Haier MRVⅡ Air Conditioning

Haier MRVⅡ can be used in a large combination with multiple outdoor units, it is only one system and is the second generation of Haier C-MRV product. Major features are energy saving, intelligent control and precise temperature control, for R410A system, that is more friendly for environment as well.

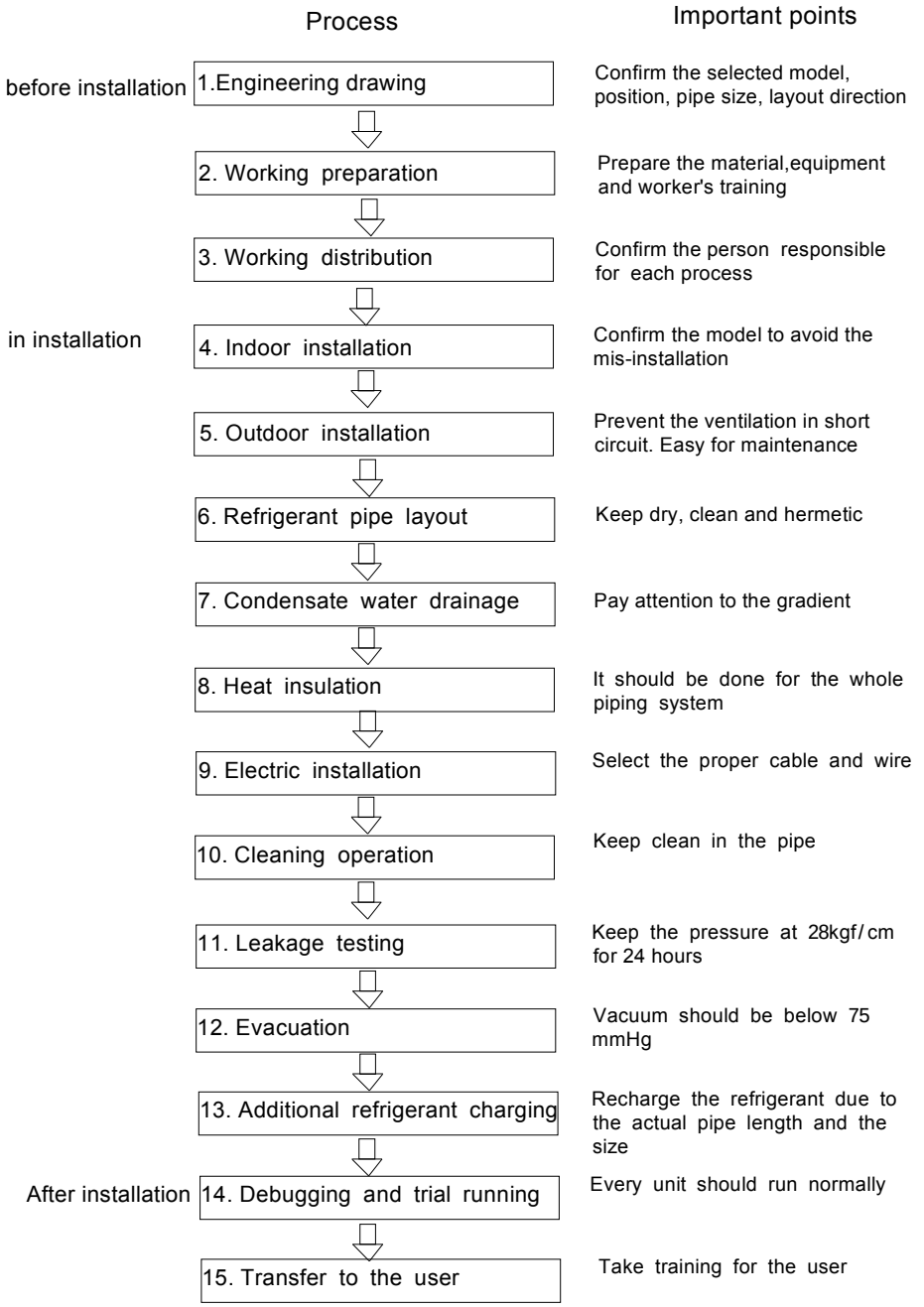
To regulate the installation, commissioning and maintenance procedure, and ensure the working quality, also to improve the working efficiency, we make this guide for reference.

This regulation is applicable for Haier A/C Elec. Corp. Ltd.

Index

Part 1 Installation regulation

1 Installation flowchart



2 Equipment delivery

2.1 After the equipment is delivered to the site, all relative persons should join the unpacking and checking work.

2.2 Pay attention to the below points when unpacking:

a. Check the equipment name, model, specification and the quantity, etc.

b. Suspend the equipment to the site or near the site before unpacking the unit. Forbidden to suspend the unit after unpacking to avoid being damaged.

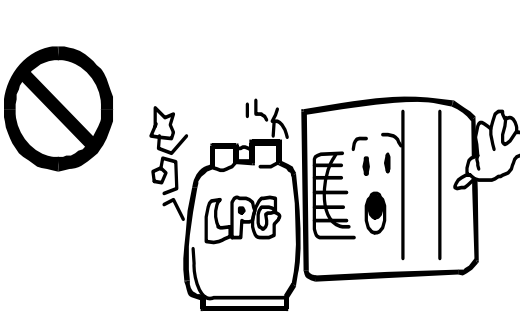
c. When unpacking, do not operate wildly to avoid being damaged.

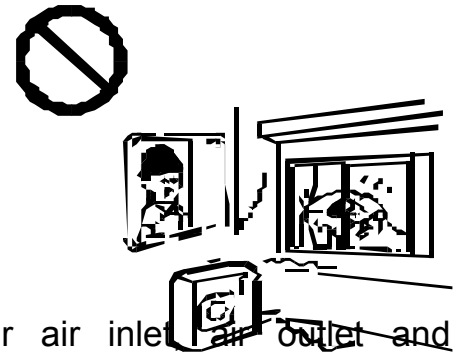
d. Check if the accessories are complete due to the packing list after unpacking. Any question, contact the after-sale persons.

3 Outdoor installation

3.1 The unit should be placed far away the flammable, explosive or oily place.

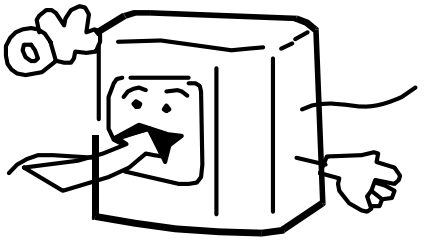
3.2 The noise and the outlet air should not affect the neighbors.

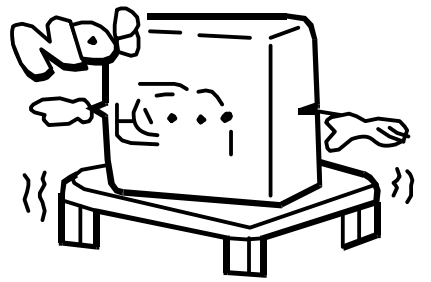




3.3 There should be enough space for air inlet, air outlet and maintenance around the unit. Fluent ventilation and good heat release. If there is obstacle above the unit, it must be over 2m away from the air outlet, or there should be extended duct.

3.4 The floor and the steel bracket should be strong enough to afford the 1.5 times heavier than the unit running weight. The floor and the steel bracket should be horizontal.





3.5 The bottom of steel bracket should be made from 6# channel steel.

3.6 The floor should be over 100mm higher than the ground, and there should be the drainage around to ensure the unit not being immersed in the water.

3.7. The unit should be fixed firmly with the anti-vibration cushion.

3.8. The outdoor should be as near the indoor as possible. Shorten the pipe and decrease the bend pipe. Pipe length can not exceed the permitted range.

3.9 Avoid the dangerous place which could be easily damaged by monsoon, typhoon and earthquake, if possible, do not install the unit in the air.

4 Indoor installation

A. With the shortest refrigerant pipe, and convenient to connect with distributing pipe and water pipe. Water pipe should keep a 1% gradient at least.

B. The place for indoor unit installation should be strong enough to afford the unit weight and running shake.

C. Preset a checking hole near the indoor unit, and there should be enough space for maintenance, and convenient to maintain or change the PCB and motor.

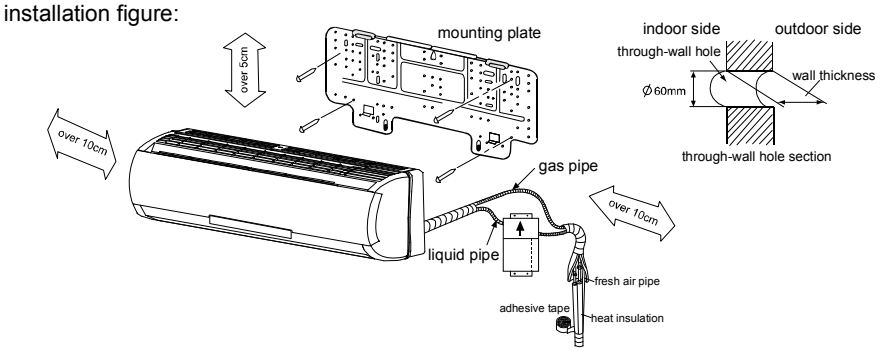
D. Ensure air return and air discharging fluent, and prevent ventilation in short circuit , also air return duct and air outlet duct is necessary.

E. Before installation, please check if the unit appearance has been damaged or the other abnormal after being unpacked. Also please check if the accessories are complete, and the accessories should be transferred to the special person for proper preservation.

F. The unit should be fixed firmly to avoid falling and shaking. After installing the indoor unit, please check it with a gradienter to ensure the indoor unit is horizontal.

4.1 Wall mounted unit installation

installation figure:

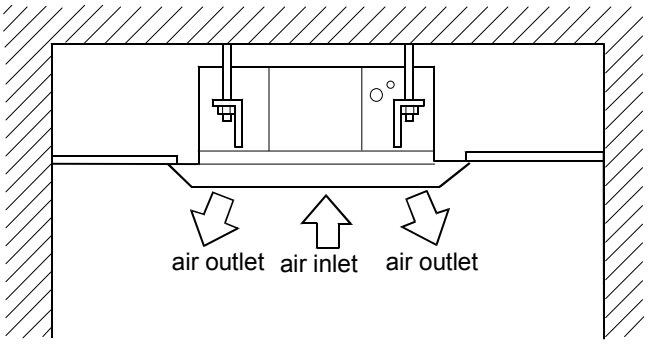


4.1.1 Fix the mounting plate, set the through-wall hole: install the unit on smooth wall beside beam and pillar. Firstly , fix the mounting plate on the wall with a steel nail ,use a thread with a screw ,drop it down vertically from the central top of the mounting plate,(or you can use a gradienter)to find the horizontal place and fix it. Drill holes in the wall according to the wall mounting plate's position , put plastic sleeve into the hole, then fasten the plate securely with 4*25 screw .

4.1.2 Make through-wall hole : make a throughout hole in the wall , after installation , please seal it with putty or gesso.

4.1.3 Hang the unit body onto the upper notches of the mounting plate ,move the body from side to verify its secure fixing.

4.2 Cassette unit installation

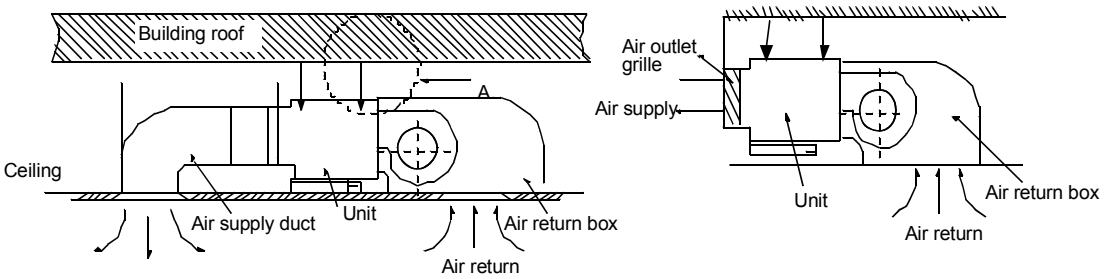


4.2.1 To ensure the air conditioner working effect, the installation height should be less than 3m.

4.2.2 After installation on the ceiling ,check the unit's horizontal level ,use a gradienter to check it.

4.2.3 Set a checking hole bigger than 400*400mm for checking and maintenance .

4.3 ESP duct unit installation

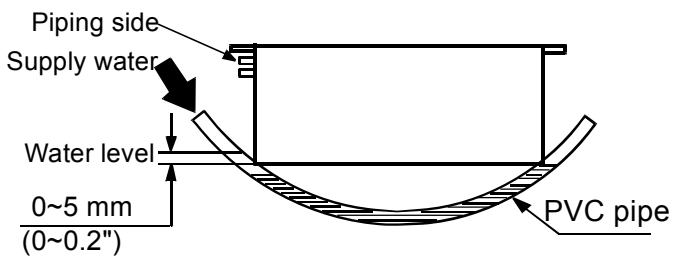


4.3.1 The indoor unit can be installed on the ceiling, which height is no more than 3m.

4.3.2 Install the unit with suspending pole, check if the installation place can bear the unit.

4.3.3 Fix the indoor unit to the suspending bolt, if necessary, it is possible to suspending the unit to the beam, etc.

4.3.4 Adjust the horizon with a gradienter or by the following method. Make adjustment so that the relation between the lower surface of the unit and water level in the hose becomes what is shown in the figure.



make the piping side slightly lower.

4.3.5 Notice for high static pressure duct unit

4.3.5.1 In order to reduce the noise level of the working room , it is better not to install indoor unit in the working room ,especially for the room where need a strict noise level. Indoor unit can be installed in a special room or stair well, and connect with working room by air sending duct and air return duct.

4.3.5.2 High static pressure duct unit is designed for duct type air

sending,

it must connect with air sending and air return duct ,it is forbidden to blow air into working room directly, otherwise the noise level will be so high due to the high fan speed from the air outlet .

4.3.5.3 Connection between indoor unit and duct should be soft, and connect a static pressure box out of unit to avoid shaking and noise pass through the duct.

4.3.5.4 The design for air sending/return duct, static pressure box, and air sending/return outlet should be done by the design organization with relative competency to ensure indoor unit air sending character matches the duct .

5 Piping work

Refrigerant pipe is made of phosphorus deoxidized copper seamless steel pipe , weld them together with copper or phosphorus welding rod. When carrying out this work please comply with the followings strictly : dry ,clean, hermetic. Therefore, note the below items during working:

5.1 After cutting off the pipe refer to dimensions, blow it with nitrogen for cleanness. For the pipe which diameter is over 25mm, the pipe inside need to be cleaned with duster cloth for dust and copper scraps.

5.2 Cover the both ends of the pipe to prevent the dust , vapor and impurity into the pipe.

5.3 Do not execute the piping work in the rain, moist air and water may

cause system block.

5.4 When welding the pipe, please blow nitrogen to prevent oxidation, pressure of nitrogen flow is about 0.02Mpa , otherwise the oxid layer on pipe inside will clog the pipe or damage the compressor.

5.5 Welding connection needs a changeable diameter pipe, the pipe inserted depth is : 10 mm : below φ19mm ; 15mm: above φ 22mm

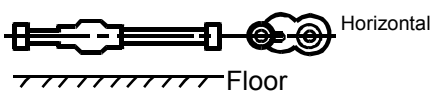
5.6 When working on the end of the pipe with metal saw or file, do not let the copper scrap into the pipe.

5.7 The flared type pipe made by expansion tools must conform to the relative standard, if not, it must be reworked.

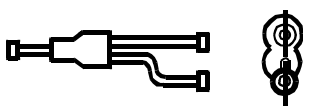
5.8 For flared type connection ， please daub some freeze oil on inside and outside of pipe to avoid pipe bend.

5.9 Refrigerant pipe should be installed horizontally or vertically and as short as possible ,protect the exposed part with ornament board. To avoid wrong connection, the pipe need to be marked every other end, set a bracket exclusively at the joint between piping and unit , do not make unit afford any weight .

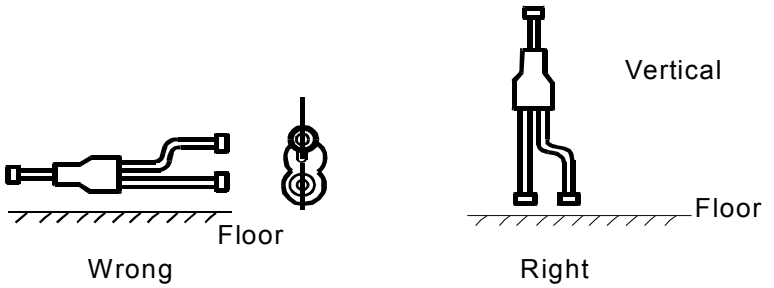
5.10 Branch pipe should be installed in horizontal or vertical direction, otherwise that will affect the air conditioner effect.



Right



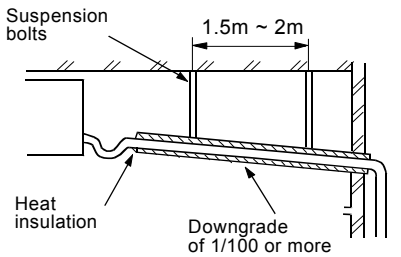
Wrong



6 Water drainage pipe installation

6.1 Drain pipe should keep a 1% gradient at least towards water outlet direction and as short as possible, if the pipe is made of hard PVC, then set a suspender at interval of 2 meters to avoid the pipe bend.

For Cassette & Ceiling concealed unit



6.2 Drain pipe diameter shall be equal or larger than that of indoor unit ,normally drained water and forcedly drained water could not gather together to one system.

6.3 Check if water drainage is smooth after installation, if the horizontal drain pipe is too long , please set an air discharge hole at interval of 5 meters.

6.4 To avoid the drain pan distortion, the connection between drain pipe and unit should be soft.

6.5 For the indoor unit whose pressure at condensing water drain pipe

connection part is negative (cassette, ceiling concealed type) ,please install a water return pipe for drain pipe.

6.6 Test the drain pipe after installation. Seal the water outlet of drain pan and charge water to 2/3 part. Check the drain pan two hours later, if there is no leakage, open the water outlet to ensure if the water drainage is fluent and if the drain pipe connection is tight.

7 Insulation treatment

7.1 If the insulating layer of condensing water pipe is made of rubber, its thickness should be over 10mm.

7.2 If the insulating layer of refrigerant pipe is rubber pad insulation pipe, its thickness should be over 15mm, if the material of insulation layer is fiberglass, the thickness should be over 20mm.

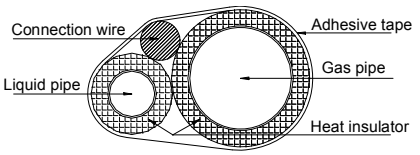
7.3 To do the refrigerant pipe insulation work , the straight pipe should be done firstly, for the welding joint and the others that can be done after checking work, then finish all the insulation work.

7.4 The gas pipe and liquid pipe should be treated separately

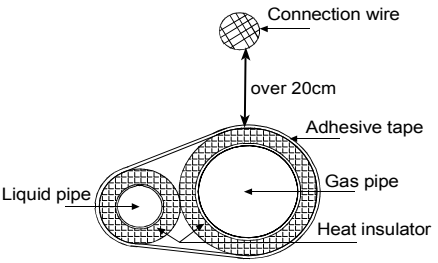
7.5 The joint of insulating material should be glued to ensure there is no gap, wrap insulating material with adhesive tape, be not too tight and no sense of looseness.

7.6 The pipe inside the ceiling needs not to be wrapped if unnecessary, only stick the control cable with adhesive tape on the outer of insulating layer, for R410A system, please refer to the below picture:

R22 system:



R410A system:



8 Electric wiring

Air conditioner electric wiring should comply with the relative articles in GB5024-96.

8.1 Electric wiring work should be done by the qualified electricians.

8.2 Indoor and outdoor unit should be grounded reliably, grounding resistance should be less than 4Ω.

8.3 All the power cables and signal cables should pass through the wire tube or wire groove. Power cable and signal wire should not go through the same wire tube.

8.4 All cables must be copper core. Power cable and signal wire shall keep a certain distance (about 200mm), or be laid on both sides of refrigerant pipe , do not wind each other, fixing by this way can avoid communication disturbance.

8.5 Power supply for indoor and outdoor can be different and supply the power separately, but the indoor units connected with one outdoor should use one power supply.

8.6The circuit breaker should be installed for every outdoor unit, the

breaker's capacity should be 1.5 times of outdoor's max. running current

8.7 Indoor unit of the same outdoor system should use one power supply.

8.8 The recommended power cable is BV.BVR and V V cable ,do not use YZW cable.

8.9 Signal wire must be double core shielded wire(1.5mm^2) ,shielded layer should be connected continuously on indoor unit and be insulated with adhesive tape, grounded at single point on outdoor unit. Communication wire is forbidden as O type.

8.10 When power cable over 10mm^2 is connected to the terminal block, the cable terminal should be O type.

8.11 All the electric wires should not touch the refrigerant pipe directly, because the insulating layer will get aging due to heat , then it will leak and cause injury accident.

8.12 Power cable of 10HP outdoor unit should not be under 6mm^2.

8.13 Power cable of indoor unit should not be under 2.5 mm^2

8.14The wire between wired controller and indoor unit is 0.5 mm^{2}RVV, polar connection. For the salve units in group control, only connect the terminal B, C.

8.15 Central control wire is 1.5 mm^2 2-core shielded wire. Terminal P, Q of communication bus line between indoor and outdoor is no polarity.

9 Pipe cleaning work

Blow nitrogen is one way to clean impurity from pipe

Note: If you did not blow nitrogen when welding pipe , this method can not clean the oxid on the pipe wall .

Connect the nitrogen with unit system via pressure relief valve, adjust the valve to 5Kg/cm^2, supply nitrogen to system, seal the pipe end by hand or others , when the pipe pressure getting too high to be sealed , open the pipe quickly, repeat this procedure four or five times, the impurity can be cleaned basically.

9.1 For MRV system , because the pipe is too thick , the cleaning work should be carried segment by segment.

9.2 When cleaning the pipe , please ensure the pressure is high enough and clean for some times, if the impurity can not be cleaned completely, the filter in system and electric expansion valve will be clogged.

9.3 When opening the pipe please make sure to do it safely, prevent the impurity blew out from hurting people.

10 Leakage test

Connect nitrogen tank, pressure relief gauge, gauge manifold and refrigerant system in turn, charge nitrogen to system both on high and low pressure sides at same time, notice items:

10.1 Please must test system by nitrogen , do not use any other gas.

10.2 It is better to do the leakage test before connecting with outdoor unit, because the stop valve of outdoor unit may leak due to welding or outside force, then nitrogen will go into outdoor circle system.

10.3 Apply pressure both on gas and liquid sides at same time, pressure charging work can be done by two or three steps , at first apply a lower pressure to system, if no big leakage be found ,then apply a higher pressure.

10.4 Check the welded joint and flared joint with suds one by one. If leaks, air bubble will come out.

10.5 After leakage test, place the unit for 24 hours, if the pressure does not go down, there is no leakage.(Environment temperature will affect system pressure, generally , when the environment temperature changes 1 degree, system pressure will change 0.1 Kg/cm^2.)

10.6 If the system pressure goes down over 0.3 Kg/cm^2 within 24 hours, and no obvious leakage position can be found ,please check again segment by segment , reduce the checking area.

10.7 After finding out the leakage and execute relative treatment , please

apply the pressure again and observe for another 24 hours.

11 Evacuation

Connect the vacuum and refrigerant system via gauge manifold ,draw out the air and moisture with vacuum pump from the pipe , then make system get vacuum and dry.

Important points:

11.1 Please must use vacuum pump to evacuate system, forbid to use refrigerant to pile out the air from system.

11.2 The propositional vacuum pump is 40L/min, vacuum pointer should be below -755mmHg.

11.3 It is better to operate evacuation treatment repeatedly , after 2 hours' evacuation, charge some refrigerant to system , then evacuate for another 2 hours, repeat to do it 2 or 3 times, the system can reach a high vacuum level.

11.4 The vacuum should be maintained often to ensure it can reach high vacuum level.

11.5 Because the electric expansion valve may be close, evacuation work should be done both from high pressure and low pressure sides.

12 Additional Refrigerant Charging

When the unit out of factory ,refrigerant charging amount is exclude the refrigerant in the pipe , so after installation the piping, additional refrigerant should be charged on site.

12.1 Connect the refrigerant tank, gauge manifold to high pressure and low pressure stop valve via flexible hose in turn, open tank valve and pile out the air in the pipe.

12.2 Additional charging amount should accord to the diameter and the length of liquid pipe , final additional charging amount should be marked on the outdoor nameplate.

12.3 Please must charge the additional refrigerant while weighing, forbid to estimate according to current or voltage.

12.4 Additional refrigerant should be charged after evacuation or when the system running in cooling mode.

12.5 Refrigerant should be charged into liquid pipe as liquid state ,if the system is running in cooling mode , refrigerant should be gas state, or compressor may be damaged.

13 Trial operation

After testing leakage, evacuation and charging additional refrigerant , before being electrified , please check the following items:

13.1 The capacity of indoor and outdoor without load, and the specs of circuit breaker. Check if power cable is in compliance with the provision.

13.2 If the power cable is fixed reliably, grounding resistance should not be over 4Ω

13.3 Check with 500V ohmmeter if the insulated resistor to ground is over 1MΩ.

13.4 Measure the voltage of power supply with multimeter and check if it is within ±10% of rating voltage.

13.5 Check if the signal wire system is connected correctly according of wiring diagram, if the shielded wire is grounded , if the diameter and color match with the wiring diagram.

13.6 Check if the refrigerant piping is connected correctly according to drawings, if the pipe diameter and branch pipe type are correct .

13.7 If the drainage testing for condensing drainage pipe has been done.

13.8 If the high pressure stop valve, low pressure stop valve and oil equalized valve are open.

After checking over all above items, supply power to air conditioner, after the compressor pre-heats for over 12 hours , system could start to run.

13.8.1 Make the system run both in cooling and heating mode

13.8.2 Record the current , voltage, temperature and frequency after system runs for 30 minutes.

13.8.3 If the failure code displays, then analyse and maintain the problem according to relative technical data, also please record the treatment and serial number of the unit.

13.8.4 Indoor unit can set address automatically and manually, here we recommend the manual way.

14 Transfer to user

14.1Transfer relative documents to the user, including operation manual, drawing list etc.

14.2 Record refrigerant piping length and additional refrigerant charging amount on the inside of maintenance plate as reference for maintenance.

14.3 Make the record in duplicate, sign it by both sides and each side shall keep one.

14.4 Bind up all the drawings and tables (include unit number of each room, electric wiring diagram, system drawing), transfer it to the user to keep it well, also hand it over to the manager.

.14.5Leave the address and telephone number to user for service.

Part 2 Commissioning and Maintenance for R22 System

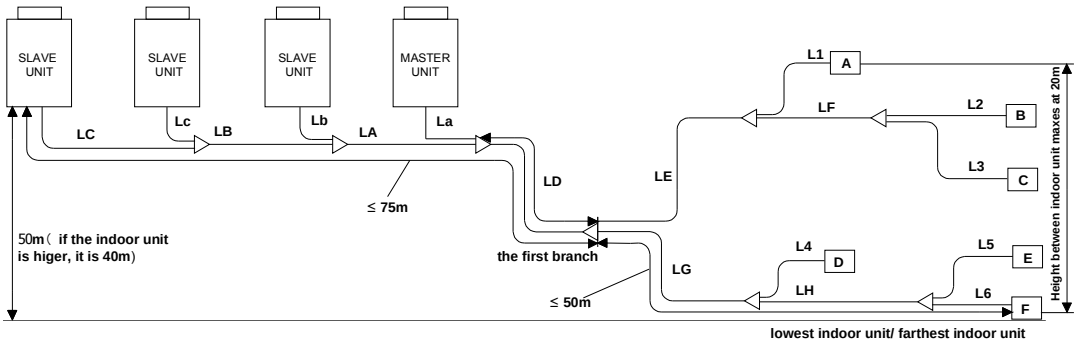
1. Working preparation before debugging

1.1 Outdoor checking

1.1.1 Refrigerant pipe length and drop height checking

Allowable refrigerant pipe length and height

Refrigerant pipe length(one way)		Indoor unit, Max. 100m
Piping length between outdoor and the first branch(main pipe)		Max. 70m
Piping length after the first branch		Max. 50m
Piping length between outdoor units		Less than 5m to the first gather pipe
Height difference between IU &OU	Outdoor is higher	Max.50m
	Indoor is higher	Max.40m
Height difference between outdoor units(the same system)		In horizon
Height difference between indoor units		Max.20m
Voltage	Voltage range	Rated voltage ±10%
	Voltage decrease when starting	Rated voltage ±15%
	Unbalance among phases	Rated voltage ±3%



Refrigerant piping length and height difference

Items	Max.piping(m)	
Total piping length	250	La+Lb+Lc+LA+LB+LC+LD+LE+LF+LG+LH+L1+L2+L3+L4+L5+L6
Max. piping length	Actual(100)	LA+LB+LC+LD+ LG+LH+ L6
	Equivalent(125)	
Max.piping length after the first branch	50	LG+LH+ L6
Main piping actual length	70	LD
Height difference between indoor units	20	------
Height difference between outdoor units	0	------

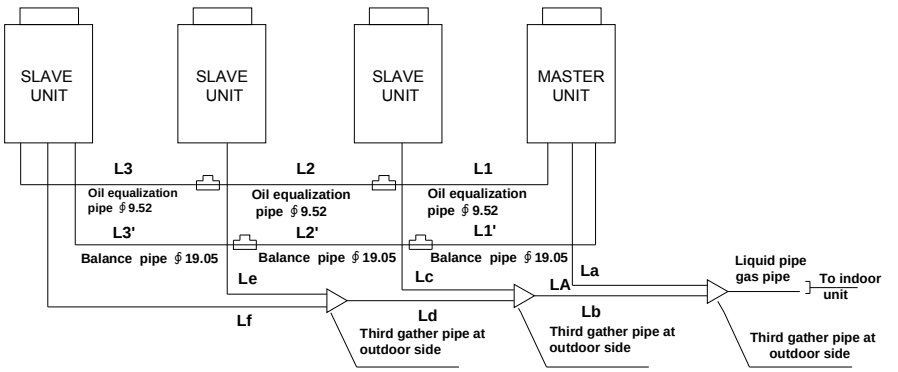
① Oil equalization pipe (L1～L3)：L1≤5m　L2≤5m　L3≤5m；

② Balance pipe (L1'～L3')：L1'≤5m　L2'≤5m　L3'≤5m

③ Gas pipe ,liquid pipe：La+Lb≤5m　Lb＋Lc≤5m　Lb＋Ld＋Le≤5m　Lb＋Ld+Lf

1.1.2 Outdoor pipe connection explanation

（take four outdoors in combination as an example）



1.1.3 Outdoor pipe size checking

Model	AU78NMTAHA	AU96NMTAHA	AV16NMTAHA	AV18NMTAHA	AV20NMTAHA	AV24NMTAHA	AV26NMTAHA
Capacity（HP）	8	10	16	18	20	24	26
Gas pipe (mm)	Φ28.58	Φ28.58	Φ38.1(Φ28.58×2)	Φ38.1(Φ28.58×2)	Φ38.1(Φ28.58×2)	Φ38.1(Φ28.58×3)	Φ44.5(Φ28.58×3)
Liquid pipe (mm)	Φ12.7	Φ12.7	Φ15.88(Φ12. 7×2)	Φ15.88(Φ12. 7×2)	Φ19.05(Φ12. 7×2)	Φ19.05(Φ12.7×3)	Φ22.22(Φ12. 7×3)
Oil equalization pipe (mm)	——	——	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52
Balance pipe（mm）	——	——	Φ19.05	Φ19.05	Φ19.05	Φ19.05	Φ19.05

Model	AV28NMTAHA	AV30NMTAHA	AV32NMTAHA	AV34NMTAHA	AV36NMTAHA	AV38NMTAHA	AV40NMTAHA
Capacity（HP）	28	30	32	34	36	38	40
Gas pipe (mm)	Φ44.5 (Φ28.58×3)	Φ44.5 (Φ28.58×3)	Φ44.5 (Φ28.58×4)	Φ44.5 (Φ28.58×4)	Φ44.5(Φ28.58×4)	Φ50.8 (Φ28.58×4)	Φ50.8 (Φ28.58×4)
Liquid pipe (mm)	Φ22.22 (Φ12.7×3)	Φ22.22 (Φ12.7×3)	Φ22.22 (Φ12.7×4)	Φ22.22 (Φ12.7×4)	Φ22.22 (Φ12.7×4)	Φ25.4(Φ12.7×4)	Φ25.4(Φ12.7×4)
Oil equalization pipe (mm)	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52
Balance pipe（mm）	Φ19.05	Φ19.05	Φ19.05	Φ19.05	Φ19.05	Φ19.05	Φ19.05

1.1.4 Additional refrigerant charging standard: refer to the following table, and fill the refrigerant charging volume in the " additional refrigerant charging" list which on the front plate of outdoor unit.

1.1.4.1 MRV□ refrigerant charging standard

A. Refrigerant charging volume when out of factory

Outdoor model	AU78NMTAHA	AU96NMTAHA	AU78NMTAAA	AU96NMTAAA
Standard charging	13Kg	13Kg	10Kg	10Kg

volume				

B． Additional refrigerant charging volume on site

Additional charging standard of liquid pipe

Liquid pipe Dia.	25.4	22.22	19.05	15.88	12.7	9.52	6.35
Additional charging volume per meter （kg/m）	0.53	0.4	0.28	0.2	0.12	0.06	0.03

Calculating method of additional refrigerant charging volume

- Charging volume of refrigerant pipe （Additional charging volume）:

length of liquid pipe× additional charging amount per meter liquid pipe

- Additional charging amount =（L1×0.53）+（L2×0.4）+（L3×0.28）+（L4×0.2）+（L5×0.12）+（L6×0.06）+（L7×0.03）

L1: length of dia.25.4 liquid pipe

L2: length of dia.22.22 liquid pipe

L3: length of dia.19.05 liquid pipe

L4: length of dia.15.88 liquid pipe

L5: length of dia.12.7 liquid pipe

L6: length of dia.9.52 liquid pipe

L7: length of dia.6.35 liquid pipe

Remark: A, Charging volume when out of factory excludes refrigerant in the pipe.

B, Actual additional charging amount should be within the figure ±5％，which is calculated additional charging amount according to the pipe length

1.1.4.2 Max. refrigerant charging volume of system

Capacity	8HP/10HP	16/18/20HP	24/26/28/30HP	32/34/36/38/40HP
Volume（KG)	26	50	74	98

Remark: Max. refrigerant charging volume of system is standard refrigerant charging amount when out of factory plus additional refrigerant charging amount on site of all the units in whole system

1.1.5 Unit No. setting for slave units

Slave units No. Setting				
1	2	3	4	Unit No.（Digital tube display）
ON	ON	ON/OFF	ON/OFF	1
ON	OFF	ON	ON/OFF	2
ON	OFF	OFF	ON/OFF	3
OFF	ON/OFF	ON/OFF	ON/OFF	4

After slave unit being electrified, it will show slave unit No. and capacity at a cycle of 10 seconds within 3 minutes, 8HP unit, it displays “8”; 10 HP unit, it displays “10”., 3 minutes later, it only shows unit No.

1.1.6 Power cable and signal wire confirmation: The signal wire shielded

layer of all indoors and outdoors should be connected together, and be grounded on outdoor at single point, and be grounded on outdoor at single point.

1.2 Indoor checking

1.2.1 Indoor unit pipe size checking

Model	22~45	56~90	112~140
Gas pipe (mm)	Φ12.7	Φ15.88	Φ15.88
Liquid pipe(mm)	Φ6.35	Φ9.52	Φ9.52

1.2.2 Power cable and signal wire confirmation: Indoor units of one system use one power supply, The signal wire shielded layer of all indoors and outdoors should be connected together, and be grounded on outdoor at single point.

1.2.3 Select control mode

Indoor PCB	Wired control master unit	Wired control slave unit	Remote control	Remark
CN23	Short connection （Set when out of factory）	Disconnection	Dis connection	1,Communication addresses between wired control master unite and wired control slave units are different from each other. 2, If there is a need of central control, all the central control addresses of indoors in one group are the same (central control address of slave unit is null.), central control addresses of indoors in different groups are different from each other.
CN30	Short connection （Set when out of factory）	Short connection （Set when out of factory）	Dis connection	
CN21	Vacancy （Set when out of factory）	Vacancy（Set when out of factory）	To remote receiver	
SW08-6	ON （Set when out of factory）	ON （Set when out of factory）	OFF	
SW01	Set on 0 （Set when out of factory）	1～15（SW01 of slave units in one group is different from each other）	Default at 0	
Signal terminal block	A,B,C to wired controller	B,C to wired controller	A,B,C Vacancy	

1.2.4 Set indoor communication address, central control address and slave unit address(model, No., position) ,and fill all these information in the “additional refrigerant charging list” on front plate of the master unit.

1.2.4.1 Setting method of communication address between indoor and outdoor

No.	Setting mode	Setting method	Remark
1	unit No. setting automatically	Dip switch SW02 and SW03 on indoor PCB are all at “off” (down), that also is the setting state when out of factory.	setting state when out of factory
2	unit No. setting by hand	1. “1” and “2” of SW03 at “ON” (up) 2. details about unit No. and dipswitch state please refer to the following table	setting on site

3	unit No. setting by wired controller	1. “1” of SW03 at “ON” (up) 2. press “filter reset” button for 5 seconds then enter system address setting mode, choose indoor address by press ”TEMP＋/－” button. 3. Temp. display area displays: system address＋XX, then press ”TEMP＋/－” button, the unit No. will change within 00~3F(00 is No 1 unit, 3F is No.64 unit) ,original value is 00. 4. after the No. of unit is chosen, press “SET” button to save all the settings. If you press the other buttons, or no any actions within 15 seconds, then the setting will exit automatically and system will keep the setting of last time.	setting on site

Communication address between indoor and outdoor (setting by hand)

Unit No. setting by hand
(dip switch position of SW03 is in correspondence with the marks on PCB)

SW03								Indoor address	SW03								Indoor address
1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	
1	1	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	33
		0	0	0	0	0	1	2			1	0	0	0	0	1	34
		0	0	0	0	1	0	3			1	0	0	0	1	0	35
		0	0	0	0	1	1	4			1	0	0	0	1	1	36
		0	0	0	1	0	0	5			1	0	0	1	0	0	37
		0	0	0	1	0	1	6			1	0	0	1	0	1	38
		0	0	0	1	1	0	7			1	0	0	1	1	0	39
		0	0	0	1	1	1	8			1	0	0	1	1	1	40

		0	0	1	0	0	0	9			1	0	1	0	0	0	41
		0	0	1	0	0	1	10			1	0	1	0	0	1	42
		0	0	1	0	1	0	11			1	0	1	0	1	0	43
		0	0	1	0	1	1	12			1	0	1	0	1	1	44
		0	0	1	1	0	0	13			1	0	1	1	0	0	45
		0	0	1	1	0	1	14			1	0	1	1	0	1	46
		0	0	1	1	1	0	15			1	0	1	1	1	0	47
		0	0	1	1	1	1	16			1	0	1	1	1	1	48

Unit No. setting by hand
(dip switch position of SW03 is in correspondence with the marks on PCB)

SW03								Indoor address	SW03								Indoor address
1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	
1	1	0	1	0	0	0	0	17	1	1	1	1	0	0	0	0	49
		0	1	0	0	0	1	18			1	1	0	0	0	1	50
		0	1	0	0	1	0	19			1	1	0	0	1	0	51
		0	1	0	0	1	1	20			1	1	0	0	1	1	52
		0	1	0	1	0	0	21			1	1	0	1	0	0	53
		0	1	0	1	0	1	22			1	1	0	1	0	1	54
		0	1	0	1	1	0	23			1	1	0	1	1	0	55
		0	1	0	1	1	1	24			1	1	0	1	1	1	56
		0	1	1	0	0	0	25			1	1	1	0	0	0	57
		0	1	1	0	0	1	26			1	1	1	0	0	1	58
		0	1	1	0	1	0	27			1	1	1	0	1	0	59
		0	1	1	0	1	1	28			1	1	1	0	1	1	60
		0	1	1	1	0	0	29			1	1	1	1	0	0	61
		0	1	1	1	0	1	30			1	1	1	1	0	1	62
		0	1	1	1	1	0	31			1	1	1	1	1	0	63
		0	1	1	1	1	1	32			1	1	1	1	1	1	64

1.2.4.2 Indoor central control address setting (necessary for the system with central control or BMS control)

No.	setting mode	setting method	remark
1	central controller address setting by hand	1. "1" of SW02 on indoor PCB at "ON" (up) 2. details about address and dipswitch position please refer to the following table.	set on site
2	central controller address setting by wired controller	1. SW02 on indoor PCB are all at "OFF" (down), that also is the setting state when out of factory. 2. press "filter reset" button for 10 seconds, then enter central control setting mode, choose indoor central address by press "TEMP ＋/－" button. 3. temp. display area displays: system address ＋XX, then press "TEMP ＋/－" button, unit No. will change within 00~7F, (00 is No. 1, 7F is No. 128"), original value is 00. 4. after the No. of units is chosen, press "SET" button to save all the setting. If you press the other buttons, or no any actions within 15 seconds, then the setting will exit automatically and system will keep the last time setting.	set on site

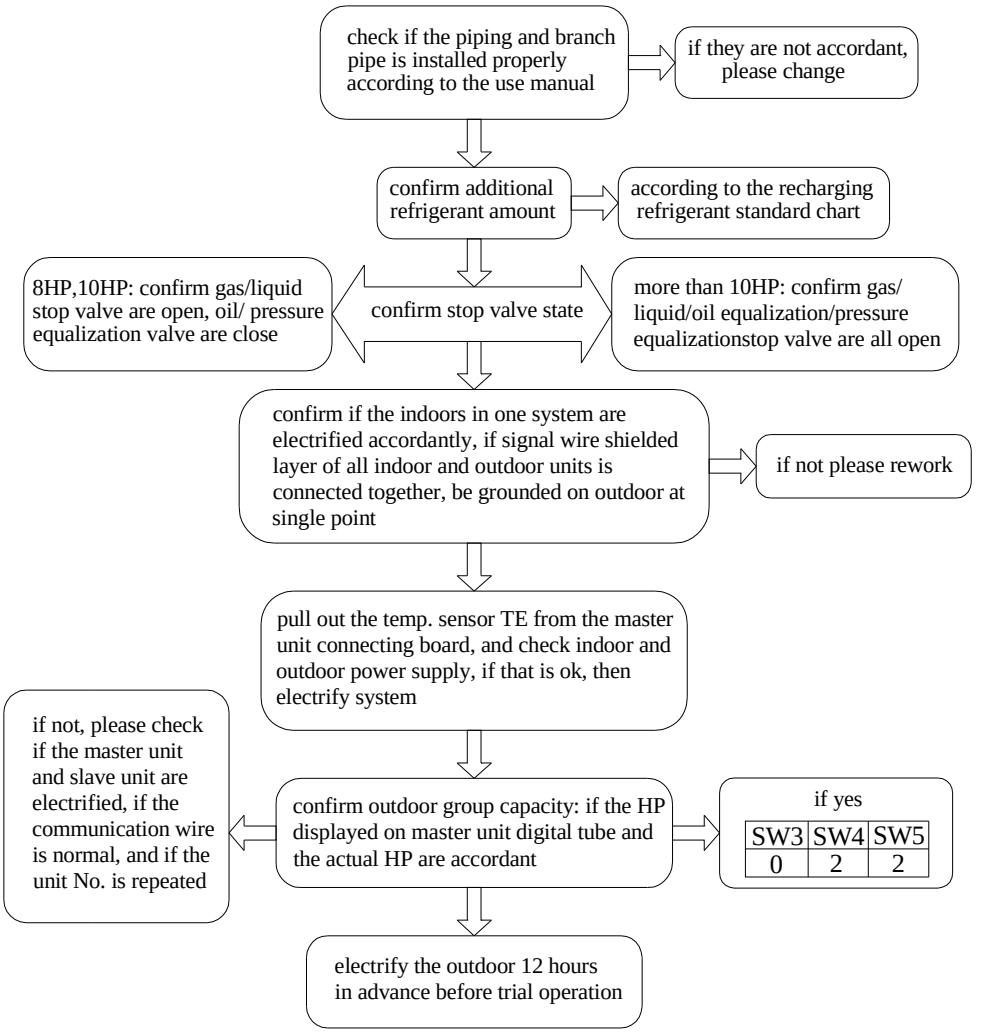
Central controller address setting table

SW02								central controller address	SW02								central controller address
1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	
1	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	33
	0	0	0	0	0	0	1	2		0	1	0	0	0	0	1	34
	0	0	0	0	0	1	0	3		0	1	0	0	0	1	0	35
	0	0	0	0	0	1	1	4		0	1	0	0	0	1	1	36
	0	0	0	0	1	0	0	5		0	1	0	0	1	0	0	37
	0	0	0	0	1	0	1	6		0	1	0	0	1	0	1	38
	0	0	0	0	1	1	0	7		0	1	0	0	1	1	0	39
	0	0	0	0	1	1	1	8		0	1	0	0	1	1	1	40
	0	0	0	1	0	0	0	9		0	1	0	1	0	0	0	41
	0	0	0	1	0	0	1	10		0	1	0	1	0	0	1	42
	0	0	0	1	0	1	0	11		0	1	0	1	0	1	0	43
	0	0	0	1	0	1	1	12		0	1	0	1	0	1	1	44
	0	0	0	1	1	0	0	13		0	1	0	1	1	0	0	45
	0	0	0	1	1	0	1	14		0	1	0	1	1	0	1	46
	0	0	0	1	1	1	0	15		0	1	0	1	1	1	0	47
	0	0	0	1	1	1	1	16		0	1	0	1	1	1	1	48

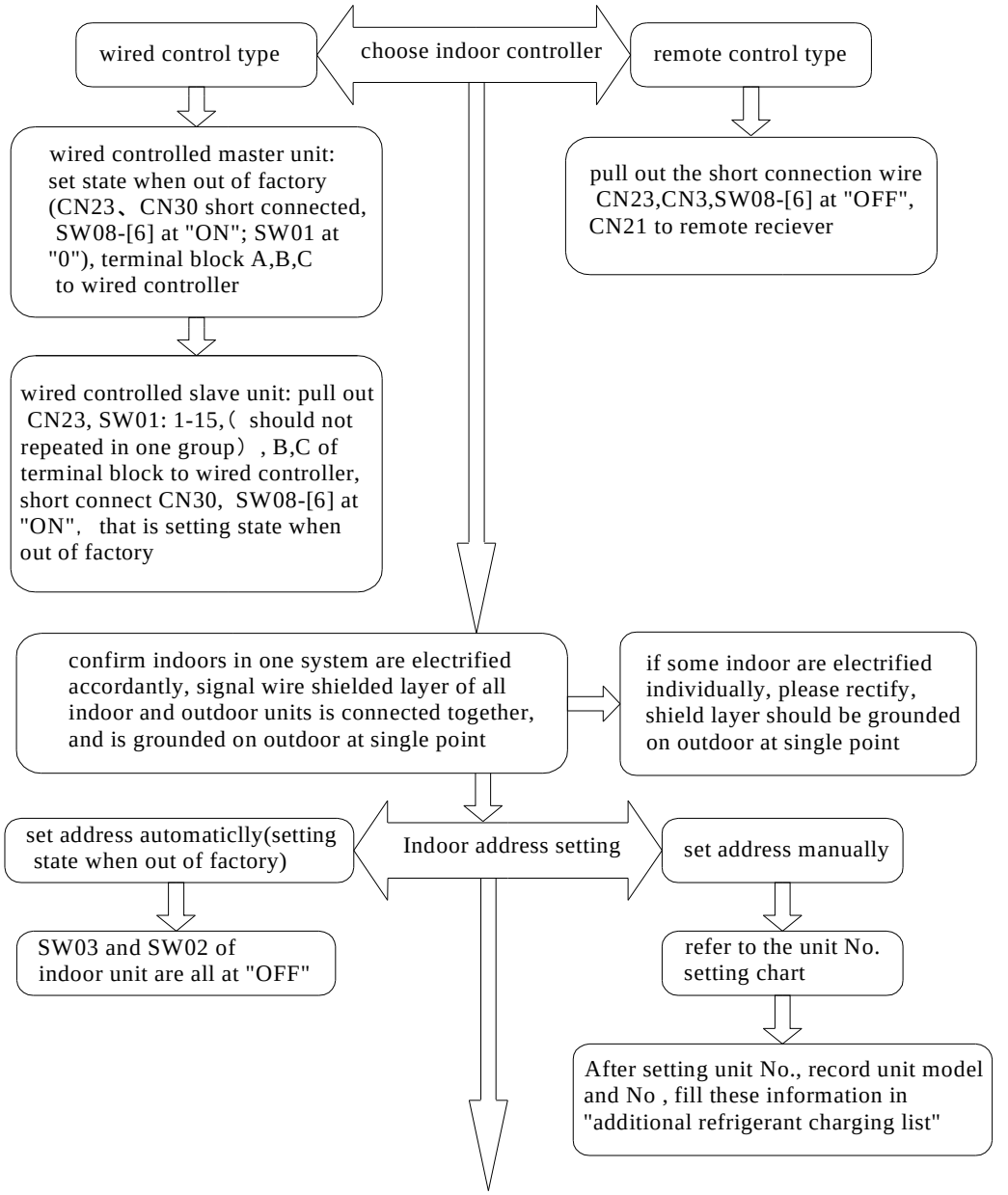
Central controller address setting table																		
SW02								central controller address	SW02								central controller address
1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	
1	0	0	1	0	0	0	0	17	1	0	1	1	0	0	0	0	49
	0	0	1	0	0	0	1	18		0	1	1	0	0	0	1	50
	0	0	1	0	0	1	0	19		0	1	1	0	0	1	0	51
	0	0	1	0	0	1	1	20		0	1	1	0	0	1	1	52
	0	0	1	0	1	0	0	21		0	1	1	0	1	0	0	53
	0	0	1	0	1	0	1	22		0	1	1	0	1	0	1	54
	0	0	1	0	1	1	0	23		0	1	1	0	1	1	0	55
	0	0	1	0	1	1	1	24		0	1	1	0	1	1	1	56
	0	0	1	1	0	0	0	25		0	1	1	1	0	0	0	57
	0	0	1	1	0	0	1	26		0	1	1	1	0	0	1	58
	0	0	1	1	0	1	0	27		0	1	1	1	0	1	0	59
	0	0	1	1	0	1	1	28		0	1	1	1	0	1	1	60
	0	0	1	1	1	0	0	29		0	1	1	1	1	0	0	61
	0	0	1	1	1	0	1	30		0	1	1	1	1	0	1	62
	0	0	1	1	1	1	0	31		0	1	1	1	1	1	0	63
	0	0	1	1	1	1	1	32		0	1	1	1	1	1	1	64

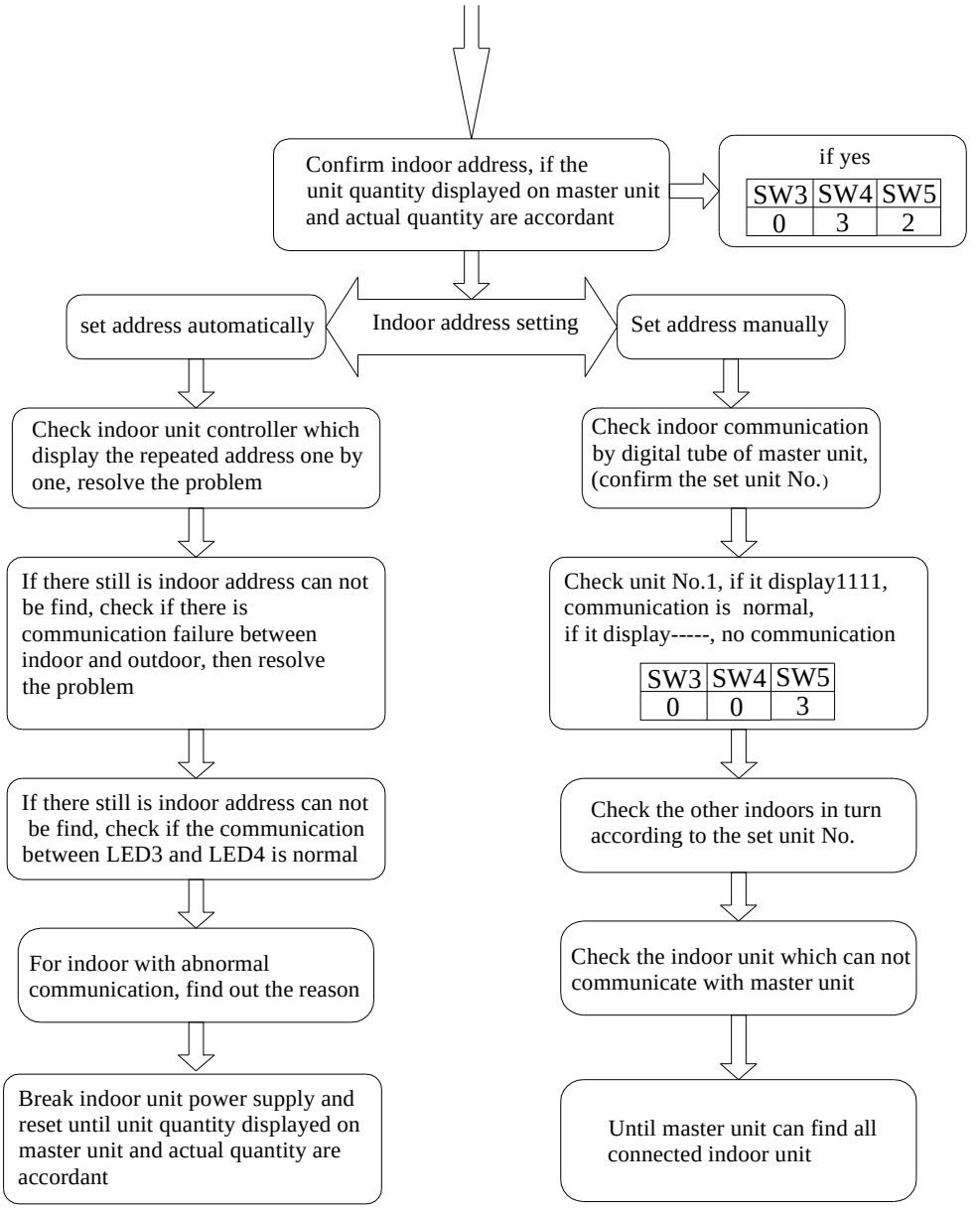
1.2.4.3Inspection flowchart before commissioning

1.2.4.3.1 Outdoor



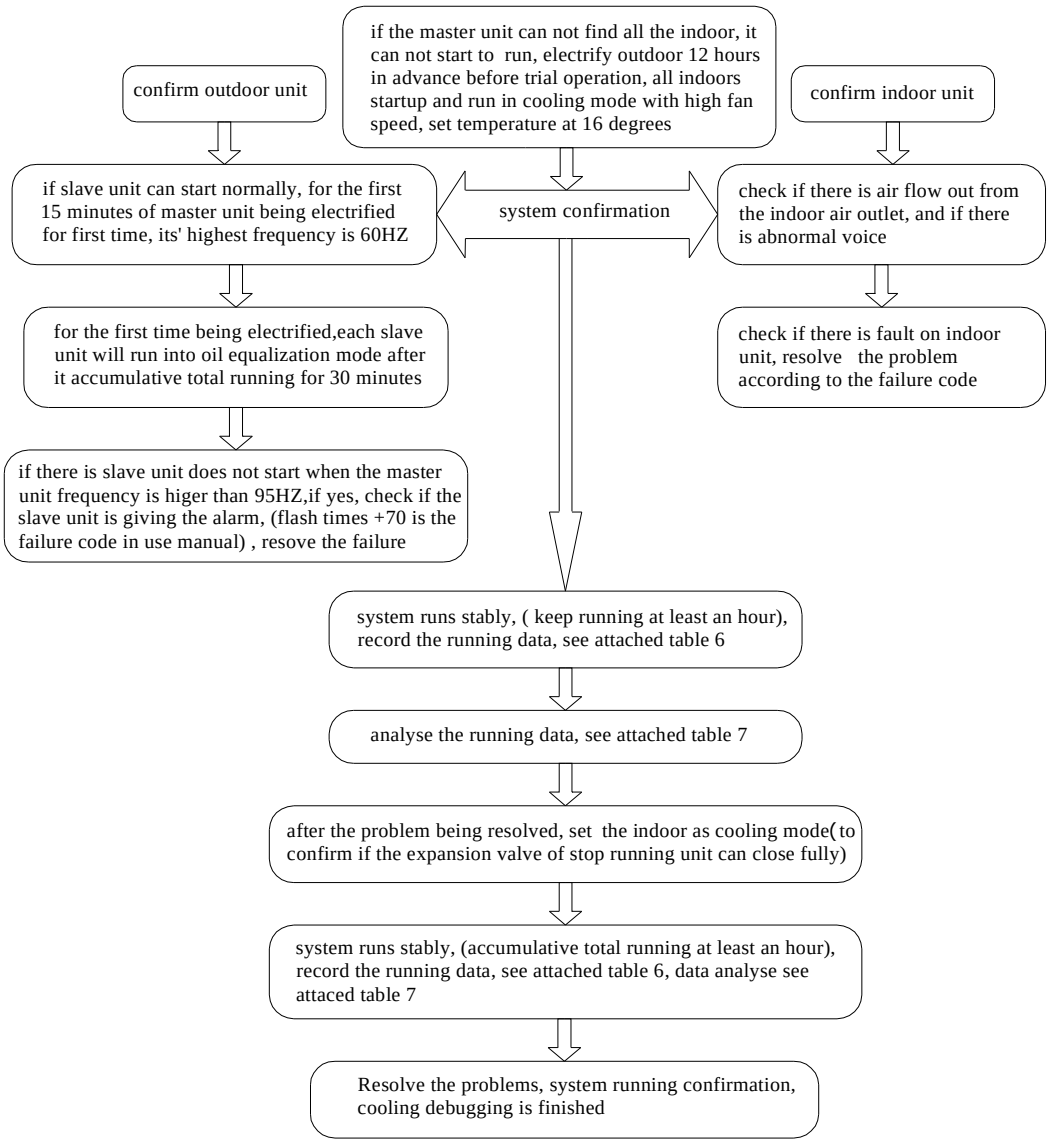
1.2.4.3.2 Indoor




Confirm indoor address, if the unit quantity displayed on master unit and actual quantity are accordant
if yes
SW3 SW4 SW5
0 3 2
Indoor address setting
set address automatically
Set address manually
Check indoor unit controller which display the repeated address one by one, resolve the problem
If there still is indoor address can not be find, check if there is communication failure between indoor and outdoor, then resolve the problem
If there still is indoor address can not be find, check if the communication between LED3 and LED4 is normal
For indoor with abnormal communication, find out the reason
Break indoor unit power supply and reset until unit quantity displayed on master unit and actual quantity are accordant
Check indoor communication by digital tube of master unit, (confirm the set unit No.)
Check unit No.1, if it display1111, communication is normal, if it display-----, no communication
SW3 SW4 SW5
0 0 3
Check the other indoors in turn according to the set unit No.
Check the indoor unit which can not communicate with master unit
Until master unit can find all connected indoor unit

2. Cooling commissioning

2.1 Commissioning flowchart



2.2 Outdoor checking

No.	Parts	Items	Estimation standard
1	Solenoid valve	If there is wrong installation of coil or valve body, electrify the unit and check if the valve body or the connected pipe is blocked, or if there is plenty of refrigerant enter compressor due to the valve body can not be closed	SV1： 1. 6A unloading valve,3-core, red（discharging from high pressure side of oil segregator to low pressure side of gas segregator），after system being electrified, pipe become hot, under the situation that unloading valve be close for long time, check the temp. behind unloading valve, if the temp. is close to ambient temp., the valve is normal, if the temp. is too high, the valve leaks 2. basic control before compressor startup, unloading valve open, after compressor startup, unloading valve close Toil≤Ps＋15ºC and Td≥90 ºC----open; Toil≥Ps＋20ºC or Td<90ºC------close in heating mode: Ps≤1.6KG---open, Ps>2.5KG---close; in cooling mode: Ps≤0.8KG---open, Ps>1.2KG----close
			SV3： 1. 2A spraying valve,3-core, white（from high pressure accumulator to compressor suction pipe），it will get cool after being electrified; under the situation that spraying valve be close for long time, check the temp. behind spraying capillary, if the temp. is close to ambient temp, the valve is normal, if the temp. is rath.er low then the valve leaks 2. basic control in cooling mode,TD>105ºC—open , TD<100ºC----close; in heating mose,TD>109ºC---open, TD<105ºC---close Toil≥70ºC---open , Toil≤65ºC---close

No.	Parts	Items	Estimation standard
1	Solenoid valve	If there is wrong installation of coil or valve body, electrify the unit and check if the valve body or the connected pipe is blocked, or if there is plenty of refrigerant enter compressor due to the valve body can not be closed	SV4: 2A, 4-core, yellow (from air discharging pipe to the top of compressor); SV5: 2A, 4-core, yellow (from the top of compressor to air suction pipe）; when SV4 open and SV5 close, compressor runs with full load, when SV4 close SV5 open, compressor runs with half load, current of full load running is over than running with half load
			master unit SV6： 1. two 6A valve body, 4-core, blue(at the balance pipe of gas-liquid separator) 2. basic control: close during cooling, open during normal heating, close during oil equalization in heating
			master unit SV7: 2A valve body, 3-core, yellow wire with white terminals（oil return capillary of gas segregator ） slave unit SV7: 2A, 4-core, blue(oil return capillary of gas segregator） In operation, compressor will run; in unit stop, compressor will stop too. In running, capillary temperature behind the valve should be lower than ambient temp., or the capillary is blocked or the valve does not open

No.	Parts	Items	Estimation standard

2	one-way valve	in heating mode, the one-way valve which paralleled with outdoor EEV leaks, so plenty of liquid refrigerant enters gas-liquid segregator	1. Connect the pressure gauge at low pressure checking joint of slave unit. low pressure of slave unit should be the same with master unit basically 2. If the temperature at the back of one-way valve is low all the time, there is leakage.
3	one-way valve	discharging one-way valve leaks, then plenty of refrigerant enters compressor	after slave unit stop running(the other unit still running) , check if there is leakage
4	EEV	in heating mode, outdoor EEV can not close fully (action is abnormal or wire sequence is wrong, wire is burnt out) , then plenty of liquid refrigerant enters gas-liquid segregator	1.connect pressure gauge at the low pressure checking joint of lave unit. low pressure of slave unit should be the same with master unit basically 2. If the temperature at the back of one-way valve is low all the time, there is leakage.
5	four-way valve	four-way valve leakage or in turbulence, then plenty of refrigerant enter gas-liquid segregator	1.during slave unit stop running, check the three ways' temp. of four-way valve: normally only the temp. of the way to gas stop valve is rather high, and temp. of the other two ways is rather low 2.after slave unit stops running（other unit still running in heating mode）, the low pressure should not change, if the four-way valve in turbulence then it will go up quickly

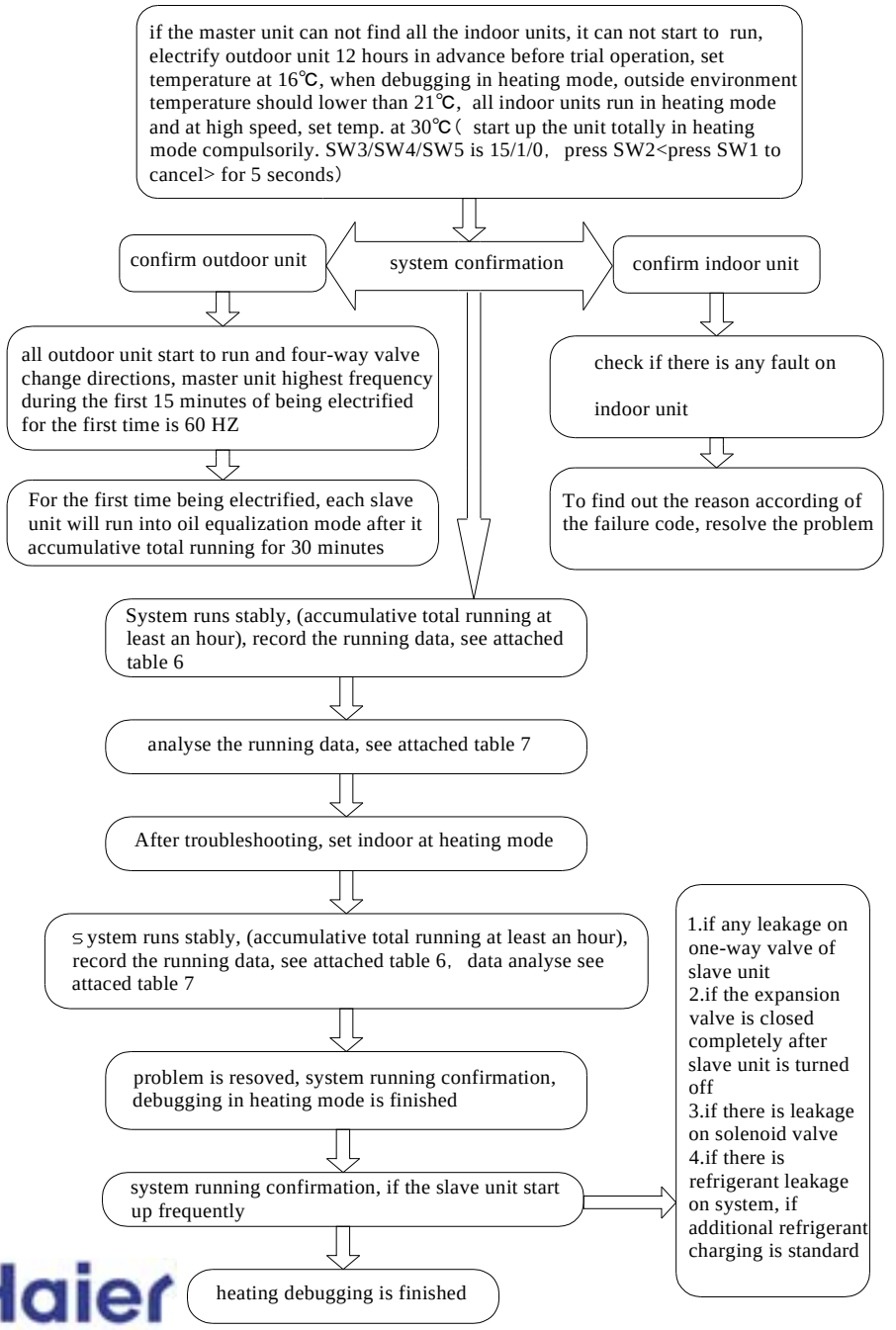
No.	Parts	Items	Estimation standard
6	high pressure oil return capillary	the high pressure capillary form oil segregator is blocked by weld	during compressor running, temp. after oil return capillary is rather high (higher than ambient temp.)
7	spraying capillary	Spraying and oil return capillary from accumulator to suction pipe is blocked by weld	open SV3 to check if the capillary temp. is going down
8	electric heater	if it can work normally	1. start to heat after being electrified 2. if Toil≥40ºC, close; if Toil≤35ºC , startup
9	sensor	check sensor position	TD discharging temp. sensor , 3-core, red
10			TOIL oil temp. sensor, 2-core, black
11			TA ambient temp. sensor, 3-core, yellow
12			TS suction temp. sensor, 2-core, blue
13			TE defrosting temp. sensor, 2-core, green
14	pipe assembly	If there is strong vibration during running	check if the pipe is in touch and rub each other
15	fan and motor	If the voice is normal during running	check if the motor or the fan fault
Remark：When welding, cool the valve against being damaged			

2.3 Indoor checking

No.	Parts	Items	Estimation standard
1	Electronic expansion valve	If the EEV has no response, or can not close fully, can not open	When all indoor in cooling mode, EEV all open to 480 or close to min, check the dip switch if SW08-7 is “off”
2	sensor	if the coil sensor is inserted conversely or with wrong resistance value, select to test ambient temp. by wired controller or by indoor	resistance value of indoor gas TC1(three cores, green), liquid pipe TC2 (3 cores, black) is 10KΩ (25□)
3	fan	When the unit is running, if the voice is normal	Check and resolve the problem
4	PCB	check if the communication is normal, and if the wire is connected reliably	confirm indoors in one system are electrified accordantly, signal wire shielded layer of all indoor and outdoor units is connected together, and grounding on outdoor at single point
4	Air duct	If the flap can open and close normally, if the duct unit has air return duct	Check and resolve the problem

3. Heating commissioning

3.1 Commissioning flowchart



3.2 Indoor and outdoor unit running checking (refer to cooling

commissioning)

4 Familiar trouble during commissioning and shooting method

4.1 Indoor trouble diagnose and trouble shooting

No.	trouble exhibition	trouble diagnose	trouble shooting	remark (trouble diagnose method)
1	indoor does not cool, or cooling effect is not good	indoor gas pipe TC1（three core, green）, liquid pipe TC2（three core, black）sensor are inserted conversely, pushed off or with wrong resistance value	check sensor position, resistance value(temp. 25□, TC1/TC2 is 10KΩ)	observe the changing trend of indoor TC1/TC2/EEV by dipswitch: EEV open angle become big, TC1 become low, open angle become small, TC2 become high
		phase sequence of EEV is converse, SW08-7 is ON	change SW08-7 to OFF	observe indoor TC1/TC2/EEV by dipswitch, after system become stable, EEV is displayed open fully, when the unit startup, you can not hear any voice about refrigerant flow
		evaporator is blocked by weld or dirt	valve action is normal but no effect, collect the refrigerant and charge nitrogen to check and clean the sundries	

No.	trouble exhibition	trouble diagnose	trouble shooting	remark (trouble diagnose method)
1	indoor does not cool, or cooling effect is not good	system lack of refrigerant	refer to the standard, calculate the amount according of pipe length, supply refrigerant	observe indoor TC1/TC2/EEV by dipswitch, TC1 is much higher than TC2, EEV is displayed open fully, when unit startup, voice of refrigerant flow can be heard, outdoor discharging temp. is high, suction and discharging pressure is rather low a
2	outdoor does not heat, or heating effect is not good	indoor EEV can not be open	the treatment is the same with problem in cooling	at the beginning TIC is high, TC2 is close to room temp., when the running become stable, TC1 and TC2 are close to room temp., EEV is displayed open fully, voice about refrigerant flow can not be heard when startup
		evaporator is blocked by weld or dirt	treatment is same as problem in cooling	
		system lack of refrigerant	treatment is same as problem in cooling	observe indoor TC1/TC2/EEV by dipswitch, TIC and TC2 are low, EEV is displayed open fully, voice of refrigerant flow can be heard when startup, outdoor discharging temp. is high, suction/discharging pressure are all low

	exhibition		shooting	diagnose method)
2	outdoor does not heat, or heating effect is not good	pipe is too long , or the height between indoor units is more than standard	change the units according of the use manual, or add a electric heater	
		Outdoor 4-way valve in turbulence results in high/low pressure too low.	change 4-way valve	high/low pressure are too low, and can not rise even supply refrigerant, indoor TC1/TC2 is too low, condenser pipes are warm
		action of outdoor EEV action is not good, or outdoor EEV being damaged due to the wrong connection of air suction temp. sensor	connect air suction temp. sensor reliably or change EEV of outdoor	EEV can not adjust normally, and usually show open or close fully, you can feel the temperature difference in front of or back of the EEV under different conditions.
3	one wired controller control one indoor, wired controller shows 8888 circularly and can not recover	SW01 on PCB does not at ”0”	change SW01 to “ 0 ”	dip switch of master wired controller must be set to “0”
		CN30 on PCB does not be short connected	make CN30 short connection	

No.	trouble	trouble	trouble	remark

	exhibition	diagnose	shooting	(trouble diagnose method)
3	one wired controller control one indoor, wired controller shows 8888 circularly and can not recover	two switches of SW01 on wired controller at “ON”	two switches of SW01 on wired controller at “OFF”	dial SW01-1 of master wired controller to “OFF”
		wired controller or PCB is damaged	change	
4	wired controller does not display	CN23 of PCB is not short connected	make CN23 short connection	supply power to wired controller
		communication wire of wired controller from CN22 to terminal is inserted conversely	adjust	
		SW08-[6] is “OFF”	change SW08-[6] to “ON”	
		wired controller is damaged	change	
5	Wired controller does not display running mode when there are master unit and slave unit	SW01 on slave wired controlled unit PCB is “0”	SW01 on wired controlled slave unit PCB can not be dialed to o, only can be dialed between 1~15	

4.2 Outdoor trouble diagnose and trouble shooting

No.	trouble exhibition	trouble analysis	trouble shooting
1	master unit alarm over current	check if the power voltage is normal, low power voltage will cause big current	380V±10%（342V～418V）
		power module is damaged, then three phase output is not in balance and power module alarm	change power module
		inverter board fault, then three phase output is not in balance and power module alarm	change inverter board
		CN1 and CN2 on power module are not inserted well	Re-insert
		Compressor coil is faulty or grounding resistor is 0	Replace compressor （3-phase coil resistor is 0.481Ω/20□）
2	frequency of master unit is too low, compressor shake greatly	three phase output current/voltage of power module in balance	change power module
		inverter board fault	change inverter board
3	other trouble	after being electrified, the digital tube of master unit display “C” or “H”, and start up automatically	cool or heat compulsorily, please change the PCB immediately

4.3Problems during installation

No.	trouble analysis	trouble shooting
1	the sensor is damaged when welding, or the sensor is pulled off and not be reposition	gas pipe sensor should be pulled off during welding, and reset it after welding
2	Dew occurs on connection pipe	insulation layer is too thin, it should thicker than 15 mm
3	system additional refrigerant charging amount is incorrect	calculate the liquid pipe length and charge refrigerant
4	connection pipe is too long	the pipe should not longer than regulated length
5	units in same system do not being electrified accordantly, so some indoor has no power supply when working	electrify the system as required, ensure the whole system act accordantly
6	signal wire is not shielded wire, so the indoor is disturbed and missing	signal wire must be shielded wire
7	outdoor can not find any indoor because the signal wire of indoor is cross and touch each other	terminal A,B of signal wire must use the wire with same color, do not make the wire cross and touch each other
8	indoor unit signal wire does not connect with the corresponding outdoor, then cause failure during running	In installation, the complete working drawing is necessary, and ensures indoor/outdoor communication wires not crossed

No.	trouble analysis	trouble shooting
9	one wired controller controls multiple indoor units, but these indoors are not in one system, so some of indoors in one system do not run	one wired controller only can control indoors in one system
10	for indoor installation, if the checking hole is too small or too far from the electric box, then the installation and maintenance will be very difficult even can not be done	the dimension and position of checking hole must be considered for convenient installation and maintenance
11	cassette unit is installed in too high position , so the heating effect is not good	cassette unit installation height should not higher than the height that required in the use manual
12	cassette unit is installed in the corner of the room, so the air flow from two outlets will flow to the wall directly, then the heating/cooling effect will be affected	refer to the use manual, the four sides of cassette unit all should keep enough distance from the wall
13	after installation, before unit startup the warm-up time is less than 12 hours, Pulling out the oil temp. sensor to heat up the oil will result in compressor burnt out when low oil temp. protection acts.	before being electrified first time the compressor must be heated at least 12 hours
14	ceiling concealed unit need weld installation, and the gas/liquid pipe sensor should be pulled off	

4.4 Diagnosing method for damaged main parts

4.4.1 Pressure sensor

high pressure sensor 0～3.33Mpa，output 0.5～3.9V, low pressure sensor 0～0.98Mpa, output 0.5～3.5V. Output voltage and pressure are linear relationship.

A . High pressure Pd is abnormal: check if there is +5V voltage between 1 and 2 pins of CN26 with multimeter, if no please check if the PCB +5V power supply (if CMOS chip 7805 is normal) is damaged, if yes please check if the voltage between 4 and 2 pins is within the output voltage range(this work also can be done by the voltage meter together with multimeter, and refer to the Pd data to analysis)

B. Low pressure Ps is abnormal: check if there is +5V voltage between 1 and 2 pins of CN27, if no please check if the PCB +5V power supply (if CMOS chip 7805 is normal) is damaged, if yes please check if the voltage between 3 and 2 pins is within the output voltage range(this work also can be done by the voltage meter together with multimeter, and refer to the Ps data to analysis).

Note:

1）Voltage precision of common multimeter is 0.1V, so there will be large tolerance while measuring, then you can use a good PCB to confirm whether the pressure sensor is good or not by the reading of rotary switch 001, 011

2）If the pressure sensor value is 0, please confirm if there still is

refrigerant in the system firstly.

4.4.2 IPM power module (the same with rectifier)

A. Remove compressor cable, capacity cable from power module, dial multimeter to “diode”, connect the red terminal (positive) to P of power module, and connect the black terminal (negative) to U, V and W in turns, check if the resistors are infinite; then connect black terminal to P, and put red terminal on U, V and W in turns, check if there is any reading (normally it is 386). If the above are all normal, the 3 IGBTs are good.

B. By above method please check if the three IGBT between N pole of power module and U/V/W is normal.

C. Check if the low voltage board of power module is burnt out.

4.4.3 Compressor

A. Measure if the compressor coil resistors among 3 phases are all 0.481Ω/20□ by the megohmmeter.

B. The insulation resistors to ground of 3 phases are all over 30MΩ

5 Attached table

5.1 Table 1: Additional refrigerant charging list

Additional refrigerant charging list					
quantity of indoor unit: pcs					
indoor address No.	indoor model	indoor position	indoor address No.	indoor model	indoor position
pipe length and refrigerant recharging amount					
liquid pipe dia.	additional refrigerant charging amount(kg)		liquid pipe dia.	additional refrigerant charging amount(kg)	
φ6.35	0.03kg/m× m= kg		φ19.05	0.28kg/m× m= kg	
φ9.52	0.06kg/m× m= kg		φ22.2	0.4kg/m× m= kg	
φ12.7	0.12kg/m× m= kg		φ25.4	0.53kg/m× m= kg	
φ15.88	0.2kg/m× m= kg				
total recharging amount(kg)					
charging volume when out of factory (kg)			total charging amount (kg)		
Lister: Date:					

5.2 Table 2: Relative settings

5.2.1 Communication address between indoor and outdoor setting method

No.	Setting mode	Setting method	Remark
1	Unit No. setting automatically	1. Dip switch SW02 and SW03 on indoor PCB are all at “off” (down), that also is the setting state when out of factory.	setting state when out of factory
2	unit No. setting by hand	2. “1” and “2” of SW03 at “ON” (up) 3. details about unit No. and dipswitch state please refer to the following table	setting on site
3	unit No. setting by wired controller	4. “1” of SW03 at “ON” (up) 5. press “filter reset” button for 5 seconds then enter system address setting mode, choose indoor address by press ”TEMP ＋/－” button. 6. Temp. display area displays: system address ＋ XX, then press ”TEMP＋/－” button, the unit No. will change within 00~3F(00 is No 1 unit, 3F is No.64 unit) ,original value is 00. 7. after the No. of unit is chosen, press “SET” button to save all the settings. If you press the other buttons, or no any actions within 15 seconds, then the setting will exit automatically and system will keep the setting of last time.	setting on site

5.2.2 Indoor central control address setting (necessary for the system with central control or BMS control)

No.	setting mode	setting method	remark
1	central controller address setting by hand	1. “1” of SW02 on indoor PCB at “ON” (up) 2. details about address and dipswitch position please refer to the following table.	setting on site
2	central controller address setting by wired controller	3. SW02 on indoor PCB are all at “OFF” (down), that also is the setting state when out of factory. 4. press “filter reset” button for 10 seconds, then enter central control setting mode, choose indoor central address by press “TEMP ＋/－” button. 5. temp. display area displays: system address ＋XX, then press “TEMP ＋/－” button, unit No. will change within 00~7F, (00 is No. 1, 7F is No. 128”), original value is 00. 6. after the No. of units is chosen, press “SET” button to save all the setting. If you press the other buttons, or no any actions within 15 seconds, then the setting will exit automatically and system will keep the last time setting.	setting on site

5.3 Table 3: Setting state and function definition of PCB and wired controller when out of factory

No.	Items		Setting state	Function
Indoor PCB	dip switch	SW01	dial to 0	1. When one wired controller controls one indoor, or several wired controller control one indoor, or with remote controller, do not change this switch. 2. When one wired controller controls multiple indoors, set at 0 for master unit; set at different positions from 1 to 15 for slave unit.
		SW02	dial to OFF	1.when setting indoor central control address with wired controller, no need to change this dip switch 2.when setting indoor central control address by hand, the dip switch position please refer to the “indoor central control address setting” table
		SW03	all at “OFF”	1.when setting communication address between indoor and outdoor automatically, no need to change this dip switch 2.when setting communication address between indoor and outdoor by hand or by wired controller, please refer to the “indoor central control address setting” table
		SW05	according of unit model	that is set well when out of factory and no need to change, for indoor unit with different capacity this setting is different either.
	Indicator led	LED1	red	indicator led for communication with wired controller, it shows the signal from indoor to wired controller
		LED2	green	indicator led for communication with wired controller, it shows the signal that indoor received from wired controller
				LED1 is used together with LED2, if the communication between indoor and wired controller is normal, LED1 and LED2 will flash regularly, if there is wired controlled slave unit, then LED1 on slave unit will flash with low frequency
		LED3	red	indicator for communication with outdoor, it shows the signal from indoor to outdoor
		LED4	green	indicator for communication with outdoor, it shows the signal that indoor received from outdoor

No.	Items		Setting state	Function		
Indoor PCB	Indicator led			LED3 is used together with LED4, if the communication between indoor and outdoor is normal, LED3 and LED4 will flash regularly, flash frequency of red led is lower than green led		
		LED 5	trouble indicator led	it will not light in normal situation, according of the flash times you can diagnose the failure		
		LED 6	yellow	it will not light in normal situation, and it will light if the EEV is open or close fully		
wired controller	dip switch	SW 01-1	dial to "OFF"	change between master and slave wired controller	ON	set as slave wired controller
					OFF	set as master wired controller
		SW 01-2	dial to "OFF"	Changeover of □and □	ON	□
					OFF	□
	resistance	J03	1	select room temp. display	0	no display for room temp
					1	display room temp.
		J06	1	select room temp. sensor position	0	use room temp. sensor of indoor
					1	use room temp. sensor of wired controller
		J07	0	select auto restart function	0	auto recover after power is off
					1	common control
	diode	D1	0	shorten time function	0	shorten time by wired controller
					1	common control
		D2	0	compulsorily defrost	0	sends signal of compulsory defrosting to indoor
					1	commonly control
Remark : only when two wired controller control one indoor, one of the two controller can be set as slave wired controller						

0010451181A（CN10 terminal of EEV 6-core red）				
dip switch	state when out of factory	jumper	state when out of factory	functions
SW06-1	ON	J10	connected	0: fix air volume 1: commonly control
SW06-2	ON	J7	connected	0/1 temp. difference selection in AUTO mode 0: Tdif = 2□ 1: Tdif = 3□
SW06-3	ON	J6	connected	0：without TA in AUTO mode 1: with TA correction value
SW06-4	ON	J5	connected	standby
SW06-5	ON	J4	connected	0: cooling only 1: heat pump
SW06-6	ON	J3	connected	0: uniform control of temp. correction 1: individual control
SW06-7	ON	J2	connected	air inlet temp. correction value: (J1)0(J2)0：6ºC； (J1)0(J2)1：4ºC； (J1)1(J2)0：2ºC； (J1)1(J2)1：0ºC
SW06-8	ON	J1	connected	
SW07-1	ON	J16	connected	standby
SW07-2	ON	J15	connected	
SW07-3	ON	J14	connected	heat exchanging factor selection(pre-set)
SW07-4	ON	J13	connected	
SW07-5	ON	J12	connected	
SW07-6	ON	J11	connected	filter washing time selection 0：120H 1：2500H

SW07-7	ON	J9	connected	change running mode that displayed on wired controller (J8)0(J9)0: AUTO/HEAT/ DEHUMIDIFY /COOL/SWING (J8)0(J9)1: Auxiliary heat / HEAT /DEHUMIDIFY /COOL/SWING (J8)1(J9)0: DEHUMIDIFY /COOL/SWING (J8)1(J9)0: HEAT /DEHUMIDIFY /COOL/SWING
SW07-8	ON	J8	connected	
SW08-1	ON	J24	connected	0:when unit stops, oil return, in low speed 1: fan stops
SW08-2	ON	J23	connected	0: in heating mode, running as med speed in high speed(only for 3-speed fan motor) 1: normal
SW08-3	OFF	J22	disconnected	0: in heating, thermostat Off, and adjust valve due to the coil temp. Tc2 and ambient temp. 1.adjust according of outdoor high pressure saturation temp.
SW08-4	ON	J21	connected	0：Ac stepless fan motor 1：AC fan motor with three speed
SW08-5	ON	J20	connected	standby
SW08-6	ON	J19	connected	0: remote controlled 1: wired controlled
SW08-7	OFF	J18	disconnected	change phase sequence of EEV 0: reverse 1: forward
SW08-8	ON	J17	connected	0: fixed swing 1: adjustable
remark: for digital dip switch, dial to “ON” means “1”, or it means “0”				

5.4 Table 4: system running data display –digital tube of master unit data display

5.4.1 System installation data display and function operation method

SW 3	SW 4	SW 5	function definition	function operation method	content displayed on digital tube
0	0	2	refrigerant type	means R22	R22
0	2	2	quantity of outdoor connected in one system	means 3 slave units, no master unit	4
0	3	2	quantity of indoor connected in one system	means 36 indoor	36
0	4	2	quantity of working indoor	means 8 indoors are working	8
0	5	2	quantity of indoor whose running mode is the same with outdoor	——	16
0	11	2	outdoor runs manually with fix frequency	● run as the running mode of outdoor, press SW2 for 5 seconds, display master unit setting frequency, original value is 100Hz. press SW2 to rise frequency, press SW1 to reduce frequency ●to run this function, there must be running indoor ●SW8-8 on right side -- that means master unit is running and slave unit is not running	display the setting frequency of master unit

SW 3	SW 4	SW 5	function definition	function operation method	content displayed on digital tube
0	11	2	outdoor runs manually with fix frequency	●SW8-8 on left side –– that mean slave unit running fully while master unit is running ●SW8-7 on left side – that means slave unit running 62% while master unit is running	display the setting frequency of master unit
0	12	2	valve of indoor open fully	press SW2 for 5 seconds, digital tube display “1111”, indoor PMV open for 2 minutes compulsorily	“1111”
15	0	0	outdoor runs in cooling mode compulsorily	press SW2 for 5 seconds, digital tube display “1111”, that means system enter compulsory cool running, press SW1 for 5 seconds, digital tube display “ “, that means out of compulsory running mode	“1111” or “0000”
15	1	0	outdoor runs in heating mode compulsorily	press SW2 for 5 seconds, digital tube display “1111”, that means system enter compulsory running mode, press SW1 for 5 seconds, digital tube display “ “, that means out of compulsory running mode	“1111” or ”0000”

5.4.2 Indoor unit running data display

SW 3	SW 4	SW 5	function definition	content displayed on digital tube	remark
0/1/ 2/3	0～ 15	3	display the indoor has or has not communicat ion	“1111” means the indoor has communicati on “----“ means no communicati on	1.dial SW03 to 0, it shows running data of indoor from No.1 to No.16 2.Dial SW03 to 1, it shows running data of indoor from No.17 to No.32 3.Dial SW03 to 2, it shows running data of indoor from No.33 to No.48 4.Dial SW03 to 3, it shows running data of indoor from No.49 to No.64
0/1/ 2/3	0～ 15	4	display failure code of the indoor unit	such as “1”, if no failure it will display “0”	
0/1/ 2/3	0～ 15	5	display capacity of the indoor unit	such as “1.5”	
0/1/ 2/3	0～ 15	6	display open angle of the indoor EEV	such as “280”	
0/1/ 2/3	0～ 15	7	display return air temp. of the indoor unit	such as “28”	
0/1/ 2/3	0～ 15	8	display gas pipe “TC1” temp. of indoor	such as “9”	
0/1/ 2/3	0～ 15	9	display liquid pipe “TC2” temp. of indoor	such as “8”	

5.4.3 Outdoor running data display

SW 3	SW 4	SW 5	function definition	content displayed on digital tube
0/1/ 2/3	0	0	display failure code of the outdoor	such as “20”, if no failure it will shows “0”
0/1/ 2/3	2	0	display running mode of the outdoor	“HHHH” means heating “CCCC” means cooling
0/1/ 2/3	3	0	display capacity of the outdoor	such as “10” means 10 HP
0/1/ 2/3	5	0	display running frequency and energy class of the outdoor	such as “30” means master unit running with 30Hz eg.: “10.0” shows 100% capacity of slave unit; “6.0” shows 60% capacity of slave unit
0	6	0	display fan speed of the master unit	such as “9”, fan speed for slave unit can not be displayed
0/1/ 2/3	8	0	the outdoor four-way valve state	LED1 display “1” means open, ”0” means close
			the outdoor unloading valve SV1 state	LED2 display “1” means open, ”0” means close
			the outdoor oil equalization valve SV2 state	LED3 display “1” means open, ”0” means close
			the outdoor spraying valve SV3 state	LED4 display “1” means open, ”0” means close

SW3	SW4	SW5	function definition	content displayed on digital tube
1/2/3	9	0	the slave unit capacity valve SV4 state	LED1 display “1” means open, ”0” means close
			the slave unit capacity valve SV5 state	LED2 display “1” means open, ”0” means close
			the slave unit capacity valve SV6 state	LED3 display “1” means open, ”0” means close
0/1/2/3	10	0	EEV open angle of the outdoor	such as “1600”
0/1/2/3	0	1	high pressure of master unit	such as “18.08”, high pressure of slave unit can not be displayed
0/1/2/3	1	1	low pressure of master unit	such as “3.86”, low pressure of slave unit can not be displayed
0/1/2/3	2	1	the outdoor air discharging temp. Td	such as “89”
0/1/2/3	3	1	the outdoor air suction temp. Ts	such as “12”
0/1/2/3	4	1	the outdoor defrosting temp.Te	such as “38”
0/1/2/3	5	1	outdoor ambient temp. Ta	such as “32”
0/1/2/3	6	1	the outdoor oil temp. Toil	such as “58”
0/1/2/3	10	1	the outdoor current	such as “12.5”
1.Dial SW3 to 0, display master unit running data; 2. Dial SW3 to 1, display slave unit running data; 3.Dial SW3 to 2, display slave unit No.2 running data; 4.Dial SW3 to 3,display slave unit No.3 running data				

5.5Table 5: Failure code list

5.5.1 Outdoor failure code list

digital tube indication on master unit	indication on wired controller (hex)	failure code definition	failure description
20	14	master unit defrosting temp. sensor Te failure	sensor temp. is below -60.87□ (open circuit) or over 135.4□ (short circuit) for 1 minute
21	15	master unit ambient temp. sensor Ta failure	sensor temp. is below -60.87□ (open circuit) or over 135.4□ (short circuit) for 1 minute
22	16	master suction temp. sensor Ts failure	sensor temp. is below -60.87□ (open circuit) or over 135.4□ (short circuit) for 1 minute
23	17	master unit air discharging temp. sensor Td failure	after compressor runs for 5 minutes, sensor temp. is under-4.45□(open circuit) or over 337.14□ (short circuit) for 1 minute
24	18	master unit oil temp. sensor Toil failure	sensor temp. is below -60.87□ (open circuit) or over 135.4□ (short circuit) for 1 minute
25	19	master unit compressor over current	input from chip 840 on inverter board
26	1A	communication between indoor and outdoor failure	outdoor can not find any indoor
27	1B	master unit oil temp. is too high	oil temp. over 80□ for 10 minutes, resumable automatically

tube indication on master unit	indication on wired controller (hex)	failure code definition	failure description
28	1C	master unit high pressure sensor Pd failure	high pressure over 4.9V, or below 0.1V for 30 seconds, resume manually then turn to backup running
29	1D	master unit low pressure sensor Ps failure	high pressure over 4.9V, or below 0.1V for 30 seconds, resume manually then turn to backup running
30	1E	master unit high pressure switch failure	the switch open for 1 minute, alarm, switch closes for 1 minute, resume
31	1F	master unit low pressure switch failure	the switch open for 1 minute, alarm, switch closes for 1 minute, resume
32	20	master unit IPM module protection	input from chip 840 on inverter board
33	21	EEPROM failure of master unit main chip 538	EEPROM faulty, or being inserted conversely, with incorrect part
34	22	master unit discharging temp. Td protection	Td sensor is over 125ºC for 10 seconds, when below 100ºC, resumable

digital tube indication on master unit	indication on wired controller (hex)	failure code definition	failure description
35	23	inner thermal protector circuit of master unit compressor failure	inner thermal protector of master unit compressor acts
37	25	wrong wiring for master unit high/low pressure sensor Pd,Ps	after compressor startup for 3 minutes, Pd is lower than Ps for 1 minute
40	28	master unit high pressure sensor Pd protection	Pd is over 28.5kgG/cm² for 30 seconds
43	2B	master unit low frequency air discharging temp. sensor Td protection	running frequency of inverter compressor is below 30Hz, Td is over 110ºC for 10 minutes
44	2C	communication between master unit main chip 538 and chip 807(indoor) failure	no communication for 4 minutes
45	2D	communication between master unit main chip 538 and chip 807(central communication) failure	no communication for 4 minutes
46	2E	communication between master unit connecting board and inverter board failure	communication is abnormal for 2 minutes after being electrified
49	31	driving chip EEPROM on master unit inverter board failure	EEPROM faulty, or being inserted conversely, with incorrect part

digital tube indication on master unit	indication on wired controller (hex)	failure code definition	failure description
54	36	master unit oil temp. is too low	in operation, compressor oil temp. is below (Ps＋10)ºC for 5 minutes, resumable
69	45	slave unit is missing in operation	in operation, slave unit communication is abnormal, or slave unit is powered off
70	46	system lack of refrigerant	the failure only is displayed, no protection occurs
71（1）	47	lack of phase or incorrect phase sequence	
72（2）	48	compressor over current protection	
73（3）	49	the slave unit defrosting temp. sensor Te failure	sensor temp. is below -60.87□ (open circuit) or over 135.4□（short circuit）for 1 minute
74(4)	4A	the slave unit ambient temp. sensor Ta failure	sensor temp. is below -60.87□ (open circuit) or over 135.4□（short circuit）for 1 minute
75(5)	4B	the slave unit suction temp. sensor Ts failure	sensor temp. is below -60.87□ (open circuit) or over 135.4□（short circuit）for 1 minute
76(6)	4C	the slave unit discharging temp. sensor Td failure	after compressor runs for 5 minutes, the sensor temp. is below -4.45□(open circuit) or over 337.14□ (short circuit) for 1 minute

digital tube indication on master unit	indication on wired controller (hex)	failure code definition	failure description
77(7)	4D	the slave unit oil temp. sensor Toil failure	sensor is below -60.87 (open circuit) or over 135.4□ (short circuit) for 1 minute
78(8)	4E	the slave unit E²PROM failure	EEPROM faulty or being inserted conversely, with incorrect part
79(9)	4F	the slave unit sensor Ps failure	high pressure 4.9V, or below 0.1V for 30 seconds
79(9)	4F	the slave unit sensor Ps failure	high pressure 4.9V, or below 0.1V for 30 seconds
80(10)	50	the slave unit discharging temp. Td protection response	Td sensor is over 120ºC for 10 seconds, when below 100ºC, resumable
82(11)	52	communication between the slave unit and connecting board failure	communication abnormal for 1 minute and alarm
83(12)	53	the slave unit high pressure switch protection	switch opens for 1 minute, alarm; switch close for 1 minute, resumable
84(14)	54	the slave unit low pressure switch protection	switch opens for 1 minute, alarm; switch close for 1 minute, resumable
86(16)	56	the slave unit oil temp. is too high	oil temp. is over 80□ for 10 minutes, resumable
87(17)	57	the slave unit oil temp. is too low	in operation, compressor oil temp. is below (Ps＋10) ºC for 5 minutes, resumable

5.5.2 Indoor failure code list

indication on wired controller	flash times of LED5 on indoor PCB/timer LED on remote receiver	flash times of health LED on wall mounted unit remote receiver	failure code definition
01	1	——	indoor ambient sensor Ta failure
02	2	——	indoor gas pipe temp. sensor TC1 failure
03	3	——	indoor liquid pipe temp. sensor TC2 failure
04	4	——	indoor water temp. sensor failure
05	5	——	indoor PCB EEPROM failure
06	6	——	communication between indoor and outdoor failure
07	7	——	communication between indoor and wired controller failure
08	8	——	indoor drainage failure
09	9	——	indoor address repeated

indication on wired controller	flash times of LED5 on indoor PCB/timer LED on remote receiver	flash times of health LED on wall mounted unit remote receiver	failure code definition
0A	10	——	indoor central control address repeated
0C	12	——	wall mounted unit connecting board failure
20～87	20	——	outdoor corresponding failure
——	——	1	wall mounted unit P/G motor failure
——	——	2	EEPROM of wall mounted unit board A failure
——	——	3	communication between wall mounted unit board A and wired controller failure
——	——	4	serial communication failure between wall mounted board A and board B
——	——	5	set mode of wall mounted board A and B conflict

5.6 Table

MRV trial operation data tracking list				
	master unit	slave unit 1	slave unit 2	slave unit 3
PD				
PS				
TD				
TS				
TE				
TA				
TOIL				
PMV				
A				
FQY				

MRV trial operation data tracking list

indoor running data

unit No.	indoor capacity	PMV	TA	TC1	TC2	unit No.	indoor capacity	PMV	TA	TC1	TC2	unit No.	indoor capacity	PMV	TA	TC1	TC2	unit No.	indoor capacity	PMV	TA	TC1	TC2
1						17						33						49					
2						18						34						50					
3						19						35						51					
4						20						36						52					
5						21						37						53					
6						22						38						54					
7						23						39						55					
8						24						40						56					
9						25						41						57					
10						26						42						58					
11						27						43						59					
12						28						44						60					
13						29						45						61					
14						30						46						62					
15						31						47						63					
16						32						48						64					

MRV trial operation data analysis

5.7.1 MRV□ trial operation data analysis (cooling fully)

	master unit				slave unit 1					slave unit 2				
PD	15.88													
PS	4.19													
TD	67				66					63				
TS	6				8					2				
TE	37				36					31				
TA	31				31					27				
TOIL	31				21					10				
PMV	2000/2000				2000					2000				
A	10.5				8.7					12				
FQY	66				100%					100%				
PMV	TC1	TC2	TA	HP	PMV	TC1	TC2	TA	HP	PMV	TC1	TC2	TA	HP
112	16	8	21		166	9	7	18		100	5	4	21	
130	9	9	23		74	21	20	22		74	21	21	21	
96	9	8	23		102	7	8	21		74	22	22	22	
103	8	7	22		106	9	7	21		110	6	6	21	
102	14	7	22		116	11	4	21		108	8	6	20	
118	7	7	22		126	9	7	21		74	3	22	21	
134	10	8	21		4	7	7	20		176	12	9	20	
4	22	20	22		124	4	6	21		112	9	6	20	
74	4	22	22		96	8	3	20		4	46	28	28	
74	8	23	22		86	9	2	19		480	30	8	28	
74	19	19	19		4	23	23	26						
74	19	19	18		136	16	6	23						

data analysis

No.	problem	diagnose
1	one EEV can not be closed fully	open angle of EEV on stop indoor shows 4 (close fully), normally the coil temp. should close to indoor ambient temp. (TA±3); this indoor two coil temp. is much lower than ambient temp., that is EEV does not closed fully and cause liquid return----to find the reason
2	sensors of two indoors are inserted conversely	1.in cooling operation, the min. open angle of indoor EEV is 90 and the max. is 480 2.if the sensor is inserted conversely, the EEV will close to min or open max. 3.if EEV close to min, the flow volume is min too, temp of TC2 is low (much lower than TC1), TC1 is close to ambient temp; when EEV open max. the flow volume is too big, TC1 is low and TC2 is high----liquid return, please confirm if the two sensors are inserted properly
3	resistance of gas pipe sensor on two indoors is wrong	1. one unit does not startup, EEV open angle shows 4, coil temp. should be close to ambient temp., but TC1 shows 46, that should be wrong sensor resistance 2.start one unit, EEV shows 480, but TC1 still is too high, that should be wrong sensor resistance
4	5 indoors do not cool	confirm if the EEV can be open: break power supply and resume to listen to the EEV action voice, or turn off the indoor for 1 minute and turn it on to check if there is cooling air flow out, if yes the EEV is normal, if the EEV does not open please open to check
		check if the sensor is inserted conversely
		If all of above are normal, adjust the indoor EEV open angle to 90 in cooling mode
5	current of No.1 slave unit is abnormal	position of solenoid SV4,SV5 is wrong

5.7.2 MRV□ single unit running data analysis (cooling mode)

PD														
PS														
TD														
TS														
TE														
TA														
TOIL														
PMV														
A														
FQY														
PMV	TC1	TC2	TA	HP	PMV	TC1	TC2	TA	HP	PMV	TC1	TC2	TA	HP
4	19	19	21		4	23	24	23						
4	19	20	21		4	24	24	28						
4	18	20	22		108	10	8	19						
4	18	20	23		118	16	8	20						
4	22	22	23		4	24	24	25						
4	25	27	27		244	17	10	24						
4	22	22	-30		122	15	7	20						
4	19	21	22		4	22	22	24						
4	19	20	22		4	21	21	22						
4	7	6	21		4	20	20	22						

Data analysis

No.	problems	diagnose	remark
1	one EEV can not be closed fully	open angle of EEV on stop indoor shows 4 (close fully), normally the coil temp. should be close to indoor ambient temp. （TA±3）, this indoor coil temp. is much lower than ambient temp., that should be EEV does not closed fully and cause liquid return---to find the reason	diagnose should be done after oil is return and system become stable
2	one ambient temp. sensor failure	ambient sensor failure---to find the reason	

5.7.3 MRV□ running data analysis(all in heating mode)

	master unit				slave unit 2					slave unit 3				
PD	19.68													
PS	3.35													
TD	101				101					105				
TS	4				13					13				
TE	4				7					7				
TA	18				18					17				
TOIL	44				40					33				
PMV	1248				1800					1360				
A	21.5				11.4					11.0				
FQY	105				100%					100%				
P MV	T C1	T C2	TA	HP	P MV	T C1	T C2	TA	HP	P MV	T C1	T C2	TA	HP
480	45	19	18	1.2	358	80	45	19	2.0					
360	54	45	19	1.2	480	27	19	16	1.2					
74	31	49	23	1．7	74	34	50	19	0．8					
480	32	17	19	1.7	480	76	44	22	1.7					
480	66	21	20	1.7	480	70	42	21	1.7					
450	70	43	28	3.2	480	48	22	21	1.7					
480	68	33	20	1.7	480	68	37	20	1.7					
322	65	45	21	1.0	480	68	43	25	3.2					
480	65	44	19	1.0	480	64	47	20	1.7					
480	49	20	18	2.0										

Data analysis

No.	problems	diagnose
1	EEV of 6 indoors can not open	liquid pipe (TC2) temp. is low,TC2 < TA+10; gas pipe (TC1) temp. is low because the EEV can not open, so the refrigerant does not flow, then the coil temp. is close to ambient temp.
2	sensors of 2 indoors are inserted conversely	in heating mode the indoor TC1>TC2, but these two indoor TC1<TC2

Part 3 Commissioning and Maintenance for R410A System

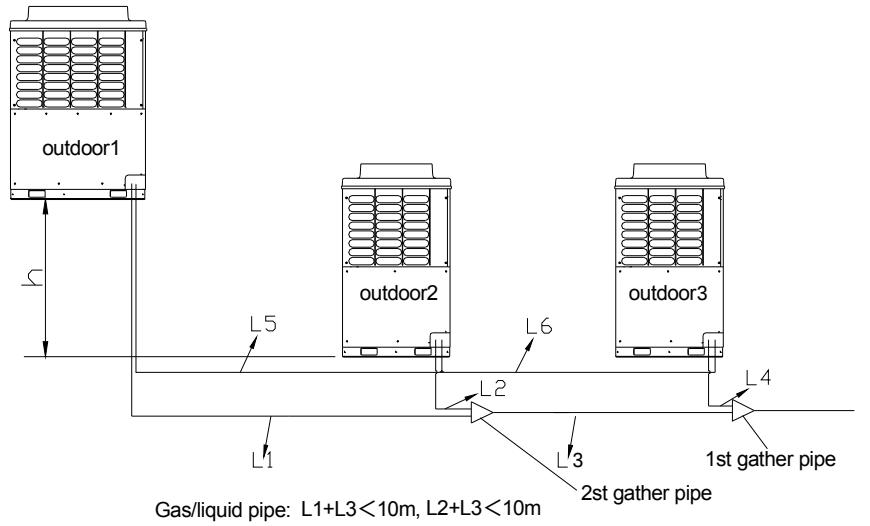
1.Working preparation before commissioning

1.1 Outdoor checking

1.1.1 Refrigerant pipe length and drop height checking

Allowable refrigerant pipe length and height

Refrigerant pipe total length(one way)		300m
Refrigerant pipe max. length(one way)		150m
Piping length between outdoor and the first branch(main pipe)		Max. 90m
Piping length after the first branch		Max. 40m
Piping length between outdoor units		Less than 10m to the first gather pipe
Height difference between IN &OU	Outdoor is higher	Max.50m
	Indoor is higher	Max.40m
Height difference between outdoor units(the same system)		Less than 5m (best in horizon)
Height difference between indoor units		Max.15m



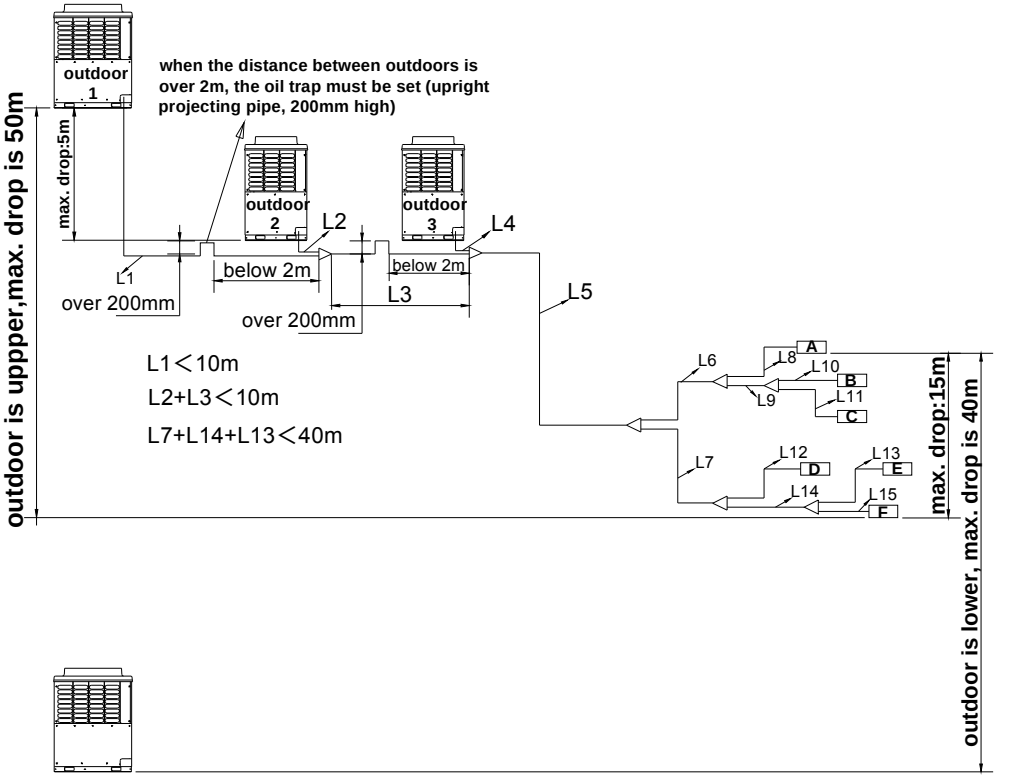
Gas/liquid pipe: L1+L3＜10m, L2+L3＜10m
Oil equalization pipe: L5+L6＜10m
ght difference between outdoors: h＜5m

Note: a. HZG-30/A includes HZG-20/A;

b. The connection pipe among outdoors can not be higher than the stop valve position;

c. The connection pipe among outdoors should be horizontal or be in a certain angle (less than 15degree).

1.1.2 Refrigerant pipe length layout



	Max. length	Pipe in above figure
Single way total pipe length	300	L1+L2+ L3+ L4+ L5+ L6+ L7+L8+ L9+ L10+ L11+ L12+ L13+ L14+ L15
Single way max. pipe length	150	**L1+L2+ L3+ L5+ L7+ L14+ L13**
Max. pipe length after 1st branch pipe	40	L7+L13+L14
Main pipe actual length	90	L5
Height difference between indoors	15	————
Height difference between outdoors	5	————

1.1.3 Outdoor pipe size checking

Model	AV08NM VERA	AV10NM VERA	AV12NM VERA	AV14NM VERA	AV16NM VERA	AV18NM VERA	AV20NM VERA
Capacity（HP）	8	10	12	14	16	18	20
Gas pipe(mm)	Φ19.05	Φ22.22	Φ25.4	Φ25.4	Φ28.58	Φ28.58	Φ28.58
Liquid pipe (mm)	Φ9.52	Φ9.52	Φ12.7	Φ12.7	Φ12. 7	Φ15.88	Φ15.88
Oil equalization pipe(mm)	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52
Balance pipe（mm）	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52
Model	AV22NM VERAA	AV24NM VERA	AV26NM VERA	AV28NM VERA	AV30NM VERA	AV32NM VERA	AV34NM VERA
Capacity（HP）	22	24	26	28	30	32	34
Gas pipe(mm)	Φ28.58	Φ28.58	Φ31.8	Φ31.8	Φ31.8	Φ31.8	Φ31.8
Liquid pipe (mm)	Φ15.88	Φ15.88	Φ19.05	Φ19.05	Φ19.05	Φ19.05	Φ19.05
Oil equalization pipe(mm)	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52
Balance pipe（mm）	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52

Model	AV36NM VERA	AV38NM VERA	AV40NM VERA	AV42NM VERA	AV44NM VERA	AV46NM VERA	AV48NM VERA
Capacity（HP）	36	38	40	42	44	46	48
Gas pipe(mm)	Φ38.1	Φ38.1	Φ38.1	Φ38.1	Φ38.1	Φ38.1	Φ38.1
Liquid pipe (mm)	Φ19.05	Φ19.05	Φ19.05	Φ19.05	Φ19.05	Φ19.05	Φ19.05
Oil equalization pipe(mm)	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52
Balance pipe（mm）	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52

1.1.4 Additional refrigerant charging standard: refer to the following table, and fill the refrigerant charging volume in the “ additional refrigerant charging” list which on the front plate of outdoor unit.

1.1.4.1 MRV□ refrigerant charging standard

A. Refrigerant charging volume when out of factory

Outdoor model	AV08M VERA	AV10NM VERA	AV12NM VERA	AV14NM VERA	AV16NM VERA
Standard charging volume	10Kg	10Kg	16Kg	16Kg	16Kg

B. Additional refrigerant charging volume on site

Additional charging standard of liquid pipe

Liquid pipe Dia.	¢ 22.22	¢ 19.05	¢ 15.88	¢ 12.7	¢ 9.52	¢ 6.35
Additional charging volume per meter	0.35 kg/m	0.25 kg/m	0.17 kg/m	0.11 kg/m	0.054 kg/m	0.022 kg/m

Remark:

A. Charging amount when out of factory excludes the refrigerant in the pipe.

B . Additional charging amount=actual length of liquid pipe*additional amount per meter liquid pipe

Additional charging amount=L1*0.35+L2*0.25+L3*0.17+L4*0.11 +L5*0.054 +L6*0.022

L1: total length of 22.22 liquid pipe

L2: total length of 19.05 liquid pipe

L3: total length of 15.88 liquid pipe

L4: total length of 12.7 liquid pipe

L5: total length of 9.52 liquid pipe

L6:total length of 6.35 liquid pipe

1.2 Indoor checking

1.2.1 Indoor unit pipe size checking

Model	22~28	36~56	71~140
Gas pipe (mm)	Φ9.52	Φ12.7	Φ15.88
Liquid pipe(mm)	Φ6.35	Φ6.35	Φ9.52

Remark: the above table does not include wall mounted indoor

1.2.2 Power signal wire confirmation: Indoor units of one system use one power supply, The signal wire shielded layer of all indoor and outdoor units should be connected together, and be grounded on outdoor at single point.

1.2.3 Select control mode

control type / socket /dip switch	wired control master unit	wired control slave unit	remote control
CN23	short connected	disconnected	disconnected
CN30	short connected	short connected	disconnected
CN21	blank	blank	to remote receiver
SW08-[6]	ON	ON	OFF
signal terminal block	A,B,C to wired controller	B,C to wired controller	A,B,C not to wired controller

Note:

A. In the above figure, the state in the frame is set when out of

B. The indoor controlled by master/slave wired controller and the indoor controlled by individual wired controller are all wired controlled master indoor.

C. The remote receiver is equipped with a wire which can be inserted in CN21.

1.3 Relative settings

1.3.1 Setting method in central control

1) Indoor central control address setting method:

Central control address dip switch: SW02 (8-bit), the setting is below: (only the master indoor in a unit needs to be set the address)

SW02								description
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	
__	0	0	0	0	0	0	0	central control address=1
__	0	0	0	0	0	0	1	central control address=2
——								———
__	1	1	1	1	1	1	0	central control address=127
__	1	1	1	1	1	1	1	central control address=128
0								set central control address by wired controller
1								Forbidden to set address by wired controller

When the first bit of SW02 is ON, indoor central control address will be set by wired controller, and the address will be saved in EEPROM of wired controller (it won't miss even though indoor and wired controller are electrified again). So the first bit of SW02 must be OFF

2) When the wired control type unit does not connect the wired controller, the central control setting method is as follows:

In this case, you must set the PCB as remote wireless control type,

and cancel the communication with wired controller, the detailed method is as follows:

Set the jumper J19 on indoor PCB:

J19	function
connected	wired control
disconnected	remote control

CN30 on indoor PCB:

CN30	function
connected	wired control
disconnected	remote control

Note: if making central control for more than one indoor, please must connect the wired controller.

1.3.2 Setting method in group control

1）When making group control with wired controller, the indoor unit connected to the wired controller is the master unit. Use the rotary switch SW01 to set the indoor unit address, for master unit, SW01 is at 0, while the rotary switch SW01 of the slave unit will be at the other digits except 0, and can not repeat

2) Wiring method of serial communication wires between wired controller and indoors

Connect A, B, C on the wiring block of the serial communication wire between wired controller and indoor master unit; Only connect B, C on the wiring block of the serial communication wire between indoor slave unit and

3) Pull out the jumper of CN23 on the indoor slave unit PCB

1.3.3 Dip switch setting

"1" shows dip switch is ON or jumper is short connected; "0" shows dip switch is OFF or jumper is disconnected.

1). Indoor dip switch setting

A. Indoor address setting when in group control by wired controller: SW01.

SW01								Description
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	
0	0	0	0	--	--	--	--	wired controller address=1
0	0	0	1	--	--	--	--	wired controller address=2
--	--	--	--	--	--	--	--	--
1	1	0	1	--	--	--	--	wired controller address=15
1	1	1	1	--	--	--	--	wired controller address=16
--	--	--	--	0	0	0	0	indoor horse power=0.6HP
--	--	--	--	0	0	0	1	indoor horse power=0.8HP
--	--	--	--	0	0	1	0	indoor horse power=1.0HP
--	--	--	--	0	0	1	1	indoor horse power=1.25HP
--	--	--	--	0	1	0	0	indoor horse power=1.5HP
--	--	--	--	0	1	0	1	indoor horse power=1.7HP
--	--	--	--	0	1	1	0	indoor horse power=2.0HP
--	--	--	--	0	1	1	1	indoor horse power=2.5HP
--	--	--	--	1	0	0	0	indoor horse power=3.0HP
--	--	--	--	1	0	0	1	indoor horse power=3.2HP
--	--	--	--	1	0	1	0	indoor horse power=4.0HP
--	--	--	--	1	0	1	1	indoor horse power=5.0HP
--	--	--	--	1	1	0	0	indoor horse power=6.0HP
--	--	--	--	1	1	0	1	indoor horse power=8.0HP
--	--	--	--	1	1	1	0	indoor horse power=10.0HP
--	--	--	--	1	1	1	1	indoor horse power=15.0HP

B. Indoor address setting when in central control by central controller: SW02 (only on the master unit).

SW02								description
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	
__	0	0	0	0	0	0	0	central control address=1
__	0	0	0	0	0	0	1	central control address=2
----					----			
__	1	1	1	1	1	1	0	central control address=127
__	1	1	1	1	1	1	1	central control address=128
0								set central control address by wired controller
1								Forbidden to set address by wired controller

C. Indoor communication address

SW03								description
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	
__	-	0	0	0	0	0	0	central control address=1
__	-	0	0	0	0	0	1	central control address=2
----					----			
__	-	1	1	1	1	1	0	central control address=63
__	-	1	1	1	1	1	1	central control address=64
-	0							set central control address by wired controller
-	1							Forbidden to set address by wired controller
0								set address automatically
1								set address by hand

There are three kinds of address setting method for indoor units: automatically address setting, manual address setting, wired controller setting. Any one of them can set the address and wired controller setting type has the highest priority.

1.3.4 Dip switch setting of wired controller

No.	selection item	state	function description
J02	changeover of controller type	0	set as simple controller
		1	set as standard controller
J08	selection of room temp. sensor	0	use room temp. sensor on wired controller
		1	not use room temp. sensor on wired controller
J07	auto restart	0	without auto restart
		1	with auto restart
J03	selection of room temp. display	0	display room temp.
		1	not display room temp.
SW20-[1]	changeover of master/slave controller	ON	set as slave controller
		OFF	set as master controller
SW20-[2]	℃ or ℉	ON	℉
		OFF	℃
D1	shorten time function	0	indoor shorting time
		1	without shorten time
D2	compulsory defrost	0	send to compulsory defrost signal
		1	normal operation

Note: A. D1, D2 are the diode, if the two terminals are disconnected, the state is "1"; if the two terminals are connected with a jumper, the state is "0".

B. Only when two controllers control one indoor unit, one of wired controllers can be set as slave controller, and set SW20-[1] as ON, the others keep the state when out of factory, set SW20-[1] as OFF.

1.3.5 Dip switch on inverter board

SW1-1	inspection of operation without load	0	cannot run without load, set when out of factory
		1	can run without load
SW1-2	pre-set	0	set as OFF when out of factory
SW1-3	pre-set	1	set as OFF when out of factory
SW1-4	communication failure alarm with connecting board serial port	0	alarm, set when out of factory
		1	not alarm, set when out of factory
SW1-5	pre-set	0	set as OFF when out of factory
SW1-6	pre-set	0	set as OFF when out of factory
SW2-1	pre-set	0	set as OFF when out of factory
SW2-2	pre-set	0	set as OFF when out of factory
SW2-3	pre-set	0	set as OFF when out of factory
SW2-4	pre-set	0	set as OFF when out of factory

1.4 Indoor parameters

SW9	SW10	address
0	0-15	1-16
1		17-32
2		33-48
3		49-64

SW11	function	control description
3	indoor communication checking	LED3, LED4, indoor available, display 1111; indoor unavailable, display ----
4	indoor abnormal	display indoor failure code; no failure, display 0
5	indoor capacity	LED3, LED4, display indoor capacity, 1.5HP displays 1.5
6	indoor EEV open angle	LED2, LED3, LED4 display valve open angle
7	air inlet temp.	LED2, LED3, LED4 display air inelt temp. -2 degree displays -02
8	indoor gas pipe temp.	LED2, LED3, LED4 display air inelt temp. -2 degree displays -02
9	indoor liquid pipe temp.	LED2, LED3, LED4 display air inelt temp. -2 degree displays -02
10-15	pre-set	

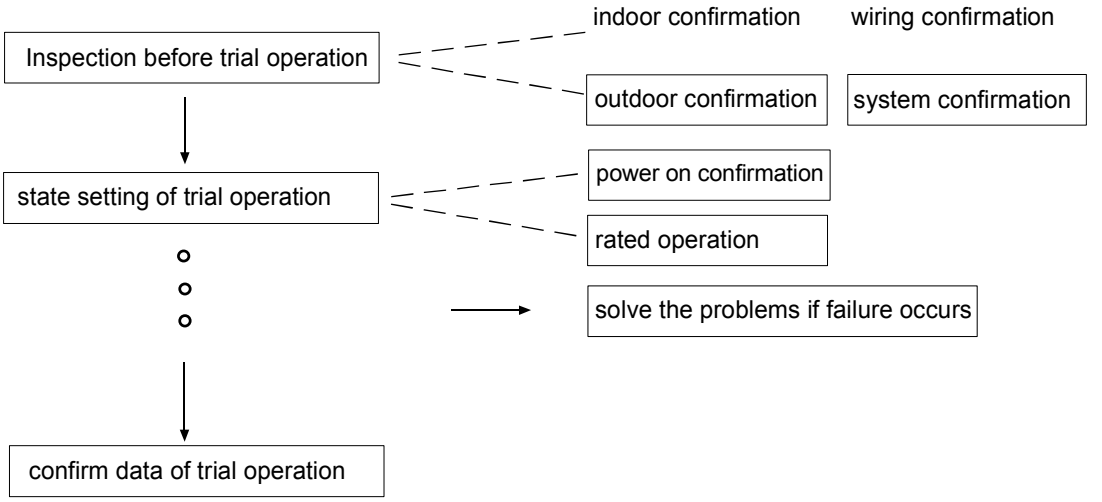
1.5 Outdoor parameters

SW9	SW10	SW11	function	description
unit No. 0-8	0	0	display outdoor failure code	failure code of outdoor bus data transmission
	1	0	display outdoor No. priority	pre-set
	2	0	display running mode	H H H H: heat C C C C: cool
	3	0	outdoor capacity	10.0 shows 10HP
	4	0	outdoor total running frequency	210 stands for 210Hz
	5	0	compressor frequency	110 stands for 110Hz
	6	0	outdoor fan running	9 stands for 9-class fan speed
	7	0	outdoor backup running	1111: backup running; ----: normal operation
	8	0	outdoor valve output indication	LED1: 1 open 4MV 0 close LED2: 1 open SV1 0 close LED3: 1 open SV2 0 close LED4: 1 open SV3 0 close
	9	0	outdoor valve output indication	LED1: 1 open SV4 0 close LED2: 1 open SV5 0 close LED3: 1 open SV6 0 close LED4: 1 open SV7 0 close
	10	0	outdoor PMV1 open angle	0--2000 steps
	11	0	outdoor PMV2 open angle	0--480 steps
	12	0	outdoor valve output indication	LED1: 1 open SV8 0 close LED2: 1 open SV9 0 close LED3: 1 open SV10 0 close LED4: 1 open SV11 0 close
	13	0	outdoor valve and heater output indication	LED1: 1 open SV12 0 close LED2: 1 open CH 0 close LED3: 1 open HH 0 close LED4: 1 open PTC relay for fan motor 0 close
	14	0	setting state indication of connecting board when out of factory	pre-set, display 1111
	15	0	setting state on field of connecting board	pre-set, display 0101

SW9	SW10	SW11	function	description
unit No. 0-8	0	1	Pd pressure	unit: KG
	1	1	Ps pressure	unit: KG
	2	1	TD inverter discharging temp.	LED1, LED2, LED3 will display
	3	1	TS inverter suction temp.	LED1, LED2, LED3 will display
	4	1	TE inverter defrosting temp.	LED1, LED2, LED3 will display
unit No. 0-8	5	1	TA inverter ambient temp.	unit: KG
	6	1	TOIL	unit: KG
	7	1	pre-set	LED1, LED2, LED3 will display
	8	1	TOCI	LED1, LED2, LED3 will display
	9	1	radiator sensor temp.	LED1, LED2, LED3 will display
	10	1	W-phase compressor current	LED1, LED2, LED3 will display
	11	1	U-phase compressor current	LED1, LED2, LED3 will display
	12	1	live wire current	LED1, LED2, LED3 will display
	13	1	live wire voltage	LED1, LED2, LED3 will display
	14	1	transducer state(pre-set)	0=normal; 2=standby; 6=emergent stop
	15	1	defrosting compensation	

2.Trial operation and the performance

2.1 Trial operation sequence



2.2 Inspection before trial operation

Before inspection, confirm the state of indoor and outdoor to avoid the trial failure because of the incorrect installation.

2.2.1 Indoor unit confirmation

No.	inspection items	results
1	If indoor unit is in good condition, and if the electric box position is in accordance with the state when out of factory, also if it is fixed firmly.	
2	If indoor wiring is correct. If the connecting terminal of the fan motor, swing motor and water pump is connected well. If the sensor is in good condition and it is at the proper place.	
3	If the dip switch of indoor unit is set correctly. If the indoor address, central controller address, wired controller address and its other selection are correct.	
4	If the wire sequence of wired controller is correct.	
5	Before being electrified, measure the resistors among live wire, neutral wire and earthing point on the terminal block with the 500V ohmmeter. The resistor must be over 1 M Ohm.	

2.2.2 Outdoor unit confirmation

No.	inspection items	results
1	If outdoor unit is in good condition, and if the electric box is fixed firmly.	
2	If outdoor wiring is correct. If the wires are broken.	
3	If the dip switch of outdoor unit is set correctly. If the outdoor address is correct. The master unit No. must be No.1, and the other units can be No. 2, No.3. If there are multiple outdoors, before being electrified, the master unit SW4-5 is set as "searching outdoor".	
4	if the communication wire between indoor and outdoor is connected to master unit, or the master unit will occur failure code 1002.	
5	Before being electrified, measure the resistors among live wire, neutral wire and earthing point on the terminal block with the 500V ohmmeter. The resistor must be over 1 M Ohm.	

2.2.3 Wiring confirmation

No.	inspection items	results
1	If outdoor power cable is fixed at correct position. And if the power cable is in compliance with the requirement.	
2	If indoor power cable is fixed at correct position. And if the power cable is in compliance with the requirement.	
3	Check the indoor power wiring to prevent that one of indoors has already powered down, all the other indoors and outdoors in one system are normally running. Indoors in one system should adopt one power supply.	
4	If the communication wire between outdoors complies with requirement, and A, B, C must be corresponding, or the PCB will be damaged.	
5	If the communication wire between indoor and outdoor complies with requirement, and the communication wires do not care the phase sequence, but the shielded wire is needed. The shielded layer among indoors must be continuous. The communication wire of the whole system must be earthed at the farthest shielded wires of indoor and outdoor.	
6	If the communication wire between indoor and wired controller complies with requirement, and A, B, C must be corresponding, or the wired controller will be abnormal.	
7	The distance between high voltage and low voltage of the power cable and the communication wire must be over 50mm. Or communciation failure will occur.	

2.2.4 System confirmation

liquid pipe diameter	standard additional charging amount(kg/m)	total length of liquid pipe (mm)	every liquid pipe additional charging amount(kg)
Ø 6.35	6.35	=	
Ø 9.52	9.52	=	
Ø 12.7	12.7	=	
Ø 15.88	15.88	=	
Ø 19.05	19.05	=	
Ø 22.22	22.22	=	
		total additional charging amount	

Note: Check if outdoor stop valve has been open fully. When there is only master unit, please confirm if the oil pipe stop valve has been close fully.

2.3 State setting of trial operation

Confirm being electrified

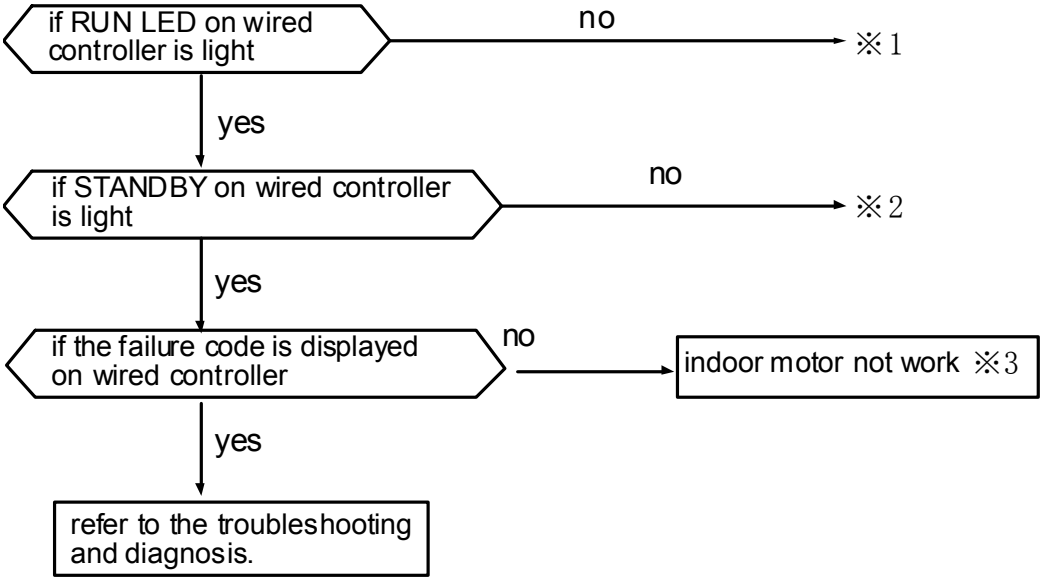
Indoor and outdoor are electrified respectively and then check as the following table:

No.	inspection items	results
1	If outdoor connecting board is electrified; if digital tube is working well (when moving the dip switch, check if digital tube data changes.	
2	If indoor/outdoor communication indicator LED4 and LED7 flash.	
3	If indicator LED2 and LED5 of communication between master unit and connecting board flash.	
4	If the outdoor quantity that master unit searched is correct. If there is one slave unit, LED on master unit will display 0000, 1111 repeatedly; if there are two slave units, LED on master unit will display 0000, 1111, 2222 repeatedly... and so on.	
5	Check if the outdoor data is correct by the dip switch on outdoor connecting board or the testing device and the software. Check the data such as outdoor sensor, EEV open angle, etc.	
6	Check if the indoor data is correct by the dip switch on indoor connecting board or the testing device and the software. Check the data such as indoor sensor, EEV open angle, etc.	
7	Check if the oil temp. sensor at compressor bottom is over 35 degree, if less than 35degree, please electrify the outdoor for 12 hours; if more than 35 degree, please make compulsory operation. Otherwise the unit will not start up, even in compulsory operation.	

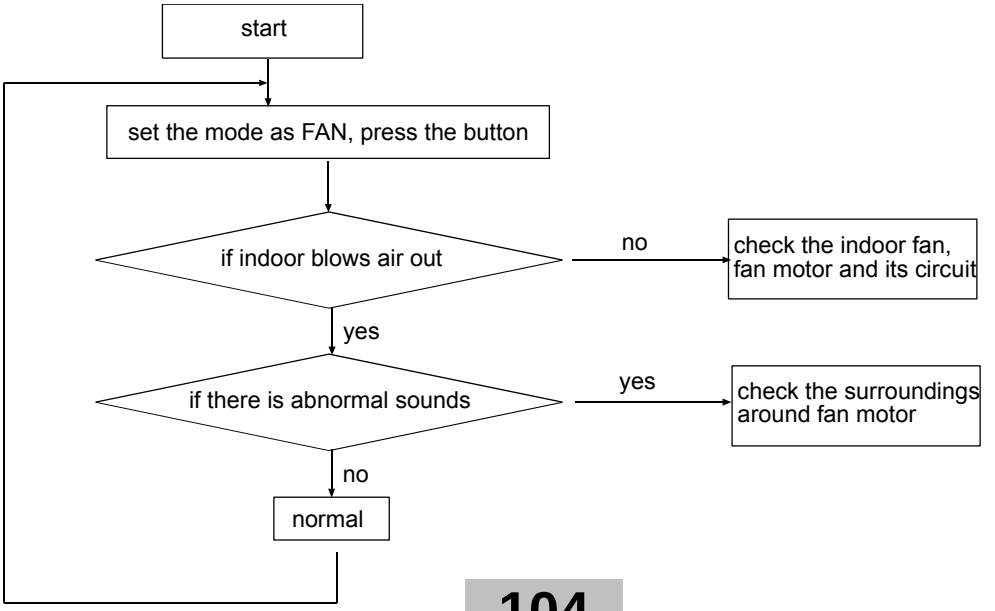
2.4 Trial operation

Generally, confirm all the indoors one by one. Please set the other indoors at STOP state

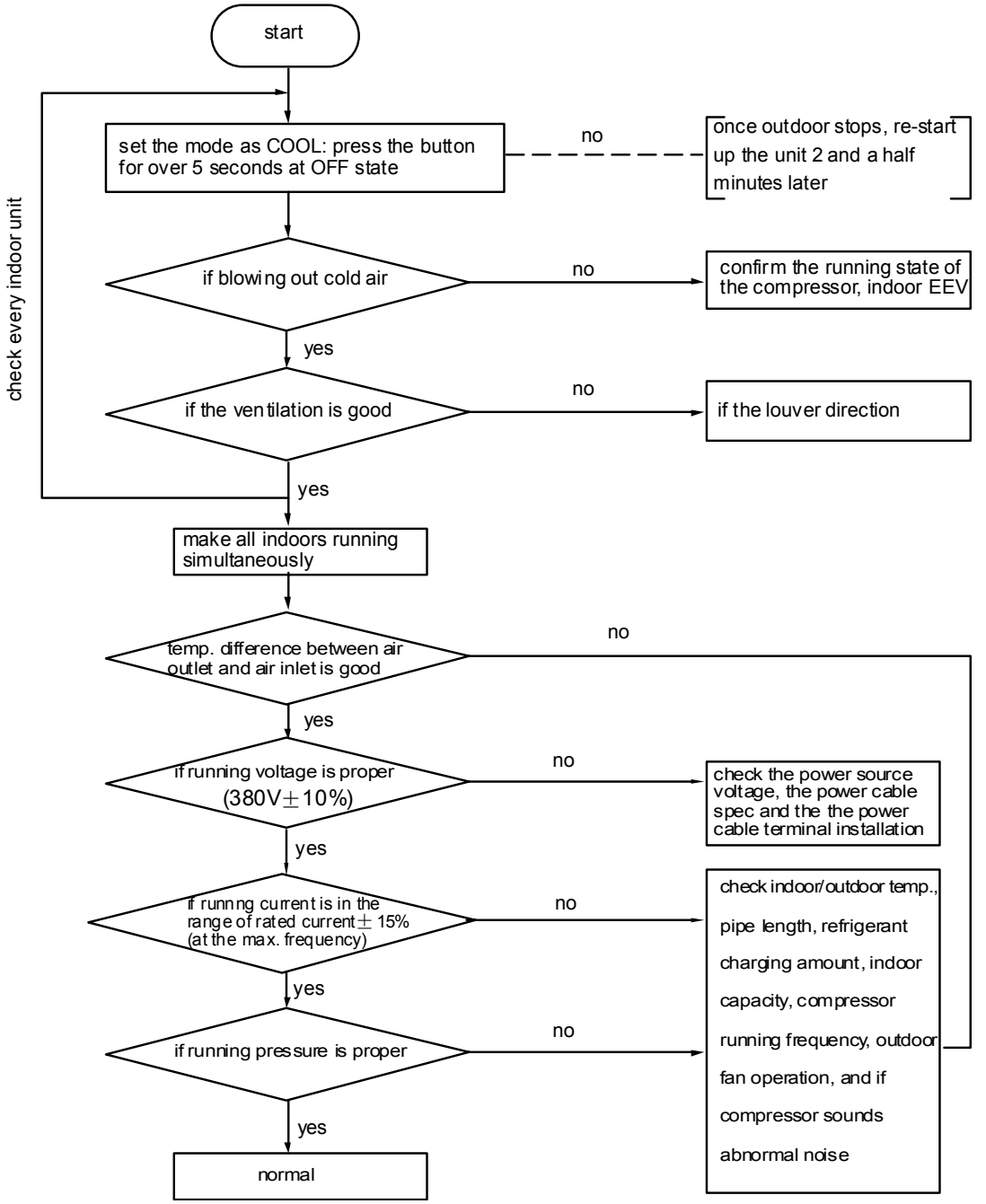
2.4.1 Main power supply and preliminary confirmation



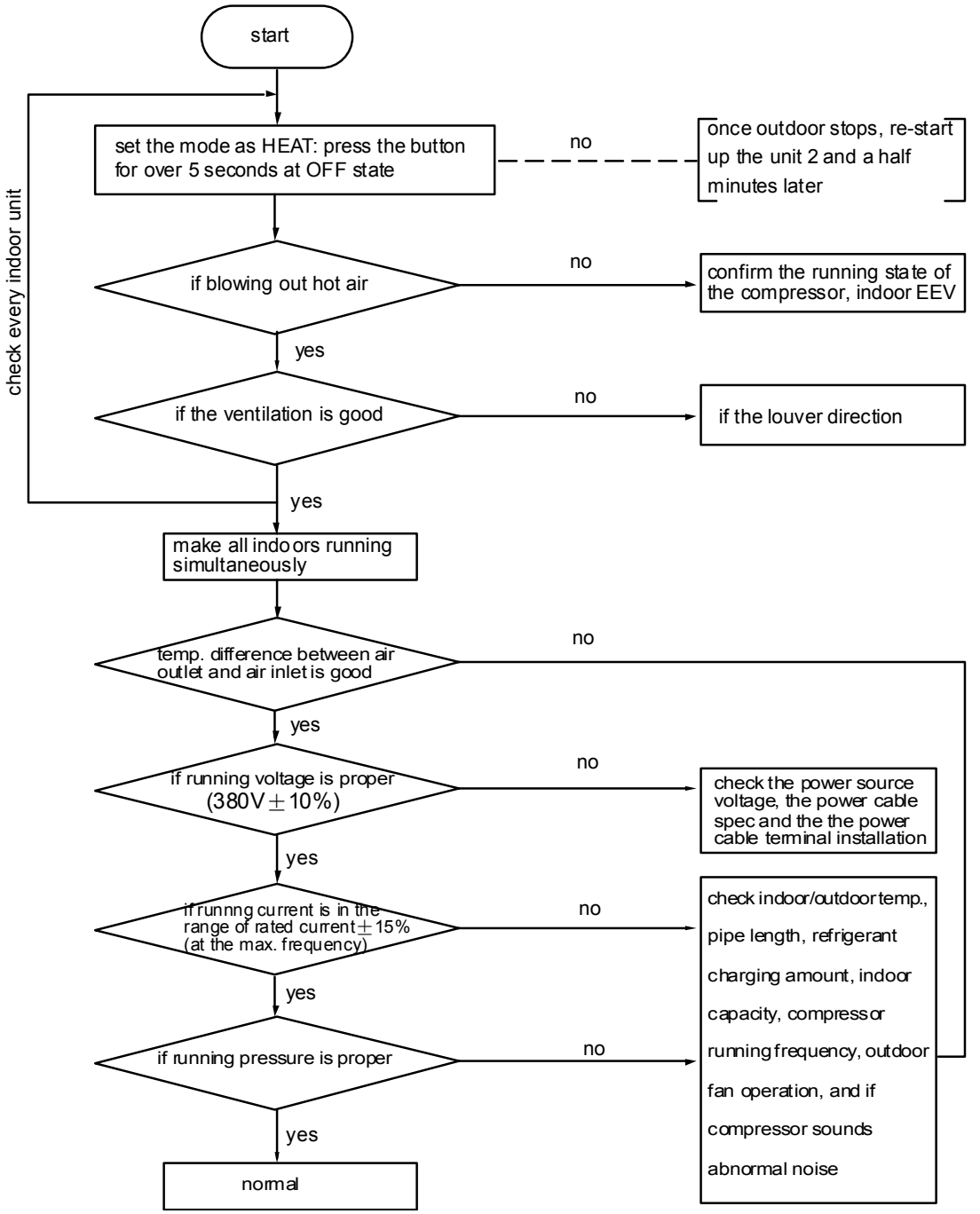
2.4.2 Motor operation confirmation



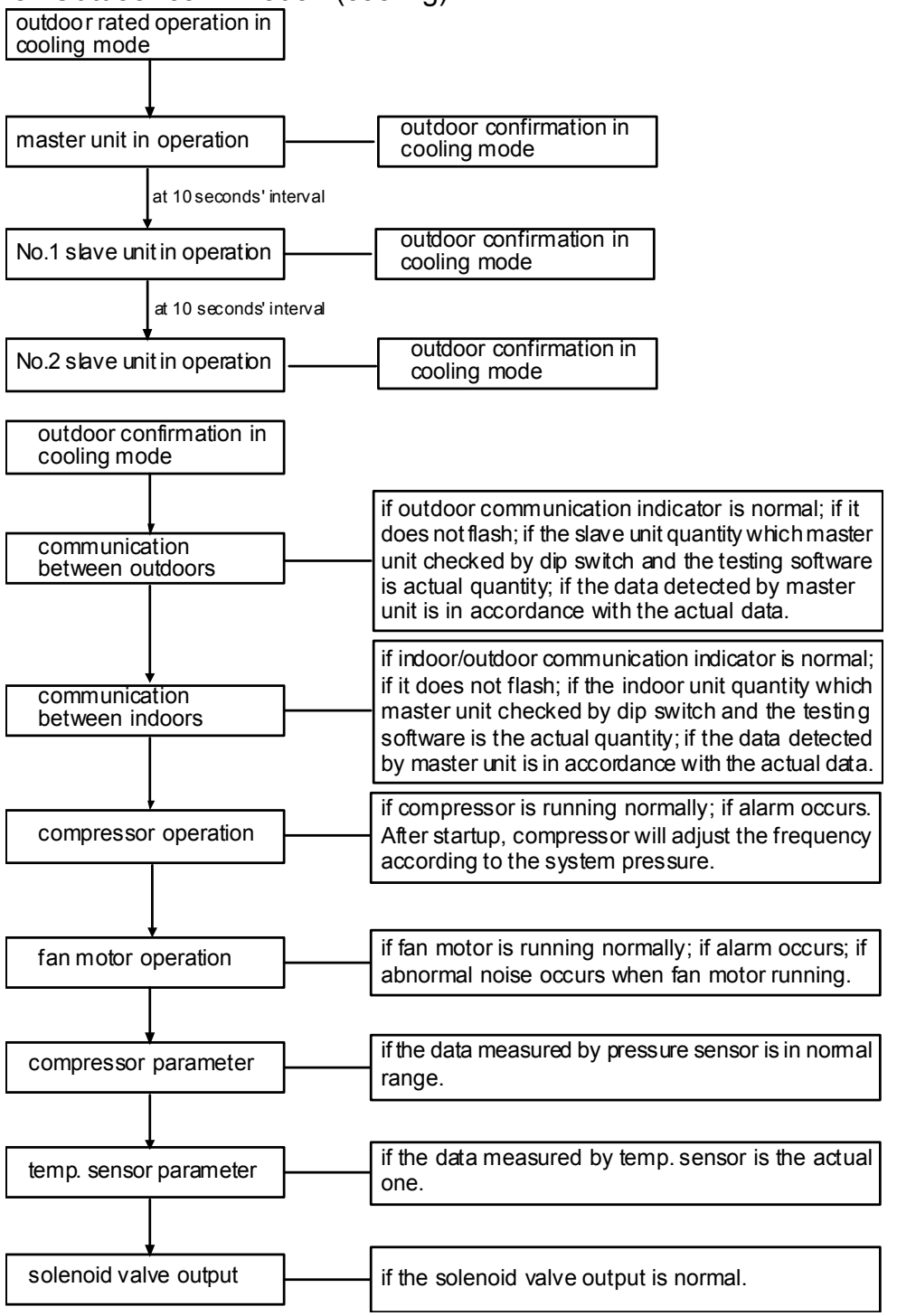
2.4.3 Cooling operation confirmation



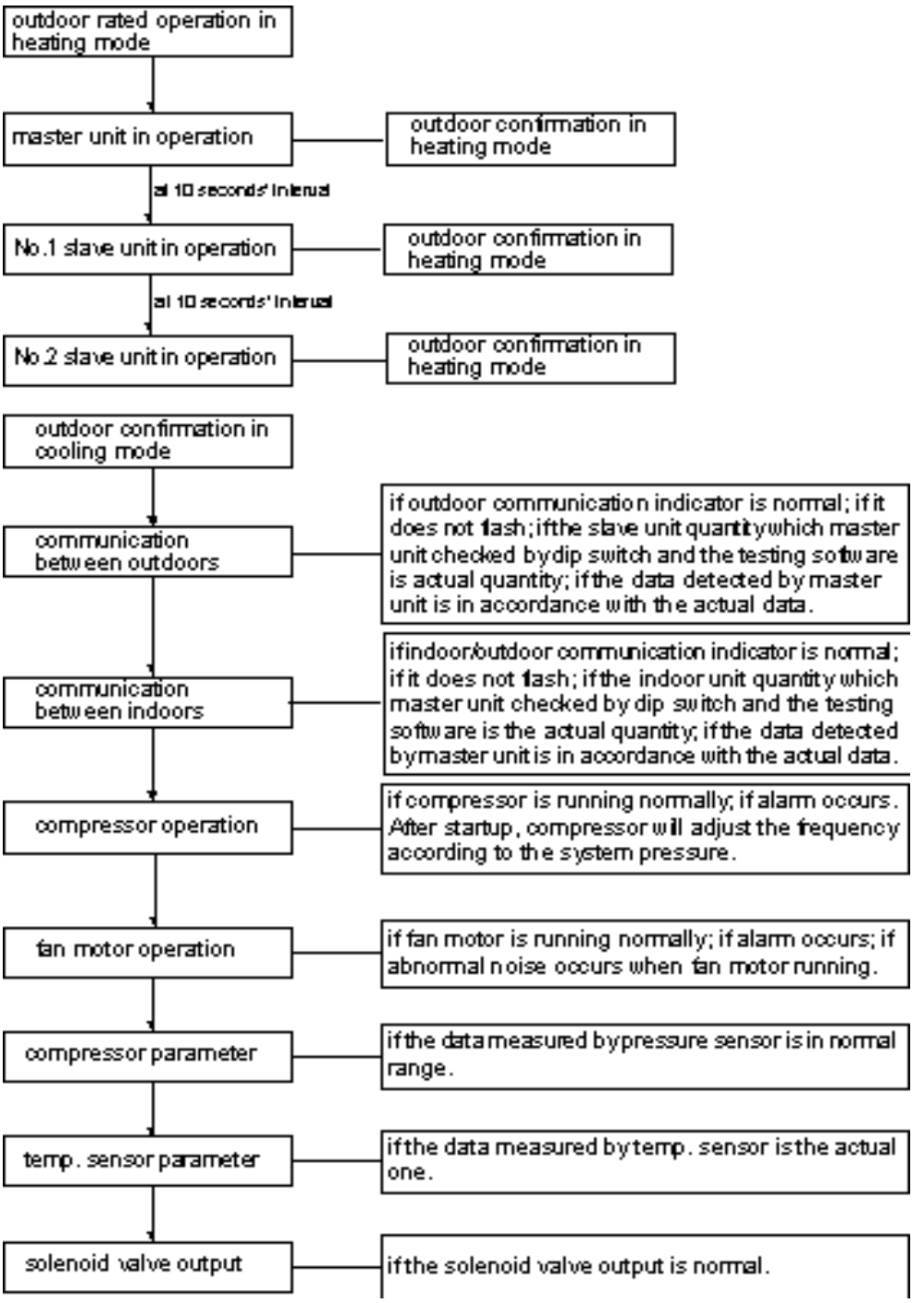
2.4.4 Heating operation confirmation

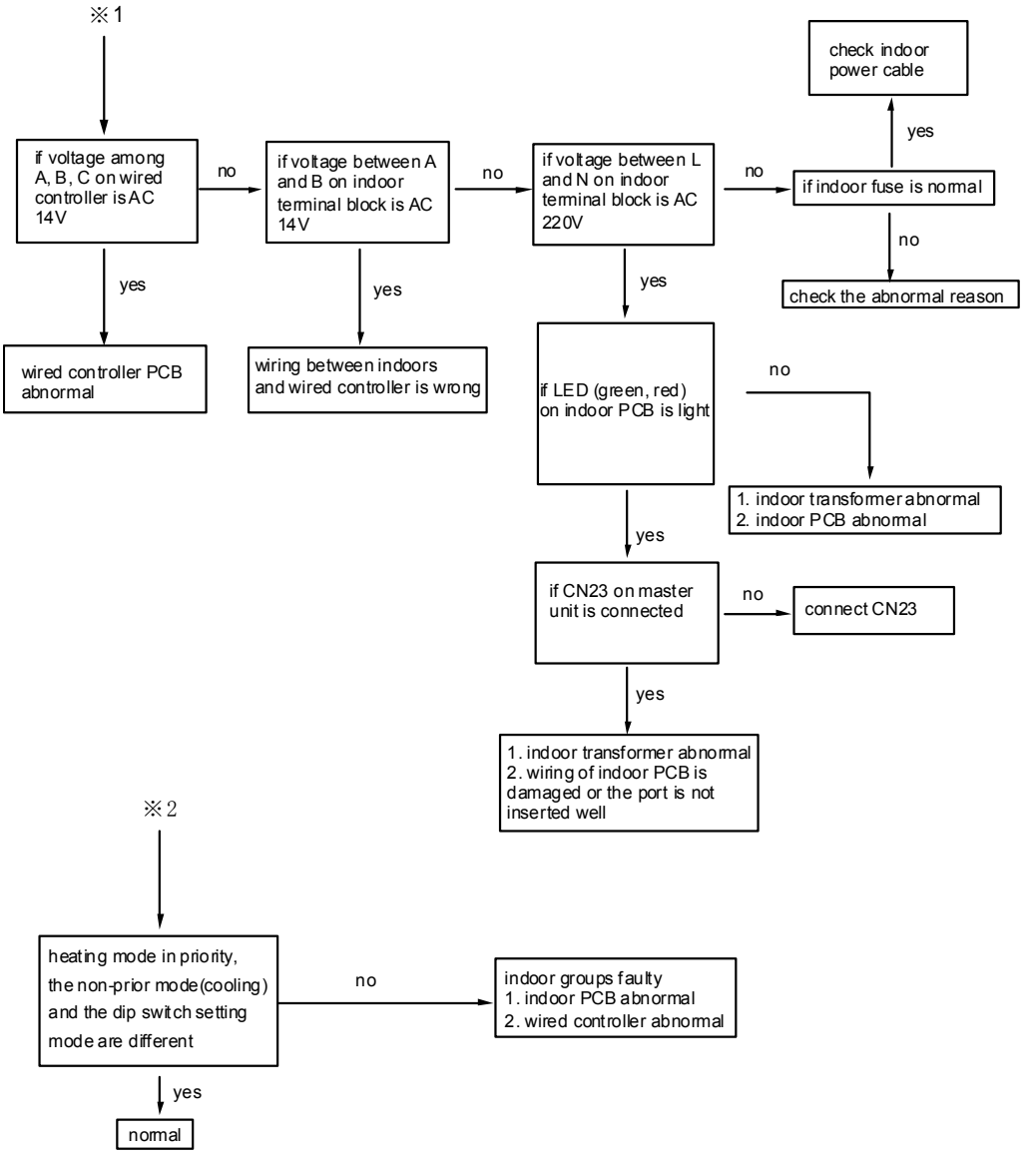


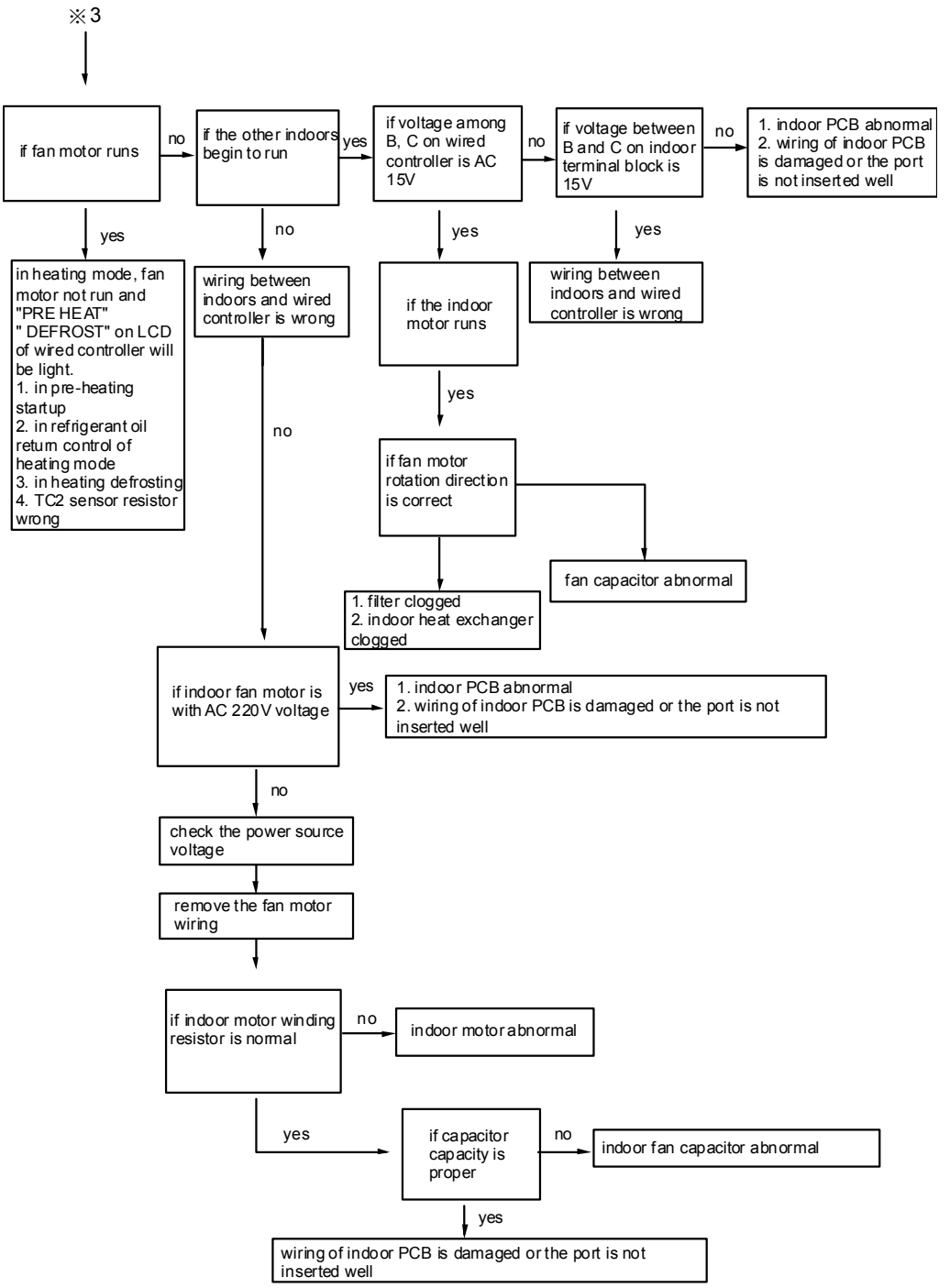
2.4.5 Outdoor confirmation (cooling)



2.4.6 Outdoor confirmation (heating)




※1
if voltage among A, B, C on wired controller is AC 14V
no
if voltage between A and B on indoor terminal block is AC 14V
no
if voltage between L and N on indoor terminal block is AC 220V
no
if indoor fuse is normal
yes
check indoor power cable
no
check the abnormal reason
yes
wired controller PCB abnormal
yes
wiring between indoors and wired controller is wrong
yes
if LED (green, red) on indoor PCB is light
no
1. indoor transformer abnormal
2. indoor PCB abnormal
yes
if CN23 on master unit is connected
no
connect CN23
yes
1. indoor transformer abnormal
2. wiring of indoor PCB is damaged or the port is not inserted well
※2
heating mode in priority, the non-prior mode(cooling) and the dip switch setting mode are different
no
indoor groups faulty
1. indoor PCB abnormal
2. wired controller abnormal
yes
normal


※3
if fan motor runs
no
if the other indoors begin to run
yes
if voltage among B, C on wired controller is AC 15V
no
if voltage between B and C on indoor terminal block is 15V
no
1. indoor PCB abnormal
2. wiring of indoor PCB is damaged or the port is not inserted well
yes
in heating mode, fan motor not run and "PRE HEAT" " DEFROST" on LCD of wired controller will be light.
1. in pre-heating startup
2. in refrigerant oil return control of heating mode
3. in heating defrosting
4. TC2 sensor resistor wrong
no
wiring between indoors and wired controller is wrong
yes
if the indoor motor runs
yes
wiring between indoors and wired controller is wrong
yes
if fan motor rotation direction is correct
fan capacitor abnormal
1. filter clogged
2. indoor heat exchanger clogged
no
if indoor fan motor is with AC 220V voltage
yes
1. indoor PCB abnormal
2. wiring of indoor PCB is damaged or the port is not inserted well
no
check the power source voltage
remove the fan motor wiring
if indoor motor winding resistor is normal
no
indoor motor abnormal
yes
if capacitor capacity is proper
no
indoor fan capacitor abnormal
yes
wiring of indoor PCB is damaged or the port is not inserted well

Note 1): Temp. difference between air inlet and air outlet Standard
A. In cooling mode, after running for at least 30 minutes, it is normal that the temp. difference between air inlet and air outlet is over 10□, (at max. frequency)
B. In heating mode, after running for at least 30 minutes, it is normal that the temp. difference between air inlet and air outlet is over 14□, (at max. frequency).
Note 2): Running current standard
It is normal that the running current is in the range of rated current ±15％(at max. frequency) . The current will be different for the below condition:
if more than the rated current: high indoor/outdoor temp. ; outdoor bad ventilation (cooling mode), indoor bad ventilation (heating mode).
if lower than rated current: low indoor/outdoor temp.; refrigerant leakage (lack of refrigerant).

Note 3): Running pressure standard

cooling (at max. frequency)	high pressure 2.0~3.5MPa	indoor 18~32℃ outdoor 25~35℃
	low pressure 0.6~1.0MPa	
heating (at max. frequency)	high pressure 2.2~2.8MPa	indoor 15~25℃ outdoor 5~10℃
	low pressure 0.3~0.8MPa	

The above value is measured after running for 15 minutes (ambient temp. is DB□)

High/low pressure changing trend due to the running condition:

Cooling/heating:

indoor temp. goes up---high/low pressure goes up

indoor temp. goes down---high/low pressure goes down

outdoor temp. goes up---high/low pressure goes up

outdoor temp. goes down---high/low pressure goes down

3 Failure code

3.1 Inverter master outdoor failure code list

digital tube indication on master unit	indication on wired controller (hex)	failure code definition	failure description
20	20	master unit defrosting temp. sensor Te failure	the sensor voltage is below 0.1V (open circuit) or over 4.8V (short circuit) for 1 minute, not alarm in defrosting and within 3 minutes after defrosting.
21	20	master unit ambient temp. sensor Ta failure	the sensor voltage is below 0.1V (open circuit) or over 4.8V (short circuit) for 1 minute, not alarm in defrosting and within 3 minutes after defrosting.
22	20	master unit suction temp. sensor Ts failure	the sensor voltage is below 0.1V (open circuit) or over 4.8V (short circuit) for 1 minute, not alarm in defrosting and within 3 minutes after defrosting.
23	20	master unit discharging temp. sensor Td failure	after compressor runs for 5 minutes, sensor voltage is below 0.1V(open circuit) or over 4.8V (short circuit) for 1 minute, not alarm in defrosting or within 3 minutes after defrosting
24	20	master unit oil temp. sensor Toil failure	the sensor voltage is below 0.1V (open circuit) or over 4.8V (short circuit) for 1 minute, not alarm in defrosting and within 3 minutes after defrosting.
25	20	heat exchanger inlet temp. Toci failure	the sensor voltage is below 0.1V (open circuit) or over 4.8V (short circuit) for 1 minute, not alarm in defrosting and within 3 minutes after defrosting.
27	20	master unit oil temp. too high	when compressor is running, oil temp. is no less than 80℃, unit stops and alarms for 4 minutes; after compressor stops, when oil temp. is no more than 70℃ for 1 minute, resumable. If the failure occurs 3 times in an hour, confirm the alarm.
28	20	master unit high pressure sensor Pd failure	the sensor voltage is below 0.1V (open circuit) or over 4.8V (short circuit) for 30 seconds, not alarm in defrosting and within 3 minutes after defrosting.
29	20	master unit low pressure sensor Ps failure	the sensor voltage is below 0.1V (open circuit) or over 4.8V (short circuit) for 30 seconds, not alarm in defrosting and within 3 minutes after defrosting.
30	20	master unit high pressure switch failure	when compressor is running, if switch opens for 1 minute, alarm; after the unit stops for 2 minutes and 50 seconds, resumable. If the failure occurs 3 times in an hour, confirm the alarm.
31	20	master unit low pressure switch failure	compressor stops, if detecting pressure switch for 30 seconds, alarm; after compressor is running for 10 minutes, switch opens for 1 minute, alarm; if the failure occurs 3 times in an hour, confirm the alarm. Not detect in the course of soft start, defrosting and within 3 minutes after defrosting, oil return and within 5 minutes after oil return.
32	20	overcooling heat exchanger outlet temp. Tsco failure	the sensor voltage is below 0.1V (open circuit) or over 4.8V (short circuit) for 1 minute, not alarm in defrosting and within 3 minutes after defrosting.

digital tube indication on master unit	indication on wired controller (hex)	failure code definition	failure description
33	20	EEPROM failure of master unit main chip 849	EEPROM faulty, or being inserted conversely, with incorrect part
34	20	master unit discharging temp. Td protection	Td sensor is over 120℃ for 10 seconds, unit stops and alarms; 2 minutes and 50 seconds later, resumable. If it occurs 3 times in an hour, confirm the alarm.
36	20	master unit oil temp. too low	compressor is running, Toil < PS+10 for 4 minutes or Toil <Ps+3 for 10 seconds, the unit stops and alarms; if it occurs 3 times in an hour, confirm the alarm. The failure resume condition: 1. When Ta<=0℃, Toil>=Ps+10 and Toil >=6; 2.When Ta>0℃, Toil>=Ps+10 or Toil >=36
38	20	master unit high pressure sensor Pd too low protection	compressor is running, detecting Pd sensor is below 17. 8kg/cm², and compression ratio is below 2 for 5 minutes, the unit stops and alarms. Not detect in the course of defrosting, within 3 minutes after defrosting, oil return, within 5 minutes after oil return.
39	20	master unit low pressure sensor Ps too low protection	compressor is running, detecting Ps sensor is below 0. 5kg/cm²for 10 seconds; in oil return, detecting Ps sensor is below 0.3kg/cm²for 10 seconds, the unit stops and alarms. 2 minutes and 50 seconds later after unit stops, resume.
40	20	master unit high pressure sensor Pd too high protection	compressor is running, detecting Pd sensor is over 40kg/cm²for 10 seconds; the unit stops and alarms. 2 minutes and 50 seconds later after unit stops, resume.If it occurs 3 times in an hour, confirm the alarm
43	20	discharging temp. sensor Td protection	compressor is running, Td<Pd+5 for 1 minute, the unit stops and alarms. 2 minutes and 50 seconds later after unit stops, resume.If it occurs 3 times in an hour, confirm the alarm.In defrosting and within 3 minutes after defrosting, not alarm.
44	20	communication between master unit main chip 849 and communication chip 849 failure	no communication for 4 minutes
46	20	communication between connecting board and module board failure	no communication for 4 minutes
47	20	radiator failure	radiator temp. is over 95degree, the unit alarms. 2 minutes and 50 seconds later after unit stops, resume.
48	20	ACCT over current protection (instant value)	ACCT sensor detects that he instant current peak value between U and V is over 94A, 2 minutes and 50 seconds later after the unit stops, resume.
49	20	ACCT over current protection (virtual value)	ACCT sensor detects that he instant current peak value between U and V is over 34Arms, 2 minutes and 50 seconds later after the unit stops, resume.
50	20	over voltage	VDC is over 817V, 2 minutes and 50 seconds later after the unit stops, resume.
51	20	current detecting failure	after compressor has run for 10 seconds, current among U, V, W is below 1.5Arms, 2 minutes and 50 seconds later after the unit stops, resume.

digital tube indication on master unit	indication on wired controller (hex)	failure code definition	failure description
52	20	radiator sensor failure	before startup, detect if the sensor is in short circuit or in open circuit. 2 minutes and 50 seconds later after unit stops, resume.
53	20	current sensor broken down	before startup, the sensor is in short circuit or in open circuit. 2 minutes and 50 seconds later after unit stops, resume.
54	20	voltage is too low	detecting VDC is less than 289V. 2 minutes and 50 seconds later after unit stops, resume.
55	20	radiator fan broken down	STANDBY state keeps for 10 minutes. 2 minutes and 50 seconds later after unit stops, resume.
56	20	ACCT faulty	in running, H/W of ACCT is faulty. 2 minutes and 50 seconds later after unit stops, resume.
57	20	DCCT faulty	in running, H/W of ACCT is faulty. 2 minutes and 50 seconds later after unit stops, resume.
58	20	IPM faulty	in running, IPM output is faulty. 2 minutes and 50 seconds later after unit stops, resume.
59	20	VDC faulty	in running, H/W of VDC is faulty. 2 minutes and 50 seconds later after unit stops, resume.
60	20	logic problem	when startup or running, PWM output is abnormal, 2 minutes and 50 seconds later after unit stops, resume.
61	20	IPM in short circuit or the earthing is short circuit	IPM in short circuit or earthing in short circuitl, 2 minutes and 50 seconds later after unit stops, resume.
62	20	load is short circuit	load in short circuit, 2 minutes and 50 seconds later after unit stops, resume.
63	20	incorrect wiring	ACCT wiring is faulty, 2 minutes and 50 seconds later after unit stops, resume.
64	20	overload	current exceeds the limitation for 10 minutes, 2 minutes and 50 seconds later after unit stops, resume.
65	20	DCCT sensor detecting abnormal	in startup, DCCT current is less than 6.5A. 2 minutes and 50 seconds later after unit stops, resume.
66	20	DCCT sensor broken down	before startup, DCCT voltage is out of control. 2 minutes and 50 seconds later after unit stops, resume.
67	20	communication abnormal with fan motor driving board	no communication for 4 minutes
68	20	DC fan motor driving board IPM alarms	in communication the code byte is 0*20. 2 minutes and 50 seconds later after unit stops, resume.If it occurs 3 times in an hour, confirm the alarm.
69	20	DC fan motor driving board pressure too high protection	in communication the code byte is 0*04. 2 minutes and 50 seconds later after unit stops, resume.If it occurs 3 times in an hour, confirm the alarm.
70	20	DC fan motor driving board pressure too low protection	in communication the code byte is 0*08. 2 minutes and 50 seconds later after unit stops, resume.If it occurs 3 times in an hour, confirm the alarm.
71	20	DC fan motor driving board blocked	in communication the code byte is 0*01. 2 minutes and 50 seconds later after unit stops, resume.If it occurs 3 times in an hour, confirm the alarm.
72	20	DC fan motor driving board EEPROM faulty	in communication the code byte is 0*02. 2 minutes and 50 seconds later after unit stops, resume.If it occurs 3 times in an hour, confirm the alarm.
73	20	DC fan motor driving board detecting out of control	in communication the code byte is 0*10. 2 minutes and 50 seconds later after unit stops, resume.If it occurs 3 times in an hour, confirm the alarm.

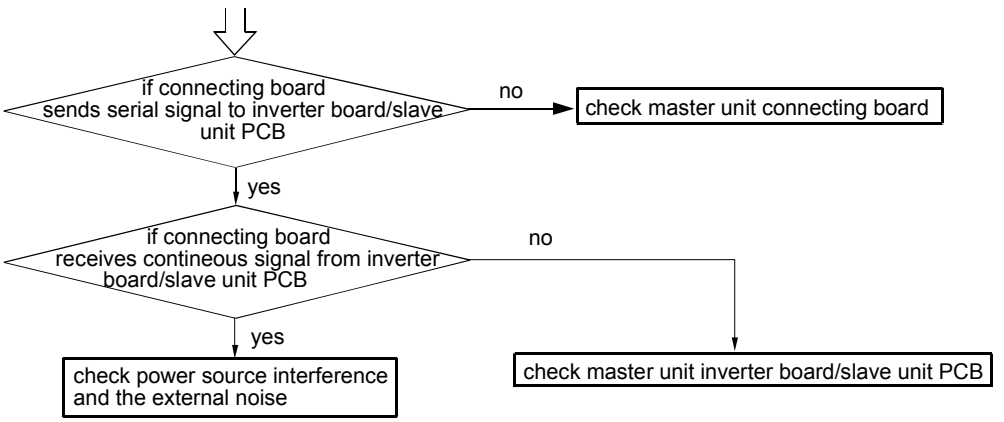
digital tube indication on master unit	indication on wired controller (hex)	failure code definition	failure description
74	20	DC fan motor driving board over current or curent transducer broken down	in communication the code byte is 0*40. 2 minutes and 50 seconds later after unit stops, resume.If it occurs 3 times in an hour, confirm the alarm.
75	20	compressor power cable of inverter board phase sequence is incorrect	after compressor starts up, the high pressure is lower than the low pressure for 1 minute continuously.

3.2 Indoor failure code list

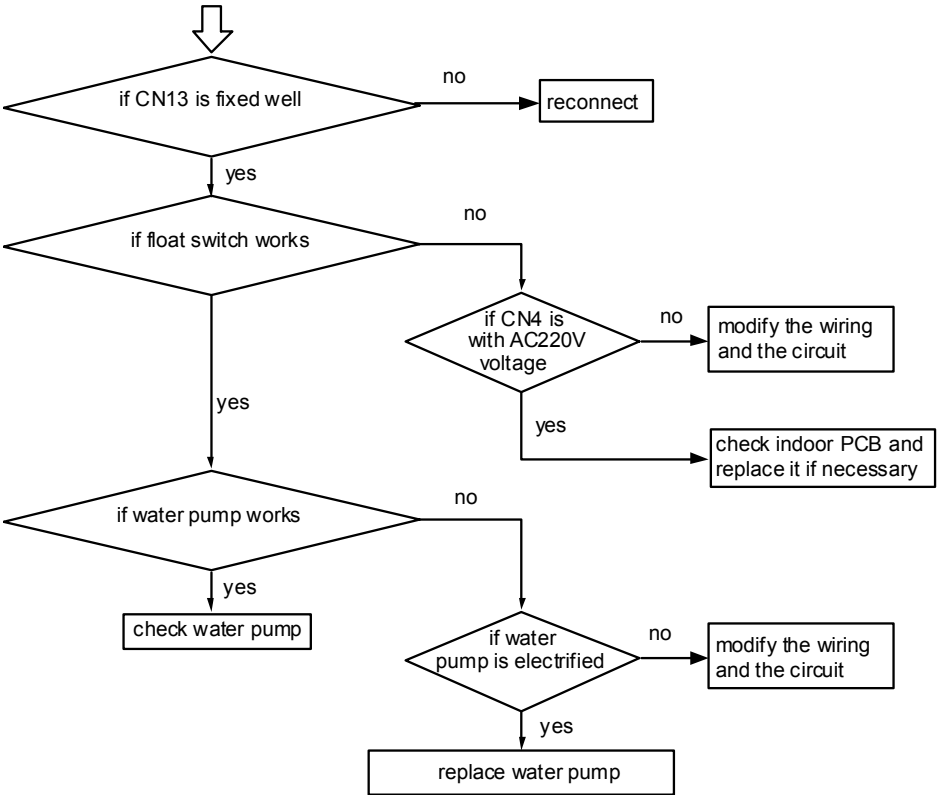
01 02	indication on wired controller	flash times of LED5 on indoor PCB/timer LED on remote receiver	failure code definition
03	01	1	indoor ambient temp. sensor Ta failure
04	02	2	indoor coil temp. sensor Tc1 failure
05	03	3	indoor coil temp. sensor Tc2 failure
06	04	4	indoor TES sensor failure
07	05	5	indoor EEPROM failure
	06	6	communication between indoor and outdoor failure
08 09	07	7	communication between indoor and wired controller failure
0A	08	8	indoor drainage failure
outdoor failure code	09	9	indoor repeated address
	0A	10	indoor repeated central control address
	outdoor failure code	20	outdoor corresponding failure

4.Trouble diagnose and trouble shooting

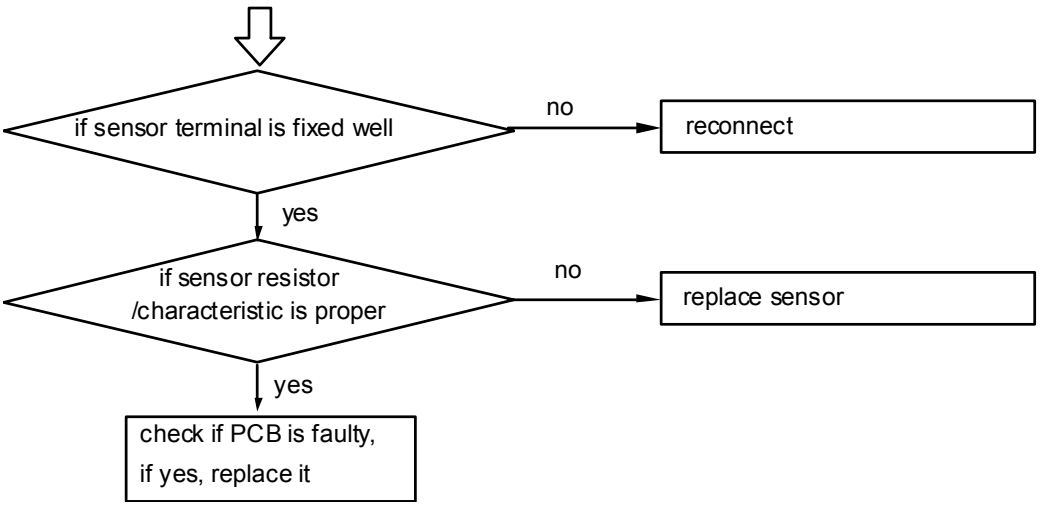
[46]communication between master unit connecting board and inverter board failure



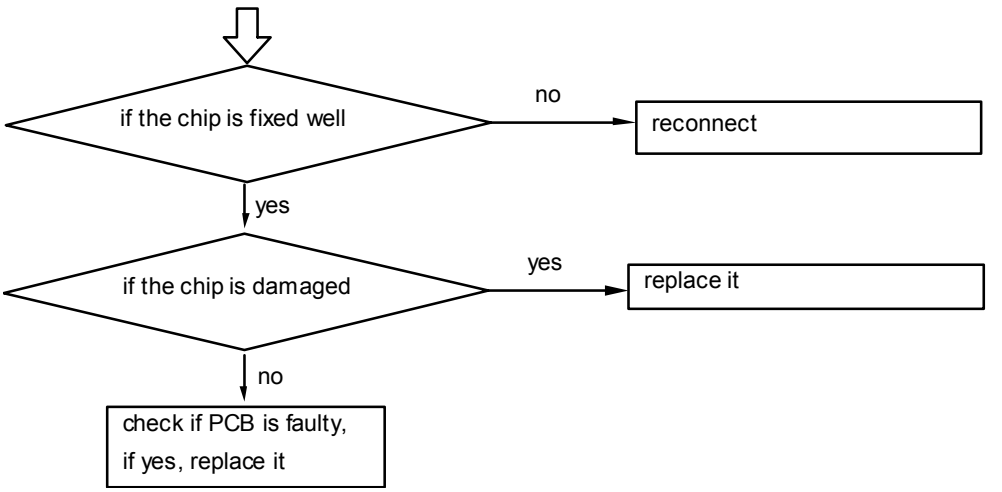
[08]indoor drainage system failure/float switch circuit on indoor PCB failure



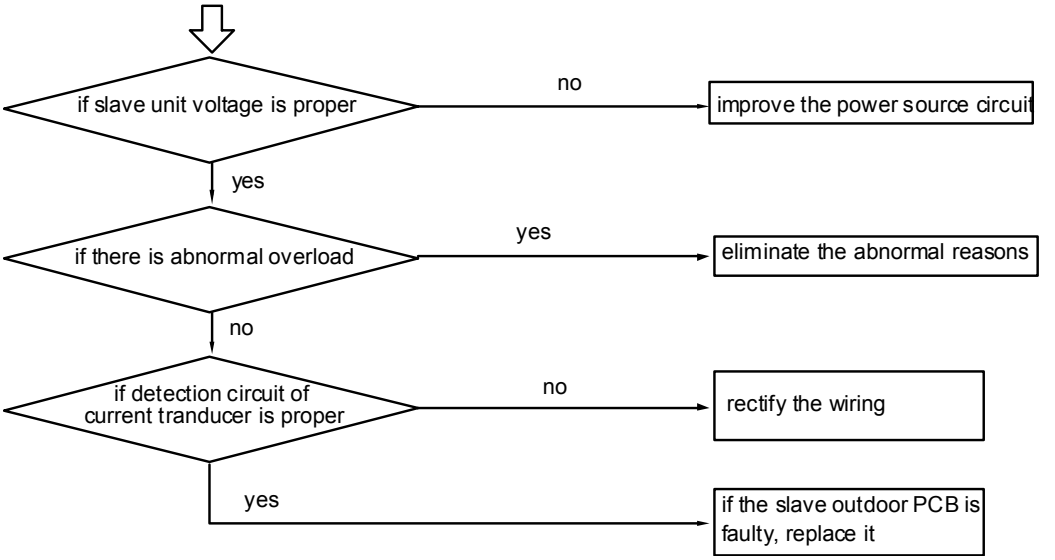
[01/02/03/04/20/21/22/23/24] sensor circuit



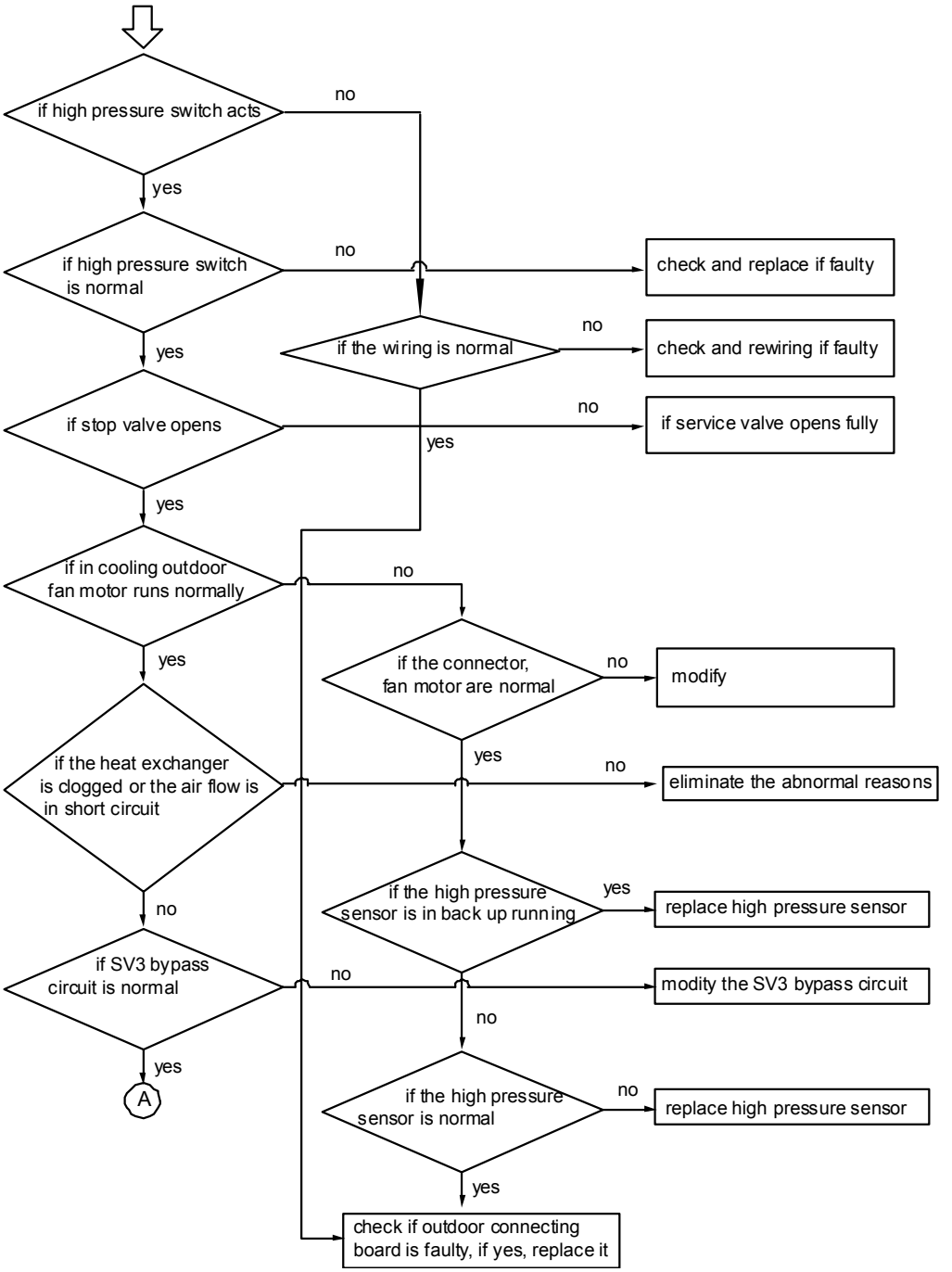
[05/33] EEPROM failure



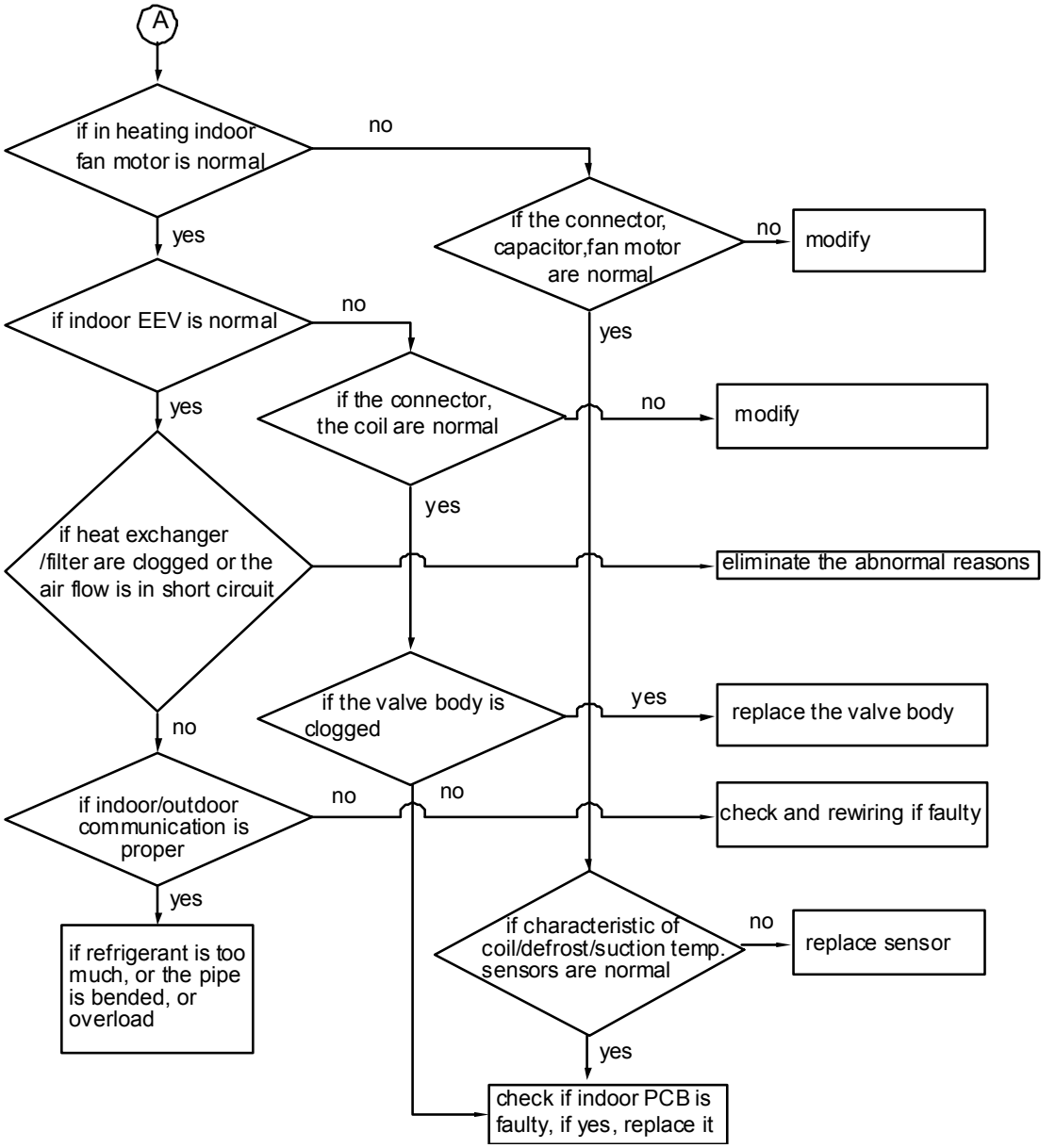
[74] compressor overcurrent protection



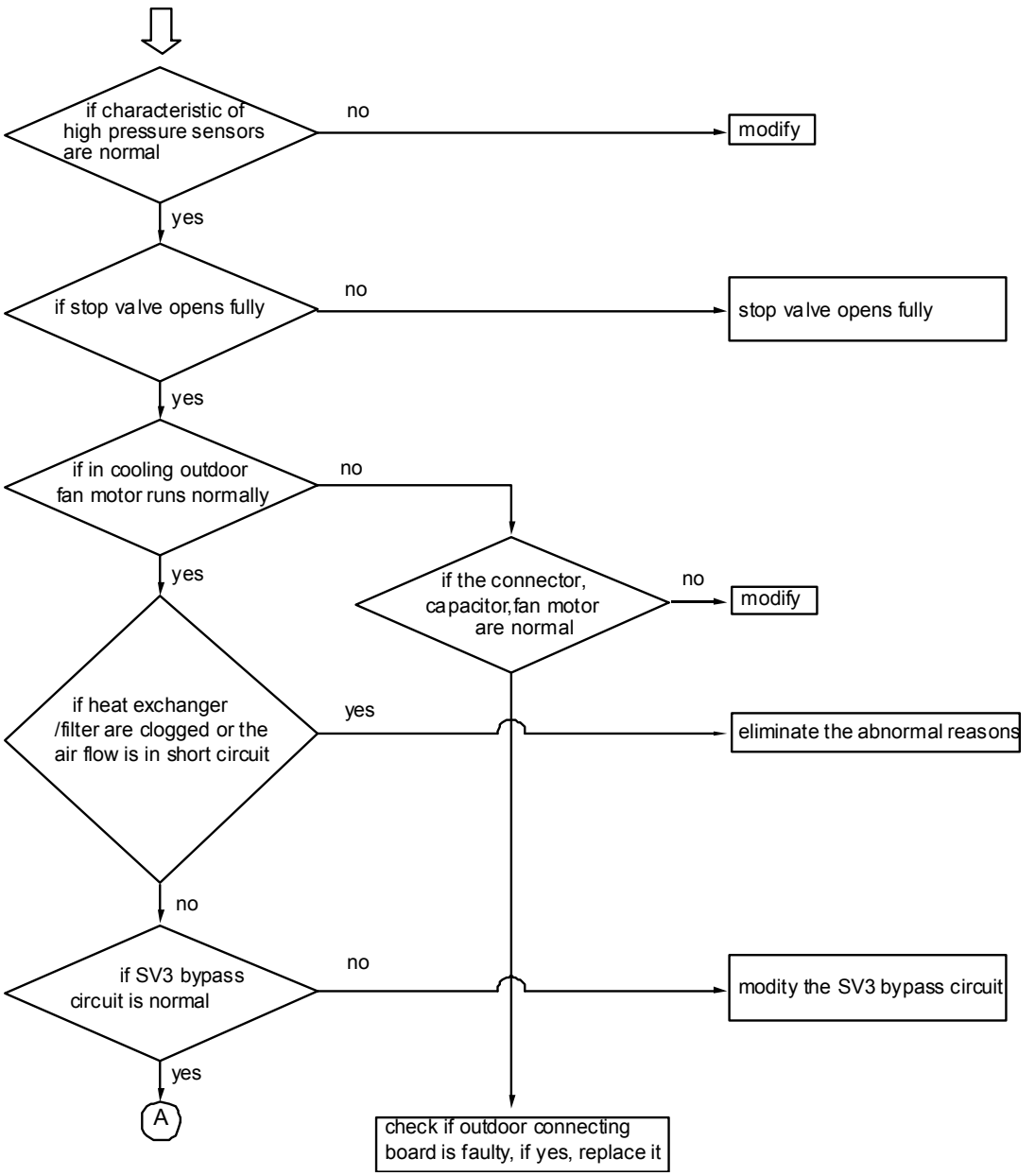
[30] high pressure switch circuit



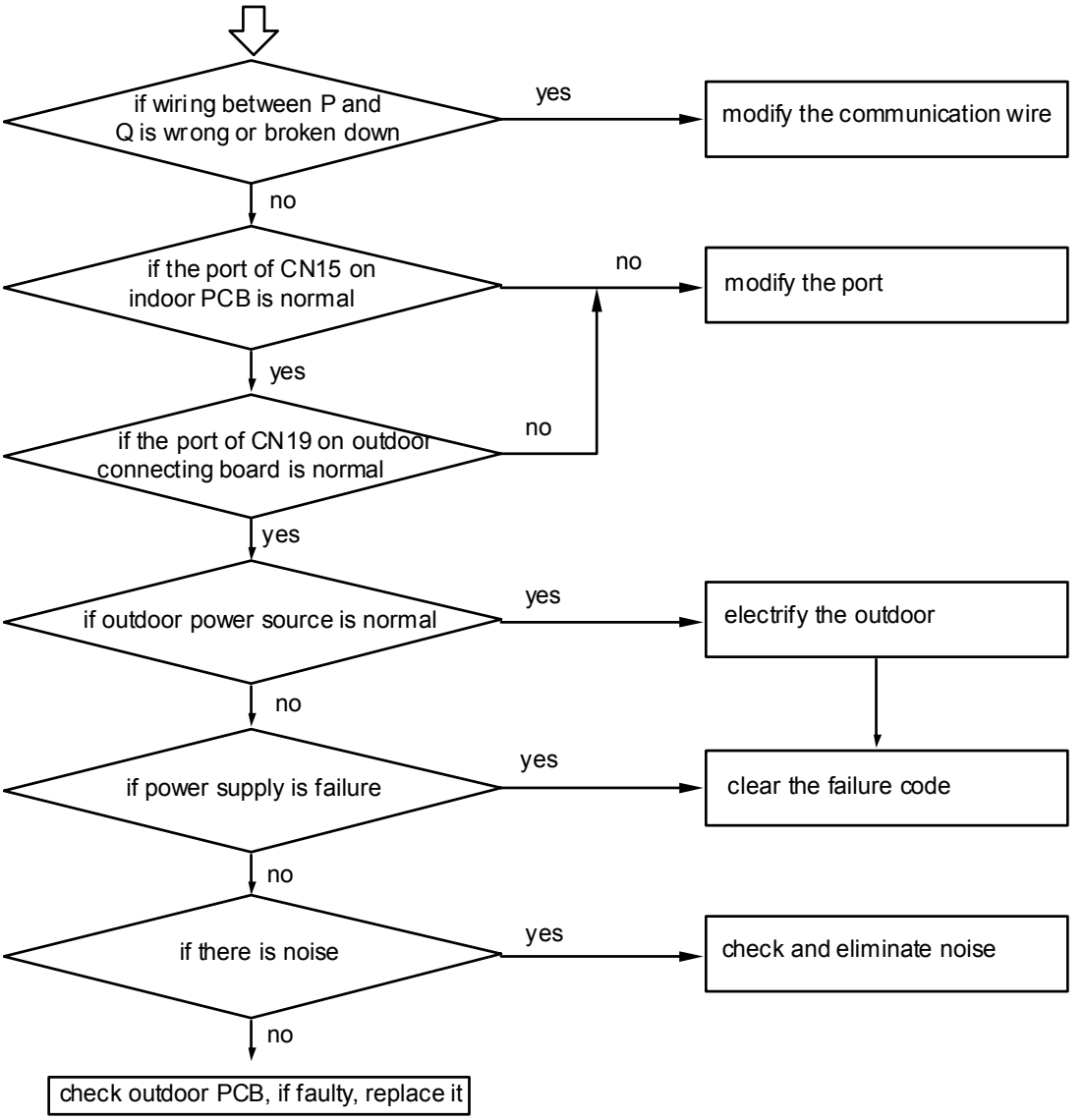
[30/31] high/low pressure switch circuit



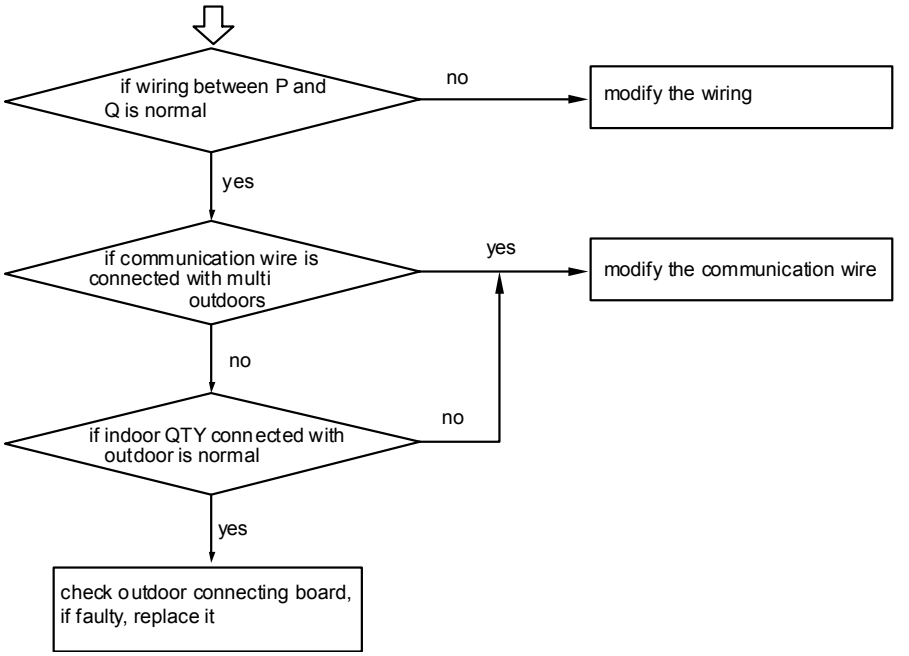
[38/40] high pressure protection (Pd sensor)



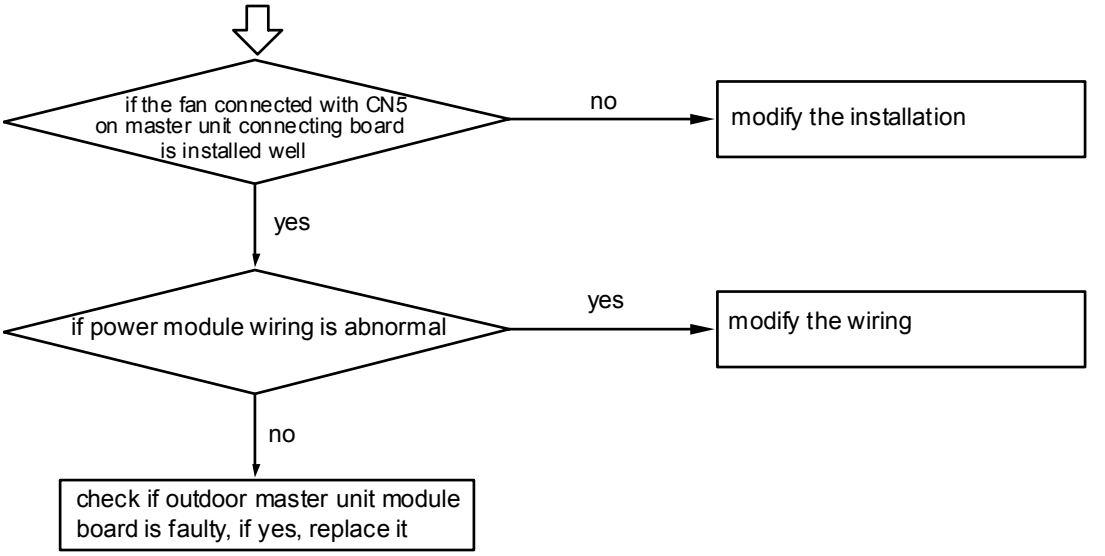
[44/06]communication circuit between indoor and outdoor



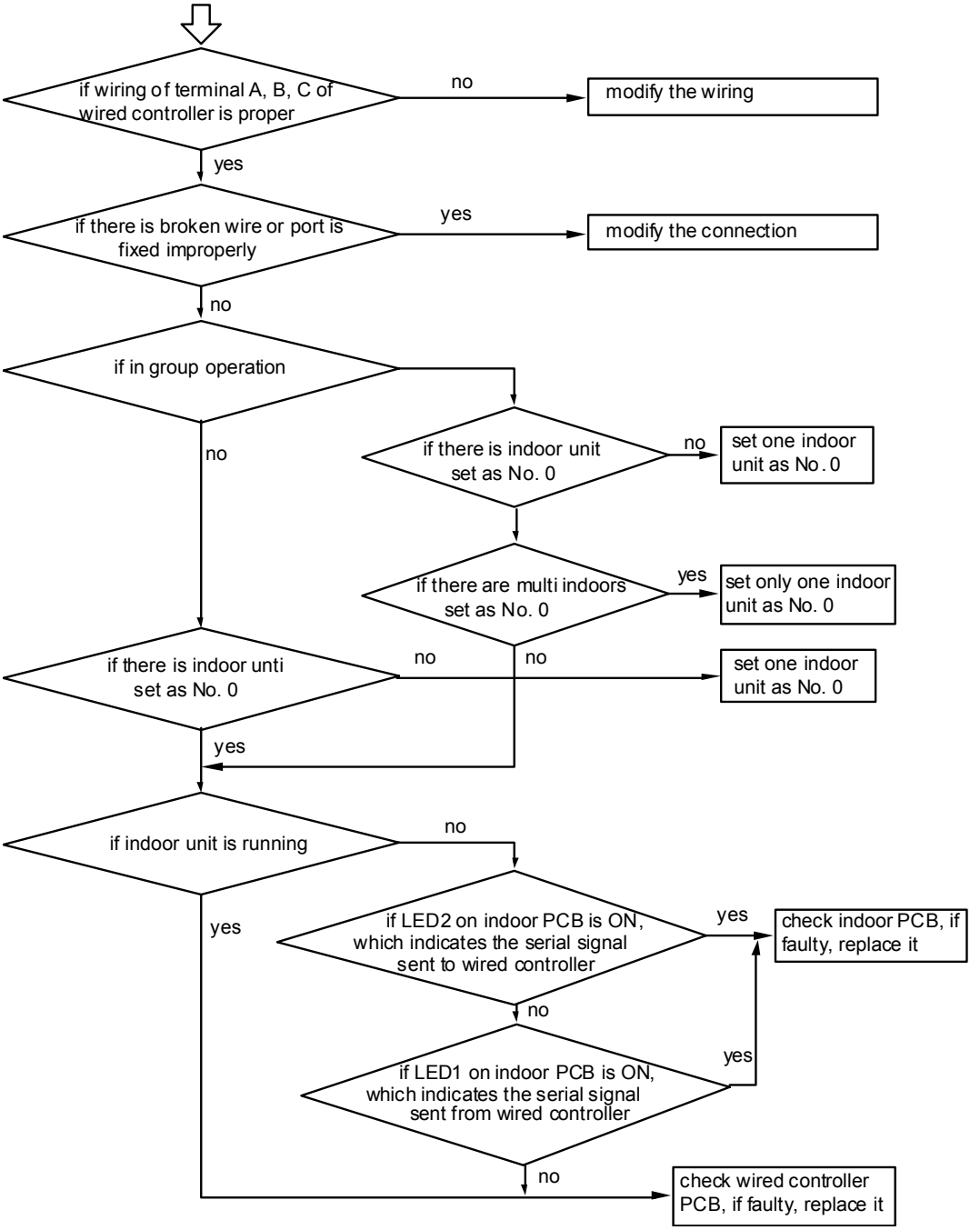
[09]indoor address repeated



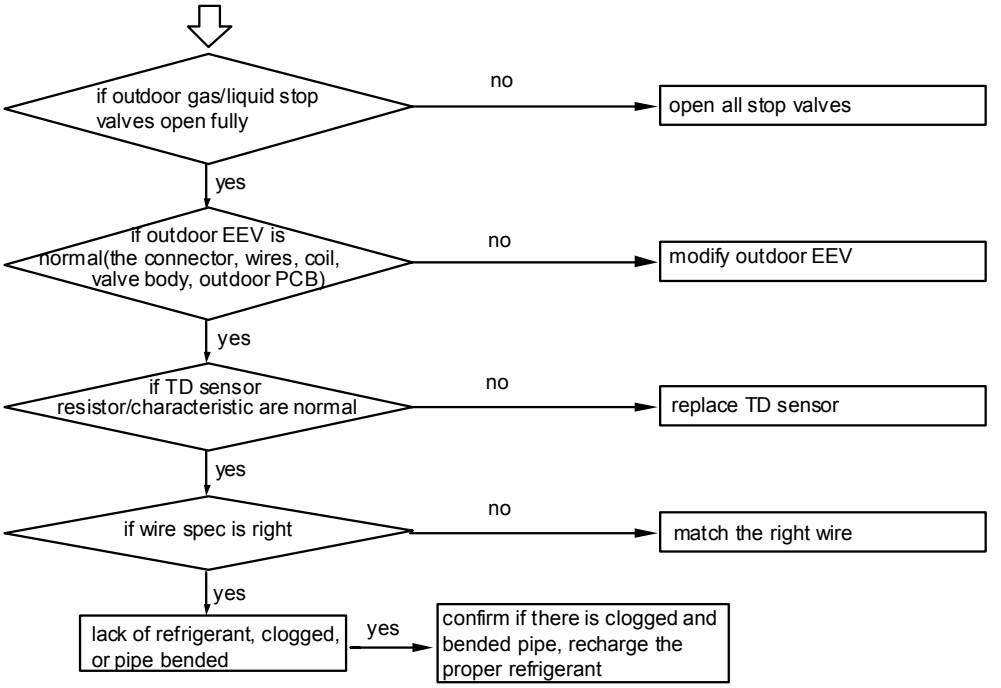
[61]master unit IPM (power module) alarms



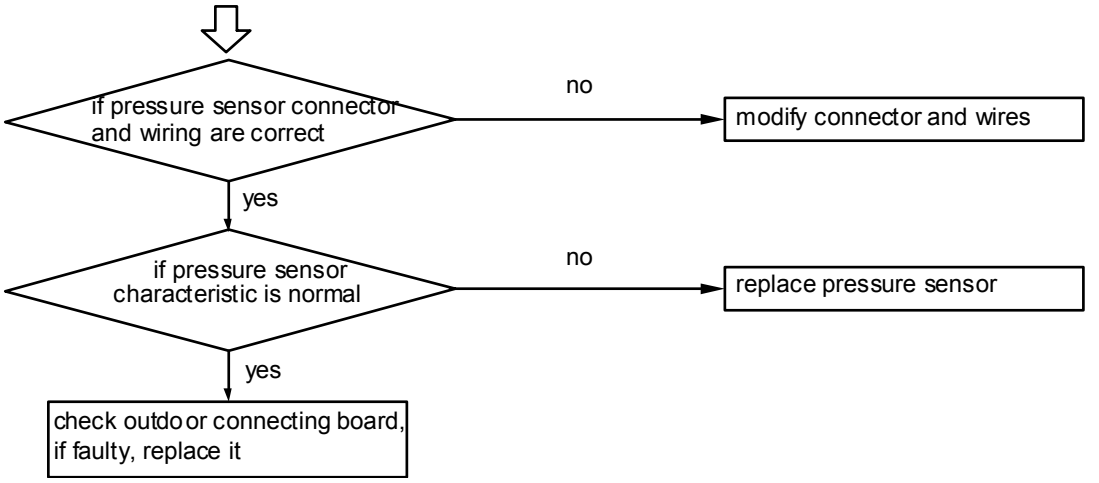
[07]communication abnormal between indoor and wired controller



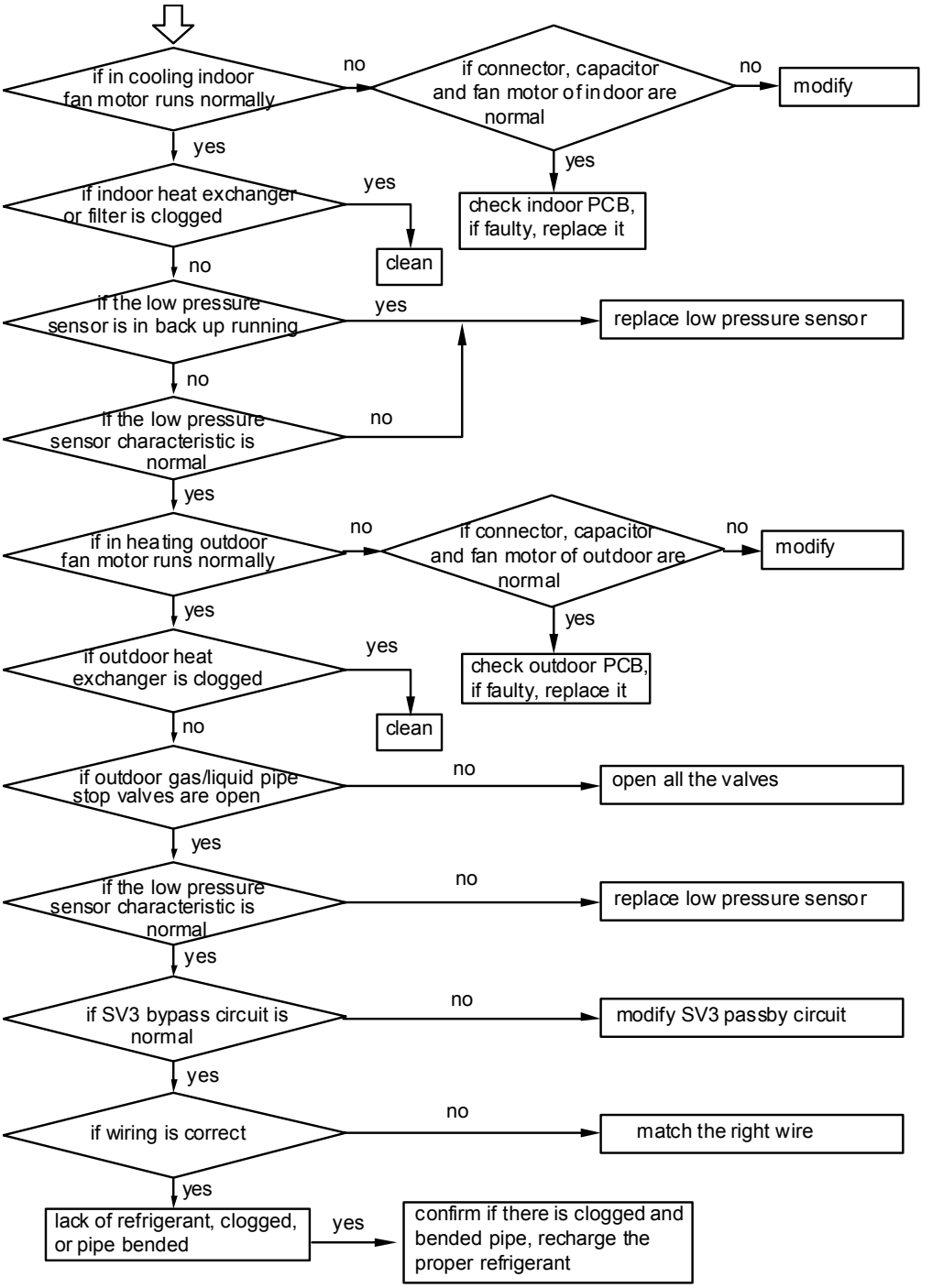
[34] discharging temp. (TD) protection acts



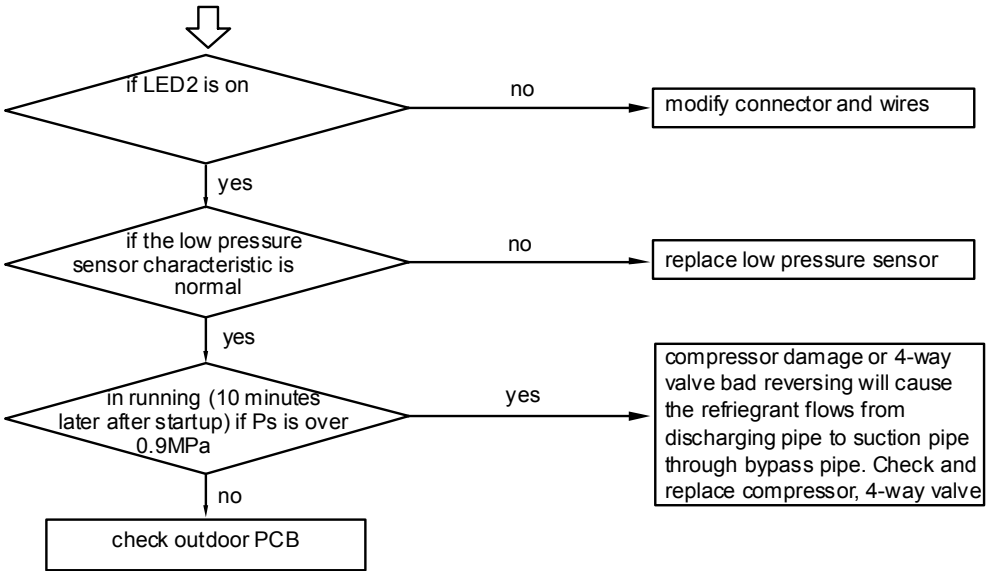
[28/29] high/low pressure sensor circuit



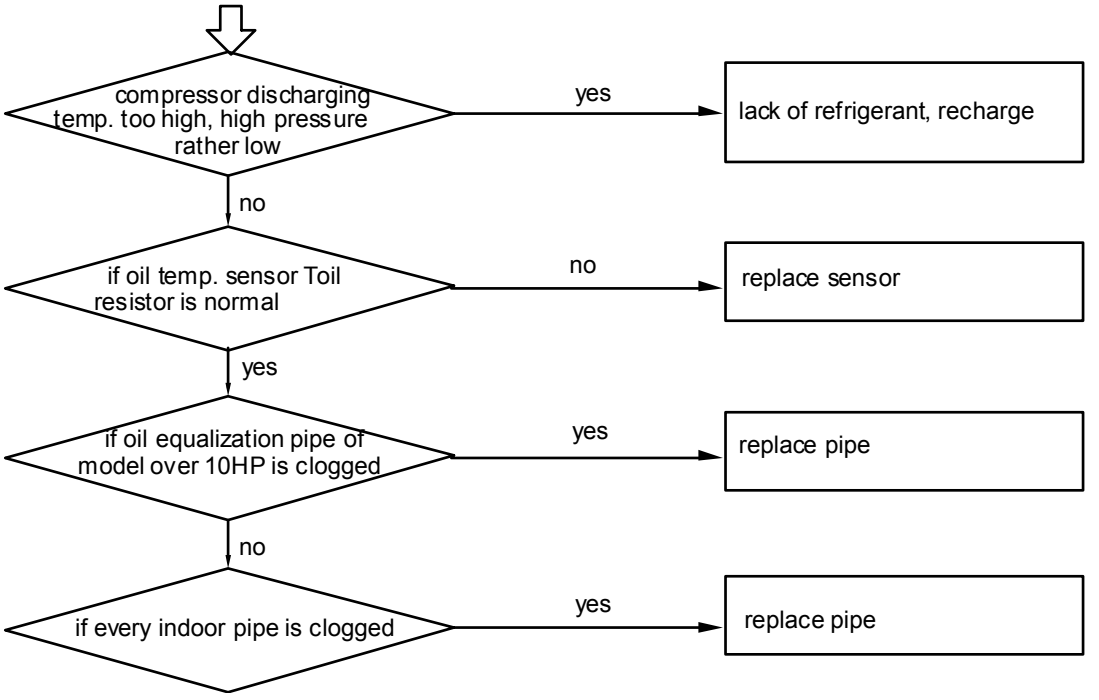
[39/31] low pressure protection acts



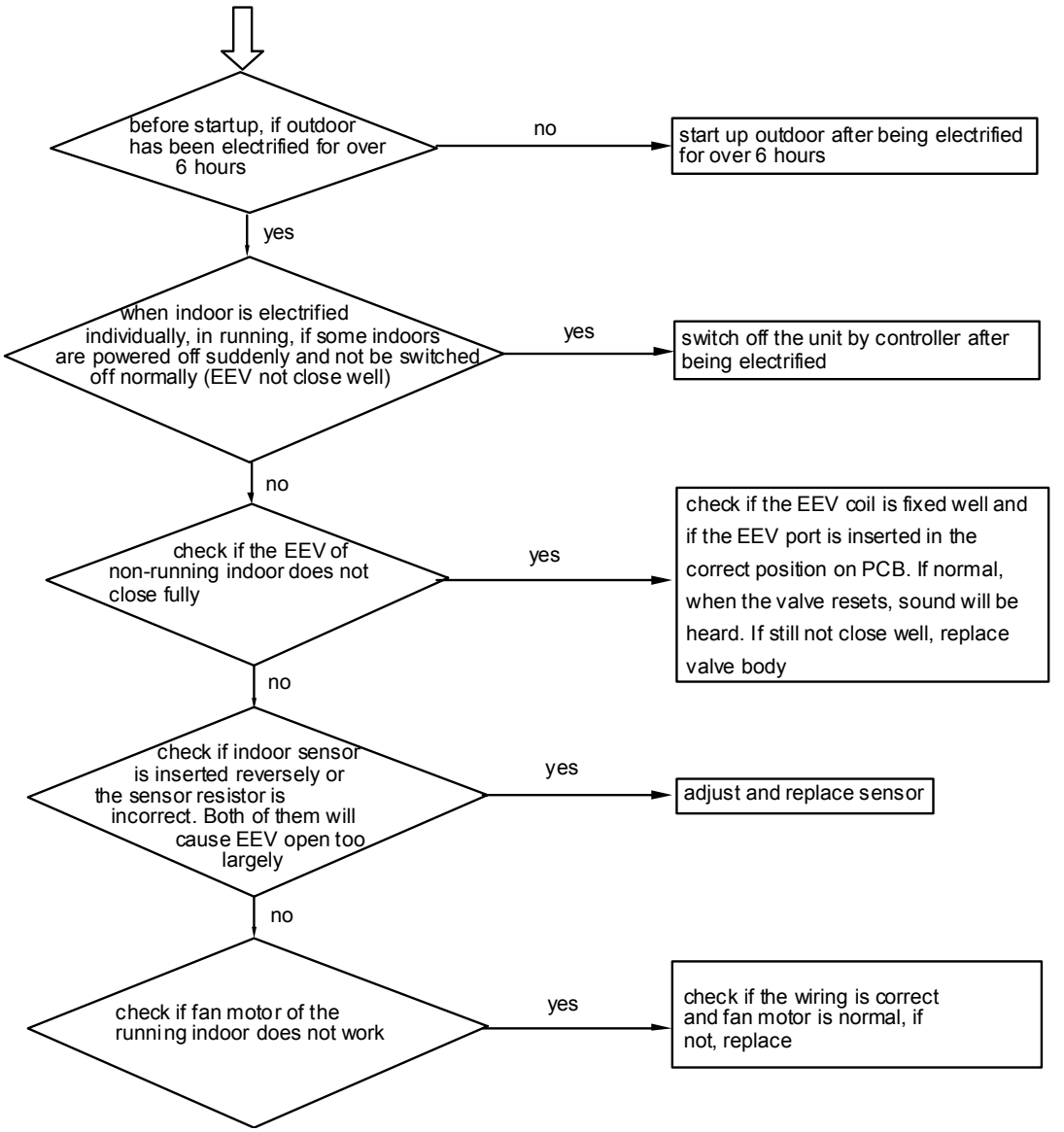
[39] low pressure sensor Ps circuit



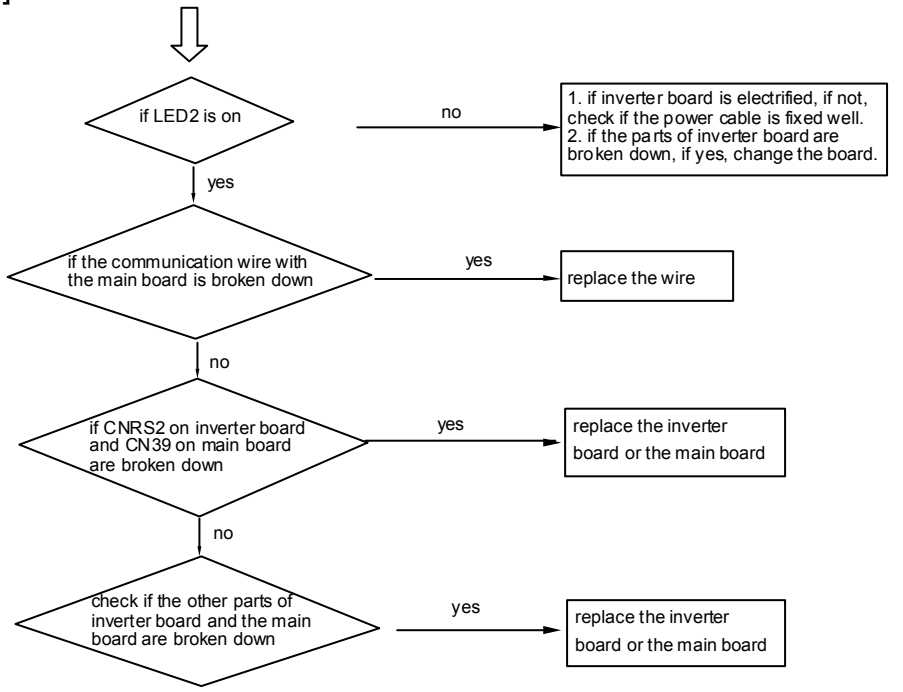
[27] oil temp. too high



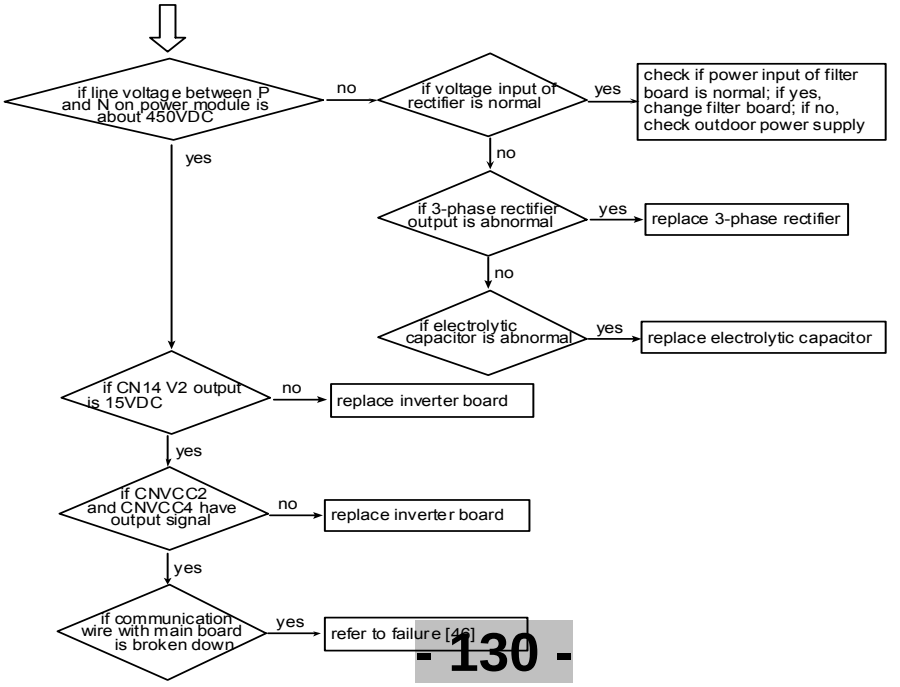
[36] oil temp. too low



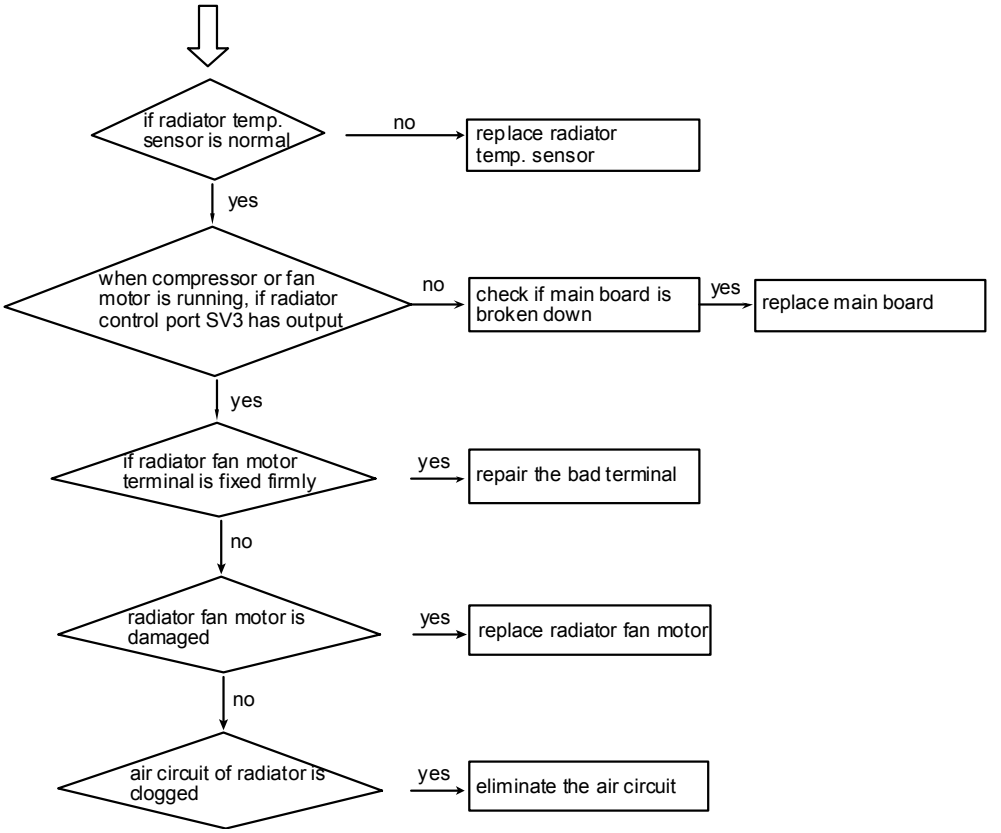
[46] communication abnormal with inverter board



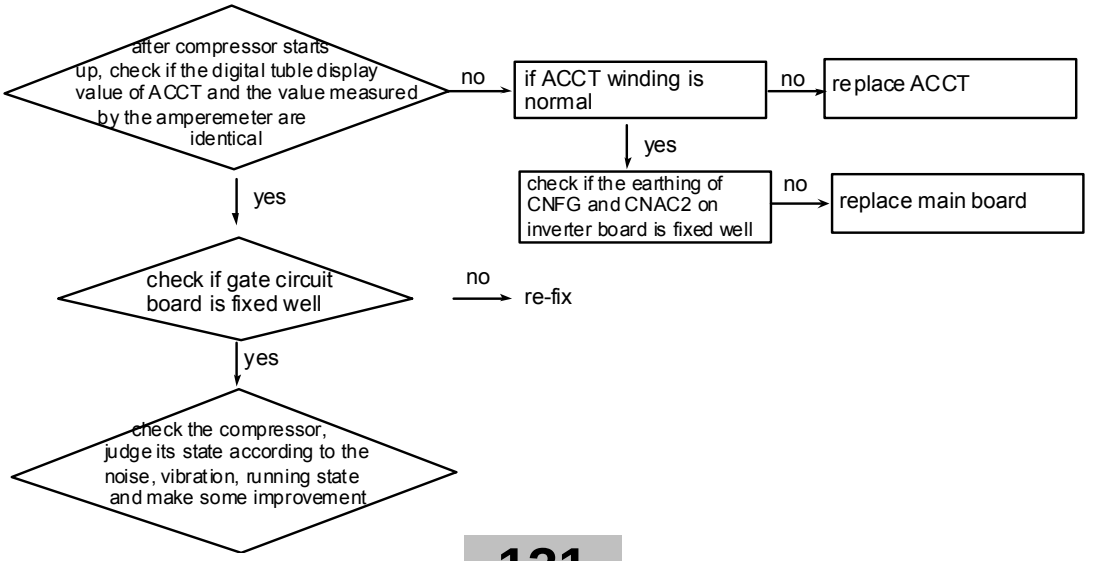
compressor not work



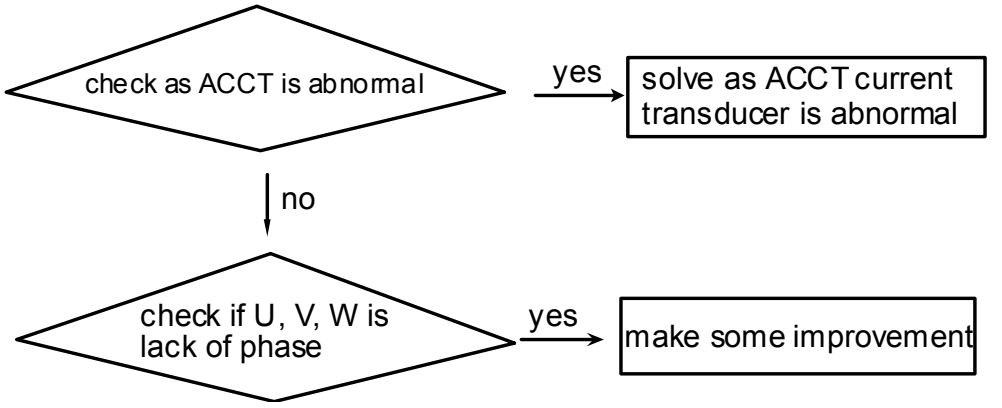
[47] radiator temp. abnormal



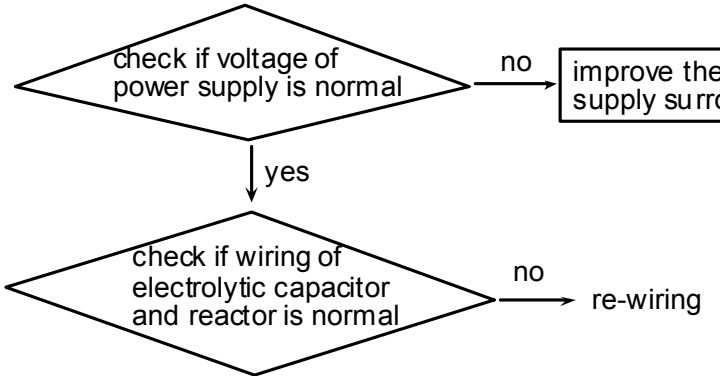
[48] ACCT over current protection



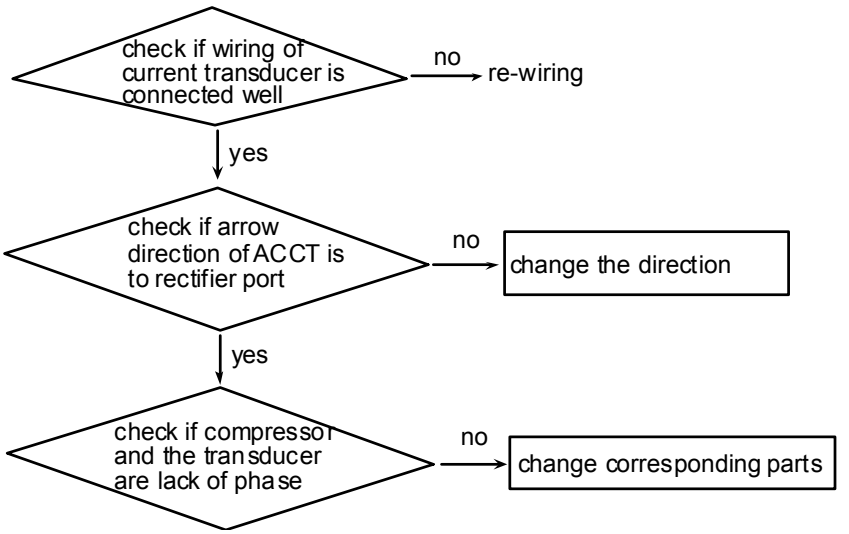
[63] incorrect wiring



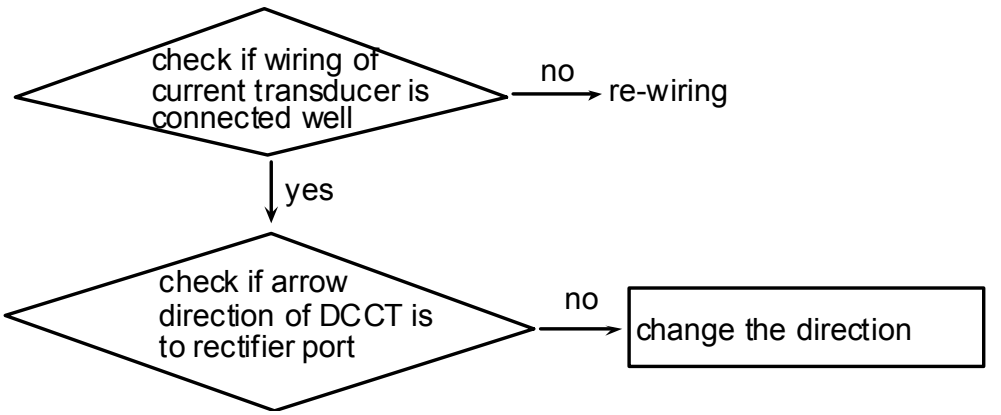
[50] voltage too high



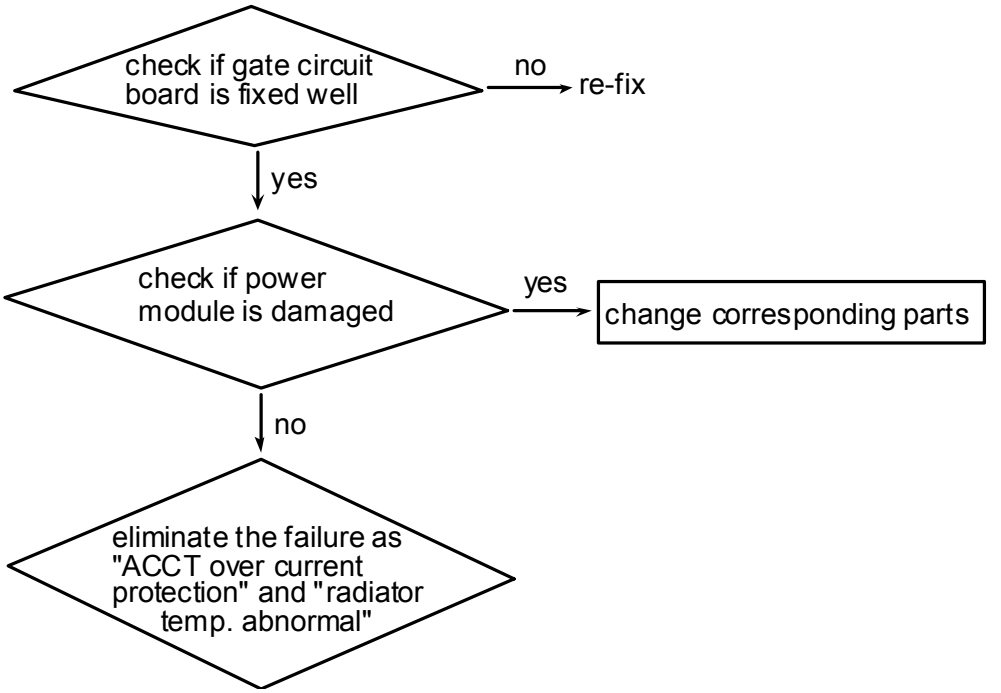
[53] ACCT current transducer abnormal



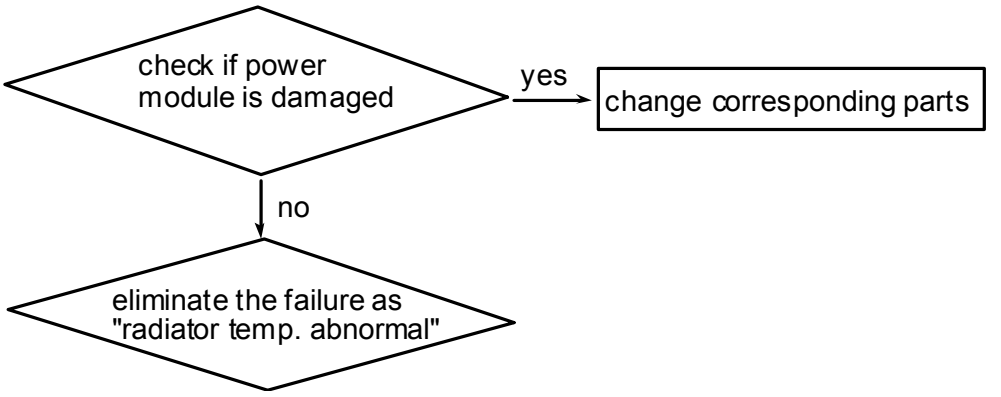
[65] DCCT current transducer abnormal



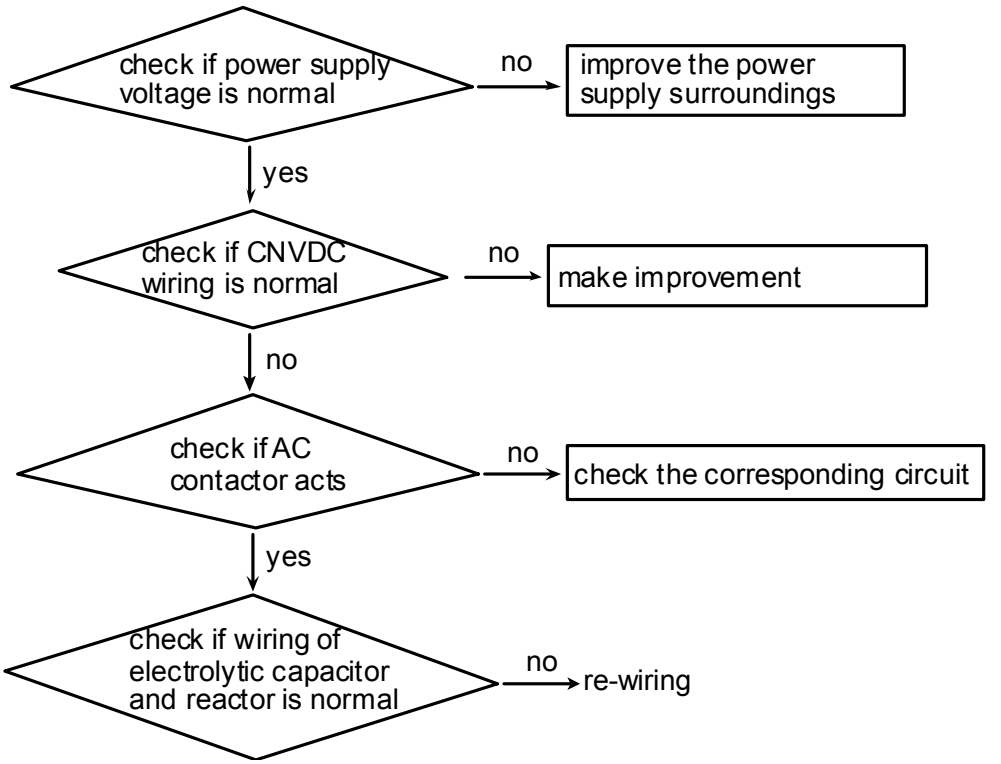
[58] IPM alarms



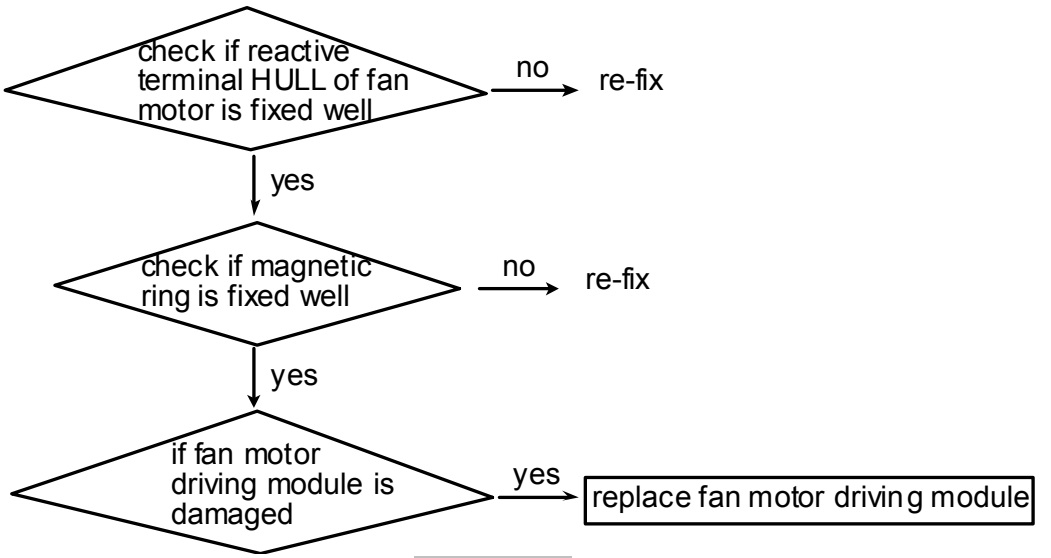
[68] fan motor IPM alarms



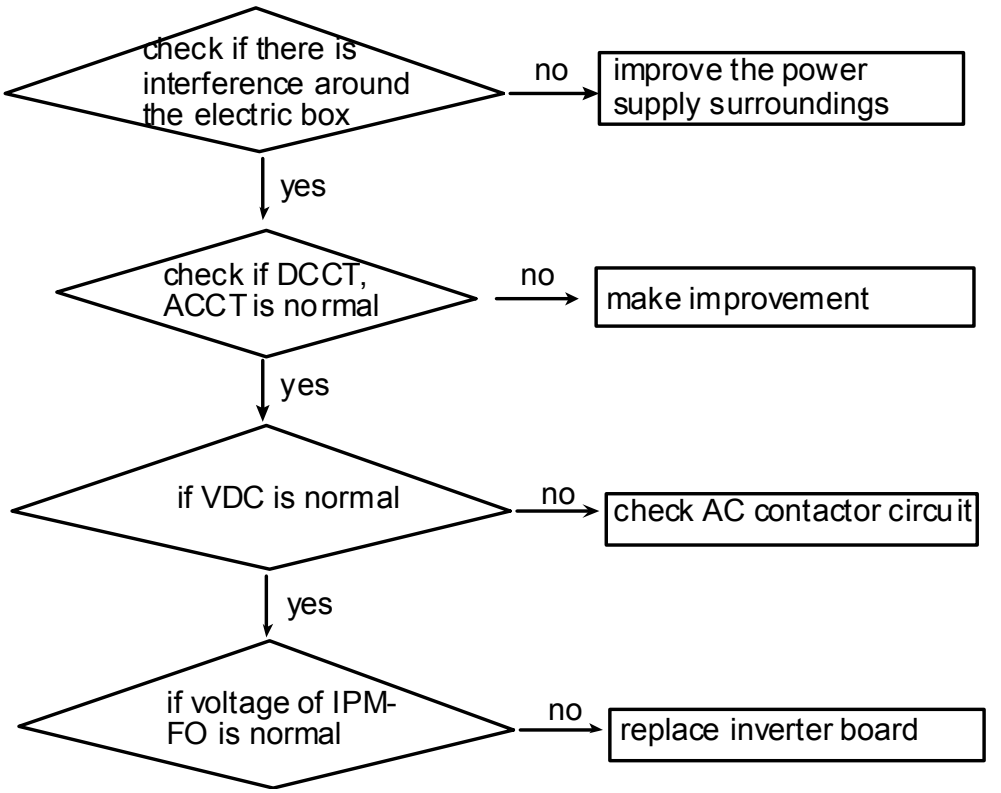
[54] voltage too low



[73] fan motor detecting out of control



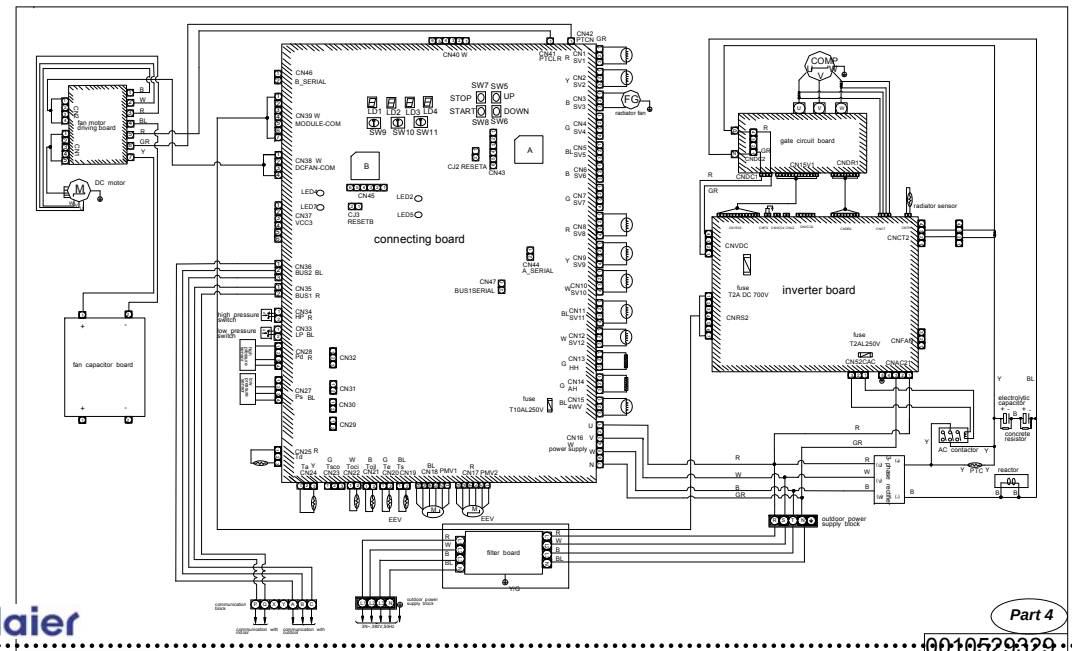
[60] logic abnormal



Part 4 Wiring diagram

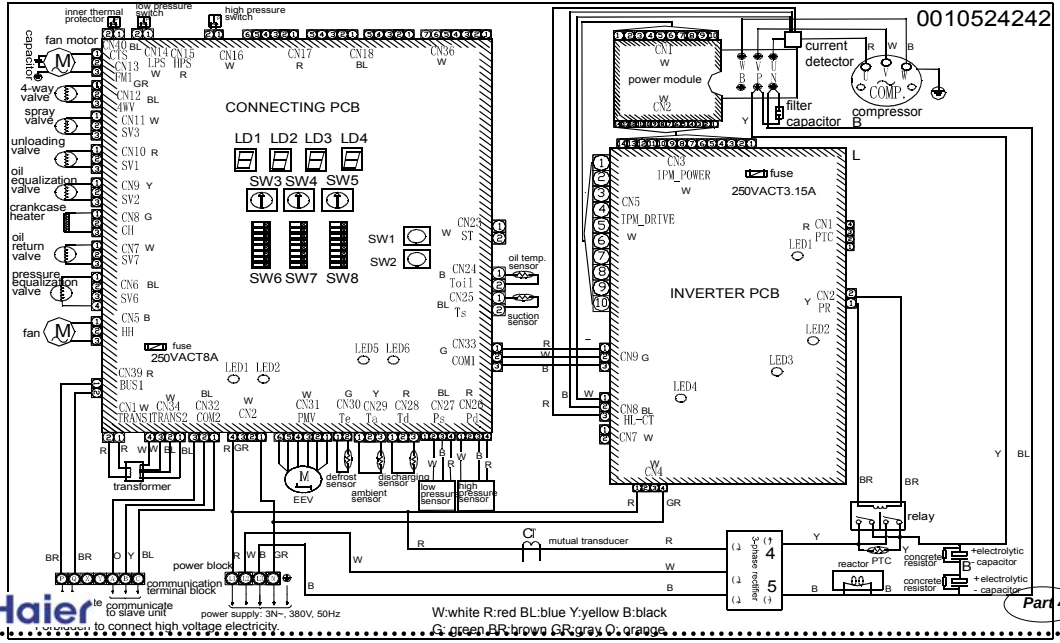
1. Wiring diagram of Outdoor unit

1.1 R410A system



1.2 R22 system

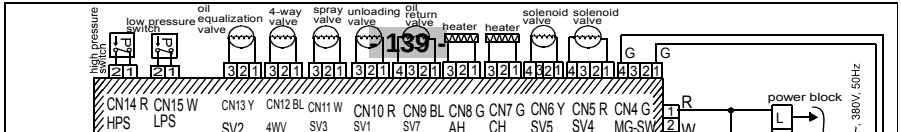
1.2.1 Master unit: AU96NMTAHA, AU78NMTAHA



Haier

Note: Do not connect high voltage electricity. communicate to slave unit

1.2.2 Slave unit: AU96NMTAAA, AU78NMTAAA



2. Wiring diagram of indoor unit

2.1 High static pressure duct unit

WIRING DIAGRAM OF INDOOR UNIT

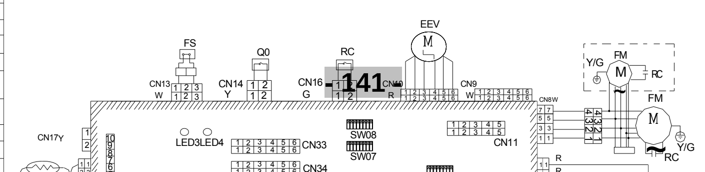
0010525047

Symbol	Description
FM	Fan Motor
RC	Running Capacitor
TR	Transformer
TA	Ambient Temperature Sensor
TC1	Gas Pipe Temperature Sensor
TC2	Liquid Pipe Temperature Sensor

2.2 Med static pressure duct unit

WIRING DIAGRAM OF INDOOR UNIT 0010578437

Symbol	Description
FM	Fan Motor
RC	Running Capacitor
TR	Transformer
TA	Ambient Temperature Sensor
TC1	Gas Pipe Temperature Sensor
TC2	Liquid Pipe Temperature Sensor
TW1	Terminal block (Power)
TW2	Terminal block (Control)
EEV	Electronic Expansion Valve



Malfunction Code indication by Wired Remote Controller

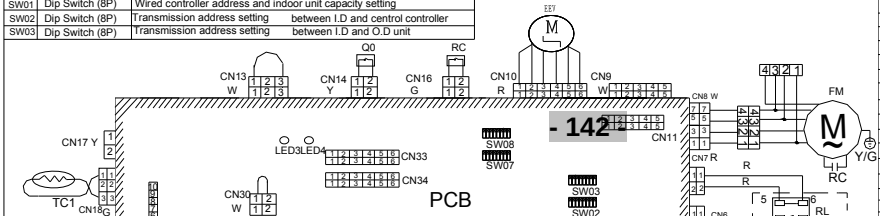
Malfunction Code	The Flash Times of LED5 on the the PCB/Timing LED on the Wireless Receiver	Malfunction Contents
01	1	Indoor ambient temp. sensor TA failure
02	2	Indoor gas pipe temp. sensor TC1 failure
03	3	Indoor liquid pipe temp. sensor TC2 failure
04	4	Indoor twin energy source sensor failure

2.3 Ceiling concealed duct unit

WIRING DIAGRAM OF INDOOR UNIT

0010578433

Dip Switch Function		
SW01	Dip Switch (8P)	Wired controller address and indoor unit capacity setting
SW02	Dip Switch (8P)	Transmission address setting between I.D and centrol controller
SW03	Dip Switch (8P)	Transmission address setting between I.D and O.D unit



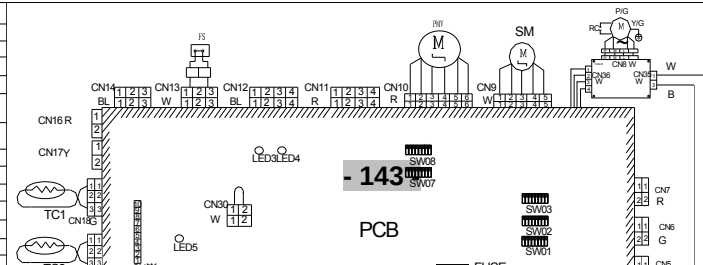
Symbol	Description
FM	Fan Motor
RC	Running Capacitor
TR	Transformer
TA	Ambient Temperature Sensor
TC1	Gas Pipe Temperature Sensor
TC2	Liquid Pipe Temperature Sensor
TW1	Terminal Block (Power)
TW2	Terminal Block (Control)
EEV	Electronic Expansion Valve
RL	Relay Unit
EH	Electronic Heater
TS	Temperature Switch
F	Fusion (One-Off Protector)
QO	Quiet Operation
RC	Room Card
LED	

2.4 Cassette unit AB09-16

CIRCUIT DIAGRAM OF INDOOR UNIT(AB09-16)

0010578434

Symbol	Description
FM	Fan Motor
RC	Running Capacitor
TR	Transformer
TA	Ambient Temperature Sensor
TC1	Gas Pipe Temperature Sensor
TC2	Liquid Pipe Temperature Sensor
TW1	Terminal block (Power)
TW2	Terminal block (Control)
EEV	Electronic Expansion Valve
FS	Float Switch
PM	Pump Motor
SM	Swing Motor
PG	Plastic Motor



Malfunction Code indication by Wired Remote Controller

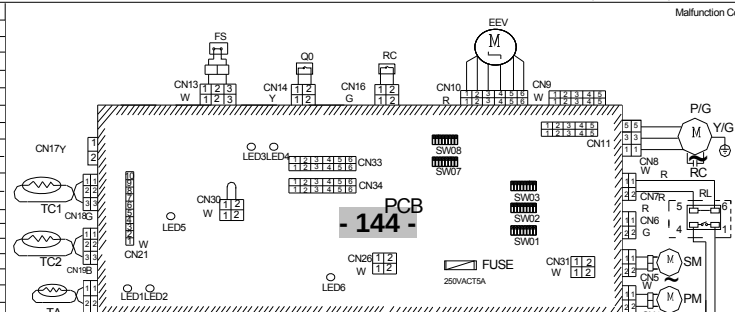
Malfunction Code	The Flash Times of LED5 on the the PCB/Timing LED on the Wireless Receiver	Malfunction Contents
01	1	Indoor ambient temp. sensor TA failure
02	2	Indoor gas pipe temp. sensor TC1 failure
03	3	Indoor liquid pipe temp. sensor TC2 failure
04	4	Indoor twin energy source sensor failure
05	5	EEPROM failure
06	6	Malfunction of transmission between I.D and O.D unit
		Malfunction of transmission

2.5 Cassette unit AB18-48

WIRING DIAGRAM OF INDOOR UNIT(AB18-48)

0010578436

Symbol	Description
P/G	P/G Motor
RC	Running Capacitor
TR	Transformer
TA	Ambient Temperature Sensor
TC1	Gas Pipe Temperature Sensor
TC2	Liquid Pipe Temperature Sensor
TW1	Terminal Block (Power)
TW2	Terminal Block (Control)
EEV	Electronic Expansion Valve
FS	Float Switch
PM	Pump Motor
SM	Swing Motor
RL	Relay Unit
EH	Electronic Heater
TS	Temperature Switch
F1	Fusion (One-Off Protector)
QO	Quiet Operation
RC	Room Card



Malfunction Code indication by Wired Remote Controller

Malfunction Code	The Flash Times of LED5 on the PCB/ Timing LED on the Wireless Receiver	Malfunction contents
01	1	Indoor ambient temp. sensor TA failure
02	2	Indoor gas pipe temp. sensor TC1 failure
03	3	Indoor liquid pipe temp. sensor TC2 failure
04	4	Indoor twin energy source sensor failure
05	5	EEPROM failure
06	6	Malfunction of transmission between I.D and O.D unit
07	7	Malfunction of transmission between remote and I.D unit
08	8	Malfunction of Drain level control system
09	9	Address duplication, improper setting SW03
0A	10	Address duplication improper setting SW02
	20	Malfunction of O.D unit

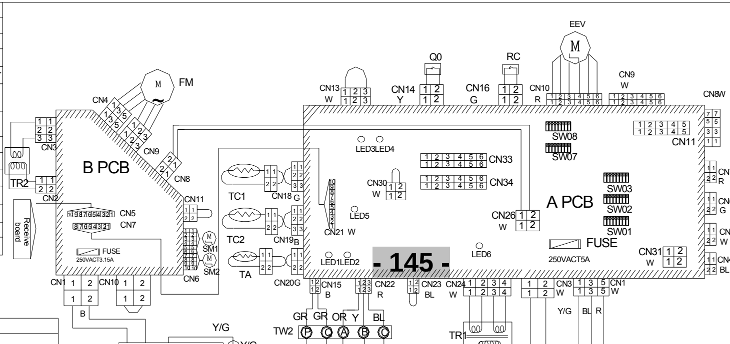
*Master/Slave Wired Remote controller and Wireless Remote Controller Setting At the time of installation or after service inspection/repair make the local setting in accordance with the following table

2.6 Wall mounted unit

WIRING DIAGRAM OF INDOOR UNIT

0010578435

Symbol	Description
FM	Fan Motor
RC	Running Capacitor
TR1,2	Transformer
TA	Ambient Temperature Sensor
TC1	Gas Pipe Temperature sensor
TC2	Liquid Pipe Temperature sensor
TW1	Terminal block (Power)
TW2	Terminal block (Control)
TW3	Terminal block (Power)
EEV	Electronic Expansion Valve
SM	Swing Motor
QO	Quiet Operation
RC	Room Card



LED

LED1 R Transmission Lamp between

Malfunction Code indication by Wired Remote Controller

Malfunction Code	The Flash Times of LED5 on the the PCB/Timing LED on the Wireless Receiver	Malfunction Contents
01	1	Indoor ambient temp. sensor TA failure
02	2	Indoor gas pipe temp. sensor TC1 failure
03	3	Indoor liquid pipe temp. sensor TC2 failure
04	4	Indoor twin energy source sensor failure
05	5	EEPROM failure
06	6	Malfunction of transmission between I.D and O.D unit
07	7	Malfunction of transmission between rmote Controller and I.D unit
08	8	Malfunction of Drain level control system
09	9	Address duplication improper setting SW03
0A	10	Address duplication improper setting SW02

2.7 Convertible unit