

**Design, Installation
and Maintenance instruction
R410A Heat Pump 50 Hz**

FlowLogic II



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R410A Full-variation multi-combination system

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PART 1 General Information

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1. Indoor/outdoor models

Indoor units








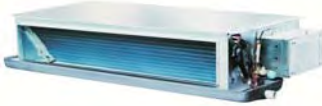






Type		Model							
4-way cassette type CBV Panel	CBV0*	09	12	16					
4-way cassette type CCV Panel	CCV0*	18	24	28	30	38	48		
Low ESP duct type	DAV0*	07	09	12	16	18	24		
Med ESP duct type	DBV0*	18	24	28	30	38	48		
High ESP duct type	DCV0*	18	24	28	30	38	48	72	96
Convertible type	FAV0*	09	12	16	18	24	38	48	
Wall mounted type	HAV0*	07	09	12	16	18	24		
Console type	EAV0*	07	09	12	18				

Outdoor units

Type	Model			
YCV*	10HP	12HP	14HP	16HP
	280	335	400	450

2. External appearance

Outdoor	<p>YCV280</p> 	<p>YCV335 YCV400 YCV450</p> 
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Indoor	<p>4-WAY CASSETTE TYPE / CBV Panel</p> <p>CBV009 CBV012 CBV016</p> 	<p>WALL MOUNTED TYPE</p> <p>HAV007 HAV009 HAV012 HAV016 HAV018 HAV024</p> 
	<p>4-WAY CASSETTE TYPE / CCV Panel</p> <p>CCV018 CCV024 CCV028</p>  <p>CCV030 CCV038 CCV048</p> 	<p>CONVERTIBLE TYPE</p> <p>FAV009 FAV012 FAV016 FAV018 FAV024</p>  <p>FAV038 FAV048</p> 
	<p>LOW ESP DUCT TYPE</p> <p>DAV007 DAV009 DAV012</p>  <p>DAV016 DAV018 DAV024</p> 	<p>MED ESP DUCT TYPE</p> <p>DBV018 DBV024 DBV028</p>  <p>DBV030 DBV038 DBV048</p> 
	<p>HIGH ESP DUCT TYPE</p> <p>DCV018 DCV024 DCV028 DCV030 DCV038 DCV048</p>  <p>DCV072 DCV096</p> 	<p>HRV(heat reclaimed ventilation)</p> <p>HRV0150 HRV0260 HRV0800 HRV1000</p> 
	<p>CONSOLE TYPE</p> <p>EAV009 EVA012 EVA018</p> 	



3. Combination of outdoor units

Capacity(100W)	HP	QTY of Outdoor unit				Total QTY
		280	335	400	450	
280	10	1	0	0	0	1
335	12	0	1	0	0	1
400	14	0	0	1	0	1
450	16	0	0	0	1	1
506	18	1	0	0	0	2
560	20	2	0	0	0	2
615	22	1	1	0	0	2
680	24	1	0	1	0	2
730	26	1	0	0	1	2
800	28	0	0	2	0	2
850	30	0	0	1	1	2
900	32	0	0	0	2	2
960	34	2	0	1	0	3
1010	36	2	0	0	1	3
1080	38	1	0	2	0	3
1130	40	1	0	1	1	3
1180	42	1	0	0	2	3
1235	44	0	1	0	2	3
1300	46	0	0	1	2	3
1350	48	0	0	0	3	3



4. Capacity range

outdoor capacity	10HP	12HP	14HP	16HP	18HP	20HP	22HP
max. indoor unit quantity	16	19	23	26	29	33	36
total indoor capacity range (*100W)	140~364	168~436	200~520	226~588	253~658	280~728	308~800

outdoor capacity	24HP	26HP	28HP	30HP	32HP	34HP	36HP	38HP
max. indoor unit quantity	39	43	46	50	53	56	59	63
total indoor capacity range (*100W)	340~884	365~949	400~1040	425~1105	450~1170	480~1248	505~1313	540~1404

outdoor capacity	40HP	42HP	44HP	46HP	48HP
max. indoor unit quantity	64	64	64	64	64
total indoor capacity range (*100W)	565~1469	590~1534	618~1606	650~1690	675~1755

5. Features

5.1 Use high efficiency DC inverter scroll compressor,high efficy,low noise

The highly efficient scroll compressor is equipped with a "Framen Compliance Mechanism"that allows movement in the axiak direction of the frame supporting the cradle scroll. This greatly reduces both leakage and friction loss,ensuring very high efficiency throughout the speed range



5.2 New big diameter "aviation"fan

The new fan could reduce air loss,air resistance and noise,increase heat exchange efficiency Adopt the 4-way air returen heat exchanger technology; the comoressor and condenser are placed in separated compartments.; this structure of outdoor unit can realize lower air resistance,higher heat efficiency and lower noise level



5.3 High efficiency DC fan motor

The speed of wide range DC fan motor can be adjusted from 0 r/min to 1000 r/min; Compared to conventional ACmotors, a DC fan motor offers greater operating efficiency, especially during low-spped rotation.The efficiency could be 90%



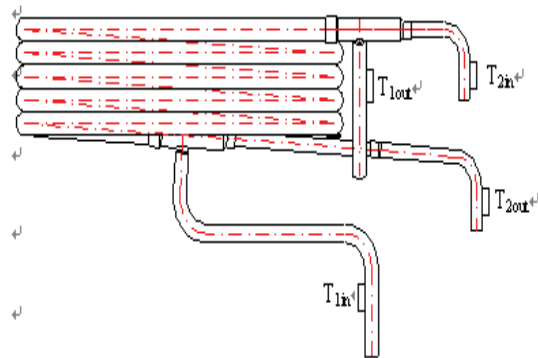
5.4 Efficient exchanger

W-model ϕ 8 innergrooved tube; hydrophilic aluminum coil fin, it will increase efficiency of heat exchange by 5%



5.5 Heat exchanger adopts the subcooling technology, to keep the refrigerant in indoor unit flowing normally, further to enhance the unit efficiency greatly.

Outdoor adopts the sub-cooling circuit utilizes little refrigerant to cool most of refrigerant in system, and makes it further cooling , improves sub-cooling degree of refrigerant, it can avoid energy loss due to refrigerant flash evaporating when it goes through PMV ; It will increase cooling capacity by 6%, reduce refrigerant circulation amounts, so that it can increase the efficiency of system



5.6 Flexible installation and design

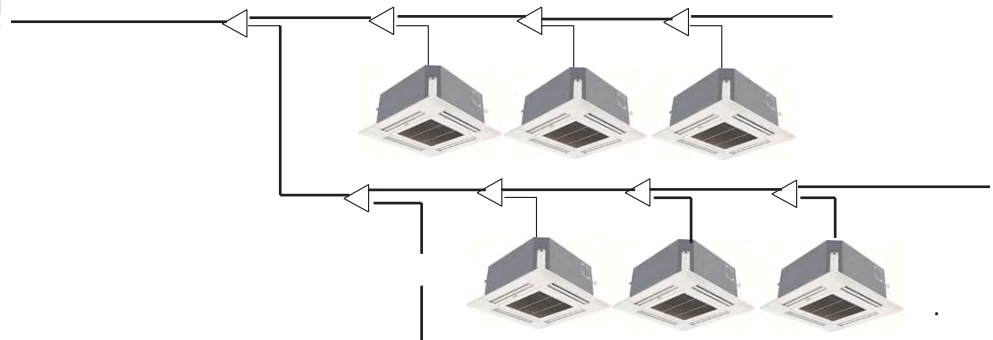
Indoor quantity can be up to 64 sets in maximum. And the indoor total capacity can be 50%~130% of outdoor capacity.

If there are multiple outdoors, the outdoors will be in running by turns, much longer life.

Multiple types of indoor can be chosen for different requirements.



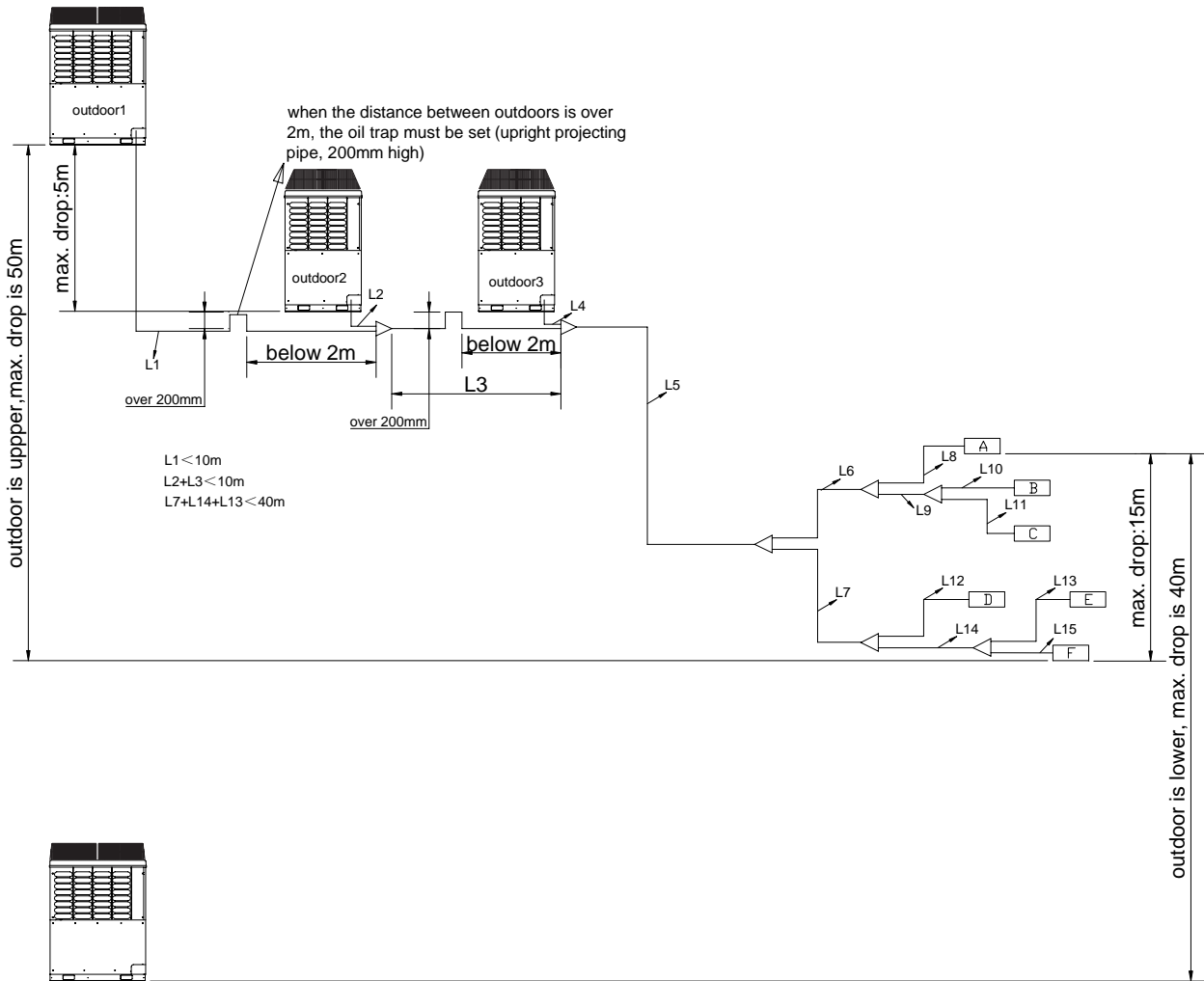
up to 64 sets of indoor



5.7 More optional outdoor capacity

The basic outdoor unit can be combined as the standard modular. The combined outdoors will get the capacity at the interval of 2HP

5.8 Allowable pipe length and height difference



	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+L3+ L5+ L7+ L14+ L13
Max. pipe length after 1 st branch pipe	40	L7+L13+L14
Main pipe actual length	90	L5
Height difference between indoors	15	_____
Height difference between outdoors	5	_____



5.9 Easier maintenance

a. Backup operation

If one outdoor unit malfunction happens the other units provide emergent operation until repair is achieved. In one model system, also can realize back up operation when fixed speed compressor error happens.

b. Auto check function

Failure codes displayed by LED in outdoor PCB or controllers are so detailed for us to find the failure place more quickly, and can judge the failure content easily.



5.10 Reliable performance

a. High COP

High efficiency and great energy saving are the purchased aim for every air conditioning manufacturer. This range has been designed to get high COP from the reasonable structure and the excellent electric system.

	<i>HEATING</i>	<i>COOLING</i>
<i>10HP</i>	<i>COP 3.95</i>	<i>EER 3.80</i>
<i>12HP</i>	<i>COP 4.12</i>	<i>EER 3.90</i>
<i>14HP</i>	<i>COP 3.85</i>	<i>EER 3.25</i>
<i>16HP</i>	<i>COP 3.90</i>	<i>EER 3.20</i>

Cooling operation condition: indoor temp is 27⁰CDB/19⁰CWB; outdoor temp is 35⁰CDB/24⁰CWB;
Heating operation condition: indoor temp is 20⁰DB, outdoor temp is 7⁰CDB/6⁰CWB.

b. Approved for RoHS certificate

All the parts in the unit have been approved for RoHS certificate. The parts are in conformance with RoHS directive. Thus it will be environmental for human and nature.

The directive is to approximate the laws of the Member States on the restrictions of the use of hazardous substances in electrical and electronics equipment and to contribute to the protection of human health and the environmentally sound recovery and disposal of waste electrical and electronic equipment.

c. Less chance of refrigerant leakage

The connection type of outdoor gas stop valve is brazed, therefore it is not easy to leak any refrigerant.

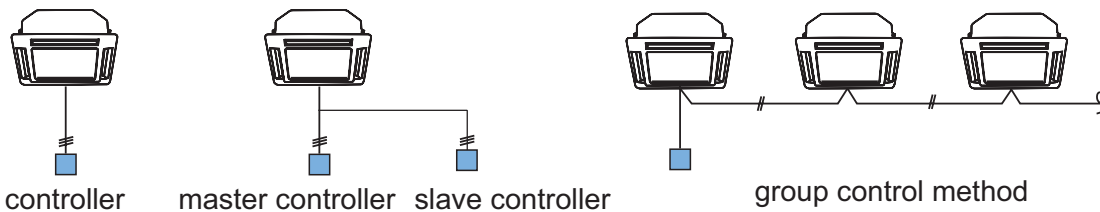
5.11 Control system

a. Individual control system

Wired controller RWV01



- Used to set the MODE, FAN, SWING, HEALTH, TEMP., TIMER etc.
- Large LCD is easy to read the data; set the temp. at 1°C.
- 24-hour timer function: to set the schedule in a whole day
- Enable to set the HRV (heat reclaimed ventilation) mode
- Designed to check the system failure automatically by pressing CHECK button. Also the failure code will display on LCD
- When the filter needs to be cleaned and indoor will send signal to the controller, FILTER icon will display on LCD.
- Can display the indoor central address on LCD
- Can query the malfunction history by pressing CHECK button
- Can change the controller types between master and slave one by adjusting the jumper state
- Can realize dual controllers to control one unit, or one controller to control multiple indoor units
- Equipped with the indoor ambient temp. sensor in the controller, which makes the indoor temp. more comfortable



Infrared remote controller RCV01



- Used to set the MODE, FAN, SWING, HEALTH, TEMP., TIMER etc.
- Large LCD is easy to read the data; set the temp. at 1°C.
- 24-hour timer function: to set the schedule in a whole day
- Can be combined with the individual remote receiver.
- Electric heating button can realize the electric heating function if the unit is with this function.

remote receiver RE-02

b. Central control system

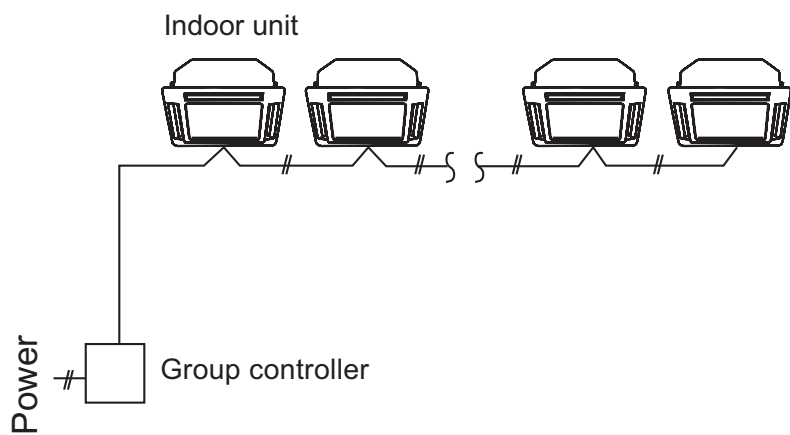
Group controller:



RWV01

- Realize to control 16 indoor units ON/OFF synchronously. Set indoor units at the same mode.

Note: When the indoor unit is in group control, it CAN NOT be controlled by its individual controller (wired controller or infrared controller).



Central controller(1:64)



RWV02

- Can control and monitor the indoor units condition ,maximum can control 128 groups,,each group can maximum connect to 16 indoor units.

- All the controls, ,such as individual control ,zone control, time setting, timer setting etc. ,can be realized by touch screen.



5.12 HRV(heat reclaimed ventilation)

5.12.1 Product introduction

Development background:

Under the background of energy getting more and more shortage and the user's request for the life quality getting more and more high, we develop the heat reclaimed ventilation system to meet the needs.

Comparison between the HRV and the old sensible heat exchanger:

HRV is the changerover of sensible heat exchange and latent heat exchange, thus it can avoid the large number of condensate water being caused when the unit operates in the condition of great humidity, furthermore the condensate water needs the special drainage device, also the water always leaks to cause the unnecessary economic loss.

So Haier HRV always is used at the coastal area to reduce the indoor humidity and gives the user a much more comfortable space.

Advantage of using air conditioner with HRV comparing to using air conditioner individually:

- a. The modern people seldom go out for the fresh air because of the busy work, and oppositely we always stay in the airtight office with the unhealthy air. More and more we rely on the air conditioner, less and less we can adapt the surroundings. After installing the HRV system, we can breathe the fresh air directly from outside, and make us more healthy.
- b. HRV needs not run for a long time such as the air conditioner. You can set ON or OFF in time to adjust the indoor air quality.

Room type	no smoke				less smoke		much smoke
	common room	building	office	PC room	restaurant	advanced room	meeting room
necessary fresh air volume for each person (m ³ /h)	17-42	8.5-21	25-62	40-100	20-50	30-75	50-125
fresh air exchanging times	1.06-2.65	0.5-2.66	1.56-3.90	2.5-6.25	1.25-3.13	1.88-4.69	3.13-7.81



5.12.2 Function description

HRV will make the sufficient heat exchange by air inlet and air discharging, and compensate the energy loss in the course of getting fresh air to the max. limit. Meanwhile the latent heat exchanger will perform good efficiency to control the indoor humidity. The HRV can be used individually, also can be used in combination with the indoor unit to reach the effect of air adjustment and get fresh air.

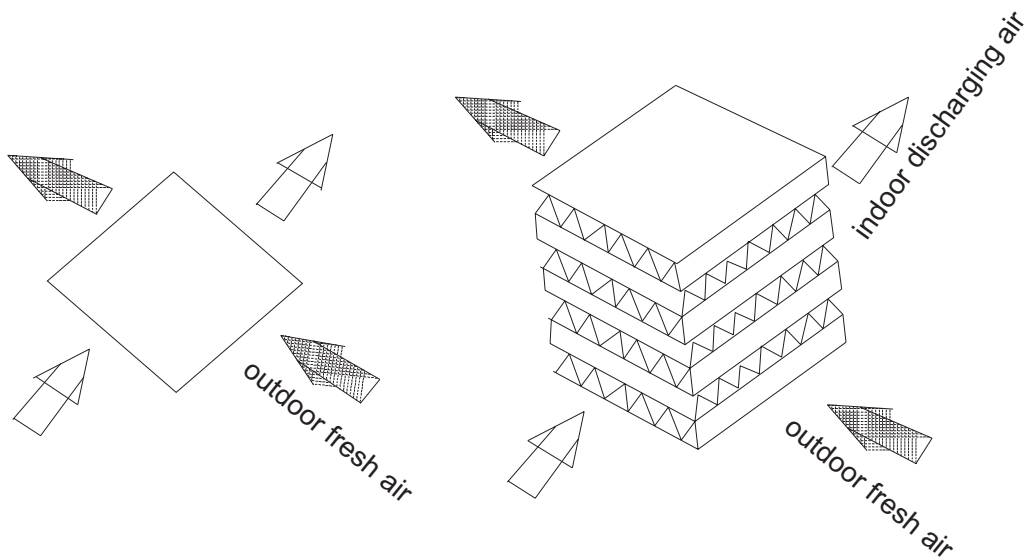
flow volume selection	air volume selection	indoor/outdoor motor state	remarks
flow volume to indoor =flow volume to outdoor	low speed	indoor motor low speed outdoor motor low speed	default mode
	high speed	indoor motor med speed outdoor motor med speed	
flow volume to indoor >flow volume to outdoor	low speed	indoor motor low speed outdoor motor med speed	the two modes can be set due to the user's request before out of factory.
	high speed	indoor motor med speed outdoor motor high speed	
flow volume to indoor <flow volume to outdoor	low speed	indoor motor med speed outdoor motor low speed	
	high speed	indoor motor high speed outdoor motor med speed	

You can select different operation mode according to the different environment, for example, to avoid the funk or humidity from toilet or kitchen into indoor side, select the mode of "flow volume to indoor>flow volume to outdoor"; to avoid the abnormal smell from the sickroom or the air with virus into the lobby, select the mode of "flow volume to indoor<flow volume to outdoor".

5.12.3 Operation principle

a. Operation type: forced air inlet → indoor positive pressure → air release
 supply air → indoor minus pressure → forced discharging air

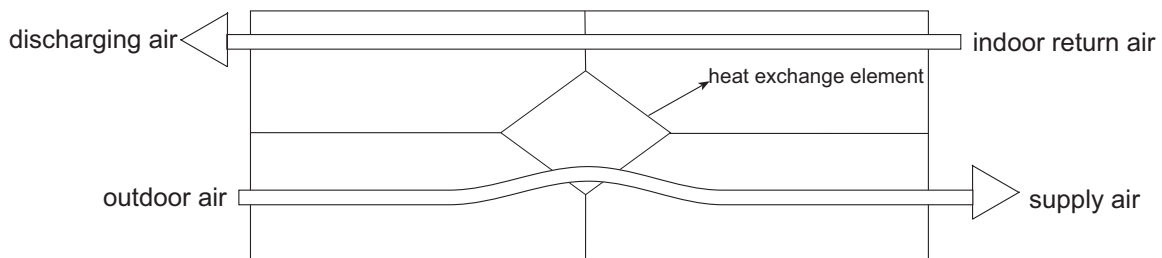
b. Heat exchange figure

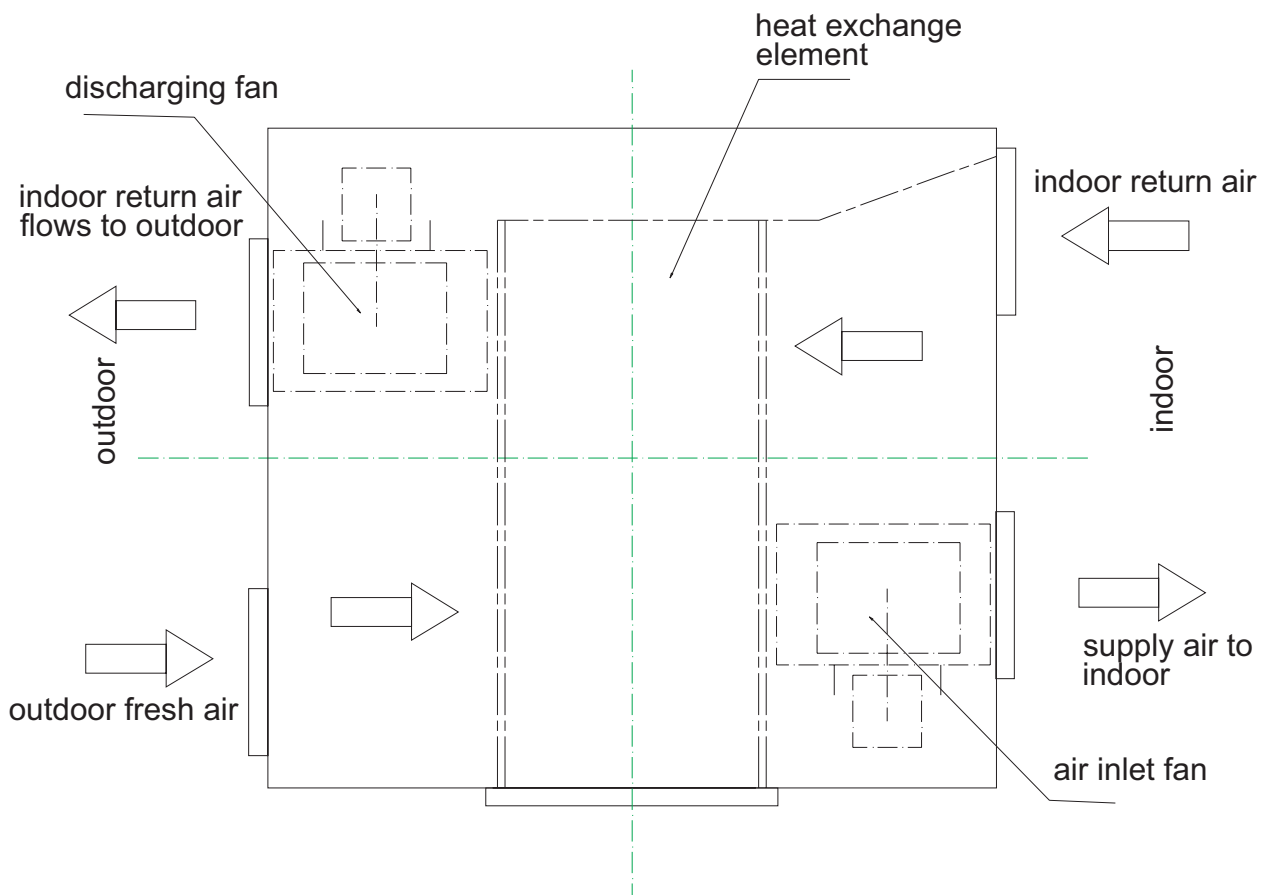


c. Operation sketch map

When the heat exchange element is at the position as the figure, the unit is in heat reclaimed ventilation state; when the heat exchange rotates, indoor return air will not pass the heat exchange element, and flow to outside directly, that is bypass state.

Bypass state:

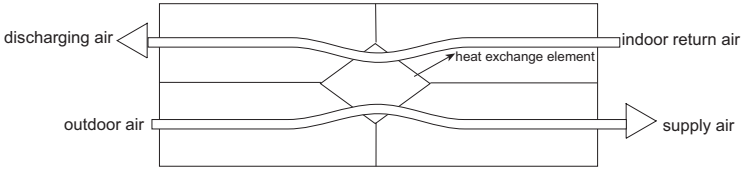
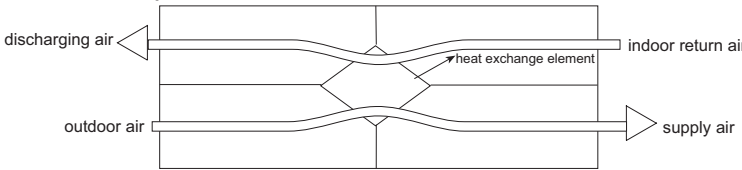
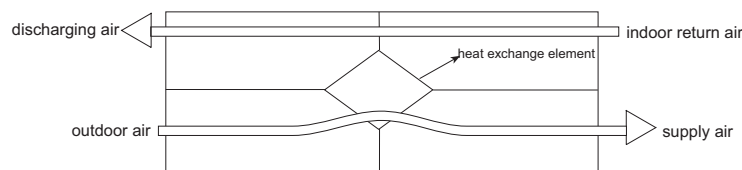




5.12.4 Features

1. Automatic ventilation mode changeover: Auto/Heat recovery/Bypass
2. Fan speed changeover by indoor wired controller
3. Filter icon display when the filter needs to be cleaned
4. Standard HRV wired controller
5. Timer function
6. HRV can be used individually without indoor unit
7. Auto restart function

Energy saving

<p>Heat recovery mode: Reduce about 20% reduction of heating/cooling load</p>	<p>HRV unit will reclaim the energy in cooling/heating operation of air conditioner. HRV will reduce the cooling/heating load and increase the cooling/heating efficiency.</p> 												
<p>Auto mode: Reduce about 8% reduction of heating/cooling load</p>	<p>Properly select the different operation mode can improve the efficiency. When the cooling operation is required in winter, you'd better use the bypass mode, refer to the below table:</p> <table border="1"> <thead> <tr> <th>operation</th> <th>ventilation sensor</th> <th></th> </tr> </thead> <tbody> <tr> <td></td> <td>difference between indoor temp. and outdoor temp.</td> <td>higher efficiency mode</td> </tr> <tr> <td>cooling</td> <td>indoor temp.>outdoor temp. indoor temp.<outdoor temp.</td> <td>bypass mode heat recovery mode</td> </tr> <tr> <td>heating</td> <td>indoor temp.>outdoor temp. indoor temp.<outdoor temp.</td> <td>heat recovery mode bypass mode</td> </tr> </tbody> </table> <p>Heat recovery mode:</p>  <p>Bypass mode:</p> 	operation	ventilation sensor			difference between indoor temp. and outdoor temp.	higher efficiency mode	cooling	indoor temp.>outdoor temp. indoor temp.<outdoor temp.	bypass mode heat recovery mode	heating	indoor temp.>outdoor temp. indoor temp.<outdoor temp.	heat recovery mode bypass mode
operation	ventilation sensor												
	difference between indoor temp. and outdoor temp.	higher efficiency mode											
cooling	indoor temp.>outdoor temp. indoor temp.<outdoor temp.	bypass mode heat recovery mode											
heating	indoor temp.>outdoor temp. indoor temp.<outdoor temp.	heat recovery mode bypass mode											
<p>By prerunning mode: Reduce about 2% reduction of heating/cooling load</p>	<p>When the unit is in the prerunning mode, HRV will be at standby state. After finishing pre-running mode, HRV will turn into normal mode. Thus the cooling/heating load will be reduced and reach the admired temp. quickly.</p>												

Heat recovery element



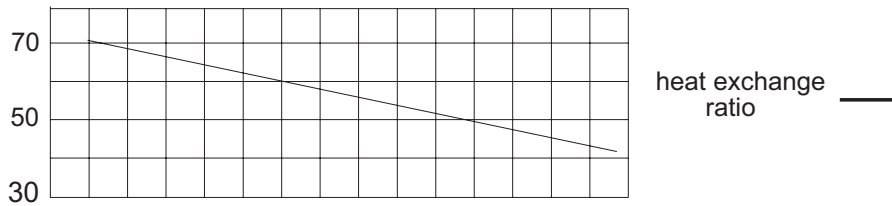
The heat recovery element is composed of flat paper and ripple paper. The thickness of flat paper is 50um. It is non-hole, water permeability but not gas permeability, which will ensure the humidity exchange and prevent the air mixture from indoor and outdoor. Meanwhile the angle between the air discharging passage and the indoor air return passage is 90degree, which can prevent air mixture further.

The ripple paper is with plastic character, and it will not distort even under the great humidity. Therefore it can support the structure firmly.

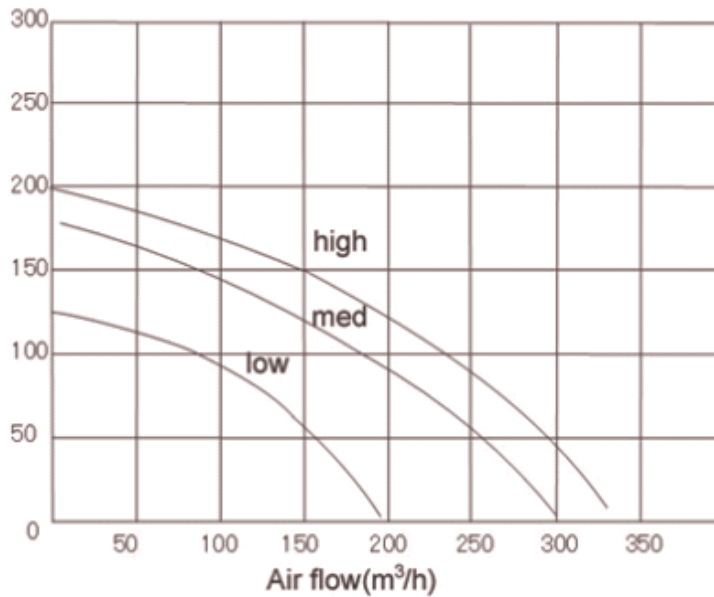
Heat exchange ratio, static pressure and air flow:

HRV0150 HRV0260

heat exchange ratio(%)

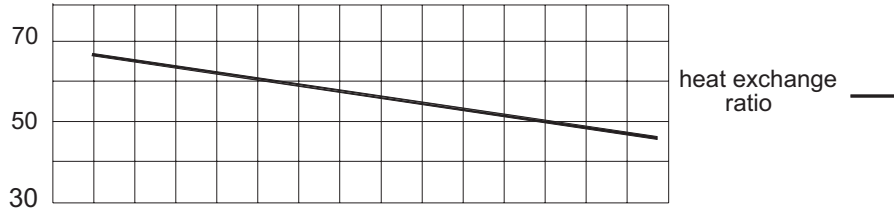


External static pressure (Pa)

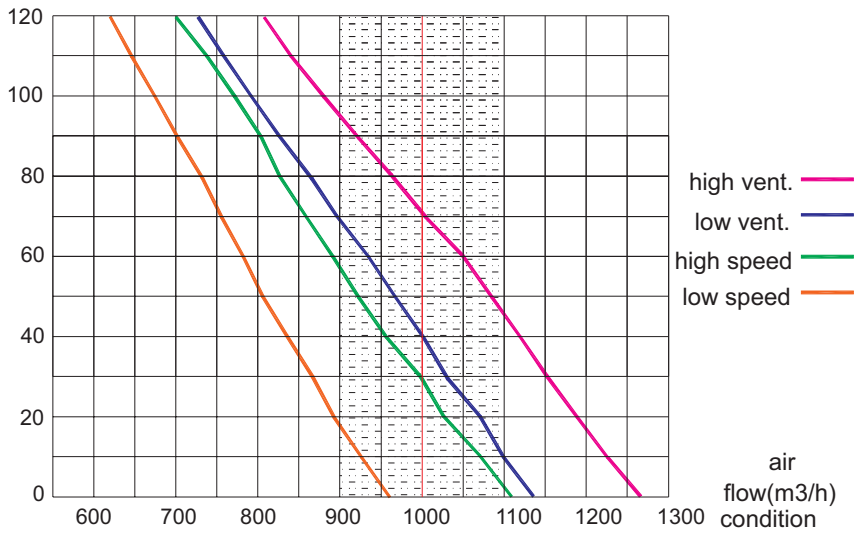


HRV0800 HRV1000

heat exchange ratio(%)



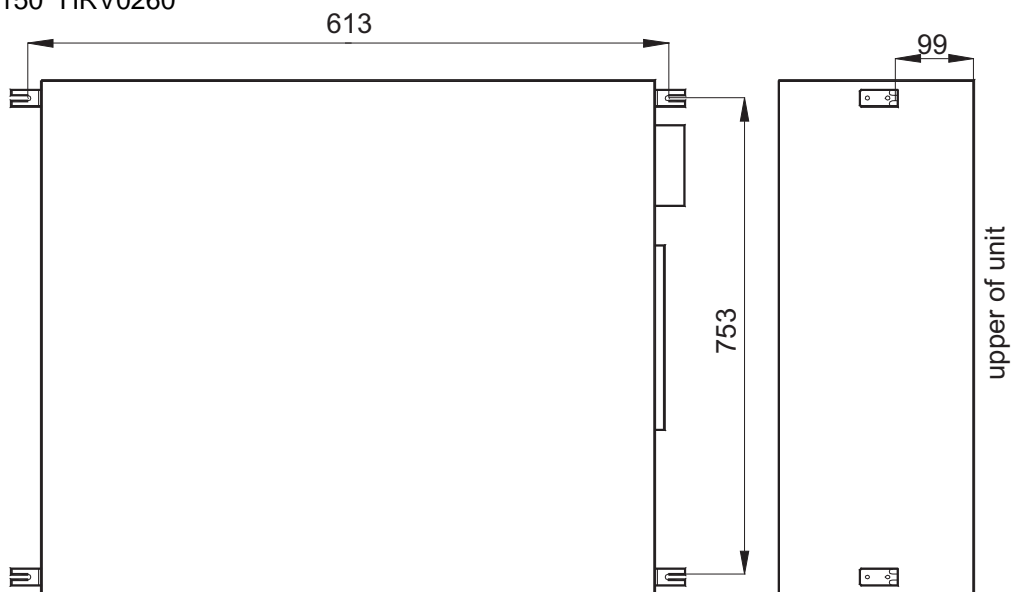
external pressure Pa



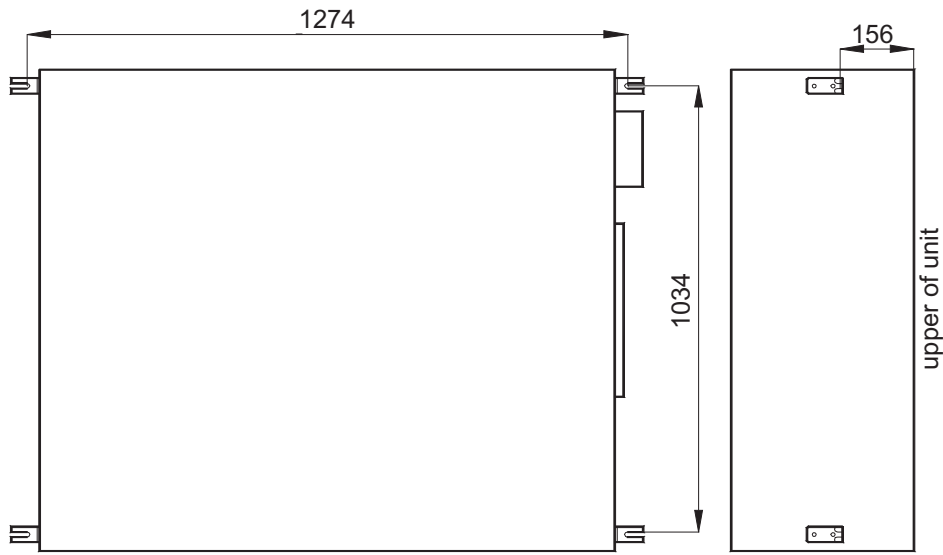
Easy installation and maintenance

Installation dimensions:

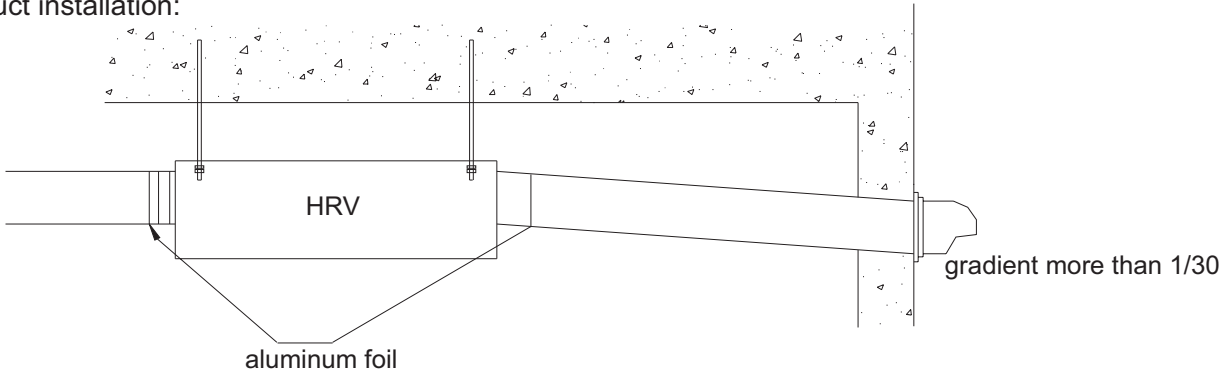
HRV0150 HRV0260



HRV0800 HRV1000

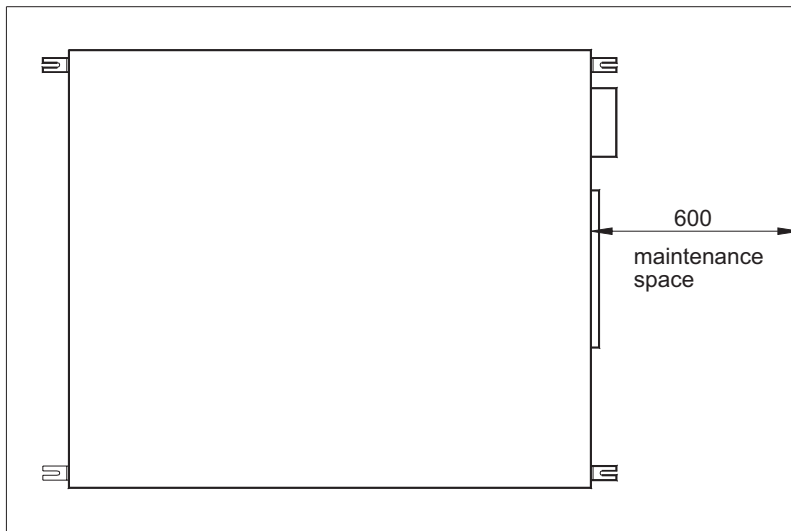


Duct installation:



Install the two outdoor ducts at a certain gradient (no less than 1/30) to avoid the water flowing backward. Meanwhile the three ducts (two outdoor ducts, one indoor duct) all need the heat insulation material against the dew. Installation distance between air discharging hole and air inlet hole should be 3 times longer than duct.

Maintenance space:





PART 2 Indoor Units

1. 4-way cassette type indoor unit-----	27
2. Ceiling concealed type indoor unit-----	56
3. Med static pressure duct type indoor unit-----	78
4. High static pressure duct type indoor unit-----	103
5. Convertible type indoor unit-----	150
6. Wall mounted type indoor unit-----	188
7. Console type indoor unit-----	204

4-way cassette type indoor unit

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1. Features



CBV009
CBV012
CBV016
PANEL:
CBV Panel



CCV018
CCV024
CCV028
PANEL:
CCV Panel



CCV030
CCV038
CCV048
PANEL:
CCV Panel

Totally new appearance design

CBV009~16 adopt the 700*700 panel with 660*570 unit body. And CCV018~48 use the same panel, herein, the cassette is with new unit body and new panel; more easy installation and design. Compact and unitary appearance to get perfect harmonized indoor decor.



Thanks for the light unit weight, suspension is convenient and easy

Low operation noise level

model	CBV009	CBV012	CBV016	CCV018	CCV024	CCV028	CCV030	CCV038	CCV048
noise level H/M/L	32/30/29	32/30/29	33/30/29	34/32/30	35/34/31	37/35/31	37/35/31	37/35/31	42/39/35

Built-in high head drainage

A standard built-in drain pump can realize up to Max. 600mm drainage head, which creates the ideal solution for perfect water drainage.

Fresh air inlet

Pre-set fresh air inlet hole, which can lead the fresh air from outside into indoor, greatly improves indoor air quality.

Long life filter is standard part with the unit.



2. Specification

Model		CBV009	CBV012	CBV016	CCV018
Nominal cooling capacity(KW)		2.8	3.6	4.5	5.6
Nominal heating capacity(KW)		3.2	4.0	5.0	6.3
Electrical heating power(KW) /Current(A)		----	----	----	----
Heating capacity at low temp.(KW)		2.5	3.2	4.0	5
Electrical characteristics	Power source(PH,V,Hz)	1,220~230,50	1,220~230,50	1,220~230,50	1,220~230,50
	Operating current(A)	0.47	0.47	0.47	0.45
	Power consumption(KW)	0.08	0.08	0.08	0.09
Fan characteristics	Fan type and Qty	centrifugal*1	centrifugal*1	centrifugal*1	centrifugal*1
	Fan motor output(KW)	0.04	0.04	0.04	0.05
	Standard airflow(m ³ /h)	700	700	700	1200
	Standard static pressure(Pa)	0	0	0	0
	Max. static pressure(Pa)	----	----	----	----
Exterior dimensions(mm)		660*570*260	660*570*260	660*570*260	840*840*240
Panel exterior dimensions(mm)		700*700*60	700*700*60	700*700*60	950*950*80
Weight(unit,net/gross, Kg)		19/21.6	19/21.6	19/21.6	30/36
Weight(panel, net/gross, Kg)		2.8/4.8	2.8/4.8	2.8/4.8	6/9
Expansion mode		Electronic expansion valve			
Controller		Wired controller/ wireless controller (optional)			
Piping dimension	Gas piping(mm)	Ø9.52	Ø12.7	Ø12.7	Ø12.7
	Liquid piping(mm)	Ø6.35	Ø6.35	Ø6.35	Ø6.35
	Drain hose(mm)	Ø32	Ø32	Ø32	Ø32
Noise level(dB(A)) H/M/L		32/30/29	32/30/29	33/30/29	34/32/30

Normal condition: indoor temperature (cooling): 27°CDB/19°CWB, indoor temperature (heating): 20°CDB/14.5°CWB

Outdoor temperature(cooling): 35°CDB/24°CWB, outdoor temperature(heating): 7°CDB/6°CWB

The noise level will be measured in the third octave band limited values in the semi-anechoic chamber, using a Real Time Analyser calibrated sound intensity meter. It is a sound pressure noise level.



Model		CCV024	CCV028	CCV030
Nominal cooling capacity(KW)		7.1	8	9
Nominal heating capacity(KW)		8	9	10
Electrical heating power(KW) /Current(A)		----	----	/
Heating capacity at low temp.(KW)		6	7.0	8.0
Electrical characteristics	Power source(PH,V,Hz)	1,220~230,50	1,220~230,50	1,220~230,50
	Operating current(A)	0.51	0.51	0.76
	Power consumption(KW)	0.1	0.1	0.15
Fan characteristics	Fan type and Qty	centrifugal*1	centrifugal*1	centrifugal*1
	Fan motor output(KW)	0.05	0.05	0.09
	Standard airflow(m ³ /h)	1200	1200	1800
	Standard static pressure(Pa)	0	0	0
	Max. static pressure(Pa)	----	----	----
Exterior dimensions(mm)		840*840*240	840*840*240	840*840*280
Panel exterior dimensions(mm)		950*950*80	950*950*80	950*950*80
Weight(unit,net/gross, Kg)		30/36	30/36	30/36
Weight(panel, net/gross, Kg)		6/9	6/9	6/9
Expansion mode		Electronic expansion valve		
Controller		Wired controller/ wireless controller (optional)		
Piping dimension	Gas piping(mm)	Ø15.88	Ø 15.88	Ø 15.88
	Liquid piping(mm)	Ø 9.52	Ø 9.52	Ø 9.52
	Drain hose(mm)	Ø 32	Ø 32	Ø 32
Noise level(dB(A)) H/M/L		35/34/31	37/35/31	37/35/31

Normal condition: indoor temperature (cooling): 27⁰CDB/19⁰CWB, indoor temperature (heating): 20⁰CDB/14.5⁰CWB
 Outdoor temperature(cooling): 35⁰CDB/24⁰CWB, outdoor temperature(heating): 7⁰CDB/6⁰CWB

The noise level will be measured in the third octave band limited values in the semi-anechoic chamber, using a Real T Analyser calibrated sound intensity meter. It is a sound pressure noise level.



Model		CCV038	CCV048
Nominal cooling capacity(KW)		11.2	14
Nominal heating capacity(KW)		12.5	16
Electrical heating power(KW) /Current(A)		/	/
Heating capacity at low temp.(KW)		10	12.5
Electrical characteristics	Power source(PH,V,Hz)	1,220~230,50	1,220~230,50
	Operating current(A)	0.76	0.76
	Power consumption(KW)	0.15	0.15
Fan characteristics	Fan type and Qty	centrifugal*1	centrifugal*1
	Fan motor output(KW)	0.09	0.09
	Standard airflow(m ³ /h)	1800	1800
	Standard static pressure(Pa)	0	0
	Max. static pressure(Pa)	----	----
Exterior dimensions(mm)		840*840*280	840*840*280
Panel exterior dimensions(mm)		950*950*80	950*950*80
Weight(unit,net/gross, Kg)		38/40	38/40
Weight(panel, net/gross, Kg)		6/9	6/9
Expansion mode		Electronic expansion valve	
Controller		Wired controller/ wireless controller (optional)	
Piping dimension	Gas piping(mm)	Ø15.88	Ø 15.88
	Liquid piping(mm)	Ø 9.52	Ø 9.52
	Drain hose(mm)	Ø 32	Ø 32
Noise level(dB(A)) H/M/L		37/35/31	44/40/36

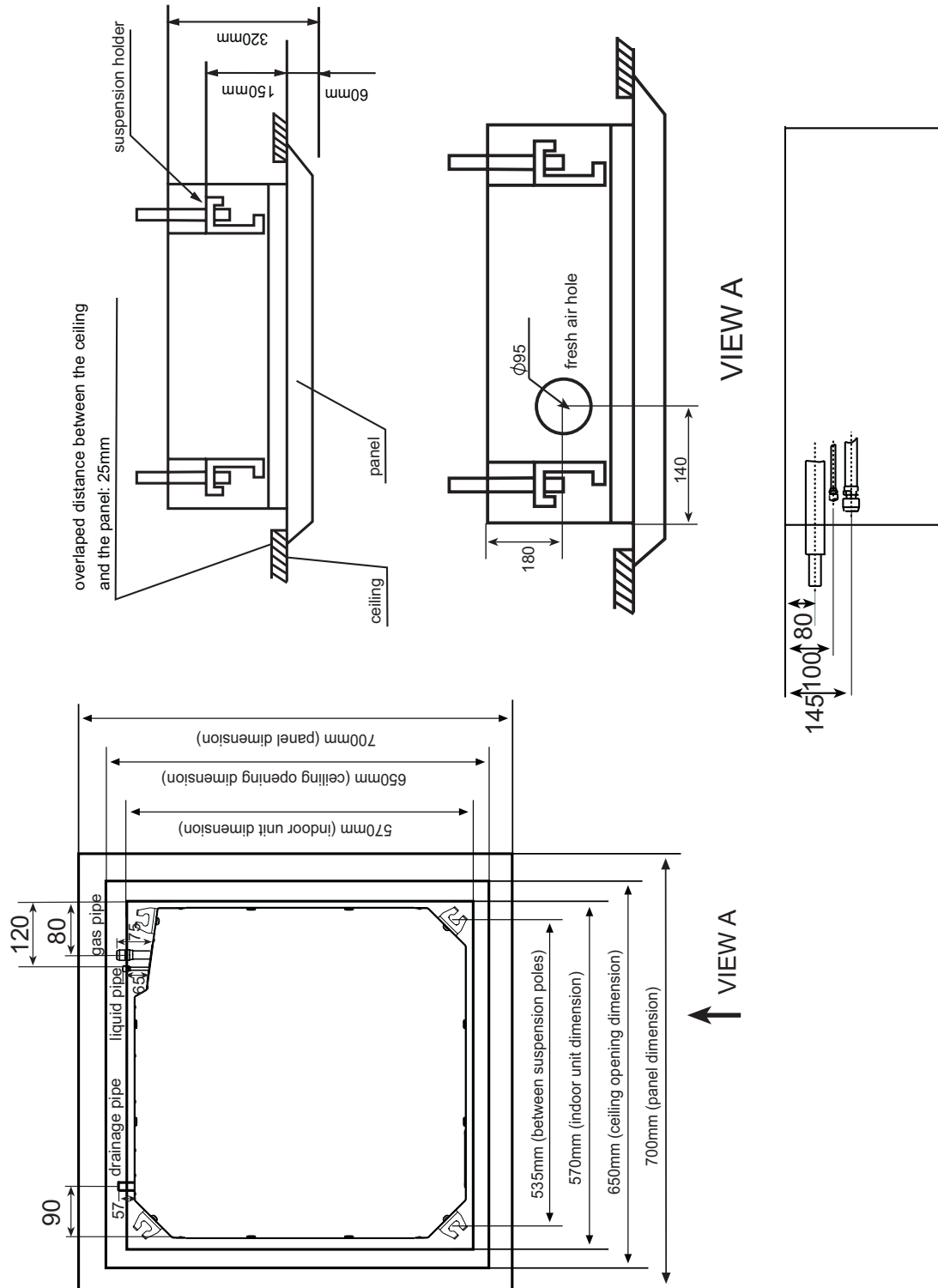
Norminal condition: indoor temperature (cooling): 27°CDB/19°CWB, indoor temperature (heating): 20°CDB/14.5°CWB

Outdoor temperature(cooling): 35°CDB/24°CWB, outdoor temperature(heating): 7°CDB/6°CWB

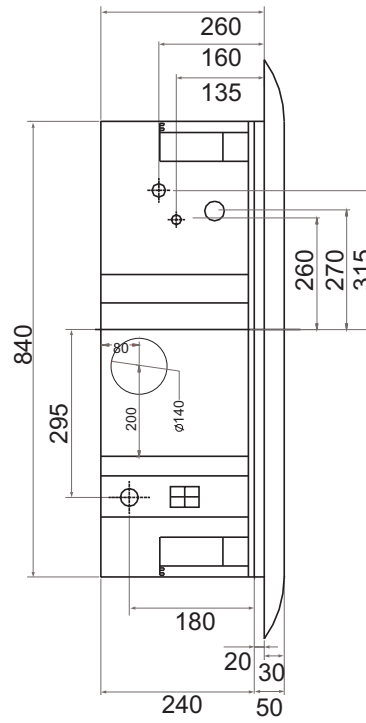
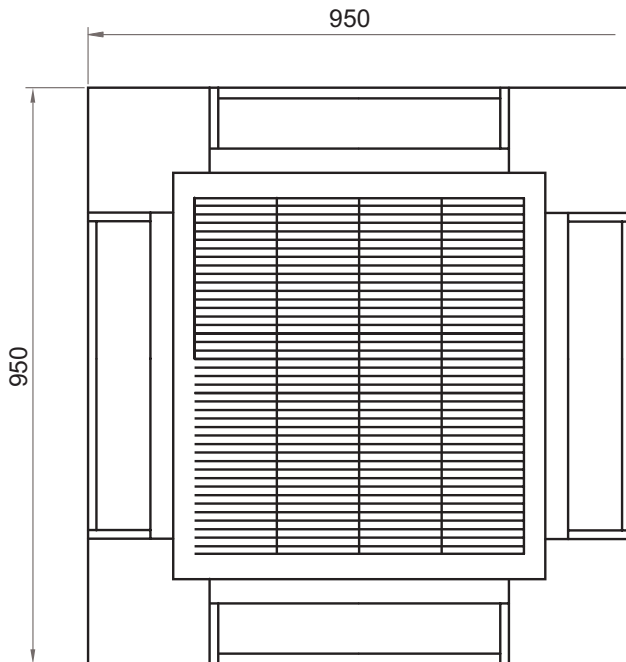
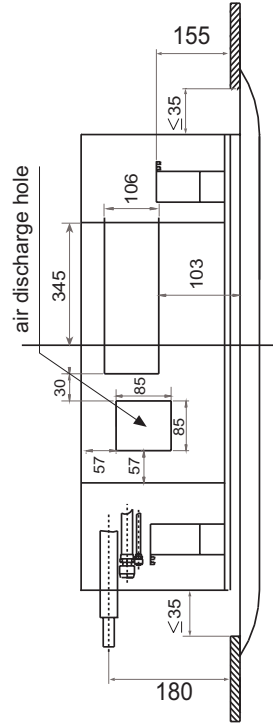
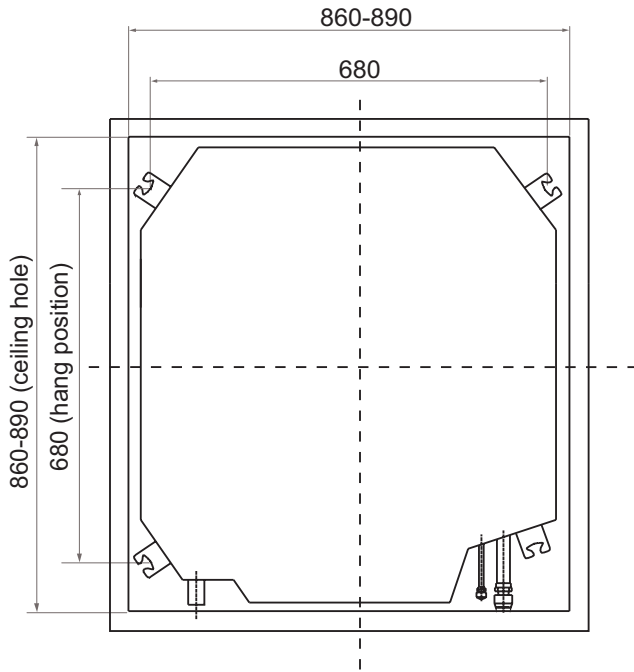
The noise level will be measured in the third octave band limited values in the semi-anechoic chamber, using a Real Time Analyser calibrated sound intensity meter. It is a sound pressure noise level.

3. Dimension

CBV009 CBV012 CBV016

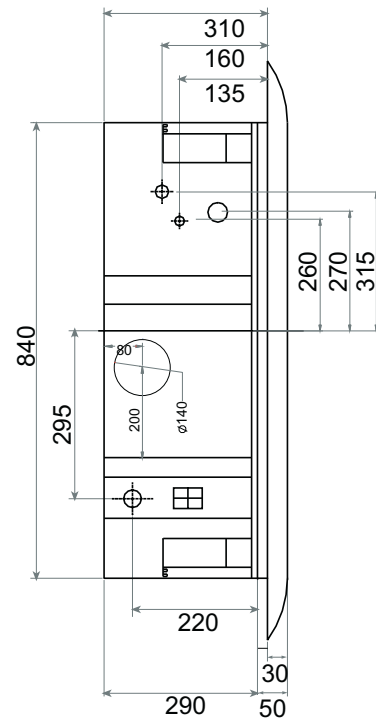
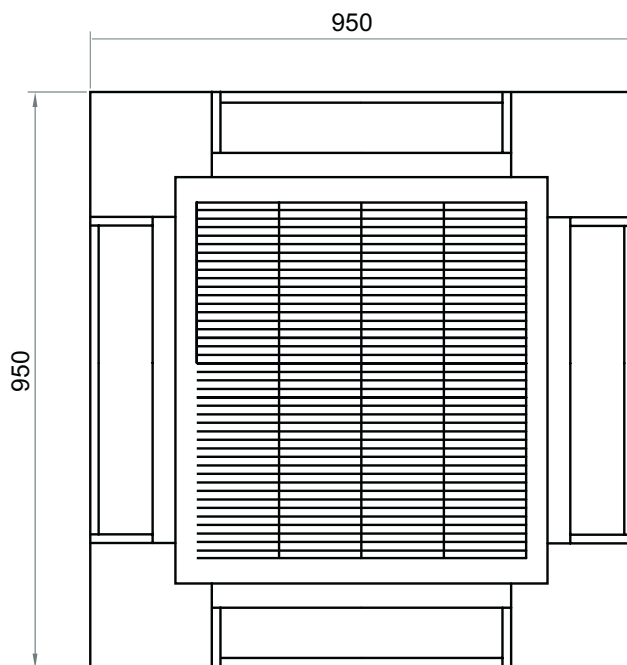
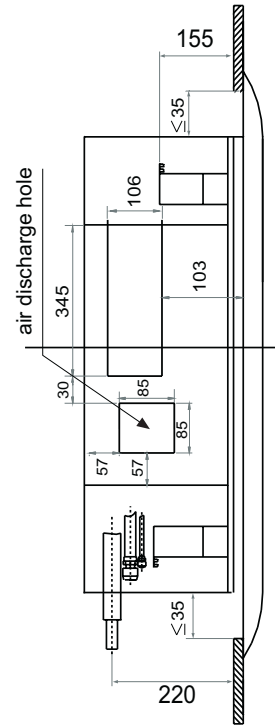
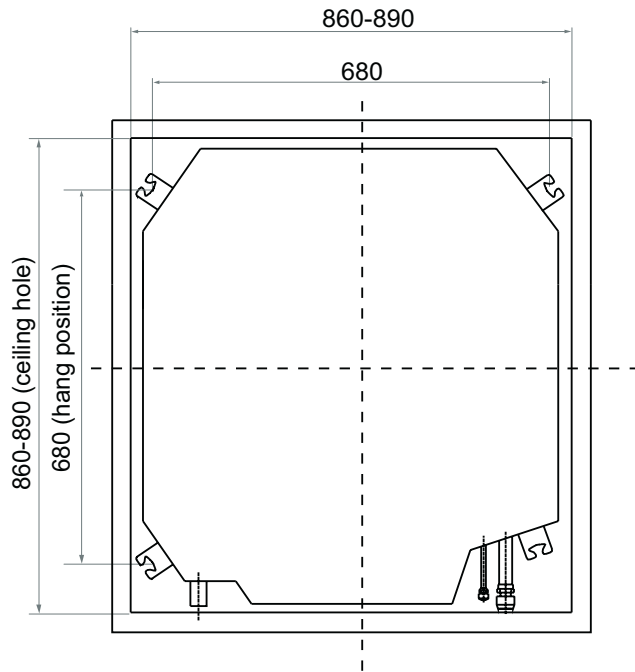


CCV018 CCV024 CCV028



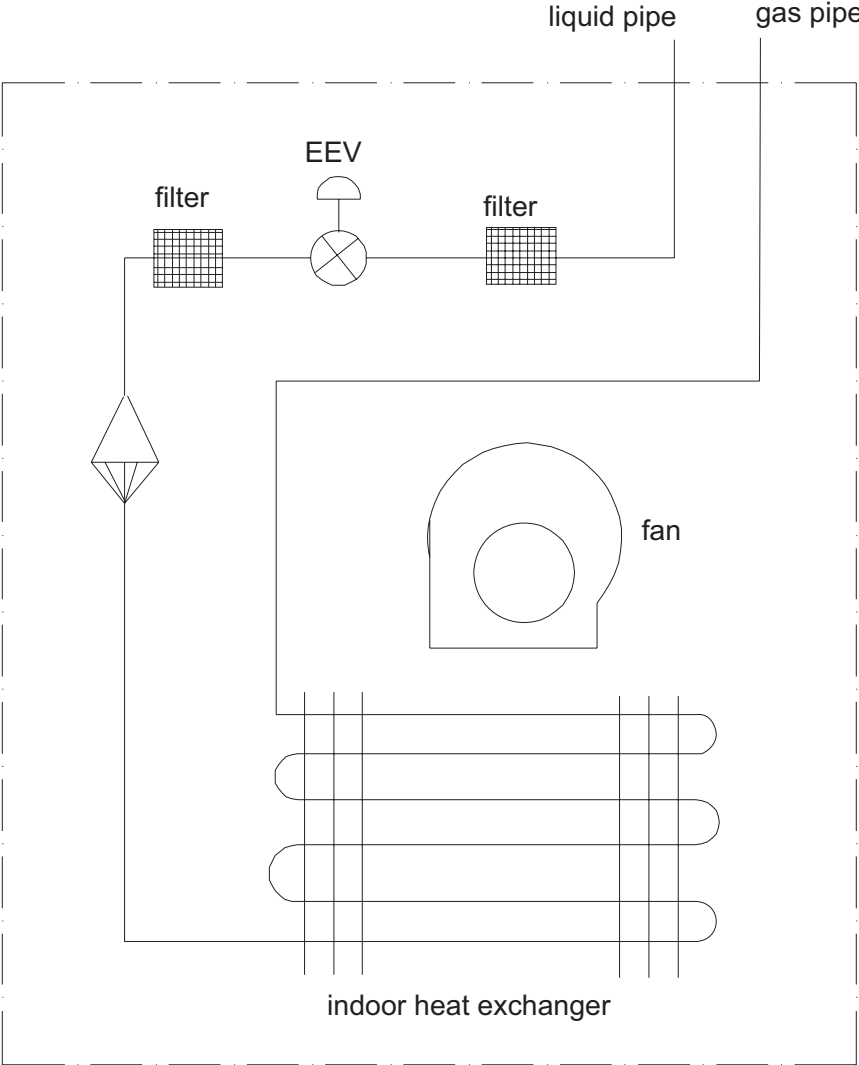
(mm)

CCV030 CCV038 CCV048

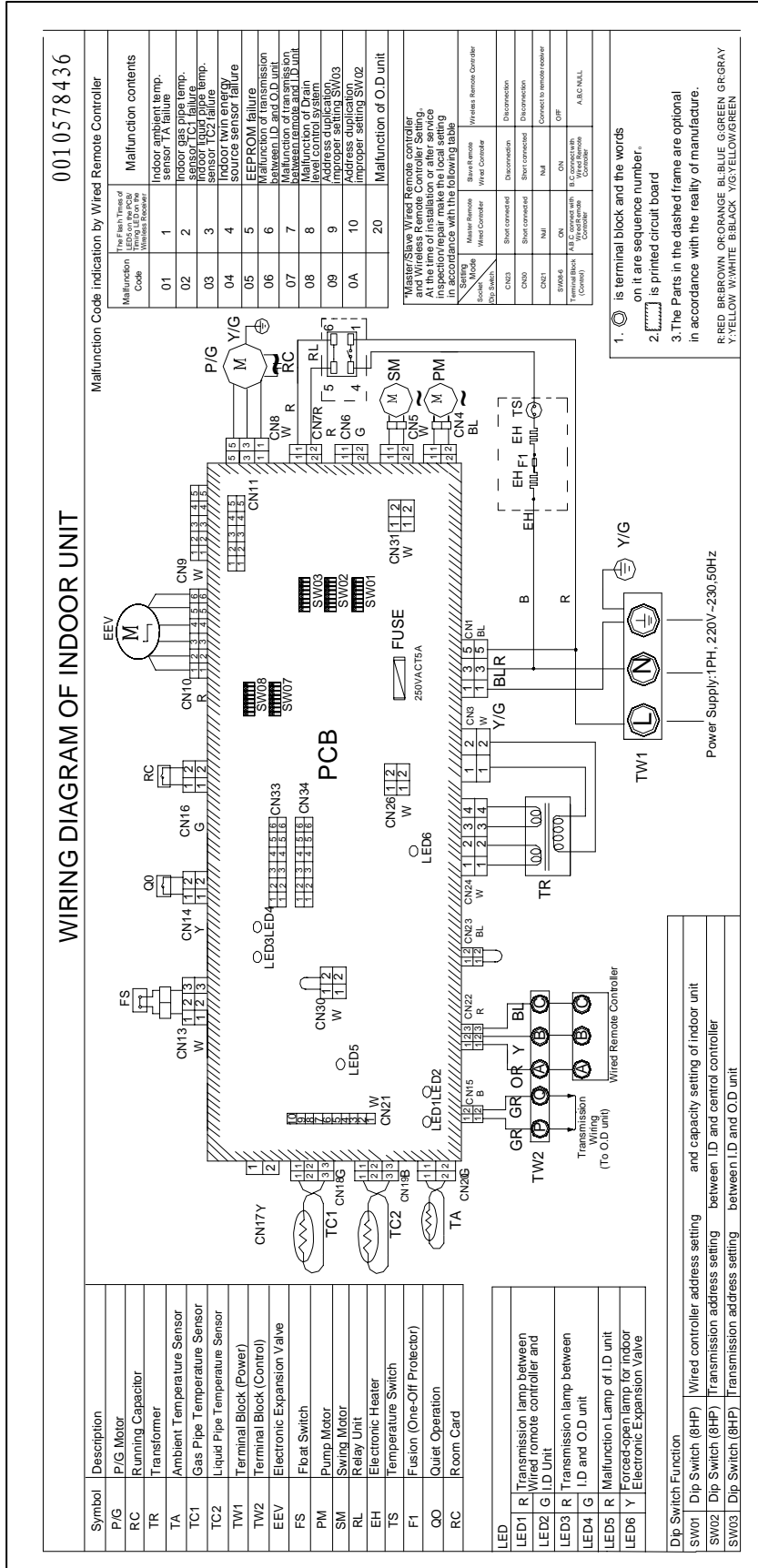


(mm)

4. Piping diagram



5. Wiring diagram





6. Electric characteristics

units					power supply		indoor fan motor		power input(W)	
model	phase	FQY	voltage	volt. range	MCA	MFA	W	FLA	cooling	heating
CBV009	1	50	220	198~242	0.5	1.6	20	0.4	80	80
CBV012	1	50	220	198~242	0.5	1.6	20	0.4	80	80
CBV016	1	50	220	198~242	0.5	1.6	20	0.4	80	80
CCV018	1	50	220	198~242	0.69	2.2	45	0.55	90	90
CCV024	1	50	220	198~242	0.69	2.2	45	0.55	100	100
CCV028	1	50	220	198~242	0.69	2.2	45	0.55	100	100
CCV030	1	50	220	198~242	1.38	4.4	53	1.1	150	150
CCV038	1	50	220	198~242	1.38	4.4	53	1.1	150	150
CCV048	1	50	220	198~242	1.38	4.4	53	1.1	150	150

Symbols:

MCA: Min. circuit amps (A)

MFA: Max. fuse amps of circuit breaker

W: Fan motor rated output(W)

FLA: Full load amps(A)

Notes:

1. Voltage range

The units are applicable for the electrical systems where voltage supplied to unit is in the range.

2. Maximum allowable voltage unbalance between phases is 2%.

3. $MCA=1.25*FLA$

$$MFA \leq 4*FLA$$

4. Power supply uses the circuit breaker



7. Capacity table (CA: total capacity; SHC: sensible heat capacity)

Cooling mode:

capacity(W*100)	outdoor temp.	indoor temp.													
		21.5°CDB 15°CWB		23°CDB 16°CWB		25°CDB 18°CWB		27°CDB 19°CWB		28°CDB 20°CWB		30°CDB 32°CWB		32°CDB 24°CWB	
		°CDB	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA
22	20.0	2.2	1.6	2.2	1.6	2.3	1.6	2.3	1.6	2.4	1.6	2.5	1.6	2.6	1.5
	22.5	2.1	1.5	2.2	1.6	2.3	1.5	2.3	1.6	2.4	1.6	2.4	1.6	2.5	1.5
	25.0	2.1	1.5	2.2	1.6	2.2	1.5	2.3	1.5	2.3	1.6	2.4	1.5	2.5	1.5
	27.5	2.1	1.5	2.1	1.6	2.2	1.5	2.3	1.5	2.3	1.6	2.4	1.5	2.5	1.5
	30.0	2.1	1.5	2.1	1.5	2.2	1.5	2.2	1.5	2.3	1.6	2.4	1.5	2.5	1.5
	32.5	2.0	1.5	2.1	1.5	2.2	1.5	2.2	1.5	2.3	1.6	2.4	1.5	2.4	1.5
	35.0	2.0	1.5	2.1	1.5	2.2	1.5	2.2	1.5	2.2	1.6	2.3	1.5	2.4	1.5
	37.5	2.0	1.5	2.0	1.5	2.1	1.5	2.2	1.5	2.2	1.5	2.3	1.5	2.4	1.5
	40.0	2.0	1.5	2.0	1.5	2.1	1.5	2.2	1.5	2.2	1.5	2.3	1.5	2.4	1.5
43.0	2.0	1.5	2.0	1.5	2.1	1.5	2.1	1.5	2.2	1.5	2.3	1.5	2.3	1.5	
28	20.0	2.7	2.0	2.8	2.1	2.9	2.0	3.0	2.0	3.0	2.1	3.1	2.0	3.2	2.0
	22.5	2.7	2.0	2.8	2.0	2.9	2.0	2.9	2.0	3.0	2.1	3.1	2.0	3.2	2.0
	25.0	2.7	2.0	2.7	2.0	2.9	2.0	2.9	2.0	3.0	2.1	3.1	2.0	3.2	1.9
	27.5	2.7	2.0	2.7	2.0	2.8	2.0	2.9	2.0	2.9	2.0	3.1	2.0	3.2	1.9
	30.0	2.6	2.0	2.7	2.0	2.8	2.0	2.9	2.0	2.9	2.0	3.0	2.0	3.1	1.9
	32.5	2.6	1.9	2.7	2.0	2.8	1.9	2.8	2.0	2.9	2.0	3.0	2.0	3.1	1.9
	35.0	2.6	1.9	2.6	2.0	2.7	1.9	2.8	1.9	2.9	2.0	3.0	1.9	3.1	1.9
	37.5	2.5	1.9	2.6	2.0	2.7	1.9	2.8	1.9	2.8	2.0	2.9	1.9	3.1	1.9
	40.0	2.5	1.9	2.6	1.9	2.7	1.9	2.7	1.9	2.8	2.0	2.9	1.9	3.0	1.9
43.0	2.5	1.9	2.5	1.9	2.7	1.9	2.7	1.9	2.8	2.0	2.9	2.7	3.0	1.9	
36	20.0	3.5	2.7	3.6	2.7	3.7	2.7	3.8	2.7	3.9	2.8	4.0	2.7	4.2	2.6
	22.5	3.5	2.7	3.6	2.7	3.7	2.7	3.8	2.7	3.9	2.8	4.0	2.7	4.1	2.6
	25.0	3.5	2.6	3.5	2.7	3.7	2.6	3.7	2.7	3.8	2.8	4.0	2.7	4.1	2.6
	27.5	3.4	2.6	3.5	2.7	3.6	2.6	3.7	2.7	3.8	2.7	3.9	2.7	4.1	2.6
	30.0	3.4	2.6	3.5	2.7	3.6	2.6	3.7	2.6	3.7	2.7	3.9	2.7	4.0	2.6
	32.5	3.3	2.6	3.4	2.7	3.6	2.6	3.6	2.6	3.7	2.7	3.9	2.6	4.0	2.6
	35.0	3.3	2.6	3.4	2.7	3.5	2.6	3.6	2.6	3.7	2.7	3.8	2.6	4.0	2.6
	37.5	3.3	2.6	3.3	2.6	3.5	2.6	3.5	2.6	3.6	2.7	3.8	2.6	3.9	2.6
	40.0	3.2	2.5	3.3	2.6	3.5	2.6	3.5	2.6	3.6	2.7	3.7	2.6	3.9	2.5
43.0	3.2	2.5	3.3	2.6	3.4	2.5	4.3	2.6	3.6	2.7	3.7	2.9	3.8	2.5	
40	20.0	3.9	2.9	4.0	2.9	4.2	2.9	4.2	2.9	4.3	3.0	4.5	2.9	4.7	2.8
	22.5	3.9	2.9	4.0	2.9	4.1	2.9	4.2	2.9	4.3	3.0	4.5	2.9	4.6	2.8
	25.0	3.9	2.8	3.9	2.9	4.1	2.8	4.1	2.9	4.3	2.9	4.4	2.9	4.6	2.8
	27.5	3.8	2.8	3.9	2.9	4.1	2.8	4.1	2.8	4.2	2.9	4.4	2.8	4.5	2.8
	30.0	3.8	2.8	3.9	2.9	4.0	2.8	4.1	2.8	4.2	2.9	4.3	2.8	4.5	2.8
	32.5	3.7	2.8	3.8	2.8	4.0	2.8	4.0	2.8	4.1	2.9	4.3	2.8	4.5	2.7
	35.0	3.7	2.8	3.8	2.8	3.9	2.8	4.0	2.8	4.1	2.9	4.3	2.8	4.4	2.7
	37.5	3.7	2.7	3.7	2.8	3.9	2.8	3.9	2.8	4.1	2.9	4.2	2.8	4.4	2.7
	40.0	3.6	2.7	3.7	2.8	3.9	2.7	3.9	2.8	4.0	2.8	4.2	2.8	4.3	2.7
43.0	3.6	2.7	3.7	2.8	3.8	2.7	4.8	2.7	4.0	2.8	4.1	3.4	4.3	2.7	
45	20.0	4.4	3.4	4.5	3.5	4.7	3.4	4.7	3.4	4.9	3.5	5.0	3.4	5.2	3.3
	22.5	4.4	3.4	4.5	3.4	4.6	3.4	4.7	3.4	4.8	3.5	5.0	3.4	5.2	3.3
	25.0	4.3	3.3	4.4	3.4	4.6	3.3	4.6	3.4	4.8	3.5	5.0	3.4	5.1	3.3
	27.5	4.3	3.3	4.4	3.4	4.5	3.3	4.6	3.4	4.7	3.5	4.9	3.4	5.1	3.3
	30.0	4.2	3.3	4.3	3.4	4.5	3.3	4.5	3.3	4.7	3.5	4.9	3.4	5.0	3.3
	32.5	4.2	3.3	4.3	3.4	4.5	3.3	4.5	3.3	4.6	3.4	4.8	3.3	5.0	3.3
	35.0	4.1	3.2	4.2	3.3	4.4	3.3	4.5	3.3	4.6	3.4	4.8	3.3	5.0	3.3
	37.5	4.1	3.2	4.2	3.3	4.4	3.3	4.4	3.3	4.5	3.4	4.7	3.3	4.9	3.2
	40.0	4.1	3.2	4.1	3.3	4.3	3.2	4.4	3.3	4.5	3.4	4.7	3.3	4.9	3.2
43.0	4.0	3.2	4.1	3.3	4.3	3.2	3.6	3.2	4.4	3.4	4.6	2.0	4.8	3.2	
50	20.0	5.5	4.0	5.6	4.1	5.8	4.0	5.9	4.0	6.0	4.1	6.3	4.0	6.5	3.9
	22.5	5.4	3.9	5.5	4.0	5.8	3.9	5.9	4.0	6.0	4.1	6.2	4.0	6.4	3.9
	25.0	5.4	3.9	5.5	4.0	5.7	3.9	5.8	3.9	5.9	4.1	6.2	3.9	6.4	3.8

56	27.5	5.3	3.9	5.4	4.0	5.7	3.9	5.8	3.9	5.9	4.0	6.1	3.9	6.3	3.8
	30.0	5.3	3.9	5.4	3.9	5.6	3.9	5.7	3.9	5.8	4.0	6.0	3.9	6.3	3.8
	32.5	5.2	3.8	5.3	3.9	5.5	3.8	5.7	3.9	5.8	4.0	6.0	3.9	6.2	3.8
	35.0	5.2	3.8	5.3	3.9	5.5	3.8	5.6	3.8	5.7	4.0	5.9	3.9	6.2	3.8
	37.5	5.1	3.8	5.2	3.9	5.4	3.8	5.5	3.8	5.7	3.9	5.9	3.8	6.1	3.7
	40.0	5.0	3.7	5.2	3.8	5.4	3.8	5.5	3.8	5.6	3.9	5.8	3.8	6.0	3.7
	43.0	5.0	3.7	5.1	3.8	5.3	3.7	5.4	3.8	5.5	3.9	5.8	3.8	6.0	3.7
71	20.0	7.0	4.9	7.1	5.0	7.4	4.9	7.5	4.9	7.7	5.0	8.0	4.9	8.2	4.7
	22.5	6.9	4.9	7.0	4.9	7.3	4.8	7.5	4.8	7.6	5.0	7.9	4.8	8.2	4.7
	25.0	6.8	4.8	7.0	4.9	7.2	4.8	7.4	4.8	7.5	4.9	7.8	4.8	8.1	4.7
	27.5	6.7	4.8	6.9	4.9	7.2	4.8	7.3	4.8	7.5	4.9	7.7	4.8	8.0	4.6
	30.0	6.7	4.7	6.8	4.8	7.1	4.7	7.2	4.7	7.4	4.9	7.7	4.7	8.0	4.6
	32.5	6.6	4.7	6.7	4.8	7.0	4.7	7.2	4.7	7.3	4.8	7.6	4.7	7.9	4.6
	35.0	6.5	4.7	6.7	4.8	7.0	4.7	7.1	4.7	7.2	4.8	7.5	4.7	7.8	4.6
	37.5	6.5	4.6	6.6	4.7	6.9	4.6	7.0	4.6	7.2	4.8	7.5	4.7	7.7	4.5
	40.0	6.4	4.6	6.5	4.7	6.8	4.6	7.0	4.6	7.1	4.8	7.4	4.6	7.7	4.5
43.0	6.3	4.6	6.4	4.6	6.7	4.6	6.9	4.6	7.0	4.7	7.3	4.6	7.6	4.5	
80	20.0	7.8	5.5	8.0	5.6	8.3	5.5	8.5	5.5	8.6	5.7	9.0	5.5	9.3	5.3
	22.5	7.8	5.5	7.9	5.5	8.2	5.4	8.4	5.4	8.6	5.6	8.9	5.4	9.2	5.3
	25.0	7.7	5.4	7.8	5.5	8.2	5.4	8.3	5.4	8.5	5.5	8.8	5.4	9.1	5.3
	27.5	7.6	5.4	7.8	5.5	8.1	5.4	8.2	5.4	8.4	5.5	8.7	5.4	9.0	5.2
	30.0	7.5	5.3	7.7	5.4	8.0	5.3	8.2	5.3	8.3	5.4	8.6	5.3	9.0	5.2
	32.5	7.4	5.3	7.6	5.4	7.9	5.3	8.1	5.3	8.2	5.4	8.6	5.3	8.9	5.1
	35.0	7.4	5.3	7.5	5.4	7.8	5.3	8.0	5.3	8.2	5.4	8.5	5.3	8.8	5.1
	37.5	7.3	5.2	7.4	5.3	7.8	5.2	7.9	5.2	8.1	5.4	8.4	5.3	8.7	5.1
	40.0	7.2	5.1	7.4	5.3	7.7	5.1	7.8	5.2	8.0	5.4	8.3	5.2	8.6	5.1
43.0	7.1	5.1	7.3	5.2	7.6	5.1	7.7	5.1	7.9	5.3	8.2	5.2	8.5	5.0	
90	20.0	8.8	6.4	9.0	6.5	9.4	6.4	9.5	6.4	9.7	6.6	10.1	6.4	10.4	6.2
	22.5	8.7	6.4	8.9	6.5	9.3	6.3	9.5	6.4	9.6	6.6	10.0	6.4	10.4	6.2
	25.0	8.6	6.3	8.8	6.4	9.2	6.3	9.4	6.3	9.5	6.5	9.9	6.4	10.3	6.2
	27.5	8.6	6.3	8.7	6.4	9.1	6.3	9.3	6.3	9.5	6.5	9.8	6.3	10.2	6.1
	30.0	8.5	6.2	8.6	6.4	9.0	6.2	9.2	6.3	9.4	6.5	9.7	6.3	10.1	6.1
	32.5	8.4	6.2	8.6	6.3	8.9	6.2	9.1	6.2	9.3	6.4	9.6	6.3	10.0	6.1
	35.0	8.3	6.1	8.5	6.3	8.8	6.1	9.0	6.2	9.2	6.4	9.5	6.2	9.9	6.0
	37.5	8.2	6.1	8.4	6.2	8.7	6.1	8.9	6.1	9.1	6.3	9.5	6.2	9.8	6.0
	40.0	8.1	6.0	8.3	6.2	8.6	6.1	8.8	6.1	9.0	6.3	9.4	6.1	9.7	6.0
43.0	8.0	6.0	8.2	6.1	8.5	6.0	8.7	6.1	8.9	6.3	9.3	6.1	9.6	5.9	
112	20.0	11.0	8.0	11.2	8.2	11.6	8.0	11.9	8.1	12.1	8.3	12.5	8.1	13.0	7.9
	22.5	10.9	8.0	11.1	8.2	11.5	8.0	11.8	8.0	12.0	8.3	12.4	8.1	12.9	7.8
	25.0	10.8	7.9	11.0	8.1	11.4	7.9	11.6	8.0	11.9	8.2	12.3	8.0	12.8	7.8
	27.5	10.6	7.9	10.9	8.1	11.3	7.9	11.5	7.9	11.8	8.2	12.2	8.0	12.7	7.8
	30.0	10.5	7.8	10.8	8.0	11.2	7.8	11.4	7.9	11.6	8.1	12.1	7.9	12.5	7.7
	32.5	10.4	7.8	10.6	7.9	11.1	7.8	11.3	7.8	11.5	8.1	12.0	7.9	12.4	7.7
	35.0	10.3	7.7	10.5	7.9	11.0	7.7	11.2	7.8	11.4	8.1	11.9	7.9	12.3	7.6
	37.5	10.2	7.7	10.4	7.8	10.9	7.7	11.1	7.8	11.3	8.0	11.8	7.8	12.2	7.6
	40.0	10.1	7.6	10.3	7.8	10.8	7.6	11.0	7.7	11.2	8.0	11.6	7.8	12.1	7.6
43.0	9.9	7.5	10.2	7.7	10.6	7.6	10.8	7.6	11.1	7.9	11.5	7.7	12.0	7.5	
140	20.0	13.7	9.6	14.0	9.8	14.6	9.6	14.8	9.6	15.1	9.9	15.7	9.6	16.2	9.3
	22.5	13.6	9.6	13.9	9.7	14.4	9.5	14.7	9.5	15.0	9.8	15.5	9.5	16.1	9.2
	25.0	13.4	9.5	13.7	9.7	14.3	9.4	14.6	9.5	14.8	9.7	15.4	9.5	16.0	9.2
	27.5	13.3	9.4	13.6	9.6	14.1	9.4	14.4	9.4	14.7	9.6	15.3	9.4	15.8	9.1
	30.0	13.2	9.3	13.4	9.5	14.0	9.3	14.3	9.3	14.6	9.5	15.1	9.3	15.7	9.1
	32.5	13.0	9.3	13.3	9.4	13.9	9.2	14.1	9.3	14.4	9.5	15.0	9.3	15.5	9.0
	35.0	12.9	9.2	13.2	9.4	13.7	9.2	14.0	9.2	14.3	9.5	14.8	9.2	15.4	9.0
	37.5	12.7	9.1	13.0	9.3	13.6	9.1	13.9	9.1	14.1	9.4	14.7	9.2	15.3	8.9
	40.0	12.6	9.0	12.9	9.2	13.4	9.0	13.7	9.1	14.0	9.4	14.6	9.1	15.1	8.9
43.0	12.4	9.0	12.7	9.1	13.3	9.0	13.6	9.0	13.8	9.3	14.4	9.1	15.0	8.8	



Heating mode:

capa city(W*1 00)	outdoor temp.	indoor temp.(CDB)				capa city(W*10 0)	outdoor temp.	indoor temp.(CDB)				capaci ty(W* 100)	outdoor temp.	indoor temp.(CDB)			
		15.0	20.0	25.0	27.0			15.0	20.0	25.0	27.0			15.0	20.0	25.0	27.0
		°CDB	SHC	SHC	SHC			SHC	°CDB	SHC	SHC			SHC	SHC	°CDB	SHC
22	-15.0	1.7	1.6	1.6	1.6	56	-15.0	4.2	4.2	4.1	4.1	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	1.9	1.9	1.9	1.7		-10.0	4.8	4.8	4.7	4.3		-10.0	12.2	12.1	11.9	11.0
	-5.0	2.1	2.1	1.9	1.7		-5.0	5.4	5.3	4.9	4.3		-5.0	13.7	13.6	12.5	11.0
	0.0	2.4	2.4	1.9	1.7		0.0	6.0	5.9	4.9	4.3		0.0	15.3	15.1	12.5	11.0
	2.5	2.5	2.5	1.9	1.7		2.5	6.3	6.2	4.9	4.3		2.5	16.0	15.8	12.5	11.0
	6.0	2.5	2.5	1.9	1.7		6.0	6.4	6.3	4.9	4.3		6.0	16.2	16.0	12.5	11.0
	6.5	2.6	2.5	1.9	1.7		6.5	6.6	6.3	4.9	4.3		6.5	16.8	16.0	12.5	11.0
	10.0	2.8	2.5	1.9	1.7		10.0	7.1	6.3	4.9	4.3		10.0	18.0	16.0	12.5	11.0
	12.5	3.0	2.5	1.9	1.7		12.5	7.5	6.3	4.9	4.3		12.5	19.1	16.0	12.5	11.0
	15.5	3.0	2.5	1.9	1.7		15.5	7.6	6.3	4.9	4.3		15.5	19.4	16.0	12.5	11.0
28	-15.0	2.1	2.1	2.1	2.1	71	-15.0	5.4	5.3	5.2	5.2	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	2.4	2.4	2.4	2.2		-10.0	6.1	6.0	6.0	5.5		-10.0	12.2	12.1	11.9	11.0
	-5.0	2.7	2.7	2.5	2.2		-5.0	6.9	6.8	6.2	5.5		-5.0	13.7	13.6	12.5	11.0
	0.0	3.1	3.0	2.5	2.2		0.0	7.6	7.5	6.2	5.5		0.0	15.3	15.1	12.5	11.0
	2.5	3.2	3.2	2.5	2.2		2.5	8.0	7.9	6.2	5.5		2.5	16.0	15.8	12.5	11.0
	6.0	3.2	3.2	2.5	2.2		6.0	8.1	8.0	6.2	5.5		6.0	16.2	16.0	12.5	11.0
	6.5	3.4	3.2	2.5	2.2		6.5	8.4	8.0	6.2	5.5		6.5	16.8	16.0	12.5	11.0
	10.0	3.6	3.2	2.5	2.2		10.0	9.0	8.0	6.2	5.5		10.0	18.0	16.0	12.5	11.0
	12.5	3.8	3.2	2.5	2.2		12.5	9.6	8.0	6.2	5.5		12.5	19.1	16.0	12.5	11.0
	15.5	3.9	3.2	2.5	2.2		15.5	9.7	8.0	6.2	5.5		15.5	19.4	16.0	12.5	11.0
36	-15.0	2.7	2.6	2.6	2.6	80	-15.0	6.0	5.9	5.9	5.9	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	3.1	3.0	3.0	2.8		-10.0	6.9	6.8	6.7	6.2		-10.0	12.2	12.1	11.9	11.0
	-5.0	3.4	3.4	3.1	2.8		-5.0	7.7	7.6	7.0	6.2		-5.0	13.7	13.6	12.5	11.0
	0.0	3.8	3.8	3.1	2.8		0.0	8.6	8.5	7.0	6.2		0.0	15.3	15.1	12.5	11.0
	2.5	4.0	4.0	3.1	2.8		2.5	9.0	8.9	7.0	6.2		2.5	16.0	15.8	12.5	11.0
	6.0	4.0	4.0	3.1	2.8		6.0	9.1	9.0	7.0	6.2		6.0	16.2	16.0	12.5	11.0
	6.5	4.2	4.0	3.1	2.8		6.5	9.5	9.0	7.0	6.2		6.5	16.8	16.0	12.5	11.0
	10.0	4.5	4.0	3.1	2.8		10.0	10.1	9.0	7.0	6.2		10.0	18.0	16.0	12.5	11.0
	12.5	4.8	4.0	3.1	2.8		12.5	10.8	9.0	7.0	6.2		12.5	19.1	16.0	12.5	11.0
	15.5	4.8	4.0	3.1	2.8		15.5	10.9	9.0	7.0	6.2		15.5	19.4	16.0	12.5	11.0
40	-15.0	3.0	3.0	3.0	3.0	90	-15.0	6.7	6.6	6.5	6.5	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	3.5	3.4	3.4	3.1		-10.0	7.6	7.5	7.4	6.9		-10.0	12.2	12.1	11.9	11.0
	-5.0	3.9	3.8	3.5	3.1		-5.0	8.6	8.5	7.8	6.9		-5.0	13.7	13.6	12.5	11.0
	0.0	4.3	4.3	3.5	3.1		0.0	9.5	9.4	7.8	6.9		0.0	15.3	15.1	12.5	11.0
	2.5	4.5	4.5	3.5	3.1		2.5	10.0	9.9	7.8	6.9		2.5	16.0	15.8	12.5	11.0
	6.0	4.6	4.5	3.5	3.1		6.0	10.1	10.0	7.8	6.9		6.0	16.2	16.0	12.5	11.0
	6.5	4.8	4.5	3.5	3.1		6.5	10.5	10.0	7.8	6.9		6.5	16.8	16.0	12.5	11.0
	10.0	5.1	4.5	3.5	3.1		10.0	11.2	10.0	7.8	6.9		10.0	18.0	16.0	12.5	11.0
	12.5	5.4	4.5	3.5	3.1		12.5	12.0	10.0	7.8	6.9		12.5	19.1	16.0	12.5	11.0
	15.5	5.5	4.5	3.5	3.1		15.5	12.1	10.0	7.8	6.9		15.5	19.4	16.0	12.5	11.0
45	-15.0	3.3	3.3	3.3	3.3	112	-15.0	8.4	8.2	8.2	8.1	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	3.8	3.8	3.7	3.5		-10.0	9.6	9.4	9.3	8.6		-10.0	12.2	12.1	11.9	11.0
	-5.0	4.3	4.2	3.9	3.5		-5.0	10.7	10.6	9.8	8.6		-5.0	13.7	13.6	12.5	11.0
	0.0	4.8	4.7	3.9	3.5		0.0	11.9	11.8	9.8	8.6		0.0	15.3	15.1	12.5	11.0
	2.5	5.0	5.0	3.9	3.5		2.5	12.5	12.4	9.8	8.6		2.5	16.0	15.8	12.5	11.0
	6.0	5.1	5.0	3.9	3.5		6.0	12.5	12.5	9.8	8.6		6.0	16.2	16.0	12.5	11.0
	6.5	5.3	5.0	3.9	3.5		6.5	13.2	12.5	9.8	8.6		6.5	16.8	16.0	12.5	11.0
	10.0	5.6	5.0	3.9	3.5		10.0	14.1	12.5	9.8	8.6		10.0	18.0	16.0	12.5	11.0
	12.5	6.0	5.0	3.9	3.5		12.5	15.0	12.5	9.8	8.6		12.5	19.1	16.0	12.5	11.0
	15.5	6.1	5.0	3.9	3.5		15.5	15.1	12.5	9.8	8.6		15.5	19.4	16.0	12.5	11.0

8. Air velocity and temperature distribution

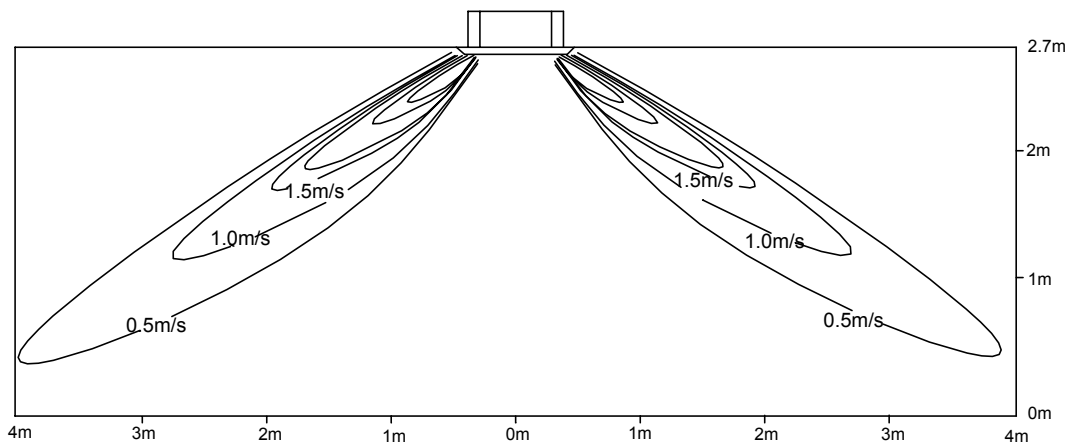
CBV009 CBV012 CBV016

a. Cooling / Air Velocity Distribution

Cooling

Blow angle:40

Air Velocity Distribution

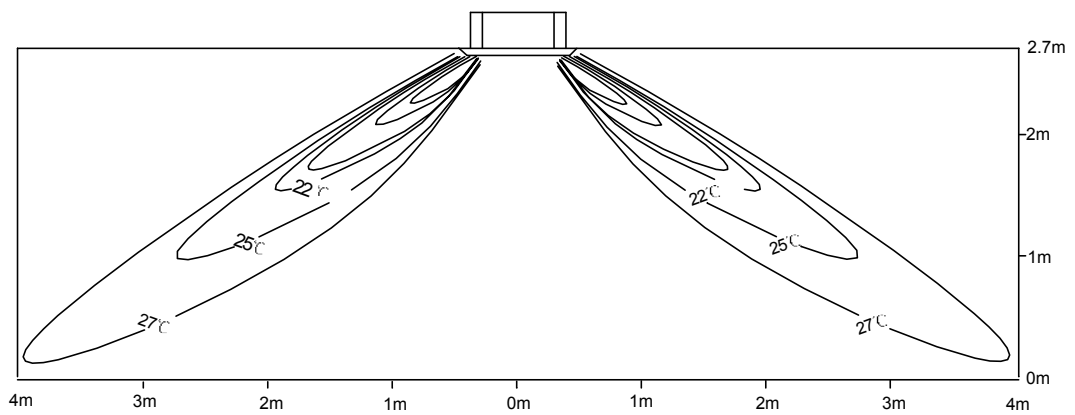


b. Cooling / Temperature Distribution

Cooling

Blow angle:40

Temperature Distribution

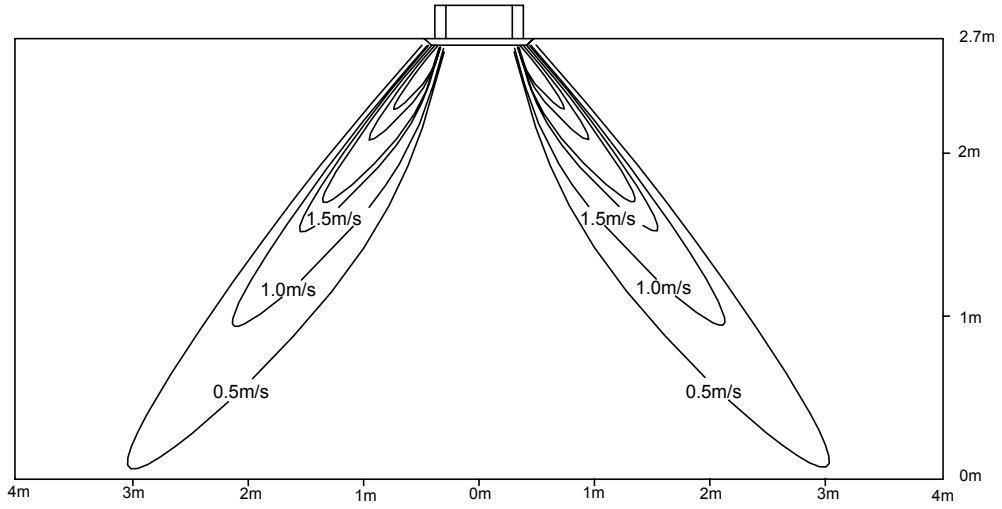


c. Heating / Air Velocity Distribution

Heating

Blow angle:70

Air velocity Distribution

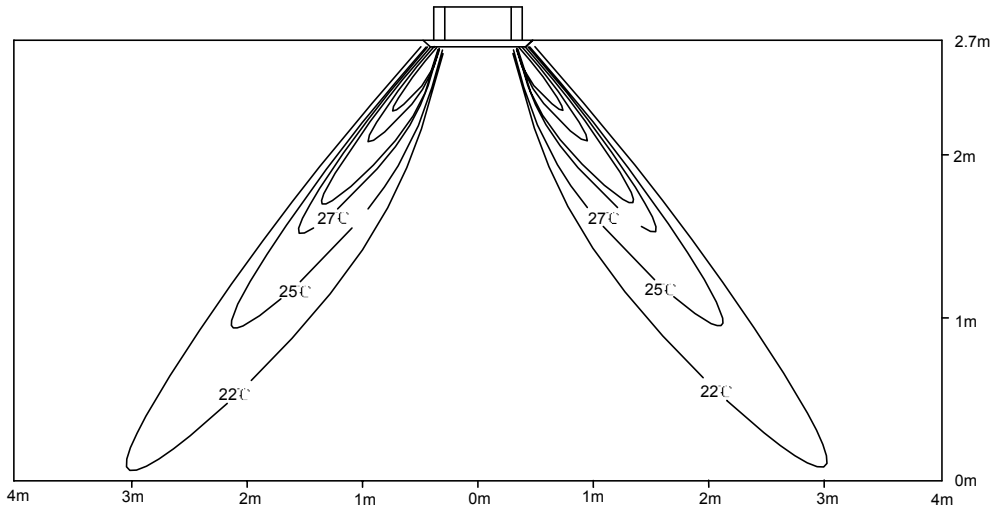


d. Heating / Temperature Distribution

Heating

Blow angle:70

Temperature Distribution



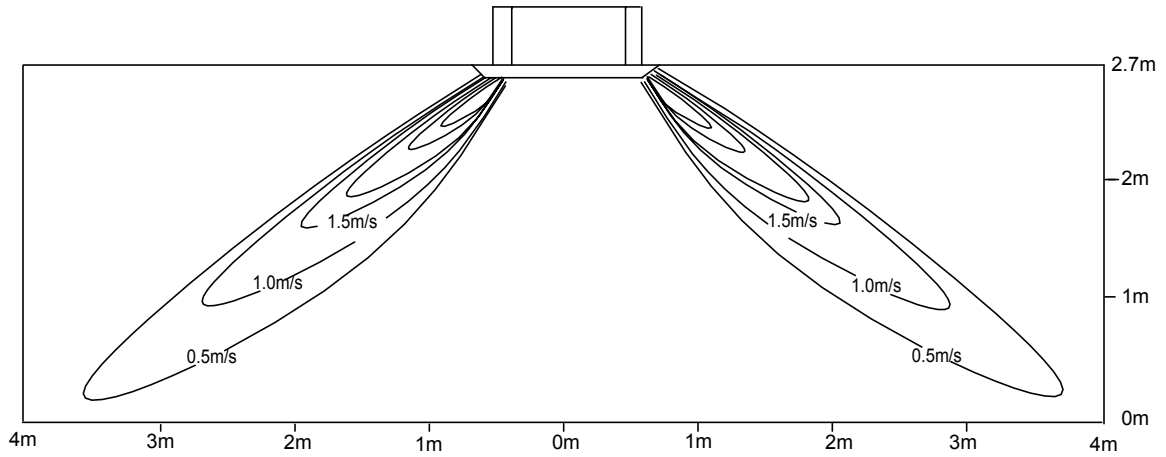
CCV018 CCV024 CCV028 CCV030 CCV038 CCV048

a. Cooling / Air Velocity Distribution

Cooling

Blow angle:40

Air Velocity Distribution

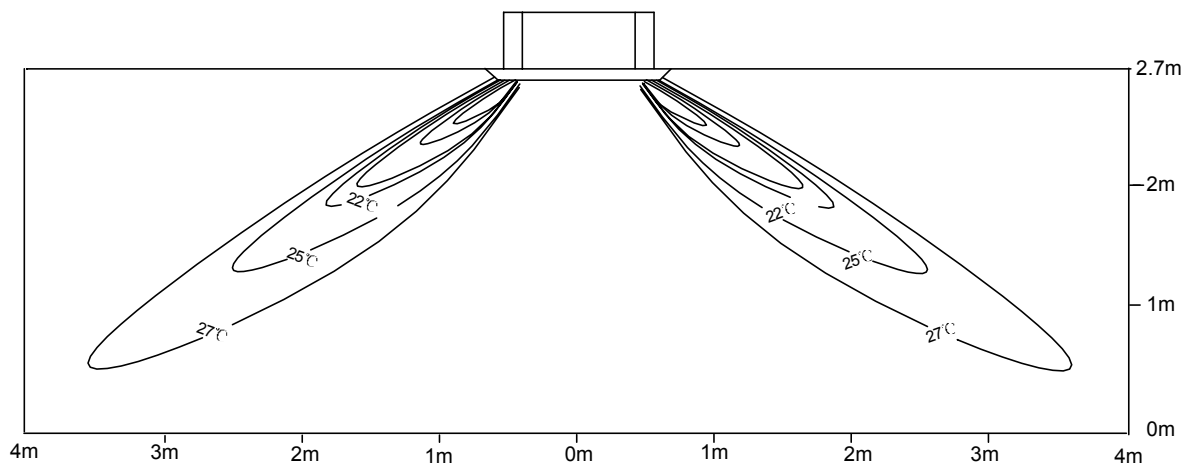


b. Cooling / Temperature Distribution

Cooling

Blow angle:40

Temperature Distribution

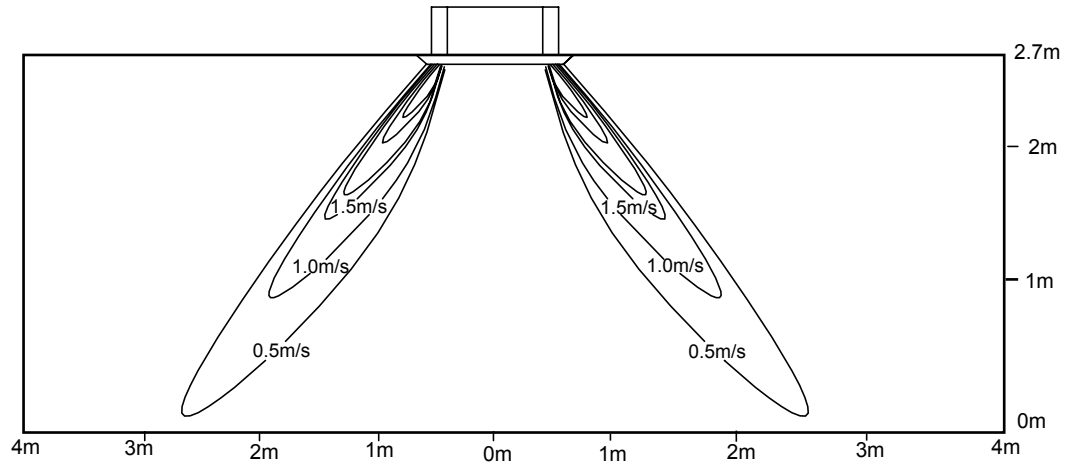


c. Heating / Air Velocity Distribution

Heating

Blow angle:70

Air velocity Distribution

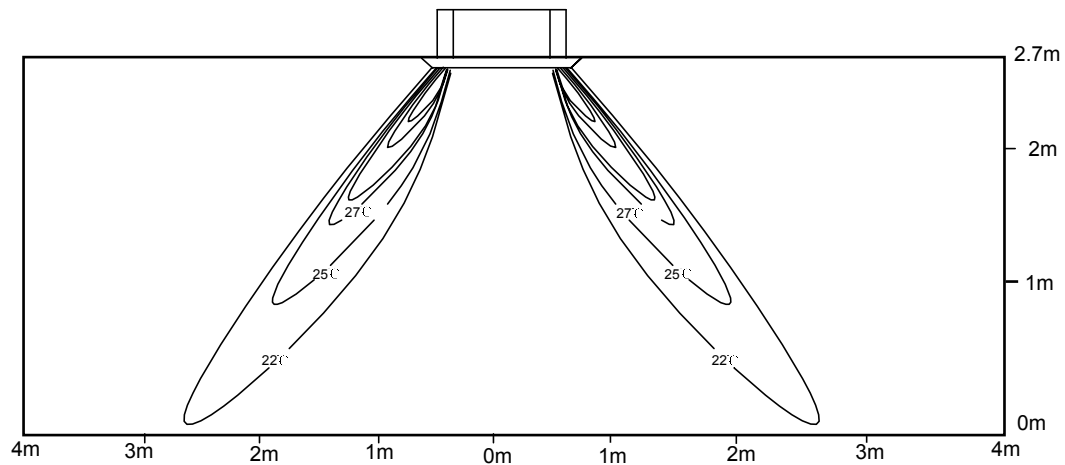


d. Heating / Temperature Distribution

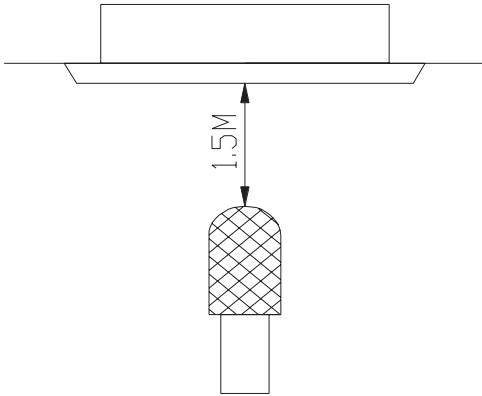
Heating

Blow angle:70

Temperature Distribution



9. Noise level

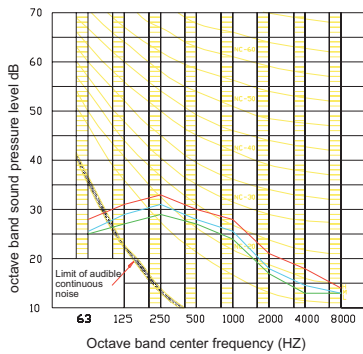


(1) Testing illustrate:

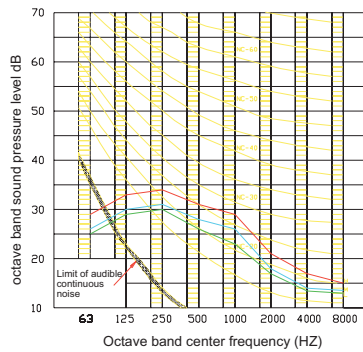
(2) Testing condition:

- a. Unit running in the nominal condition
- b. Test in the semi-anechoic chamber
- c. Noise level varies from the actual factors such as room structure, etc.

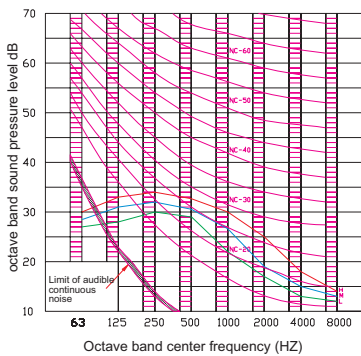
CBV009 CBV012



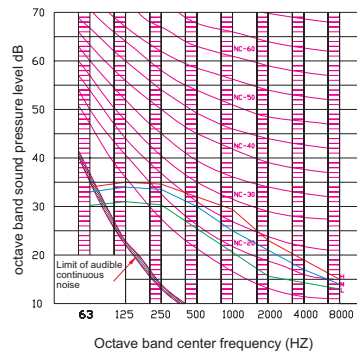
CBV016



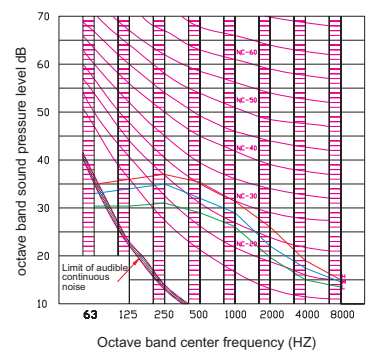
CCV018



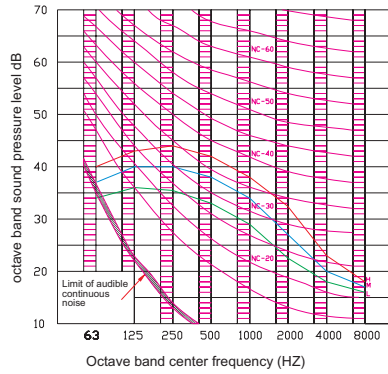
CCV024



CCV028 CCV030 CCV038



CCV048



10. Installation

(1) Selection of Installation Place

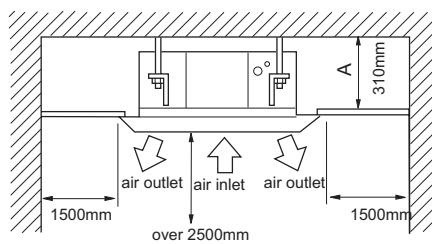
- A. Place above the ceiling where have enough space to arrange the unit.
- B. Place where the drainage pipe can be arranged well.
- C. Distance from air outlet to the floor not more than 2.7m.
- D. Place where inlet and outlet air of indoor ot be blocked.
- E. Place strong enough to support the unit weight.
- F. No expensive articles such as television and piano below indoor unit.
- G. Place more than 1m away from television and radio to avoid disturbing television and radio.

(2) Installation space

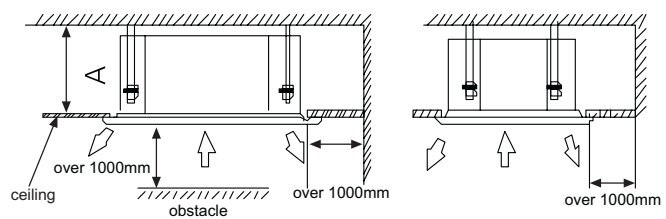
Ensure there is enough space for installation and maintenance.

Installation height not more than 2.7m, or when the ceiling is over 2.7m, the warm air can not arrive the floor.

CBV009 CBV012 CBV016



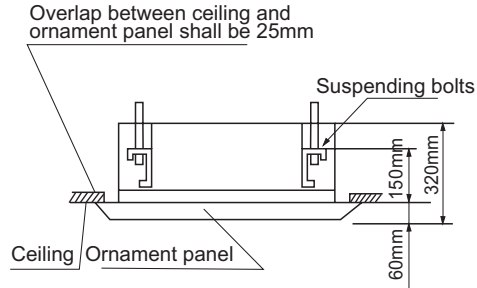
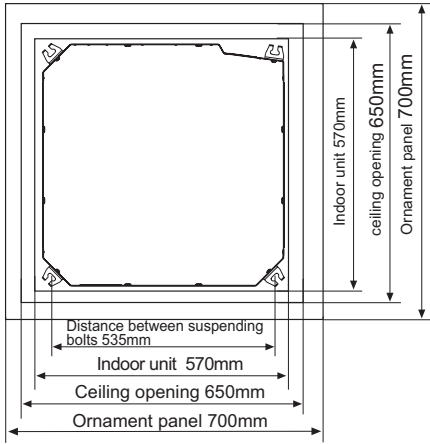
CBV018~48



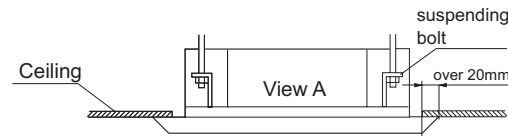
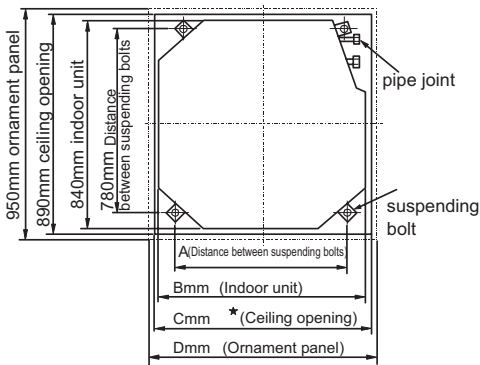
model	A(mm)
CBV009~16	310
CBV018~28	280
CBV030~48	320

(3) Position among ceiling opening, unit and suspending bolt

Model: CBV009~16



Model: CBV018~28

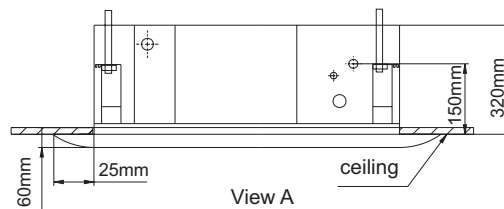
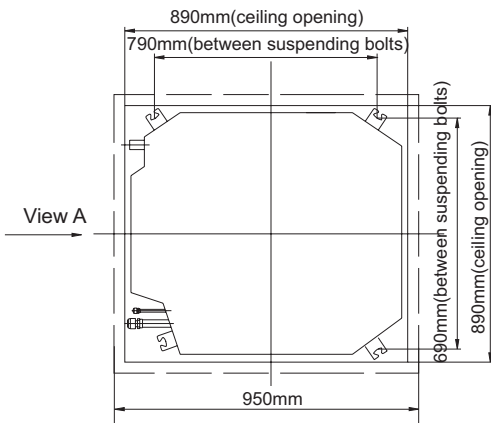


model	A	B	C	D
CBV018~28	680	840	890	950

Note:

The dimension marked with ★ can be up to 910mm, but the overlap distance should be over 20mm.

Model: CBV030~48



Note:

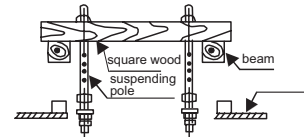
- Before hanging indoor unit, decide the installation position and the pipe direction due to the piping and the wiring in the ceiling.
- Before hanging indoor unit, firstly prepare all the pipes(refrigerant pipe and drainage pipe) and the wires(remote controller wire, connecting wire between indoor and outdoor), in order to connect with the indoor at once after installation.
If the ceiling is existing, before hanging, place the refrigerant pipe, drainage pipe, indoor wires, controller wires on the prepared position.
- Confirm indoor dimension. For the unit with installation paper pattern, use the paper pattern to make the dimension and the position of the unit and the ceiling ceiling opening identical when installation.

(4) The ceiling opening and reinforcement

- According to indoor dimension, cut down and take away the ceiling base plate.
- After making the proper installation hole, reinforce the cut surface of ceiling base plate, and modify the ceiling edge to consolidate the base plate. To avoid ceiling vibration, it is important to consolidate the base plate and keep the original level.

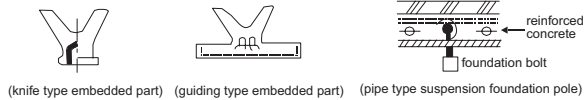
(5) Install the suspending pole

- To bear the unit, in the place with existing ceiling, use the foundation bolt; while in the place with new built ceiling, use the built-in bolt, embedded bolt or other parts supplied on field. Before installation, adjust the distance to the ceiling.
- Fix the unit with M10 suspending pole (4 pieces, prepared on field) as the showed dimension in the figure. Execute the proper installation due to the different room structure and keep horizontal with th gradienter.



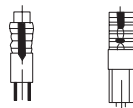
New concrete slab

To fix with built-in parts, foundation bolts, etc.



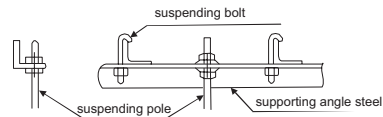
Original concrete slab

Use hole-in hinge, hole-in plunger or hole-in bolt.



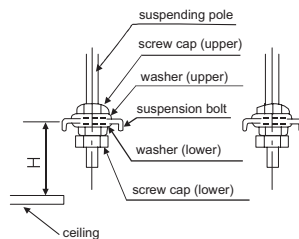
Steel reinforcement structure

Use angle steel or new supporting angle steel directly.



Hanging indoor unit

Adjust the screw cap (lower) position, and keep the distance between washer (lower) and the ceiling is Hmm, as the table:



model	H(mm)
CBV009~16	150
CBV018~28	135
CBV030~48	150

(6) Indoor unit installation

In case of no ceiling

A. Install unit temporarily

Put suspending bracket on the suspending bolt to hang the unit up. Be sure to use nut and washer at both end of the bracket to secure firmly.

B. Ceiling opening hole dimension, refer to the figure on Page 54.

After installing on the ceiling

C. Adjust unit to its right position

D. Check if the unit is horizontal.

The unit is with built-in water pump and float switch, check if the four corners of the unit are horizontal with the gradienter or the PVC tube with water. (If unit is tilting against the direction of water drainage, float switch will be abnormal and cause water drop).

E. Fasten the nut up on the washer.

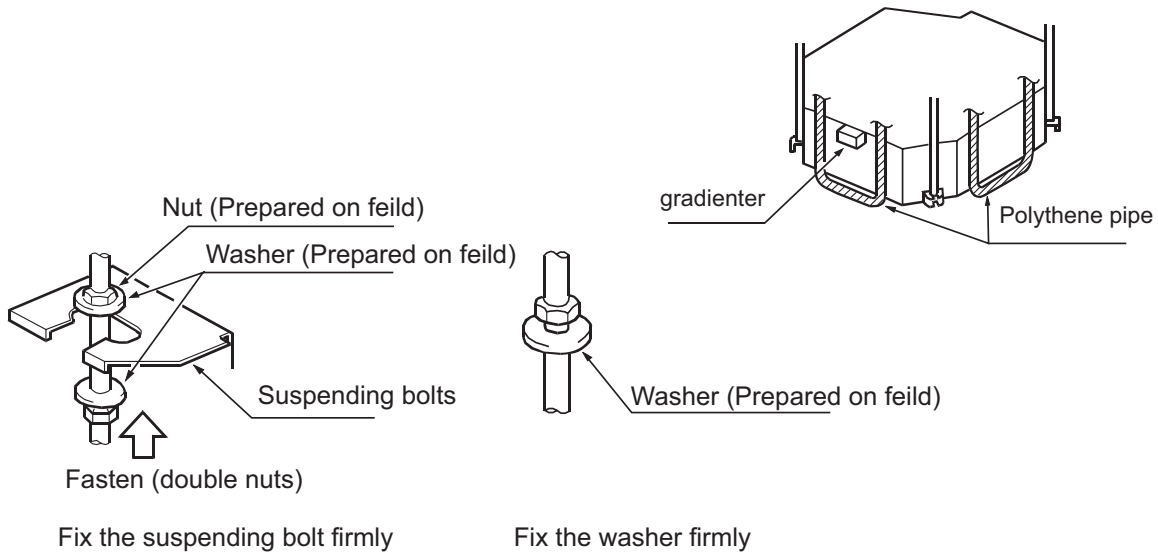
In the case of existing ceiling

F. Install unit temporarily

Put suspending bracket on the suspending bolt to hang the unit up. Be sure to use nut and washer at both end of the bracket to secure it firmly.

G. Adjust the height and position of the unit.

H. Proceed the procedure D, E of " In the case of no ceiling "



(7) Ornament panel installation

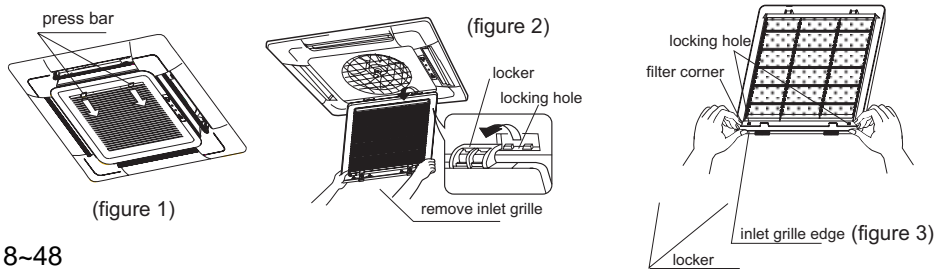
A. Preparing and handling with ornament panel

- Ornament panel shall not be placed face down or against wall, neither on an uneven object.
- Don't bend carelessly the swing flap, or problem may occur.

CBV009~16

1. Remove air inlet grille and push down the two bars on the inlet grille (see figure 1), move it close to the grille and then lift it up for 45degree (see figure 2), and take off the air inlet grille.

2. Take off the filter and press the air inlet grille outer edge with thumb, and pull out the filter corner with forefinger, to lift the filter after leaving the locker, then remove the filter (see figure 3).

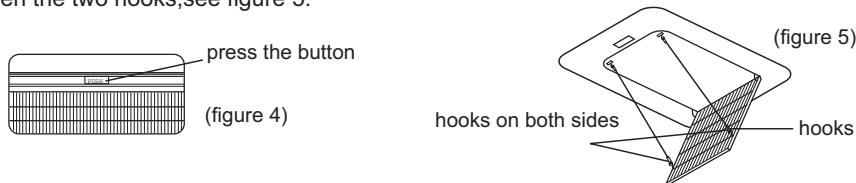


CBV018~48

1. Open the grille

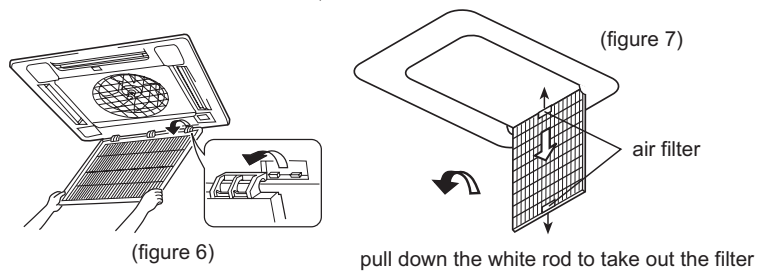
Press "PUSH" button, the inlet grille will open automatically (there are hooks on both sides of inlet grille, see figure 4).

2. Open the two hooks, see figure 5.



3. Remove the air filter, see figure 6.

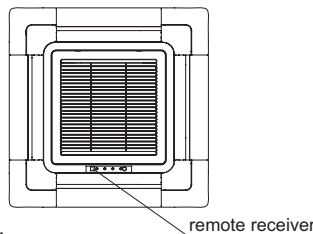
4. Remove air inlet grille, see figure 7.



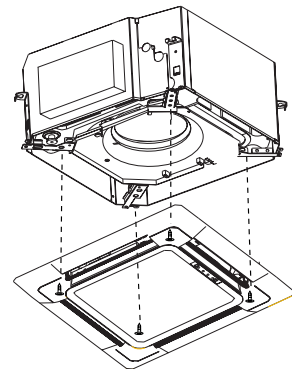
B. Ornament panel installation on the indoor unit

1) CBV009~16

- Install the panel as the direction in the figure, if not, there will be air leakage; also the swing and receiver can not connect successfully.



- Firstly fix the panel with screws temporarily.
- Fasten the two temporary screws and the other two screws.
- Connect the motor, the communication wire and the power cable, and check if the wiring is correct with a controller. After confirming the unit can run normally, install the air inlet grille, corner cover, etc.



2) CBV018~48

Shown as figure 1, put the swing motor on the ornament panel and the pipe on the unit at the same position, then install the ornament panel on the indoor unit.

Install the ornament panel

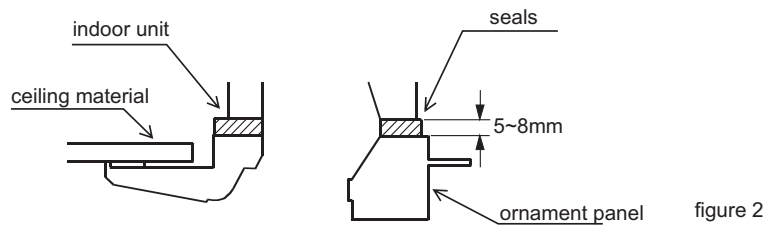
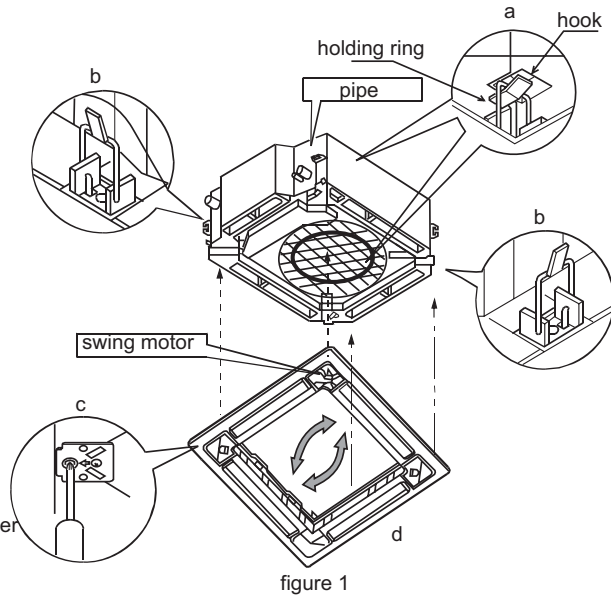
a. Place the holding ring on swing motor opposite side temporarily on hooks of the indoor unit. (2 pcs)

b. Put the other two holding rings on the hooks at both sides of the indoor unit temporarily. (Pay attention not to push wires of swing motor into seals).

c. Screw in all 4 screws under holding ring for about 15mm. (Panel will rise).

d. Adjust the ornament panel as per procedure d to cover the ceiling opening.

e. Tighten screws to reduce the thickness of seals between ornament and indoor unit to 5-8mm.



Warning

If screws are not tighten properly, problems in Fig. 3 might occur.

If there are still space between ornament panel and ceiling, after tightening of screws, please readjust the height of indoor unit. (Refer to Fig. 4)

If indoor unit is horizontal and water drainage is smooth, then, indoor unit height can be adjusted through holes in corners of ornament panel.

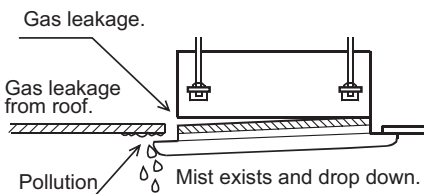


figure 3

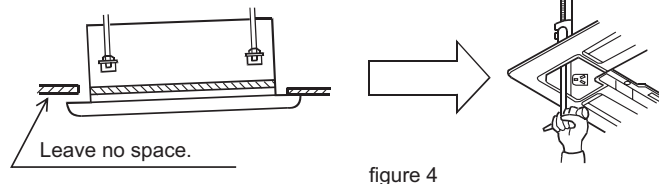


figure 4

Wiring of ornament panel

- f. Connect the swing motor wires connectors on the ornament panel, see figure 5.
- g. Connect the remote receiver port on the ornament panel.

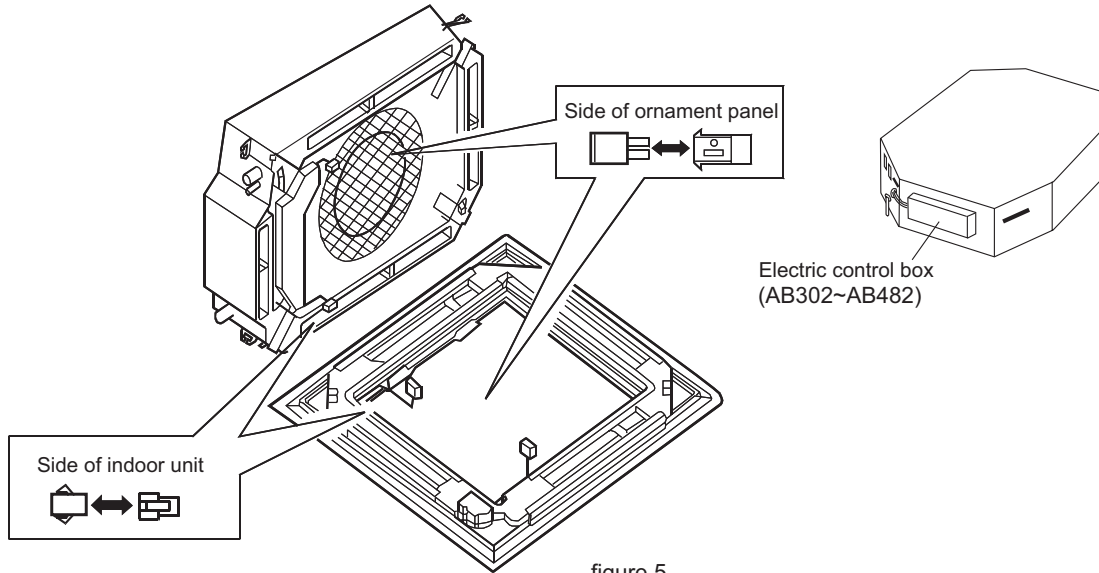


figure 5

C. Installation of inlet grille and corner cover

1) Installation of inlet grille

Install in opposite order of "Prepare ornament panel".

When installing inlet grille, pay attention to the swing motor wires not to be twisted.

2) For the model CBV018~48, install the corner cover on the unit corner.

- a. As shown in figure 6, tie the corner cover thread onto the bolt of ornament panel.
- b. Fix the corner cover on the ornament panel, see figure 7.

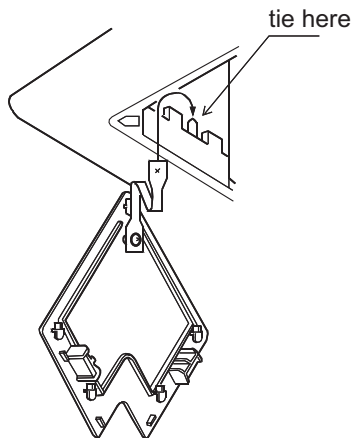


figure 6

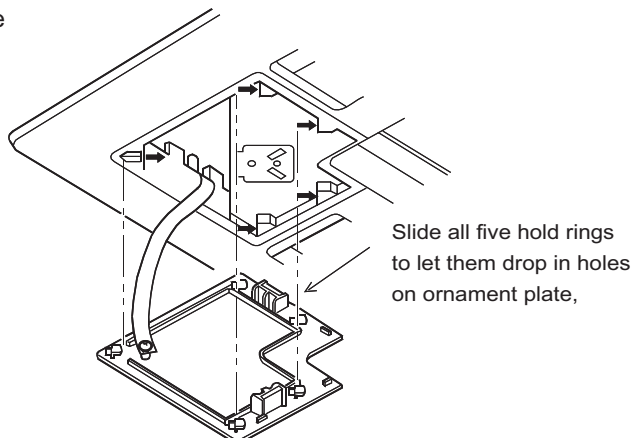


figure 7

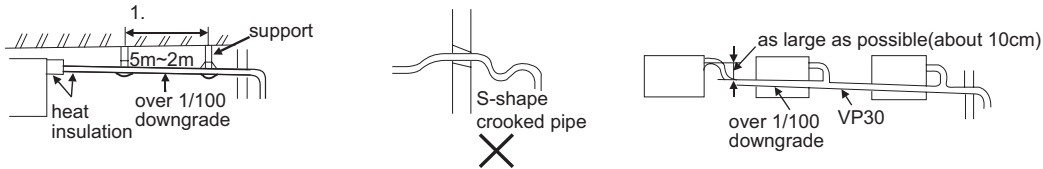
D. Installation of drainage pipe

NOTE

- In order to normal drain, the drainage pipe should be specified as the installation manual. Otherwise, water drop will occur. Heat insulation is required.

Requirements:

- Indoor drainage pipe should be heat insulated.
- The connection section with indoor unit must be heat insulated. Improper heat insulation will cause dew.
- Drainage pipe is downgrade over 1/100, and the pipe should not be crooked, or noise will occur.
- The horizontal length should be no more than 20m. In case of long pipe, there should be support for every 1.5~2m to avoid unevenness.
- The central pipe is executed as the below figure.
- Take care not to put force to the drainage pipe connection section.



3) Material of pipe and heat insulation

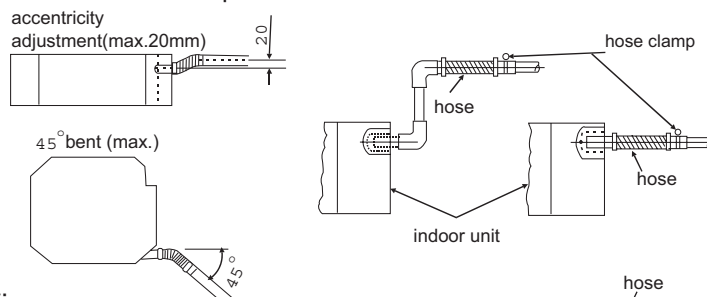
In order to avoid causing dew, heat insulation should be dealt with at gas side and liquid side.

Pipe	Rigid PVC pipe VP31.5mm (internal diameter)
Insulation	Foamed PE with thickness above 7 mm

4) Hose

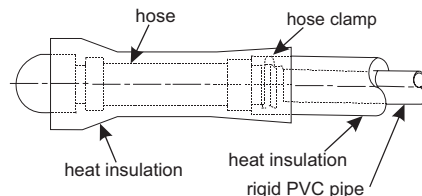
The hose is used for adjusting the eccentricity and angle of the rigid PVC pipe.

- Directly stretch the hose to install without making any deformation.
- The soft end of the hose must be fastened with a hose clamp.
- Please apply the hose on horizontal part



Insulation treatment:

- Wrap the hose and its clamp until to the indoor unit without any clearance with insulating material, as shown in the



5) Drainage pipe elevation

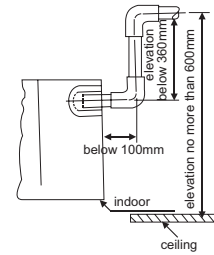
Drainage pipe can be risen up 360mm.

When the downgrade can be sure, go down slope after being risen up.

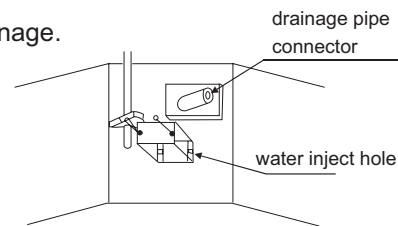
6) Drain confirmation

During trial run, check that there is no leakage at the pipe connection part during water draining even in winter.

Inject 600cc water from the water pipe with the hose slowly, and not to spray on the pump motor.



- After installing electric system, set the unit in cooling mode, meanwhile charging water to check.
- If electric installation is not finished, pull out the float switch connector(2P).
After confirming not leakage, connect the float switch connector, and the pump motor will run for another 5 minutes, then it will stop automatically.
- Confirm the motor noise
Confirm the pump motor operation noise and check water drainage.



7) Allowable pipe length and drop

These parameters differ from the outdoor unit. See the instruction manual attached with the outdoor unit for details.

8) Pipe material and size

Pipe material	Phosphorus deoxidized copper seamless pipe (TP2) for air conditioner			
model		CBV009	CBV012~16	CBV018~48
Pipe size (mm)	Gas side	∅9.52	∅12.7	∅15.88
	Liquid side	∅6.35	∅6.35	∅9.52

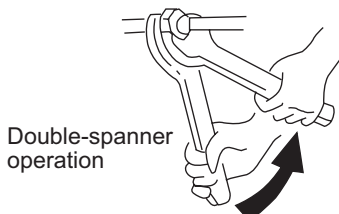
9) Recharge of refrigerant

The refrigerant recharge shall be performed as specified in the installation instructions. The adding procedure shall be aided with a measuring meter for a specified amount of supplemented refrigerant.

10) Refrigerant pipe connection




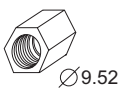
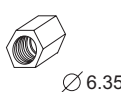
Conduct flared connection work to connect all refrigerant pipes.

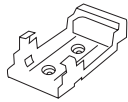
- The connection of indoor unit pipes must use double spanners.
- The installing torque shall be as given in the following table.



Connecting pipe O.D.(mm)	Installing torque (N-m)	Additional installing torque (N-m)
∅ 6.35	11.8(1.2kgf-m)	13.7(1.4kgf-m)
∅ 9.52	24.5(2.5kgf-m)	29.4(3.0kgf-m)
∅ 12.70	49.0(5.0kgf-m)	53.9(5.5kgf-m)
∅ 15.88	78.4(8.0kgf-m)	98.0(10.0kgf-m)
∅ 19.05	98.0(10.0kgf-m)	117.7(12.0kgf-m)

Standard accessories

name		Battery	Wire clamp	Screw cap	Screw cap
shape					
quantity	1	2	6	1	1

name	Remote controller bracket	The others: operation manual or other documents
shape		
quantity	1	

Ceiling concealed duct type indoor unit

1. Features	57
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7. Capacity tables	66.
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10. Installation	73
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1.Feature



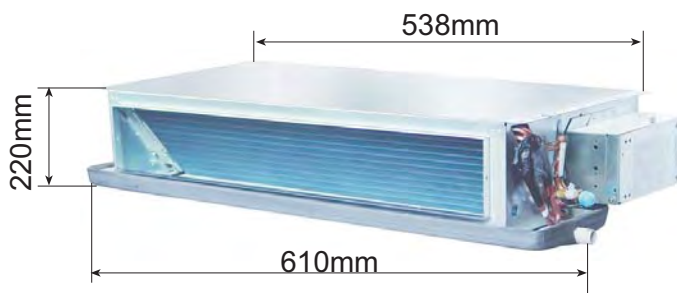
DAV007
DAV009
DAV012



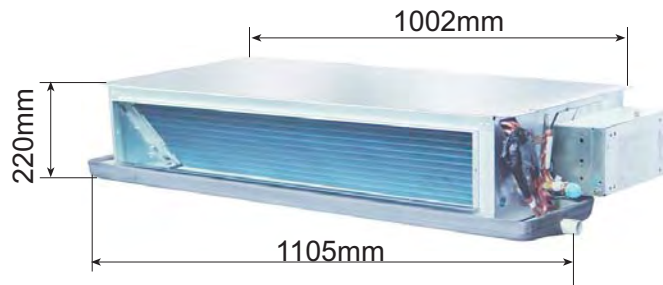
DAV016
DAV018
DAV024

Super slim design, silent and static pressure switchover

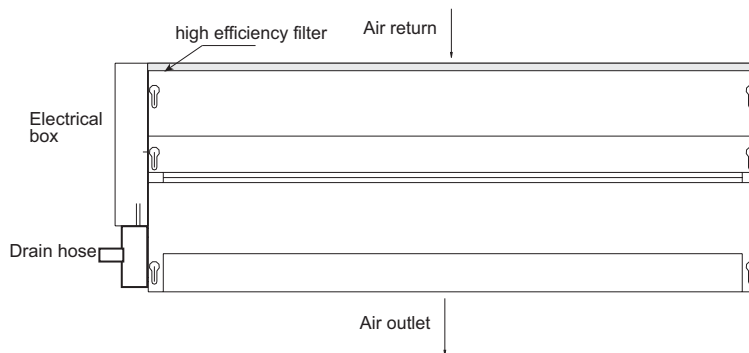
The compact appearance is perfect for the commercial space and the large building. Also it can be applicable for the house, which will be harmonious with indoor decor.



DAV007~12



DAV016~24



High efficiency filter is equipped at the air return side of the unit. Much purer air will be supplied to indoor.



External static pressure can be switched by the terminal in the electric control box. Select between 0Pa and 20Pa.

Low noise level:

	07	09	12	16	18	24
Noise level(dB(A)) H/M/L	35/32/30	35/32/30	35/32/30	36/33/31	36/33/31	39/37/35

Note: The noise level will be measured in the third octave band limited values in the semi-anechoic chamber, using a Real Time Analyser calibrated sound intensity meter. It is a sound pressure noise level.



2. Specification

Model		DAV007	DAV009	DAV012
Nominal cooling capacity(KW)		2.2	2.8	3.6
Nominal heating capacity(KW)		2.5	3.2	4.0
Electrical heating power(KW) /Current(A)		0.8/3.6	0.8/3.6	1.0/4.6
Heating capacity at low temp.(KW)		2.0	2.5	3.2
Electrical characteristics	Power source	1PH, 220~230V, 50Hz		
	Operating current(A)	0.15	0.15	0.25
	Power consumption(KW)	0.03	0.03	0.045
Fan characteristic	Fan type	centrifugal*1		
	Fan motor output(KW)	0.012	0.012	0.02
	Standard airflow(m ³ /h)	400	400	500
	Standard static pressure(Pa)	0	0	0
	Max. static pressure(Pa)	20	20	20
Exterior dimensions(mm)		610*483.5 *220	610*483.5 *220	610*483.5 *220
Air outlet dimensions(mm)		418*131	418*131	418*131
Air return dimensions(mm)		480*218	480*218	480*218
Weight(Kg)		13/13.5	13/13.5	14/14.5
Expansion mode		Electronic expansion valve		
Controller		Wired controller/ wireless controller (optional)		
Piping dimension	Gas piping(mm)	∅9.52	∅9.52	∅12.7
	Liquid piping(mm)	∅6.35	∅6.35	∅6.35
	Drain hose(mm)	∅24/20	∅24/20	∅24/20
Noise level(dB(A)) H/M/L		35/32/30	35/32/30	35/32/30

Norminal condition: indoor temperature (cooling): 27°CDB/19°CWB, indoor temperature (heating): 20°CDB/14.5°CWB

Outdoor temperature(cooling): 35°CDB/24°CWB, outdoor temperature(heating): 7°CDB/6°CWB

The noise level will be measured in the third octave band limited values in the semi-anechoic chamber, using a Real Time Analyser calibrated sound intensity meter. It is a sound pressure noise level.



Model		DAV016	DAV018	DAV024
Nominal cooling capacity(KW)		4.5	5.6	7.1
Nominal heating capacity(KW)		5.0	6.3	8.0
Electrical heating power(KW) /Current(A)		1.8/8.2	1.8/8.2	1.8/8.2
Heating capacity at low temp.(KW)		4.0	5.0	6.3
Electrical characteristics	Power source	1PH, 220~230V, 50Hz		
	Operating current(A)	0.27	0.55	0.55
	Power consumption(KW)	0.05	0.11	0.11
Fan characteristic	Fan type	centrifugal*2		
	Fan motor output(KW)	0.04	0.0	0.1
	Standard airflow(m ³ /h)	850	1250	1250
	Standard static pressure(Pa)	0	0	0
	Max. static pressure(Pa)	20	20	20
Exterior dimensions(mm)		1105*483.5* 220	1105*483.5* 220	1105*483.5*220
Air outlet dimensions(mm)		880*131	880*131	880*131
Air return dimensions(mm)		1064*218	1064*218	1064*218
Weight(Kg)		25/26	28/29	28/29
Expansion mode		Electronic expansion valve		
Controller		Wired controller/ wireless controller (optional)		
Piping dimension	Gas piping(mm)	∅ 12.7	∅ 12.7	∅ 15.88
	Liquid piping(mm)	∅ 6.35	∅ 6.35	∅ 9.52
	Drain hose(mm)	∅ 24/20	∅ 24/20	∅ 24/20
Noise level(dB(A)) H/M/L		36/33/31	36/33/31	39/37/35

Norminal condition: indoor temperature (cooling): 27°CDB/19°CWB, indoor temperature (heating): 20°CDB/14.5°CWB

Outdoor temperature(cooling): 35°CDB/24°CWB, outdoor temperature(heating): 7°CDB/6°CWB

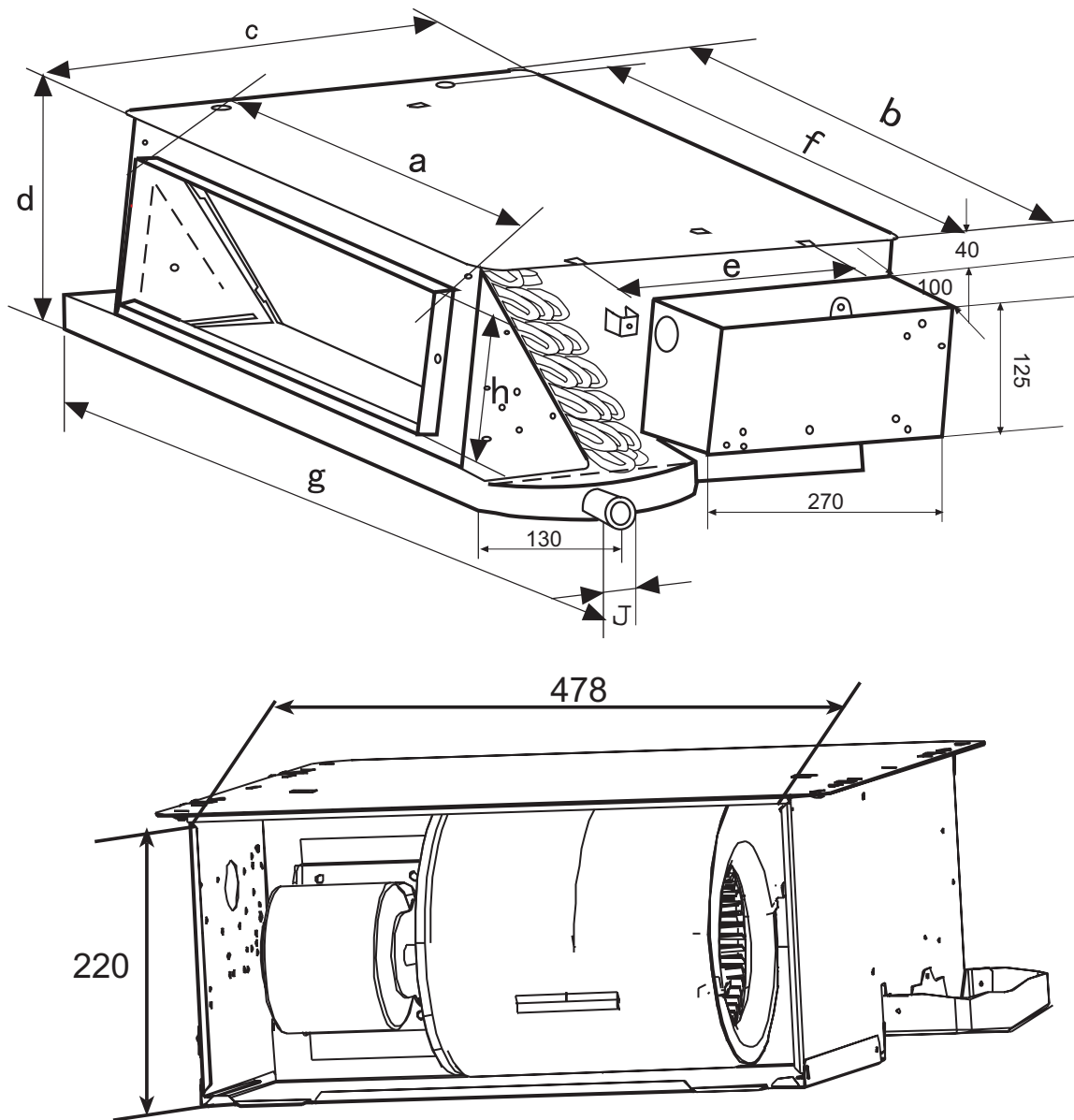
The noise level will be measured in the third octave band limited values in the semi-anechoic chamber, using a Real Time Analyser calibrated sound intensity meter. It is a sound pressure noise level.

3. Dimensions

Model	a	b	c	d	e	f	g	h	i	J
DAV007~12	418	538	483	220	255	508	610	136	—	24
DAV016~24	1002	483	136	1105	255	105	880	970	220	24

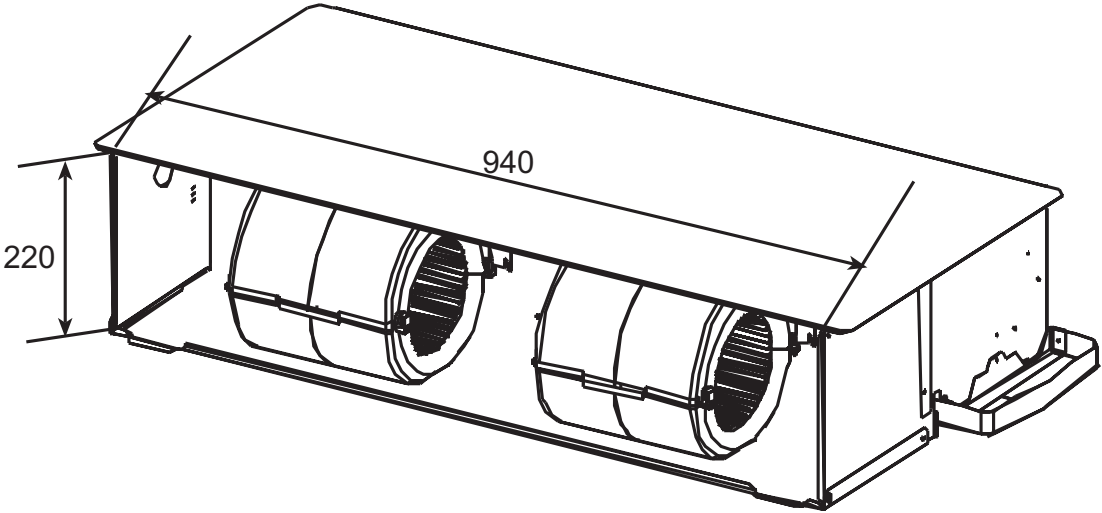
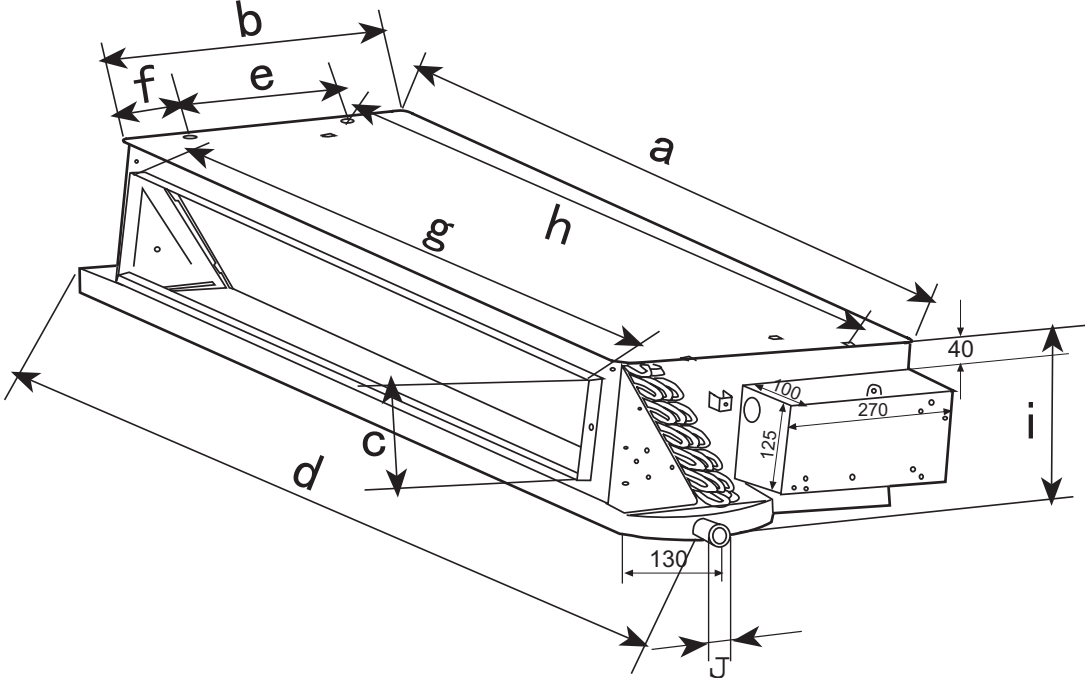
DAV007~12

Evaporators of 07, 09 are 2-row type; evaporator of 12 is 3-row type.

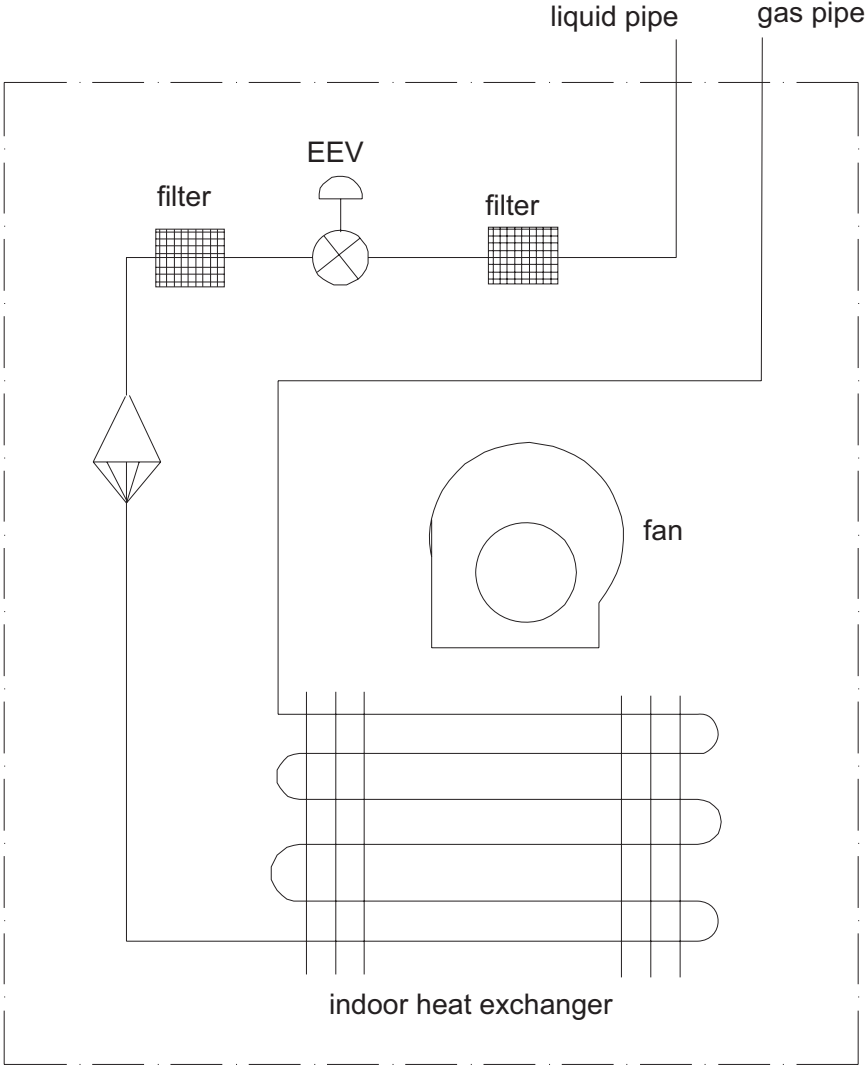


Evaporators of 16 is 2-row type; evaporator of 18,24 are 3-row type.

DAV016~24



4. Piping diagrams



5. Wiring diagrams

0010578433

WIRING DIAGRAM OF INDOOR UNIT

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

The diagram shows the PCB with various components: Fan Motor (FM), Running Capacitor (RC), Transformer (TR), Ambient Temperature Sensor (TA), Gas Pipe Temperature Sensor (TC1, TC2), Liquid Pipe Temperature Sensor (TW1, TW2), Terminal Block (Control) (EEV), Electronic Expansion Valve (RL), Electronic Heater (EH), Temperature Switch (TS), Fusion (One-Off Protector) (F), Quiet Operation Room Card (QO), Transmission lamp between wired remote controller and I.D unit (LED1, LED2), Transmission lamp between I.D and O.D unit (LED3, LED4), Malfunction Lamp of I.D unit (LED5), Forced-open lamp for indoor Electronic Expansion Valve (LED6), and Malfunction Code indication by Wired Remote Controller (LED7).

Power Supply:
1PH, 220V~230V, 50Hz

1. is terminal block and the words on it are sequence number.
2. is printed circuit board.
3. The Parts in the dashed frame are optional in accordance with the reality of manufacture.

RED BROWN OR GRANGE BL-BLUE G-GREEN GR GRAY
Y-YELLOW W-WHITE B-BLACK Y-G-YELLOW/GREEN

*Master/Slave Wired Remote controller and Wireless Remote Controller Setting. At the time of installation or after service inspection/repairer, please set the local setting in accordance with the following table.

Slave/Remote Dip Switch	Master/Remote Dip Switch	Mode	Wired Remote Controller	Wireless Remote Controller
ON	ON	Short connected	Short connected	Disconnection
ON	OFF	Short connected	Short connected	Disconnection
ON	ON	Null	Connected to remote receiver	Disconnection
ON	OFF	Null	Connected to remote receiver	Disconnection
OFF	ON	Null	Connected to remote receiver	Disconnection
OFF	OFF	Null	Connected to remote receiver	Disconnection



6. Electric characteristic

units					power supply		indoor fan motor		power input(W)	
model	phase	FQY	voltage	volt. range	MCA	MFA	W	FLA	cooling	heating
DAV007	1	50	220	198~242	0.31	1	16	0.25	30	30
DAV009	1	50	220	198~242	0.31	1	16	0.25	30	30
DAV012	1	50	220	198~242	0.44	1.2	30	0.35	45	45
DAV016	1	50	220	198~242	0.4	1.28	30	0.32	50	50
DAV018	1	50	220	198~242	1.25	4	80	1	110	110
DAV024	1	50	220	198~242	1.25	4	80	1	110	110

Symbols:

MCA: Min. circuit amps (A)

MFA: Max. fuse amps of circuit breaker

W: Fan motor rated output(W)

FLA: Full load amps(A)

Notes:

1. Voltage range

The units are applicable for the electrical systems where voltage supplied to unit is in the range.

2. Maximum allowable voltage unbalance between phases is 2%.

3. $MCA=1.25*FLA$

$$MFA \leq 4*FLA$$

4. Power supply uses the circuit breaker



7. Capacity table (CA: total capacity; SHC: sensible heat capacity)

Cooling mode:

capaci ty(W* 100)	outdoor temp. °CDB	indoor temp.													
		21.5°CDB		23°CDB		25°CDB		27°CDB		28°CDB		30°CDB		32°CDB	
		CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC
22	20.0	2.2	1.8	2.2	1.9	2.3	1.9	2.3	1.9	2.4	2.0	2.5	1.9	2.6	1.9
	22.5	2.1	1.8	2.2	1.9	2.3	1.8	2.3	1.9	2.4	1.9	2.4	1.9	2.5	1.9
	25.0	2.1	1.8	2.2	1.9	2.2	1.8	2.3	1.9	2.3	1.9	2.4	1.9	2.5	1.9
	27.5	2.1	1.8	2.1	1.9	2.2	1.8	2.3	1.9	2.3	1.9	2.4	1.9	2.5	1.8
	30.0	2.1	1.8	2.1	1.9	2.2	1.8	2.2	1.9	2.3	1.9	2.4	1.9	2.5	1.8
	32.5	2.0	1.8	2.1	1.8	2.2	1.8	2.2	1.8	2.3	1.9	2.4	1.9	2.4	1.8
	35.0	2.0	1.8	2.1	1.8	2.2	1.8	2.2	1.8	2.2	1.9	2.3	1.9	2.4	1.8
	37.5	2.0	1.8	2.0	1.8	2.1	1.8	2.2	1.8	2.2	1.9	2.3	1.9	2.4	1.8
	40.0	2.0	1.8	2.0	1.8	2.1	1.8	2.2	1.8	2.2	1.9	2.3	1.8	2.4	1.8
43.0	2.0	1.7	2.0	1.8	2.1	1.8	2.1	1.8	2.2	1.9	2.3	1.8	2.3	1.8	
28	20.0	2.7	2.2	2.8	2.2	2.9	2.2	3.0	2.2	3.0	2.3	3.1	2.2	3.2	2.2
	22.5	2.7	2.2	2.8	2.2	2.9	2.2	2.9	2.2	3.0	2.3	3.1	2.2	3.2	2.2
	25.0	2.7	2.1	2.7	2.2	2.9	2.2	2.9	2.2	3.0	2.3	3.1	2.2	3.2	2.1
	27.5	2.7	2.1	2.7	2.2	2.8	2.2	2.9	2.2	2.9	2.2	3.1	2.2	3.2	2.1
	30.0	2.6	2.1	2.7	2.2	2.8	2.1	2.9	2.2	2.9	2.2	3.0	2.2	3.1	2.1
	32.5	2.6	2.1	2.7	2.2	2.8	2.1	2.8	2.1	2.9	2.2	3.0	2.2	3.1	2.1
	35.0	2.6	2.1	2.6	2.1	2.7	2.1	2.8	2.1	2.9	2.2	3.0	2.2	3.1	2.1
	37.5	2.5	2.1	2.6	2.1	2.7	2.1	2.8	2.1	2.8	2.2	2.9	2.2	3.1	2.1
	40.0	2.5	2.1	2.6	2.1	2.7	2.1	2.7	2.1	2.8	2.2	2.9	2.1	3.0	2.1
43.0	2.5	2.0	2.5	2.1	2.7	2.1	2.7	2.1	2.8	2.2	2.9	2.1	3.0	2.1	
36	20.0	3.5	2.7	3.6	2.8	3.7	2.7	3.8	2.7	3.9	2.8	4.0	2.7	4.2	2.7
	22.5	3.5	2.7	3.6	2.7	3.7	2.7	3.8	2.7	3.9	2.8	4.0	2.7	4.1	2.7
	25.0	3.5	2.7	3.5	2.7	3.7	2.7	3.7	2.7	3.8	2.8	4.0	2.7	4.1	2.6
	27.5	3.4	2.6	3.5	2.7	3.6	2.7	3.7	2.7	3.8	2.8	3.9	2.7	4.1	2.6
	30.0	3.4	2.6	3.5	2.7	3.6	2.6	3.7	2.7	3.7	2.8	3.9	2.7	4.0	2.6
	32.5	3.3	2.6	3.4	2.7	3.6	2.6	3.6	2.7	3.7	2.7	3.9	2.7	4.0	2.6
	35.0	3.3	2.6	3.4	2.7	3.5	2.6	3.6	2.6	3.7	2.7	3.8	2.7	4.0	2.6
	37.5	3.3	2.6	3.3	2.6	3.5	2.6	3.6	2.6	3.6	2.7	3.8	2.7	3.9	2.6
	40.0	3.2	2.6	3.3	2.6	3.5	2.6	3.5	2.6	3.6	2.7	3.7	2.6	3.9	2.6
43.0	3.2	2.5	3.3	2.6	3.4	2.6	3.5	2.6	3.6	2.7	3.7	2.6	3.8	2.6	
40	20.0	3.9	2.9	4.0	2.9	4.2	2.9	4.3	2.9	4.3	3.0	4.5	2.9	4.7	2.8
	22.5	3.9	2.9	4.0	2.9	4.1	2.9	4.2	2.9	4.3	3.0	4.5	2.9	4.6	2.8
	25.0	3.9	2.8	3.9	2.9	4.1	2.8	4.2	2.9	4.3	2.9	4.4	2.9	4.6	2.8
	27.5	3.8	2.8	3.9	2.9	4.1	2.8	4.1	2.8	4.2	2.9	4.4	2.9	4.5	2.8
	30.0	3.8	2.8	3.9	2.9	4.0	2.8	4.1	2.8	4.2	2.9	4.3	2.8	4.5	2.8
	32.5	3.7	2.8	3.8	2.8	4.0	2.8	4.1	2.8	4.1	2.9	4.3	2.8	4.5	2.7
	35.0	3.7	2.8	3.8	2.8	3.9	2.8	4.0	2.8	4.1	2.9	4.3	2.8	4.4	2.7
	37.5	3.7	2.7	3.7	2.8	3.9	2.8	4.0	2.8	4.1	2.9	4.2	2.8	4.4	2.7
	40.0	3.6	2.7	3.7	2.8	3.9	2.7	3.9	2.8	4.0	2.8	4.2	2.8	4.3	2.7
43.0	3.6	2.7	3.7	2.8	3.8	2.7	3.9	2.7	4.0	2.8	4.1	2.8	4.3	2.7	
45	20.0	4.4	3.3	4.5	3.4	4.7	3.3	4.8	3.4	4.9	3.5	5.0	3.4	5.2	3.3
	22.5	4.4	3.3	4.5	3.4	4.6	3.3	4.7	3.3	4.8	3.4	5.0	3.4	5.2	3.3
	25.0	4.3	3.3	4.4	3.4	4.6	3.3	4.7	3.3	4.8	3.4	5.0	3.3	5.1	3.2
	27.5	4.3	3.3	4.4	3.3	4.5	3.3	4.6	3.3	4.7	3.4	4.9	3.3	5.1	3.2
	30.0	4.2	3.2	4.3	3.3	4.5	3.2	4.6	3.3	4.7	3.4	4.9	3.3	5.0	3.2
	32.5	4.2	3.2	4.3	3.3	4.5	3.2	4.5	3.3	4.6	3.4	4.8	3.3	5.0	3.2
	35.0	4.1	3.2	4.1	3.3	4.4	3.2	4.5	3.2	4.6	3.3	4.8	3.3	5.0	3.2
	37.5	4.1	3.2	4.2	3.2	4.4	3.2	4.5	3.2	4.5	3.3	4.7	3.3	4.9	3.2
	40.0	4.1	3.1	4.1	3.2	4.3	3.2	4.4	3.2	4.5	3.3	4.7	3.2	4.9	3.2
43.0	4.0	3.1	4.1	3.2	4.3	3.1	4.4	3.2	4.4	3.3	4.6	3.2	4.8	3.1	
56	20.0	5.5	3.9	5.6	4.0	5.8	3.9	5.9	3.9	6.0	4.0	6.3	3.9	6.5	3.8
	22.5	5.4	3.9	5.5	3.9	5.8	3.9	5.9	3.9	6.0	4.0	6.2	3.9	6.4	3.8
	25.0	5.4	3.8	5.5	3.9	5.7	3.8	5.8	3.8	5.9	4.0	6.2	3.8	6.4	3.7
	27.5	5.3	3.8	5.4	3.9	5.7	3.8	5.8	3.8	5.9	3.9	6.1	3.8	6.3	3.7
	30.0	5.3	3.8	5.4	3.9	5.6	3.8	5.7	3.8	5.8	3.9	6.0	3.8	6.3	3.7
32.5	5.2	3.8	5.3	3.8	5.5	3.7	5.7	3.8	5.8	3.9	6.0	3.8	6.2	3.7	

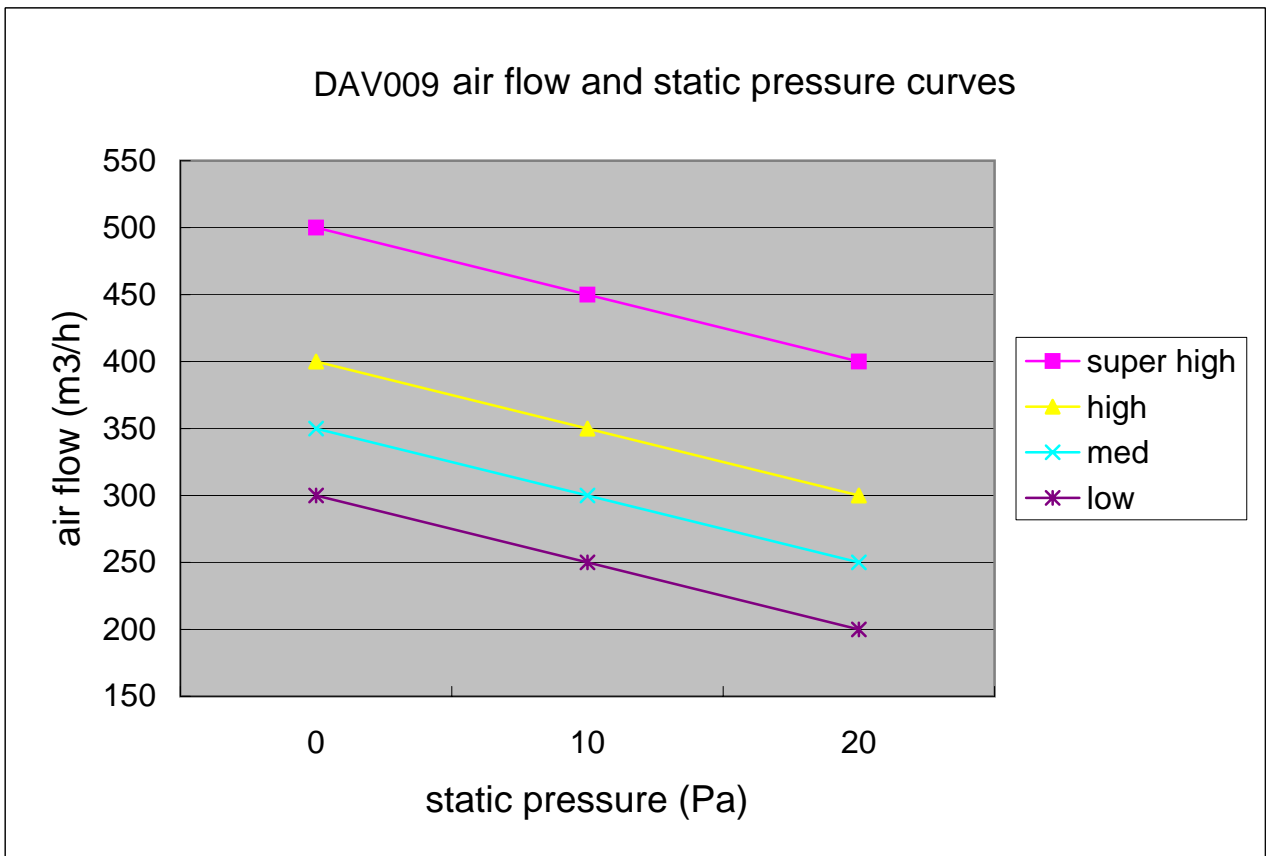
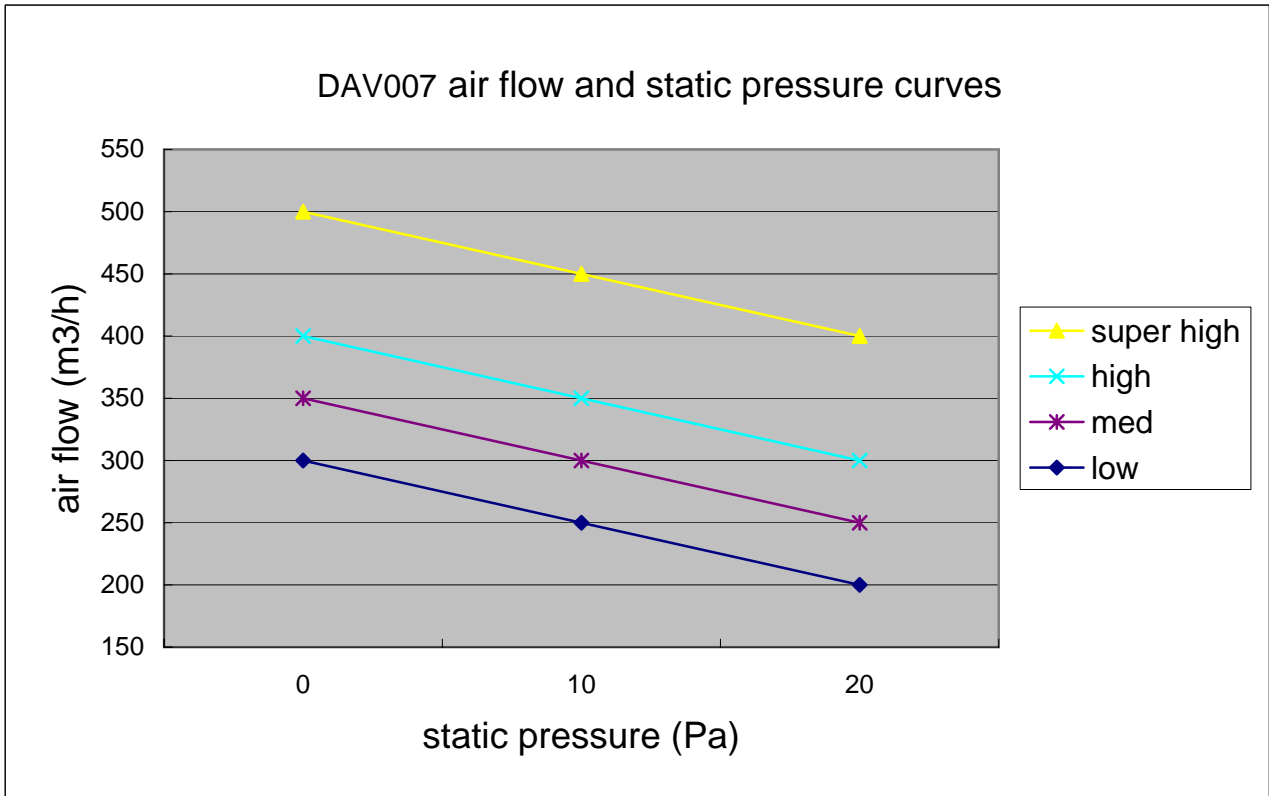
	35.0	5.2	3.7	5.3	3.8	5.5	3.7	5.6	3.7	5.7	3.9	5.9	3.8	6.2	3.7
	37.5	5.1	3.7	5.2	3.8	5.4	3.7	5.5	3.7	5.7	3.8	5.9	3.7	6.1	3.6
	40.0	5.0	3.7	5.2	3.8	5.4	3.7	5.5	3.7	5.6	3.8	5.8	3.7	6.0	3.6
	43.0	5.0	3.6	5.1	3.7	5.3	3.6	5.4	3.7	5.5	3.8	5.8	3.7	6.0	3.6
71	20.0	7.0	5.1	7.1	5.2	7.4	5.1	7.5	5.1	7.7	5.3	8.0	5.2	8.2	5.0
	22.5	6.9	5.1	7.0	5.2	7.3	5.1	7.5	5.1	7.6	5.3	7.9	5.1	8.2	5.0
	25.0	6.8	5.0	7.0	5.2	7.2	5.0	7.4	5.1	7.5	5.2	7.8	5.1	8.1	5.0
	27.5	6.7	5.0	6.9	5.1	7.2	5.0	7.3	5.1	7.5	5.2	7.7	5.1	8.0	4.9
	30.0	6.7	5.0	6.8	5.1	7.1	5.0	7.2	5.0	7.4	5.2	7.7	5.0	8.0	4.9
	32.5	6.6	4.9	6.7	5.1	7.0	4.9	7.2	5.0	7.3	5.2	7.6	5.0	7.9	4.9
	35.0	6.5	4.9	6.7	5.0	7.0	4.9	7.1	5.0	7.2	5.1	7.5	5.0	7.8	4.9
	37.5	6.5	4.9	6.6	5.0	6.9	4.9	7.0	4.9	7.2	5.1	7.5	5.0	7.7	4.8
	40.0	6.4	4.8	6.5	5.0	6.8	4.9	7.0	4.9	7.1	5.1	7.4	4.9	7.7	4.8
43.0	6.3	4.8	6.4	4.9	6.7	4.8	6.9	4.9	7.0	5.0	7.3	4.9	7.6	4.8	
80	20.0	7.8	5.4	8.0	5.5	8.3	5.4	8.5	5.4	8.6	5.6	9.0	5.4	9.3	5.2
	22.5	7.8	5.4	7.9	5.4	8.2	5.3	8.4	5.3	8.6	5.5	8.9	5.3	9.2	5.2
	25.0	7.7	5.3	7.8	5.4	8.2	5.3	8.3	5.3	8.5	5.4	8.8	5.3	9.1	5.2
	27.5	7.6	5.3	7.8	5.4	8.1	5.3	8.2	5.3	8.4	5.4	8.7	5.3	9.0	5.1
	30.0	7.5	5.2	7.7	5.3	8.0	5.2	8.2	5.2	8.3	5.3	8.6	5.2	9.0	5.1
	32.5	7.4	5.2	7.6	5.3	7.9	5.2	8.1	5.2	8.2	5.3	8.6	5.2	8.9	5.0
	35.0	7.4	5.2	7.5	5.3	7.8	5.2	8.0	5.2	8.2	5.3	8.5	5.2	8.8	5.0
	37.5	7.3	5.1	7.4	5.2	7.8	5.1	7.9	5.1	8.1	5.3	8.4	5.2	8.7	5.0
	40.0	7.2	5.0	7.4	5.2	7.7	5.0	7.8	5.1	8.0	5.3	8.3	5.1	8.6	5.0
43.0	7.1	5.0	7.3	5.1	7.6	5.0	7.7	5.0	7.9	5.2	8.2	5.1	8.5	4.9	
90	20.0	8.8	6.3	9.0	6.4	9.4	6.3	9.5	6.3	9.7	6.5	10.1	6.3	10.4	6.1
	22.5	8.7	6.3	8.9	6.4	9.3	6.2	9.5	6.3	9.6	6.5	10.0	6.3	10.4	6.1
	25.0	8.6	6.2	8.8	6.3	9.2	6.2	9.4	6.2	9.5	6.4	9.9	6.3	10.3	6.1
	27.5	8.6	6.2	8.7	6.3	9.1	6.2	9.3	6.2	9.5	6.4	9.8	6.2	10.2	6.0
	30.0	8.5	6.1	8.6	6.3	9.0	6.1	9.2	6.2	9.4	6.4	9.7	6.2	10.1	6.0
	32.5	8.4	6.1	8.6	6.2	8.9	6.1	9.1	6.1	9.3	6.3	9.6	6.2	10.0	6.0
	35.0	8.3	6.0	8.5	6.2	8.8	6.0	9.0	6.1	9.2	6.3	9.6	6.1	9.9	5.9
	37.5	8.2	6.0	8.4	6.1	8.7	6.0	8.9	6.0	9.1	6.2	9.5	6.1	9.8	5.9
	40.0	8.1	5.9	8.3	6.1	8.6	6.0	8.8	6.0	9.0	6.2	9.4	6.0	9.7	5.9
43.0	8.0	5.9	8.2	6.0	8.5	5.9	8.7	6.0	8.9	6.2	9.3	6.0	9.6	5.8	
112	20.0	11.0	7.9	11.2	8.1	11.6	7.9	11.9	8.0	12.1	8.2	12.5	8.0	13.0	7.8
	22.5	10.9	7.9	11.1	8.1	11.5	7.9	11.8	7.9	12.0	8.2	12.4	8.0	12.9	7.7
	25.0	10.8	7.8	11.0	8.0	11.4	7.8	11.5	7.9	11.9	8.1	12.3	7.9	12.8	7.7
	27.5	10.6	7.8	10.9	8.0	11.3	7.8	11.5	7.8	11.8	8.1	12.2	7.9	12.7	7.7
	30.0	10.5	7.7	10.8	7.9	11.2	7.7	11.4	7.8	11.6	8.0	12.1	7.8	12.5	7.6
	32.5	10.4	7.7	10.6	7.8	11.1	7.7	11.3	7.7	11.5	8.0	12.0	7.8	12.4	7.6
	35.0	10.3	7.6	10.5	7.8	11.0	7.6	11.2	7.7	11.4	8.0	11.9	7.8	12.3	7.5
	37.5	10.2	7.6	10.4	7.7	10.9	7.6	11.1	7.7	11.3	7.9	11.8	7.7	12.2	7.5
	40.0	10.1	7.5	10.3	7.7	10.8	7.5	11.0	7.6	11.2	7.9	11.6	7.7	12.1	7.4
43.0	9.9	7.4	10.2	7.6	10.6	7.5	10.8	7.5	11.1	7.8	11.5	7.6	12.0	7.4	
140	20.0	13.7	9.5	14.0	9.7	14.6	9.5	14.8	9.5	15.1	9.8	15.7	9.5	16.2	9.2
	22.5	13.6	9.5	13.9	9.6	14.4	9.5	14.7	9.4	15.0	9.7	15.5	9.4	16.1	9.1
	25.0	13.4	9.4	13.7	9.6	14.3	9.3	14.6	9.4	14.8	9.6	15.4	9.4	16.0	9.1
	27.5	13.3	9.2	13.6	9.5	14.1	9.3	14.4	9.3	14.7	9.5	15.3	9.3	15.8	9.0
	30.0	13.2	9.2	13.4	9.4	14.0	9.2	14.3	9.2	14.6	9.4	15.1	9.2	15.7	9.0
	32.5	13.0	9.2	13.3	9.3	13.9	9.1	14.1	9.2	14.4	9.4	15.0	9.2	15.5	8.9
	35.0	12.9	9.1	13.2	9.3	13.7	9.1	14.0	9.1	14.3	9.4	14.8	9.1	15.4	8.9
	37.5	12.7	9.0	13.0	9.2	13.6	9.0	13.9	9.0	14.1	9.3	14.7	9.1	15.3	8.8
	40.0	12.6	8.9	12.9	9.1	13.4	8.9	13.7	9.0	14.0	9.3	14.6	9.0	15.1	8.8
43.0	12.4	8.9	12.7	9.0	13.3	8.9	13.6	8.9	13.8	9.2	14.4	9.0	15.0	8.7	



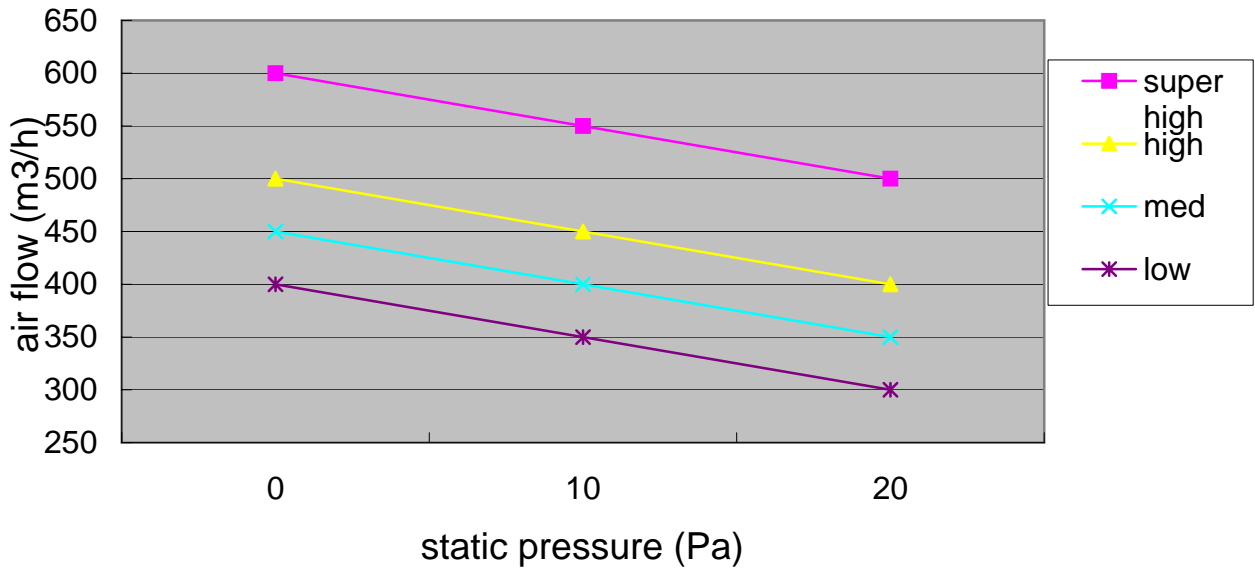
Heating mode:

capa city(W*1 00)	outdoor temp.	indoor temp.(°CDB)				capa city(W*10 0)	outdoor temp.	indoor temp.(°CDB)				capaci ty(W* 100)	outdoor temp.	indoor temp.(°CDB)			
		15.0	20.0	25.0	27.0			15.0	20.0	25.0	27.0			15.0	20.0	25.0	27.0
		°CDB	SHC	SHC	SHC			SHC	°CDB	SHC	SHC			SHC	SHC	°CDB	SHC
22	-15.0	1.7	1.6	1.6	1.6	56	-15.0	4.2	4.2	4.1	4.1	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	1.9	1.9	1.9	1.7		-10.0	4.8	4.8	4.7	4.3		-10.0	12.2	12.1	11.9	11.0
	-5.0	2.1	2.1	1.9	1.7		-5.0	5.4	5.3	4.9	4.3		-5.0	13.7	13.6	12.5	11.0
	0.0	2.4	2.4	1.9	1.7		0.0	6.0	5.9	4.9	4.3		0.0	15.3	15.1	12.5	11.0
	2.5	2.5	2.5	1.9	1.7		2.5	6.3	6.2	4.9	4.3		2.5	16.0	15.8	12.5	11.0
	6.0	2.5	2.5	1.9	1.7		6.0	6.4	6.3	4.9	4.3		6.0	16.2	16.0	12.5	11.0
	6.5	2.6	2.5	1.9	1.7		6.5	6.6	6.3	4.9	4.3		6.5	16.8	16.0	12.5	11.0
	10.0	2.8	2.5	1.9	1.7		10.0	7.1	6.3	4.9	4.3		10.0	18.0	16.0	12.5	11.0
	12.5	3.0	2.5	1.9	1.7		12.5	7.5	6.3	4.9	4.3		12.5	19.1	16.0	12.5	11.0
	15.5	3.0	2.5	1.9	1.7		15.5	7.6	6.3	4.9	4.3		15.5	19.4	16.0	12.5	11.0
28	-15.0	2.1	2.1	2.1	2.1	71	-15.0	5.4	5.3	5.2	5.2	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	2.4	2.4	2.4	2.2		-10.0	6.1	6.0	6.0	5.5		-10.0	12.2	12.1	11.9	11.0
	-5.0	2.7	2.7	2.5	2.2		-5.0	6.9	6.8	6.2	5.5		-5.0	13.7	13.6	12.5	11.0
	0.0	3.1	3.0	2.5	2.2		0.0	7.6	7.5	6.2	5.5		0.0	15.3	15.1	12.5	11.0
	2.5	3.2	3.2	2.5	2.2		2.5	8.0	7.9	6.2	5.5		2.5	16.0	15.8	12.5	11.0
	6.0	3.2	3.2	2.5	2.2		6.0	8.1	8.0	6.2	5.5		6.0	16.2	16.0	12.5	11.0
	6.5	3.4	3.2	2.5	2.2		6.5	8.4	8.0	6.2	5.5		6.5	16.8	16.0	12.5	11.0
	10.0	3.6	3.2	2.5	2.2		10.0	9.0	8.0	6.2	5.5		10.0	18.0	16.0	12.5	11.0
	12.5	3.8	3.2	2.5	2.2		12.5	9.6	8.0	6.2	5.5		12.5	19.1	16.0	12.5	11.0
	15.5	3.9	3.2	2.5	2.2		15.5	9.7	8.0	6.2	5.5		15.5	19.4	16.0	12.5	11.0
36	-15.0	2.7	2.6	2.6	2.6	80	-15.0	6.0	5.9	5.9	5.9	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	3.1	3.0	3.0	2.8		-10.0	6.9	6.8	6.7	6.2		-10.0	12.2	12.1	11.9	11.0
	-5.0	3.4	3.4	3.1	2.8		-5.0	7.7	7.6	7.0	6.2		-5.0	13.7	13.6	12.5	11.0
	0.0	3.8	3.8	3.1	2.8		0.0	8.6	8.5	7.0	6.2		0.0	15.3	15.1	12.5	11.0
	2.5	4.0	4.0	3.1	2.8		2.5	9.0	8.9	7.0	6.2		2.5	16.0	15.8	12.5	11.0
	6.0	4.0	4.0	3.1	2.8		6.0	9.1	9.0	7.0	6.2		6.0	16.2	16.0	12.5	11.0
	6.5	4.2	4.0	3.1	2.8		6.5	9.5	9.0	7.0	6.2		6.5	16.8	16.0	12.5	11.0
	10.0	4.5	4.0	3.1	2.8		10.0	10.1	9.0	7.0	6.2		10.0	18.0	16.0	12.5	11.0
	12.5	4.8	4.0	3.1	2.8		12.5	10.8	9.0	7.0	6.2		12.5	19.1	16.0	12.5	11.0
	15.5	4.8	4.0	3.1	2.8		15.5	10.9	9.0	7.0	6.2		15.5	19.4	16.0	12.5	11.0
40	-15.0	3.0	3.0	3.0	3.0	90	-15.0	6.7	6.6	6.5	6.5	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	3.5	3.4	3.4	3.1		-10.0	7.6	7.5	7.4	6.9		-10.0	12.2	12.1	11.9	11.0
	-5.0	3.9	3.8	3.5	3.1		-5.0	8.6	8.5	7.8	6.9		-5.0	13.7	13.6	12.5	11.0
	0.0	4.3	4.3	3.5	3.1		0.0	9.5	9.4	7.8	6.9		0.0	15.3	15.1	12.5	11.0
	2.5	4.5	4.5	3.5	3.1		2.5	10.0	9.9	7.8	6.9		2.5	16.0	15.8	12.5	11.0
	6.0	4.6	4.5	3.5	3.1		6.0	10.1	10.0	7.8	6.9		6.0	16.2	16.0	12.5	11.0
	6.5	4.8	4.5	3.5	3.1		6.5	10.5	10.0	7.8	6.9		6.5	16.8	16.0	12.5	11.0
	10.0	5.1	4.5	3.5	3.1		10.0	11.2	10.0	7.8	6.9		10.0	18.0	16.0	12.5	11.0
	12.5	5.4	4.5	3.5	3.1		12.5	12.0	10.0	7.8	6.9		12.5	19.1	16.0	12.5	11.0
	15.5	5.5	4.5	3.5	3.1		15.5	12.1	10.0	7.8	6.9		15.5	19.4	16.0	12.5	11.0
45	-15.0	3.3	3.3	3.3	3.3	112	-15.0	8.4	8.2	8.2	8.1	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	3.8	3.8	3.7	3.5		-10.0	9.6	9.4	9.3	8.6		-10.0	12.2	12.1	11.9	11.0
	-5.0	4.3	4.2	3.9	3.5		-5.0	10.7	10.6	9.8	8.6		-5.0	13.7	13.6	12.5	11.0
	0.0	4.8	4.7	3.9	3.5		0.0	11.9	11.8	9.8	8.6		0.0	15.3	15.1	12.5	11.0
	2.5	5.0	5.0	3.9	3.5		2.5	12.5	12.4	9.8	8.6		2.5	16.0	15.8	12.5	11.0
	6.0	5.1	5.0	3.9	3.5		6.0	12.5	12.5	9.8	8.6		6.0	16.2	16.0	12.5	11.0
	6.5	5.3	5.0	3.9	3.5		6.5	13.2	12.5	9.8	8.6		6.5	16.8	16.0	12.5	11.0
	10.0	5.6	5.0	3.9	3.5		10.0	14.1	12.5	9.8	8.6		10.0	18.0	16.0	12.5	11.0
	12.5	6.0	5.0	3.9	3.5		12.5	15.0	12.5	9.8	8.6		12.5	19.1	16.0	12.5	11.0
	15.5	6.1	5.0	3.9	3.5		15.5	15.1	12.5	9.8	8.6		15.5	19.4	16.0	12.5	11.0

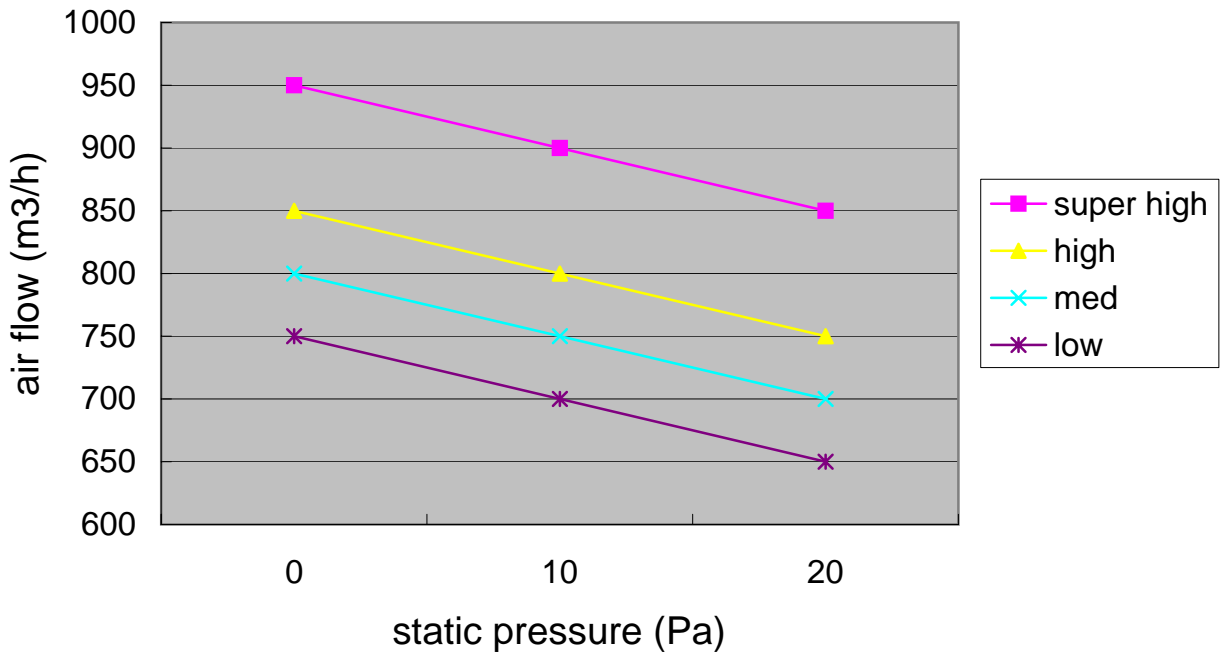
8. Air flow and static pressure curves

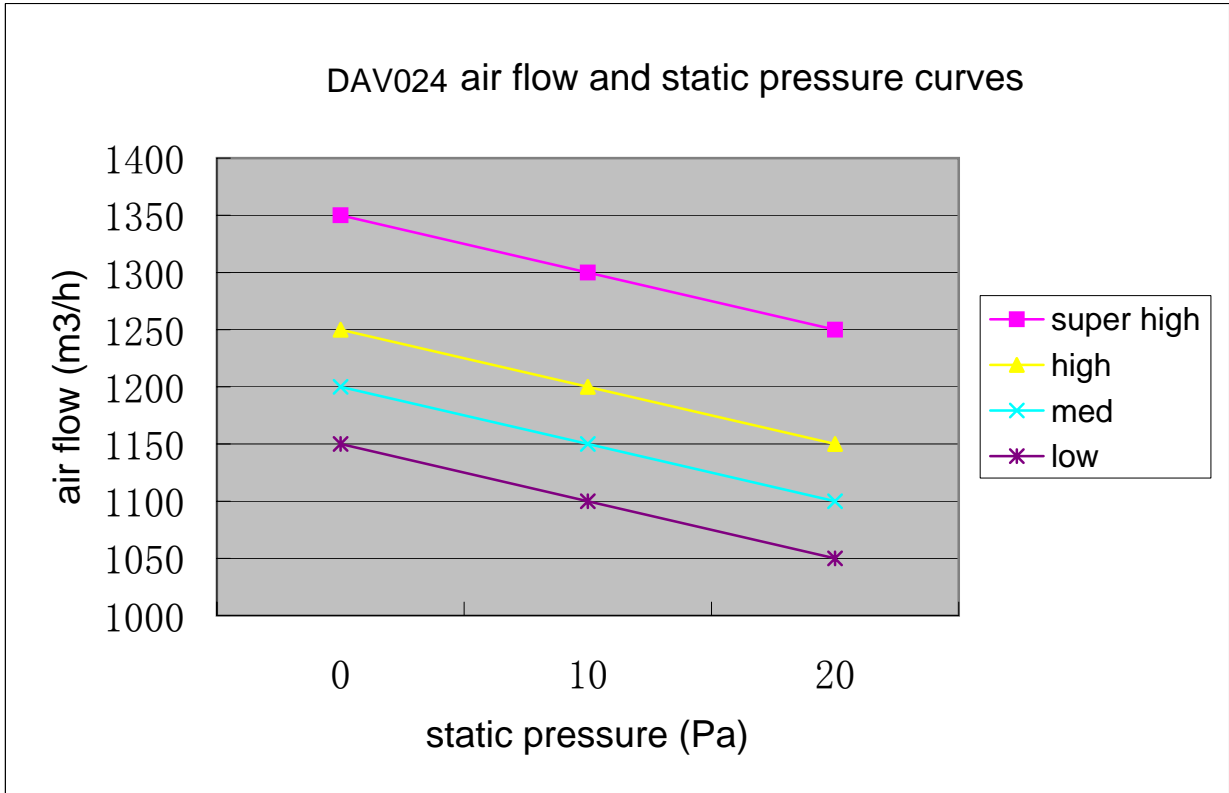
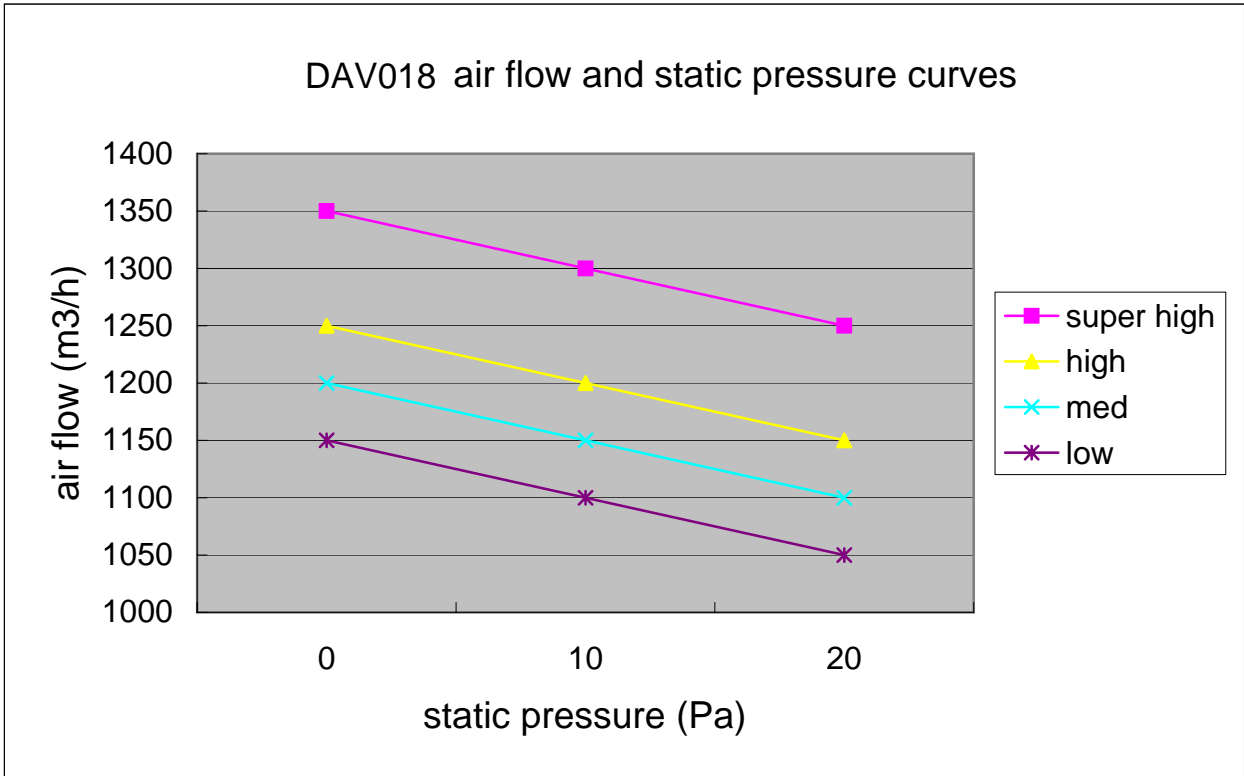


DAV012 air flow and static pressure curves



DAV016 air flow and static pressure curves

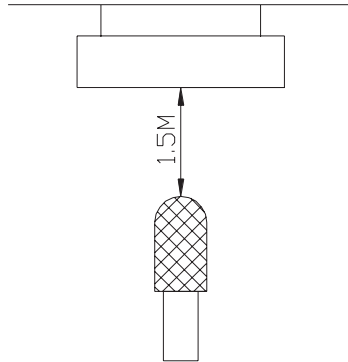




9. Noise level

2. Ceiling concealed duct type running noise:

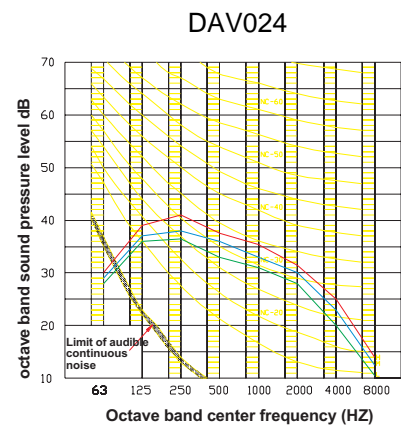
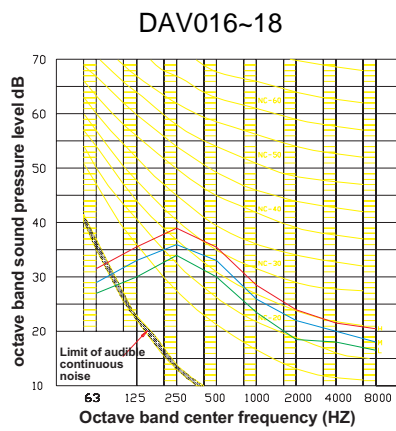
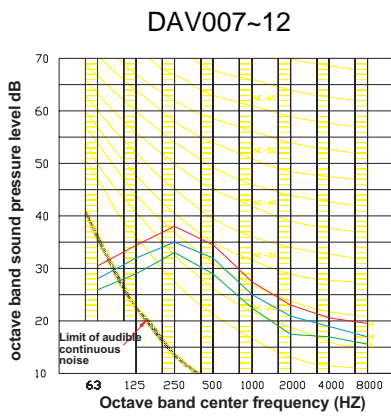
(1) Testing illustrate:



(2) Testing condition:

- a. Unit running in the nominal condition
- b. Test in the semi-anechoic chamber
- c. Noise level varies from the actual factors such as room structure, etc.

(3) Octave band level



10. Installation

WARNING

- It should be installed at places where it is firm enough to bear the air conditioner to prevent falling.
- To avoid the strong wind and earthquake, it should be installed due to specific requirements. Improper installation may lead to accidents.

After selecting the installation space, proceed the following steps:

1. Drill a hole in the wall and insert the connecting pipe and wire through a PVC wall-through tube purchased locally. The wall hole shall be with a outward down slope of at least 1/100. (See Figure 2)
2. Before drilling check that there is no pipe or reinforcing bar just behind the drilling position. Drilling shall avoid at positions with electric wire or pipe.
3. Mount the unit on a strong and horizontal building roof. If the base is not firm, it will cause noise, vibration or leakage.
4. Support the unit firmly.
5. Change the form of the connection pipe, connection wire and drain pipe so that they can go through the wall hole easily.

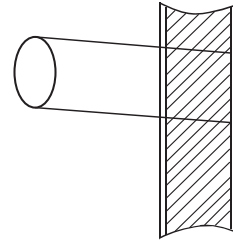
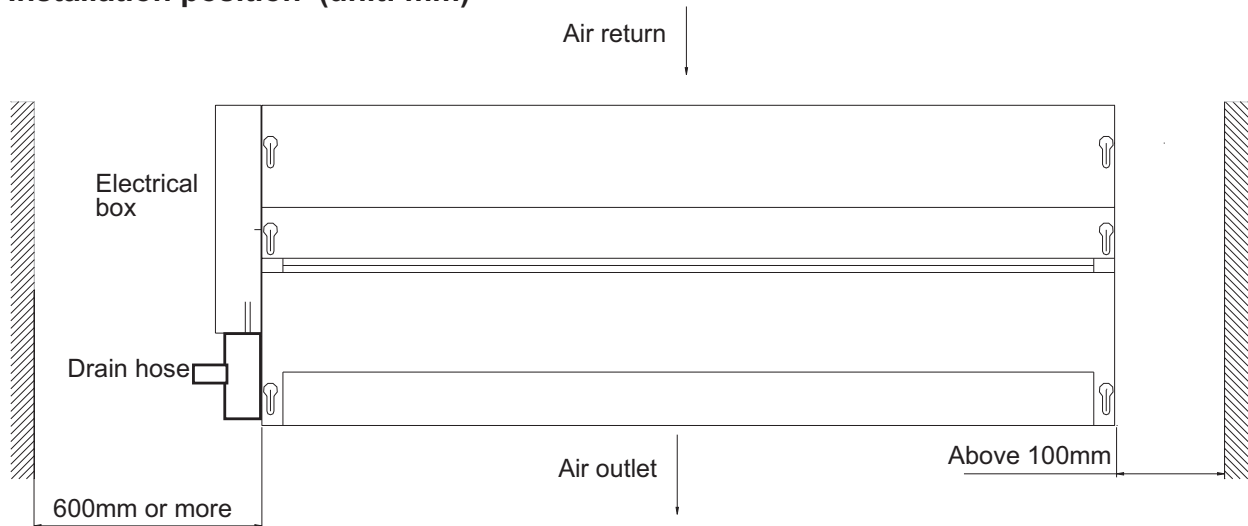


fig. 2

Installation position (unit: mm)



Fan speed selection (when using high efficient filter)

The fan motor composes red terminal and white terminal, which has been set at standard position when out of factory. When the static pressure is increased for using high efficient filter, you can change the connector position on the side of electric control box.

Standard Style(set in Factory)		High Speed Style	
Control Box	Yellow	Yellow	Fan motor terminal
	Black	Orange	
	Blue	Black	
	Red	Blue	

Static pressure range Unit: Pa

Standard static pressure	Max. static pressure
0	20

(4) Installation of air return duct

The unit is with air return and is set as back return type when out of factory. When installation, it can be changed to down return type.

Ceiling Concealed type indoor unit must be with air return duct when installation, as figure 3 and 4:

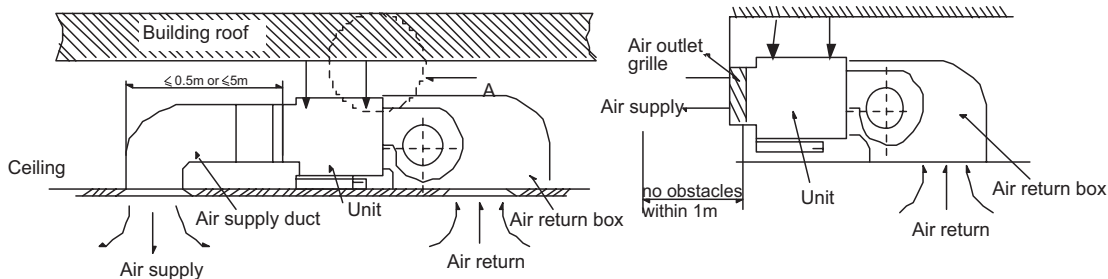


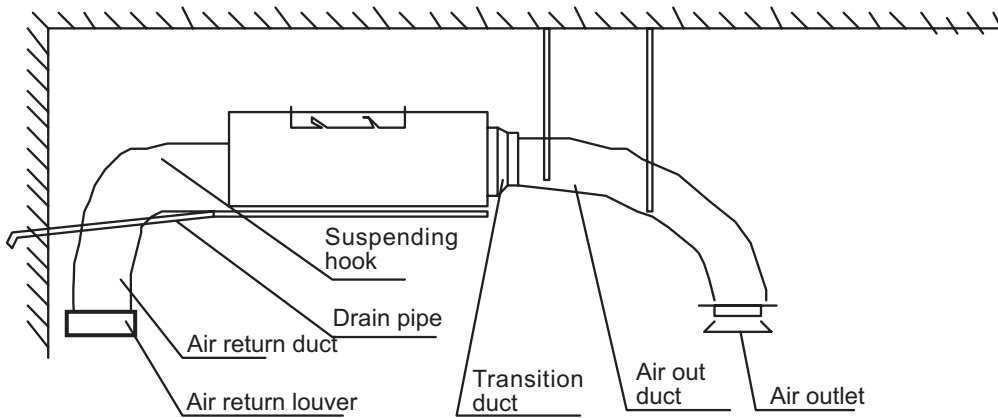
Fig. 3

Fig. 4(for A)

Every air sending duct and air return duct shall be fixed on the ceiling prefabricated panel by the iron bracket. The duct joint is sealed with the glue. The recommended distance between the edge of the air return duct and the wall is over 150mm.

The distance from the air outlet of the duct to the air outlet of the air conditioner is decided by the length of duct and static pressure terminal:

Installation of short and long ducts is as below figure, when connecting the short ducts, use the low static pressure terminals, which is white, the distance from the air outlet of the duct to the air outlet of the air conditioner shall be no more than 0.5 m; When connecting the long ducts, use the middle static pressure terminals, which is red. The distance from the air outlet of the duct to the air outlet of the air conditioner shall be no more than 5m.



The gradient of the condensate water pipe shall keep over 1/100. The condensate water pipe shall be thermal insulated.

Installation of indoor unit duct

A. Installation of air sending duct

This unit uses rectangle duct, the diameter of the duct is less than air outlet.

B. Installation of air return duct

Use rivet to connect the air return duct on the air return inlet of the indoor unit, then connect the other end with the air return blind. As Fig. 2 shown.

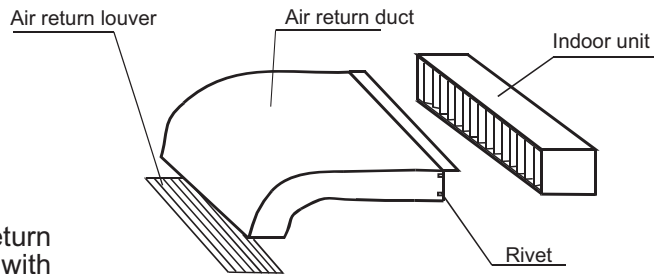


Fig. 2 Connection of air return duct

C. Thermal insulation of duct

Air-sending duct and air return duct shall be thermally insulated. First stick the gluey nail on the duct, then attach the heat preservation cotton with a layer of tinfoil paper and use the gluey nail cap to fix. Finally use the tinfoil adhesive tape to seal the connected part. As Fig. 3 shown.

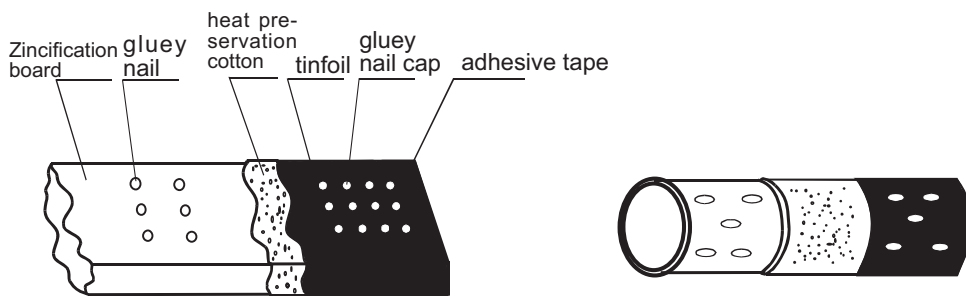


Fig. 3

Note:

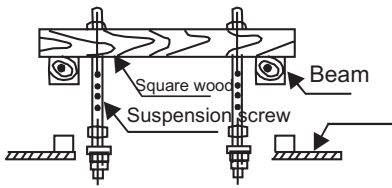
- (1)The air sending/return duct should be heat insulated properly.
- (2)Forbidden to get air return directly from the ceiling.
- (3)Air return must in indoor, not allowed in the corridor.

(6) Installing the suspension screw:

Use M8 or M10 suspension screws (4, prepared in the field) (when the suspension screw height exceeds 0.9m, M10 size is the only choice). These screws shall be installed as follows with space adapting to air conditioner overall dimensions according to the original building structures.

Wooden structure

A square wood shall be supported by the beams and then set the suspension screws.

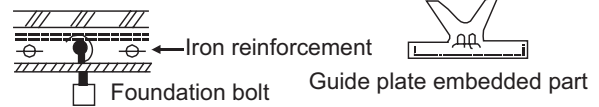


New concrete slab

To set with embedded parts, foundation bolts etc.



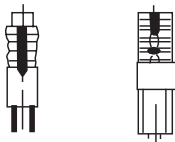
Knife embedded part



(Pipe suspension foundation bolt)

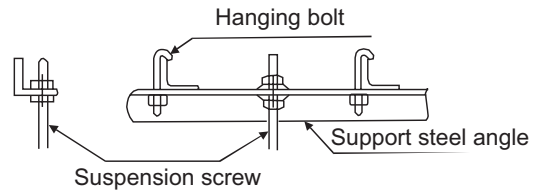
Original concrete slab

Use hole hinge, hole plunger or hole bolt.



Steel reinforcement structure

Use steel angle or new support steel angle directly.



Hanging of the indoor unit

Fasten the nut on the suspension screw and then hang the suspension screw in the T slot of the suspension part of the unit. Aided with a level meter, adjust level of the unit within 5mm.

Suspension units as follows:

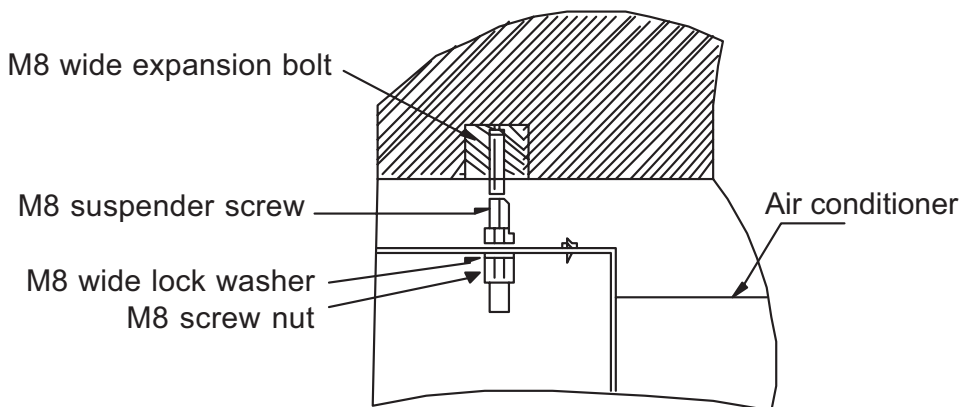
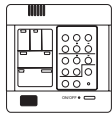





Fig. 5

11. Accessories

Standard accessories

name	Wired controller	Signal wire	Screw cap	Screw cap	The others: operation manual or other documents
shape			 large	 small	
quantity	1	1	1	1	



Med static pressure duct type indoor unit

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1. Features



DBV018
DBV024
DBV028



DBV030
DBV038
DBV048

Optional external static pressure

The duct unit has two kinds of static pressure: standard static pressure 0~50Pa and optional static pressure 50~96Pa. Flexible air supply mode, much freer installation and meet the personal requests.

Multi rooms sharing one indoor unit

The duct unit can be applicable for multi rooms, because the duct can be set as multiple air outlets according to the load.

The unit is built in the ceiling, space saving

The duct unit is installed above the ceiling, just leaving the air outlet in the ceiling, which will not affect the indoor decor and supply less space of indoor.

Large head of water pump

The duct unit is equipped with water pump to drain the condensate water. The head of water pump can be up to 1.2m, which improves the water drainage quality greatly and can meet many installation conditions.



2. Specifications

Model	DBV018	DBV024	DBV028	
Nominal cooling capacity(KW)	5.6	7.1	8.0	
Nominal heating capacity(KW)	6.3	8.0	9.0	
Electrical heating power(KW) /Current(A)	/	/	/	
Heating capacity at low temp.(KW)	5.0	6.3	7.1	
Electrical characteristics	Power source	1PH, 220V, 50Hz		
	Operating current(A)	0.51		
	Power consumption(KW)	0.1		
Fan characteristics	Fan type and Qty	centrifugal*3	centrifugal*3	centrifugal*3
	Fan motor output(KW)	0.15	0.15	0.15
	Standard airflow(m ³ /h)	1200	1200	1470
	Standard static pressure(Pa)	50		
	Max. static pressure(Pa)	96		
Exterior dimensions(mm)	990*650*300			
Air outlet dimensions(mm)	Ø200*3			
Weight(Kg)	39/40.4			
Controller	Wired controller/ wireless controller (optional)			
Accessories	Use for installation			
Piping dimension	Gas piping(mm)	Ø 12.7	Ø 15.88	
	Liquid piping(mm)	Ø 6.35	Ø 9.52	
	Drain hose(mm)	Ø 32		
Noise level(dB(A)) H/M/L	43/37/35			

Norminal condition: indoor temperature (cooling): 27°CDB/19°CWB, indoor temperature (heating): 20°CDB/14.5°CWB
Outdoor temperature(cooling): 35°CDB/24°CWB, outdoor temperature(heating): 7°CDB/6°CWB

The noise level will be measured in the third octave band limited values in the semi-anechoic chamber, using a Real Time Analyser calibrated sound intensity meter. It is a sound pressure noise level.



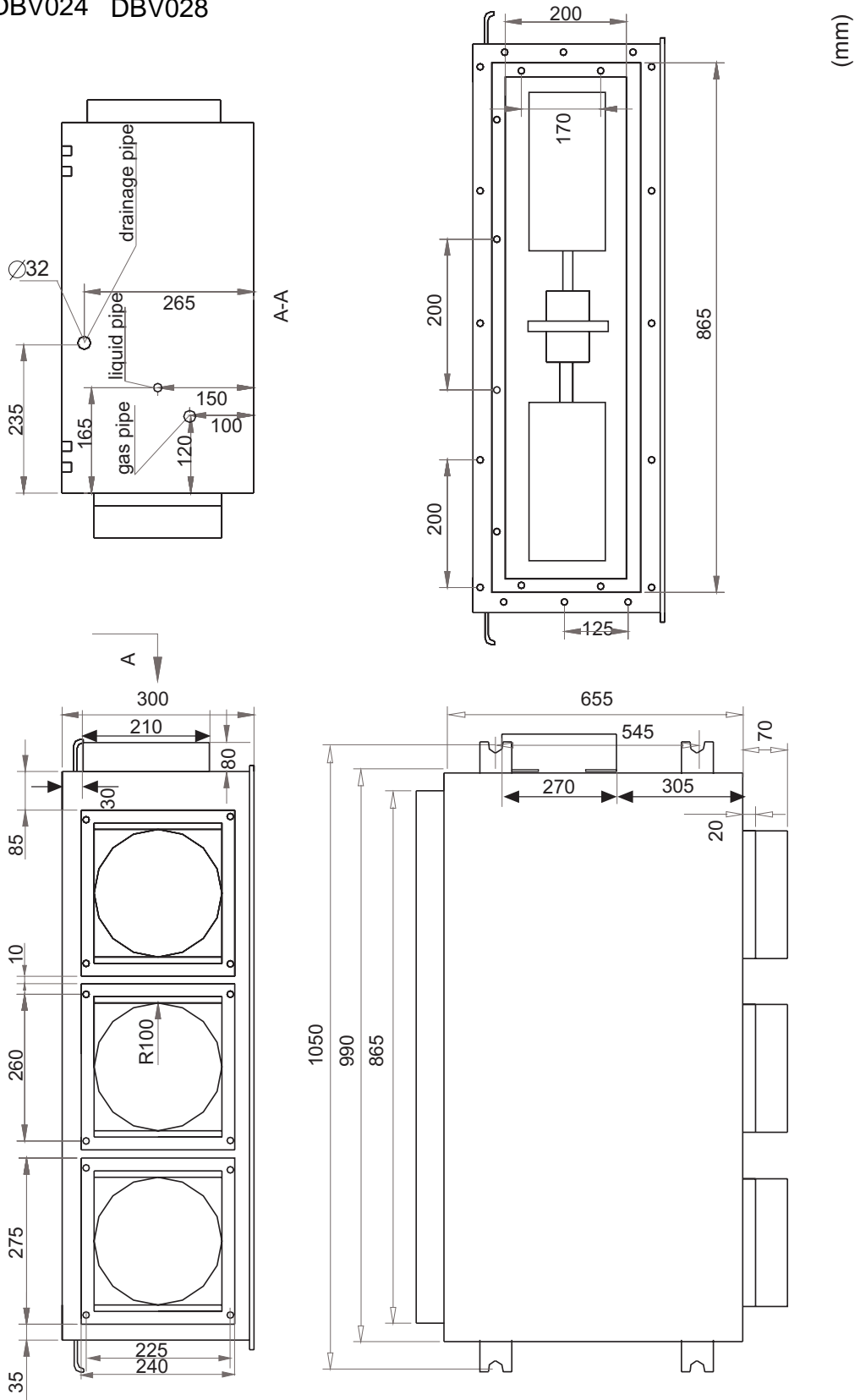
Model		DBV030	DBV038	DBV048
Nominal cooling capacity(KW)		9.0	11.2	14.0
Nominal heating capacity(KW)		10.0	12.5	16.0
Electrical heating power(KW) /Current(A)		2.4/10.91	2.4/10.91	2.4/10.91
Heating capacity at low temp.(KW)		8.0	10.0	12.5
Electrical characteristics	Power source	1PH, 220~230V, 50Hz		
	Operating current(A)	0.51		
	Power consumption(KW)	0.1		
Fan characteristics	Fan type and Qty	centrifugal*3	centrifugal*3	centrifugal*3
	Fan motor output(KW)	0.15	0.15	0.15
	Standard airflow(m ³ /h)	1900	1900	2100
	Standard static pressure(Pa)	50		
	Max. static pressure(Pa)	96		
Exterior dimensions(mm)		1410*645*350		
Air outlet dimensions(mm)		Ø200*4		
Weight(Kg)		55/57		
Controller		Wired controller/ wireless controller (optional)		
Accessories		Use for installation		
Piping dimension	Gas piping(mm)	Ø 15.88		
	Liquid piping(mm)	Ø 9.52		
	Drain hose(mm)	Ø 32		
Noise level(dB(A)) H/M/L		43/37/35		44/40/36

Normal condition: indoor temperature (cooling): 27°CDB/19°CWB, indoor temperature (heating): 20°CDB/14.5°CWB
 Outdoor temperature(cooling): 35°CDB/24°CWB, outdoor temperature(heating): 7°CDB/6°CWB

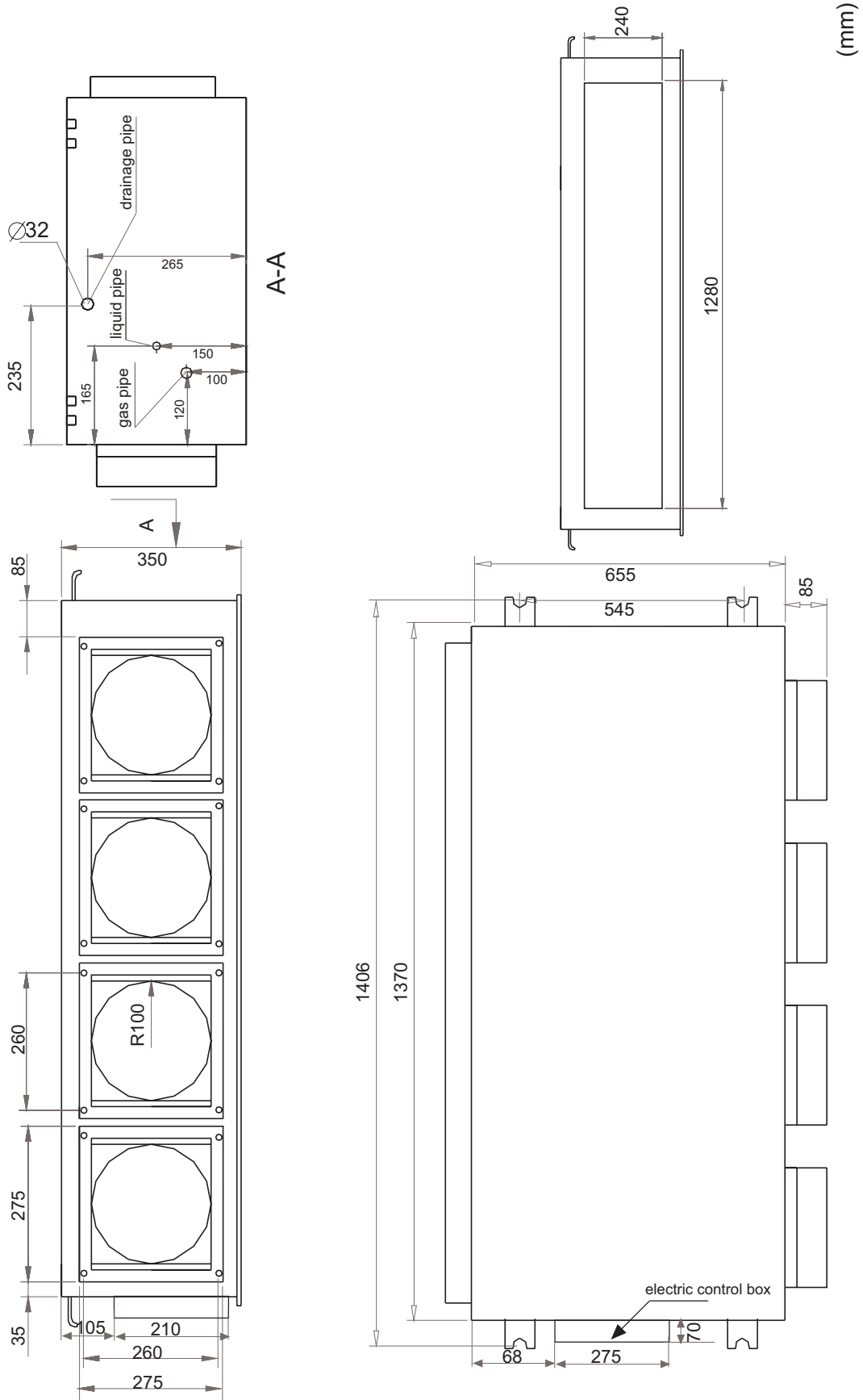
The noise level will be measured in the third octave band limited values in the semi-anechoic chamber, using a Real Time Analyser calibrated sound intensity meter. It is a sound pressure noise level.

3. Dimensions

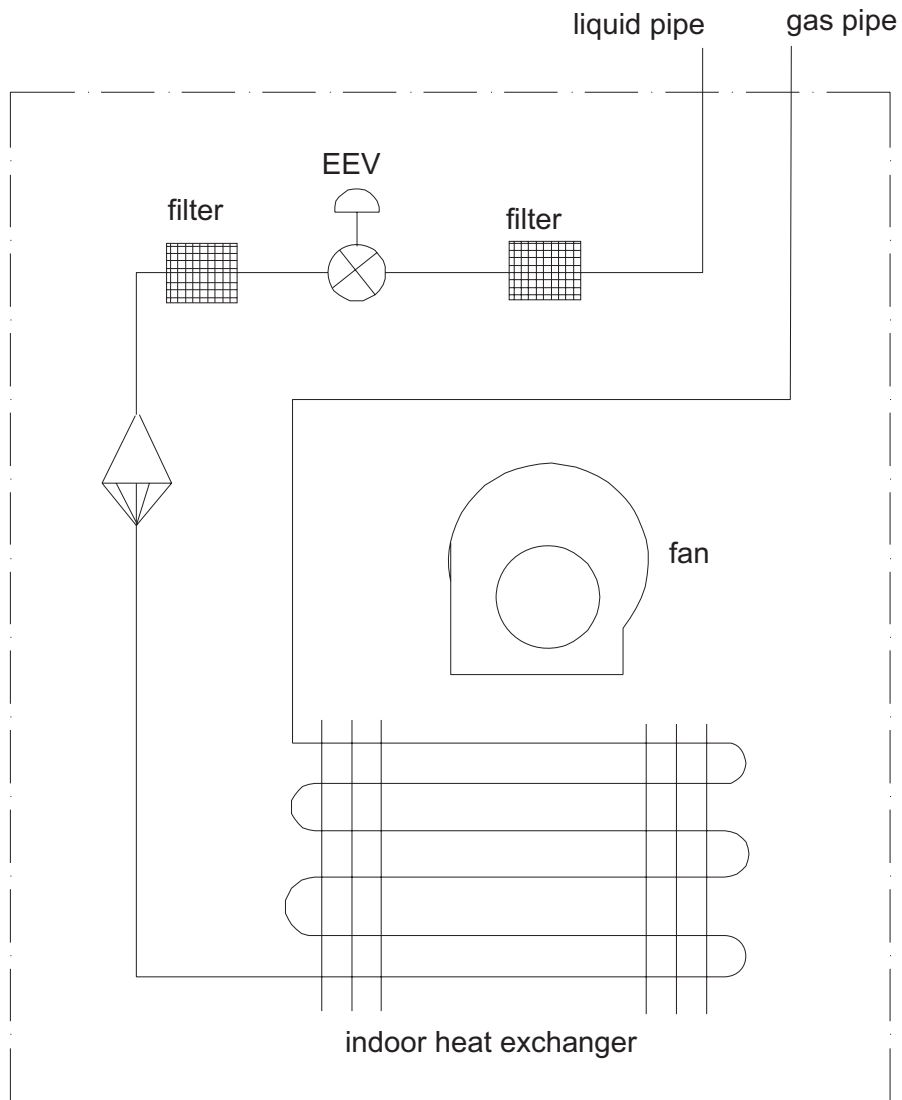
DBV018 DBV024 DBV028



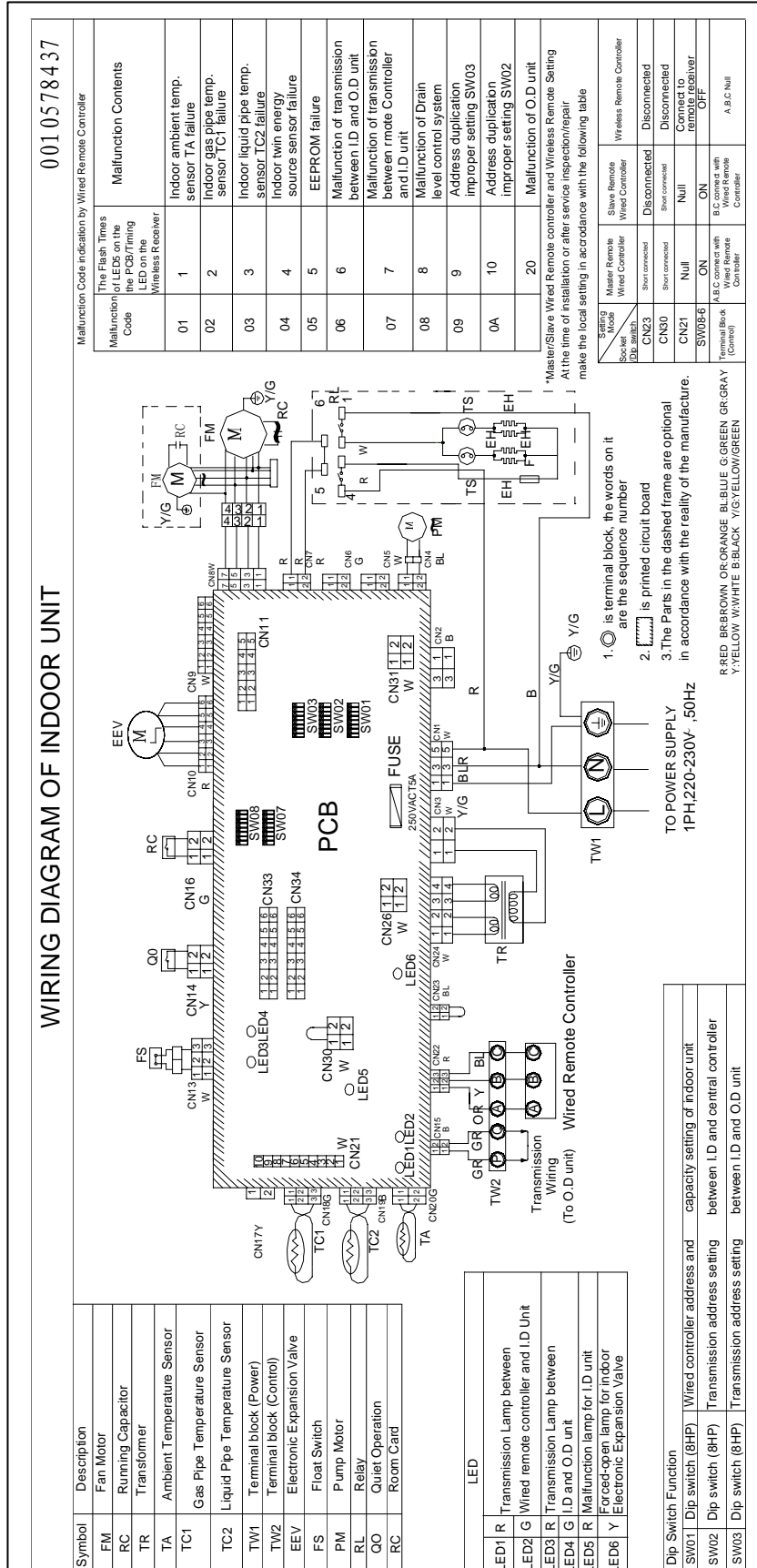
DCV018 DCV024 DCV028



4. Piping diagrams



5. Wiring diagrams



1. [] is terminal block, the words on it are the sequence number

2. [] is printed circuit board

3. The Parts in the dashed frame are optional in accordance with the reality of the manufacture.

TO POWER SUPPLY
1PH;220-230V, 50HZ

R:RED B:BLACK W:WHITE O:ORANGE BL:BLUE G:GREEN GR:GRAY Y:YELLOW

Malfunction Code Indication by Wired Remote Controller

Malfunction Code	The Flash Times of LEDs on the 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 Controller and I.D unit
08	8	Malfunction of Drain level control system
09	9	Address duplication
0A	10	Address duplication improper setting SW03
		Address duplication improper setting SW02
20		Malfunction of O.D unit

At the time of installation or after service inspection/repair make the local setting in accordance with the following table

Setting Dip switch Socket	Master Remote Wired Controller	Slave Remote Wired Controller	Wireless Remote Controller
CN23	Short connected	Disconnected	Disconnected
CN30	Short connected	Short connected	Disconnected
CN21	Null	Null	Connect to remote receiver
SW05-6	ON	ON	OFF
	A.B.C connect with Terminal Block (Control)	B.C connect with Wireless Remote Controller	A.B.C Null



6. Electric characteristic

units					power supply		indoor fan motor		power input(W)	
model	phase	FQY	voltage	volt. range	MCA	MFA	W	FLA	cooling	heating
DBV018	1	50	220	198~242	1.79	3.8	75	0.95	100	100
DBV024	1	50	220	198~242	1.79	3.8	75	0.95	100	100
DBV028	1	50	220	198~242	1.79	3.8	75	0.95	100	100
DBV030	1	50	220	198~242	2.42	5.8	100	1.45	200	200
DBV038	1	50	220	198~242	2.42	5.8	100	1.45	200	200
DBV048	1	50	220	198~242	2.42	5.8	100	1.45	200	200

Symbols:

MCA: Min. circuit amps (A)

MFA: Max. fuse amps of circuit breaker

KW: Fan motor rated output(KW)

FLA: Full load amps(A)

IFM: Indoor fan motor

Notes:

1. Voltage range

The units are applicable for the electrical systems where voltage supplied to unit is in the range.

2. Maximum allowable voltage unbalance between phases is 2%.

3. $MCA=1.25*FLA$

$MFA \leq 4*FLA$

4. Power supply uses the circuit breaker



7. Capacity table (CA: total capacity; SHC: sensible heat capacity)

Cooling mode:

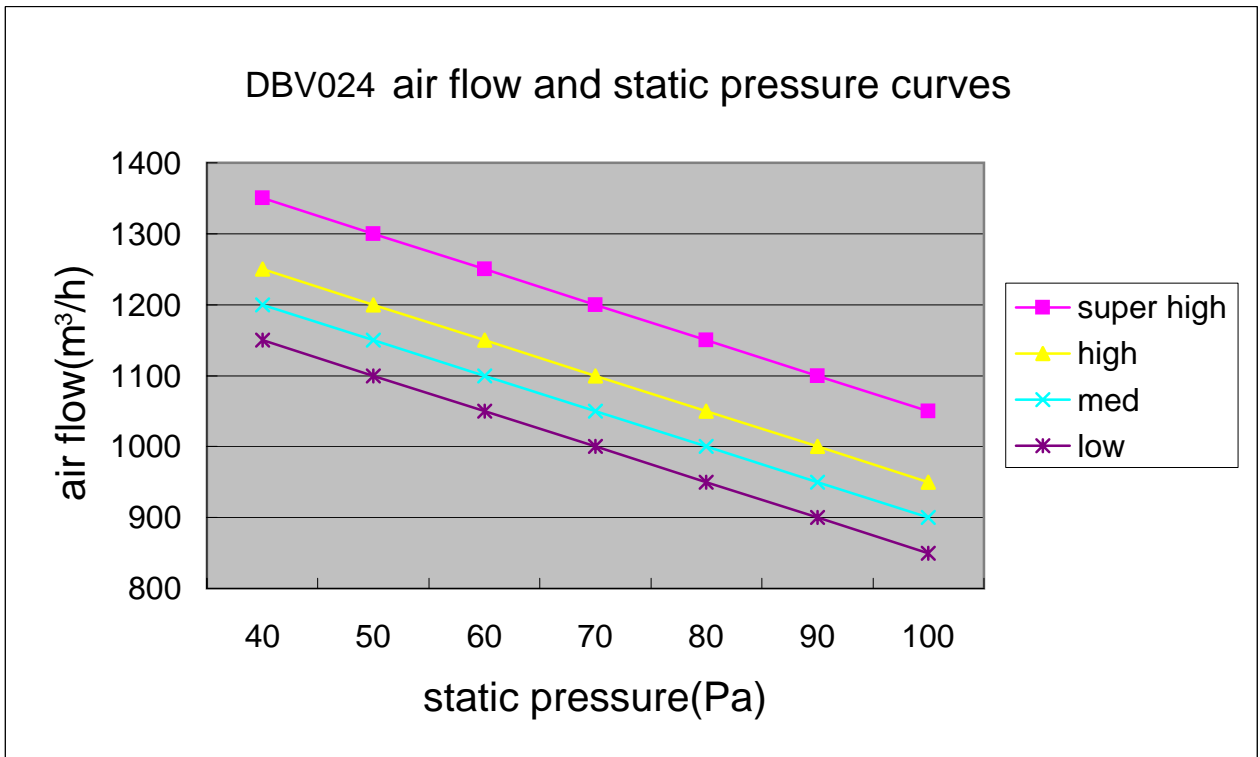
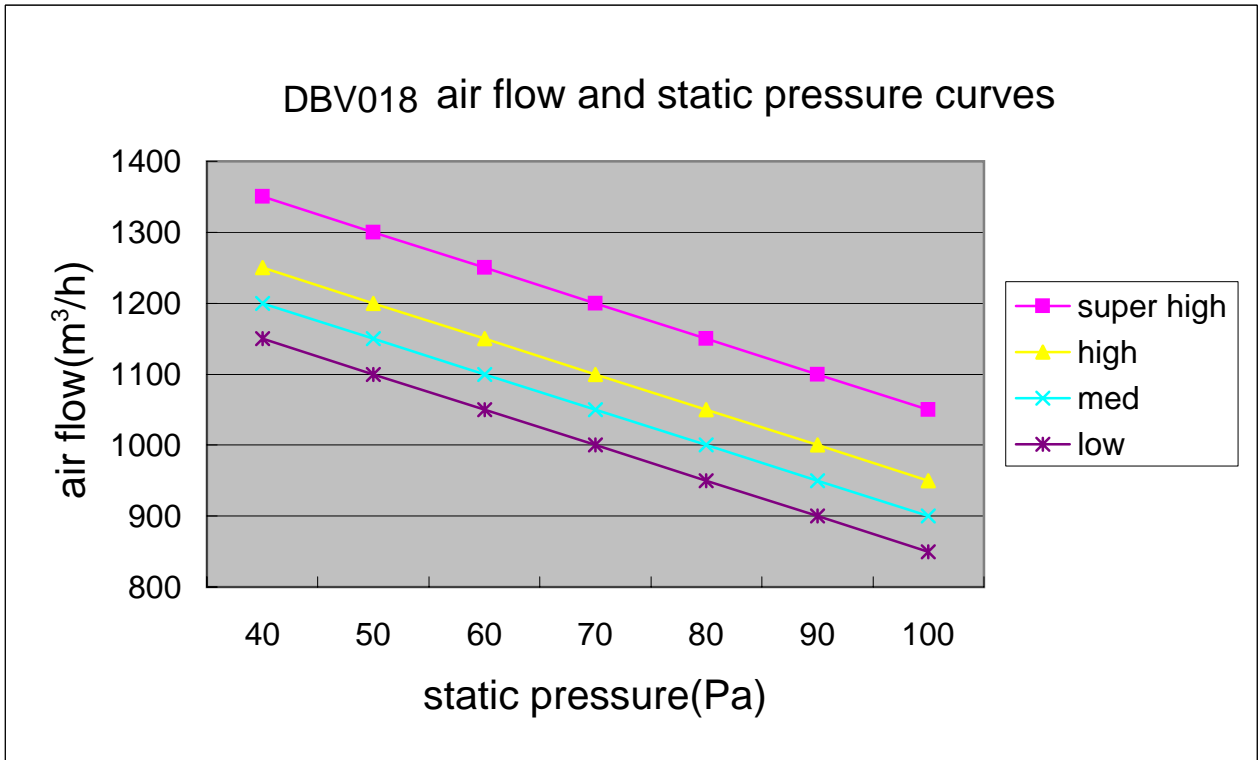
capacity(W*100)	outdoor temp.	indoor temp.													
		21.5°CDB 15°CWB		23°CDB 16°CWB		25°CDB 18°CWB		27°CDB 19°CWB		28°CDB 20°CWB		30°CDB 32°CWB		32°CDB 24°CWB	
		°CDB	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA
56	20.0	5.5	3.8	5.5	3.9	5.8	3.7	5.9	3.8	6.0	3.9	6.3	3.7	6.5	3.6
	22.5	5.4	3.8	5.5	3.8	5.8	3.7	5.9	3.7	6.0	3.8	6.2	3.7	6.4	3.6
	25.0	5.4	3.7	5.4	3.8	5.7	3.7	5.8	3.7	5.9	3.8	6.2	3.7	6.4	3.6
	27.5	5.3	3.7	5.4	3.8	5.7	3.7	5.8	3.7	5.8	3.8	6.1	3.7	6.3	3.6
	30.0	5.3	3.7	5.3	3.7	5.6	3.6	5.7	3.7	5.8	3.8	6.0	3.7	6.3	3.5
	32.5	5.2	3.6	5.3	3.7	5.5	3.6	5.7	3.6	5.7	3.7	6.0	3.6	6.2	3.5
	35.0	5.2	3.6	5.2	3.7	5.5	3.6	5.6	3.6	5.7	3.7	5.9	3.6	6.2	3.5
	37.5	5.1	3.6	5.2	3.7	5.4	3.5	5.5	3.6	5.6	3.7	5.9	3.6	6.1	3.5
	40.0	5.0	3.6	5.1	3.6	5.4	3.5	5.5	3.6	5.5	3.7	5.8	3.6	6.0	3.5
71	20.0	7.0	4.9	7.1	5.0	7.4	4.9	7.5	4.9	7.7	5.0	8.0	4.9	8.2	4.7
	22.5	6.9	4.9	7.0	4.9	7.3	4.8	7.5	4.8	7.6	5.0	7.9	4.8	8.2	4.7
	25.0	6.8	4.8	7.0	4.9	7.2	4.8	7.4	4.8	7.5	4.9	7.8	4.8	8.1	4.7
	27.5	6.7	4.8	6.9	4.9	7.2	4.8	7.3	4.8	7.5	4.9	7.7	4.8	8.0	4.6
	30.0	6.7	4.7	6.8	4.8	7.1	4.7	7.2	4.7	7.4	4.9	7.7	4.7	8.0	4.6
	32.5	6.6	4.7	6.7	4.8	7.0	4.7	7.2	4.7	7.3	4.8	7.6	4.7	7.9	4.6
	35.0	6.5	4.7	6.7	4.8	7.0	4.7	7.1	4.7	7.2	4.8	7.5	4.7	7.8	4.6
	37.5	6.5	4.6	6.6	4.7	6.9	4.6	7.0	4.6	7.2	4.8	7.5	4.7	7.7	4.5
	40.0	6.4	4.6	6.5	4.7	6.8	4.6	7.0	4.6	7.1	4.8	7.4	4.6	7.7	4.5
80	20.0	7.8	5.5	8.0	5.6	8.3	5.5	8.5	5.5	8.6	5.7	9.0	5.5	9.3	5.3
	22.5	7.8	5.5	7.9	5.5	8.2	5.4	8.4	5.4	8.6	5.6	8.9	5.4	9.2	5.3
	25.0	7.7	5.4	7.8	5.5	8.2	5.4	8.3	5.4	8.5	5.5	8.8	5.4	9.1	5.3
	27.5	7.6	5.4	7.8	5.5	8.1	5.4	8.2	5.4	8.4	5.5	8.7	5.4	9.0	5.2
	30.0	7.5	5.3	7.7	5.4	8.0	5.3	8.2	5.3	8.3	5.4	8.6	5.3	9.0	5.2
	32.5	7.4	5.3	7.6	5.4	7.9	5.3	8.1	5.3	8.2	5.4	8.6	5.3	8.9	5.1
	35.0	7.4	5.3	7.5	5.4	7.8	5.3	8.0	5.3	8.2	5.4	8.5	5.3	8.8	5.1
	37.5	7.3	5.2	7.4	5.3	7.8	5.2	7.9	5.2	8.1	5.4	8.4	5.3	8.7	5.1
	40.0	7.2	5.1	7.4	5.3	7.7	5.1	7.8	5.2	8.0	5.4	8.3	5.2	8.6	5.1
90	20.0	8.8	6.2	9.0	6.4	9.4	6.2	9.5	6.2	9.7	6.4	10.1	6.2	10.4	6.0
	22.5	8.7	6.2	8.9	6.3	9.3	6.2	9.5	6.2	9.6	6.4	10.0	6.2	10.4	6.0
	25.0	8.6	6.1	8.8	6.3	9.2	6.1	9.4	6.1	9.5	6.3	9.9	6.1	10.3	6.0
	27.5	8.6	6.1	8.7	6.2	9.1	6.1	9.3	6.1	9.5	6.3	9.8	6.1	10.2	5.9
	30.0	8.5	6.1	8.6	6.2	9.0	6.0	9.2	6.1	9.4	6.2	9.7	6.1	10.1	5.9
	32.5	8.4	6.0	8.6	6.1	8.9	6.0	9.1	6.0	9.3	6.2	9.6	6.0	10.0	5.9
	35.0	8.3	6.0	8.5	6.1	8.8	5.9	9.0	6.0	9.2	6.2	9.5	6.0	9.9	5.8
	37.5	8.2	5.9	8.4	6.0	8.7	5.9	8.9	5.9	9.1	6.1	9.5	6.0	9.8	5.8
	40.0	8.1	5.9	8.3	6.0	8.6	5.9	8.8	5.9	9.0	6.1	9.4	5.9	9.7	5.8
112	20.0	11.0	8.5	11.2	8.7	11.6	8.5	11.9	8.6	12.1	8.9	12.5	8.6	13.0	8.4
	22.5	10.9	8.4	11.1	8.6	11.5	8.4	11.8	8.5	12.0	8.8	12.4	8.6	12.9	8.4
	25.0	10.8	8.3	11.0	8.6	11.4	8.4	11.6	8.5	11.9	8.8	12.3	8.5	12.8	8.3
	27.5	10.6	8.3	10.9	8.5	11.3	8.3	11.5	8.4	11.8	8.7	12.2	8.5	12.7	8.3
	30.0	10.5	8.2	10.8	8.5	11.2	8.3	11.4	8.4	11.6	8.7	12.1	8.5	12.5	8.2
	32.5	10.4	8.2	10.6	8.4	11.1	8.2	11.3	8.3	11.5	8.6	12.0	8.4	12.4	8.2
	35.0	10.3	8.1	10.5	8.4	11.0	8.2	11.2	8.3	11.4	8.6	11.9	8.4	12.3	8.2
	37.5	10.2	8.1	10.4	8.3	10.9	8.1	11.1	8.2	11.3	8.5	11.8	8.3	12.2	8.1
	40.0	10.1	8.0	10.3	8.2	10.8	8.1	11.0	8.2	11.2	8.5	11.6	8.3	12.1	8.1
140	20.0	13.7	10.4	14.0	10.6	14.6	10.4	14.8	10.5	15.1	10.8	15.7	10.5	16.2	10.2
	22.5	13.6	10.3	13.9	10.5	14.4	10.3	14.7	10.4	15.0	10.7	15.5	10.5	16.1	10.2
	25.0	13.4	10.2	13.7	10.5	14.3	10.2	14.6	10.3	14.8	10.7	15.4	10.4	16.0	10.1
	27.5	13.3	10.2	13.6	10.4	14.1	10.2	14.4	10.3	14.7	10.6	15.3	10.4	15.8	10.1
	30.0	13.2	10.1	13.4	10.3	14.0	10.1	14.3	10.2	14.6	10.6	15.1	10.3	15.7	10.0
	32.5	13.0	10.0	13.3	10.3	13.9	10.1	14.1	10.2	14.4	10.5	15.0	10.3	15.5	10.0
	35.0	12.9	10.0	13.2	10.2	13.7	10.0	14.0	10.1	14.3	10.5	14.8	10.2	15.4	9.9
	37.5	12.7	9.9	13.0	10.1	13.6	9.9	13.9	10.1	14.1	10.4	14.7	10.2	15.3	9.9
	40.0	12.6	9.8	12.9	10.1	13.4	9.9	13.7	10.0	14.0	10.3	14.6	10.1	15.1	9.9
43.0	12.4	9.7	12.7	10.0	13.3	9.8	13.6	9.9	13.8	10.3	14.4	10.0	15.0	9.8	

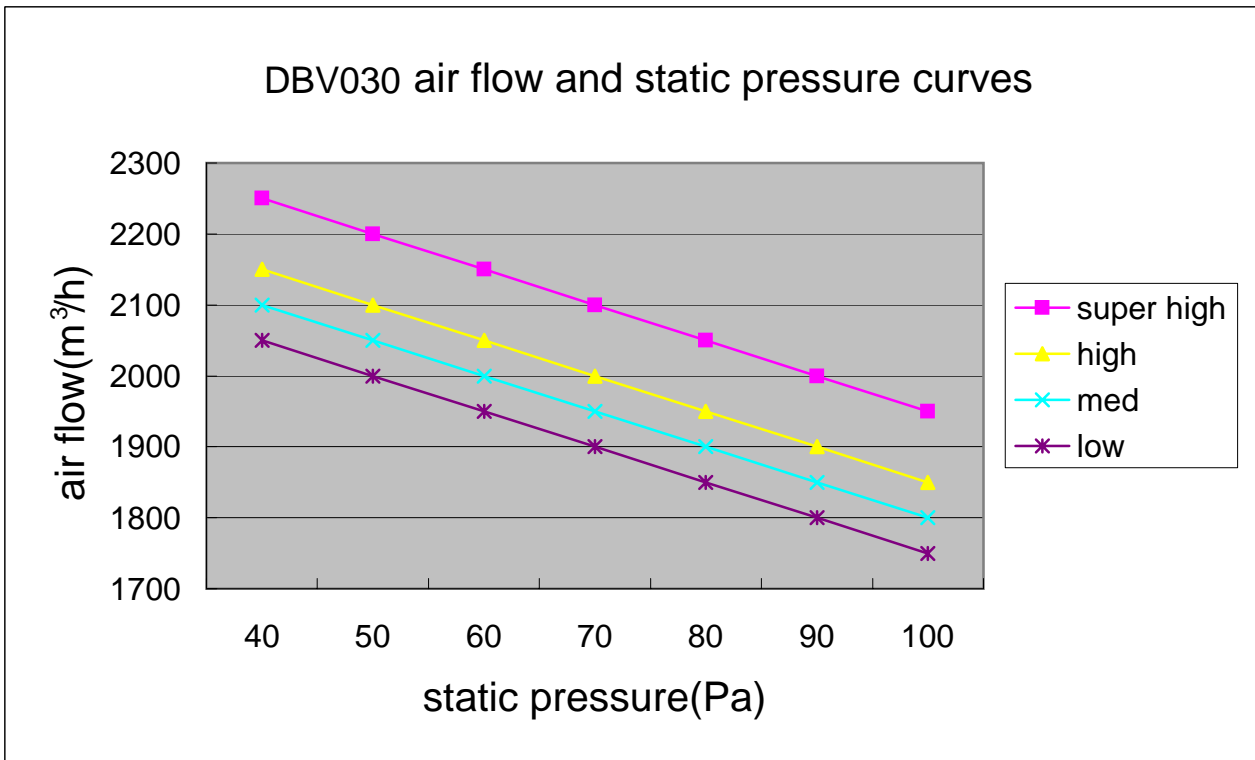
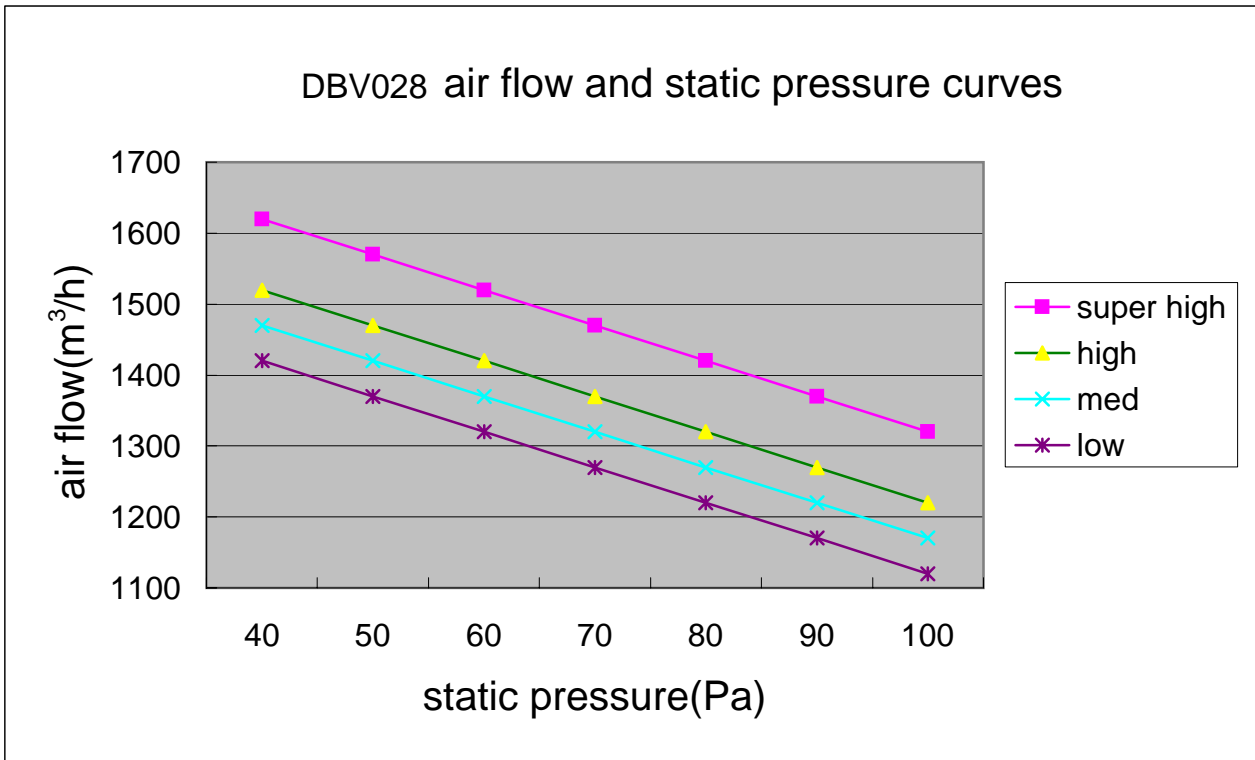


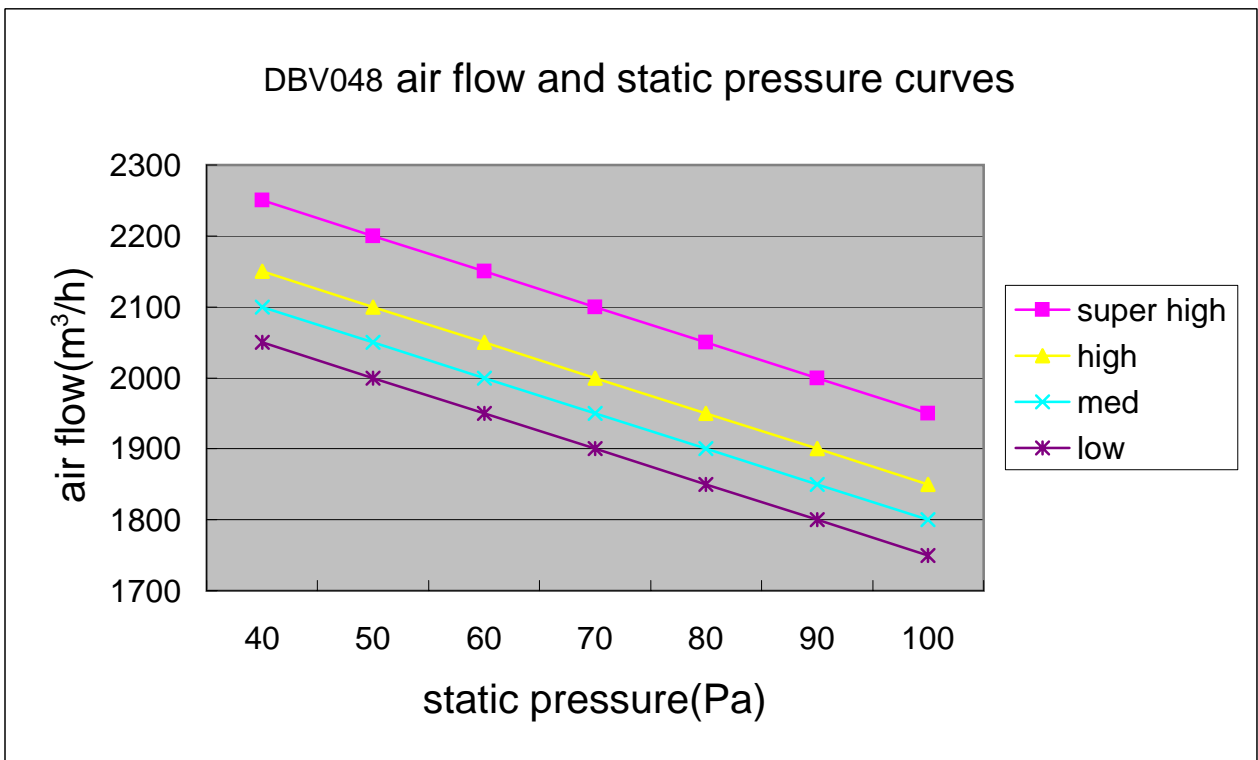
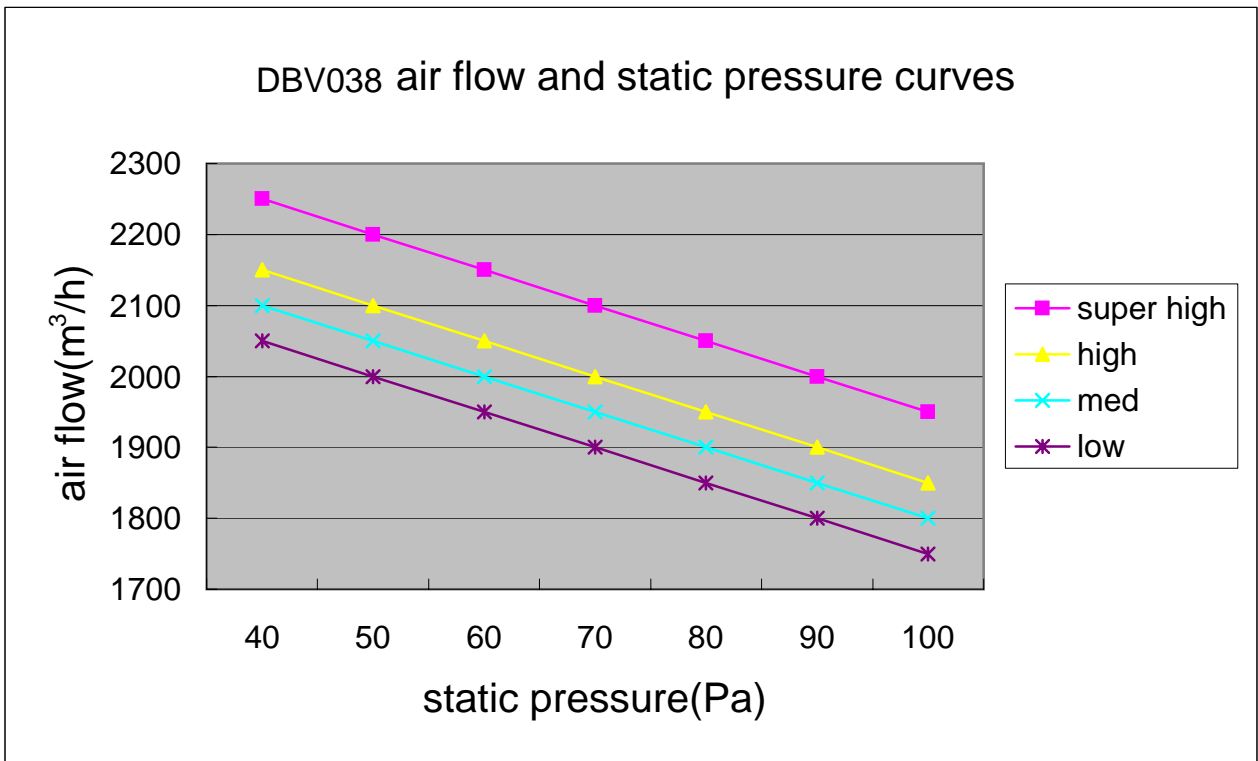
Heating mode:

capa city(W*1 00)	outdoor temp.	indoor temp.(CDB)				capa city(W*10 0)	outdoor r temp.	indoor temp.(CDB)				capaci ty(W* 100)	outdoor temp.	indoor temp.(CDB)			
		15.0	20.0	25.0	27.0			15.0	20.0	25.0	27.0			15.0	20.0	25.0	27.0
		°CDB	SHC	SHC	SHC			SHC	°CDB	SHC	SHC			SHC	SHC	°CDB	SHC
22	-15.0	1.7	1.6	1.6	1.6	56	-15.0	4.2	4.2	4.1	4.1	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	1.9	1.9	1.9	1.7		-10.0	4.8	4.8	4.7	4.3		-10.0	12.2	12.1	11.9	11.0
	-5.0	2.1	2.1	1.9	1.7		-5.0	5.4	5.3	4.9	4.3		-5.0	13.7	13.6	12.5	11.0
	0.0	2.4	2.4	1.9	1.7		0.0	6.0	5.9	4.9	4.3		0.0	15.3	15.1	12.5	11.0
	2.5	2.5	2.5	1.9	1.7		2.5	6.3	6.2	4.9	4.3		2.5	16.0	15.8	12.5	11.0
	6.0	2.5	2.5	1.9	1.7		6.0	6.4	6.3	4.9	4.3		6.0	16.2	16.0	12.5	11.0
	6.5	2.6	2.5	1.9	1.7		6.5	6.6	6.3	4.9	4.3		6.5	16.8	16.0	12.5	11.0
	10.0	2.8	2.5	1.9	1.7		10.0	7.1	6.3	4.9	4.3		10.0	18.0	16.0	12.5	11.0
	12.5	3.0	2.5	1.9	1.7		12.5	7.5	6.3	4.9	4.3		12.5	19.1	16.0	12.5	11.0
	15.5	3.0	2.5	1.9	1.7		15.5	7.6	6.3	4.9	4.3		15.5	19.4	16.0	12.5	11.0
28	-15.0	2.1	2.1	2.1	2.1	71	-15.0	5.4	5.3	5.2	5.2	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	2.4	2.4	2.4	2.2		-10.0	6.1	6.0	6.0	5.5		-10.0	12.2	12.1	11.9	11.0
	-5.0	2.7	2.7	2.5	2.2		-5.0	6.9	6.8	6.2	5.5		-5.0	13.7	13.6	12.5	11.0
	0.0	3.1	3.0	2.5	2.2		0.0	7.6	7.5	6.2	5.5		0.0	15.3	15.1	12.5	11.0
	2.5	3.2	3.2	2.5	2.2		2.5	8.0	7.9	6.2	5.5		2.5	16.0	15.8	12.5	11.0
	6.0	3.2	3.2	2.5	2.2		6.0	8.1	8.0	6.2	5.5		6.0	16.2	16.0	12.5	11.0
	6.5	3.4	3.2	2.5	2.2		6.5	8.4	8.0	6.2	5.5		6.5	16.8	16.0	12.5	11.0
	10.0	3.6	3.2	2.5	2.2		10.0	9.0	8.0	6.2	5.5		10.0	18.0	16.0	12.5	11.0
	12.5	3.8	3.2	2.5	2.2		12.5	9.6	8.0	6.2	5.5		12.5	19.1	16.0	12.5	11.0
	15.5	3.9	3.2	2.5	2.2		15.5	9.7	8.0	6.2	5.5		15.5	19.4	16.0	12.5	11.0
36	-15.0	2.7	2.6	2.6	2.6	80	-15.0	6.0	5.9	5.9	5.9	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	3.1	3.0	3.0	2.8		-10.0	6.9	6.8	6.7	6.2		-10.0	12.2	12.1	11.9	11.0
	-5.0	3.4	3.4	3.1	2.8		-5.0	7.7	7.6	7.0	6.2		-5.0	13.7	13.6	12.5	11.0
	0.0	3.8	3.8	3.1	2.8		0.0	8.6	8.5	7.0	6.2		0.0	15.3	15.1	12.5	11.0
	2.5	4.0	4.0	3.1	2.8		2.5	9.0	8.9	7.0	6.2		2.5	16.0	15.8	12.5	11.0
	6.0	4.0	4.0	3.1	2.8		6.0	9.1	9.0	7.0	6.2		6.0	16.2	16.0	12.5	11.0
	6.5	4.2	4.0	3.1	2.8		6.5	9.5	9.0	7.0	6.2		6.5	16.8	16.0	12.5	11.0
	10.0	4.5	4.0	3.1	2.8		10.0	10.1	9.0	7.0	6.2		10.0	18.0	16.0	12.5	11.0
	12.5	4.8	4.0	3.1	2.8		12.5	10.8	9.0	7.0	6.2		12.5	19.1	16.0	12.5	11.0
	15.5	4.8	4.0	3.1	2.8		15.5	10.9	9.0	7.0	6.2		15.5	19.4	16.0	12.5	11.0
40	-15.0	3.0	3.0	3.0	3.0	90	-15.0	6.7	6.6	6.5	6.5	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	3.5	3.4	3.4	3.1		-10.0	7.6	7.5	7.4	6.9		-10.0	12.2	12.1	11.9	11.0
	-5.0	3.9	3.8	3.5	3.1		-5.0	8.6	8.5	7.8	6.9		-5.0	13.7	13.6	12.5	11.0
	0.0	4.3	4.3	3.5	3.1		0.0	9.5	9.4	7.8	6.9		0.0	15.3	15.1	12.5	11.0
	2.5	4.5	4.5	3.5	3.1		2.5	10.0	9.9	7.8	6.9		2.5	16.0	15.8	12.5	11.0
	6.0	4.6	4.5	3.5	3.1		6.0	10.1	10.0	7.8	6.9		6.0	16.2	16.0	12.5	11.0
	6.5	4.8	4.5	3.5	3.1		6.5	10.5	10.0	7.8	6.9		6.5	16.8	16.0	12.5	11.0
	10.0	5.1	4.5	3.5	3.1		10.0	11.2	10.0	7.8	6.9		10.0	18.0	16.0	12.5	11.0
	12.5	5.4	4.5	3.5	3.1		12.5	12.0	10.0	7.8	6.9		12.5	19.1	16.0	12.5	11.0
	15.5	5.5	4.5	3.5	3.1		15.5	12.1	10.0	7.8	6.9		15.5	19.4	16.0	12.5	11.0
45	-15.0	3.3	3.3	3.3	3.3	112	-15.0	8.4	8.2	8.2	8.1	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	3.8	3.8	3.7	3.5		-10.0	9.6	9.4	9.3	8.6		-10.0	12.2	12.1	11.9	11.0
	-5.0	4.3	4.2	3.9	3.5		-5.0	10.7	10.6	9.8	8.6		-5.0	13.7	13.6	12.5	11.0
	0.0	4.8	4.7	3.9	3.5		0.0	11.9	11.8	9.8	8.6		0.0	15.3	15.1	12.5	11.0
	2.5	5.0	5.0	3.9	3.5		2.5	12.5	12.4	9.8	8.6		2.5	16.0	15.8	12.5	11.0
	6.0	5.1	5.0	3.9	3.5		6.0	12.5	12.5	9.8	8.6		6.0	16.2	16.0	12.5	11.0
	6.5	5.3	5.0	3.9	3.5		6.5	13.2	12.5	9.8	8.6		6.5	16.8	16.0	12.5	11.0
	10.0	5.6	5.0	3.9	3.5		10.0	14.1	12.5	9.8	8.6		10.0	18.0	16.0	12.5	11.0
	12.5	6.0	5.0	3.9	3.5		12.5	15.0	12.5	9.8	8.6		12.5	19.1	16.0	12.5	11.0
	15.5	6.1	5.0	3.9	3.5		15.5	15.1	12.5	9.8	8.6		15.5	19.4	16.0	12.5	11.0

8. Air flow and static pressure curves

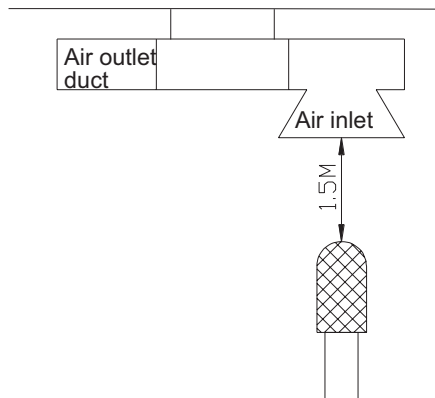






9. Noise level

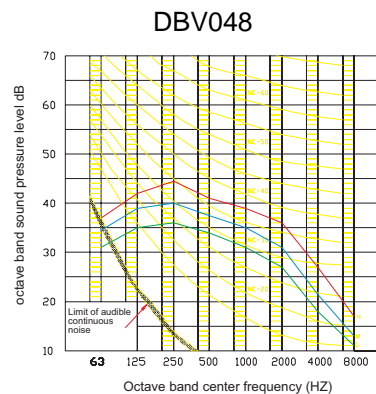
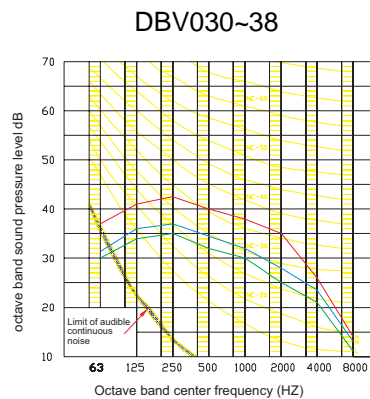
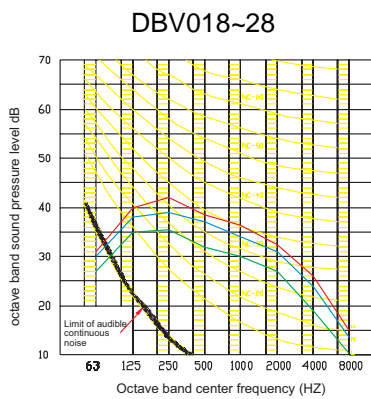
(1) Testing illustrate:



(2) Testing condition:

- a. Unit running in the nominal condition
- b. Test in the semi-anechoic chamber
- c. Noise level varies from the actual factors such as room structure, etc.

(3) Octave band level



10. Installation

(1) Before installation

- Confirm the way to move the unit to the installation place.
- Before moving the unit to the installation place, do not remove their packages.
When have to remove the package, use a soft material or protection board with rope to lift the unit assembly to avoid unit damage or bumping a scrape.

(2) Choose installation place

A. The chosen installation place should meet the following requirements and get the user's agreement.

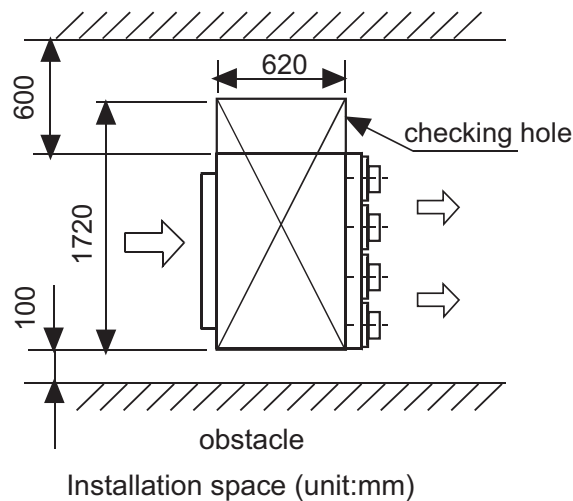
- Place ensures ideal airflow distribution.
- The passage of airflow has no obstacles.
- When importing outside air, it should be imported directly from outdoors. (if the pipe can not be extended, it also can not be imported from top)
- Place ensures enough space for maintenance.
- The pipe length between indoor and outdoor unit is in the permitted limit (referring to outdoor unit installation part).
- The indoor unit, outdoor unit, electric wire and connection wire is at least 1m away from television and radio. This is to avoid the image disturbance and noise caused by the above-mentioned home appliance. (Even if 1m away, if the electromagnetic wave is too strong, it can also cause noise.)

B. The height of ceiling

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

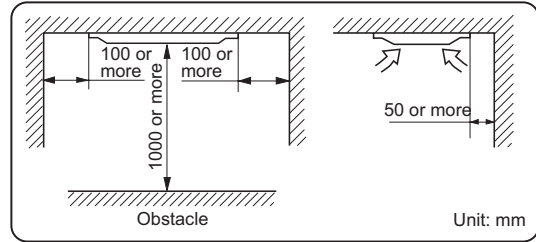
C. Install the unit with suspending pole. Check if the installation place can bear the unit.

If not certain, strengthen it before installing the unit.



	DBV030 DBV038 DBV048	DBV018 DBV024 DBV028
Combination with panel	416mm	366mm

• Installation space



(3) Indoor installation

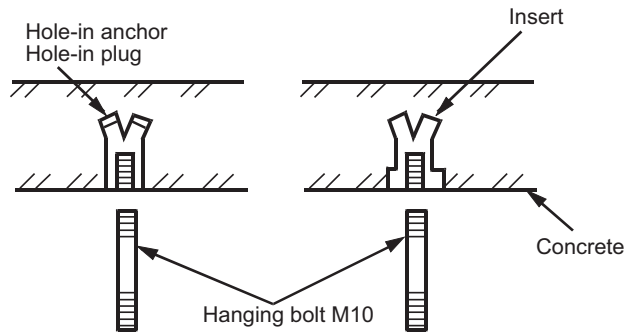
If necessary, prepare all the needed installation and checking hole on the ceiling (with existing ceiling)

- Before installation, prepare all the pipes (refrigerant, drainage) and wire (wire controller connection wire, indoor and outdoor unit connection wire) connected with indoor, so that after installation, they can be immediately connected with indoor.
- Cut the opening on the ceiling. Maybe it needs to strengthen the ceiling to keep the ceiling even and flat and prevent the ceiling from vibration. For details, please consult the builder.

Suspending bolts installation

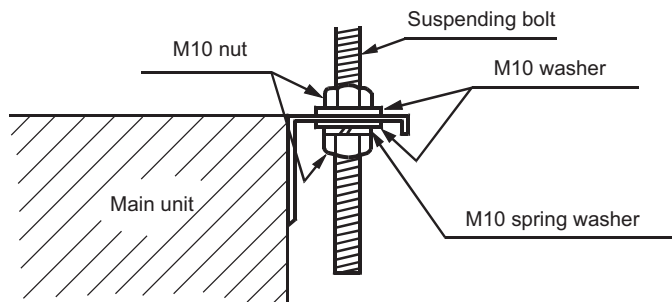
(Use M10 screw bolt)

To bear the unit, in the place with existing ceiling, use the foundation bolt; while in the place with new built ceiling, use the built-in bolt, embedded bolt or other parts supplied on field. Before installation, adjust the distance to the ceiling.



Installation of indoor unit

Fix the indoor unit to the suspending bolts. If necessary, it is possible to suspend the unit to the beam, etc. Directly use the suspending bolts instead of the suspending screws.



Note

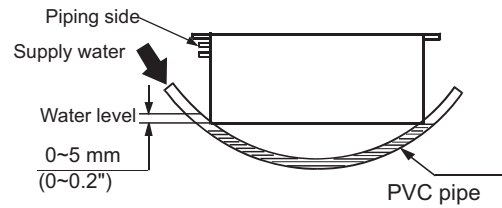
When the dimensions of main unit and ceiling holes does not match, it can be adjusted with the slot holes of hanging bracket.

Adjusting to the horizon

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 in the figure.

Unless the adjustment to the horizon is made properly, failure of the float switch may occur.



make the piping side slightly lower.

Fan speed selection (when using high efficient filter)

The fan motor composes red terminal and white terminal, which has been set at standard position when out of factory. When the static pressure is increased for using high efficient filter, you can change the connector position on the side of electric control box.

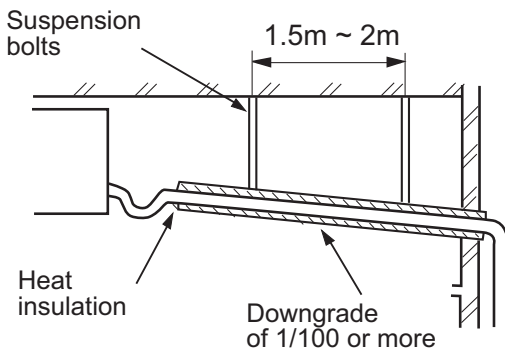
standard fan speed (out of factory)				high speed air outlet			
electric control box side	white	white connector	white	electric control box side	white	white connector	black
	blue		blue		white		
	yellow	yellow	blue				
	red	red	red				
fan motor side		fan motor side		fan motor side		fan motor side	

Static pressure, unit: Pa	
standard	max.
50	96

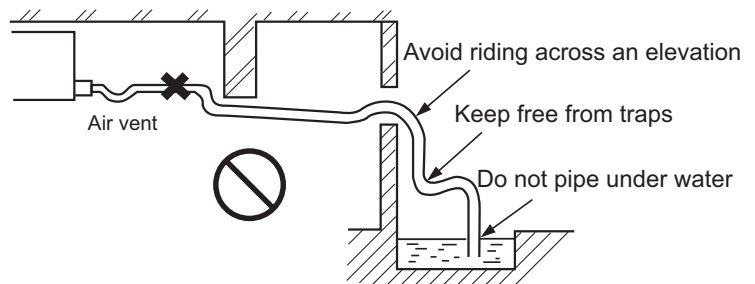
(4) Drain Piping

a. Drain piping should always be in a downhill grade (1/50~1/100) and avoid riding across an elevation or making traps.

● Good piping

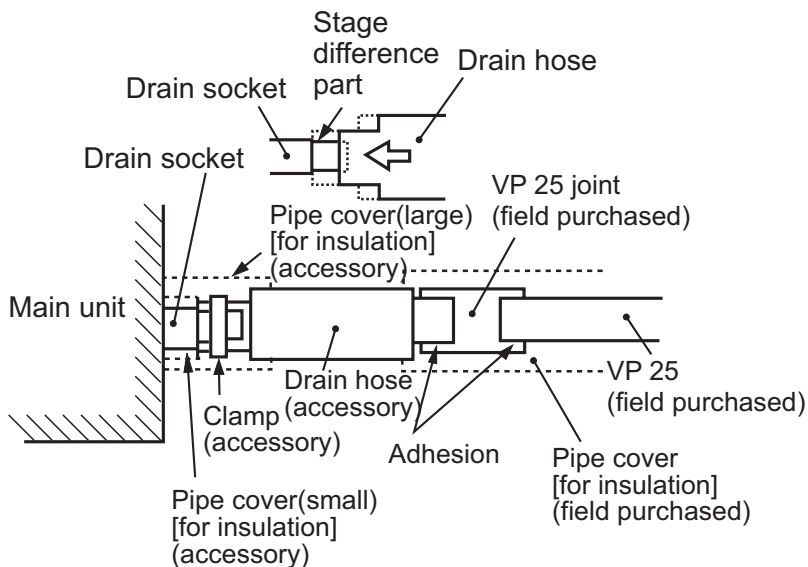


● Improper piping

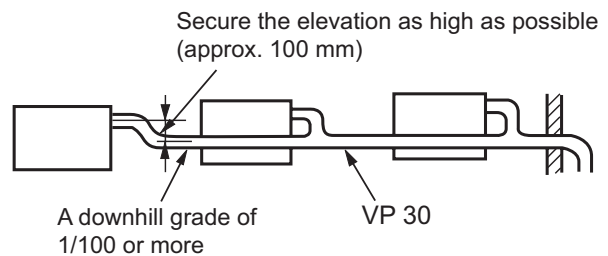


b. When connecting the drain pipe to unit, pay sufficient attention not to apply excess force to the piping on the unit side. Also, fix the piping at a point as close as possible to the unit.

c. For drain pipe, use hard PVC general purpose pipe VP-25(I.D.1") which can be purchased locally. When connecting, insert a PVC pipe end securely into the drain socket before tightening securely using the attached drain hose and clamp. Adhesive must not be used connection of the drain socket and drain hose (accessory).

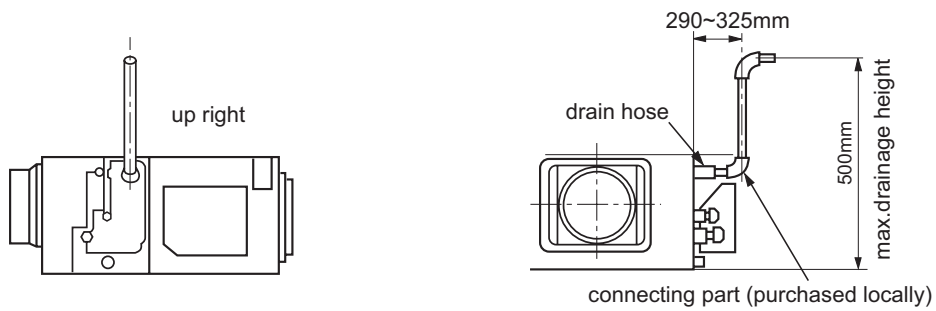


d. When constructing drain piping for several units, position the common pipe about 100 mm below the drain outlet of each unit as shown in the sketch. Use VP-30(11/4") or thicker pipe for this purpose.



e. The stiff PVC pipe put indoor side should be heat insulated.

f. The water pipe should be rised up within 500mm above the ceiling. When there is obstacle above the ceiling, adopt the bracket for water pipe to round the obstacle. When the extending height is higher than 500mm, the water return volume will be too much to cause drain pan overflow. So drainage pipe height should be in the range shown in the below figure.



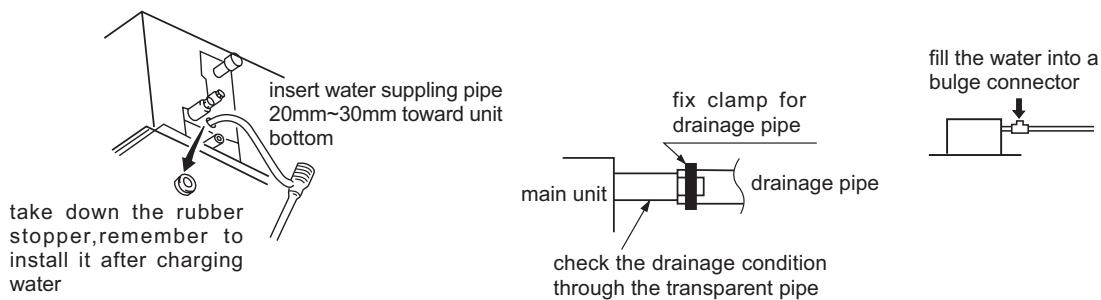
g. Avoid putting the outlet of drain hose in the places with irritant gas generated. Do not insert the drain hose directly into drainage, where the gas with sulfur may be generated.

(5) Drainage Test

- Conduct a drainage test after completion of the electrical work.
- During the trial, make sure that drain flows properly through the piping and that no water leaks from connections.
- In case of a new building, conduct the test before it is furnished with the ceiling.
- Be sure to conduct this test even when the unit is installed in the heating season.

(6) Procedures

- Supply about 1000 cc of water to the unit through the air outlet using a water feeding pump.
- Check the drain while cooling operation.

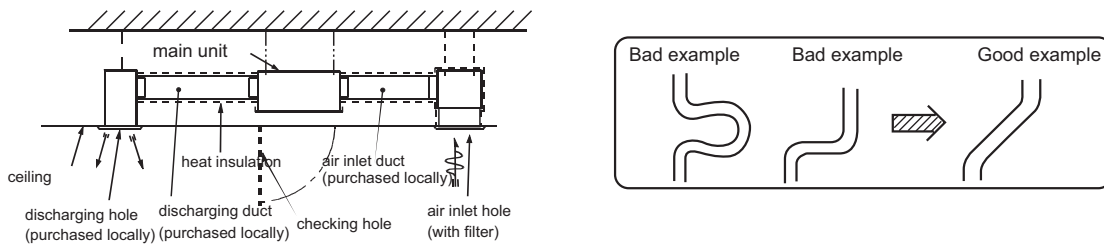


When the electric installation has not been finished, install a bulge connector on the drainage pipe to supply a water inlet. Then if there is water leaking from the pipe, check the system until the water can flow normally.

(7) Installation of air return duct and discharging duct

Please consult the after-sales service worker of Haier Air Conditioner for the choosing and installation of air inlet, air inlet duct, discharging outlet and discharging duct. Calculating the design drawing and outer static pressure, and choose the discharging duct with proper length and shape.

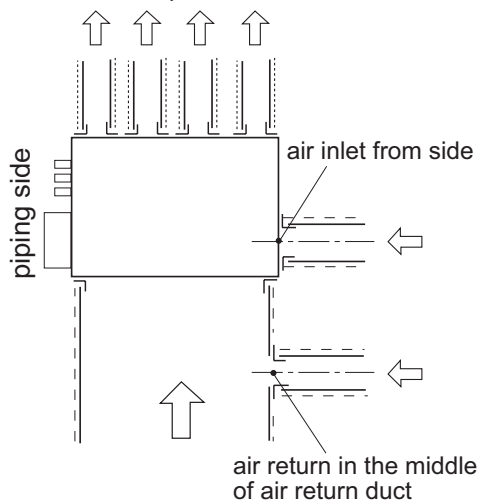
- The length difference among every duct is limited below 2:1.
- Reduce the length of duct as possible as can.
- Reduce the amount of bend as possible as can.
- Use heat insulation material to wrap the flange part between main unit and air discharging duct. Perform duct installation before the ceiling decoration.



(8) Connection of air return duct and discharging duct

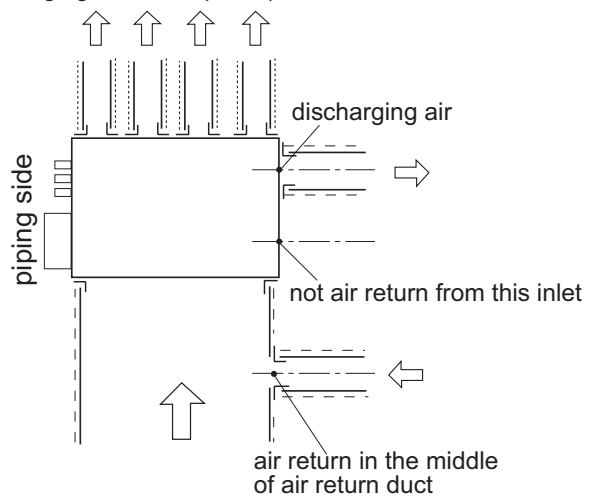
(a) fresh air inlet (from single side)

Air inlet from side plate or from air return duct



(b) discharging duct

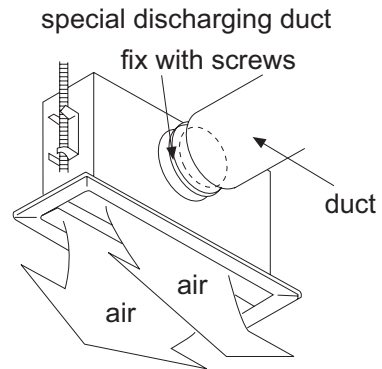
Discharging from side plate (combined with air return duct)



(c) Duct must be heat insulated to avoid causing dew.

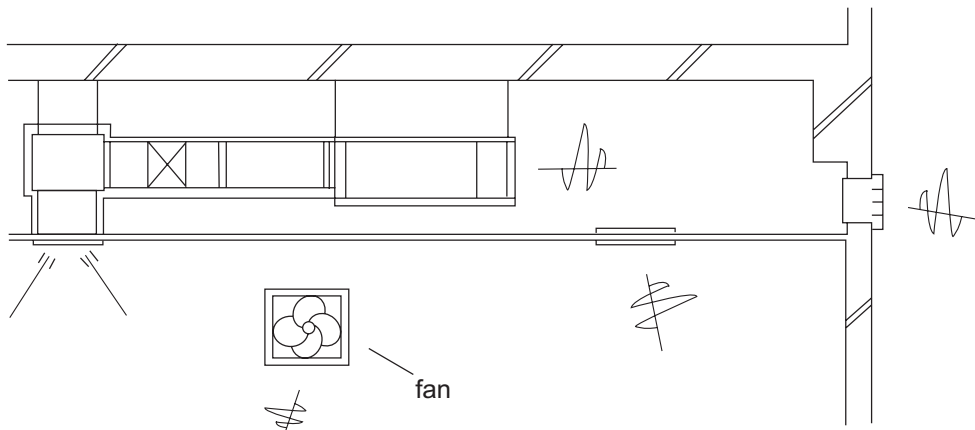
(9) Cautions for air return duct and discharging duct installation

- Suggest the duct with against-dew and noise absorbing material. (purchased locally)
- Finish duct installation before ceiling decoration.
- Duct must be heat insulated.
- Special discharging duct should be in the place where air can be distributed reasonably.
- Checking hole must be pre-set in the ceiling for easy checking and maintenance.



(10) Improper installation examples

- Without air return duct, take the ceiling inside as the duct. It will cause large humidity for nonregular air, strong wind, sunshine, etc.
- Water will drop from the outside of duct. For the new building with concrete, the humidity will be great, even through not taking the ceiling inside as the duct, so the duct should be with heat insulation.
- Exceed the unit operation range (e.g.: indoor DB 35degree, WB 24degree), which will result in compressor overload.
- Affected by the fan, strong wind and air direction, etc, when the unit air velocity exceeds the allowable limitation, the heat exchanger discharging water will overflow to cause water leakage.



improper example

A. Allowable pipe length and drop

These parameters differ from the outdoor unit. See the instruction manual attached with the outdoor unit for details.

B. Material of pipe and heat insulation

In order to avoid causing dew, heat insulation should be dealt with at gas side and liquid side.

Pipe	Rigid PVC pipe VP32mm (exterior diameter)
Insulation	Foamed PE with thickness above 7 mm

C. Pipe material and size

Pipe material	Phosphorus deoxidized copper seamless pipe (TP2) for air conditioner		
model		DBV030	DBV038~48
Pipe size (mm)	Gas side	∅ 15.88	∅ 15.88
	Liquid side	∅ 9.52	∅ 9.52

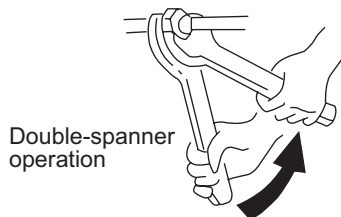
D. Recharge of refrigerant

The refrigerant recharge shall be performed as specified in the installation instructions. The adding procedure shall be aided with a measuring meter for a specified amount of supplemented refrigerant.

E. Refrigerant pipe connection

Conduct flared connection work to connect all refrigerant pipes.

- The connection of indoor unit pipes must use double spanners.
- The installing torque shall be as given in the following table.



Connecting pipe O.D.(mm)	Installing torque (N.m)
∅ 9.52	32.7~39.9
∅ 15.88	78.4~98.0
∅ 19.05	97.2~118.6

11) Duct design and installation

A. Count the necessary static pressure for air sending duct and air return duct and select proper model due to static pressure. Forbidden to take the MED ESP unit as the Low ESP unit or use the unit without duct.

B. Air sending duct and air return duct should be heat insulated.

C. Forbidden to get air return from the ceiling directly.

D. Adopt air return from indoor, and forbidden air return from corridor.

E. Forbidden to use the duct unit as the fresh air motor.

F. The selection of indoor air sending/return duct should consider the indoor air distribution. Air sending hole and air return hole should be a distance to avoid the short circuit. Meanwhile air outlet position and direction should consider the cooling/heating effect and avoid the hot air can blow down because of the air outlet too high.

Cut pipe and expand pipe

When pipe is too long or flared pipe is damaged, the intaller will cut pipe or expand pipe.

Evacuation

Evacuate from the stop valve with vacuum pump, and must not discharge the refrigerant in the outdoor directly.

Open all valves

Open all valves, but when only one master unit is running, the oil equalization valve should close.

Leakage checking

Check if there is leakage on the pipe connection and the valve cap with a leakage detector or soap water.

Wiring method



1. Ring terminal wiring:

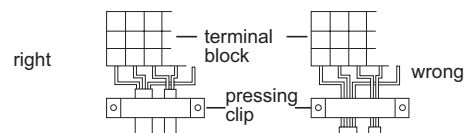
The wiring method is as the above figure, take off the screw, lead the screw through the ring terminal, then press it in the terminal block to fasten the screw.

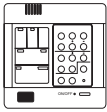




2. Straight terminal wiring





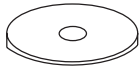
Loose the screw, put the wire end into the terminal block, then fasten the screw, pull out the wire to confirm if the wire is fixed firmly.

3. Pressing method of connection wire

After wiring, press the connection wire at the wire sleeve firmly with pressing clip, as the figure:



name	Wired controller	Signal wire		Screw cap
shape				 large  small
quantity	1	1	6	1 + 1

name	Screw	Heat insulation cushion	Cement steel nail	Washer
shape		 for gas pipe  for liquid pipe		
quantity	12	1 + 1	12	8

The others: operation manual or other documents

High static pressure duct type indoor unit

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9. Noise level	120
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11. Accessories	128

1. Features



DCV018
DCV024
DCV028
DCV030
DCV038
DCV048



DCV072
DCV096

0~196Pa external static pressure

The external static pressure can be adjusted from 0Pa to 196Pa steplessly, which will make the unit supply quick temperature adjustment to the room.

The unit is built in the ceiling, space saving

The duct unit is installed above the ceiling, just leaving the air outlet in the ceiling, which will not affect the indoor decor and supply less space of indoor.

Multi rooms sharing one indoor unit

The duct unit can be applicable for multi rooms, because the duct can be set as multiple air outlets according to the load.



2. Specifications

Model		DCV018	DCV024	DCV028
Nominal cooling capacity(KW)		5.6	7.1	8
Nominal heating capacity(KW)		6.3	8	9
Electrical heating power(KW) /Current(A)		2.6/11.9	2.6/11.9	2.6/11.9
Heating capacity at low temp.(KW)		5.0	6.3	7.1
Electrical characteristics	Power source	1PH, 220~230V, 50Hz		
	Operating current(A)	1.4	1.4	1.4
	Power consumption(KW)	0.28	0.28	0.28
Fan characteristics	Fan type and Qty	centrifugal*2	centrifugal*2	centrifugal*2
	Fan motor output(KW)	0.23	0.23	0.23
	Standard airflow(m ³ /h)	900~1500	900~1500	900~1500
	Standard static pressure(Pa)	100	100	100
	Max. static pressure(Pa)	196	196	196
Exterior dimensions(mm)		970*875*360	970*875*360	970*875*360
Air outlet dimensions(mm)		600*250	600*250	600*250
Weight(net/gross, Kg)		48/56	48/56	48/56
Controller		Wired controller/ wireless controller (optional)		
Accessories		Use for installation		
Piping dimension	Gas piping(mm)	∅ 12.7	∅ 15.88	∅ 15.88
	Liquid piping(mm)	∅ 6.35	∅ 9.52	∅ 9.52
	Drain hose(mm)	∅ 32	∅ 32	∅ 32
Noise level(dB(A)) H/L		42/40	42/40	42/40

Norminal condition: indoor temperature (cooling): 27°CDB/19°CWB, indoor temperature (heating): 20°CDB/14.5°CWB

Outdoor temperature(cooling): 35°CDB/24°CWB, outdoor temperature(heating): 7°CDB/6°CWB

The noise level will be measured in the third octave band limited values in the semi-anechoic chamber, using a Real Time Analyser calibrated sound intensity meter. It is a sound pressure noise level.



Model	DCV030	DCV038	DCV048	
Nominal cooling capacity(KW)	9.0	11.2	14.0	
Nominal heating capacity(KW)	10.0	12.5	16.0	
Electrical heating power(KW) /Current(A)	----	----	----	
Heating capacity at low temp.(KW)	8.0	10.0	12.5	
Electrical characteristics	Power source	1PH, 220~230V, 50Hz		
	Operating current(A)	1.5	1.6	1.8
	Power consumption(KW)	0.3	0.32	0.36
Fan characteristics	Fan type and Qty	centrifugal*2	centrifugal*2	centrifugal*2
	Fan motor output(KW)	0.27	0.27	0.27
	Standard airflow(m ³ /h)	1560	1600	2100
	Standard static pressure(Pa)	100	100	100
	Max. static pressure(Pa)	196	196	196
Exterior dimensions(mm)	1350*875*360	1350*875*360	1350*875*360	
Air outlet dimensions(mm)	850*250	850*250	850*250	
Weight(net/gross, Kg)	62/77	62/77	62/77	
Controller	Wired controller/ wireless controller (optional)			
Accessories	Use for installation			
Piping dimension	Gas piping(mm)	Ø 15.88	Ø 15.88	Ø 15.88
	Liquid piping(mm)	Ø 9.52	Ø 9.52	Ø 9.52
	Drain hose(mm)	Ø 32	Ø 32	Ø 32
Noise level(dB(A)) H/L	45/40	45/40	45/40	

Norminal condition: indoor temperature (cooling): 27°CDB/19°CWB, indoor temperature (heating): 20°CDB/14.5°CWB
 Outdoor temperature(cooling): 35°CDB/24°CWB, outdoor temperature(heating): 7°CDB/6°CWB

The noise level will be measured in the third octave band limited values in the semi-anechoic chamber, using a Real Time Analyser calibrated sound intensity meter. It is a sound pressure noise level.



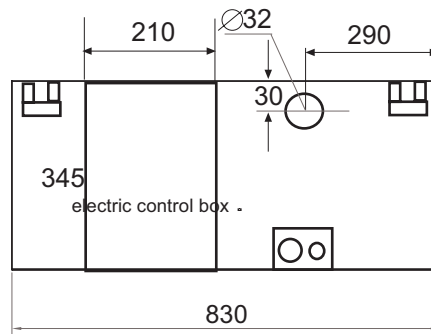
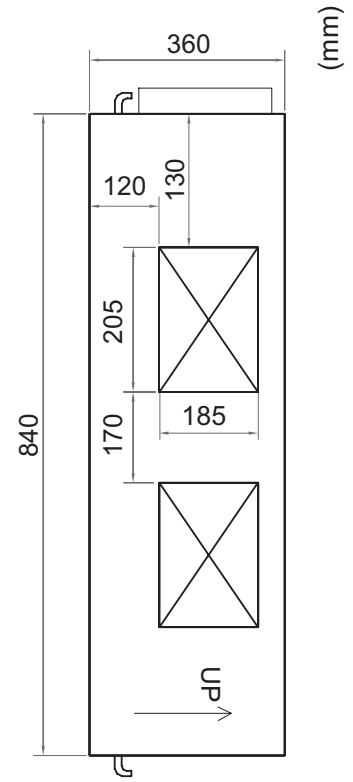
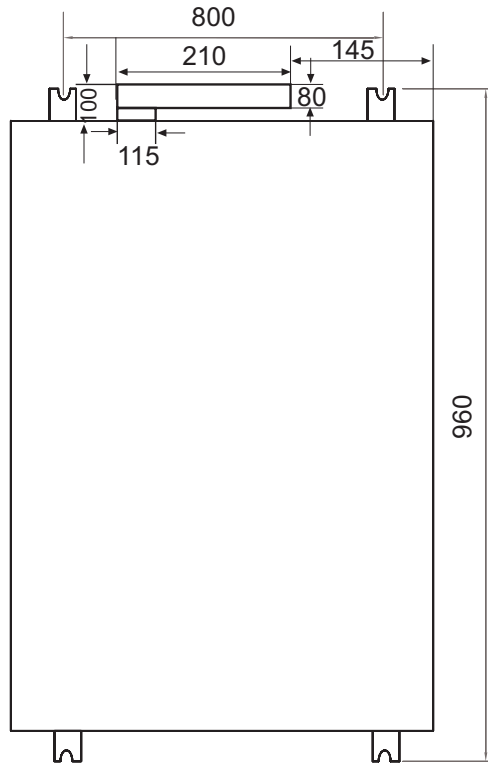
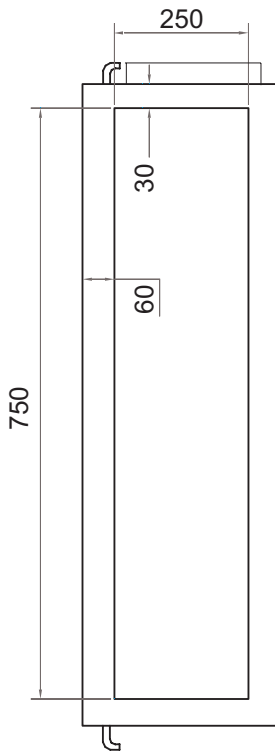
Model	DCV072	DCV096
Nominal cooling capacity(KW)	22.6	28
Nominal heating capacity(KW)	25	31
Electrical heating power(KW) /Current(A)	---	---
Heating capacity at low temp.(KW)	---	---
Electrical characteristics	Power source	1PH, 220~230V, 50Hz
	Operating current(A)	3
	Power consumption(KW)	0.6
Fan characteristics	Fan type and Qty	centrifugal*4
	Fan motor output(KW)	0.27
	Standard airflow(m ³ /h)	4050/3600/3000
	Standard static pressure(Pa)	100
	Max. static pressure(Pa)	196
Exterior dimensions(mm)	1570*830*360	1570*830*360
Air outlet dimensions(mm)	1515*250	1515*250
Weight(net/gross, Kg)	92/100	92/100
Controller	Wired controller/ wireless controller (optional)	
Accessories	Use for installation	
Piping dimension	Gas piping(mm)	∅ 15.88*2
	Liquid piping(mm)	∅ 9.52*2
	Drain hose(mm)	∅ 32
Noise level(dB(A)) H/L	54/49	54/49

Norminal condition: indoor temperature (cooling): 27°CDB/19°CWB, indoor temperature (heating): 20°CDB/14.5°CWB
 Outdoor temperature(cooling): 35°CDB/24°CWB, outdoor temperature(heating): 7°CDB/6°CWB

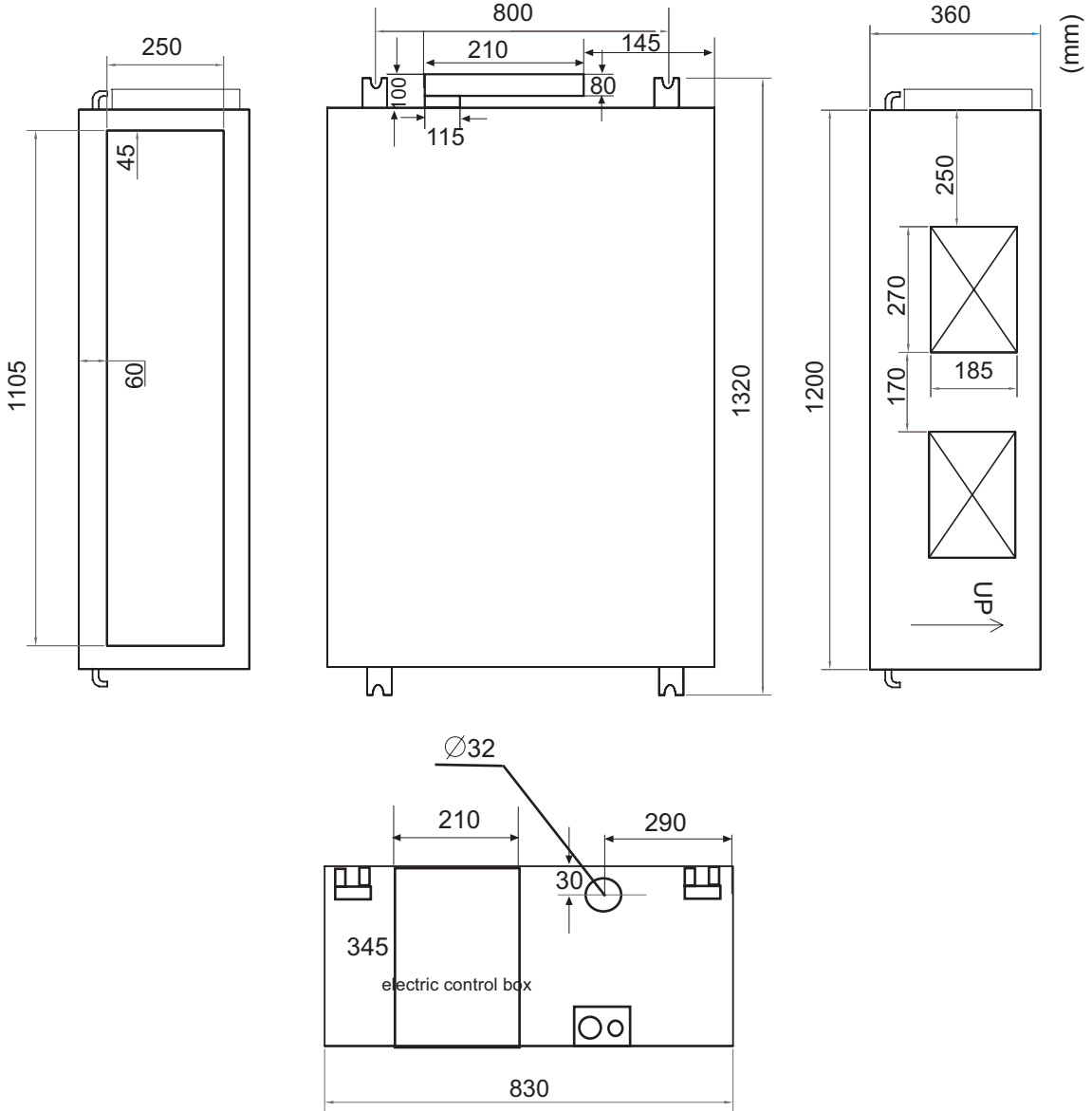
The noise level will be measured in the third octave band limited values in the semi-anechoic chamber, using a Real Time Analyser calibrated sound intensity meter. It is a sound pressure noise level.

3. Dimensions

DCV018 DCV024 DCV028

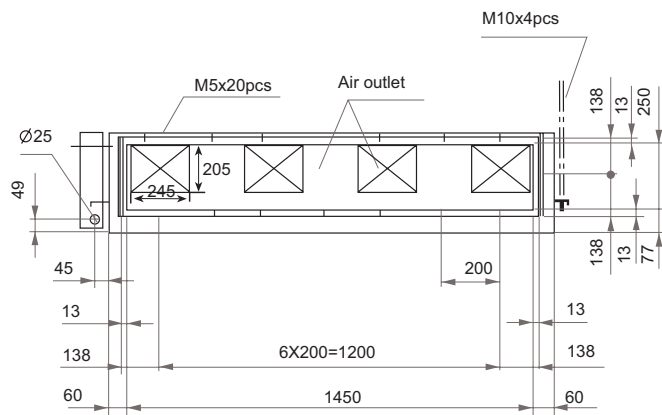
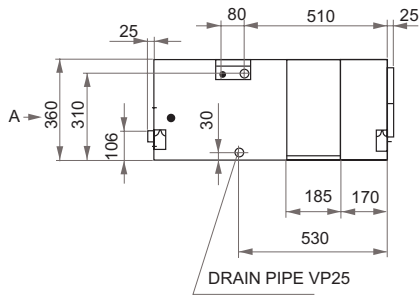
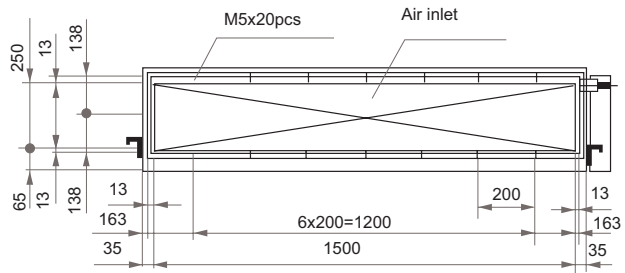
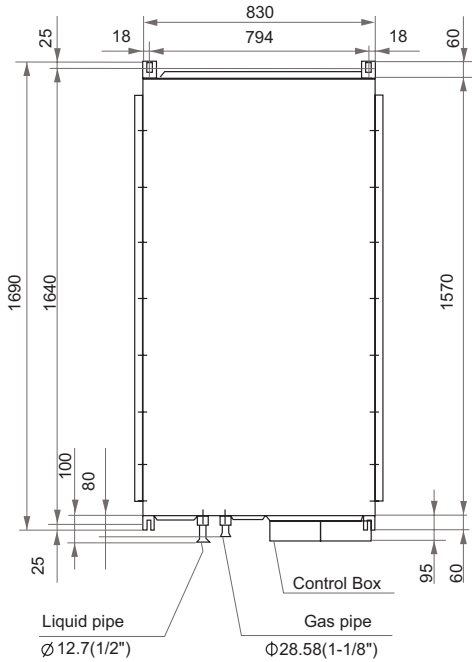


DCV030 DCV038 DCV048

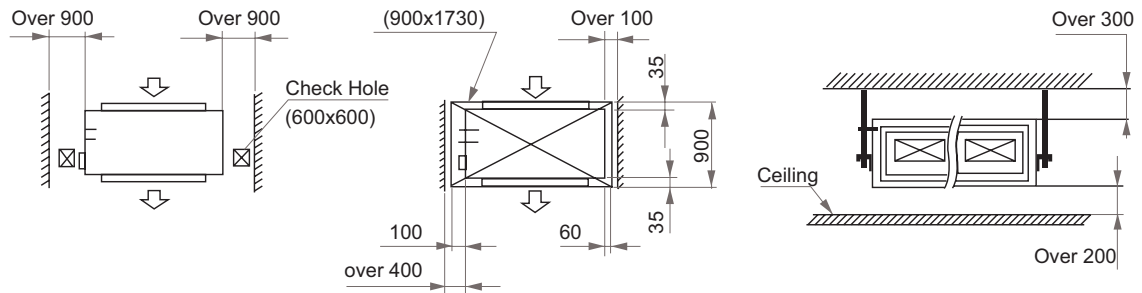


DCV072 DCV096

(mm)

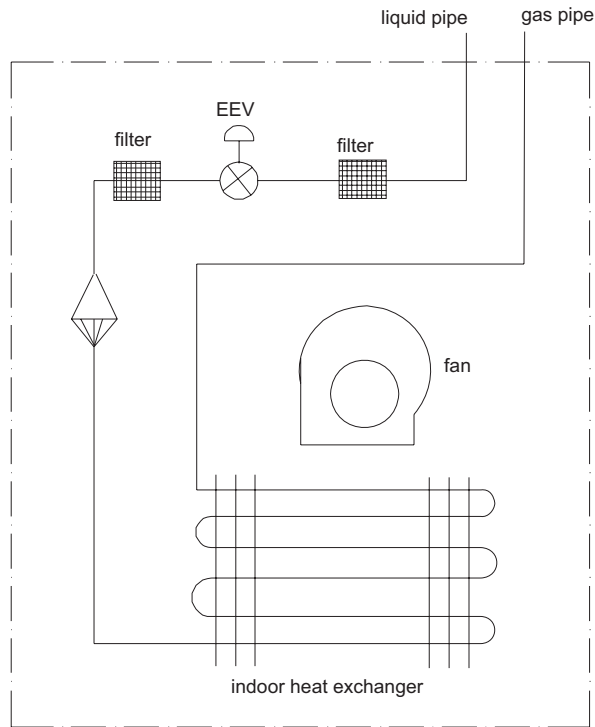


Installation dimension

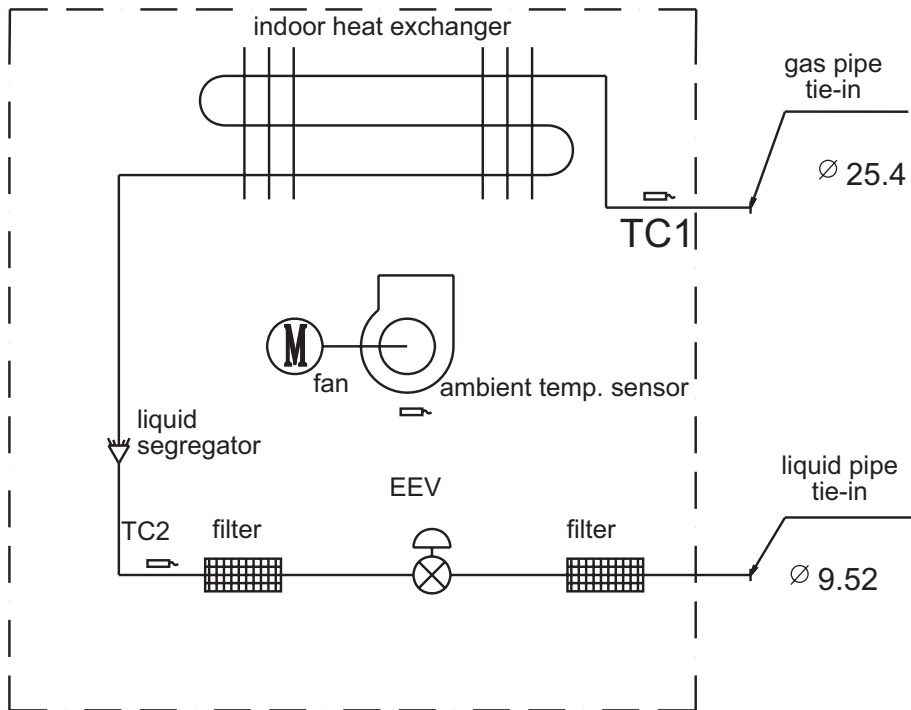


4. Piping diagrams

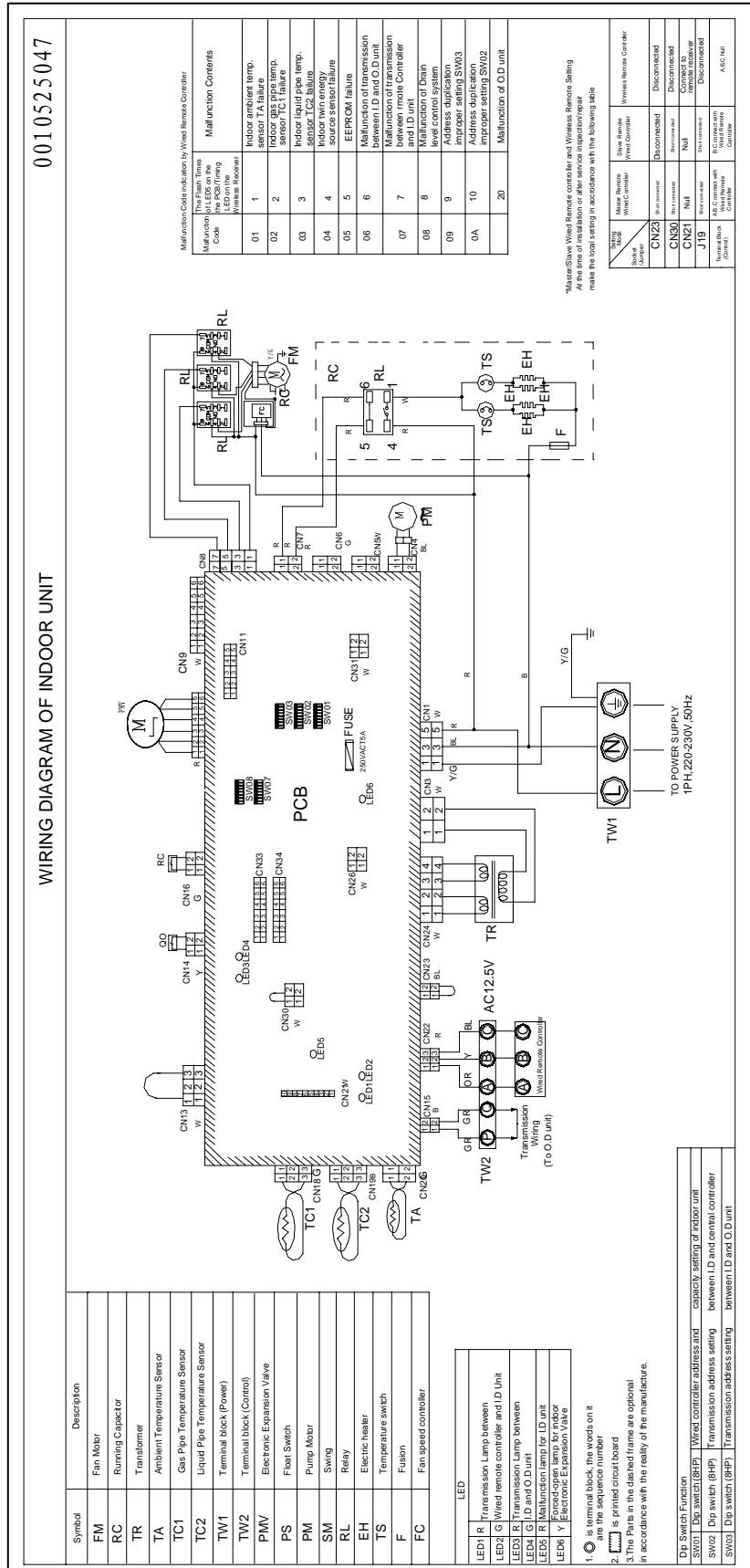
DCV018~48



DCV072~96



5. Wiring diagrams





6. Electric characteristic

units					power supply		indoor fan motor		power input(W)	
model	phase	FQY	voltage	volt. range	MCA	MFA	W	FLA	cooling	heating
DCV018	1	50	220	198~242	3.5	8	240	2	280	280
DCV024	1	50	220	198~242	3.5	8	240	2	280	280
DCV028	1	50	220	198~242	3.4	9	240	2.3	280	280
DCV030	1	50	220	198~242	3.375	10.8	270	2.7	300	300
DCV038	1	50	220	198~242	3.375	10.8	270	2.7	320	320
DCV048	1	50	220	198~242	3.375	10.8	270	2.7	360	360
DCV072	1	50	220	198~242	1.88	6	270	1.5	600	600
DCV096	1	50	220	198~242	1.88	6	270	1.5	600	600

Symbols:

MCA: Min. circuit amps (A)

MFA: Max. fuse amps of circuit breaker

W: Fan motor rated output(W)

FLA: Full load amps(A)

Notes:

1. Voltage range

The units are applicable for the electrical systems where voltage supplied to unit is in the range.

2. Maximum allowable voltage unbalance between phases is 2%.

3. $MCA = 1.25 * FLA$

$$MFA \leq 4 * FLA$$

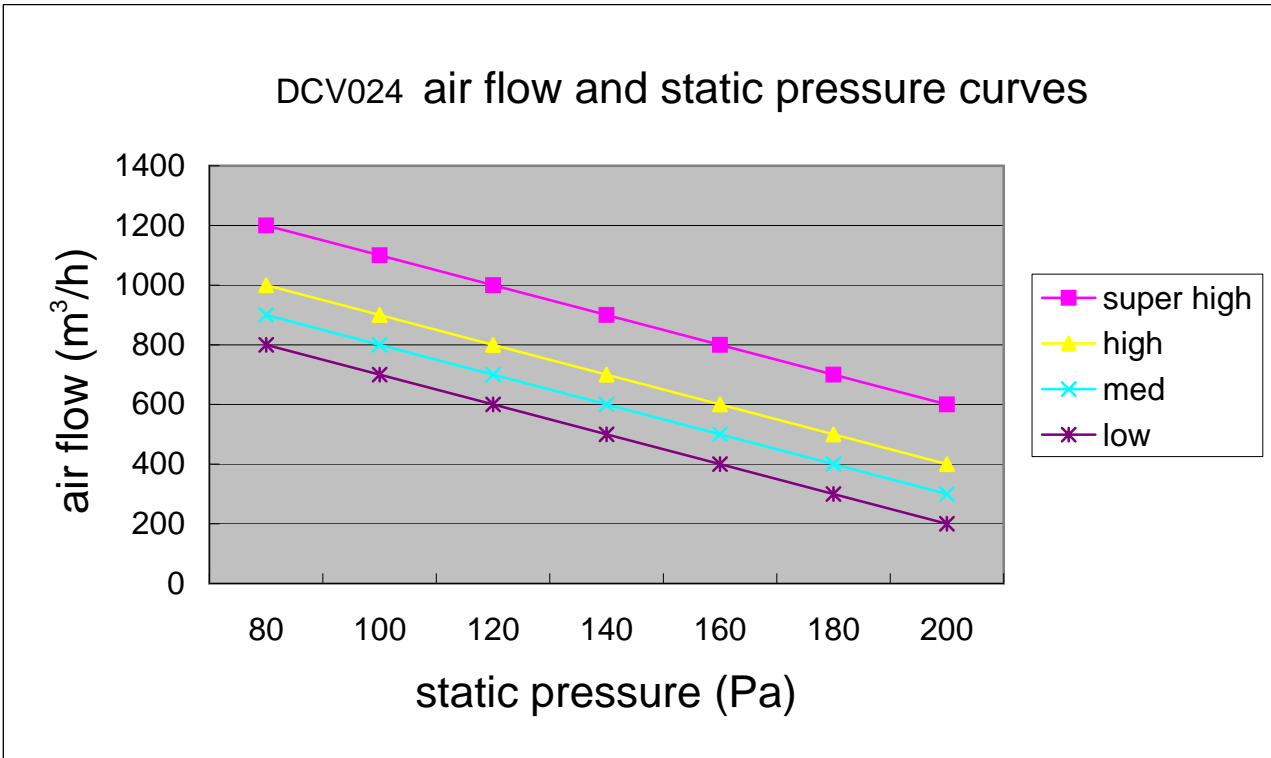
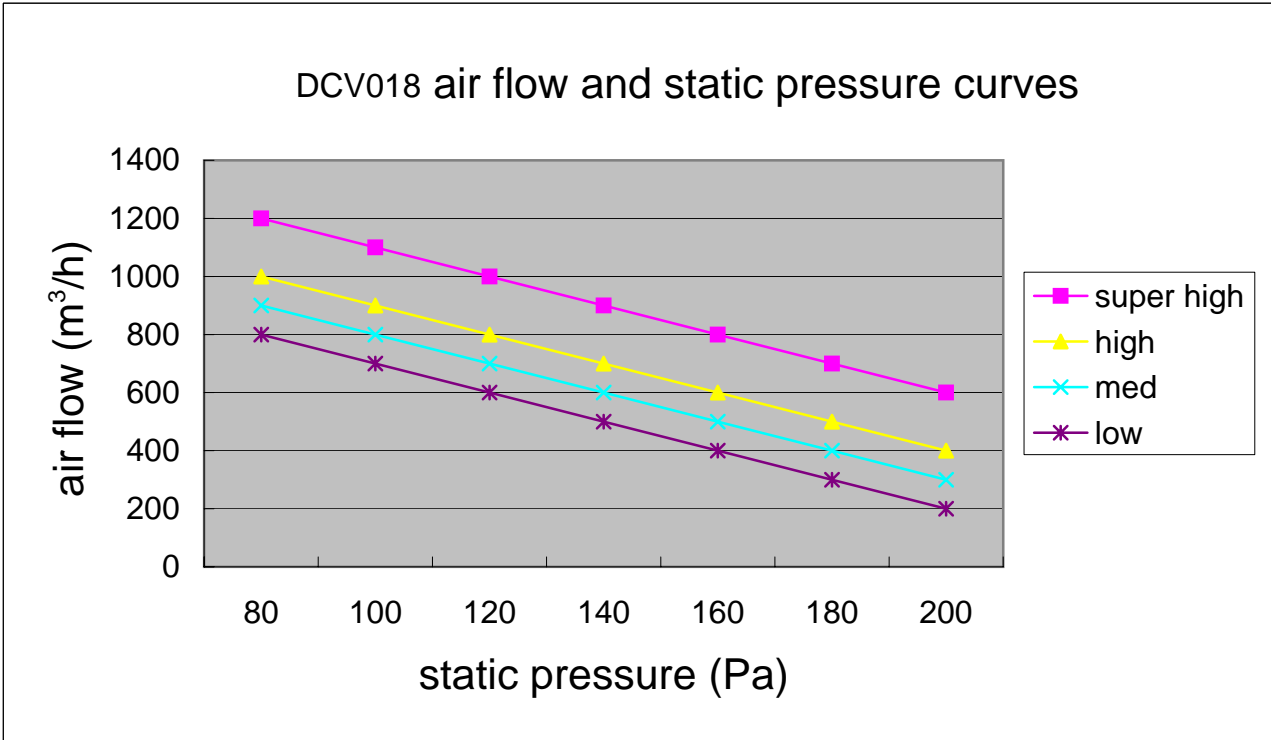
4. Power supply uses the circuit breaker



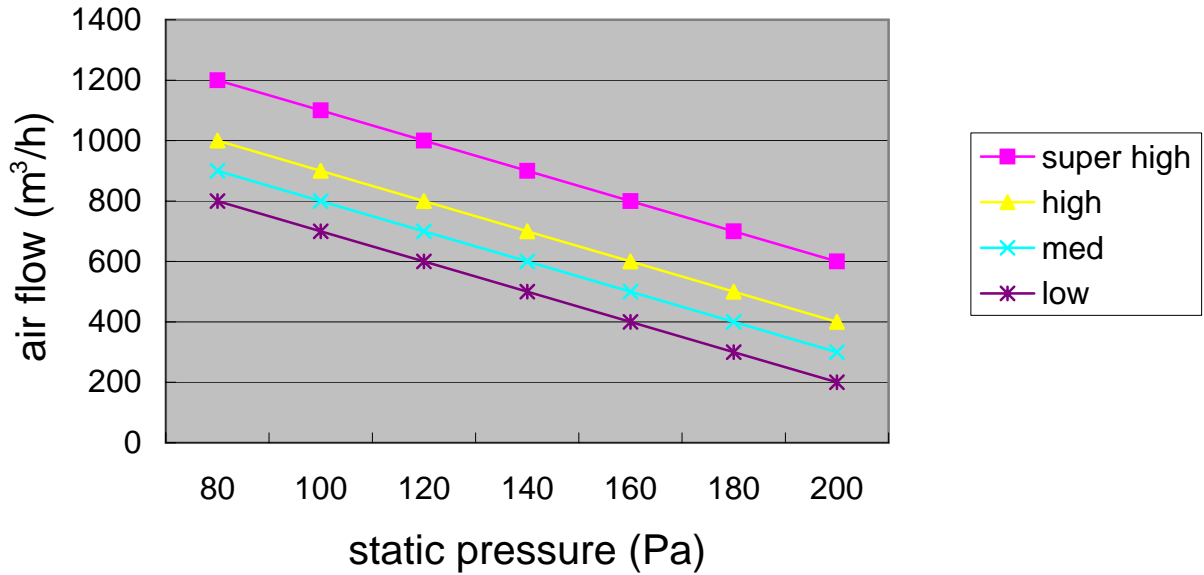
Heating mode:

capa city(W*1 00)	outdoor temp. °CDB	indoor temp.(°CDB)				capa city(W*10 0)	outdoor r temp. °CDB	indoor temp.(°CDB)				capaci ty(W* 100)	outdoor temp. °CDB	indoor temp.(°CDB)			
		15.0	20.0	25.0	27.0			15.0	20.0	25.0	27.0			15.0	20.0	25.0	27.0
		SHC	SHC	SHC	SHC			SHC	SHC	SHC	SHC			SHC	SHC	SHC	SHC
22	-15.0	1.7	1.6	1.6	1.6	56	-15.0	4.2	4.2	4.1	4.1	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	1.9	1.9	1.9	1.7		-10.0	4.8	4.8	4.7	4.3		-10.0	12.2	12.1	11.9	11.0
	-5.0	2.1	2.1	1.9	1.7		-5.0	5.4	5.3	4.9	4.3		-5.0	13.7	13.6	12.5	11.0
	0.0	2.4	2.4	1.9	1.7		0.0	6.0	5.9	4.9	4.3		0.0	15.3	15.1	12.5	11.0
	2.5	2.5	2.5	1.9	1.7		2.5	6.3	6.2	4.9	4.3		2.5	16.0	15.8	12.5	11.0
	6.0	2.5	2.5	1.9	1.7		6.0	6.4	6.3	4.9	4.3		6.0	16.2	16.0	12.5	11.0
	6.5	2.6	2.5	1.9	1.7		6.5	6.6	6.3	4.9	4.3		6.5	16.8	16.0	12.5	11.0
	10.0	2.8	2.5	1.9	1.7		10.0	7.1	6.3	4.9	4.3		10.0	18.0	16.0	12.5	11.0
	12.5	3.0	2.5	1.9	1.7		12.5	7.5	6.3	4.9	4.3		12.5	19.1	16.0	12.5	11.0
	15.5	3.0	2.5	1.9	1.7		15.5	7.6	6.3	4.9	4.3		15.5	19.4	16.0	12.5	11.0
28	-15.0	2.1	2.1	2.1	2.1	71	-15.0	5.4	5.3	5.2	5.2	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	2.4	2.4	2.4	2.2		-10.0	6.1	6.0	6.0	5.5		-10.0	12.2	12.1	11.9	11.0
	-5.0	2.7	2.7	2.5	2.2		-5.0	6.9	6.8	6.2	5.5		-5.0	13.7	13.6	12.5	11.0
	0.0	3.1	3.0	2.5	2.2		0.0	7.6	7.5	6.2	5.5		0.0	15.3	15.1	12.5	11.0
	2.5	3.2	3.2	2.5	2.2		2.5	8.0	7.9	6.2	5.5		2.5	16.0	15.8	12.5	11.0
	6.0	3.2	3.2	2.5	2.2		6.0	8.1	8.0	6.2	5.5		6.0	16.2	16.0	12.5	11.0
	6.5	3.4	3.2	2.5	2.2		6.5	8.4	8.0	6.2	5.5		6.5	16.8	16.0	12.5	11.0
	10.0	3.6	3.2	2.5	2.2		10.0	9.0	8.0	6.2	5.5		10.0	18.0	16.0	12.5	11.0
	12.5	3.8	3.2	2.5	2.2		12.5	9.6	8.0	6.2	5.5		12.5	19.1	16.0	12.5	11.0
	15.5	3.9	3.2	2.5	2.2		15.5	9.7	8.0	6.2	5.5		15.5	19.4	16.0	12.5	11.0
36	-15.0	2.7	2.6	2.6	2.6	80	-15.0	6.0	5.9	5.9	5.9	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	3.1	3.0	3.0	2.8		-10.0	6.9	6.8	6.7	6.2		-10.0	12.2	12.1	11.9	11.0
	-5.0	3.4	3.4	3.1	2.8		-5.0	7.7	7.6	7.0	6.2		-5.0	13.7	13.6	12.5	11.0
	0.0	3.8	3.8	3.1	2.8		0.0	8.6	8.5	7.0	6.2		0.0	15.3	15.1	12.5	11.0
	2.5	4.0	4.0	3.1	2.8		2.5	9.0	8.9	7.0	6.2		2.5	16.0	15.8	12.5	11.0
	6.0	4.0	4.0	3.1	2.8		6.0	9.1	9.0	7.0	6.2		6.0	16.2	16.0	12.5	11.0
	6.5	4.2	4.0	3.1	2.8		6.5	9.5	9.0	7.0	6.2		6.5	16.8	16.0	12.5	11.0
	10.0	4.5	4.0	3.1	2.8		10.0	10.1	9.0	7.0	6.2		10.0	18.0	16.0	12.5	11.0
	12.5	4.8	4.0	3.1	2.8		12.5	10.8	9.0	7.0	6.2		12.5	19.1	16.0	12.5	11.0
	15.5	4.8	4.0	3.1	2.8		15.5	10.9	9.0	7.0	6.2		15.5	19.4	16.0	12.5	11.0
40	-15.0	3.0	3.0	3.0	3.0	90	-15.0	6.7	6.6	6.5	6.5	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	3.5	3.4	3.4	3.1		-10.0	7.6	7.5	7.4	6.9		-10.0	12.2	12.1	11.9	11.0
	-5.0	3.9	3.8	3.5	3.1		-5.0	8.6	8.5	7.8	6.9		-5.0	13.7	13.6	12.5	11.0
	0.0	4.3	4.3	3.5	3.1		0.0	9.5	9.4	7.8	6.9		0.0	15.3	15.1	12.5	11.0
	2.5	4.5	4.5	3.5	3.1		2.5	10.0	9.9	7.8	6.9		2.5	16.0	15.8	12.5	11.0
	6.0	4.6	4.5	3.5	3.1		6.0	10.1	10.0	7.8	6.9		6.0	16.2	16.0	12.5	11.0
	6.5	4.8	4.5	3.5	3.1		6.5	10.5	10.0	7.8	6.9		6.5	16.8	16.0	12.5	11.0
	10.0	5.1	4.5	3.5	3.1		10.0	11.2	10.0	7.8	6.9		10.0	18.0	16.0	12.5	11.0
	12.5	5.4	4.5	3.5	3.1		12.5	12.0	10.0	7.8	6.9		12.5	19.1	16.0	12.5	11.0
	15.5	5.5	4.5	3.5	3.1		15.5	12.1	10.0	7.8	6.9		15.5	19.4	16.0	12.5	11.0
45	-15.0	3.3	3.3	3.3	3.3	112	-15.0	8.4	8.2	8.2	8.1	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	3.8	3.8	3.7	3.5		-10.0	9.6	9.4	9.3	8.6		-10.0	12.2	12.1	11.9	11.0
	-5.0	4.3	4.2	3.9	3.5		-5.0	10.7	10.6	9.8	8.6		-5.0	13.7	13.6	12.5	11.0
	0.0	4.8	4.7	3.9	3.5		0.0	11.9	11.8	9.8	8.6		0.0	15.3	15.1	12.5	11.0
	2.5	5.0	5.0	3.9	3.5		2.5	12.5	12.4	9.8	8.6		2.5	16.0	15.8	12.5	11.0
	6.0	5.1	5.0	3.9	3.5		6.0	12.5	12.5	9.8	8.6		6.0	16.2	16.0	12.5	11.0
	6.5	5.3	5.0	3.9	3.5		6.5	13.2	12.5	9.8	8.6		6.5	16.8	16.0	12.5	11.0
	10.0	5.6	5.0	3.9	3.5		10.0	14.1	12.5	9.8	8.6		10.0	18.0	16.0	12.5	11.0
	12.5	6.0	5.0	3.9	3.5		12.5	15.0	12.5	9.8	8.6		12.5	19.1	16.0	12.5	11.0
	15.5	6.1	5.0	3.9	3.5		15.5	15.1	12.5	9.8	8.6		15.5	19.4	16.0	12.5	11.0

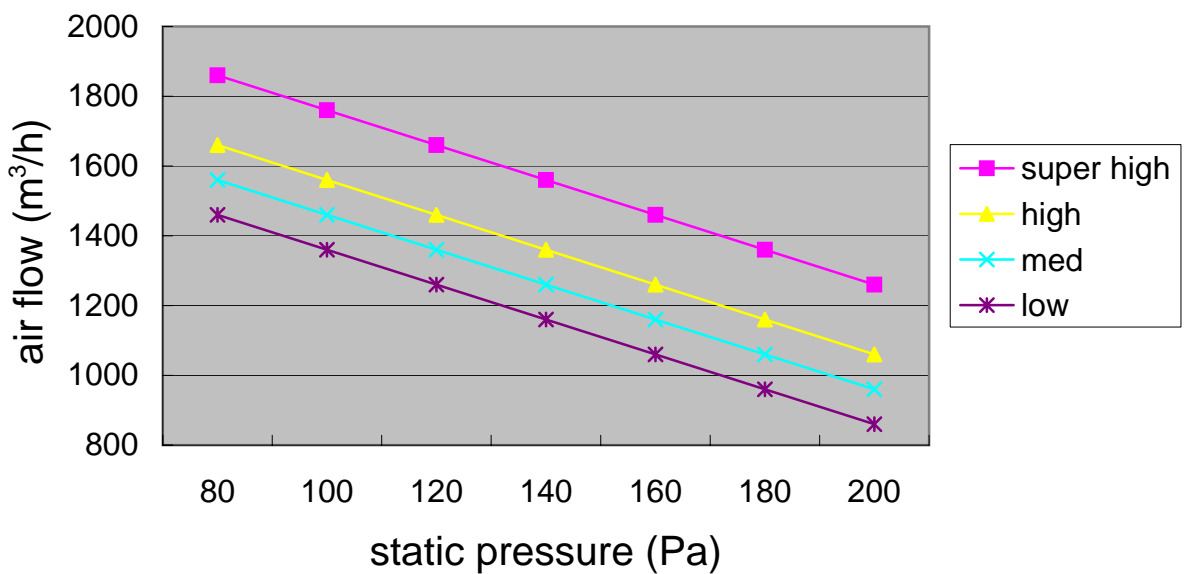
8. Air flow and static pressure curves

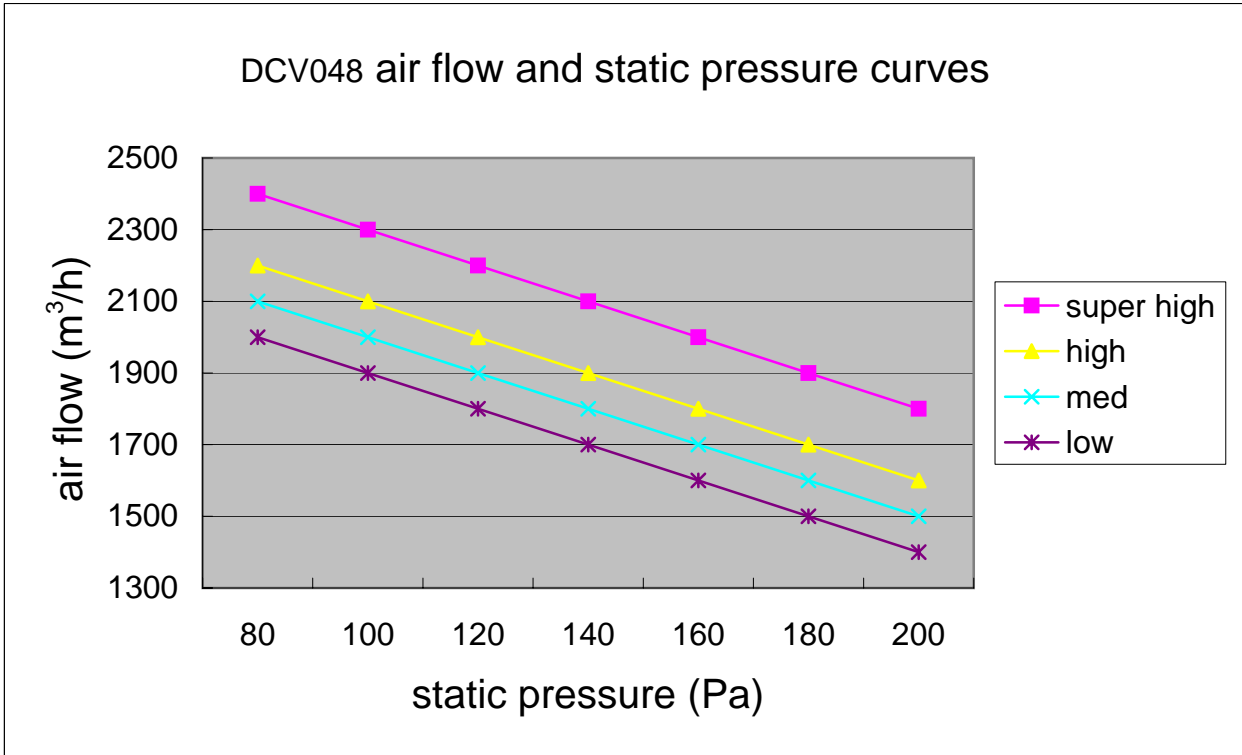
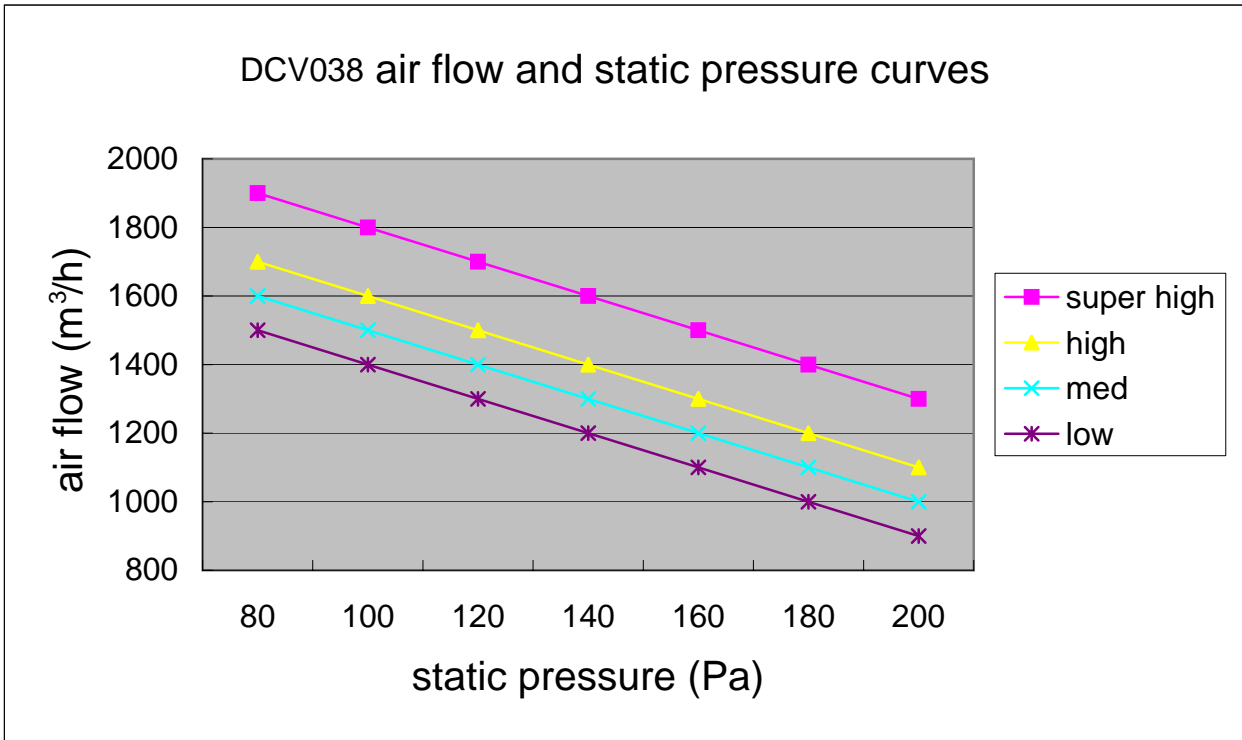


DCV028 air flow and static pressure curves



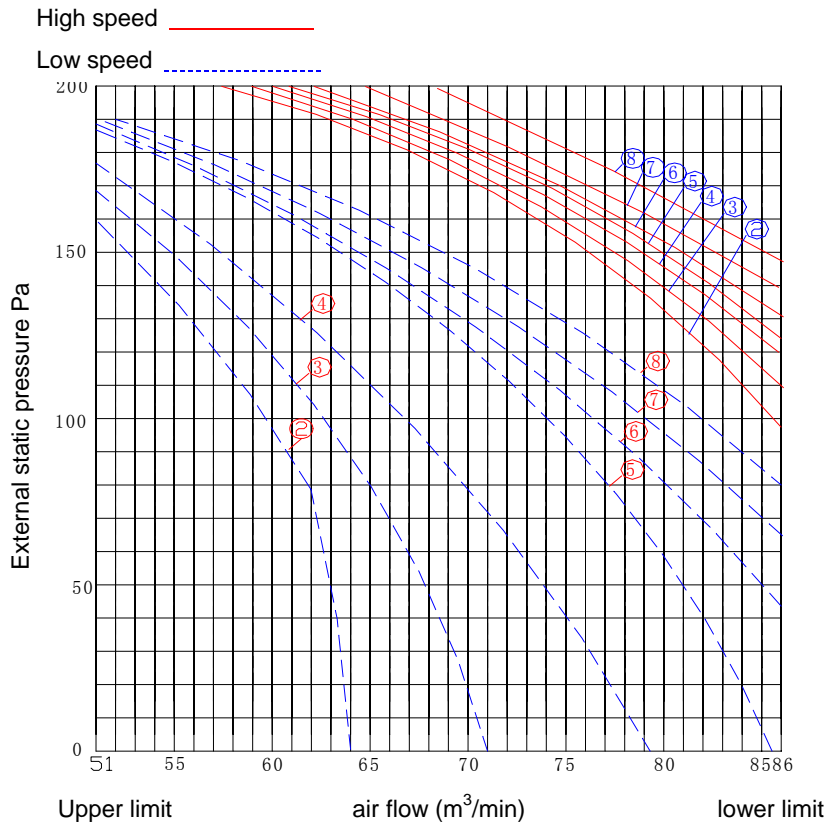
DCV030 air flow and static pressure curves





DCV072~96

1. The number in the circle stands for the step on the fan speed controller.
2. The red line shows the air flow and the static pressure varies due to the different steps in high speed. The blue dashed line shows the air flow and the static pressure varies due to the different steps in low speed.

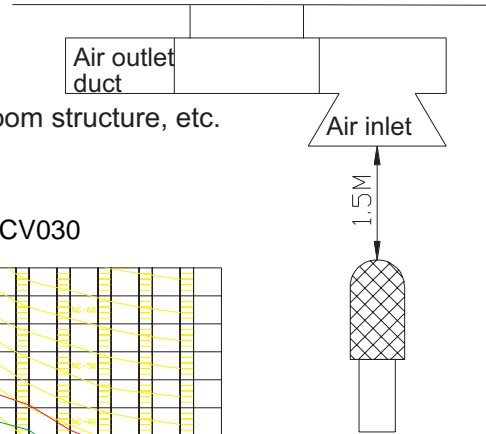


9. Noise level

(1) Testing illustrate:

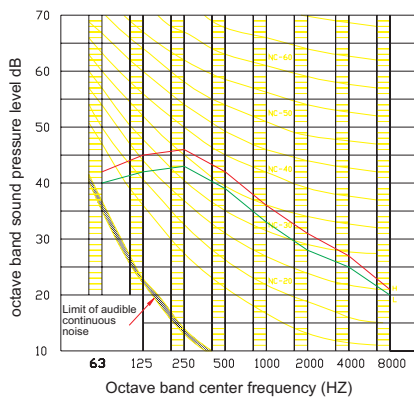
(2) Testing condition:

- a. Unit running in the nominal condition
- b. Test in the semi-anechoic chamber
- c. Noise level varies from the actual factors such as room structure, etc.

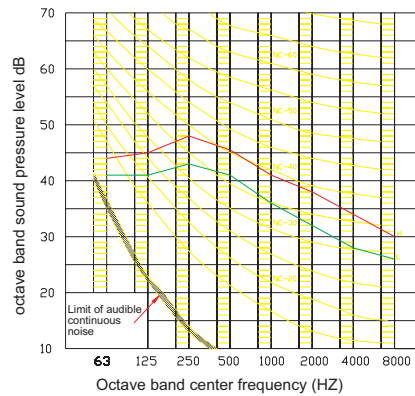


(3) Octave band level

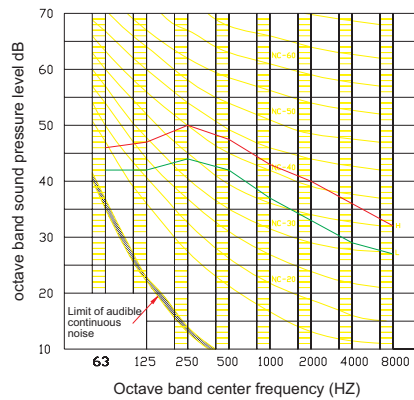
DCV018~28



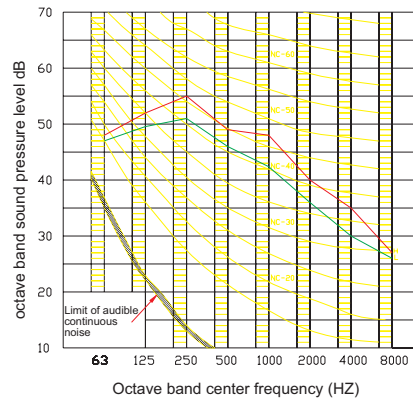
DCV030



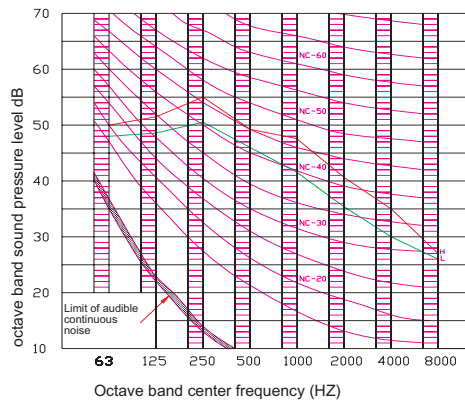
DCV038



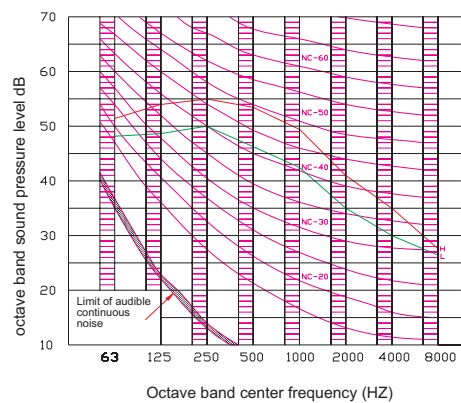
DCV048



DCV072



DCV096





10. Installation

(1) Before installation

- Confirm the way to move the unit to the installation place.
- Before moving the unit to the installation place, do not remove their packages.

When have to remove the package, use a soft material or protection board with rope to lift the unit assembly to avoid unit damage or bumping a scrape.

(2) Choose installation place

A. The chosen installation place should meet the following requirements and get the user's agreement.

- Place ensures ideal airflow distribution.
- The passage of airflow has no obstacles.
- When importing outside air, it should be imported directly from outdoors. (if the pipe can not be extended, it also can not be imported from top)
- Place ensures enough space for maintenance.
- The pipe length between indoor and outdoor unit is in the permitted limit (referring to outdoor unit installation part).
- The indoor unit, outdoor unit, electric wire and connection wire is at least 1m away from television and radio. This is to avoid the image disturbance and noise caused by the above-mentioned home appliance. (Even if 1m away, if the electromagnetic wave is too strong, it can also cause noise.)

B. The height of ceiling

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

C. Install the unit with suspending pole. Check if the installation place can bear the unit.

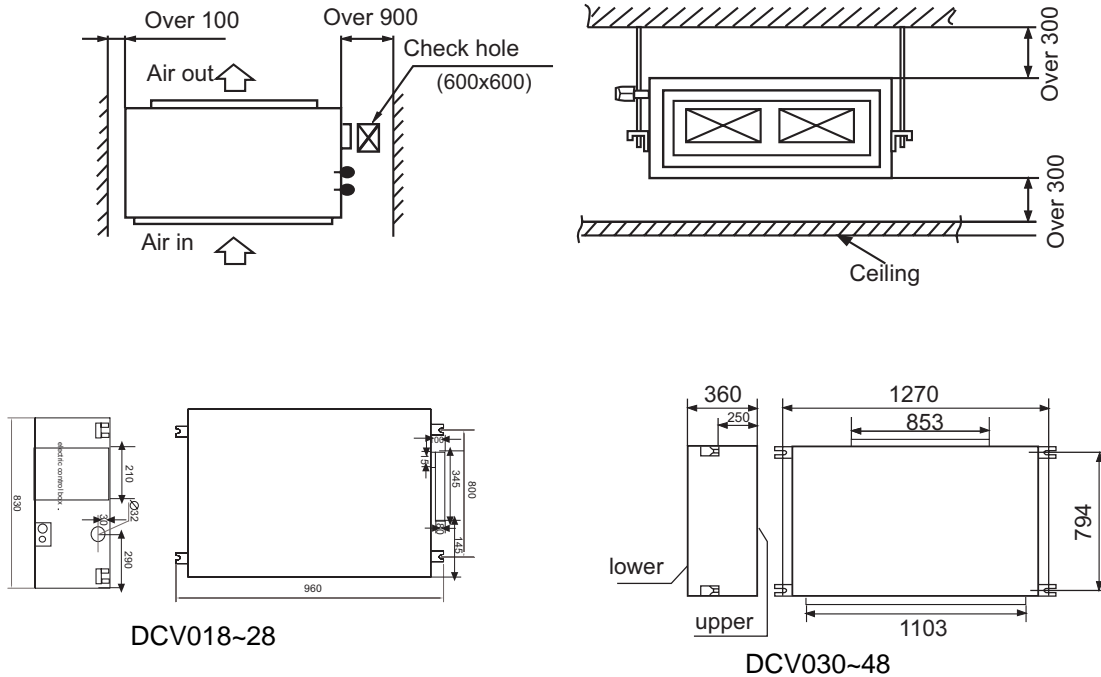
If not certain, strengthen it before installing the unit.

Pay attention: for DCV072~96, there are two sets of pipes in the unit, please use branch pipe when installation, the spec is TAU 506, details please refer to the using guide of the Branch pipe.

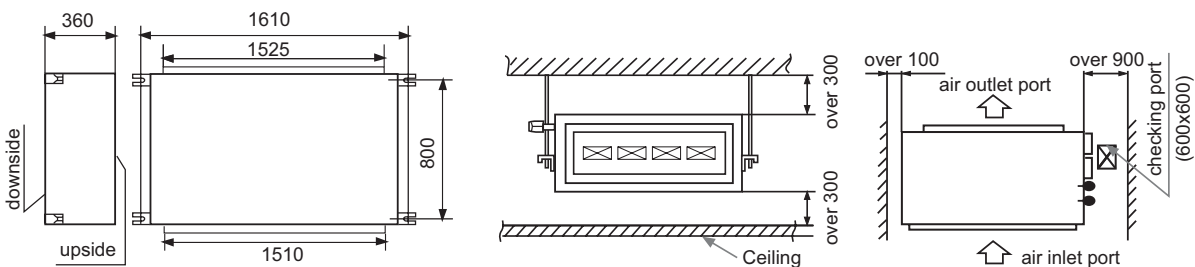
(3) Indoor installation

A. The relationship among the ceiling checking hole, the unit and the suspension pole (unit: mm)

DCV018~48



DCV072~96



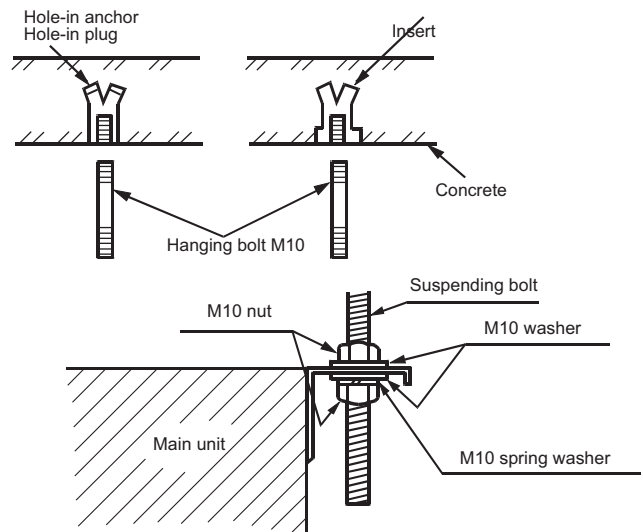
B. If necessary, prepare all the needed installation and checking hole on the ceiling (with existing ceiling)

- Before installation, prepare all the pipes (refrigerant, drainage) and wire (wire controller connection wire, indoor and outdoor unit connection wire) connected with indoor, so that after installation, they can be immediately connected with indoor.
- Cut the opening on the ceiling. Maybe it needs to strengthen the ceiling to keep the ceiling even and flat and prevent the ceiling from vibration. For details, please consult the builder.

C. Suspending bolts installation

(Use M10 screw bolt)

To bear the unit, in the place with existing ceiling, use the foundation bolt; while in the place with new built ceiling, use the built-in bolt, embedded bolt or other parts supplied on field. Before installation, adjust the distance to the ceiling.



D. Installation of indoor unit

Fix the indoor unit to the suspending bolts.

If necessary, it is possible to suspend the unit to the beam, etc.

Directly use the suspending bolts instead of the suspending screws.

Note

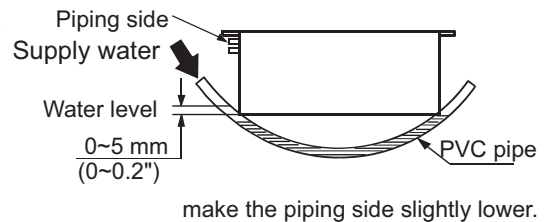
When the dimensions of main unit and ceiling holes does not match, it can be adjusted with the slot holes of hanging bracket.

Adjusting to the horizon

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 in the figure.

Unless the adjustment to the horizon is made properly, failure of the float switch may occur.



Air volume adjustment:

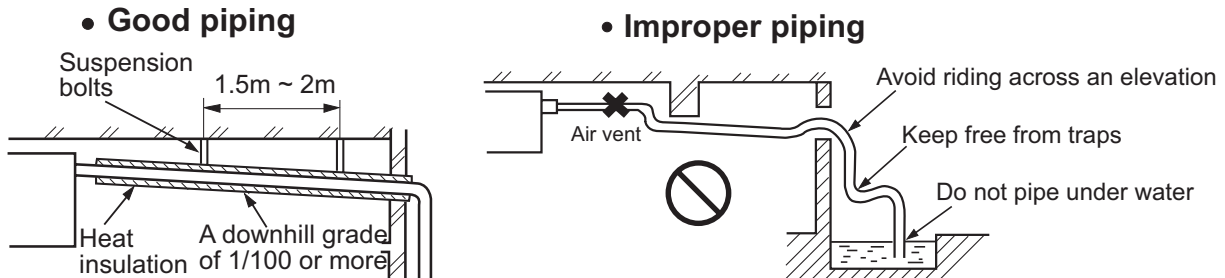
The air volume adjustment board is in the left down corner in the electric control box, by which you can adjust the air volume due to the requirement.

(4) Design of the duct and the air outlet

- a. Count the necessary ESP to design the air sending/return duct and the bend. And select the proper model according to the ESP. Forbidden to use the high ESP unit as the low ESP unit, or to use without duct.
- b. The air sending/return duct must be heat insulated.
- c. Forbidden to get the air return directly from the ceiling.
- d. Air return must be from the indoor side, and can not be from the corridor.
- e. Forbidden to use the duct as the fresh air unit.
- f. The air sending/return design should take the indoor air volume distribution into consideration. There should be a certain distance between air sending hole and air return hole, to prevent the air in short circuit. Meanwhile, position and direction of air outlet should consider the cooling/heating efficiency, and prevent the warm air not being blown down because of the too high air outlet.

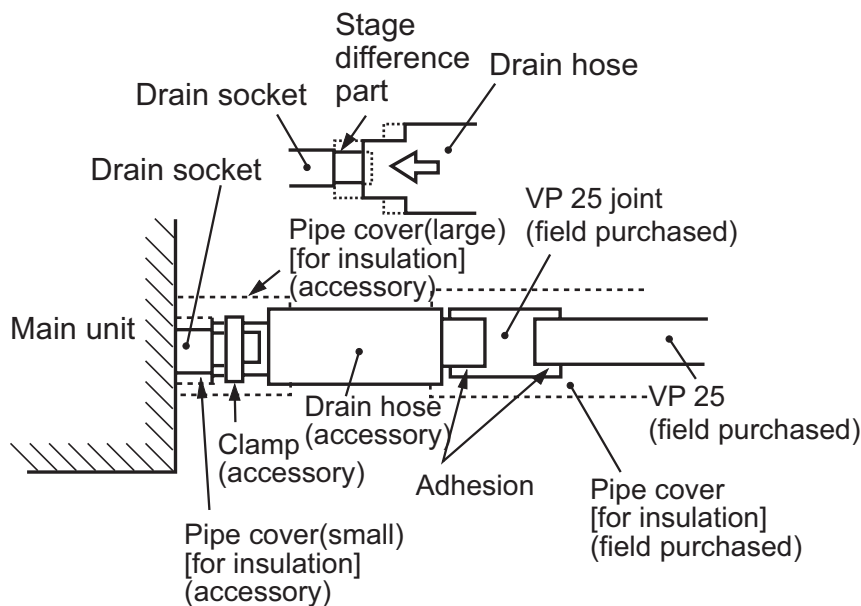
5. Drain Piping

(a) Drain piping should always be in a downhill grade (1/50~1/100) and avoid riding across an elevation or making traps.

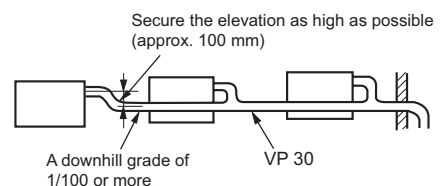


(b) When connecting the drain pipe to unit, pay sufficient attention not to apply excess force to the piping on the unit side. Also, fix the piping at a point as close as possible to the unit.

(c) For drain pipe, use hard PVC general purpose pipe VP-25(I.D.1") which can be purchased locally. When connecting, insert a PVC pipe end securely into the drain socket before tightening securely using the attached drain hose and clamp. Adhesive must not be used connection of the drain socket and drain hose (accessory).



(d) When constructing drain piping for several units, position the common pipe about 100 mm below the drain outlet of each unit as shown in the sketch. Use VP-30(1 1/4") or thicker pipe for this purpose.



(e) The stiff PVC pipe put indoor side should be heat insulated.

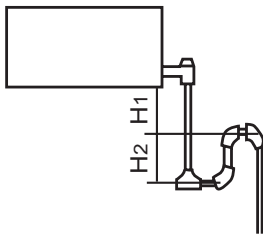
(f) Avoid putting the outlet of drain hose in the places with irritant gas generated. Do not insert the drain hose directly into drainage, where the gas with sulfur may be generated.

(g) Backwater bend

Because the drain spout is at the position, which negative pressure may occur. So with the rise of water level in the drain pan, water leakage may occur. In order to prevent water leakage, we designed a backwater bend.

The structure of backwater bend should be able to be cleaned. As the below figure shown, use T type joint. The backwater bend is set near the air conditioner.

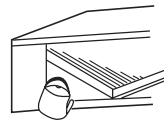
- As figure shown, set a backwater bend in the middle of drain hose.



H1=100mm or the static pressure of air sending motor
H2=1/2H1 (or between 50~100mm)

Drainage Test

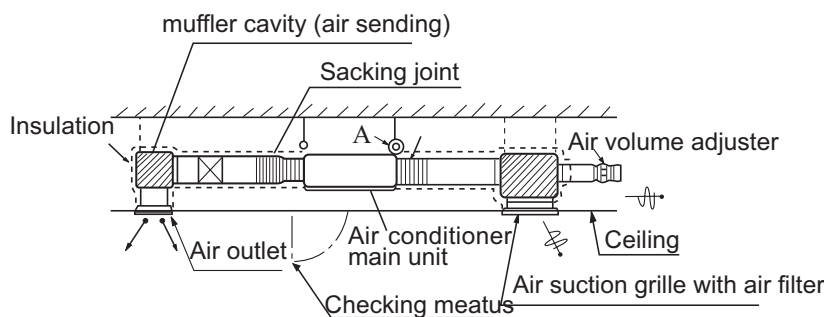
- ① Conduct a drainage test after completion of the electrical work.
- ② During the trial, make sure that drain flows properly through the piping and that no water leaks from connections.
- ③ In case of a new building, conduct the test before it is furnished with the ceiling.
- ④ Be sure to conduct this test even when the unit is installed in the heating season.



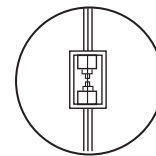
Procedures

- ① Supply about 1000 cc of water to the unit through the air outlet using a feed water pump.
- ② Check the drain while cooling operation.

6. Installation of air suction and discharging duct

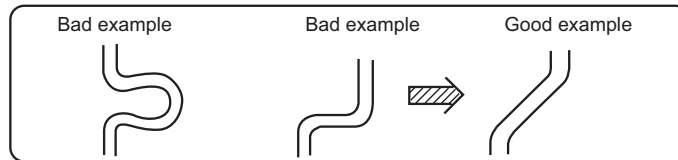


Enlarging chart of profile chart A
Vibration resistance hook



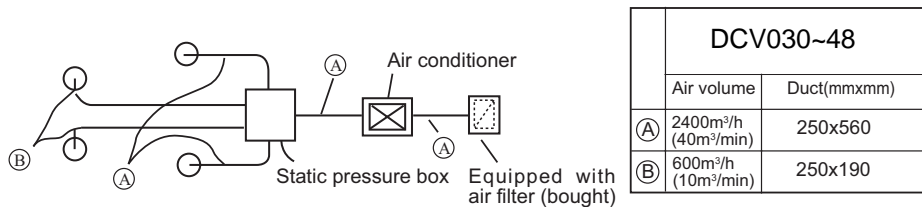
Please consult the after-sales service worker of Haier Air Conditioner for the choosing and installation of suction inlet, suction duct, discharging outlet and discharging duct. Calculating the design drawing and outer static pressure, and choose the discharging duct with proper length and shape.

- The length difference among every duct is limited below 2:1.
- Reduce the length of duct as possible as can.
- Reduce the amount of bend as possible as can.
- Use heat insulation material to bind and seal the part connecting main unit and the flare part of air discharging duct. Perform duct installation work, before the ceiling fit.



7. Calculation method of the dimension of the simple quadrate air duct

Presuming the unit length friction impedance of the duct is 1Pa/m, when the dimension of one side of the air duct is fixed as 250mm, as shown below:



- The calculation of duct resistance (the simple calculation is as follow table)

Straight part	Calculate as per 1m length 1Pa, 1Pa/m
Bend part	Each bend takes as a3~4m long straight duct
Air out part	Calculate as 25Pa
Static pressure box	Calculate as 50Pa/each
Air inlet grille (with air filter)	Calculate as 40Pa/each

- The chosen chart of simple duct

Note: 1Pa/m=0.1mmAq/m

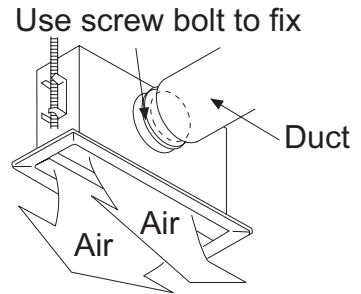
Shape	Square duct
Item	Dimension
Air volume	
m³/h(m³/n)	(mmxmm)
100	250 x 60
200	250 x 90
300	250 x 120
400	250 x 140
500	250 x 170
600(10)	250 x 190
800	250 x 230
1,000	250 x 270
1,200(20)	250 x 310
1,400	250 x 350
1,600	250 x 390

Shape	Square duct
Item	Dimension
Air volume	
m³/h(m³/n)	(mmxmm)
1,800(30)	250 x 430
2000	250 x 470
2400	250 x 560
3,000(50)	250 x 650
3,500	250 x 740
4,000	250 x 830
4,500	250 x 920
5,000	250 x 1000
5,500	250 x 1090
6,000(100)	250 x 1180

8. The attentive matters in installation of air suction and discharging duct

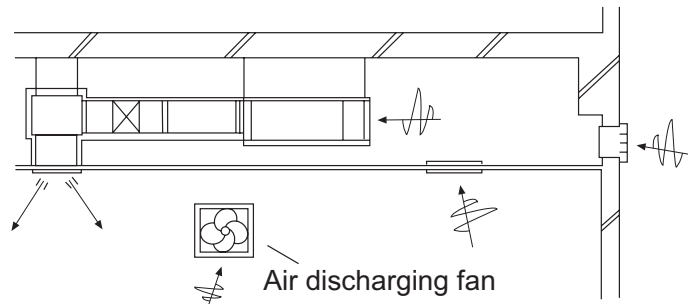
- Recommend to use anti-frost and sound-absorbing duct. (locally bought)
- The duct installation work should be finished before the fitment of ceiling.
- The duct must be heat insulated.
- The specific air-discharging outlet should be installed at the place where the airflow can be reasonably distributed.
- The surface should leave a checking meatus for checking and maintenance.

Special air discharging outlet



9. The examples of improper installation

- Do not use air in duct and take the ceiling inner side instead. The result is because of the irregular outer air mass, strong wind and sunshine, the humidity is increased.
- There may be water drop on the outside of duct. For cement and other new constructions, even if not taking ceiling inner side as duct, the humidity will also be so high. At this time, use glass fiber to perform heat preservation to the whole. (use iron net to bind the glass fiber)
- Maybe exceeding the unit operation limit (for example: when indoor dry bulb temperature is 35degree, web bulb temperature is 24degree), it may lead to overload of compressor.
- Affected by the capacity of air discharging fan, the strong wind in the outer duct and wind direction, when unit air sending volume exceeds the limit, the discharged water of heat exchanger will overflow, leading to water leakage.



Improper example

Cut pipe and expand pipe

When pipe is too long or flared pipe is damaged, the intaller will cut pipe or expand pipe.

Evacuation

Evacuate from the stop valve with vacuum pump, and must not discharge the refrigerant in the outdoor directly.

Open all valves

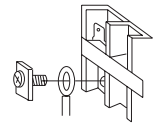
Open all valves, but when only one master unit is running, the oil equalization valve should close.

Leakage checking

Check if there is leakage on the pipe connection and the valve cap with a leakage detector or soap water.

Wiring method

ring terminal wiring:



1. Ring terminal wiring:

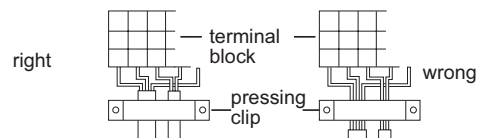
The wiring method is as the above figure, take off the screw, lead the screw through the ring terminal, then press it in the terminal block to fasten the screw.

2. Straight terminal wiring

Loose the screw, put the wire end into the terminal block, then fasten the screw, pull out the wire to confirm if the wire is fixed firmly.

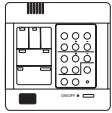

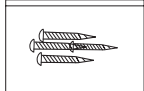


3. Pressing method of connection wire



After wiring, press the connection wire at the wire sleeve firmly with pressing clip, as the figure:



11. Accessories

Standard accessories

name	Wired controller	Signal wire	Screw	Screw cap
shape				 large  small
quantity	1	1	1	1 + 1

name	Heat insulation cushion	The others: operation manual or other documents
shape	 for gas pipe  for liquid pipe	
quantity	1 + 1	



Convertible type indoor unit

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1. Features



FAV009
FAV012
FAV016
FAV018
FAV024



FAV038
FAV048

Ultra thin unit, only thick 199mm

The convertible unit adopts a double drain pan design. The unit body of FAV009~24 is only thick 199mm. Slim, elegant and beautiful, supply more decoration to indoor. The convertible indoor unit can be used in the commercial building, the hotel, the hospital, or the house.



→199←

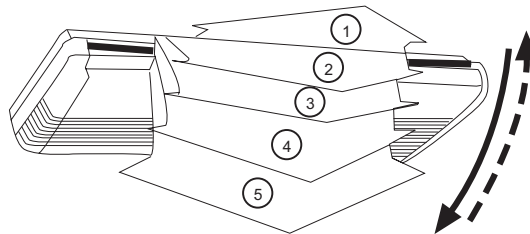
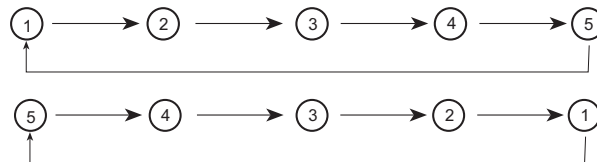


Wide angle airflow

100° wide angle louvers and 70° wide angle blades design to make a precise control of the airflow. It averagely distributes the comfortable air to every corner of the room.

Multiple air distribution direction

Every time press the SWING button, the flap will be at the following different position:



Long life and high efficiency air filter

Behind the front grille, you can find the standard air filter in the unit. It is long life and high efficiency, which will absorb the dust in the air and make the unit supply much purer air.



2. Specifications

Model	FAV009	FAV012	FAV016	FAV018
Nominal cooling capacity(KW)	2.8	3.6	4.5	5.6
Nominal heating capacity(KW)	3.2	4	5	6.3
Electrical heating power(KW) /Current(A)	/	/	/	/
Heating capacity at low temp.(KW)	2.5	3.2	4	5
Electrical characteristics	Power source	1PH, 220V, 50Hz		
	Operating current(A)	0.3	0.3	0.3
	Power consumption(KW)	0.06	0.06	0.06
Fan characteristics	Fan type and Qty	centrifugal*2	centrifugal*2	centrifugal*2
	Fan motor output(KW)	0.05	0.05	0.05
	Standard airflow(m ³ /h)	750	750	750
	Standard static pressure(Pa)	/		
	Max. static pressure(Pa)	/		
Exterior dimensions(mm)	990*655*199	990*655*199	990*655*199	990*655*199
Air outlet dimensions(mm)	--	--	--	--
Weight(Kg)	28.3/34.3	28.3/34.3	28.3/34.3	28.3/34.3
Controller	Wired controller/ wireless controller (optional)			
Accessories	Use for installation			
Piping dimension	Gas piping(mm)	Ø 9.52	Ø 12.7	
	Liquid piping(mm)	Ø 6.35	Ø 6.35	
	Drain hose(mm)	Ø 20	Ø 20	
Noise level(dB(A)) H/M/L	48/46/44	48/46/44	48/46/44	48/46/44

Norminal condition: indoor temperature (cooling): 27°CDB/19°CWB, indoor temperature (heating): 20°CDB/14.5°CWB

Outdoor temperature(cooling): 35°CDB/24°CWB, outdoor temperature(heating): 7°CDB/6°CWB

The noise level will be measured in the third octave band limited values in the semi-anechoic chamber, using a Real Time Analyser calibrated sound intensity meter. It is a sound pressure noise level.



Model	FAV024	FAV038	FAV048	
Nominal cooling capacity(KW)	7.1	11.2	14	
Nominal heating capacity(KW)	8	12.5	16	
Electrical heating power(KW) /Current(A)	/	/	/	
Heating capacity at low temp.(KW)	6.3	8	10	
Electrical characteristics	Power source	1PH, 220V, 50Hz		
	Operating current(A)	0.5	0.5	0.5
	Power consumption(KW)	0.1	0.1	0.1
Fan characteristics	Fan type and Qty	centrifugal*4	centrifugal*4	centrifugal*4
	Fan motor output(KW)	0.09	0.09	0.09
	Standard airflow(m ³ /h)	800	1500	1800
	Standard static pressure(Pa)	/		
	Max. static pressure(Pa)	/		
Exterior dimensions(mm)	990*655*199	1580*700*240	1580*700*240	
Air outlet dimensions(mm)	--	--	--	
Weight(Kg)	28.3/34.3	54/61	54/61	
Controller	Wired controller/ wireless controller (optional)			
Accessories	Use for installation			
Piping dimension	Gas piping(mm)	Ø 15.88		
	Liquid piping(mm)	Ø 9.52		
	Drain hose(mm)	Ø 20	Ø 25	
Noise level(dB(A)) H/M/L	48/46/44	53/51/49	53/51/49	

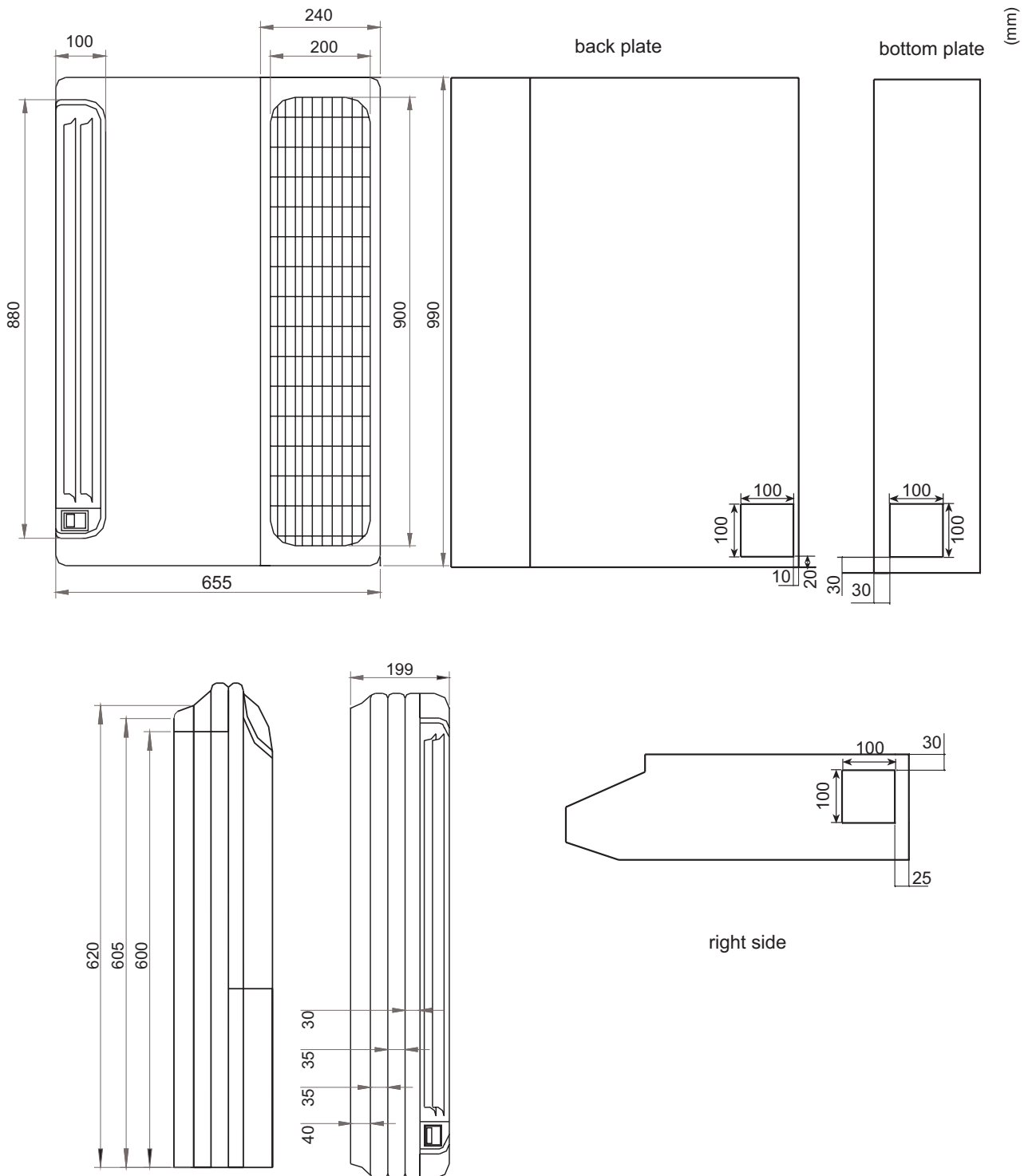
Norminal condition: indoor temperature (cooling): 27°CDB/19°CWB, indoor temperature (heating): 20°CDB/14.5°CWB

Outdoor temperature(cooling): 35°CDB/24°CWB, outdoor temperature(heating): 7°CDB/6°CWB

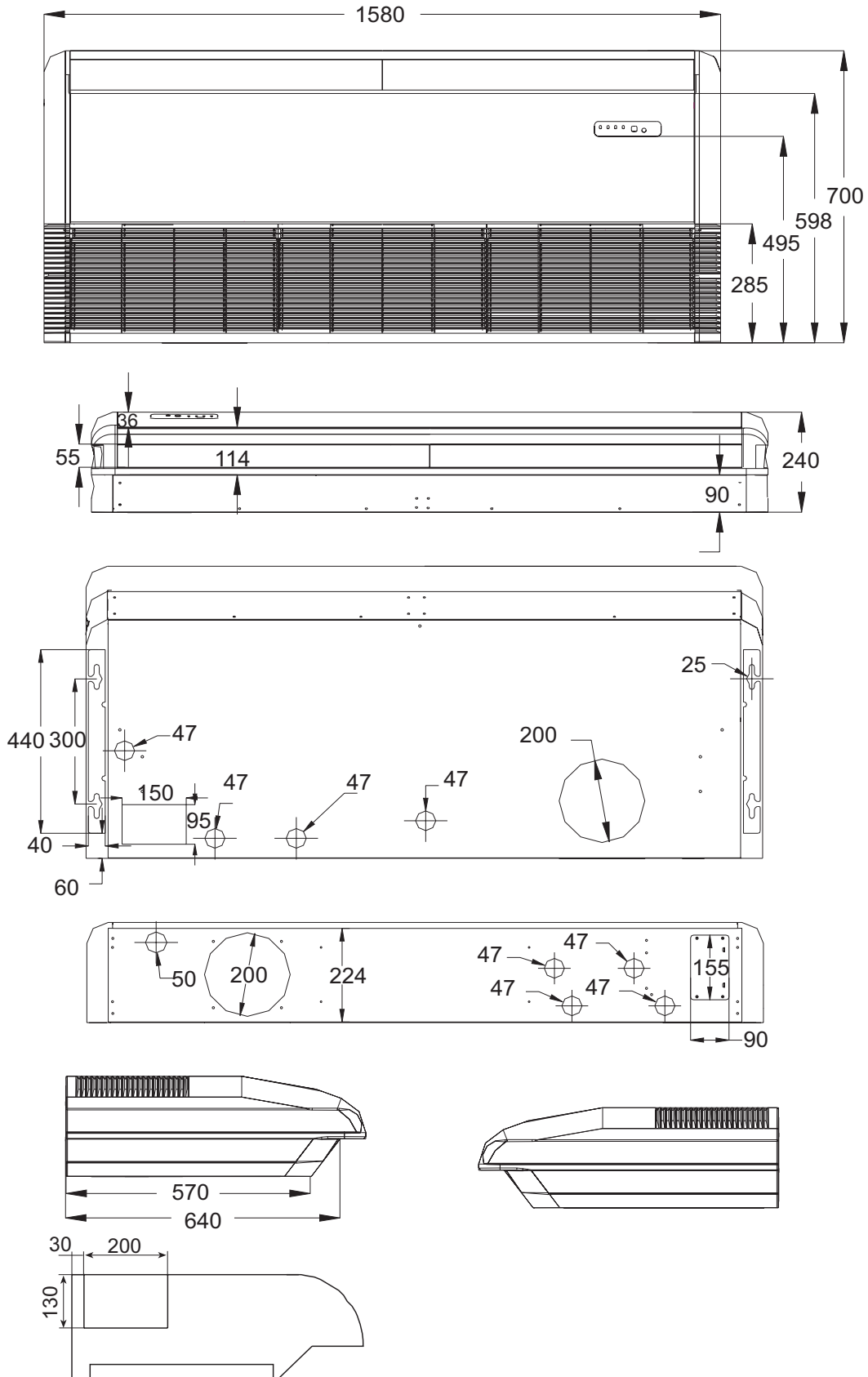
The noise level will be measured in the third octave band limited values in the semi-anechoic chamber, using a Real Time Analyser calibrated sound intensity meter. It is a sound pressure noise level.

3. Dimensions

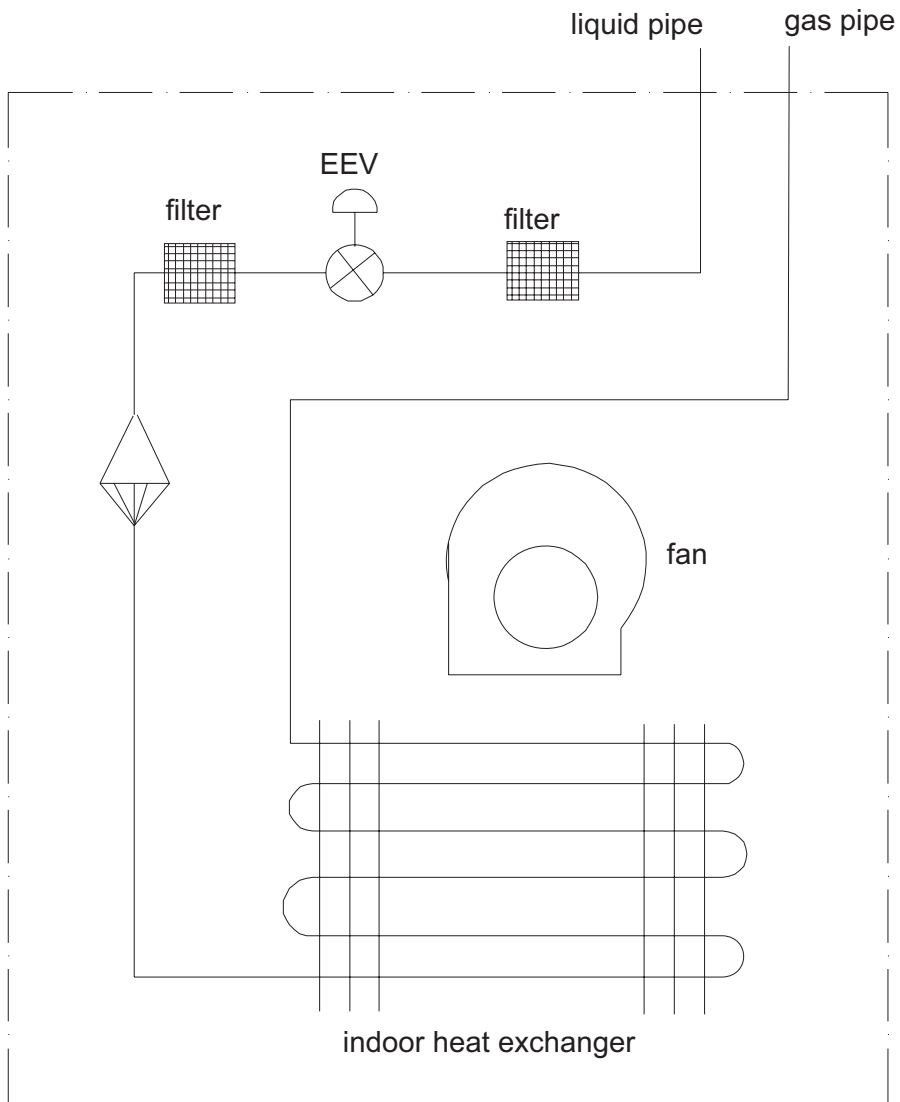
FAV009~24



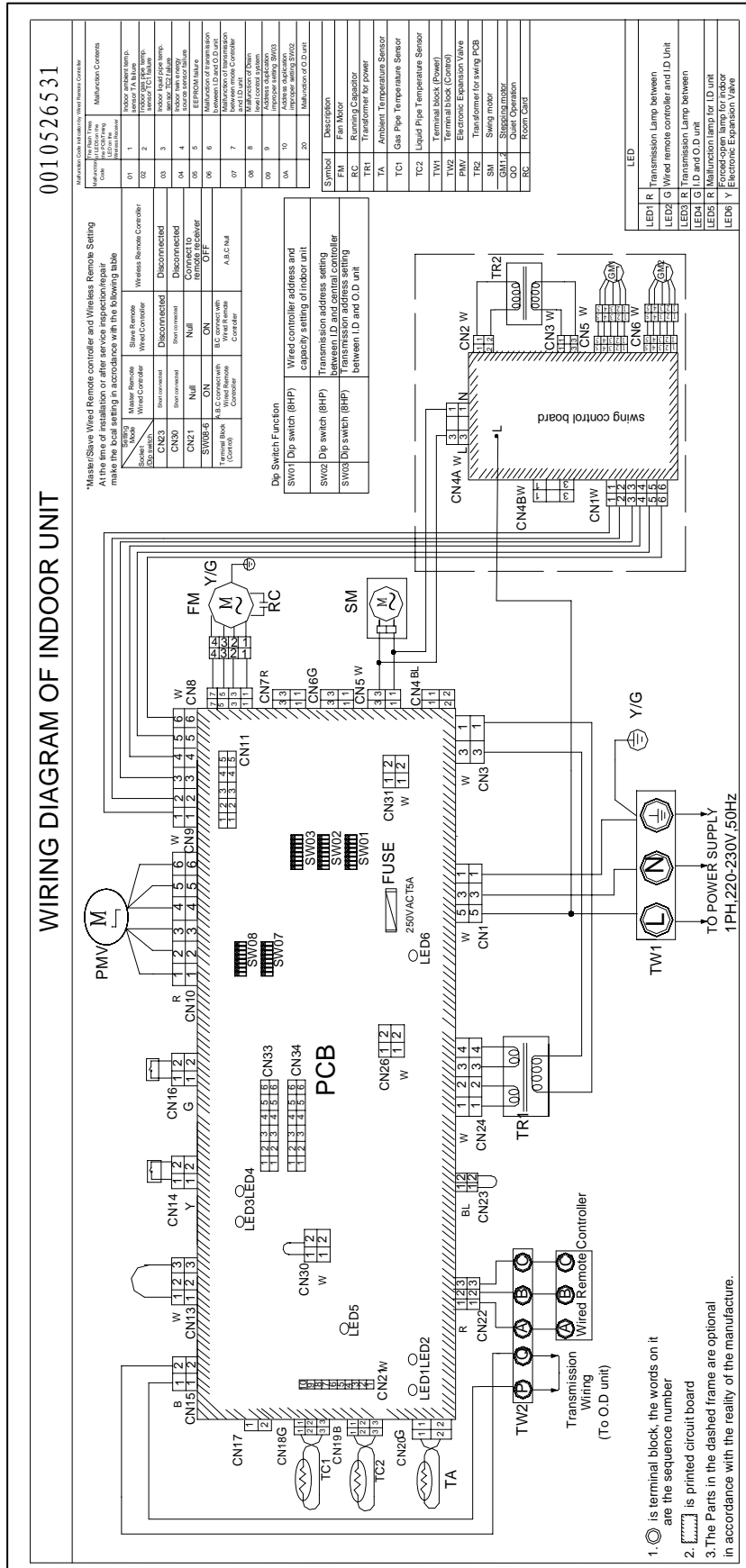
FAV038~48



4. Piping diagrams



5. Wiring diagrams





6. Electric characteristic

units					power supply		indoor fan motor		power input(W)	
model	phase	FQY	voltage	volt. range	MCA	MFA	KW	FLA	cooling	heating
FAV016	1	50	220	198~242	0.45	1.44	26	0.36	60	60
FAV018	1	50	220	198~242	0.45	1.44	26	0.36	60	60
FAV024	1	50	220	198~242	0.45	1.44	26	0.36	100	100
FAV038	1	50	220	198~242	1.69	5.4	100	1.35	100	100
FAV048	1	50	220	198~242	1.69	5.4	100	1.35	100	100

Symbols:

MCA: Min. circuit amps (A)

MFA: Max. fuse amps of circuit breaker

KW: Fan motor rated output(KW)

FLA: Full load amps(A)

IFM: Indoor fan motor

Notes:

1. Voltage range

The units are applicable for the electrical systems where voltage supplied to unit is in the range.

2. Maximum allowable voltage unbalance between phases is 2%.

3. $MCA = 1.25 * FLA$

$MFA \leq 4 * FLA$

4. Power supply uses the circuit breaker



7. Capacity table (CA: total capacity; SHC: sensible heat capacity)

Cooling mode:

capacity(W*100)	outdoor temp.	indoor temp.													
		21.5°CDB		23°CDB		25°CDB		27°CDB		28°CDB		30°CDB		32°CDB	
	°CDB	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC
45	20.0	3.5	2.7	3.6	2.7	3.7	2.7	3.8	2.7	3.9	2.8	4.0	2.7	4.2	2.6
	22.5	3.5	2.7	3.6	2.7	3.7	2.7	3.8	2.7	3.9	2.8	4.0	2.7	4.1	2.6
	25.0	3.5	2.7	3.5	2.7	3.7	2.6	3.7	2.7	3.8	2.8	4.0	2.7	4.1	2.6
	27.5	3.4	2.6	3.5	2.7	3.6	2.6	3.7	2.7	3.8	2.7	3.9	2.7	4.1	2.6
	30.0	3.4	2.6	3.5	2.7	3.6	2.6	3.7	2.6	3.7	2.7	3.9	2.7	4.0	2.6
	32.5	3.3	2.6	3.4	2.7	3.6	2.6	3.6	2.6	3.7	2.7	3.9	2.6	4.0	2.6
	35.0	3.3	2.6	3.4	2.7	3.5	2.6	3.6	2.6	3.7	2.7	3.8	2.6	4.0	2.6
	37.5	3.3	2.6	3.3	2.6	3.5	2.6	3.5	2.6	3.6	2.7	3.8	2.6	3.9	2.6
	40.0	3.2	2.5	3.3	2.6	3.5	2.6	3.5	2.6	3.6	2.7	3.7	2.6	3.9	2.5
43.0	3.2	2.5	3.3	2.6	3.4	2.5	4.3	2.6	3.6	2.7	3.7	2.9	3.8	2.5	
56	20.0	5.5	4.0	5.6	4.1	5.8	4.0	5.9	4.0	6.0	4.1	6.3	4.0	6.5	3.9
	22.5	5.4	3.9	5.5	4.0	5.8	3.9	5.9	4.0	6.0	4.1	6.2	4.0	6.4	3.9
	25.0	5.4	3.9	5.5	4.0	5.7	3.9	5.8	3.9	5.9	4.1	6.2	3.9	6.4	3.8
	27.5	5.3	3.9	5.4	4.0	5.7	3.9	5.8	3.9	5.9	4.0	6.1	3.9	6.3	3.8
	30.0	5.3	3.9	5.4	3.9	5.6	3.9	5.7	3.9	5.8	4.0	6.0	3.9	6.3	3.8
	32.5	5.2	3.8	5.3	3.9	5.5	3.8	5.7	3.9	5.8	4.0	6.0	3.9	6.2	3.8
	35.0	5.2	3.8	5.3	3.9	5.5	3.8	5.6	3.8	5.7	4.0	5.9	3.9	6.2	3.8
	37.5	5.1	3.8	5.2	3.9	5.4	3.8	5.5	3.8	5.7	3.9	5.9	3.8	6.1	3.7
	40.0	5.0	3.7	5.2	3.8	5.4	3.8	5.5	3.8	5.6	3.9	5.8	3.8	6.0	3.7
43.0	5.0	3.7	5.1	3.8	5.3	3.7	5.4	3.8	5.5	3.9	5.8	3.8	6.0	3.7	
71	20.0	7.0	4.9	7.1	5.0	7.4	4.9	7.5	4.9	7.7	5.0	8.0	4.9	8.2	4.7
	22.5	6.9	4.9	7.0	4.9	7.3	4.8	7.5	4.8	7.6	5.0	7.9	4.8	8.2	4.7
	25.0	6.8	4.8	7.0	4.9	7.2	4.8	7.4	4.8	7.5	4.9	7.8	4.8	8.1	4.7
	27.5	6.7	4.8	6.9	4.9	7.2	4.8	7.3	4.8	7.5	4.9	7.7	4.8	8.0	4.6
	30.0	6.7	4.7	6.8	4.8	7.1	4.7	7.2	4.7	7.4	4.9	7.7	4.7	8.0	4.6
	32.5	6.6	4.7	6.7	4.8	7.0	4.7	7.2	4.7	7.3	4.8	7.6	4.7	7.9	4.6
	35.0	6.5	4.7	6.7	4.8	7.0	4.7	7.1	4.7	7.2	4.8	7.5	4.7	7.8	4.6
	37.5	6.5	4.6	6.6	4.7	6.9	4.6	7.0	4.6	7.2	4.8	7.5	4.7	7.7	4.5
	40.0	6.4	4.6	6.5	4.7	6.8	4.6	7.0	4.6	7.1	4.8	7.4	4.6	7.7	4.5
43.0	6.3	4.6	6.4	4.6	6.7	4.6	6.9	4.6	7.0	4.7	7.3	4.6	7.6	4.5	
112	20.0	11.0	8.0	11.2	8.2	11.6	8.0	11.9	8.1	12.1	8.3	12.5	8.1	13.0	7.9
	22.5	10.9	8.0	11.1	8.2	11.5	8.0	11.8	8.0	12.0	8.3	12.4	8.1	12.9	7.8
	25.0	10.8	7.9	11.0	8.1	11.4	7.9	11.6	8.0	11.9	8.2	12.3	8.0	12.8	7.8
	27.5	10.6	7.9	10.9	8.1	11.3	7.9	11.5	7.9	11.8	8.2	12.2	8.0	12.7	7.8
	30.0	10.5	7.8	10.8	8.0	11.2	7.8	11.4	7.9	11.6	8.1	12.1	7.9	12.5	7.7
	32.5	10.4	7.8	10.6	7.9	11.1	7.8	11.3	7.8	11.5	8.1	12.0	7.9	12.4	7.7
	35.0	10.3	7.7	10.5	7.9	11.0	7.7	11.2	7.8	11.4	8.1	11.9	7.9	12.3	7.6
	37.5	10.2	7.7	10.4	7.8	10.9	7.7	11.1	7.8	11.3	8.0	11.8	7.8	12.2	7.6
	40.0	10.1	7.6	10.3	7.8	10.8	7.6	11.0	7.7	11.2	8.0	11.6	7.8	12.1	7.6
43.0	9.9	7.5	10.2	7.7	10.6	7.6	10.8	7.6	11.1	7.9	11.5	7.7	12.0	7.5	
140	20.0	13.7	9.6	14.0	9.8	14.6	9.6	14.8	9.6	15.1	9.9	15.7	9.6	16.2	9.3
	22.5	13.6	9.6	13.9	9.7	14.4	9.5	14.7	9.5	15.0	9.8	15.5	9.5	16.1	9.2
	25.0	13.4	9.5	13.7	9.7	14.3	9.4	14.6	9.5	14.8	9.7	15.4	9.5	16.0	9.2
	27.5	13.3	9.4	13.6	9.6	14.1	9.4	14.4	9.4	14.7	9.6	15.3	9.4	15.8	9.1
	30.0	13.2	9.3	13.4	9.5	14.0	9.3	14.3	9.3	14.6	9.5	15.1	9.3	15.7	9.1
	32.5	13.0	9.3	13.3	9.4	13.9	9.2	14.1	9.3	14.4	9.5	15.0	9.3	15.5	9.0
	35.0	12.9	9.2	13.2	9.4	13.7	9.2	14.0	9.2	14.3	9.5	14.8	9.2	15.4	9.0
	37.5	12.7	9.1	13.0	9.3	13.6	9.1	13.9	9.1	14.1	9.4	14.7	9.2	15.3	8.9
	40.0	12.6	9.0	12.9	9.2	13.4	9.0	13.7	9.1	14.0	9.4	14.6	9.1	15.1	8.9
43.0	12.4	9.0	12.7	9.1	13.3	9.0	13.6	9.0	13.8	9.3	14.4	9.1	15.0	8.8	



Heating mode:

capa city(W*1 00)	outdoor temp.	indoor temp.(°CDB)				capa city(W*10 0)	outdoor r temp.	indoor temp.(°CDB)				capaci ty(W* 100)	outdoor temp.	indoor temp.(°CDB)			
		15.0	20.0	25.0	27.0			15.0	20.0	25.0	27.0			15.0	20.0	25.0	27.0
		°CDB	SHC	SHC	SHC			SHC	°CDB	SHC	SHC			SHC	SHC	°CDB	SHC
22	-15.0	1.7	1.6	1.6	1.6	56	-15.0	4.2	4.2	4.1	4.1	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	1.9	1.9	1.9	1.7		-10.0	4.8	4.8	4.7	4.3		-10.0	12.2	12.1	11.9	11.0
	-5.0	2.1	2.1	1.9	1.7		-5.0	5.4	5.3	4.9	4.3		-5.0	13.7	13.6	12.5	11.0
	0.0	2.4	2.4	1.9	1.7		0.0	6.0	5.9	4.9	4.3		0.0	15.3	15.1	12.5	11.0
	2.5	2.5	2.5	1.9	1.7		2.5	6.3	6.2	4.9	4.3		2.5	16.0	15.8	12.5	11.0
	6.0	2.5	2.5	1.9	1.7		6.0	6.4	6.3	4.9	4.3		6.0	16.2	16.0	12.5	11.0
	6.5	2.6	2.5	1.9	1.7		6.5	6.6	6.3	4.9	4.3		6.5	16.8	16.0	12.5	11.0
	10.0	2.8	2.5	1.9	1.7		10.0	7.1	6.3	4.9	4.3		10.0	18.0	16.0	12.5	11.0
	12.5	3.0	2.5	1.9	1.7		12.5	7.5	6.3	4.9	4.3		12.5	19.1	16.0	12.5	11.0
15.5	3.0	2.5	1.9	1.7	15.5	7.6	6.3	4.9	4.3	15.5	19.4	16.0	12.5	11.0			
28	-15.0	2.1	2.1	2.1	2.1	71	-15.0	5.4	5.3	5.2	5.2	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	2.4	2.4	2.4	2.2		-10.0	6.1	6.0	6.0	5.5		-10.0	12.2	12.1	11.9	11.0
	-5.0	2.7	2.7	2.5	2.2		-5.0	6.9	6.8	6.2	5.5		-5.0	13.7	13.6	12.5	11.0
	0.0	3.1	3.0	2.5	2.2		0.0	7.6	7.5	6.2	5.5		0.0	15.3	15.1	12.5	11.0
	2.5	3.2	3.2	2.5	2.2		2.5	8.0	7.9	6.2	5.5		2.5	16.0	15.8	12.5	11.0
	6.0	3.2	3.2	2.5	2.2		6.0	8.1	8.0	6.2	5.5		6.0	16.2	16.0	12.5	11.0
	6.5	3.4	3.2	2.5	2.2		6.5	8.4	8.0	6.2	5.5		6.5	16.8	16.0	12.5	11.0
	10.0	3.6	3.2	2.5	2.2		10.0	9.0	8.0	6.2	5.5		10.0	18.0	16.0	12.5	11.0
	12.5	3.8	3.2	2.5	2.2		12.5	9.6	8.0	6.2	5.5		12.5	19.1	16.0	12.5	11.0
15.5	3.9	3.2	2.5	2.2	15.5	9.7	8.0	6.2	5.5	15.5	19.4	16.0	12.5	11.0			
36	-15.0	2.7	2.6	2.6	2.6	80	-15.0	6.0	5.9	5.9	5.9	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	3.1	3.0	3.0	2.8		-10.0	6.9	6.8	6.7	6.2		-10.0	12.2	12.1	11.9	11.0
	-5.0	3.4	3.4	3.1	2.8		-5.0	7.7	7.6	7.0	6.2		-5.0	13.7	13.6	12.5	11.0
	0.0	3.8	3.8	3.1	2.8		0.0	8.6	8.5	7.0	6.2		0.0	15.3	15.1	12.5	11.0
	2.5	4.0	4.0	3.1	2.8		2.5	9.0	8.9	7.0	6.2		2.5	16.0	15.8	12.5	11.0
	6.0	4.0	4.0	3.1	2.8		6.0	9.1	9.0	7.0	6.2		6.0	16.2	16.0	12.5	11.0
	6.5	4.2	4.0	3.1	2.8		6.5	9.5	9.0	7.0	6.2		6.5	16.8	16.0	12.5	11.0
	10.0	4.5	4.0	3.1	2.8		10.0	10.1	9.0	7.0	6.2		10.0	18.0	16.0	12.5	11.0
	12.5	4.8	4.0	3.1	2.8		12.5	10.8	9.0	7.0	6.2		12.5	19.1	16.0	12.5	11.0
15.5	4.8	4.0	3.1	2.8	15.5	10.9	9.0	7.0	6.2	15.5	19.4	16.0	12.5	11.0			
40	-15.0	3.0	3.0	3.0	3.0	90	-15.0	6.7	6.6	6.5	6.5	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	3.5	3.4	3.4	3.1		-10.0	7.6	7.5	7.4	6.9		-10.0	12.2	12.1	11.9	11.0
	-5.0	3.9	3.8	3.5	3.1		-5.0	8.6	8.5	7.8	6.9		-5.0	13.7	13.6	12.5	11.0
	0.0	4.3	4.3	3.5	3.1		0.0	9.5	9.4	7.8	6.9		0.0	15.3	15.1	12.5	11.0
	2.5	4.5	4.5	3.5	3.1		2.5	10.0	9.9	7.8	6.9		2.5	16.0	15.8	12.5	11.0
	6.0	4.6	4.5	3.5	3.1		6.0	10.1	10.0	7.8	6.9		6.0	16.2	16.0	12.5	11.0
	6.5	4.8	4.5	3.5	3.1		6.5	10.5	10.0	7.8	6.9		6.5	16.8	16.0	12.5	11.0
	10.0	5.1	4.5	3.5	3.1		10.0	11.2	10.0	7.8	6.9		10.0	18.0	16.0	12.5	11.0
	12.5	5.4	4.5	3.5	3.1		12.5	12.0	10.0	7.8	6.9		12.5	19.1	16.0	12.5	11.0
15.5	5.5	4.5	3.5	3.1	15.5	12.1	10.0	7.8	6.9	15.5	19.4	16.0	12.5	11.0			
45	-15.0	3.3	3.3	3.3	3.3	112	-15.0	8.4	8.2	8.2	8.1	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	3.8	3.8	3.7	3.5		-10.0	9.6	9.4	9.3	8.6		-10.0	12.2	12.1	11.9	11.0
	-5.0	4.3	4.2	3.9	3.5		-5.0	10.7	10.6	9.8	8.6		-5.0	13.7	13.6	12.5	11.0
	0.0	4.8	4.7	3.9	3.5		0.0	11.9	11.8	9.8	8.6		0.0	15.3	15.1	12.5	11.0
	2.5	5.0	5.0	3.9	3.5		2.5	12.5	12.4	9.8	8.6		2.5	16.0	15.8	12.5	11.0
	6.0	5.1	5.0	3.9	3.5		6.0	12.5	12.5	9.8	8.6		6.0	16.2	16.0	12.5	11.0
	6.5	5.3	5.0	3.9	3.5		6.5	13.2	12.5	9.8	8.6		6.5	16.8	16.0	12.5	11.0
	10.0	5.6	5.0	3.9	3.5		10.0	14.1	12.5	9.8	8.6		10.0	18.0	16.0	12.5	11.0
	12.5	6.0	5.0	3.9	3.5		12.5	15.0	12.5	9.8	8.6		12.5	19.1	16.0	12.5	11.0
15.5	6.1	5.0	3.9	3.5	15.5	15.1	12.5	9.8	8.6	15.5	19.4	16.0	12.5	11.0			

8. Air velocity and temperature distribution

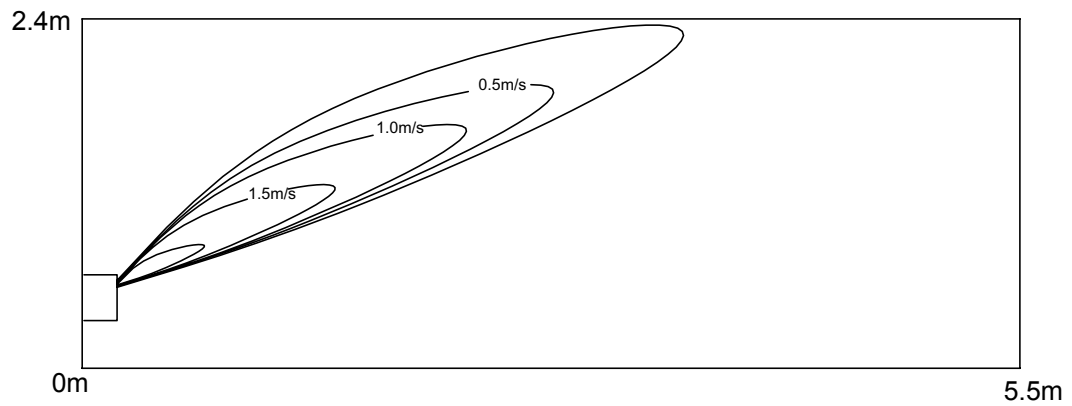
a) On the floor

a. Cooling / Air Velocity Distribution

Cooling

Blow angle: 25

Air Velocity Distribution

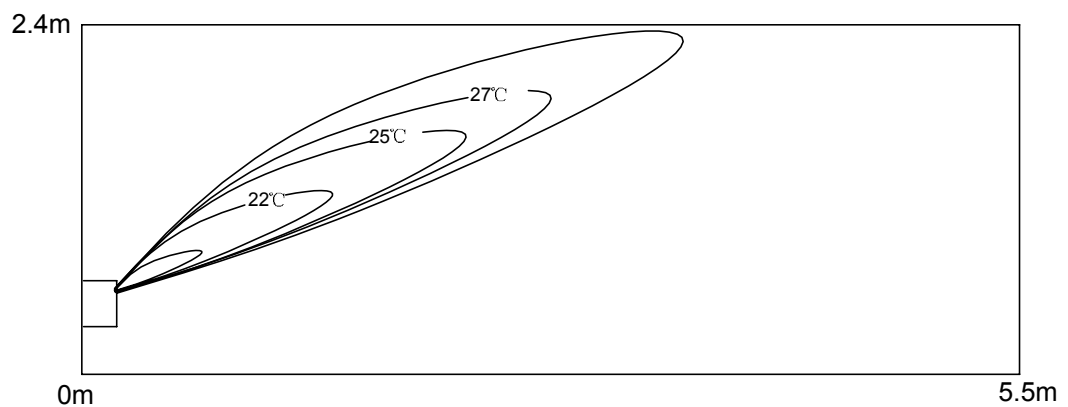


b. Cooling / Temperature Distribution

Cooling

Blow angle: 25

Temperature Distribution

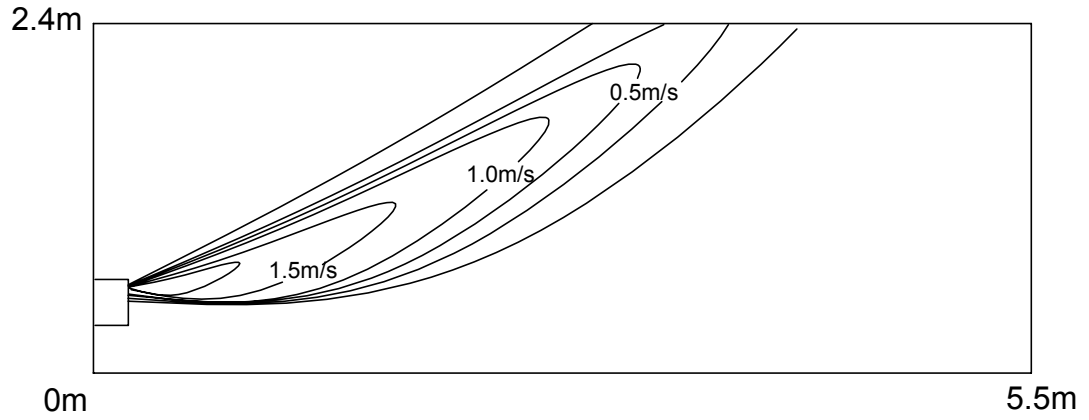


c. Heating / Air Velocity Distribution

Heating

Blow angle:5

Air velocity Distribution

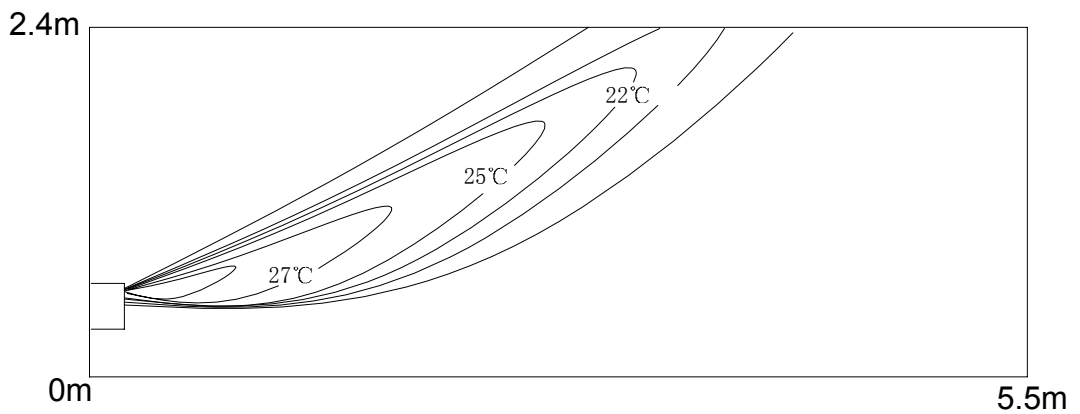


d. Heating / Temperature Distribution

Heating

Blow angle:5

Temperature Distribution



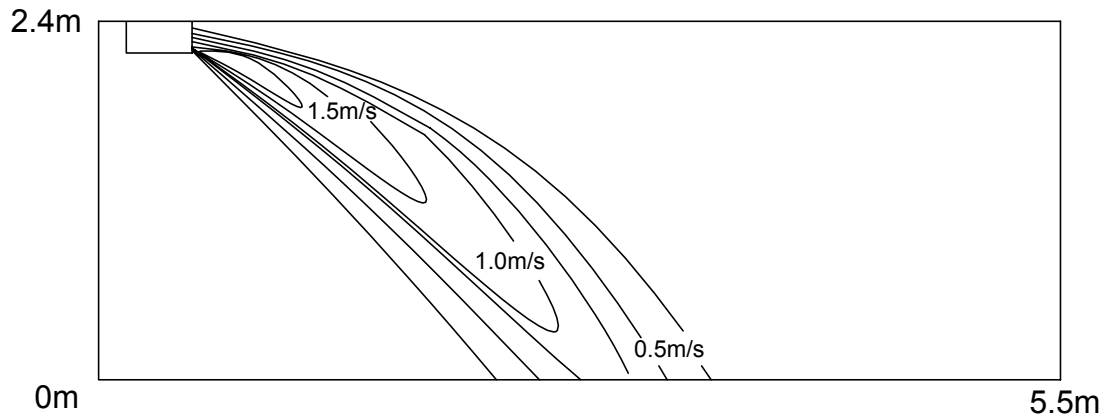
b) Ceiling

a. Cooling / Air Velocity Distribution

Cooling

Blow angle:25

Air Velocity Distribution

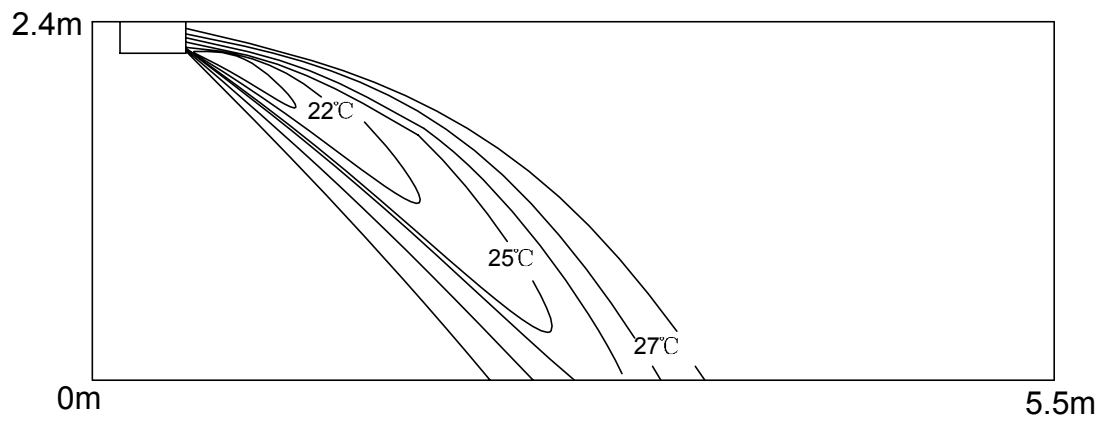


b. Cooling / Temperature Distribution

Cooling

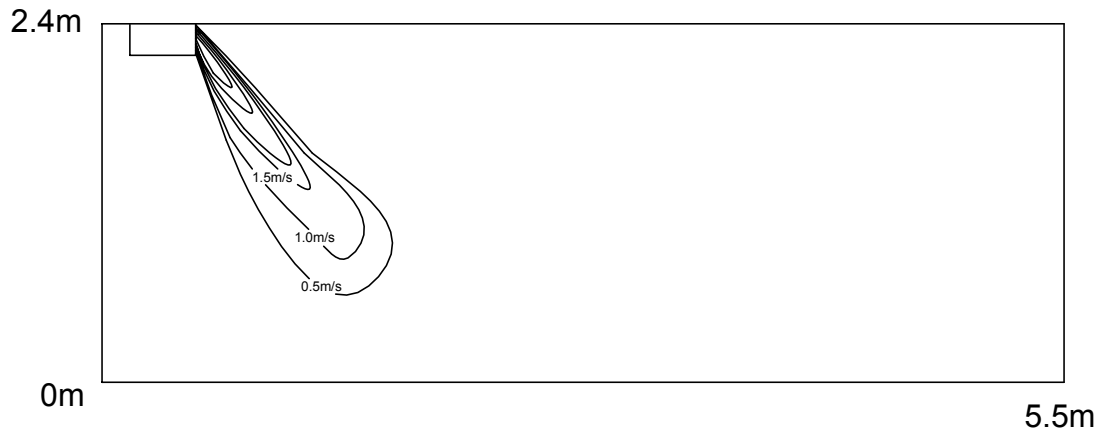
Blow angle:25

Temperature Distribution



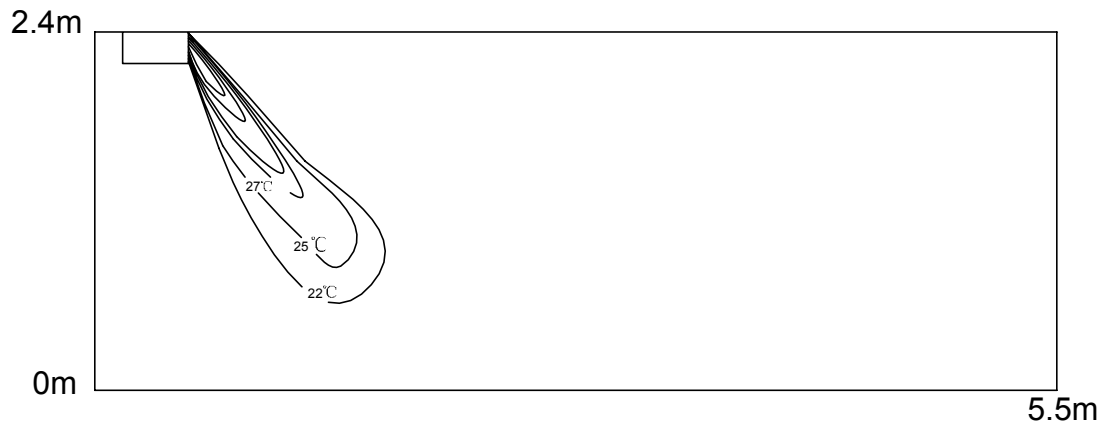
c. Heating / Air Velocity Distribution

Heating
Blow angle:65
Air velocity Distribution



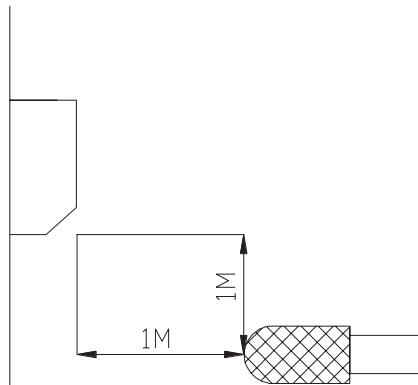
d. Heating / Temperature Distribution

Heating
Blow angle:65
Temperature Distribution



9. Noise level

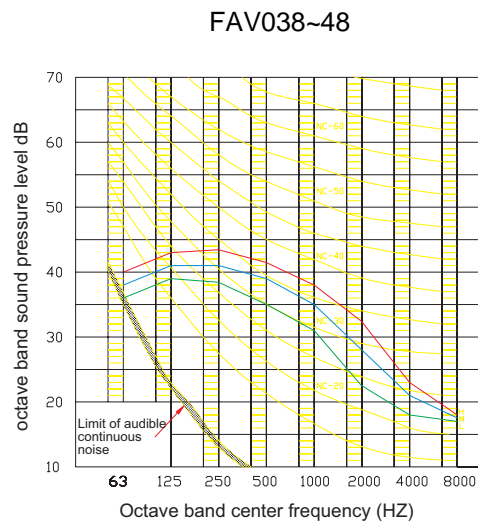
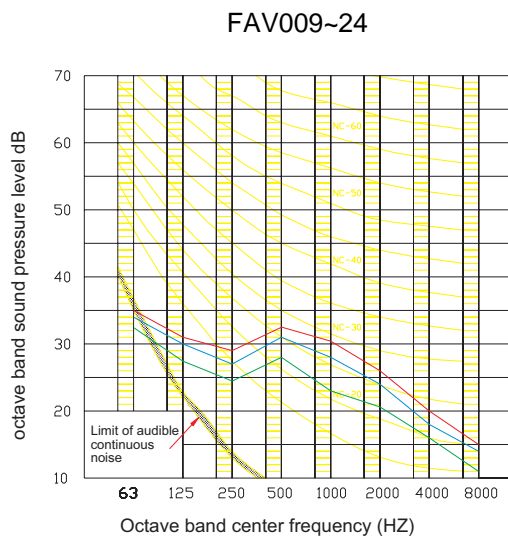
(1) Testing illustrate:



(2) Testing condition:

- a. Unit running in the nominal condition
- b. Test in the semi-anechoic chamber
- c. Noise level varies from the actual factors such as room structure, etc.

(3) Octave band level



10. Installation

10.1 FAV009~24 installation

Pipe connection requirement

Please refer to the specification to confirm the stop valve diameter and the permitted pipe drop and pipe length.

INSTALLATION PROCEDURE

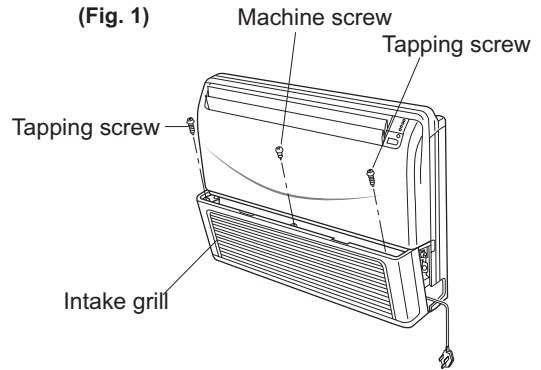
Install the room air conditioner as follows:

PREPARING INDOOR UNIT INSTALLATION

1. REMOVE THE INTAKE GRILL

Open the intake grill and remove the three or four or six screws.(Fig. 1)

Remark: The main unit can be wired before the indoor unit is installed. Select the most appropriate installation order.



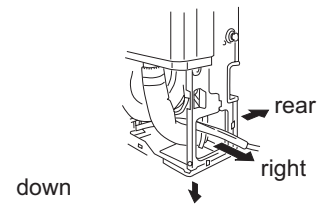
A. FLOOR CONSOLE TYPE

1. DRILLING FOR PIPING

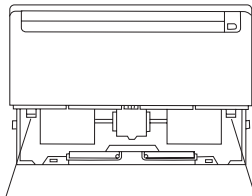
Select piping and drain directions.(Fig.2)

The piping and drain can be made in three directions as shown below.

(Fig. 2)



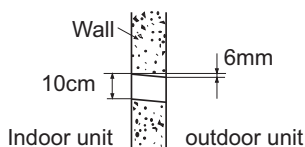
(Fig.3)



Drain hose (Left side) Drain hose (Right side)

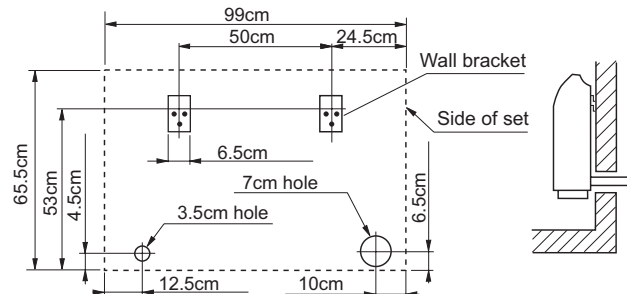
When the directions are selected, drill a 7 cm dia. hole on the wall so that the hole is tilted downward toward the outdoor for smooth water flow. When the pipe is led out from the rear, make a hole in Fig.6, at the position shown.

(Fig. 4)



For series 14,18,24 when installing set to wall, install the accessory wall bracket at the position shown in Fig.5,and mount the set to it.

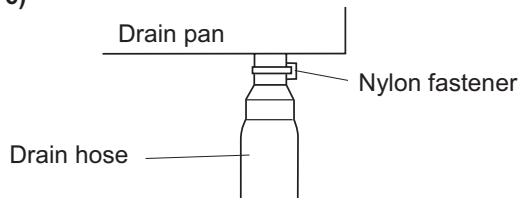
(Fig. 5)



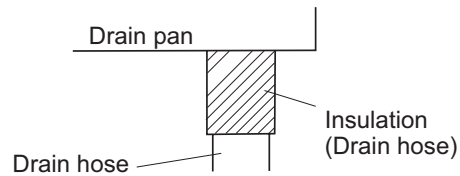
2. INSTALLING DRAIN HOSE

Select whether the drain hose will be connected to the left or right side.(Fig.3) Insert the drain hose into the drain pan, then secure the drain hose with a nylon fastener. (Fig.6)

(Fig. 6)



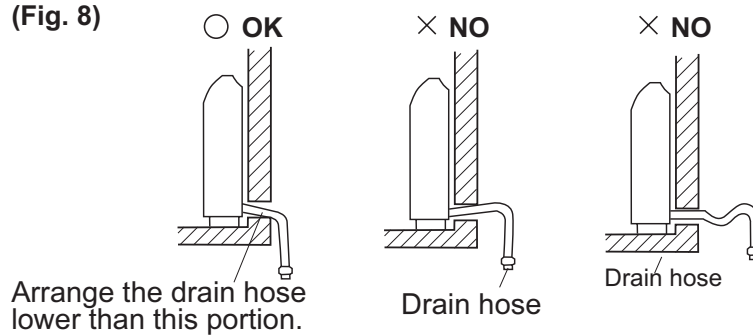
(Fig. 7)



Wrap the insulation (drain hose) around the drain hose connection.(Fig.7)

Be sure to arrange the drain hose correctly so that it is leveled lower than the drain hose connecting port of the indoor unit.

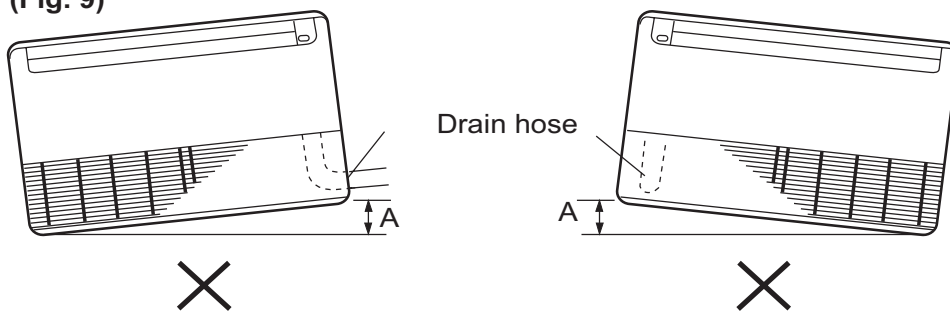
(Fig. 8)



⚠ CAUTION

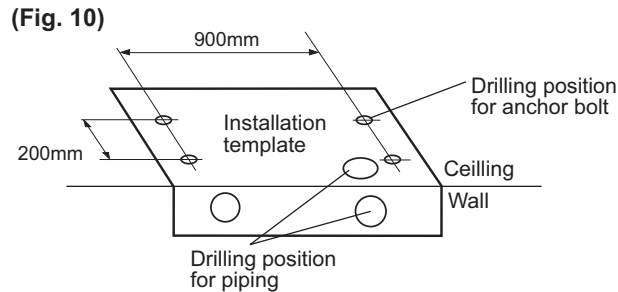
Do not install the unit drain hose side is too high. Height A should be less than 5 mm.(Fig.9)

(Fig. 9)



B. UNDER CEILING TYPE

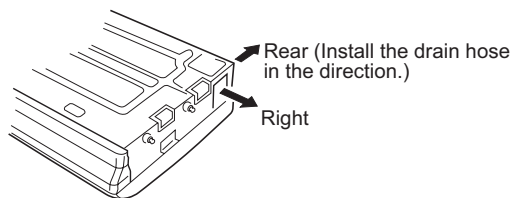
Using the installation template, drill holes for piping and anchor bolts(for holes).(Fig.10)



1. DRILLING FOR PIPING

Select piping and drain directions. (Fig.11)

(Fig. 11)

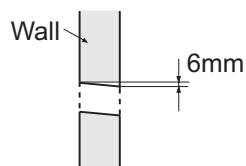


⚠ CAUTION
Install the drain hose at the rear; it should not be installed on the top or right side.

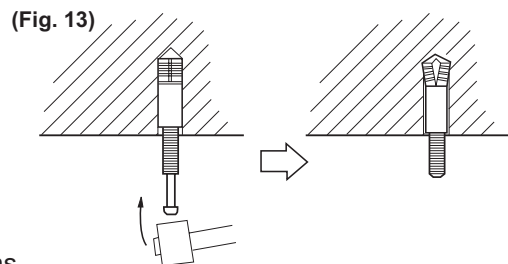
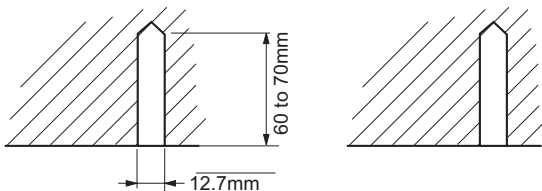
2. DRILLING HOLES FOR ANCHOR BOLTS AND INSTALLING THE ANCHOR BOLTS

When the directions are selected, drill 80mm and 50mm or 150mm dia. hole on the wall so that the hole is tilted downward toward the outdoor for smooth water flow.

(Fig. 12)



With a concrete drill, drill four 12.7 mm dia. Holes.(Fig.12)

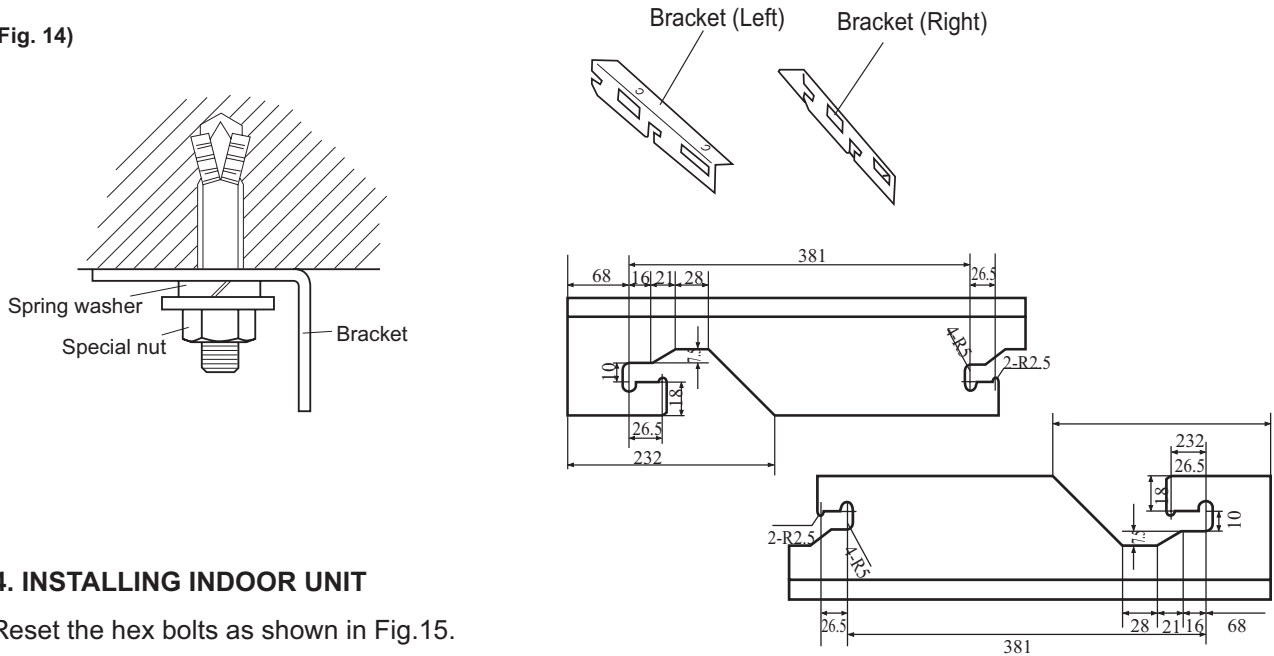


Insert the anchor bolts into the drilled holes, and drive the pins completely into the anchor bolts with a hammer. (Fig. 13)

3. INSTALLING BRACKETS

Install the brackets with nuts, washers and spring washers.(Fig. 14)

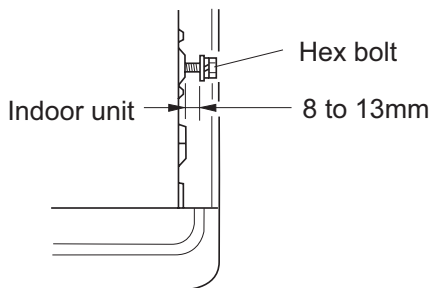
(Fig. 14)



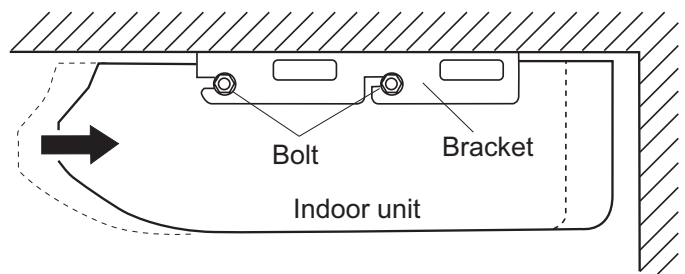
4. INSTALLING INDOOR UNIT

Reset the hex bolts as shown in Fig.15.

(Fig. 15)



(Fig. 16)



Now, securely tighten the hex bolts in both sides.

Apply the indoor unit to the brackets.(Fig.16)

5. INSTALL THE DRAIN HOSE

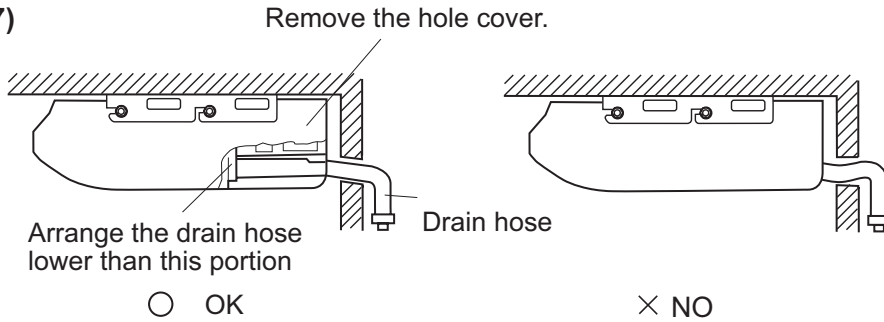
Select whether the drain hose will be connected to the left or right side.(Fig.3)

Insert the drain hose into the drain pan, then secure the drain hose with a nylon fastener.(Fig.6)

Wrap the insulation (drain hose)around the drain hose connection.(Fig.7)

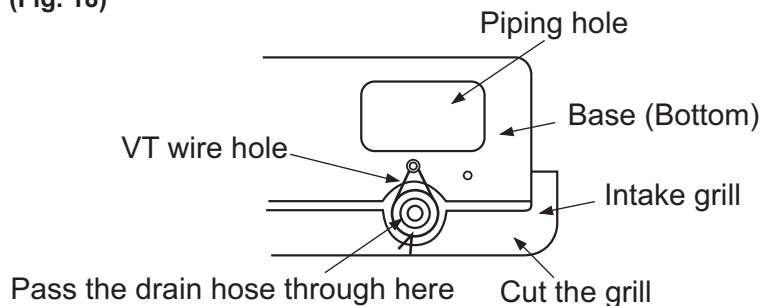
Be sure to arrange the drain hose correctly so that it is leveled lower than the drain hose connecting part of the indoor unit.(Fig.8)

(Fig. 17)



When drain hose is arranged backward. Secure the drain hose with the VT wire. (Fig. 18)

(Fig. 18)



GAS LEAKAGE INSPECTION

⚠ CAUTION

After connecting the piping, check the joints for gas leakage with leakage detector.

HOW TO CONNECT WIRING TO THE TERMINALS

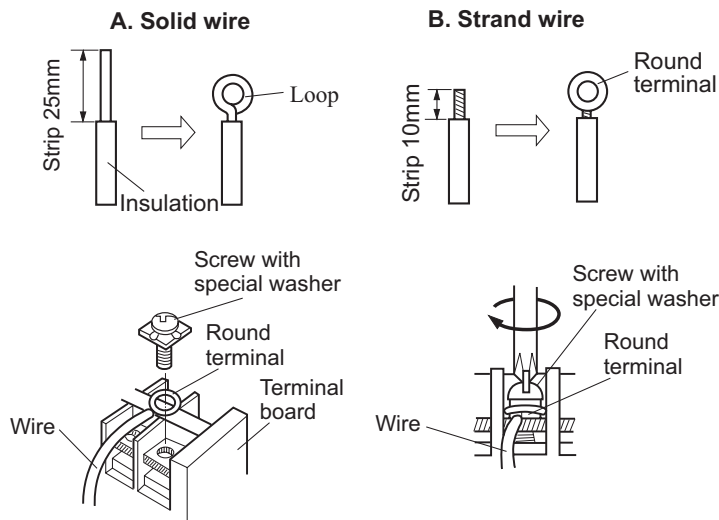
A. For solid core wiring (or F-cable)(Fig.19A)

- (1) Cut the wire with a wire cutter or wire-cutting pliers, then strip the insulation to about 25mm of the exposed solid wire.
- (2) Using a screwdriver, remove the terminal screw(s) on the terminal board.
- (3) Using pliers, bend the solid wire to form a loop suitable for the terminal screw.
- (4) Shape the loop wire properly, place it on the terminal board and tighten securely with the terminal screw using a screw driver.

B. For strand wiring(Fig.19B)

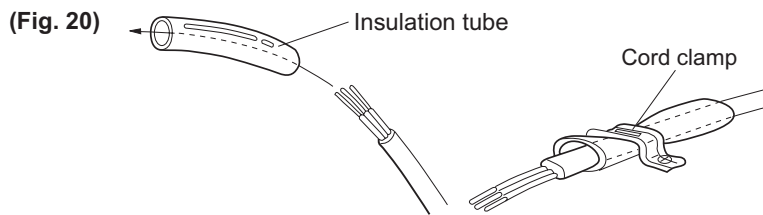
- (1) Cut the wire with a wire cutter or wire-cutting pliers, then strip the insulation to about 10mm of the exposed strand wiring.
- (2) Using a screwdriver, remove the terminal screw(s) on the terminal board.
- (3) Using a round terminal fastener or pliers, securely clamp a round terminal to each stripped wire end.
- (4) Position the round terminal wire, and replace and tighten the terminal screw using a screw driver.

(Fig. 19)



HOW TO FIXED CONNECTION CORD AND POWER CABLE AT THE CORD CLAMP

After passing the connection cord and power cable through the insulation tube, fasten it with the cord clamp, as shown in Fig.20



Use VW-1, 0.5 to 1.0 mm thick, PVC tube as the insulation tube.

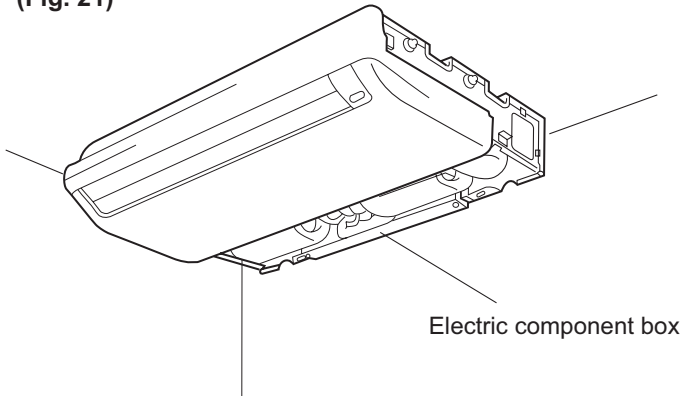
ELECTRICAL WIRING

⚠ CAUTION
(1) Match the terminal block numbers and connection cord colors with those of the outdoor unit. Erroneous wiring may cause burning of the electric parts.
(2) Connect the connection cords firmly to the terminal block. Imperfect installation may cause a fire.
(3) Always fasten the outside covering of the connection cord with the cord clamp. (If the insulator is chafed, electric leakage may occur.)
(4) Always connect the ground wire.

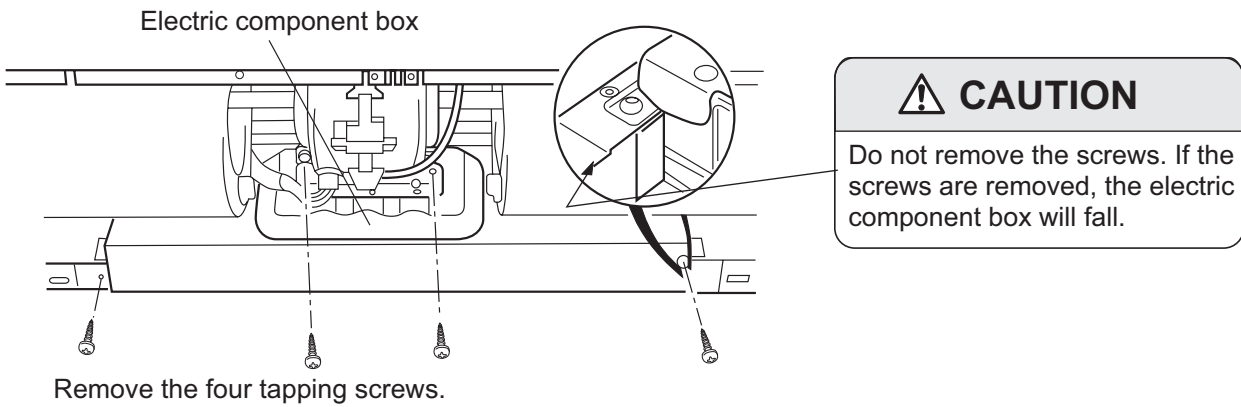
1. INDOOR UNIT SIDE

(1) Remove the electric component box.

(Fig. 21)

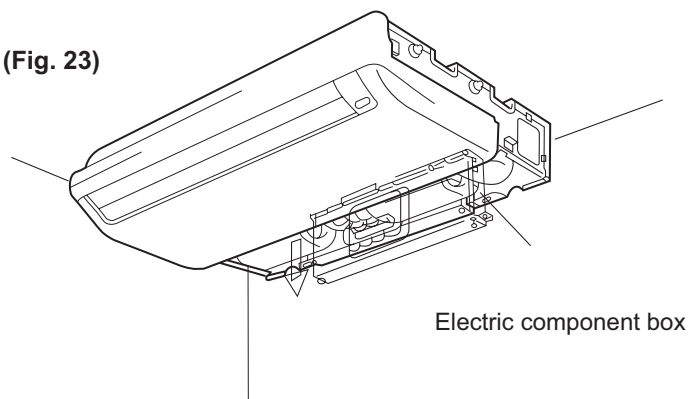


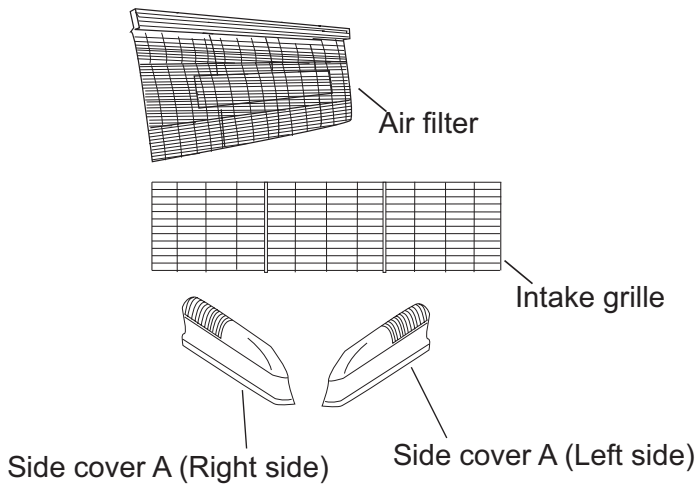
(Fig. 22)



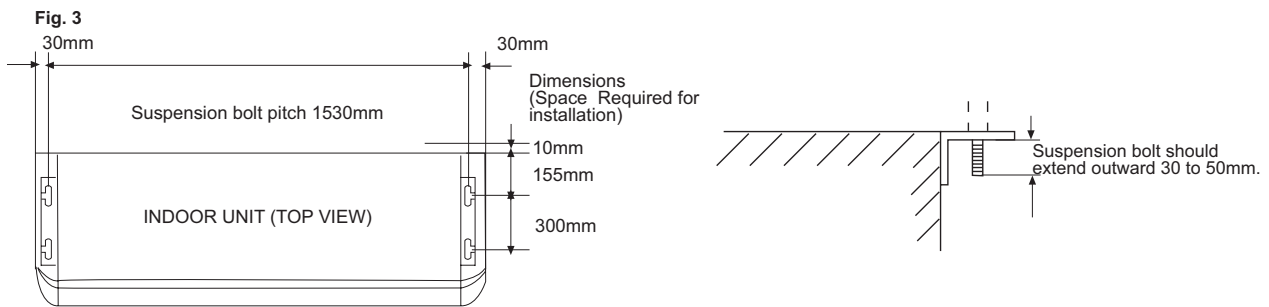
(2) Pull out the electric component box.

(Fig. 23)





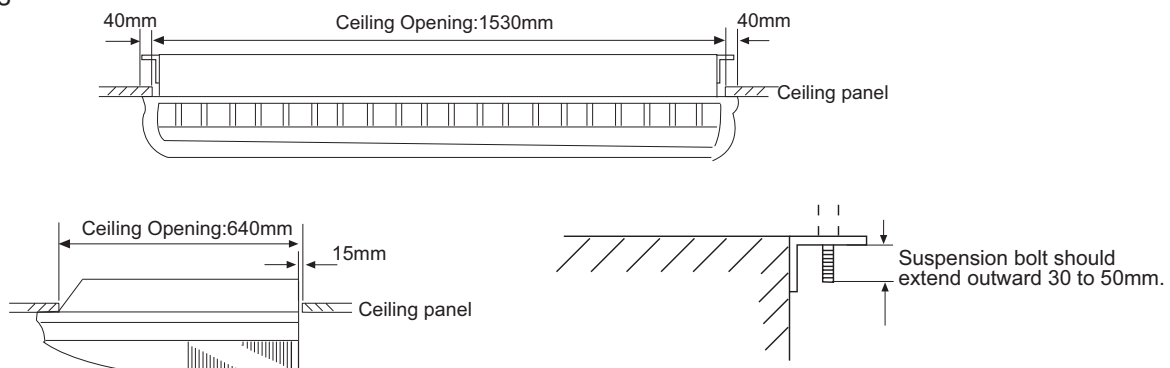
2) LOCATION OF CEILING SUSPENSION BOLTS



For half-concealed installation

Suspension-bolt pitch should be as shown in Fig.4.

Fig. 4



3. DRILLING THE HOLES AND ATTACHING THE SUSPENSION BOLTS

(1) Drill $\phi 25\text{mm}$ holes at the suspension-bolt locations.

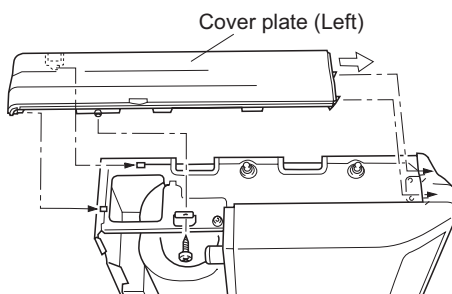
(The two special nuts are provided with the unit. The M10 nut must be obtained locally.) Refer to Fig.5.

(2) Install the bolts, then temporarily attach Special nuts A and B and a normal M10 nut to each bolt.

2. Mount the cover plate.(Left)

(1) Join the cover plate (left) and mount with screws.

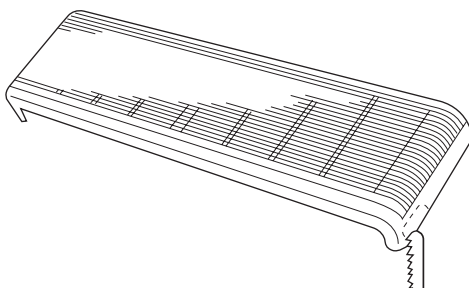
(Fig. 28)



3. Mount the intake grill.

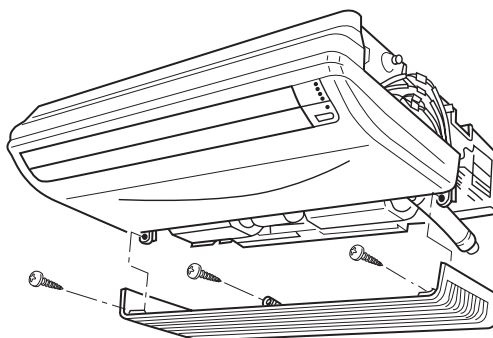
(1) Cut the right side of the intake grill. This is only when the pipe exits from the right side

(Fig. 29)



(2) Insert the hinges on the bottom of the intake grill into the holes in the base assembly. Then mount the arms to the three areas on the top of the intake grill.

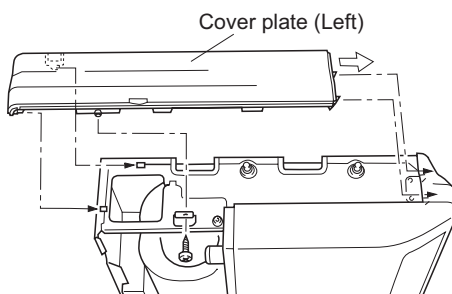
(Fig.30)



2. Mount the cover plate.(Left)

(1) Join the cover plate (left) and mount with screws.

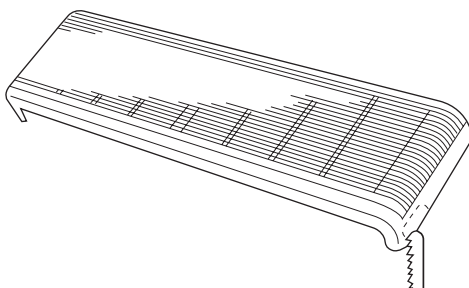
(Fig. 28)



3. Mount the intake grill.

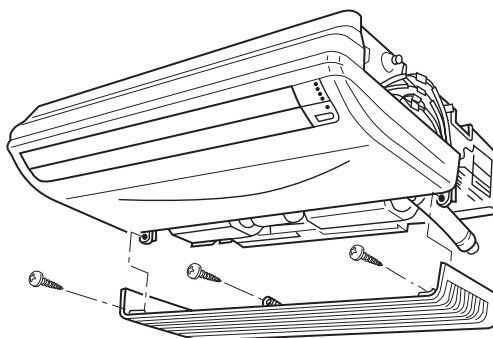
(1) Cut the right side of the intake grill. This is only when the pipe exits from the right side

(Fig. 29)



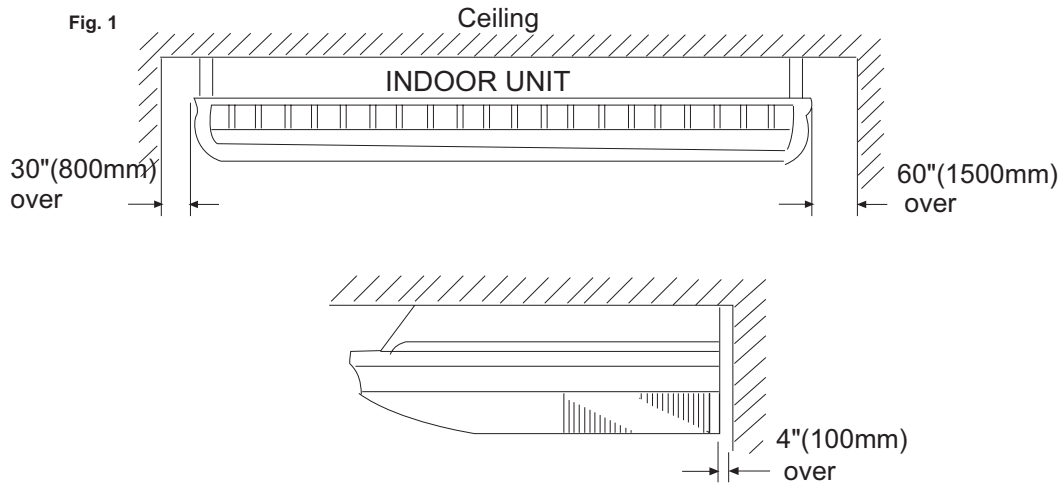
(2) Insert the hinges on the bottom of the intake grill into the holes in the base assembly. Then mount the arms to the three areas on the top of the intake grill.

(Fig.30)

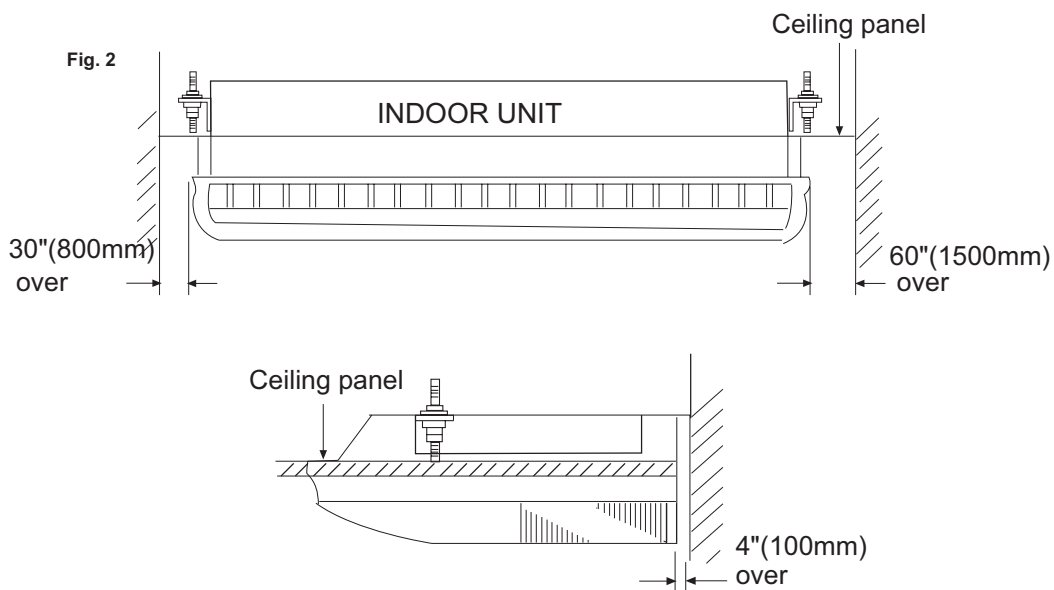


10.2 FAV038~48 installation

For mounted on the ceiling:



For half concealed installation:



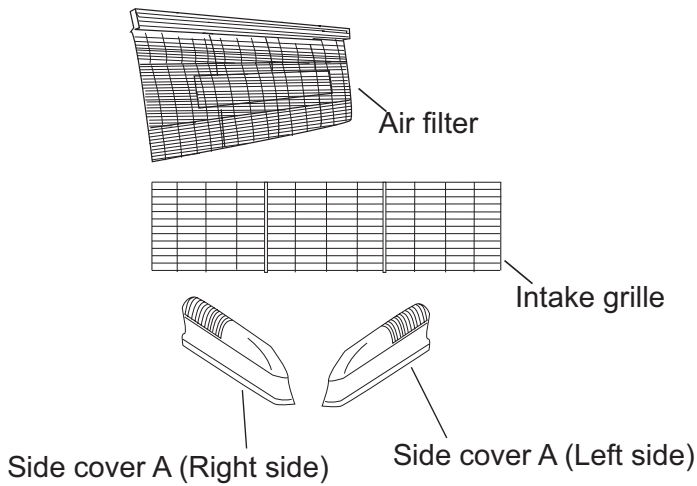
2. CONNECTION PIPE REQUIREMENT

INSTALLATION PROCEDURE

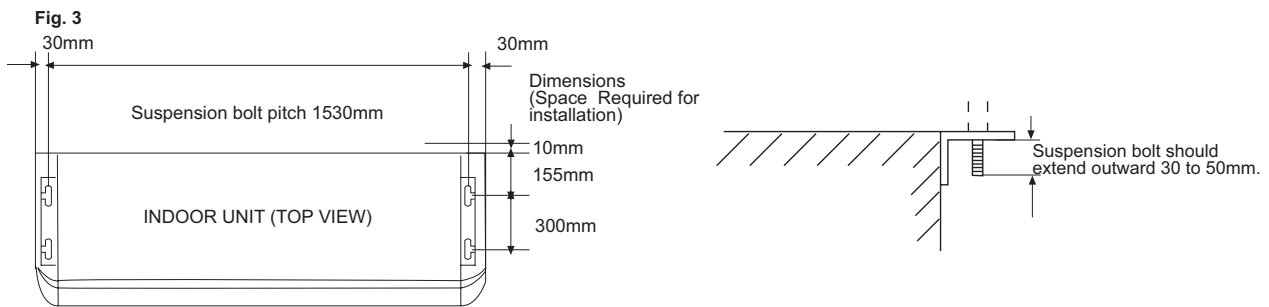
Install the room air conditioner as follows:

1) REMOVE THE INTAKE GRILL AND SIDE COVER

- (1) Remove the two Air filters
- (2) Remove the two intake grilles
- (3) Remove the Side cover A (Right and left side)
- (4) This air conditioner can be set up to intake fresh air .



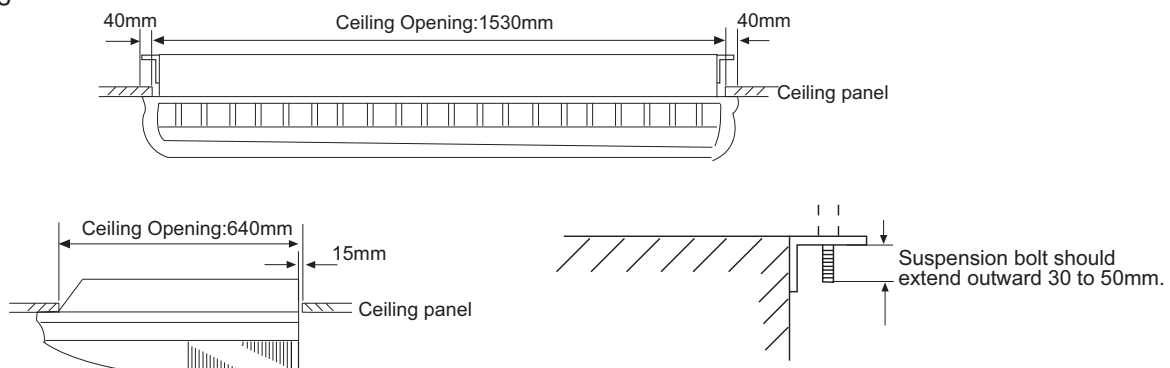
2) LOCATION OF CEILING SUSPENSION BOLTS



For half-concealed installation

Suspension-bolt pitch should be as shown in Fig.4.

Fig. 4

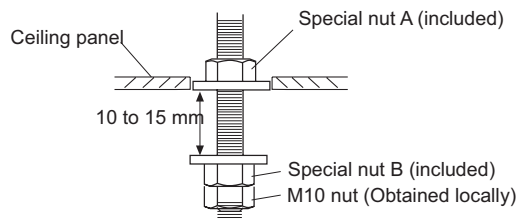


3. DRILLING THE HOLES AND ATTACHING THE SUSPENSION BOLTS

- (1) Drill $\phi 25\text{mm}$ holes at the suspension-bolt locations.
(The two special nuts are provided with the unit. The M10 nut must be obtained locally.) Refer to Fig.5.
- (2) Install the bolts, then temporarily attach Special nuts A and B and a normal M10 nut to each bolt.

Fig. 5

Bolt Strength	980 to 1470 N (100 TO 150 kgf)
---------------	--------------------------------

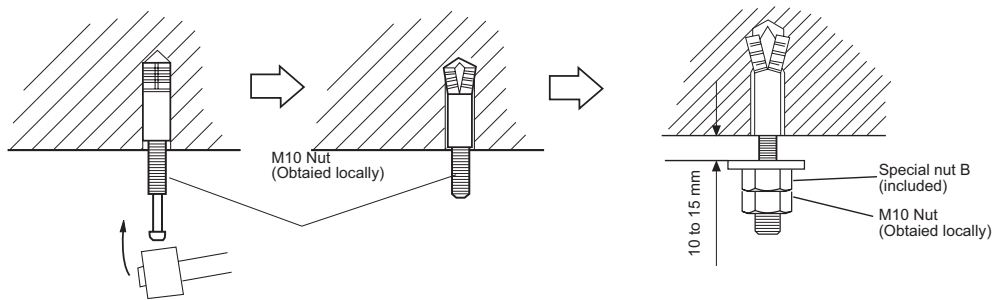


IF USING ANCHOR BOLTS

- (1) Drill holes for anchor bolts at the locations at which you will set the suspension bolts. Note that anchor bolts (to be obtained locally).
- (2) Install the anchor bolts, then temporarily attach special nut "B" (included) and a locally-procured M10 nut to each of the bolts. (See Fig.6.)

Anchor-Bolt Strength	980 to 1470 N (100 TO 150 kgf)
----------------------	--------------------------------

Fig. 6



4. INSTALLING THE INDOOR UNIT

- (1) Lift unit so that suspension bolts pass through suspension fittings at the sides (four places), and slide the unit back. (See Fig.8.)

Fig. 7

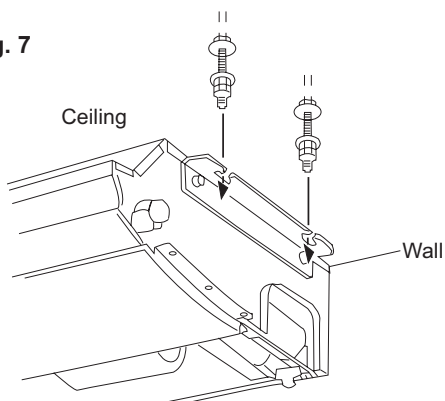
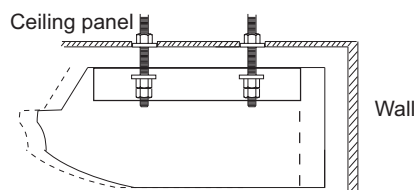
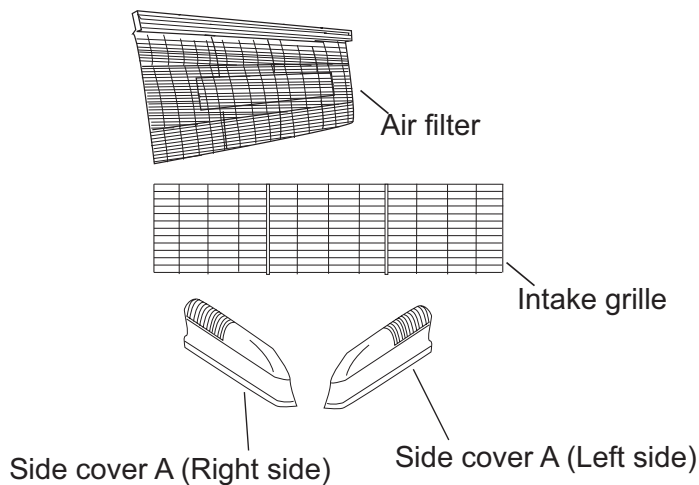
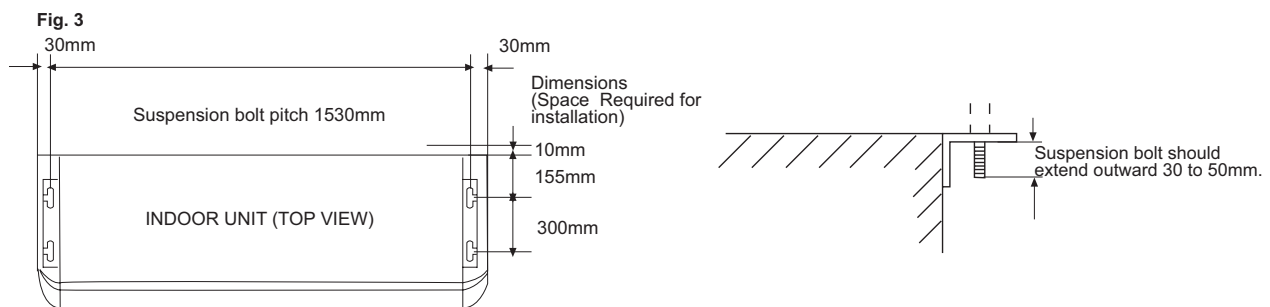


Fig. 8





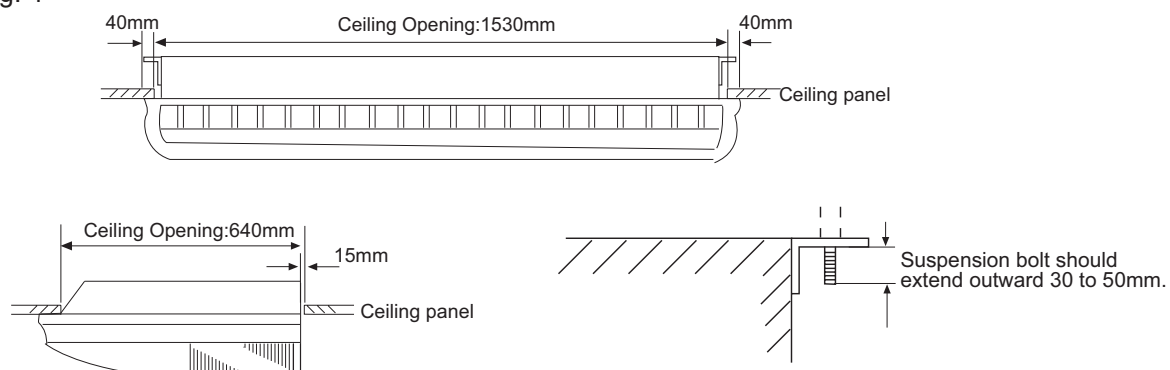
2) LOCATION OF CEILING SUSPENSION BOLTS



For half-concealed installation

Suspension-bolt pitch should be as shown in Fig.4.

Fig. 4

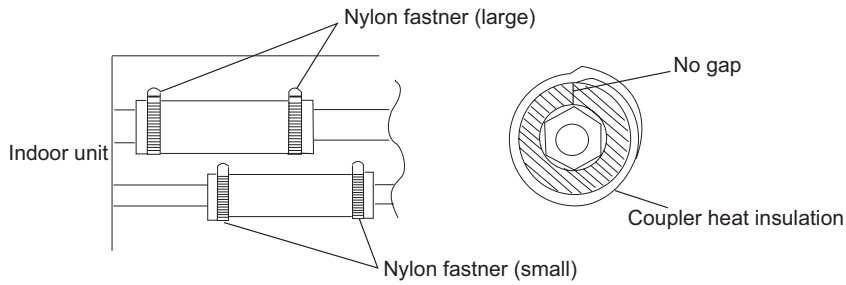


3. DRILLING THE HOLES AND ATTACHING THE SUSPENSION BOLTS

(1) Drill $\phi 25\text{mm}$ holes at the suspension-bolt locations.

(The two special nuts are provided with the unit. The M10 nut must be obtained locally.) Refer to Fig.5.

(2) Install the bolts, then temporarily attach Special nuts A and B and a normal M10 nut to each bolt.



When using an auxiliary pipe, make sure that the fastener used is insulated in the same way.

6. DRAIN PIPING

Install the drain pipe with downward gradient (1/50 to 1/100) and so there are no rises or traps in the pipe.

Use general hard polyvinyl chloride pipe (VP25)[outside diameter 38 mm.]

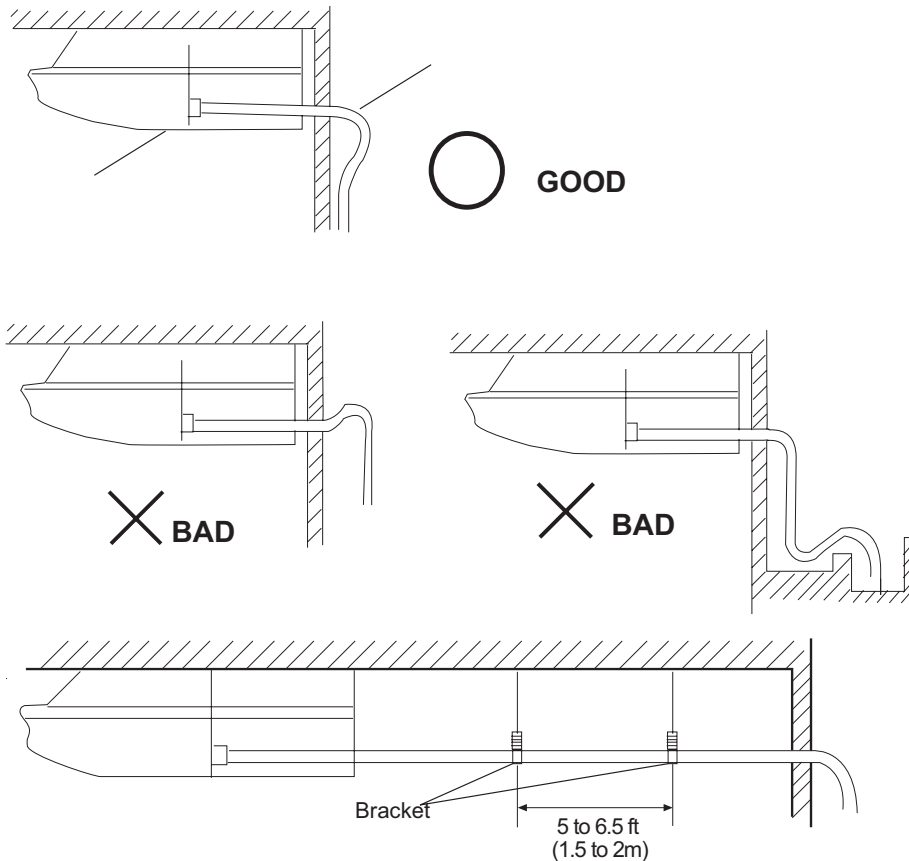
During installation of the drain pipe, be careful to avoid applying pressure to the drain point of the unit.

When the pipe is long, install supporters (Fig 11).

Do not perform air bleeding.

Always heat insulate (8mm or over thick) the indoor side of the drain pipe.

Fig. 11



(1) Install insulation for the drain pipe.(See Fig.12 and 13)

Cut the included insulation material to an appropriate size and adhere it to the pipe.

Fig. 12

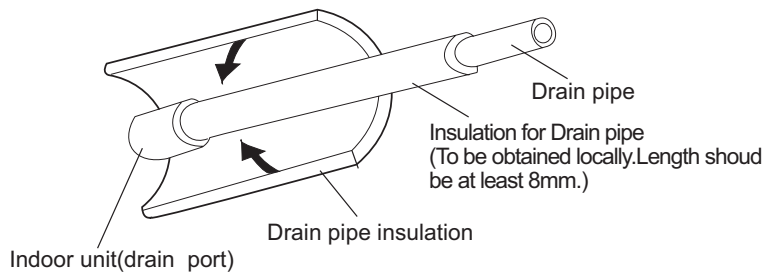
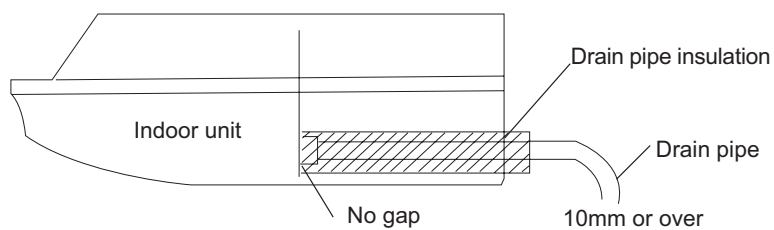
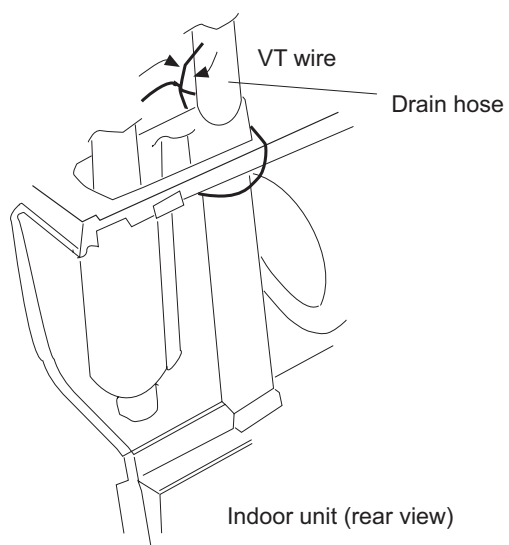


Fig. 13



(2) If "Right rear piping ":fasten the drain pipe with VT wires so that the pipe slopes correctly within the indoor unit.

Fig. 14



7. ELECTRICAL WIRING

HOW TO CONNECT WIRING TO THE TERMINALS

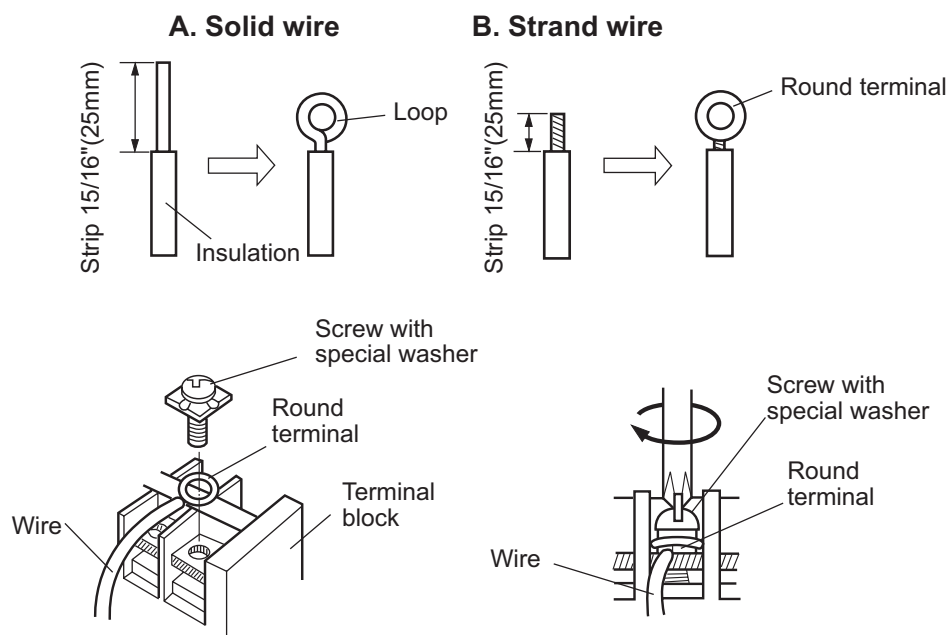
A. For solid core wiring (or F-cable)

- (1) Cut the wire and with a wire cutter or wire-cutting pliers, then strip the insulation to about 15/16" (25mm) of expose the solid wire.
- (2) Using a screwdriver, remove the terminal screw(s) on the terminal board.
- (3) Using pliers, bend the solid wire to form a loop suitable for the terminal screw.
- (4) shape the loop wire properly, place it on the terminal board and tighten securely with the terminal screw using a screwdriver.

B. For strand wiring

- (1) Cut the wire and with a wire cutter or wire-cutting pliers, then strip the insulation to about 3/8" (10mm) of expose the solid wire.
- (2) Using a screwdriver, remove the terminal screw(s) on the terminal board.
- (3) Using a round terminal fastener or pliers, securely clamp a round terminal to each stripped wire end.
- (4) Position the round terminal wire, and replace and tighten the terminal screw using a screwdriver.

Fig. 15



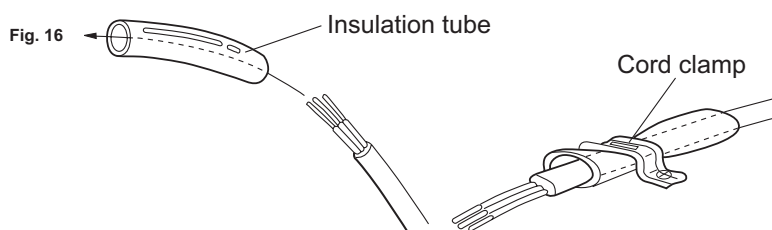
HOW TO FIX CONNECTION CORD AND POWER CABLE AT THE CORD CLAMP

After passing the connection cord and power cable through the insulation tube, fasten it with the cord clamp, as shown in Fig.16

ELECTRICAL REQUIREMENT

- Electric wire size and fuse capacity:

Series	38, 48	
Connection cord (mm ²)	MAX	3.5
	MIN	2.0
Fuse capacity(A)	30	



Use VW-1, 0.5 to 1.0 mm thick, PVC tube as the insulation tube.

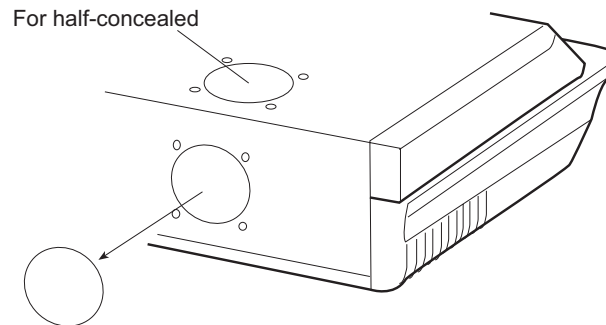
⚠ CAUTION

- (1) Match the terminal block numbers and connection cord colors with those of the outdoor unit. Erroneous wiring may cause burning of the electric parts.
- (2) Connect the connection cords firmly to the terminal block. Imperfect installation may cause a fire.
- (3) Always fasten the outside covering of the connection cord with the cord clamp. (If the insulator is chafed, electric leakage may occur.)
- (4) Always connect the ground wire.

8. FRESH-AIR INTAKE

(1) Take away the knockout hole for the fresh-air intake, as shown in Fig. 17. (If using half-concealed installation, take down the top knockout hole instead)

Fig. 17

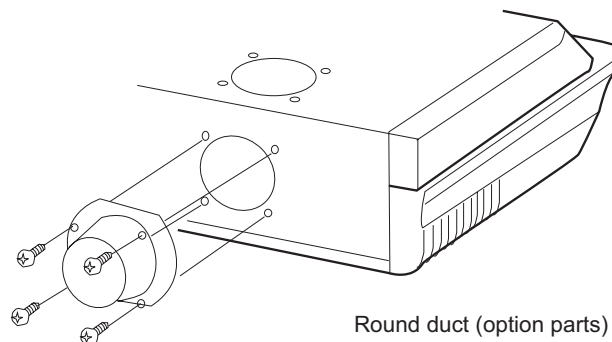


⚠ CAUTION

- (1) When removing the cabinet (iron plate), be careful not to damage the indoor unit internal parts and surrounding area (outer case).
- (2) When processing the cabinet (iron plate), be careful not to injure yourself with burrs, etc.

(2) Fasten the round flange (optional) to the fresh air intake, as shown in Fig. 18. (If using half-concealed installation, attach to the top.)

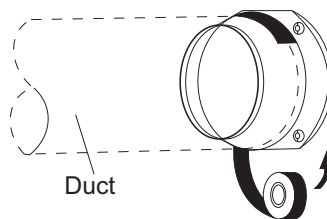
Fig. 18



[After completing "INDOOR UNIT INSTALLATION"....]

- (3) Connect the duct to the round flange.
- (4) Seal with a band and vinyl tape, etc. so that air does not leak from the connection.

Fig. 19



9. CONNECTION CORDS





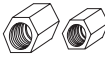
- (1) Remove the cord clamp.
- (2) Put the end of the connection cords to the correct positions.
- (3) Connect the end of the connection cord fully into the terminal block.
- (4) Fasten the connection cord with a cord clamp.
- (5) Fasten the end of the connection cord with the screw.
- (6) The power cable and connecting cable are self-provided.

 **WARNING**








- | |
|--|
| (1) Always use a special branch circuit and install a special receptacle to supply power to the room air conditioner. |
| (2) Use a circuit breaker and receptacle matched to the capacity of the room air conditioner. |
| (3) The circuit breaker is installed in the permanent wiring. Always use a circuit that can trip all the poles of the wiring and has an isolation distance of at least 3mm between the contacts of each pole. |
| (4) Perform wiring work in accordance with standards so that the room air conditioner can be operated safely and positively. |
| (5) Install a leakage circuit breaker in accordance with the related laws and regulations and electric company standards. |

11. Accessories

FAV009~24 accessories:

No.	Accessory parts	Qty.
①	 Wired controller	1
②	 Wire clamp	4
③	 Heat insulation sheathing	1+1
④	 Screw	2+2
⑤	 Screw cap	1+1

FAV038~48 accessories:

No.	Accessory parts	Qty.	Remarks
①	 Wired controller	1	—
②	 Wire clamp	4	—
③	 Heat insulation sheathing	1+1	—
④	 Screw	2+2	—
⑤	 Drain hose	1	—
⑥	 Screw cap	1+1	—
⑦	 Flat washer	8	—

Wall mounted type indoor unit

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10. Installation-----	200



1. Features



HAV007
HAV009
HAV012
HAV016
HAV018
HAV024

EEV inside put

The EEV box inside put, easy for installation

High-quality DC fan motor, reduce the indoor unit noise greatly

New fashion design





2. Specifications

Indoor units Wall mounted type

Hp	0.8	1	1.25	
Model	HAV007	HAV009	HAV012	
Nominal cooling capacity(KW)	2.2	2.8	3.6	
Nominal heating capacity(KW)	2.5	3.2	4.0	
Heating capacity at low temp.(KW)	2.0	2.5	3.2	
Electrical characteristics	Power source	1PH, 220~230V, 50/60Hz		
	Running current(A)	0.25	0.25	0.25
	Power consumption(KW)	0.05	0.05	0.05
Fan characteristics	Fan type and Qty	cross*1	cross*1	cross*1
	Fan motor output(KW)	0.04	0.04	0.025
	Standard airflow(m ³ /h)	600	600	600
	Standard static pressure(Pa)	0	0	0
	Max. static pressure(Pa)	0	0	0
Exterior dimensions(mm)	938*187*265	938*187*265	938*187*265	
Net weight(Kg)	10.9	10.9	10.9	
Gross Weight(Kg)	12.6	12.6	12.6	
Refrigment control method	EEV	EEV	EEV	
Controller	remote RCV01			
Accessory	Used for installation			
Piping dimension	Gas piping(mm)	∅ 12.7	∅ 12.7	∅ 12.7
	Liquid piping(mm)	∅ 6.35	∅ 6.35	∅ 6.35
	Drain hose(mm)	∅ 16.8	∅ 16.8	∅ 16.8
	Connection method	flared	flared	flared
Noise level(dB(A)) H/M/L	37/33/31	37/34/31	41/36/33	
EEV model	2.4	2.4	2.4	

Normal condition: indoor temperature (cooling): 27°CDB/19°CWB, indoor temperature (heating): 20°CDB/14.5°CWB
Outdoor temperature(cooling): 35°CDB/24°CWB, outdoor temperature(heating): 7°CDB/6°CWB

The noise level will be measured in the third octave band limited values in the semi-anechoic chamber, using a Real Time Analyser calibrated sound intensity meter. It is a sound pressure noise level.



Indoor units
Wall mounted type

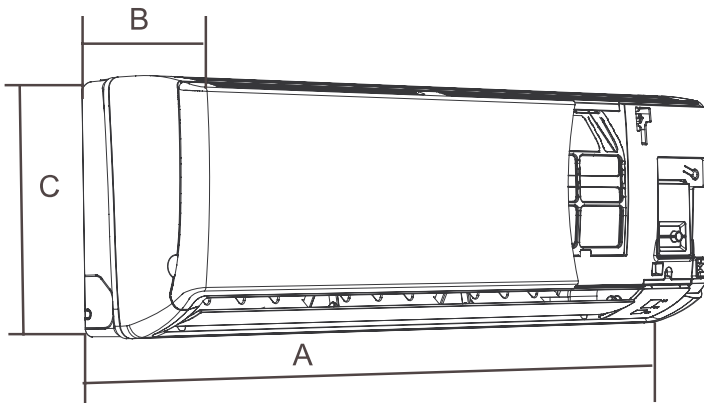
Hp		1.7	2	2.5
Model		HAV016	HAV018	HAV024
Nominal cooling capacity(KW)		2.2	2.8	3.6
Nominal heating capacity(KW)		5	3.2	4.0
Heating capacity at low temp.(KW)		4	2.5	3.2
Electrical characteristics	Power source	1PH, 220~230V, 50/60Hz		
	Running current(A)	0.25	0.25	0.25
	Power consumption(KW)	0.05	0.05	0.05
Fan characteristics	Fan type and Qty	cross*1	cross*1	cross*1
	Fan motor output(KW)	0.04	0.04	0.025
	Standard airflow(m ³ /h)	600	600	600
	Standard static pressure(Pa)	0	0	0
	Max. static pressure(Pa)	0	0	0
Exterior dimensions(mm)		938*187*265	1046*239*299	1046*239*299
Net weight(Kg)		10.9	13	10.9
Gross Weight(Kg)		12.6	16.5	12.6
Refrigment control method		EEV	EEV	EEV
Controller		remote RCV01		
Accessory		Used for installation		
Piping dimension	Gas piping(mm)	∅ 12.7	∅ 15.88	∅ 15.88
	Liquid piping(mm)	∅ 6.35	∅ 9.52	∅ 9.52
	Drain hose(mm)	∅ 16.8	∅ 16.8	∅ 16.8
	Connection method	flared	flared	flared
Noise level(dB(A)) H/M/L		43/36/33	43/39/34	48/39/37
EEV model		2.4	2.4	2.4

Norminal condition: indoor temperature (cooling): 27°CDB/19°CWB, indoor temperature (heating): 20°CDB/14.5°CWB
Outdoor temperature(cooling): 35°CDB/24°CWB, outdoor temperature(heating): 7°CDB/6°CWB

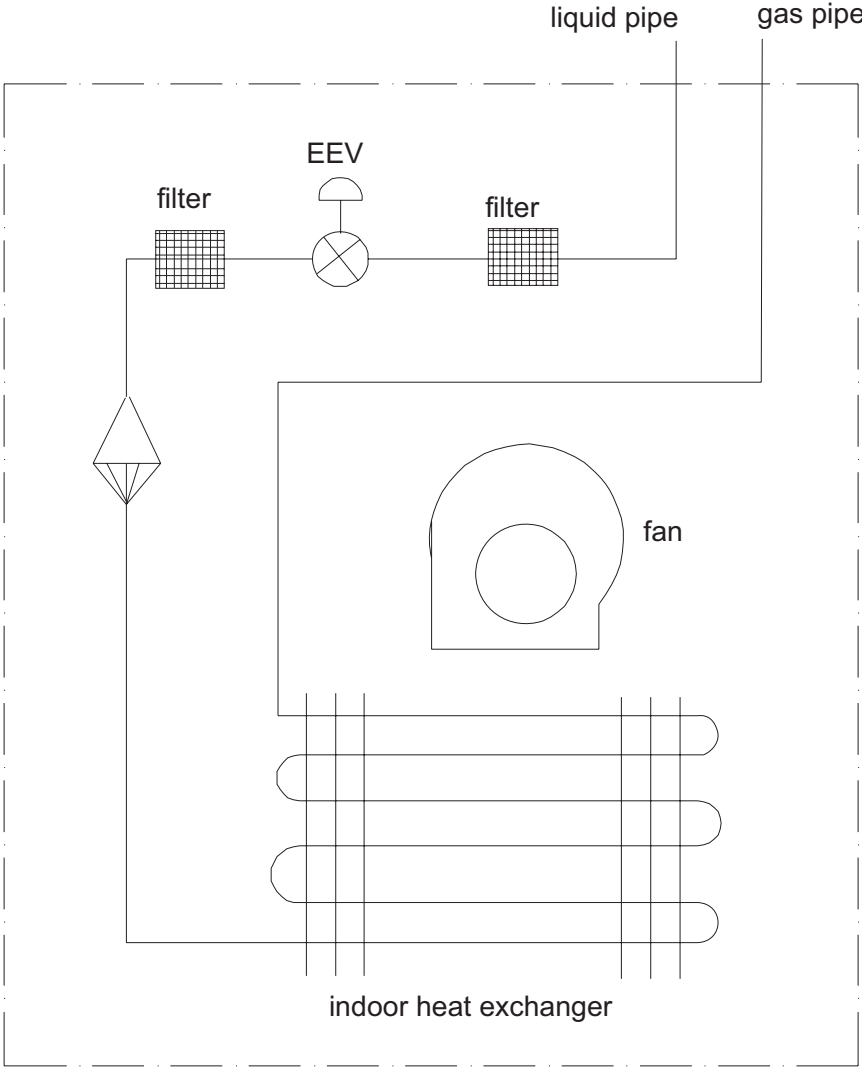
The noise level will be measured in the third octave band limited values in the semi-anechoic chamber, using a Real Time Analyser calibrated sound intensity meter. It is a sound pressure noise level.

3. Dimensions

MODEL	A	B	C
HAV007~16	938	186.5	265
HAV018~24	1046	234	299



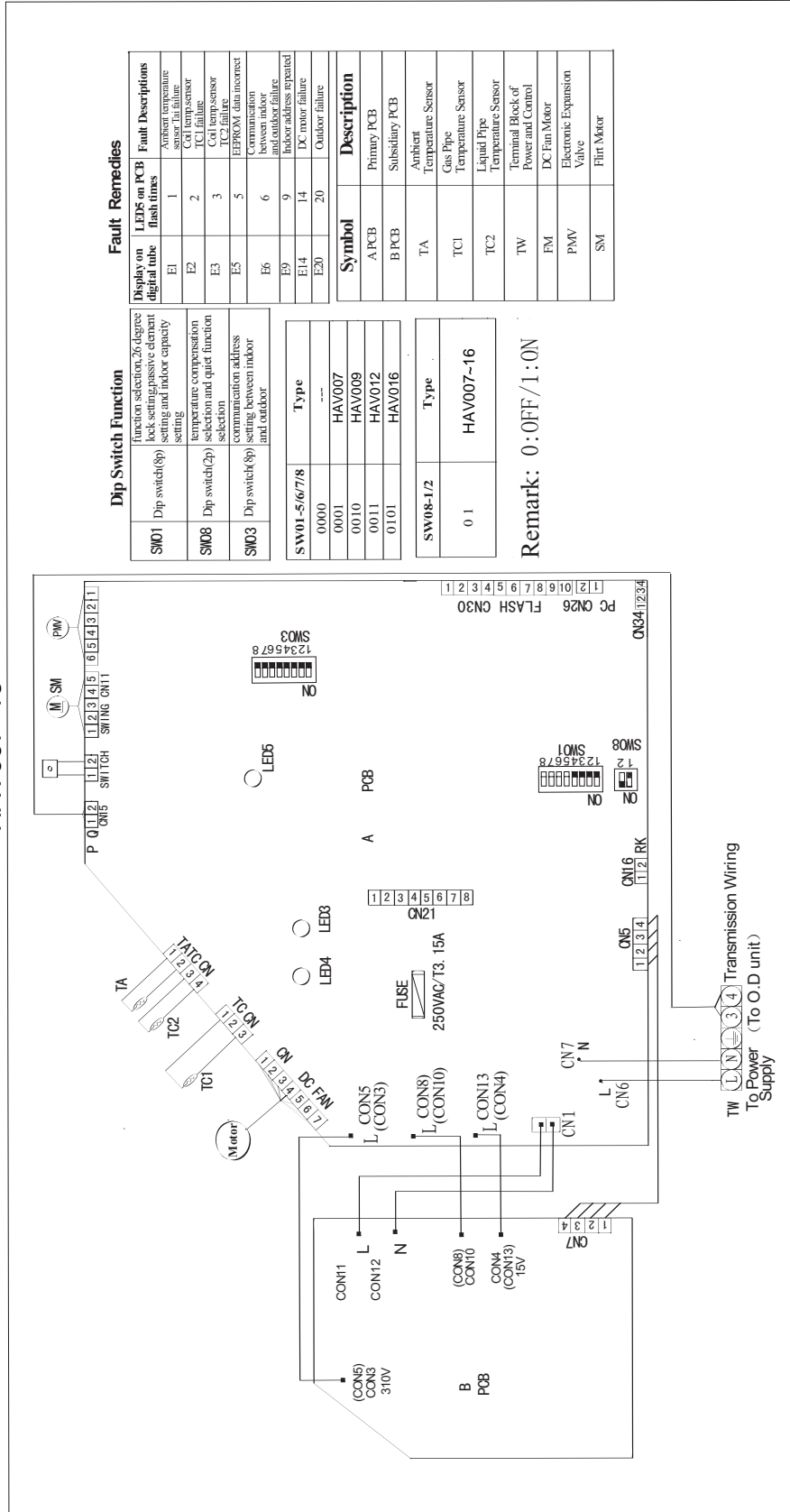
4. Piping diagrams



5. Wiring diagrams

WIRING DIAGRAM OF HAV007~16

0150508609



WIRING DIAGRAM OF HAV018~24

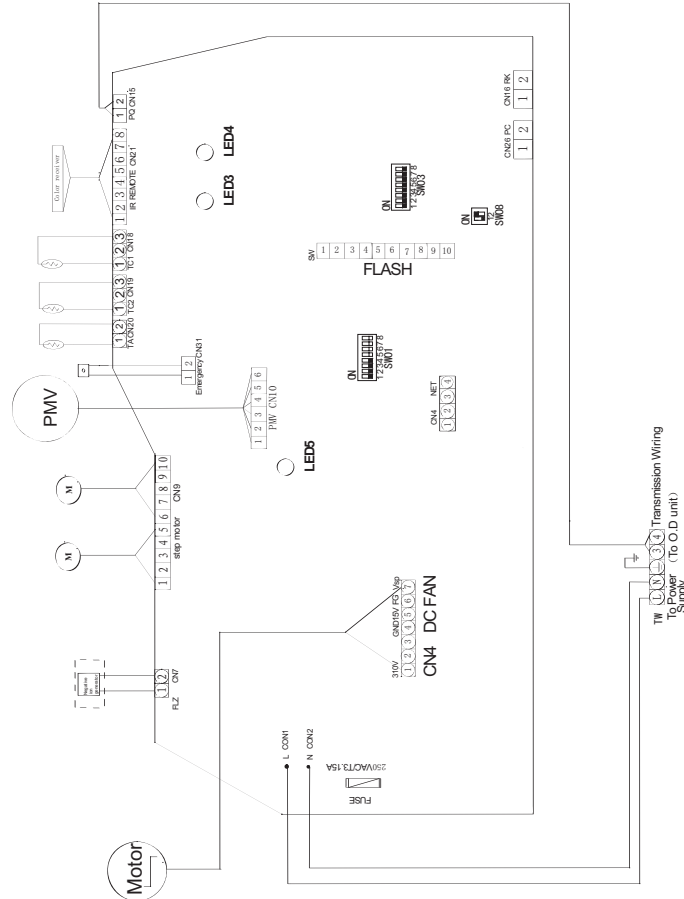
0150508610

Symbol	Description
SM1	Flirt Motor1
SM2	Flirt Motor2
TA	Ambient Temperature Sensor
TC1	Gas Pipe Temperature Sensor
TC2	Liquid Pipe Temperature Sensor
TW	Terminal Block of Power and Control
FM	DC Fan Motor
PMV	Electronic Expansion Valve

SW01-5/6/7/8	Type
0110	HAV018
0111	HAV024

SW08-1/2	Type
01	HAV018~24

Remark: 0: OFF / 1: ON



Fault Remedies

Display on digital tube	LED5 on PCB flash times	Fault Descriptions
E1	1	Ambient temperature sensor fail failure
E2	2	Coil temp. sensor TC1 failure
E3	3	Coil temp. sensor TC2 failure
E5	5	EEPROM data incorrect
E6	6	Communication between indoor and outdoor failure
E9	9	Indoor address repeated
E14	14	DC motor failure
E20	20	Outdoor failure

Dip Switch Function (0: OFF / 1: ON)

SW01	Dip switch(Sp)	function selection, 26 degree lock setting, passive element setting and indoor capacity setting
SW08	Dip switch(Cp)	temperature compensation selection and quiet function selection
SW03	Dip switch(Sp)	communication address setting between indoor and outdoor



6. Capacity table (CA: total capacity; SHC: sensible heat capacity)

Capacity (W*100)	Outdoor temp.	Indoor temperature													
		21.5°CDB		23°CDB		25°CDB		27°CDB		28°CDB		30°CDB		32°CDB	
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC
22	20	2.2	1.5	2.2	1.5	2.3	1.5	2.3	1.5	2.4	1.6	2.5	1.5	2.6	1.5
	22.5	2.1	1.5	2.2	1.5	2.3	1.5	2.3	1.5	2.4	1.5	2.4	1.5	2.5	1.5
	25	2.1	1.5	2.2	1.5	2.2	1.5	2.3	1.5	2.3	1.5	2.4	1.5	2.5	1.5
	27.5	2.1	1.5	2.1	1.5	2.2	1.5	2.3	1.5	2.3	1.5	2.4	1.5	2.5	1.4
	30	2.1	1.5	2.1	1.5	2.2	1.5	2.2	1.5	2.3	1.5	2.4	1.5	2.5	1.4
	32.5	2	1.5	2.1	1.5	2.2	1.5	2.2	1.5	2.3	1.5	2.4	1.5	2.4	1.4
	35	2	1.5	2	1.5	2.2	1.5	2.2	1.5	2.2	1.5	2.3	1.5	2.4	1.4
	37.5	2	1.4	2	1.5	2.1	1.4	2.2	1.4	2.2	1.5	2.3	1.5	2.4	1.4
	40	2	1.4	2	1.5	2.1	1.4	2.2	1.4	2.2	1.5	2.3	1.4	2.4	1.4
43	2	1.4	2.8	1.4	2.1	1.4	2.1	1.4	2.2	1.5	2.3	1.4	2.3	1.4	
28	20	2.7	1.9	2.8	1.9	2.9	1.9	3	1.9	3	1.9	3.1	1.9	3.2	1.8
	22.5	2.7	1.9	2.7	1.9	2.9	1.9	2.9	1.9	3	1.9	3.1	1.9	3.2	1.8
	25	2.7	1.9	2.7	1.9	2.9	1.9	2.9	1.9	3	1.9	3.1	1.9	3.2	1.8
	27.5	2.7	1.9	2.7	1.9	2.8	1.8	2.9	1.9	2.9	1.9	3.1	1.9	3.2	1.8
	30	2.6	1.8	2.7	1.9	2.8	1.8	2.9	1.8	2.9	1.9	3	1.8	3.1	1.8
	32.5	2.6	1.8	2.6	1.9	2.8	1.8	2.8	1.8	2.9	1.9	3	1.8	3.1	1.8
	35	2.6	1.8	2.6	1.9	2.7	1.8	2.8	1.8	2.9	1.9	3	1.8	3.1	1.8
	37.5	2.5	1.8	2.6	1.8	2.7	1.8	2.8	1.8	2.8	1.9	2.9	1.8	3.1	1.8
	40	2.5	1.8	2.5	1.8	2.7	1.8	2.7	1.8	2.8	1.8	2.9	1.8	3	1.7
43	2.5	1.8	3.6	1.8	2.7	1.8	2.7	1.8	2.8	1.8	2.9	1.8	3	1.7	
36	20	3.5	2.8	3.6	2.9	3.7	2.8	3.8	2.9	3.9	3	4	2.9	4.2	2.8
	22.5	3.5	2.8	3.5	2.9	3.7	2.8	3.8	2.9	3.9	3	4	2.9	4.1	2.8
	25	3.5	2.8	3.5	2.9	3.7	2.8	3.7	2.9	3.8	3	4	2.9	4.1	2.8
	27.5	3.4	2.8	3.5	2.9	3.6	2.8	3.7	2.8	3.8	2.9	3.9	2.9	4.1	2.8
	30	3.4	2.8	3.4	2.8	3.6	2.8	3.7	2.8	3.7	2.9	3.9	2.9	4	2.8
	32.5	3.3	2.7	3.4	2.8	3.6	2.8	3.6	2.8	3.7	2.9	3.9	2.9	4	2.8
	35	3.3	2.7	3.3	2.8	3.5	2.7	3.6	2.8	3.7	2.9	3.8	2.8	4	2.8
	37.5	3.3	2.7	3.3	2.8	3.5	2.7	3.6	2.8	3.6	2.9	3.8	2.8	3.9	2.8
	40	3.2	2.7	3.3	2.8	3.5	2.7	3.5	2.8	3.6	2.9	3.7	2.8	3.9	2.7
43	3.2	2.7	4	2.8	3.4	2.9	3.5	2.8	3.6	2.9	3.7	2.8	3.8	2.7	
40	20	3.9	2.9	4	3	4.2	2.9	4.3	3	4.3	3.2	4.5	3	4.7	2.9
	22.5	3.9	2.9	3.9	3	4.1	2.9	4.2	3	4.3	3.2	4.5	3	4.6	2.9
	25	3.9	2.9	3.9	3	4.1	2.9	4.2	3	4.3	3.2	4.4	3	4.6	2.9
	27.5	3.8	2.9	3.9	3	4.1	2.9	4.1	2.9	4.2	3	4.4	3	4.5	2.9
	30	3.8	2.9	3.8	2.9	4	2.9	4.1	2.9	4.2	3	4.3	3	4.5	2.9
	32.5	3.7	2.8	3.8	2.9	4	2.9	4.1	2.9	4.1	3	4.3	3	4.5	2.9
	35	3.7	2.8	3.7	2.9	3.9	2.8	4	2.9	4.1	3	4.3	2.9	4.4	2.9
	37.5	3.7	2.8	3.7	2.9	3.9	2.8	4	2.9	4.1	3	4.2	2.9	4.4	2.9
	40	3.6	2.8	3.7	2.9	3.9	2.8	3.9	2.9	4	3	4.2	2.9	4.3	2.8
43	3.6	2.8	4.5	2.9	3.8	3.2	3.9	2.9	4	3	4.1	2.9	4.3	2.8	



Capacity (W*100)	Outdoor temp.	Indoor temperature													
		21.5°CDB		23°CDB		25°CDB		27°CDB		28°CDB		30°CDB		32°CDB	
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC
45	20	4.4	3.2	4.5	3.3	4.7	3.2	4.8	3.2	4.9	3.3	5	3.3	5.2	3.2
	22.5	4.4	3.2	4.4	3.3	4.6	3.2	4.7	3.2	4.8	3.3	5	3.2	5.2	3.2
	25	4.3	3.2	4.4	3.3	4.6	3.2	4.7	3.2	4.8	3.3	5	3.2	5.1	3.1
	27.5	4.3	3.2	4.3	3.2	4.5	3.1	4.6	3.2	4.7	3.3	4.9	3.2	5.1	3.1
	30	4.2	3.1	4.3	3.2	4.5	3.1	4.6	3.2	4.7	3.3	4.9	3.2	5	3.1
	32.5	4.2	3.1	4.2	3.2	4.5	3.1	4.5	3.2	4.6	3.3	4.8	3.2	5	3.1
	35	4.1	3.1	4.2	3.2	4.4	3.1	4.5	3.1	4.6	3.2	4.8	3.2	5	3.1
	37.5	4.1	3.1	4.1	3.2	4.4	3.1	4.5	3.1	4.5	3.2	4.7	3.1	4.9	3.1
	40	4.1	3.1	4.1	3.1	4.3	3	4.4	3.1	4.5	3.2	4.7	3.1	4.9	3
43	4	3	5.6	3.1	4.3	3.8	4.4	3.1	4.4	3.2	4.6	3.1	4.8	3	
56	20	5.5	3.8	5.5	3.9	5.8	3.7	5.9	3.8	6	3.9	6.3	3.7	6.5	3.6
	22.5	5.4	3.8	5.5	3.8	5.8	3.7	5.9	3.7	6	3.8	6.2	3.7	6.4	3.6
	25	5.4	3.7	5.4	3.8	5.7	3.7	5.8	3.7	5.9	3.8	6.2	3.7	6.4	3.6
	27.5	5.3	3.7	5.4	3.8	5.7	3.7	5.8	3.7	5.8	3.8	6.1	3.7	6.3	3.6
	30	5.3	3.7	5.3	3.7	5.6	3.6	5.7	3.7	5.8	3.8	6	3.7	6.3	3.5
	32.5	5.2	3.6	5.3	3.7	5.5	3.6	5.7	3.6	5.7	3.7	6	3.6	6.2	3.5
	35	5.2	3.6	5.2	3.7	5.5	3.6	5.6	3.6	5.7	3.7	5.9	3.6	6.2	3.5
	37.5	5.1	3.6	5.2	3.7	5.4	3.5	5.5	3.6	5.6	3.7	5.9	3.6	6.1	3.5
	40	5	3.6	5.1	3.6	5.4	3.5	5.5	3.6	5.5	3.7	5.8	3.6	6	3.5
43	5	3.5	2.1	3.6	5.3	2.8	5.4	3.5	5.9	3.6	5.8	3.5	6	3.4	
71	20	7	4.9	7.1	5	7.4	4.9	7.5	4.9	7.7	5	8	4.9	8.2	4.7
	22.5	6.9	4.9	7	4.9	7.3	4.8	7.5	4.8	7.6	5	7.9	4.8	8.2	4.7
	25	6.8	4.8	7	4.9	7.2	4.8	7.4	4.8	7.5	4.9	7.8	4.8	8.1	4.7
	27.5	6.7	4.8	6.9	4.9	7.2	4.8	7.3	4.8	7.5	4.9	7.7	4.8	8	4.6
	30	6.7	4.7	6.8	4.8	7.1	4.7	7.2	4.7	7.4	4.9	7.7	4.7	8	4.6
	32.5	6.6	4.7	6.7	4.8	7	4.7	7.2	4.7	7.3	4.8	7.6	4.7	7.9	4.6
	35	6.5	4.7	6.7	4.8	7	4.7	7.1	4.7	7.2	4.8	7.5	4.7	7.8	4.6
	37.5	6.5	4.6	6.6	4.7	6.9	4.6	7	4.6	7.2	4.8	7.5	4.7	7.7	4.5
	40	6.4	4.6	6.5	4.7	6.8	4.6	7	4.6	7.1	4.8	7.4	4.6	7.7	4.5
43	6.3	4.6	6.4	4.6	6.7	4.6	6.9	4.6	7	4.7	7.3	4.6	7.6	4.5	

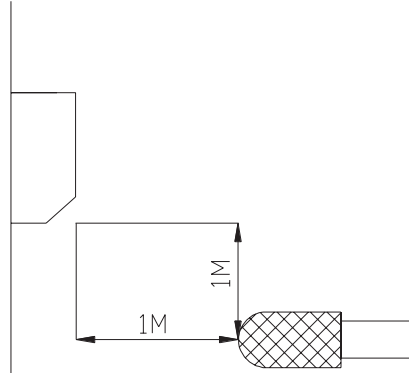


Heating mode:

Capacity (W*100)	outdoor temperature	Indoor temp.(°CDB)				Capacity (W*100)	outdoor temperature	Indoor temp.(°CDB)			
		16	20	25	24			16	20	25	24
	°CWB	SHC	SHC	SHC	SHC		°CWB	SHC	SHC	SHC	SHC
22	-15	1.7	1.6	1.6	1.6	45	-15	3.3	3.3	3.3	3.3
	-10	1.9	1.9	1.9	1.7		-10	3.8	3.8	3.7	3.5
	-5	2.1	2.1	1.9	1.7		-5	4.3	4.2	3.9	3.5
	0	2.4	2.4	1.9	1.7		0	4.8	4.7	3.9	3.5
	2.5	2.5	2.5	1.9	1.7		2.5	5	5	3.9	3.5
	6	2.5	2.5	1.9	1.7		6	5.1	5	3.9	3.5
	6.5	2.6	2.5	1.9	1.7		6.5	5.3	5	3.9	3.5
	10	2.8	2.5	1.9	1.7		10	5.6	5	3.9	3.5
	12.5	3	2.5	1.9	1.7		12.5	6	5	3.9	3.5
	15.5	3	2.5	1.9	1.7		15.5	6.1	5	3.9	3.5
28	-15	2.1	2.1	2.1	2.1	56	-15	4.2	4.2	4.1	4.1
	-10	2.4	2.4	2.4	2.2		-10	4.8	4.8	4.7	4.3
	-5	2.7	2.7	2.5	2.2		-5	5.4	5.3	4.9	4.3
	0	3.1	3	2.5	2.2		0	6	5.9	4.9	4.3
	2.5	3.2	3.2	2.5	2.2		2.5	6.3	6.2	4.9	4.3
	6	3.2	3.2	2.5	2.2		6	6.4	6.3	4.9	4.3
	6.5	3.4	3.2	2.5	2.2		6.5	6.6	6.3	4.9	4.3
	10	3.6	3.2	2.5	2.2		10	7.1	6.3	4.9	4.3
	12.5	3.8	3.2	2.5	2.2		12.5	7.5	6.3	4.9	4.3
	15.5	3.9	3.2	2.5	2.2		15.5	7.6	6.3	4.9	4.3
36	-15	2.7	2.6	2.6	2.6	71	-15	5.4	5.3	5.2	5.2
	-10	3.1	3	3	2.8		-10	6.1	6	6	5.5
	-5	3.4	3.4	3.1	2.8		-5	6.9	6.8	6.2	5.5
	0	3.8	3.8	3.1	2.8		0	7.6	7.5	6.2	5.5
	2.5	4	4	3.1	2.8		2.5	8	7.9	6.2	5.5
	6	4	4	3.1	2.8		6	8.1	8	6.2	5.5
	6.5	4.2	4	3.1	2.8		6.5	8.4	8	6.2	5.5
	10	4.5	4	3.1	2.8		10	9	8	6.2	5.5
	12.5	4.8	4	3.1	2.8		12.5	9.6	8	6.2	5.5
	15.5	4.8	4	3.1	2.8		15.5	9.7	8	6.2	5.5
40	-15	3	3	3	3		-15				
	-10	3.5	3.4	3.4	3.1		-10				
	-5	3.9	3.8	3.5	3.1		-5				
	0	4.3	4.3	3.5	3.1		0				
	2.5	4.5	4.5	3.5	3.1		2.5				
	6	4.6	4.5	3.5	3.1		6				
	6.5	4.8	4.5	3.5	3.1		6.5				
	10	5.1	4.5	3.5	3.1		10				
	12.5	5.4	4.5	3.5	3.1		12.5				
	15.5	5.5	4.5	3.5	3.1		15.5				

7. Noise level

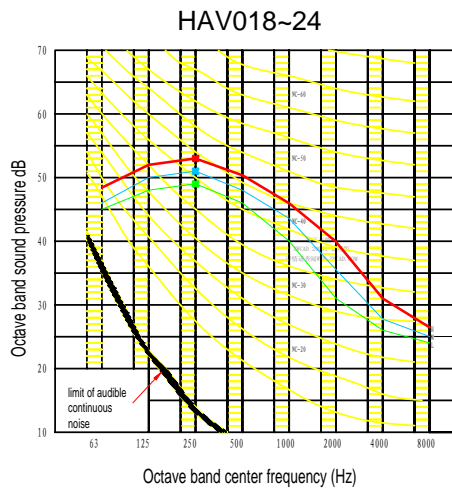
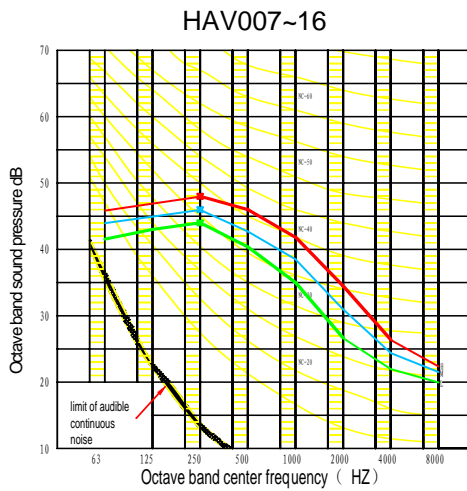
(1) Testing illustrate:



(2) Testing condition:

- a. Unit running in the nominal condition
- b. Test in the semi-anechoic chamber
- c. Noise level varies from the actual factors such as room structure, etc.

(3) Octave band level



8. Installation

This manual cannot completely illustrate all the properties of the products you bought. Please contact the local Haier distribution center if you have any question or request.

Please use the standard tool according to the installation requirements.

The standard attached accessories of the units of this series refer to the packing; prepare other accessories according to the requirements of the local installation point of our company.

1. Choose the suitable installation location. Indoor units should be installed in places with the environment of even circulation of cool and warm blows. The following places should be avoided.

※ Places with high salinity (beach), high sulfureted gas (such as the thermal spring regions where copper tubes and soft soldering are easy to be eroded), much oil (including mechanical oil) and steam; places where organic substance solvent is frequently used; places where machines generate the high frequency electromagnetic wave (abnormal condition will appear in the control system); places where there is high humidity exists near the door or windows (dew is easily formed); and places where the special sprayer is frequently used.

Indoor Units

(1) The distance between wind outlet port and the ground should not be more than 2.7m. The distance to streets should not be less than 2.5m.

(2) Select appropriate places for installation where the outlet air can be spread to places all over the house and arrange proper locations for connecting pipes and lines as well as the drainpipe to the outdoor.

(3) Ceiling construction must be hard enough to hold the weight of the unit.

(4) Make sure that the connecting pipe, drainpipe and connecting guide line can be put into walls to connect the outdoor units.

(5) It is recommended to make the connecting pipe between the outdoor and indoor units and the drainpipe as short as possible.

(6) Please read the attached installation instruction of outdoor units for regulation of filling amount of refrigerant if necessary.

(7) Select a place close to the supply socket of air conditioner and enough space should be kept near the machine.

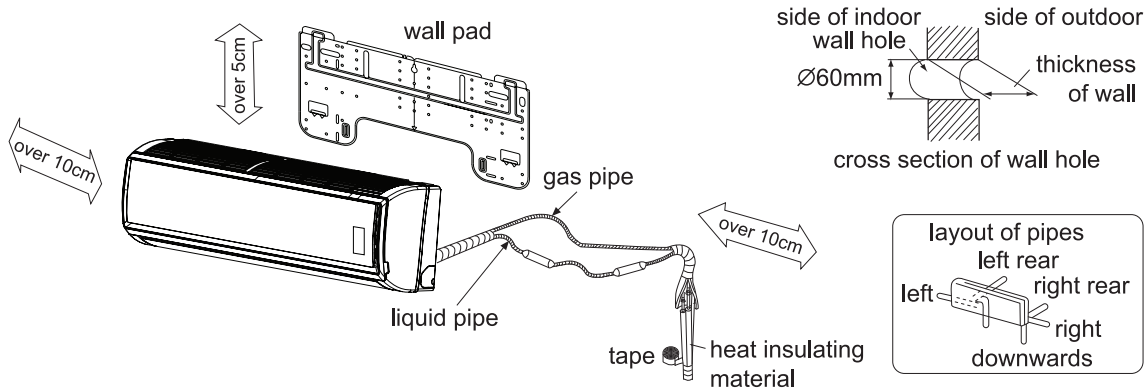
(8) Those electrical appliances such as television, instruments, devices, artwork, piano, wireless equipment and other valuables should not be placed under the indoor unit and over 1m away from the daylight lamp as to prevent condensate from dropping into them and causing damage.

2. The following steps can be taken after selecting the installation place:

Cut a hole on the wall and put the connecting pipe and connecting thread into the PVC, which is purchased at the local shop. With a slight downwards tilt towards the exterior, the gradient should be kept at least 1/100. before cutting the hole, check if there are pipes or reinforcing steel bars at the rear of the hole. Making the hole in the place with wires or pipes should be avoided.

Installation Procedures

3. Installation Drawing of Indoor Units:



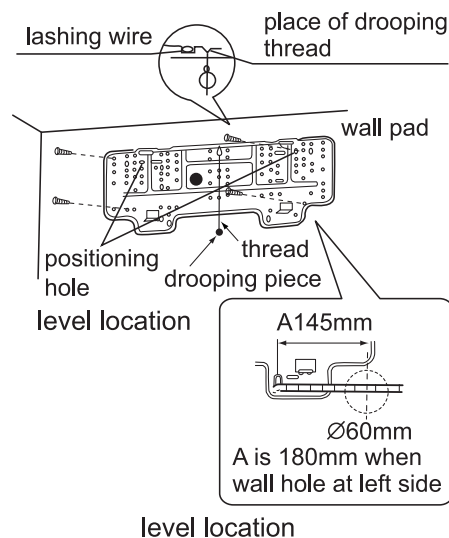
(1) Positioning Wall Pad & Locating Wall Holes

Fix the pad according to the installation location and the pipe layout of indoor unit (please refer to the installation drawing).

Installation should be done under the crossbeam or on the flat wall near the pillar. First fix the pad with a steel nail on the wall.

Drop a thread with a bolt through the pad center or use a level meter to find the level.

Then fix it with a concrete steel nail, (if it is fixed by the expansion bolts, drill holes on the wall according to the pad position with the electric drill (bore: 4.8mm, put the plastic sleeves into the holes, stick the panel onto the wall, and then position the pad with 4×25 bolts) and measure the position of the wall hole A.



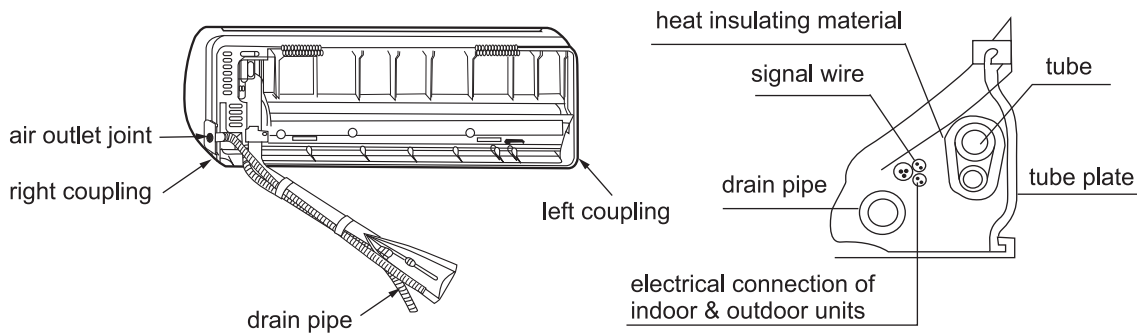
(2) Drilling Hole & Mounting Guard Ring

Drill a hole of 60mm bore with a slight tilt downwards to the outside, mount the guard ring, and seal it with gesso or putty after finishing the installation.

(3) Arranging Wiring of Indoor Unit

Arrange the layout of connection pipe, drain pipe, connecting line, signal line and air refreshing pipe according to the locations of your indoor unit, outdoor unit and wall holes, with drainage hose lower, connecting line upper. Intercrossing winding is not allowed between the mains line and the connecting line, and the drain pipe (especially in the indoor unit and the inside of machine) should be wound with heat insulating materials for heat preservation.

Installation Procedures



(4) Lead the connection tubing(liquid pipe and gas pipe) through the hole into the wall, or connect piping and wiring of indoor unit(check the number of wiring terminals of indoor and outdoor units and connect terminals with the same number and color), and then put the connection tubing and the connecting line through from the inside wall for the connection with outdoor unit.

Tubing Permissible Length & Height Difference

Please refer to the attached manual of outdoor units.

Tubing Materials & Specifications

Model		HAV007~16	HAV018~24
Tubing Size (mm)	Gas pipe	Ø12.7	Ø15.88
	Liquid pipe	Ø6.35	Ø9.52
Tubing Material	Phosphor deoxybronze seamless pipe (TP ₂) for air conditioner		

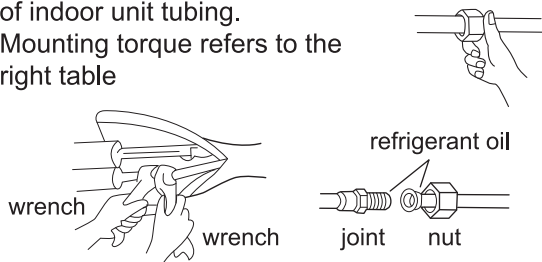
Refrigerant Filling Amount

Add the refrigerant according to the installation instruction of outdoor unit. The addition of R410A refrigerant must be performed with a measure gage to ensure the specified amount or compressor failure can be caused by filling too much or little refrigerant.

Connecting Procedures of Refrigerant Tubing

Proceed the flare tube connecting operation to connect all the refrigerant tubes.

- Dual wrenches must be used in the connection of indoor unit tubing.
- Mounting torque refers to the right table



Outer Diameter of Tubing (mm)	Mounting Torque (N-m)	Increase mounting Torque (N-m)
Ø6.35	11.8(1.2kgf-m)	13.7(1.4kgf-m)
Ø9.52	24.5(2.5kgf-m)	29.4(3.0kgf-m)
Ø12.70	49.0(5.0kgf-m)	53.9(5.5kgf-m)
Ø15.88	78.4(8.0kgf-m)	98.0(10.0kgf-m)
Ø19.05	98.0(10.0kgf-m)	117.7(12.0kgf-m)

Installation Procedures

Cutting and Enlarging

Cutting or enlarging pipes should be proceeded by installation personnel according to the operating criterion if the tube is too long or flare opening is broken.

Vacuumizing

Vacuumize from the stop valve of outdoor units with vacuum pump. Refrigerant sealed in indoor machine is not allowed to use for vacuumization.

Open All Valves

Open all the valves of outdoor units. [NB: oil balancing stop valve must be shut up completely when connected one main unit.]

Checkup for Air Leakage

Check if there is any leakage at the connecting part and bonnet with hydrophone or soapsuds.

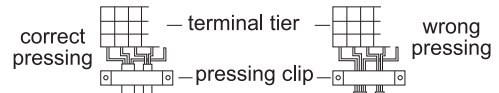
Connecting



1. Connecting circular terminals:
The connecting method of circular terminal is shown in the Fig. Take off the screw, connect it to the terminal tier after heading it through the ring at the end of the lead and then tighten it.

2. Connecting straight terminals:
The connection methods for the circular terminals are shown as follows: loosen the screw before putting the line terminal into the terminal tier, tighten the screw and confirm it has been clamped by pulling the line gently.

3. Pressing connecting line
After connecting line is completed, press the connecting line with clips which should press on the protective sleeve of the connecting line.



Installing and Dismantling Indoor Unit

1. Installation

During the installation of this series machines, fasten the wall pad on the wall first, hang the machine on the pothook, push it towards the wall pad until the sound of 'pa' 'pa' is heard. At this time, the agraffes of the indoor unit have hitched on the pad, as shown in the Fig.1 with dotted line.

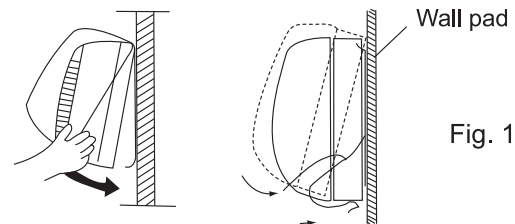


Fig. 1

2. Dismantling

During dismantling this series machines, push agraffes at the bottom of indoor unit upwards to release them, as shown in Fig.3, and pull up the bottom of indoor unit outwards gently and then raise the unit upwards in the bevel direction to release the pothook at the upper part of the wall pad, as shown in Fig.3.

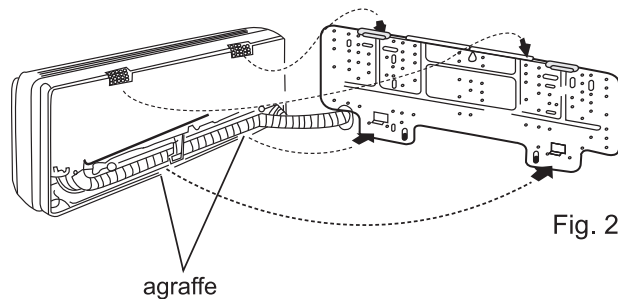


Fig. 2

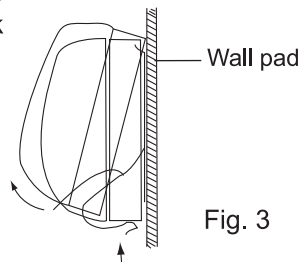


Fig. 3

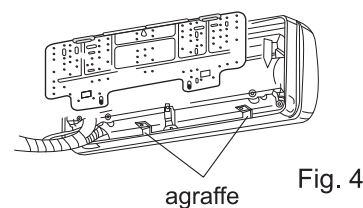


Fig. 4



Console type indoor unit

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6. Electric characteristics	210
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1. Features



EAV009
EAV012
EAV018

Compact unit, space saving

The console indoor unit is very slim and will be harmonious with room. It can be placed at the corner, and it is very space saving.

Quiet operation

Thanks to the low noise centrifugal fan, the unit always works quietly, it lets your life more comfortable.

Dual air sending position

The console indoor unit can send the air from the top and the bottom, which will realize the indoor temperature be adjusted soon.

High efficiency filter

The console indoor unit adopts high efficiency filter to improve the air quality.





2. Specifications

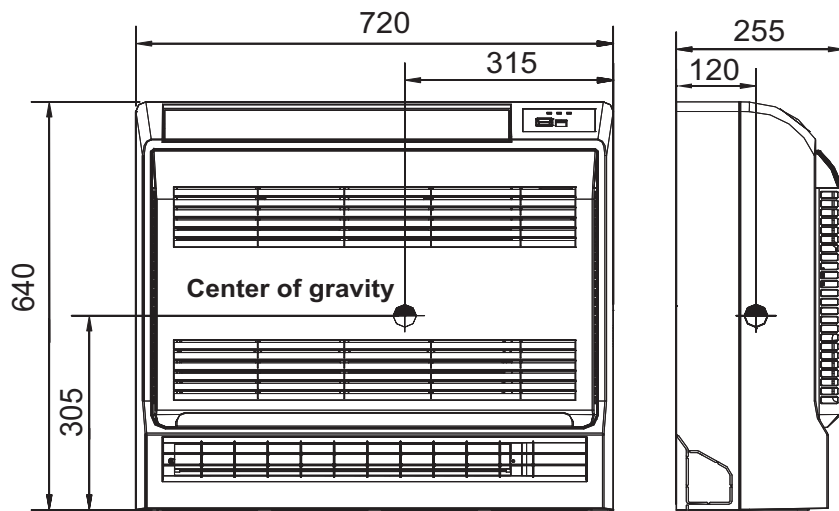
Model	EAV009	EVA012	EVA018	
Nominal cooling capacity(KW)	2.8	3.6	5.0	
Nominal heating capacity(KW)	3.2	4.0	6.0	
Heating capacity at low temp.(KW)	2.5	3.2	4.5	
Electrical characteristics	Power source	1PH, 220~230V, 50Hz		
	Operating current(A)	0.45	0.45	0.45
	Power consumption(KW)	0.08	0.08	0.08
Fan characteristics	Fan type and Qty	cross*2	cross*2	cross*2
	Upper motor output(KW)	0.020	0.020	0.020
	Lower motor output(KW)	0.011	0.011	0.011
	Standard airflow(m ³ /h)	460	520	580
	Standard static pressure(Pa)	0	0	0
	Max. static pressure(Pa)	0	0	0
Exterior dimensions(mm)	720*255*640	720*255*640	720*255*640	
Shipping dimensions(mm)	772*292*704	772*292*704	772*292*704	
Weight(Kg)	17.5/20	17.5/20	17.5/20	
Controller	Wireless controller			
Piping dimension	Gas piping(mm)	Ø 12.7	Ø 12.7	Ø 12.7
	Liquid piping(mm)	Ø 6.35	Ø 6.35	Ø 6.35
	Drain hose(mm)	Ø 16.5	Ø 16.5	Ø 16.5
Noise level(dB(A)) H/M/L	43/39/36	43/39/36	48/46/42	

Normal condition: indoor temperature (cooling): 27°CDB/19°CWB, indoor temperature (heating): 20°CDB/14.5°CWB

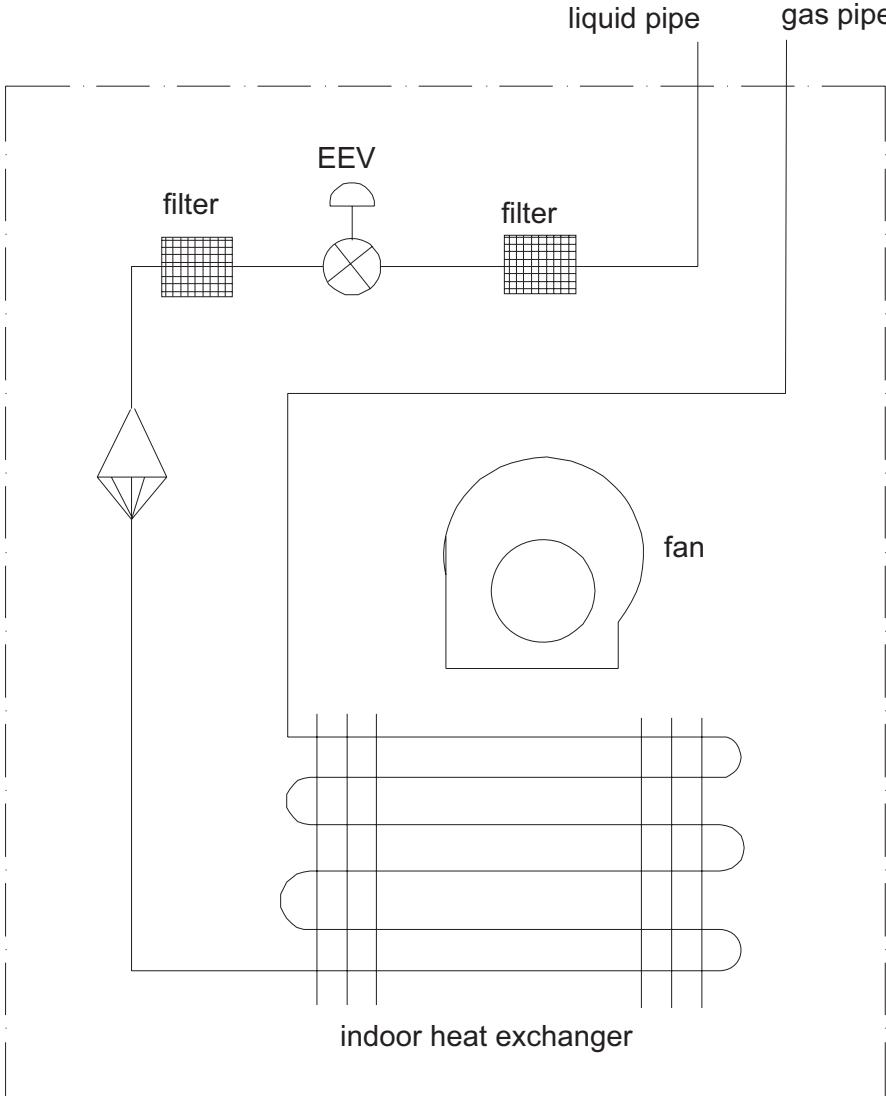
Outdoor temperature(cooling): 35°CDB/24°CWB, outdoor temperature(heating): 7°CDB/6°CWB

The noise level will be measured in the third octave band limited values in the semi-anechoic chamber, using a Real Time Analyser calibrated sound intensity meter. It is a sound pressure noise level.

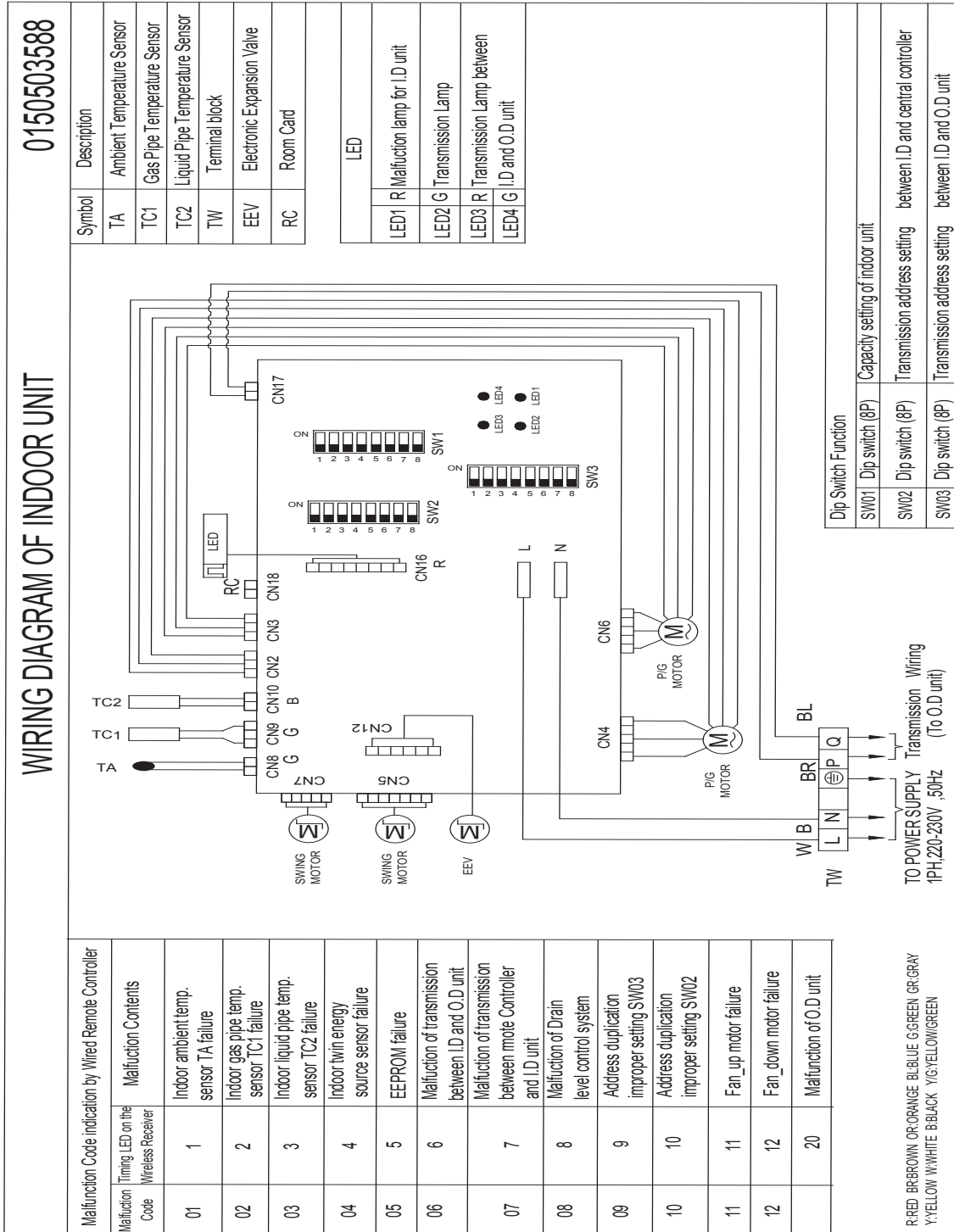
3. Dimensions



4. Piping diagrams



5. Wiring diagrams





6. Electric characteristic

units					power supply		indoor fan motor		power input(W)	
model	phase	FQY	voltage	volt. range	MCA	MFA	KW	FLA	cooling	heating
EAV009	1	50	220	198~242	0.28	0.88	20	0.22	27	27
EVA012	1	50	220	198~242	0.28	0.88	20	0.22	27	27
EVA018	1	50	220	198~242	0.32	1.00	30	0.25	45	45

Symbols:

MCA: Min. circuit amps (A)

MFA: Max. fuse amps of circuit breaker

KW: Fan motor rated output(KW)

FLA: Full load amps(A)

IFM: Indoor fan motor

Notes:

1. Voltage range

The units are applicable for the electrical systems where voltage supplied to unit is in the range.

2. Maximum allowable voltage unbalance between phases is 2%.

3. $MCA=1.25*FLA$

$MFA \leq 4*FLA$

4. Power supply uses the circuit breaker



7. Capacity table (CA: total capacity; SHC: sensible heat capacity)

Cooling mode:

capacity(W*100)	outdoor temp.	indoor temp.													
		21.5°CDB 15°CWB		23°CDB 16°CWB		25°CDB 18°CWB		27°CDB 19°CWB		28°CDB 20°CWB		30°CDB 32°CWB		32°CDB 24°CWB	
	°CDB	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC
22	20.0	2.2	1.6	2.2	1.6	2.3	1.6	2.3	1.6	2.4	1.6	2.5	1.6	2.6	1.5
	22.5	2.1	1.5	2.2	1.6	2.3	1.5	2.3	1.6	2.4	1.6	2.4	1.6	2.5	1.5
	25.0	2.1	1.5	2.2	1.6	2.2	1.5	2.3	1.5	2.3	1.6	2.4	1.5	2.5	1.5
	27.5	2.1	1.5	2.1	1.6	2.2	1.5	2.3	1.5	2.3	1.6	2.4	1.5	2.5	1.5
	30.0	2.1	1.5	2.1	1.5	2.2	1.5	2.2	1.5	2.3	1.6	2.4	1.5	2.5	1.5
	32.5	2.0	1.5	2.1	1.5	2.2	1.5	2.2	1.5	2.3	1.6	2.4	1.5	2.4	1.5
	35.0	2.0	1.5	2.1	1.5	2.2	1.5	2.2	1.5	2.2	1.6	2.3	1.5	2.4	1.5
	37.5	2.0	1.5	2.0	1.5	2.1	1.5	2.2	1.5	2.2	1.5	2.3	1.5	2.4	1.5
	40.0	2.0	1.5	2.0	1.5	2.1	1.5	2.2	1.5	2.2	1.5	2.3	1.5	2.4	1.5
43.0	2.0	1.5	2.0	1.5	2.1	1.5	2.1	1.5	2.2	1.5	2.3	1.5	2.3	1.5	
28	20.0	2.7	2.0	2.8	2.1	2.9	2.0	3.0	2.0	3.0	2.1	3.1	2.0	3.2	2.0
	22.5	2.7	2.0	2.8	2.0	2.9	2.0	2.9	2.0	3.0	2.1	3.1	2.0	3.2	2.0
	25.0	2.7	2.0	2.8	2.0	2.9	2.0	2.9	2.0	3.0	2.1	3.1	2.0	3.2	1.9
	27.5	2.7	2.0	2.7	2.0	2.8	2.0	2.9	2.0	2.9	2.0	3.0	2.0	3.2	1.9
	30.0	2.6	2.0	2.7	2.0	2.8	2.0	2.8	2.0	2.9	2.0	3.0	2.0	3.1	1.9
	32.5	2.6	1.9	2.6	2.0	2.8	1.9	2.8	2.0	2.9	2.0	3.0	2.0	3.1	1.9
	35.0	2.6	1.9	2.6	2.0	2.7	1.9	2.8	1.9	2.8	2.0	3.0	1.9	3.1	1.9
	37.5	2.5	1.9	2.6	2.0	2.7	1.9	2.8	1.9	2.8	2.0	2.9	1.9	3.1	1.9
	40.0	2.5	1.9	2.6	1.9	2.7	1.9	2.7	1.9	2.8	2.0	2.9	1.9	3.0	1.9
43.0	2.5	1.9	2.5	1.9	2.7	1.9	2.7	1.9	2.8	2.0	2.9	2.7	3.0	1.9	
36	20.0	3.5	2.7	3.6	2.7	3.7	2.7	3.8	2.7	3.9	2.8	4.0	2.7	4.2	2.6
	22.5	3.5	2.7	3.6	2.7	3.7	2.7	3.8	2.7	3.9	2.8	4.0	2.7	4.1	2.6
	25.0	3.5	2.7	3.5	2.7	3.7	2.7	3.7	2.7	3.8	2.8	4.0	2.7	4.1	2.6
	27.5	3.4	2.6	3.5	2.7	3.6	2.7	3.7	2.7	3.8	2.7	3.9	2.7	4.1	2.6
	30.0	3.4	2.6	3.5	2.7	3.6	2.6	3.7	2.6	3.7	2.7	3.9	2.7	4.0	2.6
	32.5	3.3	2.6	3.4	2.6	3.6	2.6	3.6	2.6	3.7	2.7	3.9	2.6	4.0	2.6
	35.0	3.3	2.6	3.4	2.6	3.5	2.6	3.6	2.6	3.7	2.7	3.8	2.6	4.0	2.6
	37.5	3.3	2.6	3.3	2.6	3.5	2.6	3.5	2.6	3.6	2.7	3.8	2.6	3.9	2.6
	40.0	3.2	2.5	3.3	2.6	3.5	2.6	3.5	2.6	3.6	2.7	3.7	2.6	3.9	2.5
43.0	3.2	2.5	3.3	2.6	3.4	2.5	4.3	2.6	3.6	2.7	3.7	2.9	3.8	2.5	



Heating mode:

capa city(W*1 00)	outdoor temp.	indoor temp.(°CDB)				capa city(W*10 0)	outdoor r temp.	indoor temp.(°CDB)				capaci ty(W* 100)	outdoor temp.	indoor temp.(°CDB)			
		15.0	20.0	25.0	27.0			15.0	20.0	25.0	27.0			15.0	20.0	25.0	27.0
		°CDB	SHC	SHC	SHC			SHC	°CDB	SHC	SHC			SHC	SHC	°CDB	SHC
22	-15.0	1.7	1.6	1.6	1.6	56	-15.0	4.2	4.2	4.1	4.1	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	1.9	1.9	1.9	1.7		-10.0	4.8	4.8	4.7	4.3		-10.0	12.2	12.1	11.9	11.0
	-5.0	2.1	2.1	1.9	1.7		-5.0	5.4	5.3	4.9	4.3		-5.0	13.7	13.6	12.5	11.0
	0.0	2.4	2.4	1.9	1.7		0.0	6.0	5.9	4.9	4.3		0.0	15.3	15.1	12.5	11.0
	2.5	2.5	2.5	1.9	1.7		2.5	6.3	6.2	4.9	4.3		2.5	16.0	15.8	12.5	11.0
	6.0	2.5	2.5	1.9	1.7		6.0	6.4	6.3	4.9	4.3		6.0	16.2	16.0	12.5	11.0
	6.5	2.6	2.5	1.9	1.7		6.5	6.6	6.3	4.9	4.3		6.5	16.8	16.0	12.5	11.0
	10.0	2.8	2.5	1.9	1.7		10.0	7.1	6.3	4.9	4.3		10.0	18.0	16.0	12.5	11.0
	12.5	3.0	2.5	1.9	1.7		12.5	7.5	6.3	4.9	4.3		12.5	19.1	16.0	12.5	11.0
	15.5	3.0	2.5	1.9	1.7		15.5	7.6	6.3	4.9	4.3		15.5	19.4	16.0	12.5	11.0
28	-15.0	2.1	2.1	2.1	2.1	71	-15.0	5.4	5.3	5.2	5.2	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	2.4	2.4	2.4	2.2		-10.0	6.1	6.0	6.0	5.5		-10.0	12.2	12.1	11.9	11.0
	-5.0	2.7	2.7	2.5	2.2		-5.0	6.9	6.8	6.2	5.5		-5.0	13.7	13.6	12.5	11.0
	0.0	3.1	3.0	2.5	2.2		0.0	7.6	7.5	6.2	5.5		0.0	15.3	15.1	12.5	11.0
	2.5	3.2	3.2	2.5	2.2		2.5	8.0	7.9	6.2	5.5		2.5	16.0	15.8	12.5	11.0
	6.0	3.2	3.2	2.5	2.2		6.0	8.1	8.0	6.2	5.5		6.0	16.2	16.0	12.5	11.0
	6.5	3.4	3.2	2.5	2.2		6.5	8.4	8.0	6.2	5.5		6.5	16.8	16.0	12.5	11.0
	10.0	3.6	3.2	2.5	2.2		10.0	9.0	8.0	6.2	5.5		10.0	18.0	16.0	12.5	11.0
	12.5	3.8	3.2	2.5	2.2		12.5	9.6	8.0	6.2	5.5		12.5	19.1	16.0	12.5	11.0
	15.5	3.9	3.2	2.5	2.2		15.5	9.7	8.0	6.2	5.5		15.5	19.4	16.0	12.5	11.0
36	-15.0	2.7	2.6	2.6	2.6	80	-15.0	6.0	5.9	5.9	5.9	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	3.1	3.0	3.0	2.8		-10.0	6.9	6.8	6.7	6.2		-10.0	12.2	12.1	11.9	11.0
	-5.0	3.4	3.4	3.1	2.8		-5.0	7.7	7.6	7.0	6.2		-5.0	13.7	13.6	12.5	11.0
	0.0	3.8	3.8	3.1	2.8		0.0	8.6	8.5	7.0	6.2		0.0	15.3	15.1	12.5	11.0
	2.5	4.0	4.0	3.1	2.8		2.5	9.0	8.9	7.0	6.2		2.5	16.0	15.8	12.5	11.0
	6.0	4.0	4.0	3.1	2.8		6.0	9.1	9.0	7.0	6.2		6.0	16.2	16.0	12.5	11.0
	6.5	4.2	4.0	3.1	2.8		6.5	9.5	9.0	7.0	6.2		6.5	16.8	16.0	12.5	11.0
	10.0	4.5	4.0	3.1	2.8		10.0	10.1	9.0	7.0	6.2		10.0	18.0	16.0	12.5	11.0
	12.5	4.8	4.0	3.1	2.8		12.5	10.8	9.0	7.0	6.2		12.5	19.1	16.0	12.5	11.0
	15.5	4.8	4.0	3.1	2.8		15.5	10.9	9.0	7.0	6.2		15.5	19.4	16.0	12.5	11.0
40	-15.0	3.0	3.0	3.0	3.0	90	-15.0	6.7	6.6	6.5	6.5	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	3.5	3.4	3.4	3.1		-10.0	7.6	7.5	7.4	6.9		-10.0	12.2	12.1	11.9	11.0
	-5.0	3.9	3.8	3.5	3.1		-5.0	8.6	8.5	7.8	6.9		-5.0	13.7	13.6	12.5	11.0
	0.0	4.3	4.3	3.5	3.1		0.0	9.5	9.4	7.8	6.9		0.0	15.3	15.1	12.5	11.0
	2.5	4.5	4.5	3.5	3.1		2.5	10.0	9.9	7.8	6.9		2.5	16.0	15.8	12.5	11.0
	6.0	4.6	4.5	3.5	3.1		6.0	10.1	10.0	7.8	6.9		6.0	16.2	16.0	12.5	11.0
	6.5	4.8	4.5	3.5	3.1		6.5	10.5	10.0	7.8	6.9		6.5	16.8	16.0	12.5	11.0
	10.0	5.1	4.5	3.5	3.1		10.0	11.2	10.0	7.8	6.9		10.0	18.0	16.0	12.5	11.0
	12.5	5.4	4.5	3.5	3.1		12.5	12.0	10.0	7.8	6.9		12.5	19.1	16.0	12.5	11.0
	15.5	5.5	4.5	3.5	3.1		15.5	12.1	10.0	7.8	6.9		15.5	19.4	16.0	12.5	11.0
45	-15.0	3.3	3.3	3.3	3.3	112	-15.0	8.4	8.2	8.2	8.1	140	-15.0	10.7	10.6	10.5	10.4
	-10.0	3.8	3.8	3.7	3.5		-10.0	9.6	9.4	9.3	8.6		-10.0	12.2	12.1	11.9	11.0
	-5.0	4.3	4.2	3.9	3.5		-5.0	10.7	10.6	9.8	8.6		-5.0	13.7	13.6	12.5	11.0
	0.0	4.8	4.7	3.9	3.5		0.0	11.9	11.8	9.8	8.6		0.0	15.3	15.1	12.5	11.0
	2.5	5.0	5.0	3.9	3.5		2.5	12.5	12.4	9.8	8.6		2.5	16.0	15.8	12.5	11.0
	6.0	5.1	5.0	3.9	3.5		6.0	12.5	12.5	9.8	8.6		6.0	16.2	16.0	12.5	11.0
	6.5	5.3	5.0	3.9	3.5		6.5	13.2	12.5	9.8	8.6		6.5	16.8	16.0	12.5	11.0
	10.0	5.6	5.0	3.9	3.5		10.0	14.1	12.5	9.8	8.6		10.0	18.0	16.0	12.5	11.0
	12.5	6.0	5.0	3.9	3.5		12.5	15.0	12.5	9.8	8.6		12.5	19.1	16.0	12.5	11.0
	15.5	6.1	5.0	3.9	3.5		15.5	15.1	12.5	9.8	8.6		15.5	19.4	16.0	12.5	11.0

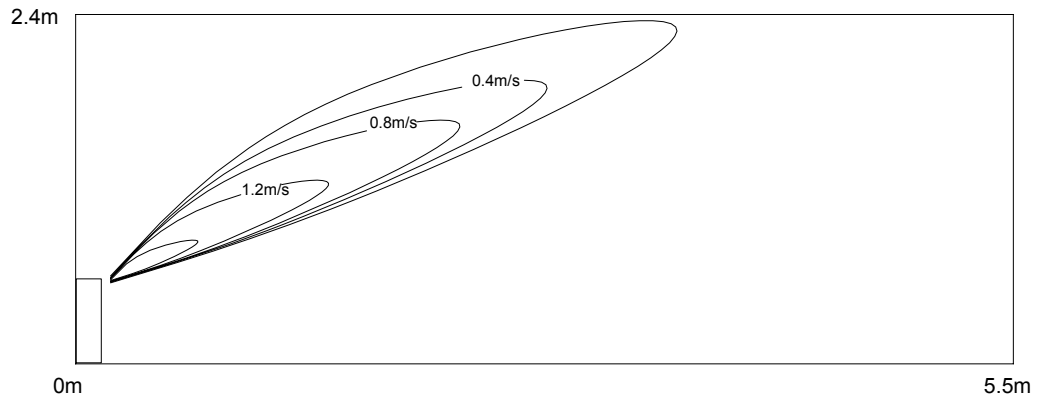
8. Air velocity and temperature distribution

a. Cooling / Air Velocity Distribution

Cooling

Blow angle:25

Air Velocity Distribution

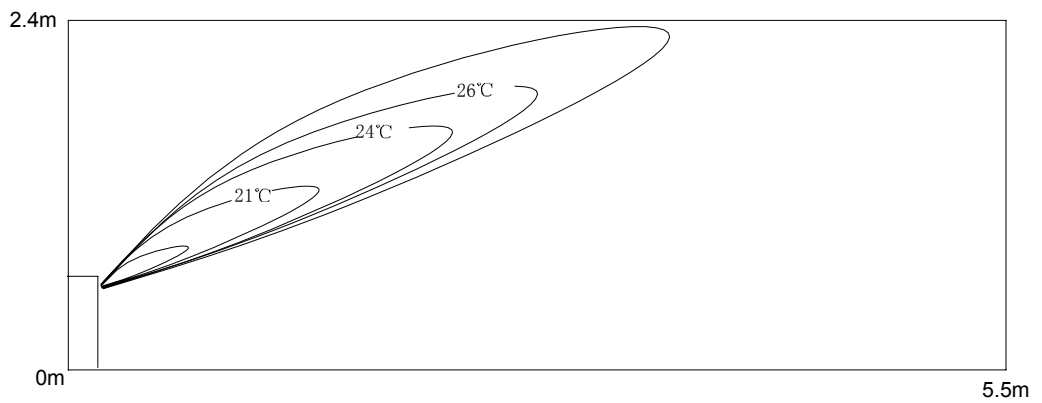


b. Cooling / Temperature Distribution

Cooling

Blow angle:25

Temperature Distribution

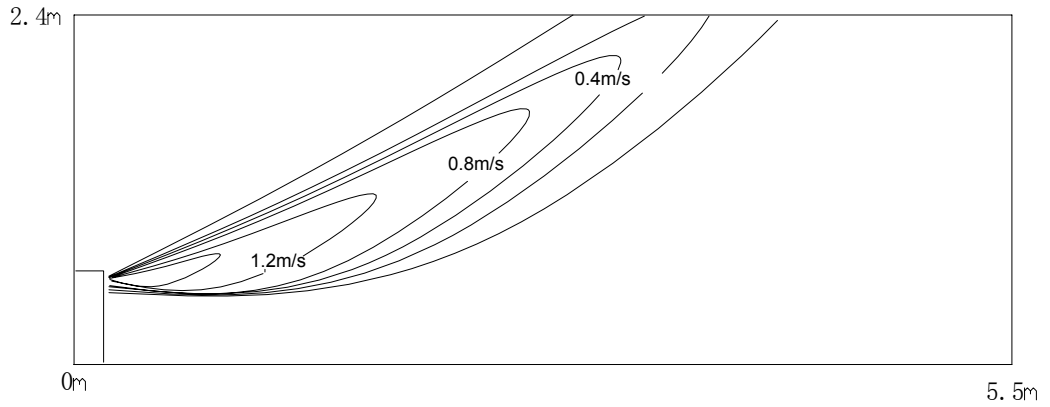


c. Heating / Air Velocity Distribution

Heating

Blow angle:5

Air velocity Distribution

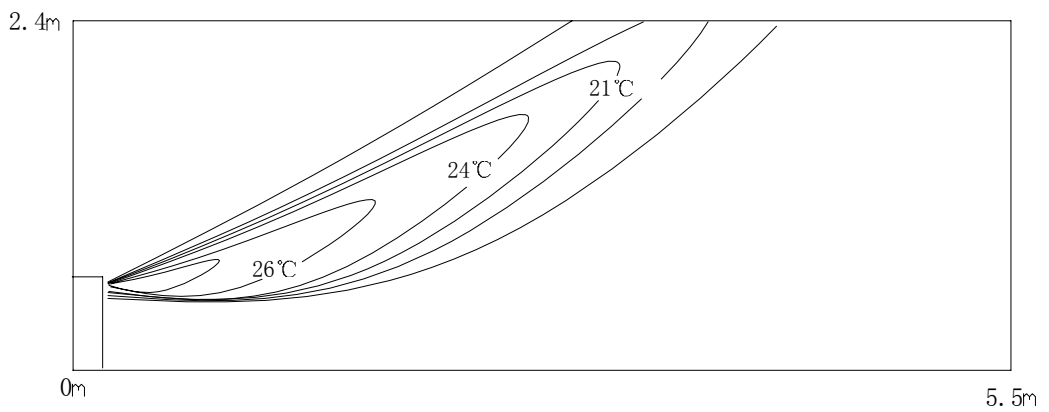


d. Heating / Temperature Distribution

Heating

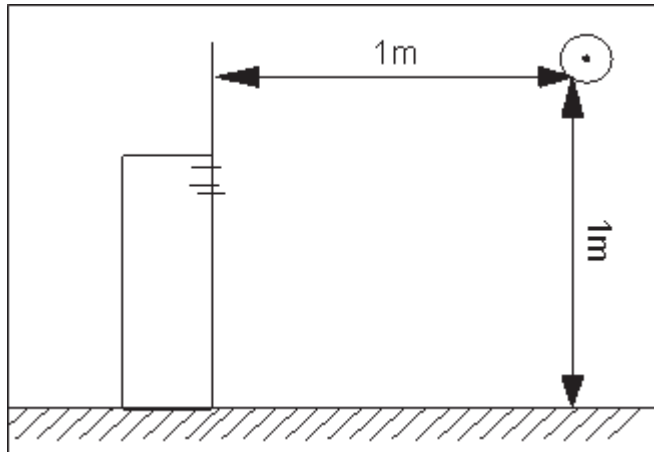
Blow angle:5

Temperature Distribution



9. Noise level

(1) Testing illustrate:

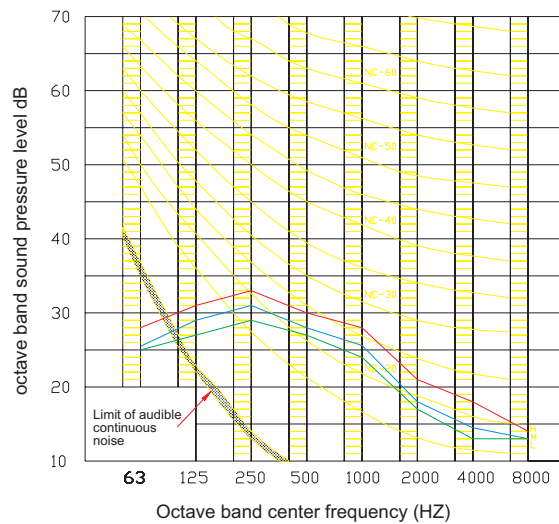


(2) Testing condition:

- a. Unit running in the nominal condition
- b. Test in the semi-anechoic chamber
- c. Noise level varies from the actual factors such as room structure, etc.

(3) Octave band level

EAV009 EVA012



10. Installation

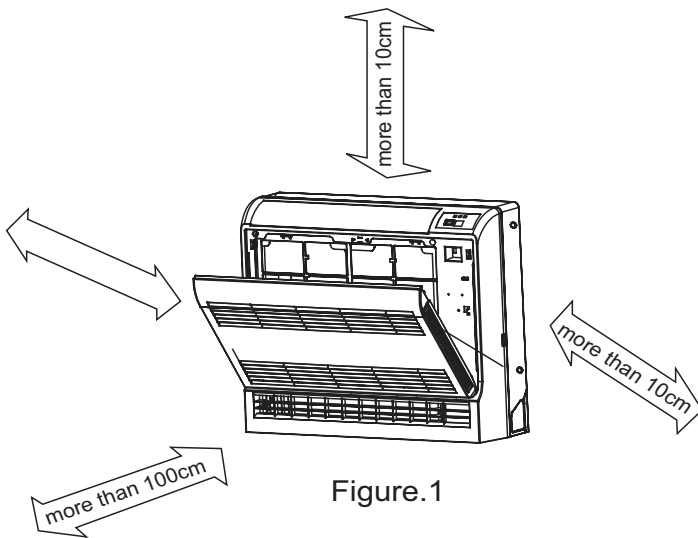


Figure.1

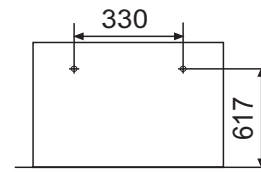


Figure.2

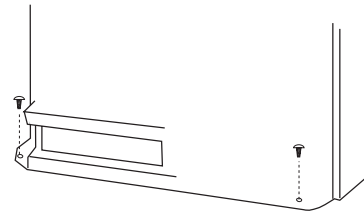


Figure.3

Fixing the unit

1. Position of the wall hole

Wall hole should be decided according to installation place and piping direction.(refer to installation drawings).

2. Making a wall hole

Drill a hole of 120X70mm dia. with a little slope towards outside.

3. Piping connection

Tool necessary

1. Screw driver
2. Hacksaw
3. 70mm dia.hole core drill
4. Spanner(dia. 17,27mm)
5. Spanner(14,17,27mm)
6. Pipe cutter
7. Flaring tool
8. Knife
9. Nipper
10. Gas leakage detector or soap water
11. Measuring tape
12. Reamer
13. Refrigerant oil

Selection of installation place

Place where it is easy to route drainage pipe and outdoor piping.

Place ,away from heat source and with less direct sunlight.

Place where cool and warm air could be delivered evenly to every corner of the room.

Place near power supply socket.Leave enough space around the unit.

Place ,robust not causing vibration,where the body can be supported sufficiently.

To prevent interference, place it at least 1m away from other electric machines, such as TV set, radio.

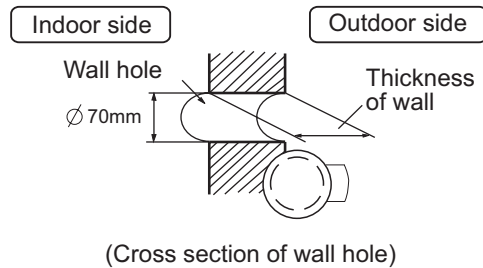
Installation

According to the dimension of the figure 2 shown, nail two cement steel nails on the wall,Keep 2~3 mm out.then hang the back of the unit on them.

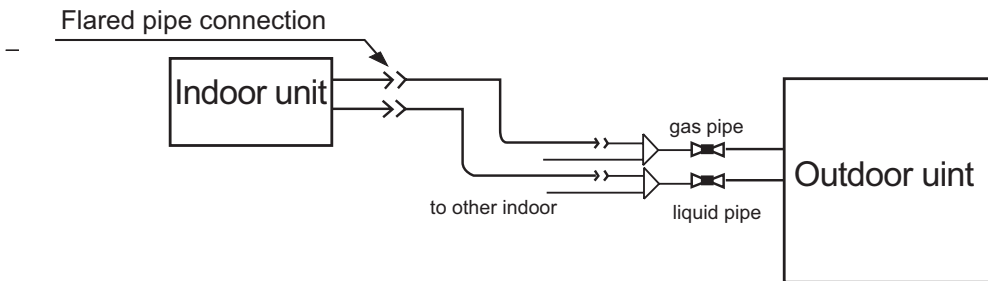
There must be no gap between the indoor unit and wall.

Remove the front panel, then use two expansible screws to fix the unit on the floor. As figure 3 shown. Once refrigerant piping and drain piping connections are complete, fill the gap of the throught hole with putty.

Attach the front panel and front grille in their original positions once all connections are complete.

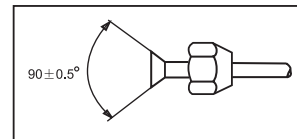


(1) Schematic diagram for unit connection



(2) Connection pipe dimensions:

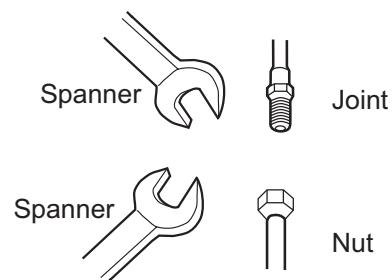
Pipe Value		Torque
Liquid	6.35mm	18 N·m
Gas	12.7mm	50 N·m



- Apply and tighten the nut.

(3) Cautions for pipe connection

- Pipes free from twists, deformation, water, dust.
- Dedicated tools for each R407C and R22 should be used and stored separately.
- Optimized radii of bends
- Insulation to be applied on all gaseous pipes
Flared section free from cracks



Threads on the pipes may be damaged when tightening if the pipes are not well aligned.

(4) Pipe connection process

Apply refrigeration oil on the end of the pipe to be connected and on the flared section.

Align the pipes to be connected and tighten the nut. (See the figure)

Ensure that no foreign articles enter into the pipes.

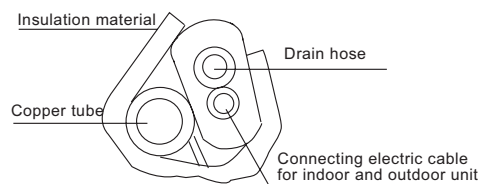
Piping connection of the indoor unit

1. Arrangement of piping and drainage pipe

After opening inlet grill, you will see a control box.

Remove the cover before working.

Cut away, with a hammer or a saw, the lid for piping according to piping direction.



According to the piping method, connect the piping on indoor unit with union of connection pipe. Arrange the piping as per the wall hole and bind drain hose connecting electric cable and piping together with polyethylene tape.

Insert the bound piping connecting electric cable and drain hoses through wall hole to connect with outdoor unit.

2. Arrangement drain hose

Drain hose shall be placed in under place.

There should be a slope when arrange drain hose. Avoid up and down waves in drain hose.

If humidity is high, drain pipe(especially in room and indoor unit) must be covered with installation material.

Electric wiring :

Process of wire connections

1. Loop terminal

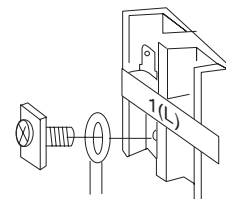
After removing the screw, fix the wire ring on the screw, reinsert the screw into the block terminal and then tighten the screw.

2. Straight terminal

After loosening the screw, inset the wire end into the block terminal and then tighten the screw. Slightly pull the wire to see if it is tightly fixed.

3. Wire capping

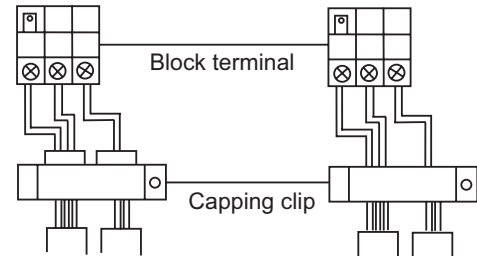
After completion of connection, capping clips must be applied on the external sleeve of the wires.



Wiring diagram of loop terminals

Wiring of indoor unit

- Remove air intake screen and take out the front wires.
- Connect the wires as specified in the above methods and diagrams for indoor unit and wire connections.
- Properly apply capping clips on the wires.
- Replace the air intake screen.
- Do not link the connecting and signal wire with the same cable, a snug space must be maintained between connecting and signal wires.
- Shield of the signal wire should be spot grounded.



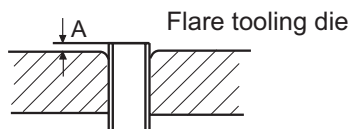
Others

1. Power supply requirements:

- Voltage: single-phase 1PH, 220-230V~, 50Hz
- Dedicated electrical cable should be installed by a qualified technician in accordance with the state regulation for electrical engineering.
- The power source must be grounded.
- A circuit breaker must be installed
- Electrical cables should be connected by "Y" method. Damaged or worn electrical cable must be replaced by authorized after sales agents.
- The power plug should be connected as follows: L for live line, N for neutral line and ⊕ for grounding.
- Connection parameters: H05RN-F 3G(1.0-1.5)mm²
- Signal parameters: H05RN-F2X(0.75-1.5)mm² (Shielded wire)
- Cables for power supply, connection and signals are prepared by the owner.

2. Piping cutting and flaring

Be sure to carry out deburring after cutting with a pipe cutter.
Insert flaring tool to make a flare.



	Pipe diameter ϕ	Size A (mm)
Liquid pipe	6.35mm(1/4")	0.8 ~ 1.5
Gas pipe	12.7mm(1/2")	1.2 ~ 2.0

Correct	Incorrect				
	Lean	Damage of flare	Crack	Partial	Too outside



Installation inspection and test run:

Please operate unit according to this Manual.

Items to be checked during test run. Please make a "✓" in "□"







- Are there any gas leakage?
- How is insulation at piping connection carried out?
- Are electric wires of indoor and outdoor unit firmly inserted into terminal block?
- Is electric wiring of indoor and outdoor securely fixed?
- Is drainage securely carried out?
- Is earth line(grounding) securely connected?
- Is power supply voltage abided by the code?
- Is there any noise?
- Is control display normal?
- Is cooling operation normal?
- Is room temp. regulator normal?

11. Accessories

Standard accessories

Following parts shall be field supplied

Mark	Part name
(A)	Adhesive tape
(B)	Pipe clip
(C)	Connecting hose
(D)	Insulation material
(E)	Putty
(F)	Drain hose

No.	Shape and description	QTY
①	 Remote controller	1
②	 Expansion bushing	4
③	 Self-tapping screw	4
④	 Wall hole cover	1
⑤	 Dry battery #7	1
⑥	 Cement steel nail	6

Note: There isn't connecting wire with this unit.



PART 3
Outdoor Units

Heat pump 50Hz 232

Heat pump 50Hz

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9. Operation limit	384
10. Sound level	385



1. Specifications

Equivalent HP		10	
Model		YCV280	
Combination mode		**	
Nominal cooling capacity(kW)		28.0	
Nominal heating capacity(kW)		31.5	
Power source		3N~, 380~400V, 50Hz	
Electrical characteristics	Cooling	Rated/Max.current(A)	11.1/23.4
		Rated/Max.power input(KW)	7.36/14.7
	Heating	Rated/Max.current(A)	12.5/19
		Rated/Max.power input(KW)	7.97/11.9
	Outdoor motor power input(kW)		0.75
	External dimensions (L*W*H,mm)		990*750*1808
Shipping dimension (L*W*H,mm)		1090*860*1990	
Net weight (kg)		240	
Shipping weight (kg)		255	
Compressor type		scroll	
Compressor model		ANB52FKEMT	
Compressor oil type/charge (L)		FV50S/1	
Outdoor airflow (m ³ /min)		185	
Refrigerant (R410A) charge (kg)		11	
Piping	Gas piping(mm)		∅ 22.22
	Liquid piping(mm)		∅ 9.52
	Oil equalization piping(mm)		∅ 9.52
Noise level(dB(A))		57	

Norminal condition: indoor temperature (cooling): 27°CDB/19°CWB, indoor temperature (heating): 20°CDB/14.5°CWB

Outdoor temperature(cooling): 35°CDB/24°CWB, outdoor temperature(heating): 7°CDB/6°CWB

The data is measured with 7.5m equivalent pipe and 0m height difference.

The noise level will be measured in the third octave band limited values in the semi-anechoic chamber, using a Real Time Analyser calibrated sound intensity meter. It is a sound pressure noise level.



Equivalent HP		12	14	
Model		YCV335	YCV400	
Combination mode		**	**	
Nominal cooling capacity(kW)		33.5	40.0	
Nominal heating capacity(kW)		37.5	45.0	
Power source		3N~, 380~400V, 50Hz		
Electrical characteristics	Cooling	Rated/Max.current(A)	14.2/24.7	19.05/28.5
		Rated/Max.power input(KW)	10/15.5	11.4/17.9
	Heating	Rated/Max.current(A)	15.1/21.7	17.96/24.9
		Rated/Max.power input(KW)	10/13.6	11.6/15.6
	Outdoor motor power input(kW)		0.375*2	0.375*2
External dimensions (L*W*H,mm)		1390*750*1808	1390*750*1808	
Shipping dimension (L*W*H,mm)		1490*860*1990	1490*860*1990	
Net weight (kg)		360	360	
Shipping weight (kg)		378	378	
Compressor type		scroll	scroll	
Compressor model		ANB42FBRMT+BN52YFHMT	ANB52FKEMT+BN52YFHMT	
Compressor oil type/charge (L)		FV50S/2	FV50S/2	
Outdoor airflow (m ³ /min)		235	235	
Refrigerant (R410A) charge (kg)		12	12	
Piping	Gas piping(mm)	∅ 25.4	∅ 25.4	
	Liquid piping(mm)	∅ 12.7	∅ 12.7	
	Oil equalization piping(mm)	∅ 9.52	∅ 9.52	
Noise level(dB(A))		60	60	

Norminal condition: indoor temperature (cooling): 27°CDB/19°CWB, indoor temperature (heating): 20°CDB/14.5°CWB

Outdoor temperature(cooling): 35°CDB/24°CWB, outdoor temperature(heating): 7°CDB/6°CWB

The data is measured with 7.5m equivalent pipe and 0m height difference.

The noise level will be measured in the third octave band limited values in the semi-anechoic chamber, using a Real Time Analyser calibrated sound intensity meter. It is a sound pressure noise level.



Equivalent HP		16	
Model		YCV450	
Combination mode		**	
Nominal cooling capacity(kW)		45.0	
Nominal heating capacity(kW)		50.0	
Power source		3N~, 380~400V, 50Hz	
Electrical characteristics	Cooling	Rated/Max.current(A)	20.3/31.6
		Rated/Max.power input(KW)	13.4/19.99
	Heating	Rated/Max.current(A)	19.3/27.3
		Rated/Max.power input(KW)	13.5/17.1
	Outdoor motor power input(kW)		0.375*2
External dimensions (L*W*H,mm)		1390*750*1808	
Shipping dimension (L*W*H,mm)		1490*860*1990	
Net weight (kg)		368	
Shipping weight (kg)		386	
Compressor type		scroll	
Compressor model		ANB52FKEMT+BN65YFHMT	
Compressor oil type/charge (L)		FV50S/2	
Outdoor airflow (m ³ /min)		235	
Refrigerant (R410A) charge (kg)		14.5	
Piping	Gas piping(mm)		∅ 28.58
	Liquid piping(mm)		∅ 12.7
	Oil equalization piping(mm)		∅ 9.52
Noise level(dB(A))		60	

Norminal condition: indoor temperature (cooling): 27°CDB/19°CWB, indoor temperature (heating): 20°CDB/14.5°CWB
 Outdoor temperature(cooling): 35°CDB/24°CWB, outdoor temperature(heating): 7°CDB/6°CWB

The data is measured with 7.5m equivalent pipe and 0m height difference.

The noise level will be measured in the third octave band limited values in the semi-anechoic chamber, using a Real Time Analyser calibrated sound intensity meter. It is a sound pressure noise level.

2. Dimensions

2.1 Single unit

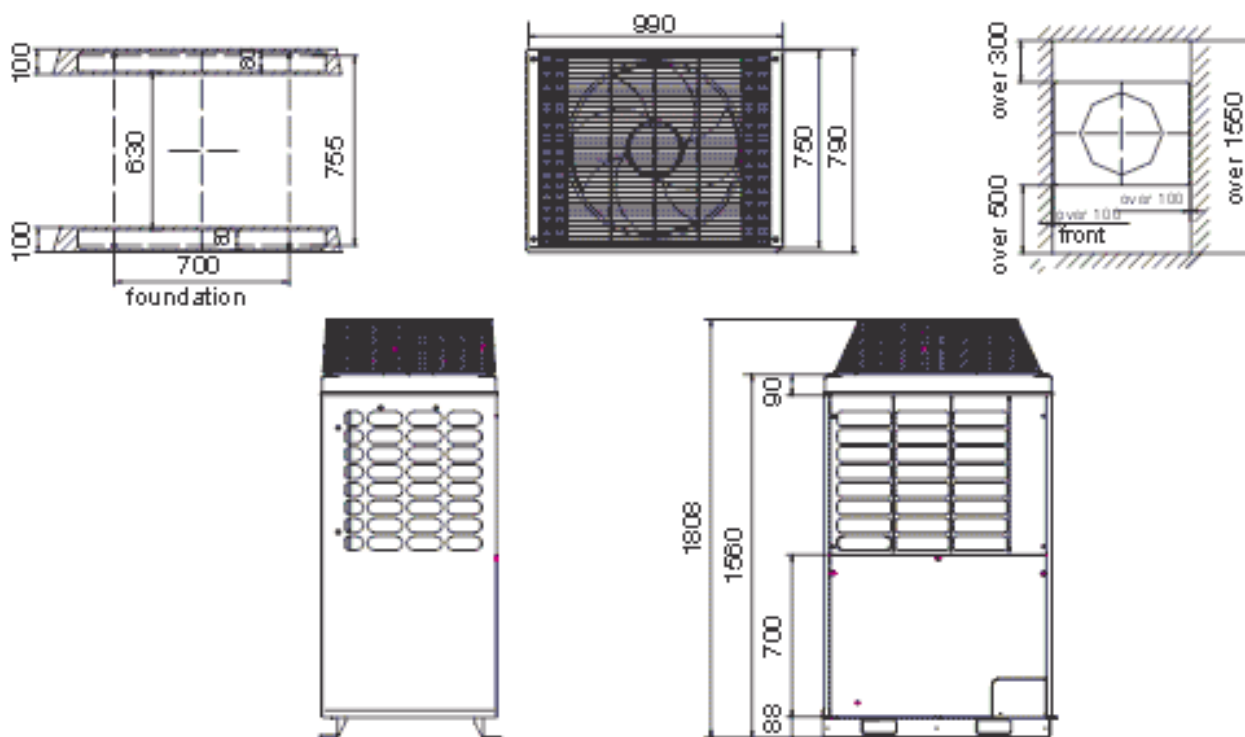
Note:

A. There should be no obstacles in 2000mm above the top of outdoor unit; If there is obstacle in 2000mm, air duct should be connected and keep the air flow smoothly, besides, the air inlet and the air return can not be in short circuit. The max. external static pressure of outdoor is 50Pa.

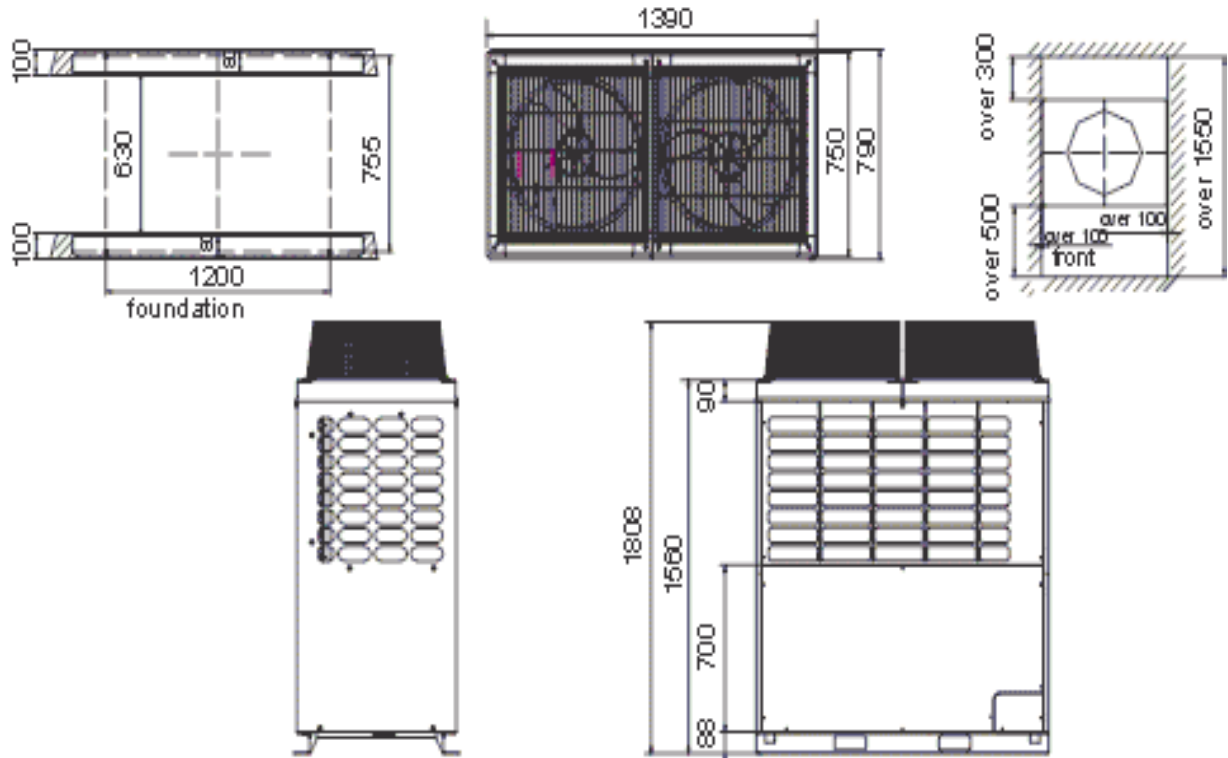
B. Obstacles around outdoor should be less than 800mm to the bottom of unit.

C. The distance between two outdoor units in the same line and the distance from unit to the wall can be increased for easy maintenance if there is enough space.

10HP



12, 14, 16HP:

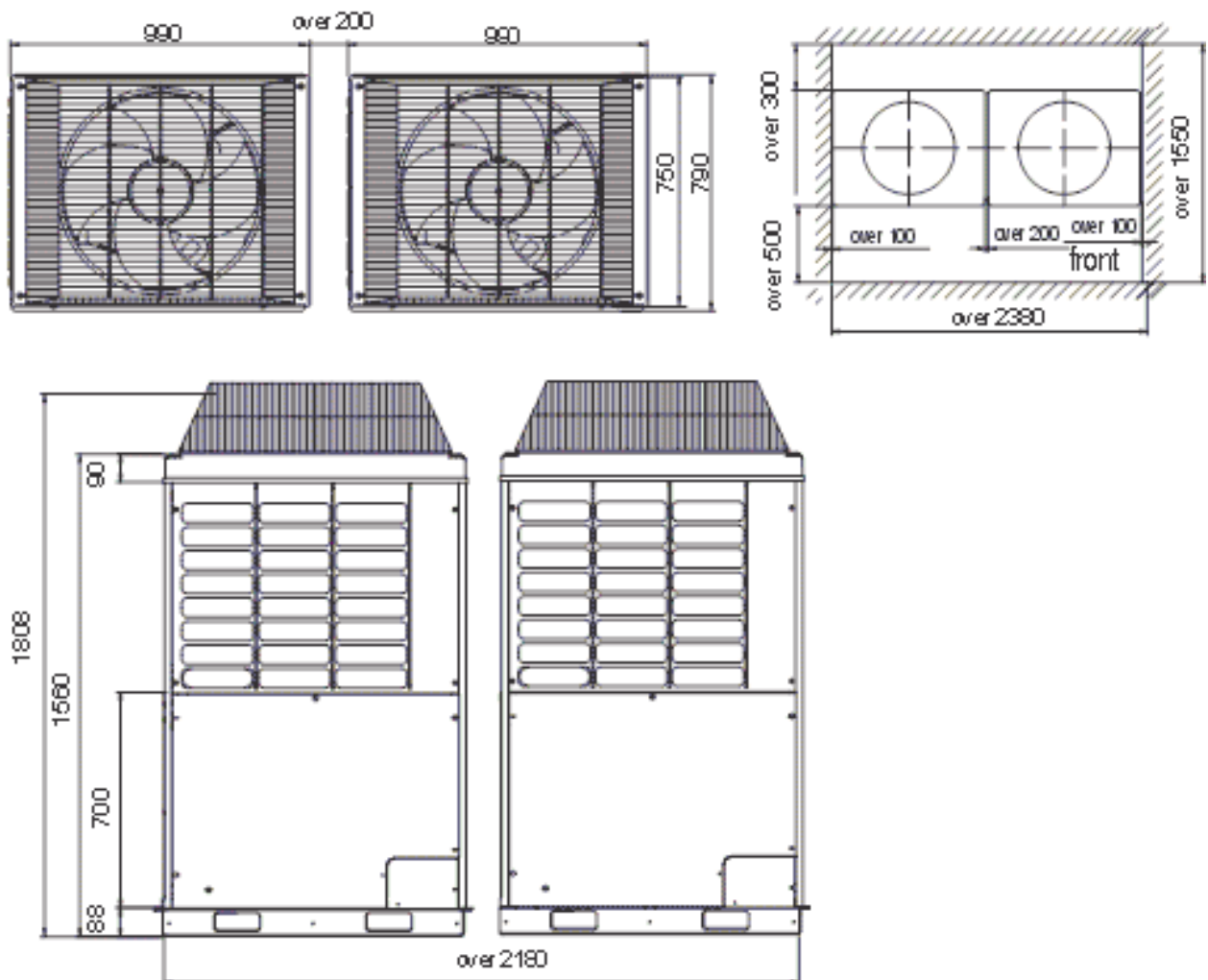


2.2 Combined outdoor unit

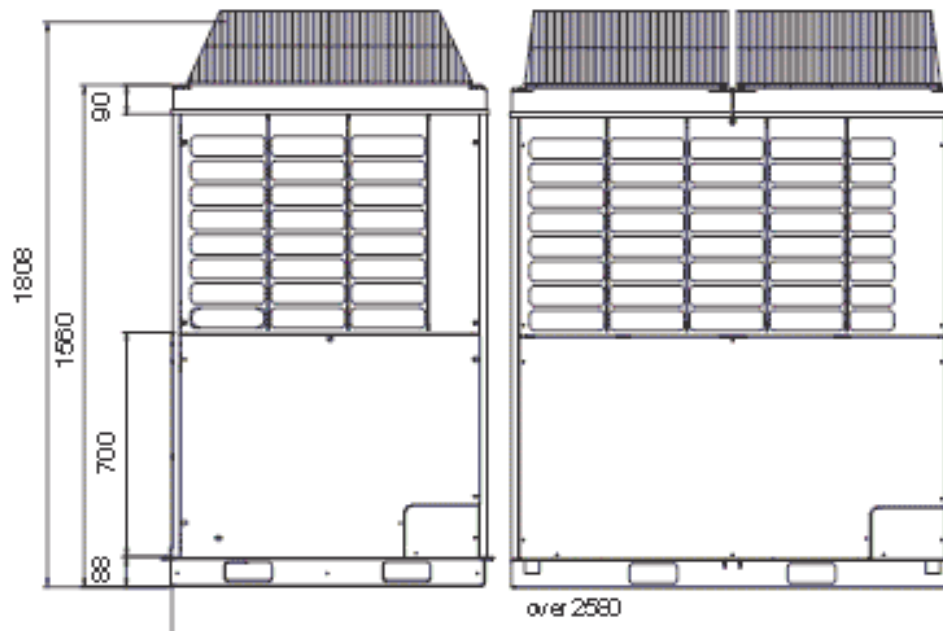
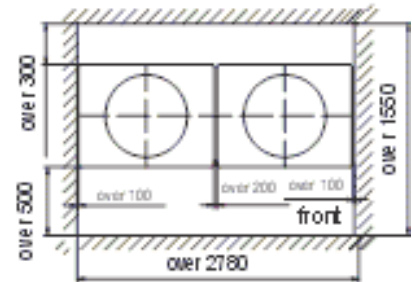
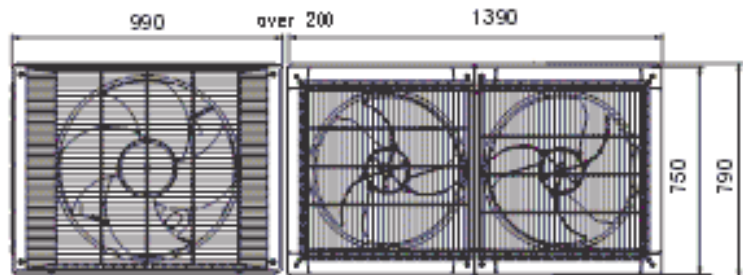
Note:

- A. There should be no obstacles in 2000mm above the top of outdoor unit; If there is obstacle in 2000mm, air duct should be connected and keep the air flow smoothly, besides, the air inlet and the air return can not be in short circuit. The max. external static pressure of outdoor is 50Pa.
- B. Obstacles around outdoor should be less than 800mm to the bottom of unit.
- C. The distance between two outdoor units in the same line and the distance from unit to the wall can be increased for easy maintenance if there is enough space.

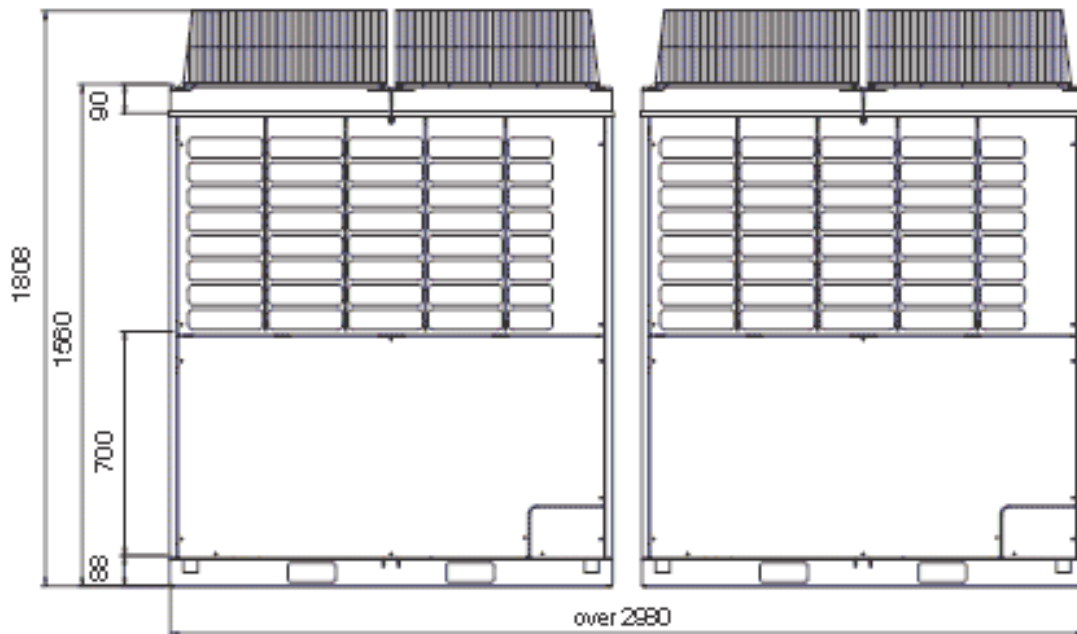
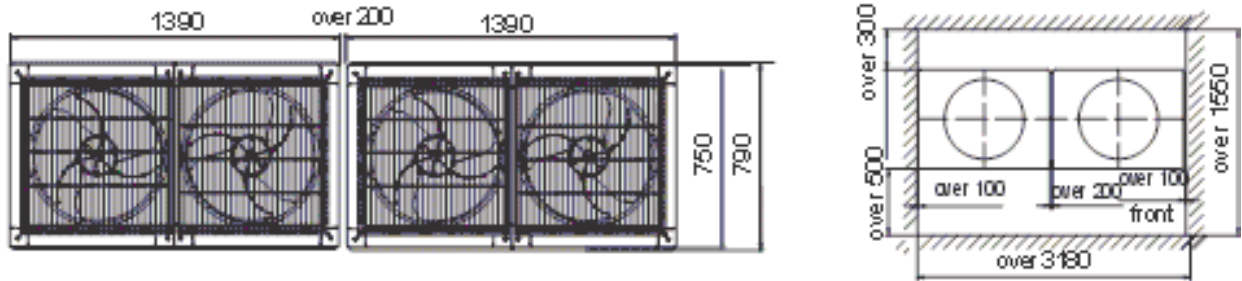
18,20HP:



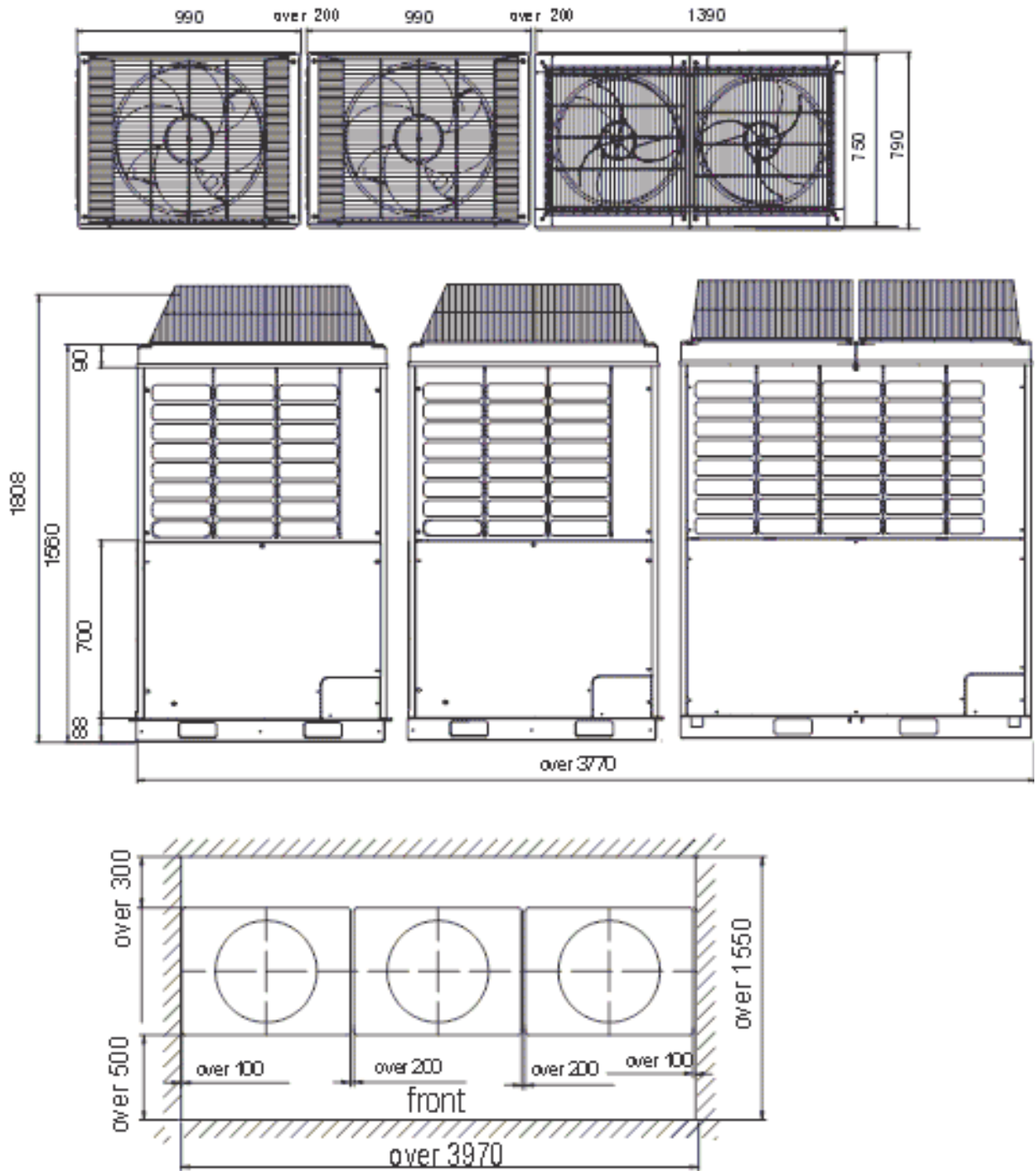
22, 24, 26HP:



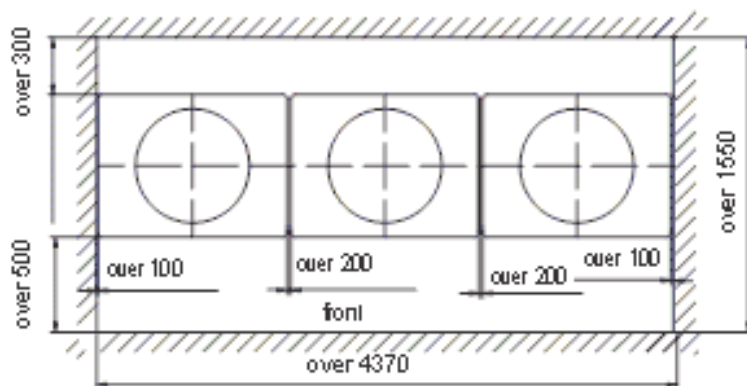
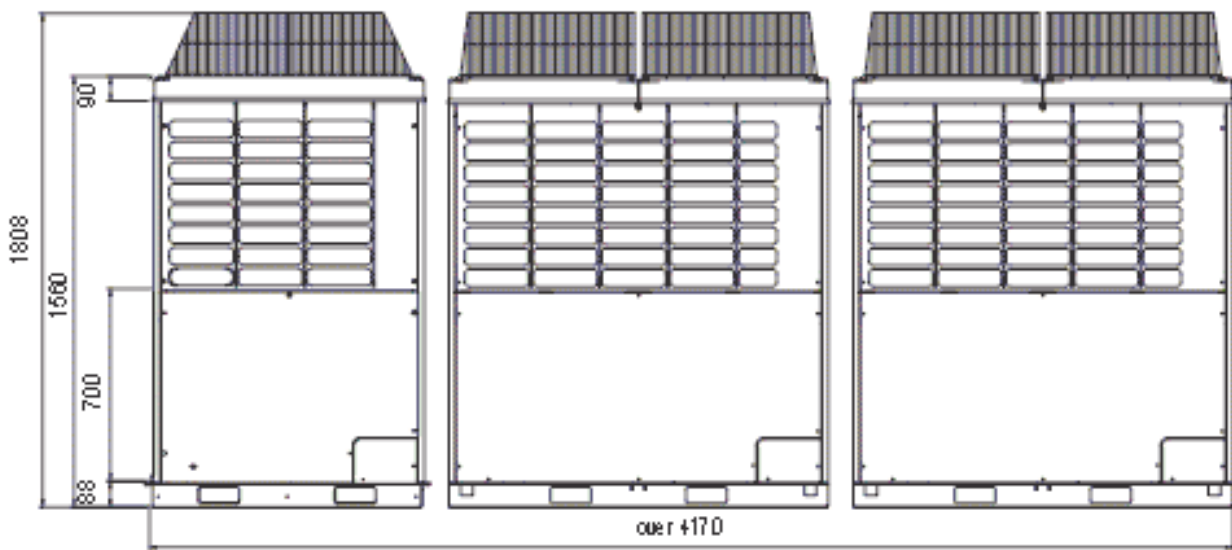
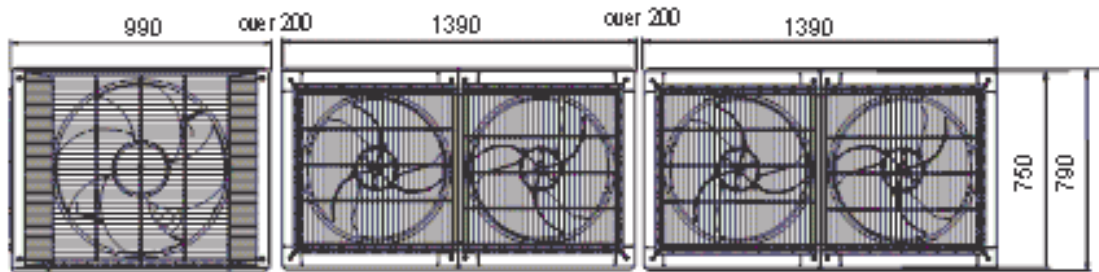
28, 30, 32HP:



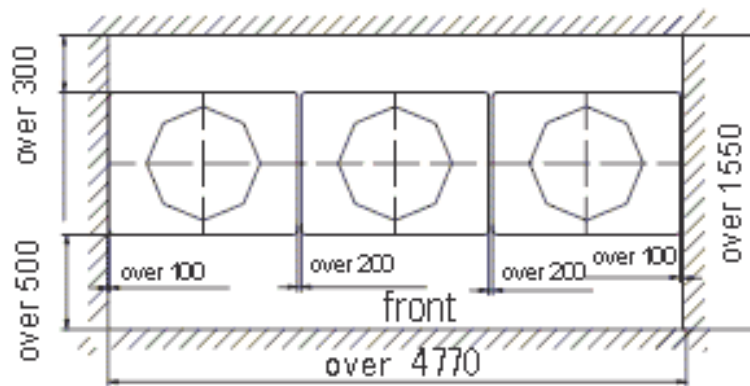
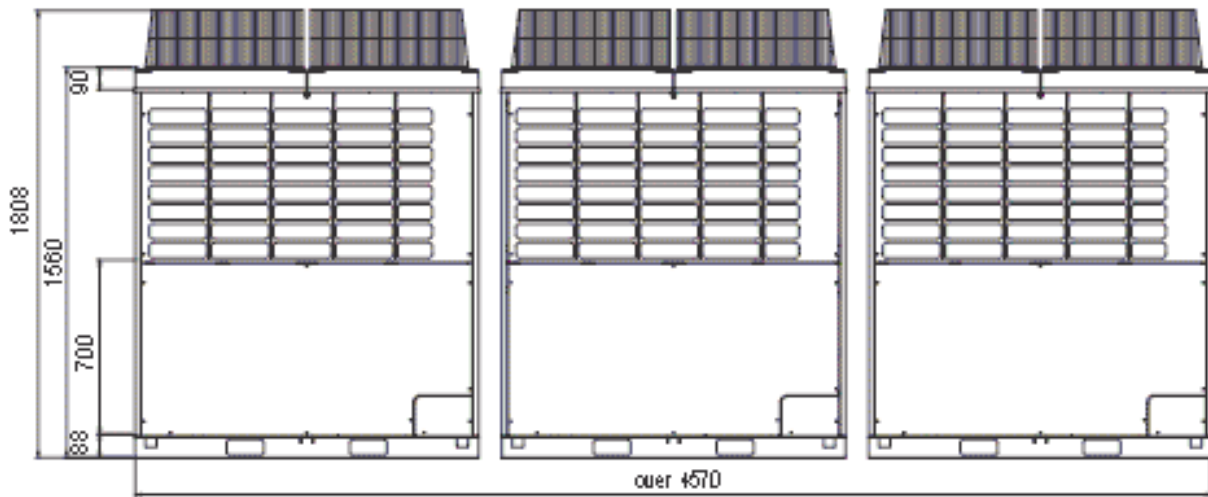
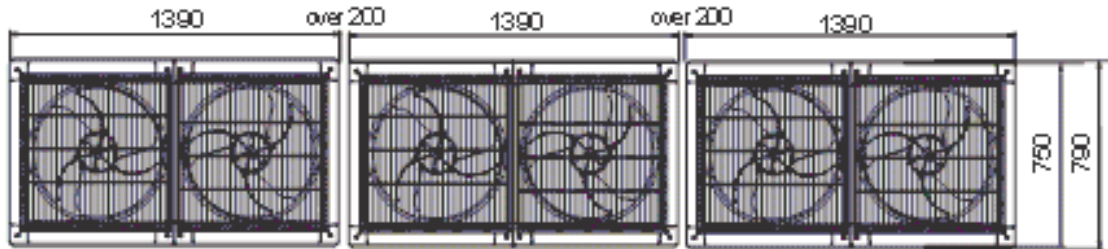
34, 36HP:



38, 40, 42HP:



44, 46, 48HP:

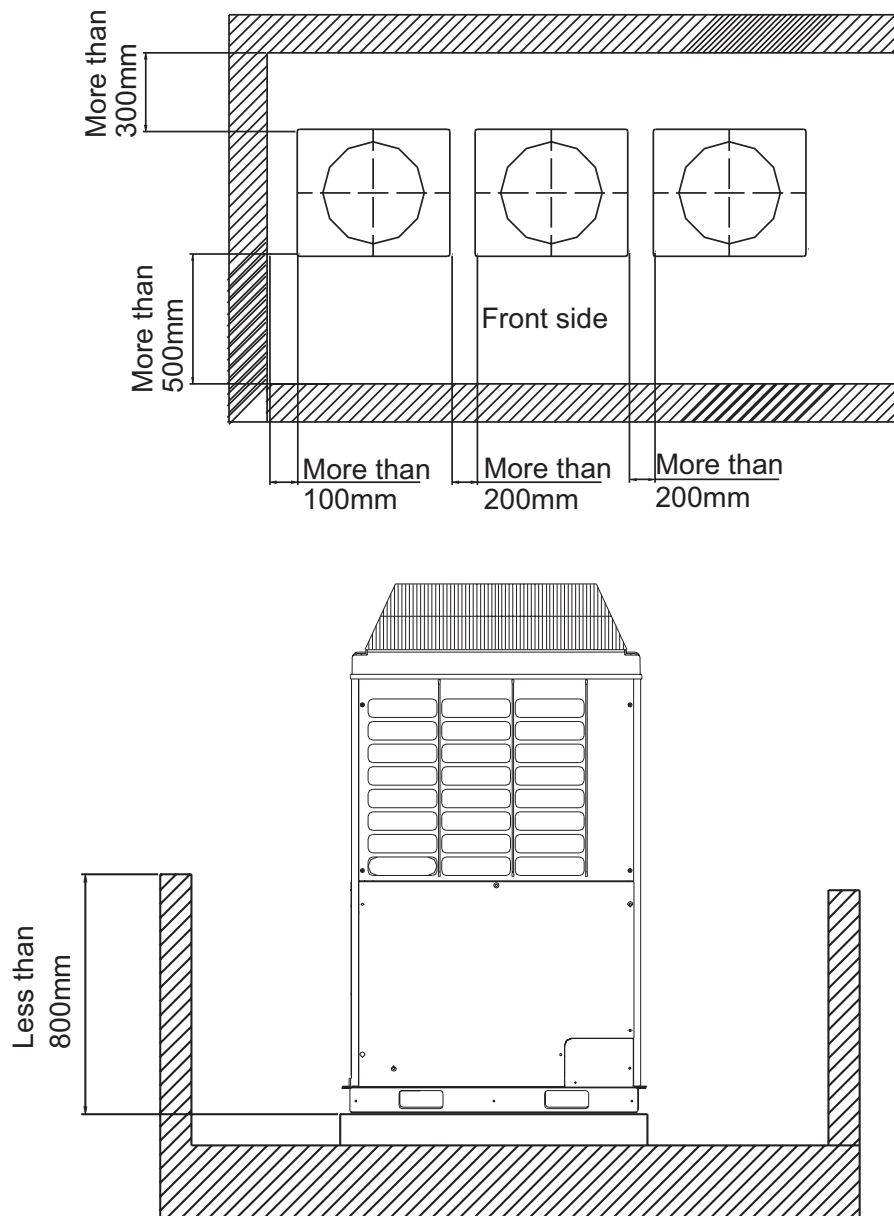


3. Installation space

(1) When outer wall is lower than the outdoor condenser

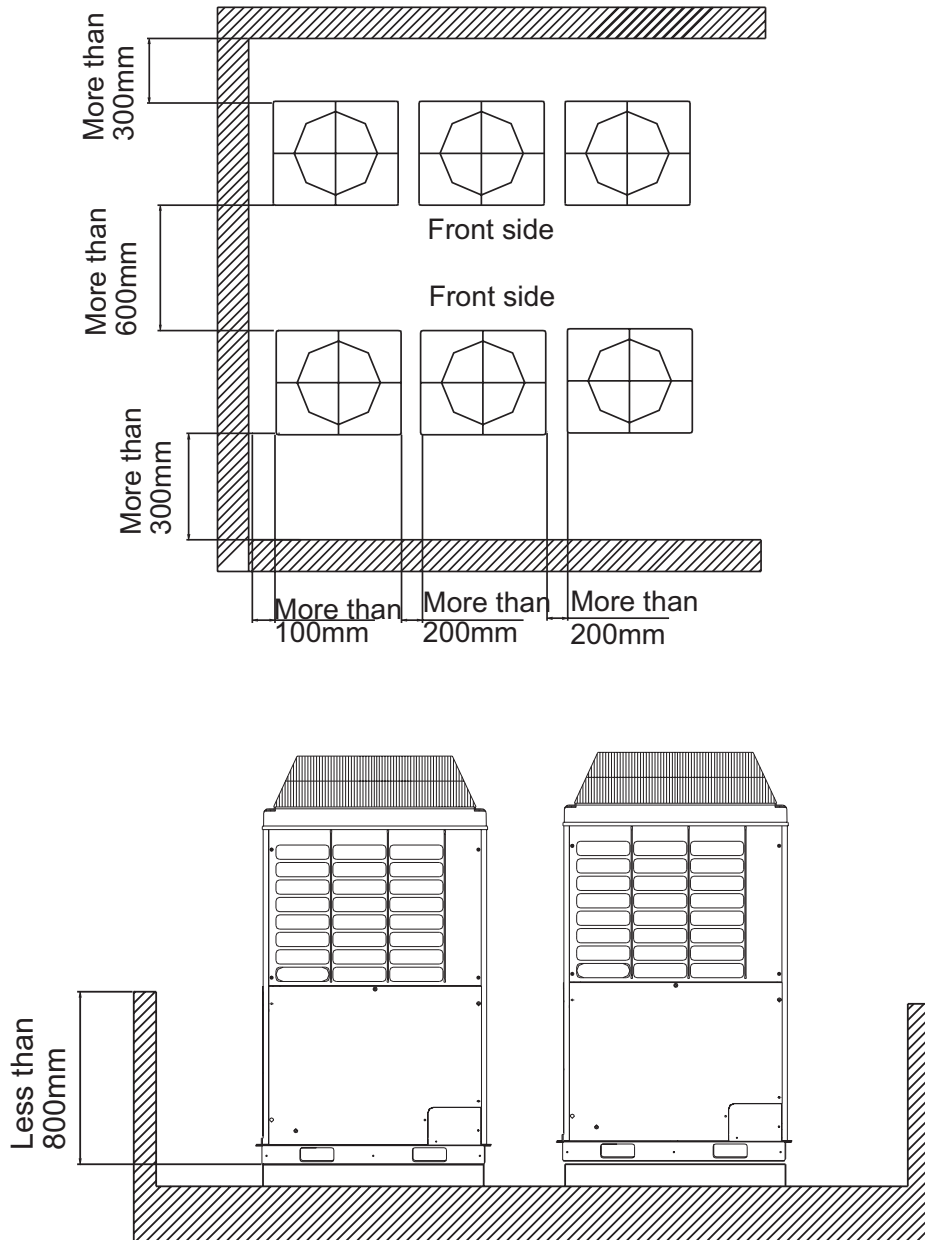
A. Sites for one-row layout

The distance between two outdoor units in the same line and the distance from unit to the wall can be increased for easy maintenance if there is enough space.



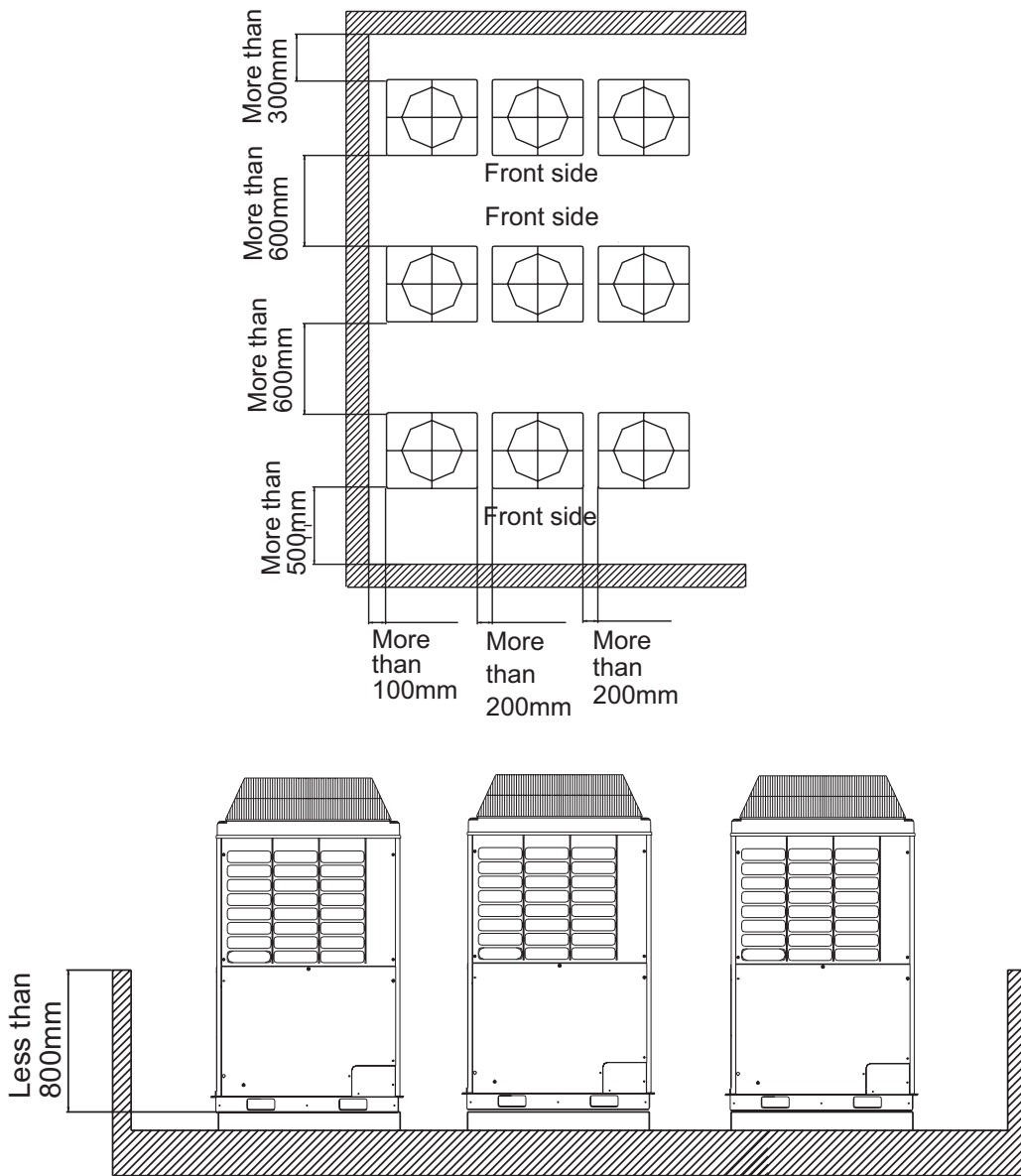
B. Sites for two-row layout

The distance between two outdoor units in the same line and the distance from unit to the wall can be increased for easy maintenance if there is enough space.

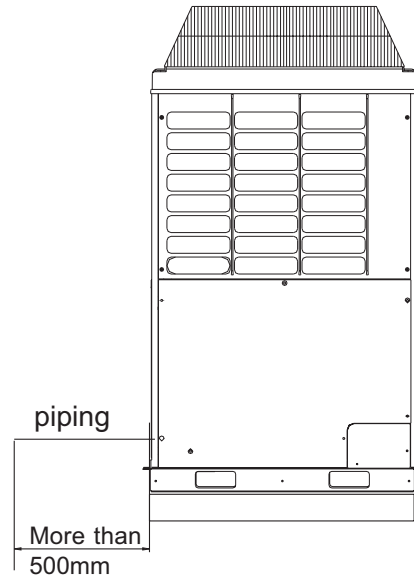
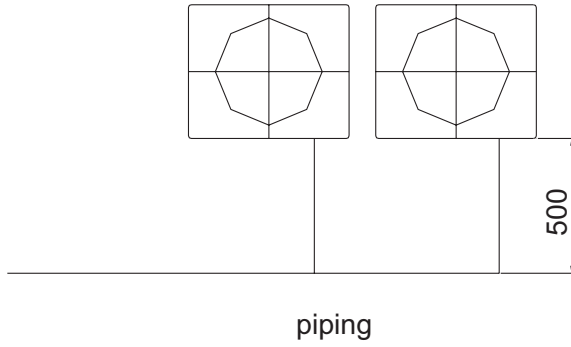


C. Sites for three-row layout

The distance between two outdoor units in the same line and the distance from unit to the wall can be increased for easy maintenance if there is enough space.



D. Piping

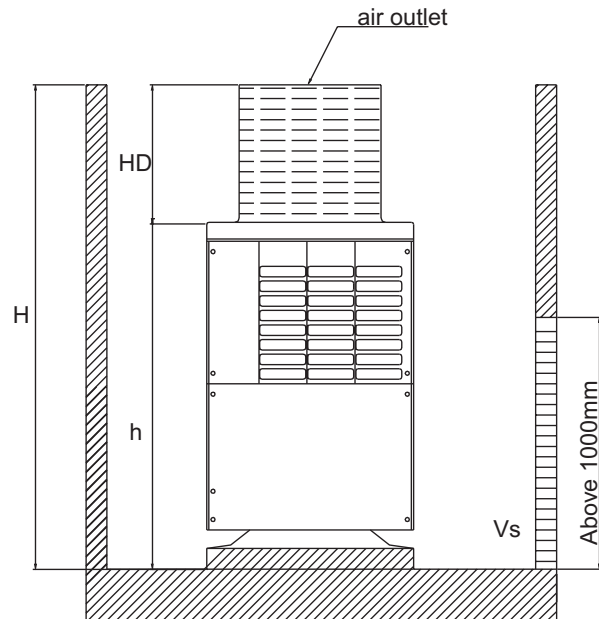
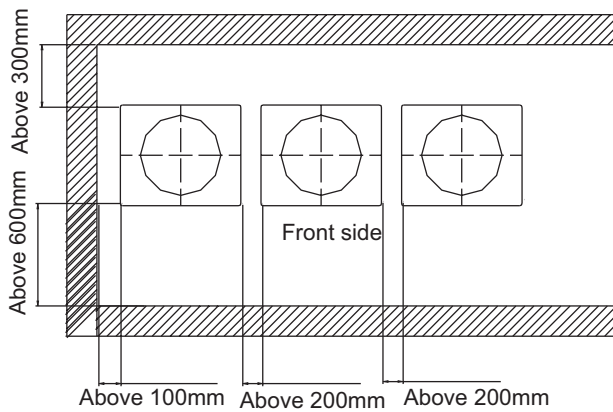


(2) Wall higher than the outdoor unit

A. Place with air inlet hole

Notes:

1. Fan speed V_s at air inlet is 1.5m/s or below.
2. Air outlet height $H_D = H - h$ and below 1m.

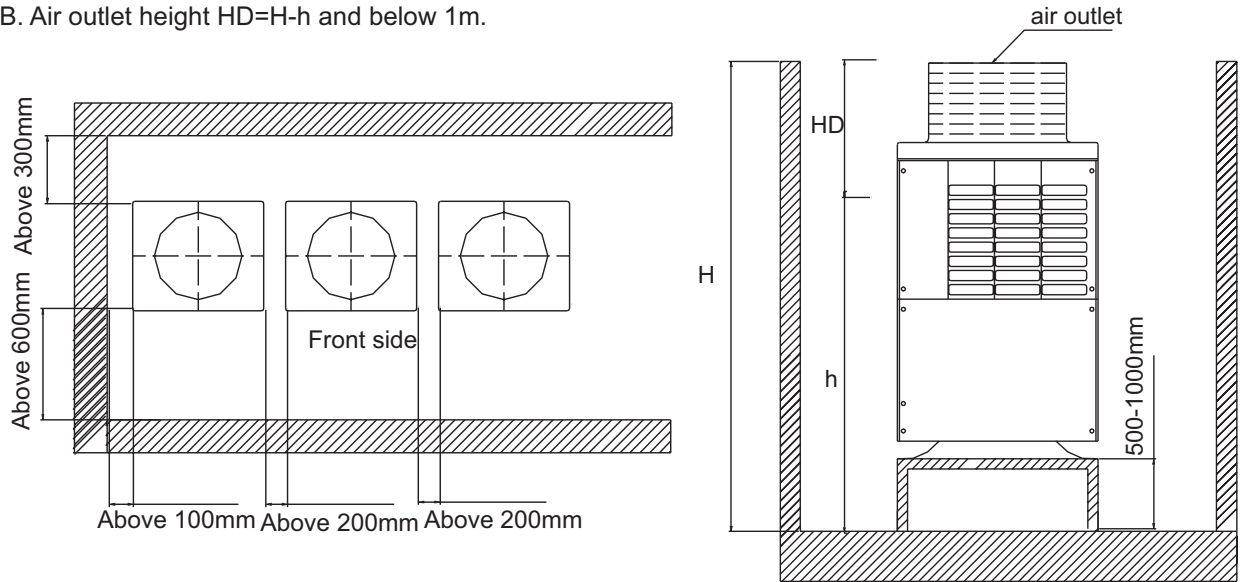


B. Place without air inlet hole

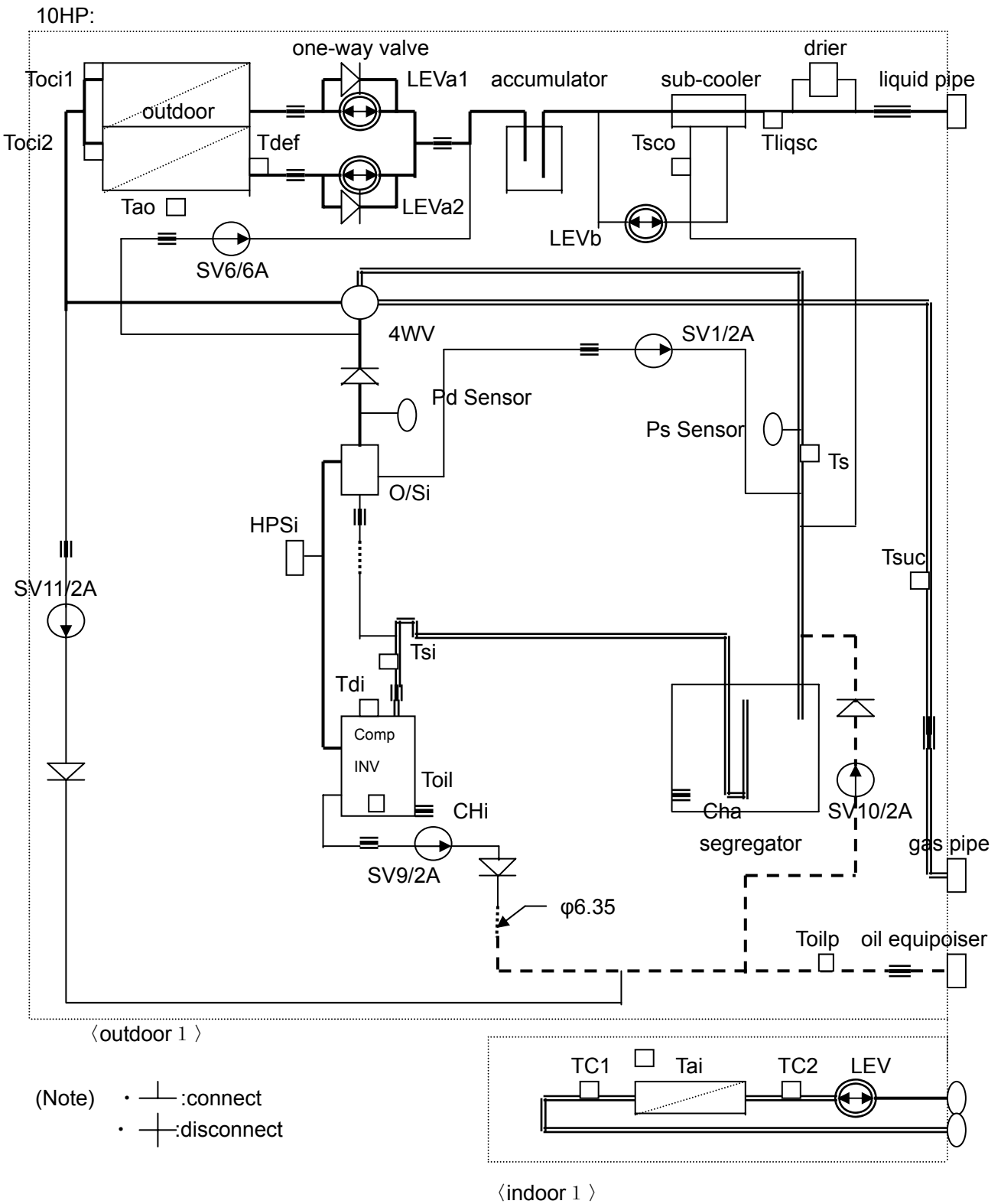
Notes:

A. Set a 500~1000mm bracket.

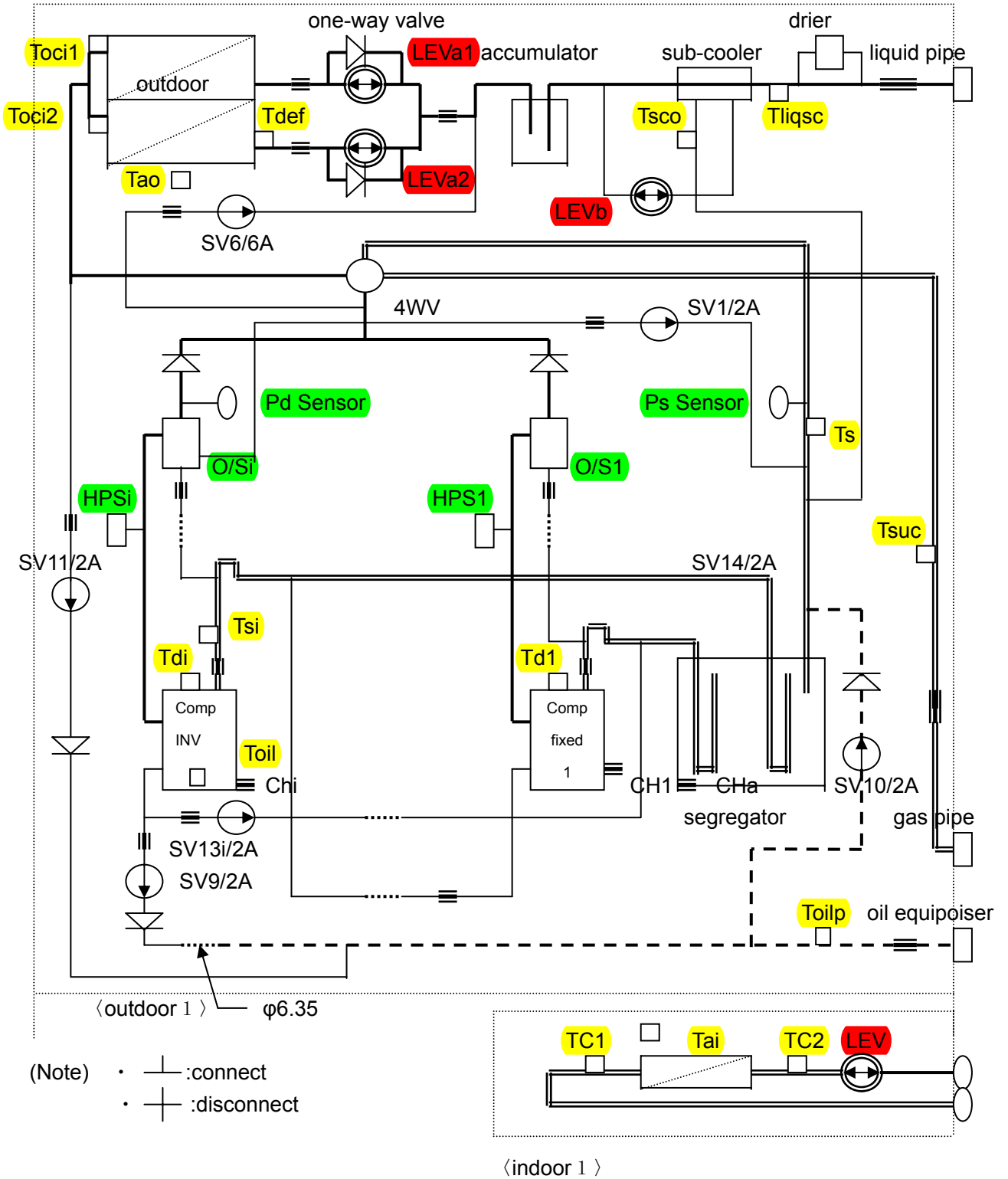
B. Air outlet height $HD=H-h$ and below 1m.



4. Piping diagram



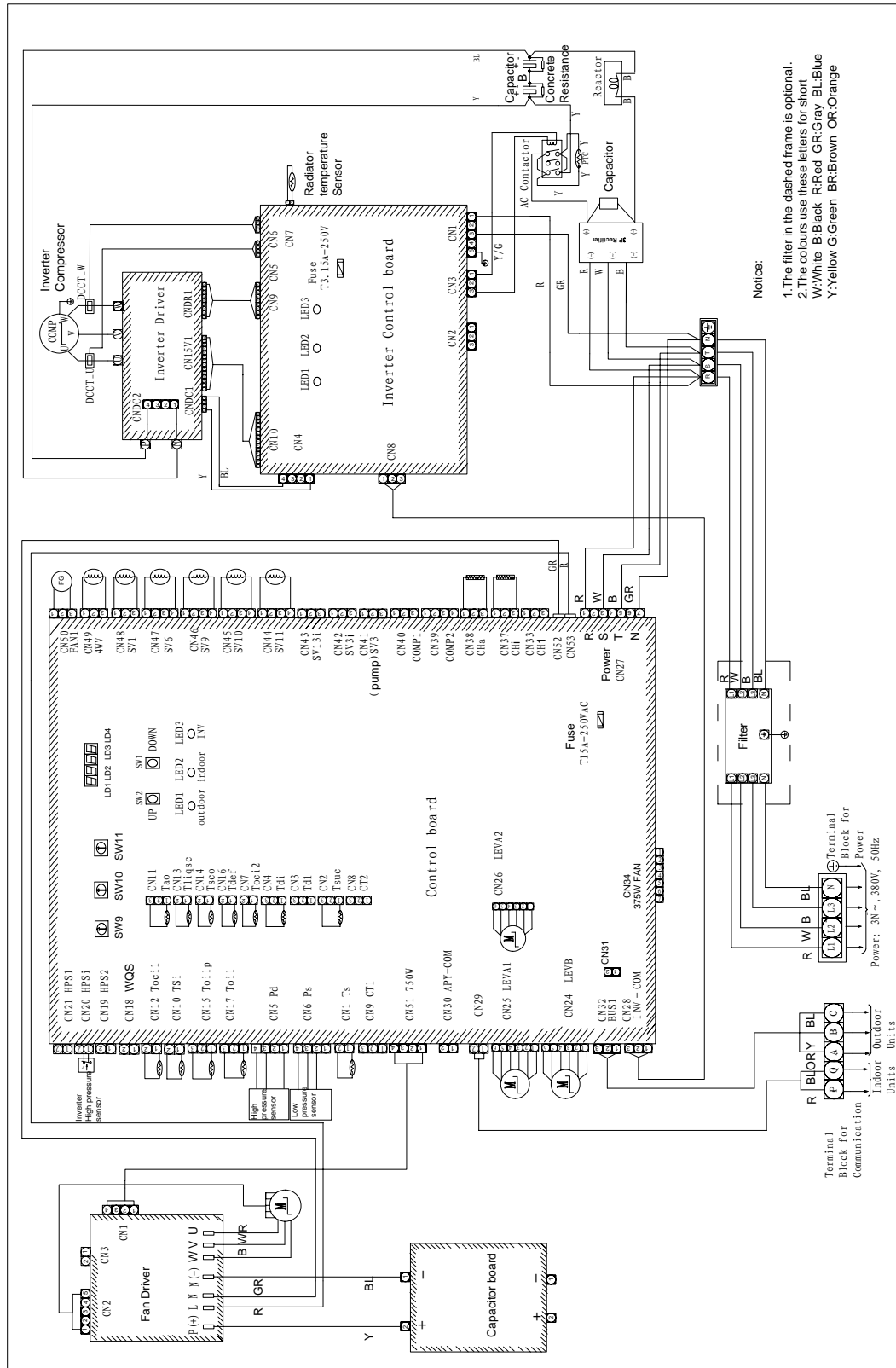
12,14,16HP:



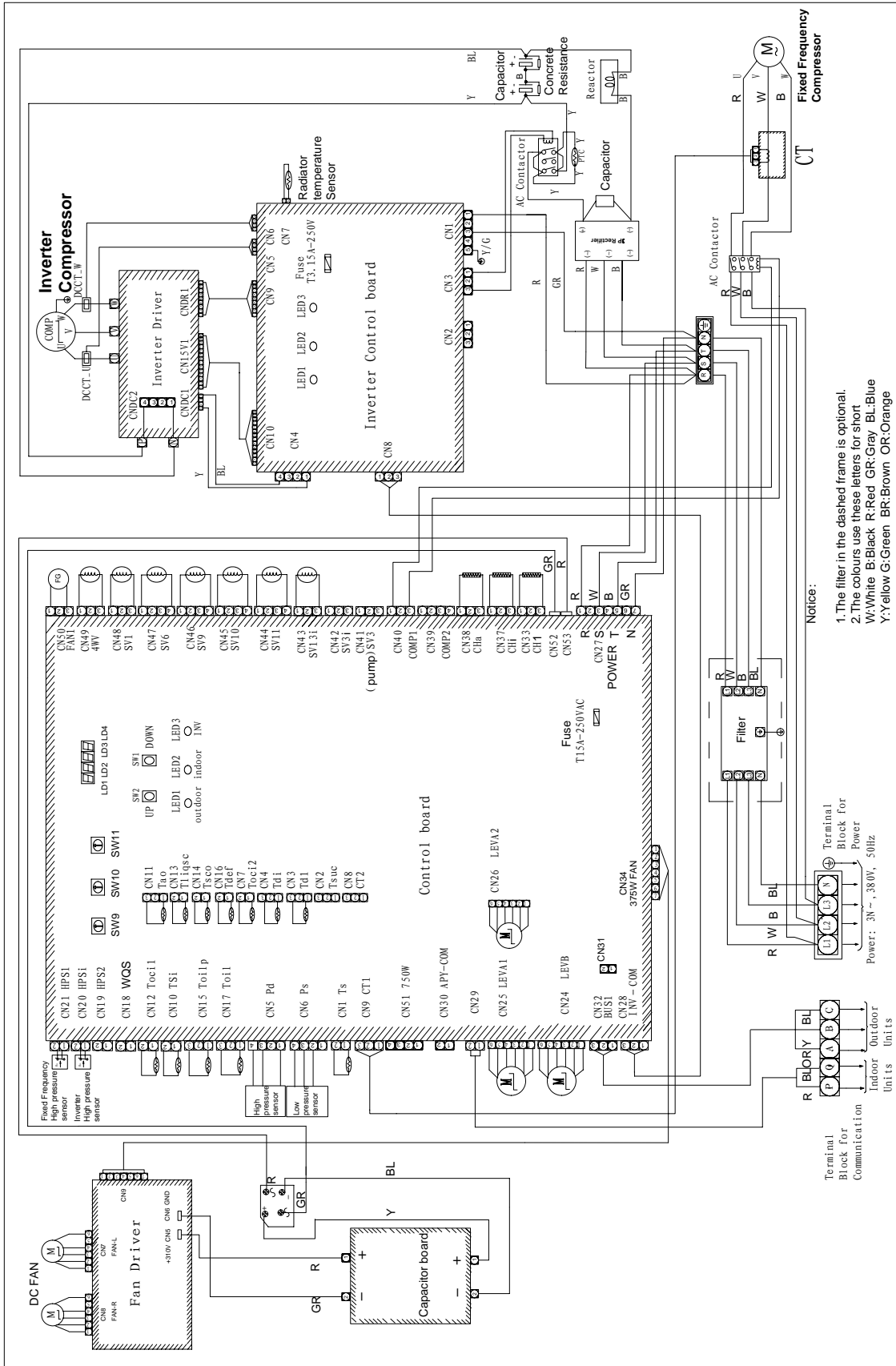
Part name	Sign	Function	Data
Compressor	MC	capacity control, meet indoor load request by adjusting the frequency	resistor of 3-phase coil:0.583 Ω (20℃)
Pressure switch	Hs	High pressure protection	4.05Mpa, OFF
	Ls	Low pressure protection	0.05 Mpa,OFF
Pressure sensor	Pd	in heating,compressor frequency adjustment,abnormal pressure protection	PS8051A150NH4-H4
	Ps	in cooling,compressor frequency adjustment, abnormal pressure protection	PS8051A150NH4-L2
Electronic expansion valve	PMV1	in heating,refrigerant flow control	10TON
	PMV2	1. sub-cooling valve. In cooling, be controlled due to air return sub-cooling degree. 2. refrigerant spraying when discharging temp. or oil temp. is too high	Ø2.4(8~14HP) Ø3.0(16HP)
Solenoid valve	SV1	1. keep balance of high/low pressure when compressor starts up or stops; 2. high/low pressure protection, and auxiliary oil return when FQY is over 85Hz.	AC220V, open when power is on; close when power is off
	SV8	when equalizing oil, the discharging oil outdoor starts up and make high pressure for the oil groove.	
	SV9	when equalizing oil among modules, SV9 will open.	
	SV10	oil equalization route	
	SV11	in heating, SV11 in the stop unit will open to balance the pressure at the low pressure side against liquid return	
	SV12	open at non-oil equalization to balance pressure between oil tank and compressor	
4-way valve	4WV	change over between cooling and heating	AC220V,electrified in heating; not electrified in cooling or defrosting
Temp. sensor	Toil	check refrigerant oil temp. at compressor bottom	R(25℃)=10K B(25/50℃)=3700K
	Te	check frost condition of outdoor heat exchanger	
	Td	detect the discharge temp. of compressor	R(80℃)=50K B(25/80℃)=4450K
	Ts	detect the suction temp. of compressor	R(25℃)=10K B(25/50℃)=3700K
	Ta	detect ambient temp.,set primary setting for fan speed, target pressure and EEV open angle	
	Toci	detect the condenser gas pipe temp., and control MPV1 in heating mode	
	Tin	detect the radiator temp.	R(50℃)=17K B(25/80℃)=4170K
Heater	CH1	used to heat liquid refrigerant in gas-liquid segregator	40W, 220V
	CH2	used to heat oil in compressor	40W, 220V

5. Wiring diagram

10HP

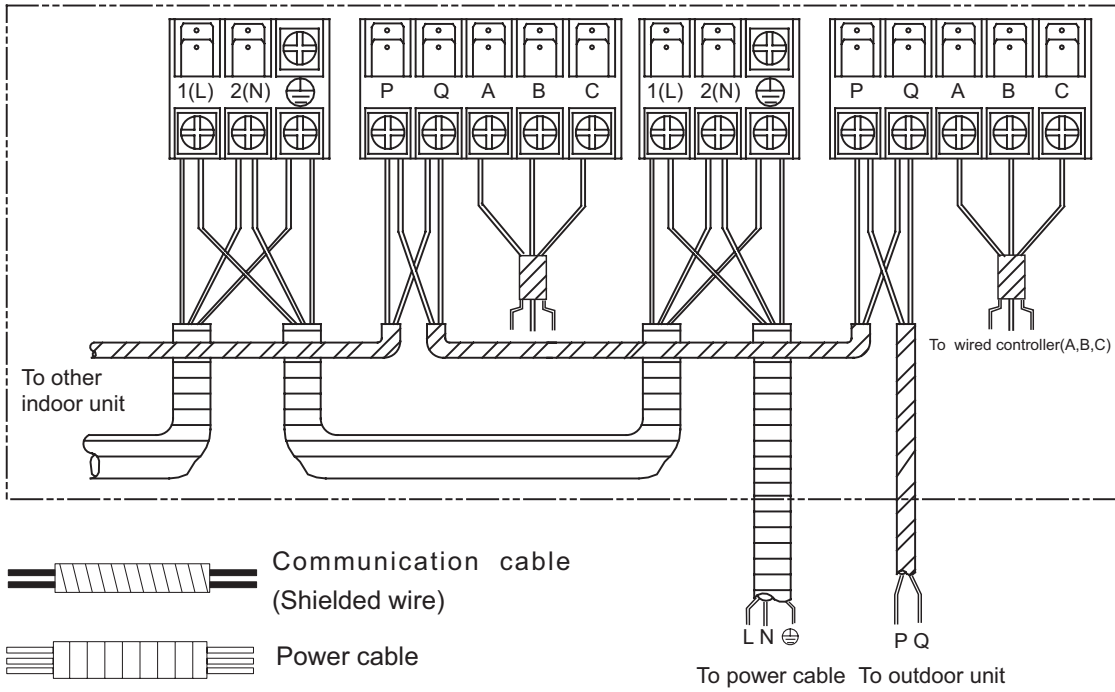


12HP/14HP/16HP

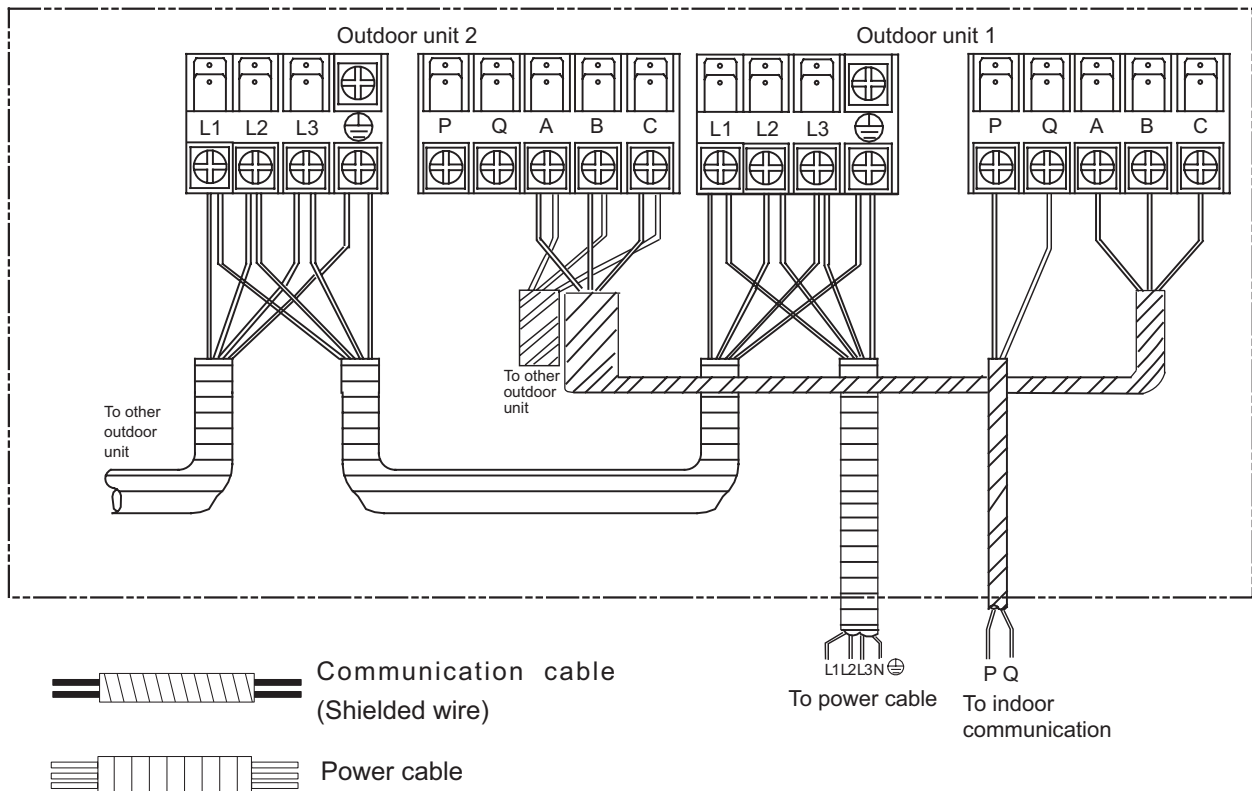


6. Field wiring

Wiring of indoor units (for example)



Wiring of outdoor units (for example)





YCV280															
cooling capacity															
capacity factor (%)	outdoor temp	indoor temp.(°CWB)													
	(°CDB)	14(°C)		16(°C)		18(°C)		19(°C)		20(°C)		22(°C)		24(°C)	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
		KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW
130%	5	25.20	3.91	29.70	4.68	34.20	5.38	36.20	5.98	37.40	5.92	38.10	5.37	39.10	5.26
	10	25.20	3.97	29.70	4.76	34.20	5.56	36.60	5.96	36.90	5.86	37.80	5.60	38.60	5.34
	15	25.20	4.14	29.70	4.97	34.20	5.80	35.90	5.95	36.20	5.89	36.60	5.93	37.50	5.94
	20	25.20	4.36	29.70	5.50	33.80	6.63	34.80	6.65	34.60	6.69	35.50	6.75	36.30	6.81
	25	25.20	5.21	29.70	6.58	32.80	7.50	33.60	7.51	33.50	7.54	34.40	7.60	35.10	7.70
	30	25.20	6.17	29.70	7.30	31.50	8.30	31.80	8.37	32.30	8.40	32.20	8.50	33.90	8.60
	35	25.20	7.20	29.40	9.10	30.80	9.20	30.70	9.27	31.20	9.27	32.10	9.40	32.80	9.40
	41	25.20	8.40	29.20	9.90	29.20	10.00	29.70	10.00	30.00	10.00	31.00	10.00	31.40	10.10
	43	25.20	9.10	28.70	10.00	28.60	10.00	29.10	10.09	29.30	10.09	30.40	10.12	30.50	10.14
120%	5	23.40	3.57	27.40	4.20	31.60	4.92	33.70	5.32	35.70	5.71	37.60	5.83	38.40	5.58
	10	23.40	3.63	27.40	4.36	31.60	5.10	33.70	5.46	35.70	5.83	37.20	5.79	37.90	5.56
	15	23.40	3.80	27.40	4.56	31.60	5.32	33.70	5.70	35.20	5.97	35.90	5.87	36.70	5.90
	20	23.40	3.97	27.40	4.90	31.60	6.01	33.70	6.61	34.10	6.65	34.80	6.70	35.60	6.76
	25	23.40	4.67	27.40	5.87	31.60	7.20	32.60	7.46	33.00	7.50	33.80	7.60	34.40	7.60
	30	23.40	5.53	27.40	6.96	30.80	8.30	31.30	8.34	31.70	8.37	32.40	8.40	33.30	8.50
	35	23.40	6.48	27.40	8.20	30.20	9.10	30.20	9.17	30.60	9.17	31.40	9.30	32.10	9.40
	41	23.40	7.50	27.40	9.40	28.60	10.00	29.20	10.00	29.60	10.00	29.90	10.00	30.70	10.00
	43	23.40	8.30	27.40	10.00	28.00	10.10	28.60	10.09	28.90	10.09	29.20	10.10	30.20	10.12
110%	5	21.50	3.24	25.10	3.82	29.00	4.46	30.90	4.84	32.70	5.22	37.00	6.01	37.70	5.80
	10	21.50	3.30	25.10	3.96	29.00	4.63	30.90	4.97	32.70	5.31	36.50	5.98	37.20	5.77
	15	21.50	3.46	25.10	4.14	29.00	4.84	30.90	5.19	32.70	5.54	35.30	5.95	36.10	5.86
	20	21.50	3.61	25.10	4.35	29.00	5.30	30.90	5.81	32.70	6.34	34.20	6.66	34.90	6.71
	25	21.50	4.15	25.10	5.20	29.00	6.34	30.90	6.96	32.30	7.45	33.00	7.50	33.70	7.60
	30	21.50	4.90	25.10	6.15	29.00	7.60	30.90	8.21	30.90	8.29	31.90	8.40	32.60	8.40
	35	21.50	5.76	25.10	7.23	29.00	8.30	29.70	9.08	30.10	9.17	30.70	9.30	31.40	9.40
	41	21.50	6.73	25.10	8.50	28.30	9.00	28.70	9.82	29.00	9.82	29.30	9.90	30.20	9.90
	43	21.50	7.30	25.10	9.20	27.60	9.70	28.10	9.91	28.30	9.91	28.60	10.00	29.50	10.00
100%	5	19.40	2.93	22.80	3.45	26.30	4.05	28.00	4.58	29.70	4.65	33.20	5.30	38.30	6.00
	10	19.40	2.98	22.80	3.57	26.30	4.16	28.00	4.46	29.70	4.78	33.20	5.39	37.70	5.97
	15	19.40	3.11	22.80	3.72	26.30	4.35	28.00	4.68	29.70	4.99	33.20	5.63	37.00	5.94
	20	19.40	3.26	22.80	3.90	26.30	4.63	28.00	5.07	29.70	5.53	33.20	6.49	36.40	6.66
	25	19.40	3.66	22.80	4.56	26.30	5.54	28.00	6.07	29.70	6.61	32.40	7.50	35.10	7.50
	30	19.40	4.33	22.80	5.34	26.30	6.56	28.00	7.09	29.70	7.84	31.20	8.30	33.50	8.40
	35	19.40	5.07	22.80	6.32	26.30	7.72	28.00	7.36	29.50	9.08	30.10	9.20	31.90	9.30
	41	19.40	5.92	22.80	7.40	26.30	8.99	28.00	9.36	28.40	9.73	29.00	9.90	29.60	9.70
	43	19.40	6.60	22.80	8.00	26.30	9.72	28.00	9.72	27.70	10.00	28.50	10.00	28.90	9.90
90%	5	17.60	2.62	20.60	3.13	23.70	3.64	25.30	3.87	26.90	4.22	29.90	4.66	33.00	5.21
	10	17.60	2.67	20.60	3.18	23.70	3.70	25.30	3.98	26.90	4.25	29.90	4.80	33.00	5.35
	15	17.60	2.78	20.60	3.32	23.70	3.87	25.30	4.14	26.90	4.45	29.90	5.01	33.00	5.59
	20	17.60	2.91	20.60	3.48	23.70	4.05	25.30	4.37	26.90	4.76	29.90	5.56	33.00	6.43
	25	17.60	3.20	20.60	3.96	23.70	4.79	25.30	5.23	26.90	5.68	29.90	6.65	32.40	7.50
	30	17.60	3.78	20.60	4.68	23.70	5.67	25.30	6.19	26.90	6.74	29.90	7.90	31.30	8.30
	35	17.60	4.42	20.60	5.48	23.70	6.65	25.30	7.28	26.90	7.93	29.50	9.10	30.10	9.20
	41	17.60	5.09	20.60	6.39	23.70	7.70	25.30	8.50	26.90	9.08	28.20	9.90	29.00	9.90
	43	17.60	5.27	20.60	6.94	23.70	8.30	25.30	8.90	26.90	9.36	27.00	10.00	28.40	10.00
	5	15.80	2.33	18.20	2.76	21.20	3.21	22.50	3.48	23.80	3.63	26.60	4.11	29.30	4.45
	10	15.80	2.37	18.20	2.81	21.20	3.26	22.50	3.56	23.80	3.73	26.60	4.22	29.30	4.70
	15	15.80	2.46	18.20	2.93	21.20	3.41	22.50	3.65	23.80	3.90	26.60	4.41	29.30	4.91



YCV280																cooling capacity	
capacity factor (%)	outdoor temp	indoor temp.(°CWB)															
	(°CDB)	14(°C)		16(°C)		18(°C)		19(°C)		20(°C)		22(°C)		24(°C)			
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI		
		KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	
80%	20	15.80	2.57	18.20	3.05	21.20	3.56	22.50	3.82	23.80	4.08	26.60	4.70	29.30	5.42		
	25	15.80	2.76	18.20	3.39	21.20	4.08	22.50	4.45	23.80	4.82	26.60	5.63	29.30	6.48		
	30	15.80	3.26	18.20	4.01	21.20	4.82	22.50	5.26	23.80	5.71	26.60	6.66	29.30	7.70		
	35	15.80	3.81	18.20	4.69	21.20	5.67	22.50	6.18	23.80	6.71	26.60	7.80	29.30	9.10		
	41	15.80	4.32	18.20	5.58	21.20	6.59	22.50	7.18	23.80	7.79	26.10	9.00	28.10	9.70		
	43	15.80	4.60	18.20	5.58	21.20	7.12	22.50	7.63	23.80	8.16	24.90	9.40	27.50	9.90		
70%	5	13.60	2.03	16.20	2.40	18.60	2.70	19.60	3.01	20.80	3.14	23.20	3.55	25.70	3.84		
	10	13.60	2.06	16.20	2.44	18.60	2.82	19.60	3.03	20.80	3.23	23.20	3.64	25.70	4.06		
	15	13.60	2.15	16.20	2.54	18.60	2.95	19.60	3.15	20.80	3.37	23.20	3.80	25.70	4.25		
	20	13.60	2.24	16.20	2.65	18.60	3.08	19.60	3.30	20.80	3.52	23.20	3.98	25.70	4.48		
	25	13.60	2.36	16.20	2.87	18.60	3.43	19.60	3.72	20.80	4.03	23.20	4.68	25.70	5.36		
	30	13.60	2.78	16.20	3.37	18.60	4.05	19.60	4.40	20.80	4.77	23.20	5.54	25.70	6.35		
	35	13.60	3.25	16.20	3.96	18.60	4.75	19.60	5.16	20.80	5.59	23.20	6.50	25.70	7.50		
	41	13.60	3.70	16.20	4.60	18.60	5.55	19.60	6.02	20.80	6.51	23.20	7.50	25.70	8.70		
60%	43	13.60	3.97	16.20	4.99	18.60	6.00	19.60	6.57	20.80	7.06	22.00	7.90	25.10	9.10		
	5	11.80	1.75	13.80	2.06	15.90	2.36	16.80	2.55	17.80	2.68	19.90	2.91	22.00	3.22		
	10	11.80	1.78	13.80	2.09	15.90	2.40	16.80	2.66	17.80	2.74	19.90	3.08	22.00	3.43		
	15	11.80	1.85	13.80	2.17	15.90	2.50	16.80	2.68	17.80	2.86	19.90	3.21	22.00	3.58		
	20	11.80	1.93	13.80	2.27	15.90	2.61	16.80	2.80	17.80	2.98	19.90	3.36	22.00	3.74		
	25	11.80	2.01	13.80	2.39	15.90	2.82	16.80	3.06	17.80	3.30	19.90	3.81	22.00	4.34		
	30	11.80	2.33	13.80	2.82	15.90	4.25	16.80	3.61	17.80	3.88	19.90	4.49	22.00	5.13		
	35	11.80	2.71	13.80	3.28	15.90	3.91	16.80	4.23	17.80	4.57	19.90	5.27	22.00	6.02		
	41	11.80	3.15	13.80	2.88	15.90	4.49	16.80	4.63	17.80	5.30	19.90	6.14	22.00	7.03		
50%	43	11.80	3.43	13.80	3.15	15.90	4.68	16.80	5.08	17.80	5.76	19.90	6.69	22.00	7.18		
	5	9.76	1.49	11.50	1.73	13.20	1.98	14.00	2.12	14.80	2.22	16.60	2.45	18.30	2.74		
	10	9.76	1.51	11.50	1.75	13.20	2.01	14.00	2.14	14.80	2.27	16.60	2.54	18.30	2.82		
	15	9.76	1.56	11.50	1.82	13.20	2.08	14.00	2.22	14.80	2.36	16.60	2.64	18.30	2.93		
	20	9.76	1.62	11.50	1.89	13.20	2.17	14.00	2.32	14.80	2.47	16.60	2.76	18.30	3.07		
	25	9.76	1.69	11.50	1.97	13.20	2.28	14.00	2.45	14.80	2.63	16.60	3.02	18.30	3.41		
	30	9.76	1.92	11.50	2.28	13.20	2.68	14.00	2.89	14.80	3.11	16.60	3.55	18.30	4.03		
	35	9.76	2.23	11.50	2.67	13.20	3.14	14.00	3.37	14.80	3.63	16.60	4.16	18.30	4.72		
	41	9.76	2.60	11.50	3.09	13.20	3.62	14.00	3.90	14.80	4.22	16.60	4.98	18.30	5.56		
43	9.76	2.87	11.50	3.37	13.20	3.91	14.00	4.45	14.80	4.57	16.60	5.25	18.30	6.19			

TC: total capacity, KW

PI: power input, KW (compressor+outdoor motor)



YCV335																cooling capacity	
capacity factor (%)	outdoor temp	indoor temp.(°CWB)															
	(°CDB)	14(°C)		16(°C)		18(°C)		19(°C)		20(°C)		22(°C)		24(°C)			
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI		
		KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	
130%	5	30.30	4.55	35.80	5.45	41.20	6.27	44.00	6.97	45.80	6.90	47.10	6.26	47.90	6.13		
	10	30.30	4.63	35.80	5.55	41.20	6.49	44.00	6.95	44.50	6.83	45.50	6.53	46.50	6.23		
	15	30.30	4.83	35.80	5.79	41.20	6.76	42.50	6.94	43.10	6.87	44.00	6.91	45.20	6.92		
	20	30.30	5.08	35.80	6.41	40.80	7.73	41.20	7.76	41.70	7.80	42.70	7.86	43.70	7.94		
	25	30.30	6.07	35.80	7.67	39.30	8.70	39.70	8.75	40.30	8.80	41.40	8.90	42.40	9.00		
	30	30.30	7.19	35.80	8.50	37.90	9.70	38.40	9.76	39.00	9.80	39.90	9.90	41.10	10.00		
	35	30.30	8.40	35.50	10.60	36.60	10.70	37.10	10.80	37.50	10.80	38.50	10.90	39.60	11.00		
	41	30.30	9.80	34.30	11.50	35.30	11.70	35.70	11.66	36.30	11.70	37.20	11.70	38.40	11.70		
120%	43	30.30	10.60	33.50	11.70	34.40	11.80	35.00	11.83	35.60	11.90	36.50	11.98	37.50	12.20		
	5	28.00	4.16	33.00	4.90	38.10	5.74	40.50	6.20	43.60	6.66	46.10	6.80	47.00	6.51		
	10	28.00	4.23	33.00	5.08	38.10	5.94	40.50	6.37	43.00	6.80	44.80	6.75	45.70	6.48		
	15	28.00	4.43	33.00	5.31	38.10	6.20	40.50	6.65	42.50	6.96	43.40	6.84	44.30	6.88		
	20	28.00	4.63	33.00	5.72	38.10	7.01	40.50	7.70	41.10	7.75	41.90	7.81	42.80	7.89		
	25	28.00	5.44	33.00	6.84	38.10	8.40	39.10	8.70	39.70	8.70	40.60	8.80	41.50	8.90		
	30	28.00	6.44	33.00	8.11	37.20	9.60	37.80	9.72	38.40	9.80	39.10	9.80	40.00	9.90		
	35	28.00	7.55	33.00	9.50	35.90	10.60	36.50	10.70	36.90	10.70	37.80	10.80	38.70	10.90		
110%	41	28.00	8.80	33.00	10.90	34.50	11.70	35.00	11.66	35.60	11.70	36.50	11.70	37.40	11.70		
	43	28.00	9.60	33.00	11.60	33.80	11.80	34.20	11.76	34.70	11.80	35.60	11.80	36.60	11.80		
	5	25.60	3.77	30.30	4.46	34.80	5.21	37.10	5.64	39.40	6.08	45.40	7.01	46.40	6.76		
	10	25.60	3.85	30.30	4.62	34.80	5.40	37.10	5.79	39.40	6.19	44.00	6.97	44.90	6.72		
	15	25.60	4.03	30.30	4.82	34.80	5.64	37.10	6.05	39.40	6.45	42.50	6.94	43.40	6.83		
	20	25.60	4.21	30.30	5.07	34.80	6.18	37.10	6.78	39.40	7.39	41.20	7.77	42.10	7.82		
	25	25.60	4.84	30.30	6.06	34.80	7.39	37.10	8.11	38.40	8.70	39.30	8.80	40.20	8.80		
	30	25.60	5.72	30.30	7.17	34.80	8.90	37.10	9.57	37.40	9.70	38.40	9.80	39.30	9.80		
100%	35	25.60	6.71	30.30	8.43	34.80	9.70	35.70	10.59	36.20	10.70	37.10	10.80	37.90	10.90		
	41	25.60	7.84	30.30	9.90	33.80	10.50	34.40	11.44	34.80	11.40	35.60	11.50	36.60	11.50		
	43	25.60	8.50	30.30	10.70	32.90	11.30	33.60	11.55	34.10	11.50	34.80	11.70	35.70	11.70		
	5	23.30	3.41	27.50	4.02	31.60	4.72	33.50	5.34	35.90	5.42	40.00	6.18	45.50	6.99		
	10	23.30	3.47	27.50	4.16	31.60	4.85	33.50	5.21	35.90	5.57	40.00	6.28	44.00	6.96		
	15	23.30	3.62	27.50	4.34	31.60	5.07	33.50	5.45	35.90	5.81	40.00	6.56	42.50	6.92		
	20	23.30	3.80	27.50	4.54	31.60	5.40	33.50	5.91	35.90	6.44	40.00	7.57	41.20	7.77		
	25	23.30	4.27	27.50	5.31	31.60	6.45	33.50	7.07	35.90	7.70	39.10	8.70	39.90	8.80		
90%	30	23.30	5.04	27.50	6.23	31.60	7.65	33.50	8.26	35.90	9.10	37.70	9.70	38.40	9.80		
	35	23.30	5.91	27.50	7.37	31.60	9.00	33.50	10.00	35.60	10.60	36.30	10.70	37.10	10.80		
	41	23.30	6.90	27.50	8.60	31.60	10.48	33.50	10.91	34.20	11.30	35.00	11.50	35.70	11.30		
	43	23.30	7.69	27.50	9.30	31.60	11.34	33.50	11.34	33.40	11.70	34.20	11.70	35.00	11.50		
	5	21.00	3.06	24.80	3.65	28.60	4.24	30.40	4.51	32.30	4.92	36.00	5.43	39.70	6.07		
	10	21.00	3.11	24.80	3.71	28.60	4.32	30.40	4.64	32.30	4.96	36.00	5.60	39.70	6.24		
	15	21.00	3.24	24.80	3.87	28.60	4.51	30.40	4.83	32.30	5.18	36.00	5.85	39.70	6.52		
	20	21.00	3.39	24.80	4.05	28.60	4.72	30.40	5.10	32.30	5.55	36.00	6.49	39.70	7.49		
80%	25	21.00	3.73	24.80	4.62	28.60	5.58	30.40	6.09	32.30	6.63	36.00	7.76	39.00	8.70		
	30	21.00	4.40	24.80	5.45	28.60	6.60	30.40	7.21	32.30	7.85	36.00	9.20	37.70	9.70		
	35	21.00	5.15	24.80	6.39	28.60	7.76	30.40	8.48	32.30	9.20	35.60	10.60	36.30	10.70		
	41	21.00	5.93	24.80	7.45	28.60	9.00	30.40	9.90	32.30	10.60	34.20	11.50	34.70	11.50		
	43	21.00	6.15	24.80	8.09	28.60	9.60	30.40	10.37	32.30	10.90	33.40	11.70	33.90	11.70		
	5	18.60	2.72	22.00	3.22	25.30	3.74	27.10	4.05	28.60	4.23	32.00	4.79	35.40	5.18		



YCV335																cooling capacity	
capacity factor (%)	outdoor temp	indoor temp.(°CWB)															
	(°CDB)	14(°C)		16(°C)		18(°C)		19(°C)		20(°C)		22(°C)		24(°C)			
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI		
		KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW		
80%	10	18.60	2.76	22.00	3.27	25.30	3.81	27.10	4.15	28.60	4.35	32.00	4.92	35.40	5.48		
	15	18.60	2.87	22.00	3.41	25.30	3.98	27.10	4.25	28.60	4.54	32.00	5.14	35.40	5.73		
	20	18.60	2.99	22.00	3.56	25.30	4.15	27.10	4.46	28.60	4.76	32.00	5.48	35.40	6.32		
	25	18.60	3.22	22.00	3.96	25.30	4.76	27.10	5.18	28.60	5.62	32.00	6.56	35.40	7.55		
	30	18.60	3.80	22.00	4.67	25.30	5.62	27.10	6.13	28.60	6.66	32.00	7.77	35.40	9.00		
	35	18.60	4.45	22.00	5.47	25.30	6.60	27.10	7.20	28.60	7.82	32.00	9.10	35.40	10.60		
	41	18.60	5.03	22.00	6.51	25.30	7.68	27.10	8.37	28.60	9.10	32.00	10.50	33.80	11.30		
	43	18.60	5.37	22.00	6.51	25.30	8.30	27.10	8.89	28.60	9.50	32.00	10.90	32.20	11.50		
70%	5	16.30	2.36	19.30	2.80	22.10	3.14	23.60	3.51	25.10	3.66	28.00	4.14	31.00	4.48		
	10	16.30	2.41	19.30	2.84	22.10	3.29	23.60	3.53	25.10	3.76	28.00	4.24	31.00	4.74		
	15	16.30	2.50	19.30	2.96	22.10	3.44	23.60	3.68	25.10	3.92	28.00	4.43	31.00	4.95		
	20	16.30	2.61	19.30	3.09	22.10	3.59	23.60	3.85	25.10	4.10	28.00	4.64	31.00	5.23		
	25	16.30	2.75	19.30	3.35	22.10	4.00	23.60	4.34	25.10	4.70	28.00	5.45	31.00	6.25		
	30	16.30	3.24	19.30	3.93	22.10	4.72	23.60	5.13	25.10	5.56	28.00	6.45	31.00	7.41		
	35	16.30	3.78	19.30	4.62	22.10	5.54	23.60	6.02	25.10	6.52	28.00	7.58	31.00	8.70		
	41	16.30	4.31	19.30	5.37	22.10	6.47	23.60	7.02	25.10	7.59	28.00	8.80	31.00	10.20		
43	16.30	4.63	19.30	5.81	22.10	7.00	23.60	7.66	25.10	8.23	28.00	9.20	31.00	10.60			
60%	5	13.90	2.04	16.50	2.41	19.00	2.75	20.30	2.97	21.60	3.12	24.00	3.39	26.50	3.75		
	10	13.90	2.08	16.50	2.44	19.00	2.80	20.30	3.10	21.60	3.20	24.00	3.59	26.50	4.00		
	15	13.90	2.16	16.50	2.53	19.00	2.92	20.30	3.12	21.60	3.34	24.00	3.74	26.50	4.17		
	20	13.90	2.25	16.50	2.64	19.00	3.05	20.30	3.26	21.60	3.47	24.00	3.91	26.50	4.36		
	25	13.90	2.34	16.50	2.78	19.00	3.29	20.30	3.57	21.60	3.85	24.00	4.44	26.50	5.06		
	30	13.90	2.72	16.50	3.28	19.00	4.95	20.30	4.21	21.60	4.52	24.00	5.24	26.50	5.98		
	35	13.90	3.16	16.50	3.83	19.00	4.55	20.30	4.93	21.60	5.32	24.00	6.15	26.50	7.02		
	41	13.90	3.68	16.50	3.36	19.00	5.24	20.30	5.40	21.60	6.18	24.00	7.16	26.50	8.20		
43	13.90	4.00	16.50	3.68	19.00	5.45	20.30	5.92	21.60	6.71	24.00	7.80	26.50	8.37			
50%	5	11.70	1.73	13.80	2.01	15.90	2.31	16.90	2.47	17.90	2.59	20.00	2.86	22.10	3.20		
	10	11.70	1.76	13.80	2.04	15.90	2.34	16.90	2.49	17.90	2.64	20.00	2.96	22.10	3.28		
	15	11.70	1.82	13.80	2.12	15.90	2.43	16.90	2.59	17.90	2.75	20.00	3.08	22.10	3.42		
	20	11.70	1.89	13.80	2.20	15.90	2.53	16.90	2.71	17.90	2.88	20.00	3.22	22.10	3.58		
	25	11.70	1.97	13.80	2.30	15.90	2.65	16.90	2.86	17.90	3.07	20.00	3.52	22.10	3.98		
	30	11.70	2.24	13.80	2.66	15.90	3.12	16.90	3.37	17.90	3.62	20.00	4.14	22.10	4.70		
	35	11.70	2.60	13.80	3.11	15.90	3.66	16.90	3.93	17.90	4.23	20.00	4.85	22.10	5.50		
	41	11.70	3.03	13.80	3.60	15.90	4.22	16.90	4.54	17.90	4.92	20.00	5.80	22.10	6.48		
43	11.70	3.35	13.80	3.92	15.90	4.55	16.90	5.18	17.90	5.33	20.00	6.12	22.10	7.21			

TC: total capacity, KW

PI: power input, KW (compressor+outdoor motor)



		YCV400														cooling capacity	
capacity factor (%)	outdoor temp	indoor temp.(°CWB)															
	(°CDB)	14(°C)		16(°C)		18(°C)		19(°C)		20(°C)		22(°C)		24(°C)			
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI		
		KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	
130%	5	36.20	5.31	42.70	6.50	49.20	7.67	52.60	8.69	54.70	8.47	56.30	7.69	57.20	6.91		
	10	36.20	5.59	42.70	6.81	49.20	8.05	52.60	8.67	53.10	8.51	54.30	8.12	55.60	7.72		
	15	36.20	5.88	42.70	7.13	49.20	8.43	50.80	8.66	51.50	8.56	52.60	8.55	54.00	8.59		
	20	36.20	6.19	42.70	7.96	48.70	9.71	49.20	9.75	49.70	9.80	51.00	9.90	52.20	9.99		
	25	36.20	7.51	42.70	9.63	46.90	11.00	47.40	11.10	48.10	11.10	49.40	11.20	50.60	11.30		
	30	36.20	8.91	42.70	11.50	45.30	12.40	45.80	12.40	46.50	12.40	47.60	12.50	49.00	13.00		
	35	36.20	10.70	42.40	13.50	43.70	13.70	44.20	13.70	44.80	13.80	46.00	13.90	47.30	14.10		
	41	36.20	12.00	41.00	14.40	42.10	14.60	42.70	14.70	43.40	14.80	44.40	15.10	45.80	15.20		
	43	36.20	13.10	40.00	14.90	41.10	15.10	41.80	15.40	42.50	15.60	43.50	15.82	44.80	16.55		
120%	5	33.40	4.94	39.40	5.89	45.50	6.62	48.30	7.51	52.00	8.16	55.00	8.28	56.10	7.66		
	10	33.40	5.07	39.40	6.19	45.50	7.32	48.30	7.89	51.30	8.47	53.50	8.40	54.50	8.04		
	15	33.40	5.32	39.40	6.50	45.50	7.70	48.30	8.28	50.80	8.69	51.90	8.53	52.90	8.42		
	20	33.40	5.59	39.40	7.04	45.50	8.75	48.30	9.66	49.00	9.74	50.10	9.82	51.20	9.91		
	25	33.40	6.67	39.40	8.53	45.50	10.58	46.70	11.00	47.40	11.00	48.50	11.20	49.60	11.20		
	30	33.40	7.83	39.40	10.20	44.40	12.20	45.10	12.30	45.80	12.40	46.70	12.50	47.80	12.60		
	35	33.40	9.48	39.40	12.10	42.80	13.60	43.50	13.60	44.10	13.70	45.10	13.80	46.20	14.00		
	41	33.40	10.80	39.40	14.10	41.20	14.40	41.80	14.50	42.50	14.50	43.50	15.10	44.60	15.10		
	43	33.40	11.60	39.40	14.80	40.40	14.90	40.90	15.10	41.40	15.40	42.50	15.70	43.70	15.89		
110%	5	30.60	4.34	36.20	5.31	41.60	6.29	44.20	6.83	47.10	7.29	54.20	8.74	55.40	8.23		
	10	30.60	4.56	36.20	5.58	41.60	6.61	44.20	7.13	47.10	7.66	52.60	8.69	53.60	8.37		
	15	30.60	4.78	36.20	5.85	41.60	6.93	44.20	7.43	47.10	8.02	50.80	8.64	51.90	8.51		
	20	30.60	5.04	36.20	6.16	41.60	7.66	44.20	8.43	47.10	9.26	49.20	9.75	50.30	9.83		
	25	30.60	5.88	36.20	7.48	41.60	9.26	44.20	10.99	45.80	11.50	46.90	11.60	48.00	11.70		
	30	30.60	7.05	36.20	8.96	41.60	11.10	44.20	12.10	44.60	12.30	45.80	12.40	46.90	12.50		
	35	30.60	8.35	36.20	10.63	41.60	13.20	42.70	13.50	43.20	13.60	44.20	13.70	45.30	13.90		
	41	30.60	9.69	36.20	12.40	40.40	14.60	41.10	14.70	41.60	14.60	42.50	14.90	43.70	15.20		
	43	30.60	10.50	36.20	13.20	39.30	14.50	40.20	14.90	40.70	15.30	41.60	15.50	42.70	15.80		
100%	5	27.80	4.03	32.80	4.73	37.70	5.69	40.00	6.07	42.80	6.50	47.80	7.40	54.30	8.74		
	10	27.80	4.07	32.80	4.97	37.70	5.89	40.00	6.37	42.80	6.83	47.80	7.78	52.60	8.69		
	15	27.80	4.26	32.80	5.21	37.70	6.18	40.00	6.67	42.80	7.16	47.80	8.16	50.80	8.64		
	20	27.80	4.48	32.80	5.48	37.70	6.61	40.00	7.29	42.80	7.99	47.80	9.48	49.20	9.75		
	25	27.80	5.11	32.80	6.50	37.70	8.02	40.00	8.83	42.80	9.67	46.70	11.00	47.60	11.10		
	30	27.80	6.12	32.80	7.78	37.70	9.59	40.00	10.56	42.80	11.50	45.00	12.30	45.80	12.40		
	35	27.80	7.29	32.80	9.24	37.70	11.39	40.00	11.40	42.50	13.50	43.40	13.60	44.20	13.70		
	41	27.80	8.43	32.80	10.60	37.70	13.23	40.00	13.98	40.90	14.70	41.80	14.80	42.70	14.90		
	43	27.80	9.24	32.80	11.50	37.70	14.04	40.00	14.55	39.80	14.90	40.90	15.20	41.80	15.50		
	5	25.10	3.38	29.60	4.16	34.20	4.96	36.30	5.34	38.60	5.72	43.00	6.56	47.40	7.37		
	10	25.10	3.57	29.60	4.37	34.20	5.19	36.30	5.61	38.60	6.02	43.00	6.88	47.40	7.74		
	15	25.10	3.76	29.60	4.57	34.20	5.43	36.30	5.88	38.60	6.32	43.00	7.20	47.40	8.10		
	20	25.10	3.96	29.60	4.81	34.20	5.72	36.30	6.21	38.60	6.80	43.00	8.05	47.40	9.39		
	25	25.10	4.40	29.60	5.58	34.20	6.85	36.30	7.53	38.60	8.24	43.00	9.75	46.50	11.00		
	30	25.10	5.29	29.60	6.69	34.20	8.21	36.30	9.02	38.60	9.86	43.00	11.70	45.00	12.30		
	35	25.10	6.29	29.60	7.93	34.20	9.74	36.30	10.70	38.60	11.70	42.50	13.50	43.40	13.60		



YCV400																cooling capacity	
capacity factor (%)	outdoor temp	indoor temp.(°CWB)															
	(°CDB)	14(°C)		16(°C)		18(°C)		19(°C)		20(°C)		22(°C)		24(°C)			
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI		
		KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	
90%	41	25.10	7.24	29.60	9.18	34.20	11.30	36.30	11.70	38.60	13.60	40.90	14.70	41.40	14.80		
	43	25.10	8.07	29.60	9.75	34.20	12.10	36.30	13.00	38.60	13.90	39.80	14.20	40.50	15.20		
80%	5	22.20	2.97	26.20	3.62	30.30	4.27	32.40	4.62	34.20	4.97	38.20	5.69	42.30	6.39		
	10	22.20	3.11	26.20	3.80	30.30	4.50	32.40	4.86	34.20	5.23	38.20	5.97	42.30	6.72		
	15	22.20	3.26	26.20	3.97	30.30	4.72	32.40	5.10	34.20	5.48	38.20	6.26	42.30	7.05		
	20	22.20	3.43	26.20	4.18	30.30	4.96	32.40	5.35	34.20	5.77	38.20	6.72	42.30	8.15		
	25	22.20	3.73	26.20	4.70	30.30	5.77	32.40	6.32	34.20	6.91	38.20	8.15	42.30	10.20		
	30	22.20	4.50	26.20	5.65	30.30	6.91	32.40	7.59	34.20	8.28	38.20	9.75	42.30	11.30		
	35	22.20	5.35	26.20	6.72	30.30	8.21	32.40	9.01	34.20	9.83	38.20	11.60	42.30	13.40		
	41	22.20	6.31	26.20	7.74	30.30	9.48	32.40	10.44	34.20	11.50	38.20	13.50	40.40	14.60		
80%	43	22.20	7.35	26.20	8.45	30.30	10.09	32.40	11.40	34.20	12.60	38.20	13.90	38.40	15.00		
70%	5	19.50	2.53	23.00	3.07	26.40	3.64	28.10	3.92	29.90	4.24	33.50	4.84	37.00	3.88		
	10	19.50	2.65	23.00	3.22	26.40	3.83	28.10	4.13	29.90	4.45	33.50	5.08	37.00	5.73		
	15	19.50	2.78	23.00	3.38	26.40	4.02	28.10	4.34	29.90	4.65	33.50	5.32	37.00	6.00		
	20	19.50	2.92	23.00	3.56	26.40	4.23	28.10	4.56	29.90	4.91	33.50	5.61	37.00	6.39		
	25	19.50	3.10	23.00	3.89	26.40	4.75	28.10	5.21	29.90	5.69	33.50	6.69	37.00	7.74		
	30	19.50	3.75	23.00	4.69	26.40	5.72	28.10	6.26	29.90	6.81	33.50	8.01	37.00	9.26		
	35	19.50	4.48	23.00	5.58	26.40	6.78	28.10	7.43	29.90	8.08	33.50	9.50	37.00	11.00		
	41	19.50	5.11	23.00	6.32	26.40	7.83	28.10	8.43	29.90	9.36	33.50	11.00	37.00	12.80		
70%	43	19.50	5.43	23.00	6.66	26.40	8.70	28.10	9.41	29.90	10.12	33.50	12.00	37.00	14.00		
60%	5	16.60	2.10	19.70	2.56	22.70	3.02	24.20	3.29	25.80	3.51	28.70	4.00	31.70	4.51		
	10	16.60	2.21	19.70	2.68	22.70	3.18	24.20	3.43	25.80	3.69	28.70	4.21	31.70	4.75		
	15	16.60	2.32	19.70	2.81	22.70	3.34	24.20	3.61	25.80	3.86	28.70	4.42	31.70	4.99		
	20	16.60	2.43	19.70	2.95	22.70	3.49	24.20	3.78	25.80	4.07	28.70	4.65	31.70	5.24		
	25	16.60	2.56	19.70	3.15	22.70	3.83	24.20	4.18	25.80	4.56	28.70	5.34	31.70	6.16		
	30	16.60	3.05	19.70	3.81	22.70	4.62	24.20	5.04	25.80	5.48	28.70	6.40	31.70	7.39		
	35	16.60	3.65	19.70	4.54	22.70	5.48	24.20	5.99	25.80	6.51	28.70	7.59	31.70	8.77		
	41	16.60	4.16	19.70	5.16	22.70	6.29	24.20	6.88	25.80	7.50	28.70	8.78	31.70	10.17		
60%	43	16.60	4.54	19.70	5.27	22.70	6.86	24.20	7.69	25.80	8.21	28.70	9.44	31.70	11.12		
50%	5	13.90	1.70	16.50	2.10	18.90	2.43	20.20	2.57	21.40	2.80	23.90	3.22	26.40	3.62		
	10	13.90	1.78	16.50	2.16	18.90	2.56	20.20	2.75	21.40	2.95	23.90	3.38	26.40	3.81		
	15	13.90	1.86	16.50	2.22	18.90	2.68	20.20	2.89	21.40	3.11	23.90	3.54	26.40	4.00		
	20	13.90	1.95	16.50	2.38	18.90	2.81	20.20	3.03	21.40	3.26	23.90	3.73	26.40	4.21		
	25	13.90	2.06	16.50	2.49	18.90	2.97	20.20	3.24	21.40	3.53	23.90	4.11	26.40	4.73		
	30	13.90	2.41	16.50	2.99	18.90	3.59	20.20	3.92	21.40	4.26	23.90	4.97	26.40	5.69		
	35	13.90	2.91	16.50	3.57	18.90	4.30	20.20	4.67	21.40	5.07	23.90	5.89	26.40	6.75		
	41	13.90	3.30	16.50	3.80	18.90	4.91	20.20	5.35	21.40	5.81	23.90	6.77	26.40	7.78		
50%	43	13.90	3.69	16.50	4.18	18.90	5.38	20.20	5.83	21.40	6.29	23.90	7.39	26.40	8.50		

TC: total capacity, KW

PI: power input, KW (compressor+outdoor motor)



		YCV450														cooling capacity	
capacity factor (%)	outdoor temp	indoor temp.(°CWB)															
	(°CDB)	14(°C)		16(°C)		18(°C)		19(°C)		20(°C)		22(°C)		24(°C)			
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI		
		KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	
130%	5	40.70	6.06	48.10	7.42	55.40	8.76	59.10	9.92	61.50	9.67	63.30	8.78	64.60	7.89		
	10	40.70	6.39	48.10	7.78	55.40	9.20	59.10	9.91	59.70	9.72	61.10	9.27	62.80	8.82		
	15	40.70	6.71	48.10	8.15	55.40	9.63	57.10	9.89	57.90	9.78	59.10	9.76	61.00	9.81		
	20	40.70	7.08	48.10	9.09	54.80	11.08	55.40	11.14	56.00	11.19	57.30	11.30	59.00	11.41		
	25	40.70	8.58	48.10	10.99	52.80	12.60	53.40	12.60	54.20	12.70	55.60	12.80	57.20	13.00		
	30	40.70	10.18	48.10	13.17	51.00	14.20	51.60	14.20	52.40	14.20	53.60	14.30	55.40	14.80		
	35	40.70	12.20	47.70	15.40	49.20	15.60	49.80	15.70	50.40	15.80	51.80	15.90	53.40	16.10		
	41	40.70	13.80	46.10	16.50	47.40	16.70	48.00	16.80	48.80	16.90	50.00	17.20	51.80	17.40		
	43	40.70	14.90	45.00	17.00	46.20	17.30	47.00	17.60	47.80	17.80	49.00	18.06	50.60	18.32		
120%	5	37.60	5.64	44.30	6.73	51.20	7.57	54.40	8.58	58.50	9.32	61.90	9.45	63.40	8.74		
	10	37.60	5.79	44.30	7.08	51.20	8.36	54.40	9.02	57.70	9.67	60.10	9.60	61.60	9.18		
	15	37.60	6.08	44.30	7.42	51.20	8.80	54.40	9.45	57.10	9.92	58.30	9.74	59.80	9.62		
	20	37.60	6.39	44.30	8.04	51.20	10.00	54.40	11.03	55.20	11.12	56.30	11.21	57.80	11.32		
	25	37.60	7.62	44.30	9.74	51.20	12.08	52.60	12.60	53.40	12.60	54.60	12.70	56.00	12.80		
	30	37.60	8.94	44.30	11.65	50.00	14.00	50.80	14.10	51.60	14.10	52.60	14.30	54.00	14.40		
	35	37.60	10.83	44.30	13.82	48.20	15.50	49.00	15.60	49.60	15.70	50.80	15.80	52.20	16.00		
	41	37.60	12.40	44.30	16.10	46.40	16.50	47.00	16.50	47.80	16.50	49.00	17.20	50.40	17.20		
	43	37.60	13.30	44.30	16.90	45.40	17.00	46.00	17.30	46.60	17.60	47.80	17.90	49.40	18.15		
110%	5	34.40	4.95	40.70	6.06	46.80	7.18	49.80	7.80	53.00	8.33	60.90	9.98	62.60	9.40		
	10	34.40	5.21	40.70	6.37	46.80	7.55	49.80	8.15	53.00	8.74	59.10	9.92	60.60	9.56		
	15	34.40	5.46	40.70	6.68	46.80	7.91	49.80	8.49	53.00	9.16	57.10	9.87	58.60	9.72		
	20	34.40	5.75	40.70	7.04	46.80	8.74	49.80	9.63	53.00	10.58	55.40	11.14	56.80	11.23		
	25	34.40	6.71	40.70	8.54	46.80	10.58	49.80	12.55	51.60	13.10	52.80	13.20	54.20	13.40		
	30	34.40	8.06	40.70	10.23	46.80	12.70	49.80	13.90	50.20	14.00	51.60	14.20	53.00	14.30		
	35	34.40	9.54	40.70	12.14	46.80	15.00	48.00	15.50	48.60	15.50	49.80	15.70	51.20	15.80		
	41	34.40	11.07	40.70	14.13	45.40	16.70	46.20	16.80	46.80	16.70	47.80	17.10	49.40	17.40		
	43	34.40	12.00	40.70	15.10	44.20	16.60	45.20	17.00	45.80	17.50	46.80	17.70	48.20	18.10		
100%	5	31.30	4.61	36.90	5.41	42.40	6.49	45.00	6.93	48.20	7.42	53.80	8.45	61.40	9.98		
	10	31.30	4.64	36.90	5.68	42.40	6.73	45.00	7.27	48.20	7.80	53.80	8.89	59.40	9.92		
	15	31.30	4.86	36.90	5.95	42.40	7.06	45.00	7.62	48.20	8.18	53.80	9.32	57.40	9.87		
	20	31.30	5.12	36.90	6.26	42.40	7.55	45.00	8.33	48.20	9.13	53.80	10.83	55.60	11.14		
	25	31.30	5.84	36.90	7.42	42.40	9.16	45.00	10.09	48.20	11.05	52.60	12.50	53.80	12.60		
	30	31.30	6.98	36.90	8.89	42.40	10.96	45.00	12.06	48.20	13.10	50.60	14.00	51.80	14.20		
	35	31.30	8.33	36.90	10.56	42.40	13.01	45.00	13.40	47.80	15.40	48.80	15.60	50.00	15.70		
	41	31.30	9.63	36.90	12.16	42.40	15.11	45.00	16.00	46.00	16.80	47.00	16.90	48.20	17.10		
	43	31.30	10.56	36.90	13.08	42.40	16.04	45.00	16.60	44.80	17.00	46.00	17.40	47.20	17.70		
90%	5	28.30	3.86	33.30	4.75	38.40	5.66	40.80	6.10	43.40	6.53	48.40	7.49	53.60	8.42		
	10	28.30	4.08	33.30	4.99	38.40	5.93	40.80	6.40	43.40	6.88	48.40	7.86	53.60	8.84		
	15	28.30	4.30	33.30	5.22	38.40	6.20	40.80	6.71	43.40	7.22	48.40	8.22	53.60	9.25		
	20	28.30	4.52	33.30	5.50	38.40	6.53	40.80	7.09	43.40	7.76	48.40	9.20	53.60	10.72		
	25	28.30	5.03	33.30	6.37	38.40	7.82	40.80	8.60	43.40	9.42	48.40	11.14	52.60	12.50		
	30	28.30	6.04	33.30	7.64	38.40	9.38	40.80	10.30	43.40	11.27	48.40	13.40	50.80	14.00		
	35	28.30	7.18	33.30	9.05	38.40	11.12	40.80	12.20	43.40	13.40	47.80	15.40	49.00	15.50		
	41	28.30	8.27	33.30	10.49	38.40	12.90	40.80	13.30	43.40	15.50	46.00	16.70	46.80	16.90		
	43	28.30	9.22	33.30	11.14	38.40	13.80	40.80	14.90	43.40	15.80	44.80	16.30	45.80	17.40		
	5	25.00	3.39	29.50	4.14	34.00	4.88	36.40	5.28	38.40	5.68	43.00	6.49	47.80	7.29		
	10	25.00	3.56	29.50	4.34	34.00	5.13	36.40	5.55	38.40	5.97	43.00	6.82	47.80	7.67		
	15	25.00	3.72	29.50	4.54	34.00	5.39	36.40	5.82	38.40	6.26	43.00	7.15	47.80	8.06		
	20	25.00	3.92	29.50	4.77	34.00	5.66	36.40	6.11	38.40	6.59	43.00	7.67	47.80	9.31		



YCV450															
		cooling capacity													
capacity factor (%)	outdoor temp	indoor temp.(°CWB)													
	(°CDB)	14(°C)		16(°C)		18(°C)		19(°C)		20(°C)		22(°C)		24(°C)	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
		KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW
80%	25	25.00	4.26	29.50	5.37	34.00	6.59	36.40	7.22	38.40	7.89	43.00	9.31	47.80	11.65
	30	25.00	5.13	29.50	6.46	34.00	7.89	36.40	8.67	38.40	9.45	43.00	11.14	47.80	13.00
	35	25.00	6.11	29.50	7.67	34.00	9.38	36.40	10.29	38.40	11.23	43.00	13.20	47.80	15.30
	41	25.00	7.20	29.50	8.84	34.00	10.83	36.40	11.92	38.40	13.10	43.00	15.40	45.60	16.70
	43	25.00	8.40	29.50	9.65	34.00	11.52	36.40	13.00	38.40	14.40	43.00	15.90	43.40	17.10
70%	5	22.00	2.88	25.90	3.50	29.70	4.15	31.70	4.48	33.70	4.84	37.60	5.53	41.80	4.43
	10	22.00	3.03	25.90	3.68	29.70	4.37	31.70	4.72	33.70	5.08	37.60	5.81	41.80	6.55
	15	22.00	3.17	25.90	3.86	29.70	4.59	31.70	4.95	33.70	5.32	37.60	6.08	41.80	6.86
	20	22.00	3.34	25.90	4.06	29.70	4.83	31.70	5.21	33.70	5.61	37.60	6.40	41.80	7.29
	25	22.00	3.54	25.90	4.44	29.70	5.42	31.70	5.95	33.70	6.49	37.60	7.64	41.80	8.84
	30	22.00	4.28	25.90	5.35	29.70	6.53	31.70	7.15	33.70	7.78	37.60	9.14	41.80	10.58
	35	22.00	5.12	25.90	6.37	29.70	7.75	31.70	8.49	33.70	9.23	37.60	10.85	41.80	12.60
	41	22.00	5.84	25.90	7.22	29.70	8.94	31.70	9.63	33.70	10.69	37.60	12.60	41.80	14.60
	43	22.00	6.20	25.90	7.60	29.70	9.94	31.70	10.75	33.70	11.56	37.60	13.70	41.80	16.00
60%	5	18.70	2.39	22.10	2.92	25.50	3.45	27.30	3.76	29.10	4.01	32.30	4.57	35.80	5.15
	10	18.70	2.52	22.10	3.07	25.50	3.63	27.30	3.92	29.10	4.21	32.30	4.81	35.80	5.42
	15	18.70	2.65	22.10	3.21	25.50	3.81	27.30	4.12	29.10	4.41	32.30	5.04	35.80	5.70
	20	18.70	2.78	22.10	3.37	25.50	3.99	27.30	4.32	29.10	4.64	32.30	5.32	35.80	5.99
	25	18.70	2.92	22.10	3.59	25.50	4.37	27.30	4.77	29.10	5.21	32.30	6.10	35.80	7.04
	30	18.70	3.48	22.10	4.35	25.50	5.28	27.30	5.75	29.10	6.26	32.30	7.31	35.80	8.44
	35	18.70	4.17	22.10	5.19	25.50	6.26	27.30	6.84	29.10	7.44	32.30	8.67	35.80	10.01
	41	18.70	4.75	22.10	5.90	25.50	7.18	27.30	7.86	29.10	8.56	32.30	10.03	35.80	11.61
	43	18.70	5.19	22.10	6.02	25.50	7.84	27.30	8.78	29.10	9.38	32.30	10.78	35.80	12.70
50%	5	15.70	1.94	18.50	2.39	21.30	2.78	22.70	2.94	24.10	3.19	26.90	3.68	29.80	4.14
	10	15.70	2.03	18.50	2.47	21.30	2.92	22.70	3.14	24.10	3.37	26.90	3.86	29.80	4.35
	15	15.70	2.12	18.50	2.54	21.30	3.07	22.70	3.30	24.10	3.56	26.90	4.05	29.80	4.57
	20	15.70	2.23	18.50	2.72	21.30	3.21	22.70	3.47	24.10	3.72	26.90	4.26	29.80	4.81
	25	15.70	2.36	18.50	2.85	21.30	3.39	22.70	3.70	24.10	4.03	26.90	4.70	29.80	5.41
	30	15.70	2.76	18.50	3.41	21.30	4.10	22.70	4.48	24.10	4.86	26.90	5.68	29.80	6.49
	35	15.70	3.32	18.50	4.08	21.30	4.92	22.70	5.33	24.10	5.79	26.90	6.73	29.80	7.71
	41	15.70	3.77	18.50	4.34	21.30	5.61	22.70	6.11	24.10	6.64	26.90	7.73	29.80	8.89
	43	15.70	4.21	18.50	4.77	21.30	6.15	22.70	6.66	24.10	7.18	26.90	8.44	29.80	9.71

TC: total capacity, KW

PI: power input, KW (compressor+outdoor motor)



capacity factor (%)		YCV280 heating capacity													
		outdoor temp		indoor temp. °CDB											
				16		18		20		21		22		24	
				TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
°CDB	°CWB	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW		
130	-14.7	-15	20.10	4.96	20.10	5.25	20.10	5.54	20.00	5.69	20.00	5.84	20.00	6.13	
	-12.6	-13	21.10	5.26	21.10	5.54	21.10	5.82	21.10	5.95	21.10	6.09	21.10	6.36	
	-10.5	-11	22.20	5.53	22.20	5.80	22.20	6.05	22.20	6.18	22.20	6.32	22.20	6.56	
	-9.5	-10	22.80	5.66	22.80	5.91	22.80	6.16	22.80	6.29	22.80	6.42	22.80	6.68	
	-8.5	-9.1	23.30	5.77	23.30	6.02	23.30	6.26	23.30	6.38	23.30	6.49	23.30	6.75	
	-7	-7.6	24.20	5.93	24.20	6.17	24.20	6.41	24.20	6.56	24.20	6.62	24.20	6.88	
	-5	-5.6	25.20	6.13	25.20	6.36	25.20	6.56	25.20	6.68	25.20	6.81	25.20	7.01	
	-3	-3.7	26.20	6.31	26.20	6.49	26.20	6.75	26.20	6.88	26.20	6.94	26.20	7.20	
	0	-0.7	27.90	6.56	27.90	6.75	27.90	6.94	27.90	7.07	27.90	7.13	27.90	7.33	
	3	2.2	29.30	6.75	29.30	6.94	29.30	7.13	29.30	7.20	29.30	7.33	29.30	7.52	
	5	4.1	30.50	6.88	30.50	7.07	30.50	7.26	30.50	7.33	30.50	7.46	30.50	7.58	
	7	6	31.50	7.01	31.50	7.20	31.50	7.33	31.50	7.46	31.50	7.52	31.50	7.71	
	9	7.9	32.60	7.07	32.50	7.26	32.50	7.46	32.50	7.52	32.50	7.58	32.50	7.78	
	11	9.8	33.60	7.20	33.60	7.33	33.60	7.52	33.60	7.58	33.60	7.71	33.60	7.84	
	13	11.8	34.70	7.26	34.70	7.46	34.70	7.58	34.70	7.71	34.70	7.78	34.70	7.91	
15	13.7	35.70	7.39	35.70	7.52	35.70	7.65	35.70	7.78	35.70	7.84	35.70	7.84		
19	14.2	35.70	7.46	35.70	7.60	35.70	7.72	35.70	7.84	35.70	7.91	35.70	7.69		
21	15	35.70	7.51	35.70	7.67	35.70	7.79	35.70	7.89	35.70	7.79	35.70	7.61		
120	-14.7	-15	20.10	5.35	20.00	5.62	20.00	5.89	20.00	6.03	20.00	6.16	20.00	6.43	
	-12.6	-13	21.10	5.64	21.10	5.89	21.10	6.14	21.10	6.27	21.10	6.40	21.10	6.68	
	-10.5	-11	22.20	5.89	22.20	6.13	22.20	6.36	22.20	6.49	22.20	6.62	22.20	6.88	
	-9.5	-10	22.80	6.00	22.80	6.23	22.80	6.49	22.80	6.56	22.80	6.68	22.80	6.94	
	-8.5	-9.1	23.30	6.10	23.30	6.32	23.30	6.56	23.30	6.68	23.30	6.81	23.30	7.01	
	-7	-7.6	24.20	6.25	24.20	6.49	24.20	6.68	24.20	6.81	24.20	6.88	24.20	7.13	
	-5	-5.6	25.20	6.43	25.20	6.62	25.20	6.88	25.20	6.94	25.20	7.07	25.20	7.26	
	-3	-3.7	26.20	6.62	26.20	6.81	26.20	7.01	26.20	7.07	26.20	7.20	26.20	7.39	
	0	-0.7	27.90	6.81	27.90	7.01	27.90	7.20	27.90	7.26	27.90	7.39	27.90	7.58	
	3	2.2	29.30	7.01	29.30	7.20	29.30	7.39	29.30	7.46	29.30	7.52	29.30	7.71	
	5	4.1	30.50	7.13	30.50	7.26	30.50	7.46	30.50	7.52	30.50	7.65	30.50	7.78	
	7	6	31.50	7.20	31.50	7.39	31.50	7.58	31.50	7.65	31.50	7.71	31.50	7.91	
	9	7.9	32.50	7.33	32.50	7.46	32.50	7.65	32.50	7.71	32.50	7.78	32.50	7.97	
	11	9.8	33.60	7.39	33.60	7.58	33.60	7.71	33.60	7.78	33.60	7.84	32.90	7.71	
	13	11.8	34.70	7.52	34.70	7.65	34.70	7.78	34.70	7.84	34.70	7.97	32.90	7.46	
15	13.7	35.70	7.58	35.70	7.71	35.70	7.84	35.70	7.91	35.70	7.78	32.90	7.13		
19	14.2	35.70	7.65	35.70	7.78	35.70	7.85	35.70	7.83	35.70	7.65	32.90	6.96		
21	15	35.70	7.73	35.70	7.84	35.70	7.90	35.70	7.77	35.70	7.41	32.90	6.84		
120	-14.7	-15	20.00	5.75	20.00	6.00	20.00	6.23	20.00	6.36	20.00	6.49	20.00	6.75	
	-12.6	-13	21.10	6.01	21.10	6.24	21.10	6.49	21.10	6.62	21.10	6.68	21.10	6.94	
	-10.5	-11	22.20	6.23	22.20	6.43	22.20	6.68	22.20	6.81	22.20	6.88	22.20	7.13	
	-9.5	-10	22.80	6.34	22.80	6.56	22.80	6.75	22.80	6.88	22.80	7.01	22.80	7.20	
	-8.5	-9.1	23.30	6.43	23.30	6.62	23.30	6.88	23.30	6.94	23.30	7.07	23.30	7.26	
	-7	-7.6	24.20	6.56	24.20	6.75	24.20	6.94	24.20	7.07	24.20	7.20	24.20	7.39	
	-5	-5.6	25.20	6.75	25.20	6.94	25.20	7.13	25.20	7.20	25.20	7.33	25.20	7.52	
	-3	-3.7	26.20	6.88	26.20	7.07	26.20	7.26	26.20	7.33	26.20	7.46	26.20	7.58	
	0	-0.7	27.90	7.07	27.80	7.26	27.80	7.46	27.80	7.52	27.80	7.58	27.80	7.78	
	3	2.2	29.30	7.26	29.30	7.46	29.30	7.58	29.30	7.65	29.30	7.78	29.30	7.91	
	5	4.1	30.50	7.39	30.50	7.52	30.50	7.65	30.50	7.78	30.50	7.84	30.20	7.91	
	7	6	31.50	7.46	31.50	7.58	31.50	7.78	31.50	7.84	31.50	7.91	30.20	7.58	
	9	7.9	32.50	7.58	32.50	7.71	32.50	7.84	32.50	7.91	32.30	7.91	30.20	7.26	



capacity factor (%)		YCV280 heating capacity													
		outdoor temp		indoor temp. °CDB											
				16		18		20		21		22		24	
				TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
°CDB	°CWB	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW		
110	11	9.8	33.60	7.65	33.60	7.78	33.60	7.91	33.50	7.91	32.30	7.58	30.20	7.01	
	13	11.8	34.70	7.71	34.70	7.84	34.70	7.84	33.50	7.58	32.30	7.26	30.20	6.75	
	15	13.7	35.70	7.78	35.70	7.91	34.70	7.58	33.50	7.33	32.30	7.01	30.20	6.49	
	19	14.2	35.70	7.27	35.70	7.83	34.70	7.34	33.50	7.03	32.30	6.77	30.20	6.28	
	21	15	35.70	7.33	35.70	7.61	34.70	6.95	33.50	6.82	32.30	6.58	30.20	6.19	
	100	-14.7	-15	20.00	6.14	20.00	6.37	20.00	6.62	20.00	6.68	20.00	6.81	20.00	7.07
-12.6		-13	21.10	6.38	21.10	6.62	21.10	6.81	21.10	6.88	21.10	7.01	21.10	7.20	
-10.5		-11	22.20	6.62	22.20	6.81	22.20	7.01	22.20	7.07	22.20	7.20	22.20	7.39	
-9.5		-10	22.80	6.68	22.80	6.88	22.80	7.07	22.80	7.20	22.80	7.26	22.80	7.46	
-8.5		-9.1	23.30	6.75	23.30	6.94	23.30	7.13	23.30	7.26	23.30	7.33	23.30	7.52	
-7		-7.6	24.20	6.88	24.20	7.07	24.20	7.26	24.20	7.33	24.20	7.46	24.20	7.65	
-5		-5.6	25.20	7.07	25.20	7.20	25.20	7.39	25.20	7.46	25.20	7.58	25.20	7.71	
-3		-3.7	26.20	7.20	26.20	7.33	26.20	7.52	26.20	7.58	26.20	7.65	26.20	7.84	
0		-0.7	27.80	7.39	27.80	7.52	27.80	7.65	27.80	7.78	27.80	7.84	27.50	7.97	
3		2.2	29.30	7.52	29.30	7.65	29.30	7.84	29.30	7.91	29.30	7.97	27.50	7.46	
5		4.1	30.50	7.58	30.50	7.78	30.50	7.91	30.50	7.97	29.50	7.71	27.50	7.13	
7		6	31.50	7.71	31.50	7.84	31.50	7.97	30.50	7.65	29.50	7.39	27.50	6.81	
9		7.9	32.50	7.78	32.50	7.91	31.50	7.65	30.50	7.39	29.50	7.07	27.50	6.56	
11		9.8	33.60	7.84	33.50	7.91	31.50	7.33	30.50	7.07	29.50	6.81	27.50	6.31	
13		11.8	34.70	7.91	33.50	7.58	31.50	7.07	30.50	6.81	29.50	6.56	27.50	6.07	
15		13.7	35.50	7.78	33.50	7.33	31.50	6.81	30.50	6.56	29.50	6.32	27.50	5.86	
19		14.2	35.50	7.57	33.50	7.08	31.50	6.64	30.50	6.28	29.50	6.08	27.50	5.70	
21		15	35.50	7.33	33.50	6.77	31.50	6.39	30.50	6.19	29.50	5.90	27.50	5.57	
90		-14.7	-15	20.00	6.56	20.00	6.75	20.00	6.94	20.00	7.07	20.00	7.13	20.00	7.33
		-12.6	-13	21.10	6.75	21.10	6.94	21.10	7.13	21.10	7.20	21.10	7.33	21.10	7.52
		-10.5	-11	22.20	6.94	22.20	7.13	22.20	7.33	22.20	7.39	22.20	7.46	22.20	7.65
	-9.5	-10	22.80	7.01	22.80	7.20	22.80	7.39	22.80	7.46	22.80	7.52	22.80	7.71	
	-8.5	-9.1	23.30	7.07	23.30	7.26	23.30	7.46	23.30	7.52	23.30	7.58	23.30	7.78	
	-7	-7.6	24.20	7.20	24.20	7.39	24.20	7.52	24.20	7.65	24.20	7.71	24.10	7.84	
	-5	-5.6	25.20	7.33	25.20	7.52	25.20	7.65	25.20	7.71	25.20	7.84	24.60	7.97	
	-3	-3.7	26.20	7.46	26.20	7.65	26.20	7.78	26.20	7.84	26.20	7.91	24.60	7.65	
	0	-0.7	27.80	7.65	27.80	7.78	27.80	7.91	27.30	7.97	26.50	7.65	24.60	7.07	
	3	2.2	29.30	7.78	29.30	7.91	28.30	7.71	27.30	7.46	26.50	7.13	24.60	6.62	
	5	4.1	30.50	7.84	30.30	7.91	28.30	7.39	27.30	7.13	26.50	6.81	24.60	6.32	
	7	6	31.50	7.91	30.30	7.58	28.30	7.07	27.30	6.81	26.50	6.56	24.60	6.07	
	9	7.9	32.00	7.78	30.30	7.26	28.30	6.81	27.30	6.56	26.50	6.31	24.60	5.84	
	11	9.8	32.00	7.46	30.30	7.01	28.30	6.56	27.30	6.30	26.50	6.07	24.60	5.63	
	13	11.8	32.00	7.20	30.30	6.75	28.30	6.28	27.30	6.06	26.50	5.85	24.60	5.42	
	15	13.7	32.00	6.94	30.30	6.49	28.30	6.06	27.30	5.86	26.50	5.65	24.60	5.24	
	19	14.2	32.00	6.77	30.30	6.31	28.30	5.87	27.30	5.68	26.50	5.45	24.60	5.05	
	21	15	32.00	6.52	30.30	6.07	28.30	5.76	27.30	5.49	26.50	5.25	24.60	4.84	
	90	-14.7	-15	20.00	6.94	20.00	7.13	20.00	7.33	20.00	7.39	20.00	7.46	20.00	7.65
		-12.6	-13	21.10	7.13	21.10	7.26	21.10	7.46	21.10	7.52	21.10	7.65	21.10	7.78
		-10.5	-11	22.20	7.26	22.20	7.46	22.20	7.58	22.20	7.71	22.20	7.78	22.00	7.91
-9.5		-10	22.80	7.39	22.80	7.52	22.80	7.65	22.80	7.78	22.80	7.84	22.00	7.97	
-8.5		-9.1	23.30	7.46	23.30	7.58	23.30	7.71	23.30	7.84	23.30	7.91	22.00	7.84	
-7		-7.6	24.20	7.52	24.20	7.65	24.10	7.84	24.10	7.91	23.60	7.97	22.00	7.46	
-5		-5.6	25.20	7.65	25.20	7.78	25.20	7.91	24.30	7.97	23.60	7.65	22.00	7.07	
-3		-3.7	26.20	7.78	26.20	7.91	25.20	7.84	24.30	7.52	23.60	7.26	22.00	6.68	



capacity factor (%)		YCV280												heating capacity					
		outdoor temp		indoor temp. °CDB										TC		PI			
				16		18		20		21		22						24	
				°CDB	°CWB	KW	KW	KW	KW	KW	KW	KW	KW					KW	KW
80	0	-0.7	27.80	7.91	26.80	7.78	25.20	7.26	24.30	7.01	23.60	6.68	22.00	6.21					
	3	2.2	28.30	7.71	26.80	7.26	25.20	6.75	24.30	6.49	23.60	6.27	22.00	5.81					
	5	4.1	28.30	7.39	26.80	6.94	25.20	6.49	24.30	6.23	23.60	6.01	22.00	5.57					
	7	6	28.30	7.07	26.80	6.62	25.20	6.20	24.30	5.99	23.60	5.78	22.00	5.36					
	9	7.9	28.30	6.81	26.80	6.38	25.20	5.96	24.30	5.76	23.60	5.56	22.00	5.16					
	11	9.8	28.30	6.56	26.80	6.14	25.20	5.75	24.30	5.55	23.60	5.36	22.00	4.97					
	13	11.8	28.30	6.31	26.80	5.91	25.20	5.53	24.30	5.35	23.60	5.16	22.00	4.80					
	15	13.7	28.30	6.09	26.80	5.66	25.20	5.35	24.30	5.17	23.60	4.99	22.00	4.65					
	19	14.2	28.30	5.88	26.80	5.56	25.20	5.13	24.30	4.98	23.60	4.78	22.00	4.53					
	21	15	28.30	5.71	26.80	5.32	25.20	5.00	24.30	4.82	23.60	4.62	22.00	4.29					
	70	-14.7	-15	20.00	7.33	20.00	7.52	20.00	7.65	20.00	7.71	20.00	7.78	19.20	7.97				
-12.6		-13	21.10	7.52	21.10	7.65	21.10	7.78	21.10	7.84	20.60	7.97	19.20	7.65					
-10.5		-11	22.20	7.65	22.20	7.78	22.10	7.91	21.30	7.97	20.60	7.71	19.20	7.13					
-9.5		-10	22.80	7.71	22.80	7.84	22.10	7.97	21.30	7.78	20.60	7.46	19.20	6.88					
-8.5		-9.1	23.30	7.78	23.30	7.91	22.10	7.84	21.30	7.58	20.60	7.26	19.20	6.75					
-7		-7.6	24.10	7.84	23.50	7.97	22.10	7.52	21.30	7.20	20.60	6.94	19.20	6.43					
-5		-5.6	24.90	7.97	23.50	7.58	22.10	7.07	21.30	6.81	20.60	6.56	19.20	6.09					
-3		-3.7	24.90	7.71	23.50	7.20	22.10	6.75	21.30	6.49	20.60	6.25	19.20	5.79					
0		-0.7	24.90	7.13	23.50	6.68	22.10	6.24	21.30	6.02	20.60	5.80	19.20	5.39					
3		2.2	24.90	6.68	23.50	6.24	22.10	5.83	21.30	5.63	20.60	5.44	19.20	5.05					
5		4.1	24.90	6.38	23.50	5.98	22.10	5.60	21.30	5.41	20.60	5.22	19.20	4.85					
7		6	24.90	6.12	23.50	5.75	22.10	5.38	21.30	5.20	20.60	5.02	19.20	4.67					
9		7.9	24.90	5.89	23.50	5.53	22.10	5.18	21.30	5.01	20.60	4.84	19.20	4.51					
11		9.8	24.90	5.67	23.50	5.33	22.10	5.00	21.30	4.83	20.60	4.63	19.20	4.35					
13		11.8	24.90	5.46	23.50	5.14	22.10	4.82	21.30	4.67	20.60	4.51	19.20	4.20					
15	13.7	24.90	5.28	23.50	4.97	22.10	4.67	21.30	4.51	20.60	4.36	19.20	4.07						
19	14.2	24.90	5.01	23.50	4.83	22.10	4.54	21.30	4.30	20.60	4.12	19.20	3.91						
21	15	24.90	4.83	23.50	4.59	22.10	4.33	21.30	4.10	20.60	3.91	19.20	3.69						
60	-14.7	-15	20.00	7.71	20.00	7.84	18.90	7.97	18.30	7.71	17.70	7.46	16.50	6.88					
	-12.6	-13	21.10	7.84	20.10	7.97	18.90	7.46	18.30	7.20	17.70	6.94	16.50	6.41					
	-10.5	-11	21.30	7.97	20.10	7.52	18.90	7.01	18.30	6.75	17.70	6.49	16.50	6.02					
	-9.5	-10	21.30	7.78	20.10	7.26	18.90	6.81	18.30	6.56	17.70	6.31	16.50	5.84					
	-8.5	-9.1	21.30	7.58	20.10	7.07	18.90	6.62	18.30	6.37	17.70	6.14	16.50	5.69					
	-7	-7.6	21.30	7.20	20.10	6.75	18.90	6.32	18.30	6.09	17.70	5.88	16.50	5.45					
	-5	-5.6	21.30	6.81	20.10	6.40	18.90	5.98	18.30	5.77	17.70	5.57	16.50	5.17					
	-3	-3.7	21.30	6.49	20.10	6.08	18.90	5.69	18.30	5.50	17.70	5.30	16.50	4.93					
	0	-0.7	21.30	6.02	20.10	5.65	18.90	5.29	18.30	5.12	17.70	4.94	16.50	4.60					
	3	2.2	21.30	5.63	20.10	5.29	18.90	4.96	18.30	4.80	17.70	4.64	16.50	4.33					
	5	4.1	21.30	5.41	20.10	5.08	18.90	4.77	18.30	4.61	17.70	4.46	16.50	4.16					
	7	6	21.30	5.19	20.10	4.89	18.90	4.60	18.30	4.45	17.70	4.30	16.50	4.01					
	9	7.9	21.30	5.01	20.10	4.72	18.90	4.43	18.30	4.29	17.70	4.15	16.50	3.88					
	11	9.8	21.30	4.83	20.10	4.55	18.90	4.28	18.30	4.15	17.70	4.01	16.50	3.75					
	13	11.8	21.30	4.66	20.10	4.40	18.90	4.13	18.30	4.00	17.70	3.88	16.50	3.63					
15	13.7	21.30	4.51	20.10	4.25	18.90	4.00	18.30	3.88	17.70	3.76	16.50	3.52						
19	14.2	21.30	4.38	20.10	4.05	18.90	3.88	18.30	3.76	17.70	3.62	16.50	3.37						
21	15	21.30	4.20	20.10	3.93	18.90	3.72	18.30	3.64	17.70	3.50	16.50	3.24						
	-14.7	-15	17.80	7.46	16.80	7.01	15.80	6.56	15.20	6.31	14.70	6.08	13.70	5.64					
	-12.6	-13	17.80	7.01	16.80	6.56	15.80	6.11	15.20	5.90	14.70	5.69	13.70	5.28					
	-10.5	-11	17.80	6.56	16.80	6.13	15.80	5.73	15.20	5.54	14.70	5.35	13.70	4.97					



capacity factor (%)		YCV280 heating capacity												
		outdoor temp		indoor temp. °CDB										
				16		18		20		21		22		24
°CDB	°CWB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	
50	-9.5	-10	17.80	6.34	16.80	5.95	15.80	5.57	15.20	5.38	14.70	5.19	13.70	4.83
	-8.5	-9.1	17.80	6.17	16.80	5.79	15.80	5.42	15.20	5.24	14.70	5.06	13.70	4.70
	-7	-7.6	17.80	5.91	16.80	5.55	15.80	5.20	15.20	5.03	14.70	4.86	13.70	4.52
	-5	-5.6	17.80	5.60	16.80	5.26	15.80	4.94	15.20	4.78	14.70	4.61	13.70	4.30
	-3	-3.7	17.80	5.33	16.80	5.02	15.80	4.71	15.20	4.56	14.70	4.41	13.70	4.11
	0	-0.7	17.80	4.97	16.80	4.68	15.80	4.40	15.20	4.26	14.70	4.12	13.70	3.85
	3	2.2	17.80	4.66	16.80	4.40	15.80	4.14	15.20	4.01	14.70	3.88	13.70	3.63
	5	4.1	17.80	4.49	16.80	4.24	15.80	3.99	15.20	3.86	14.70	3.67	13.70	3.50
	7	6	17.80	4.32	16.80	4.08	15.80	3.84	15.20	3.73	14.70	3.61	13.70	3.39
	9	7.9	17.80	4.17	16.80	3.94	15.80	3.72	15.20	3.61	14.70	3.50	13.70	3.28
	11	9.8	17.80	4.03	16.80	3.81	15.80	3.60	15.20	3.49	14.70	3.39	13.70	3.18
	13	11.8	17.80	3.90	16.80	3.69	15.80	3.48	15.20	3.38	14.70	3.28	13.70	3.08
	15	13.7	17.80	3.78	16.80	3.58	15.80	3.38	15.20	3.28	14.70	3.18	13.70	3.00
	19	14.2	17.80	3.66	16.80	3.44	15.80	3.26	15.20	3.14	14.70	3.07	13.70	2.86
21	15	17.80	3.42	16.80	3.34	15.80	3.18	15.20	3.01	14.70	2.95	13.70	2.75	

TC: total capacity, KW

PI: power input, KW (compressor+outdoor motor)



		YCV335												heating capacity	
capacity factor (%)	outdoor temp		indoor temp. °CDB												
			16		18		20		21		22		24		
	°CDB	°CWB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	
130	-14.7	-15	23.60	6.00	23.60	6.31	23.60	6.64	23.60	6.79	23.60	6.95	23.60	7.28	
	-12.6	-13	24.80	6.27	24.80	6.60	24.80	6.89	24.80	7.03	24.80	7.19	24.80	7.50	
	-10.5	-11	26.00	6.56	26.00	6.83	26.00	7.12	26.00	7.26	26.00	7.39	26.00	7.67	
	-9.5	-10	27.10	6.68	27.10	6.93	27.10	7.21	27.10	7.38	27.10	7.50	27.10	7.77	
	-8.5	-9.1	28.20	6.76	28.20	7.03	28.20	7.30	28.20	7.46	28.20	7.58	28.20	7.85	
	-7	-7.6	29.50	6.93	29.50	7.19	29.50	7.46	29.50	7.58	29.50	7.71	29.50	7.97	
	-5	-5.6	30.80	7.12	30.80	7.38	30.80	7.62	30.80	7.75	30.80	7.87	30.80	8.12	
	-3	-3.7	32.00	7.30	32.00	7.54	32.00	7.77	32.00	7.90	32.00	8.01	32.00	8.28	
	0	-0.7	33.50	7.54	33.50	7.77	33.50	7.99	33.50	8.10	33.50	8.20	33.50	8.44	
	3	2.2	34.80	7.75	34.80	7.95	34.80	8.16	34.80	8.28	34.80	8.36	34.80	8.61	
	5	4.1	36.20	7.87	36.20	8.08	36.20	8.28	36.20	8.36	36.20	8.53	36.20	8.69	
	7	6	37.50	7.99	37.50	8.19	37.50	8.36	37.50	8.44	37.50	8.61	37.50	8.77	
	9	7.9	38.90	8.08	38.90	8.28	38.90	8.44	38.90	8.61	38.90	8.69	38.90	8.85	
	11	9.8	40.50	8.20	40.50	8.36	40.50	8.61	40.50	8.69	40.50	8.77	40.50	8.94	
	13	11.8	41.10	8.28	41.10	8.44	41.10	8.69	41.10	8.77	41.10	8.85	41.10	9.02	
	120	-14.7	-15	23.60	6.44	23.60	6.72	23.60	7.02	23.60	7.16	23.60	7.30	23.60	7.61
-12.6		-13	24.80	6.69	24.80	6.97	24.80	7.26	24.80	7.38	24.80	7.50	24.80	7.79	
-10.5		-11	26.00	6.93	26.00	7.17	26.00	7.46	26.00	7.58	26.00	7.71	26.00	7.99	
-9.5		-10	27.10	7.05	27.10	7.30	27.10	7.54	27.10	7.67	27.10	7.79	27.10	8.08	
-8.5		-9.1	28.20	7.13	28.20	7.38	28.20	7.62	28.20	7.75	28.20	7.87	28.20	8.12	
-7		-7.6	29.50	7.28	29.50	7.52	29.50	7.75	29.50	7.87	29.50	7.99	29.50	8.28	
-5		-5.6	30.80	7.46	30.80	7.69	30.80	7.91	30.80	8.03	30.80	8.16	30.80	8.36	
-3		-3.7	32.00	7.62	32.00	7.83	32.00	8.08	32.00	8.20	32.00	8.28	32.00	8.53	
0		-0.7	33.50	7.85	33.50	8.05	33.50	8.28	33.50	8.36	33.50	8.44	33.50	8.20	
3		2.2	34.80	8.03	34.80	8.20	34.80	8.44	34.80	8.53	34.80	8.61	34.80	8.85	
5		4.1	36.20	8.16	36.20	8.36	36.20	8.53	36.20	8.61	36.20	8.69	36.20	8.94	
7		6	37.50	8.28	37.50	8.44	37.50	8.61	37.50	8.69	37.50	8.77	37.50	9.02	
9		7.9	38.90	8.36	38.90	8.53	38.90	8.69	38.90	8.77	38.90	8.85	39.20	9.10	
11		9.8	40.50	8.44	40.50	8.61	40.50	8.77	40.50	8.85	40.50	8.94	39.20	8.94	
13		11.8	41.10	8.53	41.10	8.69	41.10	8.85	41.10	8.94	41.10	9.02	39.20	8.61	
120		-14.7	-15	23.60	6.85	23.60	7.13	23.60	7.38	23.60	7.53	23.60	7.67	23.60	7.91
	-12.6	-13	24.80	7.09	24.80	7.36	24.80	7.58	24.80	7.75	24.80	7.87	24.80	8.12	
	-10.5	-11	26.00	7.31	26.00	7.54	26.00	7.79	26.00	7.91	26.00	8.03	26.00	8.28	
	-9.5	-10	27.10	7.42	27.10	7.67	27.10	7.87	27.10	7.99	27.10	8.12	27.10	8.36	
	-8.5	-9.1	28.20	7.50	28.20	7.75	28.20	7.95	28.20	8.08	28.20	8.20	28.20	8.44	
	-7	-7.6	29.50	7.62	29.50	7.85	29.50	8.08	29.50	8.18	29.50	8.28	29.50	8.53	
	-5	-5.6	30.80	7.79	30.80	8.01	30.80	8.20	30.80	8.36	30.80	8.44	30.80	8.61	
	-3	-3.7	32.00	7.95	32.00	8.16	32.00	8.36	32.00	8.44	32.00	8.61	32.00	8.77	
	0	-0.7	33.50	8.16	33.50	8.36	33.50	8.53	33.50	8.61	33.50	8.69	33.50	8.94	
	3	2.2	34.80	8.36	34.80	8.53	34.80	8.69	34.80	8.77	34.80	8.85	34.80	9.02	



YCV335														heating capacity	
capacity factor (%)	outdoor temp		indoor temp. °CDB												
			16		18		20		21		22		24		
	°CDB	°CWB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	
110	5	4.1	36.20	8.44	36.20	8.61	36.20	8.77	36.20	8.85	36.20	8.94	36.00	9.02	
	7	6	37.50	8.53	37.50	8.69	37.50	8.85	37.50	8.94	37.50	9.02	36.00	8.61	
	9	7.9	38.90	8.61	38.90	8.77	38.90	8.94	38.90	9.02	38.60	8.85	36.00	8.36	
	11	9.8	40.50	8.69	40.50	8.85	40.50	9.02	39.90	9.10	38.60	8.77	36.00	8.08	
	13	11.8	41.10	8.77	41.10	8.94	41.10	9.10	39.90	8.77	38.60	8.44	36.00	7.79	
	15	13.7	42.30	8.85	42.30	9.02	41.30	8.77	39.90	8.44	38.60	8.16	36.00	7.50	
	19	14.2	42.30	9.02	42.30	8.85	41.30	8.44	39.90	8.08	38.60	7.75	36.00	7.36	
	21	15	42.30	8.85	42.30	8.61	41.30	8.20	39.90	7.79	38.60	7.57	36.00	7.21	
	100	-14.7	-15	23.60	7.28	23.60	7.53	23.60	7.76	23.60	7.91	23.60	7.99	23.60	8.20
		-12.6	-13	24.80	7.50	24.80	7.75	24.80	7.95	24.80	8.08	24.80	8.20	24.80	8.44
-10.5		-11	26.00	7.69	26.00	7.91	26.00	8.12	26.00	8.28	26.00	8.36	26.00	8.53	
-9.5		-10	27.10	7.79	27.10	7.99	27.10	8.20	27.10	8.28	27.10	8.44	27.10	8.61	
-8.5		-9.1	28.20	7.86	28.20	8.08	28.20	8.28	28.20	8.36	28.20	8.53	28.20	8.69	
-7		-7.6	29.50	7.99	29.50	8.20	29.50	8.36	29.50	8.53	29.50	8.61	29.50	8.77	
-5		-5.6	30.80	8.12	30.80	8.36	30.80	8.53	30.80	8.61	30.80	8.69	30.80	8.94	
-3		-3.7	32.00	8.28	32.00	8.44	32.00	8.61	32.00	8.69	32.00	8.85	32.00	9.02	
0		-0.7	33.50	8.44	33.50	8.61	33.50	8.77	33.50	8.85	33.50	8.94	32.60	8.94	
3		2.2	34.80	8.61	34.80	8.77	34.80	8.94	34.80	9.02	34.80	9.10	32.60	8.44	
5		4.1	36.20	8.69	36.20	8.85	36.20	9.02	36.20	9.10	35.10	8.77	32.60	8.08	
7		6	37.50	8.77	37.50	8.94	37.50	10.00	36.20	8.77	35.10	8.44	32.60	7.79	
9		7.9	38.90	8.85	38.70	9.02	37.50	8.77	36.20	8.44	35.10	8.12	32.60	7.50	
11		9.8	40.50	8.94	39.80	9.10	37.50	8.44	36.20	8.16	35.10	7.83	32.60	8.08	
13		11.8	41.10	9.02	39.80	8.69	37.50	8.16	36.20	7.84	35.10	7.58	32.60	7.01	
15		13.7	42.30	9.02	39.80	8.44	37.50	7.87	36.20	7.58	35.10	7.34	32.60	6.76	
19		14.2	42.30	8.69	39.80	8.20	37.50	7.67	36.20	7.26	35.10	6.93	32.60	6.39	
21		15	42.30	8.51	39.80	7.91	37.50	7.38	36.20	6.97	35.10	6.56	32.60	6.13	
90		-14.7	-15	23.60	7.71	23.60	7.92	23.60	8.16	23.60	8.28	23.60	8.36	23.60	8.53
	-12.6	-13	24.80	7.91	24.80	8.12	24.80	8.28	24.80	8.44	24.80	8.44	24.80	8.69	
	-10.5	-11	26.00	8.08	26.00	8.28	26.00	8.44	26.00	8.61	26.00	8.61	26.00	8.77	
	-9.5	-10	27.10	8.17	27.10	8.36	27.10	8.61	27.10	8.69	27.10	8.69	27.10	8.94	
	-8.5	-9.1	28.20	8.20	28.20	8.44	28.20	8.69	28.20	8.77	28.20	8.77	28.20	9.02	
	-7	-7.6	29.50	8.36	29.50	8.53	29.50	8.77	29.50	8.85	29.50	8.94	29.50	9.10	
	-5	-5.6	30.80	8.44	30.80	8.61	30.80	8.85	30.80	8.94	30.80	9.02	29.40	8.85	
	-3	-3.7	32.00	8.61	32.00	8.77	32.00	8.94	32.00	9.02	32.00	9.10	29.40	8.61	
	0	-0.7	33.50	8.77	33.50	8.94	33.50	9.10	32.60	8.85	31.50	8.69	29.40	7.79	
	3	2.2	34.80	8.94	35.80	9.02	33.70	8.69	32.60	8.44	31.50	8.08	29.40	7.47	
	5	4.1	36.20	9.02	35.80	9.02	33.70	8.36	32.60	8.08	31.50	7.79	29.40	7.20	
	7	6	37.50	9.10	35.80	8.69	33.70	8.08	32.60	7.79	31.50	7.50	29.40	6.93	
	9	7.9	38.00	8.94	35.80	8.36	33.70	7.79	32.60	7.50	31.50	7.22	29.40	6.68	
	11	9.8	38.00	8.61	35.80	8.03	33.70	7.50	32.60	7.26	31.50	6.98	29.40	6.48	
	13	11.8	38.00	8.28	35.80	7.76	33.70	7.26	32.60	7.01	31.50	6.76	29.40	6.27	
	15	13.7	38.00	8.00	35.80	7.50	33.70	7.01	32.60	6.76	31.50	6.56	29.40	6.07	
	19	14.2	38.00	7.75	35.80	7.28	33.70	6.80	32.60	6.50	31.50	6.26	29.40	5.76	
	21	15	38.00	7.38	35.80	6.85	33.70	6.58	32.60	6.23	31.50	5.90	29.40	5.56	
		-14.7	-15	23.60	8.12	23.60	8.36	23.60	8.53	23.60	8.61	23.60	8.69	23.60	8.85
-12.6		-13	24.80	8.28	24.80	8.53	24.80	8.69	24.80	8.77	24.80	8.85	24.80	9.02	



capacity factor (%)		YCV335 heating capacity													
		outdoor temp		indoor temp. °CDB											
				16		18		20		21		22		24	
				TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
°CDB	°CWB	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW		
80	-10.5	-11	26.00	8.44	26.00	8.61	26.00	8.77	26.00	8.85	26.00	9.02	26.10	9.02	
	-9.5	-10	27.10	8.53	27.10	8.69	27.10	8.85	27.10	8.94	27.10	9.02	26.10	8.77	
	-8.5	-9.1	28.20	8.61	28.20	8.77	28.20	8.94	28.20	9.02	28.20	9.10	26.10	8.44	
	-7	-7.6	29.50	8.69	29.50	8.85	29.50	9.02	29.50	9.10	28.00	8.85	26.10	8.20	
	-5	-5.6	30.80	8.85	30.80	8.94	30.80	9.10	29.00	8.77	28.00	8.44	26.10	7.80	
	-3	-3.7	32.00	8.94	32.00	9.10	30.00	8.69	29.00	8.36	28.00	8.08	26.10	7.47	
	0	-0.7	33.50	9.10	31.80	8.61	30.00	8.13	29.00	7.84	28.00	7.54	26.10	6.99	
	3	2.2	33.80	8.77	31.80	8.20	30.00	7.67	29.00	7.38	28.00	7.09	26.10	6.60	
	5	4.1	33.80	8.44	31.80	7.87	30.00	7.34	29.00	7.09	28.00	6.85	26.10	6.35	
	7	6	33.80	8.10	31.80	7.58	30.00	7.09	29.00	6.85	28.00	6.60	26.10	6.11	
	9	7.9	33.80	7.79	31.80	7.30	30.00	6.85	29.00	6.60	28.00	6.37	26.10	5.90	
	11	9.8	33.80	7.54	31.80	7.05	30.00	6.60	29.00	6.38	28.00	6.15	26.10	5.74	
	13	11.8	33.80	7.28	31.80	6.83	30.00	6.39	29.00	6.16	28.00	5.94	26.10	5.53	
	15	13.7	33.80	7.05	31.80	6.60	30.00	6.19	29.00	5.98	28.00	5.78	26.10	5.37	
19	14.2	33.80	6.80	31.80	6.40	30.00	6.01	29.00	5.71	28.00	5.53	26.10	5.11		
21	15	33.80	6.56	31.80	6.20	30.00	5.75	29.00	5.46	28.00	5.26	26.10	4.90		
70	-14.7	-15	23.60	8.53	23.60	8.69	23.60	8.94	23.60	9.02	23.60	9.10	22.90	8.77	
	-12.6	-13	24.80	8.69	24.80	8.85	24.80	9.02	24.80	9.10	24.50	8.85	22.90	8.28	
	-10.5	-11	26.00	8.77	26.00	9.02	26.20	9.02	25.30	8.61	24.50	8.44	22.90	7.83	
	-9.5	-10	27.10	8.85	27.10	9.02	26.20	8.77	25.30	8.44	24.50	8.20	22.90	7.54	
	-8.5	-9.1	28.20	8.94	28.20	9.10	26.20	8.53	25.30	8.20	24.50	7.96	22.90	7.38	
	-7	-7.6	29.50	9.02	27.90	8.77	26.20	8.28	25.30	7.95	24.50	7.67	22.90	7.09	
	-5	-5.6	29.60	9.02	27.90	8.44	26.20	7.83	25.30	7.58	24.50	7.30	22.90	6.76	
	-3	-3.7	29.60	8.61	27.90	8.03	26.20	7.50	25.30	7.26	24.50	6.97	22.90	6.46	
	0	-0.7	29.60	8.02	27.90	7.50	26.20	7.01	25.30	6.76	24.50	6.55	22.90	6.06	
	3	2.2	29.60	7.54	27.90	7.09	26.20	6.60	25.30	6.38	24.50	6.15	22.90	5.74	
	5	4.1	29.60	7.26	27.90	6.80	26.20	6.35	25.30	6.15	24.50	5.94	22.90	5.53	
	7	6	29.60	6.99	27.90	6.56	26.20	6.15	25.30	5.94	24.50	5.74	22.90	5.33	
	9	7.9	29.60	6.76	27.90	6.35	26.20	5.94	25.30	5.74	24.50	5.53	22.90	5.16	
	11	9.8	29.60	6.52	27.90	6.12	26.20	5.74	25.30	5.54	24.50	5.37	22.90	5.00	
13	11.8	29.60	6.30	27.90	5.93	26.20	5.55	25.30	5.37	24.50	5.21	22.90	4.84		
15	13.7	29.60	6.11	27.90	5.74	26.20	5.40	25.30	5.21	24.50	5.04	22.90	4.71		
19	14.2	29.60	5.92	27.90	5.49	26.20	5.20	25.30	5.13	24.50	4.81	22.90	4.56		
21	15	29.60	5.64	27.90	5.16	26.20	4.93	25.30	4.74	24.50	4.59	22.90	4.29		
	-14.7	-15	23.60	9.02	23.60	9.10	22.40	8.61	21.80	8.20	21.00	7.94	19.50	7.34	
	-12.6	-13	24.80	9.10	23.90	8.61	22.40	8.03	21.80	7.75	21.00	7.48	19.50	6.93	
	-10.5	-11	25.30	8.61	23.90	8.20	22.40	7.62	21.80	7.34	21.00	7.09	19.50	6.56	
	-9.5	-10	25.30	8.44	23.90	7.92	22.40	7.38	21.80	7.13	21.00	6.89	19.50	6.38	
	-8.5	-9.1	25.30	8.20	23.90	7.75	22.40	7.24	21.80	6.97	21.00	6.72	19.50	6.23	
	-7	-7.6	25.30	7.95	23.90	7.46	22.40	6.97	21.80	6.72	21.00	6.54	19.50	6.03	
	-5	-5.6	25.30	7.58	23.90	7.09	22.40	6.64	21.80	6.39	21.00	6.15	19.50	5.74	
	-3	-3.7	25.30	7.28	23.90	6.79	22.40	6.35	21.80	6.15	21.00	5.94	19.50	5.51	
	0	-0.7	25.30	6.77	23.90	6.35	22.40	5.97	21.80	5.74	21.00	5.56	19.50	5.16	
	3	2.2	25.30	6.36	23.90	6.01	22.40	5.64	21.80	5.41	21.00	5.25	19.50	4.92	
5	4.1	25.30	6.15	23.90	5.78	22.40	5.41	21.80	5.25	21.00	5.08	19.50	4.75		
7	6	25.30	5.94	23.90	5.59	22.40	5.25	21.80	5.08	21.00	4.92	19.50	4.59		



YCV335														heating capacity	
capacity factor (%)	outdoor temp		indoor temp. °CDB												
			16		18		20		21		22		24		
			TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	
	°CDB	°CWB	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW		
60	9	7.9	25.30	5.74	23.90	5.41	22.40	5.08	21.80	4.92	21.00	4.75	19.50	4.44	
	11	9.8	25.30	5.54	23.90	5.21	22.40	4.92	21.80	4.75	21.00	4.63	19.50	4.30	
	13	11.8	25.30	5.37	23.90	5.05	22.40	4.75	21.80	4.63	21.00	4.47	19.50	4.18	
	15	13.7	25.30	5.21	23.90	4.92	22.40	4.63	21.80	4.48	21.00	4.35	19.50	4.06	
	19	14.2	25.30	5.00	23.90	4.74	22.40	4.39	21.80	4.23	21.00	4.12	19.50	3.90	
	21	15	25.30	4.75	23.90	4.53	22.40	4.22	21.80	4.09	21.00	3.98	19.50	3.68	
	50	-14.7	-15	21.10	7.97	19.90	7.46	18.70	6.97	18.10	6.73	17.50	6.52	16.30	6.03
-12.6		-13	21.10	7.50	19.90	7.05	18.70	6.60	18.10	6.37	17.50	6.15	16.30	5.74	
-10.5		-11	21.10	7.10	19.90	6.68	18.70	6.26	18.10	6.03	17.50	5.82	16.30	5.41	
-9.5		-10	21.10	6.93	19.90	6.48	18.70	6.11	18.10	5.89	17.50	5.70	16.30	5.29	
-8.5		-9.1	21.10	6.76	19.90	6.35	18.70	5.94	18.10	5.74	17.50	5.56	16.30	5.16	
-7		-7.6	21.10	6.52	19.90	6.11	18.70	5.74	18.10	5.55	17.50	5.37	16.30	5.00	
-5		-5.6	21.10	6.21	19.90	5.86	18.70	5.48	18.10	5.29	17.50	5.12	16.30	4.80	
-3		-3.7	21.10	5.94	19.90	5.62	18.70	5.26	18.10	5.09	17.50	4.92	16.30	4.59	
0		-0.7	21.10	5.57	19.90	5.29	18.70	4.96	18.10	4.80	17.50	4.64	16.30	4.35	
3		2.2	21.10	5.29	19.90	4.98	18.70	4.68	18.10	4.55	17.50	4.39	16.30	4.10	
5		4.1	21.10	5.09	19.90	4.82	18.70	4.55	18.10	4.39	17.50	4.26	16.30	4.02	
7		6	21.10	4.92	19.90	4.66	18.70	4.39	18.10	4.26	17.50	4.14	16.30	3.85	
9		7.9	21.10	4.77	19.90	4.51	18.70	4.26	18.10	4.14	17.50	4.00	16.30	3.77	
11		9.8	21.10	4.63	19.90	4.39	18.70	4.14	18.10	4.02	17.50	3.89	16.30	3.65	
13		11.8	21.10	4.48	19.90	4.23	18.70	4.00	18.10	3.89	17.50	3.77	16.30	3.53	
15		13.7	21.10	4.36	19.90	4.14	18.70	3.89	18.10	3.81	17.50	3.66	16.30	3.44	
19		14.2	21.10	4.21	19.90	3.99	18.70	3.70	18.10	3.61	17.50	3.49	16.30	3.34	
21	15	21.10	4.08	19.90	3.69	18.70	3.53	18.10	3.48	17.50	3.36	16.30	3.21		

TC: total capacity, KW

PI: power input, KW (compressor+outdoor motor)



YCV400														heating capacity	
capacity factor (%)	outdoor temp		indoor temp. °CDB												
			16		18		20		21		22		24		
	°CDB	°CWB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	
			KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	
130	-14.7	-15	26.80	7.27	26.80	7.70	26.80	8.13	26.80	8.34	26.80	8.56	26.80	8.99	
	-12.6	-13	28.40	7.72	28.40	8.13	28.40	8.53	28.40	8.73	28.40	8.94	28.40	9.33	
	-10.5	-11	30.20	8.12	30.20	8.50	30.20	8.88	30.20	9.07	30.20	9.27	30.20	9.62	
	-9.5	-10	31.20	8.31	31.20	8.67	31.20	9.04	31.20	9.23	31.20	9.42	31.20	9.80	
	-8.5	-9.1	31.90	8.46	31.90	8.82	31.90	9.18	31.90	9.36	31.90	9.52	31.90	9.90	
	-7	-7.6	33.20	8.70	33.20	9.05	33.20	9.40	33.20	9.62	33.20	9.71	33.20	10.09	
	-5	-5.6	35.00	8.99	35.00	9.32	35.00	9.62	35.00	9.80	35.00	9.99	35.00	10.28	
	-3	-3.7	36.60	9.26	36.60	9.52	36.60	9.90	36.60	10.09	36.60	10.18	36.60	10.56	
	0	-0.7	39.20	9.62	39.20	9.90	39.20	10.18	39.20	10.37	39.20	10.46	39.20	10.75	
	3	2.2	41.70	9.90	41.70	10.18	41.70	10.46	41.70	10.56	41.70	10.75	41.70	11.03	
	5	4.1	43.30	10.09	43.30	10.37	43.30	10.65	43.30	10.75	43.30	10.94	43.30	11.12	
	7	6	45.00	10.28	45.00	10.56	45.00	10.75	45.00	10.94	45.00	11.03	45.00	11.31	
	9	7.9	46.60	10.37	46.60	10.65	46.60	10.94	46.60	11.03	46.60	11.12	46.60	11.41	
	11	9.8	48.20	10.56	48.20	10.75	48.20	11.03	48.20	11.12	48.20	11.31	48.20	11.50	
	13	11.8	49.00	10.65	49.00	10.94	49.00	11.12	49.00	11.31	49.00	11.41	49.00	11.60	
15	13.7	51.60	10.84	51.60	11.03	51.60	11.22	51.60	11.41	51.60	11.50	51.00	11.50		
19	14.2	51.60	10.94	51.60	11.15	51.60	11.32	51.60	11.51	51.60	11.61	51.00	11.27		
21	15	51.60	11.02	51.60	11.26	51.60	11.43	51.60	11.57	51.60	11.42	51.00	11.16		
120	-14.7	-15	26.80	7.85	26.80	8.25	26.80	8.64	26.80	8.84	26.80	9.04	26.80	9.43	
	-12.6	-13	28.40	8.27	28.40	8.64	28.40	9.01	28.40	9.20	28.40	9.39	28.40	9.80	
	-10.5	-11	30.20	8.64	30.20	8.98	30.20	9.33	30.20	9.52	30.20	9.71	30.20	10.09	
	-9.5	-10	31.20	8.81	31.20	9.14	31.20	9.52	31.20	9.62	31.20	9.80	31.20	10.18	
	-8.5	-9.1	31.90	8.95	31.90	9.28	31.90	9.62	31.90	9.80	31.90	9.99	31.90	10.28	
	-7	-7.6	33.20	9.17	33.20	9.52	33.20	9.80	33.20	9.99	33.20	10.10	33.20	10.46	
	-5	-5.6	35.00	9.43	35.00	9.71	35.00	10.09	35.00	10.18	35.00	10.40	35.00	10.65	
	-3	-3.7	36.60	9.71	36.60	9.99	36.60	10.28	36.60	10.37	36.60	10.60	36.60	10.84	
	0	-0.7	39.20	9.99	39.20	10.28	39.20	10.56	39.20	10.65	39.20	10.84	39.20	11.12	
	3	2.2	41.70	10.28	41.70	10.56	41.70	10.84	41.70	10.94	41.70	11.03	41.70	11.31	
	5	4.1	43.30	10.46	43.30	10.65	43.30	10.94	43.30	11.03	43.30	11.22	43.30	11.41	
	7	6	45.00	10.56	45.00	10.84	45.00	11.12	45.00	11.22	45.00	11.31	45.00	11.60	
	9	7.9	46.60	10.75	46.60	10.94	46.60	11.22	46.60	11.31	46.60	11.41	46.60	11.69	
	11	9.8	48.20	10.84	48.20	11.12	48.20	11.31	48.20	11.41	48.20	11.50	47.10	11.31	
	13	11.8	49.00	11.03	49.00	11.22	49.00	11.41	49.00	11.50	49.00	11.69	47.10	10.94	
15	13.7	51.60	11.12	51.60	11.31	51.60	11.50	51.60	11.60	50.50	11.41	47.10	10.46		
19	14.2	51.60	11.21	51.60	11.41	51.60	11.51	51.60	11.49	50.50	11.21	47.10	10.21		
21	15	51.60	11.33	51.60	11.50	51.60	11.58	51.60	11.40	50.50	10.87	47.10	10.03		
	-14.7	-15	26.80	8.43	26.80	8.80	26.80	9.14	26.80	9.33	26.80	9.52	26.80	9.90	
	-12.6	-13	28.40	8.81	28.40	9.15	28.40	9.52	28.40	9.71	28.40	9.80	28.40	10.18	
	-10.5	-11	30.20	9.14	30.20	9.43	30.20	9.80	30.20	9.99	30.20	10.09	30.20	10.46	
	-9.5	-10	31.20	9.30	31.20	9.62	31.20	9.90	31.20	10.10	31.20	10.28	31.20	10.56	
	-8.5	-9.1	31.90	9.43	31.90	9.71	31.90	10.09	31.90	10.20	31.90	10.37	31.90	10.65	
	-7	-7.6	33.20	9.62	33.20	9.90	33.20	10.18	33.20	10.40	33.20	10.56	33.20	10.84	
	-5	-5.6	35.00	9.90	35.00	10.18	35.00	10.46	35.00	10.60	35.00	10.75	35.00	11.03	
	-3	-3.7	36.60	10.09	36.60	10.37	36.60	10.65	36.60	10.70	36.60	10.94	36.60	11.12	
	0	-0.7	39.20	10.37	39.20	10.65	39.20	10.94	39.20	11.00	39.20	11.12	39.20	11.41	



YCV400														heating capacity	
capacity factor (%)	outdoor temp		indoor temp. °CDB												
			16		18		20		21		22		24		
	°CDB	°CWB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	
110	3	2.2	41.70	10.65	41.70	10.94	41.70	11.12	41.70	11.22	41.70	11.41	41.70	11.60	
	5	4.1	43.30	10.84	43.30	11.03	43.30	11.22	43.30	11.41	43.30	11.50	43.20	11.60	
	7	6	45.00	10.94	45.00	11.12	45.00	11.41	45.00	11.50	45.00	11.60	43.20	11.12	
	9	7.9	46.60	11.12	46.60	11.31	46.60	11.50	46.60	11.60	46.30	11.60	43.20	10.65	
	11	9.8	48.20	11.22	48.20	11.41	48.20	11.60	47.90	11.60	46.30	11.12	43.20	10.28	
	13	11.8	49.00	11.31	49.00	11.50	49.60	11.50	47.90	11.12	46.30	10.65	43.20	9.90	
	15	13.7	51.60	11.41	51.60	11.60	49.60	11.12	47.90	10.75	46.30	10.28	43.20	9.52	
	19	14.2	51.60	10.66	51.60	11.49	49.60	10.76	47.90	10.31	46.30	9.93	43.20	9.21	
	21	15	51.60	10.75	51.60	11.16	49.60	10.19	47.90	10.00	46.30	9.65	43.20	9.08	
	100	-14.7	-15	26.80	9.01	26.80	9.34	26.80	9.71	26.80	9.80	26.80	9.99	26.80	10.37
		-12.6	-13	28.40	9.36	28.40	9.71	28.40	9.99	28.40	10.09	28.40	10.28	28.40	10.56
-10.5		-11	30.20	9.71	30.20	9.99	30.20	10.28	30.20	10.37	30.20	10.56	30.20	10.84	
-9.5		-10	31.20	9.80	31.20	10.09	31.20	10.37	31.20	10.56	31.20	10.65	31.20	10.94	
-8.5		-9.1	31.90	9.90	31.90	10.18	31.90	10.46	31.90	10.70	31.90	10.75	31.90	11.03	
-7		-7.6	33.20	10.09	33.20	10.37	33.20	10.65	33.20	10.70	33.20	10.94	33.20	11.22	
-5		-5.6	35.00	10.37	35.00	10.56	35.00	10.84	35.00	10.90	35.00	11.12	35.00	11.31	
-3		-3.7	36.60	10.56	36.60	10.75	36.60	11.03	36.60	11.10	36.60	11.22	36.60	11.50	
0		-0.7	39.20	10.84	39.20	11.03	39.20	11.22	39.20	11.40	39.20	11.50	39.30	11.69	
3		2.2	41.70	11.03	41.70	11.22	41.70	11.50	41.70	11.60	41.70	11.69	39.30	10.94	
5		4.1	43.30	11.12	43.30	11.41	43.30	11.60	43.30	11.69	42.10	11.31	39.30	10.46	
7		6	45.00	11.31	45.00	11.50	45.00	11.60	43.60	11.22	42.10	10.84	39.30	9.99	
9		7.9	46.60	11.41	46.60	11.60	45.00	11.22	43.60	10.84	42.10	10.37	39.30	9.62	
11		9.8	48.20	11.50	47.90	11.60	45.00	10.75	43.60	10.37	42.10	9.99	39.30	9.25	
13	11.8	49.00	11.60	47.90	11.12	45.00	10.37	43.60	9.99	42.10	9.62	39.30	8.90		
15	13.7	50.70	11.41	47.90	10.75	45.00	9.99	43.60	9.62	42.10	9.28	39.30	8.59		
19	14.2	50.70	11.11	47.90	10.38	45.00	9.74	43.60	9.22	42.10	8.92	39.30	8.36		
21	15	50.70	10.75	47.90	9.93	45.00	9.38	43.60	9.08	42.10	8.65	39.30	8.17		
90	-14.7	-15	26.80	9.62	26.80	9.90	26.80	10.18	26.80	10.37	26.80	10.46	26.80	10.75	
	-12.6	-13	28.40	9.90	28.40	10.18	28.40	10.46	28.40	10.56	28.40	10.75	28.40	11.03	
	-10.5	-11	30.20	10.18	30.20	10.46	30.20	10.75	30.20	10.84	30.20	10.94	30.20	11.22	
	-9.5	-10	31.20	10.28	31.20	10.56	31.20	10.84	31.20	10.94	31.20	11.03	31.20	11.31	
	-8.5	-9.1	31.90	10.37	31.90	10.65	31.90	10.94	31.90	11.03	31.90	11.12	31.90	11.41	
	-7	-7.6	33.20	10.56	33.20	10.84	33.20	11.03	33.20	11.22	33.20	11.31	33.20	11.50	
	-5	-5.6	35.00	10.75	35.00	11.03	35.00	11.22	35.00	11.31	35.00	11.50	35.00	11.69	
	-3	-3.7	36.60	10.94	36.60	11.22	36.60	11.41	36.60	11.50	36.60	11.60	35.20	11.22	
	0	-0.7	39.20	11.22	39.20	11.41	39.20	11.60	39.10	11.69	37.80	11.22	35.20	10.37	
	3	2.2	41.70	11.41	41.70	11.60	40.60	11.31	39.10	10.94	37.80	10.46	35.20	9.71	
	5	4.1	43.30	11.50	43.20	11.60	40.60	10.84	39.10	10.46	37.80	9.99	35.20	9.28	
	7	6	45.00	11.60	43.20	11.12	40.60	10.37	39.10	9.99	37.80	9.62	35.20	8.91	
	9	7.9	45.80	11.41	43.20	10.65	40.60	9.99	39.10	9.62	37.80	9.26	35.20	8.57	
	11	9.8	45.80	10.94	43.20	10.28	40.60	9.62	39.10	9.24	37.80	8.91	35.20	8.26	
	13	11.8	45.80	10.56	43.20	9.90	40.60	9.21	39.10	8.89	37.80	8.58	35.20	7.96	
	15	13.7	45.80	10.18	43.20	9.52	40.60	8.89	39.10	8.59	37.80	8.29	35.20	7.68	
	19	14.2	45.80	9.93	43.20	9.25	40.60	8.61	39.10	8.33	37.80	7.99	35.20	7.41	
21	15	45.80	9.57	43.20	8.91	40.60	8.45	39.10	8.06	37.80	7.71	35.20	7.11		



YCV400														heating capacity	
capacity factor (%)	outdoor temp		indoor temp. °CDB												
			16		18		20		21		22		24		
	°CDB	°CWB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	
80	-14.7	-15	26.80	10.18	26.80	10.46	26.80	10.75	26.80	10.84	26.80	10.94	26.80	11.22	
	-12.6	-13	28.40	10.46	28.40	10.65	28.40	10.94	28.40	11.03	28.40	11.22	28.40	11.41	
	-10.5	-11	30.20	10.65	30.20	10.94	30.20	11.12	30.20	11.31	30.20	11.41	30.20	11.60	
	-9.5	-10	31.20	10.84	31.20	11.03	31.20	11.22	31.20	11.41	31.20	11.50	31.20	11.69	
	-8.5	-9.1	31.90	10.94	31.90	11.12	31.90	11.31	31.90	11.50	31.90	11.60	31.30	11.50	
	-7	-7.6	33.20	11.03	33.20	11.22	33.20	11.50	33.20	11.60	33.20	11.69	31.30	10.94	
	-5	-5.6	35.00	11.22	35.00	11.41	35.00	11.60	34.80	11.69	33.70	11.22	31.30	10.37	
	-3	-3.7	36.60	11.41	36.60	11.60	36.00	11.50	34.80	11.03	33.70	10.65	31.30	9.80	
	0	-0.7	39.20	11.60	38.30	11.41	36.00	10.65	34.80	10.28	33.70	9.80	31.30	9.11	
	3	2.2	40.70	11.31	38.30	10.65	36.00	9.90	34.80	9.52	33.70	9.20	31.30	8.52	
	5	4.1	40.70	10.84	38.30	10.18	36.00	9.52	34.80	9.14	33.70	8.81	31.30	8.17	
	7	6	40.70	10.37	38.30	9.71	36.00	9.10	34.80	8.79	33.70	8.48	31.30	7.86	
	9	7.9	40.70	9.99	38.30	9.36	36.00	8.75	34.80	8.45	33.70	8.15	31.30	7.57	
	11	9.8	40.70	9.62	38.30	9.01	36.00	8.43	34.80	8.15	33.70	7.86	31.30	7.30	
	13	11.8	40.70	9.25	38.30	8.67	36.00	8.12	34.80	7.84	33.70	7.57	31.30	7.04	
	15	13.7	40.70	8.93	38.30	8.30	36.00	7.84	34.80	7.58	33.70	7.33	31.30	6.82	
19	14.2	40.70	8.62	38.30	8.15	36.00	7.53	34.80	7.30	33.70	7.01	31.30	6.65		
21	15	40.70	8.38	38.30	7.80	36.00	7.33	34.80	7.06	33.70	6.77	31.30	6.30		
70	-14.7	-15	26.80	10.75	26.80	11.03	26.80	11.22	26.80	11.31	26.80	11.41	26.80	11.69	
	-12.6	-13	28.40	11.03	28.40	11.22	28.40	11.41	28.40	11.50	28.40	11.69	27.40	11.22	
	-10.5	-11	30.20	11.22	30.20	11.41	30.20	11.60	30.20	11.69	29.50	11.31	27.40	10.46	
	-9.5	-10	31.20	11.31	31.20	11.50	31.20	11.69	30.50	11.41	29.50	10.94	27.40	10.09	
	-8.5	-9.1	31.90	11.41	31.90	11.60	31.60	11.50	30.50	11.12	29.50	10.65	27.40	9.90	
	-7	-7.6	33.20	11.50	33.20	11.69	31.60	11.03	30.50	10.56	29.50	10.18	27.40	9.43	
	-5	-5.6	35.00	11.69	33.50	11.12	31.60	10.37	30.50	9.99	29.50	9.62	27.40	8.93	
	-3	-3.7	35.60	11.31	33.50	10.56	31.60	9.90	30.50	9.52	29.50	9.17	27.40	8.49	
	0	-0.7	35.60	10.46	33.50	9.80	31.60	9.15	30.50	8.83	29.50	8.51	27.40	7.90	
	3	2.2	35.60	9.80	33.50	9.15	31.60	8.55	30.50	8.26	29.50	7.98	27.40	7.40	
	5	4.1	35.60	9.35	33.50	8.78	31.60	8.21	30.50	7.93	29.50	7.66	27.40	7.12	
	7	6	35.60	8.97	33.50	8.43	31.60	7.89	30.50	7.63	29.50	7.36	27.40	6.85	
	9	7.9	35.60	8.64	33.50	8.11	31.60	7.60	30.50	7.34	29.50	7.10	27.40	6.61	
	11	9.8	35.60	8.31	33.50	7.82	31.60	7.33	30.50	7.09	29.50	6.80	27.40	6.38	
	13	11.8	35.60	8.01	33.50	7.53	31.60	7.07	30.50	6.84	29.50	6.61	27.40	6.17	
	15	13.7	35.60	7.74	33.50	7.29	31.60	6.84	30.50	6.62	29.50	6.40	27.40	5.98	
19	14.2	35.60	7.35	33.50	7.09	31.60	6.65	30.50	6.31	29.50	6.04	27.40	5.73		
21	15	35.60	7.09	33.50	6.74	31.60	6.35	30.50	6.02	29.50	5.74	27.40	5.42		
	-14.7	-15	26.80	11.31	26.80	11.50	26.80	11.69	26.10	11.31	25.30	10.94	23.50	10.09	
	-12.6	-13	28.40	11.50	28.40	11.69	27.00	10.94	26.10	10.56	25.30	10.18	23.50	9.41	
	-10.5	-11	30.20	11.69	28.70	11.03	27.00	10.28	26.10	9.90	25.30	9.52	23.50	8.82	
	-9.5	-10	30.50	11.41	28.70	10.65	27.00	9.99	26.10	9.62	25.30	9.25	23.50	8.56	
	-8.5	-9.1	30.50	11.12	28.70	10.37	27.00	9.71	26.10	9.34	25.30	9.00	23.50	8.34	
	-7	-7.6	30.50	10.56	28.70	9.90	27.00	9.27	26.10	8.94	25.30	8.63	23.50	7.99	
	-5	-5.6	30.50	9.99	28.70	9.38	27.00	8.77	26.10	8.47	25.30	8.16	23.50	7.58	
	-3	-3.7	30.50	9.52	28.70	8.92	27.00	8.34	26.10	8.06	25.30	7.78	23.50	7.23	
0	-0.7	30.50	8.82	28.70	8.29	27.00	7.76	26.10	7.50	25.30	7.25	23.50	6.74		



YCV400														heating capacity	
capacity factor (%)	outdoor temp		indoor temp. °CDB												
			16		18		20		21		22		24		
	°CDB	°CWB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	
		KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	
60	3	2.2	30.50	8.26	28.70	7.76	27.00	7.28	26.10	7.04	25.30	6.81	23.50	6.34	
	5	4.1	30.50	7.93	28.70	7.46	27.00	7.00	26.10	6.77	25.30	6.54	23.50	6.10	
	7	6	30.50	7.62	28.70	7.17	27.00	6.74	26.10	6.52	25.30	6.31	23.50	5.88	
	9	7.9	30.50	7.34	28.70	6.92	27.00	6.50	26.10	6.30	25.30	6.09	23.50	5.68	
	11	9.8	30.50	7.09	28.70	6.67	27.00	6.28	26.10	6.08	25.30	5.88	23.50	5.51	
	13	11.8	30.50	6.83	28.70	6.45	27.00	6.06	26.10	5.87	25.30	5.69	23.50	5.33	
	15	13.7	30.50	6.62	28.70	6.24	27.00	5.87	26.10	5.69	25.30	5.52	23.50	5.17	
	19	14.2	30.50	6.43	28.70	5.94	27.00	5.69	26.10	5.52	25.30	5.31	23.50	4.94	
	21	15	30.50	6.16	28.70	5.77	27.00	5.45	26.10	5.34	25.30	5.14	23.50	4.75	
	50	-14.7	-15	25.30	10.94	23.90	10.28	22.50	9.62	21.70	9.26	21.00	8.92	19.60	8.27
-12.6		-13	25.30	10.28	23.90	9.62	22.50	8.96	21.70	8.65	21.00	8.34	19.60	7.74	
-10.5		-11	25.30	9.62	23.90	8.99	22.50	8.41	21.70	8.13	21.00	7.84	19.60	7.29	
-9.5		-10	25.30	9.30	23.90	8.72	22.50	8.16	21.70	7.89	21.00	7.62	19.60	7.08	
-8.5		-9.1	25.30	9.05	23.90	8.49	22.50	7.96	21.70	7.68	21.00	7.42	19.60	6.90	
-7		-7.6	25.30	8.67	23.90	8.15	22.50	7.63	21.70	7.37	21.00	7.13	19.60	6.64	
-5		-5.6	25.30	8.21	23.90	7.72	22.50	7.24	21.70	7.00	21.00	6.77	19.60	6.31	
-3		-3.7	25.30	7.82	23.90	7.36	22.50	6.91	21.70	6.68	21.00	6.47	19.60	6.03	
0		-0.7	25.30	7.29	23.90	6.86	22.50	6.45	21.70	6.25	21.00	6.04	19.60	5.65	
3		2.2	25.30	6.83	23.90	6.45	22.50	6.07	21.70	5.88	21.00	5.69	19.60	5.33	
5		4.1	25.30	6.58	23.90	6.21	22.50	5.85	21.70	5.67	21.00	5.37	19.60	5.14	
7		6	25.30	6.34	23.90	5.99	22.50	5.64	21.70	5.47	21.00	5.30	19.60	4.97	
9		7.9	25.30	6.12	23.90	5.78	22.50	5.45	21.70	5.29	21.00	5.13	19.60	4.81	
11		9.8	25.30	5.91	23.90	5.59	22.50	5.28	21.70	5.12	21.00	4.97	19.60	4.66	
13		11.8	25.30	5.72	23.90	5.41	22.50	5.11	21.70	4.96	21.00	4.81	19.60	4.52	
15		13.7	25.30	5.54	23.90	5.25	22.50	4.96	21.70	4.82	21.00	4.67	19.60	4.39	
19		14.2	25.30	5.37	23.90	5.04	22.50	4.78	21.70	4.60	21.00	4.51	19.60	4.20	
21		15	25.30	5.02	23.90	4.90	22.50	4.66	21.70	4.41	21.00	4.33	19.60	4.03	

TC: total capacity, KW

PI: power input, KW (compressor+outdoor motor)



		YCV450												heating capacity	
capacity factor (%)	outdoor temp		indoor temp. °CDB												
			16		18		20		21		22		24		
	°CDB	°CWB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	
130	-14.7	-15	29.30	7.97	29.30	8.45	29.30	8.91	29.30	9.15	29.30	9.39	29.30	9.86	
	-12.6	-13	31.20	8.47	31.20	8.91	31.20	9.36	31.20	9.57	31.20	9.80	31.20	10.24	
	-10.5	-11	33.20	8.90	33.20	9.33	33.20	9.74	33.20	9.95	33.20	10.16	33.20	10.55	
	-9.5	-10	34.30	9.11	34.30	9.51	34.30	9.91	34.30	10.12	34.30	10.33	34.30	10.75	
	-8.5	-9.1	35.10	9.27	35.10	9.68	35.10	10.07	35.10	10.27	35.10	10.44	35.10	10.86	
	-7	-7.6	36.50	9.54	36.50	9.93	36.50	10.31	36.50	10.55	36.50	10.65	36.50	11.06	
	-5	-5.6	38.50	9.86	38.50	10.22	38.50	10.55	38.50	10.75	38.50	10.96	38.50	11.27	
	-3	-3.7	40.40	10.15	40.40	10.44	40.40	10.86	40.40	11.06	40.40	11.17	40.40	11.58	
	0	-0.7	43.40	10.55	43.40	10.86	43.40	11.17	43.40	11.37	43.40	11.48	43.40	11.79	
	3	2.2	46.20	10.86	46.20	11.17	46.20	11.48	46.20	11.58	46.20	11.79	46.20	12.10	
	5	4.1	48.10	11.06	48.10	11.37	48.10	11.68	48.10	11.79	48.10	11.99	48.10	12.20	
	7	6	50.00	11.27	50.00	11.58	50.00	11.79	50.00	11.99	50.00	12.10	50.00	12.41	
	9	7.9	51.80	11.37	51.80	11.68	51.80	11.99	51.80	12.10	51.80	12.20	51.80	12.51	
	11	9.8	53.70	11.58	53.70	11.79	53.70	12.10	53.70	12.20	53.70	12.41	53.70	12.61	
	13	11.8	55.78	11.68	55.78	11.99	55.78	12.20	55.78	12.41	55.78	12.51	55.78	12.72	
	15	13.7	57.60	11.89	57.50	12.10	57.50	12.30	57.50	12.51	57.50	12.61	56.60	12.61	
19	14.2	57.60	12.00	57.50	12.22	57.50	12.42	57.50	12.62	57.50	12.73	56.60	12.36		
21	15	57.60	12.09	57.50	12.34	57.50	12.54	57.50	12.69	57.50	12.53	56.60	12.23		
120	-14.7	-15	29.30	8.61	29.30	9.05	29.30	9.48	29.30	9.70	29.30	9.91	29.30	10.34	
	-12.6	-13	31.20	9.07	31.20	9.47	31.20	9.88	31.20	10.09	31.20	10.30	31.20	10.75	
	-10.5	-11	33.20	9.47	33.20	9.85	33.20	10.24	33.20	10.44	33.20	10.65	33.20	11.06	
	-9.5	-10	34.30	9.66	34.30	10.03	34.30	10.44	34.30	10.55	34.30	10.75	34.30	11.17	
	-8.5	-9.1	35.10	9.81	35.10	10.17	35.10	10.55	35.10	10.75	35.10	10.96	35.10	11.27	
	-7	-7.6	36.50	10.06	36.50	10.44	36.50	10.75	36.50	10.96	36.50	11.10	36.50	11.48	
	-5	-5.6	38.50	10.34	38.50	10.65	38.50	11.06	38.50	11.17	38.50	11.40	38.50	11.68	
	-3	-3.7	40.40	10.65	40.40	10.96	40.40	11.27	40.40	11.37	40.40	11.60	40.40	11.89	
	0	-0.7	43.40	10.96	43.40	11.27	43.40	11.58	43.40	11.68	43.40	11.89	43.40	12.20	
	3	2.2	46.20	11.27	46.20	11.58	46.20	11.89	46.20	11.99	46.20	12.10	46.20	12.41	
	5	4.1	48.10	11.48	48.10	11.68	48.10	11.99	48.10	12.10	48.10	12.30	48.10	12.51	
	7	6	50.00	11.58	50.00	11.89	50.00	12.20	50.00	12.30	50.00	12.41	50.00	12.72	
	9	7.9	51.80	11.79	51.80	11.99	51.80	12.30	51.80	12.41	51.80	12.51	51.80	12.82	
	11	9.8	53.70	11.89	53.70	12.20	53.70	12.41	53.70	12.51	53.70	12.61	52.30	12.41	
	13	11.8	55.78	12.10	55.78	12.30	55.78	12.51	55.78	12.61	55.78	12.82	52.30	11.99	
	15	13.7	57.50	12.20	57.50	12.41	57.50	12.61	57.50	12.72	56.10	12.51	52.30	11.48	
19	14.2	57.50	12.30	57.50	12.51	57.50	12.63	57.50	12.60	56.10	12.30	52.30	11.20		
21	15	57.50	12.43	57.50	12.61	57.50	12.70	57.50	12.50	56.10	11.92	52.30	11.00		
120	-14.7	-15	29.30	9.24	29.30	9.65	29.30	10.03	29.30	10.24	29.30	10.44	29.30	10.86	
	-12.6	-13	31.20	9.67	31.20	10.04	31.20	10.44	31.20	10.65	31.20	10.75	31.20	11.17	
	-10.5	-11	33.20	10.03	33.20	10.34	33.20	10.75	33.20	10.96	33.20	11.06	33.20	11.48	
	-9.5	-10	34.30	10.20	34.30	10.55	34.30	10.86	34.30	11.10	34.30	11.27	34.30	11.58	
	-8.5	-9.1	35.10	10.34	35.10	10.65	35.10	11.06	35.10	11.20	35.10	11.37	35.10	11.68	
	-7	-7.6	36.50	10.55	36.50	10.86	36.50	11.17	36.50	11.40	36.50	11.58	36.50	11.89	
	-5	-5.6	38.50	10.86	38.50	11.17	38.50	11.48	38.50	11.60	38.50	11.79	38.50	12.10	
	-3	-3.7	40.40	11.06	40.40	11.37	40.40	11.68	40.40	11.80	40.40	11.99	40.40	12.20	
0	-0.7	43.40	11.37	43.40	11.68	43.40	11.99	43.40	12.10	43.40	12.20	43.40	12.51		



YCV450														
capacity factor (%)		heating capacity												
		outdoor temp		indoor temp. °CDB										
				16		18		20		21		22		24
°CDB	°CWB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	
110	3	2.2	46.20	11.68	46.20	11.99	46.20	12.20	46.20	12.30	46.20	12.51	46.20	12.72
	5	4.1	48.10	11.89	48.10	12.10	48.10	12.30	48.10	12.51	48.10	12.61	47.90	12.72
	7	6	50.00	11.99	50.00	12.20	50.00	12.51	50.00	12.61	50.00	12.72	47.90	12.20
	9	7.9	51.80	12.20	51.80	12.41	51.80	12.61	51.80	12.72	51.40	12.72	47.90	11.68
	11	9.8	53.70	12.30	53.70	12.51	53.70	12.72	53.20	12.72	51.40	12.20	47.90	11.27
	13	11.8	55.78	12.41	55.78	12.61	55.00	12.61	53.20	12.20	51.40	11.68	47.90	10.86
	15	13.7	57.60	12.51	57.60	12.72	55.00	12.20	53.20	11.79	51.40	11.27	47.90	10.44
	19	14.2	57.60	11.69	57.60	12.60	55.00	11.80	53.20	11.31	51.40	10.89	47.90	10.10
	21	15	57.60	11.79	57.60	12.23	55.00	11.17	53.20	10.97	51.40	10.59	47.90	9.95
	100	-14.7	-15	29.30	9.88	29.30	10.25	29.30	10.65	29.30	10.75	29.30	10.96	29.30
-12.6		-13	31.20	10.27	31.20	10.65	31.20	10.96	31.20	11.06	31.20	11.27	31.20	11.58
-10.5		-11	33.20	10.65	33.20	10.96	33.20	11.27	33.20	11.37	33.20	11.58	33.20	11.89
-9.5		-10	34.30	10.75	34.30	11.06	34.30	11.37	34.30	11.58	34.30	11.68	34.30	11.99
-8.5		-9.1	35.10	10.86	35.10	11.17	35.10	11.48	35.10	11.68	35.10	11.79	35.10	12.10
-7		-7.6	36.50	11.06	36.50	11.37	36.50	11.68	36.50	11.79	36.50	11.99	36.50	12.30
-5		-5.6	38.50	11.37	38.50	11.58	38.50	11.89	38.50	11.99	38.50	12.20	38.50	12.41
-3		-3.7	40.40	11.58	40.40	11.79	40.40	12.10	40.40	12.20	40.40	12.30	40.40	12.61
0		-0.7	43.40	11.89	43.40	12.10	43.40	12.30	43.40	12.51	43.40	12.61	43.40	12.82
3		2.2	46.20	12.10	46.20	12.30	46.20	12.61	46.20	12.72	46.20	12.82	43.60	11.99
5		4.1	48.10	12.20	48.10	12.51	48.10	12.72	48.10	12.82	48.10	12.41	43.60	11.48
7		6	50.00	12.41	50.00	12.61	50.00	13.50	48.40	12.30	46.80	11.89	43.60	10.96
9		7.9	51.80	12.51	51.80	12.72	50.00	12.30	48.40	11.89	46.80	11.37	43.60	10.55
11		9.8	53.70	12.61	53.20	12.72	50.00	11.79	48.40	11.37	46.80	10.96	43.60	10.14
13		11.8	55.78	12.72	53.20	12.20	50.00	11.37	48.40	10.96	46.80	10.55	43.60	9.76
15		13.7	56.40	12.51	53.20	11.79	50.00	10.96	48.40	10.55	46.80	10.17	43.60	9.42
19	14.2	56.40	12.18	53.20	11.38	50.00	10.69	48.40	10.11	46.80	9.78	43.60	9.17	
21	15	56.40	11.79	53.20	10.89	50.00	10.28	48.40	9.95	46.80	9.49	43.60	8.96	
90	-14.7	-15	29.30	10.55	29.30	10.86	29.30	11.17	29.30	11.37	29.30	11.48	29.30	11.79
	-12.6	-13	31.20	10.86	31.20	11.17	31.20	11.48	31.20	11.58	31.20	11.79	31.20	12.10
	-10.5	-11	33.20	11.17	33.20	11.48	33.20	11.79	33.20	11.89	33.20	11.99	33.20	12.30
	-9.5	-10	34.30	11.27	34.30	11.58	34.30	11.89	34.30	11.99	34.30	12.10	34.30	12.41
	-8.5	-9.1	35.10	11.37	35.10	11.68	35.10	11.99	35.10	12.10	35.10	12.20	35.10	12.51
	-7	-7.6	36.50	11.58	36.50	11.89	36.50	12.10	36.50	12.30	36.50	12.41	36.50	12.61
	-5	-5.6	38.50	11.79	38.50	12.10	38.50	12.30	38.50	12.41	38.50	12.61	38.50	12.82
	-3	-3.7	40.40	11.99	40.40	12.30	40.40	12.51	40.40	12.61	40.40	12.72	39.20	12.30
	0	-0.7	43.40	12.30	43.40	12.51	43.40	12.72	43.40	12.82	42.10	12.30	39.20	11.37
	3	2.2	46.20	12.51	46.20	12.72	45.00	12.41	43.50	11.99	42.10	11.48	39.20	10.65
	5	4.1	48.10	12.61	47.80	12.72	45.00	11.89	43.50	11.48	42.10	10.96	39.20	10.17
	7	6	50.00	12.72	47.80	12.20	45.00	11.37	43.50	10.96	42.10	10.55	39.20	9.77
	9	7.9	50.80	12.51	47.80	11.68	45.00	10.96	43.50	10.55	42.10	10.15	39.20	9.40
	11	9.8	50.80	11.99	47.80	11.27	45.00	10.55	43.50	10.13	42.10	9.77	39.20	9.06
	13	11.8	50.80	11.58	47.80	10.86	45.00	10.10	43.50	9.75	42.10	9.41	39.20	8.73
	15	13.7	50.80	11.17	47.80	10.44	45.00	9.75	43.50	9.42	42.10	9.09	39.20	8.43
19	14.2	50.80	10.89	47.80	10.15	45.00	9.44	43.50	9.14	42.10	8.76	39.20	8.12	
21	15	50.80	10.49	47.80	9.77	45.00	9.27	43.50	8.84	42.10	8.45	39.20	7.79	



YCV450															
capacity factor (%)		heating capacity													
		outdoor temp		indoor temp. °CDB											
				16		18		20		21		22		24	
				TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
°CDB	°CWB	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW		
80	-14.7	-15	29.30	11.17	29.30	11.48	29.30	11.79	29.30	11.89	29.30	11.99	29.30	12.30	
	-12.6	-13	31.20	11.48	31.20	11.68	31.20	11.99	31.20	12.10	31.20	12.30	31.20	12.51	
	-10.5	-11	33.20	11.68	33.20	11.99	33.20	12.20	33.20	12.41	33.20	12.51	33.20	12.72	
	-9.5	-10	34.30	11.89	34.30	12.10	34.30	12.30	34.30	12.51	34.30	12.61	34.30	12.82	
	-8.5	-9.1	35.10	11.99	35.10	12.20	35.10	12.41	35.10	12.61	35.10	12.72	34.80	12.61	
	-7	-7.6	36.50	12.10	36.50	12.30	36.50	12.61	36.50	12.72	36.50	12.82	34.80	11.99	
	-5	-5.6	38.50	12.30	38.50	12.51	38.50	12.72	38.60	12.82	37.40	12.30	34.80	11.37	
	-3	-3.7	40.40	12.51	40.40	12.72	40.00	12.61	38.60	12.10	37.40	11.68	34.80	10.75	
	0	-0.7	43.40	12.72	42.50	12.51	40.00	11.68	38.60	11.27	37.40	10.75	34.80	9.99	
	3	2.2	45.10	12.41	42.50	11.68	40.00	10.86	38.60	10.44	37.40	10.09	34.80	9.35	
	5	4.1	45.10	11.89	42.50	11.17	40.00	10.44	38.60	10.03	37.40	9.67	34.80	8.96	
	7	6	45.10	11.37	42.50	10.65	40.00	9.98	38.60	9.64	37.40	9.29	34.80	8.62	
	9	7.9	45.10	10.96	42.50	10.27	40.00	9.59	38.60	9.26	37.40	8.94	34.80	8.30	
	11	9.8	45.10	10.55	42.50	9.88	40.00	9.24	38.60	8.93	37.40	8.62	34.80	8.00	
13	11.8	45.10	10.14	42.50	9.51	40.00	8.90	38.60	8.60	37.40	8.30	34.80	7.72		
15	13.7	45.10	9.79	42.50	9.10	40.00	8.60	38.60	8.31	37.40	8.03	34.80	7.47		
19	14.2	45.10	9.45	42.50	8.94	40.00	8.26	38.60	8.00	37.40	7.69	34.80	7.29		
21	15	45.10	9.18	42.50	8.55	40.00	8.04	38.60	7.75	37.40	7.43	34.80	6.90		
70	-14.7	-15	29.30	11.79	29.30	12.10	29.30	12.30	29.30	12.41	29.30	12.51	29.30	12.82	
	-12.6	-13	31.20	12.10	31.20	12.30	31.20	12.51	31.20	12.61	31.20	12.82	30.50	12.30	
	-10.5	-11	33.20	12.30	33.20	12.51	33.20	12.72	33.20	12.82	32.70	12.41	30.50	11.48	
	-9.5	-10	34.30	12.41	34.30	12.61	34.30	12.82	33.80	12.51	32.70	11.99	30.50	11.06	
	-8.5	-9.1	35.10	12.51	35.10	12.72	35.00	12.61	33.80	12.20	32.70	11.68	30.50	10.86	
	-7	-7.6	36.50	12.61	36.50	12.82	35.00	12.10	33.80	11.58	32.70	11.17	30.50	10.34	
	-5	-5.6	38.50	12.82	37.20	12.20	35.00	11.37	33.80	10.96	32.70	10.55	30.50	9.79	
	-3	-3.7	39.40	12.41	37.20	11.58	35.00	10.86	33.80	10.44	32.70	10.06	30.50	9.32	
	0	-0.7	39.40	11.48	37.20	10.75	35.00	10.04	33.80	9.69	32.70	9.34	30.50	8.66	
	3	2.2	39.40	10.75	37.20	10.04	35.00	9.38	33.80	9.06	32.70	8.75	30.50	8.12	
	5	4.1	39.40	10.26	37.20	9.63	35.00	9.01	33.80	8.69	32.70	8.40	30.50	7.81	
	7	6	39.40	9.84	37.20	9.24	35.00	8.65	33.80	8.36	32.70	8.07	30.50	7.52	
	9	7.9	39.40	9.47	37.20	8.89	35.00	8.33	33.80	8.05	32.70	7.79	30.50	7.25	
	11	9.8	39.40	9.12	37.20	8.57	35.00	8.04	33.80	7.77	32.70	7.45	30.50	7.00	
13	11.8	39.40	8.79	37.20	8.26	35.00	7.75	33.80	7.51	32.70	7.25	30.50	6.76		
15	13.7	39.40	8.49	37.20	7.99	35.00	7.51	33.80	7.26	32.70	7.02	30.50	6.55		
19	14.2	39.40	8.06	37.20	7.77	35.00	7.30	33.80	6.92	32.70	6.62	30.50	6.28		
21	15	39.40	7.77	37.20	7.39	35.00	6.97	33.80	6.60	32.70	6.29	30.50	5.94		
	-14.7	-15	29.30	12.41	29.30	12.61	29.30	12.82	29.00	12.41	28.10	11.99	26.10	11.06	
	-12.6	-13	31.20	12.61	31.20	12.82	30.00	11.99	29.00	11.58	28.10	11.17	26.10	10.32	
	-10.5	-11	33.20	12.82	31.80	12.10	30.00	11.27	29.00	10.86	28.10	10.44	26.10	9.68	
	-9.5	-10	33.80	12.51	31.80	11.68	30.00	10.96	29.00	10.55	28.10	10.14	26.10	9.39	
	-8.5	-9.1	33.80	12.20	31.80	11.37	30.00	10.65	29.00	10.25	28.10	9.87	26.10	9.15	
	-7	-7.6	33.80	11.58	31.80	10.86	30.00	10.16	29.00	9.80	28.10	9.46	26.10	8.77	
	-5	-5.6	33.80	10.96	31.80	10.29	30.00	9.62	29.00	9.28	28.10	8.95	26.10	8.31	
	-3	-3.7	33.80	10.44	31.80	9.78	30.00	9.15	29.00	8.84	28.10	8.53	26.10	7.93	
0	-0.7	33.80	9.68	31.80	9.09	30.00	8.51	29.00	8.23	28.10	7.95	26.10	7.39		



YCV450														heating capacity	
capacity factor (%)	outdoor temp		indoor temp. °CDB												
			16		18		20		21		22		24		
	°CDB	°CWB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	
60	3	2.2	33.80	9.06	31.80	8.51	30.00	7.98	29.00	7.72	28.10	7.46	26.10	6.96	
	5	4.1	33.80	8.69	31.80	8.18	30.00	7.67	29.00	7.42	28.10	7.18	26.10	6.69	
	7	6	33.80	8.35	31.80	7.87	30.00	7.39	29.00	7.15	28.10	6.92	26.10	6.45	
	9	7.9	33.80	8.05	31.80	7.59	30.00	7.12	29.00	6.91	28.10	6.68	26.10	6.23	
	11	9.8	33.80	7.77	31.80	7.32	30.00	6.89	29.00	6.67	28.10	6.45	26.10	6.04	
	13	11.8	33.80	7.50	31.80	7.07	30.00	6.65	29.00	6.44	28.10	6.24	26.10	5.84	
	15	13.7	33.80	7.26	31.80	6.84	30.00	6.44	29.00	6.24	28.10	6.05	26.10	5.67	
	19	14.2	33.80	7.05	31.80	6.51	30.00	6.25	29.00	6.05	28.10	5.82	26.10	5.42	
	21	15	33.80	6.76	31.80	6.33	30.00	5.98	29.00	5.85	28.10	5.63	26.10	5.21	
50	-14.7	-15	28.20	11.99	26.50	11.27	25.00	10.55	24.20	10.15	23.40	9.78	21.70	9.07	
	-12.6	-13	28.20	11.27	26.50	10.55	25.00	9.82	24.20	9.49	23.40	9.15	21.70	8.49	
	-10.5	-11	28.20	10.55	26.50	9.86	25.00	9.22	24.20	8.91	23.40	8.60	21.70	7.99	
	-9.5	-10	28.20	10.19	26.50	9.56	25.00	8.95	24.20	8.65	23.40	8.35	21.70	7.76	
	-8.5	-9.1	28.20	9.93	26.50	9.32	25.00	8.73	24.20	8.43	23.40	8.14	21.70	7.57	
	-7	-7.6	28.20	9.51	26.50	8.93	25.00	8.36	24.20	8.08	23.40	7.82	21.70	7.28	
	-5	-5.6	28.20	9.01	26.50	8.47	25.00	7.94	24.20	7.68	23.40	7.42	21.70	6.92	
	-3	-3.7	28.20	8.58	26.50	8.07	25.00	7.58	24.20	7.33	23.40	7.09	21.70	6.62	
	0	-0.7	28.20	7.99	26.50	7.53	25.00	7.07	24.20	6.85	23.40	6.63	21.70	6.19	
	3	2.2	28.20	7.50	26.50	7.07	25.00	6.66	24.20	6.45	23.40	6.24	21.70	5.84	
	5	4.1	28.20	7.22	26.50	6.81	25.00	6.41	24.20	6.21	23.40	6.09	21.70	5.63	
	7	6	28.20	6.95	26.50	6.57	25.00	6.18	24.20	6.00	23.40	5.81	21.70	5.45	
	9	7.9	28.20	6.71	26.50	6.34	25.00	5.98	24.20	5.80	23.40	5.62	21.70	5.27	
	11	9.8	28.20	6.48	26.50	6.13	25.00	5.79	24.20	5.61	23.40	5.45	21.70	5.11	
	13	11.8	28.20	6.28	26.50	5.93	25.00	5.60	24.20	5.44	23.40	5.27	21.70	4.95	
	15	13.7	28.20	6.08	26.50	5.76	25.00	5.44	24.20	5.28	23.40	5.12	21.70	4.82	
	19	14.2	28.20	5.89	26.50	5.53	25.00	5.25	24.20	5.05	23.40	4.94	21.70	4.61	
21	15	28.20	5.50	26.50	5.38	25.00	5.11	24.20	4.83	23.40	4.75	21.70	4.42		

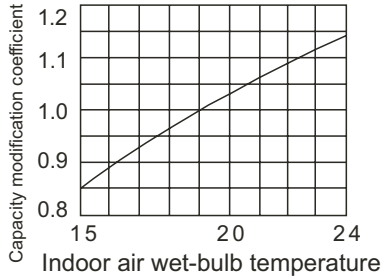
TC: total capacity, KW

PI: power input, KW (compressor+outdoor motor)

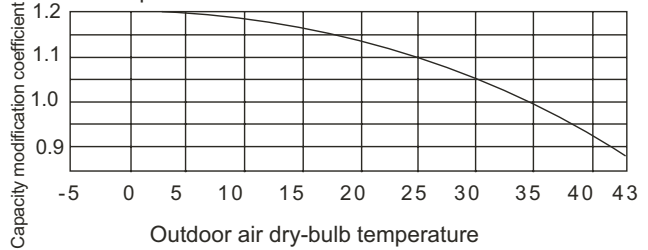
7. Capacity calculation due to capacity modification coefficient

(1) Calculation method of cooling capacity---Refrigerating capacity to be known
 =Refrigerating capacity x (A x B x C x D x E) W

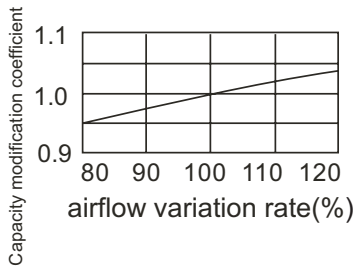
A. Capacity compensation coefficient of indoor air wet-bulb temperature condition



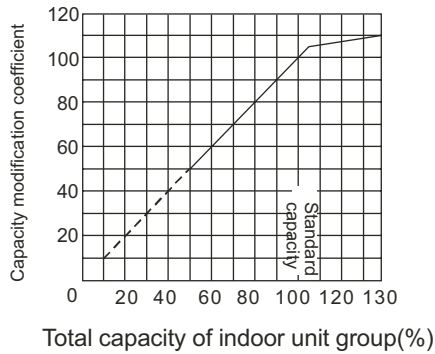
B. Capacity compensation coefficient of outdoor air dry-bulb temperature condition



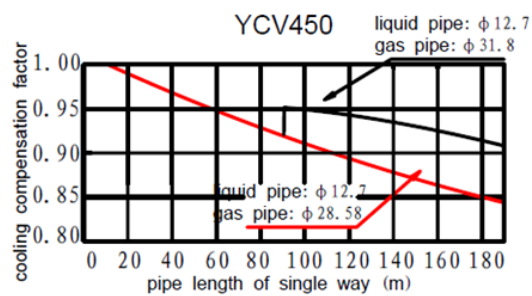
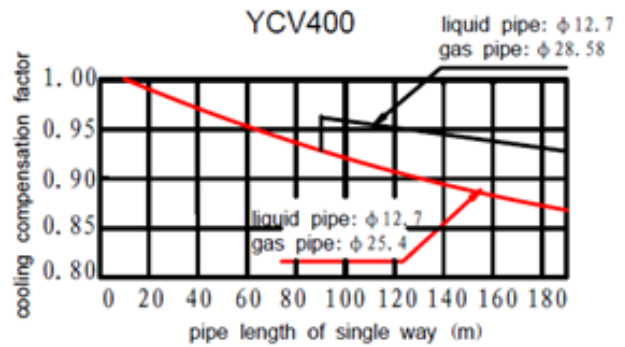
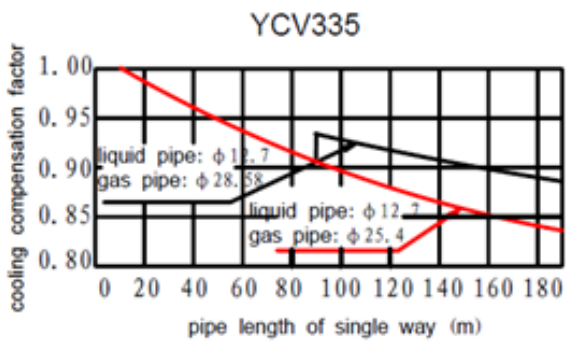
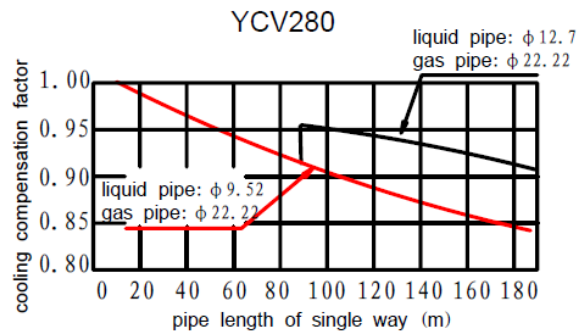
C. Capacity modification coefficient under airflow variation rate of indoor unit group (only for duct unit)



D. Capacity compensation suitable for total capability of indoor unit group (cooling)

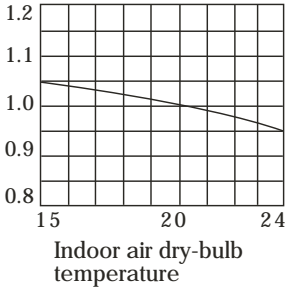


E: Capacity compensation value at different piping length and drop

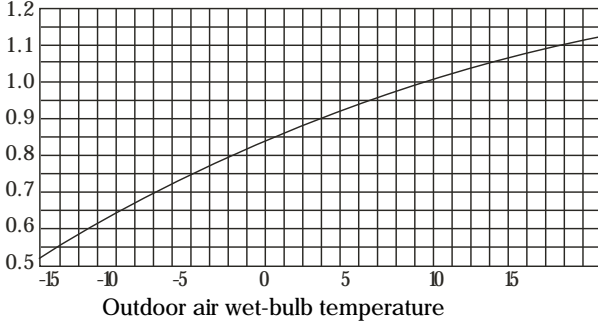


(2) Calculation method of heating capacity---Heating capacity to be known
 = Heating capacityx (A x B x C x D x E x F) W

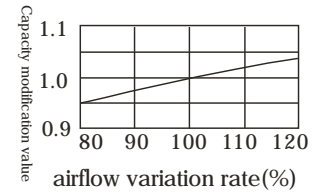
A. Capacity modification value under indoor air dry-bulb temperature condition



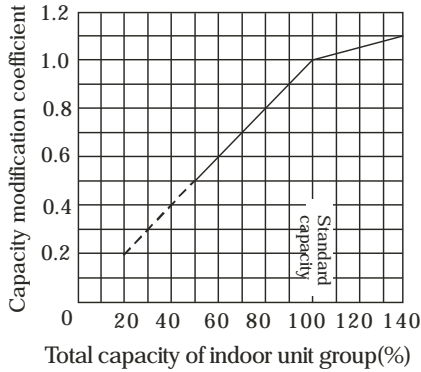
B. Capacity modification value under outdoor air wet-bulb temperature condition



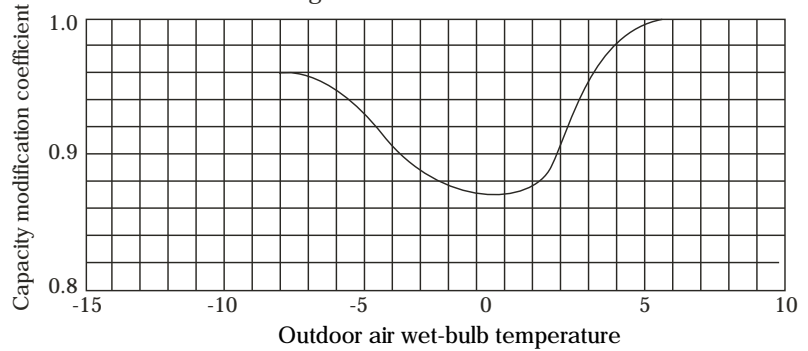
C. Capacity modification value under airflow variation rate of indoor unit group



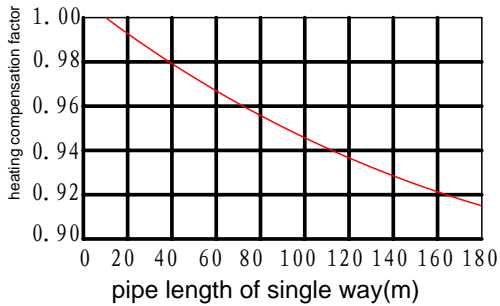
D. Capacity compensation suitable for total capability of indoor unit group (heating)



E. Capacity compensation coefficient for defrost capability of outdoor heat exchanger



F. Heating compensation factor at different pipe length for all modules

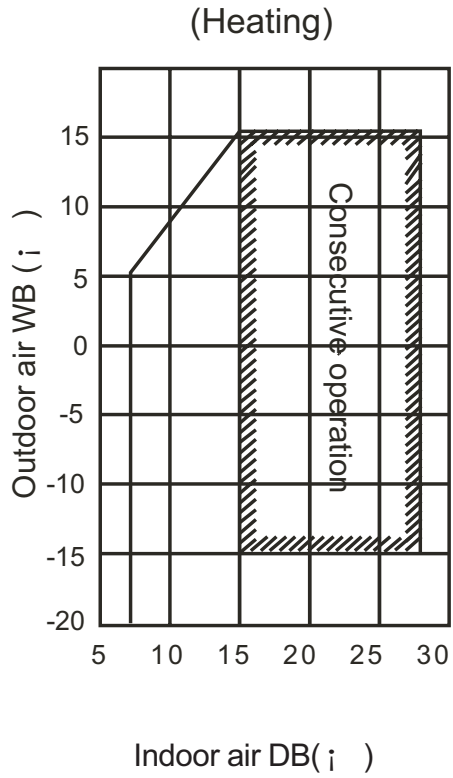
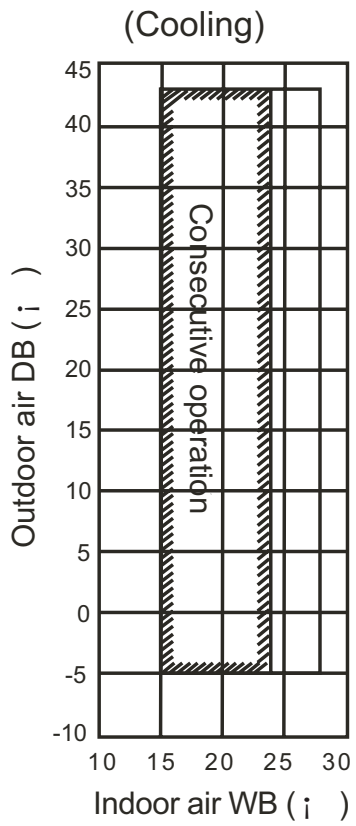


(3) Calculation method of refrigerating capacity---Only one indoor unit running

$$\text{Outdoor modified capacity with a single indoor running} = \text{outdoor modified capacity} * \frac{\text{standby indoor nominal capacity}}{\text{Indoor total nominal capacity}}$$

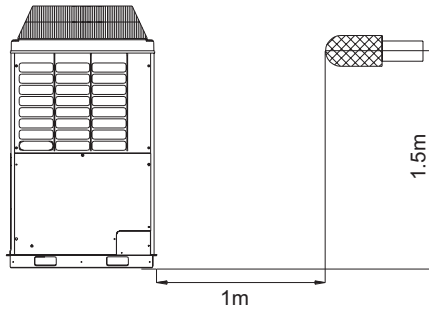
(Outdoor modified capacity: heating or cooling capacity after modify item 1 and 2)

9. Operation limit



10. Sound level

(1) Testing illustration:



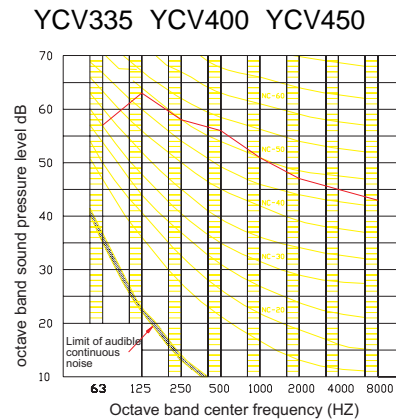
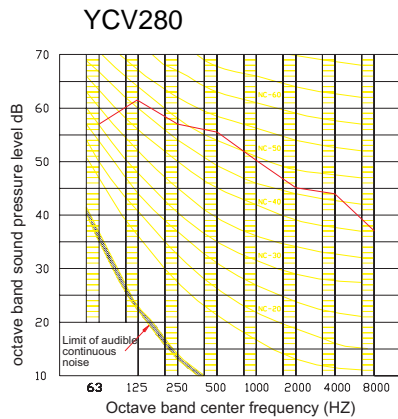
(2) Testing condition:

- a. Unit running in the nominal condition
- b. Test in the semi-anechoic chamber
- c. Noise level varies from the actual factors such as room structure, etc.

(3) Noise level dB(A):

Air speed	Outdoor unit group(380V, 50HZ)							
	10HP	12HP	14HP	16-20HP	22-26HP	28-32HP	34-42HP	44-48HP
H	57	60	60	60	61	62	63	64

(4) Octave band level



PART 4 Outdoor Installation

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1. Precaution in installation

Preface

Please read these "Safety Precautions" firstly then accurately execute the installation work.

Though the precautionary points indicated herein are divided under two headings, "WARNING" and "CAUTION", those points which are related to the strong possibility of an installation done in error resulting in death or serious injury are listed in the "WARNING" section. However, there is also a possibility of serious consequences in relationship to the points listed in the "CAUTION" section as well. In either case, important safety related information is indicated, so by all means, properly observe all that is mentioned.

After completing the installation, along with confirming that no abnormalities were seen from the operation tests, please explain operating methods as well as maintenance methods to the user (customer) of this equipment, based on the owner's manual.

Moreover, ask the customer to keep this sheet together with the owner's manual.

Warning

This system should be applied to places of office, restaurant, residence and the like. Application to inferior environment such as engineering shop could cause equipment malfunction.

Please entrust installation to either the company which sold you the equipment or to a professional contractor. Defects from improper installations can be the cause of water leakage, electric shocks and fires.

Execute the installation accurately, based on following the installation manual. Again, improper installations can result in water leakage, electric shocks and fires.

When a large air-conditioning system is installed to a small room, it is necessary to have a prior planned countermeasure for the rare case of a refrigerant leakage, to prevent the exceeding of threshold concentration. In regards to preparing this countermeasure, consult with the company from which you purchased the equipment, and make the installation accordingly. In the rare event that a refrigerant leakage and exceeding of threshold concentration does occur, there is the danger of a resultant oxygen deficiency accident.

For installation, confirm that the installation site can sufficiently support heavy weight. When strength is insufficient, injury can result from a falling of the unit.

Execute the prescribed installation construction to prepare for earthquakes and the strong winds of typhoons and hurricanes, etc. Improper installations can result in accidents due to a violent falling over of the unit.

For electrical work, please see that a licensed electrician executes the work while following the safety standards

related to electrical equipment, and local regulations as well as the installation instructions, and that only exclusive

use circuits are used. Insufficient power source circuit capacity and defective installment execution can be the cause of electric shocks and fires.

Accurately connect wiring using the proper cable, and insure that the external force of the cable is not



conducted to the terminal connection part, through properly securing it. Improper connection or securing can result in heat generation or fire.

Take care that wiring does not rise upward, and accurately install the lid/service panel. Its improper installation can also result in heat generation or fire.

When setting up or moving the location of the air conditioner, do not mix air etc. or anything other than the designated refrigerant (please see nameplate) within the refrigeration cycle.

Rupture and injury caused by abnormal high pressure can result from such mixing.

Always use accessory parts and authorized parts for installation construction. Using parts not authorized by this company can result in water leakage, electric shock, fire and refrigerant leakage.

Caution

Execute proper grounding. Do not connect the ground wire to a gas pipe, water pipe, lightning rod or a telephone ground wire.

Improper placement of ground wires can result in electric shock.

The installation of an earth leakage breaker is necessary depending on the established location of the unit.

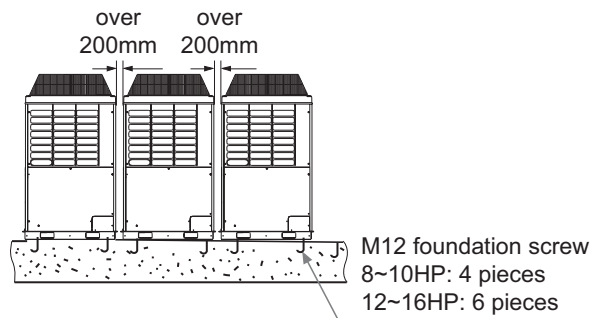
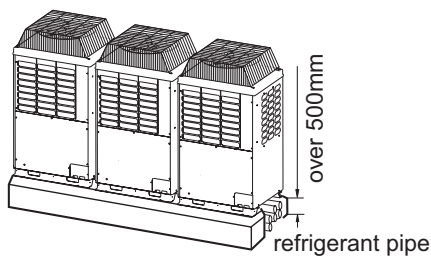
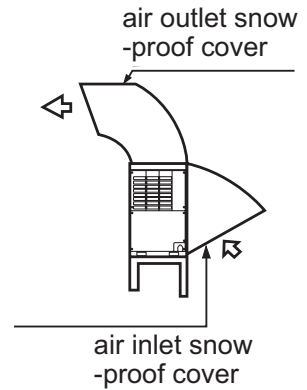
Not installing an earth leakage breaker may result in electric shock.

Do not install the unit where there is a concern about leakage of combustible gas. The rare event of leaked gas collecting around the unit could result in an outbreak of fire.

For the drain pipe, follow the installation manual to insure that it allows proper drainage and thermally insulate it to prevent condensation. Inadequate plumbing can result in water leakage and water damage to interior items.

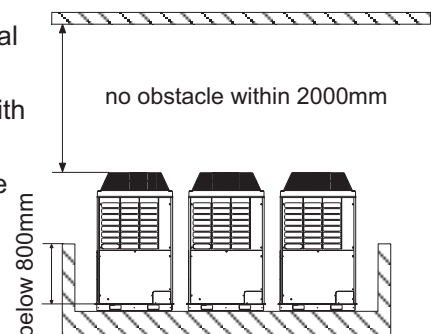
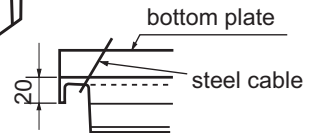
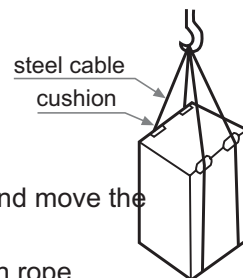
Position selection

1. Install adapter to change wind direction at the gas short circuit place.
2. When installing multiple units, there should be enough air inlet place against air in short circuit.
3. In snowy area, install the unit under the bracket or the snow-proof cover against the accumulative snow on the unit.
4. Do not install the unit at the place where the flammable gas will leak.
5. Install the unit at the strong enough place.
6. Install the unit at the flat place.
7. When the refrigerant pipe is leaded out from the bottom of the uni, the below section should be a bracket with over 500mm height, see below figure.
8. When being installed at the place with strong wind, set the air outlet of the unit and the wind direction vertical. Also fix the unit with the screw.
9. When opening the electric box cover for maintenance, please fix the cover with screw firmly.



Transportation

- In transportation, please don't dismantle the packaging, and move the unit to the installation location as closely as possible.
- If the packaging must be dismantled, hang up the unit with rope against damage.
- Don't hang the unit only at two points. When hanging the unit, don't sit on the unit. The unit should be upright.
- When removing the unit with the forklift, put the fork into the special hole at bottom of the unit.
- When being hanged, the rope should be 4 pieces of steel cable with over 6mm diameter.
- Put the cushion at the contact section between steel cable and the unit against the distortion or damage.

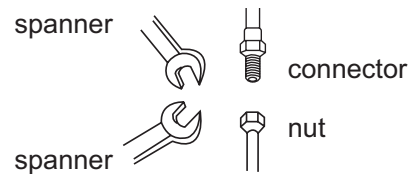


Refrigerant pipe connection

Pipe connection method:

- To ensure the efficiency, the pipe should be as short as possible.
- Daub the refrigerant oil on the connector and the flare nut.
- When bending the pipe, the bending semi-diameter should be as large as possible against the pipe being broken or bent.
- When connecting the pipe, aim at the center to thread the nut by hand and tighten it with the double spanners.
- Don't let the impurity such as sand, water etc into the pipe.

When fastening and loosening the nut, operate with double spanners, because only one spanner cannot execute firmly.



If threading the nut as not aiming at the center, the screw thread will be damaged, further it will cause leakage.

Cautions in piping installation:

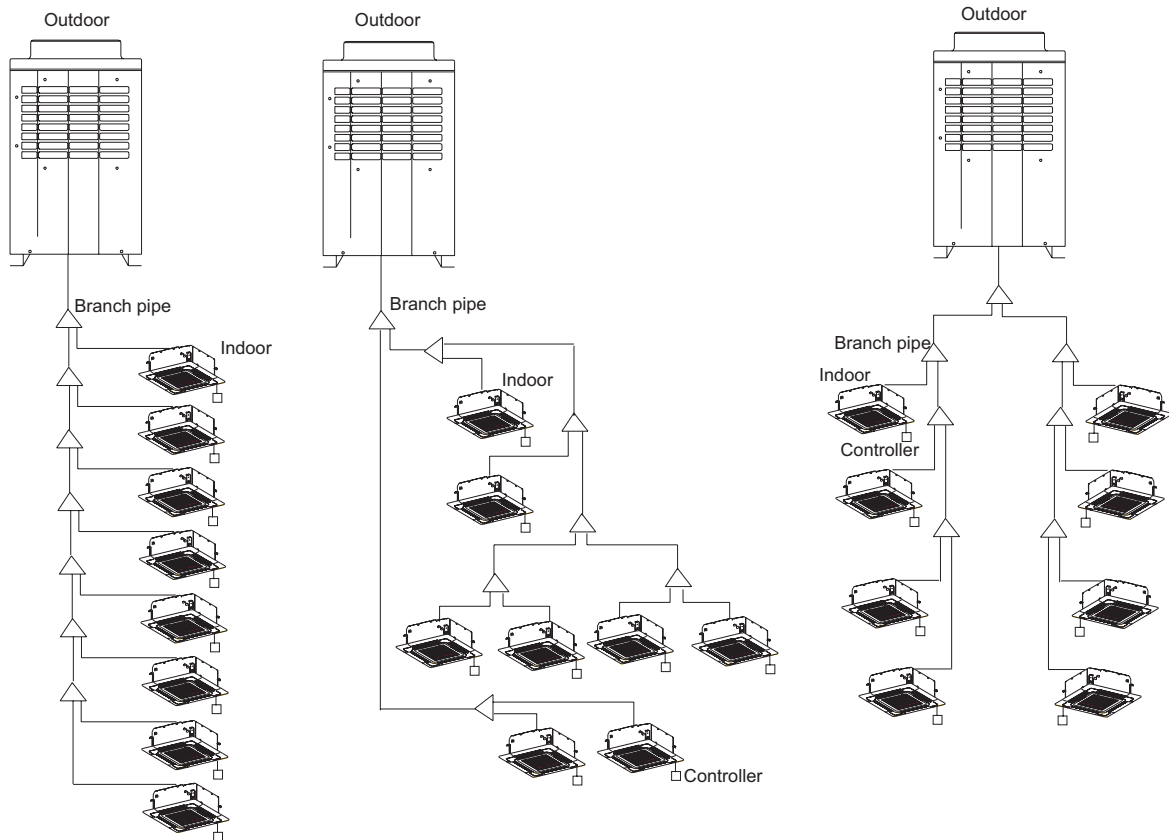
1. When welding the connector with hard solder, charge nitrogen into the pipe against oxidation. Or the oxygen film in the pipe will clog the capillary and the expansion valve, even cause the deathly accident.
2. The refrigerant pipe should be clean. If the water and the other impurity enter the pipe, charge the nitrogen to clean the pipe. The nitrogen should flow under the pressure of about 0.5Mpa and when charging the nitrogen, stop up the end of the pipe by hand to enhance the pressure in the pipe, then loose the hand (meanwhile stop up the other end).
3. The piping installation should be executed after the stop valves are closed.
4. Before welding the valve and the pipes, use the wet cloth to cool down the valve and the pipes.
5. When the connection pipe and the branch pipe need to be cut down, please use the special shears and cannot use the saw.

Pipe material and specs selection

1. Please select the refrigerant pipe of the below material.
Material: the phosphoric oxidize seamless copper pipe, model: C1220T-1/2H (diameter is over 19.05); C1220T-0(diameter is below 15.88).
2. Thickness and specs:
Confirm the pipe thickness and specs according to the pipe selection method(the unit is with R410a, if the pipe over 19.05 is 0-type, the pressure preservation will be bad, thus it must be 1/2H type and over the min. thickness.
3. The branch pipe and the gather pipe must be from Haier.
4. When installing the stop valve, refer to the relative operation instruction.
5. The pipe installation should be in the allowable range.
6. The installation of branch pipe and gather pipe should be performed according to the relative manual.

2. Piping system

2.1 Examples of piping system



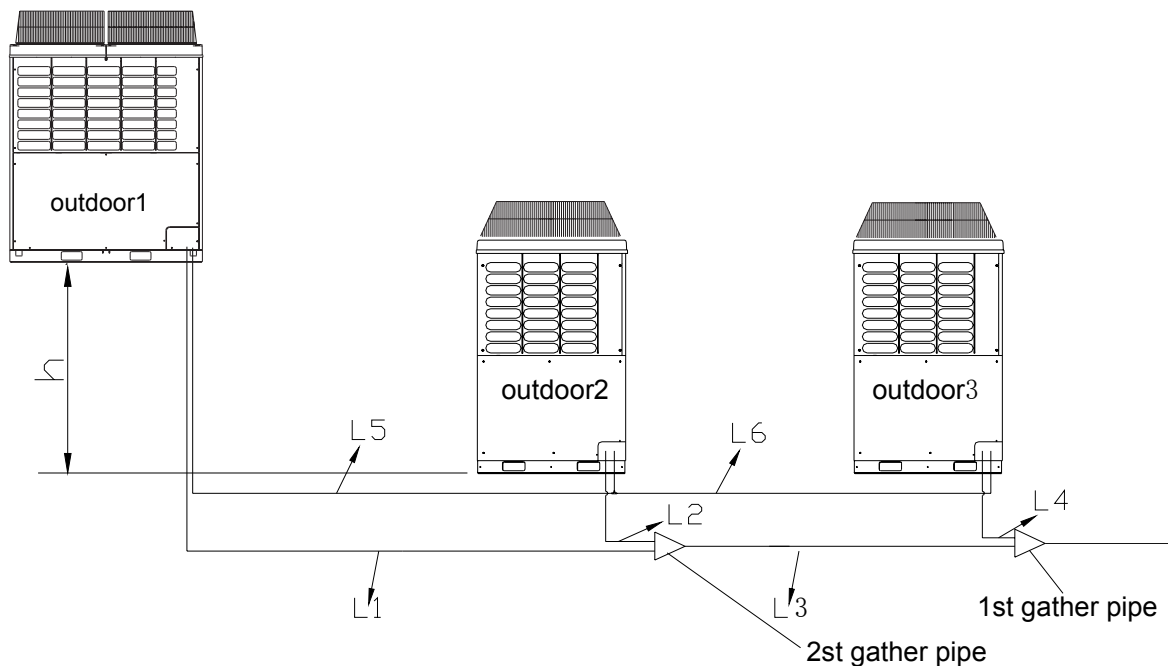
Note: 1. The indoor units in the system can be added or reduced at your will on the condition that the indoor capacity is in the allowable range
2. When the indoor total capacity is more than outdoor nominal capacity, the capacity of running indoor will be relatively reduced. The capacity of running indoor will not exceed outdoor capacity.

2.2 Allowable refrigerant piping length and height difference

a. Allowable pipe length and height difference

Single way total pipe length		300m
Single way max. pipe length		Max. 150m
Main pipe between outdoor to 1 st branch		Max. 90m
Pipe length between outdoors		Less than 10m to 1 st branch pipe
Height difference between indoor and outdoor	Outdoor is upper	Max. 50m
	Outdoor is lower	Max. 40m
Height difference between outdoors(in the same system)		Within 5m (better be horizontal)
Max. pipe length from 1 st branch pipe to indoor		Max. 40m
Height difference between indoors		Max. 15m

b. Pipe length between outdoors

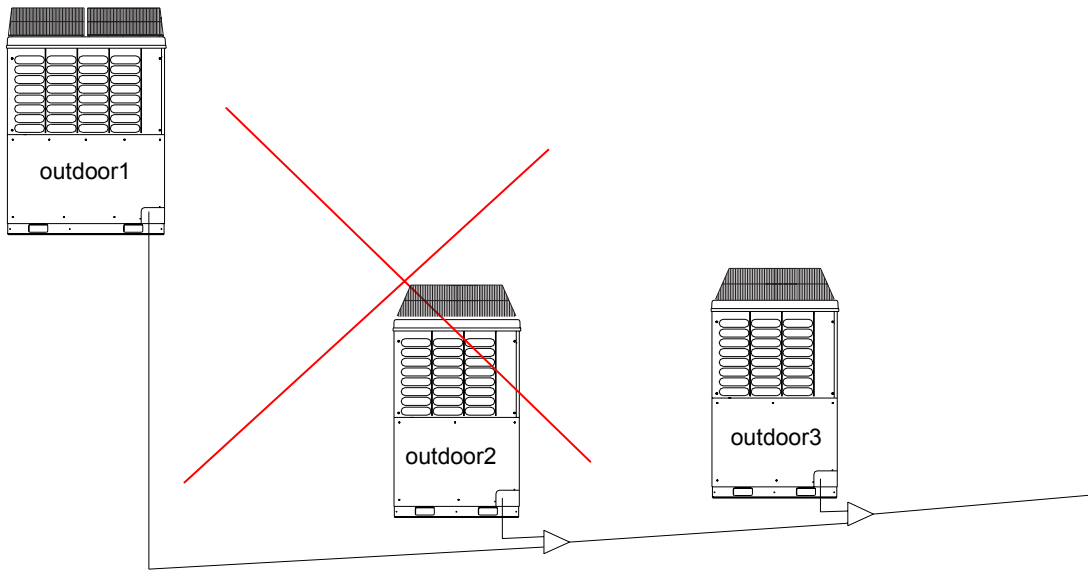
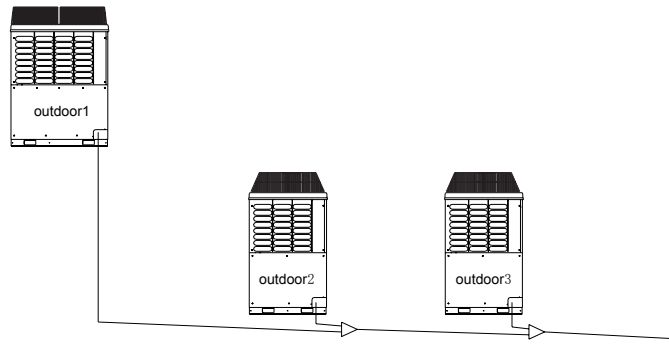


Gas/liquid pipe: $L1+L3 < 10m$, $L2+L3 < 10m$
 Oil equalization pipe: $L5+L6 < 10m$
 height difference between outdoors: $h < 5m$

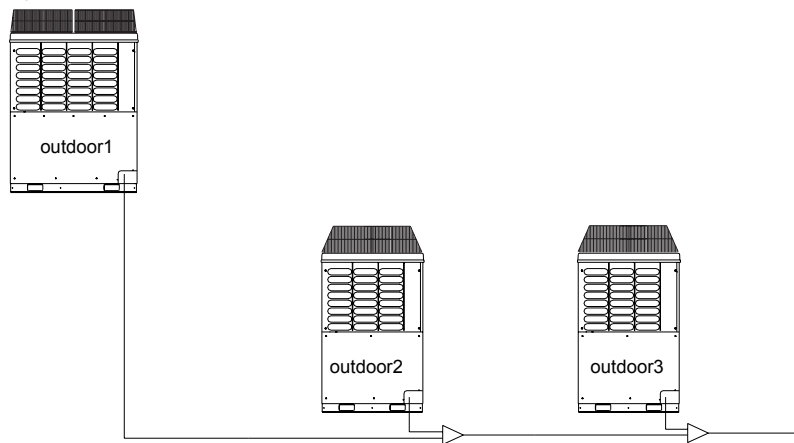
Note: a. TAS-20 includes TAS-30 ;

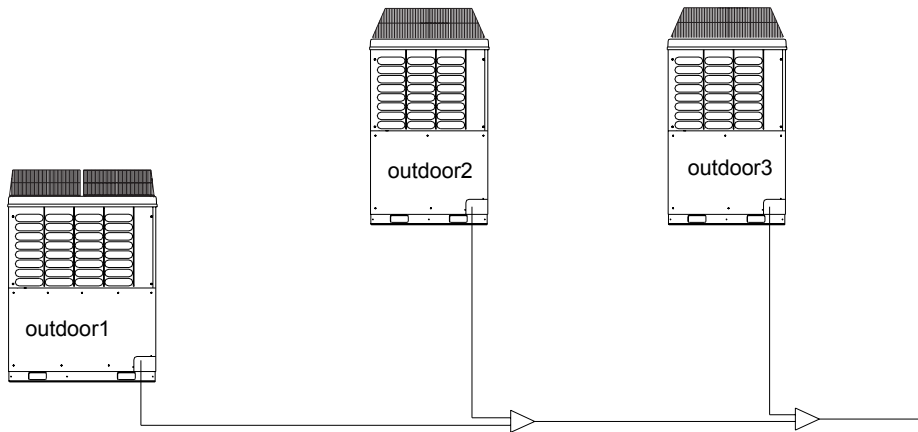
b. The connection pipe among outdoors can not be higher than the stop valve position;

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

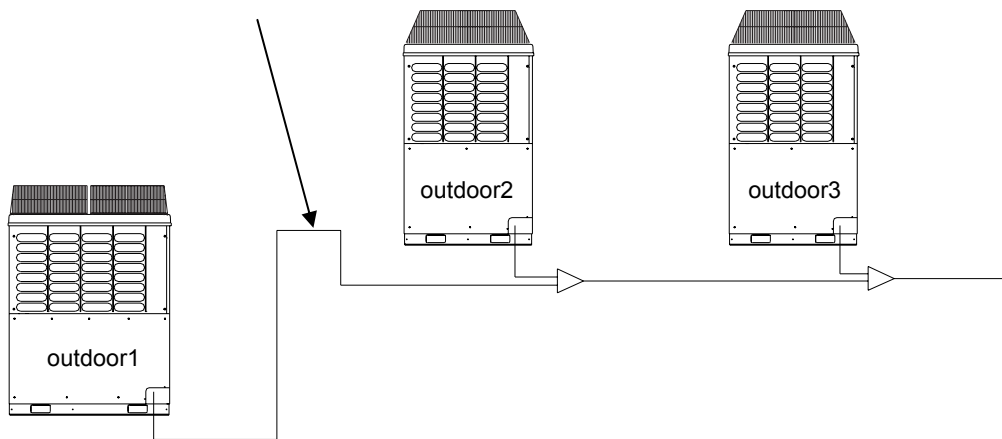


Installation at high difference:

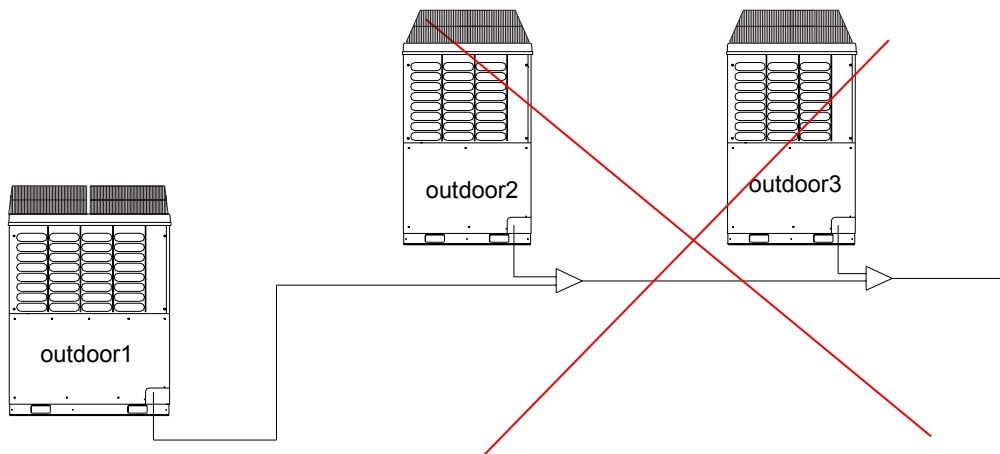




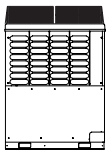
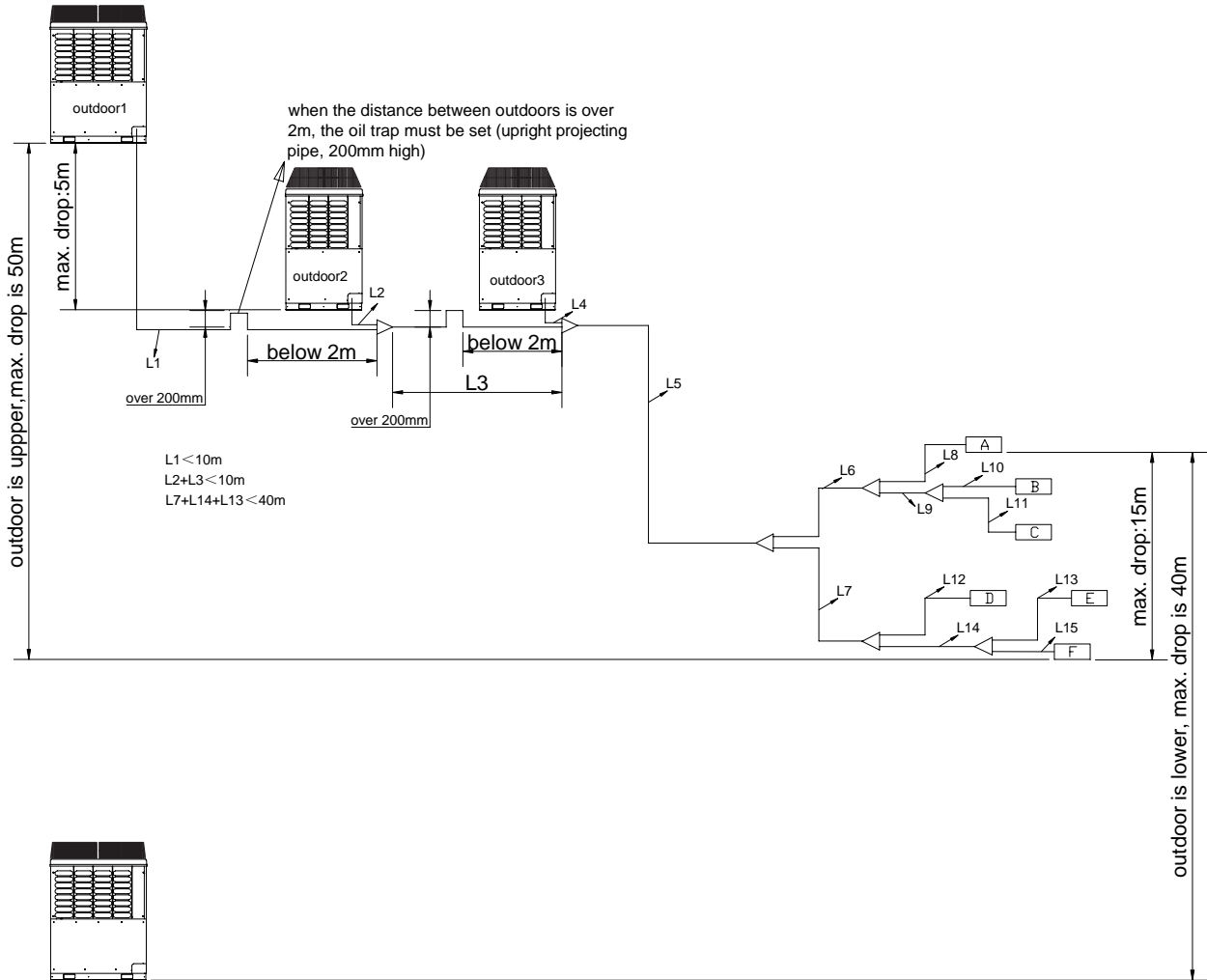
Oil trap (upright projecting pipe, 200mm high), as the figure:



Below is forbidden (compressor oil will flow into the lowest outdoor).

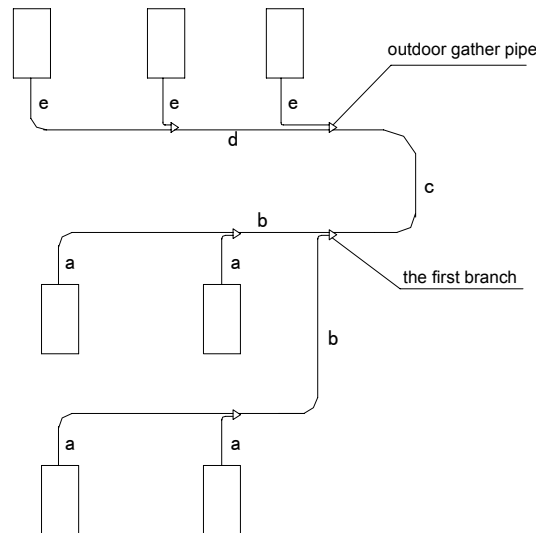


c. Allowable pipe length and height difference



	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+L3+ L5+ L7+ L14+ L13
Max. pipe length after 1 st branch pipe	40	L7+L13+L14
Main pipe actual length	90	L5
Height difference between indoors	15	_____
Height difference between outdoors	5	_____

2.3 Pipe specification:



a. Pipe “a” diameter (between indoor and branch pipe) (depends on indoor pipe, for wall mounted unit, please refer to its specification)

Indoor(*100W)	Gas pipe	Liquid pipe
22~28	φ9.52 (HAV:φ12.7)	φ6.35
36~56	φ12.7 (HAV:φ15.88)	φ6.35(HAV:φ9.52)
71~140	φ15.88 (DBV038~48 : φ19.05)	φ9.52

b. Pipe “b” diameter (between branch pipes)

Total indoor capacity after the branch pipe	Gas pipe	Liquid pipe
14.0KW 《<16.8KW	Φ15.88	Φ9.52
16.8KW 《X<22.4KW	Φ19.05	Φ9.52
22.4KW 《X<33.0KW	Φ22.22	Φ9.52
33.0KW 《X<47.0KW	Φ28.58	Φ12.7
47.0KW 《X<71.0KW		Φ15.88
71.0KW 《X<101.0KW	Φ31.88	Φ19.05
》 101.0KW	Φ38.1	

When the later indoor capacity is less than 14.0KW, the specification of pipe b should refer to the data in table a.

c. Pipe “c” diameter (main pipe, between outdoor gather pipe and the first branch pipe)

Outdoor capacity	Main pipe		Enlarged main pipe	
	Gas pipe	Liquid pipe	Gas pipe	Liquid pipe
22.6KW	φ19.05	φ9.52	φ22.2	φ12.7
28.0KW	φ22.2	φ9.52	φ25.4	φ12.7
33.5KW	φ25.4	φ12.7	φ28.58	φ12.7
40.0KW	φ25.4	φ12.7	φ28.58	φ12.7
45.0KW	φ28.58	φ12.7	φ31.8	φ12.7
50.6KW	φ28.58	φ15.88	φ31.8	φ15.88
56.0KW	φ28.58	φ15.88	φ31.8	φ15.88



61.5KW	φ28.58	φ15.88	φ31.8	φ15.88
68.0KW	φ28.58	φ15.88	φ31.8	φ15.88
73.0KW	φ31.8	φ19.05	φ38.1	φ19.05
80.0KW	φ31.8	φ19.05	φ38.1	φ19.05
85.0 KW	φ31.8	φ19.05	φ38.1	φ19.05
90.0 KW	φ31.8	φ19.05	φ38.1	φ19.05
96.0 KW	φ31.8	φ19.05	φ38.1	φ19.05
101.0KW	φ38.1	φ19.05	φ38.1	φ22.22
106.5KW	φ38.1	φ19.05	φ38.1	φ22.2
113.0KW	φ38.1	φ19.05	φ38.1	φ22.2
118.0KW	φ38.1	φ19.05	φ38.1	φ22.2
123.5KW	φ38.1	φ19.05	φ38.1	φ22.2
130.0 KW	φ38.1	φ19.05	φ38.1	φ22.2
135.0KW	φ38.1	φ19.05	φ38.1	φ22.2

Note: When the distance from outdoor to the longest indoor is over 90m, the main pipe diameter should be enlarged.

d. Pipe “d” diameter (between gather pipes)

Total outdoor capacity before the gather pipe	Liquid pipe (a, c)	Gas pipe (b, d)
~68.0KW	φ15.88	φ28.58
69.0~96.0KW	φ19.05	φ31.8
97.0KW~	φ19.05	φ38.1

e. Pipe “e” diameter (between outdoor and the gather pipe)

outdoor capacity	Gas pipe	Liquid pipe	Oil equalization pipe
10HP	φ22.2	φ9.52	φ9.52
12, 14 HP	φ25.4	φ12.7	
16HP	φ28.58	φ12.7	

Copper pipe selection:

hardness	softness				Half-hardness							
	φ6.35	φ9.52	φ12.7	φ15.88	φ19.05	φ22.2	φ25.4	φ28.58	φ31.8	φ34.9	φ38.1	φ41.3
Outer diameter												
Min. thickness	0.8	0.8	1.0	1.0	1.0	1.1	1.2	1.4	1.4	1.4	1.4	1.5

Note: If the copper pipe with outer diameter φ19.05 is bent pipe, the thickness should be over 1.1.

2.4 Field refrigerant piping

Treatment for pipes to prevent compressor being blocked

Compressor failure includes being blocked and motor burnt. It may be because of damaged parts, but mainly it is relative to the installation and the pipe specification.

Measures to prevent piping failure

A. Charge nitrogen fluently

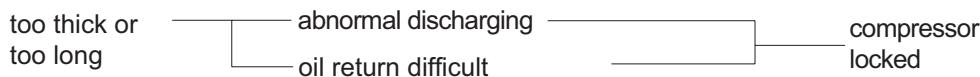
- 1) Non-flow nitrogen will produce the film (Cu_2O). The oxide film will cause the serious failure.
- 2) The exterior substance will cause the capillary or the expansion valve blocked, abnormal discharging temperature, not cooling or heating, compressor locked, etc.

B. Do not let water into the pipe.

- 1) Do not install the pipe when raining.
- 2) Hang and fix the outdoor pipe to prevent water into it. The water in pipe will cause the following effect: the capillary or the expansion valve blocked, refrigerant hydrolyzed into acid substance, cause abnormal crystal by refrigerant oil reaction.

C. Do not let dust or other matter such as the concrete fragment, sand, or the clinker etc into the pipe. Please deal with them carefully.

D. Adopt the specified copper pipe.



E. Fix the refrigerant pipe

- 1) In operation, the pipe will vibrate and expand or shrink. If not being fixed, the refrigerant will focus on one part to cause the broken pipe.
- 2) To prevent the central stress, fix the pipe for every 2-3m.

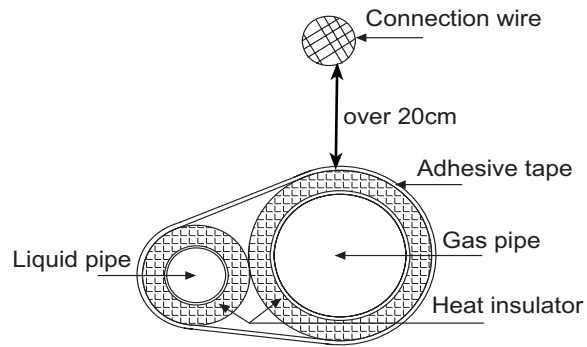
Heat insulation (Gas pipe, liquid pipe and oil equalization pipe must be treated with the heat insulation material against heat release and condensate)

A. The heat insulation material can prevent the condensate caused on gas pipe, which will result in leakage; and the material can prevent someone being scalded for the high temperature on the gas pipe.

B. Wrap the indoor connection pipe with the heat insulation material.

- 1) Gas pipe and liquid pipe should be heat insulated separately.
- 2) The material for gas pipe should endure the high temperature over 120°C .
- 3) The material thickness should be over 10mm, when ambient temp. is 30°C , and the relative humidity is over 80%, the material thickness should be over 15mm.

C. The material should cling the pipe closely without gap, then be wrapped with adhesive tape. The connection wire can not be put together with the heat insulation material and should be far at least 20cm.

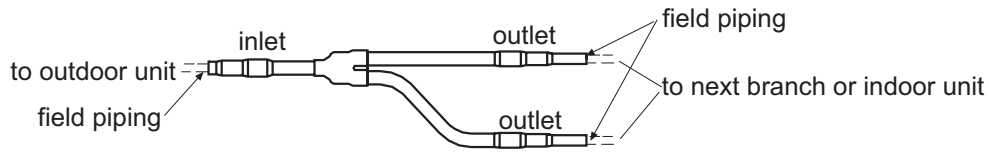


Equivalent pipe length of bend pipe and branch pipe (FYI)

Pipe size	Ø6.35	Ø9.52	Ø12.7	Ø15.88	Ø19.1	Ø31.8
 bend pipe	0.16	0.18	0.20	0.25	0.35	0.55
 branch pipe	0.5	0.5	0.5	0.5	0.5	0.5

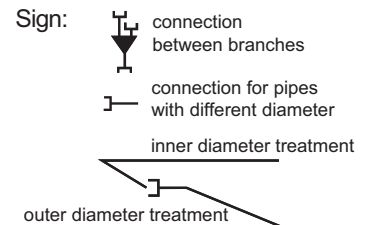
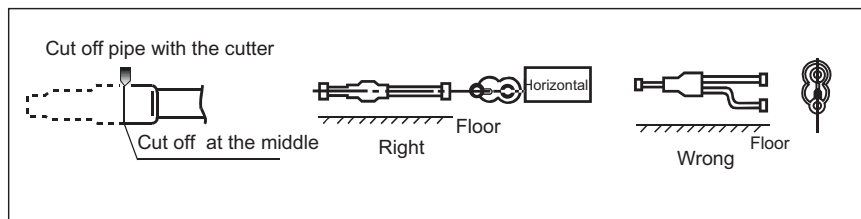
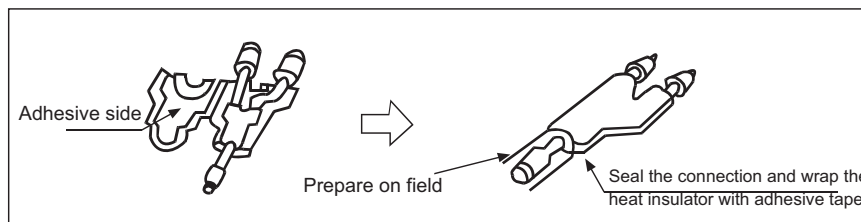
2.5 Branch pipe

Introduction of branch pipe:



Note:

1. When connecting the gather pipe or branch pipe and the outdoor, please pay attention to the outdoor pipe dimension.
2. When adjusting the diameter among gather pipes and among the units, please must execute at the branch pipe side.
3. Please install the branch pipe(gas/liqiud side) in horizontal or vertical direction.
4. When welding with hard solder, please must blow nitrogen. If not, a number of oxide will be produced and cause heavy damage.Besides,to prevent water and dust into the pipe, please make the brim as outer roll.
5. If the size of the selected field pipe is different from that of the branch pipe, the connecting pipe should be cut with the pipe cutter.



Branch pipe selection:

Total capacity of indoor units(100W)	Branch pipe model
Less than 335	TAU 335
Not less than 335 and less than 506	TAU 506
Not less than 506 and less than 730	TAU 730
Not less than 730	TAU 1350

Branch pipe dimensions:

unit:mm ID: inner diameter OD: outer diameter

	Side		Connection of manifold pipe
TAU 335	Gas Pipe		
	Liquid Pipe		
TAU 506	Gas Pipe		
	Liquid Pipe		
TAU 730	Gas Pipe		
	Liquid Pipe		

TAU 1350		<h3>Connection of manifold pipe</h3>

2.6 Gather pipe

Gather pipe is used for combination of outdoor unit

TAS-20 (for 2 basic modules); TAS-30 (for 3 basic modules)

unit:mm, ID: inner diameter; OD: outer diameter Note: Cut off the pipe from its middle when using

Model	Side	Mark	Manifold pipe	Insulation material	Side	Mark	Connection of manifold pipe
TAS-20	Gas side	Ⓐ			Gas side	↻	
	Liquid side	Ⓑ			Gas side	↻	
TAS-30	Gas side	Ⓒ			Gas side	↻	
	Gas side	Ⓓ	<p>Double</p>		Gas side	↻	
	Liquid side	Ⓔ			Liquid side	↻	



2.7 Pipe specifications and connection methods (unit: mm)

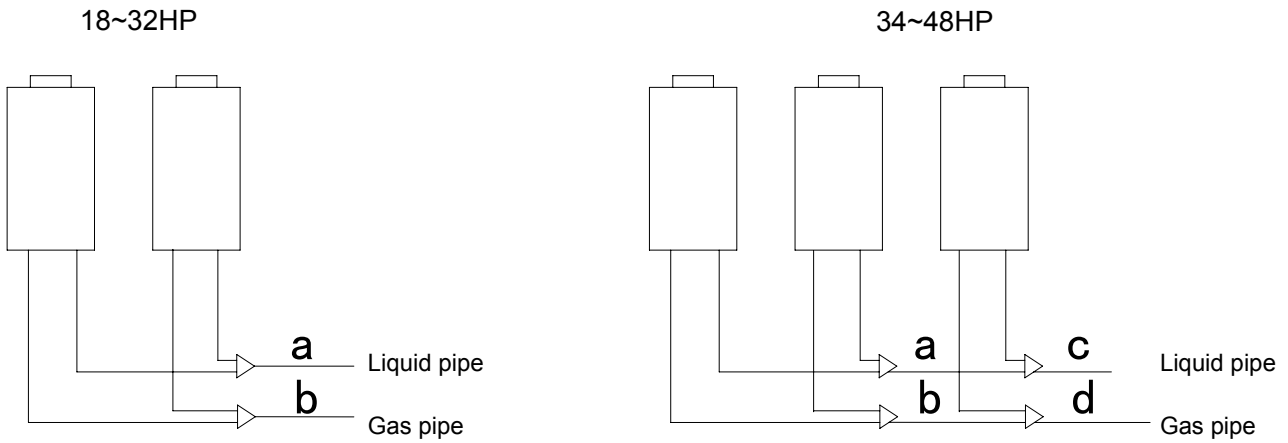
A. Outdoor unit

Model	Gas pipe side		Liquid pipe side		Oil pipe side	
	Diameter	Connecting method	Diameter	Connecting method	Diameter	Connecting method
YCV280	∅ 22.22	Brazing	∅ 9.52	Flared joint	∅ 9.52	Flared joint
YCV335	∅ 25.4	Brazing	∅ 12.7	Flared joint	∅ 9.52	Flared joint
YCV400	∅ 25.4					
YCV450	∅ 28.58					

B. Indoor unit

Model Capacity	Gas pipe side		Liquid pipe side	
	Diameter	Connecting method	Diameter	Connecting method
07	∅9.52(AS07:12.7)	Flared joint	∅6.35	Flared joint
09	∅9.52(AS09:12.7)		∅6.35	
12	∅12.7		∅6.35	
14	∅12.7		∅6.35	
16	∅12.7		∅6.35	
18	∅12.7		∅6.35	
24	∅15.88		∅9.52	
28	∅15.88		∅9.52	
32	∅15.88		∅9.52	
38	∅15.88		∅9.52	
48	∅15.88		∅9.52	
72	∅15.88*2		∅9.52	
96	∅15.88*2		∅9.52	

(1) Outdoor pipe dimension

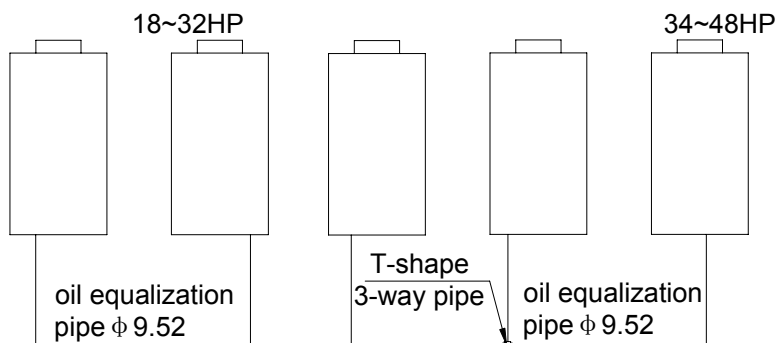


The pipe "a, b, c, d" should be confirmed as to the below table.

Former outdoor capacity	Liquid pipe (a, c)	Gas pipe (b, d)
~62.0KW	φ15.88	φ28.58
62.0KW~96.0KW	φ15.88	φ31.8
96.0KW~101KW	φ15.88	φ38.1
101.0KW~	φ19.05	φ38.1

Note: When the single pipe length is over 90m, the above pipe should be enlarged as the former information.

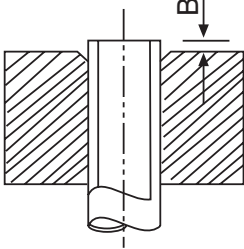
(2) Oil equalization pipe connection



2.9 Pipe installation

Important!

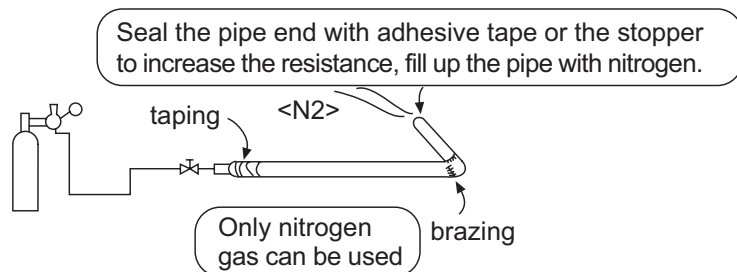
- Please don't let the pipe and the parts in the unit collide each other.
- When connecting the pipes, close the valves fully.
- Protect the pipe end against the water, impurity into the pipes (welding after being flat, or being sealed with adhesive tape).
- Bend the pipe as large semi-diameter as possible(over 4 times of the pipe diameter).
- The connection between outdoor liquid pipe and the distributing pipe is flared type. Please expand the pipe with the special tool for R410A after installing the expanding nut. But if the projecting pipe length has been adjusted with the copper pipe gauge, you can use the original tool to expand the pipe.
- Since the unit is with R410A, the expanding oil is ester oil, not the mineral oil.
- When connecting the expanding pipe, fasten the pipes with double-spanner. The torque refers to the former info.

Expanding pipe:A(mm)		Projecting length of pipe to be expanded:B(mm)			
pipe outer diameter	A ⁰ _{-0.4}		pipe outer diameter	when it is hard pipe special tool for R410A	the former tool
∅6.35	9.1		∅6.35	0-0.5	1.0-1.5
∅9.52	13.2		∅9.52		
∅12.7	16.6		∅12.7		
∅15.88	19.7		∅15.88		

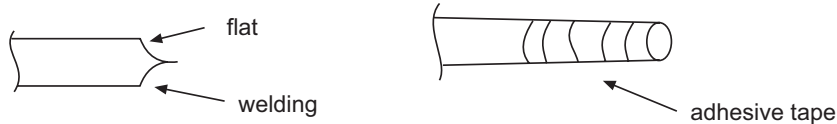
- The outdoor gas pipe and the refrigerant distributing pipe, as well the refrigerant distributing pipe and the branch pipe should be welded with hard solder.
- Weld the pipe at the same time charge the nitrogen. Or it will cause a number of impurity (a film of oxidation) to clog the capillary and the expansion valve, further cause the deadly failure.

Operation procedure

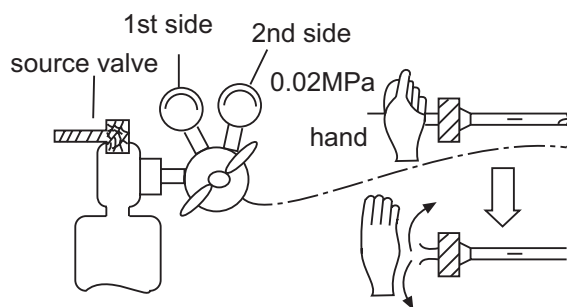
- Weld the pipe at the same time charge the nitrogen. Or it will cause a number of impurity (a film of oxidation) to clog the capillary and the expansion valve, further cause the deadly failure.



- Protect the pipe end against the water, impurity into the pipes (welding after being flat, or being sealed with adhesive tape).



- The refrigerant pipe should be clean. The nitrogen should flow under the pressure of about 0.02MPa and when charging the nitrogen, stop up the end of the pipe by hand to enhance the pressure in the pipe, then loose the hand (meanwhile stop up the other end).



- When connecting the pipes, close the valves fully.
- When welding the valve and the pipes, use the wet cloth to cool down the valve and the pipes.

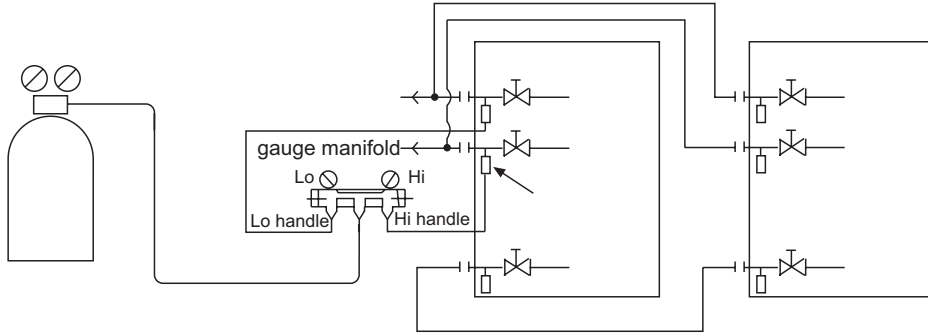
3. Leakage testing

Charge nitrogen(to test the leakage condition)

To prevent the nitrogen into outdoor system, charge nitrogen to the indoor respectively. Connect the connection pipe to checking joint of the indoor gas pipe stop valve, and seal all the other joints except for outdoor's, charge the nitrogen, the gas pressure should be 40Kf/cm².

- 1) The outdoor unit has been executed the leakage test in the factory. After connecting the distributing pipe, execute the leakage test from the outdoor check valve and the indoor. Besides, while testing, the valves should be close.
- 2) Refer to the below figure to charge the nitrogen into the unit to take a test. Never use the chlorin, oxygen, flammable gas in the leakage test. Apply pressure both on the gas pipe and the liquid pipe.
- 3) Apply the pressure step by step to the target pressure.
 - a. Apply the pressure to 0.5MPa for more than 5 minutes, confirm if pressure goes down.
 - b. Apply the pressure to 1.5MPa for more than 5 minutes, confirm if pressure goes down.
 - c. Apply the pressure to the target pressure (4.05MPa), record the temp. and the pressure.
 - d. Leave it at 4.05MPa for over 1 day, if pressure does not go down, the test is passed. Meanwhile, when the temp. changes for 1degree, pressure will change 0.01MPa as well. Correct the pressure.

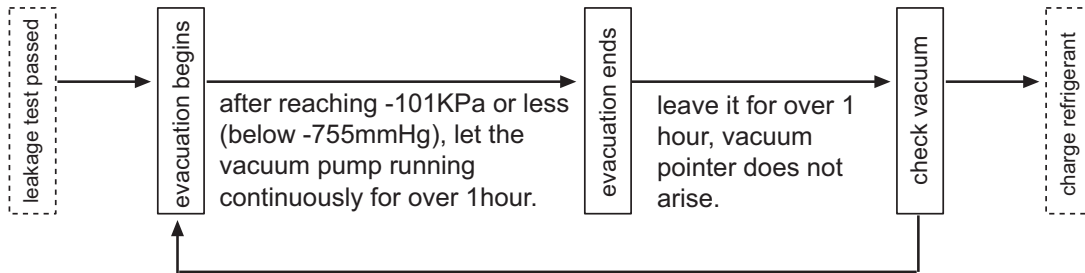
- e. After confirmation of a~d, if pressure goes down, there is leakage. Check the brazing position, flared position by laying on the soap. modify the leakage point and take another leakage test.
- 4) After leakage test, must execute the evacuation.



4 . Evacuation

Evacuate at the check valve of liquid stop valve and both sides of the gas stop valve. The oil equalization pipe also must be vacuum (executed at the oil equalization pipe check valve respectively).

Operation procedure:



if vacuum pointer arises, it shows there is water or leakage in the system, please check and modify it, and then evacuate again.

Because the unit is with refrigerant R410A, the below issues should be paid attention:

- To prevent the different oil into the pipe, please use the special tool for R410A, especially for gauge manifold and charging hose.
- To prevent the compressor oil into the refrigerant cycle, please use the anti-counter-flow adapter.
- When maintaining the outdoor, release refrigerant from check valve. When taking vacuum evacuation, set the relative dip switch, the detailed refers to Page 38.

5. Refrigerant charging and additional charging

Model	additional refrigerant charging per meter(kg/m)						charge when out of factory
	∅22.22	∅19.05	∅15.88	∅12.7	∅9.52	∅6.35	
YCV280	0.35	0.25	0.17	0.11	0.054	0.022	11kg
YCV335							12kg
YCV400							12kg
YCV450							14.5kg

Remarks:

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

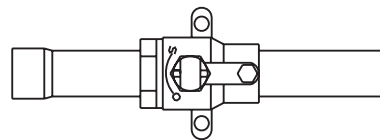
L5: total length of 9.52 liquid pipe L6:total length of 6.35 liquid pipe

6. Check valve operation

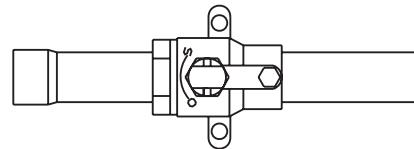
Open/close method:(The gas pipe stop valve for YCV335 YCV400 YCV450

- Take down the valve cap, gas pipe turns to "open" state as right figure.
- Turn the liquid pipe and the oil equalization pipe with hexangular spanner until it stops. If opening the valve strongly, the valve will be damaged.
- Tighten the valve cap.

Tighten torque as the table below:



"open"state



"close"state

Tighten torque N.m			
	shaft (valve body)	cap (cover)	T-shape nut (check joint)
for gas pipe	less than 7	less than 30	13
for liquid pipe	7.85 (MAX15.7)	29.4 (MAX39.2)	8.8 (MAX14.7)
for oil equalization pipe	4.9 (MAX11.8)	16.2 (MAX24.5)	8.8 (MAX14.7)

Note: The gas pipe stop valve for AV08NMVESA AV10NMVESA is screw type, rotate the rod clockwise totally, the valve is close; rotate the rod counterclockwise totally, the valve is open; if the rod is not rotated clockwise totally and also not rotated counterclockwise totally, the check valves of indoor, outdoor and the stop valve are connected.

7. Requestment of copper pipe specs and thickness

Exterior diameter(mm)	Pipe thickness(mm)	Torque(N.m)	Remarks
6.35	0.8	16~20	bent pipe
9.52	0.8	40~50	
12.7	1.0		
15.88	1.0	90~120	
19.05	1.0(straight pipe)	100~140	more than 1.0 (bent pipe)
22.22	1.1	----	straight pipe
25.4	1.2		
28.58	1.4		
31.8	1.4		
34.9	1.4		
38.1	1.4		
41.8	1.43		

8. Utilized tool comparison for MRVII R22 and R410A

TOOL	PURPOSE	R22	R410A	REASON
knife	cut the pipe	○	○	
expander	enlarge the pipe	○	×	for R410A, must enlarge the projecting pipe
spanner	fasten the flare nut	○	×	standard torque of 1/2, 5/8 pipe is larger
flare tool	flare the pipe	○	○	
pipe bender	bend the pipe	○	○	
pressure gauge	used in leakage test	○	×	leakage test pressure is higher
welding torch	brazing the pipe	○	○	
gauge manifold	evacuation device	○	×	different pressure from R22: max.: HP5.3Mpa min.:3.5Mpa
charging hose	charging refrigerant	○	×	
vacuum pump with one-way stop valve	evacuation device	○	×	must ensure oil in vacuum pump can not flow into the unit when pump stops
charging cylinder	charging refrigerant	○	×	R410A can not be charged as gas state
electronic charging scale	charging refrigerant	○	○	
leakage detector	leakage detecting	○	×	can not use freon detector (CFCs or HCFCs), R410A excludes Cl. Use the hydrogen detector (or R134a detector)

Note: The pipes of R410A connection with the same diameter can not be welded with the flared joints. You must expand the diameter of pipe joint, then weld the connecting pipe.



9. Trial running

9.1 Before trial running

Make sure the following works have been finished according to the installation manual.

- a. Piping work
- b. Wiring work
- c. Leakage check
- d. Evacuate work
- e. Additional refrigerant charging
- f. Also check if the indoor works have been finished

9.2 Trial running

After checking the above works are finished, operate the unit normally and check the following items:

- a. Make sure the indoor and the outdoor are operating normally;
- b. Operate indoor unit one by one and make sure the corresponding outdoor unit is also running well;
- c. Check if the proper temperature air is blowing out from indoor unit;
- d. Check if the fan speed can be adjusted properly by the controller

Note:

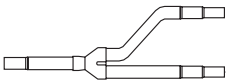


1. Heating and cooling mode can be operated under the correct temperature range.
2. If a knocking noise can be heard from the compressor, stop the unit immediately and then energize the crankcase heater to get enough long time before restarting the unit.
3. Once stopping, the compressor will not run right now only after the unit has stopped for 3 minutes, which can protect the compressor.
4. In the quiet running at night mode, the outdoor fan will be at low speed. But this is not a malfunction.

9.3 Check after trial running

Perform the following inspections after the trial running is finished:

1. Record the field setting
2. Record the installation data: pipe length, height difference, charge amount, etc..

10. Accessories

name	3-way pipe	Wire clamp	Wire clamp	The others: operation manual or other documents
shape		 large	 small	
quantity	1	3	4	

PART 5 Electric Control and Debugging

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1. Electric installation

Warning :In European Market :local 3 phase isolator (power switch) must be fitted locally to the unit (Legal requirement for EU).

For other area, pls. comply with local regulation requirement.

Electric wiring should be executed by the specialized well-trained person.

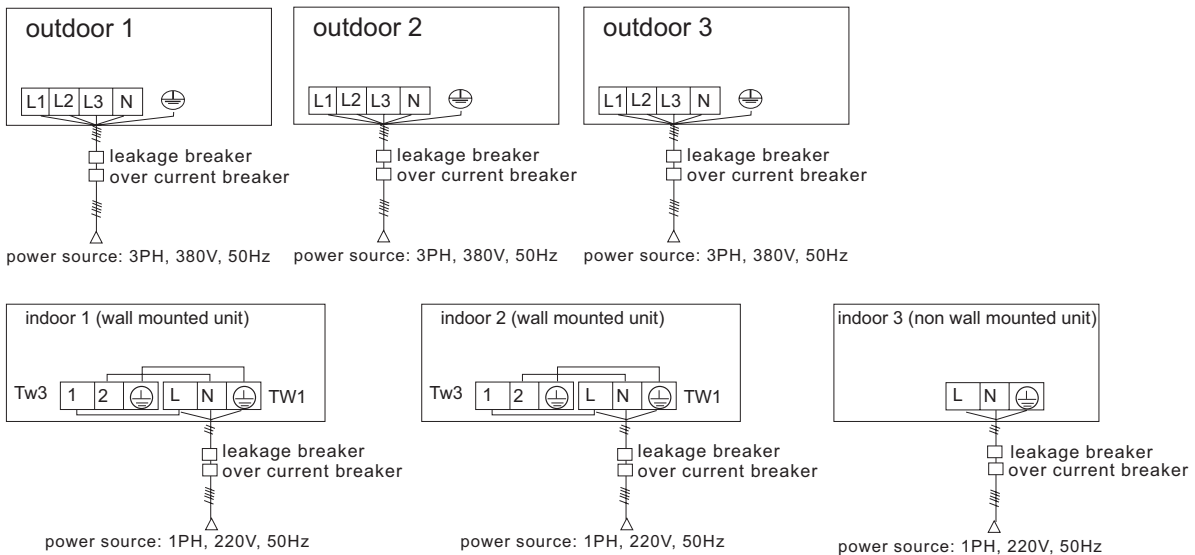
Warnings:

- A. Do not take the other wire except for copper wire as the power cable.
- B. All indoor/outdoor units must be connected with the earthing wire of power cable. The earthing wire can not be connected onto the earthing wire of coal gas pipe, water pipe, lightning rod, or telephone. Or the electric shock or fire will occur.
- C. Must install the leakage breaker and the over current breaker, or electric shock will occur.
- D. Before finishing electric installation, do not electrify the unit.
- E. Indoor and outdoor use their individual power source. All indoors use one power source.
- F. The communication wire and the power cable must be individual and can not use one multi-core cable, or the communication wire will be interfered to cause abnormal.

Note: When one wired controller controls multiple indoors, the connected indoor units must use the common phase of power source, or the communication will be abnormal. For example, the power source is L1, L2, L3, and N, all the indoor units must use L1/N or L2/N or L3/N.

1. Wiring system:

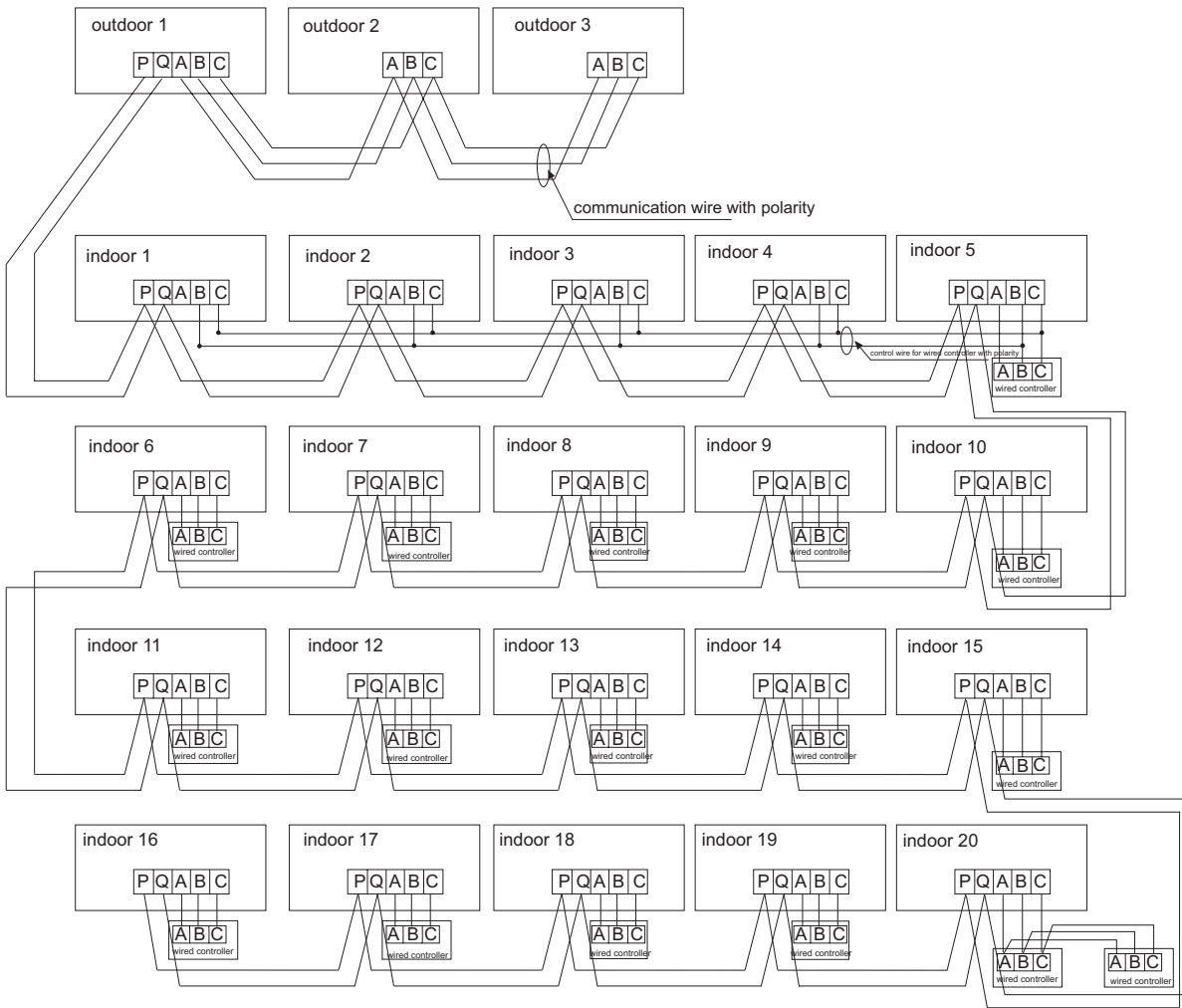
(1) Power wiring figure



Note:

- Indoor and outdoor use their individual power source.
- All indoors use one power source.
- Must install the leakage breaker and the over current breaker, or electric shock will occur.

(2) Communication wiring figure



Outdoor units are in parallel through 3 polar wires. The outdoor and all indoor units are in parallel through 2 non-polar wires.

Three wiring methods between wired controller and indoor unit:

A. 1 to multi (group control): one wired controller controls 2~16 indoors, as shown in above figure, indoor 1~indoor 5: indoor 5 is wired control master unit, the others are wired control slave units. Wired controller and the master indoor (directly connected to wired controller) is connected by 3 polar wires; the other indoors and the master indoors are connected by 2 polar wires.

B. 1 to 1 (one wired controller controls one indoor): as shown in above figure, indoor 6~ indoor 19, indoor and wired controller are connected by 3 polar wires.

C. 2 to 1 (two wired controller controls one indoor): as shown in above figure, indoor 20. Either of wired controllers can be set as master wired controller, and the other is slave wired controller. Master/slave wired controller, and master/indoor are connected by 3 polar wires.

When indoor is controlled by remote controller, refer to the "wired control master unit/wired control slave unit/remote control unit table". A, B, C on signal terminal block need not wires and not connect the wired controller.

2. Specs for power cable and communication wire

(1) Outdoor power source and power cable

item model		power source	power cable section (mm ²)	wire length (m)	circuit breaker (A)	rated current of residual current circuit breaker(A) leakage current (mA) response time(s)	earthing wire	
							section (mm ²)	screw
individual power	YCV280	3N~, 380V, 50Hz	10	60	40	40A 30mA below 0.1s	3.5	M5
	YCV335		10	60	60	60A 30mA below 0.1s	3.5	M5
	YCV400		16	60	60	60A 30mA below 0.1s	3.5	M5
	YCV450		16	60	70	70A 30mA below 0.1s	3.5	M5

- Power cable must be fixed firmly.
- Each outdoor must be earthed well.
- When power cable exceeds the range, thicken it appropriately.

(2) Indoor power source, communication wire between indoor and outdoor, among indoors

indoor total current (A)	item	power cable section (mm ²)	wire length (m)	rated current of overcurrent breaker(A)	rated current of residual current circuit breaker(A) leakage current (mA) response time(s)	communication wire section	
						outdoor/indoor (mm ²)	indoor/indoor (mm ²)
< 10		2	23	20	20A, 30mA, below 0.1s	2-core * (0.75-2.0mm ²) shielded wire	
≥ 10 and < 15		3.5	24	30	30A, 30mA, below 0.1s		
≥ 15 and < 22		5.5	27	40	40A, 30mA, below 0.1s		
≥ 22 and < 27		10	42	50	50A, 30mA, below 0.1s		

- Power cable and communication wire must be fixed firmly.
- Each indoor must be earthed well.
- When power cable exceeds the range, thicken it appropriately.
- Shielded layer of communication wires must be connected together and be earthed at single point.
- Communication wire total length cannot exceed 1000m.

(3) Communication wire for wired controller

wire length(m)	wire spec	wire length(m)	wire spec
< 100	0.3mm ² * (3-core) shielded wire	≥ 300 and < 400	1.25mm ² * (3-core) shielded wire
≥ 100 and < 200	0.5mm ² * (3-core) shielded wire	≥ 400 and < 600	2mm ² * (3-core) shielded wire
≥ 200 and < 300	0.75mm ² * (3-core) shielded wire		

- Shielded layer of communication wire must be earthed at one end.
- The total length cannot exceed 600m.

(4) Control type and the switchover

- Indoor unit can be controlled by wired controller or remote controller.
- When installation, the installer must set the unit due to the control type and wiring type.
Switchover between wired control master/slave unit /remote control unit, set when installation:

Indoor control type selection

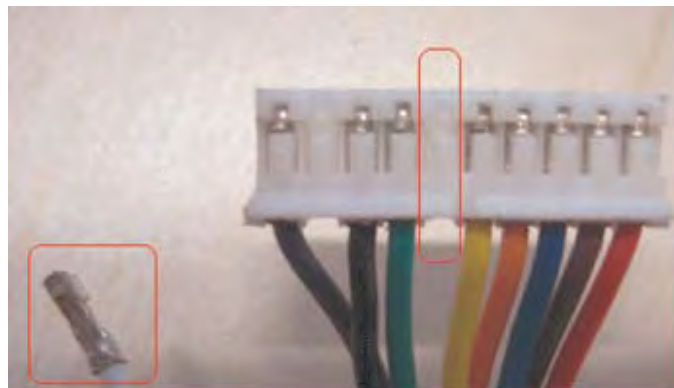
indoor PCB	wired control master unit	wired control slave unit	remote control	remarks
CN23	short connected	disconnected	disconnected	1.The communication address between master/slave wired controller and the outdoor is different. 2. If central control is necessary, all indoor central control addresses in one group are identical, while the indoor address in different groups is different too.
CN30	short connected	short connected	disconnected	
CN21	blank	blank	to remote receiver	
SW08-[6]	ON	ON	OFF	
SW01-1 2 3 4	"0"	1~15 (different dialing setting on SW01 for the slave units in one group)	"0"	
signal terminal block	A,B,C to wired controller	B,C to wired controller	A,B,C not to wired controller	

Note: In the above figure, the state in the frame is set when out of factory.

Note:

1. In the above figure, the state in the frame is set when out of factory.
2. The indoor controlled by master/slave wired controller and the indoor controlled by individual wired controller are all wired controlled master indoor.
3. The remote receiver is equipped with a multi-wire which can be inserted in CN21.

3. Note: For the indoor unit controlled by wired controller, if indoor unit is with the remote receiver, MUST pull out the white wire from the remote receiver connector.



4. Note: Correct procedure to shut off the unit: switch off the unit by the controller, then cut off the power source. **FORBIDDEN** to cut off the power directly!
5. All the indoor EEVs are at open state which are set out of factory.



2. Trial operation and the performance

3-minute delay function

If starting up the unit after being powered off, the compressor will run about 3 minutes later against being damaged.

Cooling/heating operation

Indoor units can be controlled individually, but cannot run in cool and heat mode at the same time. If the cool mode and the heat mode are existing simultaneously, the unit set latter will be standby, and the unit set earlier will run normally. If the A/C manager sets the unit at cooling or heating mode fixedly, the unit can not run at the other modes.

Defrosting in heating mode

In heating mode, outdoor defrosting will affect the heating efficiency. The unit will defrost for about 2~10 minutes automatically, at this time, the condensate will flow from outdoor, also in defrosting, the vapour will appear at outdoor, which is normal. Indoor motor will run at low speed or stop, and outdoor motor will stop.

The unit operation condition

To use the unit properly, please operate the unit under the allowed condition range.

If operating beyond the range, the protection device will act.

The relative humidity should be lower than 80%. If the unit runs at the humidity over 80% for a long period, the dew on the unit will drop down and the vapour will be blown from air outlet.

Protection device (such as high pressure switch)

High pressure switch is the device which can stop the unit automatically when the unit runs abnormally.

When the high pressure switch acts, the cooling/heating mode will stop but the running LED on wired controller will be light still. The wired controller will display failure code.

When the following cases occur, the protection device will act:

In cooling mode, air outlet and air inlet of outdoor are clogged.

In heating mode, indoor filter is stucked with duct; indoor air outlet is clogged.

When protection device acts, please cut off the power source and re-start up after eliminating the trouble.

When power is failure

When power is failure in running, all the operations will stop.

After being electrified again, if with re-start up function, the unit can resume to the state before power off automatically; if without re-start up function, the unit needs to be switched on again.

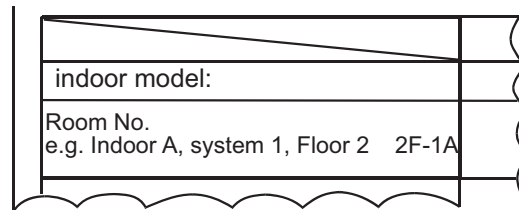
When abnormal occurs in running because of the thunder, the lightning, the interference of car or radio, etc, please cut off the power source, after eliminating the failure, press "ON/OFF" button to start up the unit.

Heating capacity

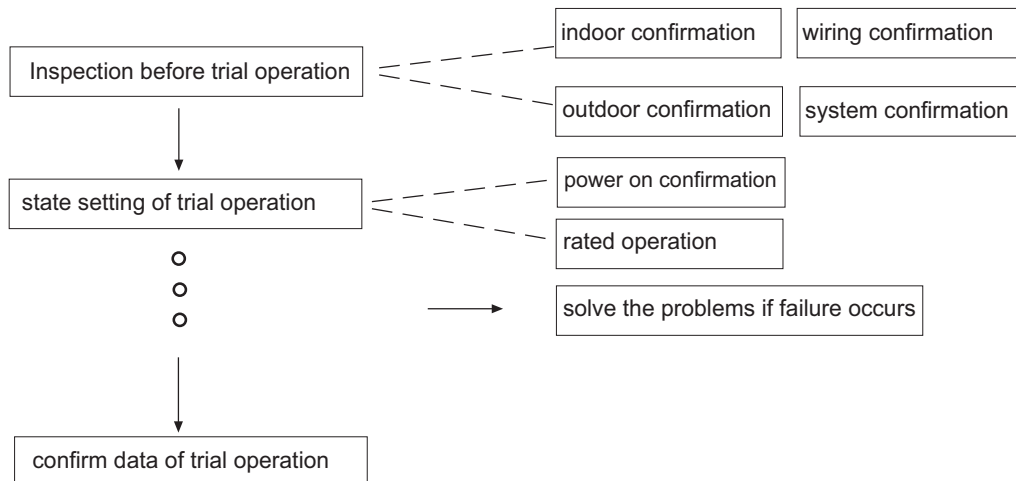
The heating mode adopts the heat pump type that absorbs outdoor heat energy and releases into indoor. So if outdoor temperature goes down, the heating capacity will decrease.

1. System marks

On the condition that multi MRV II systems are installed, in order to confirm the relationship between outdoor and indoor, please make marks on outdoor electric control box cover to indicate the connected indoor unit. As the below figure:



2. Trial operation sequence



3. Inspection before trial operation

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

3.1 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.	

3.2 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.	

3.3 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 communication failure will occur.	

3.4 System confirmation

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

4. State setting of trial operation

4.1 Confirm being electrified

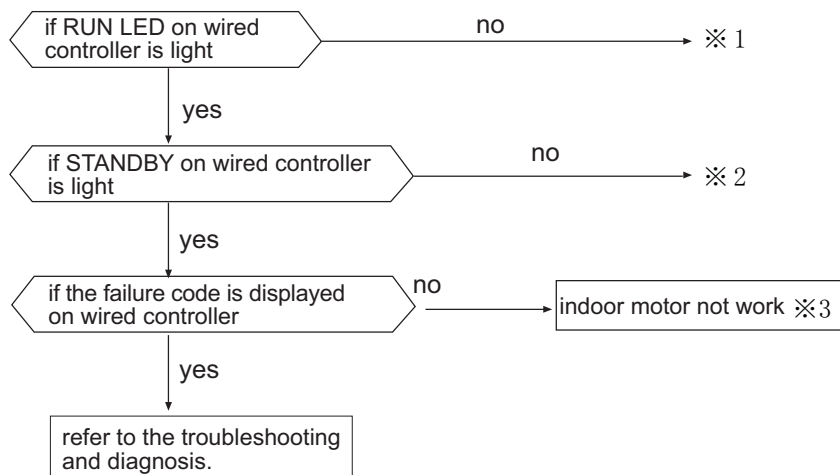
Indoor and outdoor are electrified respectively and then check as the following table:

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.	

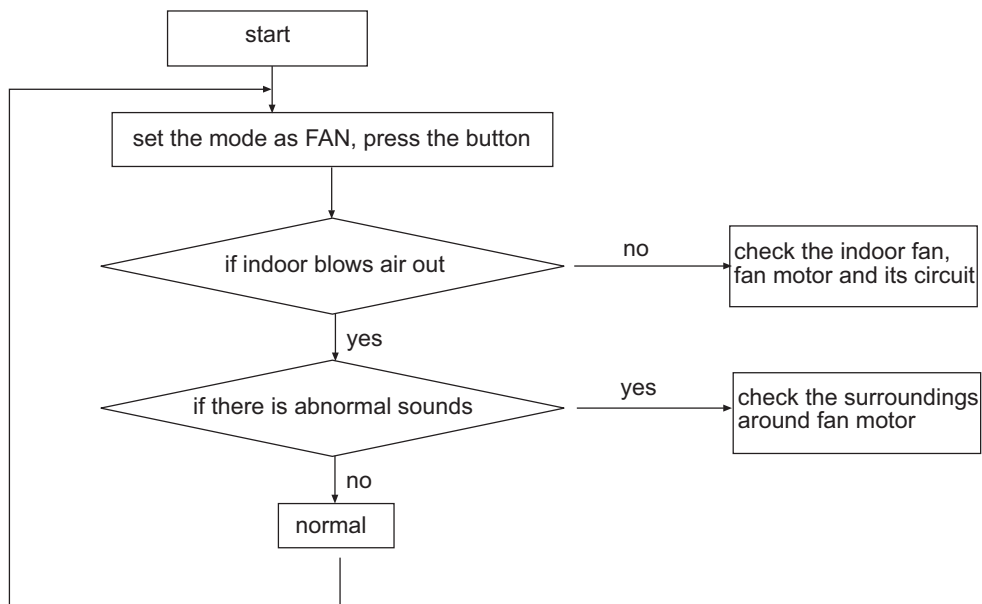
5. Trial operation

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

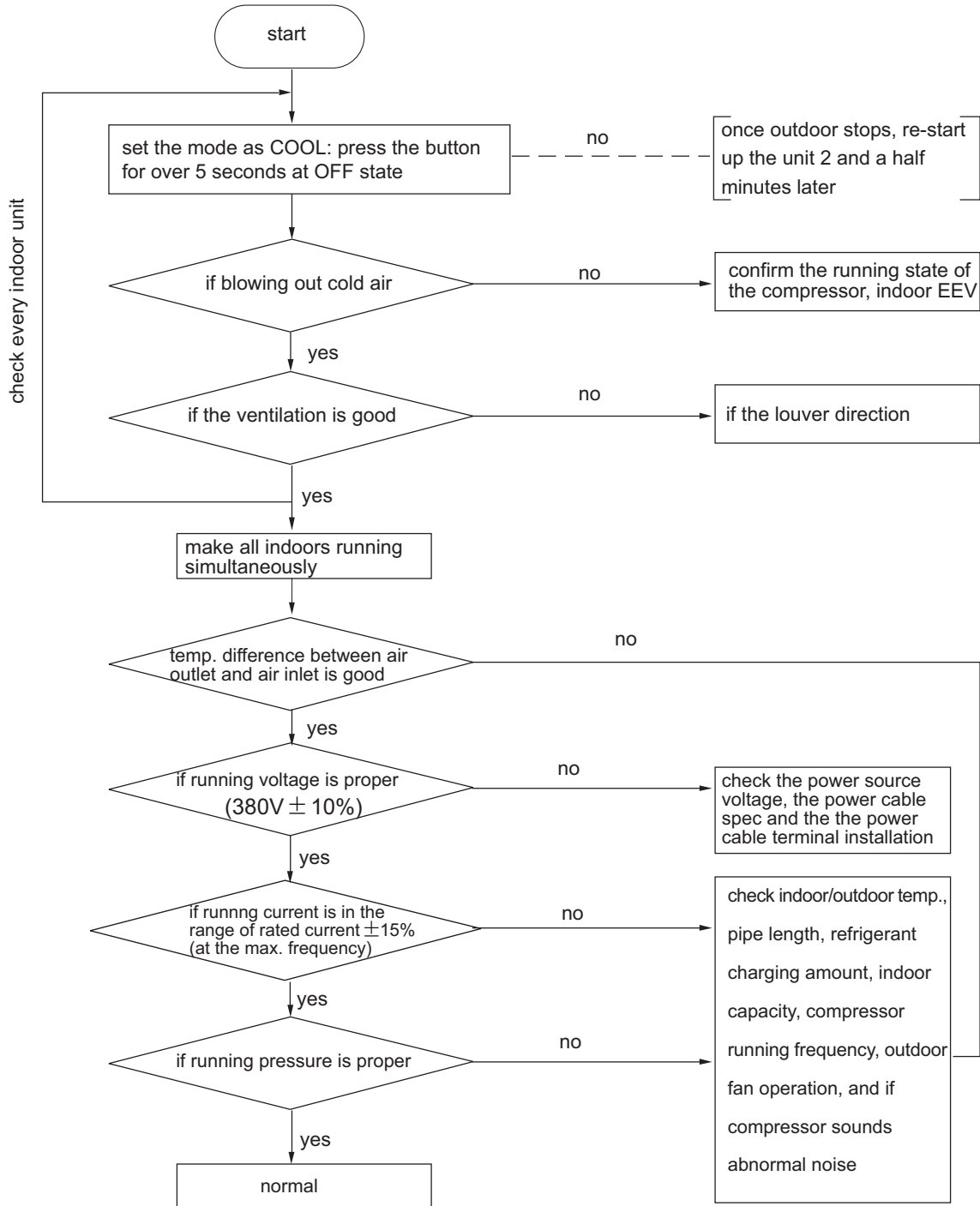
(1) Main power supply and preliminary confirmation



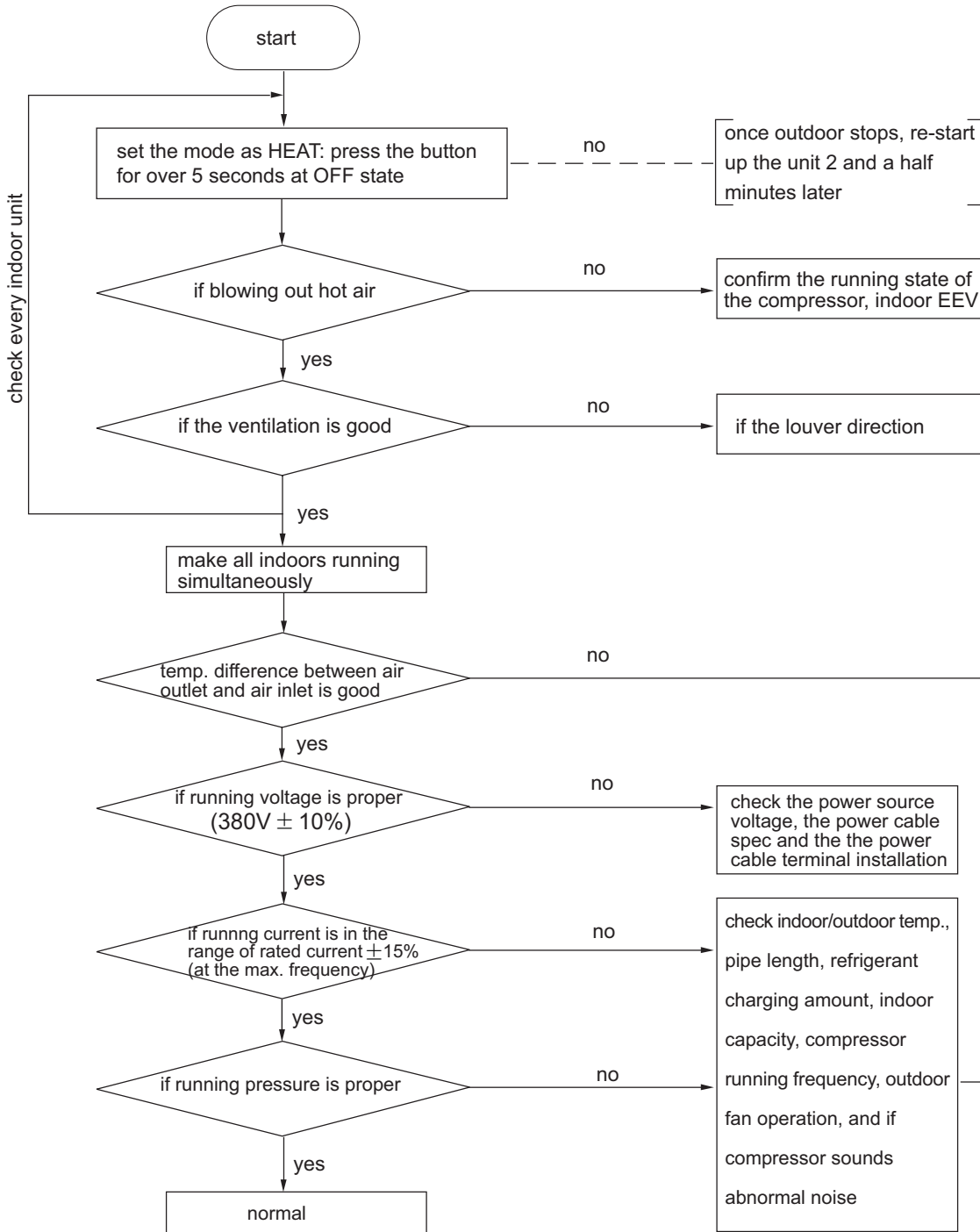
(2) Motor operation confirmation



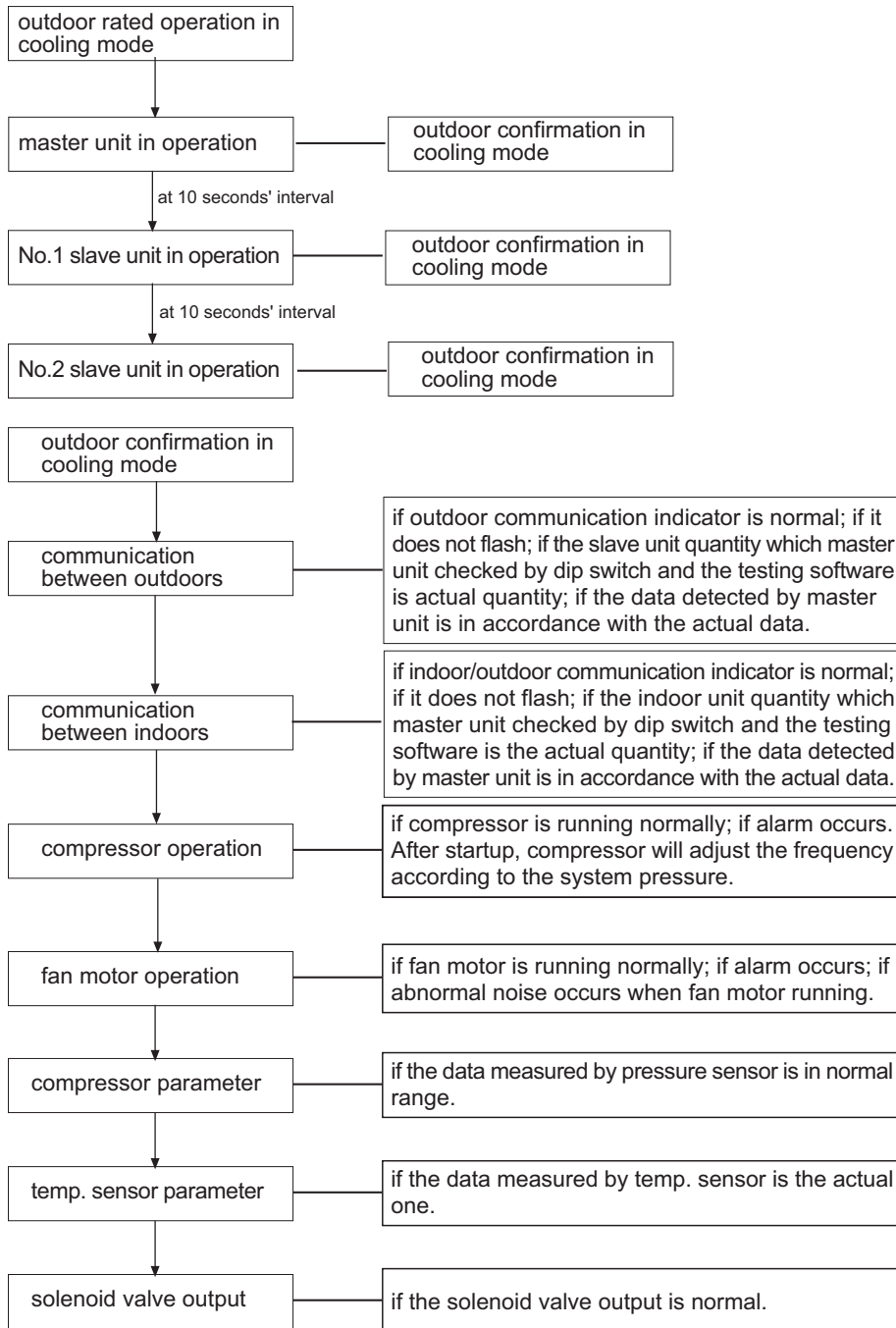
(3) Cooling operation confirmation

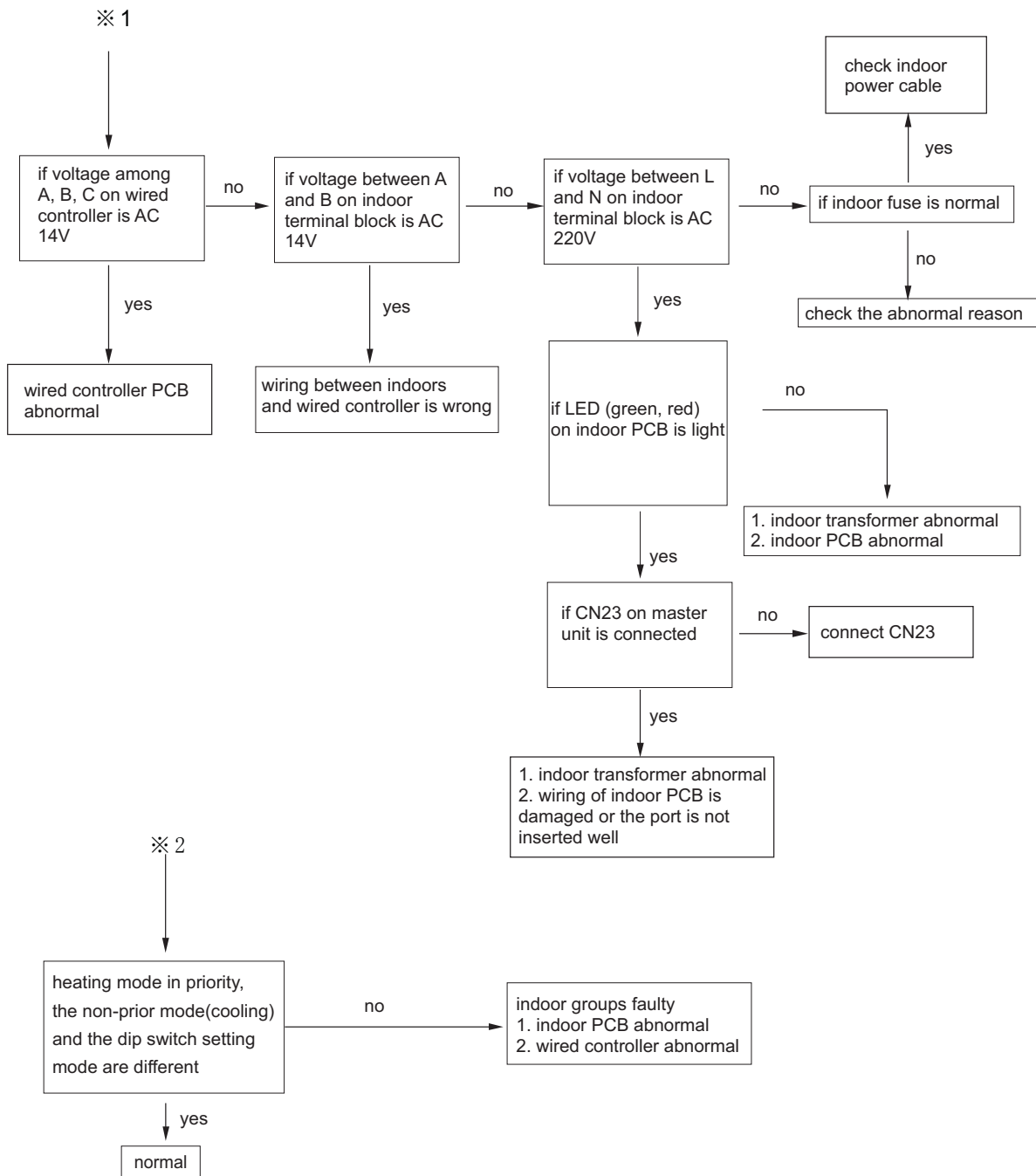


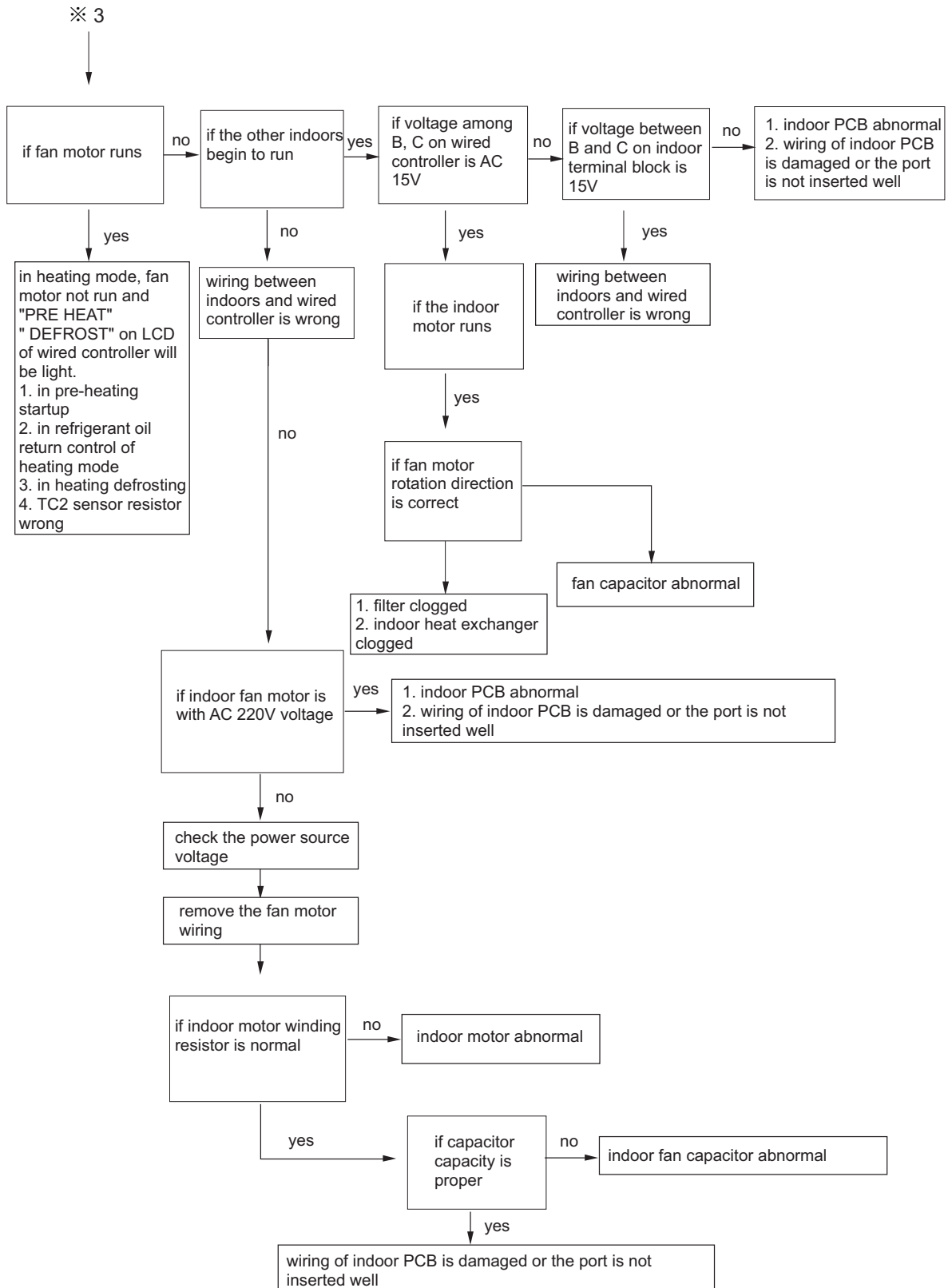
(4) Heating operation confirmation



(5) Outdoor confirmation (cooling)









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 °C , (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 °C , (at max. frequency).

Note 2: Running current standard

It is normal that the running current is in the range of rated current $\pm 15\%$ (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 °C
	low pressure 0.6~1.0MPa	outdoor 25~35 °C
heating (at max. frequency)	high pressure 2.2~2.8MPa	indoor 15~25 °C
	low pressure 0.3~0.8MPa	outdoor 5~10 °C

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

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

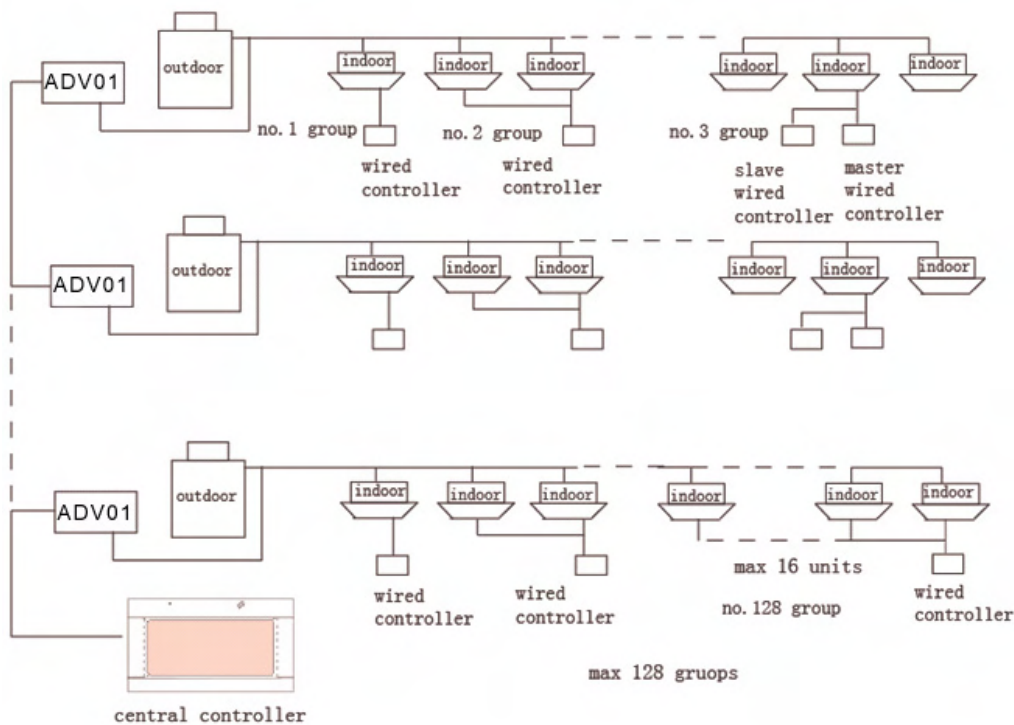
outdoor temp. goes up---high/low pressure goes up

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

3. Control function

1. Features and functions of central controller

Central controller RWV02 Mainly design for FlowLogic series system. Can control and monitor the indoor units condition, maximum can control 128 groups, each group can maximum connect to 16 indoor units. All the controls, such as individual control, zone control, time setting, timer setting etc., can be realized by touch screen. Connecting diagram as follows:



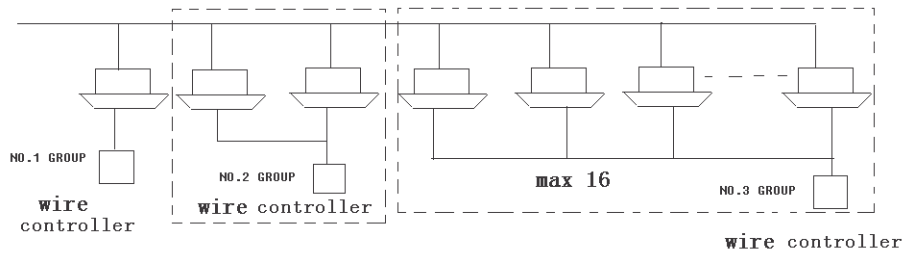
Main functions of central controller

1. Maximum can monitor 128 groups* indoor unit operation mode ,airflow speed, temp., setting ,ON/OFF ,error code display etc. condition.
2. Can set mode ,airflow speed ,temp. etc. for individual /zone /All .
3. Can check indoor unit real temp., pipe temp. etc. parameters.
4. Can set LIFO (Last enter have high priority),central control ,lock etc. 3 types of operation modes.
5. Can monitor the indoor units malfunction and save the error code for future checking.
6. Receive the external signal input, after receiving the fire alarm signal and alarm.
7. Weekly timer setting ;
8. Can set random units groups to one zone ,maximum can set 128 groups to one zone, after set zone ,each indoor unit of this zone can have same operation status.(default setting :one group is one zone).

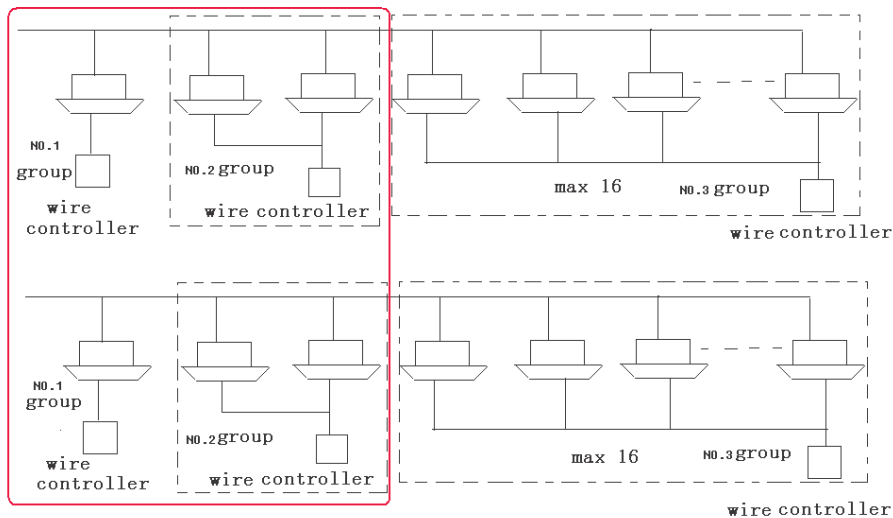
(8)Central controller Mainly design for MRV series system.

Can control and monitor the indoor units condition ,maximum can control 128 groups ,each group can maximum connect to 16 indoor units. All the controls, ,such as individual control ,zone control, time setting, timer setting etc. ,can be realized by touch screen. Connecting diagram as follows:

Group



Zone

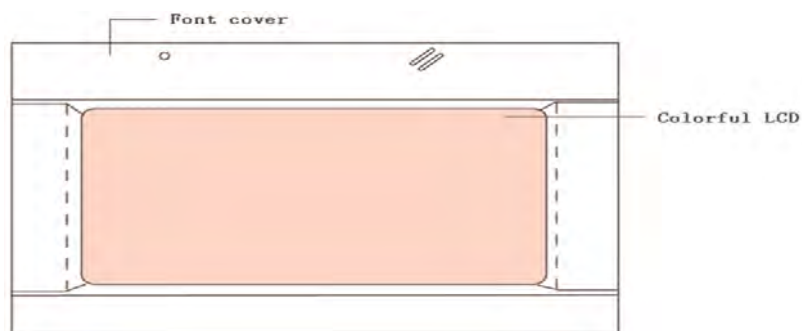


We can set several group with same function or near position as one zone.

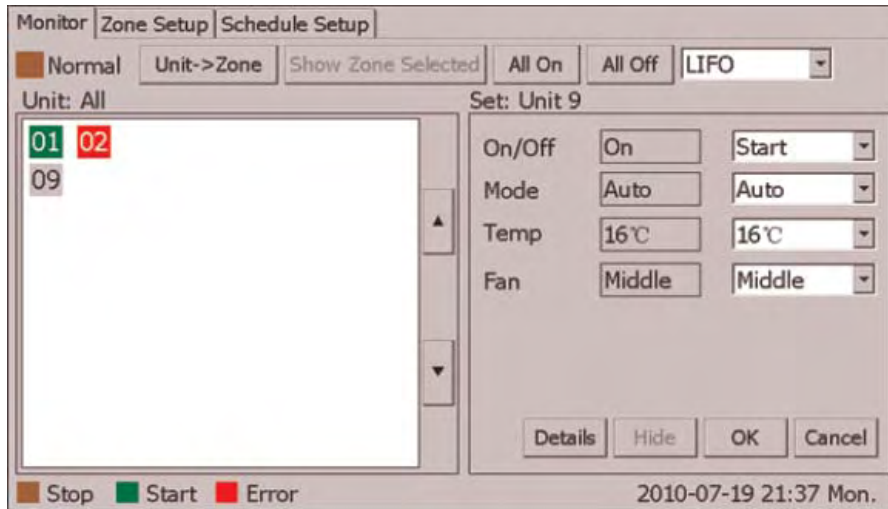
We can control the whole zone ,also can control one group individually. Default group can put into one corresponding zone.

Minimum one zone has one group ,maximum one zone can have 128 groups.

Part name

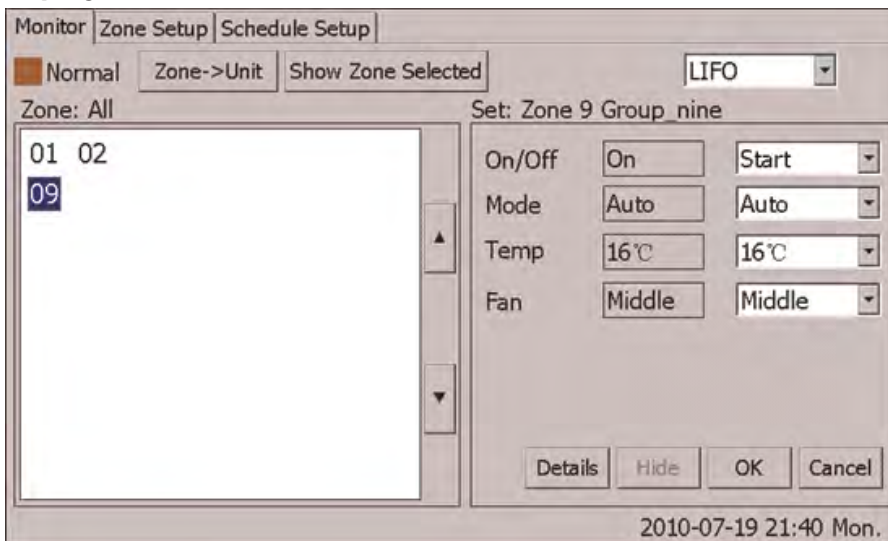


Indoor unit display



The indoor unit be checked will display in this page ,if one page can't display all the units ,we can use page up/down button check .
 use green color standard unit in operation ,use brown color standard for stop unit ,use RED color standard for the unit with malfunction.

Zone display



Default design are: each indoor unit stay at the corresponding number zone ,such as No.1 unit stay no.1 zone ,No.2 unit stay at zone 2,No. 128 unit stay at no.128 zone.
 When the indoor unit in communications, the zone can be displayed.
 When select one zone ,the right side condition frames will display the indoor unit condition with smallest no. of this zone.

Display and LCD explanation



Button Explanation:

Monitor: Main View

Zone Setup: Zone set

Schedule Setup: Weekly timer setting

Unit->Zone: From Unit no. display change to Zone display

Zone-> unit: From Zone display to Unit no. display

Start All: All ON

Stop All: All OFF

Show Zone Schedule: Display the indoor unit no.

On/Off: Unit On/Off

Operation Mode: Operation mode and setting

Set Temperature: Temp. display and setting

Fan Speed: Fan speed display and setting

TC1 Temp: Indoor gas pipe temp.

TC2 Temp: Indoor liquid pipe temp.

Room Temp: Indoor real temp.

Error Code: Error code

OK: All the condition setting finished, press OK send out order;

Cancel: Cancel

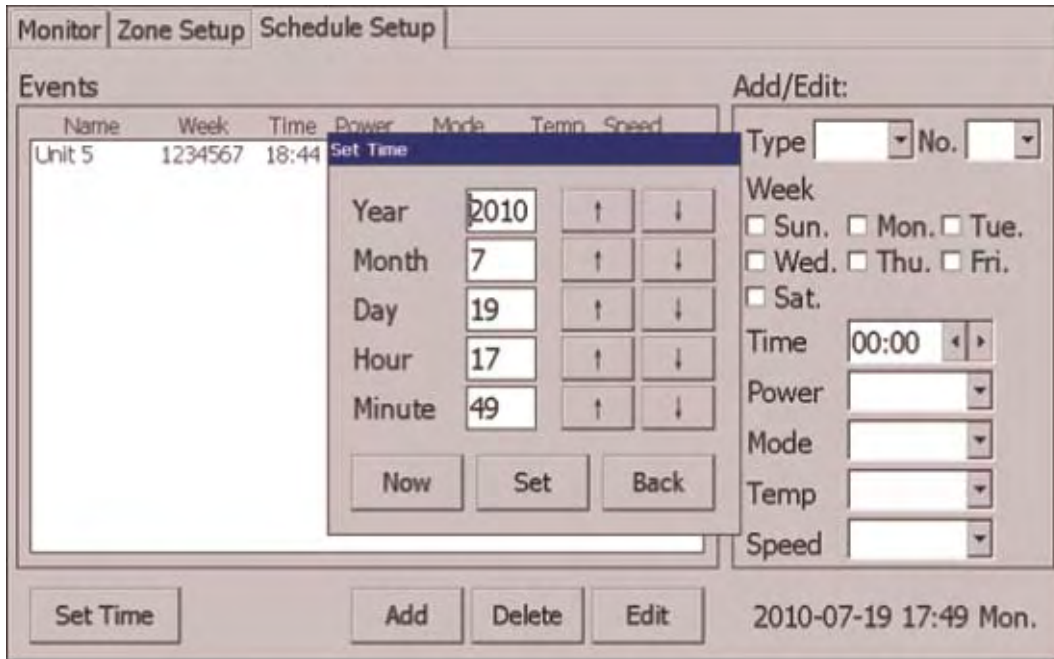
Icons

grey: Operation

Brown :Stop

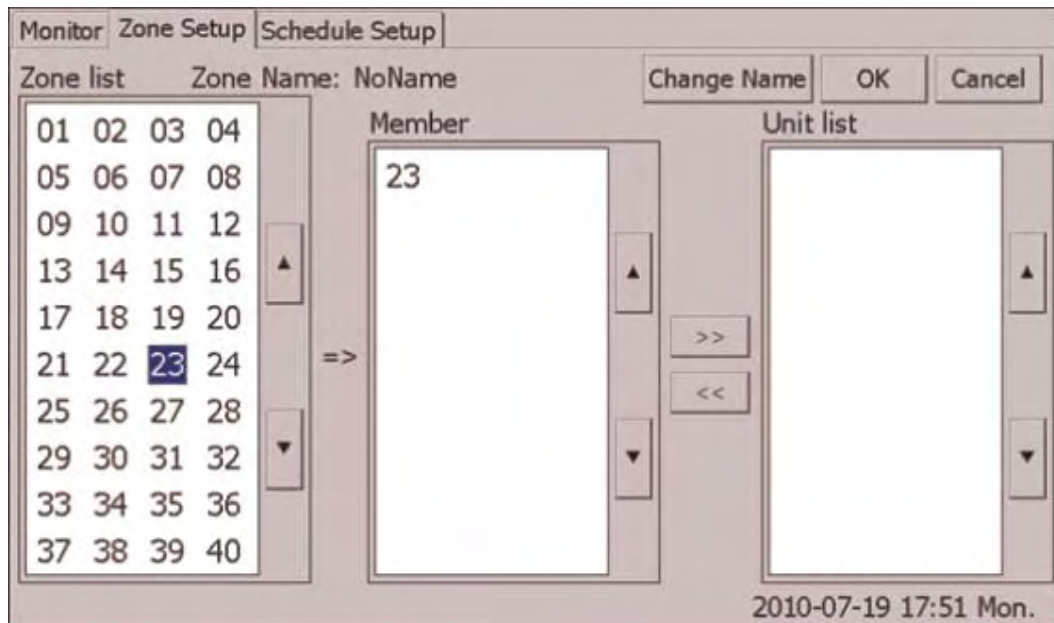
Red: malfunction

Date and time setting



Press "set time", the timer setting interface will pop-up. adjust the year/month /date and time by pressing the up/down button.

Zone name setting



Select the zone no. to be changes, press "change name",enter the zone name interface.

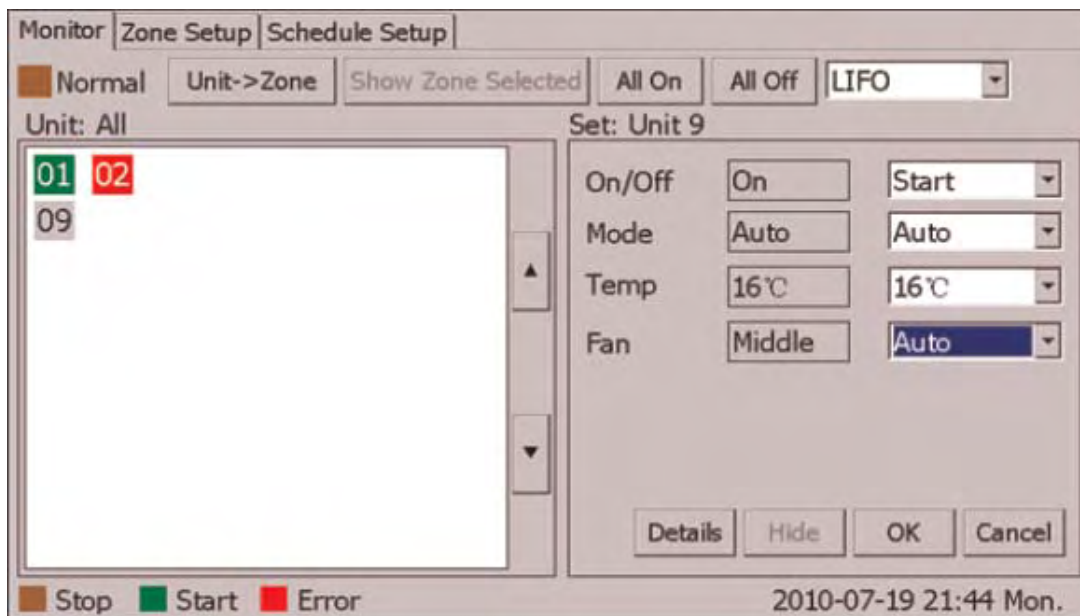


The 'Set Zone Name' interface shows the 'Original Name' as 'NoName' and the 'New Name' as 'snow'. Below the text fields is a virtual keyboard with three rows of buttons: the first row contains 'q', 'w', 'e', 'r', 't', 'y', 'u', 'i', 'o', 'p', and 'Backspace'; the second row contains 'a', 's', 'd', 'f', 'g', 'h', 'j', 'k', 'l', and '_'; the third row contains 'z', 'x', 'c', 'v', 'b', 'n', 'm', 'Space', 'Clear', and 'Shift'. At the bottom right, there are two buttons: 'Set' and 'Back'.

Input name and press set ,then the setting finished, pls. notice: Maximum 12 letters permitted.

Control explanation

Individual indoor unit setting



The 'Monitor Zone Setup' interface has tabs for 'Monitor', 'Zone Setup', and 'Schedule Setup'. It features a status bar with 'Normal', 'Unit->Zone', 'Show Zone Selected', 'All On', 'All Off', and a 'LIFO' dropdown menu. The 'Unit: All' section shows a list of units: '01' (green), '02' (red), and '09' (grey). The 'Set: Unit 9' section displays settings for 'On/Off' (On), 'Mode' (Auto), 'Temp' (16°C), and 'Fan' (Middle). At the bottom, there are 'Details', 'Hide', 'OK', and 'Cancel' buttons. A legend at the bottom left shows 'Stop' (brown), 'Start' (green), and 'Error' (red). The date and time '2010-07-19 21:44 Mon.' are shown at the bottom right.

Set the indoor unit

Use ON/OFF to set start/stop the unit setting;

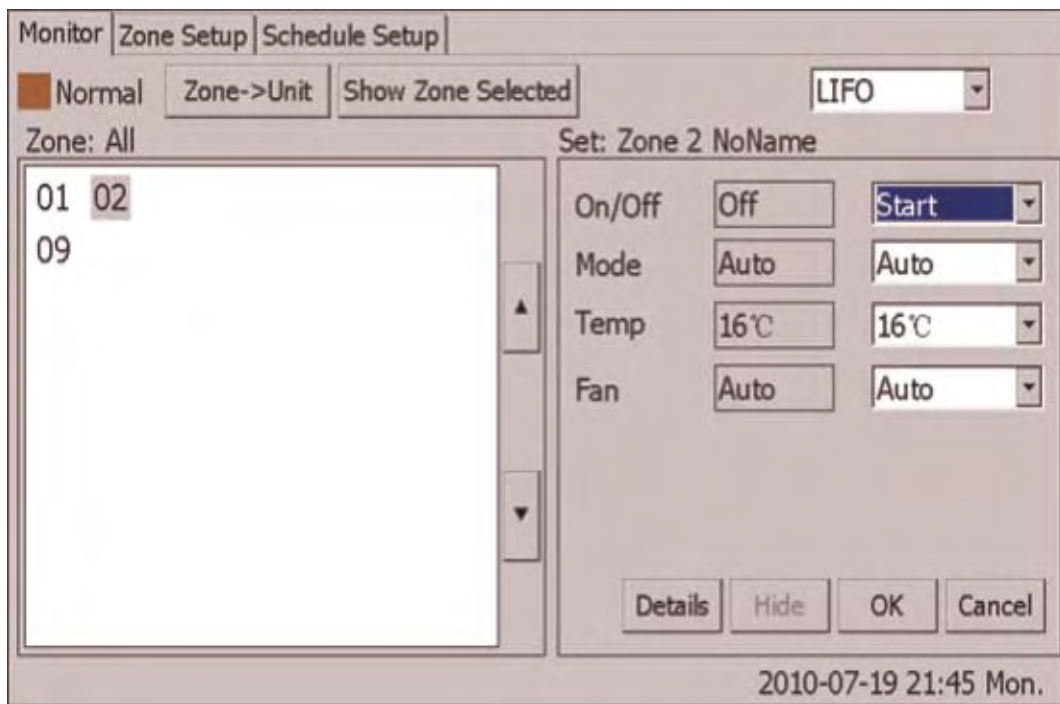
ON= Start the unit ,OFF=stop the unit ,No change=don't change the condition;

Use Mode to set the operation setting; Auto=auto, Heat=heating, Cool=Cooling, Dry=dehumidify ,Fan =Airflow ; no change =don't change the current mode,

Use temp. to set the temperature(16~30degree),set no change =don't change current temp, fan =set airflow speed, auto=auto, high=High speed airflow ,middle =middle speed airflow, low=low speed airflow ,no change=don't change the current airflow.

The date displayed is current setting condition.

Zone indoor unit setting



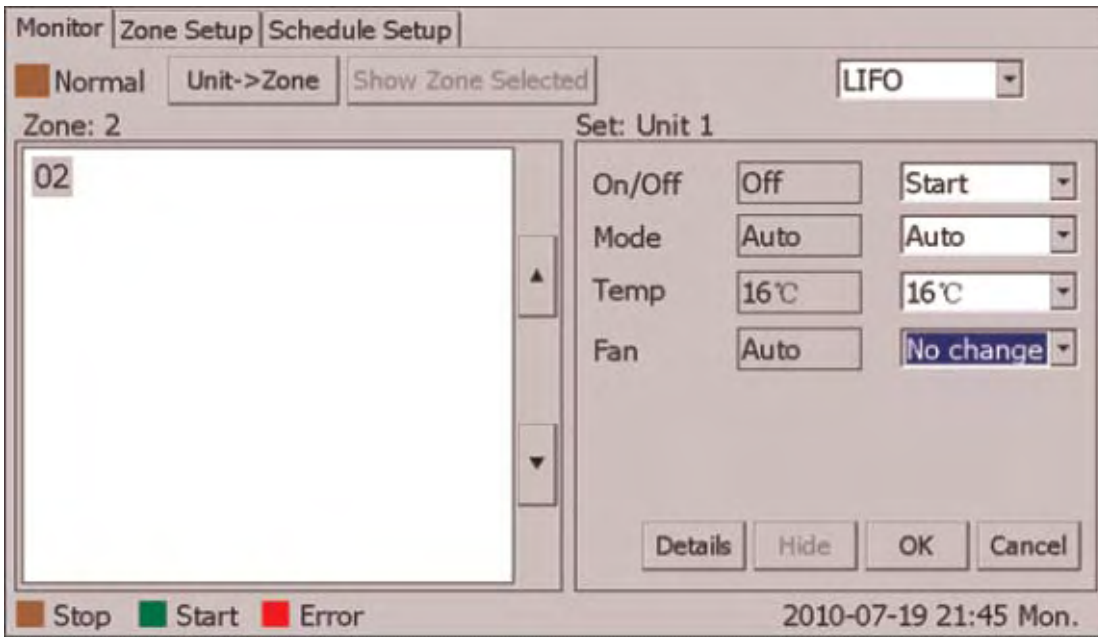
Whole zone control

Set one zone ,control from the right size control zone ,control setting method same as individual control.

The frame displayed condition is the minimum no. indoor unit condition of this zone.

Individual control of zone

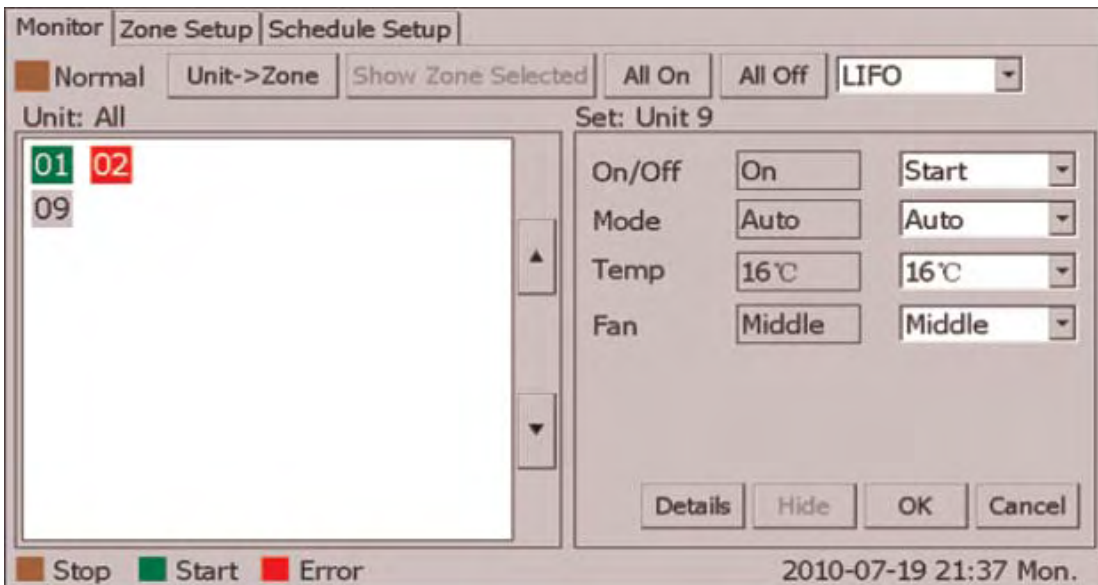
Press "show zone selected" ,the interface will display all the indoor units of target zone.



All the indoor unit setting

Press the indoor unit to be controlled ,control the indoor unit from right size frame, the control method is the same as individual control.

Press "All on",all the indoor units start to operation ,keep all the status before start ,press "All off", stop all the indoor units ,the previous setting status don't change.



Schedule setting

Name	Week	Time	Power	Mode	Temp	Speed
Unit 5	1234567	18:44	On	Auto	22°C	High
Zone 5	1234567	18:44	On	Auto	22°C	High
Unit All	1234567	18:44	On	Auto	22°C	High
Unit All	1245	18:44	Off	Auto	22°C	Middle
Unit All	67	18:44	On	Fan	22°C	Middle

Type : Select indoor no. setting or zone setting,. Select "zone"= setting as zone, select "group"= setting as indoor unit no.

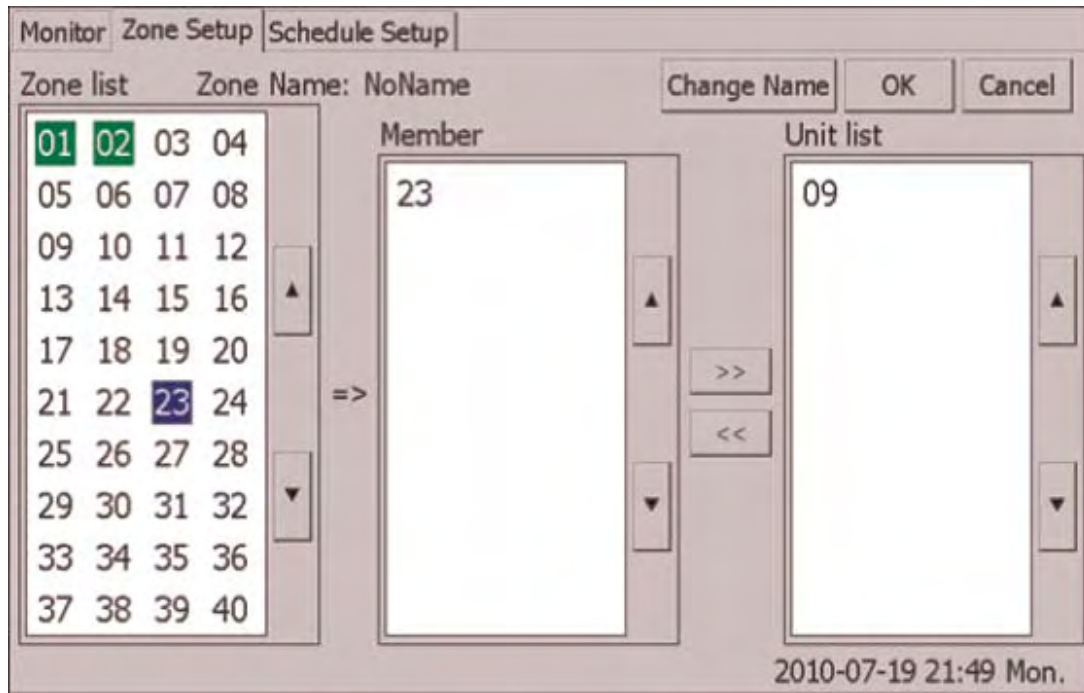
No: Zone no. or indoor unit No.

Setting: set timer setting method and indoor unit no. or zone no., select ";" before the day no. ,then set Time, ON/OFF,MODE, airflow speed, then press ADD ,one setting will finished.

Edit: select the items to be edited ,right size frame will display all the parameters, change the parameter ,then press Edit, the revise will be finished.

Delete :Select the items to be deleted, press "delete", the operation will be finished.

Zone Setting



Zone list: Zone no.

Member: indoor unit of the zone Group list*indoor unit no. First time operation, each indoor unit default as itself zone ,such as no.1 unit as zone 1,no. 128 unit as zone no. 128.

If we want to change the zone setting ,first take out the indoor unit from default zone, then add to target zone .

Zone setting

Select the zone no. from left side frame, then select the target no. of the right side frame ,press <<,the indoor unit will adds to target zone ,*member* list display the unit added .

Zone Cancel

Press the target zone no., "Member" list will display all the indoor unit no., select one indoor unit no., press >> ,the unit no. will disappear from this zone ,and right side "group list" will display the unit no.

When cancel all the indoor unit from this zone ,this zone no. will disappear.

Off Power Clock setting

If power off time less than 192 hours, the internal time no need to reset;

If the power off time more than 192 hours ,the internal clock will stop , all the time will disappear and need to reset the time.

Notice:

If the power off time more than 192 hours, and don't reset the clock ,the system will supply wrong time schedule.

The screenshot displays the 'Schedule Setup' window in the Airwell software. It features a table of events and an 'Add/Edit' configuration panel. A 'Set Time' dialog box is currently open, allowing the user to adjust the date and time for a selected event.

Name	Week	Time	Power	Mode	Temp	Speed
Unit 5	1234567	18:44				

Set Time Dialog:

- Year: 2010
- Month: 7
- Day: 19
- Hour: 17
- Minute: 49
- Buttons: Now, Set, Back

Add/Edit Panel:

- Type: [Dropdown]
- No.: [Dropdown]
- Week: Sun. Mon. Tue. Wed. Thu. Fri. Sat.
- Time: 00:00
- Power: [Dropdown]
- Mode: [Dropdown]
- Temp: [Dropdown]
- Speed: [Dropdown]

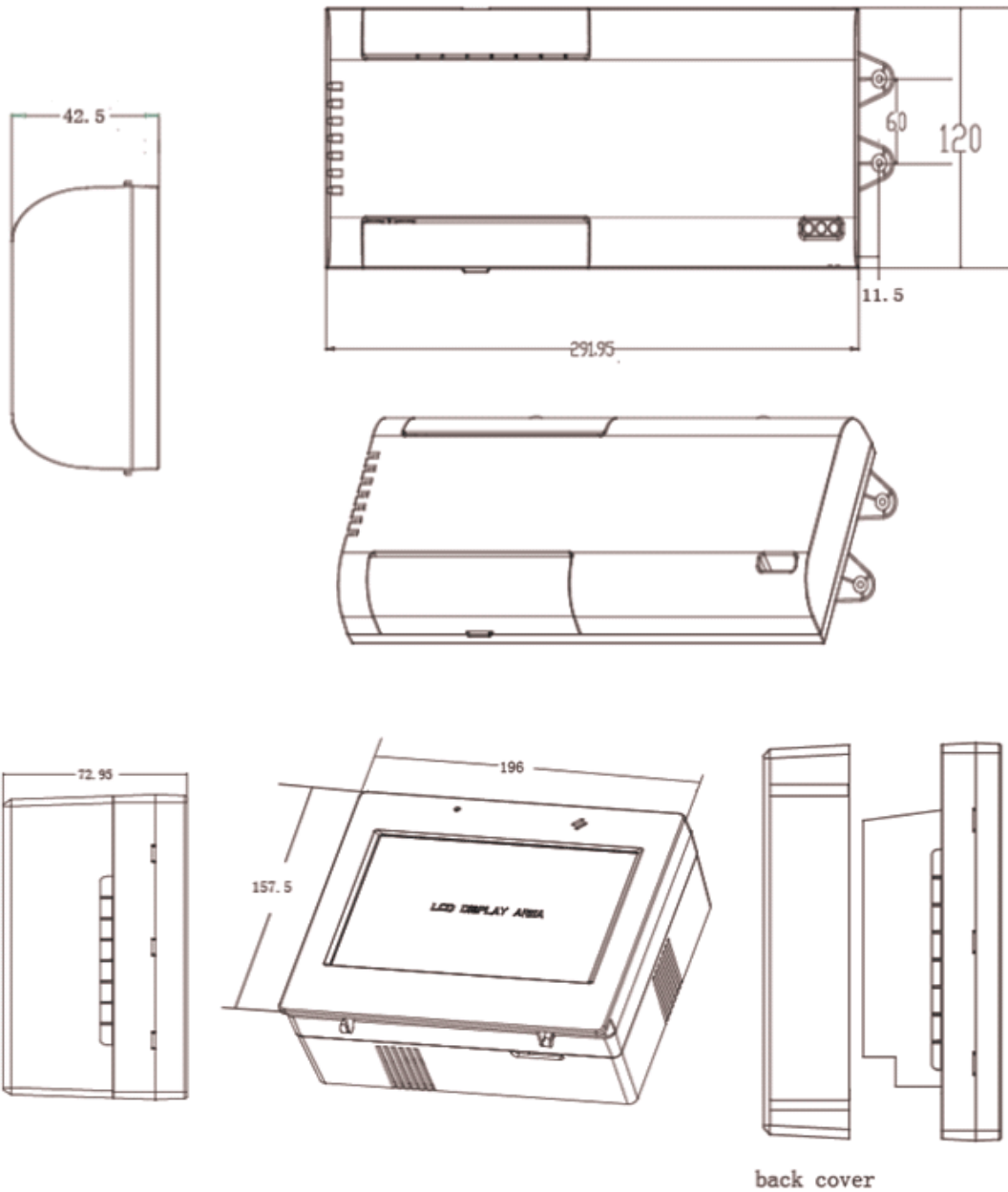
At the bottom of the window, there are buttons for 'Set Time', 'Add', 'Delete', and 'Edit', along with a timestamp: '2010-07-19 17:49 Mon.'

Press "Set time", the date setting interface will pop-up ,adjust the time by using ; , ; button.

Installation and connections

Dimensions

Connecting board



Installation and connections

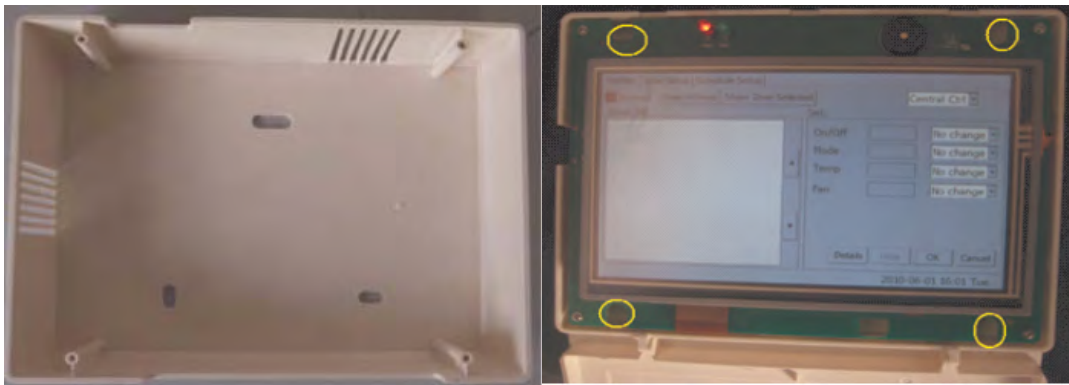
Strong commended that RWW02 and ADV01 install the unattached power switch, it is very convenient for service.

Easy installation, allows for installation the unit either directly to the wall surface or use the back cover hole in the wall.

First fix the back cover embed the wall or wall surface.

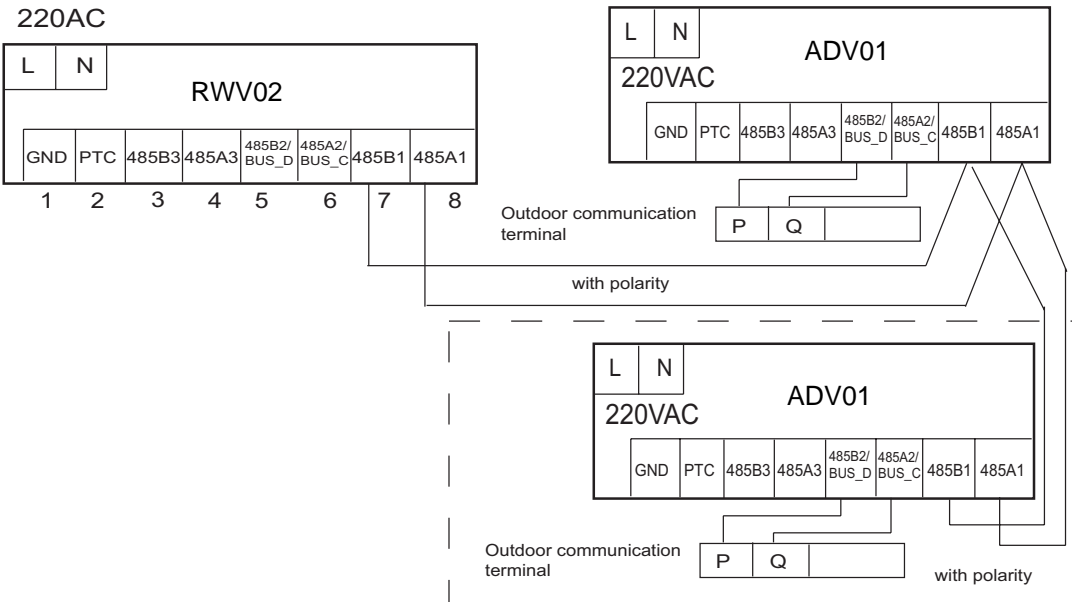
Easy installation, allows for installation the unit either directly to the wall surface or use the back cover hole in the wall.

First fix the back cover embed the wall or wall surface.



After connecting wirings, insert the central controller into the back cover ,open the front cover , fix the central controller to the back cover by using 4 screws according to the above pictures shows ,then cover the front cover.

Wiring Connection



Cautions:

Wrong connections that power supply leads to the part of PCB burded and fire



Connecting board address setting method

OFF:1 ON:0

1	2	3	4	5	6	7	8	No.
--	--	--	0	0	0	0	0	1
--	--	--	0	0	0	0	1	2
--	--	--	0	0	0	1	0	3
--	--	--	0	0	0	1	1	4
--	--	--	0	0	1	0	0	5
--	--	--	0	0	1	0	1	6
--	--	--	0	0	1	1	0	7
--	--	--	0	0	1	1	1	8
--	--	--	0	1	0	0	0	9
--	--	--	0	1	0	0	1	10
--	--	--	0	1	0	1	0	11
--	--	--	0	1	0	1	1	12
--	--	--	0	1	1	0	0	13
--	--	--	0	1	1	0	1	14
--	--	--	0	1	1	1	0	15
--	--	--	0	1	1	1	1	16
--	--	--	1	0	0	0	0	17
--	--	--	1	0	0	0	1	18
--	--	--	1	0	0	1	0	19
--	--	--	1	0	0	1	1	20
--	--	--	1	0	1	0	0	21
--	--	--	1	0	1	0	1	22
--	--	--	1	0	1	1	0	23
--	--	--	1	0	1	1	1	24
--	--	--	1	1	0	0	0	25
--	--	--	1	1	0	0	1	26
--	--	--	1	1	0	1	0	27
--	--	--	1	1	0	1	1	28
--	--	--	1	1	1	0	0	29
--	--	--	1	1	1	0	1	30
--	--	--	1	1	1	1	0	31
--	--	--	1	1	1	1	1	32
--	--	--	--	--	--	--	--	Reserved
--	--	--	--	--	--	--	--	Reserved
--	--	--	--	--	--	--	--	Reserved



Central controller address switch:

1	2	3	4	5	6	7	8	No.
--	--	--	0	0	0	0	0	1
--	--	--	0	0	0	0	1	2
--	--	--	0	0	0	1	0	3
--	--	--	0	0	0	1	1	4
--	--	--	0	0	1	0	0	5
--	--	--	0	0	1	0	1	6
--	--	--	0	0	1	1	0	7
--	--	--	0	0	1	1	1	8
--	--	--	0	1	0	0	0	9
--	--	--	0	1	0	0	1	10
--	--	--	0	1	0	1	0	11
--	--	--	0	1	0	1	1	12
--	--	--	0	1	1	0	0	13
--	--	--	0	1	1	0	1	14
--	--	--	0	1	1	1	0	15
--	--	--	0	1	1	1	1	16
--	--	--	1	0	0	0	0	17
--	--	--	1	0	0	0	1	18
--	--	--	1	0	0	1	0	19
--	--	--	1	0	0	1	1	20
--	--	--	1	0	1	0	0	21
--	--	--	1	0	1	0	1	22
--	--	--	1	0	1	1	0	23
--	--	--	1	0	1	1	1	24
--	--	--	1	1	0	0	0	25
--	--	--	1	1	0	0	1	26
--	--	--	1	1	0	1	0	27
--	--	--	1	1	0	1	1	28
--	--	--	1	1	1	0	0	29
--	--	--	1	1	1	0	1	30
--	--	--	1	1	1	1	0	31
--	--	--	1	1	1	1	1	32
--	--	--	--	--	--	--	--	Reserved
--	--	--	--	--	--	--	--	Reserved
--	--	--	--	--	--	--	--	Reserved

Wiring standard

10.5 central controller signal wiring standard

The wire from connecting board to central controller and from master to slave controller should use twin-core shield wiring. The detailed size as follow sheet

Signal wire length	Wiring size
<100	0.3mm ²
100<X<200	0.5mm ²
200<X<300	0.75mm ²
300<X<400	1.25x2mm ²
400<X<1000	2x2mm ²

And one end of the shield level must connect to the earth .

Installation position selection

1. Don't install the position near to the noise atmosphere,
Such as Computer ,Elevator, lift or other equipment to avoid malfunction happens.
2. Don't install the controller in high humidity or heavy vibration position
3. No sun shine direct access or close to thermal resources, try to avoid the malfunction.

Troubleshooting

phenomenon	Reason	Solutions
Unit no. display Red	This unit Error happens	Check the unit
Press the LCD and no action happens	Malfunction happens because of static electricity	Stop the power and restart the unit ,if still can't resolve it ,contact our after-service people.
No signal display on the LCD	Malfunction happens because of static electricity	Stop the power and restart the unit ,if still can't resolve it ,contact our after-service people.
Controller is very hot when touch it	Pls. check whether the ambient temp. is very hot	Pls. check whether the ambient temp. is very hot
Air conditioner operate automatically	Pls. check the schedule timer setting ,change it if needed	Pls. try to install the unit below 40 ; Degree atmosphere

4. Management system H-CACS

General information

Bacnet edition connection system can connect to BACNET protocol BMS system.

BMV02 can transfer the air conditioner system parameter to the PC ,user can control and monitor the system operation status real time and check the electricity bill ,set the system parameter and operation status ,set indoor unit start/stop, group control and interlock control, and output the alarm information for control, create the bill report according to the database information.

System combinations

1. Inverter protocol adapter (ADV02): Transform the air conditioner protocol into protocol 485; receive ammeter pulse signal; account and save the power cost of the connected system, then transfer it to the computer.
2. Software: Air conditioner parameter display and control interface, calculate the electricity cost and report output, and realize remote control by internet or LAN.
3. IPC (Industrial personal computer): with 8 RS 485 ports.

IPC



System Brief

Ports



Each port have serial number, like ,1,2,3.....8.



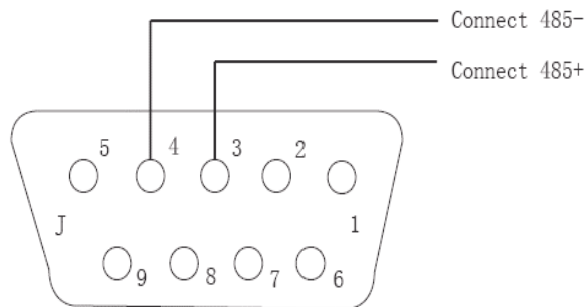
Port no. setting:

Port	Port No. Setting in system design	Note
IPC default 1	1	--
IPC default 2	2	--
IPC RS 485 port 1	3	To ADV02
IPC RS 485 port 2	4	To ADV02
IPC RS 485 port 3	5	To ADV02
IPC RS 485 port 4	6	To ADV02
IPC RS 485 port 5	7	To ADV02
IPC RS 485 port 6	8	To ADV02
IPC RS 485 port 7	9	To ADV02
IPC RS 485 port 8	10	To ADV02

One of RS 485 Port serial number:

Note :

If the customer want to calculate the power consumption cost , each ADV02 should connect one Pulse Ammeter (the Ammeter should purchased locally);



System range

Attentions:

BMV02 :(IPC + software): Maximum have 8 Ports ,each port can maximum connect to 12 sets ADV02 ;

Adaptor ADV02 : ADV02 quantity equal to outdoor system quantity, each ADV02 can connect to 40 sets indoor units maximum.

Suggest :total indoor units limited to 1024 sets.

Application range and certificate

(1)Application range:

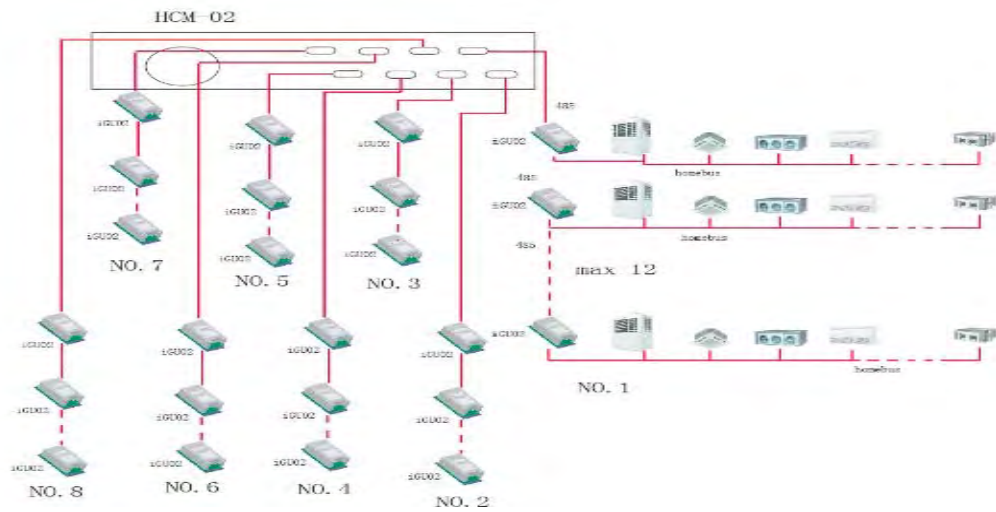
Temperature range:-30~52 ℃ Ambient temp. range of controller:-30~52 ℃

Ambient humidity range of controller:10%~85%; Altitude:0~6000m;

Voltage:220Vac ±10%; Frequency:50Hz.

(2)Safety certificate:/;

(3)Environment certificate: Conform with ROHS;



IPC port connectors(Pictures as follows)

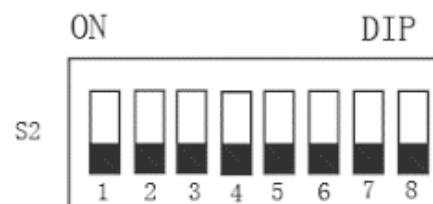
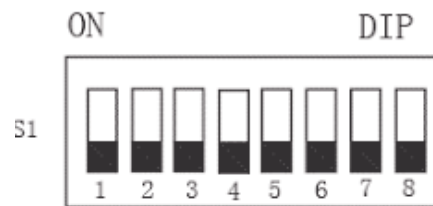
1. 8 sets RS 485 Port, Connect to ADV02.(RS 485/232 already available)
2. TCP/IP port ,can connect with LAN & internet.
3. BACnet port ,can connect to other Bacnet protocol port.
4. modbus Port, standard modbus connector.



Serial interface port setting (Default):

Mode	S1	S2
RS-232*	---	---
RS-422	---	ON
4-wire RS-485	ON	OFF
2-wire RS-485	OFF	OFF

Serial interface port dip switch setting:



5. Management system H-CACSII

BMS system H-CACS transfer the data of air conditioner to the computer through the inverter protocol adapter (ADV02), and the user can monitor the working state and the power consumption of indoor and outdoor on real time at the computer. Set the parameter of system in time; start or stop a certain indoor individually, or in group as the request; receive the alarm and make some measures on real time; deal with the data and make some cost account tables.

Part 1: brief

1.1 Applicable for MVi(R22 & R410A) system.

1.2 System combination

1. Inverter protocol adapter (ADV02): Transform the air conditioner protocol into protocol 485; receive ammeter pulse signal; account and save the power cost of the connected system, then transfer it to the computer.
2. Software: parameter display and human-computer operation surface, and account and save the power cost, output the cost table.
3. RS 485&232 Converter (hardware), Item 2 & 3 name is BMV01 .

1.3 Control range

1. If the H-CACSII is necessary, pay attention that the indoor quantity of every system cannot be over 40 sets. Or the adapter can not work normally.
2. Every system needs one protocol adapter.
3. One Microsoft can control indoors within 400 sets.

1.4 Applicable range and relative certificate

1) Applicable range

- Temp. range: -30°C 52°C
- Ambient temperature of controller: -30°C 52°C
- Ambient humidity of controller: -30°C 52°C
- Save temp. range of controller: -30°C 52°C
- Altitude: 0 6000m
- Voltage: 220Vac±10%
- Frequency: 50Hz

2) Safe certificate: Conform with HR and CCC

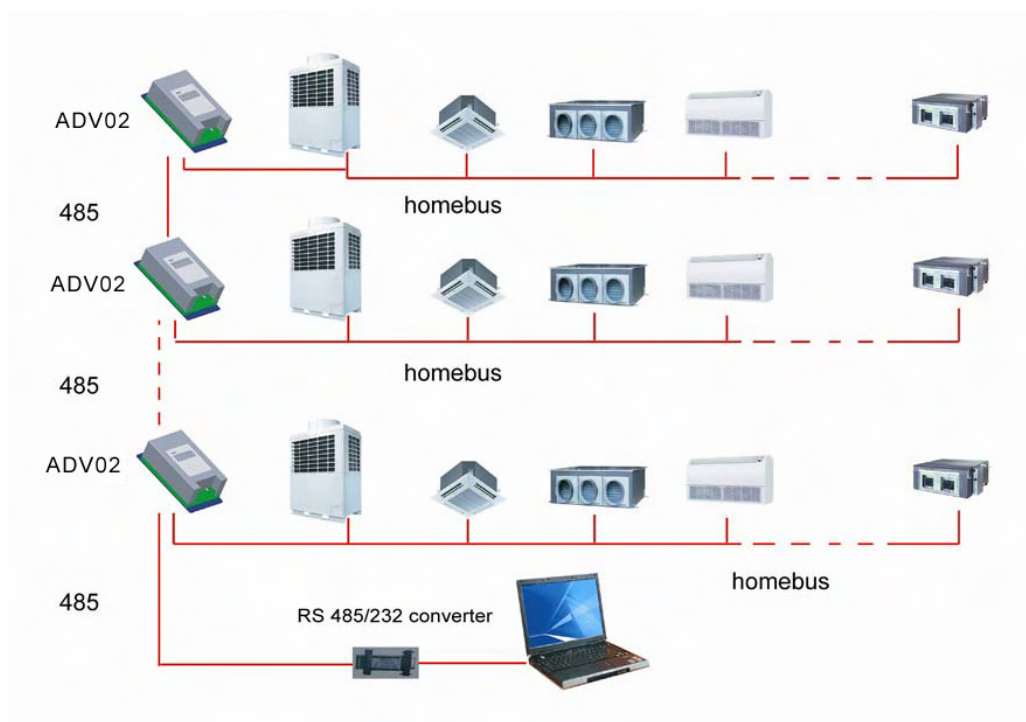
3) Environment certificate: conform with ROHS

1.5 Reliable request

1) Application standards: QB1238-91, GB4706.1-92, GB4706.12-95

2) Special requirement:

Part 2: Scheme of H-CACSII



Part 3: Appearance and dimension of protocol adapter

Appearance:

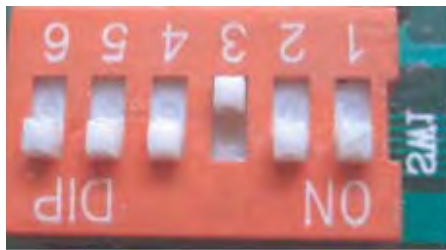


Dimension: 2000*1300*430(mm)

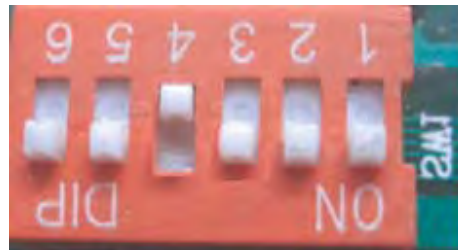
Part 4: Wiring request

1. Protocol adapter needs 220V AC power supply.
 2. The communication line between indoor and outdoor and the bus line 485 among the protocol adapters should be through steel wire sleeve in the H-CACSII.
 3. Set the indoor central address and the indoor/outdoor unit address by hand.
- The system with H-CACSII should not set the group function of wired controller.

Dip switch setting: ON: 0; OFF: 1



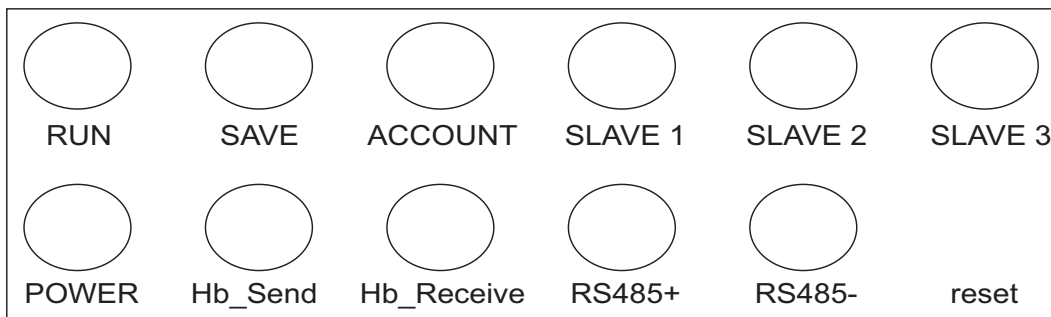
left: 4



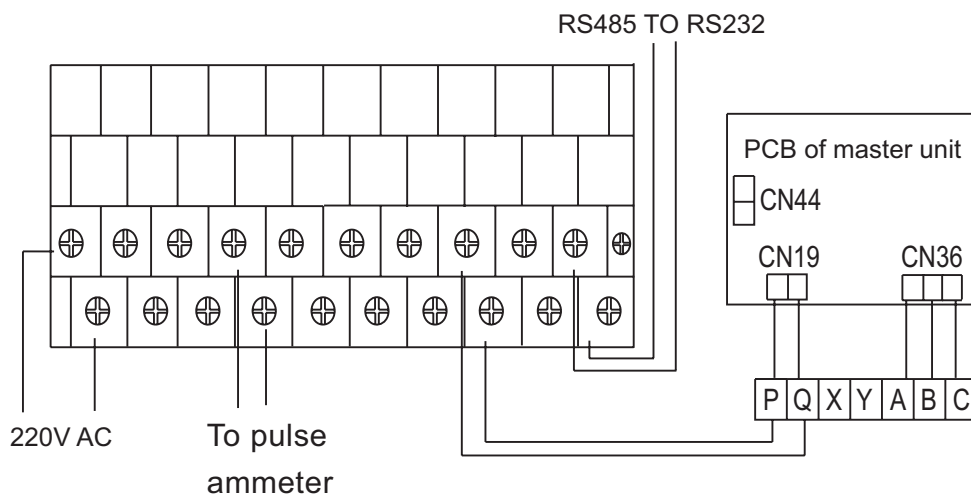
right: 4

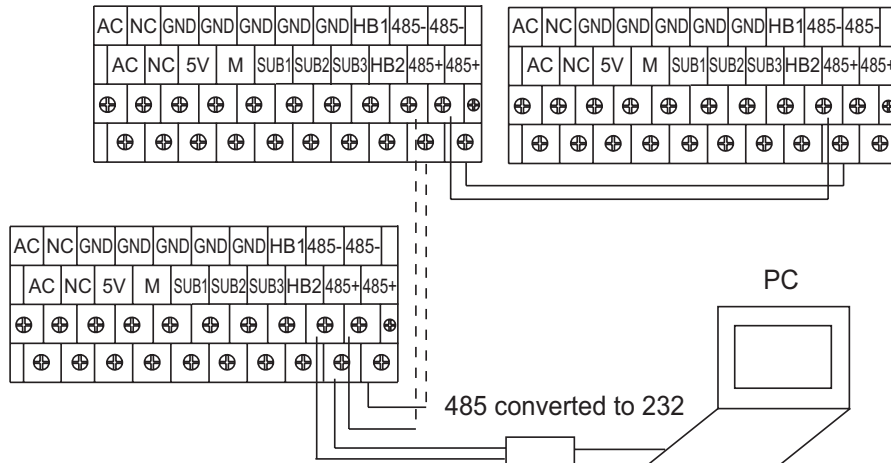
Shows address of IGU02, address range: 1-32.

Communication lamp definition:



Wiring terminal:

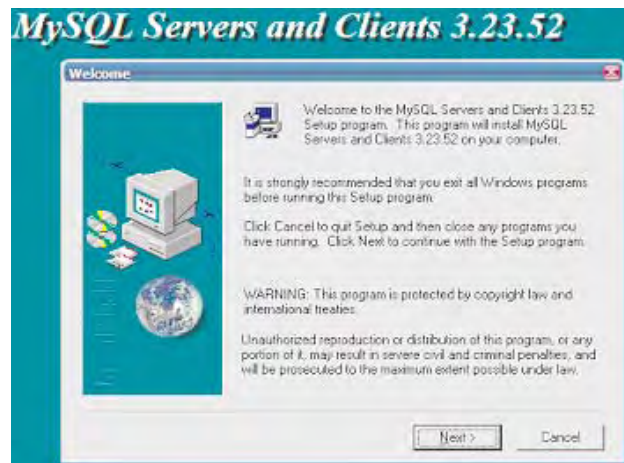




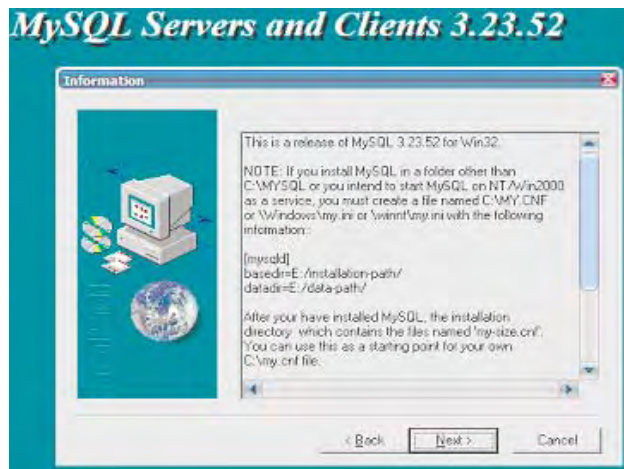
Part 5: install the software

1. Install database

Firstly install Mysql Database,



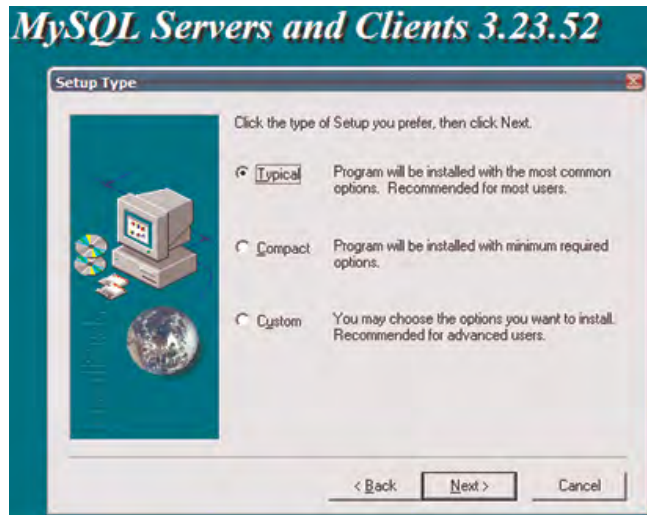
Next:



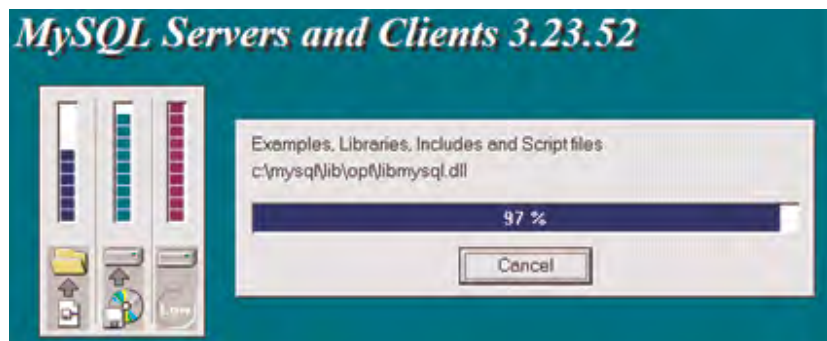
Next:



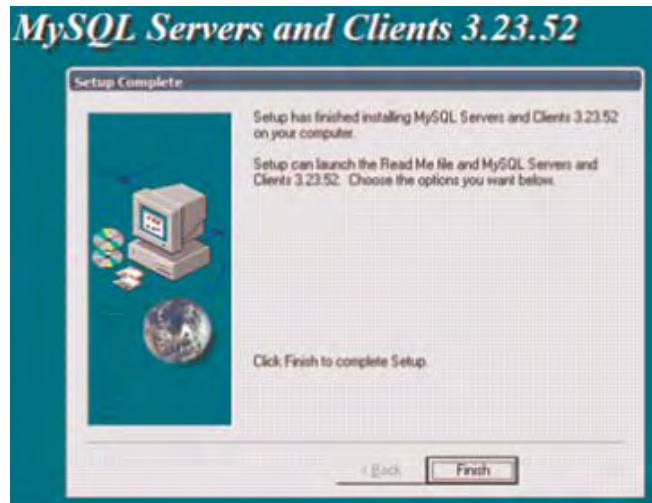
Next:



Next:



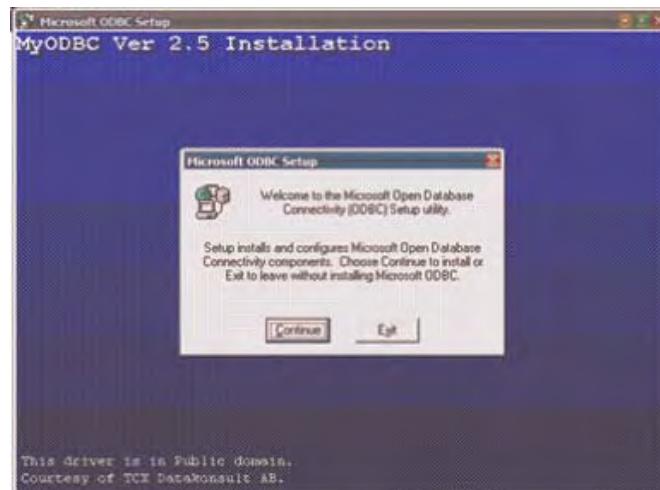
Then click "Finish", installation succeeds.



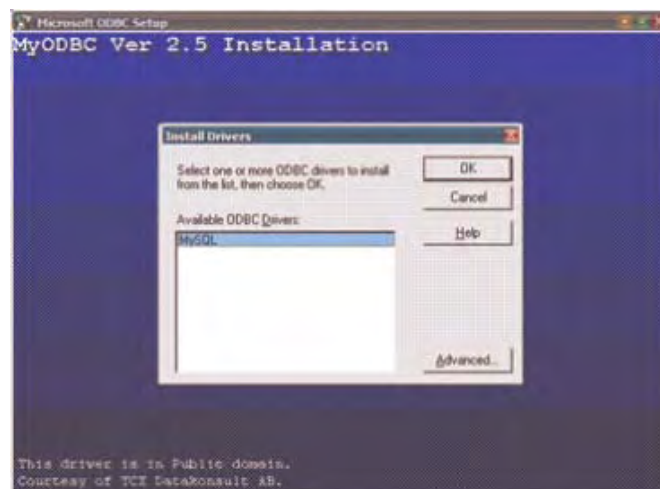
Note: No need to change the default setting, just click "next" all the way.

2. ODBC installation and setting

ODBC installation:



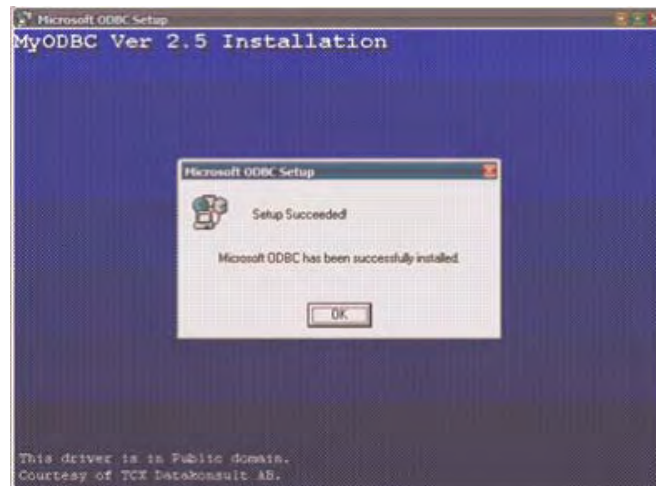
Continue



Select mysql, then click "ok"



Then click "close"

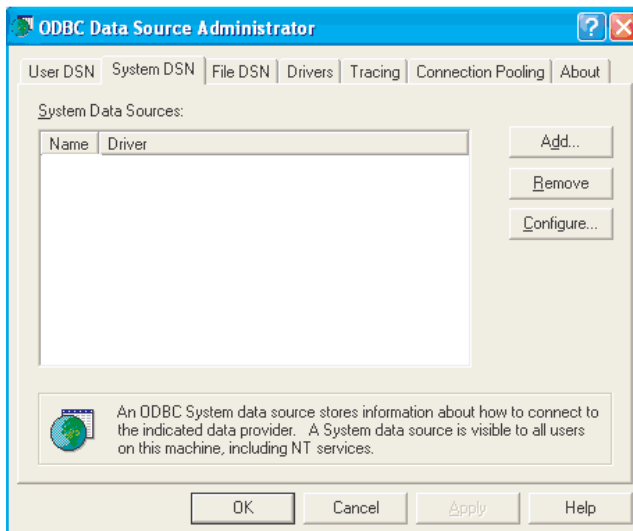
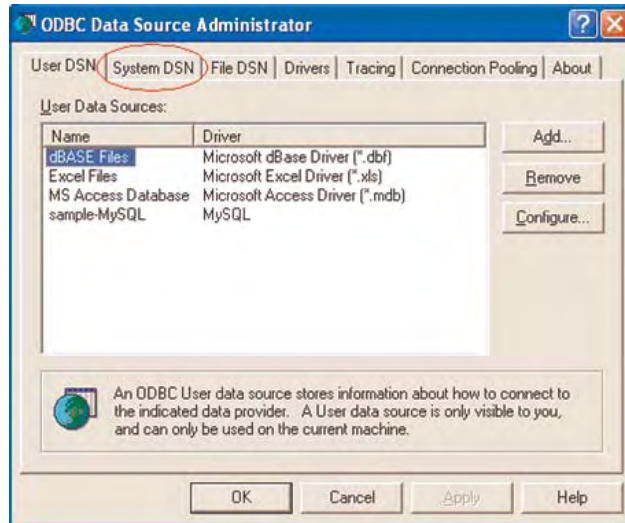


ODBC setting:

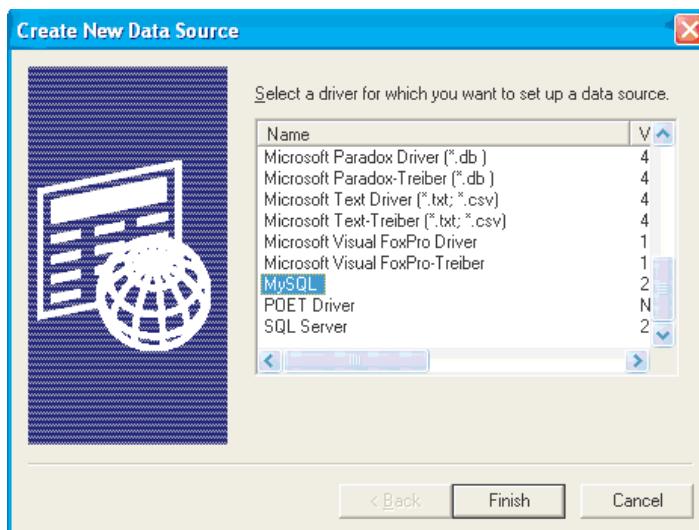
Open ODBC database in the route: control panel/manage tool



Select "system DNS"



Click and add



Select "mysql", then click "finish"

Input according to the below information in the page:

TDX mysql Driver default configuration

This is in public domain and comes with NO WARRANTY of any kind
Enter a database and options for connect

Windows DSN name:

MySQL host (name or IP):

MySQL database name:

User:

Password:

Port (if not 3306):

SQL command on connect:

Options that affects the behaviour of MyODBC

<input type="checkbox"/> Don't optimize column width	<input type="checkbox"/> Pad CHAR to full length
<input type="checkbox"/> Return matching rows	<input type="checkbox"/> Return table names in SQLDescribeCol
<input type="checkbox"/> Trace MyODBC	<input type="checkbox"/> Use compressed protocol
<input type="checkbox"/> Allow BIG results	<input type="checkbox"/> Ignore space after function names
<input type="checkbox"/> Don't prompt on connect	<input type="checkbox"/> Force use of named pipes
<input type="checkbox"/> Simulate ODBC 1.0	<input type="checkbox"/> Change BIGINT columns to INT
<input type="checkbox"/> Ignore # in #.table	<input type="checkbox"/> No catalog (exp)
<input type="checkbox"/> Use manager cursors (exp)	<input type="checkbox"/> Read options from C:\my.cnf
<input type="checkbox"/> Don't use setlocale	<input type="checkbox"/> Safety (Check this if you have problems)
	<input type="checkbox"/> Disable transactions

Password is 1

ODBC Data Source Administrator

User DSN | **System DSN** | File DSN | Drivers | Tracing | Connection Pooling | About

System Data Sources:

Name	Driver
monitor	MySQL

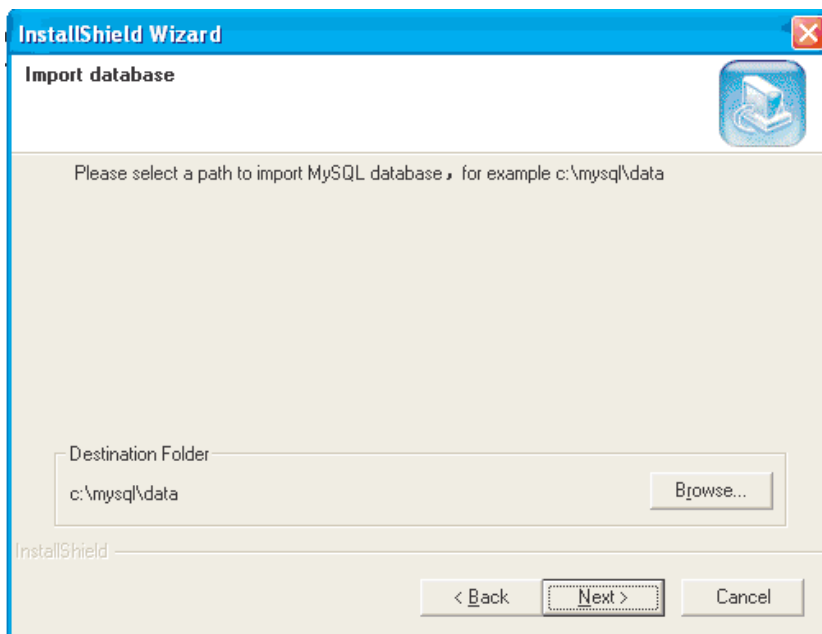
An ODBC System data source stores information about how to connect to the indicated data provider. A System data source is visible to all users on this machine, including NT services.

Click OK.

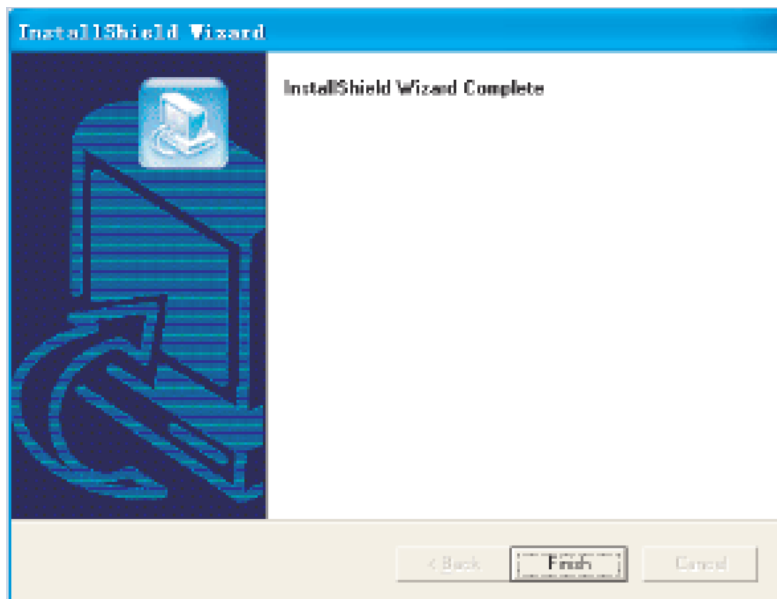
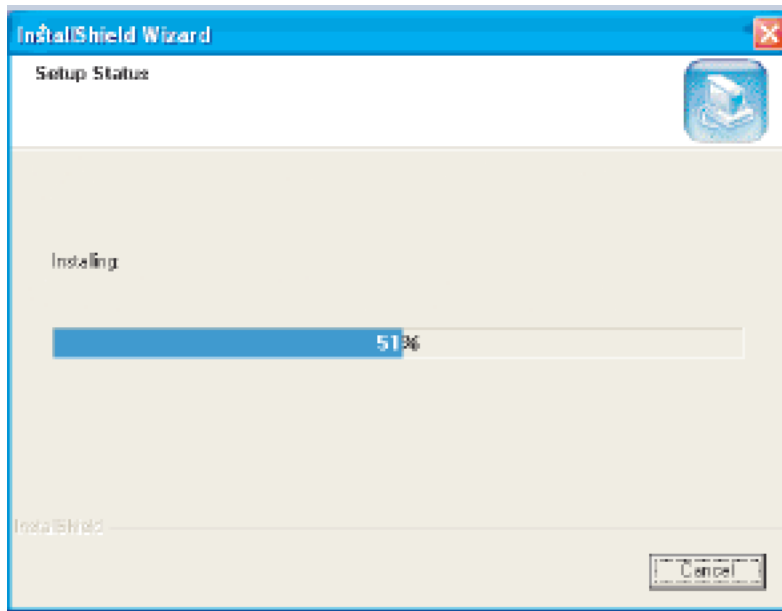
3. Software installation



Next



Next

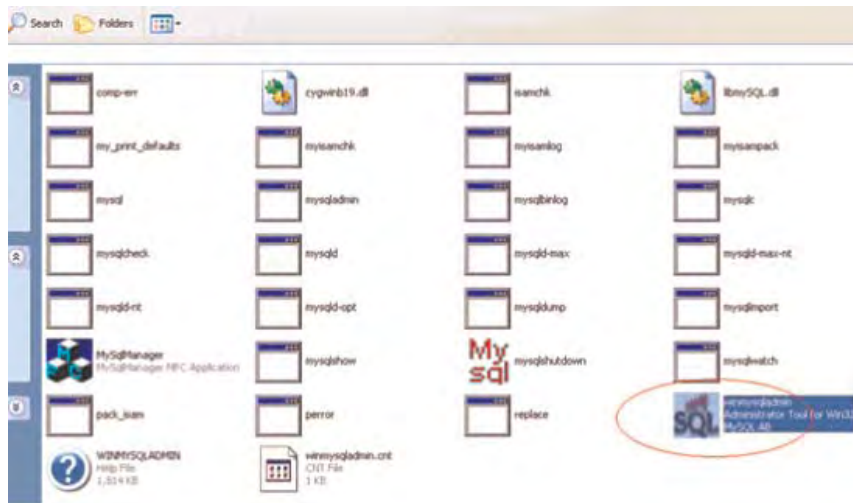


Click finish.

Software startup:

1. Startup of database

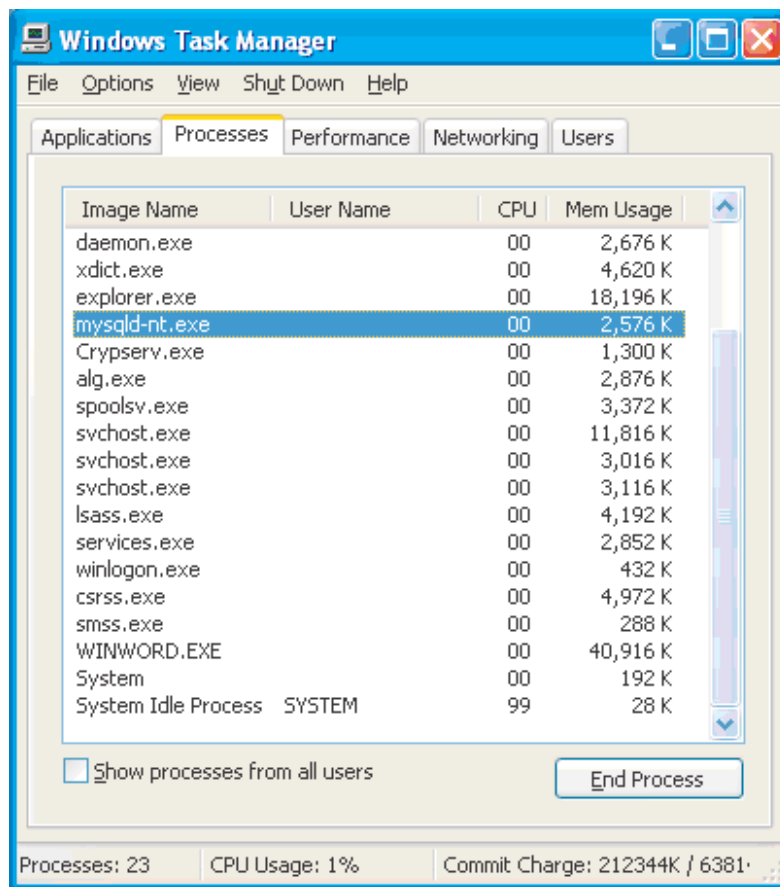
In the folder C:\mysql\bin, look for winmysqladmin.exe and click twice to open it.



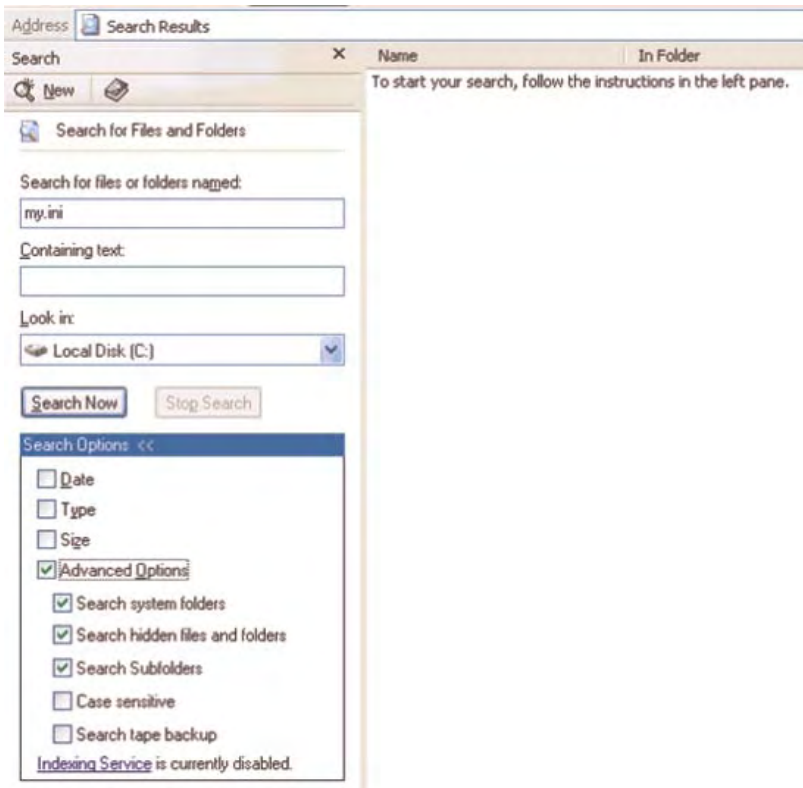
Note: Install mysql for the first time, open it, then you need enter username and password, username is "sa", password is "a".

Problems in installation:

If problem occurs, the system needs to be re-installed. Firstly stop "mysqld-nt.exe".

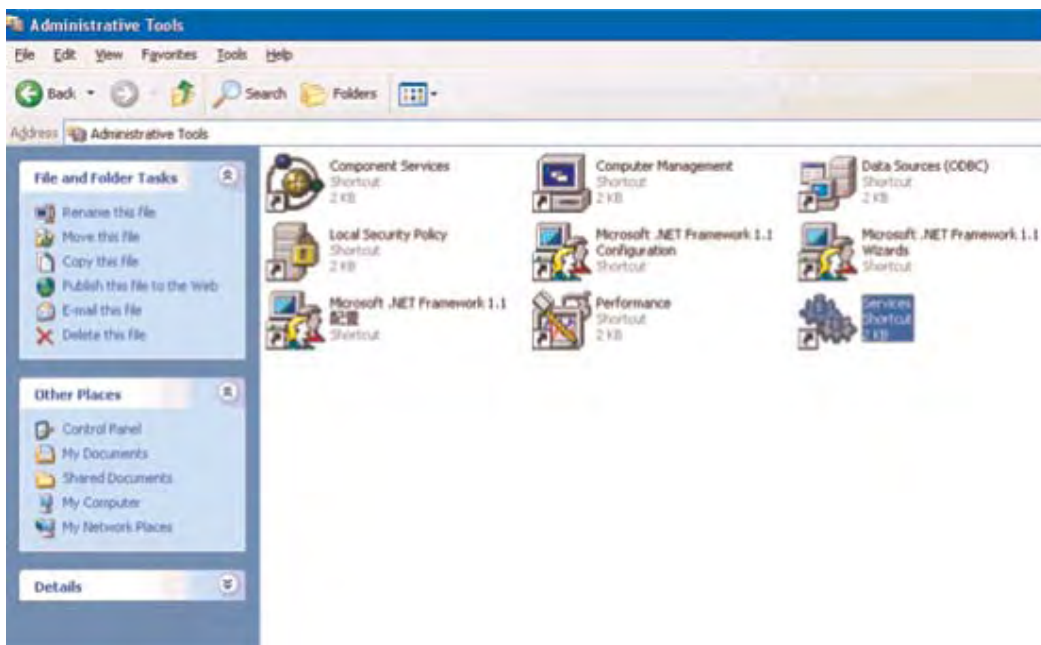


Search the file `my.ini` in disk C, and then cancel it.
If it cannot be found, modify the search item, as the following:



Choose the three items (search system folder, search hidden file and folder, search sub-folder) as the figure.

Stop "mysql" in "service" in the manage tool folder, if it is already stopped, you need not change it.



Services (Local)

MySQL

[Stop the service](#)
[Pause the service](#)
[Restart the service](#)

Name	Description	Status	Startup Type	Log On As
Alerter	Notifies sel...	Disabled	Local Service	Local Service
Application Layer G...	Provides s...	Started	Automatic	Local System
Application Manage...	Provides s...	Manual	Local System	Local System
ASP.NET State Serv...	Provides s...	Manual	Network S...	Network S...
Automatic Updates	Enables th...	Disabled	Local System	Local System
Background Intellig...	Transfers ...	Manual	Local System	Local System
Clipboard	Enables Cl...	Disabled	Local System	Local System
COM+ Event System	Supports S...	Started	Automatic	Local System
COM+ System Appli...	Manages t...	Manual	Local System	Local System
Computer Browser	Maintains a...	Disabled	Local System	Local System
Cryptkey License		Started	Automatic	Local System
Cryptographic Servi...	Provides th...	Started	Automatic	Local System
DCOM Server Proce...	Provides la...	Started	Automatic	Local System
DHCP Client	Manages n...	Started	Automatic	Local System
Distributed Link Tra...	Maintains l...	Manual	Local System	Local System
Distributed Transac...	Coordinate...	Manual	Network S...	Network S...
DNS Client	Resolves a...	Disabled	Network S...	Network S...
Echelon LMS xDriver...	Listens for ...	Manual	Local System	Local System
Error Reporting Ser...	Allows erro...	Disabled	Local System	Local System
Event Log	Enables ev...	Started	Automatic	Local System
Fast User Switching...	Provides m...	Manual	Local System	Local System
Help and Support	Enables He...	Disabled	Local System	Local System
HTTP SSL	This servic...	Manual	Local System	Local System
Human Interface D...	Enables ge...	Disabled	Local System	Local System
IMAPI CD-Burning C...	Manages C...	Disabled	Local System	Local System
Indexing Service	Indexes co...	Disabled	Local System	Local System
IPSEC Services	Manages I...	Disabled	Local System	Local System
Logical Disk Manager	Detects an...	Manual	Local System	Local System
Logical Disk Manage...	Configures...	Manual	Local System	Local System
Messenger	Transmits ...	Disabled	Local System	Local System
MS Software Shado...	Manages s...	Disabled	Local System	Local System
MySQL		Started	Automatic	Local System
Net Logon	Supports p...	Manual	Local System	Local System
NetMeeting Remote...	Enables an...	Disabled	Local System	Local System
Network Connections	Manages o...	Started	Automatic	Local System
Network DOE	Provides n...	Disabled	Local System	Local System
Network DOE OSDM	Manages D...	Disabled	Local System	Local System
Network Location A...	Collects an...	Started	Automatic	Local System

Extended Standard



6. 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

HP	0.6	0.8	1.0	1.25	1.5	1.7	2.0	2.5	3.0	3.2	4.0	5.0	6.0	8.0	10.0	15.0
BTU/h	none	7000	9000	12000	without	16000	18000	24000	28000	30000	38000	48000	none	none	none	none

"none" shows that there is no the relative model in MVi

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: automatical 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.

D. TA correction value in AUTO mode and Tdif: SW07-1, SW07-2 (written in EEPROM)

SW07-1	function
1	TA correction value is available in AUTO mode
0	TA correction value is unavailable in AUTO mode
SW07-2	function
1	Tdif = 3°C
0	Tdif = 2°C

Note: Mode changeover condition: when $TA < \text{set temp.} - 1 \cdot Tdif$, running mode is HEAT; when $TA \geq \text{set temp.} + TA \text{ correction value} + 1 \cdot Tdif$, running mode is COOL.

E: Indoor temp. sensor selection:SW07-3

SW07-3	function
0	indoor ambient temp. and heating set temp. correction value be controlled simultaneously
1	indoor ambient temp. and heating set temp. correction value be controlled individually

Note: "indoor ambient temp. and heating set temp. correction value be controlled simultaneously" is that when in group control (wired controller: 1 to x), the indoor ambient temp. and heating set temp. correction value of slave unit are as the same as that of the master unit; "indoor ambient temp. and heating set temp. correction value be controlled individually" is that the two values of slave unit and master unit are controlled by the individual indoor unit.

F. Inlet air temp. TA correction value: (SW07-4,SW07-5, be written in EEPROM)

SW07-5	SW07-4	function
0	0	TA correction value=12°C
0	1	TA correction value=8°C
1	0	TA correction value=4°C
1	1	TA correction value=0°C

G. Filter cleaning time selection:SW07-6

SW07-6	function
1	2500 hrs
0	120 hrs

H. Operation mode changeover of wired controller (SW07-7, SW07-8)

SW07-8	SW07-7	function
0	0	[AUTO] [FAN] [COOL] [DRY] [HEAT]
0	1	[FAN] [COOL] [DRY] [HEAT] [ELECTRIC-HEAT]
1	0	[FAN] [COOL] [DRY]
1	1	[FAN] [COOL] [DRY] [HEAT]

I. Air volume: SW08-1

SW08-1	function
1	normal operation
0	air volume is fixed at high speed (for duct unit)

J. In heating, fan speed selection:SW08-2

SW08-2	function
1	normal operation
0	run at mid. speed in heating though you set high speed



K. 26 degree lock function (SW08-3): in heating mode, though set temp. exceeds 20 degree, count as 20 degree; in cooling mode, though set temp. is below 26 degree, count as 26 degree.

SW08-3	function
1	normal mode
0	26 degree lock is available

L. Indoor priority selection (SW08-4)---pre-set, not available

M. Passive contact selection (SW08-5): room card function

SW08-5	function
1	passive contact function(room card) is available
0	passive contact function(room card) is unavailable

N. Wired control/remote control selection: SW08-6

SW08-6	function
1	wired control type
0	remote control type

O. Indoor installation height selection(SW08-7)

SW08-7	function
1	normal mode
0	when height is over 2.7m, indoor motor speed will be increased one class: in low speed, unit will run at med speed; in med speed, unit will run at high speed; in high speed, unit will run at high speed(not increased)

P. For twin energy source or not be used (SW08-8)

SW08-8	function
1	TES is not available
0	TES is available

Q. EEV open angle setting manually (CN27, CN29)

When being electrified, short connect CN27, EEV will open fully for 2 minutes; short connect CN29, EEV will close fully for 2 minutes.

R. Time shorting input (CN28)

	function
0	normal
1	1. short connected after being electrified, enter time shorting function 2. short connected when being electrified and reset, enter auto-check function

S. Float switch input (CN13, jumper connected is 1)

	function
1	normal
0	float switch is close (full of water)

2. Dip switch setting of wired controller

new	old	selection item	state	function description
D9	J02	changeover of controller type	0	set as simple controller
			1	set as standard controller
D12	J06	selection of room temp. sensor	0	use room temp. sensor on wired controller
			1	not use room temp. sensor on wired controller
D15	J07	auto restart	0	without auto restart
			1	with auto restart
D14	J03	selection of room temp. display	0	display room temp.
			1	not display room temp.

new	old	selection item	state	function description
SW[1]	SW20-[1]	changeover of master/slave controller	ON	set as slave controller
			OFF	set as master controller
SW[2]	SW20-[2]	°C or °F	ON	°F
			OFF	°C
JP8	D1	shorten time function	0	indoor shorting time
			1	without shorten time
JP7	D2	compulsory defrost	0	send to compulsory defrost signal
			1	normal operation

Note: 1. 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".

2. 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.

3. The old type: there are resistors of J03 and J06 beside the dip switch.

3. Instruction and function of selection switch

Introduction of dip switch on outdoor connecting board:

BM1, BM2, BM3, BM4, BM5: 8-bit dip switch

Identification:

Physical master unit: by setting dip switch, the unit number is 0. It is used to communicate with indoor unit, also it is the organizer of outdoor communications as communication master unit.

Functional master unit: the outdoor with the highest priority of running, the priority class is 0.

Physical slave unit: by setting dip switch, the unit number is not 0.

Functional slave unit: the outdoor without the highest priority of running, the priority class is 1~3.

Group class setting: physical master unit setting is valid, which can be used for all the units. For example, silence, snow-proof, piping length etc setting. Set all kinds of state on the physical master unit as a representative.

Single class setting: only be used for the single unit, instead of the whole group. For example, sensor backup running, inverter board selection etc.

In the following table, 1 is ON, 0 is OFF.

Dip switch definition:

BM1, BM2 are usually set by the personnel on site;

BM3, BM4 are usually used in the factory.

BM1-1	outdoor searching after startup	0	begin to search outdoor	
		1	stop searching outdoor and lock the quantity	
BM1-2	indoor searching after startup	0	begin to search indoor	
		1	stop searching indoor and lock the quantity	
BM1-3	start up after pre-heating for 6 hours	no action after being electrified	allow(must be electrified for 6 hours)	Group class (physical master unit is valid)
		after being electrified:OFF to ON	forbidden(can start up immediately)	
BM1-4	heating when outdoor temperature over 25degree	0	allow	Group class (physical master unit is valid)
		1	forbidden	
BM1-5	over match setting	0	allow	Group class (physical master unit is valid)
		1	forbidden	
BM1-6	sensor backup running	0	allow	Group class (physical master unit is valid)
		1	forbidden	
BM1-7 BM1-8	address setting	BM1-7	BM1-8	unit number
		0	0	0# (physical master unit)
		0	1	1#
		1	0	2#
		1	1	3#

Note: 1. Sensor backup running

a. when outdoor is in combination or single unit, if one outdoor occurs failure, if the unit meets the backup running condition, and set the backup running by hand, the unit will enter backup running.

b. Backup running condition:

When system is working, the following failures will make the unit into backup running:

Cooling: 20(Tdef), 25-1(Toci1), 25-2(Toci2), 35 (4-way valve reversing)

Heating: 22-1(Ts), 32-1(Tsco), 32-2(Tliqsc)

2. Oil temperature too low protection

Before being electrified, if BM1-7 is OFF, the unit can start up only after being heating for 6 hours.

On the condition that outdoor is without failure, rotary switch will count down from 6 hours (as minute); if BM1-7 is ON, the unit is allowed to start up immediately.

2) BM2 introduction

BM2-1	silent operation setting	0	allow (without silent operation)	Group class (physical master unit is valid)
		1	forbidden (with silent operation)	
BM2-2	snow-proof operation setting	0	allow (without snow-proof)	Group class (physical master unit is valid)
		1	forbidden (with snow-proof)	
BM2-3 BM2-4	power consumption setting	BM2-3	BM2-4	max. capacity output
		0	0	100%
		0	1	70%
		1	0	40%
		1	1	0%

BM2-5 defrosting condition BM2-6 "a" selection		BM2-5	BM2-6	selection item	Group class (physical master unit is valid)
		0	0	8(E)	
		0	1	10(E)	
		1	0	6(E)	
		1	1	8(E)	
BM2-7 BM2-8	piping length selection	BM2-7	BM2-8	selection item	Group class (physical master unit is valid)
		0	0	medium piping length: cooling 7.5KG, heating 26.0KG	
		0	1	long piping length: cooling 7.0KG, heating 28.0KG	
		1	0	long piping length: cooling 7.0KG, heating 28.0KG	
		1	1	medium piping length: cooling 7.5KG, heating 26.0KG	

3) BM3 introduction

BM3-1 BM3-2	outdoor model setting	BM3-1	BM3-2	outdoor model	
		0	0	MVI outdoor in combination	
		0	1	MVI outdoor single unit(DC motor)	
		1	0	MVI outdoor single unit(AC motor)	
		1	1	water cooled	
BM3-3	outdoor air processing	0	MVI outdoor		
		1	outdoor air processing unit		
BM3-4	inverter board selection	0	inverter board		single class
		1	APY inverter board		
BM3-5	3PH, 50Hz or 60Hz selection	0	50Hz		single class
		1	60Hz		
BM3-6 BM3-7 BM3-8	outdoor horse power setting	BM3-6	BM3-7	BM3-8	outdoor horse power
		0	0	0	6HP
		0	0	1	8HP
		0	1	0	10HP
		0	1	1	12HP
		1	0	0	14HP
		1	0	1	16HP
		1	1	0	18HP
1	1	1	20HP		

4) BM4 introduction

BM4-1	indoor quantity	0	with indoor quantity locked function
	locked	1	without indoor quantity locked function
BM4-2	master unit running in heat, fan speed set of slave unit whose thermostat is off	0	not running
		1	in running
BM4-3	outdoor static pressure	0	outdoor motor max. speed is 14 class (default: 0Pa)
		1	outdoor motor max. speed is 15 class (80Pa)
BM4-4~8	pre-set		

5) BM5 introduction

BM5-1 ~ BM5-4	outdoor motor selection	BM5-1	BM5-2	BM5-3	BM5-4	selection item
		1	1	0	0	dual fan motor(375W)
		0	0	1	1	single fan motor(750W)
BM5-5 ~ BM5-8	inverter board selection	BM5-5	BM5-6	BM5-7	BM5-8	selection item
		1	1	0	0	APY inverter board
		0	0	1	1	inverter board

◆ Monitor code

Monitor code is as following:

Press button: SW2, SW1 are the button switch

Rotary switch: SW9, SW10, SW11, 0~15 can be set.

Display section: LD1, LD2, LD3, LD4, digital tube.

(1) Indoor parameter

Check the parameters of indoor whose address is from 1 to 64.

SW11 is set from 3~15 to check indoor parameter. SW9 and SW10 shows indoor unit number.

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

SW11	function	digital tube LD1~4 display
3	indoor communication checking	communication available, display 1111; indoor unavailable, display ----
4	indoor abnormal	display indoor failure code; no failure, display 0
5	indoor capacity	indoor capacity, 1.5HP displays 1.5
6	indoor EEV open angle	electronic expansion valve(EEV) open angle

SW11	function	digital tube LD1~4 display
7	indoor ambient temp. Tai	ambient temperature -2degree displays -2
8	indoor gas pipe temp. Tc1	gas pipe temperature -2degree displays -2
9	indoor liquid pipe temp. Tc2	liquid pipe temperature -2degree displays -2
10	indoor mode	cooling: COOL; heating: HEAT, shutoff: OFF
11	indoor set temp. Tset	set temperature, 16 degree displays 16
12	indoor SCODE code	0~15
13	wrong wiring inspection	0 shows no failure, 79 shows wiring connection failure (indoor no display)
14	indoor cooling compulsorily(pre-set)	press SW2 (UP) for 2s continuously to start up; press SW1(DN) for 2s continuously to stop. If startup,the 4 LDs will flash once and display 1; if stop, the 4 LDs will flash once and display 0.
15	indoor heating compulsorily(pre-set)	press SW2 (UP) for 2s continuously to start up; press SW1(DN) for 2s continuously to stop. If startup,the 4 LDs will flash once and display 1; if stop, the 4 LDs will flash once and display 0.

(2) Outdoor parameter

SW11: 0~2, show outdoor parameter

SW9 is used to select outdoor unit number

For example, SW9 is set 0, that shows No.0 outdoor parameter; set as 1, that shows No.1 outdoor parameter...

(master unit can display the other outdoor parameter and indoor parameter, but the slave unit only displays itself parameter). Start up for the first time, search slave units and display flashing 0 from left to right. If one slave unit is found, display 1, two slave units are found, display 2, and so on, the max. number is 8. After searching slave units, display outdoor failure code; if no failure, display 0. 0~3 of SW9 is used to select outdoor unit number.

SW9	SW10	SW11	function	digital tube LD1~4 display
unit No. 0-3	0	0	display outdoor failure code	<p>failure code transmitted by outdoor bus data. If no failure, display the time as second counting down from the 6 hours for pre-heating.</p> <p>1. Press SW2(UP) for continuous 2 seconds, display 1111, enter the failure history state. You can check the latest 10 failures: flash the failure number and failure code, every time pressing SW2(UP) once, the number will add 1; and every time pressing SW2(DN) once, the number will decrease 1. 2 minutes later, quit the set state automatically.</p> <p>2. Press SW1(DN) for continuous 2 seconds, display 0000, quit the check state, and stop flashing.</p> <p>3. Rotate switch is at 13, 0, 0, pressing SW2(UP) for 2 seconds continuously, display 1111 to clear the failure history record.</p> <p>4. When the capacity is overmatch 135% or lower than 50%, forbidden to start up, the digital tube 000 will display "555.0".</p> <p>5. When temperature is over 26degree, forbidden to operate heat mode and start up, the digital tube 000 will display "555.1".</p> <p>6. When in cooling mode, Ps<0.23MPa or in heating mode, Ps<0.12MPa, forbidden to start up, the digital tube 000 will display "555.2".</p>
	1	0	display priority of outdoor number	display outdoor priority
	2	0	display operation mode	HEAT: heating; COOL: cooling; OFF: stop
	3	0	outdoor capacity	16.0 shows 16HP, 8.0 shows 8HP
	4	0	outdoor capacity output ratio	60 shows 60% of capacity output
	5	0	current frequency of inverter compressor	<p>110.0 shows 110.0HZ. Press SW2(UP) for 2s continuously, display 1111, then to set: flashing and press SW2(UP) once, the frequency will go up 1Hz; press SW1(DN) once, the frequency will decrease 1Hz; 5 min later, quit the setting state automatically.</p> <p>Press SW1(DN) for 2s continuously, display 0000, then quit the setting state, and stop flashing.</p> <p>When system failures, compressor is forbidden to start up.</p>
	6	0	speed of outdoor fan motor 1	345 shows 345rpm. Press SW2(UP) for 2s continuously, display 1111, then to set: flashing and press SW2(UP) once, the frequency will go up 1Hz; press SW1(DN) once, the frequency will decrease 1Hz; 5 min later, quit the setting state automatically.
	7	0	speed of outdoor fan motor 2	Press SW1(DN) for 2s continuously, display 0000, then quit the setting state, and stop flashing.

SW9	SW10	SW11	function	digital tube LD1~4 display
unit No. 0-3	8	0	outdoor solenoid valve output indication	
	9	0	outdoor solenoid valve output indication	LD1: SV10: 1 ON 0 OFF LD2: SV11: 1 ON 0 OFF LD3: SV13i: 1 ON 0 OFF LD4: SV3i: 1 ON 0 OFF
	10	0	outdoor LEV a1 valve open angle	0~500 steps. Press SW2(UP) for 2s continuously, display 1111, then to set: flashing and press SW2(UP), valve opens fully; press SW1(DN), valve closes fully; 2 min later, quit the setting state automatically. Press SW1(DN) for 2s continuously, display 0000, then quit the setting state, and stop flashing.
	11	0	outdoor LEV a2 valve open angle	
	12	0	outdoor solenoid valve output indication fixed frequency compressor output indication	LD1: SV3(pump): 1 ON 0 OFF LD2: FAN_PTC: 1 ON 0 OFF LD3: COMP1: 1 ON 0 OFF LD4: COMP2: 1 ON 0 OFF
	13	0	heater output	LD1: CHi: 1 ON 0 OFF LD2: CHa: 1 ON 0 OFF LD3: CH1: 1 ON 0 OFF LD4: CH2: 1 ON 0 OFF
	14	0	outdoor LEV b valve open angle	0~500 steps. Press SW2(UP) for 2s continuously, display 1111, then to set: flashing and press SW2(UP), valve opens fully; press SW1(DN), valve closes fully; 2 min later, quit the setting state automatically. Press SW1(DN) for 2s continuously, display 0000, then quit the setting state, and stop flashing.
	15	0	unit number address	1 shows 1# unit

SW9	SW10	SW11	function	digital tube LD1~4 display
unit No. 0-3	0	1	Pd pressure	10.00 shows 10.00KG
	1	1	Ps pressure	10.00 shows 10.00KG
	2	1	Tdi discharging temp.	25 shows 25degree
	3	1	Tsi suction temp.	25 shows 25degree
	4	1	Tdef defrosting temp. (water inlet temp. Twi)	25 shows 25degree
	5	1	Tao ambient temp.	25 shows 25degree
	6	1	Toilp temp.	25 shows 25degree
	7	1	Toil temp.	25 shows 25degree
	8	1	Toci1 temp.	25 shows 25degree
	9	1	Toci2 temp. (water outlet temp. Two)	25 shows 25degree
	10	1	Tsco temp.	25 shows 25degree
	11	1	Tliqsc temp.	25 shows 25degree
	12	1	Td1 temp.	25 shows 25degree
	13	1	Tsuc temp.	25 shows 25degree
	14	1	Is current of power supply	10.2 shows 10.2A
	15	1	CT1 current of fixed frequency compressor	---- 10.2 shows 10.2A 1111 outdoor backup operation

(3) Master unit information center: display parameters of the whole system

SW9	SW10	SW11	function	description
0	0	2	refrigerant type	407C stands for R407C; 410A stands for R410A(default); R22 stands for R22
0	1	2	outdoor total capacity	48.0 stands for 48HP
0	2	2	outdoor QTY in one system	e.g.: 4 outdoors (including master outdoor)
0	3	2	indoor QTY in one system	e.g.: 64 indoors
0	4	2	running indoor QTY	thermostat ON indicates indoor running
0	5	2	indoor QTY whose operation modes are as the same as that of outdoor	e.g.: 13 indoors

SW9	SW10	SW11	function	description
0	6	2	pre-set	---
0	7	2	pre-set	---
0	8	2	refrigerant evacuation setting *only for outdoor evacuation. If indoor evacuation, do not set. When it finishes, cancel the setting or re-electricity.	press SW2(UP) for 2s continuously, display 1111 and start up; digital tube displays "YES", detailed response: SV9, SV10, SV11 open; LEVa1,2, LEVb open for 100pls, the other valves close compulsorily. Press SW1(DN) for 2s continuously, display 0000 and stops (setting is invalid when unit is running)
0	9	2	refrigerant charging setting *only for gas charged outdoor. If indoor is charged, do not set. When it finishes, cancel the setting or re-electricity.	press SW2(UP) for 2s continuously, display 1111 and start up; digital tube displays "YES", detailed response: LEVa1,2 open for 500pls, the other valves close compulsorily. Press SW1(DN) for 2s continuously, display 0000 and stops (setting is invalid when unit is running)
0	10	2	wrong wiring inspection in cooling	press SW2(UP) for 2s continuously, display 1111 and start up; digital tube counts down judging time at second; after time arrives, display the result: "00.00" shows the result is in conformity with the actual connection; "01.05" shows one outdoor and 5 indoors are abnormal, to check the abnormal units by digital tube (indoor: X_X_13, outdoor X_0_0); Press SW1(DN) for 2s continuously, display 0000 and stops
0	11	2	wrong wiring inspection in heating	
0	12	2	indoor expansion valve open fully	press SW2(UP) for 2s continuously, display 1111 and indoor valves open fully for 2 minutes, then indoor valves close automatically.
0	13	2	all indoor units running in cooling	press SW2(UP) for 2s continuously, display 1111 and start up; Press SW1(DN) for 2s continuously, display 0000 and stops.
0	14	2	all indoor units running in heating	press SW2(UP) for 2s continuously, display 1111 and start up; Press SW1(DN) for 2s continuously, display 0000 and stops.
0	15	2	cancel all manual controls (running type)	press SW2(UP) for 2s continuously, display 1111 and start up; Press SW1(DN) for 2s continuously, display 0000 and stops. Cancel items: wrong wiring inspection in cooling/heating mode; indoor running/stop totally; compulsory operation; rated operation, etc.
15	0	2	capacity correction class	0 shows short piping length; 1 shows medium piping length; 2 shows long piping length
15	1	2	defrosting compensation f	10, 8, 6
15	2	2	set temperature in cooling	25 shows 25 degree
15	3	2		25 shows 25 degree

SW9	SW10	SW11	function	description
15	4	2	electricity limitation(allow max.output)	100 show 100% output, 0 shows no output allowed
15	5	2	over match inspection	135 stands for limitation; 0: without limitation
15	6	2	heating limit when outdoor temp.over 25degree	25 shows limitation; 0 shows no limitation
15	7	2	silent operation setting	0: without silent operation; 1: with silent operation
15	8	2	snow-proof operation setting	0: without snow-proof operation; 1: with snow-proof operation
15	13	2	inverter board selection	0: HAIER inverter board; 1: APY inverter board
15	14	2	outdoor model selection	0: MRVII-C2 in combination; 1: MRVII-C2 single unit (DC motor); 2: MRVII-C2 single unit (AC motor); 3: water cooled MRVIII
15	15	2	software version	1.0 shows Ver 1.0

(4) Outdoor valves control

SW9	SW10	SW11	function	description
6	0	2	SV1 open by hand	display current state of components; 1: open; 0: close. Press SW2(UP) for 2s continuously, display 1111 then to set and flash. Press SW2(UP) to open; press SW1 (DN) to close; 2 minutes later, quit the setting state automatically. Press SW1(DN) for 2s continuously, display 0000 then quit the set, and stop flashing(if system failures, compressor is forbidden to start up).
6	1	2	SV6 open by hand	
6	2	2	SV9 open by hand	
6	3	2	SV10 open by hand	
6	4	2	SV11 open by hand	
6	5	2	SV13i open by hand	
6	6	2	SV3i open by hand	
6	7	2	SV3(pump) open by hand	
6	8	2	COMP1 running by hand	
6	9	2	COMP2 running by hand	
6	10	2	pre-set	---
6	11	2	pre-set	---
6	12	2	pre-set	---
6	13	2	pre-set	---
6	14	2	pre-set	---
6	15	2	cancel all the manual controls (component type)	Press SW2(UP) for 2s continuously, display 1111 then to quit. Or press SW1(DN) to 2s continuously, display 0000 then quit the set, Cancel items: movable component control by hand, such as compressor, motor, electronic expansion valve LEV, solenoid valve SV and so on (including evacuation, charging, excluding rated operation, compulsory operation, indoor run/stop etc.)

◆ Dip switch setting when out of factory

rotary switch	bit	set	applicable model																												
SW9		0	YCV280 YCV400 YCV335 YCV450																												
SW10		0																													
SW11		0																													
dip switch		ON:1;OFF:0																													
BM1	1	1	YCV280 YCV335 YCV400 YCV450																												
	2	0																													
	3	0																													
	4	0																													
	5	0																													
	6	0																													
	7	0																													
	8	0																													
BM2	1	0	YCV280 YCV335 YCV400 YCV450																												
	2	0																													
	3	0																													
	4	0																													
	5	0																													
	6	0																													
	7	0																													
	8	0																													
BM3	1	0	<table border="1"> <thead> <tr> <th>BM3-6</th> <th>BM3-7</th> <th>BM3-8</th> <th colspan="2">model</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>1</td> <td>0</td> <td colspan="2">YCV280</td> </tr> <tr> <td>0</td> <td>1</td> <td>1</td> <td colspan="2">YCV335</td> </tr> <tr> <td>1</td> <td>0</td> <td>0</td> <td colspan="2">YCV400</td> </tr> <tr> <td>1</td> <td>0</td> <td>1</td> <td colspan="2">YCV450</td> </tr> </tbody> </table>				BM3-6	BM3-7	BM3-8	model		0	1	0	YCV280		0	1	1	YCV335		1	0	0	YCV400		1	0	1	YCV450	
	BM3-6	BM3-7					BM3-8	model																							
	0	1					0	YCV280																							
	0	1					1	YCV335																							
	1	0					0	YCV400																							
	1	0					1	YCV450																							
	2	0																													
	3	0																													
4	0																														
5	0																														
6																															
7																															
8																															
BM4	1	0	YCV280 YCV335 YCV400 YCV450																												
	2	0																													
	3	0																													
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	8	0																													
BM5	1		<table border="1"> <thead> <tr> <th>outdoor motor selection</th> <th>BM5-1</th> <th>BM5-2</th> <th>BM5-3</th> <th>BM5-4</th> <th>applicable model</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1</td> <td>0</td> <td>0</td> <td>YCV335/400/450</td> </tr> <tr> <td>0</td> <td>0</td> <td>1</td> <td>1</td> <td>YCV280</td> </tr> </tbody> </table>				outdoor motor selection	BM5-1	BM5-2	BM5-3	BM5-4	applicable model	1	1	0	0	YCV335/400/450	0	0	1	1	YCV280									
	outdoor motor selection	BM5-1					BM5-2	BM5-3	BM5-4	applicable model																					
	1	1					0	0	YCV335/400/450																						
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	2																														
	3																														
	4																														
	5	0	YCV280 YCV400 YCV335 YCV450																												
6	0																														
7	1																														
8	1																														

6. Indoor unit control

6.1 Indoor PCB

A. Cooling operation

Set temp. in cooling: $T_s = \text{set temp. of wired controller}$;

After startup, indoor unit will send the request to outdoor according to the temp. difference between the set temp. and the room temp.

B. Heating operation

Set temp. in heating: $T_s = \text{set temp. of wired controller} + \text{TA correction value}$.

After startup, indoor unit will send the request to outdoor according to the temp. difference between the set temp. and the room temp.

C. Dry operation

room temp. - set temp. $> 2^\circ\text{C}$, indoor operation is identical with the cooling operation, and send the cooling mode to outdoor;

room temp. - set temp. $\leq 2^\circ\text{C}$, indoor will send the dry signal to outdoor, and indoor fan motor will run at low speed compulsorily when compressor is running; when room temp. $< 16^\circ\text{C}$, indoor stops and sends stop signal to outdoor.

In dry operation, the auto mode of indoor fan motor is identical with the cooling mode; EEV control mode is identical with the cooling operation.

D. Fan operation

Indoor fan motor will run at the speed set on the wired controller and sends stop signal to outdoor.

E. Abnormal operation

When the requested mode collides with the outdoor mode, the entering earlier will be in prior.

After indoor receives the startup command from wired controller (remote controller), firstly judge the outdoor current mode. If it is normal mode, the indoor will run as the request of wired controller; if it is abnormal mode, the command can not be executed, and indoor keeps stop; wired controller displays standby mode (if in remote control type, the buzzer will sound twice and the remote controller can not receive the signal). Until the outdoor stops or the outdoor mode is accordant with the requested mode of wired controller (remote controller), the outdoor will work.

COOL (including AUTO COOL), DRY, RECOVERY are regarded as the same mode;

HEAT, RECOVERY are as abnormal mode.

F. Fan speed control of indoor fan motor

a. Adjustment by hand

Set high/mid/low fan speed as the request;

b. Auto fan speed

Confirm the fan speed as the temp. difference between room temp. TA and the set temp.

c. Anti-code air control

In heating mode, after compressor startup, the unit will control indoor fan motor state due to the indoor coil temp.;

In anti-code air period, indoor sends pre-heat signal to wired controller; in outdoor defrosting period, indoor fan motor will stop, and sends defrost signal to wired controller;

After being switched off in heating mode, indoor fan motor will run at low speed and 30 seconds later will stop.



H. Set EEV open angle by hand

When being switched off, short connect CN27 to open the valve fully compulsorily for 2 minutes;

When being switched off, short connect CN29 to close the valve fully compulsorily for 2 minutes.

I. Anti-freezed protection

In cooling mode, execute the anti-freezed protection due to the measured indoor coil temp. to avoid the indoor heat exchanger causing frost or ice.

J. Other functions

a. Swing motor control

Indoor will control swing motor ON/OFF due to the swing signal from wired controller.

b. Auxiliary electric heater control

In heating mode, if the below conditions can be met, the electric heater will work:

(1) Indoor fan motor and compressor are running;

(2) Air inlet temp. is no more than 22°C;

(3) Room temp. is lower over 2°C than the set temp.;

(4) Compressor has run for 5 seconds;

Either below condition is met, the electric heater will stop:

(1) Indoor fan motor or compressor not runs;

(2) Indoor air inlet temp. is over 23°C;

(3) Indoor air inlet temp. is higher over -1°C than the set temp.;

(4) Unit stops or quit the heating mode.

c. Filter cleaning

Check and memorize the running time of indoor fan motor, once arriving the requested time (set by SW07-6), indoor will send filter cleaning signal to wired controller; when indoor receives the filter reset signal from wired controller, if the time exceeds the requested time, the filter will reset.

d. Compulsory defrosting: after indoor receives the compulsory defrosting signal from wired controller, it will send compulsory defrosting signal to outdoor continuously for 10 times. In the sending period, indoor will execute the normal defrost.

e. Trial operation

Set the mode as cooling (heating), press ON/OFF for 5 seconds to enter compulsory cooling (heating).

In compulsory cooling, display "LL" and COOL will flash;

In compulsory heating, display "HH" and HEAT will flash, fan speed is AUTO.

At this time, only ON/OFF, TEMP +/- are valid.



Wired controller functions RWW01

1. Brief Functions

- 1.1 Being connected with indoor through 3 wires, and can control 16 groups of indoor.
- 1.2 Can combine with another wired controller, the slave one will be in the same step with the master one.
- 1.3 Set unit number for indoor unit in one group
- 1.4 Record the last twice failures of each indoor in one group
- 1.5 1 port is A/D input (room temperature sensor), 16 ports are function input, 12 ports is switch state input.

2. Function switch changeover

port	description	state	function
D9	Changeover of type of wired controller	ON	Set as simple controller
		OFF	Set as standard controller
D12	Selection of room temp. sensor	ON	Use the sensor in the wired controller
		OFF	Use the sensor in the indoor unit
D15	Auto restart after power failure	ON	Without Auto restart
		OFF	With Auto restart
D14	Display room temperature or not	ON	Display room temperature
		OFF	Not display room temperature
D8	Master/slave controller changeover	ON	As slave controller
		OFF	As master controller
D11	°C or °F	ON	°F
		OFF	°C
JP8	Shorten time function	ON	Indoor unit in shorted time function
		OFF	Common control
JP7	Compulsorily defrost	ON	Send compulsorily defrost signal to indoor unit
		OFF	Common control

Note:

The switches in grey can be operated after opening the cover of wired controller.

ON: connected, OFF: disconnected

3. Function difference between master wired controller and slave one:

Contrastive items	Master wired controller	Slave wired controller
Function	All of functions	Only with below functions: ON/OFF, MODE, FAN SPEED, SET TEMP., HEALTH, SWING, and display TIMER clock, but can not set it; to cancel the timer by switching off slave controller.

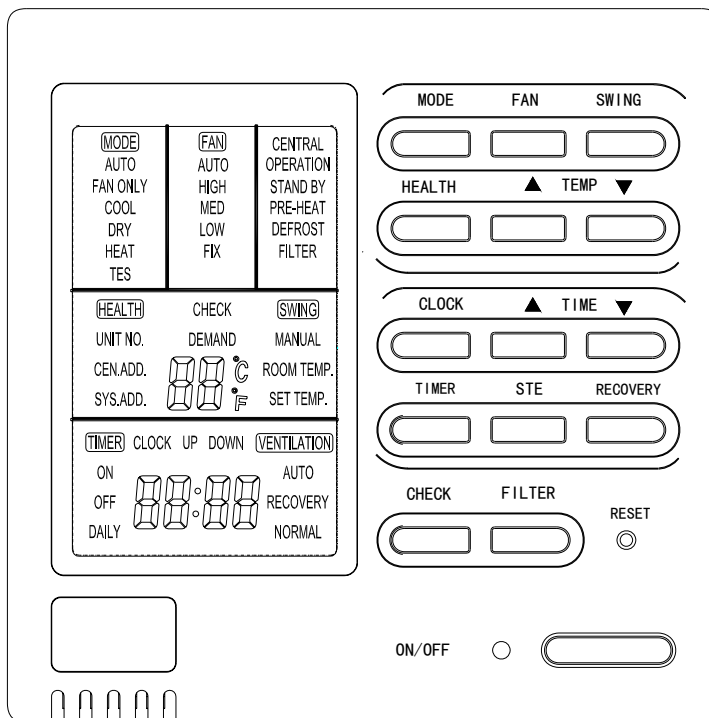
4. Function difference between simple wired controller and the standard one:

Contrastive item	Standard wired controller	Simple wired controller
Function	With all functions	New LCD, different from standard wired

		controller, so the display will be different.
Master/Slave selection	Can be either of Master and Slave controller	Only can be Master controller

5. LCD display

The LCD appearance and the display icons:



Initialization process:

1. Display on LCD

In the initialization after being electrified and reset, firstly display the whole information for 3 seconds, then display nothing for 1 second. The timer clock will display 4-bit 7-segment digit, and flash the below icons as frequency of 1Hz until the reset finishes.

[8888]→[888]→[88]→[8]

If only wired controller is electrified and reset, there is no communication, then you should electrify the indoor PCB, the normal communication will be gotten.

2. Run LED display

When being reset, LED will flash at the frequency of ON for 0.5s and OFF for 0.5s until the reset finishes.

6. Buttons operation

Do not deal with the button operation from initialization to the beginning communication.

After initialization, if there is TIMER OFF, the unit will be at OFF state, if there is no TIMER OFF, the unit will be ON.

1. ON/OFF button

Press “ON/OFF” to change over the state ON/OFF;

In running, LED is on; in stop state, LED is off.

In switchover state of cooling or heating, press ON/OFF for 5 seconds to enter compulsory running mode.

2. MODE button

2.1 The mode of 1# indoor will decide the mode which wired controller can display and set.

2.2 Mode will display as the following in turn:

[AUTO]→[FAN]→[COOL]→[DRY]→[HEAT]→[AUX HEAT]→[AUTO]

[AUX HEAT] (auxiliary heating) will not display for some models, which depends on indoor.

After reset, the displayed mode is what is memorized in EEPROM.

2.3 FAN button

Press “FAN” button, fan speed will change as following:

[AUTO]→[HIGH]→[MED]→[LOW]→[AUTO]

In FAN mode, there is no AUTO FAN mode.

If the master indoor unit requests fixed fan speed, the fan mode can not be changed, and display fan speed [FIX].

After reset, the displayed fan speed is what is memorized in EEPROM.

2.4 SWING button

① 1# indoor unit will decide if wired controller will display and set SWING function, which is not memorized after restart up.

② After swing function has been set, press SWING every time, the mode changes as following:

[]→[SWING]→[].

2.5 TEMP +/- button

The primary set temperature is 24°C, but there is no set temperature in FAN mode. After reset, the displayed temperature is what is memorized in EEPROM.

Every time press TEMP button, display SET, and the set temperature will increase or reduce 1°C; press it continuously, 2s later, the set temperature will change 1°C per 0.5s. When displaying room temperature, if no operation within 10s, it will return to display the room temperature, and SET icon is off, ROOM TEMP. will be lighten on and display the relative value, or you can set the temperature.

If the master wired controller is with room temperature sensor, the displayed temperature is measured by the master wired controller, including indoor unit; if there is no room temperature sensor, the displayed temperature is measured by indoor unit.

2.6 TIMER button

Press TIMER button, change over as the following:

[TIMER ON]→[TIMER OFF]→[TIMER ON][TIMER OFF]→[TIMER ON][TIMER OFF][recycle]→[]

In the state of timer setting, LCD will display TIMER, instead of CLOCK. When selecting TIMER ON, adjust the clock of TIMER ON, TIMER ON will flash at 1Hz, press +/- to adjust the

clock. When selecting TIMER OFF, adjust the clock of TIMER OFF, TIMER OFF will flash at 1Hz, press +/- to adjust the clock. When selecting TIMER ON/OFF, adjust the clock of TIMER ON/OFF, display TIMER ON/OFF at the same time, firstly TIMER ON will flash at 1Hz and TIMER OFF is on, which shows to set the clock of TIMER ON, then TIMER OFF will flash at 1Hz and TIMER ON is on to set the clock of TIMER OFF. The clock of TIMER ON/OFF will decide "TIMER ON→TIMER OFF" or "TIMER OFF→TIMER ON". If the two clocks are identical, the setting is invalid; when TIMER clock arrives, the icon will disappear and execute the relative operation.

In the state of time setting, press SET to finish the setting. If no clock is set in continuous 10s, quit the timer and go back to the previous state.

When setting the clock of timer, press TIMER button to quit the timer, and the clock will not be memorized, then enter the next timer setting.

After setting the timer, display the timer icon and the timer clock, instead of clock. Press CLOCK button to display the clock for 5s.

After setting the timer, press ON/OFF to cancel timer.

The default timer on clock is 08:00; the default timer off clock is 18:00.

2.7 CLOCK button

In normal state, display CLOCK and the present time. It is 24-hour clock.

If there is no timer, press once to adjust the clock, meanwhile, [CLOCK] will flash at 1Hz; if there is timer, press once to display the real clock, then press again to adjust the clock, or 5s later, display timer.

Clock adjustment: "TIMER" button is invalid, press "+/-", the clock will change as 1 minute, if press it continuously, 2s later, change once per second; 5s later, change 10times per second; 10s later, change as 10 minutes, the frequency is 10 times per second. Press SET to cancel adjustment, the clock will continue as the new time. If you do not press SET, or no operation within 10s, the clock will go back to the previous time.

2.8 TIME +/- button

In the timer state, you can set ON/OFF time. Each time press TIME +/-, the time will change 10 minutes each time or per 0.5s; press it continuously, 5s later, the time will change at 10 minutes per 0.1s; loose it, resume back to the normal speed.

2.9 FILTER button

When wired controller receives the signal of filter from indoor unit, the controller will display FILTER icon in the state of ON/OFF, which will not affect the other operation. Press filter button again, FILTER icon will disappear and send to filter reset signal to indoor.

2.10 RECOVERY button

Press RECOVERY button, the display as following:

[]→[AUTO]→[RECOVERY]→[NORMAL]→[].

It will not be memorized after power off.

2.11 HEALTH button

Press HEALTH button to realize the function. It will not be memorized after power off.

2.12 CHECK button

Refer to the detailed function.



2.13 RESET button

RESET is equal that the controller is restarted up.

7. Icon display

7.1 [CENTRAL]

After receiving the central control signal from indoor, the controller displays [CENTRAL], or [CENTRAL] is off.

Central control mode: normal on.

Compulsory mode: flash (1Hz)

7.2 [OPERATION]

After the controller starts up, when compressor is running, the controller will display [OPERATION]; when compressor stops, [OPERATION] will be off.

7.3 [STANDBY]

After the controller starts up, when receiving the signal of standby, the controller will display [STANDBY] until the signal is cancelled.

7.4 [PREHEAT]

After the controller starts up, when receiving the signal of [PREHEAT], the controller will display [PREHEAT] until the signal is cancelled. In the state of switch off and non-heating state, do not display [PREHEAT].

7.5 [DEFROST]

After startup in heating mode, if receiving the defrosting signal from indoor or wired controller enters compulsory defrosting, it displays [DEFROST], until the defrosting signal disappears.

7.6 [FILTER]

After startup, if receiving the filter cleaning signal from indoor, wired controller will display [FILTER], until it is cancelled.

In shut off state, only [CENTRAL], [CLOCK], [ROOM TEMP], [FILTER] will display.

8. Special functions

8.1 Indoor central address setting

On the condition that wired controller can set address, press [FILTER] for 10 seconds, then enter the address setting mode, to select the central address by [TEMP+/-].

Temperature area will display: [central address]+ XX, press TEMP +/- to select address in range of 0-3F, the default value is 00.

After setting, press [SET] to save and quit; if pressing button or no operation within continuous 15 seconds, the set will quit automatically and keep the former setting.

8.2 Indoor system address setting

On the condition that wired controller can set address, press [FILTER] for 5 seconds, then enter the address setting mode, to select the central address by [TEMP+/-].

Temperature area will display: [system address]+ XX, press TEMP +/- to select address in range of 0-3F, the default value is 00.

After setting, press [SET] to save and quit; if pressing button or no operation within continuous 15 seconds, the set will quit automatically and keep the former setting.

8.3 Query indoor malfunction history

In the state of power on or power off, press [CHECK] button, enter the malfunction-querying mode of all indoor units in the group. Then [CHECK] and [UNIT NO.] will display, and the actual indoor numbers will be displayed in some sequence (unit number is in decimals). At the same time, in the time region, there will be the current malfunction and the latest time malfunction, the displaying format is [XX YY], in which XX stands for the current malfunction, if normal, it will display “—”; YY stands for the latest time malfunction. The failure code of every unit will display for 3 seconds. After the failure codes of all indoor units in the whole group are displayed, the mode will quit automatically.

8.4 Clear malfunction history

In normal state, press [CHECK] button for 5 seconds to clear malfunction history. Within 5 seconds, wired controller will quit the state of failure display, before malfunction clearance, the failure display will exist.

8.5 Query indoor performance state

In normal state, press button [SET] for 5 seconds, in the set temperature region in the screen, [XX] will display, XX is indoor number, which can be selected by pressing [TEMP] [+] [-]. In the timer region in the screen, [YZZZ] will display, in which Y stands for data type, ZZZ stands for the corresponding data. which can be selected by pressing [CLOCK] [+] [-].

Y	ZZZ	Type
A	Temperature of indoor ambient temp. sensor TA	Actual value, decimal
b	Temperature of indoor gas pipe sensor TC1	Actual value, decimal
C	Temperature of indoor liquid pipe sensor TC2	Actual value, decimal
d	Open degree of indoor PMV	Actual value, decimal
E		
F		

In check mode, press [CHECK] to quit the check mode, and go into normal running mode.

8.6 Compulsorily defrost

In heating mode, D2 is in short circuit, it will enter compulsorily defrost mode; cut off D2, it will quit. It is always be used when in testing to see if the defrost function is good.

8.7 Shorten time function

In normal operation, D1 is in short circuit, it will enter shorten time mode, and the time will be shortened in the proportion of 60:1. In shorten time mode, LED will flash at the frequency of 1 Hz. Cut off D1, it will quit the shorten time mode and return to the normal operation mode.

8.8 Trial operation

By this function, the unit can make rated operation. Set the mode at cooling or heating, in shut off state, press ON/OFF button for 5 seconds continuously to enter cooling or heating trial operation.

- 1) In compulsory operation, if in cooling mode, 7-segment LCD will display LL; if in heating mode, 7-segment LCD will display HH. Wired controller will send compulsory operation signal, and in the trial operation, “COOL” or “HEAT” will flash at frequency of 1Hz.
- 2) In compulsory operation, indoor air flow is AUTO (except for model with fixed air flow), the set temperature in heating mode is 30°C, while the set temperature in cooling mode is 16°C; after quit the compulsory operation, the air flow and the set temperature will return the

original.

- 3) In compulsory operation, only “ON/OFF”, “TEMP +”, “TEMP –“ can be set.
- 4) Only “ON/OFF” can cancel this control.
- 5) The indoor units in one group will enter or quit the trial operation at the same time.

8.9 Filter elevating function: (only for the unit with elevating function)

In power off state, press [HEALTH] for 10 seconds to enter filter elevating set state. In this state, the sign [FILTER] will flash and [UP] [DOWN] will display simultaneously, Press TEMP [+], in timer section [UP] will display, while press TEMP [-], in timer section [DOWN] will display. When it arrives the appropriate position, press [UP], [UP][DOWN] will display simultaneously, filter will stop going down. Press [UP] again, filter will go up. Press [FILTER] button to quit the mode.

8.10 Auto-restart function (optional)

The following states will be memorized: mode, air flow, set temperature, TIMER ON/OFF, failure history. After being electrified again, the above states will be resumed. If there is TIMER OFF, the unit will shut off.

8.11 Central control

In the central mode, the buttons on wired controller except for ON/OFF, CLOCK, CHECK, TEMP+/- are invalid. When not receiving the central signal from indoor, [CENTRAL] will not display (central function is cancelled). When receiving the central signal from indoor, [CENTRAL] icon will flash at frequency of 1Hz; in this mode, only CHECK, QUERY, and FILTER are valid.

8.12 Communication failure

After wired controller sends data to indoor, if not receiving the signal from indoor within continuous 4 minutes, communication failure will be alarmed. Failure code is 07, press CHECK and it will display No. 1 at temperature area, also display failure code at left of time area. If communication failure is solved or there is new failure, 07 will display on right of time area.

6.3 Infrared controller RCV01 (for indoor unit)


Please press the button "CODE" to choose the program of code "B". There are some function buttons in the MRV system units that they are useless. The detailed information is as follows:


● About Health function:

There is "NEGATIVE ION" function on the WALL MOUNTED type and CABINET type indoor units, the detailed information of this function please see the following.


There is "OXYGEN GENERATING" function on this H-MRV system (it's of an optional part system). The system can generate fresh oxygen to the room space by installing this part system.


About Health function (If the unit has the function of both "NEGATIVE ION" and "OXYGEN GENERATING")

After set the right function mode, press health button, remote controller displays "  ", now the indoor unit power lamp turns from orange color to green color, oxygen pump or negative ion generator starts up to apply oxygen or negative ion to indoor.

Press the button again, the sign "  " disappeared and negative ion generator stops working. After all health function of the indoor unit being fully canceled, oxygen pump stopped.

About Health function (only has oxygen pump function):

After set the right function mode, press health button, remote controller displays "  ", now the indoor unit power lamp turns from orange color to green color, oxygen pump generator starts up to apply oxygen to indoor.

Press the button again, the sign "  " disappeared. After all health function of the indoor unit being fully canceled, oxygen pump stopped.

● NOTE: For the indoor Wall Mounted and Cabinet units

Some functions of this controller maybe not available according to the corresponding PCB's functions, such as ⑧⑪⑭⑯⑰⑲⑳㉑㉒㉓㉔㉕㉖㉗㉘㉙㉚㉛ which are optional for different unit.

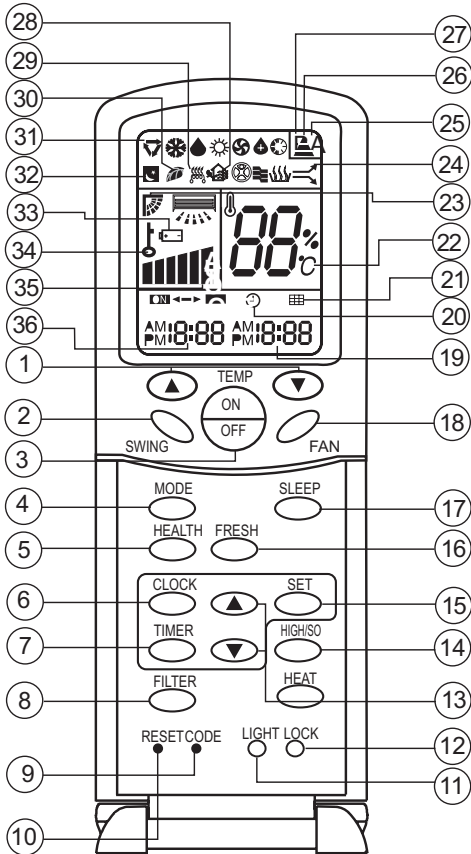
● NOTE: For the Convertible and Cassette and console indoor units

Some functions of this controller maybe not available according to the corresponding PCB's functions, such as ⑤⑧⑪⑭⑯⑰⑲⑳㉑㉒㉓㉔㉕㉖㉗㉘㉙㉚㉛ which are optional for different unit.

● NOTE: For the Duct and Ceiling concealed indoor units

Some functions of this controller maybe not available according to the corresponding PCB's functions, such as ②⑤⑧⑪⑭⑯⑰⑲⑳㉑㉒㉓㉔㉕㉖㉗㉘㉙㉚㉛ which are optional for different unit.

Remote controller



1.TEMP Setting Button

(Used to set temperature. Setting ranges: 16°C to 30°C)

2.SWING Button

If you press this button once, auto swing will be activated.

If you press this button again, the louver will fix in the present position.

3.Power ON/OFF Button

Used for unit start and stop

After power on, the LCD of remote controller will display the previous operation state (except for TIMER,SLEEP and SWING state).

4.Operation MODE

Used to select operation mode.

Every time you press MODE button, operation mode changes according to following sequence:

The function of code B



5.HEALTH Button

6.CLOCK Button

Used to set correct time.

7.TIMER Button

Used to select TIMER mode:TIMER ON,TIMER OFF.

(Note: if time of TIMER ON is the same as TIMER OFF)

8. FILTER Button

Used to set up/down function of filter.

9.CODE Button

Used to select Code A or B, this manual is for code B.

10.RESET Button

Press this button by using a sharp article to resume the correct operation of the remote controller in case of need, i.e. for example in case of malfunctions due to electromagnetic disturbance.

11.LIGHT Button

Used to light the control panel (only for cabinet unit)

12.LOCK Button

Used to lock operation button and LCD display contents: by pressing this button, other buttons comes out of function and lock state display appears; if you press it again, lock state will be no more active and lock state display will disappear.

13.HOUR Adjustment

Used to set clock and timer setting

14.HIGH/SO Button

Used to select HIGH or SOFT operation.

15.SET Button

Used to confirm TIMER and CLOCK settings when or cooling/heating

16.FRESH Button

Used to set fresh mode, the unit will draw in fresh air.

17.SLEEP Button

(The clock must be corrected before setting sleep function)

Used to set sleep mode.

18.FAN Button

Used to select fan speed:LOW,MID,HIGH,AUTO.

19.TIMER OFF Display

20.TIMER Display

21.FILTER Display

When the filter need be cleaned, the sign will appear automatically.

22.TEMPERATURE Display

23.AUTO SWING Display

24.HIGN/SO Run Display

25.Code A display

26.SIGNAL SENDING Display

27.Code B display

28.Fresh Display

29.Auxiliary ELECTRICAL HEATING Display
30.HEALTH Display

Displays when healthy run function is set.

31.Operation MODE Display

32.SLEEP State Display

33.BATTERY Energy Display

Notify the user when it is time to change the batteries

34.LOCK State Display

35.FAN SPEED Display



36.TIMER ON Display

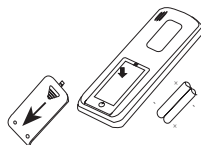
Remote Controller Operation

- When in use, direct signal transmission head to the receiver placed on the indoor unit
- The distance between the remote controller and the receiver should be max 7m and there should be no obstacle between them.
- Do not throw the remote controller; prevent it from being damaged.
- When operating the remote controller in an area where electronically controlled lights are installed or wireless handsets are used, please move closer to the indoor unit as the function of the remote controller might be affected by signals emitted by the above mentioned equipments.

Battery loading

Battery loading

Batteries are fitted as follows:



Remove the battery compartment lid Slightly press and disengage the battery compartment lid marked with "▼" and then hold the remote controller by the upper section and then remove the battery compartment lid by pressing in the direction of the arrow as shown in the figure above.

Loading the battery

Ensure that batteries are correctly placed in the compartment as required for positive and negative terminals.

Replacing the battery compartment lid

The battery compartment lid is reinstalled in the reverse sequence.

Display review

Press the button to see if batteries are properly fitted. If no display appears, refit the batteries.

Confirmation indicator

If no indication is displayed after press ON/OFF button, reload the batteries.

If the remote controller does not operate as designed after fitting new batteries of the same type, press the Reset button (marked ↓) with a pointed article.

Note:

It is recommended that the batteries be removed from the compartment if the remote controller is not used for an extended period.

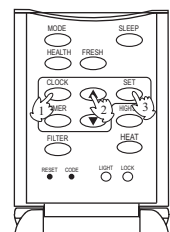
The remote controller is programmed for automatic test of operation mode after the batteries are replaced. When the test is conducted, all icons will appear on the screen and then disappear if the batteries are properly fitted.

When the display become weak, this display no power in the battery, please change the battery.

Clock Set

When unit is started for the first time and after replacing batteries in remote controller, clock should be adjusted as follows:

- 1.Press CLOCK button, clock indication of " AM " or " PM " flashes.
- 2.Press ▲ or ▼ to set correct time. Each press will increase or decrease 1 min. If the button is kept pressed, time will increase or decrease quickly.
- 3.After time setting is confirmed, press "SET" : AM or PM stop flashing, while clock starts working.Note:AM means morning and PM means afternoon.



COOL , HEAT and DRY Operation

1. Unit start

Press ON/OFF button, unit starts.

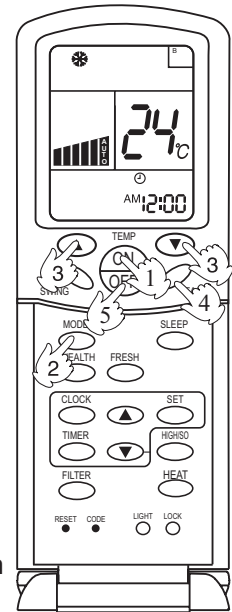
Previous operation status appears on LCD (except for TIMER, SLEEP and SWING setting)

2. Select operation mode

Press MODE button. At each press, operation mode changes as follows: follows:



Then select **COOL** operation or select **DRY** operation or select **HEAT** operation



3. Temperature setting

Press TEMP button.

- ▲ Every time the button is pressed, temp. setting increases 1 degree. If button is kept depressed, temp. setting will increase quickly.
 - ▼ Every time the button is pressed, temp. setting decreases 1 degree. If button is kept depressed, temp. setting will decrease quickly.
- Set proper temperature

4. Adjust FAN button

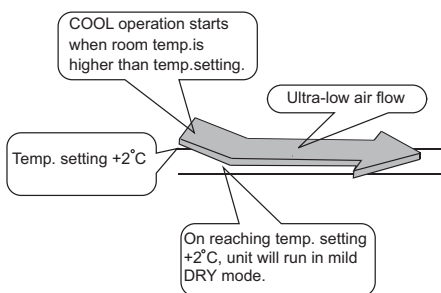
Press FAN button. At each press, fan speed changes as follows:



Air conditioner will run at the selected fan speed.

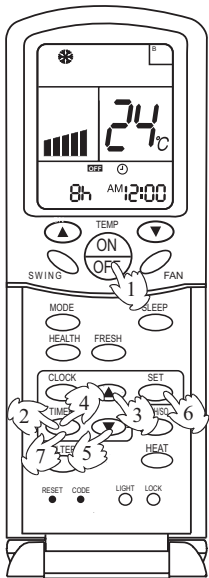
5. Unit stop

Press ON/OFF button, unit stops



In HEAT mode, warm air will blow out after a short period of time due to anti-cold function.

Timer ON/OFF Function,(Set clock correctly before starting TIMER operation)



Timer ON-OFF Function

1.Unit start

After unit starts,select your desired operation mode(Operation mode will be displayed on LCD)

2.TIMER mode selection

Press TIMER button on the remote controller to changeTIMER mode. Every time the button is pressed,display of TIMER mode changes as follows:



Then select TIMER mode as needed

3.Time setting

Press time button

- ▲ Every time the button is pressed,time increases an hour.If the button is kept pressed,time will changes quickly.
- ▼ Every time the button is pressed,time decreases an hour.If the button is kept pressed,time will changes quickly.It can be adjusted with in 12 hours at will. AM refers to morning and PM refers to afternoon.

4.Timer confirming

After time setting ,press SET button to confirm time.

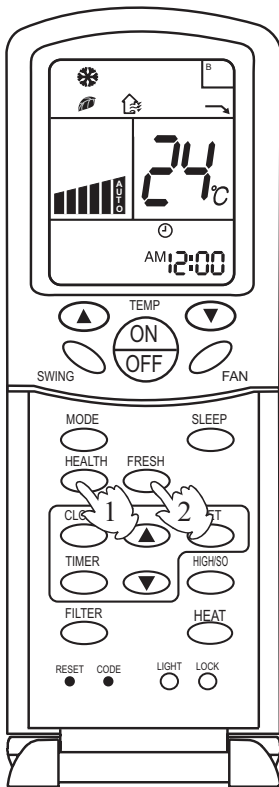
5.Canel TIMER mode

Just press TIMER button several times until TIMER mode disappears. According to the time setting sequence of TIMER ON and TIMER OFF, either start-stops or stops-start can be realized.

After replacing batteries or if apower failure occurs,TIMER setting must be reset.

Remote controller has memory function.When you use TIMER mode next time,just press SET button after mode selection if timer setting is the same as the previous one.

Health & Fresh Air operation



Health operation

After turning on the unit and set the desired working mode. Press the Health button, the LCD will display " 🌿 ", the unit begins health operation (start the negative ion generation device). Press the Health button again, the " 🌿 " displayed on the LCD disappears, health operation is cancelled (turn off the negative ion generation device).

Note: When indoor fan motor does not work, the unit will automatically turn off negative ion generation device.

About Health operation

After the start of health operation, the negative ion generator will generate large amount of negative ion, which can effectively balance the amount of positive & negative ion in the air and has the bacteria-killing and accelerating the dust deposition of the room to make the room air fresh and healthy.

Fresh Air operation

After turning on the unit and set the desired working mode (the remote controller LCD and control panel LCD display the working mode).

Press the Fresh air button of the remote controller, the LCD displays " 🏠 ", and the unit begins continuous fresh air operation; press the button again, the " 🌬️ " in " 🏠 " flashes and begin automatic fresh air operation. Press the button for the third time to cancel fresh air function.

Continuous fresh air operation: That is to say, if there is no intervention, the fresh air operation will continuously run and not stop.

Automatic fresh air operation: That is to say, the fresh air operation runs intermittently. After 20 minutes operation, the fresh air operation will stop for 20 minutes; runs for another 20 minutes, it will stop for another 20 minutes, repeatedly runs.

Note: Either in ON or OFF state, the fresh air operation can be independently set to run.

About Fresh air operation

The ventilation device of this air conditioner can discharge the indoor air to outdoors, while the outdoor fresh air supplement to indoors, so that fulfills the fresh air function.

3. Outdoor control

(1) Compressor startup control

On startup, inverter compressor will keep for 3 min at 60rps, then if TdiSH is still less than 25degree, compressor will increase frequency up to 100rps. If startup is for 15min or TdiSH is more than 25degree, quit startup and enter normal operation. In startup operation, the limitation frequency operation will be in priority, such as high pressure too high, discharging temp. too high, suction pressure too low, overcurrent.

After entering normal operation, when inverter compressor frequency arrives 100rps, fixed frequency compressor starts up, but if inverter compressor frequency is down to below 30rps, fixed frequency compressor is OFF.

(2) Compressor operation control

It will be controlled by the target pressure.

In heating mode, the target high pressure:

When $T_a > -7$ degree, target high pressure is 28Kg 0.8Kg;

When $T_a \leq -7$ degree, target high pressure is 24Kg 0.8Kg

In cooling mode, the target low pressure

When the running indoor capacity is over 5HP, if $T_a \geq 21$ degree, target pressure $P_s = 8$ Kg (4degree) 0.5Kg; if 21 degree $> T_a \geq 15$ degree, target pressure $P_s = 7$ Kg(0degree) 0.5Kg.

(3) Fan motor control

a. In cooling mode

Startup procedure: When compressor starts up, outdoor motor will not run right now, when high pressure reaches 2.1MPa, outdoor motor begins to run.

In operation, the motor will be controlled by high pressure. When high pressure reaches 2.1MPa, outdoor motor will run at class-1 speed; if pressure is more than 2.1MPa, outdoor motor will increase one class at interval of 60 seconds; if pressure is over 2.6MPa, outdoor motor will rise up to class-7. If pressure is less than 1.9MPa for 60 seconds, fan motor will decrease one class. If less than 1.8MPa for 60 seconds, fan motor will stop.

b. In heating mode

Motor control in startup procedure: $P_d < \text{set pressure} + 0.3\text{MPa}$. If P_d goes up, decrease outdoor motor speed. 1 minute later, if $P_d \geq (\text{set pressure} + 0.50\text{MPa})$, outdoor motor stops. When defrosting is over, after 4-way valve opens, fan motor starts up.

In operation, the motor will be controlled by low pressure. When low pressure is over 0.95MPa, fan motor will stop; when low pressure is less than 0.75MPa, for every 60 seconds, fan speed will increase one class; when it is less than 0.65MPa for 60 seconds, fan speed will be class-7 directly.

In defrosting, outdoor motor will stop. After the defrosting is over, 4-way valve opens, outdoor motor will start up at heating mode.

(4) Defrosting control

When one of the running outdoors reaches the defrosting condition, it will send defrosting signal to the master unit. After the master unit receives defrosting signal, it will send defrosting signal to the running outdoor. Then the slave outdoor will begin defrosting.



Entering condition:

When the unit has run in heating mode for 33 minutes and the compressor has run for 50 minutes accumulatively since the last defrosting. By measuring the defrosting sensor TE and outdoor ambient temp. sensor TA, any outdoor can meet the below conditions for 5 minutes, all the outdoors will enter defrosting operation.

- a. when $TE \leq -6^{\circ}$ for 5 minutes;
- b. when $-6 < TA < 5$, $-13.6 < TE < -6$ for 5 minutes, enter defrosting;
- c. $TA < -6$, $TE \leq -15$ for 5 minutes, and compressor has run for 90 minutes between the two defrostings;

In defrosting operation:

- a. 4-way valve OFF
- b. outdoor motor OFF
- c. anti-cold air control of indoor motor OFF
- d. outdoor EEV OFF

Quit defrosting

Any of the below conditions can be met, the unit will quit defrosting.

- a. After defrosting begins, 10 minutes later, defrosting is over;
- b. Detect the defrosting condition of outdoor heat exchanger by TE, all the temperatures at the defrosting point are over 10 degree for 60 seconds or reaches 15 degree or 10 seconds, quit defrosting;
- c. High pressure Pd is over 35kgG/cm², quit defrosting.

(5) Oil return operation control

1. Entering condition

When outdoor total running capacity is over 25% and less than 75% for 4 hours, or outdoor total running capacity is less than 25% for 2 hours, the system will enter oil return operation.

* When outdoor total running capacity is over 75% for 10 minutes continuously, the oil return time will be cleared.

* In defrosting operation, when outdoor total running capacity is over 75% for 5 minutes continuously, the oil return time will be cleared.

2. Oil return procedure:

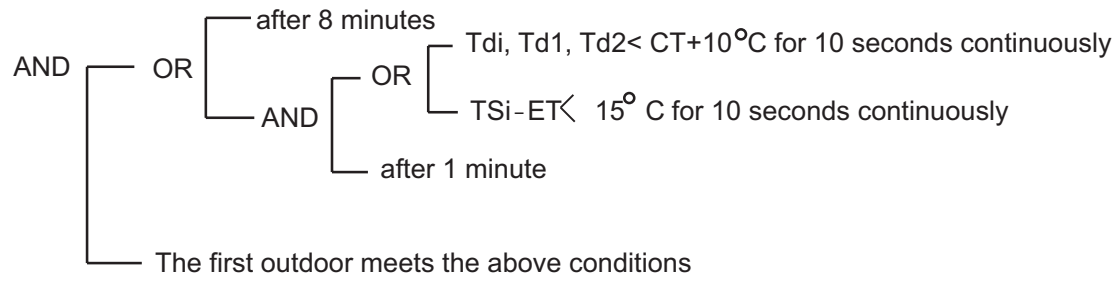
All outdoors start up, and run with 75% of total capacity in cooling mode;

In oil return course, outdoor leva1, 2 open to 250pls;

In oil return course, THERMO ON, indoor valves 250pls, THERMO OFF, indoor valves 125pls; when Tdi or Toil is over 105degree, indoor valve will open larger 10%.

In oil return, Levb OFF.

Oil return quit condition:





PART 6 Maintenance

1. Trouble diagnose	500
1.1 Failure code general information	500
1.2 Failure code	500
1.3 Failure diagnose	510

1. Failure code

Failure code description: (failure code of the whole system is showed as 8 bits, so totally 256 codes. Indoor failure code should be judged by the table and the unit number)

- Outdoor failure code exists in EEPROM, in which 5 failure codes can be kept.
- Indoor failure code exists in EEPROM, in which 5 failure codes can be kept.
- Can clear failure code by indoor or outdoor.

Failure codes are distributed as following:

0~19: indoor failure code

20~99: outdoor failure code

100~109: DC motor failure code

110~125: inverter module failure code

126~127: soft auto-check failure code

Physical master unit:

Dip switch SW9, SW10, SW11 are at 0, 0, 0, digital tube displays failure code 20~127, it is the master failure code.

Dip switch SW9, SW10, SW11 are 1, 0, 0, digital tube displays failure code 20~127, it is failure code of No. 1 slave unit.

Dip switch SW9, SW10, SW11 are 2, 0, 0, digital tube displays failure code 20~127, it is failure code of No. 2 slave unit.

Physical slave unit:

Dip switch SW9, SW10, SW11 are at 0, 0, 0, digital tube displays failure code 20~127, it is single slave unit failure code.

Outdoor failure code display principle on wired controller:

When outdoor compressor is running, indoor wired controller will display the failure code of outdoor with higher priority. When compressor stops, it displays all indoor failures. The indoor failures will be classified as below: sensor failure, inverter board failure, fan motor driving board failure, any protections etc.

Outdoor unit failure code

digital tube indication on master unit	indication on wired controller (hex)	failure code definition	failure description	remarks
20	14	defrosting temp.sensor Tdef failure	AD value is below 11(open circuit) or over 1012(short circuit) for 60seconds, in cooling mode, if the sensor is abnormal, the unit does not deal with it, besides, in defrosting and within 3 minutes after defrosting, no alarm	resumable
21	15	ambient temp.sensor Ta failure	AD value is below 11(open circuit) or over 1012(short circuit) for 60seconds, in defrosting and within 3 minutes after defrosting, no alarm	resumable
22-0	16	suction temp.sensor Tsi failure	AD value is below 11(open circuit) or over 1012(short circuit) for 60seconds, in defrosting and within 3 minutes after defrosting, no alarm	resumable

digital tube indication on master unit	indication on wired controller (hex)	failure code definition	failure description	remarks
22-1	16	suction temp.sensor Ts failure	AD value is below 11(open circuit) or over 1012(short circuit) for 60seconds, in defrosting and within 3 minutes after defrosting, no alarm	resumable
22-2	16	suction temp.sensor Tsuc failure		
23-0	17	discharging temp.sensor Tdi failure	after compressor is running for 5 minutes, AD value is below 11(open circuit) or over 1012(short circuit) for 60seconds, in course of startup, defrosting and within 3 minutes after defrosting, no alarm	resumable
23-1	17	discharging temp.sensor Td1 failure		
23-2	17	discharging temp.sensor Td2 failure		
24-1	18	oil temp.sensor Toilp failure	AD value is below 11(open circuit) or over 1012(short circuit) for 60seconds, if Ta<=-10degree or ET<=-10degree, within 5 minutes, no alarm	resumable
24-2	18	oil temp.sensor Toil failure		
25-1	19	inlet temp.of heat exchanger Toci1 failure	AD value is below 11(open circuit) or over 1012(short circuit) for 60seconds, in cooling mode, if the sensor is abnormal, the unit does not deal with it, besides, in defrosting and within 3 minutes after defrosting, no alarm	resumable
25-2	19	inlet temp.of heat exchanger Toci2 failure		
26-0	1A	indoor communication failure	for continuous 200 cycles, can not find connected indoors	resumable
26-1	1A		for continuous 270seconds, the searched indoor quantity is less than the set quantity.	
26-2	1A		for continuous 170seconds, the searched indoor quantity is more than the set quantity.	
27	1B	oil temp. too high protection(Toil)	Toil>=120degree(E) at interval of 25msec for twice continuously, and over the set value, then stop and alarm; 3 minutes later, resume automatically. If it occurs 3 times in an hour, confirm the failure.	once confirmation, un-resumable

digital tube indication on master unit	indication on wired controller (hex)	failure code definition	failure description	remarks
28	1C	high pressure sensor Pd failure	AD value is below 11(open circuit) or over 1012(short circuit) for 30seconds, in defrosting and within 3 minutes after defrosting, no alarm	resumable
29	1D	low pressure sensor Ps failure	AD value is below 11(open circuit) or over 1012(short circuit) for 30seconds, in defrosting and within 3 minutes after defrosting, no alarm	resumable
30-0	1E	high pressure switch HPSi failure	if disconnect for 50ms continuously, alarm. If alarm 3 times in an hour, confirm the failure	once confirmation , un-resumable
30-1	1E	high pressure switch HPS1 failure		
30-2	1E	high pressure switch HPS2 failure		
32-1	20	outlet temp.of subcooler Tsc0 failure	AD value is below 11(open circuit) or over 1012(short circuit) for 30seconds, in defrosting and within 3 minutes after defrosting, no alarm	resumable
32-2	20	liquid pipe SC temp.of subcooler Tliqsc failure		
33-0	21	EEPROM (AT24C04) failure	EEPROM communication failure	once confirmation , un-resumable
33-1	21		EEPROM data check failure(model code, check sum etc.)	
33-2	21		EEPROM data check failure(data beyond limit, reverse sequence etc.)	
34-0	22	discharging temp.too high protection (Tdi)	Toil>=120degree(E) at interval of 25msec for twice continuously, and over the set value, then stop and alarm; 3 minutes later, resume automatically. If it occurs 3 times in an hour, confirm the failure.	once confirmation , un-resumable
34-1	22	discharging temp.too high protection (Td1)		
34-2	22	discharging temp.too high protection (Td2)		

digital tube indication on master unit	indication on wired controller (hex)	failure code definition	failure description	remarks
35-1	23	4-way valve reversing failure	after 4-way valve is electrified for 3 minutes, if the below conditions can be met for continuous 10 seconds, that is conversing successfully: 1. this outdoor compressor is running normally 2. $T_{suc}-T_{def} \geq 10$; or $P_d - P_s \geq 0.6 \text{MPa}$ Otherwise, the system alarms reversing failure.	once confirmation, un-resumable
35-2	23	4-way valve reversing failure	in heating mode, if 4-way valve can not be electrified within 20 minutes, alarm 4-way valve failure.	
36	24	oil temp. too low protection (Toil)	in normal operation, if $T_d < CT + 10$; for continuous 5 minutes, the unit stops and alarms. 2 minutes and 50 seconds later, resume automatically. If it occurs 3 times in an hour, confirm the failure	once confirmation, un-resumable
37-1	25	lack of phase of 3N power supply or wrong phase sequence	lack of S-phase	once confirmation, un-resumable
37-2			lack of T-phase	
37-3			S and T are normal, but phase sequence is opposite	
39-0	27	low pressure sensor P_s too low protection	after compressor is running (except for residual operation), if in cooling, $P_s < 0.10 \text{Mpa}$; in heating, $P_s < 0.05 \text{Mpa}$; in oil return, $P_s < 0.035 \text{Mpa}$ for continuous 5 minutes, alarm and stop. 2 minutes and 50 seconds later, resume automatically, if it occurs 3 times in an hour, confirm the failure.	once confirmation, un-resumable
39-1	27	compression ratio too high protection	after compressor is running, compression ratio > 8 . for continuous 5 minutes stop and alarm. 2 minutes and 50 seconds later, resume automatically, if it occurs 3 times in an hour, confirm the failure.	
39-2	27	compression ratio too low protection	in normal operation, compression ratio < 1 . for continuous 5 minute,s stop and alarm. 2 minutes and 50 seconds later, resume automatically, if it occurs 3 times in an hour, confirm the failure.	
40	28	high pressure sensor P_d too high protection	in normal operation, $P_d \geq 4.15 \text{Mpa}$ for continuous 50ms, alarm and stop. 2 minutes and 50 seconds later, resume automatically, if it occurs 3 times in an hour, confirm the failure.	once confirmation, un-resumable

digital tube indication on master unit	indication on wired controller (hex)	failure code definition	failure description	remarks
43-0	2B	discharging temp. sensor Tdi too low protection	in normal operation, if $T_d < CT + 10$; for continuous 5 minutes, the unit stops and alarms. 2 minutes and 50 seconds later, resume automatically. If it occurs 3 times in an hour, confirm the failure. After fixed frequency compressor alarms, inverter compressor will continue to run. If fixed frequency compressor has been locked for 3 times, the unit will stop and alarm.	once confirmation, un-resumable
43-1	2B	discharging temp. sensor Td1 too low protection		
43-2	2B	discharging temp. sensor Td2 too low protection		
44	2C	low pressure sensor PS too high protection	in normal operation, if $P_s > 1.05\text{MPa}$ for continuous 5 minutes, unit stops and alarms, 2 minutes and 50 seconds later, resume automatically. If it occurs 3 times in an hour, alarm and confirm the failure.	once confirmation, un-resumable
45	2D	communication among outdoors failure	no communication within 3 minutes continuously	resumable
46	2E	communication with inverter board failure	no communication within 30 seconds continuously	resumable
48	30	unloading valve SV1 failure	before startup, SV1 opens for 2 minutes, if $P_d - P_s \geq 0.2\text{MPa}$, display failure code, when $P_d - P_s < 0.2\text{MPa}$, resume.	resumable
53-1	35	current detector CT1 failure	fixed frequency compressor is OFF, if $CT \geq 4.0(\text{EE})3.0\text{A}$ for 2s(not detecting in 90s after fixed frequency compressor is from ON to OFF); fixed frequency compressor is ON, if $CT \leq 2.0(\text{EE})$ for 2s(not detecting in 90s after fixed frequency compressor is from OFF to ON), it alarms failure of CT in short circuit.	resumable
53-2	35	current detector CT2 failure		
64-1	40	CT1 over current	current of fixed frequency compressor is over the limitation twice at the interval of 25msecond, unit will stop, but 3 minutes later, resume to be normal automatically. If it occurs 3 times in an hour, alarm and stop. But, in 4 seconds after startup, not detect.	once confirmation, un-resumable
64-2	40	CT2 over current		
67	43	communication with motor driving board failure	without communication for 4 minutes	
71-1	47	left DC motor blocked	running at speed below 20rpm for 30s, or at speed of 70% lower than the target for 2 minutes, 2 minutes and 50 seconds later after stop, resume automatically. It occurs 3 times in an hour, confirm the failure.	once confirmation, un-resumable
71-2	47	right DC motor blocked		

digital tube indication on master unit	indication on wired controller (hex)	failure code definition	failure description	remarks
75-0	4B	no pressure drop between high pressure and low one	in 1 minute after inverter compressor starts up, Pd-Ps<=0.1MPa. 2 minutes and 50 seconds later after unit stops, resume automatically.	
75-4	4B	pressure drop too low between high pressure and low one	in heating mode, Tao>-10degree, or in cooling mode, Tao>10degree, and Pd-Ps<=0.4MPa for 1 minute, outdoor will stop. Or in heating mode, Tao<=-10degree, Pd-Ps<=0.3MPa for 2 minutes, outdoor will stop. Or in cooling mode, Tao<=10degree, Pd-Ps<=0.3MPa for 1 minute, outdoor will stop. 5 minutes later, restart up. If over 6 times stop occur in 2 hours, alarm error and unit stops.	once confirmation, un-resumable
76-1	4C	incorrect outdoor address or capacity setting	slave unit quantity/address/horse power are not in conformance with data in EEPROM of master unit: quantity incorrect.	reset
76-2	4C	incorrect outdoor address or capacity setting	slave unit quantity/address/horse power are not in conformance with data in EEPROM of master unit: address incorrect.	
76-3	4C	incorrect outdoor address or capacity setting	slave unit quantity/address/horse power are not in conformance with data in EEPROM of master unit: horse power incorrect.	
77	4D	oil equalization protection among outdoors	ToilA - ToilB<=10degree, unit alarms and stops, not detecting in the course of startup, defrosting and oil return control, and in 10 minutes after oil return finishes. 2 minutes and 50 seconds later after unit stops, resume automatically. If it alarms twice continuously, confirm the failure.	once confirmation, un-resumable
78	4E	lack of refrigerant	compressor running in cooling mode, Ps<0.1MPa for 30 minutes; compressor running in heating mode, Tsi - ET>20; LEV will fully open for 60 minutes, the unit will output lack of refrigerant alarm, unit will not stop.	
79	4F	incorrect wiring	30 minutes later after incorrect wiring is inspected, outdoor: if Tdi<=Tao+30K, display failure code. indoor: if in cooling, Tc2>=Tai - 20K, display failure code; in heating, Tc1<=Tai+20K, display failure code.	resumable
99-X	63	self-diagnose	X=0~5	resumable
100	64	DC motor driving board IPM alarm	DC motor driving board alarms because of over current or modular temperature too high, resume automatically 2 minutes and 50 seconds later after unit stops. It occurs 3 times in an hour, confirm the failure.	once confirmation, un-resumable

digital tube indication on master unit	indication on wired controller (hex)	failure code definition	failure description	remarks
101	65	DC motor driving board detecting out of control	resume automatically 2 minutes and 50 seconds later after unit stops.It occur 3 times in an hour, confirm the failure.	once confirmation , un-resumable
102	66	DC motor driving board EEPROM faulty	resume automatically 2 minutes and 50 seconds later after unit stops.It occur 3 times in an hour, confirm the failure.	once confirmation , un-resumable
103	67	DC motor driving board over current or current detector damaged	if current of DC motor driving board is over 5A, unit alarms. 2 minutes and 50 seconds later after unit stops, resume automatically, if it occurs three times in an hour, confirm the failure.	once confirmation , un-resumable
104	68	voltage too low protection of DC motor driving board	if voltage of DC motor driving board is below 280V, unit alarms. 2 minutes and 50 seconds later after unit stops, resume automatically, if it occurs three times in an hour, confirm the failure.	once confirmation , un-resumable
105	69	voltage too high protection of DC motor driving board	if voltage of DC motor driving board is over 400V, unit alarms. 2 minutes and 50 seconds later after unit stops, resume automatically, if it occurs three times in an hour, confirm the failure.	once confirmation , un-resumable
106	6A	DC motor driving board blocked	fan motor rate can not be detected. 2 minutes and 50 seconds later after unit stops, resume automatically, if it occurs three times in an hour, confirm the failure.	once confirmation , un-resumable
107	6B	protection of motor rate over limitation	fan motor rate is higher than 1100 for 5 seconds, unit alarms.	once confirmation , un-resumable
110	6E	IPM modular protection (F0)	IPM modular over current, in short circuit, over heat, voltage too low of control circuit.	3 times in an hour, confirm failure; once confirmation , un-resumable
111	6F	compressor out of control	in the course of compressor startup or running, the unit can not detect the rotor position, or not connecting compressor.	
112	70	radiator of transducer temp.too high	radiator temp. too high	
113	71	transducer overload	output current of transducer is too high	
114	72	voltage too low of DC bus line of transducer	voltage of power source is too low	
115	73	voltage too high of DC bus line of transducer	voltage of power source is too high	
116	74	communication abnormal between transducer and control PCB	communication is disconnected	resumable

digital tube indication on master unit	indication on wired controller (hex)	failure code definition	failure description	remarks
117	75	transducer over current (software)	instant current of transducer is too high	3 times in an hour, confirm failure; once confirmation, un-resumable
118	76	compressor startup failure	compressor startup fails for 5 times continuously, or compressor is running down till stops caused by over current or over heat	
119	77	current detecting circuit abnormal of transducer	the sensor used for current detecting of transducer is abnormal, disconnected or incorrectly connection	
120	78	power supply of transducer abnormal	power supply of transducer is broken down instantly	3 times in an hour, confirm failure; once confirmation, un-resumable
121	79	power supply of inverter board is abnormal	power supply of inverter board is broken down instantly	
122	7A	radiator temp.sensor of transducer abnormal	resistor of temp.sensor abnormal or temp.sensor disconnected	
125	7D	compressor frequency not match well	(current frequency \geq inverter target frequency+3Hz) or (target frequency >0 & current frequency=0) for 2 minutes	resumable
127	7F	MCU reset abnormal	if master unit inspects that MCU of slave unit is reset, and the slave unit is running, master unit will alarm MCU reset failure, then the whole system will stop; if in heating mode, when restart up, 4-way valve will be not electrified, the whole system will execute 4-way valve reversing operation again. if it occurs three times in an hour, alarm and confirm the failure.	once confirmation, un-resumable
128	none	MCU program need be updated	versions of MRVII-C2 program can not be compatible, it shows to be updated.	

When there is no failure code, and restart up conditions can not be met, the digital tube of master unit will display stand-by code as following:

555.0	standby because of capacity over match	capacity over 135% or below 50%	resumable
555.1	standby because of heating mode at 26degree	operate in heating mode when ambient temperature is over 26degree	
555.2	standby because of pressure too low or lack of refrigerant	in cooling mode, $P_s < 0.23\text{MPa}$ or in heating mode, $P_s < 0.12\text{MPa}$, unit starts up	
555.3	standby because of cooling mode at 54degree	T3 climate, temperature is over 54degree, unit can not start up	

indoor unit code

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

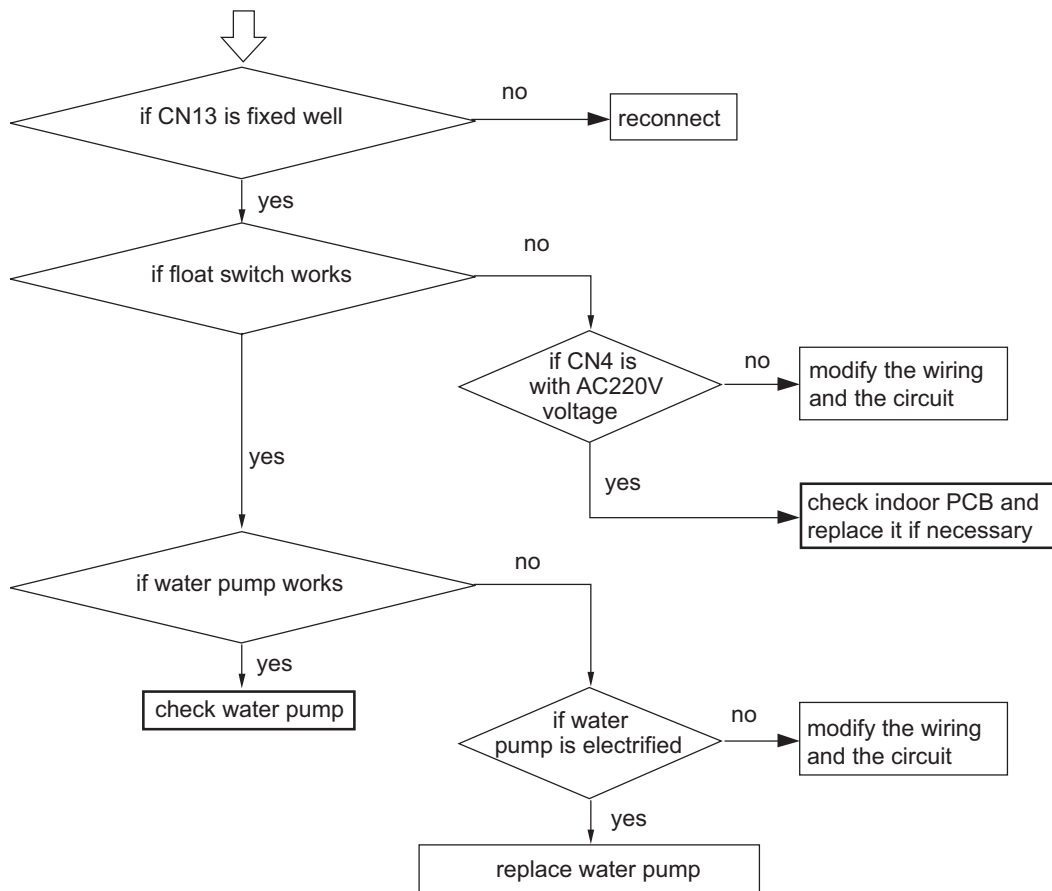
HAV007~24 failure code

PBC LED flash times	Digital tube display	Fault description
1	E1	Fault in ambient temperature sensor Tai
2	E2	Fault in coil temperature sensor TC1
3	E3	Fault in coil temperature sensor TC2
5	E5	Fault in EEPROM date
6	E6	Fault in communication between indoor unit with outdoor unit
9	E9	Fault in repeat of indoor unit address
14	E14	Fault in DC fan motor
20	E20	Fault in outdoor unit

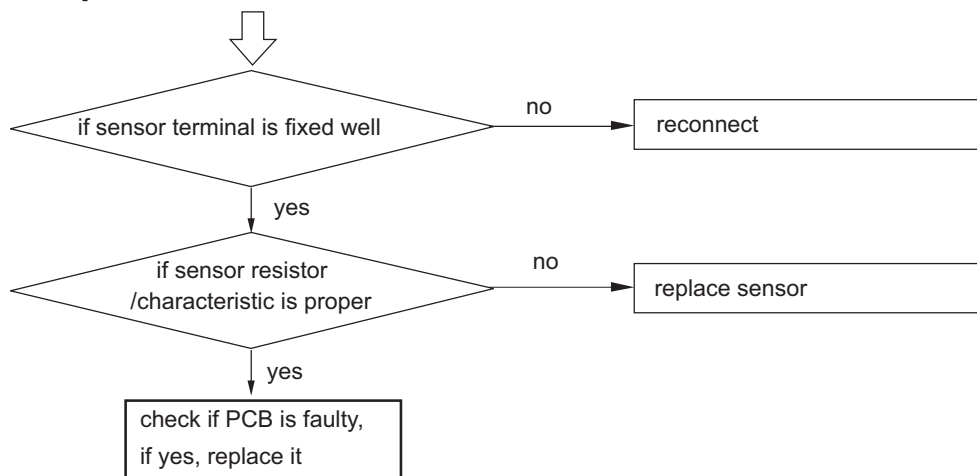
2. Failure diagnose

Indoor failure diagnose

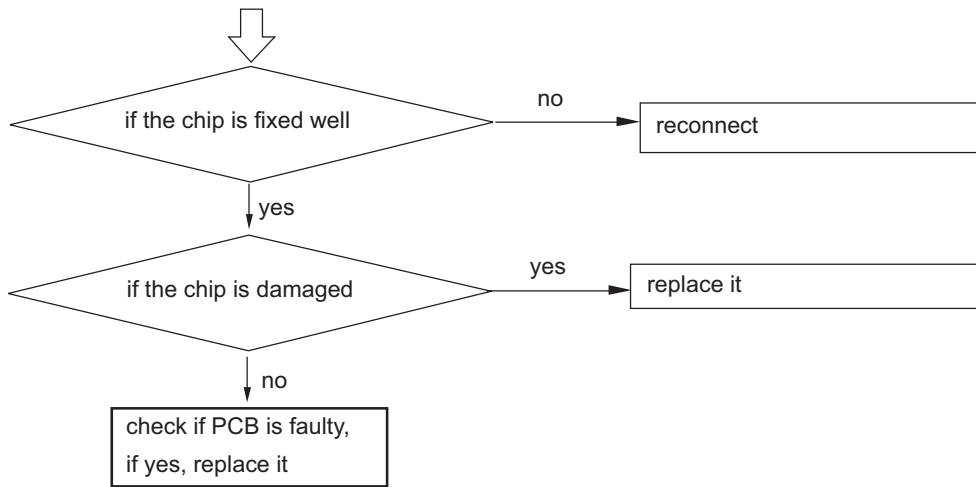
[08]indoor drainage system failure/float switch circuit on indoor PCB failure



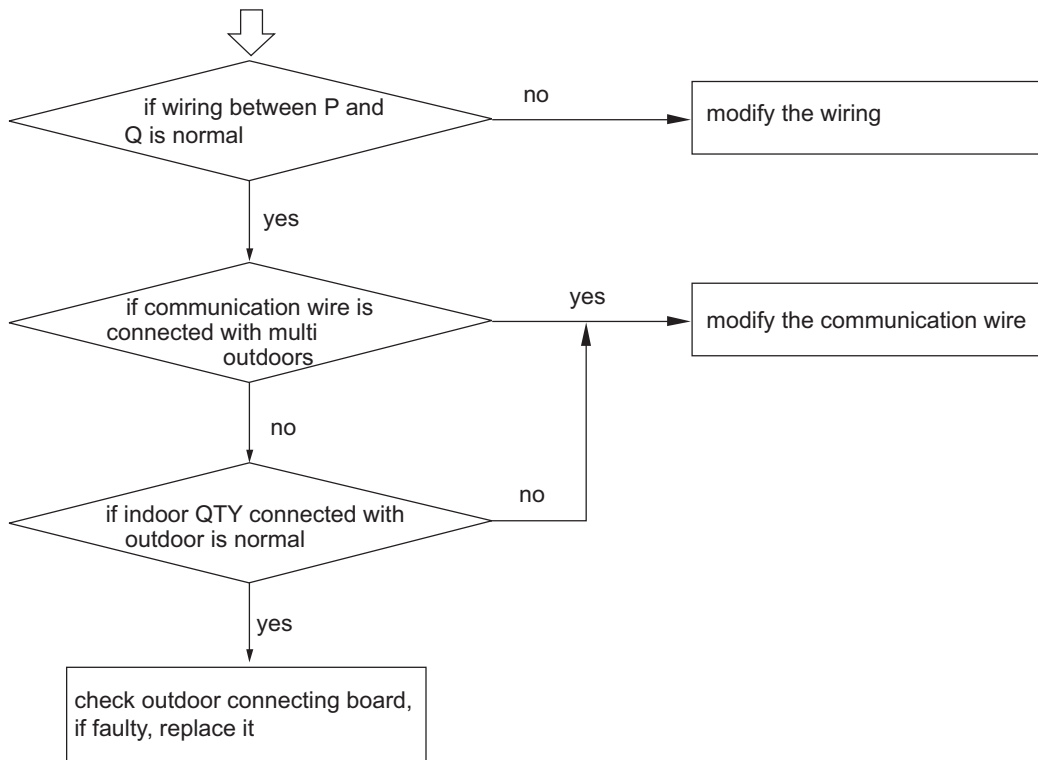
[01/02/03/04] indoor sensor failure



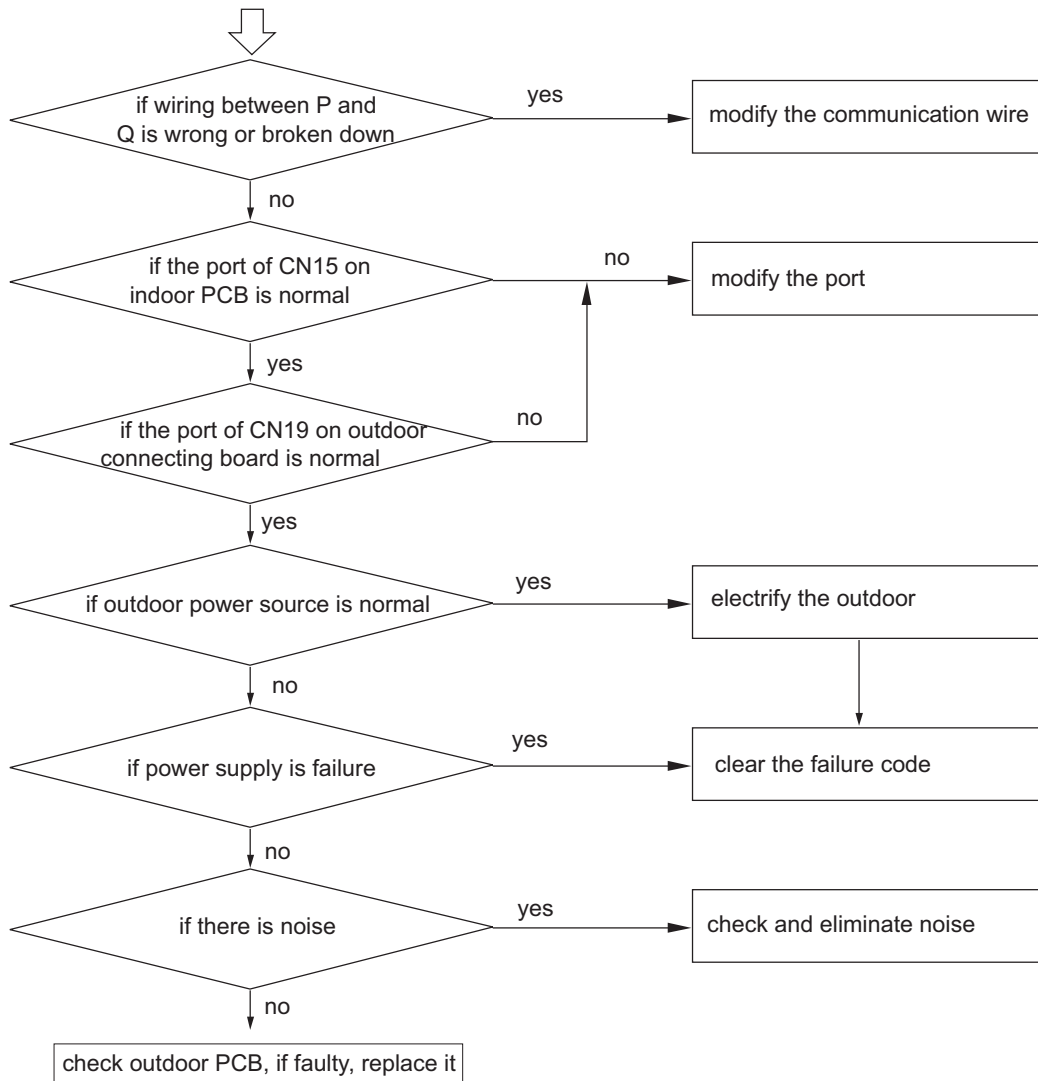
[05] EEPROM failure



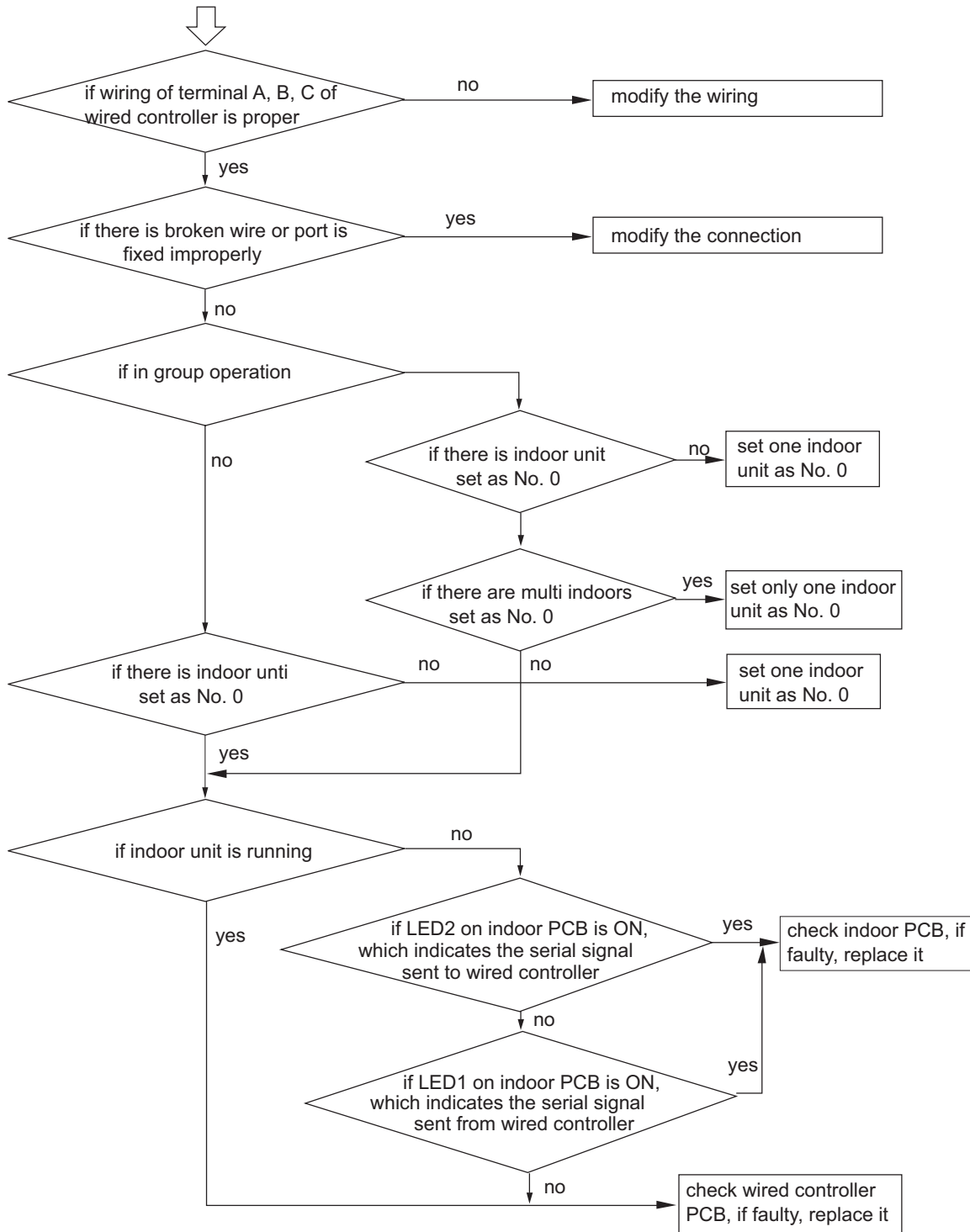
[09] indoor address repeated



[06]communication circuit between indoor and outdoor

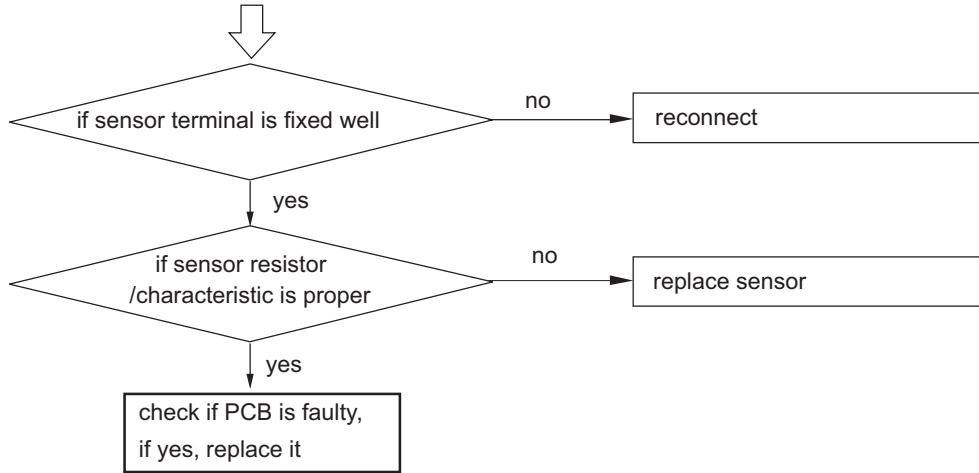


[07]communication abnormal between indoor and wired controller

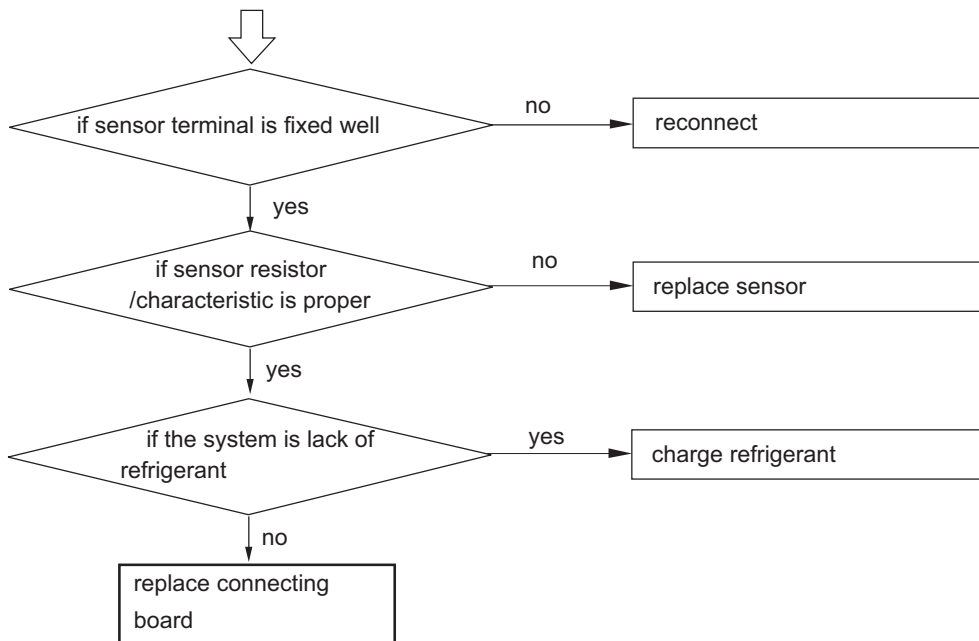


Outdoor failure diagnose

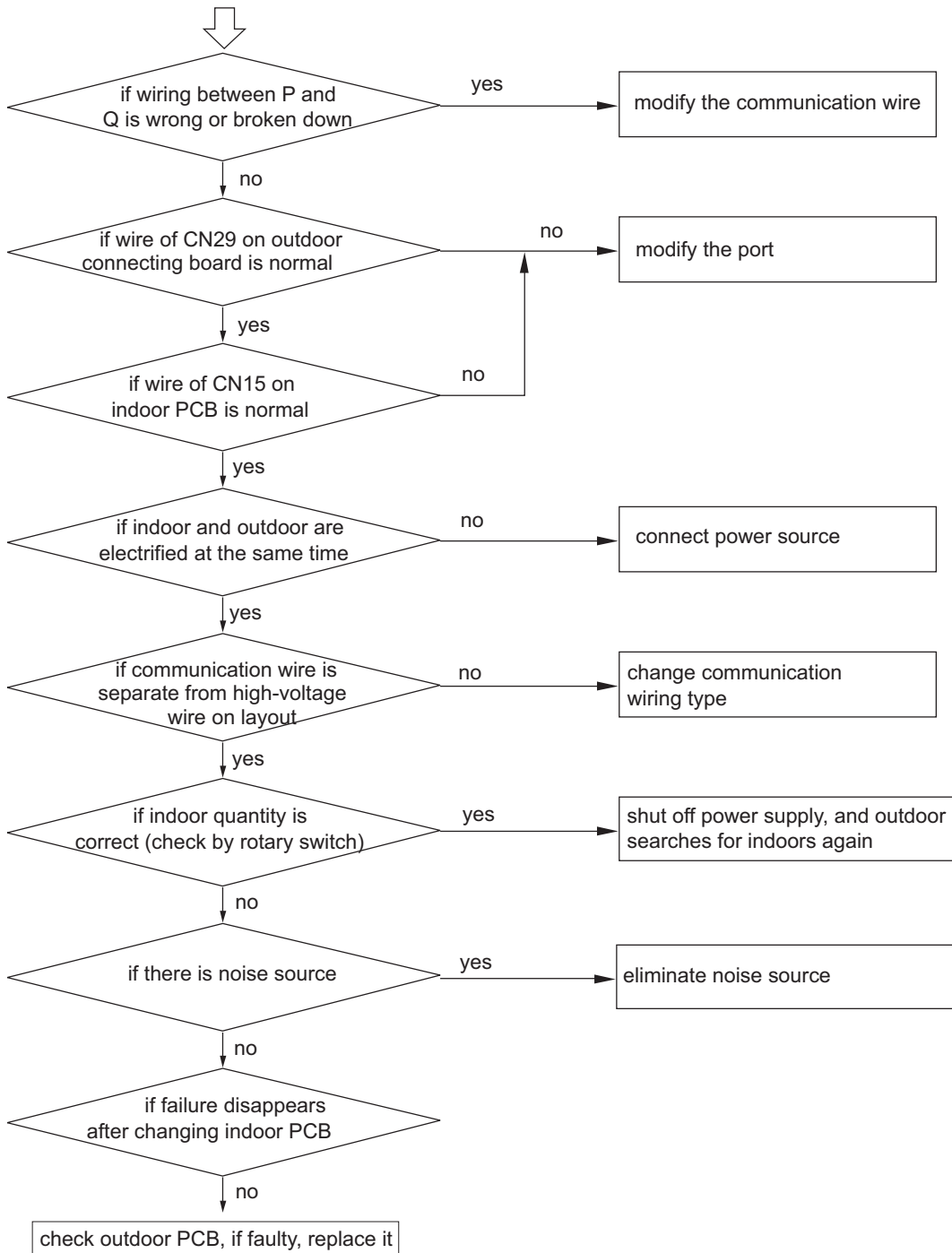
[20~25, 32] temperature sensor failure



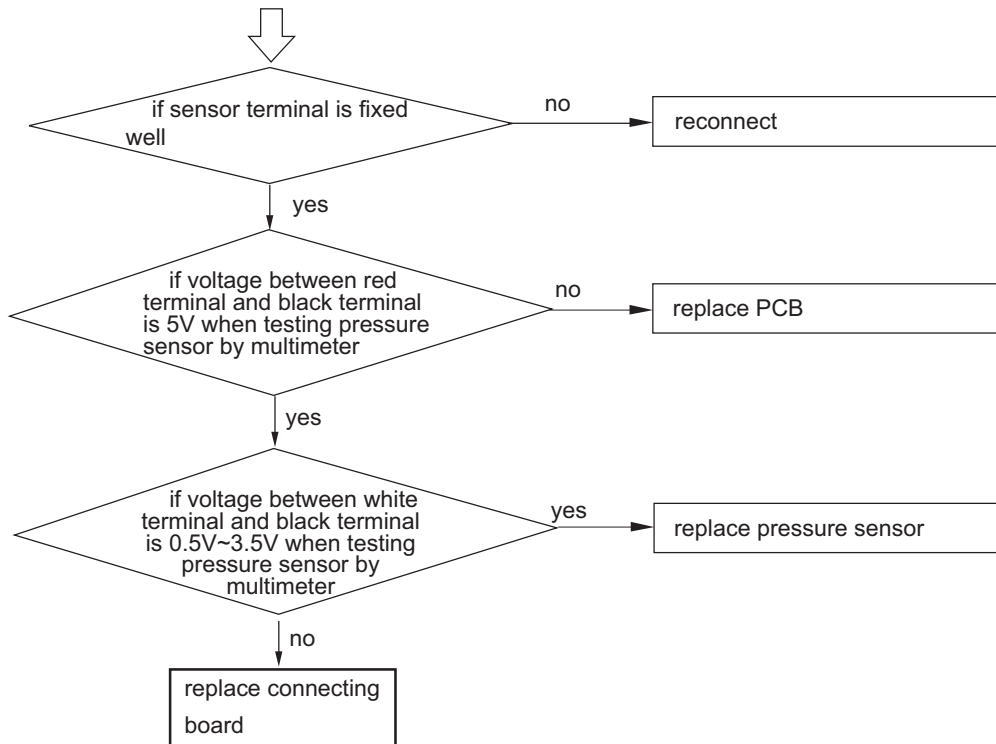
[27] protection of oil temperature too high



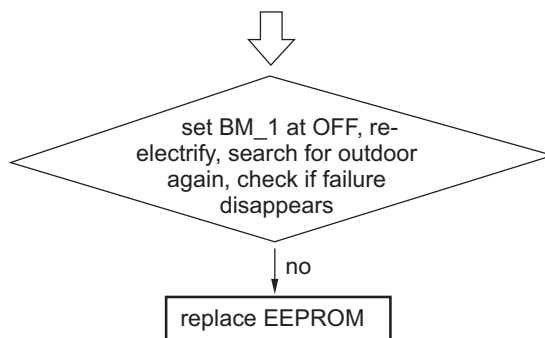
[26]communication circuit between indoor and outdoor



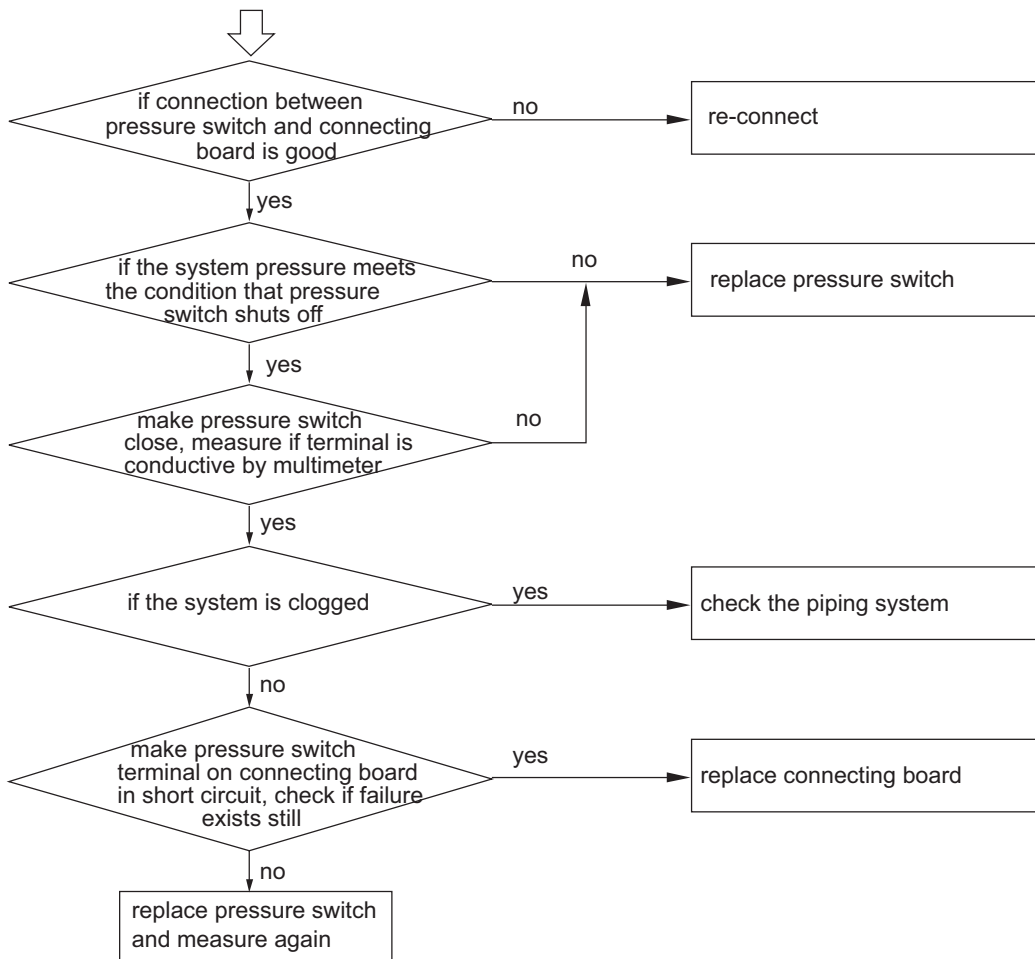
[28, 29] high/low pressure sensor failure



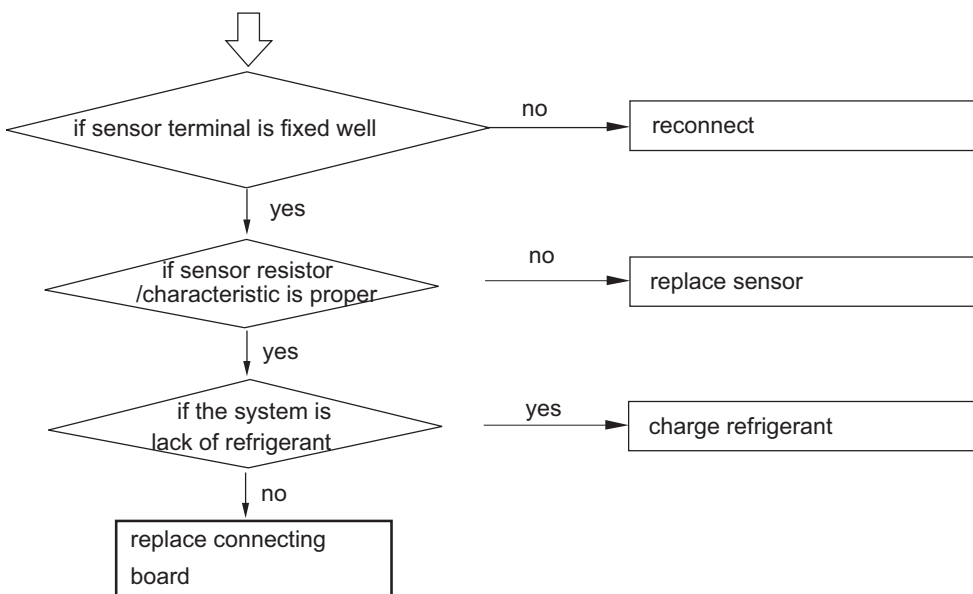
[33] outdoor EEPROM failure



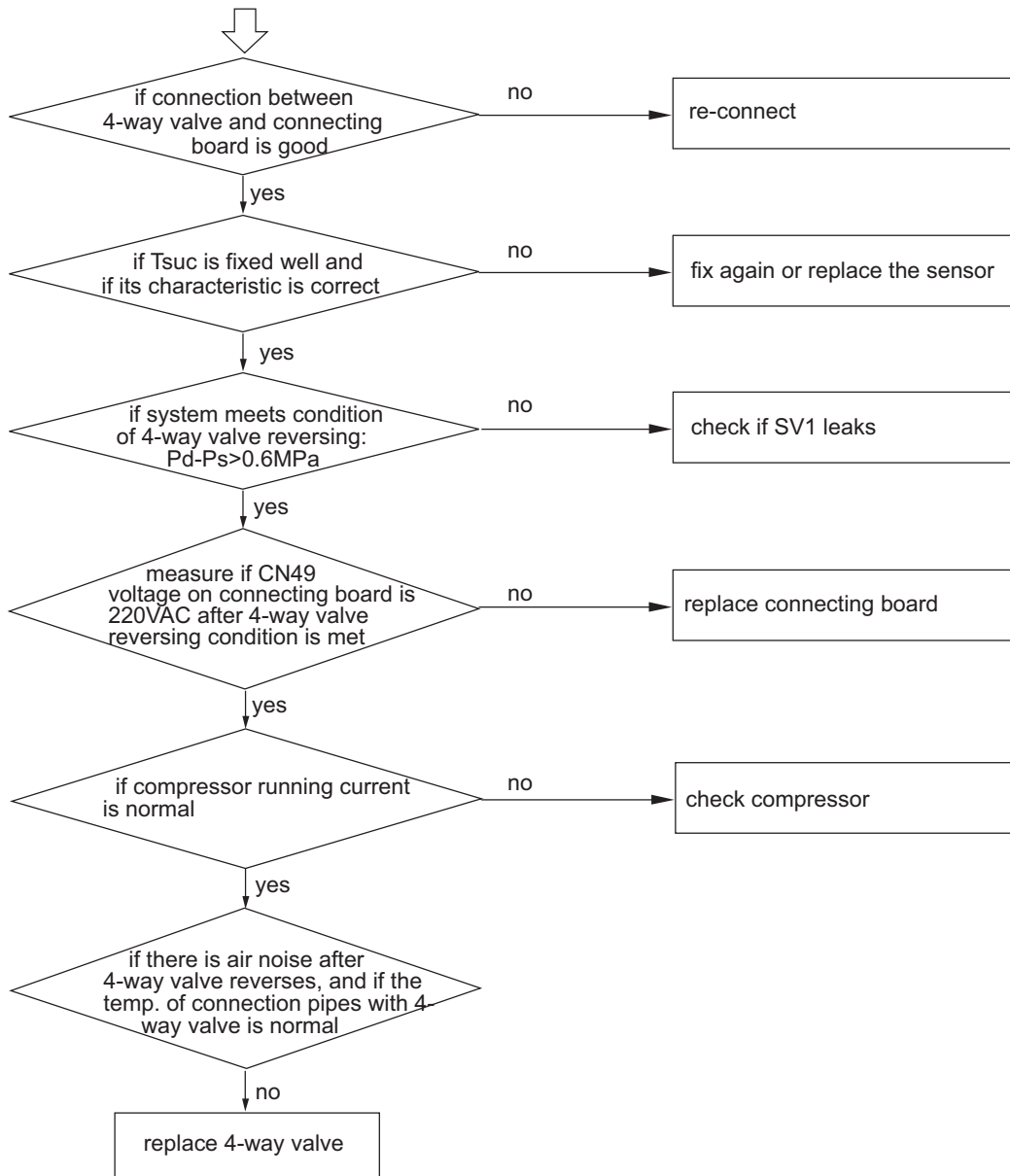
[30] high pressure switch shutoff failure



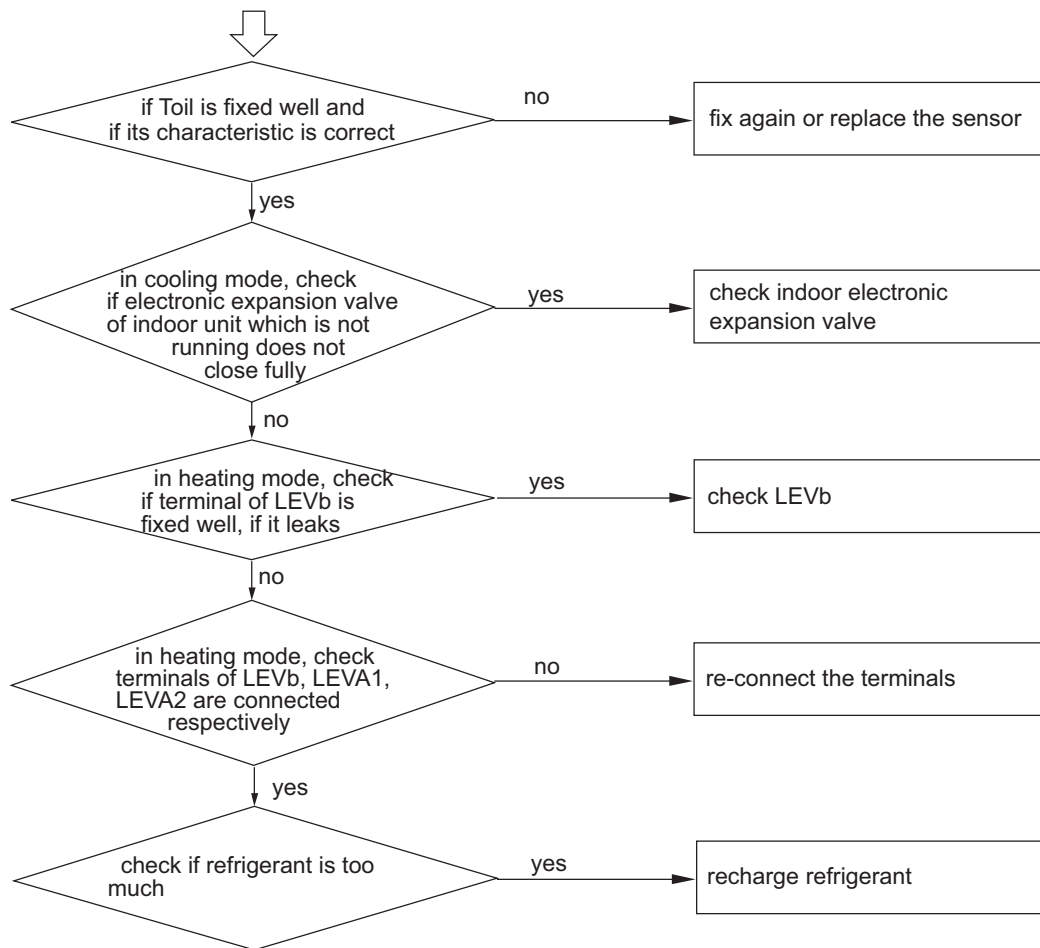
[34] protection of discharging temp. too high



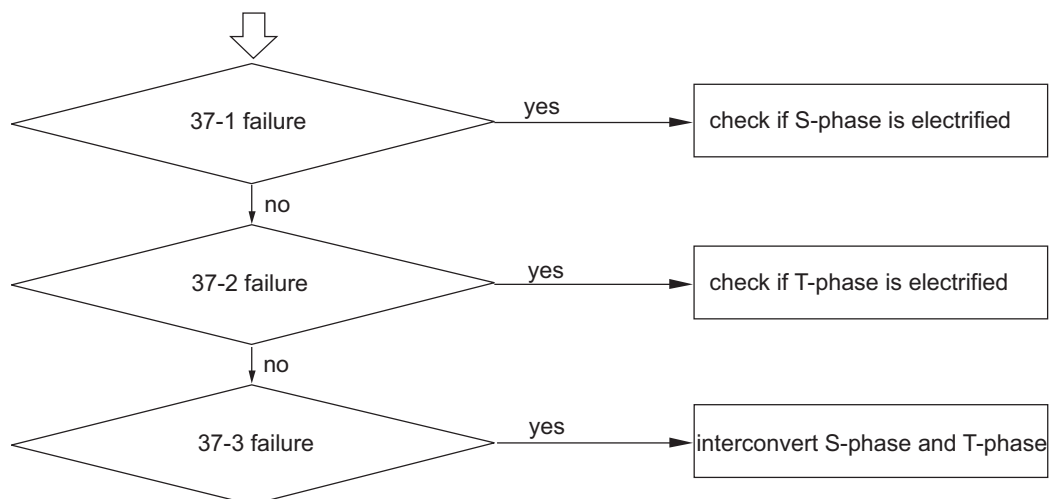
[35] 4-way valve reversing failure



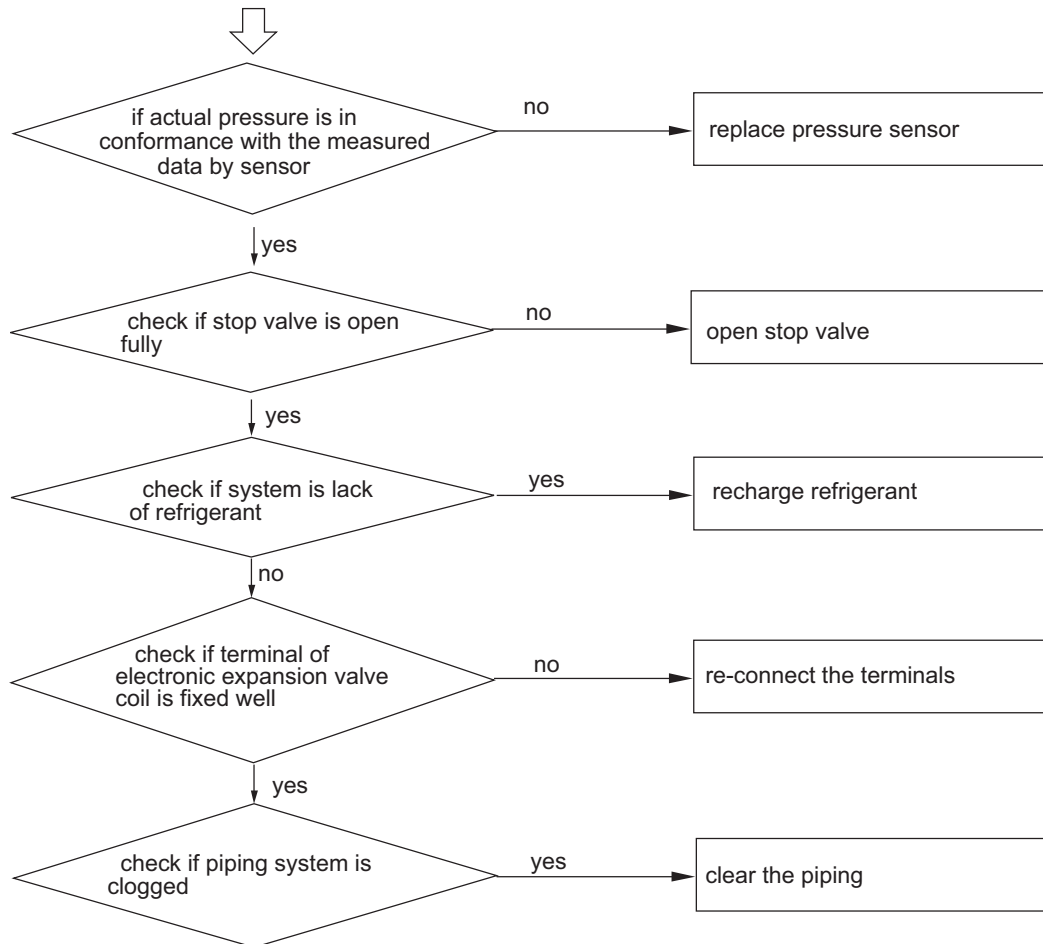
[36] protection of oil temperature too low



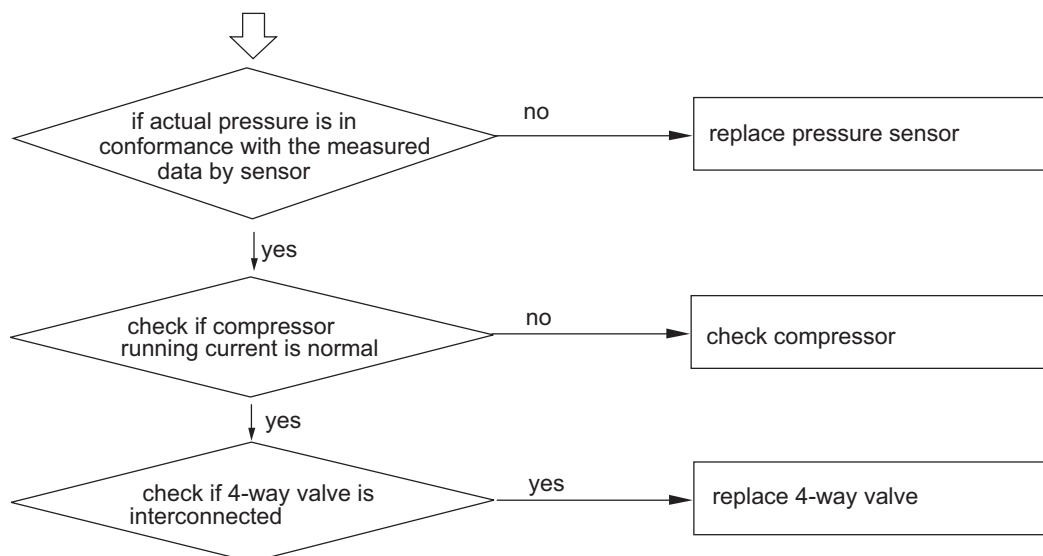
[37-1, 37-2, 37-3] lack of phase of 3N power supply or wrong phase sequence



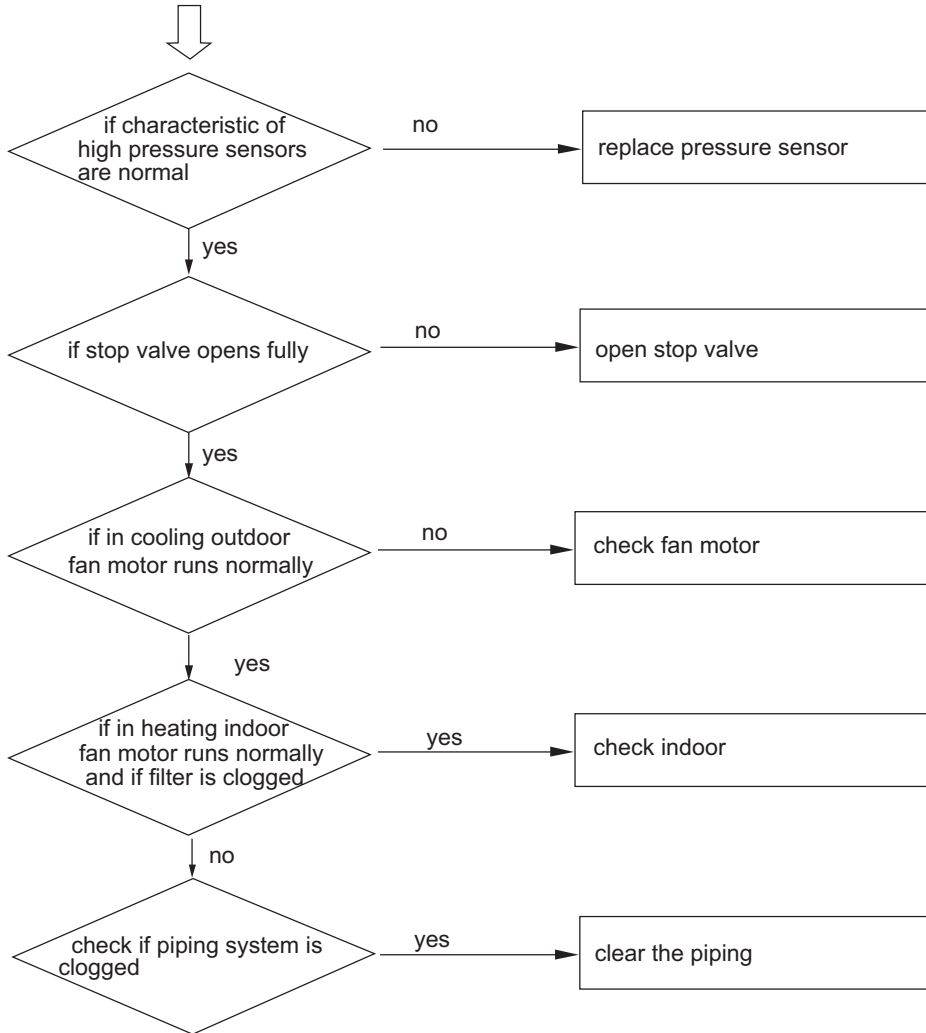
[39-0, 39-1] low pressure too low and compression ratio too high



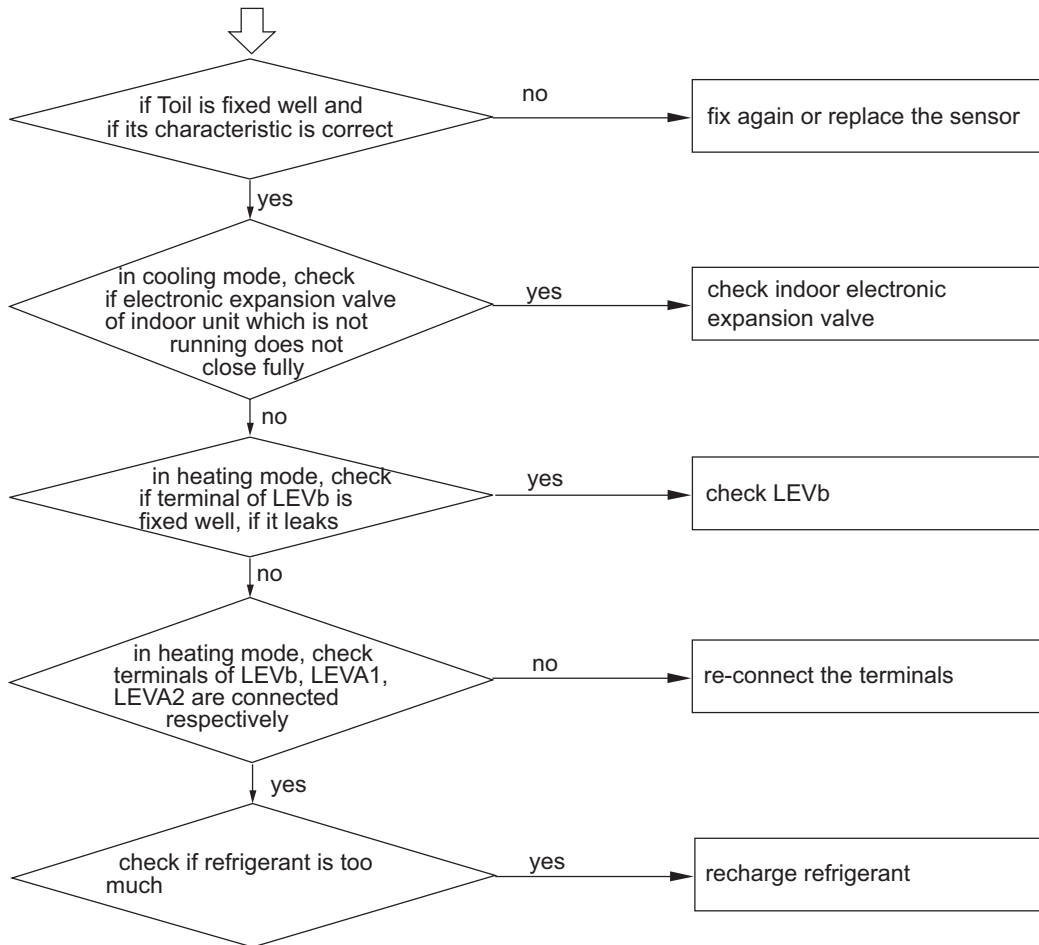
[39-2] compression ratio too low



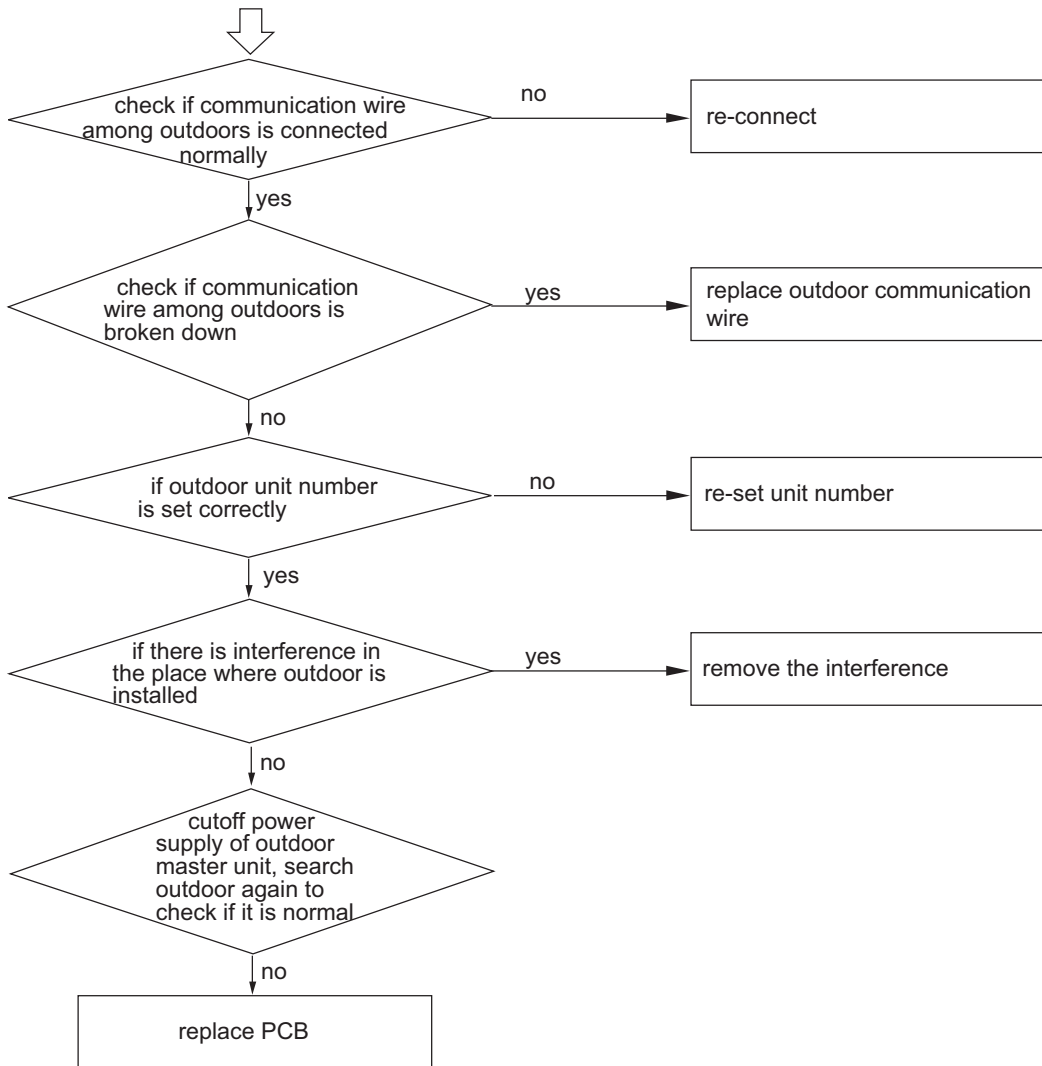
[40] high pressure protection



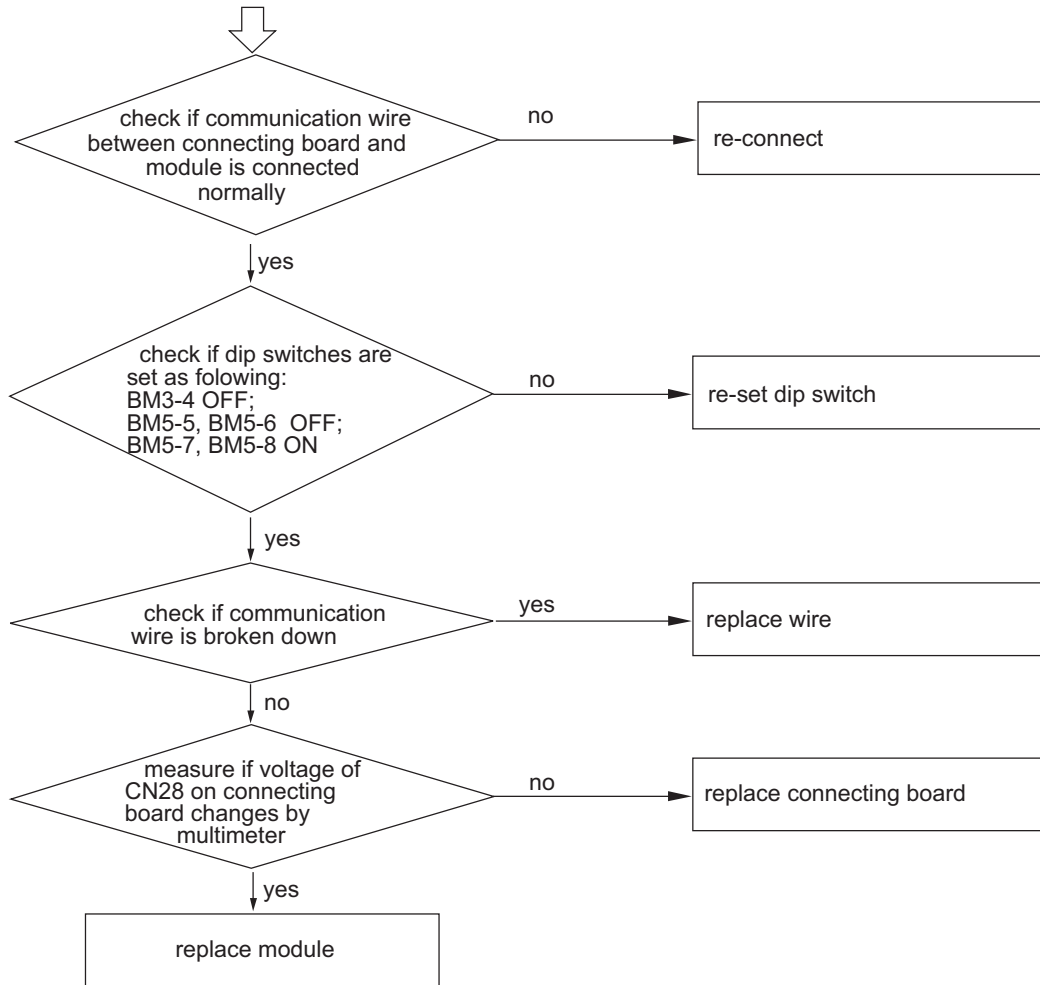
[43, 43-1] protection of discharging temperature too low



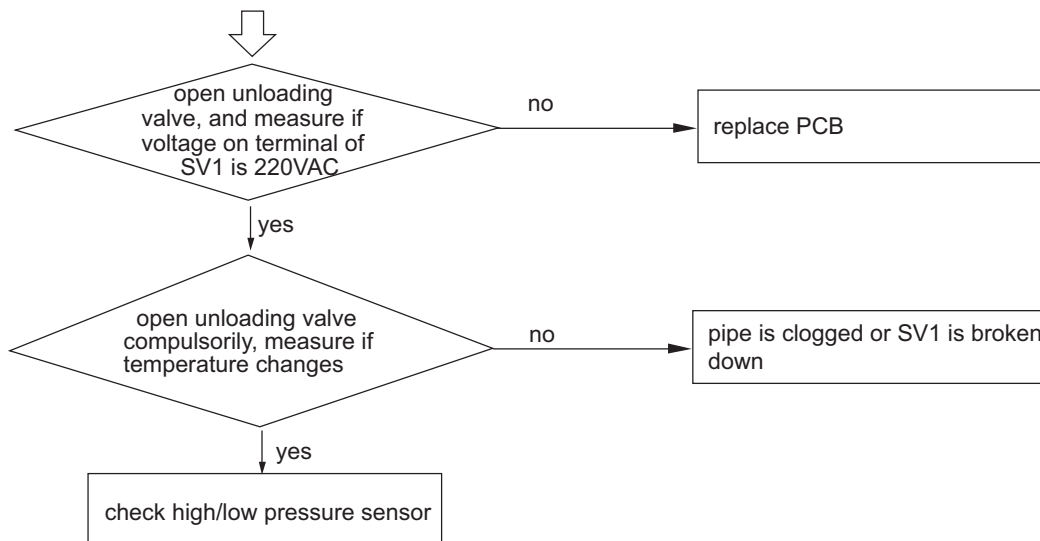
[45] communication among outdoors failure



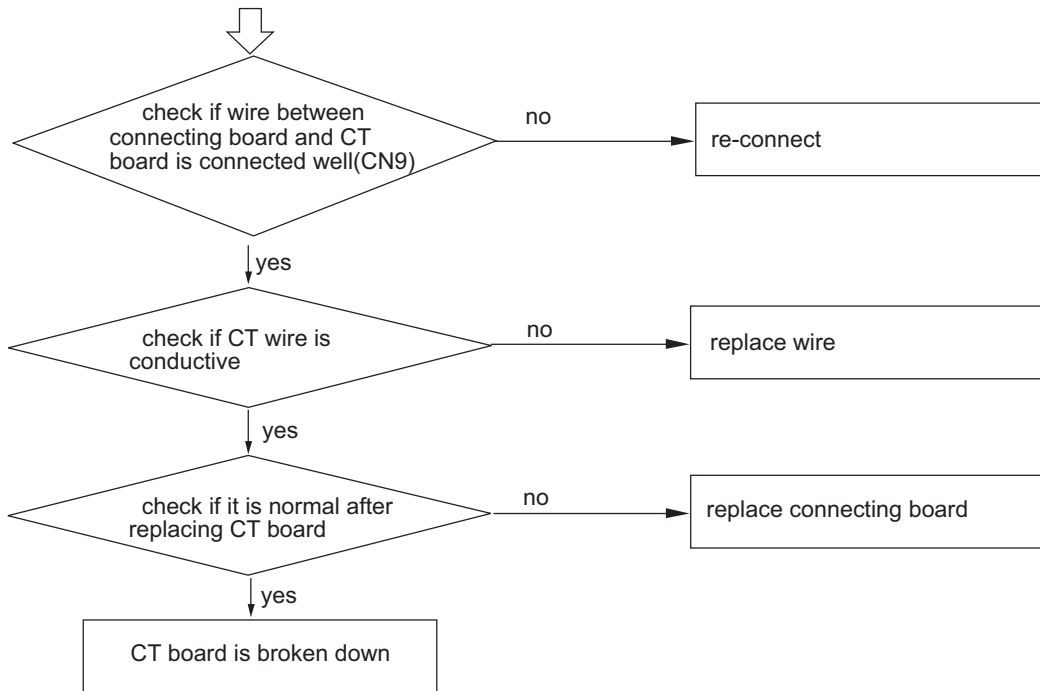
[46] communication with inverter module failure



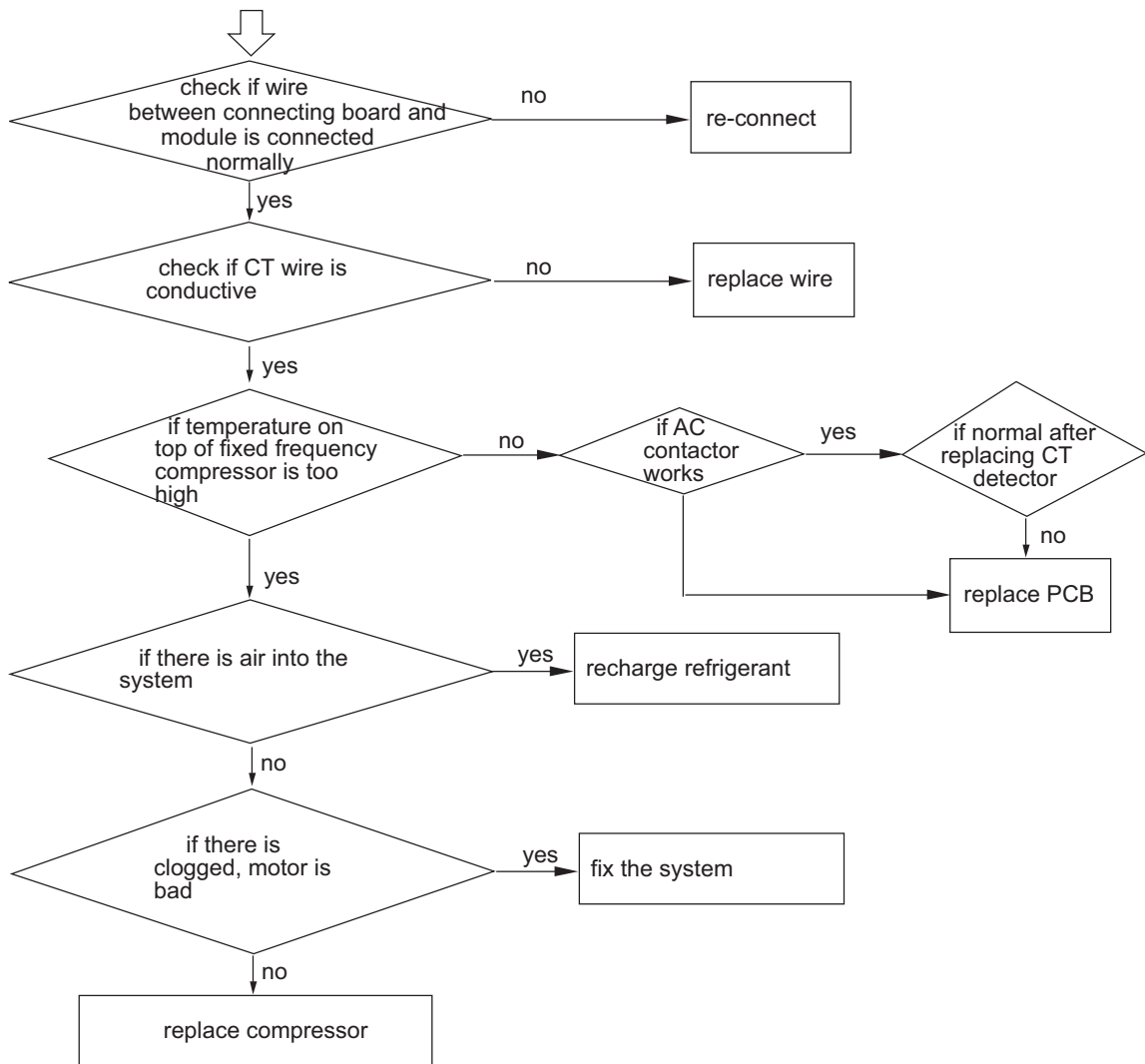
[48] unloading valve failure



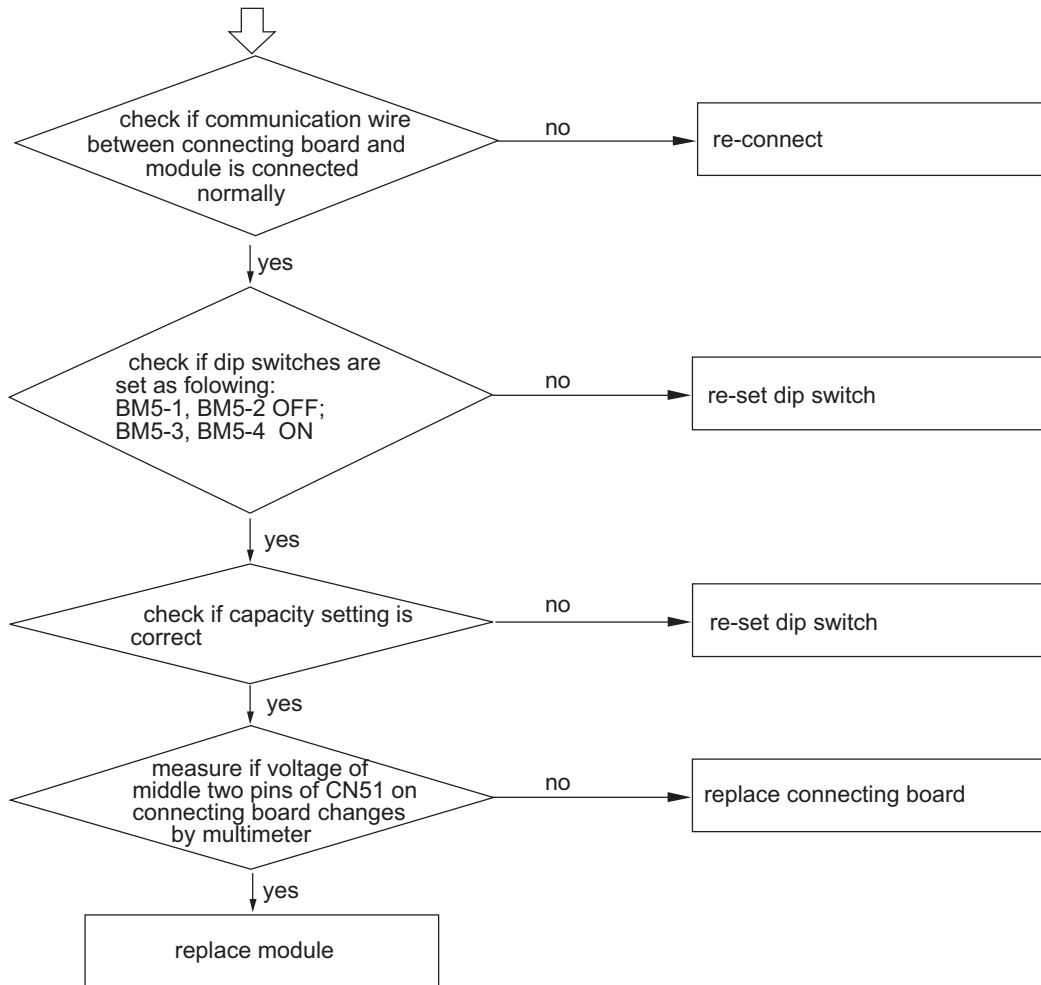
[53-1] current sensor failure



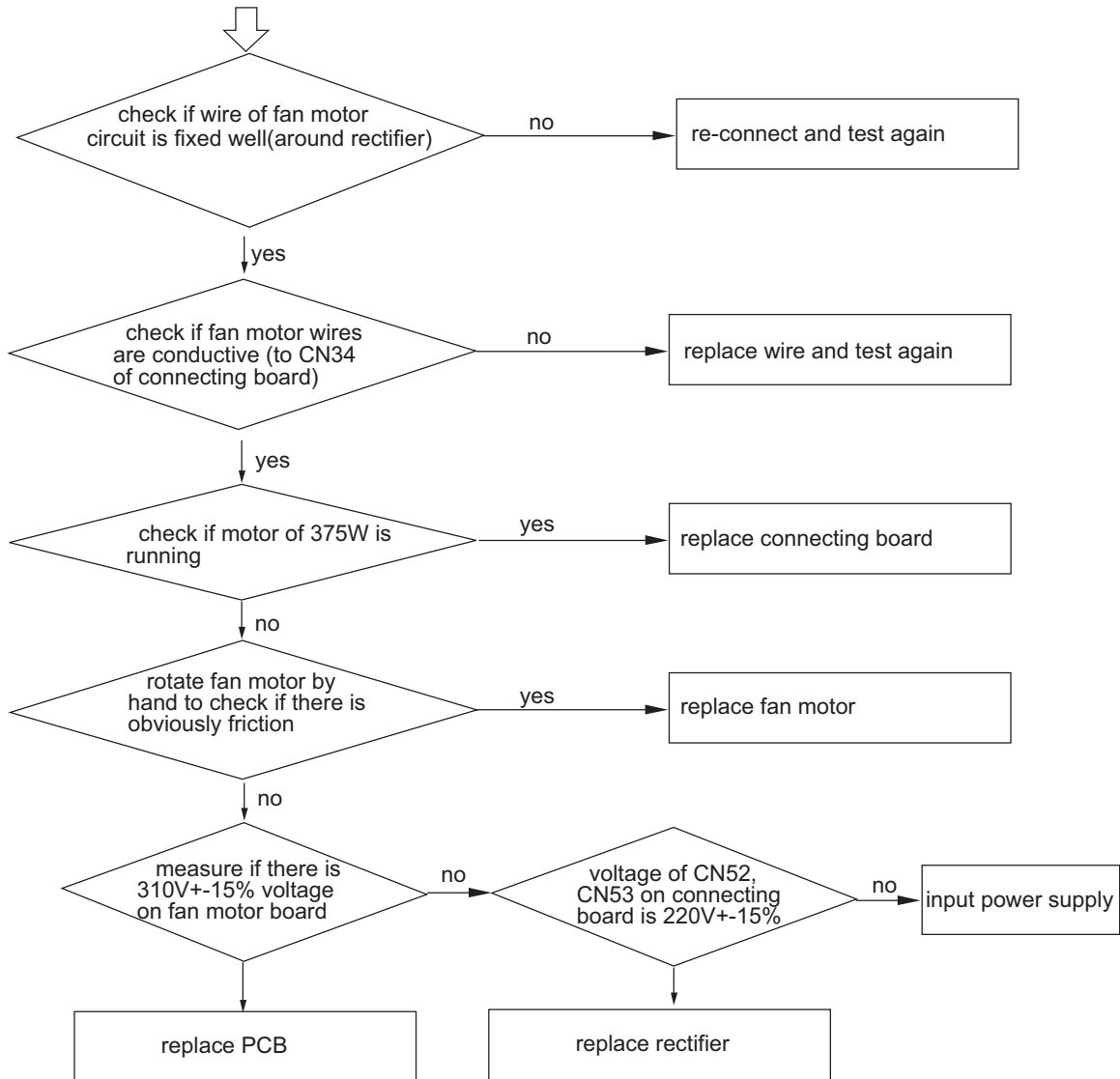
[64-1] CT over current



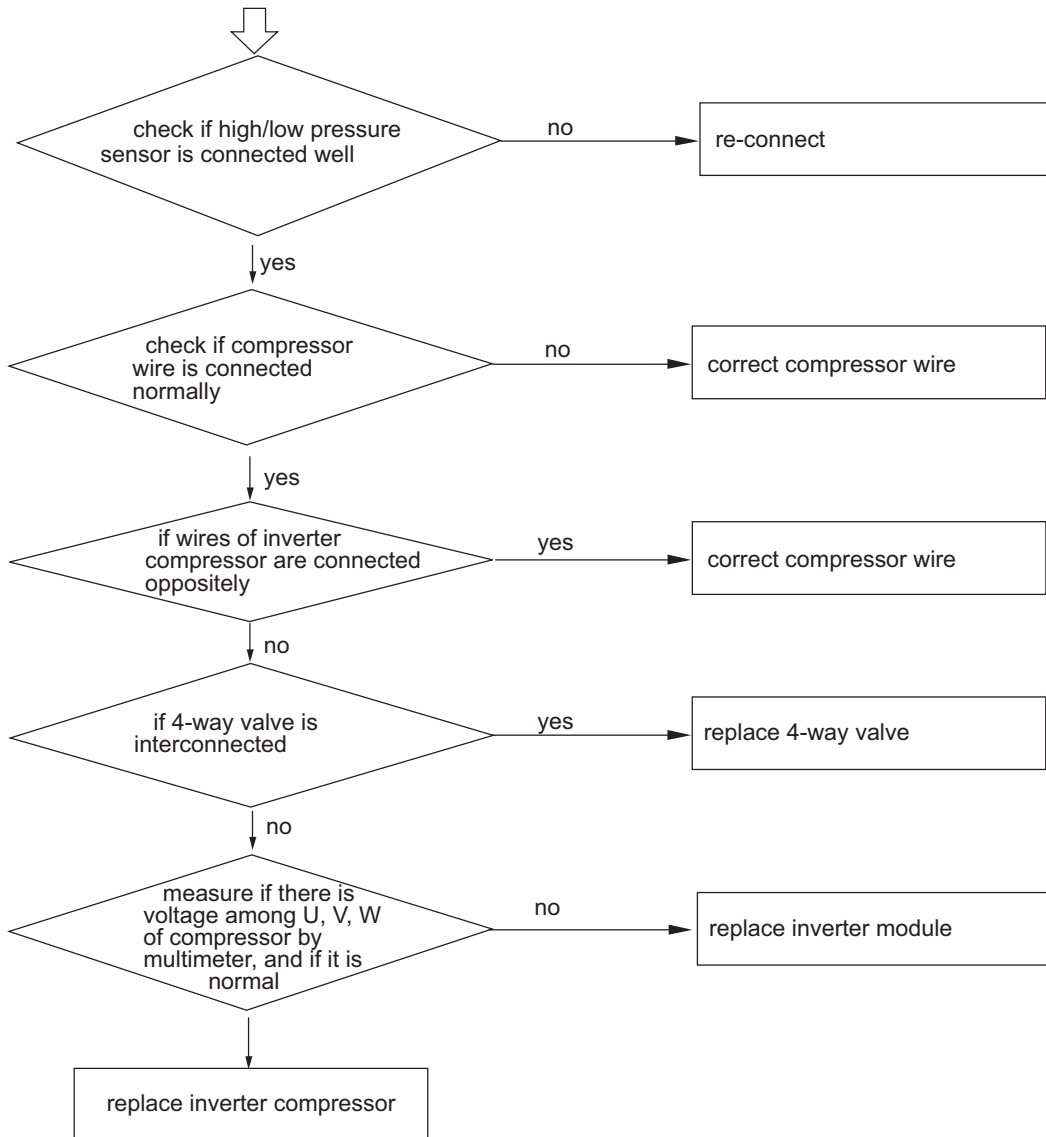
[67] communication with driving board failure



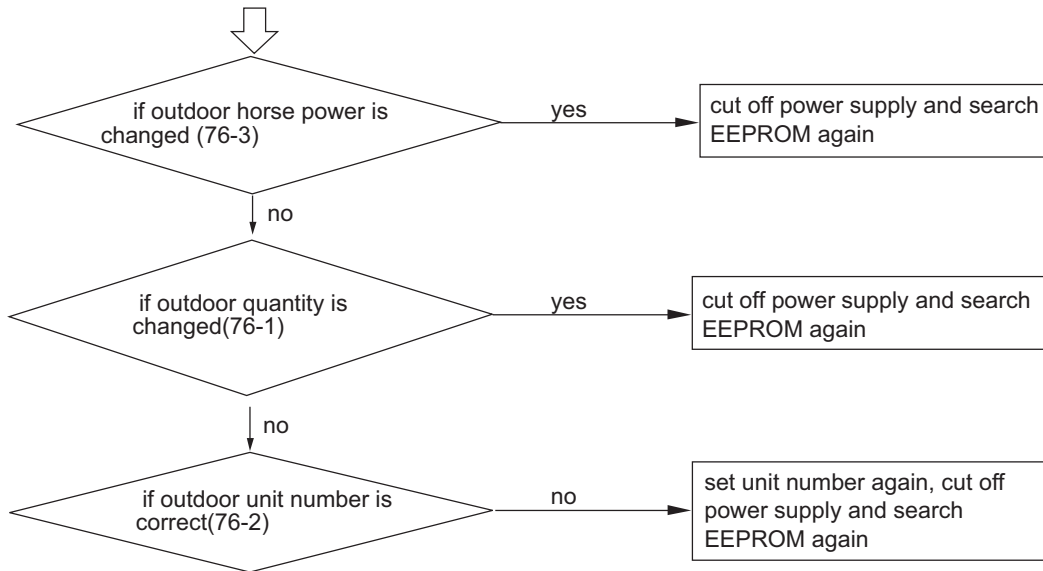
[71] DC motor blocked



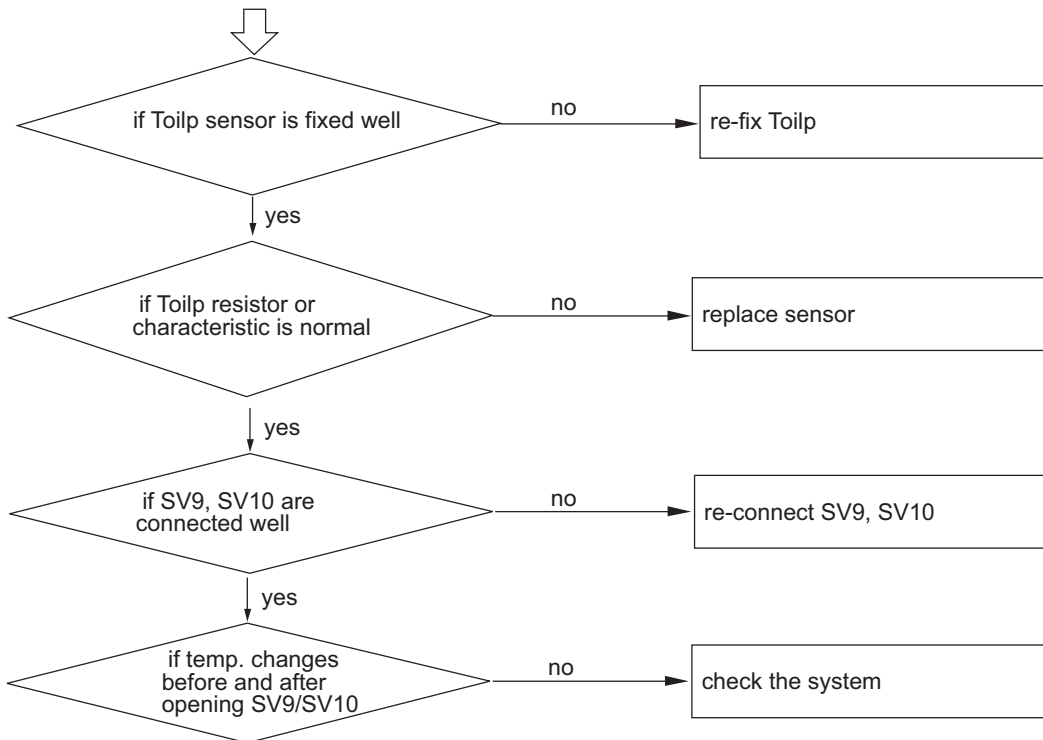
[75-0, 75-4] pressure drop too low between high pressure and low one



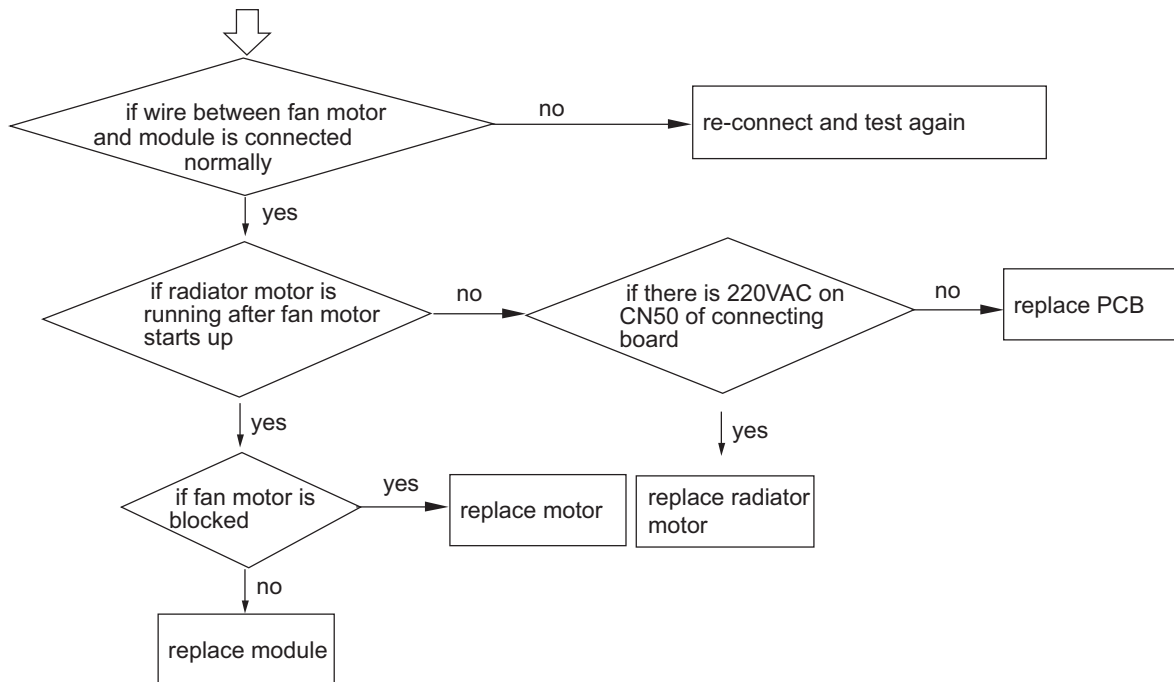
[76] outdoor address or capacity setting incorrect



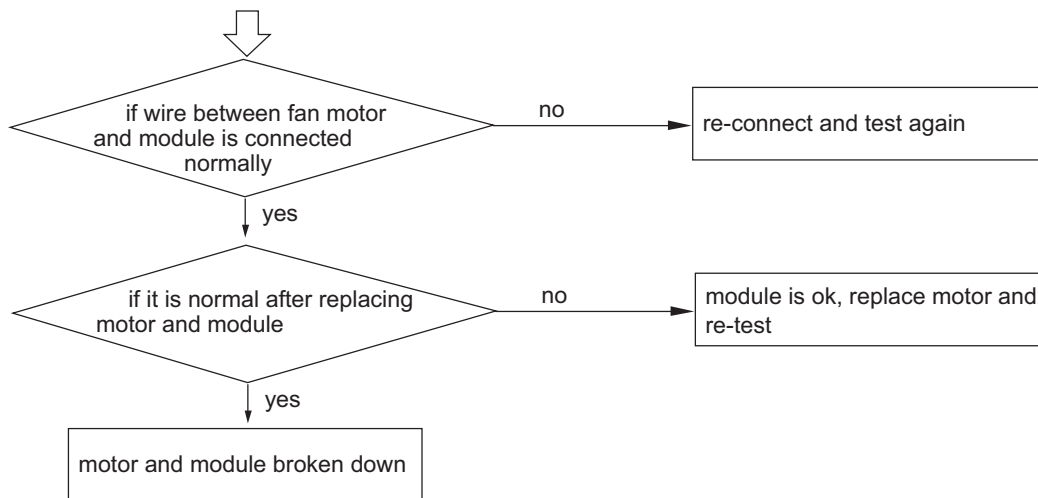
[77] oil equalization failure among outdoors



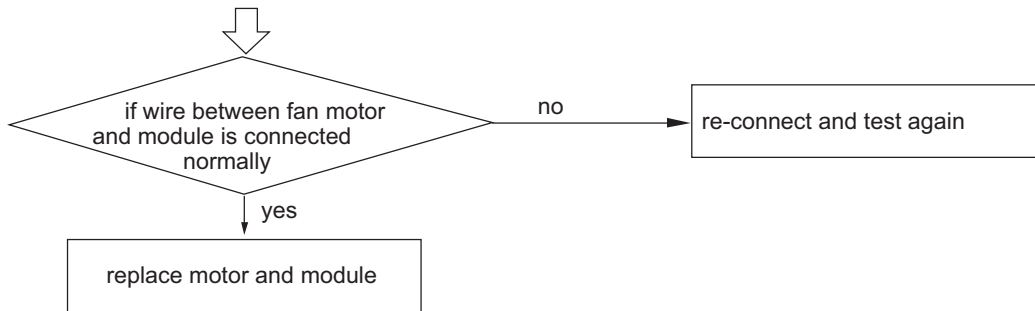
[100] IPM abnormal of DC fan motor driving board



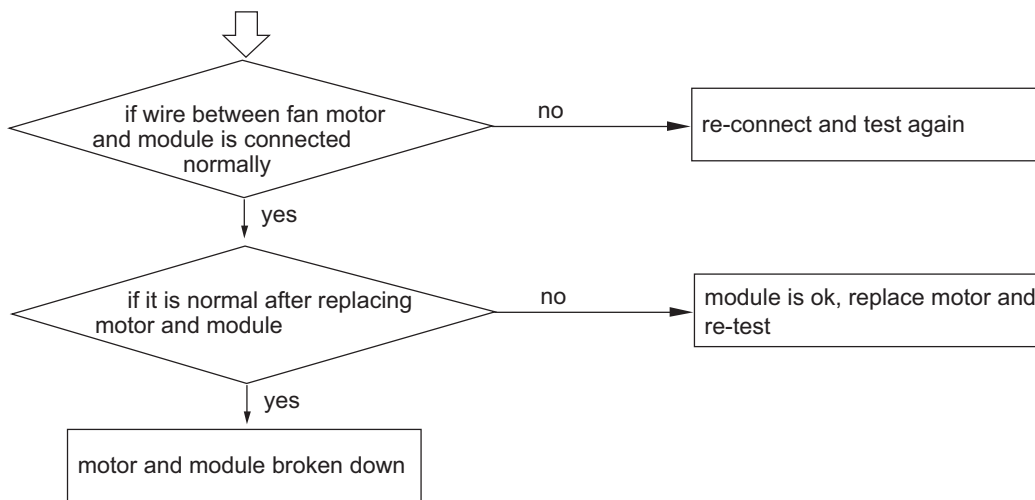
[101] DC motor driving board detecting out of control



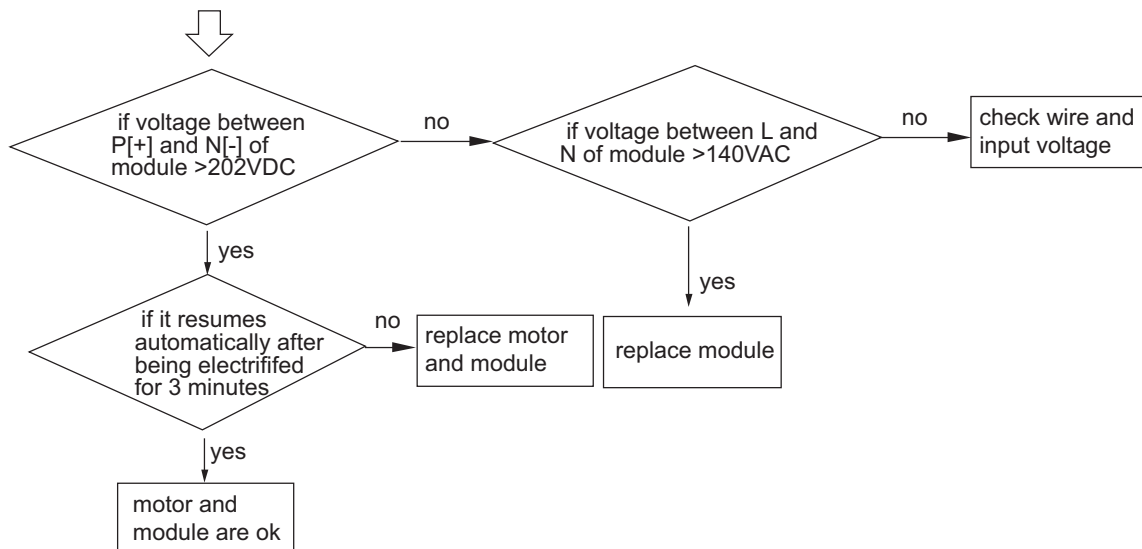
[102] DC motor driving board EEPROM failure



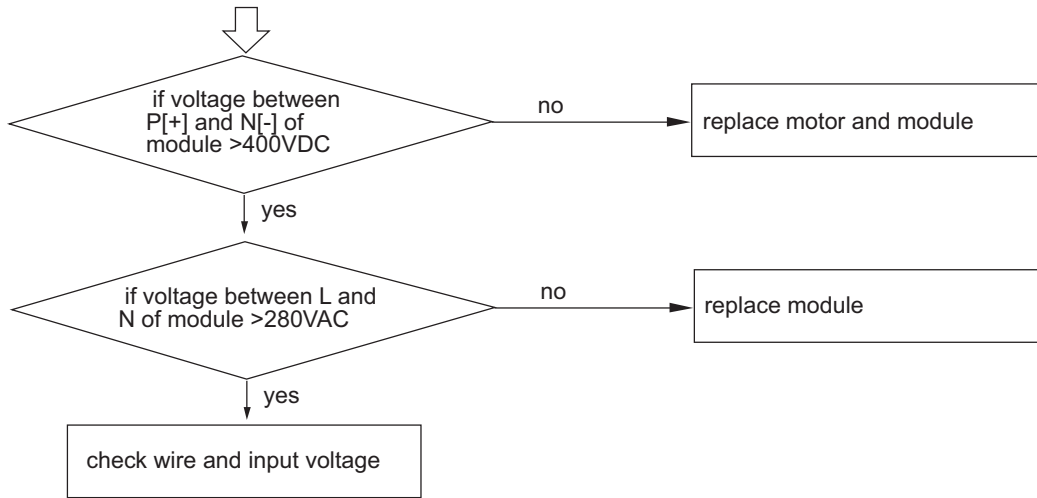
[103] DC motor driving board overcurrent or current sensor broken down



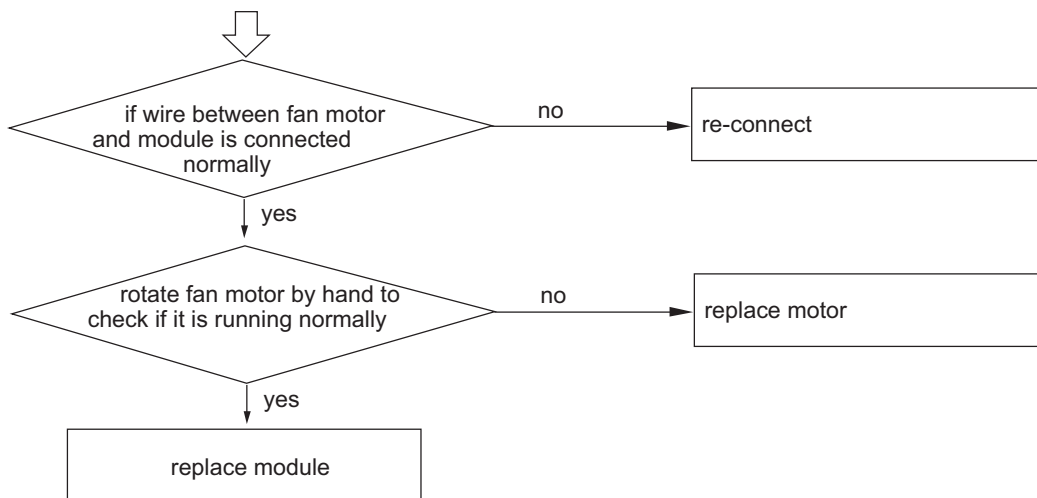
[104] voltage too low protection of DC motor driving board



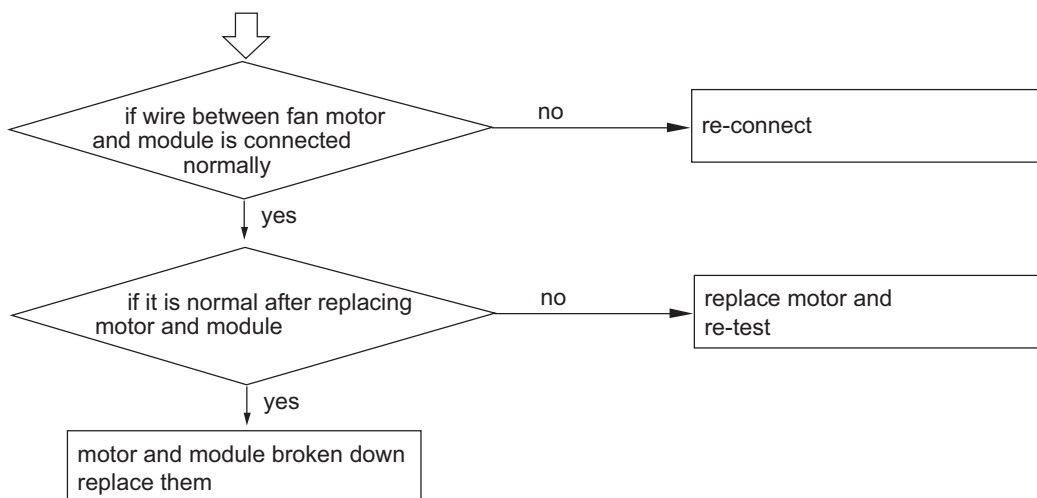
[105] protection of DC motor driving board overcurrent



[106] DC motor driving board blocked



[107] protection of motor rate over limitation

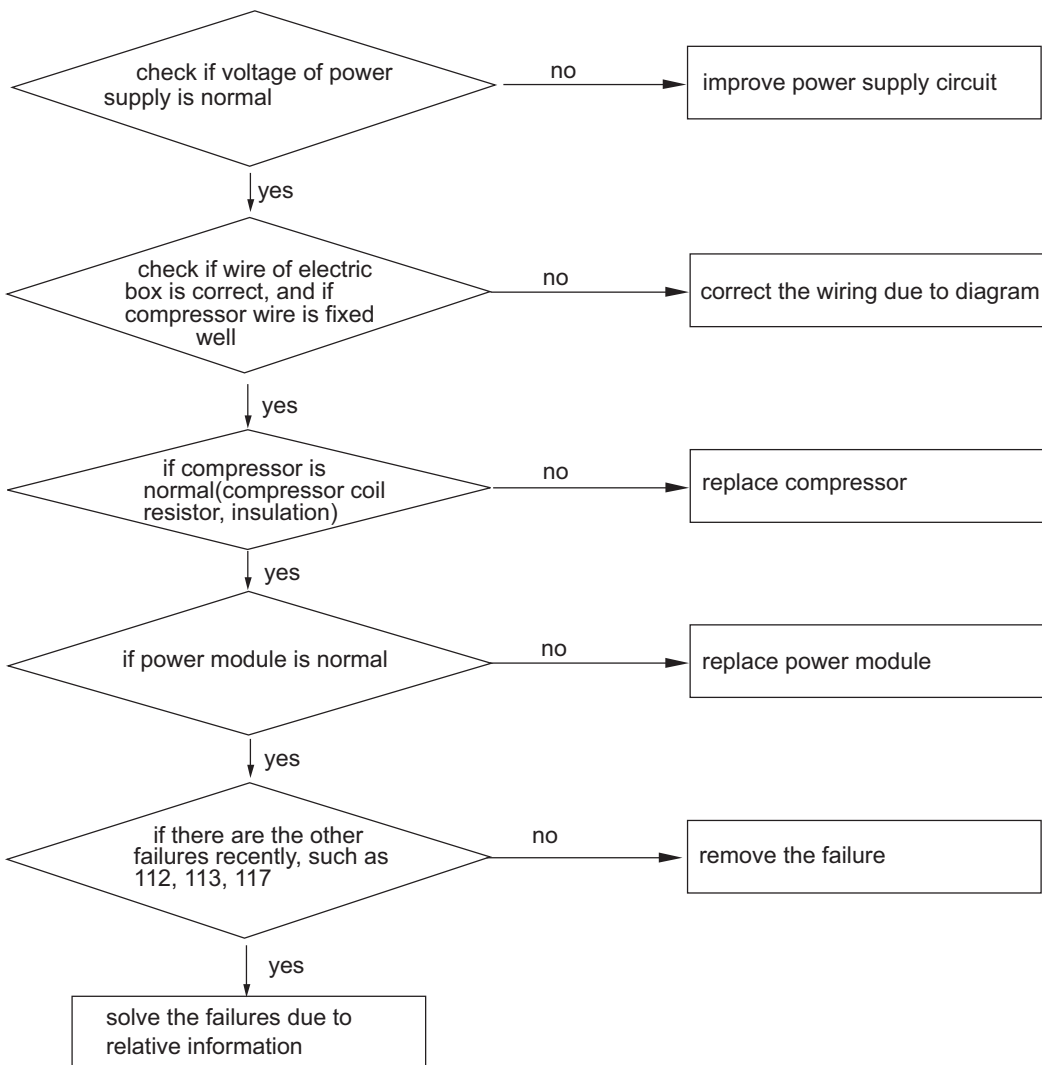


[99] self-diagnose after special process is abnormal

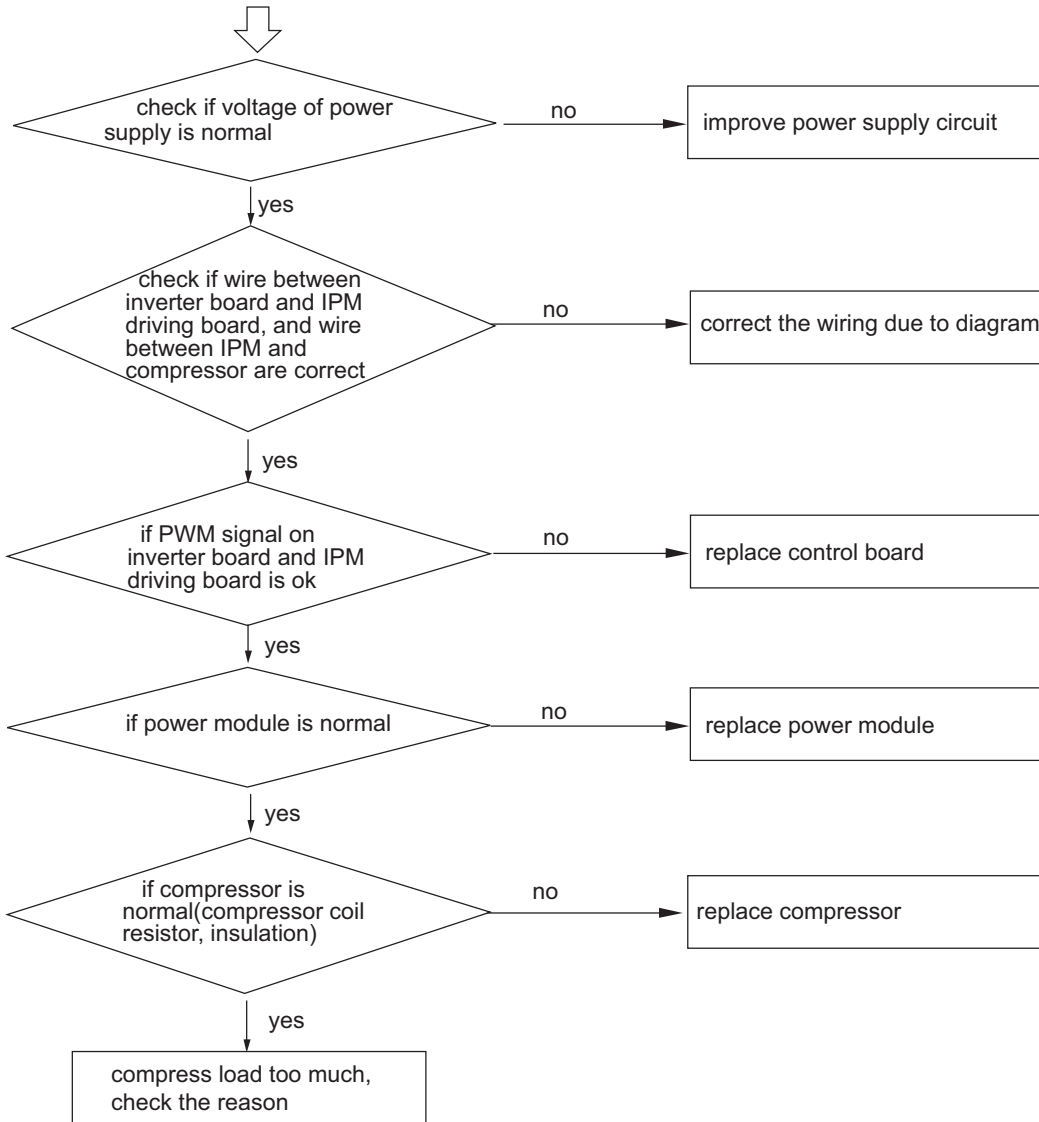


confirm if communication among outdoors is normal
(refer to solution of communication abnormal)

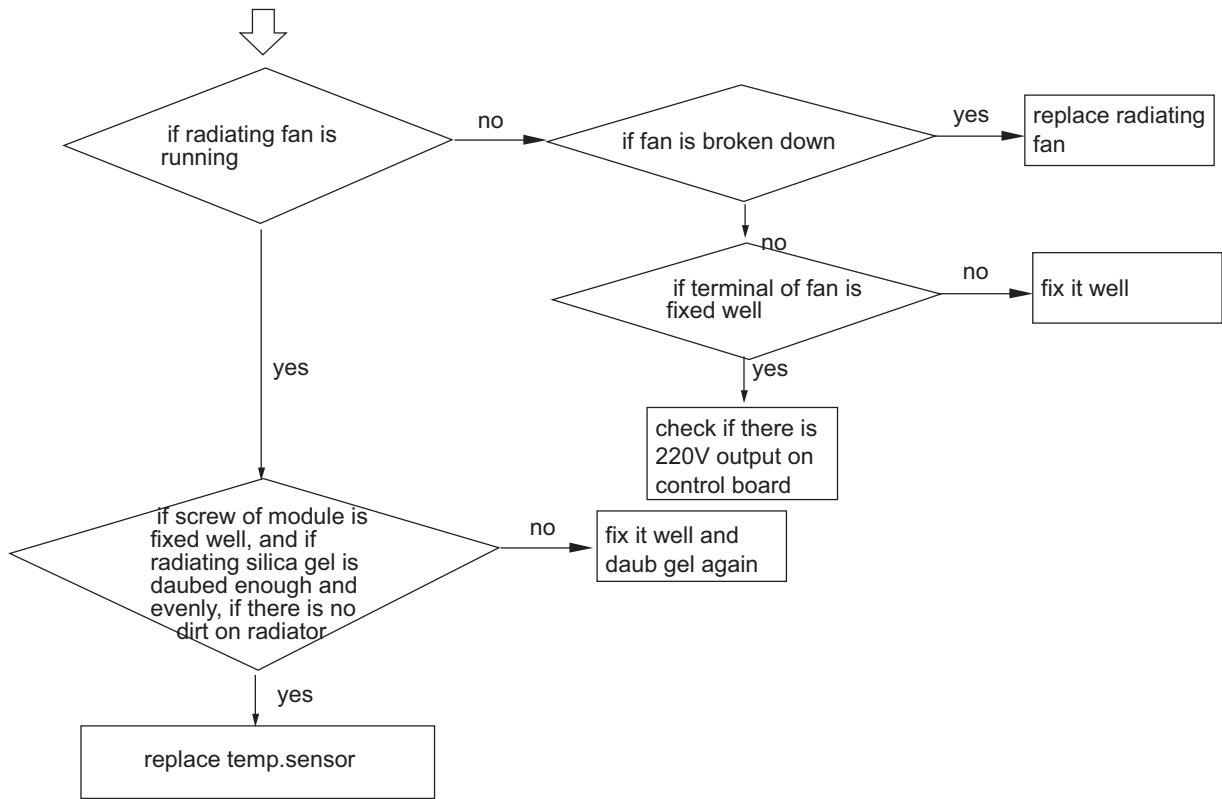
[110] power module overcurrent



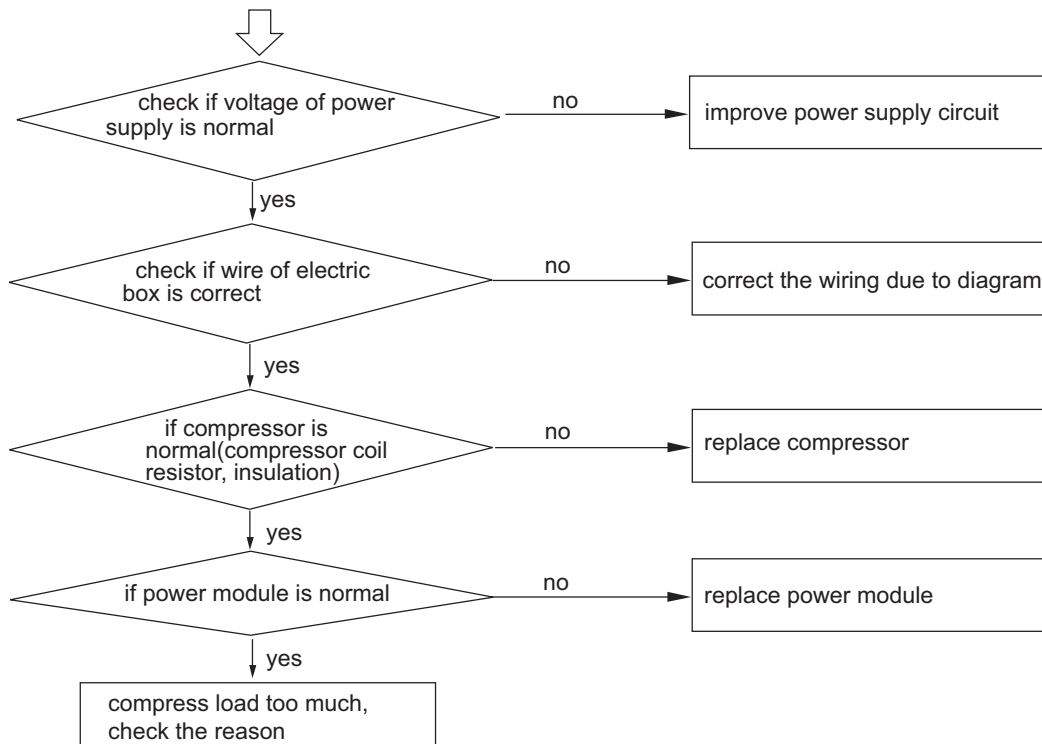
[111] compressor out of control



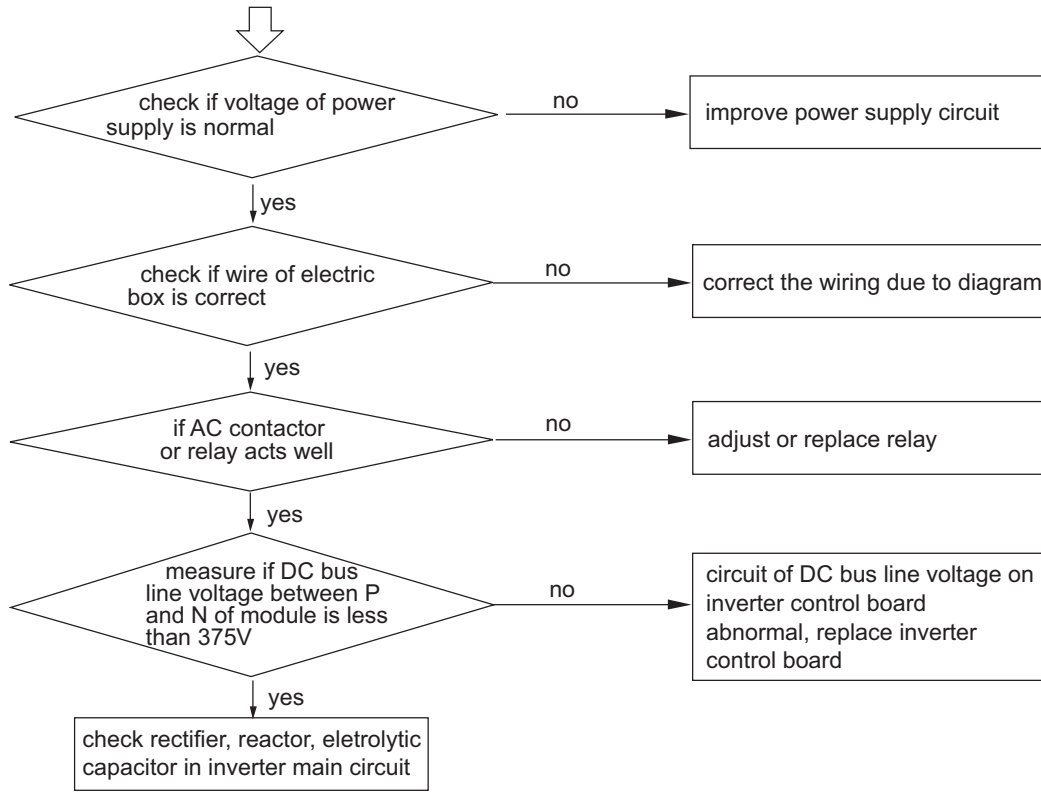
[112] radiator of transducer temp.too high



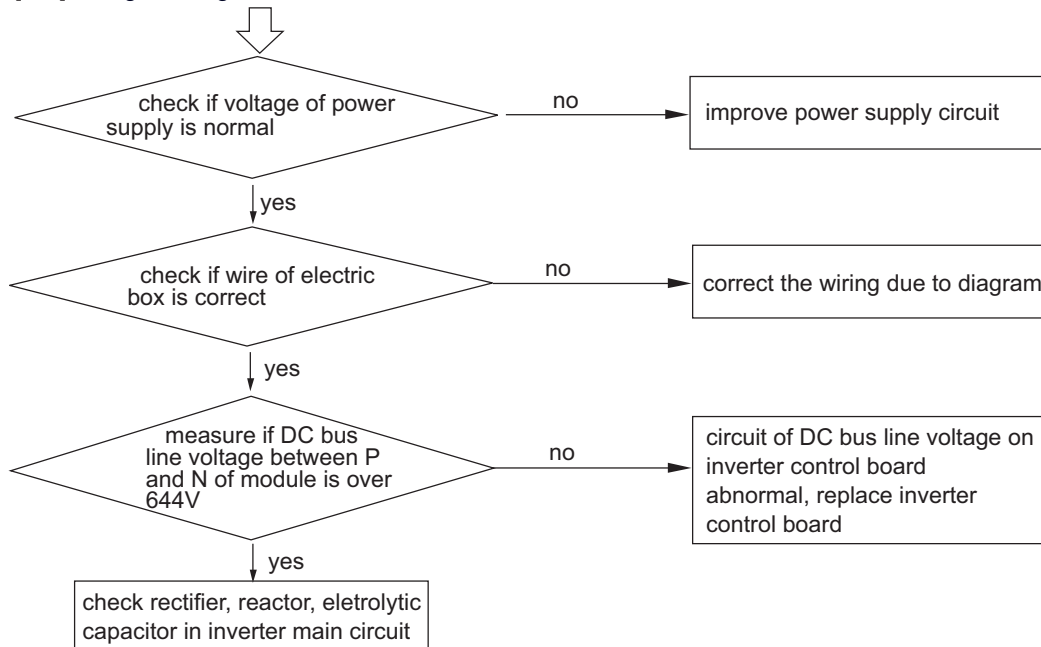
[113] protection of overload



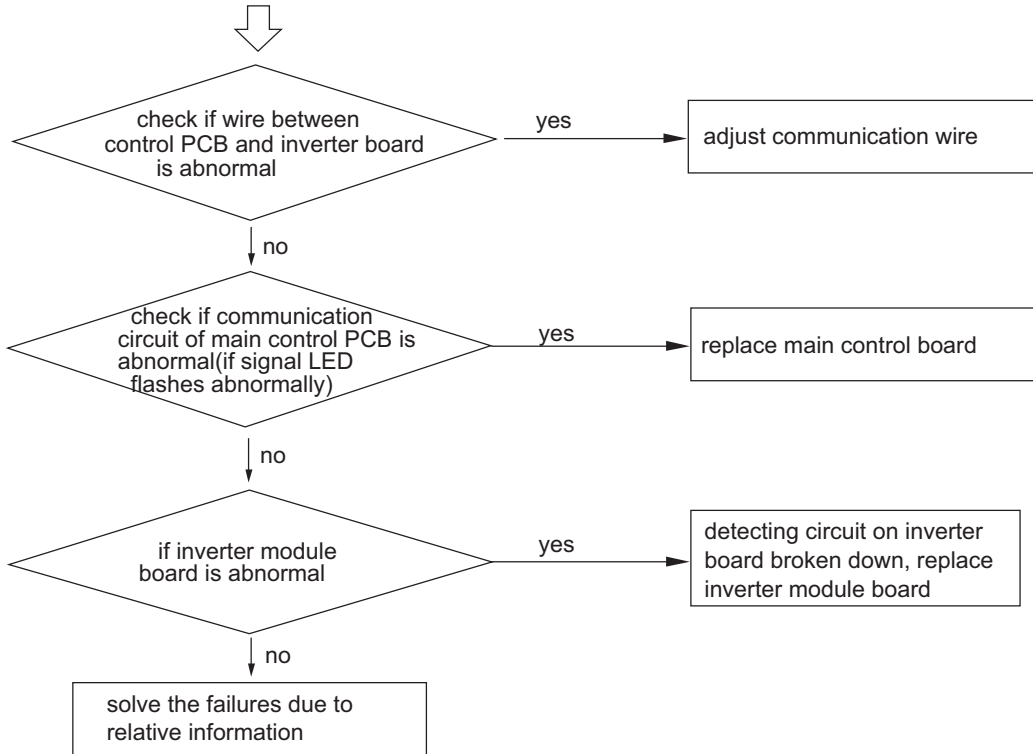
[114] voltage too low of DC bus line of transducer



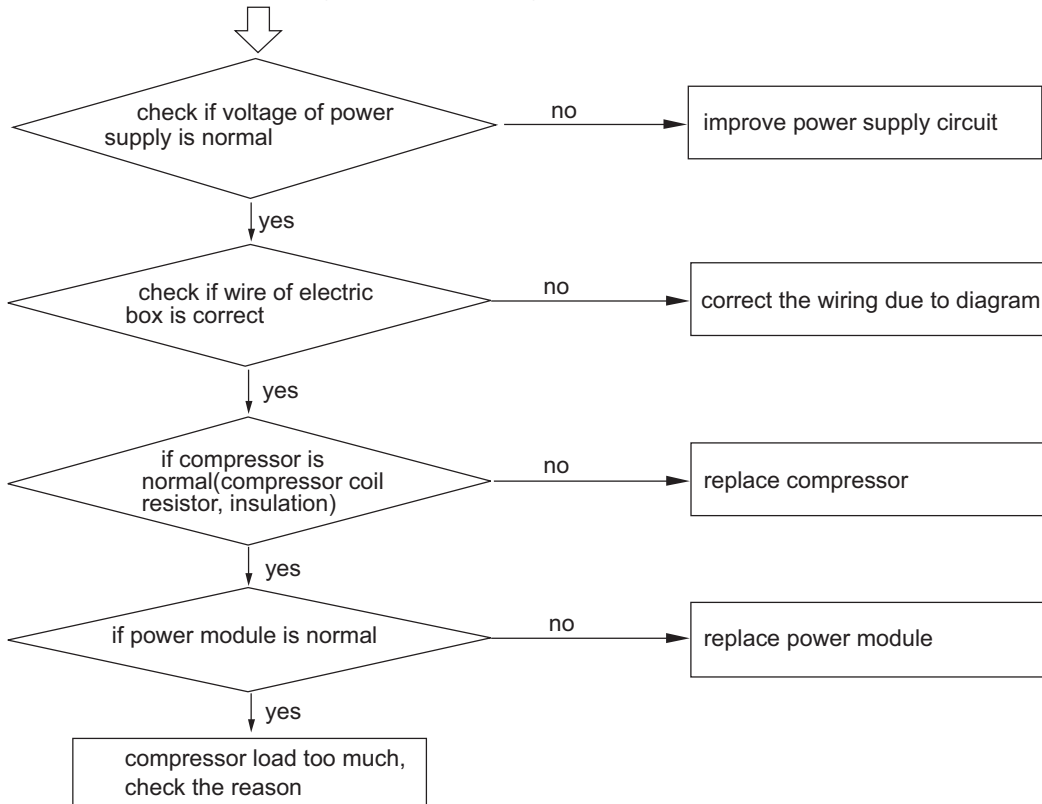
[115] voltage too high of DC bus line of transducer



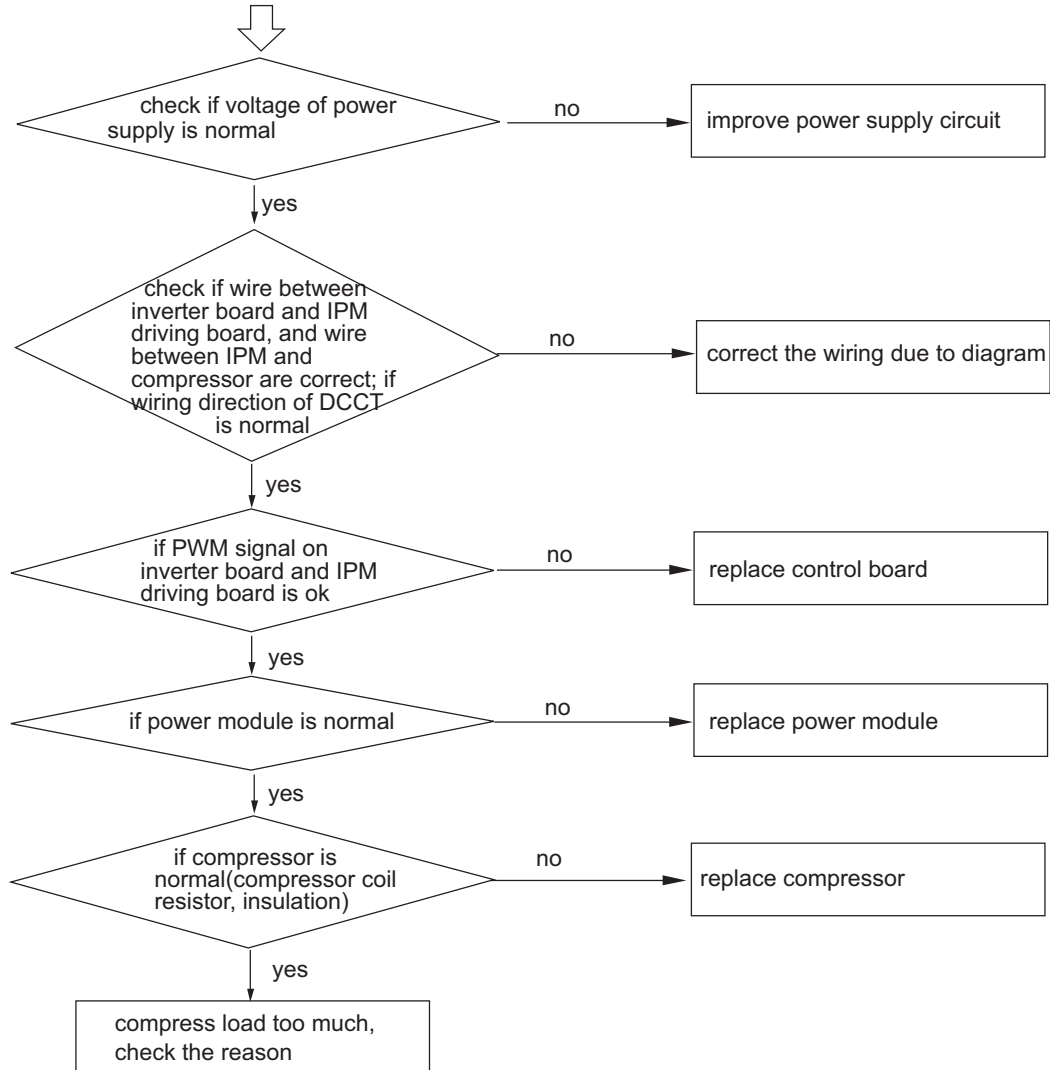
[116] communication abnormal between transducer(inverter module board) and control PCB



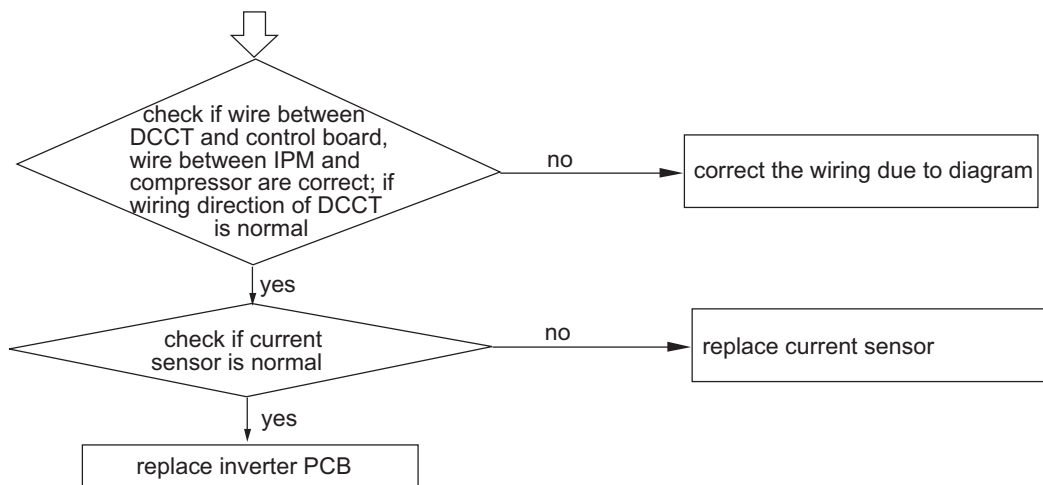
[117] transducer over current (software protection)



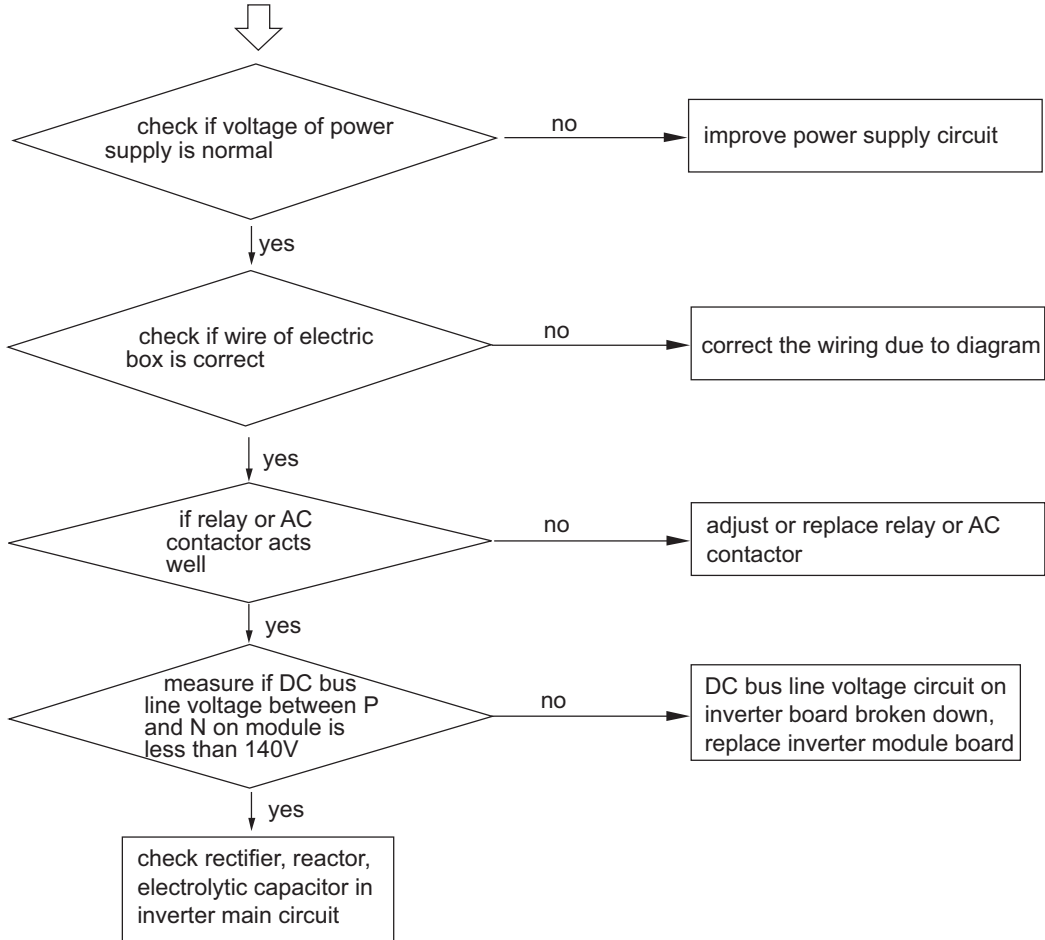
[118] compressor startup failure because of overcurrent or overheat



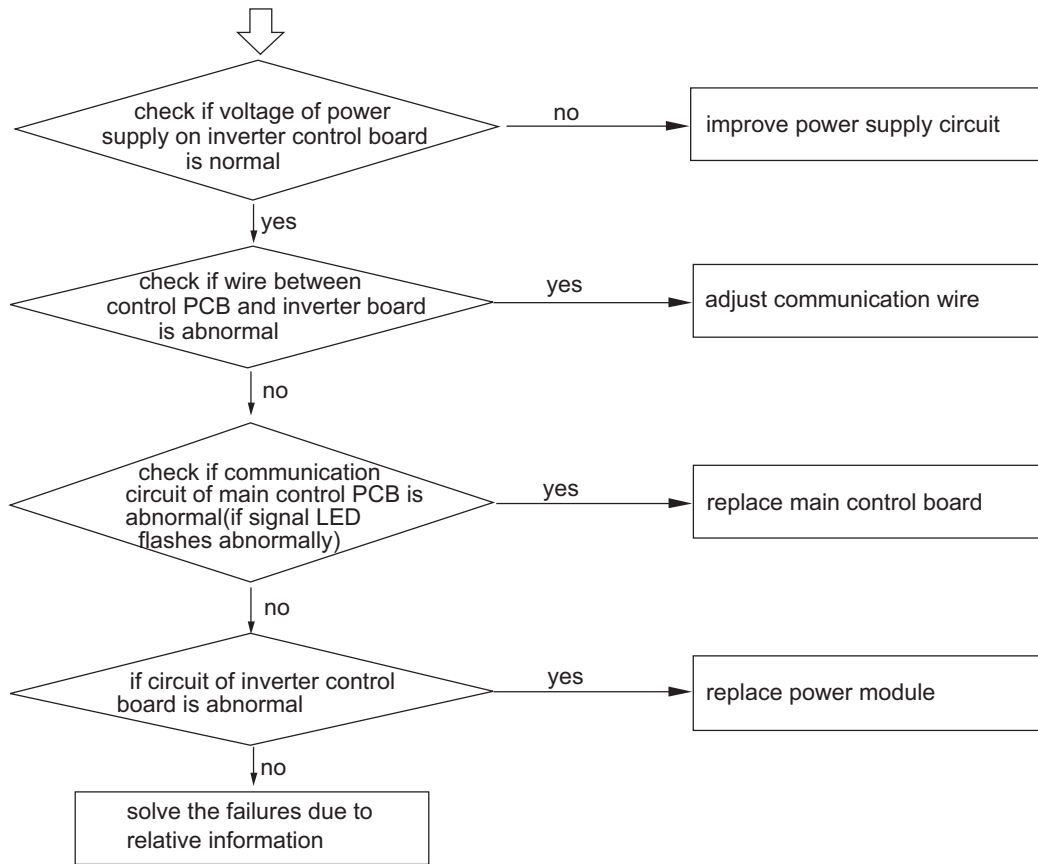
[119] current detecting circuit abnormal of transducer



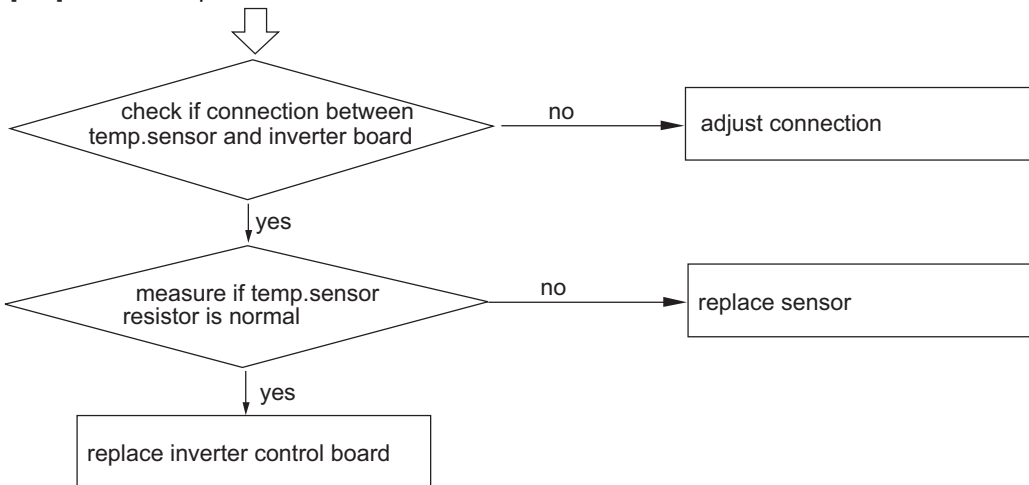
[120] power supply of transducer abnormal



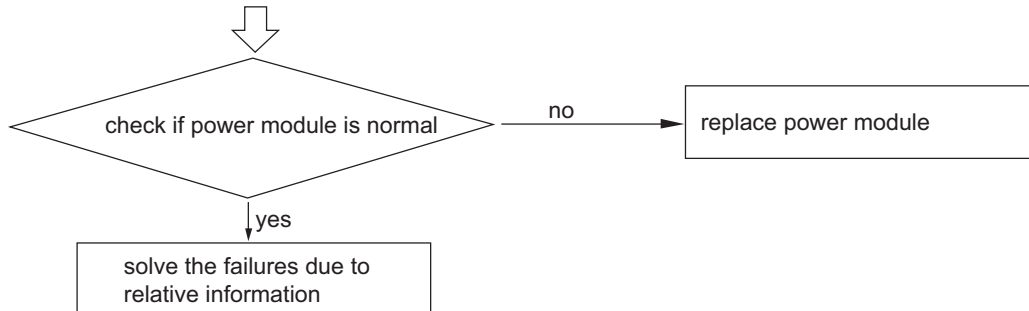
[121] power supply of inverter board is abnormal



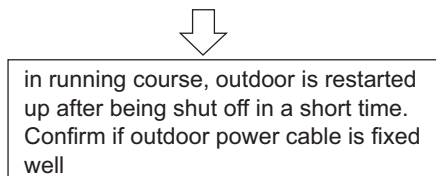
[122] radiator temp.sensor of transducer abnormal



[125] compressor frequency not match well



[127] MCU reset abnormal



[127] MCU program need be updated

Confirm the version of PCB, and update the program to the latest.

2. Sensor characteristic

1. Temp. sensor characteristic

No.	sensor type	characteristic
1	indoor coil/ outdoor suction/ oil temp./ defrost/ ambient temp. sensor	R(25°C)=10K Ω B(25°C/50°C)=3700K
2	wired controller ambient temp./indoor ambient temp. sensor	R(25°C)=23K Ω B(25°C/50°C)=4200K
3	outdoor discharging temp. sensor	R(80°C)=50K Ω B(25°C/80°C)=4450K

Herein, the sensor typical resistor is as follows:

(1) R(25 °C)=10K Ω B(25°C/50°C)=3700K

temp. sensor			
temp.(°C)	resistor(KΩ)	temp.(°C)	resistor(KΩ)
- 10	51.8	60	2.660
- 5	39.55	65	2.223
0	30.88	70	1.912
5	24.30	75	1.630
10	19.20	80	1.395
15	15.38	85	1.200
20	12.36	90	1.035
25	10.00	95	0.8967
30	8.141	100	0.7796
35	6.668	105	0.6802
40	5.492	110	0.5955
45	4.549	- 15	66.53
50	3.788	- 20	87.42
55	3.170	-25	116.0

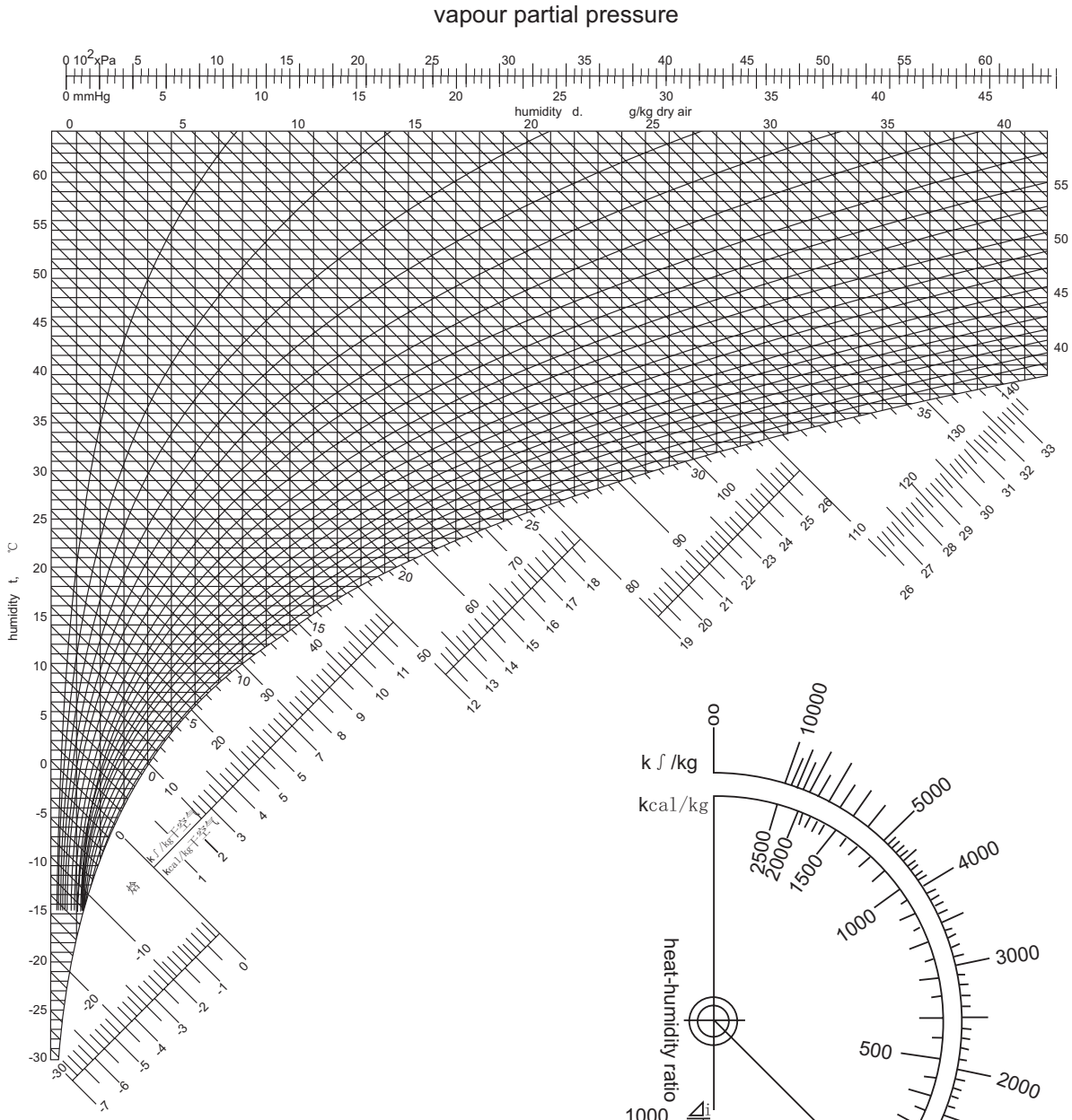
(2) $R(25^{\circ}\text{C})=23\text{K}\Omega$ $B(25^{\circ}\text{C}/50^{\circ}\text{C})=4200\text{K}$

temp. sensor			
temp.($^{\circ}\text{C}$)	resistor($\text{K}\Omega$)	temp.($^{\circ}\text{C}$)	resistor($\text{K}\Omega$)
- 10	139.5	60	5.243
- 5	105.3	65	4.336
0	80.14	70	3.603
5	61.51	75	3.008
10	47.58	80	2.522
15	35.36	- 20	251.8
20	27.93	- 19	235.9
25	23.00	- 18	223.1
30	18.30	- 17	210.1
35	14.65	- 16	197.9
40	11.79	- 15	186.5
45	9.556	- 14	176.9
50	7.780	- 13	165.9
55	6.371	- 12	156.5

(3) $R(80^{\circ}\text{C})=50\text{K}\Omega$ $B(25^{\circ}\text{C}/80^{\circ}\text{C})=4450\text{K}$

temp. sensor			
temp.($^{\circ}\text{C}$)	resistor($\text{K}\Omega$)	temp.($^{\circ}\text{C}$)	resistor($\text{K}\Omega$)
15	878.5	85	41.5
20	621.4	90	34.8
25	599.9	95	29.6
30	398.6	100	25.0
40	246.4	105	21.7
50	160.4	110	18.7
60	105.3	115	16.0
70	72.1	120	13.8
75	59.5	125	11.9
80	49.3	130	10.3

1. Enthalpy-humidity chart



Wet air enthalpy-humidity chart

atmospheric pressure 1013.25mbar(10Pa)
760 mmHg

$$\hat{h} = 1.01t + 0.001d(2500 + 1.84t) \text{ kJ/kg dry air}$$

$$\hat{h} = 1.24t + 0.001d(597.3 + 0.44t) \text{ kcal/kg dry air}$$



2. Saturated R410A thermodynamic characteristic

t °C	p' kPa	p'' kPa	p' kg/m ³	p'' kg/m ³	s' kJ/kgK	s'' kJ/kgK	h kJ/kg	h'' kJ/kg	t' kJ/kgK	t'' kJ/kgK
-70	36.13	36.11	1410.7	1.582	1.372	0.695	100.8	390.6	0.649	2.074
-68	40.83	40.80	1404.7	1.774	1.374	0.700	103.6	391.8	0.663	2.066
-66	46.02	45.98	1398.6	1.984	1.375	0.705	106.3	393.0	0.676	2.058
-64	51.73	51.68	1392.5	2.213	1.377	0.710	109.1	394.1	0.689	2.051
-62	58.00	57.94	1386.4	2.463	1.378	0.715	111.9	395.3	0.702	2.044
-60	64.87	64.80	1380.2	2.734	1.379	0.720	114.6	396.4	0.715	2.037
-58	72.38	72.29	1374.0	3.030	1.380	0.726	117.4	397.6	0.728	2.030
-56	80.57	80.46	1367.8	3.350	1.382	0.732	120.1	398.7	0.741	2.023
-54	89.49	89.36	1361.6	3.696	1.384	0.737	122.9	399.8	0.754	2.017
-52	99.18	99.03	1355.3	4.071	1.386	0.744	125.7	400.9	0.766	2.010
-51.58	101.32	101.17	1354.0	4.153	1.386	0.745	126.3	401.1	0.769	2.009
-50	109.69	109.51	1349.0	4.474	1.388	0.750	128.5	402.0	0.779	2.004
-48	121.07	120.85	1342.7	4.909	1.391	0.756	131.2	403.1	0.791	1.998
-46	133.36	133.11	1336.3	5.377	1.394	0.763	134.0	404.1	0.803	1.992
-44	146.61	146.32	1330.0	5.880	1.397	0.770	136.8	405.2	0.816	1.987
-42	160.89	160.55	1323.5	6.419	1.401	0.777	139.6	406.2	0.828	1.981
-40	176.24	175.85	1317.0	6.996	1.405	0.785	142.4	407.3	0.840	1.976
-38	192.71	192.27	1310.5	7.614	1.409	0.792	145.3	408.3	0.852	1.970
-36	210.37	209.86	1304.0	8.275	1.414	0.800	148.1	409.3	0.864	1.965
-34	229.26	228.69	1297.3	8.980	1.419	0.809	150.9	410.2	0.875	1.960
-32	249.46	248.81	1290.6	9.732	1.424	0.817	153.8	411.2	0.887	1.955
-30	271.01	270.28	1283.9	10.53	1.430	0.826	156.6	412.1	0.899	1.950
-28	293.99	293.16	1277.1	11.39	1.436	0.835	159.5	413.1	0.911	1.946
-26	318.44	317.52	1270.2	12.29	1.442	0.844	162.4	414.0	0.922	1.941
-24	344.44	343.41	1263.3	13.26	1.448	0.854	165.3	414.9	0.934	1.936
-22	372.05	370.90	1256.3	14.28	1.455	0.864	168.2	415.7	0.945	1.932
-20	401.34	400.06	1249.2	15.37	1.461	0.875	171.1	416.6	0.957	1.927
-18	432.36	430.95	1242.0	16.52	1.468	0.886	174.1	417.4	0.968	1.923
-16	465.20	463.64	1234.8	17.74	1.476	0.897	177.0	418.2	0.980	1.919
-14	499.91	498.20	1227.5	19.04	1.483	0.909	180.0	419.0	0.991	1.914
-12	536.58	534.69	1220.0	20.41	1.491	0.921	182.9	419.8	1.003	1.910
-10	575.26	573.20	1212.5	21.86	1.499	0.933	185.9	420.5	1.014	1.906
-8	616.03	613.78	1204.9	23.39	1.507	0.947	189.0	421.2	1.025	1.902
-6	658.97	656.52	1197.2	25.01	1.516	0.960	192.0	421.9	1.036	1.898
-4	704.15	701.49	1189.4	26.72	1.524	0.975	195.0	422.6	1.048	1.894
-2	751.64	748.76	1181.4	28.53	1.533	0.990	198.1	423.2	1.059	1.890
0	801.52	798.41	1173.4	30.44	1.543	1.005	201.2	423.8	1.070	1.886
2	853.87	850.52	1165.3	32.46	1.552	1.022	204.3	424.4	1.081	1.882
4	908.77	905.16	1157.0	34.59	1.563	1.039	207.4	424.9	1.092	1.878
6	966.29	962.42	1148.6	36.83	1.573	1.057	210.5	425.5	1.103	1.874
8	1026.5	1022.4	1140.0	39.21	1.584	1.076	213.7	425.9	1.114	1.870
10	1089.5	1085.1	1131.3	41.71	1.596	1.096	216.8	426.4	1.125	1.866
12	1155.4	1150.7	1122.5	44.35	1.608	1.117	220.0	426.8	1.136	1.862
14	1224.3	1219.2	1113.5	47.14	1.621	1.139	223.2	427.2	1.147	1.859
16	1296.2	1290.8	1104.4	50.09	1.635	1.163	226.5	427.5	1.158	1.855
18	1371.2	1365.5	1095.1	53.20	1.650	1.188	229.7	427.8	1.169	1.851
20	1449.4	1443.4	1085.6	56.48	1.666	1.215	233.0	428.1	1.180	1.847
22	1530.9	1524.6	1075.9	59.96	1.683	1.243	236.4	428.3	1.191	1.843
24	1615.8	1609.2	1066.0	63.63	1.701	1.273	239.7	428.4	1.202	1.839
26	1704.2	1697.2	1055.9	67.51	1.721	1.306	243.1	428.6	1.214	1.834
28	1796.2	1788.9	1045.5	71.62	1.743	1.341	246.5	428.6	1.225	1.830
30	1891.9	1884.2	1034.9	75.97	1.767	1.379	249.9	428.6	1.236	1.826
32	1991.3	1983.2	1024.1	80.58	1.793	1.420	253.4	428.6	1.247	1.822
34	2094.5	2086.2	1012.9	85.48	1.822	1.465	256.9	428.4	1.258	1.817
36	2201.7	2193.1	1001.4	90.68	1.855	1.514	260.5	428.3	1.269	1.813
38	2313.0	2304.0	989.5	96.22	1.891	1.569	264.1	428.0	1.281	1.808
40	2428.4	2419.2	977.3	102.1	1.932	1.629	267.8	427.7	1.292	1.803
42	2548.1	2538.6	964.6	108.4	1.979	1.696	271.5	427.2	1.303	1.798
44	2672.2	2662.4	951.4	115.2	2.033	1.771	275.3	426.7	1.315	1.793
46	2800.7	2790.7	937.7	122.4	2.095	1.857	279.2	426.1	1.327	1.788
48	2933.7	2923.6	923.3	130.2	2.168	1.955	283.2	425.4	1.339	1.782
50	3071.5	3061.2	908.2	138.6	2.256	2.069	287.3	424.5	1.351	1.776
52	3214.0	3203.6	892.2	147.7	2.362	2.203	291.5	423.5	1.363	1.770
54	3361.4	3351.0	875.1	157.6	2.493	2.363	295.8	422.4	1.376	1.764
56	3513.8	3503.5	856.8	168.4	2.661	2.557	300.3	421.0	1.389	1.757
58	3671.3	3661.2	836.9	180.4	2.883	2.799	305.0	419.4	1.403	1.749
60	3834.1	3824.2	814.9	193.7	3.191	3.106	310.0	417.6	1.417	1.741
62	4002.1	3992.7	790.1	208.6	3.650	3.511	315.3	415.5	1.433	1.732
64	4175.7	4166.8	761.0	225.6	4.415	4.064	321.2	413.0	1.450	1.722