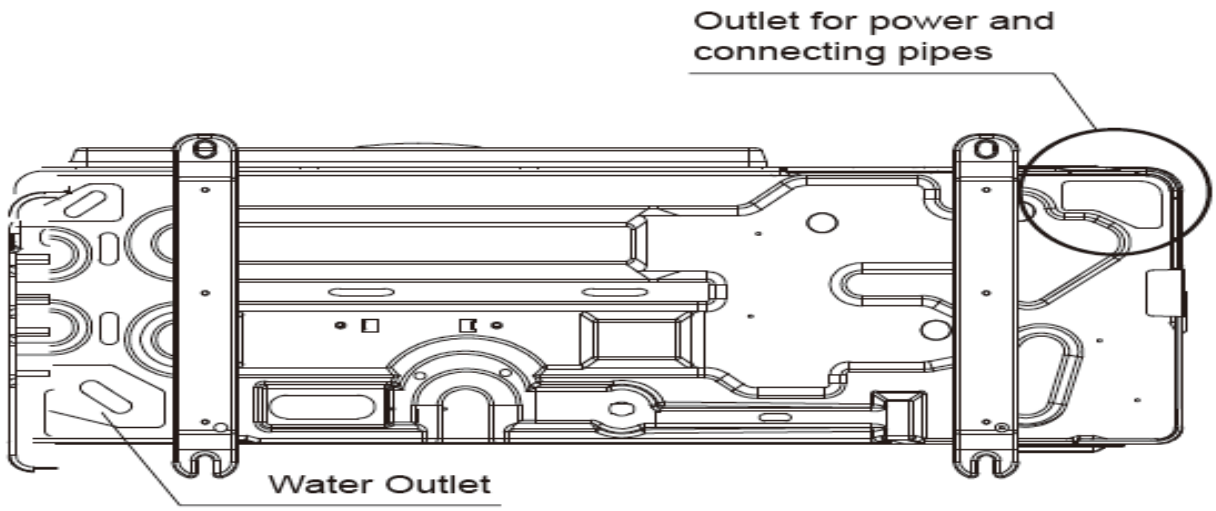
4) Do not lean it more than 45°, and do not lay it sidelong.

5) Make concrete foundation according to the specifications of the outdoor units.

6) Fasten the feet of this unit with bolts firmly to prevent it from collapsing in case of earthquake or strong wind. (Refer to follow fig.)



1.7 Water Outlet



Caution:

- While installing the outdoor unit, pay attention to the installation place and the drainage pattern; if it's installed at the alpine zone, the frozen condensed water will block up the water outlet, please pull out the rubber stopper of the reserve water outlet. If that still fails to satisfy for the water draining, please knock open the other two water outlets, and keep the water can drain in time.
- Pay attention to the knock the reserve water outlet from outside to inside, and it will be beyond repair after knocking open, please pay attention to the installation place, lest cause the inconvenience. Please do the moth proofing for the knocked out hole, to avoid the pest processing into and destroy the components.

1.8 Pipe connection

1) Check whether the height drop between the indoor unit and outdoor unit, the length of refrigerant pipe, and the number of the bends meet the following requirements:

Model	The max height drop(m)		The length of refrigerant pipe(m)
	When outdoor unit is top	When outdoor unit is bottom	
LRSJF-V120/SN1-610	15	10	50
LRSJF-V140/SN1-610	15	10	50

Model	Gas side/Connection type	Liquid side/ Connection type
LRSJF-V120/SN1-610 LRSJF-V140/SN1-610	Φ15.9/ Flaring	Φ9.5/ Flaring

Indoor unit	Φ15.9/ Flaring	Φ9.5/ Flaring

2) **Refrigerant piping heat Insulation**

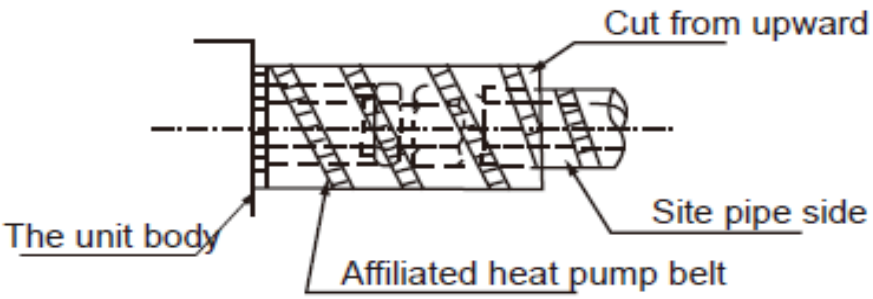
Do the heat insulation to the pipes of gas side and liquid side separately. The temperature of the pipes of gas side and liquid side when cooling, for avoiding condensation please do the heat insulation fully.

1) The gas side pipe should use closed cell foamed insulation material, which the fire-retardant is B1 grade and the heat resistance over 120℃.

2) When the external diameter of copper pipe≤Φ12.7mm, the thickness of the insulating layer at least more than 15mm;

When the external diameter of copper pipe≥Φ15.9mm, the thickness of the insulating layer at least more than 20mm.

3) Please use attached heat-insulating materials do the heat insulation without clearance for the connecting parts of the indoor unit pipes.



3) **Refrigerant piping connection**

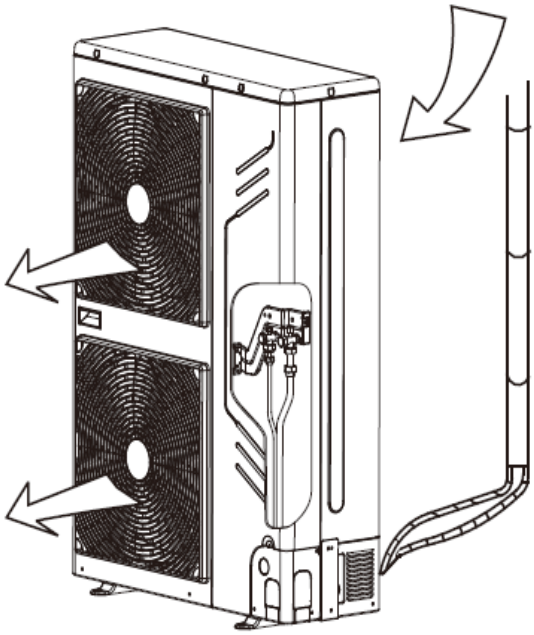
We should wash the pipes with high pressure nitrogen, never use refrigerant of the outdoor units. Make sure there is no dirt or water in the pipes before connecting the pipes to the outdoor units.

Caution:

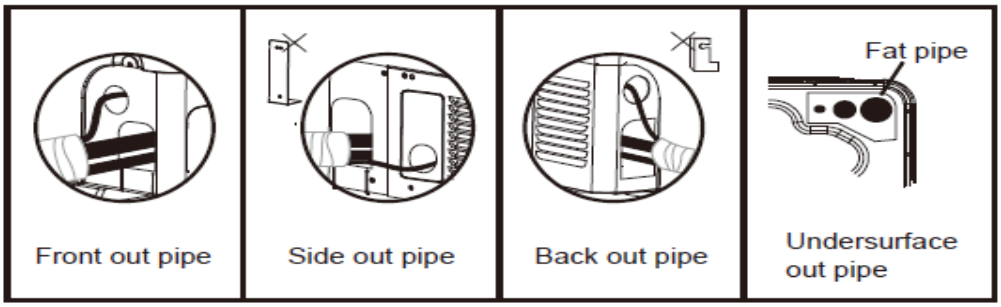
● Please pay attention to avoid the components where it is connecting to the connecting pipes.

● To prevent the refrigerant piping from oxidizing inside when welding, it is necessary to

charge nitrogen, or oxide will chock the circulation system.



The indoor and outdoor connecting pipe interface and power line outlet. Can select various piping and wiring patterns such as out from the front, the back, the side and undersurface etc.(The follow display the locations of several piping and wiring knock-off interfaces）



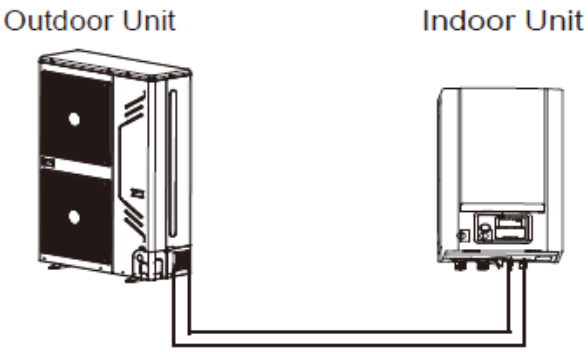
Caution:

- Side out pipe: please remove the L-shape metal plate, otherwise can not wiring.
- Back out pipe:

  Undersurface outlet pipe: the knock out should from inside to outside, and then piping and wiring through this. Pay attention to the piping, the fat connecting pipe should out from the largest hole, otherwise the pipes will be rubbed. Please do the moth proofing for the knocked out hole, to avoid the pest processing into and destroy the components.
- Please wipe off the piping support rubber blanket beside the inner outlet pipe cover of the machine while back side getting out pipes.

1.9 Airtight Test

When we have connected the refrigerant pipe as follows diagram**,** we should do airtight test to check whether the system is leakage.



Caution：

- Pressured nitrogen [4.3MPa (44kg/cm2) for R410A] should be used in the airtight test.
- Tighten high pressure/low pressure valves before applying pressured nitrogen.
- Apply pressure from air vent mouth on the high pressure/low pressure valves.
- The high pressure/low pressure valves are closed when applying pressured nitrogen.
- The airtight test should never use any oxygen, flammable gas or poisonous gas.

1.10 Air Purge With Vacuum Pump

After the airtight test, we should remove the air in the refrigerant connecting pipes.

1) Using vacuum pump to do the vacuum, never using refrigerant to expel the air.

2) Vacuuming should be done from both liquid side and gas side simultaneously.

3) The system should be vacuumized until the vacuum pump indicates the pressure of the pipes less than 10pa.

1.11 Refrigerant Amount To Be Added

Calculate the added refrigerant according to the diameter and the length of the liquid side pipe of the outdoor unit/indoor unit connection. If the length of the liquid side pipe is less than 5 meters it is no need to add more refrigerant, so than calculating the added refrigerant the length of the liquid side pipe must subtract 5 meters.

Liquid Side Piping Diameter	Refrigerant to be Added Permeter Piping
Φ9.5	0.030kg

2. Hydraulic modular unit installation

2.1 Accessory

Please check whether the following fittings are of full scopes. If there are some spare fittings , please restore them carefully.

Hydraulic Indoor Unit Accessories	Owner's & Installation Manual		1
	Mounting bracket		1
	Two-way valve		3
	M4 screws		2
	Water tank temperature sensor		1
	Y-sharp filter		1
	Floor heating inlet temperature sensor, T1B		1
	Drain pan kit		1
	M8 expansion screws		5

2.2 Installation place

Selecting an installation location

- The indoor unit is to be wall mounted in an indoor location that meets the following requirements:
- The installation location is frost-free.
- The space around the unit is adequate for serving.
- The space around the unit allows for sufficient air circulation.
- There is a provision for condensate drain and pressure relief valve blow-off.

Caution:

When the unit running in the cooling mode, Condensate may drop from the water inlet and water outlet pipes to your furniture and other devices. Please make sure the dropping condensate will not result in damage of your furniture and other devices.

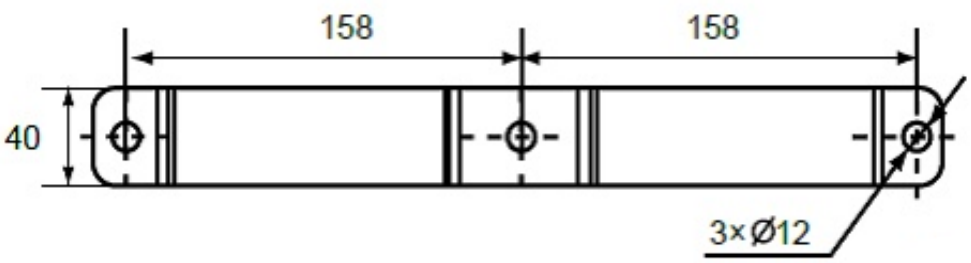
- The installation surface is a flat and vertical non-combustible wall, capable of supporting the operation weight of the unit.
- There is no danger of fire due to leakage of inflammable gas.
- All piping lengths and distance have been taken into consideration.

Requirement	SMK-120/CSD80GN1 SMK-140/CSD80GN1
Maximum allowable refrigerant piping length between outdoor unit and indoor unit.	50m
Maximum allowable height distance between outdoor unit and indoor unit when outdoor unit is top.	15m
Maximum allowable height distance between outdoor unit and indoor unit when outdoor unit is bottom	10m
Maximum allowable distance between the 2-way valve SV1 and the indoor unit (only for installations with sanitary hot water tank).	3m
Maximum allowable distance between the sanitary hot water tank and the indoor unit (only for installations with sanitary hot water tank). The thermistor cable supplied with the indoor unit is 15 min length.	10m
Maximum allowable be distance between the T1B and the indoor unit .The temperature sensor cable of T1B supplied with the indoor unit is 10m in length.	8m

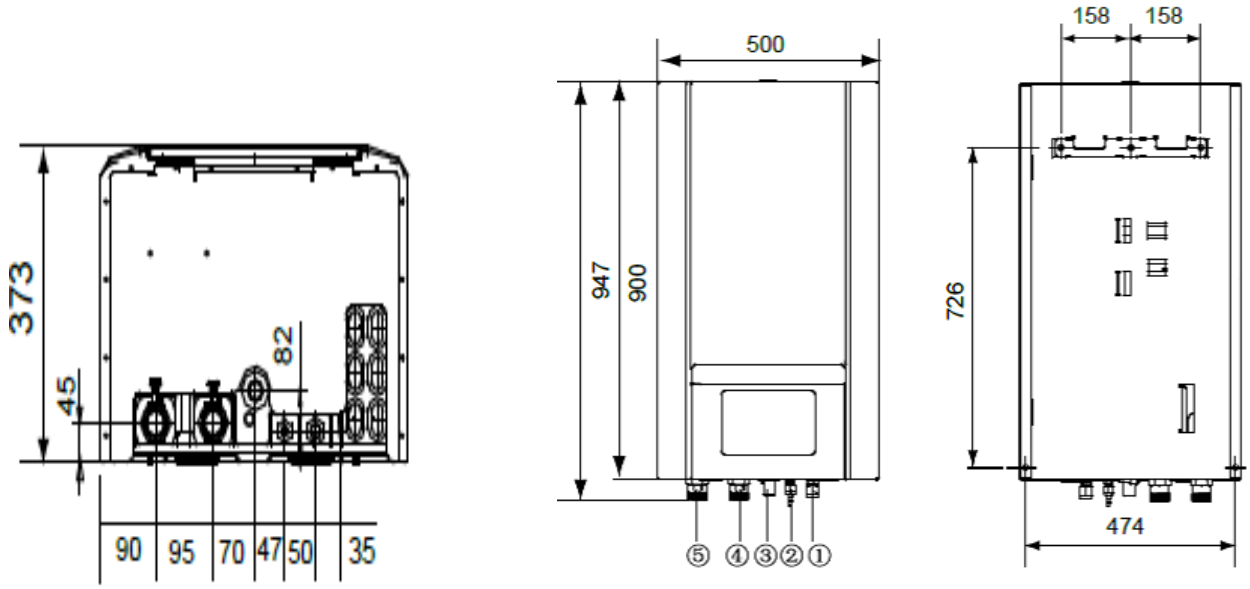
- The equipment is not intended for use in a potentially explosive atmosphere.

2.3 **Dimensions of the hydraulic indoor units**

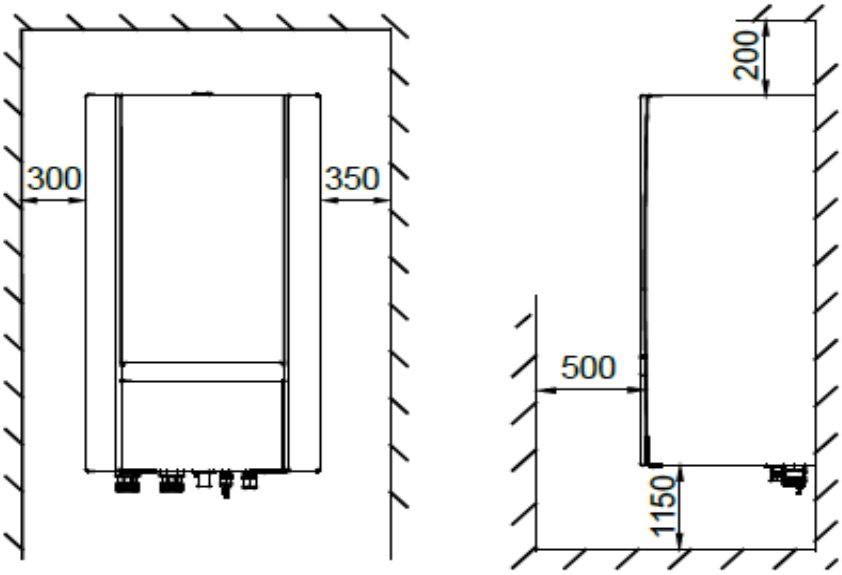
Unit of measurement: mm
Dimensions of the wall bracket:



Dimensions of the unit

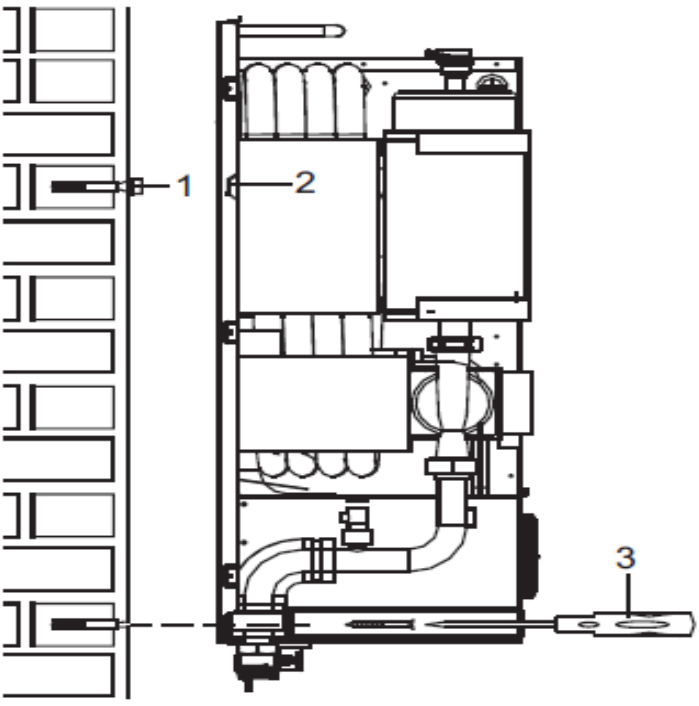


2.4 Service space



2.5 Mounting the indoor unit

- Fix the wall mounting bracket to the wall using appropriate plugs and screws.
- Make sure the wall mounting bracket is completely level.
- When the unit is not installed level, air might get trapped in the water circuit resulting in malfunctioning of the unit.
- Pay special attention to this when installing an indoor unit to prevent overflow of the drain pan Hang the indoor unit on the wall mounting bracket.
- Fix the indoor unit at the bottom inside using appropriate plugs and screws. To do so, the unit is equipped with 2 holes at the bottom outer edges of the frame.



2.6 Water pipe insulation

The complete water circuit, inclusive all piping, must be insulated to prevent condensation during cooling operation and reduction of the cooling and heating capacity.
If the temperature is higher than 30 and the humidity is higher than 80%RH, then the thickness of the sealing materials should be at least 20 mm in order to avoid condensation on the surface of the sealing.

Caution:

Failure to do good piping insulation, the cooling/heating capacity
of the unit will be reduced and condensate drop will destroy the furniture and other devices.

2.7 Water pipework

Checking the water circuit

The units are equipped with a water inlet and water outlet for connection to a water circuit. This circuit must be provided by a licensed technician and must comply with all relevant European and national regulations

WARNING:

- The unit is only to be used in a closed water system. Application in an open water circuit can lead to excessive corrosion of the piping.
- Before continuing the installation of the unit, check the following points:
- The maximum water pressure is 3 bar, but the best pressure range is between 1 to 2 bar. It will be perfect, if the water pressure is the same as pre-pressure of expansion vessel.
- To facilitate service and maintenance install one shut-off value at the water inlet and one shut-off value at the water outlet of the indoor unit.
- Drain taps must be provided at all low points of the system to permit complete drainage of the circuit during maintenance.
- Make sure to provide a proper drain for the pressure relief valve to avoid any water coming into contact with electrical parts.
- Air vents must be provided at all high points of the system. The vents should be located at points which are easily accessible for servicing. An automatic air purge is provided inside the indoor unit. Check that this air purge is not tightened too much so that automatic release of air in the water circuit remains possible.

  There might be air in the electric heater water tank. The air will cause the damage of the electric heater and cause the abnormal operation of the system. The air in the water tank can be purged by the manual discharging valve in the top of the water tank. The power for the electric heater cannot be supplied before discharging the air in the water tank. It will last 30 min until discharging the air completely.
- Take care that the components installed in the field piping can withstand the water pressure.
- The filter (accessory of indoor unit) must be connected into the water circuit.

CAUTION

When the unit running in the cooling mode, there will be condensate drop the water inlet and

water outlet pipes. Please make sure the dropping condensate will not result in damage of your furniture and other devices.

Checking the water volume and expansion vessel pressure

The unit is equipped with an expansion vessel of 6.5 liter which has a default pre-pressure of 1 bar.

To assure proper operation of the unit, the pre-pressure of the expansion vessel might need to be adjusted and the minimum and maximum water volume must be checked.

Setting the pre-pressure of the expansion vessel

When it is required to change the default pre-pressure of the expansion vessel (1bar), keep in mind the following guidelines:

- Use only dry nitrogen to set the expansion vessel pre-pressure.
- Inappropriate setting of the expansion vessel pre-pressure will lead to malfunction of the system. Therefore, the pre-pressure should be adjusted by a licensed installer.

Calculating the water circuit pressure drop

If the water circuit pressure drop excluding the indoor is too high, an auxiliary pump is necessary to be installed in the water circuit.

Caution

●An auxiliary pump should be installed while the water resistance is more than 30kpa.

●The auxiliary pump should be installed while the water resistance is more than 30kpa. The pressure drop is too high may cause heating/cooling capacity reduction, the heat exchanger freeing and the pump damage.

Warning

If the indoor unit is not running for 24 hours, the pump in the indoor unit and the auxiliary pump(if installed) will turn on and run for 3 minutes to preventing pump from blocking.

Connecting the water circuit

WARNING

Be careful! the unit pipes may be deformed by using excessive force when connecting the piping. Deformation of the piping can cause some malfunctions.

Water connections must be made in accordance with the outlook diagram delivered with the unit, respecting the water in- and outlet.

If air, moisture or dust gets in the water circuit, problems may occur. Therefore, always take into account the following when connecting the water circuit:

- Use clean pipes only.
- Hold the pipe end downwards when removing burrs.
- Cover the pipe end when inserting it through a wall so that no dust and dirt enter.
- Use a good thread sealant for the sealing of the connections. The sealing must be able to withstand the pressures and temperatures of the system.
- When using non-brass metallic piping, make sure to insulate both materials from each other to prevent galvanic corrosion.
- Because brass is a soft material, use appropriate tooling for connecting the water circuit. Inappropriate tooling will cause damage to the pipes.

WARNING

- The unit is only to be used in a closed water system. Application in an open water circuit can

lead to excessive corrosion of the water piping.

● Never use Zn-coated parts in the water circuit. Excessive corrosion of these parts may occur as copper piping is used in the unit's internal water circuit.

2.8 Charging water

■ Connect the water supply to a drain and fill valve.
■ Make sure the automatic air purge valve is open (at least 2 turns).
■ Fill with water until the manometer indicates a pressure of approximately 1.0~2.0 bar. Remove air in the circuit as much as possible using the air purge valves. Air present in the water circuit might cause malfunctioning of the auxiliary heater.
■ Check that the auxiliary heater vessel is filled with water by screw off the vent valve two laps, it will be full of water until finish draining off the air.

NOTE:

● During filling, it might not be possible to remove all air in the system. Remaining air will be removed through the automatic air purge valve during first operating hours of the system. Additional filling with water afterwards might be required.
● The water pressure indicated on the manometer will vary depending on the water temperature (higher temperature at higher water temperature).However, at all times water pressure should remain above 0.3 bar to avoid air entering the circuit.
● The unit might dispose some excessive water through the pressure relief valve.
● Water quality must be according to EN directive 98/83 EC.

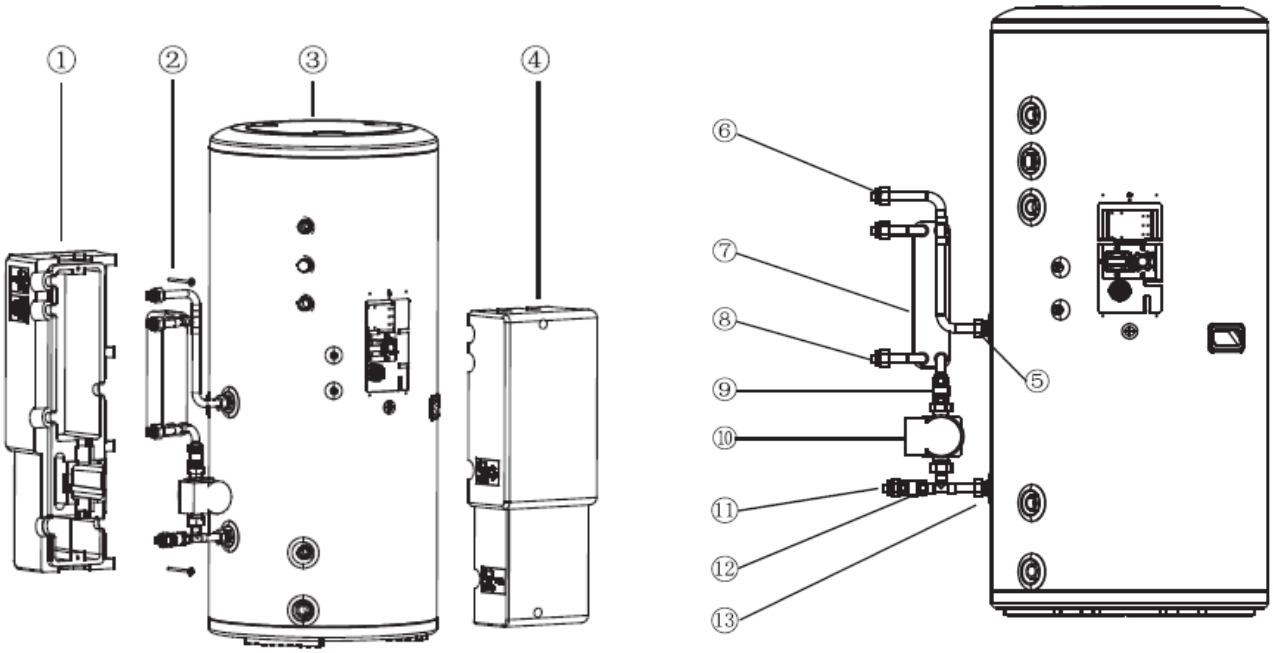
3. Installation of the solar kit

The solar kit is designed to transfer the heat from the solar panels to the heat exchanger of the sanitary hot water tank and is to be installed in the system.

3.1 Accessories supplied with the solar kit

Accessory name	Qty.	Shape	Purpose
Installation & Owner's Manual	1		This manual
adapter	2		Connection the solar kit and the sanitary hot water tank
Sealing	6		Pipe connection seal
Screws	2		Fixed left and right epp casing
Washer	2		Fixed left and right epp casing

3.2 Main components of the solar kit



1	left EPP casing	8	Return connection to solar pump station
2	Left right foam fixed screw	9	Non-return valves
3	Sanitary hot water tank	10	Solar kit circulation pump
4	Right EPP casing	11	Return connection to the indoor unit
5	Return connection to the sanitary hot water tank heat exchanger	12	Non-return valves

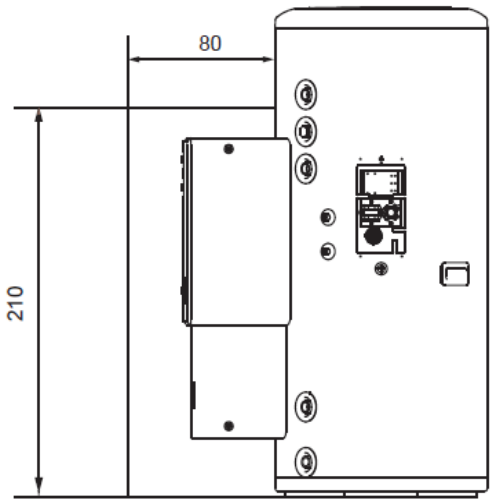
6	Inlet connection from the indoor unit	13	Inlet connection from the sanitary hot water tank heat exchanger
7	Heat exchanger		

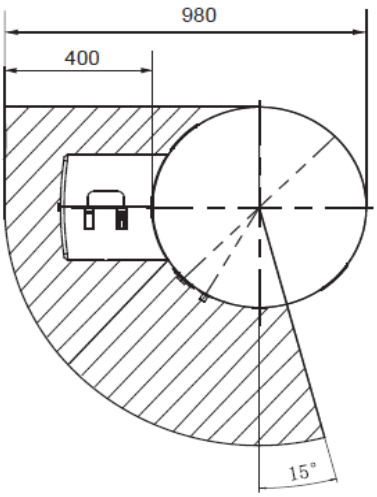
3.3 Selecting an installation location

- The solar kit is to be installed in a frost free indoor space, directly connected to the sanitary hot water tank.
- Make sure the service space is available.
- The space around the unit has to allow sufficient air circulation.
- It shall be made sure that in the case of a leak, leaking water will not cause any damage or unsafe situations.
- Do not install or operate the unit in rooms mentioned below:
  - Where corrosive gas like sulphurous gas exists: copper tubing and brazed spots may corrode.
  - Where volatile flammable gas like thinner or gasoline is used.
  - Where machines generating electromagnetic waves exist the control system may malfunction.
  - Where the air contains high levels of salt such as air near the ocean and where voltage fluctuates a lot (e.g. in factories).This applies also to vehicles or vessels.

3.4 Dimensions and service space

Service space dimensions below relate to requirements for installation of the solar kit only.

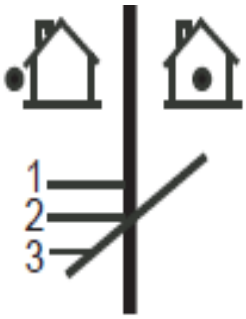




3.5 Installation guidelines

Make sure that all the piping to the solar kit is insulated.
Make sure that all the piping to the solar kit is sufficiently supported so that it will not cause any stress on the solar kit.
Make sure that the piping coming from outdoors to the solar kit is put through the wall under an

angle and the wall hole is sufficiently sealed afterwards, so no water can enter the space.



1 Wall
2 Sealing material
3 Piping under an angle

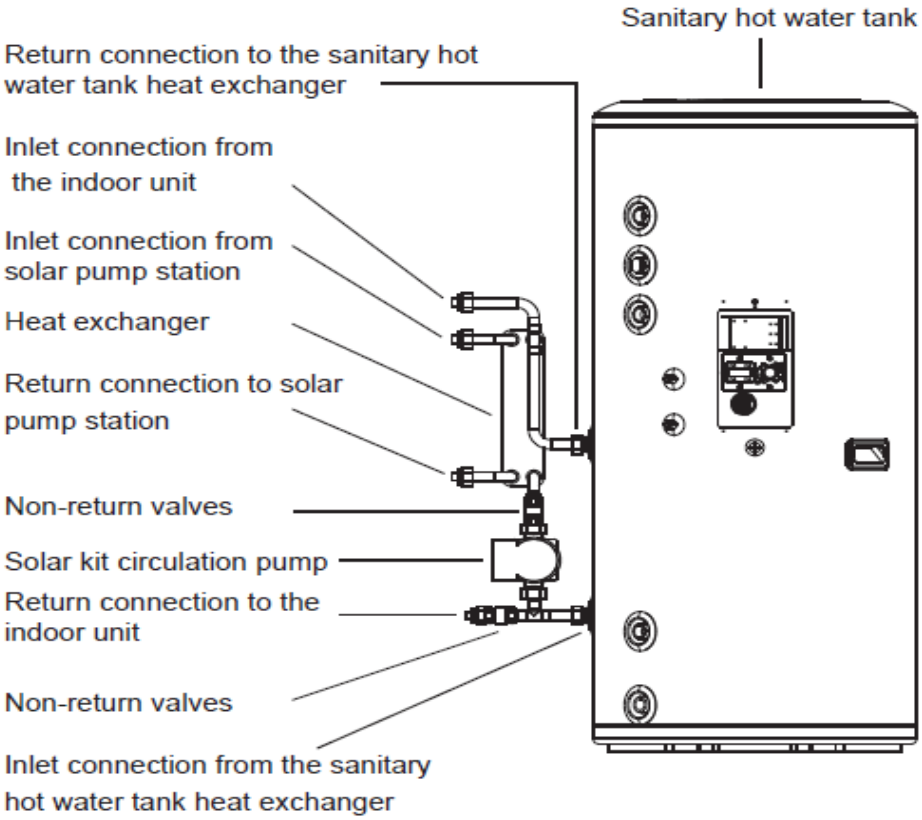
Make sure the piping is protected against dirt during installation.
Dirt in the piping might clog the heat exchanger of the solar panel and reduce its performance.

3.6 Installing the solar kit

- At delivery, the unit should be checked and any damage should be reported immediately to the carrier claims agent.
- Check if all unit's accessories are enclosed.
- Bring the unit as close as possible to its final installation position in its original package. in order to prevent damage during transport.

■ Procedure

Locate the sanitary hot water tank in a suitable position to facilitate the installation of the solar kit. It is therefore recommended to first read the entire installation procedure. Refer to the installation guidelines in the installation manual of the sanitary hot water tank.
The installation of the solar kit as following:



- Fit the adaptor 3/4" Female BSP x 3/4" Male BSP in the flow inlet connection of the sanitary hot water tank.
- Fit the connection pipe 3/4 " Male BSP x3/4" Male BSP and sealing in the flow inlet connection of the sanitary hot water tank.
- Fit the adaptor 3/4" Male BSP x3/4" Male BSP in the heat exchanger outlet connection of the sanitary hot water tank.
- Fit the solar kit and sealing (x2) on the heat exchanger in let connection and heat exchanger outlet connection of the sanitary hot water tank. Torque 5 N.m.
- Fit the adaptors 3/4" Male BSP x 3/4" Male BSP (x4) to the field piping:

  a) Inlet connection from indoor unit
  b) Return connection to indoor unit
  c) Inlet connection from solar pump station
  d) Return connection to solar pump station
- Fit the solar kit and sealing (x4) to the field piping .Torque 5N.m.
- Mount the left side of the EPP casing onto the solar kit.
- Mount the EPP lid onto the right side of the EPP casing.
- Mount the right side of the EPP casing onto the solar kit. Take case, that the pump cable is routed via the holes in the Bottom of the EPP casing.

  CAUTION:
  Ensure that the pump cable cannot come into contact with piping below the pump when cable is routed out.
- Use the screws and washers (x2) to fix the EPP casing. Screw until tight position.

  WARNING
  Do not switch inlet and outlet connections.
  To install adequate connections between the indoor unit and the solar kit, it is important that the 2-way valve is fitted correctly.
  CAUTION:
  Ensure that the water piping connected to the solar kit coming from the solar panel and the indoor unit are sufficiently supported and do not cause any stress on the solar kit
- Charging water

  Charge the water on the indoor unit and the tank .Charge the solar panel circuit with a glycol solution.

CAUTION:
Observe the instructions as given by your solar panel supplier. Make sure to use non-toxic glycol.

4. Installation of sanitary water tank

4.1 Accessories of water tank

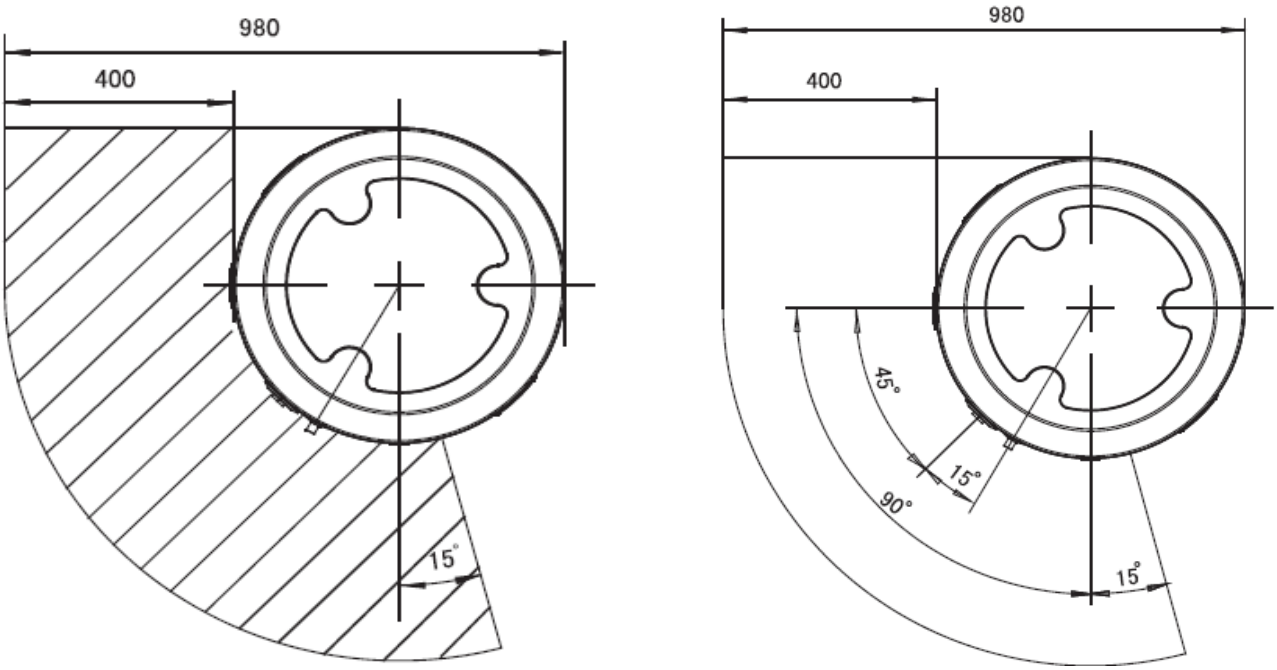
Accessory Name	Qty.	Shape	Purpose
Owner's & Installation Manual	1		Installation and use instruction This manual
Y-shaped Filter	1		To filtrate inlet water
One Way Valve	1		Prevent water from flowing back

4.2 Selecting an installation location

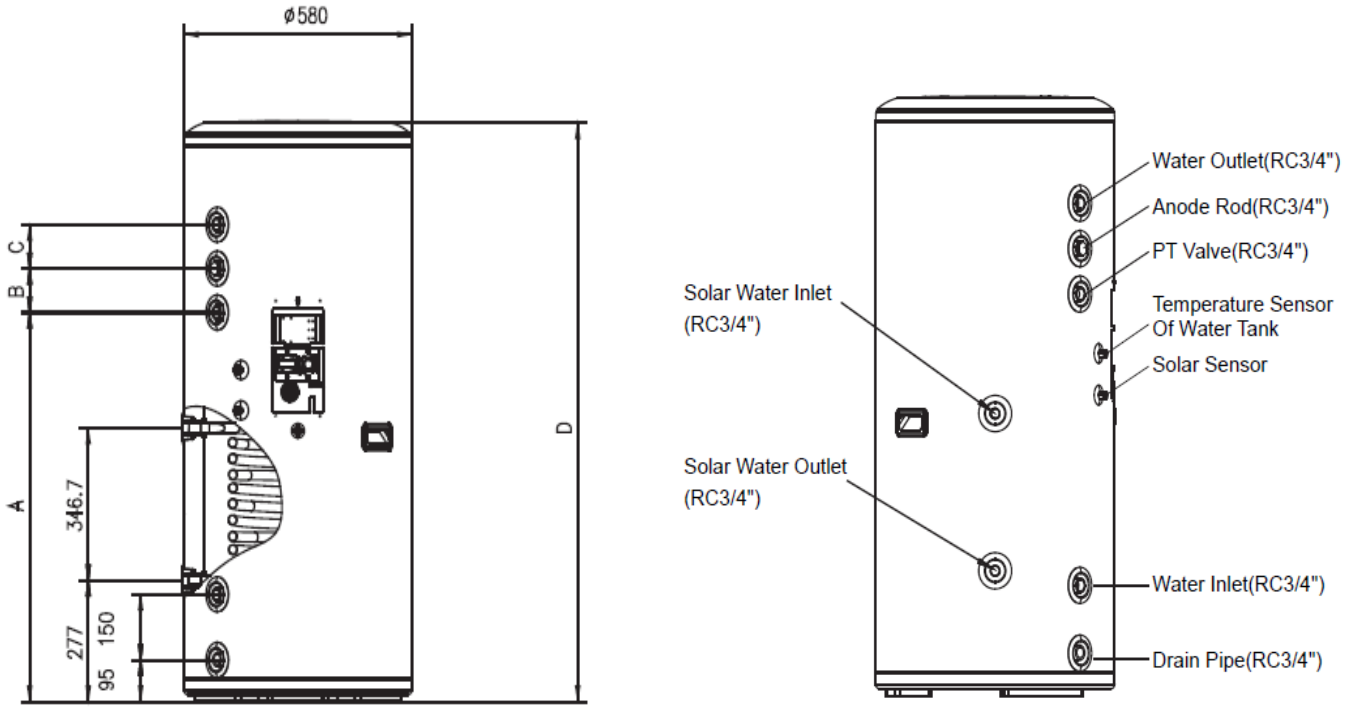
- Enough space is installation and maintenance shall be preserved.
- The bearing surface should be flat able to bear weight of the unit.
- No flammable gas is leaked nearby.
- It is convenient for piping and wiring.
- If the unit need to be installed on a metal holder, make sure they are insulated well and in accordance with local standard.
- Installing the equipment in any of the following places may lead to malfunction of the equipment (if it is inevitable, consult the supplier).
  - The site contains mineral oils such as cutting lubricant.
  - Seaside where the air contains much salt.
  - Hot spring area where corrosive gases exist, e.g., sulfide gas.
  - Factories where the power voltage fluctuates seriously.
  - Place like kitchen where oil permeates.
  - Place where strong electromagnetic waves exist.
  - Place where flammable gases or materials exist.
  - Place where acid or alkali gases evaporate.
  - Other special environments.
- Precautions before installation
  - Decide the correct way of conveying the equipment.
  - If the unit has to be installed on a metal part of the building, electric insulation must be installed, and the installation must meet the relevant technical standards for electric devices.

4.3 Dimensions and service space

Before installing the unit, reserve the space of maintenance shown in the following figure.



The dimensions of the water tank as following figure.



No	Model	A(mm)	B(mm)	C(mm)	D(mm)
1	300L	1372	100	100	1804

4.4 Installation Of The Sanitary Hot Water Tank

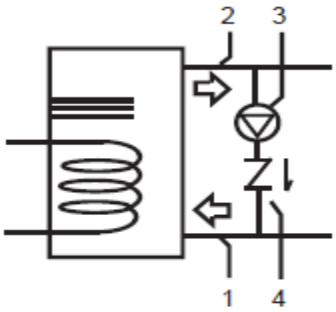
CAUTION:

The total System (Indoor unit and outdoor unit) is designed for combination with a sanitary hot water tank. In case another tank is being used in combination with the indoor unit we cannot guarantee neither good operation nor reliability of the system. For those reasons we cannot give warranty of the system in such case.

- Only this tank can be used in combination with the solar kit option.
- Sanitary hot water quality must be according to EN directive98/83 EC.
- A drain device should be installed on the cold water connection on the sanitary hot water tank.
- For safety reasons, it is not allowed to add ethylene glycol to the water circuit. Adding ethylene glycol might lead to contamination of the sanitary water if a leakage would occur in the heat exchanger coil.
- It is important that the storage capacity of the sanitary hot water tank meets normal daily fluctuations In consumption of sanitary hot water without any fall of the water outlet temperature during use.
- Immediately after installation, the sanitary hot water tank must be flushed with fresh water. This procedure must be repeated at least once a day the first 5 consecutive days after installation.

At holiday residences or at houses that are occasionally not occupied, the sanitary hot water tank installation must be fitted with a shunt pump.

- The shunt pump can be time-controlled.
- The shunt pump must operate to circulate the complete volume of the sanitary hot water tank 1.5 times per hour.
- And the shunt pump must operate or be programmed for operation. during 2 uninterrupted hours per day at least.



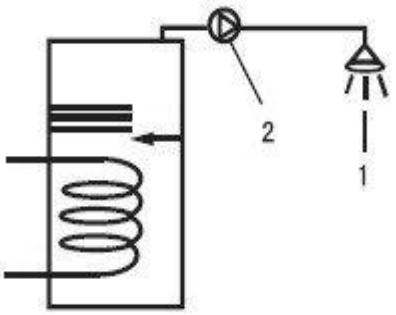
1 Cold water connection

2 Recirculation pump

3 Shunt pump
(field supply)

4 Non-return valve

In case of very long field water piping between the sanitary hot water tank and the hot water end point (shower. bath. etc.) it can take more time before the hot water from the sanitary hot water tank reaches the hot water end point.

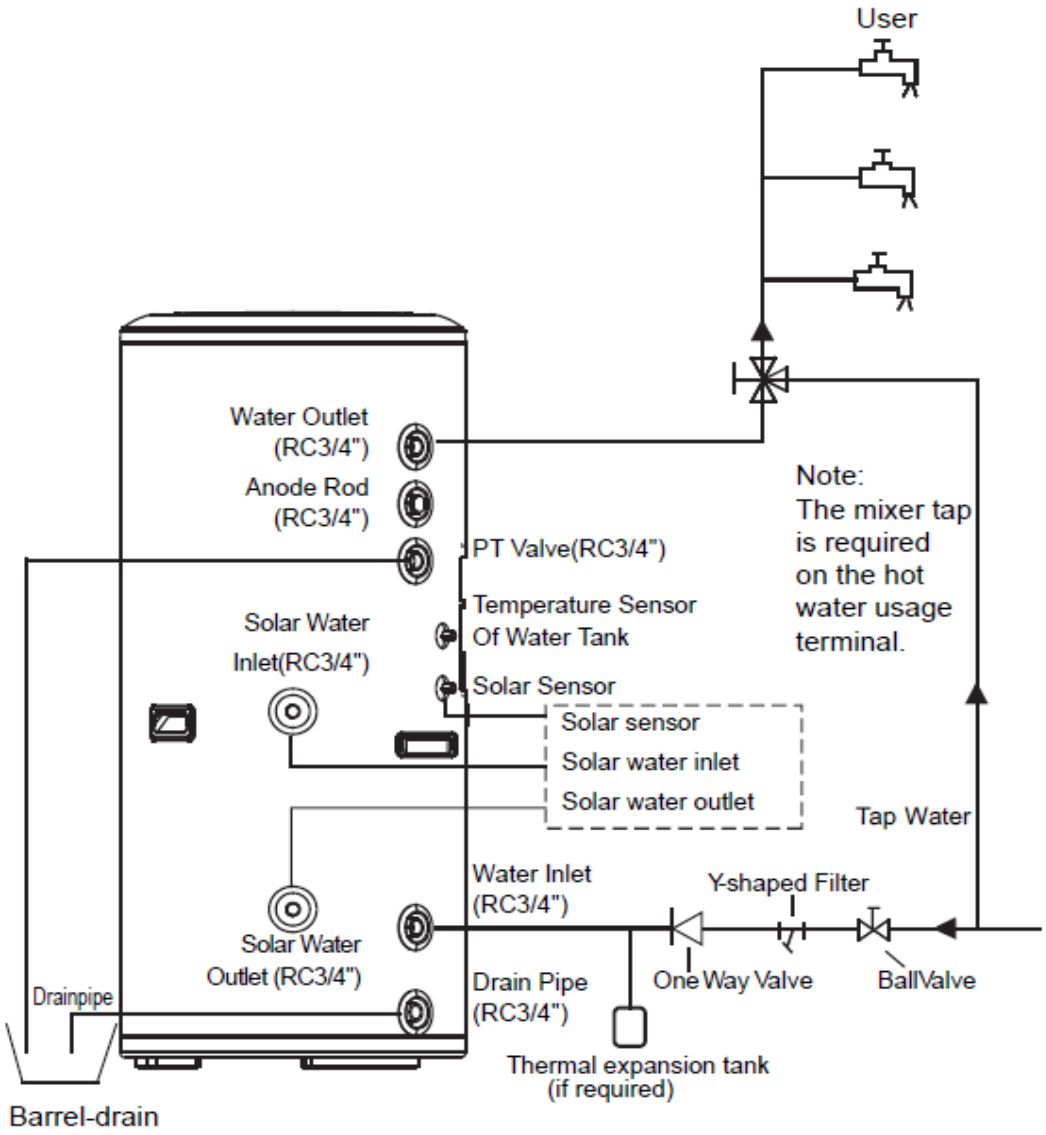


1 Shower
2 Recirculation pump

If required connect a recirculation pump in between the hot water end point and the outlet pipe in the sanitary hot water tank.

4.5 Piping Connection

Pipeline Connection Sketch



Caution:

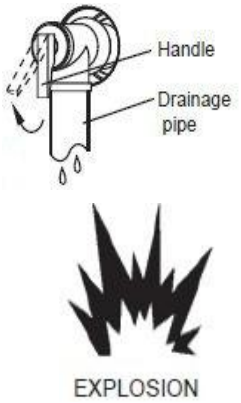
When install the main unit, please set a drain valve at the drain orifice of the unit by self.

Pipeline Connection Explanation

- Installation of the water inlet or outlet pipes: The spec of the water inlet or outlet thread is RC3/4” (internal thread). Pipes must be heat-resistant and durable.
- Installation of the pipe for PT valve: The specification of the valve connecting thread is RC3/4” (internal thread). After installation, it must be confirmed that the drainpipe outlet is exposed in the air. When flexible drainpipe is jointed to the pressure relief orifice of this valve, it must be confirmed that the flexible drainpipe is downwards vertically and exposed in the air.

  NOTE:
  - A safety valve should be installed at the water inlet of the unit.
  - The handle of PT Valve should be pulled out once per half year, to make sure that there is no jam of the valve.

    Please beware of burn, because of the high temperature of water.
    The drainage pipe should be well installed ,in order to avoid freezing up in cold weather.
  - Do not press the handle of PT Valve,
  - Do not dismantle the PT Valve,
  - Do not block off the Drainage pipe, It will cause explosion and injury, if do not comply with the above instruction.



- Installation of the one way valve: The specification of the one way valve thread in accessories is RC3/4”. It is used to prevent backflow of water.
- Installation of the Y-shaped filter: The spec of the Y-shaped filter thread in accessories is RC3/4”. It is used to filtrate inlet water.
- After all the pipes installed turn on the cool water inlet and hot water outlet and start effusing the tank. When there is water normally flowing out from water outlet, the tank is full. Turn off all valves and check all pipes. If there is any leakage, please repair.
- If the inlet water pressure is less than 0.15MPa, a pressure pump should be installed at the water inlet. For guarantee the long safety using age of tank at the condition of water supply hydraulic higher than 0.65MPa, a reducing valve should be mounted at the water inlet pipe.

5 Filed wiring

CAUTION:

- Please select power source for indoor unit and outdoor unit respectively.
- The power supply has specified branch circuit with leakage protector and manual switch.
- For LRSJF-V120/SN1-610 and LRSJF-V140/SN1-610，indoor unit and outdoor unit both connect with power supply which is 380-415V 50Hz.
- Use 3-core screened wire as indoor and outdoor control wire.
- The installation should comply with relevant national electric standard.
- Power wiring should be engaged by specialized electrician

5.1 Outdoor unit wiring

■ Field wiring guidelines

- Most field wiring on the indoor unit side is to be made on the terminal block inside the control box. To gain access to the terminal block, remove the indoor unit cover and control box service panel.
- Cable tie mountings are provided at the bottom of the control box. Fix all cables using cable ties (field supply).
- A dedicated power circuit is required for the auxiliary heater.
- Installations equipped with a sanitary hot water tank (optional), require a dedicated power circuit for the electric heater. Please refer to the sanitary hot water installation manual.

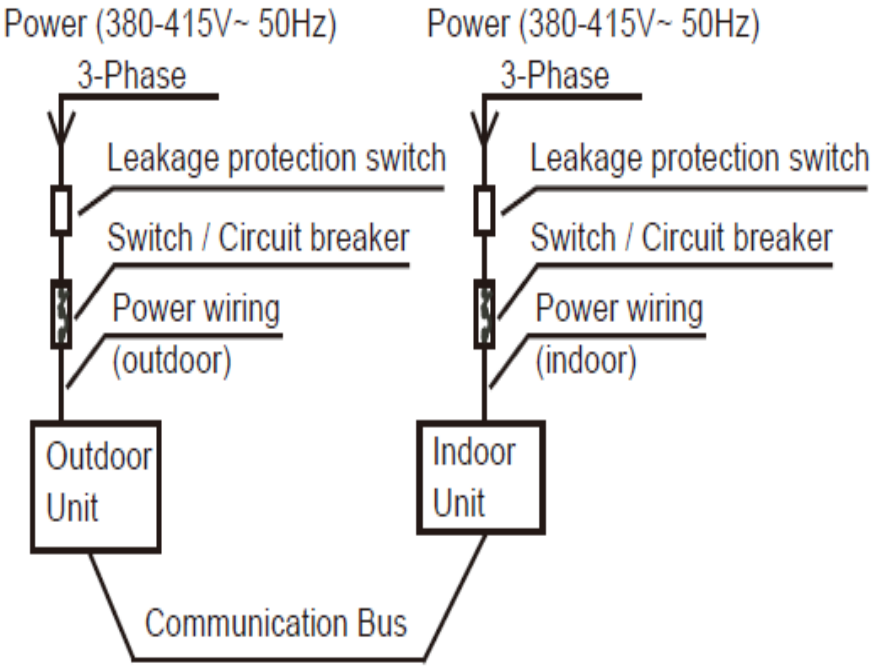
1) The Specification of Power

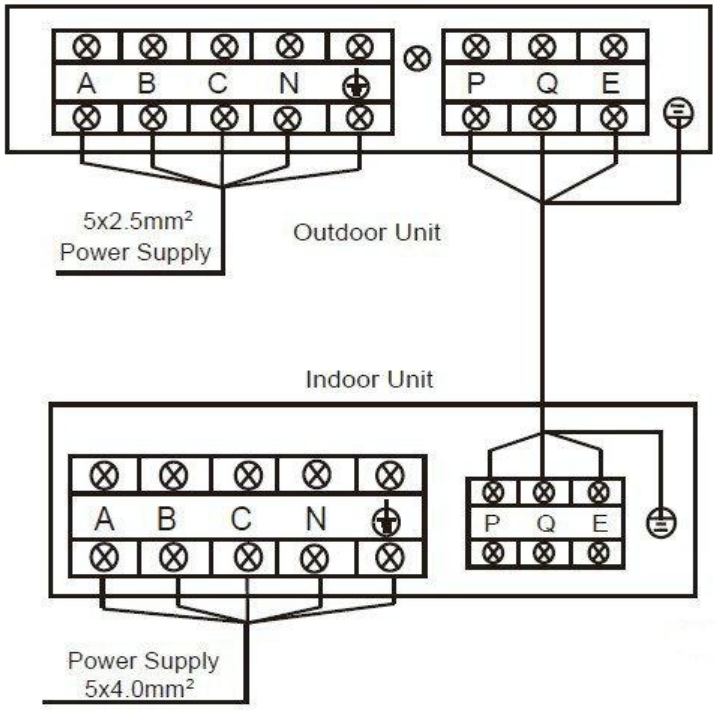
Model		LRSJF-V120/SN1-610 LRSJF-V140/SN1-610
Outdoor Unit Power	Phase	3 Phase
	Voltage and Frequency	380-415V~ 50Hz
	Power Wiring (mm2)	5X2.5
Circuit Breaker (A)		25
Indoor unit/Outdoor unit Signal wire (mm2) (Weak electric signal)		3-core shielded wire 3 X 0.5

Caution:

- Equipment complying with IEC 61000-3-12.
- A disconnection device having an air gap contact separation in all active conductors should be incorporated in the fixed wiring according to the National Wiring Regulation.

2) Outdoor unit wiring diagram


Power (380-415V~ 50Hz)
3-Phase
Leakage protection switch
Switch / Circuit breaker
Power wiring
(outdoor)
Outdoor
Unit
Power (380-415V~ 50Hz)
3-Phase
Leakage protection switch
Switch / Circuit breaker
Power wiring
(indoor)
Indoor
Unit
Communication Bus

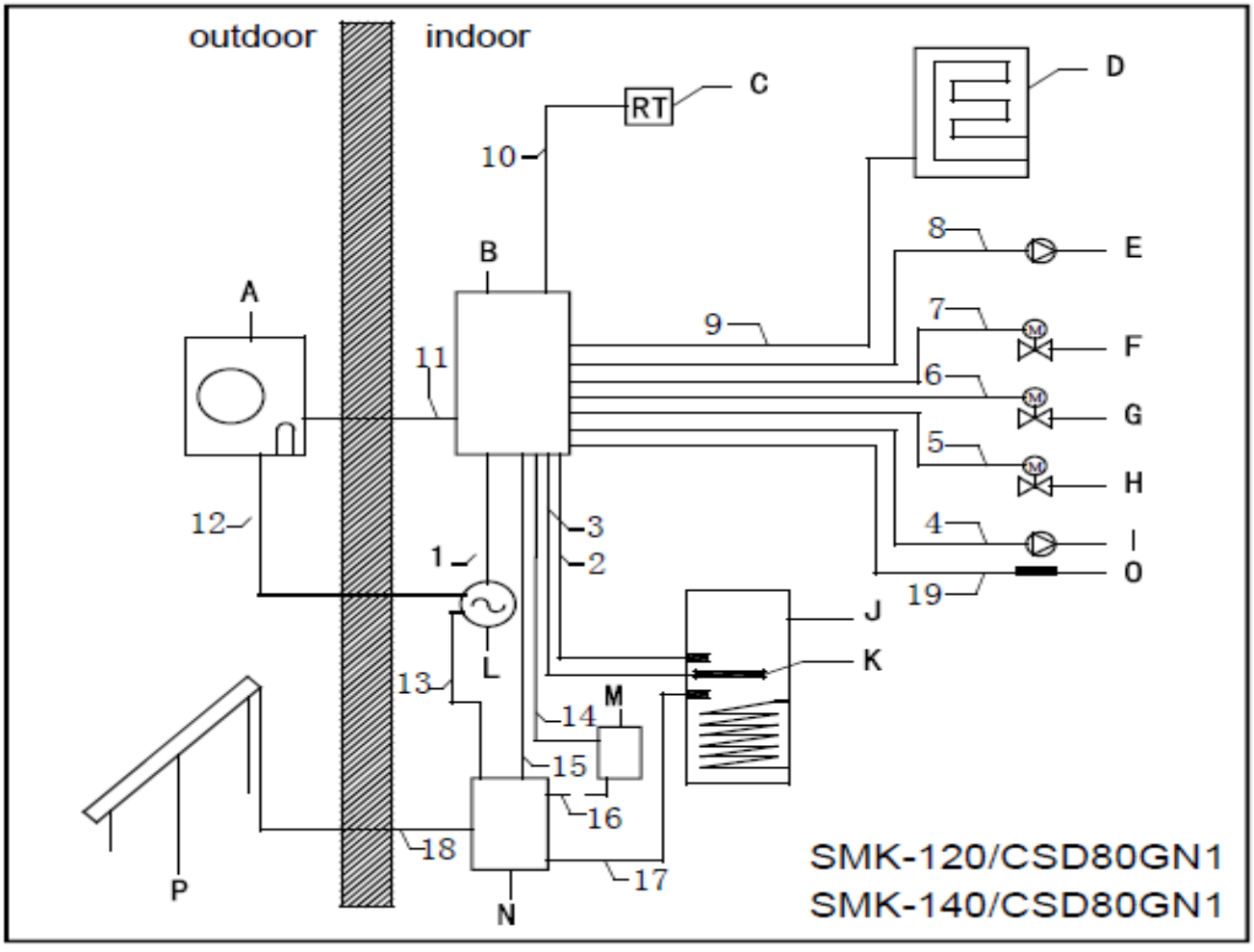

A B C N
P Q E
5x2.5mm²
Power Supply
Outdoor Unit
Indoor Unit
A B C N
P Q E
Power Supply
5x4.0mm²

5.2 Indoor unit wiring

1) **The Specification of Power**

Model		SMK-120/CSD80GN1 SMK-140/CSD80GN1
Indoor Unit Power	Phase	3 Phase
	Voltage and Frequency	380-415V~ 50Hz
	Power Wiring (mm2)	5X4.0
Circuit Breaker (A)		32
Indoor unit/Outdoor unit Signal wire (mm2) (Weak electric signal)		3-core shielded wire 3 X 0.5

2) Indoor unit wiring diagram



Cable specification

NO	Description	Require number of core	Section of the conductor
1	Power supply cable for indoor unit	3+GND	4 mm^2
2	Temperature sensor cable	2	—
3	Power supply cable from indoor unit to Sanitary hot water tank	2	2.5 mm^2
4	Power supply cable for Pump of solar kit	2+GND	1.0 mm^2

	(Pump 3)		
5	Power supply cable for motorized 2-way valve, SV3	3	1.0 mm^2
6	Power supply cable for motorized 2-way -valve, SV2	3	1.0 mm^2
7	Power supply cable for motorized 2-way valve, SV1	3	1.0 mm^2
8	Power supply cable for auxiliary pump (Pump2)	2+GND	1.0 mm^2
9	Communication cable between indoor unit and boiler	2	1.0 mm^2
10	Room thermostat cable	4(L, N, C, H)	1.0 mm^2
11	Communication cable between indoor unit and outdoor unit	3 (P, Q, E)	3×0.5 mm^2 (3 -Shield wire)
12	Power supply cable for outdoor unit	2+GND	4.0 mm^2
13	Power supply cable for solar pump station	2+GND	1.0 mm^2
14	Power supply cable for the pump of solar kit	2+GND	1.0 mm^2
15	Signal input from solar pump station to indoor unit	2	1.0 mm^2
16	Power supply cable for the pump of solar kit	2+GND	1.0 mm^2
17	Sanitary hot water tank temperature sensor cable	2	—
18	Sanitary hot water tank temperature sensor cable	2	—
19	Water circuit temperature senor T1B cable	2	—

■ Connection of the indoor unit power supply and communication cable Power circuit and cable requirements

- Power supply for the indoor units is to be provided through the indoor side. Data communication with the outdoor unit is provided through the cable which labeled as P, Q, E.
- For all guidelines and specifications regarding field wiring between the indoor unit and the outdoor unit, please refer to the outdoor unit installation manual.
- Using the appropriate cable, connect the power circuit to the appropriate terminals as shown on the wiring diagram and the illustration below.
- Connect the earth conductor (yellow/green) to the earthing screw on the control box mounting plate.
- Fix the cable with cable ties to the cable tie mountings to ensure strain relief.
- When routing out cables, make sure that these do not obstruct mounting of the indoor unit cover.

■ Connection of the auxiliary heater power supply Power circuit and cable requirements

- This power circuit must be protected with the required safety devices according to local and national regulations. Select the power cable in accordance with relevant local and national regulations.
- Using the appropriate cable, connect the power circuit to the appropriate terminals as shown on the wiring diagram.

- Connect the earth conductor (yellow/green) to the earth screw on the block terminal. Fix the cable with cable ties to the cable tie mountings to ensure strain relief.

CAUTION:

Be sure to use a dedicated power circuit for the auxiliary heater. Never use a power circuit shared by another appliance.

■ Connection of the thermostat cable

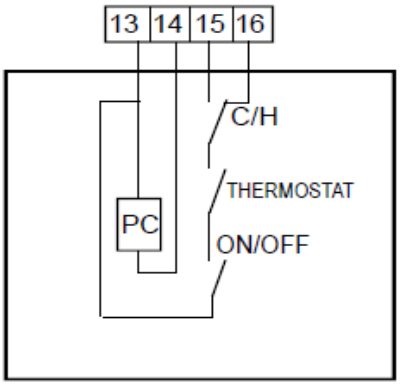
Connection of the thermostat cable depends on the application.
See section7.2 “Room thermostat installation configuration” for more information and configuration options on pump configuration in combination with room thermostat.

● Thermostat requirements

1. Power supply: 220-240V~ 50Hz or battery operated
2. Contact voltage: 220-240V~ 50Hz

● Procedure

1. Connection of the thermostat cable to the appropriate terminals shown on the wiring diagram.



2. Fix the cable with cable ties to the cable tie mountings to ensure strain relief.
3. Set the “Field setting” about the selection of Room Thermostat.

■ Connection of the valve cable

Valve requirements

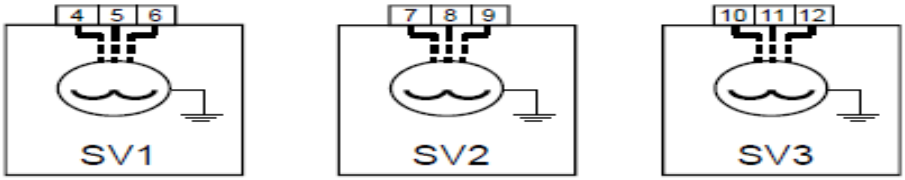
1. Power supply: 220-240V~ 50Hz
2. Maximum running current: 100mA

Wiring the 2-way valve

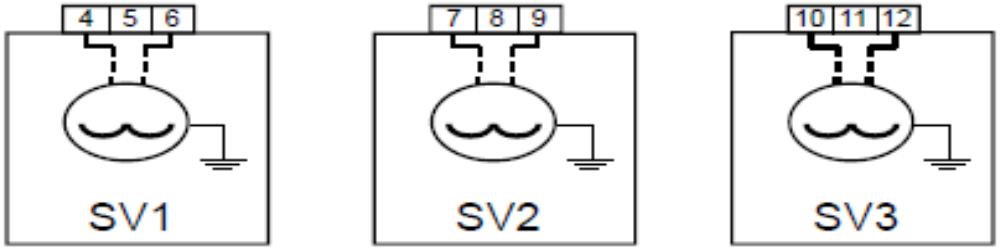
1. **Using the appropriate cable, connect the valve control cable to the terminal as shown on the wiring diagram.**

NOTE:

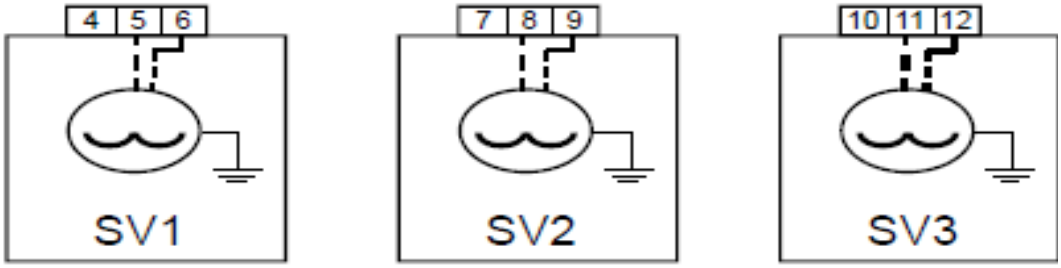
Wiring is different for a NC (normal closed) valve and a NO (normal open) valve. Make sure to connect to the correct terminal numbers as detailed on the wiring diagram and illustrations below.



3-wire NO (normal open) and NC （normal close）
2-way motorized valve



2-wire NC(normal close) 2-way motorized valve

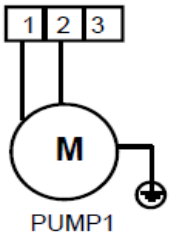


2-wire NO (normal open) 2-way motorized valve

NOTE:
For the NC (normal closed) valve, it is necessary to reverse the terminal 4 and 5, 7 and 8, 10 and 11 to get the right opening and closing of the valve.

2. Fix the cable(s) with cable ties to the cable tie mountings to ensure strain relief.

■ Electrical Connection of Water Pump



Water pump specification:
Power supply: 220-240V~ 50Hz
Maximum running current: 2A

- Using the appropriate cable, connected the pump cable to the terminals
- Fix the cable with cable ties to the cable tie mountings to ensure strain relief.

■ Electrical Connection of Anti-frozen electric heater (Reserved)

■ Electrical Connection of External Heat Source

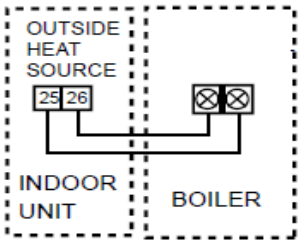
Using the appropriate cable, and connect the control terminal of heat source such as gas boiler etc., the control terminal of this unit is 25-26 terminals in the connector base.

NOTE:

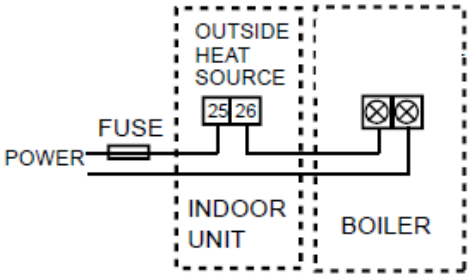
This control terminal of the indoor unit only outputs one switch signal; it needs to change wiring when matching with different external heat sources.

The signal wire connected the solar energy pump with hydraulic module need to be increased protection, such as fuse, for avoiding the abnormal operation lead to the device damage.

1. If the external heat source need some switch signal to control the input situation, then directly connect the corresponding wire terminal of this machine with the corresponding terminals of the external heat source.



2. If the external heat source needs one control signal of the specified voltage (such as 220-240V~ 50Hz), then it need to supply the control terminal25 and 26 with corresponding power.

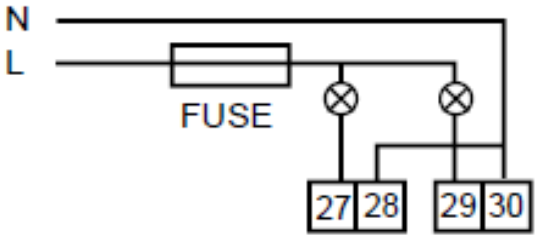


■ External Wiring of Operation/ Fault

● The terminal 27 and 28 will be conducted when the unit is running, and will be disconnected when the unit is turned off or stood by.

● The terminal 29 and 30 will be conducted when there is a running fault, and be disconnected when the unit is running correctly.

● The connection is described in the following figure.

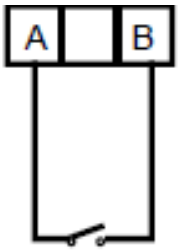


■ Remote ON/OFF Terminal

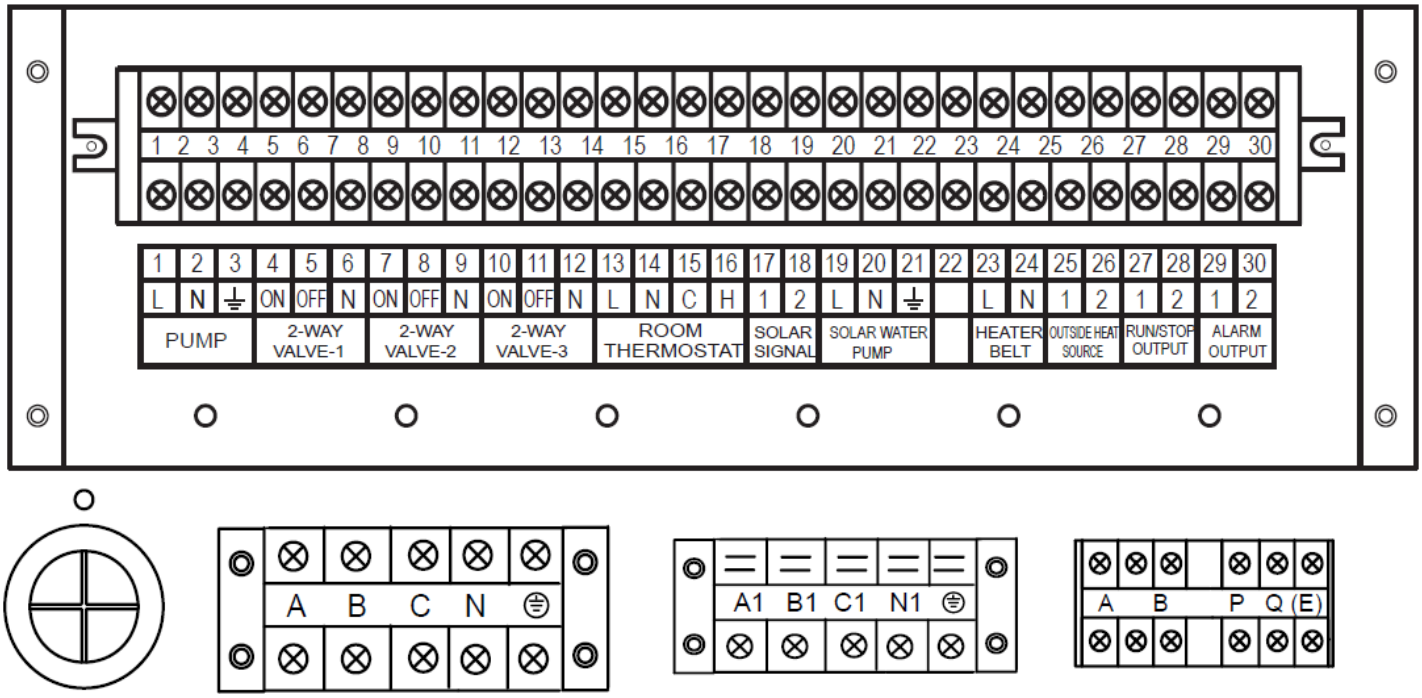
"A B" terminal is used for remote ON/OFF switch; it needs to connect external control switch, the control logic as follow:

UI	ON	ON	OFF	OFF
External switch	Close	Disconnect	Close	Disconnect
Machine state	Stop	Operate	Stop	Stop

The connection is described in the following figure.



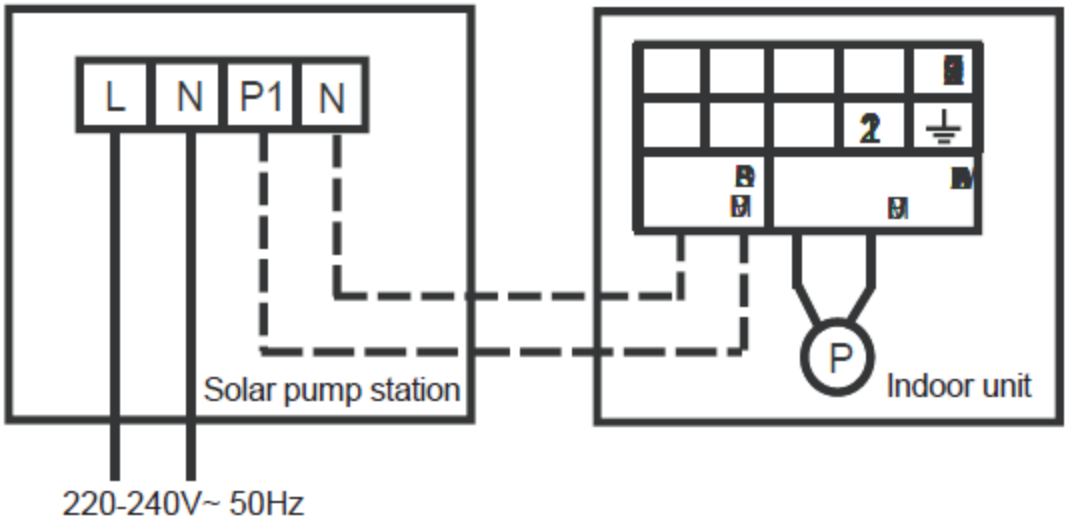
■ **The wiring terminal diagram as following figure:**



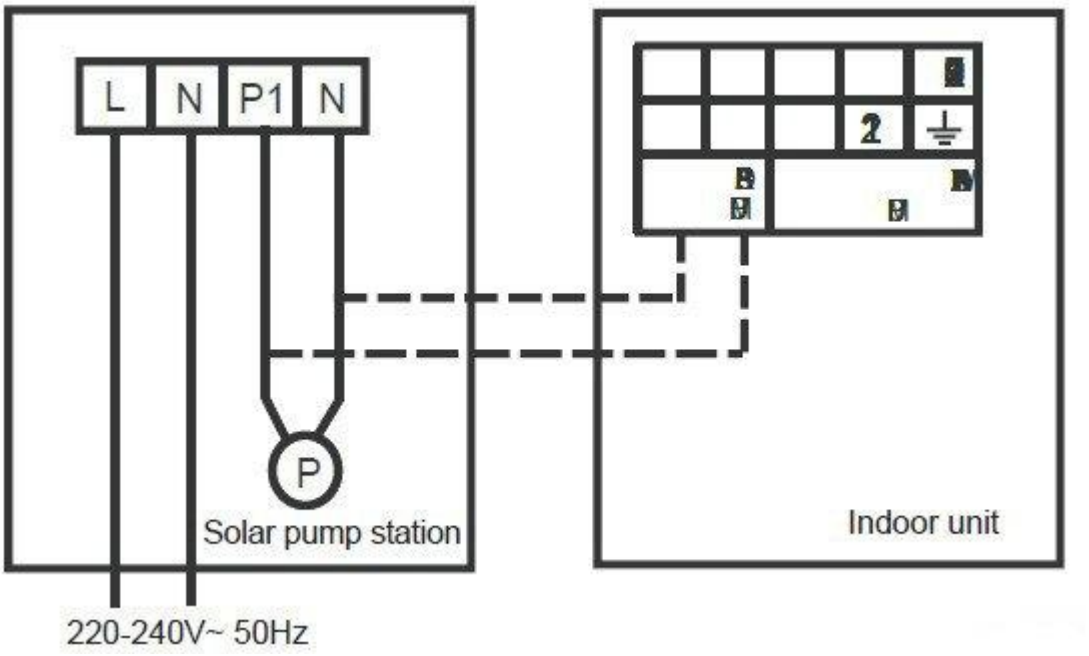
5.3 Solar kit wiring

- The solar pump station will have an auxiliary contact that closes when the contact for the pump of the solar pump station is operated.
- This contact will provide 220-240V~ 50Hz to the input of the indoor unit, and prevent sanitary water heating by the heat pump and/or electric heater during solar heating.
- For wiring examples refer to the following drawings.

If the solar energy pump cannot set the sanitary hot water tank temperature below 60˚C, then use the connecting method as shown below.



If the solar energy pump can set the sanitary hot water tank temperature below 60˚C , then use the connecting method as shown below.



Caution:

If the pump station has a speed controlled pump, make sure to disable this function so that the indoor PCB receives 220-240V~ 50Hz at all times.

5.4 Sanitary water tank wiring

■ A main or other means for disconnection, having a contact act separation in all poles, must be incorporated in the fixed wiring in accordance with relevant local and national legislation.

- All field wiring and components must be installed by a licensed electrician and must comply with relevant European and national regulations
- The field wiring must be carried out in accordance with the wiring diagram supplied with the unit and the instructions given below.
- The sanitary hot water tank must be earthed via the indoor unit.

■ Power circuit and cable requirements

CAUTION:

◆ Be sure to use a dedicated power circuit. Never use a power circuit shared by another appliance.

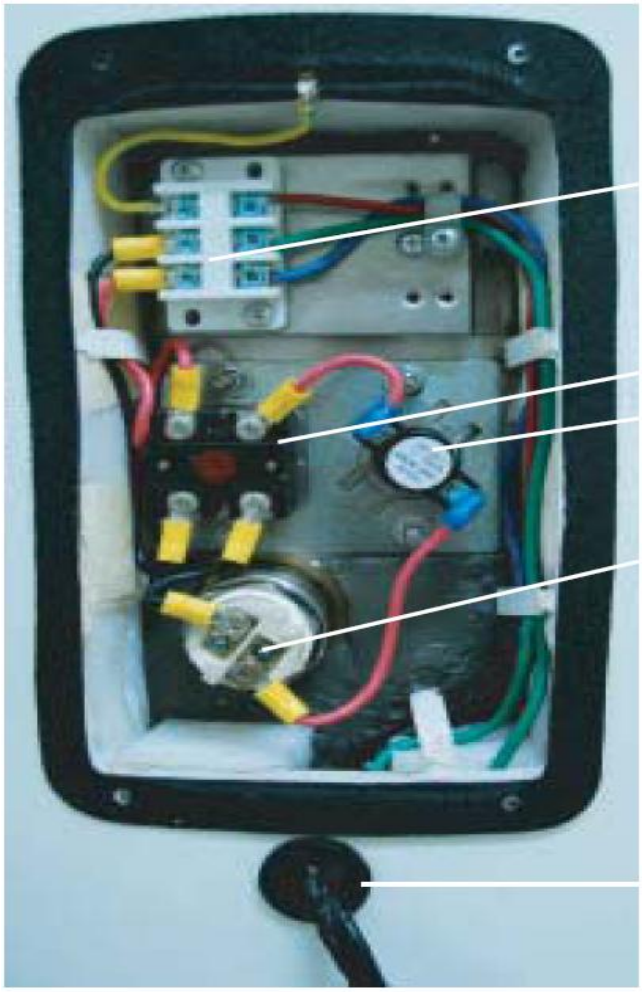
◆ Select the power cable in accordance with relevant local and national regulations.

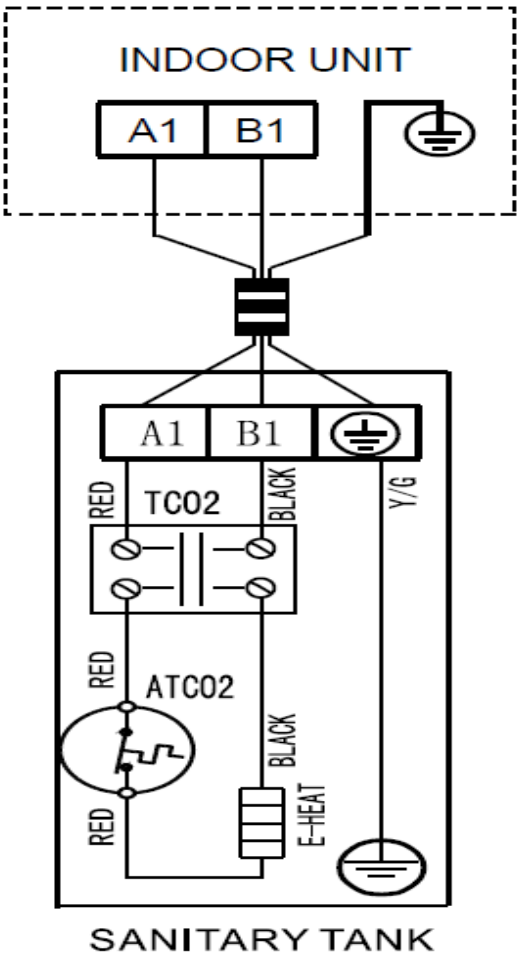
◆ Make sure all field wiring is insulated from the tank body and heater element or can resist temperatures to 90˚C

■ Thermistor cable

The distance between the thermistor cable and power supply cable must always be at least 5 cm to prevent electromagnetic interference on the thermistor cable.

■ Connections to be made in the sanitary hot water tank electrical box


Terminal
TCO
TOD
Electrical
Heater
Cable Outlet


INDOOR UNIT
A1
B1
A1
B1
RED
TCO2
BLACK
Y/G
RED
ATCO2
BLACK
RED
E-HEAT
SANITARY TANK

Part 3
Test running and maintenance

1 Pre-test and test running

1.1 Checks before initial start-up

Warning:

- Switch off the power supply before making any connections.
- Test running can not start until the outdoor unit has been connected to the power for 12 hours.
- Test running can not start until all the valves are affirmed open.
- Never force to run. (Or the protector sits back, danger will occur.)

After the installation of the unit, check the following before switching on the circuit breaker:

A. Field wiring

Make sure that the field wiring between local supply panel and indoor unit, outdoor unit and indoor unit, indoor unit and valves (when applicable), indoor unit and room thermostat (when applicable), and indoor unit and sanitary hot water tank has been connected correctly. The wiring diagrams should be according to European and national regulations.

B. Fuses or protection devices

Check that the fuses or the locally installed protection devices are of the right size and type. Make sure that neither a fuse nor a protection device has been bypassed.

C. Electric heater circuit breaker

Do not forget to turn on the electric heater circuit breaker in the control box (applies only to units with optional sanitary hot water tank installed).

D. Earth wiring

Make sure that the earth wires have been connected properly and that the earth terminals are tightened.

E. Internal wiring

Visually check the control box on loose connections or damaged electrical components.

F. Fixation

Check that the unit is properly fixed, to avoid abnormal noises and vibrations when starting up the unit.

G. Damaged equipment

Check the inside of the unit on damaged components or squeezed pipes.

H. Refrigerant leak

Check the inside of the unit on refrigerant leakage. If there is a refrigerant leak, call your local dealer.

I. Power supply voltage

Check the power supply voltage on the local supply panel. The voltage must correspond to the voltage on the identification label of the unit.

J. Air purge valve

Make sure the air purge valve is open (at least 2 turns).

K. Pressure relief valve

Check if the auxiliary heater vessel is completely filled with water by operating the pressure relief valves. It should purge water instead of air.

L. Shut-off valves

Make sure that the shut-off valves are correctly installed and fully open

.

Before switch on the unit, read following recommendations:

■ When the complete installation and all necessary settings have been carried out, close all front panels of the unit and refit the indoor unit cover.

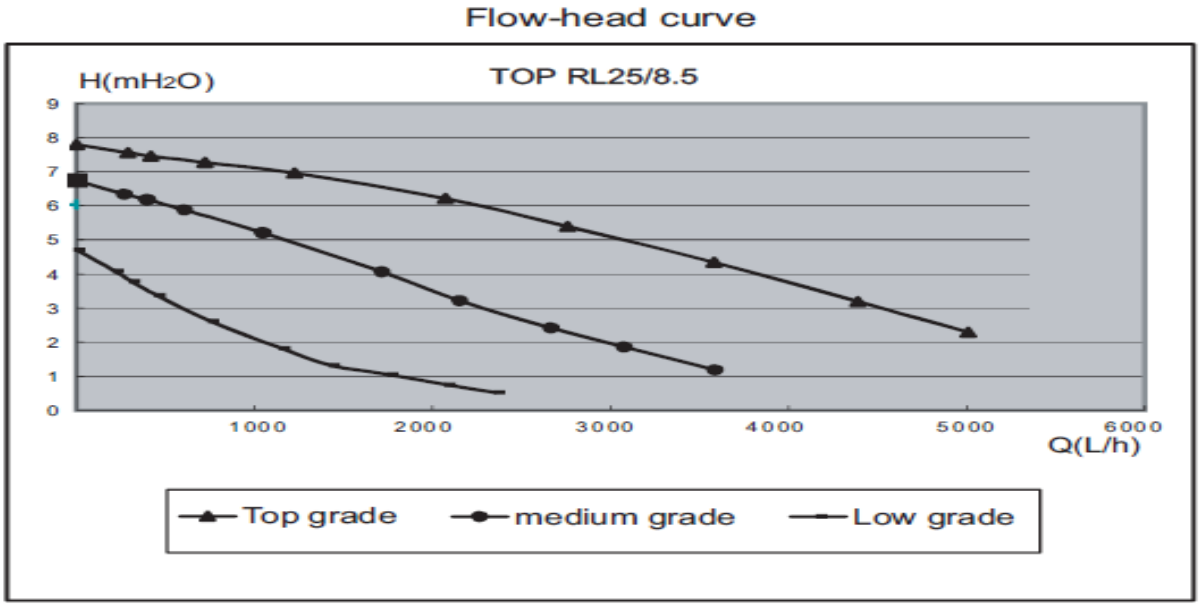
■ The service panel of the control box may only be opened by a licensed electrician for maintenance purposes.

1.2 Powering up the indoor unit

When power supply to the indoor unit is turned on, “0” is displayed on the user interface during its initialization, which might take up to 30 seconds. During this process the user interface cannot be operated.

2 Setting the pump speed

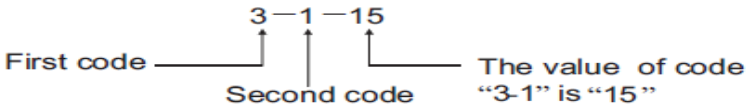
The pump speed can be selected on the pump.
The default setting is high speed. If the water flow in the system is too high (e.g., noise of running water in the installation) the speed can be set to low speed.
Note: The speed dial on the pump indicates 3 speed setting.
The available external static pressure (ESP, expressed in mmH_2O) in function of the water flow (l/min) is shown in the previous section.



CAUTION:
If the external pressure loss of the water circuit is too high, it is necessary to install an auxiliary pump. Fail to install an auxiliary pump will result in cooling/heating capacity reduction.

3 Field Settings

The indoor unit should be configured by the installer to match the installation environment (outdoor climate, installed options, etc.) and user demand. These field settings are accessible and programmable through the user interface on the indoor unit.
Each field setting is assigned a 4-digit number or code, for example, “3-1-15”, which is indicated on the user interface display. The first digit “3” indicates the “first code” or field setting group. The second digit indicates the second code. The last 2-digit number “15” indicate the value of code “3-1”.



A list of all field settings and default values is given under "Field settings table". In this same list, we provided for 2 columns to register the date and value of altered field settings at variance with the default value.

3.1 Wired controller

a) The basic controller functions are:
- Turning the unit ON/OFF
- Operation mode change-over:
- Space heating
- Space cooling
- Sanitary water heating
- Space heating & Sanitary water heating
- Space cooling & sanitary water heating
- Selection of features:
- Silent mode
- Run test function
- Air purge function

Note:
The functions "space cooling", "space heating" and "sanitary water heating" can only be selected when the corresponding equipment is installed.

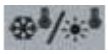
b) Clock function

The clock functions are:
- 24 hour real time clock
- Day of the week indicator
-

c) Schedule timer function

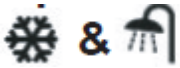
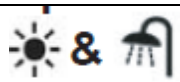
The schedule timer function allows the user to schedule the operation of the installation according to a daily or a weekly program.

d) Name and function of button

Button	Name	Function
	Cooling/Heating ON/OFF button	Starts or stops the heating or cooling function of the unit.
	Weekly schedule timer button	Enable/disable the schedule time and use to program the controller.
	Silent mode button	Enable or disable silent mode
	Clock setting button	Enable or disenable clock setting
	Sanitary water heating button	Enable or disable heating of the sanitary water
	Sanitary hot water temperature setting button	Enable or disable sanitary water temperature setting
	Space cooling/Space heating button	This button allows manual switching between cooling or heating mode.
	Space cooling/Space heating temperature setting button	Enable or disable space cooling/space heating temperature setting
	Menu button	Enable and disable menu setting function of the controller
	Check button	Enables and disenable the checking function of the controller.
	Page up button	This button is used for page up function
	Page down button	This button is used for page down function
	Increasing button	This button is used for increasing the current value
	Decreasing button	This button is used for decreasing the current value
	Confirm button	Press this button to confirm the change.
	Lock button	Press this button for locking all other buttons.
	Reset button	Reset the wire controller and return to factory default settings.

e) Name and function of icon

Icon	Name	Function
	Spacing cooling mode icon	This icon indicates the current operation mode is space cooling.
	Spacing heating mode icon	This icon indicates the current operation mode is space heating.
	Sanitary water heating icon	This icon indicates the current operation mode is sanitary water heating.
	Pump icon	This icon indicates that the circulation pump is running.
	Compressor icon	This icon indicates that the compressor in the outdoor unit is active.
	Silent mode icon	This icon indicates the current operation mode is silent mode.
	Disinfection icon	This icon indicates that the disinfection mode is active.
	Defrost icon	This icon indicates that the defrost mode is active.
	Anti-freezing icon	This icon indicates that the anti-freezing mode is active.
	Weekly schedule timer icon	These icons indicate the operation and the date of the weekly schedule timer.
	Sanitary water tank electric heater icon	This icon indicates that the electric heater of the sanitary water tank is active.
	First stage auxiliary heater icon	This icon indicates that the first stage auxiliary heater of the indoor unit is operating when there is a high demand for heating capacity.
	Second stage auxiliary heater icon	This icon indicates that the second stage auxiliary heater of the indoor unit is operating when there is a high demand for heating capacity.
	Setting temperature display	The display shows the current set temperature of the installation.
	Display temperature	The display also used to shows the water outlet temperature of indoor unit when there is no button press operation.
	External heat source icon	External heat source includes solar energy, gas boiler, etc. These icons indicate that external heat source(s) is (are) installed.
	Room thermostat icon	This icon indicates that an external room thermostat with higher priority is controlling your installation.

88:88	Clock display	The clock display shows the current time.
8-8-88	Menu code and value display	The first code and the second represent the first level and the second level menu from the field set list. The last two numbers indicate the value of the first and the second code.
●	Operation lamp	The operation lamp lights in each mode.
	Space cooling & sanitary water heating icon	These two icons indicate the current operation mode are space cooling and sanitary water heating.
	Space heating & sanitary water heating icon	These two icons indicate the current operation mode are space heating and sanitary water heating.
	Schedule timer OFF icon	This icon indicates all the operations of the schedule timer are inactive.
	Lock icon	This icon indicates all the buttons of the controller are locked except button lock
	Not available icon	This icon is displayed whenever non-installed option is addressed or a function is not available.

3.2 Setting Procedure

1 Press the button to enter FIELD SET MODE .

The SETTING icon will be displayed. The current selected field setting code is indicated “8-8-88”, with the set value displayed as the last 2-digit number.

2 Press the Prev button to select the appropriate field setting first code.

3 Press the Next button to select the appropriate field setting second code.

4 Press the ▲ and ▼ button to change the set value of the select field setting.

5 Save the new value by pressing the OK button.

6 Repeat step 2 through 4 to change other field settings as required.

7 When finished, press the button for the second time to exit.

Note: Please read the manual carefully to understand how to operate wire controller

3.3 Detailed description

a) Basic option

This part of field setting determines the basic option of the heat pump system, so that the control system can select the appropriate control mode.

- “0-0” Under floor heating terminal: defines whether the system installations with under floor

heating “1” or not “0”.

- “0-1” Fan coil: defines whether the system installations with fan coil “1” or not “0”.
- “0-2” Sanitary hot water tank: Defines whether the system installations with sanitary hot water tank “1” or not “0”.
- “0-3” Electric heater for sanitary hot water tank: Defines whether an electric heater was assembled in the sanitary hot water tank “1” or not “0”.
- “0-4” Auxiliary heating source: Defines whether there is a boiler as an auxiliary heating source for the system “1” or not “0”.
- “0-5” Solar kit: Defines whether there is a solar kit to heating the sanitary hot water tank “1” or not “0”.
- “0-6” auxiliary heater: Defines whether there are electric heaters assembled in the indoor unit “1” or not “0”.
- “0-7” Room thermostat: Defines whether there is a room thermostat connected with the indoor unit “1” or not “0”.
- “0-8” Fan coil function: Function of the fan coil,"0"for cooling only,"1" for heating and cooling.

b) Priority

This part defines the priority of space heating, space cooling and sanitary hot water tank heating.
“1-0” Space heating and sanitary heating priority: Defines the priority of space heating and sanitary heating, “0” for sanitary heating priority, “1” for space heating priority, and “2” means space heating and sanitary heating have the same priority.
“1-1” Space cooling and sanitary heating priority: defines the priority of space cooling and sanitary heating, “0” for sanitary heating priority, “1” for space cooling priority.
“1-2” Heat pump maximum running period for sanitary water tank heating: Specifies the maximum time period during which sanitary water tank heating can be activated, even when the target sanitary hot water temperature has not yet been reached..
“1-3” Solar heating priority: defines the priority sanitary hot water tank heating by solar kit “1” or by heat pump & electric heater “0”.

■ Disinfection function

Apply only to installations with a sanitary hot water tank.
The disinfection function disinfects the sanitary hot water tank by periodically heating the sanitary water to a specific temperature.
The disinfection function field settings must be configured by the installer according to national and local regulations.
“2-0” Operation interval: Day of a week, the sanitary water should be heated.
“2-1” Status: Defines whether the disinfection function is turned on (1) or off (0).
“2-2” Start time: Defines the time of the day at which the sanitary water should be heated.
“2-3” Set point: Defines the hot water temperature to be reached when disinfection function.
“2-4” Interval: Time period defining how long the set point temperature should be maintained.

■ Auxiliary heating source operation

“3-0” Temperature difference: Defines the temperature difference between the set temperature and the outlet temperature of indoor unit, above which the auxiliary heating source such as boiler may be turned on.
“3-1” Interval: Defines the time period after which the auxiliary heating source such as boiler may be turned on.
“3-2” Outdoor temperature: Defines the outdoor temperature below which the auxiliary heating source such as boiler operation may be allowed.
“3-3” Floor heating inlet temperature: Defines the temperature below which the under floor

heating may be allowed.

■ **Electric heater & HP priority**

Apply only to installations with a sanitary hot water tank.

“4-0” Electric heater delay time: Defines the time period behind which the electric heater of the sanitary hot water tank will be turned on.

“4-1” Heat pump start temperature difference: Defines the temperature difference between set temperature and water tank temperature, below which heat pump turning on will be allowed.

“4-2” Set point correction for sanitary hot water tank temperature: The temperature difference above the set temperature when the electric heater to be powered on.

■ **Auxiliary heater operation**

“5-0” Auxiliary heater delay time: Defines the time period behind which the auxiliary heater of the indoor unit will be turned on.

“5-1” Auxiliary heater turn on temperature difference 1: Defines the temperature difference between set temperature and water outlet temperature of indoor unit, below which one of the auxiliary heaters will be turned on.

“5-2” Auxiliary heater turn on temperature difference 2: Defines the temperature difference between set temperature and water tank temperature, below which both of the auxiliary heaters will be turned on.

“5-3” Auxiliary heater turn on outdoor temperature: Specifies the outdoor temperature below which the auxiliary heater may turn on.

■ **Cooling and heating set point range**

The purpose of this field setting is to prevent the user from selecting a wrong (i.e., too hot or too cold) leaving water temperature. Thereto the heating temperature set point range and the cooling temperature set point range available to the user can be configured.

“6-0” Cooling set point upper limit: Maximum leaving water temperature for cooling operation.

“6-1” Cooling set point lower limit: Minimum leaving water temperature for cooling operation.

“6-2” Heating set point upper limit: Maximum leaving water temperature for heating operation.

“6-3” Heating set point lower limit: Minimum leaving water temperature for heating operation.

“6-4” Sanitary heating set point upper limit: Maximum leaving water temperature for sanitary heating operation.

“6-5” Sanitary heating set point lower limit: Minimum leaving water temperature for sanitary heating operation.

■ **Others**

“7-0” Celsius/Fahrenheit switching: “0” for Celsius, and “1” for Fahrenheit.

“7-1” Silent mode running period: Defines the running period of silent mode.

“7-2” Run test function: “0” for run test function disable, and “1” for run test function disable.

“7-3” Run test period: Specifies the period of run test.

“7-4” Under floor first time heating function: “0” for disable and “1” for enable.

“7-5” Air purge function: “0” for disable and “1” for enable.

3.4 Field setting table

First Code	2nd Code	Setting name	Default value	Range	Step	Unit	Remark
0	Basic selection						
	0	floor heating	0	0/1			0-No selection; 1-Selection
	1	fan coil or low temperature radiat	0	0/1			0-No selection; 1-Selection
	2	sanitary hot water tank	0	0/1			0-No selection; 1-Selection
	3	Electric heater for sanitary hot water tank	1	0/1			0-No selection; 1-Selection
	4	Auxilary Heating source such as gas boiler	0	0/1			0-No selection; 1-Selection
	5	Solar kit	0	0/1			0-No selection; 1-Selection
	6	Auxiliary heater of indoor unit	1	0/1			0-No selection; 1-Selection
	7	Room thermostat	0	0/1			0-No selection; 1-Selection
	8	Fan coil function	0	0/1			0-Cooling only, 1-heating and cooling
1	Priority						
	0	Space heating and Sanitary heating priority	0	0/1/2			0-Sanitary heating priority, 1- space heating priority, 2 - both
	1	Cooling and Sanitary heating priority	0	0/1			0-Sanitary heating priority, 1- Fan coil cooling priority
	2	HP Max. Running period for heating sanitary water tank	10	10~95	5	min	
	3	Solar heating priority	0	0/1			1-solar priority; 0-HP priority
2	Disinfection function						
	0	Operation interval	5(Fri.)	0~7	-	-	0-Sun, 1-Mon,...,6-Sat, 7-all
	1	Status	1(ON)	0/1			0-OFF,1-ON
	2	Start time	23:00	0~23	1	hr	0-0:00, 1-1:00, ... , 23-23:00
	3	Set point temperature	60	50~65	5	℃	
	4	Interval	10	5~60	5	min	
3	Aux. heating resources operation						
	0	Boiler turn on temperature difference	10	5~15	1	℃	It should satisfied all conditions before turning on boiler
	1	Boiler turn on time delay	30	0~95	5	min	
	2	Boiler turn on outdoor temperatui	0	-5~35	1	℃	
	3	Under floor heating inlet temperature upper limit	60	56~70		℃	
4	Electric heater & HP priority						
	0	Electric heater delay time	20	20~95	5	min	
	1	HP Start Temperature Difference	5	1~20	1	℃	
	2	Set point correction for Sanitary hot water tank	2	0~5	1	℃	
5	Auxiliary Heater Operation						
	0	Auxiliary Heater1/2 turn on time delay	20	5~60	5	min	
	1	Auxiliary Heater1 turn on temperature difference	5	2~15	1	℃	
	2	Auxiliary Heater2 turn on temperature difference	5	2~15	1	℃	
	3	Auxiliary heater turn on outdoor temperature	0	-5~35	1	℃	
6	Cooling and heating set point ranges						
	0	Cooling set point upper limit	22	18~22	1	℃	
	1	Cooling set point lower limit	7	5~18	1	℃	
	2	Heating set point upper limit	55	37~55	1	℃	
	3	Heating set point lower limit	25	15~37	1	℃	
	4	Sanitary heating set point upper limit	55	38~60	1	℃	
	5	Sanitary heating set point lower limit	35	35~38		℃	
7	Others						
	0	Celsius / Fahrenheit switching	0	0/1	1		0-Celsius, 1-Fahrenheit
	1	Silent mode	8	1~24		hr	
	2	Run Test	0	0/1	1		0-Disable; 1-Enable
	3	Run Test period	8	8~20		min	
	4	**First time floor heating function**	0	0/1			0-Disable; 1-Enable
	5	Air purge function	0	0/1			0-Disable; 1-Enable
	6	Temperature selection	0	0/1			0-water out from indoor unit; 1-water tank;

4 Maintenance

In order to ensure optimal availability of the unit, a number of checks and inspections on the unit and the field wiring have to be carried out at regular intervals.

Caution:

Before carrying out any maintenance or repair activity, always switch off the circuit breaker on the supply panel, remove the fuse or open the protection devices of the unit.

Make sure that before starting any maintenance or repair activity, also the power supply to the outdoor unit is switched off.

The described checks must be executed at least once a year:

a) Water pressure

Check if the water pressure is above 0.3 bar. If necessary add water.

b) Water filter

Clean the water filter.

c) Water pressure relief valve

Check for correct operation of the pressure relief valve by turning the red knob along the valve counter-clockwise:

1. If you do not hear a clacking sound, contact your local dealer.
2. In case the water keeps running out of the unit, close both the water inlet and outlet shut-off valves first and then contact your local dealer.

d) Pressure relief valve hose

Check that the pressure relief valve hose is positioned appropriately to drain the water.

If the drain pan kit is installed, make sure that the pressure relief valve hose end is positioned in the drain pan.

e) Auxiliary heater vessel insulation cover

Check that the auxiliary heater insulation cover is fastened tightly around the auxiliary heater vessel.

f) Sanitary hot water tank pressure relief valve (field supply)

Apply only to the system which installs a sanitary water tank.

Check for correct operation of the pressure relief valve on the sanitary hot water tank.

g) Sanitary hot water electric heater

Apply only to the system which installs a sanitary water tank.

It is advisable to remove lime buildup on the electric heater to extend its life span, especially in regions with hot water. To do so, drain the sanitary hot water tank, remove the electric heater from the sanitary hot water tank and immerse in a bucket (or similar) with lime-removing product for 24 hours.

h) Indoor unit control box

1. Carry out a through visual inspection of the control box and look for obvious defects such as loose connections or defective wiring.
2. Check for correct operation of contactors by the use of an ohmmeter. All of these contactors must be in open position.

Part 4 trouble shooting

1. Normal Phenomenon

1.1 The heat pump does not start immediately after the ON/OFF button on the remote controller is pressed.

- If the operation lamp lights, the system is in normal condition. To prevent overloading of the compressor motor, the heat pump starts 3 minutes after it is turned ON.
- If the operation lamp and the "PRE-DEF indicator (cooling and heating type) or fan only indicator (cooling only type)" light, it means you choose the heating model.

1.2 Change into the Pump mode during heating mode

When the outlet water temperature drops to the setting temperature, the compressor goes off and the indoor unit changes to pump mode; when the temperature rises up, the compressor starts again. It is the same with heating mode.

1.3 White mist comes out of outdoor unit

When the system is changed over to heating operation after defrost operation Moisture generated by defrost becomes steam and is exhausted.

1.4 Noise of heat pump’s cooling

- A continuous low hissing sound is heard when the system is in operation.
  This is the sound of refrigerant gas flowing through both indoor and outdoor units.
- A hissing sound will be heard at the start or immediately after stopping operation or defrost operation.
  This is the noise of refrigerant caused by flow stop or flow change.
- If the tone of operating noise changes, this noise is caused by the change of compressor’s frequency.

1.5 Dust comes out of the unit

If the unit is not run for a long time, the dust has gotten into the unit.

1.6 The units can give off odors

The unit can absorb the smell of rooms, furniture, cigarettes etc., and then emit it again.

1.7 The outdoor unit fan does not spin

The speed of the fan is controlled in order to optimize product operation.
In heating mode, when the system defrosting, the fan of outdoor unit will stop

2. M-thermal system protection in Common

2.1 Compressor protection.

When the power is on, or the machine stops then restarts right away, outdoor unit will run in 3 minutes to protect the compressor from too frequent starts and stops.

2.2 When the protection device functions, running stops. Refer to the following:

① Forced to start but not possess the start article, and display light lights.

② When the operation mode is cooling, inlet and outlet of outdoor unit are blocked, outside strong air blows into outdoor unit's outlet.

③ When heating running, dust adheres to air filter to block inlet or outlet of outdoor unit.

Note: when protecting, please cut the manual power switch. After checking the reason and solving it, restart.

2.3 Power fails.

① If the power supply fails while machine is running normally, system will record this.

② When the machine is powered on again, the running light of wire controller would flash to inform user about this.

③ Press the on/off key of wire controller to confirm this before restart the system.

Note: When running, if system takes place mistaken operation or lighter, please pull down the power supply switch to cut it off. Before restarting machines, please press the on/off key again as above.

3. Trouble and causes of heat pump

If one of the following malfunctions occur, stop operation, shut off the power, and contact with your dealer.

- The lamp is flashing rapidly after turn off the power and turn on again.
- Remote controller receives malfunction or the button does not work well.
- A safety device such as a fuse, a breaker frequently actuates.
- Obstacles and water enter the unit.
- Water leaks from indoor unit.
- Other malfunctions.

If the system does not properly operate except the cases above mentioned or the malfunction above mentioned is evident, investigate the system according to the following procedures.

Symptom	**Causes**	**Solution**
Unit does not start	● Power failure. ● Power switch is off. ● Fuse of power switch may have burned. ● Batteries of remote controller exhausted or other problem of controller.	● Wait for the comeback of power. ● Switch on the power. ● Replace Location: ● Replace the batteries or check the controller.
Water flowing normally but completely can't cooling	● Temperature is not set correctly. ● Be in 3 minutes protection of compressor.	● Set the temperature properly. ● Wait.
Units start or stop frequently	● Refrigerant is too little or too much. ● Air or no concreting gas in the system ● Compressor is malfunction. ● Voltage is too high or too low. ● System circuit is blocked.	● Check leakage, recharge refrigerant. ● Vacuum and recharge refrigerant. ● Maintenance or change compressor. ● Install manostat. ● Find reasons and solution.
Low cooling effect	● Outdoor unit and indoor unit heat	● Clean the heat exchanger.

	exchanger is dirty. ● The water filter is dirty. ● Inlet/outlet of indoor/outdoor units is blocked. ● Sunlight shines directly. ● Too much heat resource. ● Outdoor temp. is too high. ● Leakage of refrigerant or lack of refrigerant.	● Clean the water filter. ● Eliminate all dirties and make air smooth. ● Make curtains in order to shelter from ● sunshine. ● Reduce heat source. ● AC cooling capacity reduces (normal). ● Check leakage and rightly recharge refrigerant.
Low heating effect	Outdoor temperature is lower than 7℃ Leakage of refrigerant or lack of refrigerant.	● Use heating device. ● Check leakage and rightly recharge refrigerant.

4. Malfunction Code and Troubleshooting

If there is phenomenon as follows, please stop running and cut power supply and refer to the following.
If the problem still appears, please contact with your dealer and offer machine's model and detailed malfunction**.**

4.1 Outdoor unit malfunction Code and troubleshooting

Display	Malfunction or Protection
E0	EEPROM error
E2	Communication error of the outdoor chip and the indoor chip
E3	Communication error
E4	T3, T4 sensor error
E5	Voltage protection error
E6	Direct-current fan error
E7	Heating fan error in the area A lasts for 5 minutes
E8	There are two times E6 error in 10 minutes(recovery will be after power off)
P0	The cooling fin high temperature protection
P1	High pressure protection
P2	Low pressure protection
P3	Compressor current protection
P4	Discharge temperature protection
P5	Outdoor condenser T3 high temperature protection
P6	Modules protection
P7	Evaporator T2 high temperature protection
P8	Typhoon protection

Display Function Instruction:

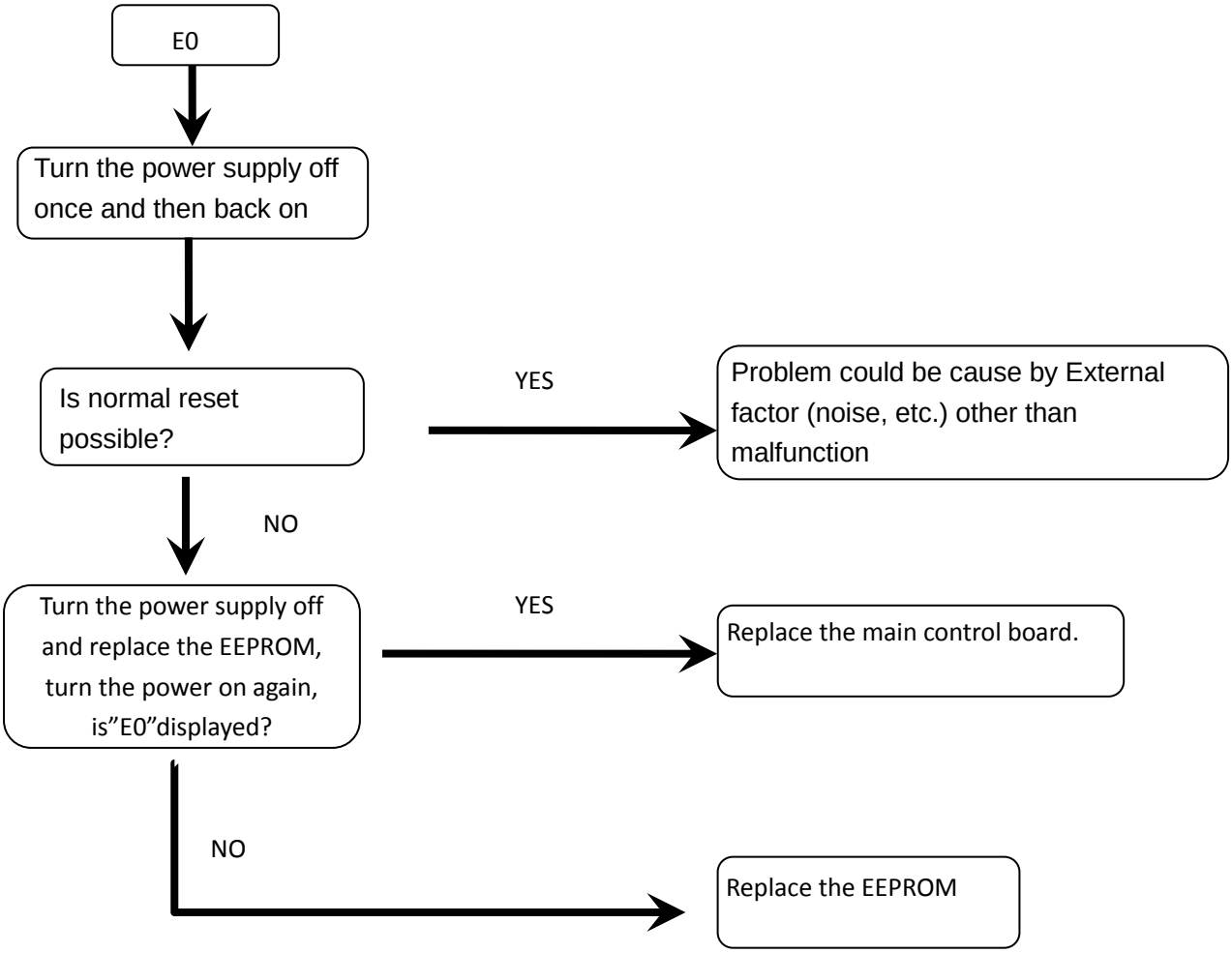
1. When stand by, LED displaying the amount of indoor units online which communicate with outdoor units.

2. When operation, LED displaying frequency value of compressor. 3. When defrost, LED displaying "dF".

A. "E0": Outdoor unit EEPROM malfunction

Outdoor Unit Display	**E0**
Method of malfunction detection	**Check whether EEPROM is normal**
Supposed Causes	**1. Something wrong with the outdoor unit PCB.** **2. Something wrong with the EEPROM.** **3. External factor other than malfunction.**

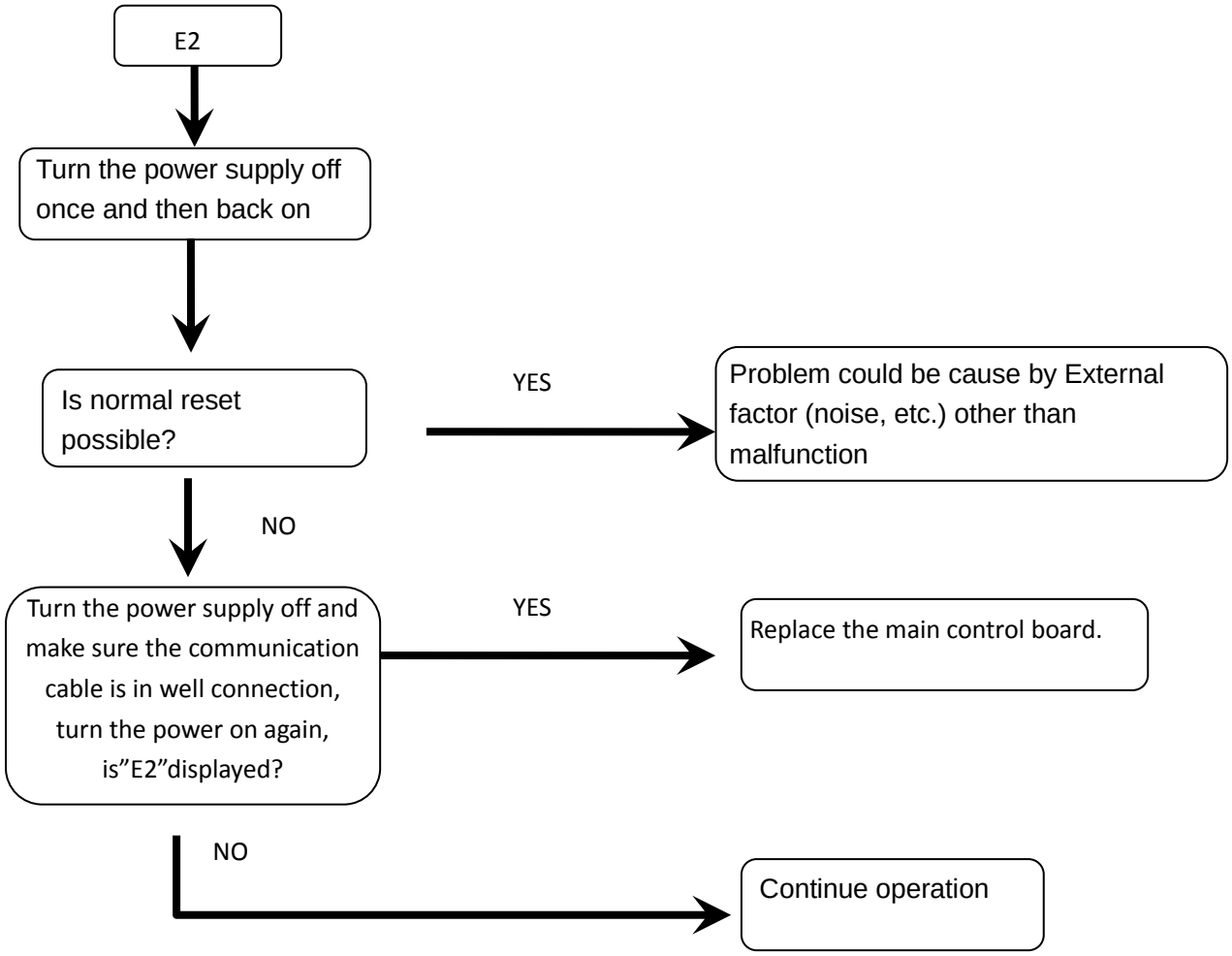
Troubleshooting



B. "E2": Communication error of the outdoor chip and the indoor chip

Outdoor Unit Display	**E2**
Method of malfunction detection	**Check whether communication cable is normal**
Supposed Causes	**1. Communication cable doesn't connect well.** **2. External factor other than malfunction.**

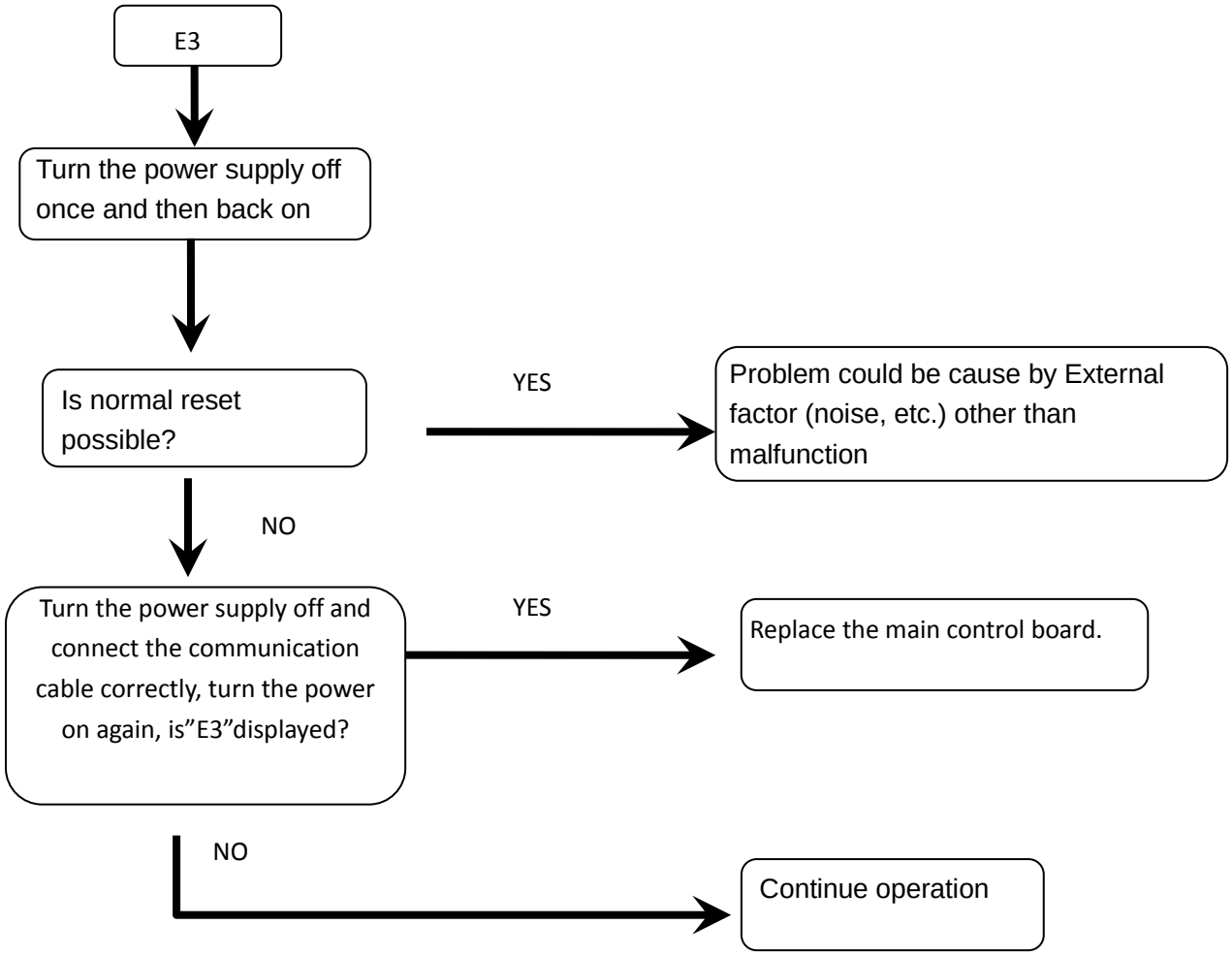
Troubleshooting



C. "E3": Communication error of outdoor chip and DSP

Outdoor Unit Display	**E3**
Method of malfunction detection	**Check whether communication cable between chip and DSP is not connected well.**
Supposed Causes	**1. Communication cable between chip and DSP is not connected well..** **2. External factor other than malfunction.**

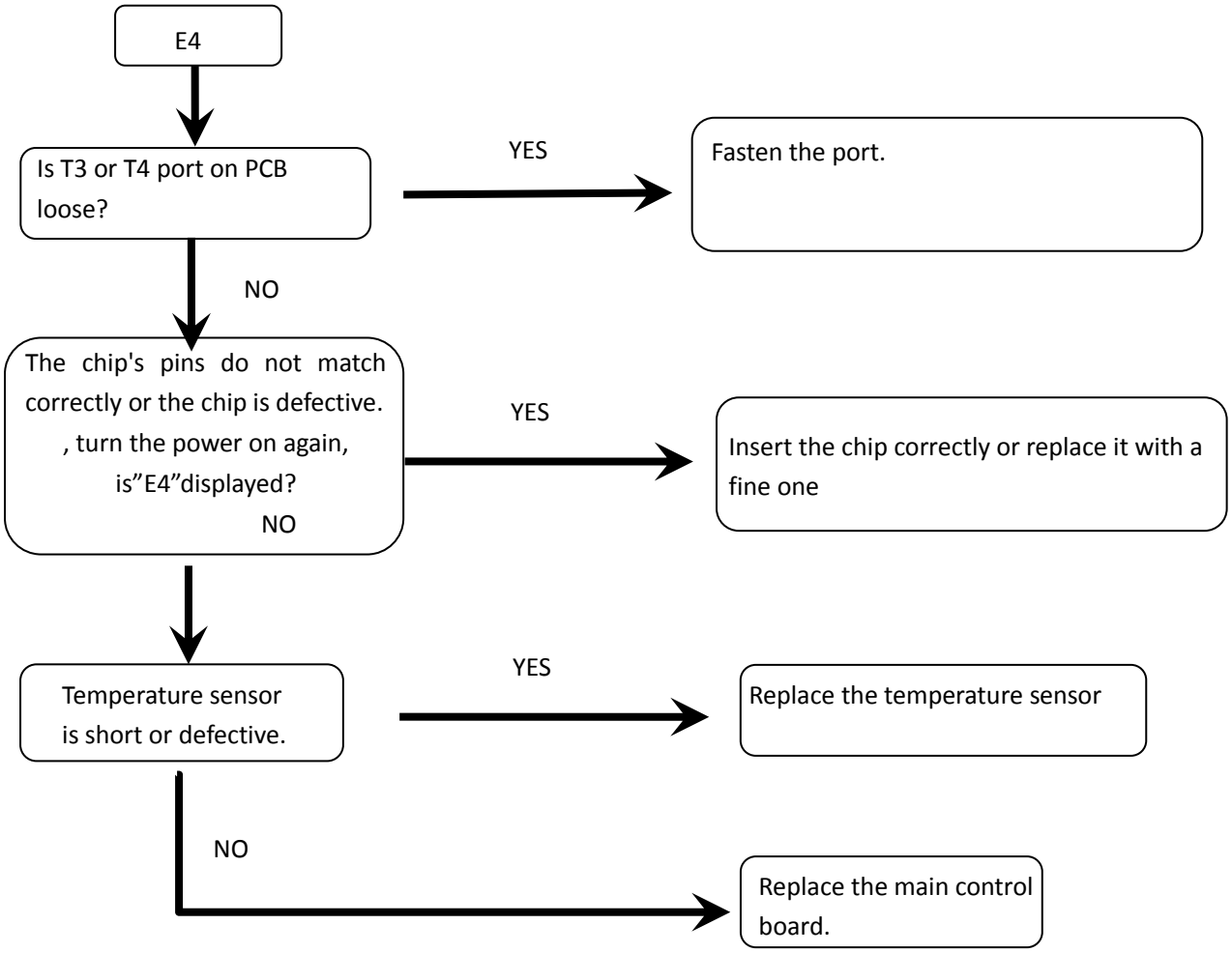
Troubleshooting



D. "E4": Outdoor temperature sensor error

Outdoor Unit Display	**E4**
Method of malfunction detection	**Check whether T3 and T4 temperature sensor cable are connected correctly.**
Supposed Causes	**1. Temperature sensor cables don't connect correctly.** **2. The sensor terminal is loose.** **3. The sensor circuit is short or open** **4. The main control board's clamp diodes are short or open.**

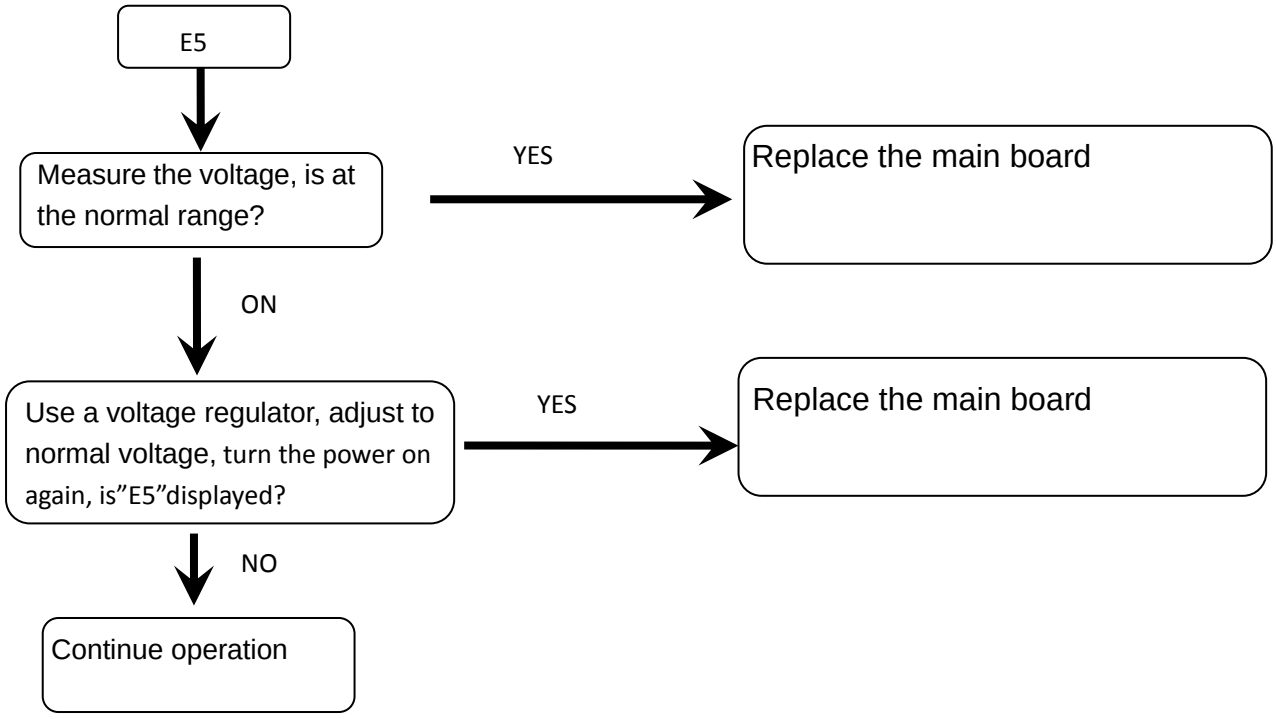
Troubleshooting



E. "E5": Voltage protection error

Outdoor Unit Display	**E5**
Method of malfunction detection	**Check whether the power supply voltage is at normal range.**
Supposed Causes	**1. The power supply voltage is too high or too low** **2. Something wrong with the detecting element on the main board**

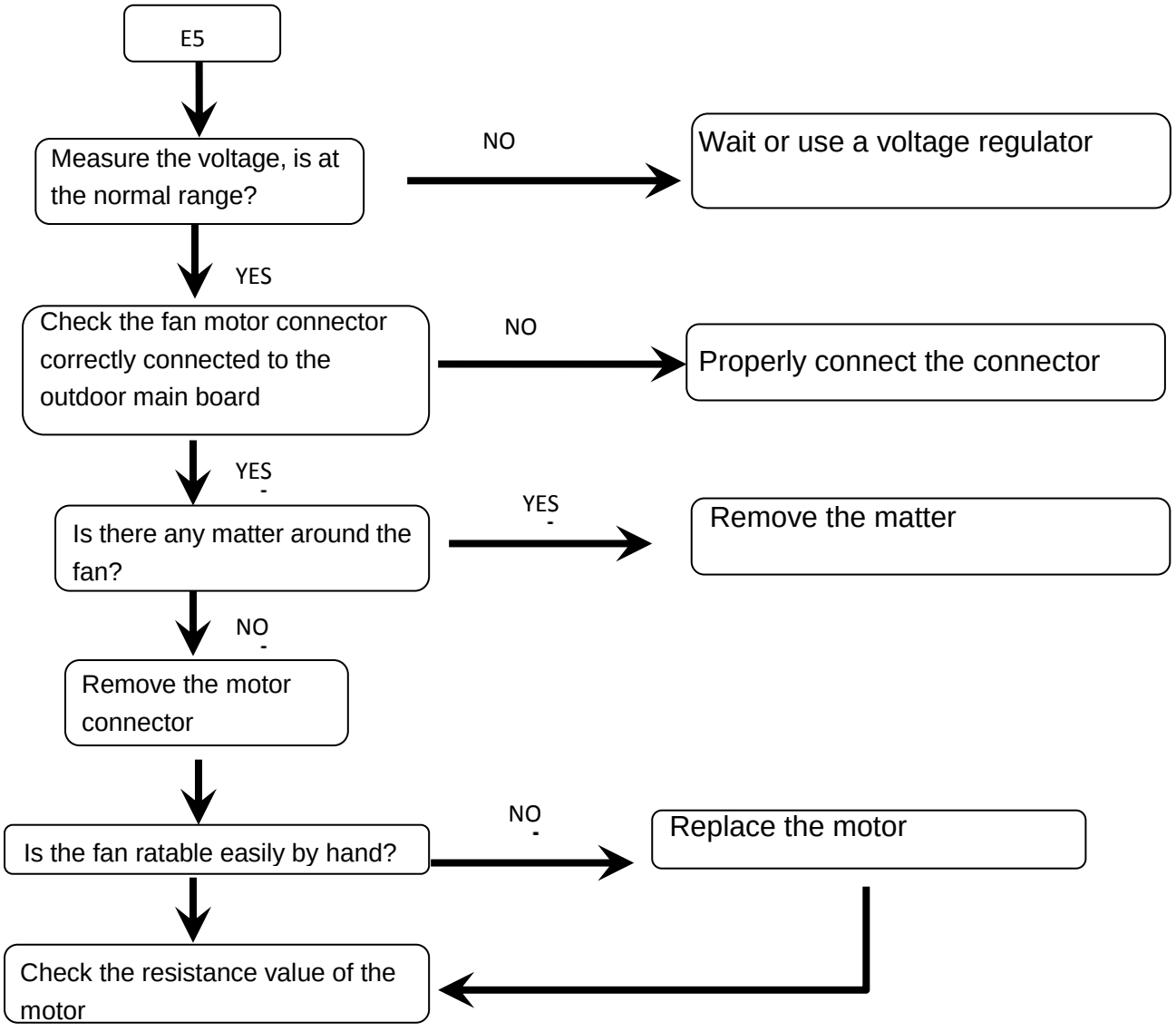
Troubleshooting



F. "E6": Direct-current fan error

Outdoor Unit Display	**E6**
Method of malfunction detection	**Check whether the wire connection is correct.**
Supposed Causes	**1. Fan wire is not connected well or correctly** **2. Fan dose not run due to some matter tangled** **3. Malfunction of the outdoor unit main board** **4. Blowout of fuse**

Troubleshooting



G. "P1": High pressure protection

Outdoor Unit Display	**P1**
Error Explanation	**The protection device circuit checks continuity in high pressure switch**
Supposed Causes	**1. Refrigerant is excess.** **2. Refrigerant does not loop smoothly.** **3. The refrigerant loop contains air.** **4. Control board is defective.**

Troubleshooting

P1: High pressure protection (R22 refrigerant system protects at 3.3Mpa, recovers at 2.4MPa; R410 refrigerant system protects at 4.4MPa, recovers at 3.2MPa).

↓

Heat exchanging of ODU is not efficient. This may be caused by dirty heat exchanger, abnormal ODU fan running, air flow keeping off to the heat exchanger, ODU are too near to each other. → Check the system and fixed up the error.

↓

System's liquid refrigerant loop is blocked. This may be caused by blocked valve, pressed tube. closed blocked valve. → Check the system and get rid of the block, and make the loop smooth.

↓

Refrigerant is excess. In this circumstance, the refrigerant's low pressure is high, so is the high pressure side, while the discharge temperature is low. → Discharge part of the refrigerant. Add some oil to the system if it leaks during the discharge.

↓

System contains air or nitrogen. In this circumstance, the high pressure is high, the current is large, the discharge temperature is high, compressor makes noise → Discharge the refrigerant. Then vacuumize the system and refill the refrigerant. Add oil to the system if it leaks.

↓

Chip is defective or incorrectly installed. Or the high pressure sensor is disconnected. → Reinstall the chip or replace it with a fine one.

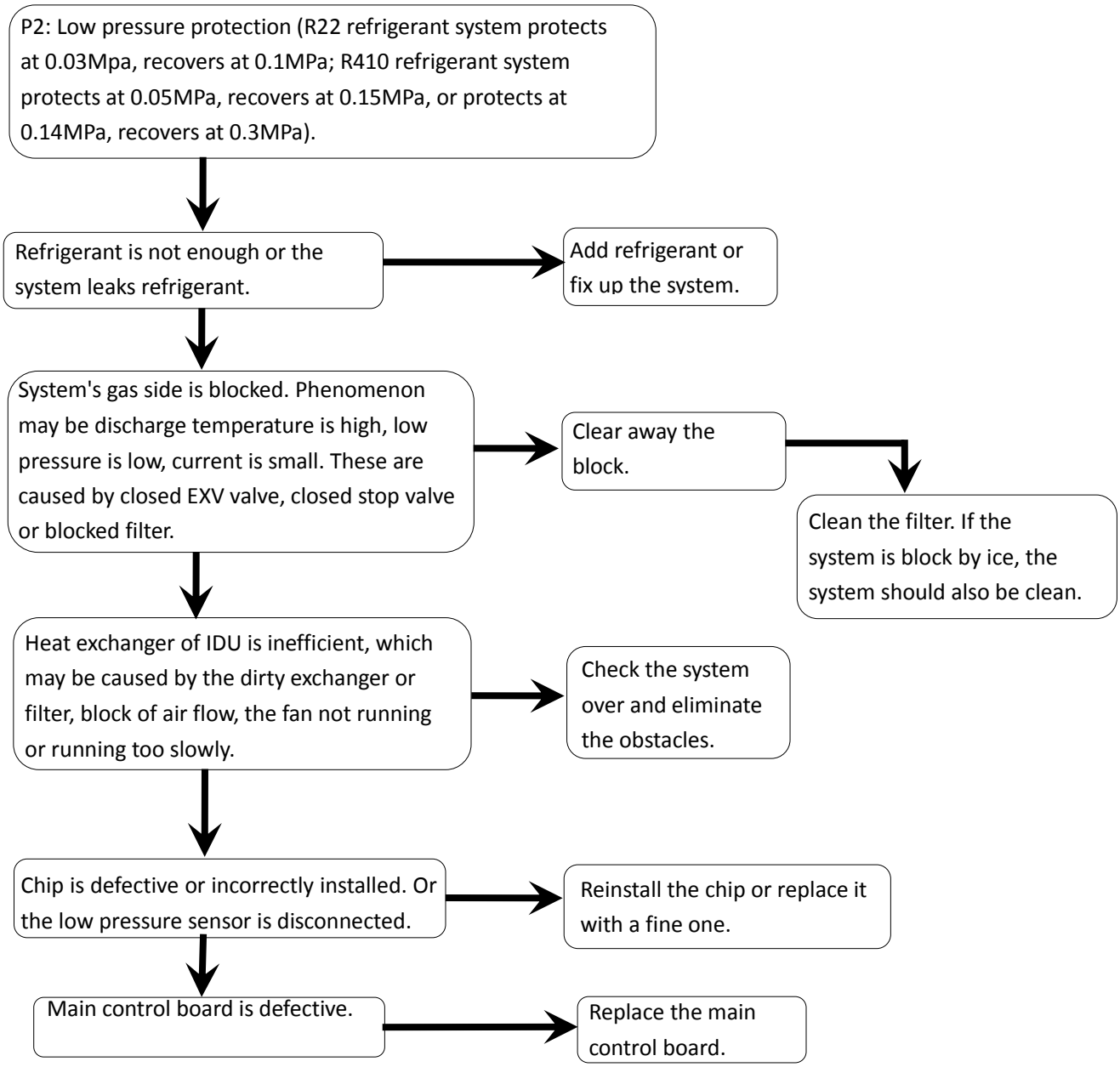
↓

Control board is defective. → Replace the main control board.

H. "P2": Low pressure protection

Outdoor Unit Display	**P2**
Error Explanation	**The protection device circuit checks continuity in low pressure switch**
Supposed Causes	**1. Faulty low pressure switch** **2. Refrigerant is not enough.** **3. Refrigerant does not loop smoothly.** **4. Efficiency of indoor heat exchange is low.** **5. Control board is not defective.**

Troubleshooting



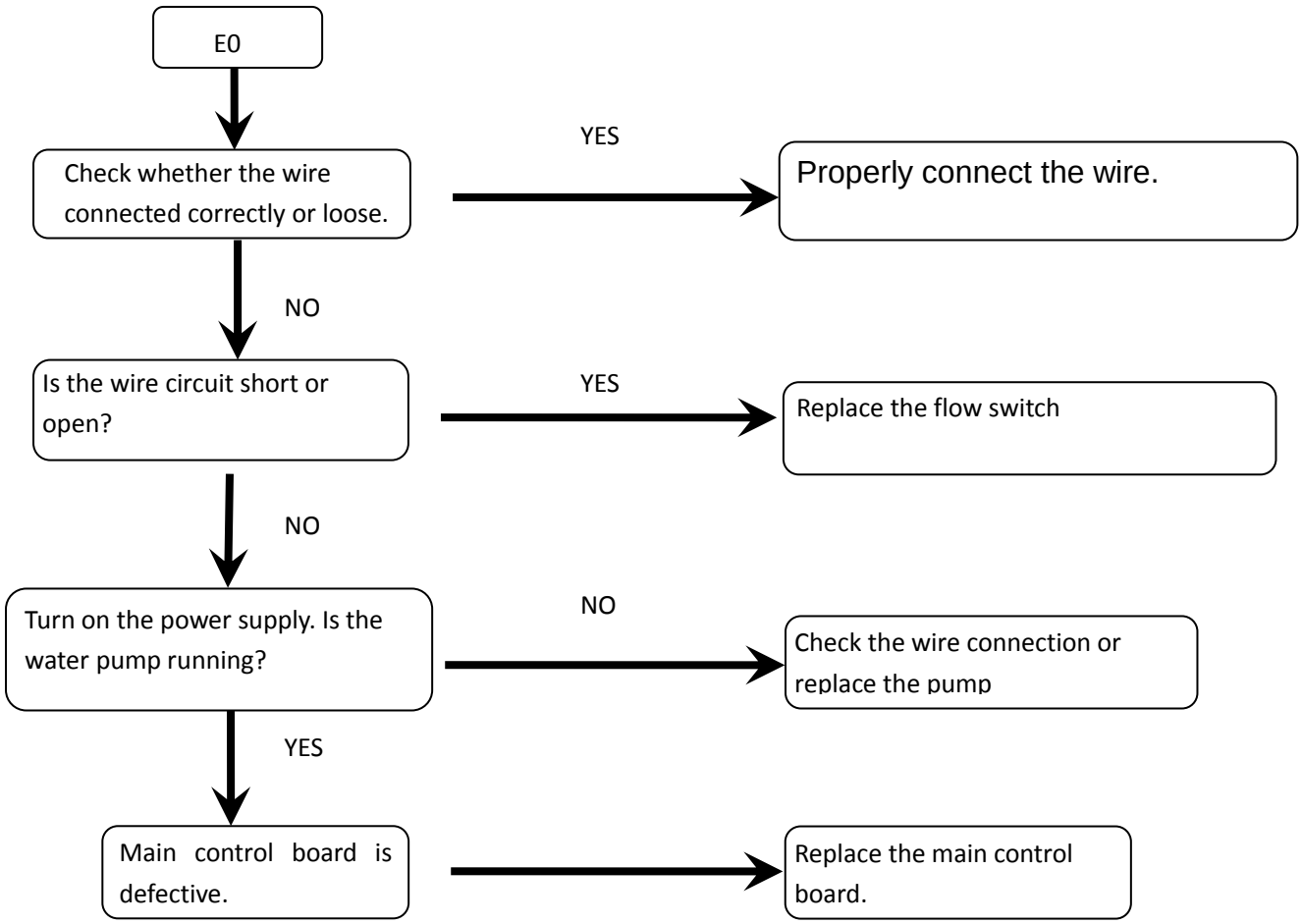
4.2 Hydraulic indoor unit malfunction Code and troubleshooting

Display	Malfunction or Protection
E0	Flow switch error(continuous for 3 times, and should be reset by switch off the power supply)
E1	T2 error
E2	UI communication error
E3	Outdoor unit communication error
E4	T2B error
E5	T5 error
E6	T1 error
E7	T1B error
E8	Flow switch(one time)
E9	TW_in error
EA	TW_out error
Eb	T4 error
Ed	Phase protection
EE	EEPROM error
P0	T2 high temperature protection
P1	T2B low temperature protection
P2	TW_out high temperature protection
P3	TW_out low temperature protection
P4	TW_in high temperature protection
P5	T1 high temperature protection
P6	T1B high temperature protection
P7	Outdoor unit protection
P8	Sanitary hot water tank electric heater protection
P9	Auxiliary heater protection
Pb	Anti -freezing protection
Pc	Temperature controller error(result from the conflict between cool mode and heat mode)
t0~t7	Run test
dF	Defrost
d0	Oil return function

A. "E0" "E8": Flow switch error

Wire controller Display	**E0 E8**
Error Explanation	**E0:Flow switch error(continuous for 3 times, and should be reset by switch off the power supply)** **E8:Flow switch error(one times)**
Supposed Causes	**1. The wire terminal is loose or connected incorrectly.** **2. The wire circuit is short or open.** **3. The pump is not running** **4. The main control board's clamp diodes are short or open.**

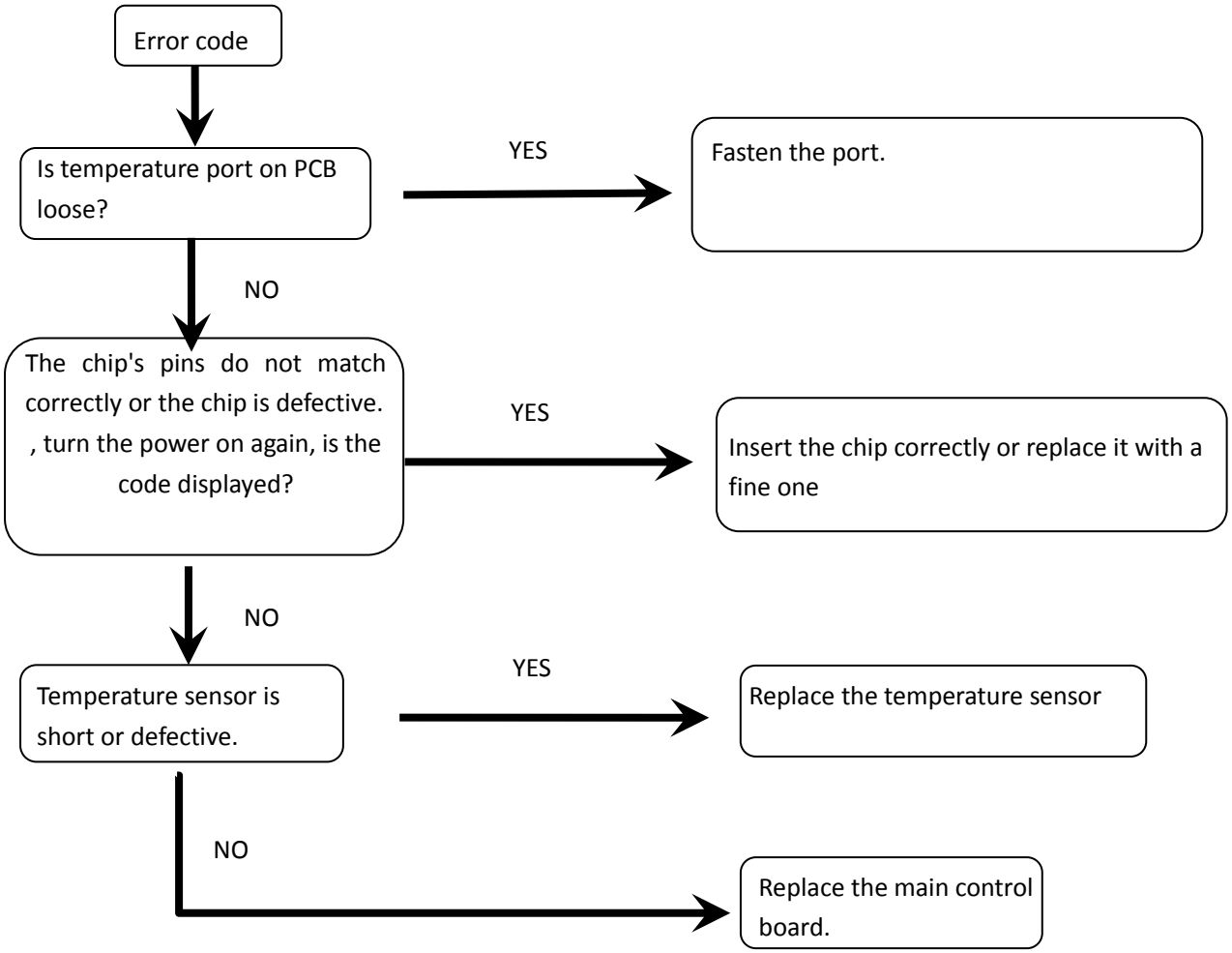
Troubleshooting



B. “E1 E3 E4 E5 E6 E7 E8 E9 EA Eb”: Temperature sensor error

Wire controller Display	**E1"E3 E4 E5 E6 E7 E8 E9 EA Eb**
Method of malfunction detection	**Malfunction is detected according to the temperature detected by each temperature sensor.**
Supposed Causes	**1. Temperature sensor cables don’t connect correctly.** **2. The sensor terminal is loose.** **3. The sensor circuit is short or open** **4. The main control board's clamp diodes are short or open.**

Troubleshooting



C. "E2": UI communication error

Wire controller Display	**E2**
Method of malfunction detection	**Check whether communication cable is normal**
Supposed Causes	**1. Communication cable doesn't connect correctly.** **2. External factor other than malfunction.**

Troubleshooting