Midea Precision Air Conditioner Technical Manual （Down delivery series）

Content

1. General information

1.1 Measurements

Type		Model	Dimension (mm, W×H×D)	Outdoor unit (Quantity)	Power Supply
20kW	Indoor	MAD020T1N1S1	895×1,971×870	1	380V~,3Ph,50Hz
	Outdoor	MA0331	1,470×988×870		380V~,3Ph,50Hz
25kW	Indoor	MAD025T1N1S1	895×1,971×870	1	380V~,3Ph,50Hz
	Outdoor	MA0431	1,470×988×870		380V~,3Ph,50Hz
30kW	Indoor	MAD030T1N1S1	895×1,971×870	1	380V~,3Ph,50Hz
	Outdoor	MA0541	1,660×1,290×870		380V~,3Ph,50Hz
35kW	Indoor	MAD035T1N1S1	1,400×1,971×870	1	380V~,3Ph,50Hz
	Outdoor	MA0601	1,660×1,290×870		380V~,3Ph,50Hz
40kW	Indoor	MAD040T2N1S1	1,790×1,971×870	2	380V~,3Ph,50Hz
	Outdoor	MA0331	1,470×988×870		380V~,3Ph,50Hz
45kW	Indoor	MAD045T1N1S1	1,790×1,971×870	1	380V~,3Ph,50Hz
	Outdoor	MA0752	1,980×1,290×870		380V~,3Ph,50Hz
50kW	Indoor	MAD050T2N1S1	1,790×1,971×870	2	380V~,3Ph,50Hz
	Outdoor	MA0431	1,470×988×870		380V~,3Ph,50Hz
60kW	Indoor	MAD060T2N1S1	1,790×1,971×870	2	380V~,3Ph,50Hz
	Outdoor	MA0541	1,660×1,290×870		380V~,3Ph,50Hz
70kW	Indoor	MAD070T2N1S1	2,685×1,971×870	2	380V~,3Ph,50Hz
	Outdoor	MA0601	1,660×1,290×870		380V~,3Ph,50Hz
80kW	Indoor	MAD080T2N1S1	2,685×1,971×870	2	380V~,3Ph,50Hz
	Outdoor	MA0752	1,980×1,290×870		380V~,3Ph,50Hz
90kW	Indoor	MAD090T2N1S1	2,685×1,971×870	2	380V~,3Ph,50Hz
	Outdoor	MA0982	2,480×1,290×870		380V~,3Ph,50Hz

1.2 Exter nal appearance

Indoo r unit-20kW, 25kW, 30 kW:

Indoo r unit-35kW, 40kW, 45 kW, 50kW, 60kW:

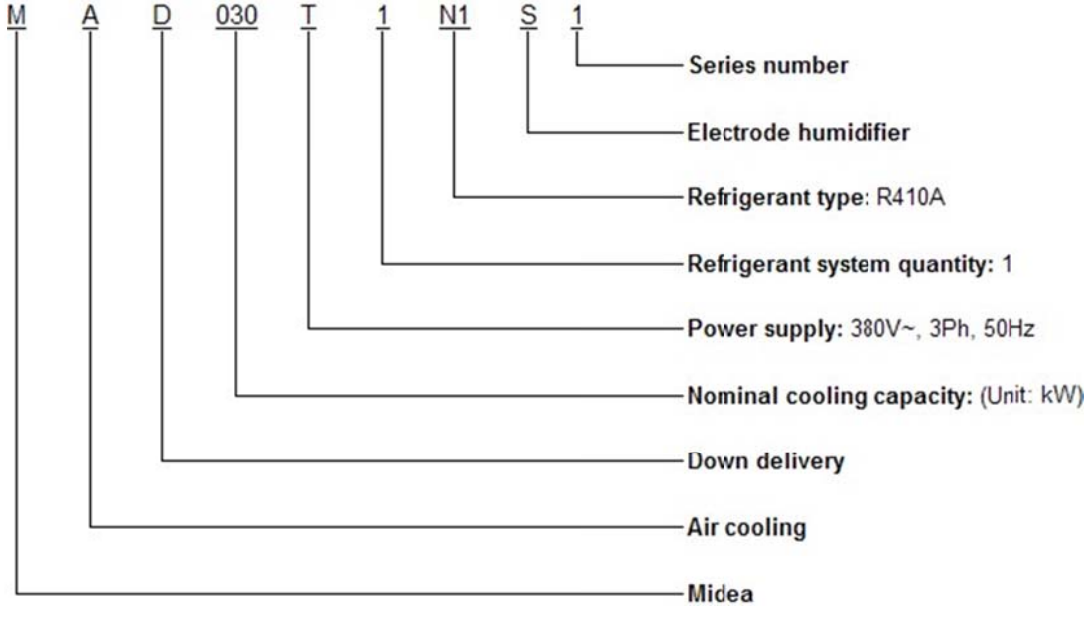
Indoo r unit-70kW, 80kW, 90 kW:

Outdoor unit-Single fan motor:

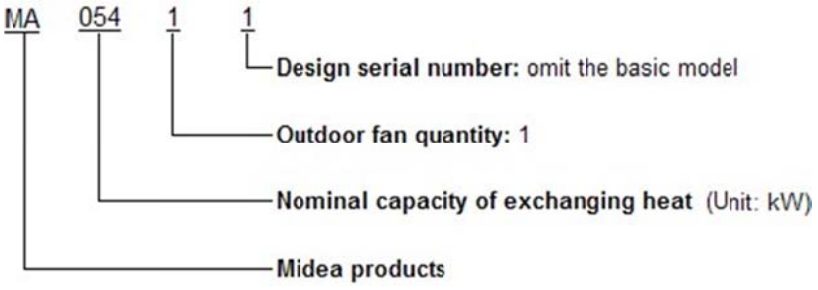
Outdoor unit-Double fan motors:

1.3 Nomenclature

Indoor unit



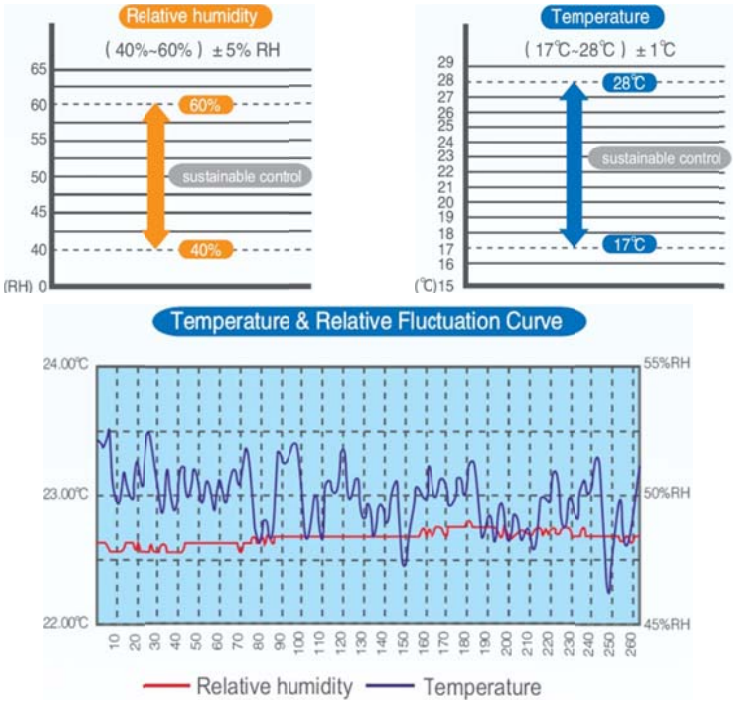
Outdoor unit



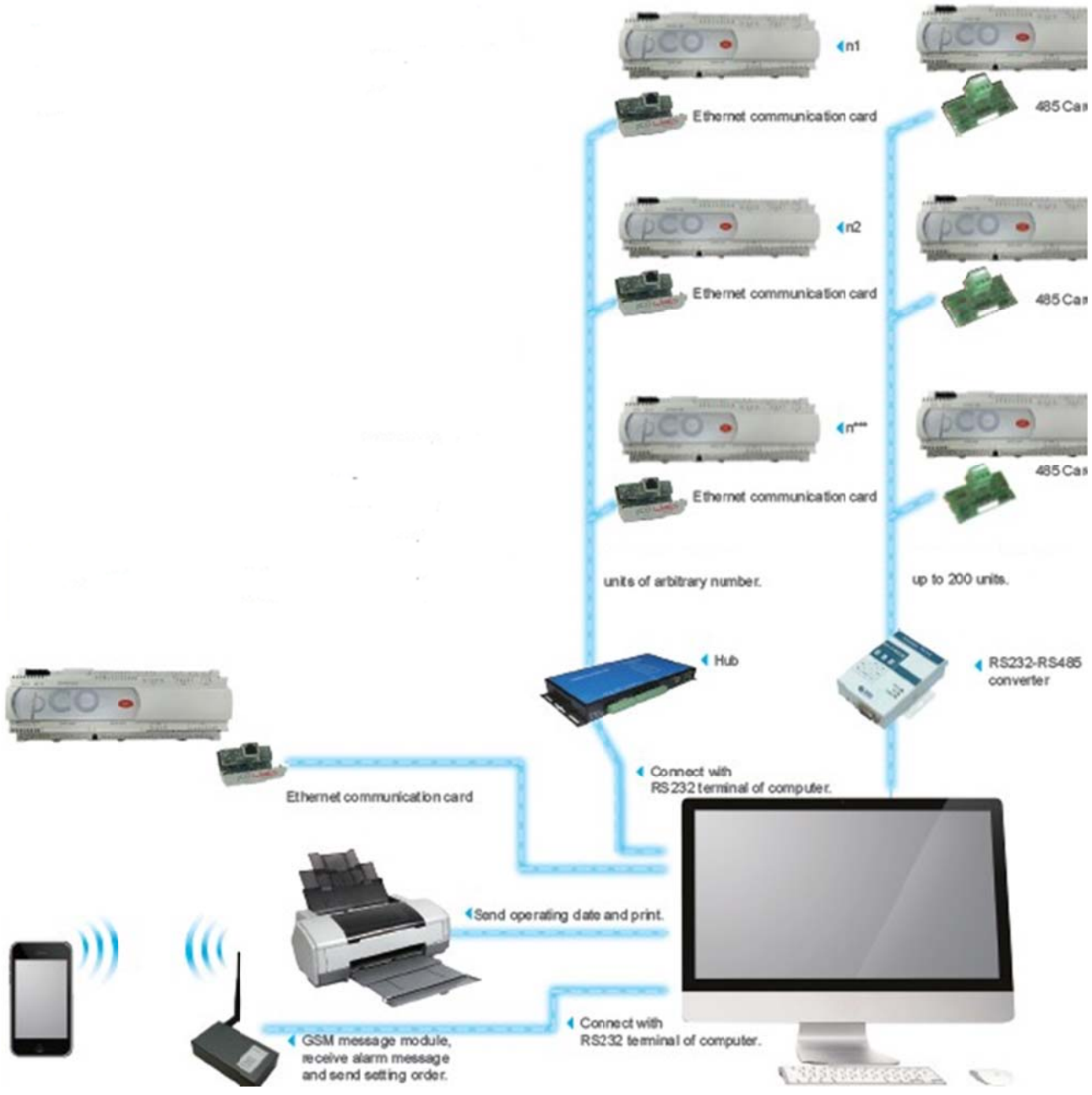
2. Specification & perf ɔrmance

2.1Features

- ✧ V sha ɒe design high efficient evaporato · with hydr ɨphilic aluminum fin and inner groɔved copper pipe.
- ✧ Chang ɘ the valid evaporator ɹarea by ele ɔtric valve t ɔ reduce the relative humidity with ɔut apparent tempe ɹature fluctuation.
- ✧ Reliable electric heater.
- ✧ Doubl ɨ wall design, heat-insulated casin ɨ reduces the exchanged heat and prevent the condensate from the unit body.
- ✧ Copel ɯnd, special high efficie ɯt compressor.
- ✧ Adopt advantage technology ɔf immerse ɗ electrode humidifier, ɔarel cleanable steam ɔylinder, and integrated control solution of humidity.
- ✧ Accurate microprocessor control technology and key parts: Hi ɟh quality humidity co ɯtrol module, tempe ɹature & humidity sensor, frequenc · converter, pressure sensor.

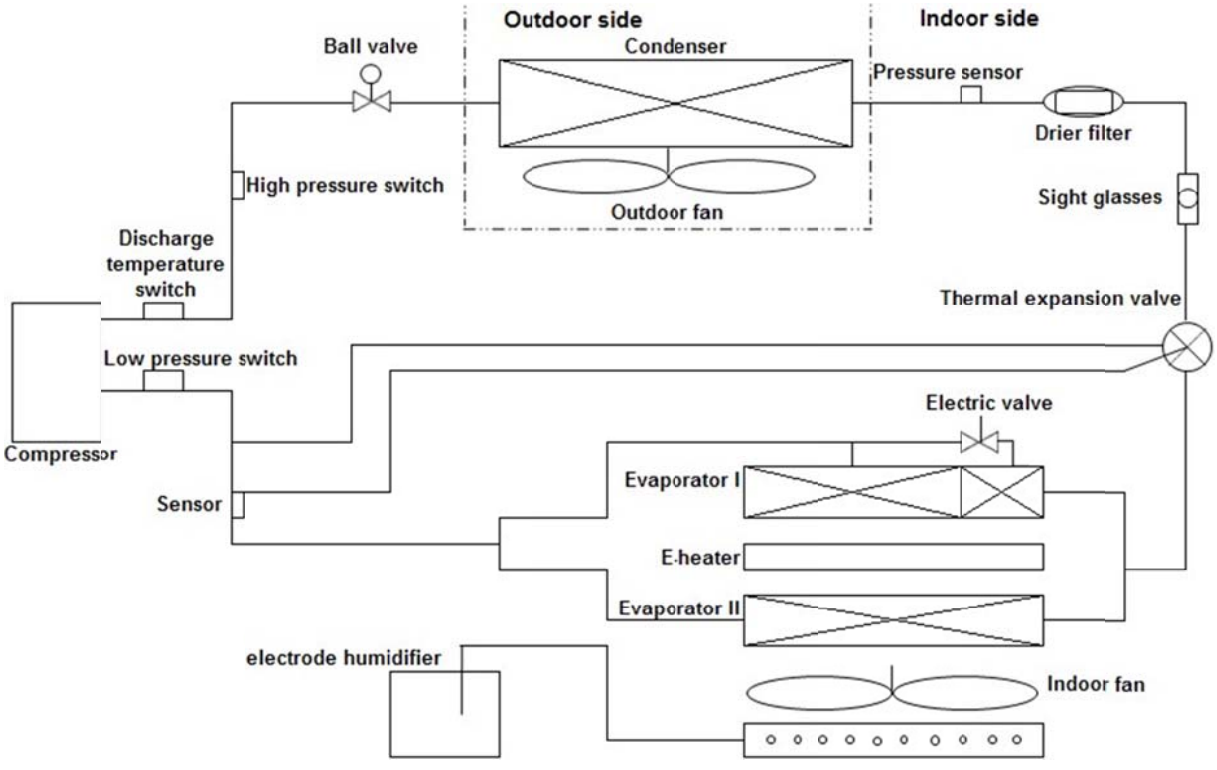


- ✧ Multiple protections: High and low pressure protection, discharge temperature protection, etc.
- ✧ The running parameter can be displayed in the screen of the control panel.
- ✧ 100 pieces of error records can be stored.
- ✧ Three types of password: user password, maintenance password, factory password.
- ✧ Rotary function, standby function and join-in function can ensure the units keep operating in the whole year.
- ✧ To enhance remote communications and control the precision air conditioners, the Ethernet communication card (optional part) and RS485 card (optional part) can support the communication capabilities as the requirements.

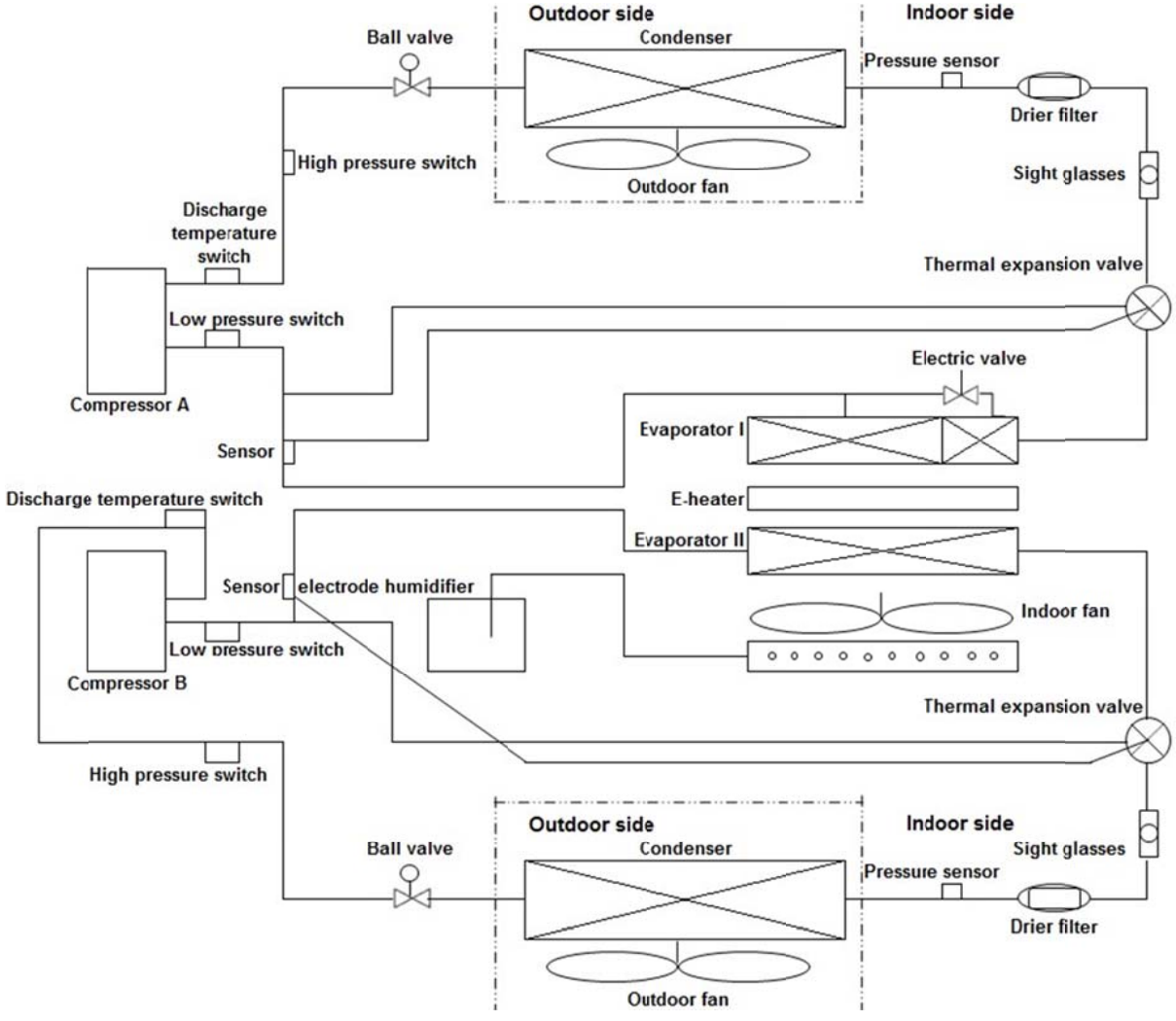


2.2 Refri erant circuit

Single refrigerant circuit type:



Dual-refrigerant circuits type:



Compressor: R410A, scroll compressor.

Evaporator (Heat exchanger): Copper tube and aluminum fin type heat exchanger.

Indoor Fan: Centrifugal fan

Outdoor Fan: Axial fan

2.3 Specifications

Indoor model			**MAD020T1N1S1**
Outdoor model (×Quantity)			**MA0331** (×1)
Indoor operating ambient temperature range		°C	0~40
Outdoor operating ambient temperature range		°C	-20~45, (-40~45, with low ambient temperature kit)
Altitude		\	≤1000m (higher than 1000m, derating use)
Indoor Power supply		V, Ph, Hz	380V~,3Ph,50Hz
Outdoor Power supply		V, Ph, Hz	380V~,3Ph,50Hz
Whole unit Rated input		W	15,000
Whole unit Rated current		A	26.8
Cooling	Total capacity	W	20,200
	Sensible capacity	W	18,580
	Input	W	7,800
	EER	W/W	2.59
E-heater	Capacity	W	6,000
Humidification	Capacity	kg/h	5
Compressor	Model	\	ZP83KCE-TFD-522
	Type	\	Scroll
	Qty.	\	1
	Brand	\	Copeland
	Capacity	W	20,000
	Input	W	6,400
	Rated current (RLA)	A	13.6
	Locked rotor Amp (LRA)	A	101
	Thermal protector	\	Internal
	Refrigerant oil	ml	1,774 (POE)
Indoor fan	Model (× quantity)	\	Y(2)100L1-4-2.2KW(YRZ) (×1)
	Brand	\	Huanqiu/Wolong
	Input	W	2,200
	Speed	r/min	1,420
Indoor coil	Number of rows	\	4
	Tube pitch(a)×row pitch(b)	mm	25.4×22
	Fin spacing	mm	1.8
	Fin type	\	Hydrophilic aluminum fin
	Pipe size	mm	Φ9.52
	Pipe type	\	Inner grooved copper pipe
	Coil(W×H)	mm	(726×686)+(726×686)
	Number of circuits	\	9+9
Outdoor fan	Type	\	Axial fan
	Motor Model (× Quantity)	\	FN071-SDK (×1)
	Motor Brand	\	Ziehl-Abegg
	Motor Input	W	940

	Speed	r/min	900
Outdoor coil	No. of rows	\	3
	Tube pitch(a)×row pitch(b)	mm	25.4×22
	Fin spacing	mm	2.2
	Fin type	\	Hydrophilic aluminum fin
	Pipe outside dia. and type	mm	Φ9.52
			Inner grooved copper pipe
	Coil (W×D)	mm	1,250×914.4
	Number of circuits	\	6
Indoor air flow		m^3/h	6,225
Indoor external static pressure		Pa	20
Indoor drain pipe I.D.		mm	Φ30
Indoor noise level		dB(A)	≤66
Outdoor noise level		dB(A)	≤64
Refrigerant	Type	\	R410A
	Recharged (After installation)	g	7,500
	Control	\	Thermostatic expansion valve
Maximum refrigeration pipe pressure		MPa	4.4
Refrigerant pipe	Max. pipe length	m	60
	Max. difference in level (O.U. up)	m	20
	Max. difference in level (O.U. down)	m	5
Connection wire	Indoor power wire	mm^2	3×10.0mm^2（A,B,C）+2×6.0mm^2（N,GND）
	Outdoor power wire	mm^2	4×1.0mm^2
	Signal wire	mm^2	4×1.0mm^2
Filter		\	G4
Indoor unit	Net dimension (W×H×D)	mm	895×1,971×870
	Net weight	kg	340
Outdoor unit	Net dimension (W×H×D)	mm	1,470×988×690(No include supporting bar)
	Net weight	kg	105

Notes:

1. The nominal cooling capacity is based on the following conditions. Indoor temperature: 24°CDB, 17°CWB; Outdoor temperature: 35°CDB, pipe length is 10 meters.
2. The noise is measured in the semi suppression lab.
3. Specifications are subject to change without prior notice for product improvement.

Indoor model			**MAD025T1N1S1**
Outdoor model (×Quantity)			**MA0431** (×1)
Indoor operating ambient temperature range		°C	0~40
Outdoor operating ambient temperature range		°C	-20~45, (-40~45, with low ambient temperature kit)
Altitude		\	≤1000m (higher than 1000m, derating use)
Indoor Power supply		V, Ph, Hz	380V~,3Ph,50Hz
Outdoor Power supply		V, Ph, Hz	380V~,3Ph,50Hz
Whole unit Rated input		W	16,500
Whole unit Rated current		A	30
Cooling	Total capacity	W	26,000
	Sensible capacity	W	23,920
	Input	W	9,400
	EER	W/W	2.77
E-heater	Capacity	W	6,000
Humidification	Capacity	kg/h	5
Compressor	Model	\	ZP103KCE-TFD-522
	Type	\	Scroll
	Qty.	\	1
	Brand	\	Copeland
	Capacity	W	25,200
	Input	W	7,800
	Rated current (RLA)	A	18.6
	Locked rotor Amp (LRA)	A	111
	Thermal protector	\	Internal
	Refrigerant oil	ml	3,253 (POE)
Indoor fan	Model (× quantity)	\	Y(2)100L2-4-3KW(YRZ) (×1)
	Brand	\	Huanqiu/Wolong
	Input	W	3,000
	Speed	r/min	1,420
Indoor coil	Number of rows	\	4
	Tube pitch(a)×row pitch(b)	mm	25.4×22
	Fin spacing	mm	1.8
	Fin type	\	Hydrophilic aluminum fin
	Pipe size	mm	Φ9.52
	Pipe type	\	Inner grooved copper pipe
	Coil(W×H)	mm	(726×686)+(726×686)
	Number of circuits	\	9+9
Outdoor fan	Type	\	Axial fan
	Motor Model (× Quantity)	\	FN080-ADK (×1)
	Motor Brand	\	Ziehl-Abegg
	Motor Input	W	1,100
	Speed	r/min	680
Outdoor coil	No. of rows	\	3

	Tube pitch(a)×row pitch(b)	mm	25.4×22
	Fin spacing	mm	2.2
	Fin type	\	Hydrophilic aluminum fin
	Pipe outside dia. and type	mm	Φ9.52
			Inner grooved copper pipe
	Coil (W×D)	mm	1,250×914.4
	Number of circuits	\	6
Indoor air flow		m^3/h	7,010
Indoor external static pressure		Pa	20
Indoor drain pipe I.D.		mm	Φ30
Indoor noise level		dB(A)	≤66
Outdoor noise level		dB(A)	≤64
Refrigerant	Type	\	R410A
	Recharged (After installation)	g	9,500
	Control	\	Thermostatic expansion valve
Maximum refrigeration pipe pressure		MPa	4.4
Refrigerant pipe	Max. pipe length	m	60
	Max. difference in level (O.U. up)	m	20
	Max. difference in level (O.U. down)	m	5
Connection wire	Indoor power wire	mm^2	3×10.0mm^2（A,B,C）+2×6.0mm^2（N,GND）
	Outdoor power wire	mm^2	4×1.0mm^2
	Signal wire	mm^2	4×1.0mm^2
Filter		\	G4
Indoor unit	Net dimension (W×H×D)	mm	895×1,971×870
	Net weight	kg	360
Outdoor unit	Net dimension (W×H×D)	mm	1,470×988×690(No include supporting bar)
	Net weight	kg	105

Notes:

1. The nominal cooling capacity is based on the following conditions. Indoor temperature: 24°CDB, 17°CWB; Outdoor temperature: 35°CDB, pipe length is 10 meters.
2. The noise is measured in the semi suppression lab.
3. Specifications are subject to change without prior notice for product improvement.

Indoor model			**MAD030T1N1S1**
Outdoor model (×Quantity)			**MA0541** (×1)
Indoor operating ambient temperature range		°C	0~40
Outdoor operating ambient temperature range		°C	-20~45, (-40~45, with low ambient temperature kit)
Altitude		\	≤1000m (higher than 1000m, derating use)
Indoor Power supply		V, Ph, Hz	380V~,3Ph,50Hz
Outdoor Power supply		V, Ph, Hz	380V~,3Ph,50Hz
Whole unit Rated input		W	18,500
Whole unit Rated current		A	33
Cooling	Total capacity	W	30,900
	Sensible capacity	W	27,810
	Input	W	11,300
	EER	W/W	2.73
E-heater	Capacity	W	6,000
Humidification	Capacity	kg/h	5
Compressor	Model	\	ZP120KCE-TFD-522
	Type	\	Scroll
	Qty.	\	1
	Brand	\	Copeland
	Capacity	W	29,200
	Input	W	9,200
	Rated current (RLA)	A	20
	Locked rotor Amp (LRA)	A	118
	Thermal protector	\	Internal
	Refrigerant oil	ml	3,253 (POE)
Indoor fan	Model (× quantity)	\	Y2FD100L2-4 (×1)
	Brand	\	Huanqiu/Wolong
	Input	W	3,000
	Speed	r/min	1,420
Indoor coil	Number of rows	\	4
	Tube pitch(a)×row pitch(b)	mm	25.4×22
	Fin spacing	mm	1.8
	Fin type	\	Hydrophilic aluminum fin
	Pipe size	mm	Φ9.52
	Pipe type	\	Inner grooved copper pipe
	Coil(W×H)	mm	(726×686)+(726×686)
	Number of circuits	\	9+9
Outdoor fan	Type	\	FN type, AC axial fan
	Motor Model (× Quantity)	\	WZZ800-8 (×1)
	Motor Brand	\	Ziehl-Abegg
	Motor Input	W	1,100/760
	Speed	r/min	680/530
Outdoor coil	No. of rows	\	3

	Tube pitch(a)×row pitch(b)	mm	25.4×22
	Fin spacing	mm	2.2
	Fin type	\	Hydrophilic aluminum fin
	Pipe outside dia. and type	mm	Φ9.52
			Inner grooved copper pipe
	Coil (W×D)	mm	1447×1219
	Number of circuits	\	12
Indoor air flow		m^3/h	8,825
Indoor external static pressure		Pa	20
Indoor drain pipe I.D.		mm	Φ30
Indoor noise level		dB(A)	67
Outdoor noise level		dB(A)	65
Refrigerant	Type	\	R410A
	Recharged (After installation)	g	12,000
	Control	\	Thermal expansion valve
Maximum refrigeration pipe pressure		MPa	4.4
Refrigerant pipe	Max. pipe length	m	60
	Max. difference in level (O.U. up)	m	20
	Max. difference in level (O.U. down)	m	5
Connection wire	Indoor power wire	mm^2	3×10.0mm^2（A,B,C）+2×6.0mm^2（N,GND）
	Outdoor power wire	mm^2	4×1.0mm^2
	Signal wire	mm^2	4×1.0mm^2
Filter		\	G4
Indoor unit	Net dimension (W×H×D)	mm	895×1,971×870
	Net weight	kg	365/432
Outdoor unit	Net dimension (W×H×D)	mm	1,660×1,290×690 (Without supporting bar)
	Net weight	kg	140/250

Notes:

1. The nominal cooling capacity is based on the following conditions. Indoor temperature: 24°CDB, 17°CWB; Outdoor temperature: 35°CDB, pipe length is 10 meters.
2. The noise is measured in the semi suppression lab.
3. Specifications are subject to change without prior notice for product improvement.

Indoor model			**MAD035T1N1S1**
Outdoor model(×Quantity)			**MA0601** (×1)
Indoor operating ambient temperature range		℃	0~40
Outdoor operating ambient temperature range		℃	-20~45, (-40~45, with low ambient temperature kit)
Altitude		\	≤1000m (higher than 1000m, derating use)
Indoor Power supply		V, Ph, Hz	380V~,3Ph,50Hz
Outdoor Power supply		V, Ph, Hz	380V~,3Ph,50Hz
Whole unit Rated input		W	25,000
Whole unit Rated current		A	46
Cooling	Total capacity	W	34,000
	Sensible capacity	W	31,280
	Input	W	12,500
	EER	W/W	2.72
E-heater	Capacity	W	6,000
Humidification	Capacity	kg/h	5
Compressor	Model	\	ZP137KCE-TFD-522
	Type	\	Scroll
	Qty.	\	1
	Brand	\	Copeland
	Capacity	W	32,600
	Input	W	10,200
	Rated current (RLA)	A	20.7
	Locked rotor Amp (LRA)	A	118
	Thermal protector	\	Internal
	Refrigerant oil	ml	3,253 (POE)
Indoor fan	Model (× quantity)	\	Y(2)100L2-4-3KW(YRZ) (×1)
	Brand	\	Huanqiu/Wolong
	Input	W	3,000
	Speed	r/min	1,420
Indoor coil	Number of rows	\	4
	Tube pitch(a)×row pitch(b)	mm	25.4×22
	Fin spacing	mm	1.8
	Fin type	\	Hydrophilic aluminum fin
	Pipe size	mm	Φ9.52
	Pipe type	\	Inner grooved copper pipe
	Coil(W×H)	mm	(1,210×660.4)+(1,210×660.4)
	Number of circuits	\	13+13
Outdoor fan	Type	\	Axial fan
	Motor Model (× Quantity)	\	FN080-ADK (×1)
	Motor Brand	\	Ziehl-Abegg
	Motor Input	W	1,100
	Speed	r/min	680

Outdoor coil	No. of rows	\	4
	Tube pitch(a)×row pitch(b)	mm	25.4×22
	Fin spacing	mm	2.2
	Fin type	\	Hydrophilic aluminum fin
	Pipe outside dia. and type	mm	Φ9.52
			Inner grooved copper pipe
	Coil (W×D)	mm	1,448×1,219.2
	Number of circuits	\	12
Indoor air flow		m^3/h	10,400
Indoor external static pressure		Pa	20
Indoor drain pipe I.D.		mm	Φ30
Indoor noise level		dB(A)	≤69
Outdoor noise level		dB(A)	≤64
Refrigerant	Type	\	R410A
	Recharged (After installation)	g	13,500
	Control	\	Thermal expansion valve
Maximum refrigeration pipe pressure		MPa	4.4
Refrigerant pipe	Max. pipe length	m	60
	Max. difference in level (O.U. up)	m	20
	Max. difference in level (O.U. down)	m	5
Connection wire	Indoor power wire	mm^2	3×10.0mm^2（A,B,C）+2×6.0mm^2（N,GND）
	Outdoor power wire	mm^2	4×1.0mm^2
	Signal wire	mm^2	4×1.0mm^2
Filter		\	G4
Indoor unit	Net dimension (W×H×D)	mm	1,400×1,971×870
	Net weight	kg	460
Outdoor unit	Net dimension (W×H×D)	mm	1,660×1,290×690(No include supporting bar)
	Net weight	kg	150

Notes:

1. The nominal cooling capacity is based on the following conditions. Indoor temperature: 24°CDB, 17°CWB; Outdoor temperature: 35°CDB, pipe length is 10 meters.
2. The noise is measured in the semi suppression lab.
3. Specifications are subject to change without prior notice for product improvement.

Indoor model			**MAD040T2N1S1**
Outdoor model(×Quantity)			**MA0331** (×2)
Indoor operating ambient temperature range		℃	0~40
Outdoor operating ambient temperature range		℃	-20~45, (-40~45, with low ambient temperature kit)
Altitude		\	≤1000m (higher than 1000m, derating use)
Indoor Power supply		V, Ph, Hz	380V~,3Ph,50Hz
Outdoor Power supply		V, Ph, Hz	380V~,3Ph,50Hz
Whole unit Rated input		W	32,000
Whole unit Rated current		A	60
Cooling	Total capacity	W	40,300
	Sensible capacity	W	38,290
	Input	W	15,400
	EER	W/W	2.62
E-heater	Capacity	W	9,000
Humidification	Capacity	kg/h	10
Compressor	Model	\	ZP83KCE-TFD-522
	Type	\	Scroll
	Qty.	\	2
	Brand	\	Copeland
	Capacity	W	20,000
	Input	W	6,400
	Rated current (RLA)	A	13.6
	Locked rotor Amp (LRA)	A	101
	Thermal protector	\	Internal
	Refrigerant oil	ml	1,774 (POE)
Indoor fan	Model (× quantity)	\	Y(2)100L1-4-2.2KW(YRZ) (×2)
	Brand	\	Huanqiu/Wolong
	Input	W	2,200
	Speed	r/min	1,420
Indoor coil	Number of rows	\	4
	Tube pitch(a)×row pitch(b)	mm	25.4×22
	Fin spacing	mm	1.8
	Fin type	\	Hydrophilic aluminum fin
	Pipe size	mm	Φ9.52
	Pipe type	\	Inner grooved copper pipe
	Coil(W×H)	mm	(1,590×685.8)+(1,590×685.8)
	Number of circuits	\	18+18
Outdoor fan (Single outdoor unit)	Type	\	Axial fan
	Motor Model (× Quantity)	\	FN071-SDK (×1)
	Motor Brand	\	Ziehl-Abegg
	Motor Input	W	940
	Speed	r/min	900

Outdoor coil (Single outdoor unit)	No. of rows	\	3
	Tube pitch(a)×row pitch(b)	mm	25.4×22
	Fin spacing	mm	2.2
	Fin type	\	Hydrophilic aluminum fin
	Pipe outside dia. and type	mm	Φ9.52
			Inner grooved copper pipe
	Coil (W×D)	mm	1,250×914.4
	Number of circuits	\	6
Indoor air flow		m^3/h	11,980
Indoor external static pressure		Pa	20
Indoor drain pipe I.D.		mm	Φ30
Indoor noise level		dB(A)	≤69
Outdoor noise level		dB(A)	≤64
Refrigerant	Type	\	R410A
	Recharged (After installation)	g	8,500×2
	Control	\	Thermostatic expansion valve
Maximum refrigeration pipe pressure		MPa	4.4
Refrigerant pipe	Max. pipe length	m	60
	Max. difference in level (O.U. up)	m	20
	Max. difference in level (O.U. down)	m	5
Connection wire	Indoor power wire	mm^2	3×10.0mm^2（A,B,C）+2×6.0mm^2（N,GND）
	Outdoor power wire	mm^2	(4×1.0mm^2)+(4×1.0mm^2)
	Signal wire	mm^2	(4×1.0mm^2)+ (4×1.0mm^2)
Filter		\	G4
Indoor unit	Net dimension (W×H×D)	mm	1,790×1,971×870
	Net weight	kg	563
Outdoor unit (Single)	Net dimension (W×H×D)	mm	1,470×988×690(No include supporting bar)
	Net weight	kg	105

Notes:

1. The nominal cooling capacity is based on the following conditions. Indoor temperature: 24°CDB, 17°CWB; Outdoor temperature: 35°CDB, pipe length is 10 meters.
2. The noise is measured in the semi suppression lab.
3. Specifications are subject to change without prior notice for product improvement.

Indoor model			**MAD045T1N1S1**
Outdoor model(×Quantity)			**MA0752** (×1)
Indoor operating ambient temperature range		℃	0~40
Outdoor operating ambient temperature range		℃	-20~45, (-40~45, with low ambient temperature kit)
Altitude		\	≤1000m (higher than 1000m, derating use)
Indoor Power supply		V, Ph, Hz	380V~,3Ph,50Hz
Outdoor Power supply		V, Ph, Hz	380V~,3Ph,50Hz
Whole unit Rated input		W	33,000
Whole unit Rated current		A	62
Cooling	Total capacity	W	44,900
	Sensible capacity	W	41,310
	Input	W	16,900
	EER	W/W	2.66
E-heater	Capacity	W	9,000
Humidification	Capacity	kg/h	10
Compressor	Model	\	ZP182KCE-TFD-522
	Type	\	Scroll
	Qty.	\	1
	Brand	\	Copeland
	Capacity	W	44,000
	Input	W	13,500
	Rated current (RLA)	A	29.3
	Locked rotor Amp (LRA)	A	174
	Thermal protector	\	Internal
	Refrigerant oil	ml	3,253 (POE)
Indoor fan	Model (× quantity)	\	Y(2)100L1-4-2.2KW(YRZ) (×2)
	Brand	\	Huanqiu/Wolong
	Input	W	2,200
	Speed	r/min	1,420
Indoor coil	Number of rows	\	4
	Tube pitch(a)×row pitch(b)	mm	25.4×22
	Fin spacing	mm	1.8
	Fin type	\	Hydrophilic aluminum fin
	Pipe size	mm	Φ9.52
	Pipe type	\	Inner grooved copper pipe
	Coil(W×H)	mm	(1,590×685.8)+(1,590×685.8)
	Number of circuits	\	18+18
Outdoor fan	Type	\	Axial fan
	Motor Model (× Quantity)	\	FN071-SDK (×2)
	Motor Brand	\	Ziehl-Abegg
	Motor Input	W	940
	Speed	r/min	900

Outdoor coil	No. of rows	\	3
	Tube pitch(a)×row pitch(b)	mm	25.4×22
	Fin spacing	mm	2.2
	Fin type	\	Hydrophilic aluminum fin
	Pipe outside dia. and type	mm	Φ9.52
			Inner grooved copper pipe
	Coil (W×D)	mm	1,750×1,219.2
	Number of circuits	\	18
Indoor air flow		m^3/h	13,030
Indoor external static pressure		Pa	20
Indoor drain pipe I.D.		mm	Φ30
Indoor noise level		dB(A)	≤69
Outdoor noise level		dB(A)	≤64
Refrigerant	Type	\	R410A
	Recharged (After installation)	g	17,000
	Control	\	Thermostatic expansion valve
Maximum refrigeration pipe pressure		MPa	4.4
Refrigerant pipe	Max. pipe length	m	60
	Max. difference in level (O.U. up)	m	20
	Max. difference in level (O.U. down)	m	5
Connection wire	Indoor power wire	mm^2	3×10.0mm^2（A,B,C）+2×6.0mm^2（N,GND）
	Outdoor power wire	mm^2	4×1.0mm^2
	Signal wire	mm^2	4×1.0mm^2
Filter		\	G4
Indoor unit	Net dimension (W×H×D)	mm	1,790×1,971×870
	Net weight	kg	560
Outdoor unit	Net dimension (W×H×D)	mm	1,980×1,290×690(No include supporting bar)
	Net weight	kg	170

Notes:

1. The nominal cooling capacity is based on the following conditions. Indoor temperature: 24°CDB, 17°CWB; Outdoor temperature: 35°CDB, pipe length is 10 meters.
2. The noise is measured in the semi suppression lab.
3. Specifications are subject to change without prior notice for product improvement.

Indoor model			**MAD050T2N1S1**
Outdoor model(×Quantity)			**MA0431** (×2)
Indoor operating ambient temperature range		℃	0~40
Outdoor operating ambient temperature range		℃	-20~45, (-40~45, with low ambient temperature kit)
Altitude		\	≤1000m (higher than 1000m, derating use)
Indoor Power supply		V, Ph, Hz	380V~,3Ph,50Hz
Outdoor Power supply		V, Ph, Hz	380V~,3Ph,50Hz
Whole unit Rated input		W	36,000
Whole unit Rated current		A	65
Cooling	Total capacity	W	49,700
	Sensible capacity	W	45,230
	Input	W	19,100
	EER	W/W	2.6
E-heater	Capacity	W	9,000
Humidification	Capacity	kg/h	10
Compressor	Model	\	ZP103KCE-TFD-522
	Type	\	Scroll
	Qty.	\	2
	Brand	\	Copeland
	Capacity	W	25,200
	Input	W	7,800
	Rated current (RLA)	A	18.6
	Locked rotor Amp (LRA)	A	111
	Thermal protector	\	Internal
	Refrigerant oil	ml	3,253 (POE)
Indoor fan	Model (× quantity)	\	Y(2)100L2-4-3KW(YRZ) (×2)
	Brand	\	Huanqiu/Wolong
	Input	W	3,000
	Speed	r/min	1,420
Indoor coil	Number of rows	\	4
	Tube pitch(a)×row pitch(b)	mm	25.4×22
	Fin spacing	mm	1.8
	Fin type	\	Hydrophilic aluminum fin
	Pipe size	mm	Φ9.52
	Pipe type	\	Inner grooved copper pipe
	Coil(W×H)	mm	(1,590×685.8)+(1,590×685.8)
	Number of circuits	\	18+18
Outdoor fan (Single outdoor unit)	Type	\	Axial fan
	Motor Model (× Quantity)	\	FN080-ADK (×1)
	Motor Brand	\	Ziehl-Abegg
	Motor Input	W	1,100
	Speed	r/min	680

Outdoor coil (Single outdoor unit)	No. of rows	\	3
	Tube pitch(a)×row pitch(b)	mm	25.4×22
	Fin spacing	mm	2.2
	Fin type	\	Hydrophilic aluminum fin
	Pipe outside dia. and type	mm	Φ9.52
			Inner grooved copper pipe
	Coil (W×D)	mm	1,250×914.4
	Number of circuits	\	6
Indoor air flow		m^3/h	14,500
Indoor external static pressure		Pa	20
Indoor drain pipe I.D.		mm	Φ30
Indoor noise level		dB(A)	≤69
Outdoor noise level		dB(A)	≤64
Refrigerant	Type	\	R410A
	Recharged (After installation)	g	9,500×2
	Control	\	Thermostatic expansion valve
Maximum refrigeration pipe pressure		MPa	4.4
Refrigerant pipe	Max. pipe length	m	60
	Max. difference in level (O.U. up)	m	20
	Max. difference in level (O.U. down)	m	5
Connection wire	Indoor power wire	mm^2	3×10.0mm^2（A,B,C）+2×6.0mm^2（N,GND）
	Outdoor power wire	mm^2	(4×1.0mm^2)+ (4×1.0mm^2)
	Signal wire	mm^2	(4×1.0mm^2)+ (4×1.0mm^2)
Filter		\	G4
Indoor unit	Net dimension (W×H×D)	mm	1,790×1,971×870
	Net weight	kg	665
Outdoor unit (Single)	Net dimension (W×H×D)	mm	1,470×988×690(No include supporting bar)
	Net weight	kg	105

Notes:

1. The nominal cooling capacity is based on the following conditions. Indoor temperature: 24°CDB, 17°CWB; Outdoor temperature: 35°CDB, pipe length is 10 meters.
2. The noise is measured in the semi suppression lab.
3. Specifications are subject to change without prior notice for product improvement.

Indoor model			**MAD060T2N1S1**
Outdoor model(×Quantity)			**MA0541** (×2)
Indoor operating ambient temperature range		℃	0~40
Outdoor operating ambient temperature range		℃	-20~45, (-40~45, with low ambient temperature kit)
Altitude		\	≤1000m (higher than 1000m, derating use)
Indoor Power supply		V, Ph, Hz	380V~,3Ph,50Hz
Outdoor Power supply		V, Ph, Hz	380V~,3Ph,50Hz
Whole unit Rated input		W	39,000
Whole unit Rated current		A	70
Cooling	Total capacity	W	59,100
	Sensible capacity	W	53,190
	Input	W	22,600
	EER	W/W	2.62
E-heater	Capacity	W	9,000
Humidification	Capacity	kg/h	10
Compressor	Model	\	ZP120KCE-TFD-522
	Type	\	Scroll
	Qty.	\	2
	Brand	\	Copeland
	Capacity	W	29,200
	Input	W	9,200
	Rated current (RLA)	A	20
	Locked rotor Amp (LRA)	A	118
	Thermal protector	\	Internal
	Refrigerant oil	ml	3,253 (POE)
Indoor fan	Model (× quantity)	\	Y(2)100L2-4-3KW(YRZ) (×2)
	Brand	\	Huanqiu/Wolong
	Input	W	3,000
	Speed	r/min	1,420
Indoor coil	Number of rows	\	4
	Tube pitch(a)×row pitch(b)	mm	25.4×22
	Fin spacing	mm	1.8
	Fin type	\	Hydrophilic aluminum fin
	Pipe size	mm	Φ9.52
	Pipe type	\	Inner grooved copper pipe
	Coil(W×H)	mm	(1,590×685.8)+(1,590×685.8)
	Number of circuits	\	18+18
Outdoor fan (Single outdoor unit)	Type	\	Axial fan
	Motor Model (× Quantity)	\	FN080-ADK (×1)
	Motor Brand	\	Ziehl-Abegg
	Motor Input	W	1,100
	Speed	r/min	680

Outdoor coil (Single outdoor unit)	No. of rows	\	3
	Tube pitch(a)×row pitch(b)	mm	25.4×22
	Fin spacing	mm	2.2
	Fin type	\	Hydrophilic aluminum fin
	Pipe outside dia. and type	mm	Φ9.52
			Inner grooved copper pipe
	Coil (W×D)	mm	1447×1219
	Number of circuits	\	12
Indoor air flow		m^3/h	17,000
Indoor external static pressure		Pa	20
Indoor drain pipe I.D.		mm	Φ30
Indoor noise level		dB(A)	≤72
Outdoor noise level		dB(A)	≤66
Refrigerant	Type	\	R410A
	Recharged (After installation)	g	11,500×2
	Control	\	Thermostatic expansion valve
Maximum refrigeration pipe pressure		MPa	4.4
Refrigerant pipe	Max. pipe length	m	60
	Max. difference in level (O.U. up)	m	20
	Max. difference in level (O.U. down)	m	5
Connection wire	Indoor power wire	mm^2	3×10.0mm^2（A,B,C）+2×6.0mm^2（N,GND）
	Outdoor power wire	mm^2	(4×1.0mm^2)+ (4×1.0mm^2)
	Signal wire	mm^2	(4×1.0mm^2)+ (4×1.0mm^2)
Filter		\	G4
Indoor unit	Net dimension (W×H×D)	mm	1,790×1,971×870
	Net weight	kg	680
Outdoor unit (Single)	Net dimension (W×H×D)	mm	1,660×1,290×690(No include supporting bar)
	Net weight	kg	140

Notes:

1. The nominal cooling capacity is based on the following conditions. Indoor temperature: 24°CDB, 17°CWB; Outdoor temperature: 35°CDB, pipe length is 10 meters.
2. The noise is measured in the semi suppression lab.
3. Specifications are subject to change without prior notice for product improvement.

Indoor model			MAD070T2N1S1
Outdoor model(×Quantity)			MA0601 (×2)
Indoor operating ambient temperature range		℃	0~40
Outdoor operating ambient temperature range		℃	-20~45, (-40~45, with low ambient temperature kit)
Altitude		\	≤1000m (higher than 1000m, derating use)
Indoor Power supply		V, Ph, Hz	380V~,3Ph,50Hz
Outdoor Power supply		V, Ph, Hz	380V~,3Ph,50Hz
Whole unit Rated input		W	42,000
Whole unit Rated current		A	74
Cooling	Total capacity	W	71,100
	Sensible capacity	W	67,550
	Input	W	26,800
	EER	W/W	2.65
E-heater	Capacity	W	12,000
Humidification	Capacity	kg/h	10
Compressor	Model	\	ZP137KCE-TFD-522
	Type	\	Scroll
	Qty.	\	2
	Brand	\	Copeland
	Capacity	W	32,600
	Input	W	10,200
	Rated current (RLA)	A	20.7
	Locked rotor Amp (LRA)	A	118
	Thermal protector	\	Internal
	Refrigerant oil	ml	3,253 (POE)
Indoor fan	Model (× quantity)	\	Y(2)100L1-4-2.2KW(YRZ) (×3)
	Brand	\	Huanqiu/Wolong
	Input	W	2,200
	Speed	r/min	1,420
Indoor coil	Number of rows	\	4
	Tube pitch(a)×row pitch(b)	mm	25.4×22
	Fin spacing	mm	1.8
	Fin type	\	Hydrophilic aluminum fin
	Pipe size	mm	Φ9.52
	Pipe type	\	Inner grooved copper pipe
	Coil(W×H)	mm	(2,453×660.4)+(2,453×660.4)
	Number of circuits	\	26+26
Outdoor fan (Single outdoor unit)	Type	\	Axial fan
	Motor Model (× Quantity)	\	FN080-ADK (×1)
	Motor Brand	\	Ziehl-Abegg
	Motor Input	W	1,100
	Speed	r/min	680

Outdoor coil (Single outdoor unit)	No. of rows	\	4
	Tube pitch(a)×row pitch(b)	mm	25.4×22
	Fin spacing	mm	2.2
	Fin type	\	Hydrophilic aluminum fin
	Pipe outside dia. and type	mm	Φ9.52
			Inner grooved copper pipe
	Coil (W×D)	mm	1,448×1,219.2
	Number of circuits	\	12
Indoor air flow		m^3/h	20,800
Indoor external static pressure		Pa	20
Indoor drain pipe I.D.		mm	Φ30
Indoor noise level		dB(A)	≤72
Outdoor noise level		dB(A)	≤66
Refrigerant	Type	\	R410A
	Recharged (After installation)	g	13,000×2
	Control	\	Thermostatic expansion valve
Maximum refrigeration pipe pressure		MPa	4.4
Refrigerant pipe	Max. pipe length	m	60
	Max. difference in level (O.U. up)	m	20
	Max. difference in level (O.U. down)	m	5
Connection wire	Indoor power wire	mm^2	3×10.0mm^2（A,B,C）+2×6.0mm^2（N,GND）
	Outdoor power wire	mm^2	(4×1.0mm^2)+ (4×1.0mm^2)
	Signal wire	mm^2	(4×1.0mm^2)+ (4×1.0mm^2)
Filter		\	G4
Indoor unit	Net dimension (W×H×D)	mm	2,685×1,971×870
	Net weight	kg	910
Outdoor unit (Single)	Net dimension (W×H×D)	mm	1,660×1,290×690(No include supporting bar)
	Net weight	kg	150

Notes:

1. The nominal cooling capacity is based on the following conditions. Indoor temperature: 24°CDB, 17°CWB; Outdoor temperature: 35°CDB, pipe length is 10 meters.
2. The noise is measured in the semi suppression lab.
3. Specifications are subject to change without prior notice for product improvement.

Indoor model			**MAD080T2N1S1**
Outdoor model(×Quantity)			**MA0752** (×2)
Indoor operating ambient temperature range		℃	0~40
Outdoor operating ambient temperature range		℃	-20~45, (-40~45, with low ambient temperature kit)
Altitude		\	≤1000m (higher than 1000m, derating use)
Indoor Power supply		V, Ph, Hz	380V~,3Ph,50Hz
Outdoor Power supply		V, Ph, Hz	380V~,3Ph,50Hz
Whole unit Rated input		W	48,000
Whole unit Rated current		A	91
Cooling	Total capacity	W	81,100
	Sensible capacity	W	73,800
	Input	W	30,700
	EER	W/W	2.64
E-heater	Capacity	W	12,000
Humidification	Capacity	kg/h	10
Compressor	Model	\	ZP154KCE-TFD-522
	Type	\	Scroll
	Qty.	\	2
	Brand	\	Copeland
	Capacity	W	37,300
	Input	W	11,600
	Rated current (RLA)	A	25
	Locked rotor Amp (LRA)	A	140
	Thermal protector	\	Internal
	Refrigerant oil	ml	3,253 (POE)
Indoor fan	Model (× quantity)	\	Y(2)100L1-4-2.2KW(YRZ) (×3)
	Brand	\	Huanqiu/Wolong
	Input	W	2,200
	Speed	r/min	1,420
Indoor coil	Number of rows	\	4
	Tube pitch(a)×row pitch(b)	mm	25.4×22
	Fin spacing	mm	1.8
	Fin type	\	Hydrophilic aluminum fin
	Pipe size	mm	Φ9.52
	Pipe type	\	Inner grooved copper pipe
	Coil(W×H)	mm	(2,453×660.4)+(2,453×660.4)
	Number of circuits	\	26+26
Outdoor fan (Single outdoor unit)	Type	\	Axial fan
	Motor Model (× Quantity)	\	FN071-SDK (×2)
	Motor Brand	\	Ziehl-Abegg
	Motor Input	W	940
	Speed	r/min	900

Outdoor coil (Single outdoor unit)	No. of rows	\	3
	Tube pitch(a)×row pitch(b)	mm	25.4×22
	Fin spacing	mm	2.2
	Fin type	\	Hydrophilic aluminum fin
	Pipe outside dia. and type	mm	Φ9.52
			Inner grooved copper pipe
	Coil (W×D)	mm	1,750×1,219.2
	Number of circuits	\	18
Indoor air flow		m^3/h	23,300
Indoor external static pressure		Pa	20
Indoor drain pipe I.D.		mm	Φ30
Indoor noise level		dB(A)	≤72
Outdoor noise level		dB(A)	≤66
Refrigerant	Type	\	R410A
	Recharged (After installation)	g	17,000×2
	Control	\	Thermostatic expansion valve
Maximum refrigeration pipe pressure		MPa	4.4
Refrigerant pipe	Max. pipe length	m	60
	Max. difference in level (O.U. up)	m	20
	Max. difference in level (O.U. down)	m	5
Connection wire	Indoor power wire	mm^2	3×10.0mm^2（A,B,C）+2×6.0mm^2（N,GND）
	Outdoor power wire	mm^2	(4×1.0mm^2)+ (4×1.0mm^2)
	Signal wire	mm^2	(4×1.0mm^2)+ (4×1.0mm^2)
Filter		\	G4
Indoor unit	Net dimension (W×H×D)	mm	2,685×1,971×870
	Net weight	kg	920
Outdoor unit (Single)	Net dimension (W×H×D)	mm	1,980×1,290×690(No include supporting bar)
	Net weight	kg	170

Notes:

1. The nominal cooling capacity is based on the following conditions. Indoor temperature: 24°CDB, 17°CWB; Outdoor temperature: 35°CDB, pipe length is 10 meters.
2. The noise is measured in the semi suppression lab.
3. Specifications are subject to change without prior notice for product improvement.

Indoor model			**MAD090T2N1S1**
Outdoor model(×Quantity)			**MA0982** (×2)
Indoor operating ambient temperature range		℃	0~40
Outdoor operating ambient temperature range		℃	-20~45, (-40~45, with low ambient temperature kit)
Altitude		\	≤1000m (higher than 1000m, derating use)
Indoor Power supply		V, Ph, Hz	380V~,3Ph,50Hz
Outdoor Power supply		V, Ph, Hz	380V~,3Ph,50Hz
Whole unit Rated input		W	55,000
Whole unit Rated current		A	98
Cooling	Total capacity	W	90,100
	Sensible capacity	W	81,090
	Input	W	34,300
	EER	W/W	2.63
E-heater	Capacity	W	12,000
Humidification	Capacity	kg/h	10
Compressor	Model	\	ZP182KCE-TFD-522
	Type	\	Scroll
	Qty.	\	2
	Brand	\	Copeland
	Capacity	W	44,000
	Input	W	13,500
	Rated current (RLA)	A	29.3
	Locked rotor Amp (LRA)	A	174
	Thermal protector	\	Internal
	Refrigerant oil	ml	3,253 (POE)
Indoor fan	Model (× quantity)	\	Y(2)100L2-4-3KW(YRZ) (×3)
	Brand	\	Huanqiu/Wolong
	Input	W	3,000
	Speed	r/min	1,420
Indoor coil	Number of rows	\	4
	Tube pitch(a)×row pitch(b)	mm	25.4×22
	Fin spacing	mm	1.8
	Fin type	\	Hydrophilic aluminum fin
	Pipe size	mm	Φ9.52
	Pipe type	\	Inner grooved copper pipe
	Coil(W×H)	mm	(2,453×660.4)+(2,453×660.4)
	Number of circuits	\	26+26
Outdoor fan (Single outdoor unit)	Type	\	Axial fan
	Motor Model (× Quantity)	\	FN080-ADK (×2)
	Motor Brand	\	Ziehl-Abegg
	Motor Input	W	1,100
	Speed	r/min	680

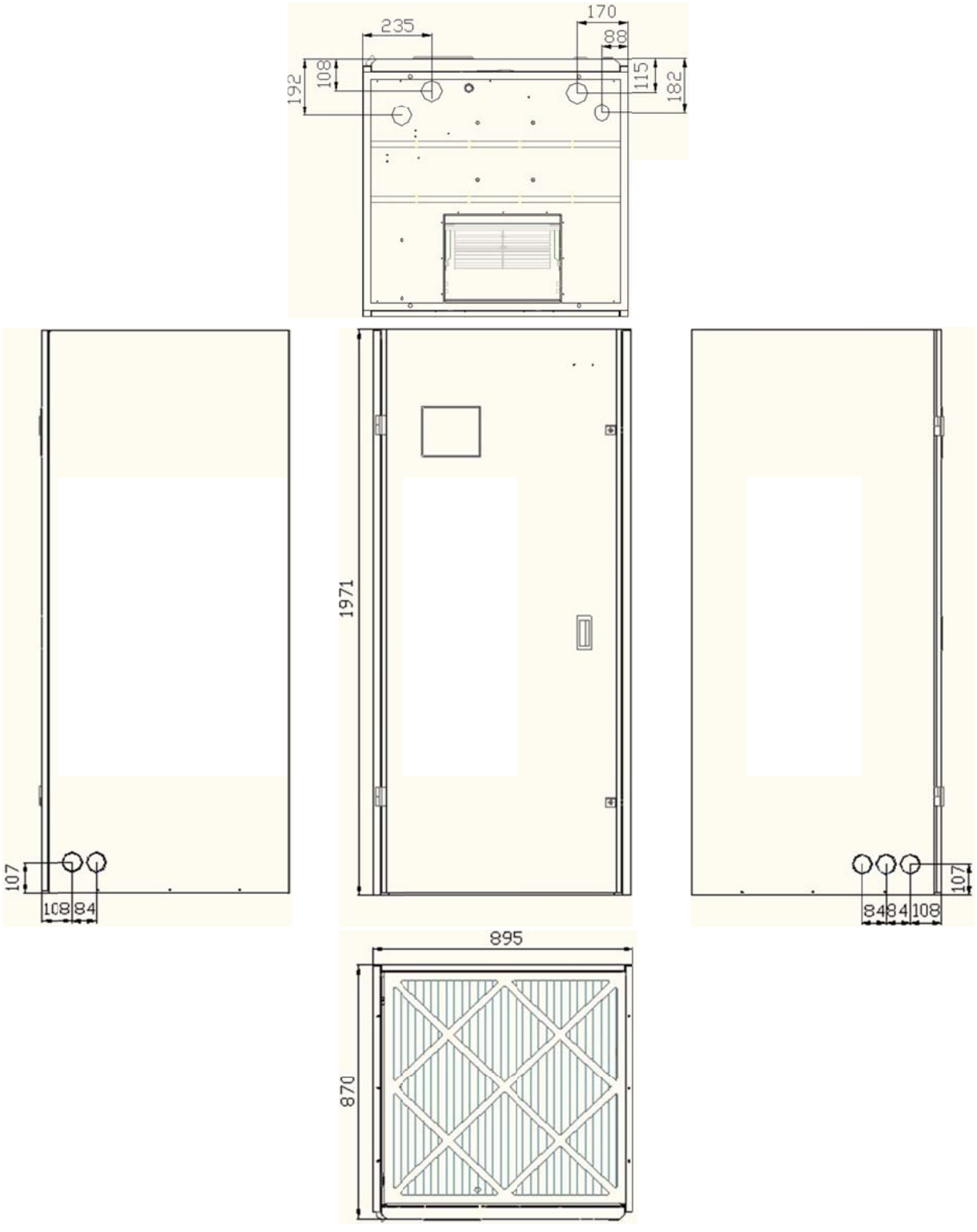
Outdoor coil (Single outdoor unit)	No. of rows	\	3
	Tube pitch(a)×row pitch(b)	mm	25.4×22
	Fin spacing	mm	2.2
	Fin type	\	Hydrophilic aluminum fin
	Pipe outside dia. and type	mm	Φ9.52
			Inner grooved copper pipe
	Coil (W×D)	mm	2,250×1,219.2
	Number of circuits	\	18
Indoor air flow		m^3/h	24,800
Indoor external static pressure		Pa	20
Indoor drain pipe I.D.		mm	Φ30
Indoor noise level		dB(A)	≤72
Outdoor noise level		dB(A)	≤66
Refrigerant	Type	\	R410A
	Recharged (After installation)	g	17,000×2
	Control	\	Thermostatic expansion valve
Maximum refrigeration pipe pressure		MPa	4.4
Refrigerant pipe	Max. pipe length	m	60
	Max. difference in level (O.U. up)	m	20
	Max. difference in level (O.U. down)	m	5
Connection wire	Indoor power wire	mm^2	3×10.0mm^2（A,B,C）+2×6.0mm^2（N,GND）
	Outdoor power wire	mm^2	(4×1.0mm^2)+ (4×1.0mm^2)
	Signal wire	mm^2	(4×1.0mm^2)+ (4×1.0mm^2)
Filter		\	G4
Indoor unit	Net dimension (W×H×D)	mm	2,685×1,971×870
	Net weight	kg	920
Outdoor unit (Single)	Net dimension (W×H×D)	mm	2,480×1,290×690(No include supporting bar)
	Net weight	kg	220

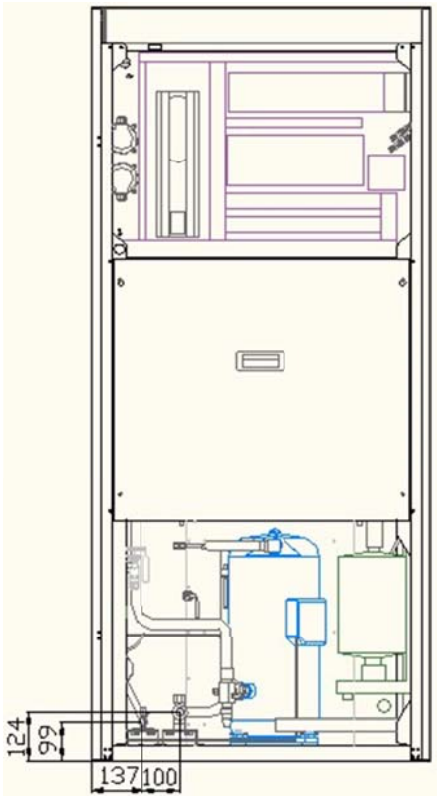
Notes:

1. The nominal cooling capacity is based on the following conditions. Indoor temperature: 24°CDB, 17°CWB; Outdoor temperature: 35°CDB, pipe length is 10 meters.
2. The noise is measured in the semi suppression lab.
3. Specifications are subject to change without prior notice for product improvement.

2.4 Dimension (Unit: mm)

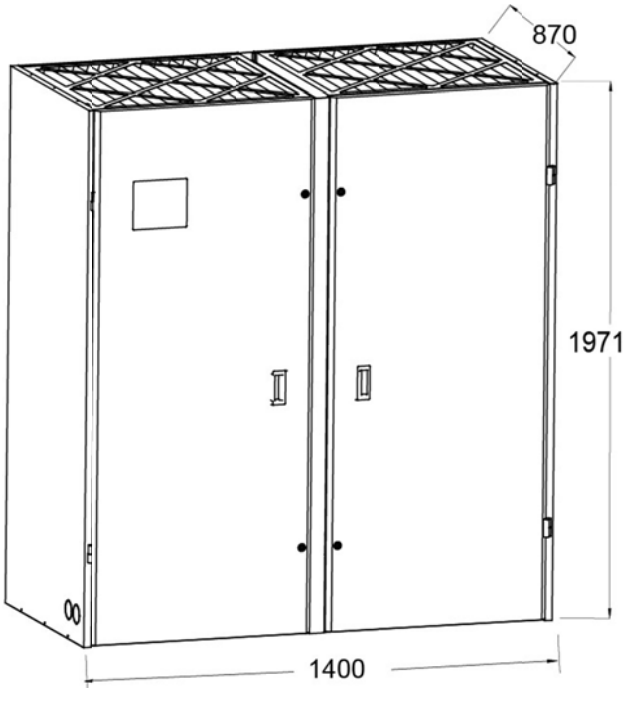
Indoor unit: MAD020T1N1S1, MAD025T1N1S1, MAD030T1N1S1





View of opened door

Indoor unit: MAD035T1N1S1



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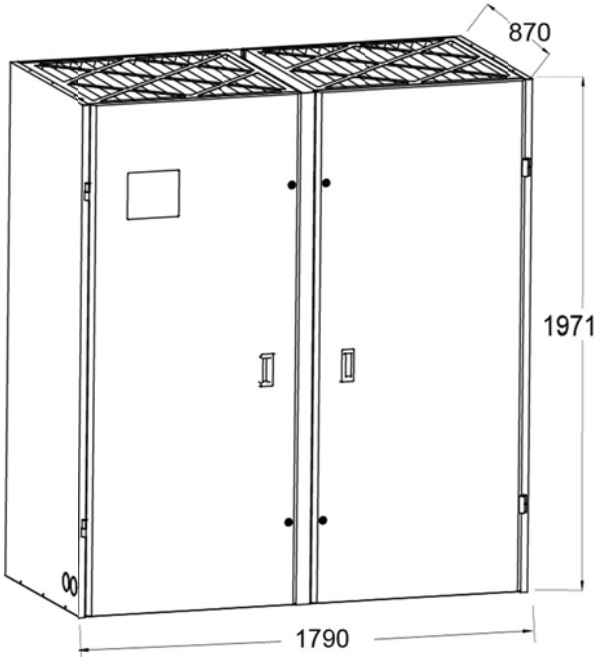
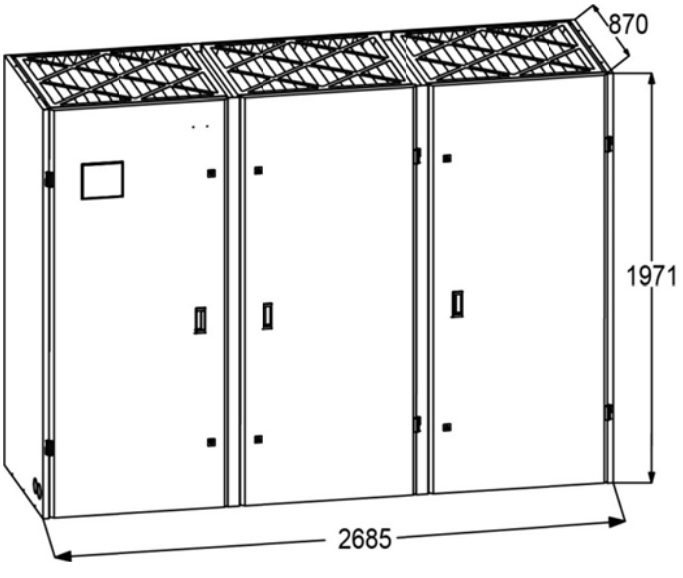
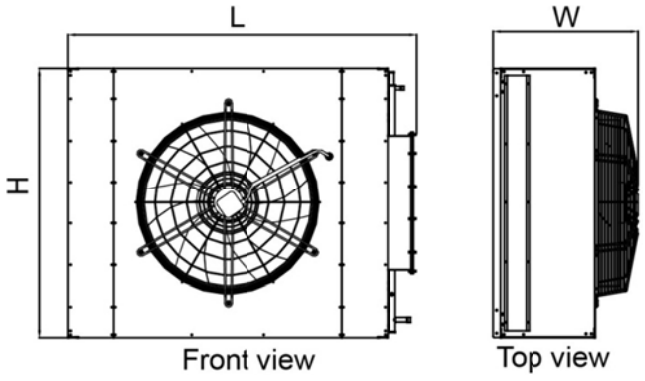


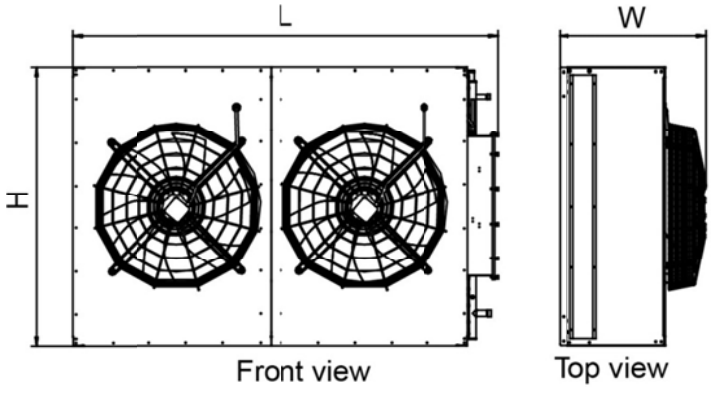
Indoo ' unit: MAD070T2N1S1, MAD080T2N1S1, M ıD090T2N1S1



Outdoor unit: MA0331, MA0431, MA05 1, MA0601



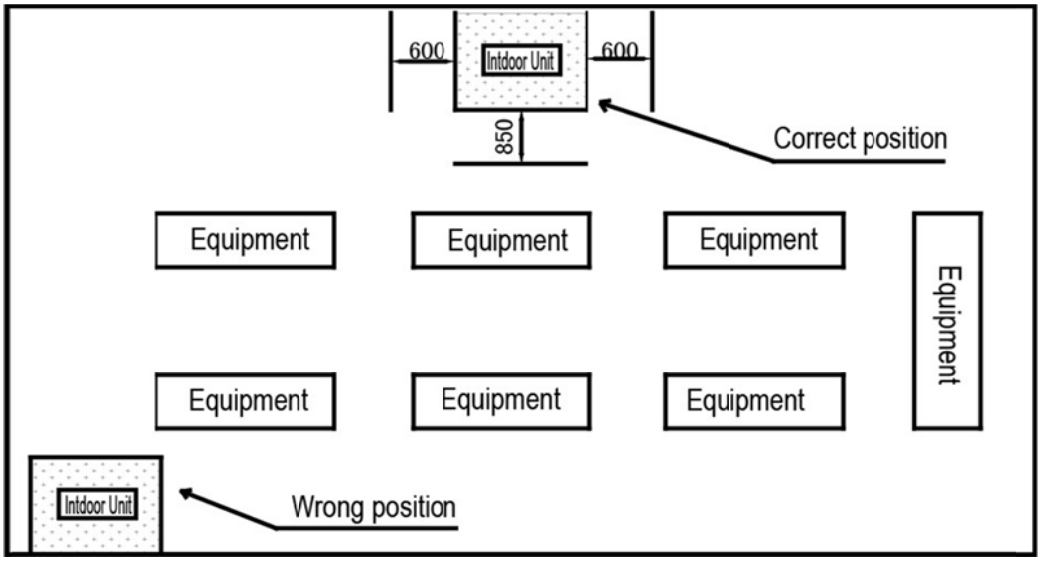
Outdoor unit: MA0752, MA0982



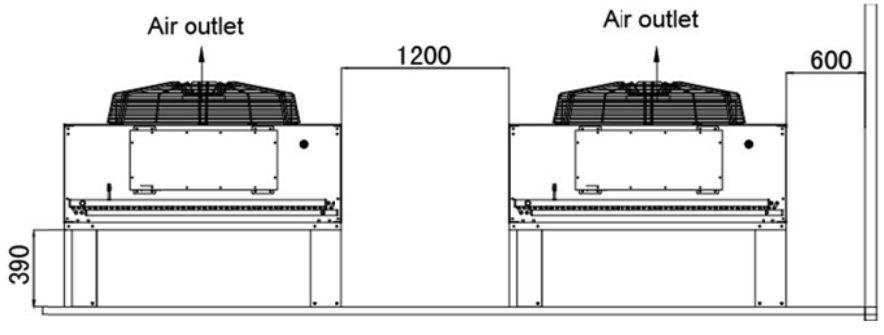
Mod l	.	H	W
MA0331	1470	988	690
MA0431			
MA0541	1660	1290	
MA0601			
MA0752	1980		
MA0982	2480		

2.5 Servi :e space

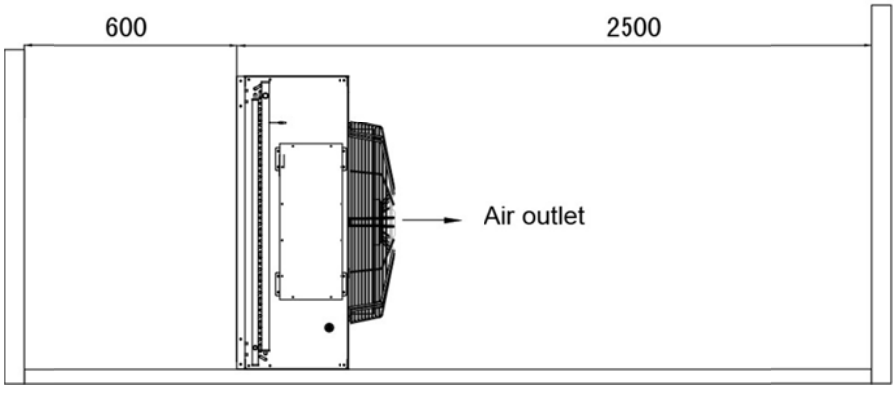
Indoo ' unit (Unit: mm)



Outdoor unit with horizontal installation (Unit: mm)

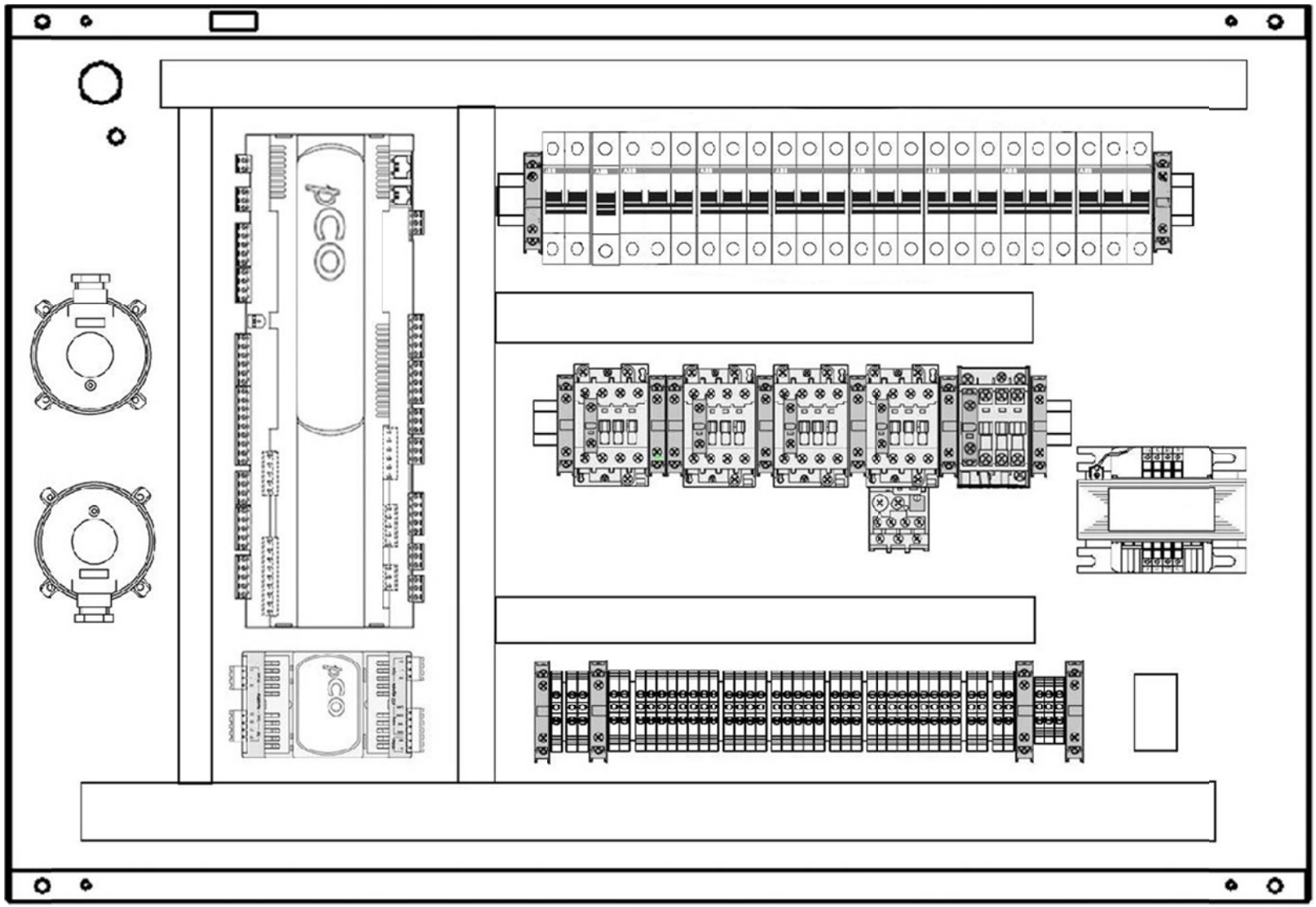


Outdoor unit with vertical installation (Unit: mm)



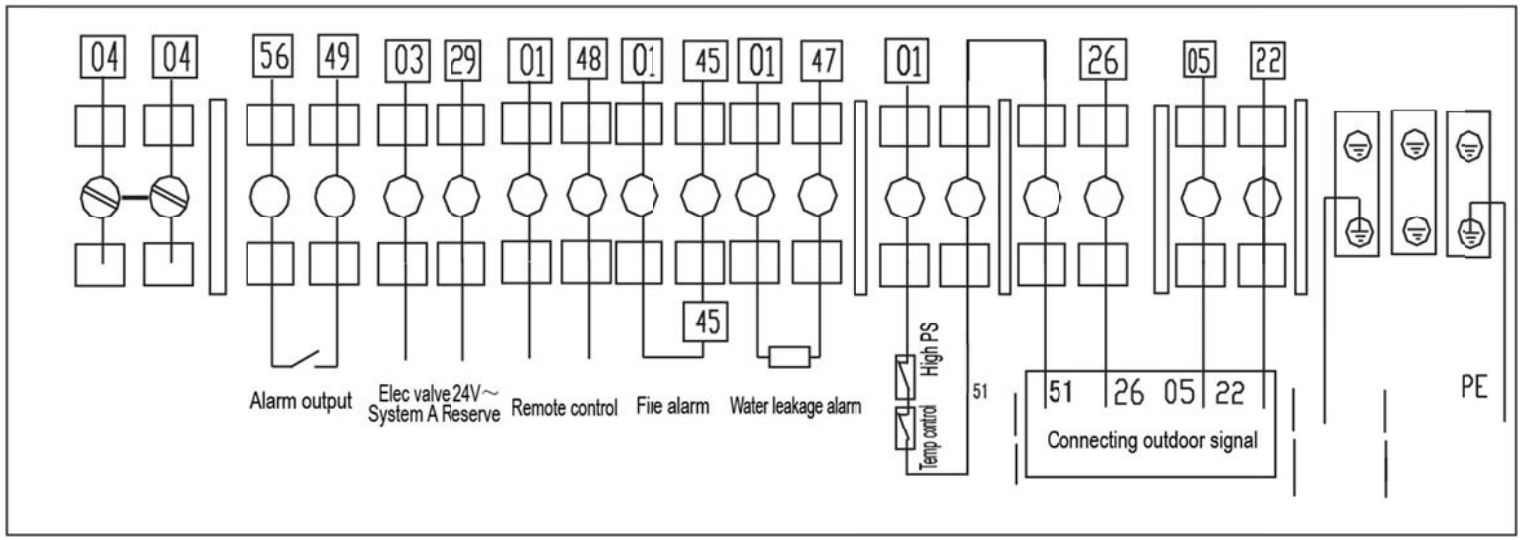
2.6 Wiring diagram

E-box view of indoor unit



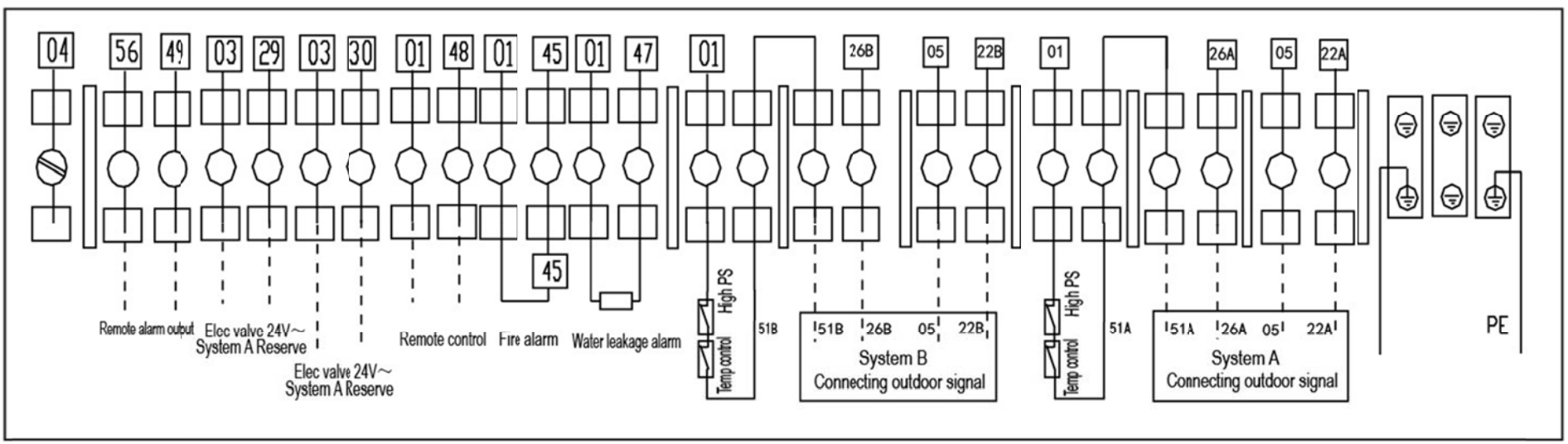
Indoor unit with single system- Controlling connection amplification figure:

Available for MAD020T1N1S1, MAD025T1N1S1, MAD030T1N1S1, and MAD035T1N1S, MAD045T1N1S1

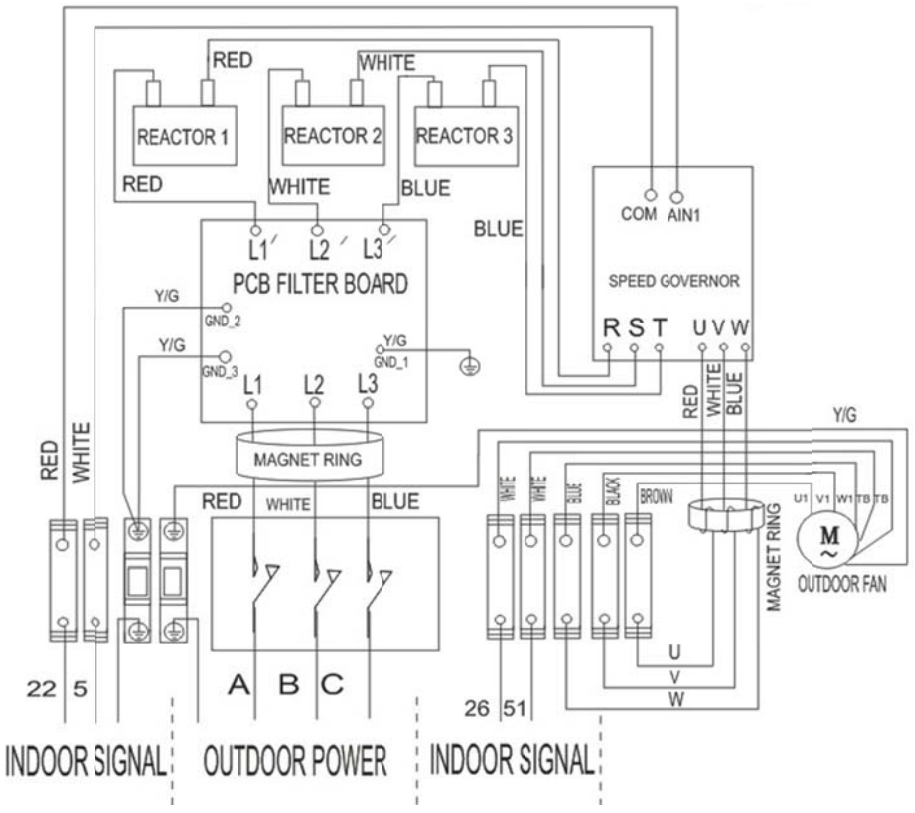


Indoor unit with dual-system- Controlling connection amplification figure:

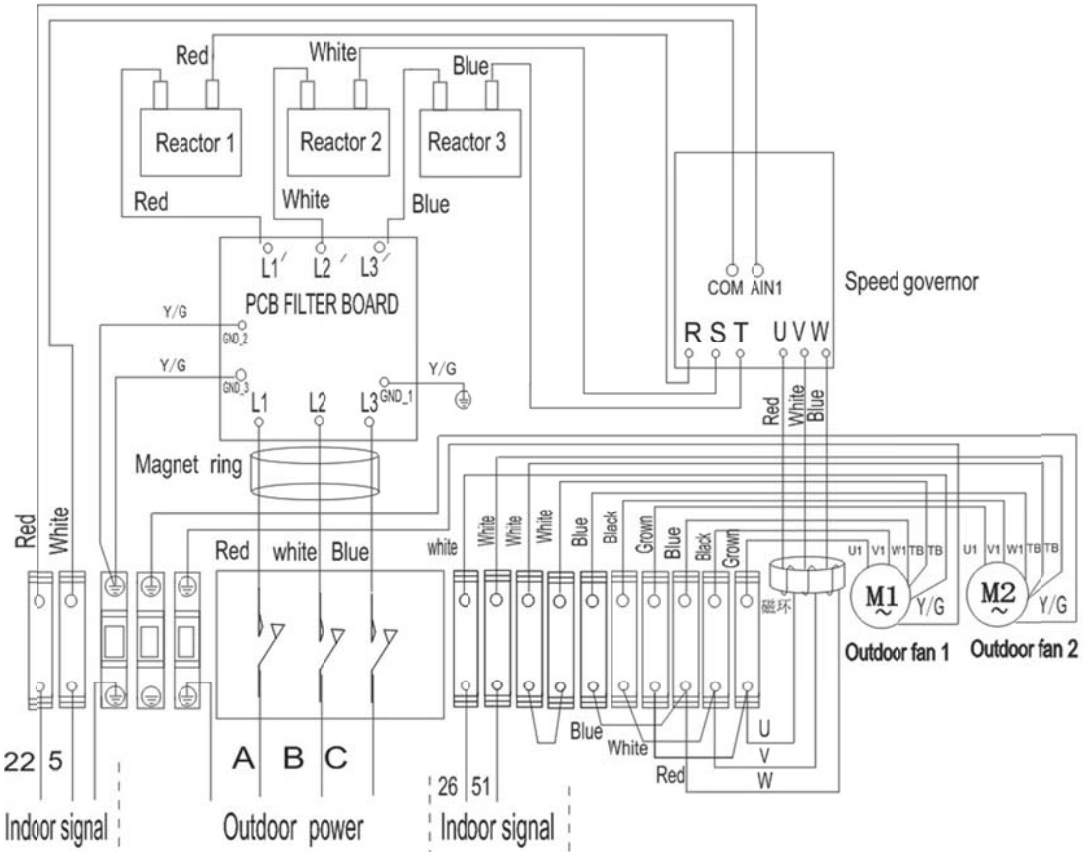
Available for MAD040T2N1S1, MAD050T2N1S1, MAD060T2N1S1, MAD070T2N1S1, MAD080T2N1S1, and MAD090T2N1S1



Outdoor unit- MA0331, MA0431, MA0531, MA0601

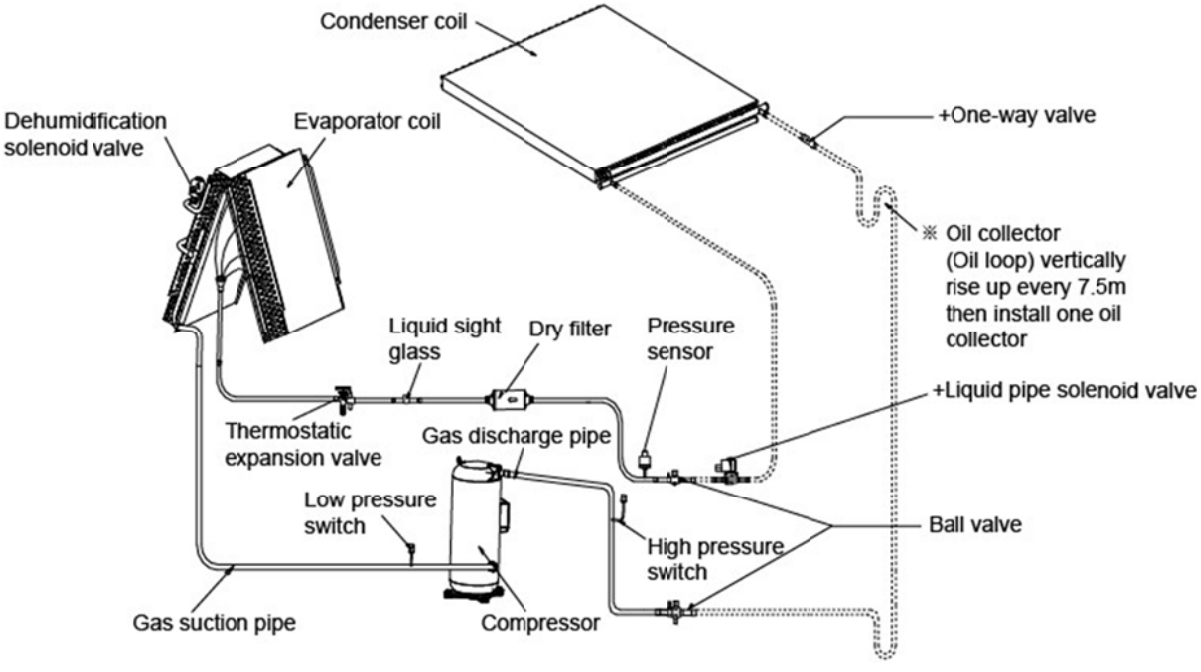


Outdoor unit- MA0752, MA0982



3. Installation

- ✧ The indoor unit must be installed on the ground of the device room or computer room. And the outdoor unit is installed on the ground of the outdoors or other rooms.
- ✧ Before the installation, confirm whether the installation enviroment meet the requirements of service, and confirm whether the buildings need to be configured with the construction work of pipeline laying, wiring and ventilation pipe.
- ✧ Installation work must strictly follow the design drawing.
- ✧ The whole system layout diagram:



Notes:

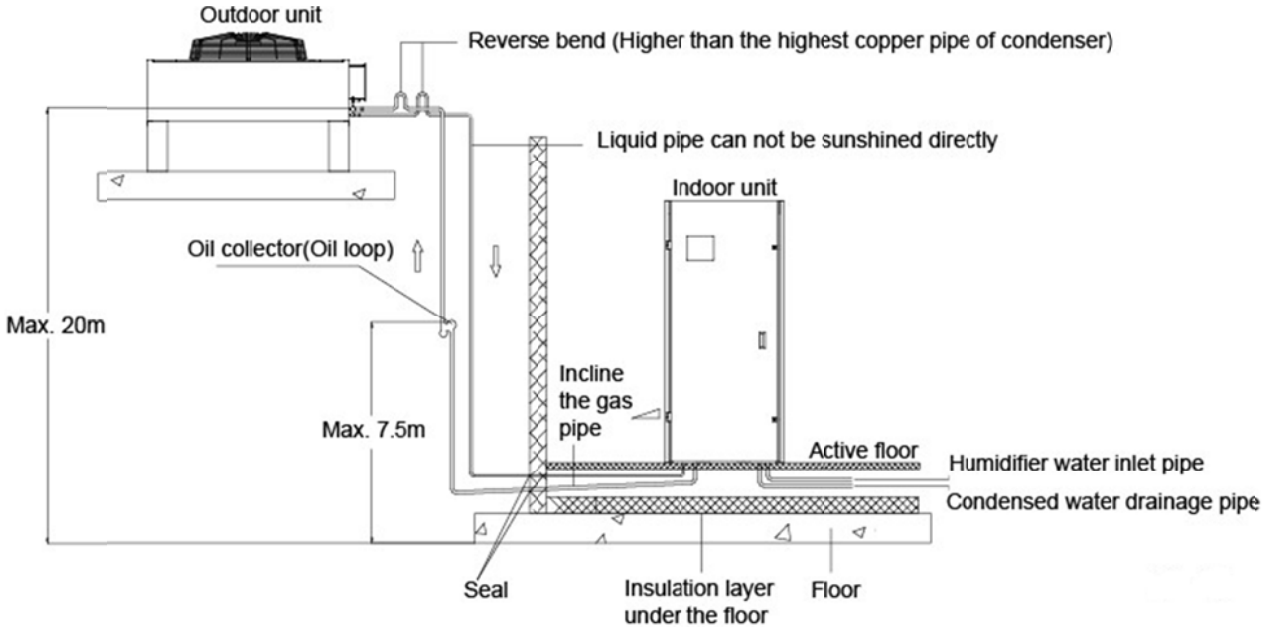
——: Pipelines provided by manufacturer

------: The site-laying pipeline (Done by technicians)

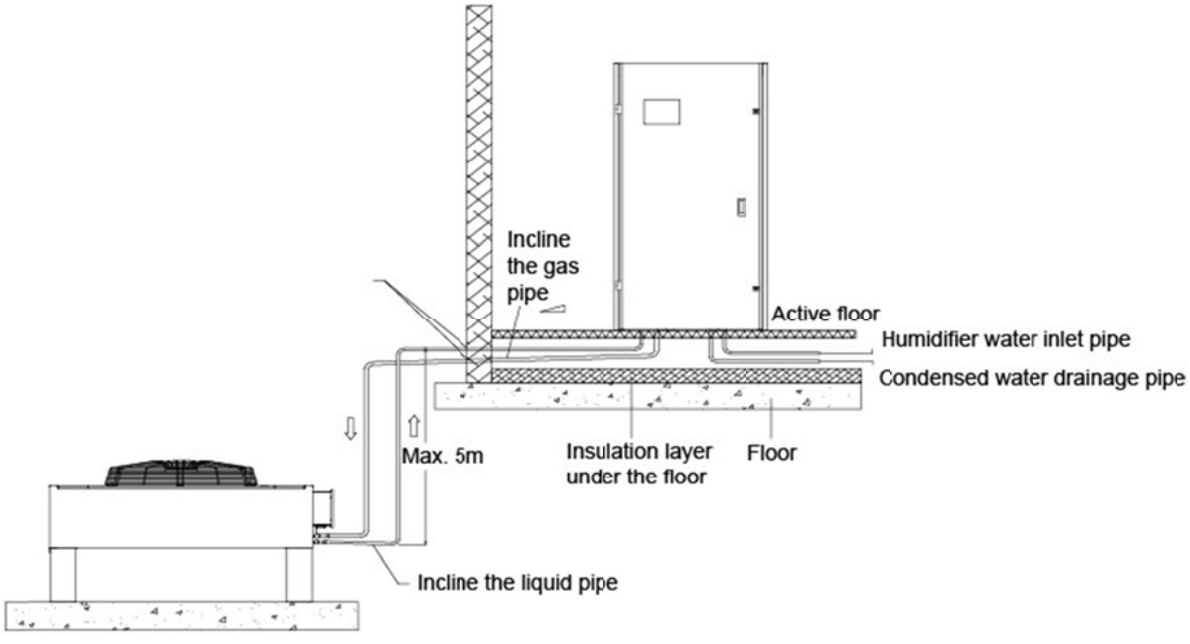
※ : For system normal operation and maintenance convenience, the components are supposed to be used. (Done by sit)

+ : When the equivaltent length of the pipe exceeds 30 meters, then it should be eqquipped with these components. (These optional components need to be purchased by another order).

✧ When the condenser is higher than compressor, install reverse bend on the inlet and outlet pipes of the condenser, to avoid liquid refrigerant backflow when the units stops. When installing the reverse bend, it must ensure that the top elbow pipe of the reverse bend higher than the top row copper pipe of condenser.



✧ The installation diagram, when the indoor unit is higher than outdoor unit.

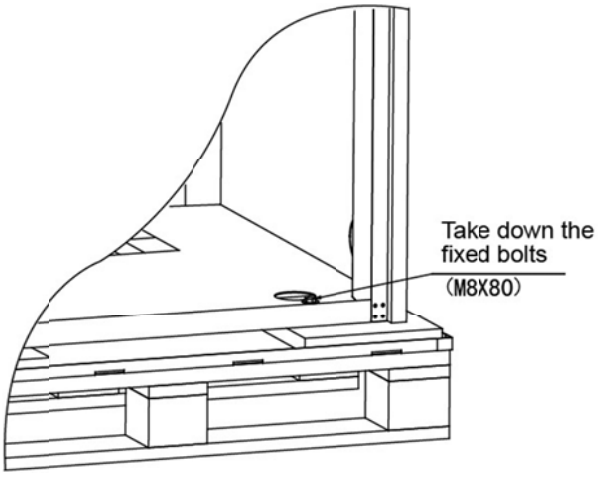


3.1 Storage environment

Items	Requirements
Storage environment	Indoor, clean.
Ambient humidity	5%~85% RH (No condensation)
Ambient temperature	Indoor unit: -20°C~54°C; Outdoor unit: -40°C~70°C.
Storage time	Total time of transportation and storage time should not exceed 6 months. If exceed 6 months, it need to re-calibrate the capacity.

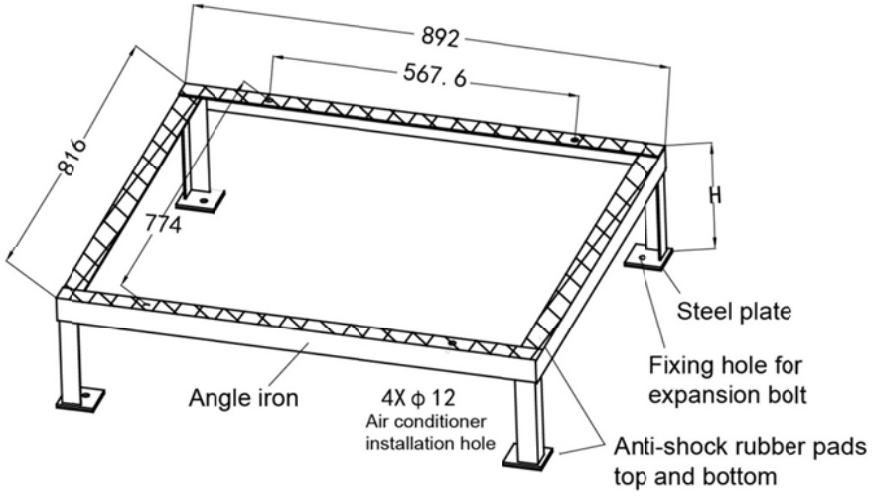
3.2 Indoor installation

- ✧ Take down the packaging case, according to the package diagram to remove the packaging wooden case.
- ✧ Move the back plate, and the unit base was fixed in the bottom wood tray with M8 bolts, remove the bolts with wrench.

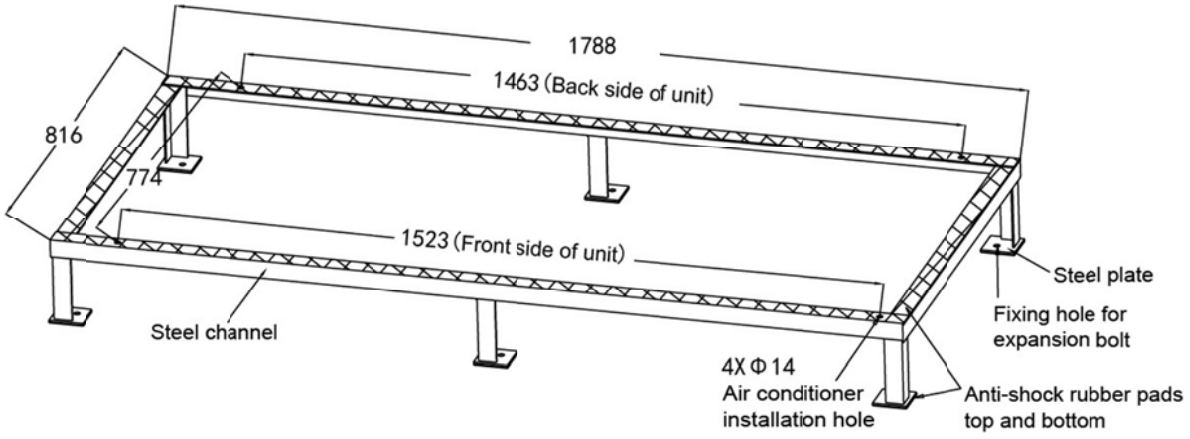


- ✧ In order to ensure that the environment control system in the air conditioning room works normally, it should do the moisture-proof and heat preservation work.
- ✧ Computer room should have good thermal insulation and sealed moisture-proof layer, the moisture-proof layer of ceiling and wall must use polyethylene film materials. The painting of concrete wall and ground must be moisture-proof.
- ✧ Outdoor air enter into the room may increase the system cooling, heating, humidifying and dehumidifyting load, so it is necessary to minimize outdoor air enter into the room. Outdoor air inhaled quantity should remain below 5%of whole indoor air circulation amount, all the doors and windows should be fully enclosed type, and aperture are as small as possible.
- ✧ Because the air conditioner will produce the condensate and water leakage may cause the damage of other precision equipments nearby, there is not the precision equipments near the indoor unit, and the installation scene of air conditioner must be provided the drainage pipelines.
- ✧ To ensure the normal operation of indoor unit, it should choose capacious space as the indoor unit installation site.
- ✧ Do not install the indoor unit in the narrow space, or it would block the air flow, and shorten the refrigeration cycle, and then leads to a short circuit of returning air and air noise.

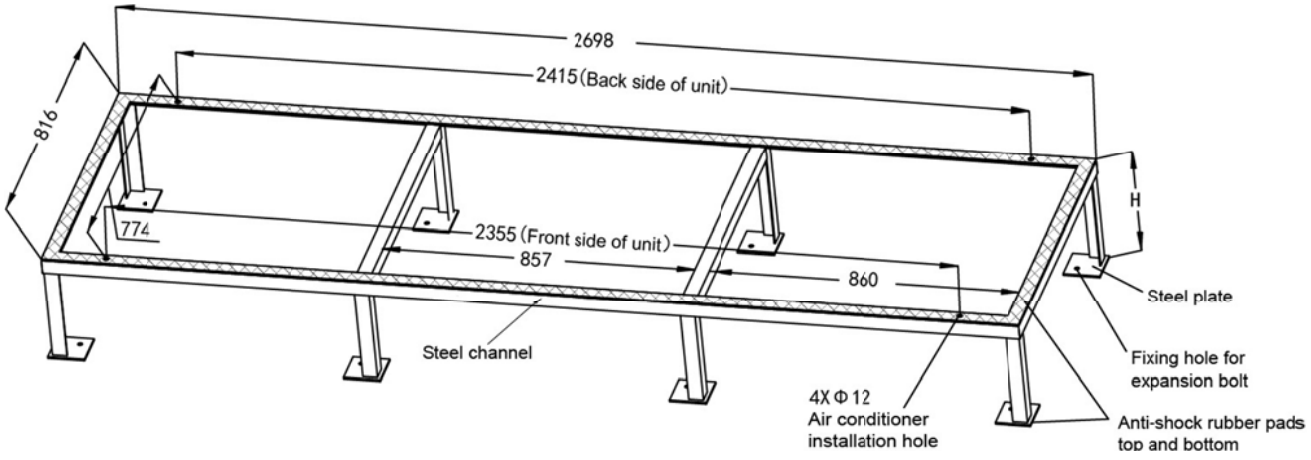
- ✧ Do not fix the indoor unit in the sunken place or at the end of the long and narrow room.
- ✧ Do not make several indoor units to be huddled together, to avoid crossing the air and producing the unbalanced competition operation.
- ✧ Do not install other equipments on its upper part, convenient for its normal maintenance.
- ✧ According to the bottom installation size of the indoor unit, the installation base should be installed.
- ✧ Place rubber damping mats on the top of the installation base and steel plate bottom.
- ✧ Determine the installation position, and according to the site condition and user's requierments to install the installation base at the selected position.
- ✧ Use bolts, cushion, flat mat and nuts to fix the air conditioner on the base.
- ✧ All outside plates of the unit should not allow bearing weight, it must be considered when choosing installation angles and fixed holes.
- ✧ Single-door unit installation basing size: (Unit: mm)



- ✧ Dual-door unit installation basing size: (Unit: mm)



✧ Three-door unit installation basing size: (Unit: mm)



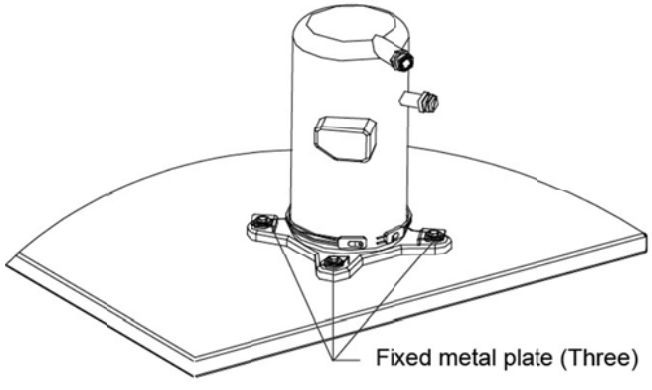
Item		Specification (mm)	Remark
Steel plate		100×100×(5~6.5)	
Angle iron (Steel channel)		40×4 or 3×3 (50×37×4.5)	
Anti-shock rubber pad	Top	Thickness: 3~5	Rubber materical can choose isoprene rubber, different bulyl rubber or rubber gasket with the same similar properties.
	Bottom	Thickness: 10~15	
Fixing hole for expansion bolt			Install as user requirements.
H		300	This is only for reference, it should according to the actual needs of users.

Notes:

The installation base should be strong to support the indoor unit.

✧ To prevent deformation and damage during transportation, it was added fasteners or vibration reduction materials on the key places when the unit left factory. Remove the transportation fasteners and vibration reduction materials before installing and debugging the unit.

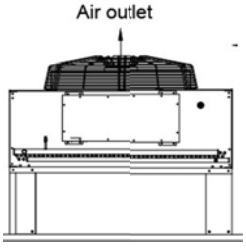
✧ First dismantled three L shape fixed metal plates, and install the bolts and gaskets with the bolts fastening torque: 12±1N. m.



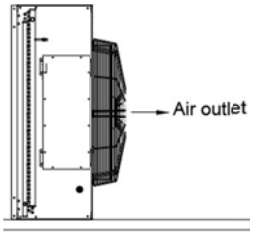
3.3 Instal ling outdoor units

- ✧ After the unit arrives, che ck whether it is damag ed during th e shipment.
- ✧ To ensure the heat dispersion of the unit, intall the outdoor unit at the will-ventilatde outdoor, avoid places with dust, s low, etc. It will block th condensed coils.
- ✧ It is suggested that user should horizontal intall the unit if th e installation conditions allow, which h lp to low down the noise.
- ✧ In stall the unit far away fr om the resi dential area.
- ✧ When it is installed at the top of the building, pay attention to the water proof layer and obey the related local rules.
- ✧ T e installation direction please refers to the installation arrow label on the outdoor unit.
- ✧ O utdoor unit has two methods of installation: horizontal inst llation and vertical inst allation.

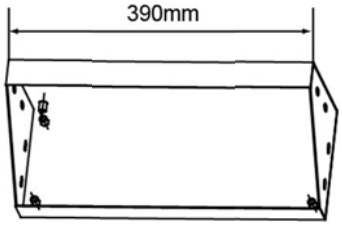
Horizontal:



Vertical (Top view)**:**

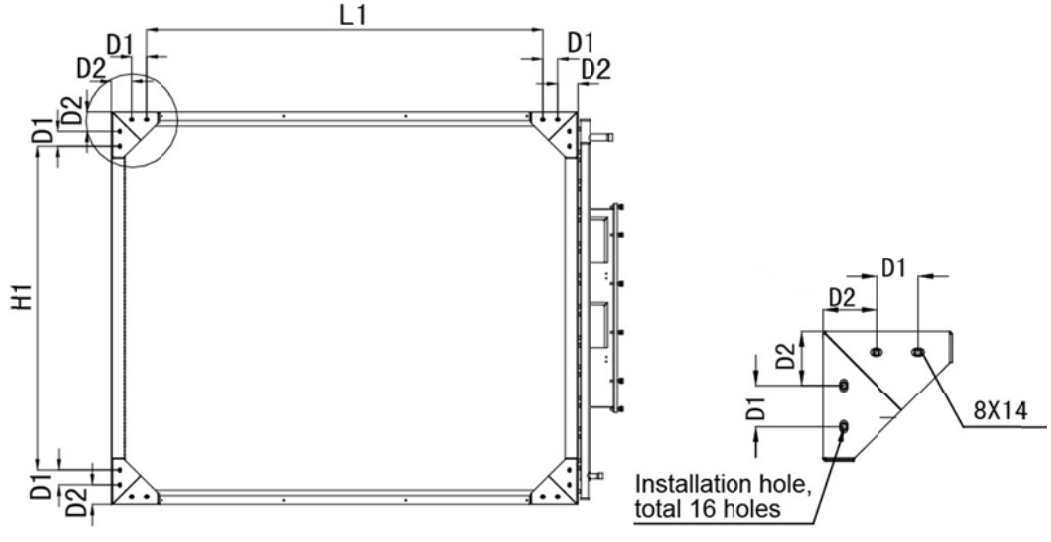


- ✧ In side the package of outdoor unit, there are fou supporting bars which are fixed in horizontal in sallation.



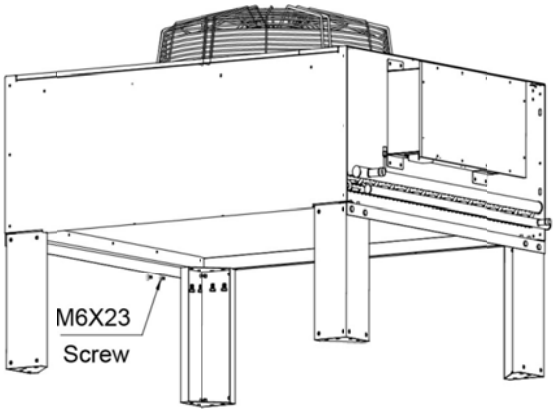
For horizontal installation:

- ✧ In stall the outdoor unit supporting ba to ghe unit first, use 6 screws to fix the supporting bar (l6×23 Screws in acces ories pack ge), totally 4 bars.



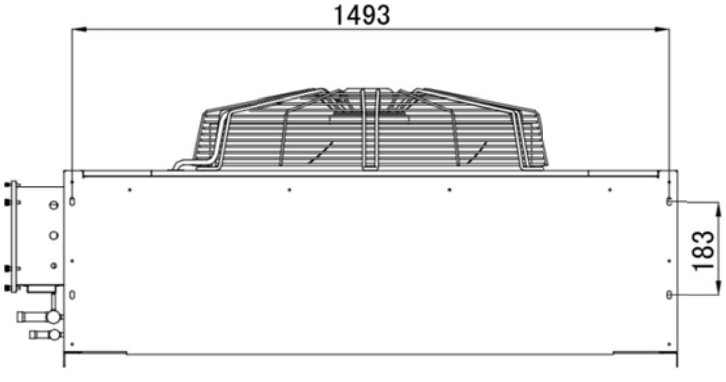
(Unit: mm)

Model	L1	H1	D1	D2
MA0331	1112	764	49	63
MA0431				
MA0541	1310	1066		
MA0601				
MA0752	1604			
MA0982	2105			



✧ It is suggested that use M6×20 expansion bolt for fixing the mounting base.

For vertical installation



✧ It is suggested that use M6×20 expansion bolt for fixing the mounting base.

3.4 Connecting refrigerant pipe

✧ For ensure safety, before welding the pipelines and welding spots, must completely discharge the nitrogen in the air conditioner system, which can release the system pressure.

✧ Do the heat insulation for the copper pipes. When the copper pipes go through the walls or other obstacles, vibration isolating measurements as shock pad should be done for avoiding the copper pipes direct contact with the wall, meanwhile pay attention to keep dust, aqueous vapor, particles and so on away from the copper pipes.

✧ It needs to apply high quality silver fiber for welding the pipeline connectors. During the welding

process, it needs to charge nitrogen into the pipeline for protection.

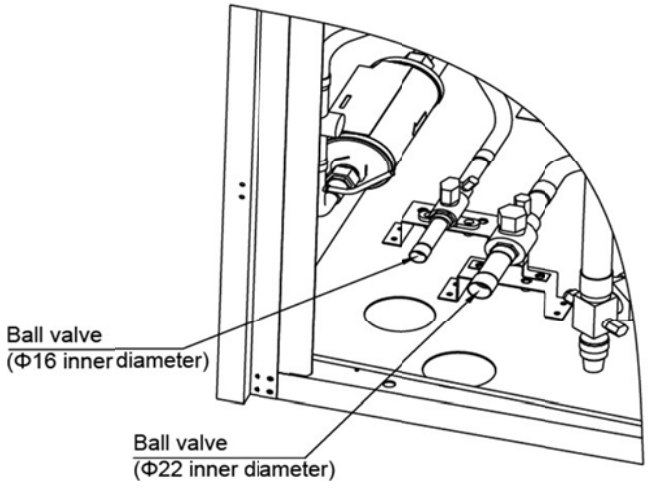
- ✧ Make sure the right connecting pipe size.
- ✧ Make sure the outdoor unit installation height of unit pipeline installation.
- ✧ Fill refrigerant and add refrigerant and add refrigerant oil of unit pipeline installation.
- ✧ The pipeline pressure drops, compressor oil return, noise reduction and vibration reduction should be considered during the design and construction processes.
- ✧ If one way equivalent length is longer than 30m, or the vertical height difference of indoor and outdoor units is higher than the numerical showed in following table, then it needs to confirm whether need to add the extended components before installation.

Relative position	Value
Outdoor unit installed level is higher than indoor unit	Max. 20m
Outdoor unit installed level is lower than indoor unit	Max. -5m

- ✧ Install grease traps (oil loop) every 7.5 meters of the all vertical height tubes.
- ✧ The suggested pipeline sizes in the following table are equivalent length, the friction losses of elbow and the valve have counted. The installer will confirm whether it is appropriate according to the site conditions.

Outdoor diameter of liquid pipe (Inch)	Equivalent length (Meter)		
	90° Bend	45° Bend	T-shape three-way
3/8	0.21	0.1	0.76
1/2	0.24	0.12	0.76
5/8	0.27	0.15	0.76
3/4	0.3	0.18	0.76
7/8	0.44	0.24	1.1
1-1/8	0.56	0.3	1.4

- ✧ When the unit leave the factory, it will has a small amount of refrigerant in the indoor unit, the outdoor unit is filled with nitrogen gas to stay the pressure, and must be put off all these materials before connect the indoor unit and outdoor unit at site.
- ✧ When welding the copper pipe with the indoor and outdoor unit, pack the wet cloth on the ball valve before welding. During welding, pay attention to do not burn the labels near the base panel and side panel of unit.



- ✧ Do not open the system pipeline more than 15 minutes, or it will lead to freeze the cooling oil and influence the usage lifespan of the key parts in the system and the system operation stability.
- ✧ The horizontal part of the gas pipe should be sloped down part after led out from the compressor, its gradient at least should be 1:200 (every 1m should drop 5mm). But if the air exhaust pipe is located at the place of cooling equipments (including under the block up floor) then it should be insulated.
- ✧ Considering the diameter will cause the system pressure drop loss, the copper pipes diameters connecting between indoor and oudoor units.

Indoor unit model	Length	10m	20m	30m	40m	50m	60m
MAD020T1N1S1	Gas pipe	22mm	22mm	22mm	22mm	22mm	22mm
	Liquid pipe	13mm	13mm	13mm	13mm	16mm	16mm
MAD025T1N1S1	Gas pipe	22mm	22mm	22mm	22mm	25mm	25mm
	Liquid pipe	13mm	13mm	16mm	16mm	16mm	16mm
MAD030T1N1S1	Gas pipe	22mm	22mm	22mm	22mm	25mm	25mm
	Liquid pipe	13mm	16mm	16mm	16mm	16mm	16mm
MAD035T1N1S1	Gas pipe	22mm	22mm	22mm	22mm	25mm	25mm
	Liquid pipe	13mm	16mm	16mm	16mm	16mm	16mm
MAD040T2N1S1	Gas pipe	22mm	22mm	22mm	22mm	22mm	22mm
	Liquid pipe	13mm	13mm	13mm	13mm	13mm	16mm
MAD045T1N1S1	Gas pipe	22mm	22mm	25mm	25mm	28mm	28mm
	Liquid pipe	16mm	16mm	16mm	16mm	19mm	19mm
MAD050T2N1S1	Gas pipe	22mm	22mm	22mm	22mm	25mm	25mm
	Liquid pipe	13mm	13mm	16mm	16mm	16mm	16mm
MAD060T2N1S1	Gas pipe	22mm	22mm	22mm	22mm	25mm	25mm
	Liquid pipe	13mm	16mm	16mm	16mm	16mm	16mm
MAD070T2N1S1	Gas pipe	22mm	22mm	22mm	22mm	25mm	25mm
	Liquid pipe	13mm	16mm	16mm	16mm	16mm	16mm
MAD080T2N1S1	Gas pipe	22mm	22mm	25mm	25mm	28mm	28mm
	Liquid pipe	16mm	16mm	16mm	16mm	19mm	19mm
MAD090T2N1S1	Gas pipe	22mm	22mm	25mm	25mm	28mm	28mm
	Liquid pipe	16mm	16mm	16mm	16mm	19mm	19mm

Notes:

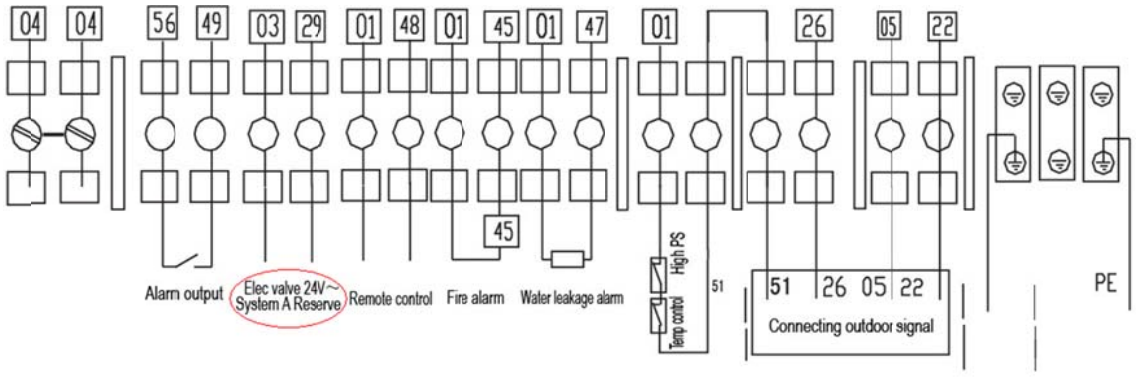
If the pipe length is more than 60m, please consult the manufacturer.

- ✧ When the pipe equivalent length is more than 30m, then it needs to install the extended components. During the extended components installation, to prevent pipelines open, it suggested that install the extended the electromagnetic valve body components on the outside of the liquid pipe ball valve, or int the outside or the bottom of the equiment.

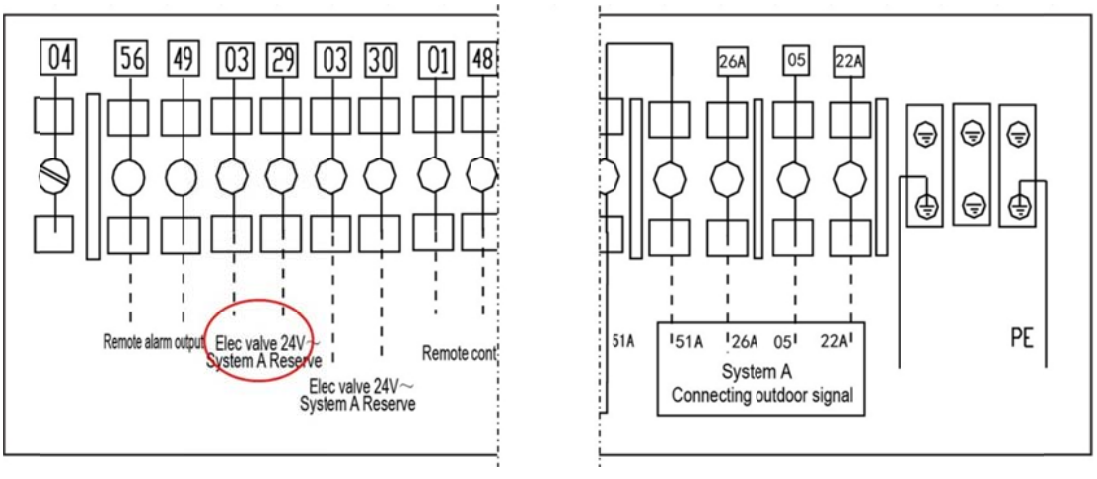
- ✧ So in the electromagnetic valve installation operation process, it do not need to cut the indoor pipeline, and after the whole system installation, then open the ball valve for pressurizing and vacuum operation, to avoid moisture absorption of the compressor frozen oil, and ensure that

the operation of the compressor and its lifespan. Trash and foreign matters may come into the pipe in the process of pipe installation. Be sure to blow them off with niltrogen before connecting the pipe to the outdoor units.

✧ The electromagnetic valve wire connection as the following figure:



Single-system type



Dual-system type

3.5 Vacuum and add refrigerant

✧ After finished piping connection between the indoor and outdoor unit, open all ball valves, and then filled with 30kgf/cm^2 nitrogen from the outdoor unit cover connector, and then pressurizing for 24 hours.

✧ Under the pipeline pressurizing was no problem, use vacuum pump to vacuum refrigeration system loop to below 20 Pa, and keep for 2 hours, if the pressure is no picks up, the liquid sight glasses in indoor unit will indicate to be green.

✧ After the vacuum inspection, the refrigeration system should static filling quickly by specified amount liquid refrigerant and adds suitable amount refrigerant oil.

✧ If the connecting pipe length of indoor unit and outdoor unit is within 10m, the filling refrigerant is 1 kg.

✧ When the connecting pipe length is more than 10m, then it needs to add refrigerant into the system for the system normal operation. The calculation for the added quantity of refrigerant is as the folling formula:

A ldding amount of refrigera nt (kg) =

C rrresponding unit Length additional refrigerant amount (kg/m) ×**Total length of extend liq uid pipe** (m)

The corresponding unit length additional refrigerant amount for different liquid pipe diameters:

Liquid pipe outer diam ɜter (mm)	Refrigera ɲt adding a ɲount per meter (kg/m)
12.7	0.11
16	0.17
19	0.26
22	0.36
25	0.52
28.6	0.68

Total length of the extend li ɋuid pipe (m) =

Total length of liquid pipe (ɲ) -10m

✧ Add refrigerant will cause the system refrigerant oil dilution, ɯhich affect the refrigerant oil lu ɔrication and cooling ef ect, therefore, it needs to add refrigerant oil. Additional formula is as follow:

A lded refrigerant oil amount (ml) =

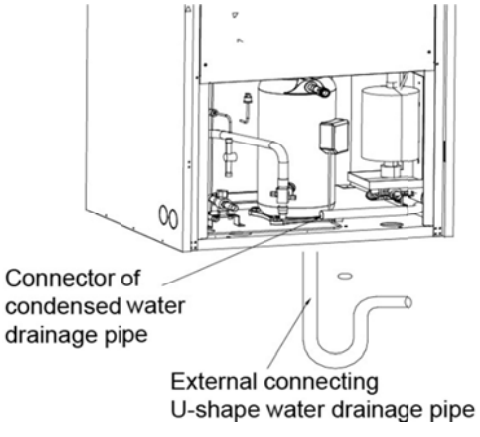
R frigerants additional amount (kg) × 22.6

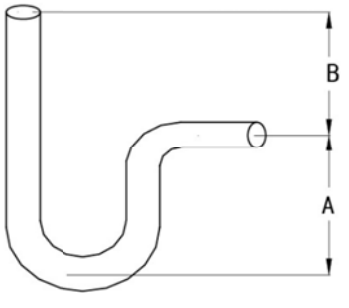
3.6 Water pipe installation

✧ C ɔndensed water draina ge pipes of humidifier and evapor ator are gathered by t ıe T adapter and drained out. The inner diameter of the tube is 30mm, if more than 3 sets units share a root pi ɔe, then the tube inner diameter sh ɔuld be minimum 40mm.

✧ T ıe drainage pipe should be connected with a U shape joint pipe, which te nperature of continuous thermal resist ance is higher than 100°C. The U shape must be installed vertically.

✧ T ıe water leakage detec or should be installed under the joint of drainage pipe an d root, which wirings is connected with terminal 01 and 47. If the place under the pipe joint is flat, the detector can directly be installed t ıere. If the place is un ɜven, the detector should be installed the place w ıere is easy to collect the water.





N ɔtes:

B ≥ P/10+20 (Unit: mm)

A ≥ B/2 (Unit: mm)

P: Air outlet static pressure (Unit: Pa)

✧ H umidifier also needs to connect wi h an inlet water pipe. Install a sid e-pass stop valve and a filter device on the wate inlet pipe, for mainte ance convenience. The filter mesh number of filters should not less tha n 40.

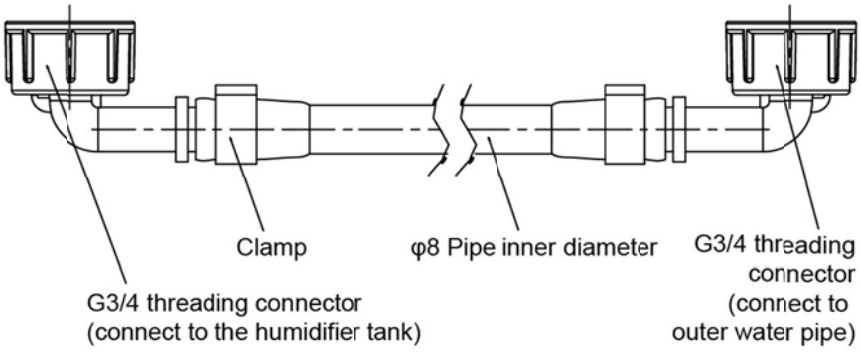
✧ R equirements for the water quality in et to the humidifier:

Fi nite index of 'ordinary' water quality			Limit valve	
			Min.	Max.
P H value	PH		7	8.5
R elative electric conducti vity at 20°C	SR,20° C	µs/ cm	3 00	1250
Total hardness	TH	mg/l $CaCO_3$	=	400
Temporary hardness		mg/l $CaCO_3$	=	300
Total non-soluble solid	CR	mg/l	(*)	(*)
S olid waste at 180°C	R180	mg/l	(*)	(*)
Iron + Manganese		mg/l Fe+Mn	=	0.2
C hlorine		ppm Cl	=	30
Silica		mg/l SiO_2	=	20
C hloride ion		mg/l Cl^-	=	0.2
C alcium sulfate		mg/l $CaSO_4$	=	100

✧ P J tube can be directly connected with outer water pipe. It must seal connect or to prevent le akage.

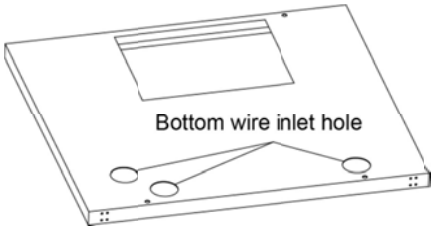
✧ T he normal working pressure rang e of main pipe is 100kPa to 800kPa. It should install a pressure reduced device on the place pressure more than 800kPa. If the main pip e pressure is below 100kPa, it should set water collecting sum p and water pump system. The water inlet pipes of main pipeline must in accordance with the loc al regulations.

✧ T he water inlet pipe con necting acc essories as following shows. It ha equipped with the unit, th e connectors of the water pipe are only for reference to ch oose.

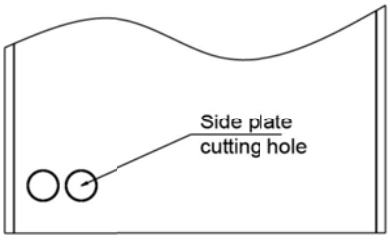


3.7 Electric connection

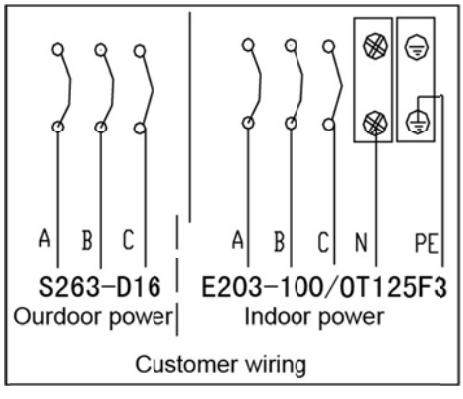
- ✧ All the power wires, controlling wires and the grounding connection should observe the national and local regulations and electrical rules.
- ✧ The main power supply requirement : 380V AC, 50Hz, 3Ph.
- ✧ Before connect the electric circuit, use the voltmeter to test the input power voltage, and confirm the power supply has been closed.
- ✧ Base panel has three cutting holes to passby the wirings.



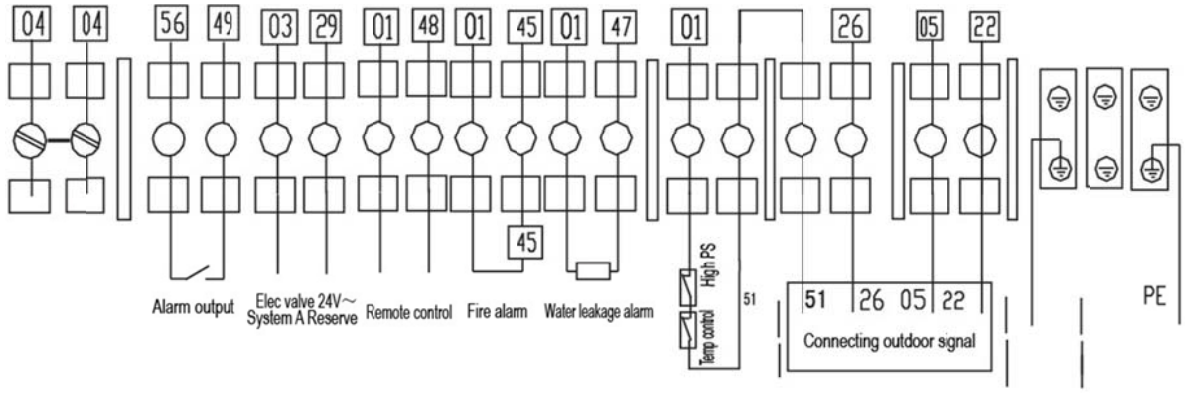
- ✧ If it is difficult for piping and wiring from the base panel, then it can choose from the side panel for connection. Knock down the plate of side panel cutting hole, (2 cutting holes both on right and left sides) according to the actual need to choose import and export ports, but it must ensure that any two of the pipeline, power wire and signal wire to outlet from the different hole.



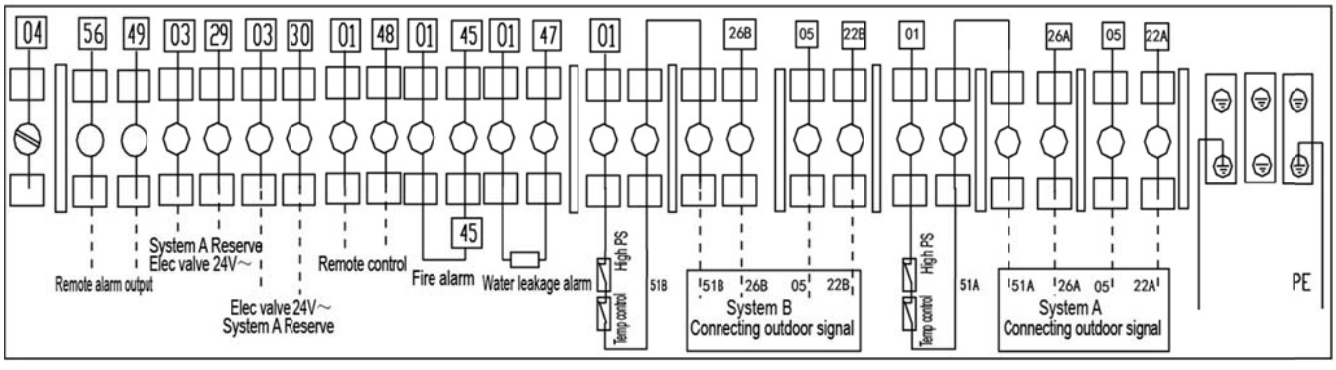
- ✧ Fix the spare wirings on the electric cable fastening clamp.
- ✧ Wiring refers to indoor unit power wiring diagram, as following picture.



✧ In door unit controlling co nnection amplification fi gure:

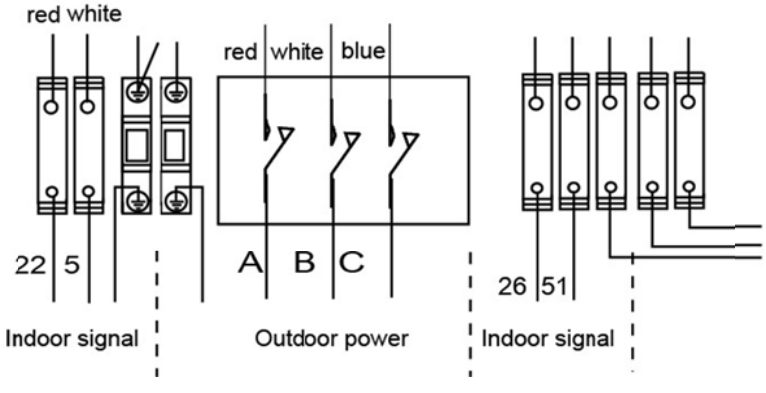


Sin gle-system type

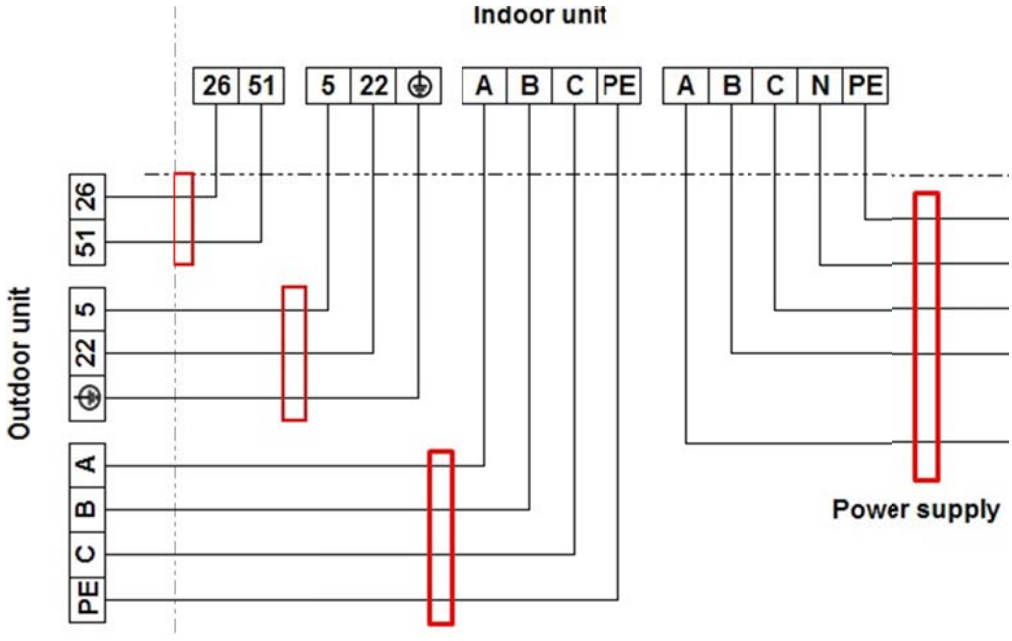


Dual-system ype

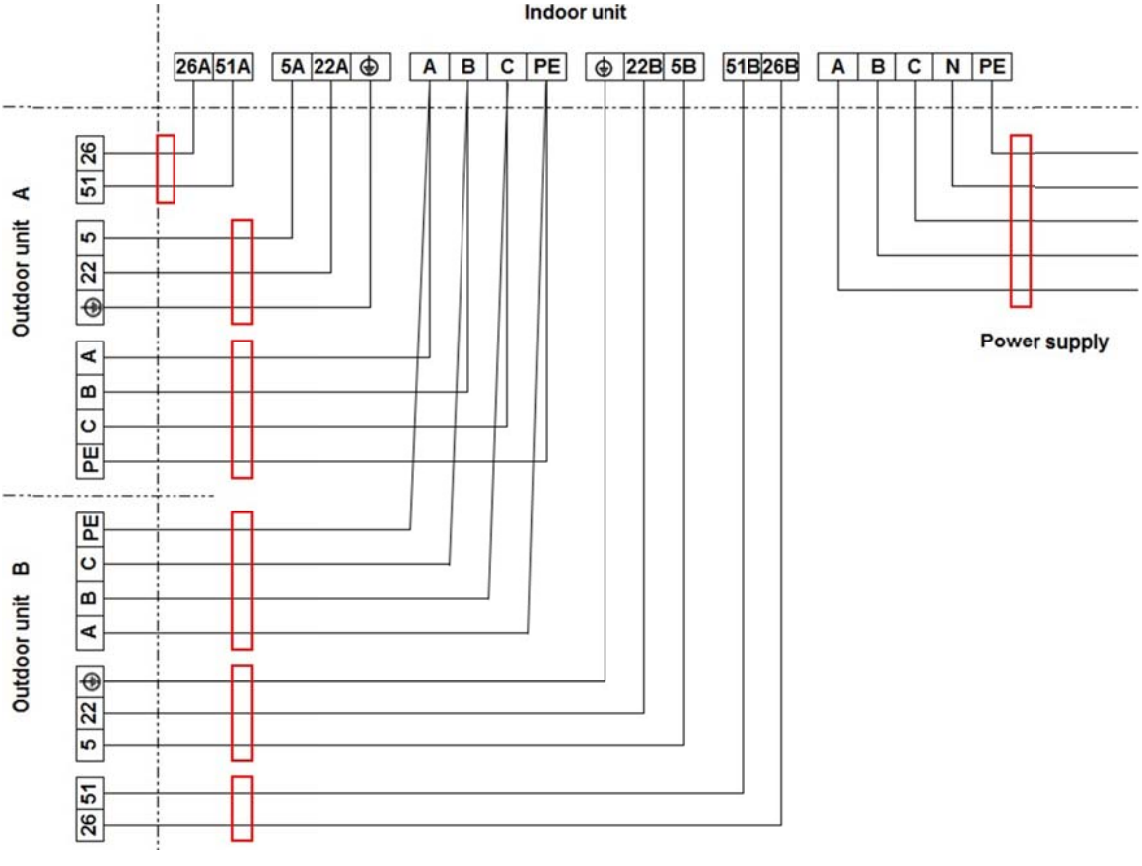
✧ Wiring refers to outdoor unit wiring diagram, as f ollowing pic ure,



✧ Field wiring,



Single-system type



Dual-system type

✧ Use protection pipe or shielding wire for the outdoor parts of the connecting wires of indoor unit and condenser.

✧ Do not contact the cables with high temperature objects (Such as non-heat insulated copper pipes, compressor, etc.) for protect the insulation layer.

3.8 Trial run

✧ In roduction of LCD man al operator functions

F r all th buttons, when it is displaying or modifying the operation para eters, sho s a green la mp to mean a paragraph is selected silicone rubber button which has three different color la mps.

Discriptions of display lamp:

O n/Off key: Green color, light up means that unit is on. Flash means that close the nit by switch in ut or monitor.

Alarm key: Red colour, Light up means one or ore alarms.

O K key: Yellow colour, light up mean s that devic e normally is powered.

B ttons descriptions of LCD man al operato r

Menu **Menu:**

Back to Menu (***M0***) under any displa r situation (Except checking factory parameter s situation) will display unit status, probe reading and operating mode, under factory interface, ressing this button can go back.

Maintenance:

Shift to the first page of the maintenance interface (***A0***), usu ally the maintenance parameters are use for check the operati g status, p obe readin , maintenance, calibration reading and manual o eratiom of the device.

Print:

Q uick display the pLAN address of c rrent contr l plate.

I/O **Status (Input/Output):**

Shift to the first page of input/output interface (***I0***), input/output status of input and output p rameters display contr l plate.

 **Time:**

Shift to the first page of time program (***K0***). Time parameter is used to display and set the operating parameter of clock plate and activate time zone.

Set:

Shift to the first page of set point program (***S1***).

Program:

Shift to the first page of user interface (***P0***). User interface is used to change the unit operating mode.

Query:

When the unit is under group control state, can press this button to shift different unit display pages.

on/off:

On/off the unit.

alarm:

Display the alarm, eliminate the alarm sound, and eliminate the current alarm.

 **Up:**

If the cursor moves to the upper left corner, click this button can page up in the same programsectiom; If the cursor moves to a certain parameter position, click this button to increase the parameter value.

 **Down:**

If the cursor moves to the upper left corner, click this button can page down in the same program section; If the cursor moves to a certain parameter position, click this button to decrease the parameter value.

enter:

Generally move the cursor from the upper left to the setting area, after setting parameters then press this button to confirm and make the cursor move to the next setting parameter.

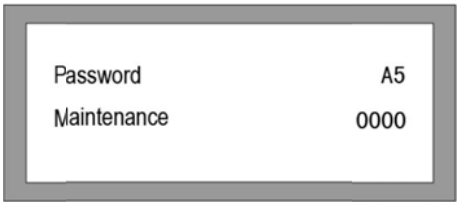
✧ Before trial run, the mechanical part and eletrical part shoud be checked first.

- ✧ The mechanical part:
  - ✓ Make sure remove the protective materials for the transportation. Check the fastening situation of motor wheel and fan wheel, and also check the parallelism of motor wheel and fan whell and the tension of the belt.
  - ✓ Make sure the refrigerant and lubrication oil have been filled strictly.
  - ✓ Make sure the water drainage pipelines of humidification system have been connected reliably and check the leakage.
  - ✓ Make sure the heating belt of compressor has been pre-heated over 12 hours.
  - ✓ Make sure the room temperature is over 20°C and has some thermal load. If not, it should be used other heating devices or operated the electrical heating of the unit to pre-heat the room environment, and make sure there are rated capacity thermal load for trial run.
  - ✓ Under the situation in winter, it needs to man-made shadow parts of condenser area and limit the condensed air volume to increase the condensed pressure.

- ✧ Electrical part:
  - ✓ Make sure the main power input voltage is in the range of -10%~15% voltage. Power disconnecting switch of the outdoor unit has been closed.
  - ✓ Make sure all the electrical or controlling wires are correctly connected, and fasten all the connectors of electrical and controlling connections.
  - ✓ When terminal number 22 and 5 are connected well, the outdoor fan can not receive the control signal from indoor unit, and it can not operate. It will cause the system stop as high pressure.
  - ✓ Separated arrange the power cable and the low voltage controlling cable.
  - ✓ It has ensured that the phase sequences of the three-phase components are the same when leaving the factory. It only needs to make sure the phase sequence is correct. If fault, change any two wires between A, B,C of the main power supply.

- ✧ The system manual detection function:

  Under standby state, the controller provides the functions of manual on and off at site to detect the status of the system functional components, detailed operation steps as following:
  - ✓ Switch on the main power supply, at that time, the unit is under standby state, and the indication lamp on the upper right corner of the main controller will display green, the manual operator display interface will display the unit was turned off.
  - ✓ Press the **Maintenance** key on the manual operator, and enter to the maintenance interface, and keep pressing the **Down** button to shift the page to A5 interface, and then it needs to type in maintenance password.

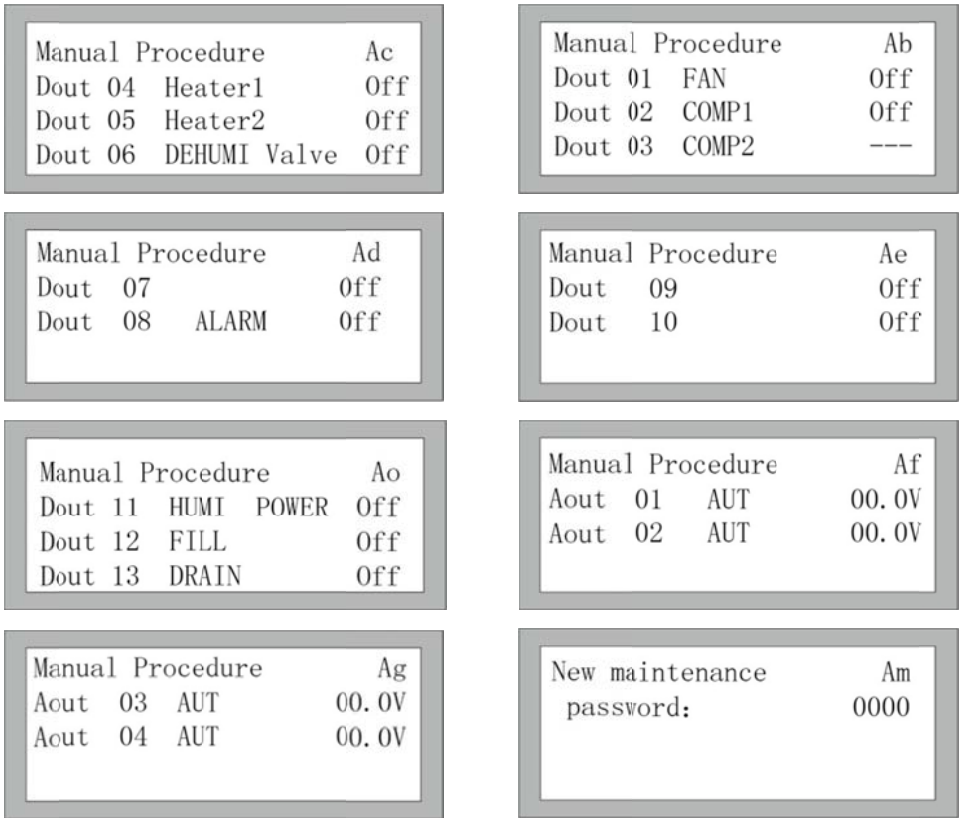


Notes:

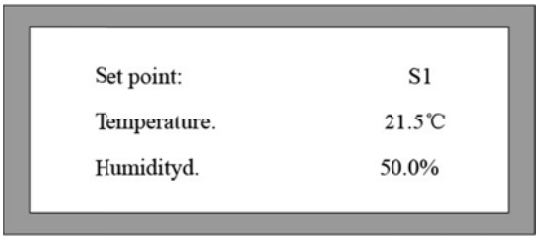
The maintenance password can be got from manufacture.

  - ✓ After confirm the password, keep pressing the **Down** button to enter the following interface,

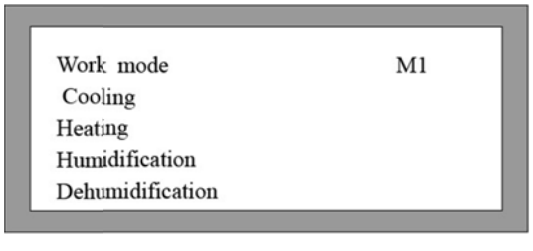
and use the **enter** key to move the cursor position, and use the **Down** button to carry out the manual on/off setting of the critical components, and then press the **enter** key for confirmation.



- ✧ Manual operator display and operation methods
  - ✓ After the unit is on, enter to the main interface and it will display some current basic parameters setting, include clock message, curren ambient temperature and humidity value and the unit status. Press the **Set** button to set the temperature and humidity, and through the **enter** key to move the cursor and use the **Up** and **Down** keys to change the parameter and press **enter** key for confirmation.



  - ✓ Press the **Menu** button to go back to ***M0*** page, and press **Down** key to query the current operating mode, or adjust the setting parameters, after adjusted the setting parameters and press **enter** button for confirmation.



- ✓ **Compressor checking:** Press the **Set** key, the setting temperature to be room temperature minus 5°C, the relative humidity to be the same as the room temperature, and press **enter** to observe the compressor whether operates or reverses. (The compressor reverse then it will has abnormal voice.)

  Note:

  The compressor cannot be reversed over 30 seconds, and it should be judged immediately and cut off the power.

  Back to ***M0*** page, and press **Status** to check the rising pressure of the compressor is normal or not, and at the same time, the outdoor fan should be high speed operating, and the stable pressure of the compressor should about 30bar.
- ✓ **Cooling state detection:** Press the **Menu** and press the **Down** button to check the current mode is cooling or not.
- ✓ **Dehumidification function detection:** Press the **Set** to change the temperature as the same as the room temperature, and relative humidity set to the room temperature minus 5%RH. Press **enter** and the compressor will be normally operated, and then press the **Menu**, press **Down** key to check the current mode is dehumidification or not.
- ✓ **Humidification function detection:** Operate the humidifier switch, press the **Set** to change the temperature as the same as the room temperature, and the relative humidity set to be the room temperature plus 5%RH, then press **enter** to check the compressor stops or not and the humidifier starts to inlet water or not. Press the **Status**, find the ***Ii*** page, and check the current flow of the humidifier whether increased gradually, and wait the action of the humidification tank change from ***Water inletting*** to be ***Evaporating***. Press **Manual drainage** switch to drain off the water.
- ✓ **The first grade heater detection:** Operate two electrical heater switchs, press **Set** to set the temperature to be room temperature plus 2°C, and the humidity stays the same as the indoor humidity. Press **enter** to check whether stop humidifying and whether operate the first grade electrical heating pipe, and then press **Menu**, **Down** key to check whether display heating mode.
- ✓ **The second grade heater detection:** Press **Set** to set the temperature to be room temperature plus 4°C, and the humidity stays the same as the indoor humidity. Press **enter** to check whether operate the second grade electrical heating pipe, and then press **Menu**, **Down** key to check whether display heating mode.
- ✓ **Dehumidification heating mode:** Press the **Set** button to change the relative humidity to be indoor humidity minus 5%, press **enter** to check the compressor whether operates, and then press **Menu**, **Down** to check whether display dehumidification heating mode.
- ✓ **Humidification heating status detection:** Press **Set** to change the relative humidity to be indoor humidity minus 5%, press **OK** to check the compressor whether stops and the humidifier starts to inlet water and starts humidifying or not, at that time the humidification tank will be getting hot, and then press **Menu**, **Down** to check whether display humidification heating mode. Press **Manual drainage** switch to drain off the water.
- ✓ **Cooling humidification status detection:** Press **Set** key to change the temperature to be indoor temperature minus 5%, press **enter**, and operate the unit after the unit stops one minute, to check whether continue humidifying or not; and press **Menu**, **Down** to check whether display cooling humidification mode.

- ✓ **Safe operation of refrigerant system detection:** Operate the compressor, and after the unit is stable operated then check whether there are bubbles in the liquid sight glass. Adjust the thermal expansion valve to the suction degree of overheating be about 5°C~8°C, and each adjustment should not over 1/2 circle and at least observe over 15 minutes every time. Observe the compressor gas suction pipeline, make sure the pipeline and the compressor cover have no condensed water and eliminate the potential liquid slugging danger. Under the status of 24°C 50%RH air return and 29~30bar condensing pressure, the compressor gas suction pressure should over 9bar. After detection, adjust the temperature and humidity back to the default setting value or the initialization setting value.

✧ Steps after trial run

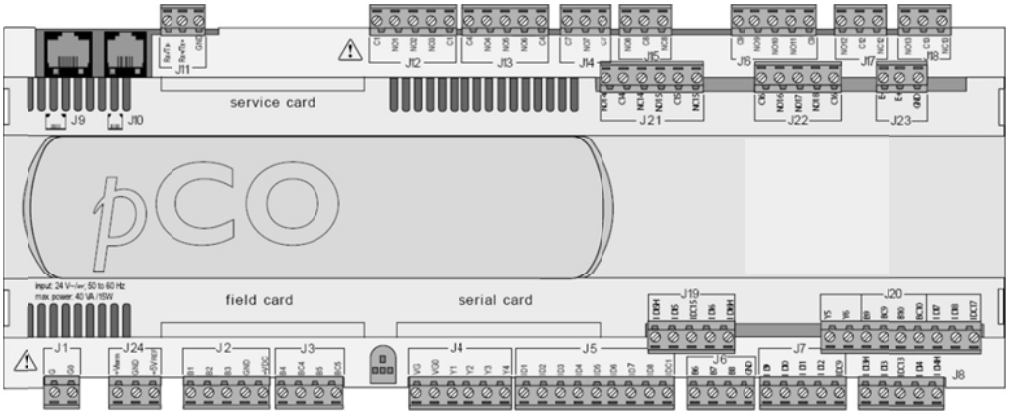
- ✓ Reset the unit to default status.
- ✓ Check and make sure the temperature and humidity setting value and control precision are reasonable.
- ✓ Check and make sure other functions are reasonable.

4. Control system

4.1 Table of main control components and control load

No.	Name	quantity
1	Controller	1
2	Operation displayer	1
3	Temperature & humidity sensor	1
4	OEM humidifier connector component	1
5	Fan speed regulating inverter	1
6	Pressure transmitter	1
7	Fan pressure differernce switch	1
8	Heater 1	1
9	Heater 2	1
10	Compressor	1
11	Inner fan	1
12	Outer fan	1

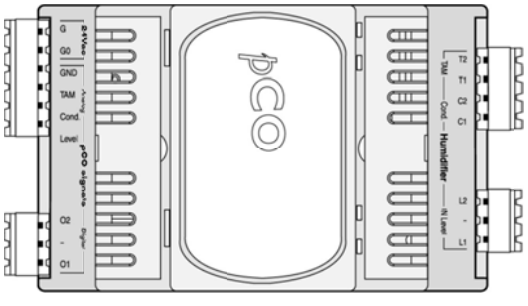
✧ Schematic diagram of the main controller terminals



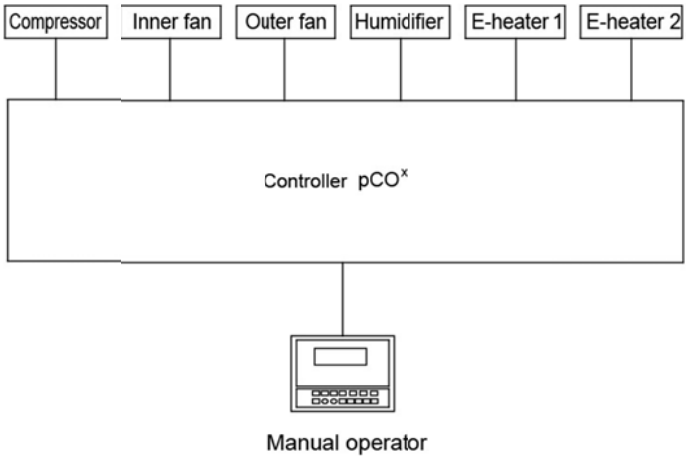
Code	Name
J10	Standard user port, non ject to manual operator
N01	Indoor fan
N02	Compressor 1
N03	Compressor 2
N04	E-heater 1
N05	E-heater 2
N06	Dehumidification solenoid valve
N08	Alarm output
N011	Humidifier
N012	Humidifier water inlet valve
N013	Humidifier water outlet valve
Y1	Indoor fan regulation
Y3	Outdoor fan egulation 1
Y4	Outdoor fan egulation 2

ID1	Compressor 1 high pressure
ID2	Compressor 2 high pressure
ID3	E-heater 1 overload
ID4	E-heater 2 overload
ID5	Phase sequence protection
ID6	Indoor fan overload
ID7	Air flow switch
ID8	Remote control
ID9	Compressor 1 low pressure
ID10	Compressor 2 low pressure
ID11	Humidifier water level alarm
ID12	Sparkles alarm
ID13	Filter screen blocking
ID14	Water leakage alarm
ID13H	To 220V signal
ID14H	To 220V signal
B1	Indoor humidity
B2	Air discharging pressure 1
B3	Air discharging pressure 2
B4	Outdoor temperature
B5	Indoor temperature
B6	Air outlet temperature
B7	Electric conductivity connector
B8	Humidification current
TX-/TX+	RS485 Concatenating connector

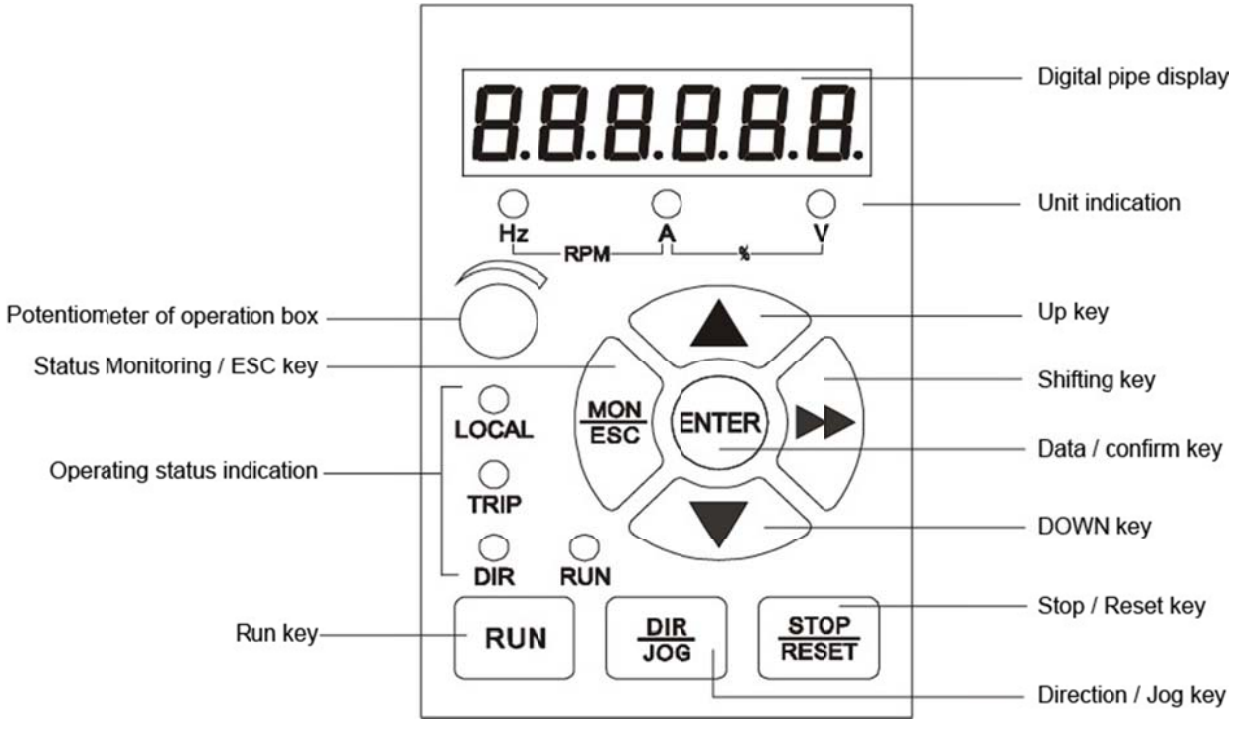
✧ OEM humidifier connector components



✧ In door schematic diagram



✧ O utdoor fan frequency conversion



Butto ı	Mame	Functions
MON/ESC	Monitoring/ESC	1, For shifting to system monitoring status. 2, Back to the previous menu. 3, Clear the alarm when the inverter was under alarm state.
ENTER	Data/Confirm	1, Enter to the menu. 2, Confirm to amend the data.
>>	Shifting	1, Under q uick monitorin g mode, shift to the monitored parameter. 2, Under d ata amending, shift to amend position. 3, When a mend the func tion code, inc ease as 10 units. (Only valid for P0 function)
▲	Up	Add the function code or data.

DIR/JOG	Direction/Jog	Accord to the function code to carry out one of the following functions: 1, Change the operating direction of inverter. 2, Operate the inverter to under the jog status, loosen the key then jog will stop.
RUN	Run	Under keypad control state, this button will operate the inverter.
▼	Down	Reduce function code or data.
STOP/RESET	Stop/Reset	1, When the inverter under normal operation, stop the inverter operation. 2, When the inverter under error status, reset the error. 3, According to the function code to carry out emergency stop functiom. (Equal to outer error input.)

Lamp name	Status	Instruction
RUN	On	The inverter is under operating or jog status.
	Flash	The inverter is slowing down to stop.
	Off	The inverter is under stop status.
DIR	On	The inverter is under inversion status.
	Flash	The inverter is under corotation-inversion transition.
	Off	The inverter is under corotation status.
LOCAL	On	Operation panel control status. (Local control)
	Off	Terminals or serial communication port control status.
TRIP	On	Slightly error alarm. (Over-current, over pressure.)
	Off	The inverter output current and bus voltage normally.

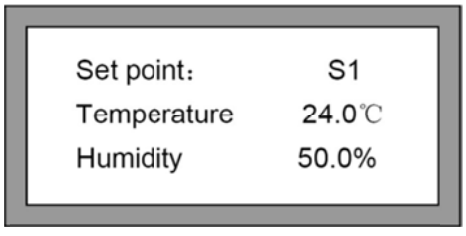
4.2 Main control function

- ✧ Adjust the civil use or industrial application environment temperature and humidity: Temperature control, hHumidity control.
- ✧ Compressor control functiom: Compressor was as simple on and off load management.
- ✧ Time setting function: Minimum running time, Minimum closing time, in the same compressor operate the minimal interval time and operate power control the shortest delay time.
- ✧ Compressor alarm function: High pressure load alarm, low pressure alarm compressiom overload alarm, General alarm.
- ✧ Control one or two electric heating equipments, at most to three electric heating power energy levels.
- ✧ The bulit-in electrode type humidifying equipment.
- ✧ Equipment manual control function: Equipment can be manually controlled, and not affect by the timing and sensor values. Under manual control state, it only responds the safety alarm. Manual control only is effective under power off. Under manual control, it can not be started.
- ✧ Temperature control of air-return port.
- ✧ Alarm management, Alarm record function.
- ✧ Power-off memory: Suddenly power off, the system has a memory function, the system automatically recover the operation state before power-off.

5. Operation

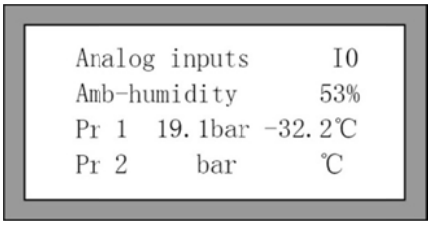
5.1 Temperature/humidity set point setting function

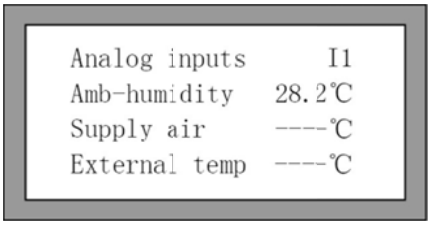
Press **Set** in menu, directly enter the user without password, and can change temperature and humidity setting point (***S1***).

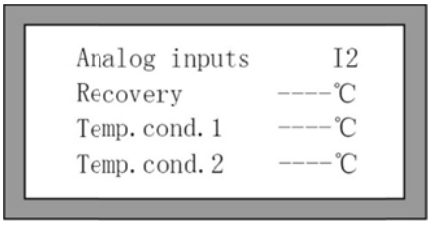


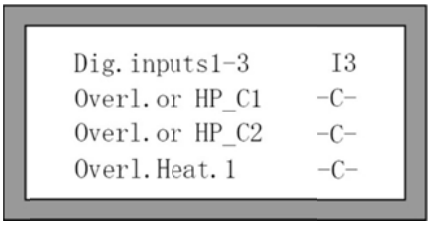
5.2 Query function for key components operating status

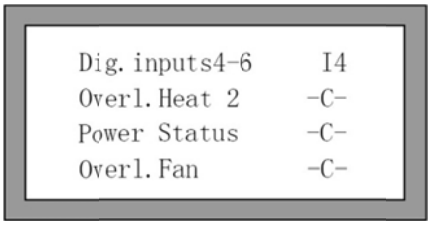
Press the **Statu** button, directly enter without password. Enter to the interface, use **Up** and **Down** buttons to turn over pages for query. Contents can be checked as following:

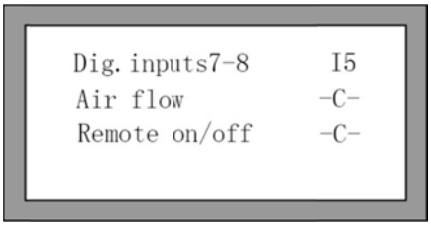


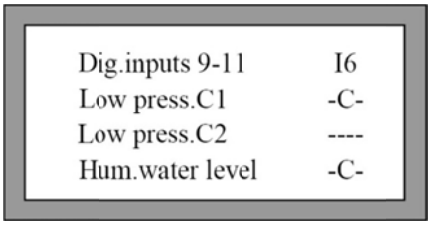


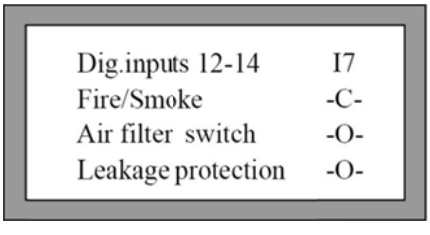


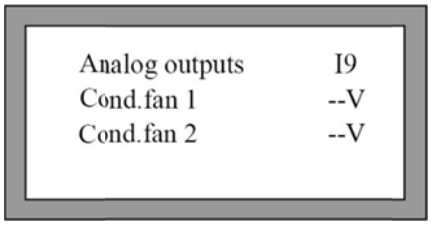


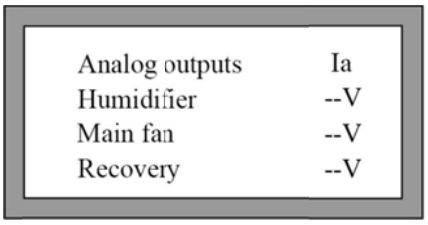


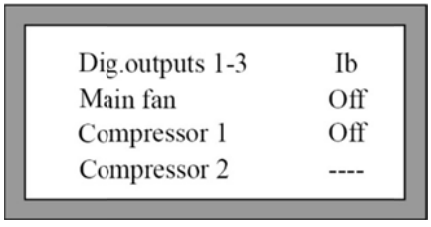


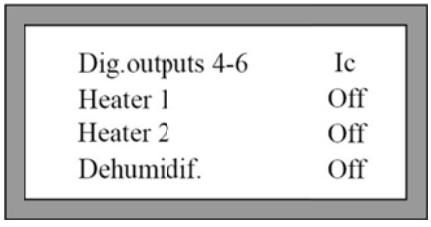


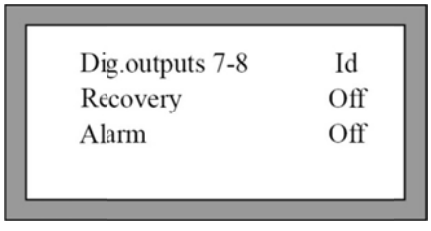


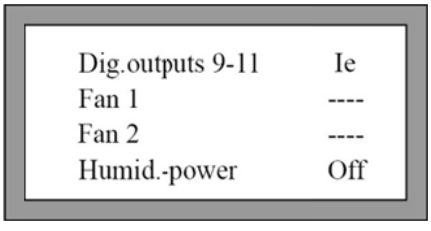


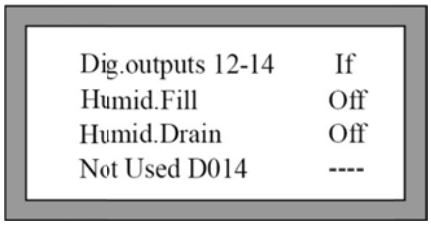


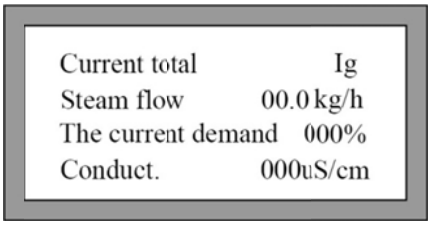


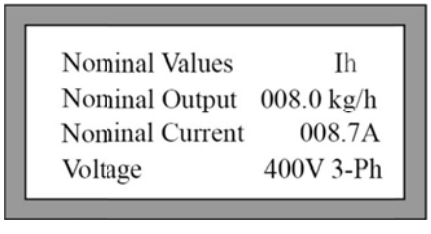


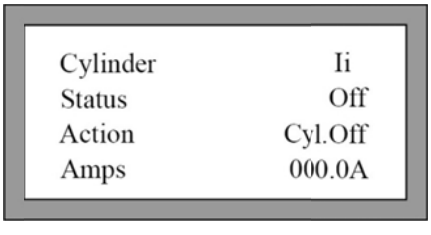


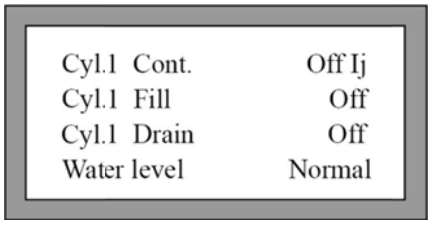










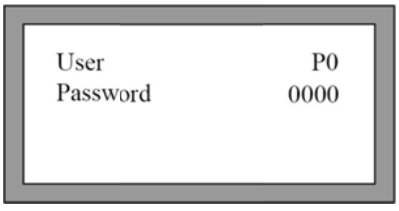


Note:

Interfac s of *Ig*, *Ih*, *Ii* and *Ij* displa y the humidi ier operatin status.

5.3 Setting function of using paramet ers

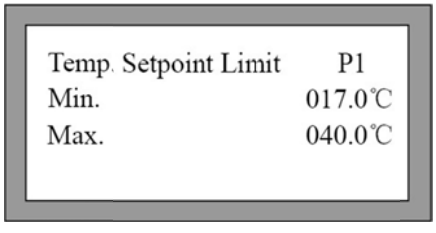
✧ Press the **Prg** button in menu, it nee d password to enter:

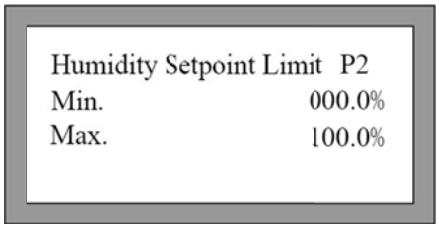


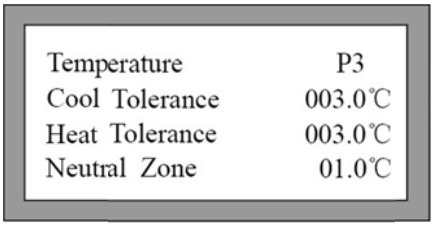
Note:

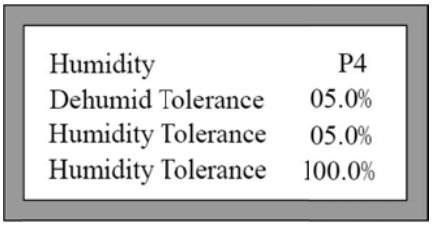
User password is 0002.

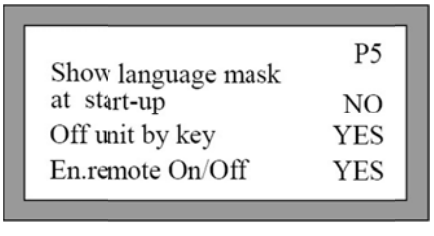
✧ Press **enter** button to enter the temperature an d humidity set point for parameters setting and use **Up** and **Down** to adj ust the para meters setti ng:

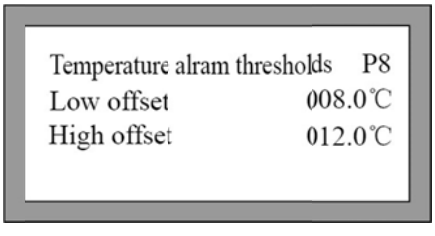


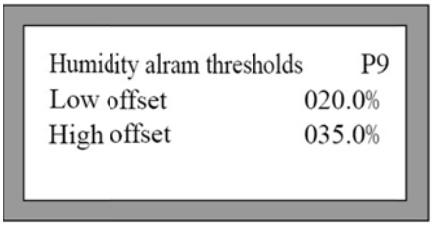


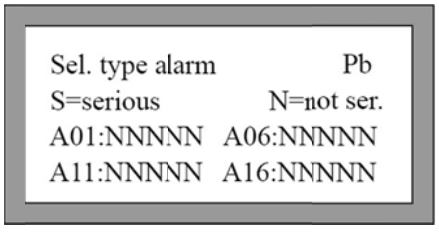


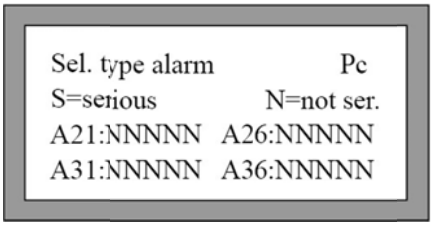


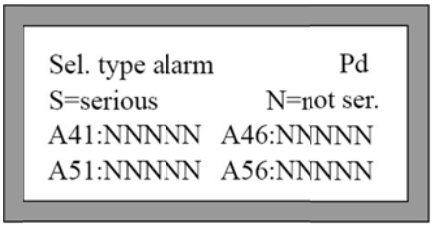


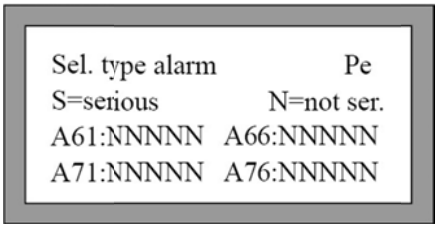


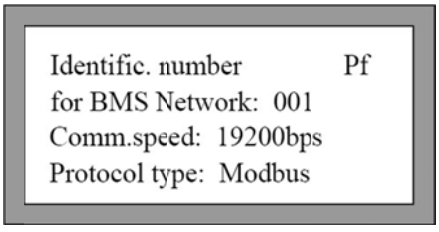


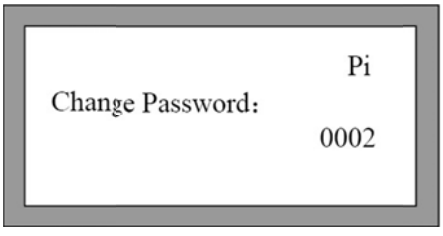


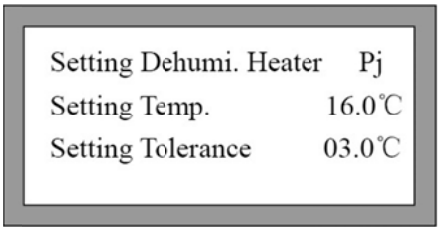












Notes:

Interface *P1* to set the temperature setting range.

Interface *P2*, *P3* and *P4* to set the deviation and dead zone.

Interface *P5* for some special functions activation.

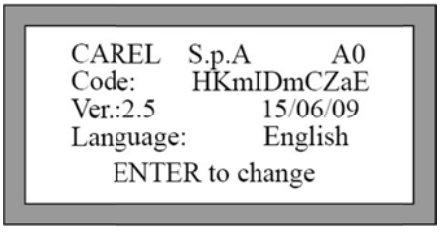
Interface *P8*, *P9* to set temperature and humidity alarm.

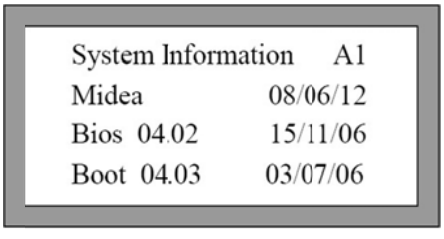
Interface from *Pb* to *Pj* for alarm selection.

5.4 Maintenance management

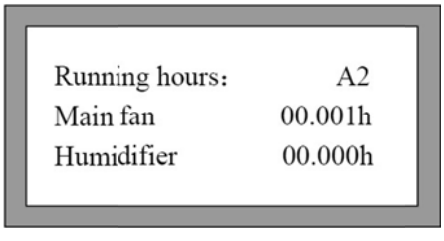
Press the **Maintenance** button, and enter the following interface.

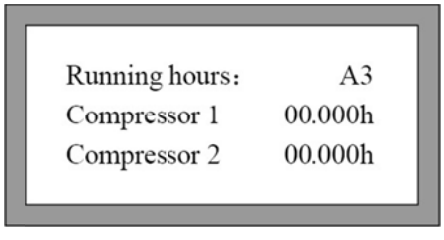
✧ Check the software version and system information:





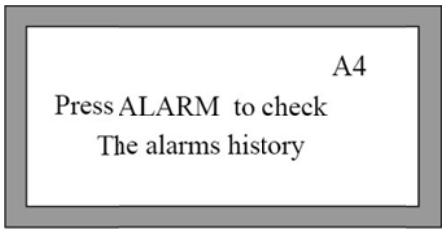
✧ Operating time of hardware devices:

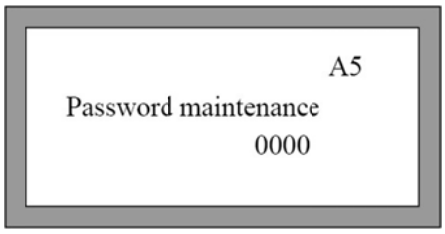


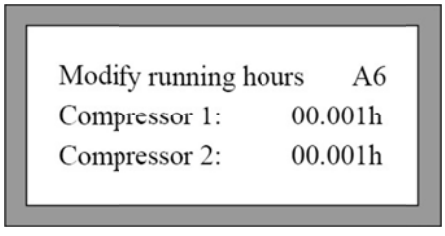


✧ Check the history alarm records and change device operating time:

It must through interface ***A5*** enter to ***A6***. After enter into the interface, it can directly from interface ***A4*** to ***A6***.





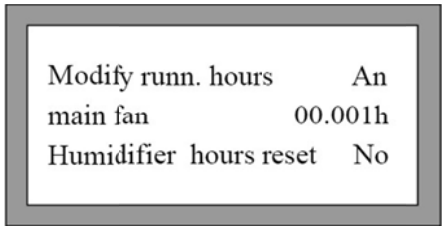


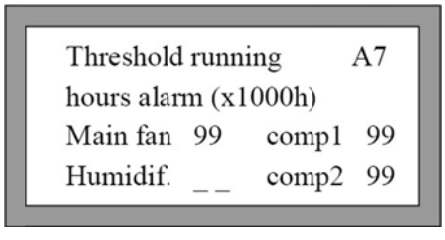
Notes:

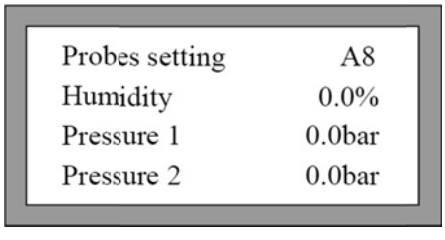
Please contact manufacturer for maintenance password.

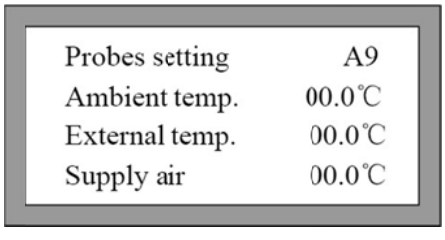
Keep pressing **Down** button, the display screen will pop up Type in maintenance password. By **Up** button to type in password, and then do the calibration setting of relative parameters in system.

✧ Probe calibration:





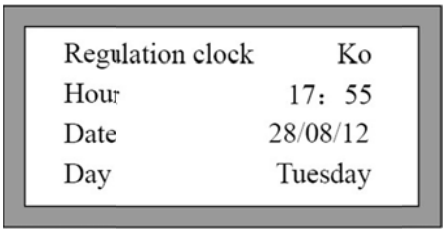




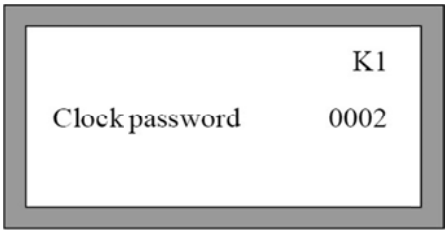
✧ Change the maintenance password:

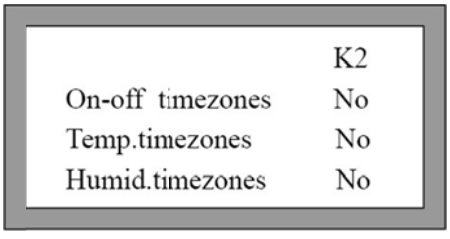
5.5 Clock management

Press **Clock** button, and enter to the following interface, and change the system time of the controller:

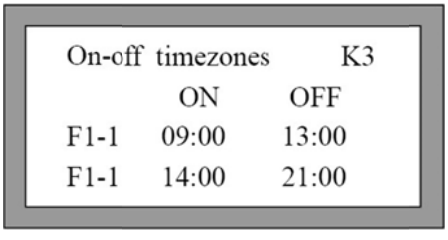


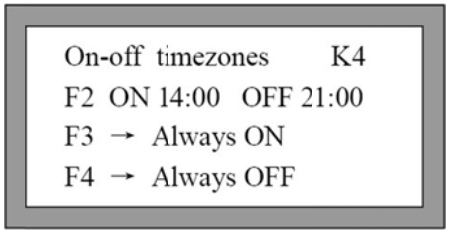
Press **Down** button, enter to ***K1*** interface and type in clock management password **002**. Press **enter** to enter ***K2*** interface, then can use the relative functions of time zone control. In ***K2*** interface there only the corresponding control function selected ***Yes*** then can do the follow up detailed setting.

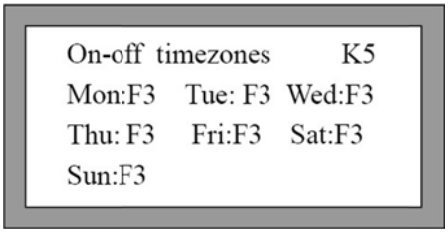


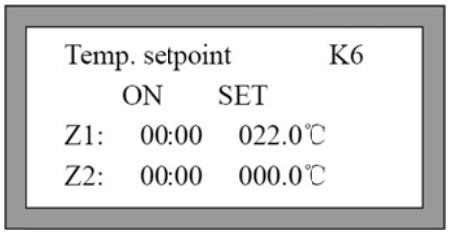


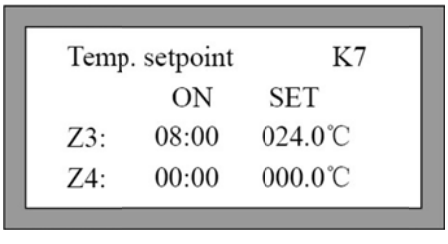
If it is not need the unit to be operated in some periods of a day, and want to close the unit to save energy, then it can set (interface ***K3***, ***K4***) to carry out timer on and off the unit, and it also can set 7 days in a week to be different time zone for controlling (interface ***K5***), which can realize not control by manual every day. Interface ***a*** to change the clock password.

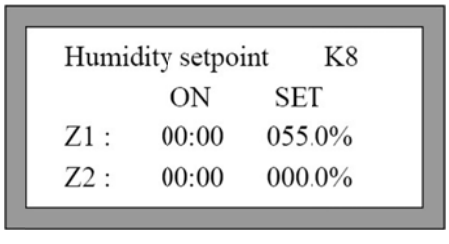


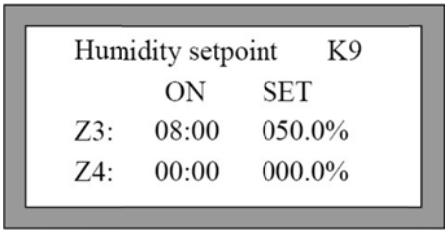


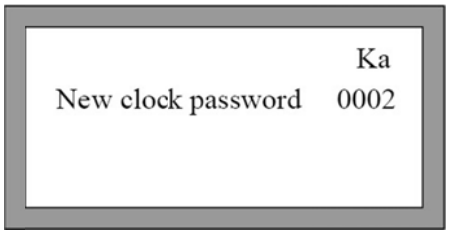










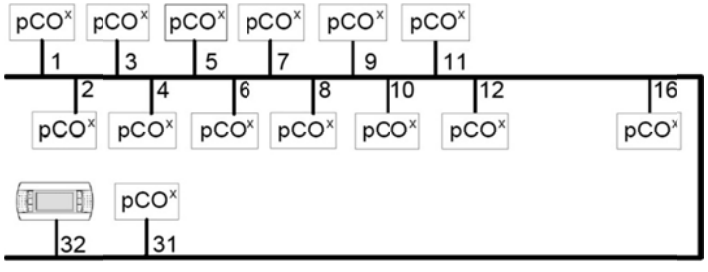


6. Network function introduction

Manual operator and controle r can be co nnected tog ether by RS485 network, to make up the LAN, and re alize the data and infor nation communication and group control functions. The manual operat or can only display info mation of o ne controller in once.

The m anual operator was used in the basic paramter setting, if one or more manual operators be discon nected or broken down, and then each controller will keep normal ope ration, no influence from the manual operator.

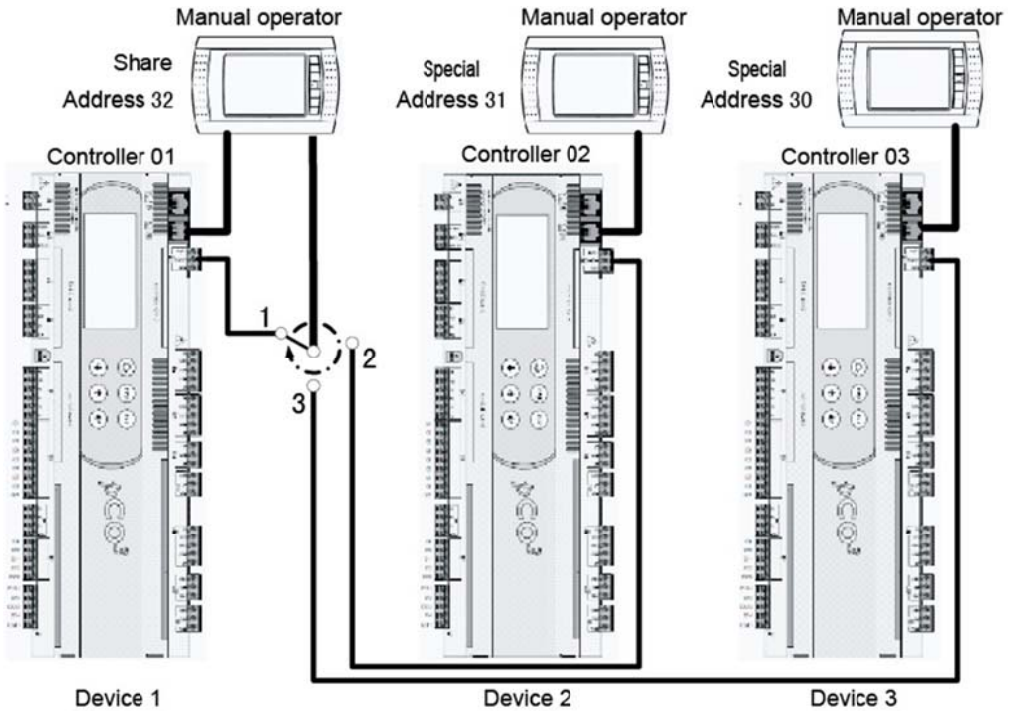
Group control network maxim al connect 32 devicesw (terminal), and these devices include controllers and manual operators. Each d evice has the only iden ified address, the addr ess range is 1~32. Address 32 is only assi gned to ghe manual op erator, and the controller address must be set to 1, then the main unit can only group control the units with the co ntroller address 2~8, and the units with the address 9~31 will not control by the main unit, and keep their single operation state. Units named from 1 to 31 can acce pt the control of the share manual operator.



A cont roller can maximal man ages 3 manual operato rs at the sa me time, bu t can not m anage two kinds of manual operator at the same time. Three manual operat ors can update the information of their c orresponding controller s synchronously, and the corresponding relation:

1. Special (***Pr***), only display the output of this controller.
2. Share (***Sh***), can shift mor e than one controllers b y pressing the **Query** button.

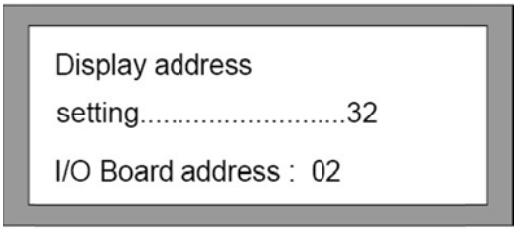
As the following picture show n, one share manual operator linked with three controllers, and only controller 1 can update the display date of the share manual operator and accept input command of manual operator, meanwhile, the other two controller s will contin ue to update the displa y data of the special manual operator. To p ress the Query button of the share manual operator for cir culated shifting (U:01>U:02>U:03>U: 01…). When address 2 and address 3 controllers have ala rm inform ation, their special man ual operator will produce the alarm information, and at the same time also can control the share ma nual operator and prod uce alarm information.



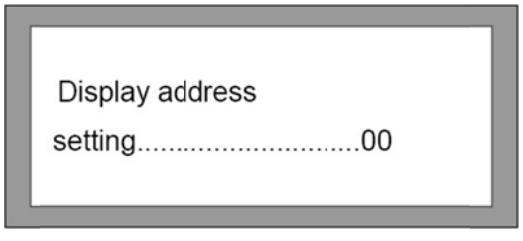
6.1 Group control network setting

According to the previous picture, an example of how to set group control network will be given.

✧ Set the manual operator address of the device 2 to be 0.
Power on the controller, and wait the controller finish operation. Press **Up**, **Down** and **enter** buttons at the same time for 5 seconds to enter the configuration mode, the manual operator display as follow:



Press **enter** button to move the cursor to the ***32*** field, and press Up key to change the manual operator address to be ***00***.

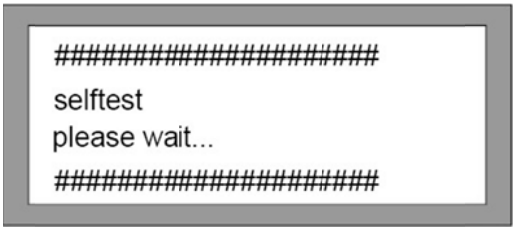


Press **enter** button to confirm the manual operator address changing.

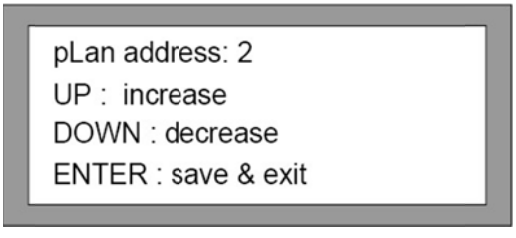
✧ Change the controller address of the device 2.

Cut off the controller power and the connections between J11 port on the controller and other controllers.

Press **Jp** and **alarm** buttons at the same time, and power on the controller, until the screen display the following interface then stop pressing.

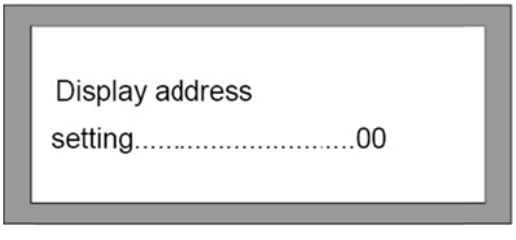


The manual operator will automatically shift to the following display, press **Up** button to set the controller address to be ***2***, and press **enter** for confirmation.

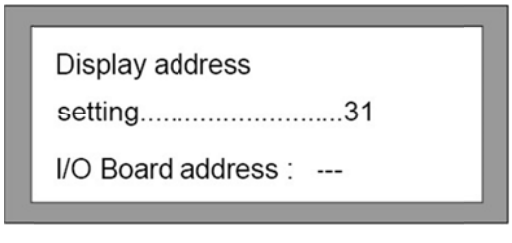


✧ Set the manual operator address of the device 2 to be 31.

Press **Jp**, **Down** and **enter** buttons at the same time for at least 5 seconds to enter the configuration mode, the manual operator display as following:



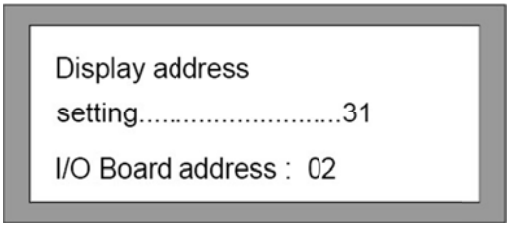
Press **enter** to move the cusor to the ***00*** field, and press **Down** to change the manual operator address to be ***31***.



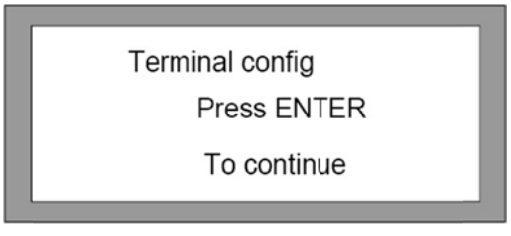
Press **enter** to confirm the manual operator address changing.

✧ Configure the corresponding relation of controller and the manual operator.

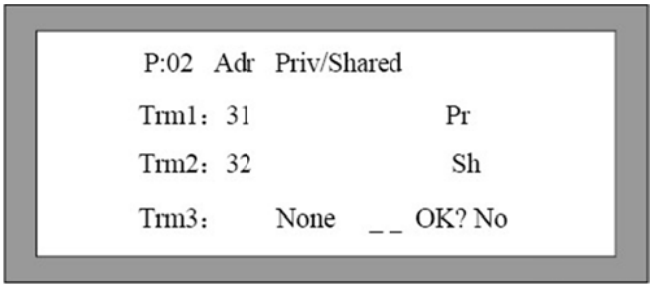
Press **Up**, **Down** and **enter** buttons at the same time for at least 5 seconds to enter the configuration mode, the manual operator display as following:



Press **enter** button 3 times, the screen display as following.



Press **enter** to enter the configuring page for corresponding relation of controller and manual operator, press **Up** and **Down** to select the manual operator address and the corresponding relation of manual operator and controller. Use **enter** button to confirm the setting and move the cursor, the manual operator display as following.



Notes:

P: 02 means that controller address is 02.

Trm1: 31 Pr means that manual operator 1 address is 31, the corresponding relation of manual operater 1 and contoller 02 is special.

Trm2: 32 Sh means manual operator 2 address is 32, the corresponding relation of manual operator 2 and controller 02 is share.

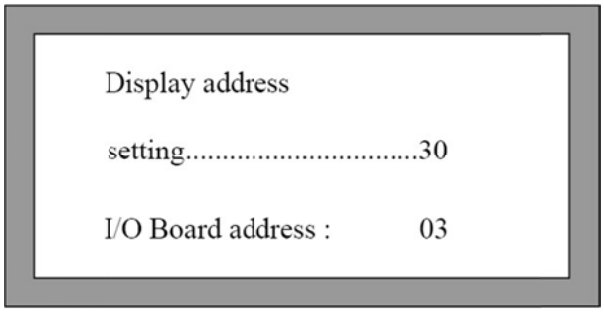
Trm3: None --- means operator 3 address is empty.

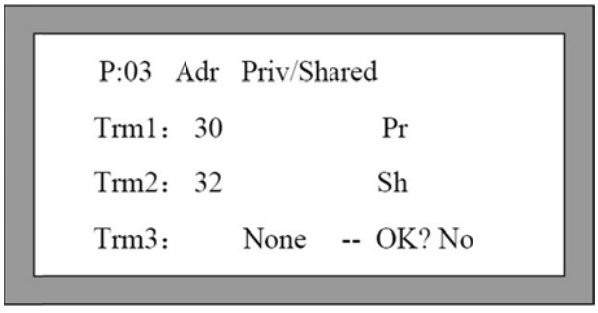
So the controller with the address 02, it is special manual operator address is 31, and the share manual operator address is 3 !.

After setting, press **enter** to move the cursor to the ***No*** field, and change to be ***Yes*** by **Down** button,

and then press **enter** for confirmation, then finish group control network configuration of one device.

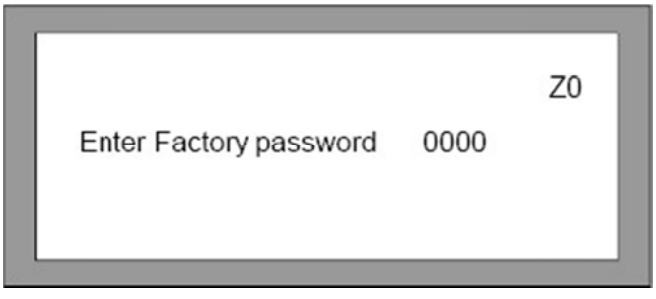
✧ Set the manual operator and controller addresses of device 3 and set their corresponding relation. Repeat same steps for device 3, and set the manual operator and controller addresses. Set the corresponding relation as the following display:





✧ Operations of the manual operator (Address No.32) which connected with device 1, configure the group control function.

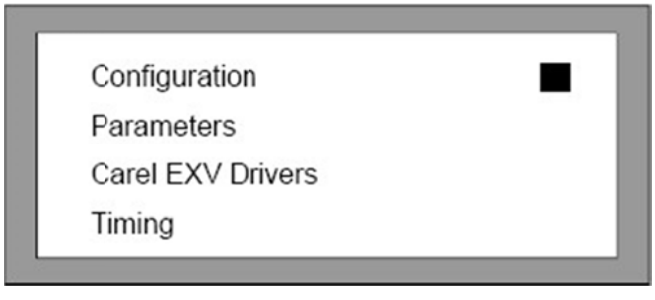
Press **Program** and **menu** buttons together to enter the factory password page. Press **enter** to move the cursor to the ***0000*** field, and type in password by **Up** button. Press **enter** to confirm entering factory configuration.



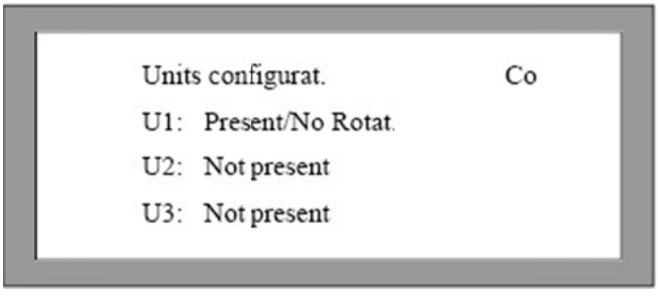
Notes:

Contact manufacture to get the factory password details.

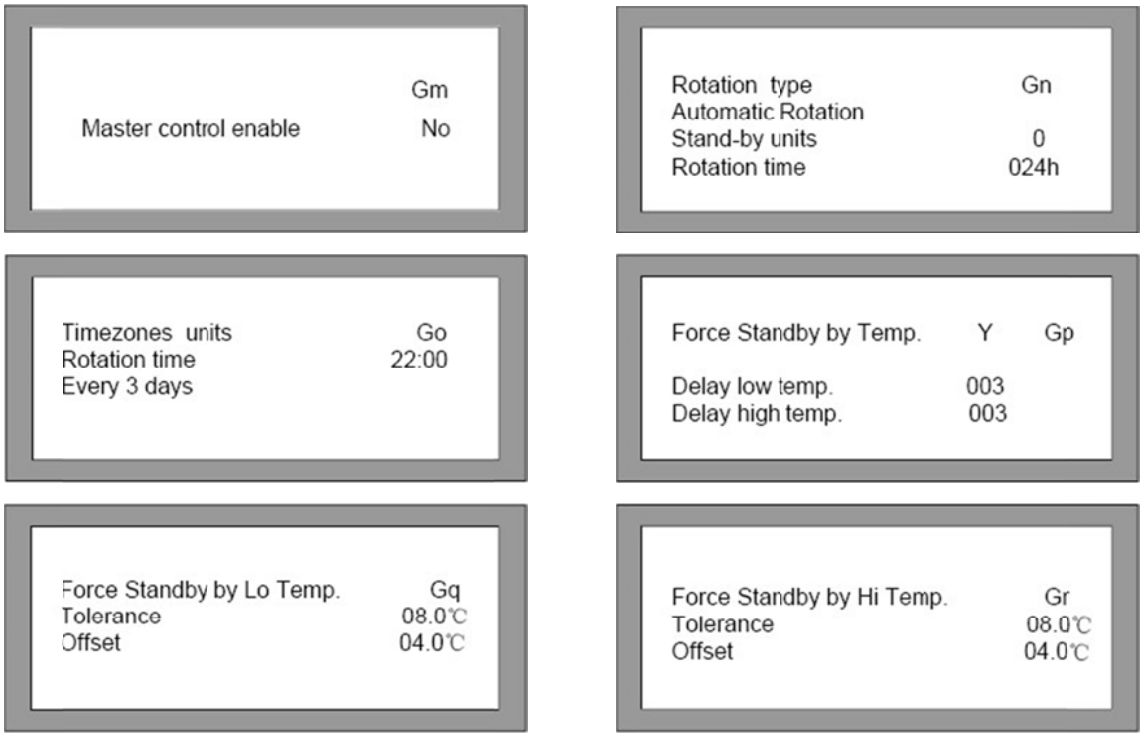
Press **enter** to enter the interface of configuration management.



Find the ***Co*** page by pressing **Down** button, and press **enter** to confirm the setting. Move the cursor, select the relative parameters by **Down** button.



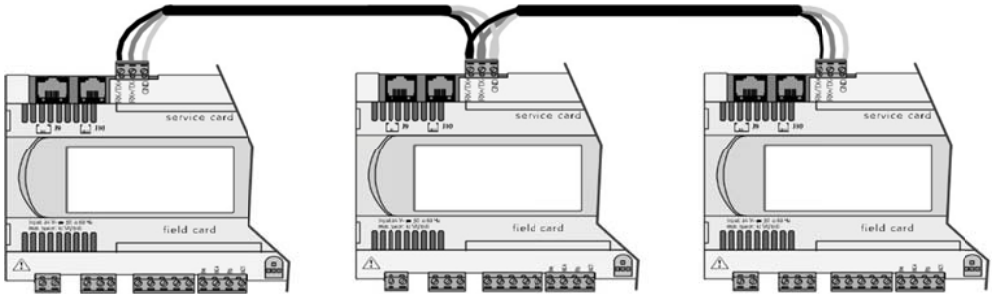
Press **menu** to exit the interface of configuration management, and press **Down** to move the cursor to the interface of parameter management, then press **enter** to confirm entering, and then find interface Gm by **Down** button.



Then the units operate after setting, there are several functions:

1. Conflict management
   Manage by the main unit, and carry out cooling, heating, huidification and dihumidification, avoid to competed operations.
2. Main unit and backup unit shifting
   When there are errors in the units of the group, the backup units will automatically operate, to increase the reliability of the aire conditioning system.
3. Rotation type
   Automatic rotation: The current rotation time set to be ***0*** hour, is used to test the rotation condition, every 5 minuts will carry out one rotation. The current rotation time set to be none 0 hour, the carry out result is the same as running hours.
   Running hours: Ratation as hours (***000~240***h), every 24 hours will carry out one rotation, under this rotation type ,it can not set the rotation time to be ***0***.
   Timezones: Rotation as time zones, carry out on rotation as the setting hour 22:00 of every Wednesday, and set other two rotation type the ***G0*** interface will be displayed, and select other two rotation types the ***G0*** interface will not be displayed.
4. Load adjustment
   The absolute value of difference between ambient temperature and setting temperature is higher than 8°C, then it will operate standby after 3 minutes.
   The absolute value of difference between ambient temperature and setting temperature is lower than 4°C, and then it will close standby.

✧ Wire figure of controller in group control network.
3-core shielding wire (large or equal to 0.75mm^2) is used to connect the controller and the J11 port, which has polarity. It needs to correctly connect Rx-/Tx-, Rx+/Tx+ and GND. The maximum distance of the controller wires should be 500 meters.

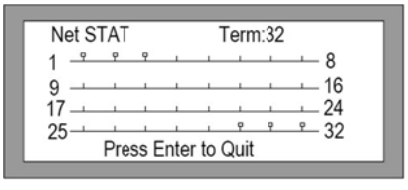


✧ Functional verification for group control network.

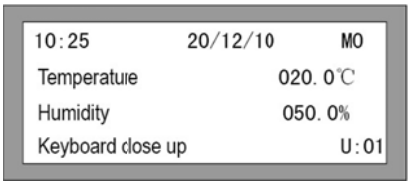
✓ Before verifying the group control network funciton, it needs to confirm all the networking units are noumal when it is operating by single (without shutting down for error).

✓ After configure all the addresses of manual operator and controller in the group control network and their corresponding relations, successively operate main power, controller power and indoor power for every units.

✓ After the controller operation, press **Down**, **Up** and **enter** keys at the same time for at least 10 seconds, then can check the online status of connect devices in the group controller network.



✓ On the manual operator with address No. 32, press **Query** to check the U:01 on the ***M0*** interface whether shift to differents units as : ***U:01***>***U:02***> ***U:03***>***U:01*** ..



✓ Press **on/off** to operate all the units in the network, to check whether the units are under standby status. Press **on/off** to close one of the operated units to check the under standby units whether it will automatically turn to ben on status. And then re-operate the unit just closed to check whether the standby units will back to standby status.

✓ Enter the ***Gn*** interface, choose the rotation type to ***Automaticn Rotation***, the standby quantity to be ***1***, and rotation time set to be ***0***. Check whether the units are under standby status, and whether carry out a rotation every 5 minutes.

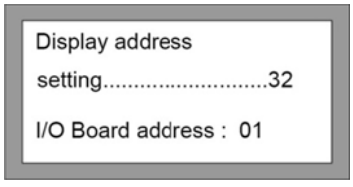
✓ Press **set** to enter temperature/humility setting interface ***S1***, set the setting temperature to lower than the ambient temperature 10°C, then after 3 minutes to check the under standby units whether will automatically turn to be on status. And then set the setting temperature to be the same as the ambient temperature to check whether the standby units will back to standby status.

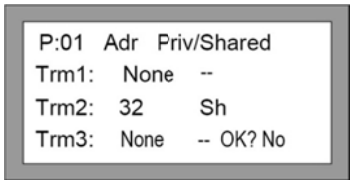
✓ Set the parameters of ***Gn*** interface and ***S1*** interface to be the values required by the actual operations.

✧ Cancel group control network.

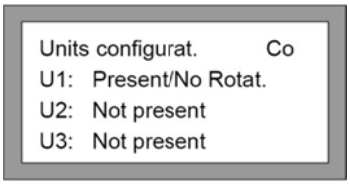
✓ Close the unit. Switch off the controller power and the network connections of controller J11 port and other controllers.

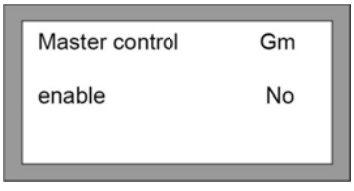
✓ Change the corresponding manual operator address of device 2 and device to be ***32***, controller addresses to be ***01***, and configure their corresponding relation as following:





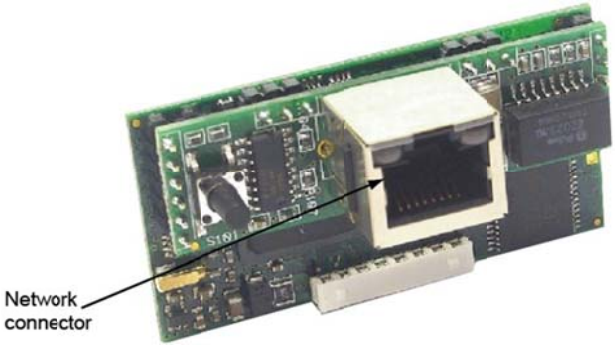
✓ Change device 1 to C0 interface and Gm interface as following:





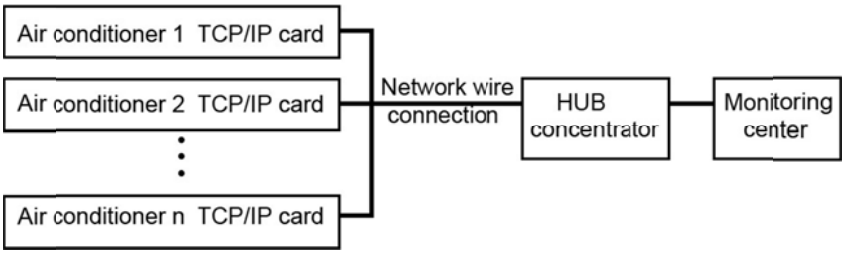
6.2 The ethernet communication card introduction

✧ TCP/IP communication card (Ethernet communiction card)



✓ This card can provide network connector, and also can view the data through the Internet Eplorer. The air conditioner is directly connected with the computer by the ethernet communication card.

✓ The network diagram of theTCP/IP communication card (Ethernet communication card) by SNMP protocol is shown as following picture, and the connecting quantity of air conditioners are no restriction.



✓ Installation of the ethernet communication

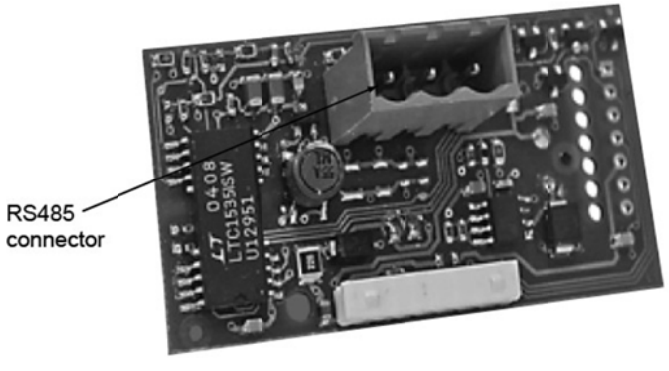
1. The board of TCP/IP card is installed in the pCO* controller.
2. Switch off the main power. Remove the cover of card from the pCO* by a screwdriver.

3. Insert the TCP/IP card in th corresponding plug-in connector, making sure it is sully inserted and in contact with the two supports located on the case of the pCO*. This operation may be difficult due to the limited space, consequently, it is recommended to insert the board at an angle and then turn it until aligning the connectors.

4. Clos the cover again, using the cover supplied with the board of TCP/IP card, lining up the connector on the serial board with the opening in the cover.

5. Stick one or both label, so that the MAC address can be read without needing to open the electrical panel.
6. For the connection to the ethernet network, use an S/FTP cable, category 5e or higher.

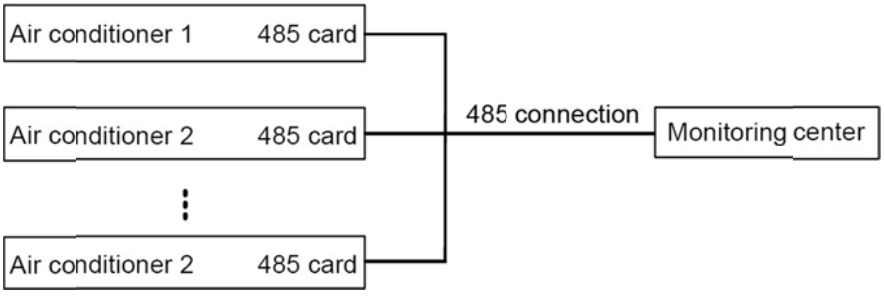
✧ RS485 communication card



✓ RS485 communication card is as shown in following picture. The RS485 card also can provide network connector, and also can view the data through the Internet Explorer by connecting R232/R485 converter.

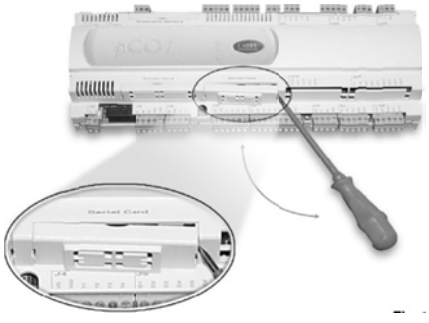
✓ The network diagram of RS485 communication card is as shown in following picture. It can connect maximum 200 sets air conditioners, and the longest R485 connecting wire which use

shielding cable is 1000m.

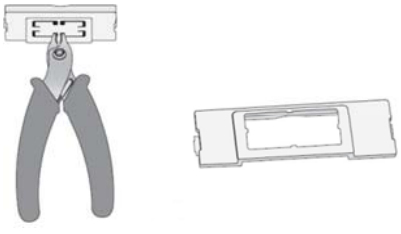


✓ Installation of RS485 card

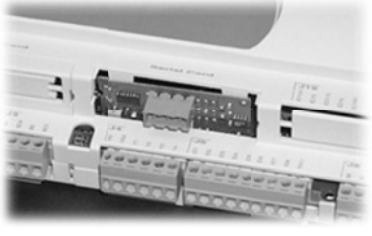
1. Remove the serial card placement cover with a screwdrive.



2. Remove the pre-punctured plastic, the hole which corresponds to the tree-pole terminal out will be found.



3. Insert the optional card into the corresponding connector, taking care that the card is firmly placed on bothe plastic supports on the pCO case.



4. Close the cover using the screwdriver making the outside card terminal fits with the punched hole made on the cover.

5. The connection with the RS485 network is carried out by means of the plug-in terminal

connector on the card.

6. There is a table of Pin-wiring of the connector stamped on the card.

Pin	Significato meaning
1	GND
2	RX+/TX+
3	RX-/TX-

7. Maintenance

7.1 Electrical maintenance

According to the following items to check appearance of the electrical connections and do the relative handlings. Before fastening any assembly connections and circuit connections, it must ensure that the power supply of the control element has been closed.

- ✧ The electrical insulation test: find out the unqualified contacts and handle them. During the rest process, pay attention to disconnect the control part of the safety or air switch, to avoid high voltage damaging the control panel.
- ✧ Static detect the suction port of each contactor is flexible or not, and whether there is card resistance.
- ✧ Use a hairbrush or dry compressed air to clean dust for the electrical and control components.
- ✧ Check the suction port of the contactor whether has arc discharge and burn mark phenomenon. When it is serious change the corresponding contactor.
- ✧ Tighten each electrical connecting terminal.
- ✧ Check whether the plug-in quick connectors whether contact well, if there is any loose condition it should be replace the terminal.

7.2 Control maintenance

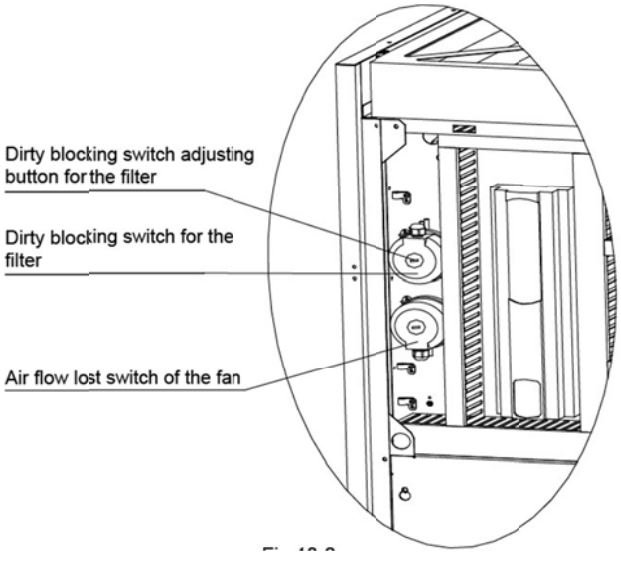
According to the following items to do the appearance check, simple function test of the electrical connections and do the relative handlings. Before fastening any assembly connections and circuit connections, it must ensure that the power supply of the control element has been closed.

- ✧ Check the appearance of the power transformer and isolated transformer, and detect the output voltage of indoor unit and outdoor unit.
- ✧ Detect the surfaces of control connector panel, display panel, sensor panel and safety panel whether there has obvious ageing.
- ✧ Clean the dust, dirt on the electric control elements and control panel by hairbrush with the electronic cleaning agent.
- ✧ Check and tighten control each input and output plug-in connector of the control connector panel, including the connection of display panel and control connector panel as well as the connection of the control connector panel and temperature/humidity sensor panel.
- ✧ Check the connection of the wiring terminals (J10, 01/45, 01/47, 01/48, etc.) and controller connector panel.

- ✧ Check the output connection between the control connector panel to each contactor, liquid pipe electromagnetic valve, and the input connection between the control connector panel to fan overload protection device, high/low pressure switch, heating thermal protection switch, filter screen clogging switch and air flow switch. It should be focusing on checking the terminals of high/low pressure switch and electromagnetic valve, if there appear loose, poor contacting conditions then it should be replaced immediately. Replace the control fuse (or air switch), control panel, electric components which have existing problems.
- ✧ Check the control wiring between the indoor unit and condenser or the specification of power wire and the ageing situation, when necessary, replace the wires.
- ✧ Use temperature and humidity measuring instrument with higher measuring precision to check, calibrate the reading of the temperature and humidity sensor. During the calibration of the humidity sensor, pay attention to select the humidity control way to be relative humidity control.
- ✧ Check the external sensors:
  1. Fireworks detector (If installed)
     Fireworks detector is located on the wind power base panel of the upper air out unit and the top of the lower air out unit. It continually does the analysis judgment through collect the return air sample, and it does not need to adjust.
  2. Water leakage detecting sensor
     Water leakage detecting sensor contains a pair of dry contact switch, and when a pair probe of the switch detect the water (or other conductive liquid), this switch is closed immediately. The sensor should be placed far away from the wet tray or floor dewatering places, and from the unit about 2 to 2.5 meters. It shall not directly install under the unit.

7.3 Filter screen maintenance

- ✧ To ensure the reliable operation, the filter screen must be monthly check and change as requirement. The position of filter screen clogging switch and air flow switch. The display positions in the following figure are for reference only, due to the different model, and the specific locations may be different.



- ✧ Shut off the power before changing the filter screen. If change the same type of filter screen, it do not need to reset the filter screen clogging switch, otherwise, it needs to calibrate the setting of

the filter screen clogging switch. The filter screen clogging switch is located in the electric control box, and collect the large air pressure and filtered air pressure through the white soft hose, and the filter screen clogging switch to compare the two pressure difference to judge the output.

✧ When installs different type of filter screen, in order to accurately find emergency alarm, it must install all the panel of the device in places and keep closed. Under the fan is operating, as the anti-clockwise direction to rotate the setting knob of the filter screen clogging switch, to make the switch contact the filter alarm, and then as clockwise direction to rotate the 100Pa deviation pressure, and then install the plastic protective cover of the filter screen clogging switch in place.

Notes:

1. **Setting point shall be appropriately, and can not deviate too much, or it will due to dirty filter screen and cannot trigger the alarm, and then cause the small system air volume and lead to abnormal operation of the system.**
2. **To change different type of the filter screen and adjust the setting, it should be confirmed by manufacture.**

7.4 Indoor fan components maintenance

Periodically check the fan components, including: belt, motor frame, fan bearing and impeller. The motor and installation panel are integration design and use bolts to fix on the installation panel. After a period of using, it should be check whether the bolts are loosened. If they are loosened, they should be promptly tightened.

✧ Fan bearing and impeller

It should be regularly check whether the fan and fan spindle are installed firmly or not. Turn the fan impeller to make sure it cannot clash the scroll shell. Use the bearing of this component is permanently sealed and self-help lubricated. During regulating the belt, it should be examined for the attrition phenomenon. Turn the belt pulley to check the rotating condition of the fan spindle. If it was found to have any big movement, then needs to replace the bearing.

✧ Belt

Use the belt tension meter to detect the tightness of the belt. Or in the connection center of motor wheel and fan wheel to tight the belt, it should has 1/2'~1' displacement. If the belt is in damage or deformation status, use the same type of belt for replacement.

✧ Motor

When the motor appears abnormal sound, burned etc, factors to make invalidation, needs to be changed, for upper air supply unit. It should pay special attention for safety. It must use special tools to hold the motor and then dismantle fixed the bolt of motor base.

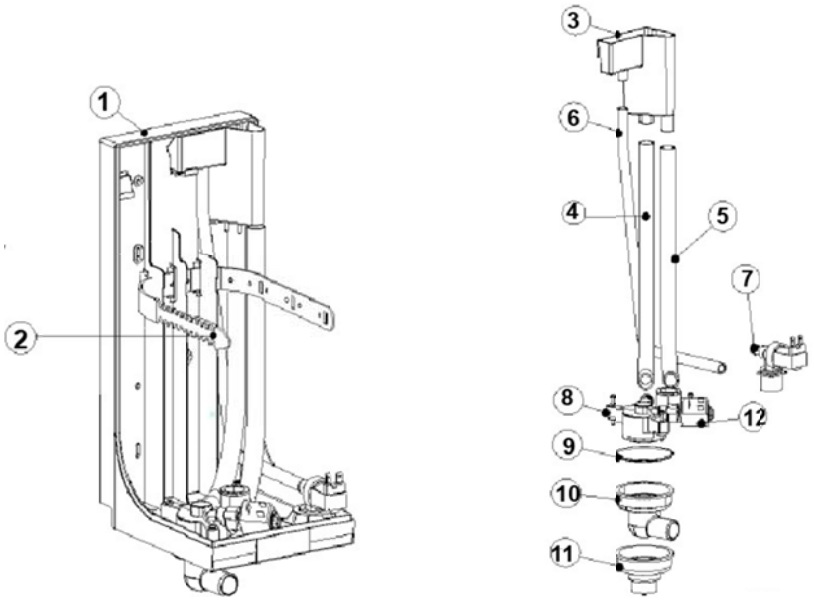
7.5 Humidifier maintenance

During the normal operation of the humidifier, articles such as mineral salt will gradually deposit and form scales on the internal wall of the humidifier tank. These scales must be regularly cleared, which can guarantee the efficient operation of humidifier. Because of different water qualities, the cleaning time should be based on the local specific situations. It is suggested to check monthly.

✧ Please do not use cleaning agent and solvents to clean the plastic components.

✧ Use materials which contain 20% acetic acid to remove the scales and residue in the water.

✧ Instruction of the steam humidifier component parts which need to maintain.



Item	Name
1	Support frame
2	Water supply tank + Conductivity meter
3	Water inlet flexible pipe of humidification tank
4	Water inlet solenoid valve (24V AC)
5	Gasket
6	Straight-water drainage connector
7	Humidification locking belt
8	Overflow pipe
9	Water inlet flexible pipe of water supply tank
10	Water supply connector (Connect to humidification tank.)
11	90° angle water drainage bend
12	Water drainage solenoid valve (24V AC)

✧ Maintenance methods

1. Humidification tank may be hot, so firstly cool the humidification tank or use protection gloves before operation.
2. After broke off the connection of the cable and pipes, dismantling the electromagnetic valve, and check the status of the inlet filter. Check whether it is necessary to use water and soft brush for cleaning the filter.
3. Check whether there are solid adhesives in the humidification tank, and remove the impurities. Check the seal O-shape ring whether has been damaged or broken, if it has any damage or broken, replace it.
4. Disconnect the power supply, and take down all the sensors, then unscrew the bolt and valve body, to remove all the impurities and clean it.
5. Check the water supply tank whether has any obstacles or solid particles. Check whether the conductivity probe is clean or not, and remove all the impurities and clean it.
6. Check these pipelines whether it was cleared and no impurities. If it has any impurities,

remove all the impurities and rinse off.

- ✧ Disassembling the humidification tank
  1. Press the **Manual dr inage** button to empty the water in humidifica ion tank.
  2. Close the unit, and s vitch off the power supple for safety operation. Open and take down the cap.
  3. Take down the steam pipe from t op of the humidification tank.
  4. Break off the electrical wirings from the top of the humidification tank.
  5. Loosen the fastening devices of umidification tank, the n lift it and take it down.
  6. According to the reverse order of above steps to install a new humidification tank on the humidification.
- ✧ Clean the humidification tank
  1. Take down the humidification tank, and use cross-screwdriver to screw open the connecting screws of the clamp i n the middle of humidifi cation tank.
  2. Take off the fixed cla mp, and vertically take out the humidification tank core b ody from the humidification tank.
  3. Place the humidification tank co e body into acetum with 20% density, waiting for scale to loose, and wash awa y all the scales carefull y by a soft hairbrush.
  4. After cleaning, install the humidification tank core back t o the humidification tank, and fasten the connecting clamp.

7.6 Electrical heating components

Check the rust situation of lectrical heating components, an d use iron brush for de-rusting, or according to the situation for replacement. The i nternal circ uit of the electric heating internal combi nation has tandem con nect two te mperature s witches. When there is heating demand but has no heating effect, then it should check whether the te mperature switches have been reset.

7.7 Refri eration system

It must monthly check the components of the refrigeration system, to view whether the system function is normal and has any sign of wear or not. For it was often accompanied by the corres onding errors before the components fail or devices damage, so regular inspection is the main easure to prevent most system failures. Refri erant pipe must have the suitable bracket, and should not rely on the ceiling, floor and fixed frame vibration place. Check the refriger nts pipeline every six months, make sure whether the y were worn or the existed fixing structure has loosen or not. Each system is equipped with a liquid sight glass for observi ng liquid re rigerant flo w and water

situation of the system. When the water content of system is more than the standard, the liquid sight glass basic color will change from green to yellow. When the refrigeration system has malfunction, judge the error according to some operating parameters of the system.

- ✧ When the suction pressure drops to below the set value of low pressure switch, it could lead to the compressor stops. On the other aspect, high suction pressure also can be reduced to cool the compressor motor, which may cause compressor damage.
- ✧ Discharge pressure may be increased or decreased for the load conditions or the efficiency of the condenser. When the discharge pressure reaches the setting value of the low pressure switch, the high voltage switch action will make the compressor stop.
- ✧ Thermal expansion valve can adjust the suction overheat degree. The suction overheat degree has great influence for the using life of compressor, if the compressor operates on the situations of too small or no suction overheat degree for long time, it may be directly led to compressor produced liquid strike, which will crush the scroll compressor. Follow the below operations to confirm the suction overheat degree of system:
  1. Measure the suction wall temperature in the thermal expansion valve temperature sensing position.
  2. Take the compressor suction pressure sample from the needle valve of suction pipe.
  3. Estimate the pressure difference between the temperature sensing position and the needle valve of suction pipe.
  4. The sum total of above two pressure plus one local standard atmospheric pressure value, then find out the corresponding saturated temperature of the saturation pressure.
  5. The suction overheat degree is the difference of the suction temperature and this saturated temperature.

7.8 Compressor monitoring and replacement

This precision air conditioning system uses high efficient scroll compressor, which has high reliability. If the project construction strictly accord with the correct program operations, then the probability of failure which appears in operation process is very small.

- ✧ If the problems which may result in compressor error can be early detected and corrected, then most of the compressor errors can be avoided. So it is suggested that customer should regularly contact the service of manufacture to do compressor operation state test, and do the monitoring records.

  During the compressor monitoring, check whether all electrical components of compressor are running normally.
  1. Check whether the corresponding air switches and contactor of the compressor are sensitive and normal.
  2. Check whether the high and low pressure switches are sensitive and normal.
  3. Check whether the upper discharge temperature switch of the compressor has been fixed reliably and done the thermal insulation.
  4. Check whether the compressor wiring terminals resistance value is normal and the grounding insulation is normal.
- ✧ If for neglecting the inspection or other reasons to cause the compressor error, then before changing the compressor it must be carefully do the fault analysis, the common errors mainly to be the following two aspect:

1. Mechanical error

   The mechanical error of compressor is mostly because that during the installation process it is not strictly accorded to the operation guidelines, and the system refrigerant leakage and improper trial run in the process of the construction and operation, and then cause the compressor return liquid operation in long term.

   Under such cases can lead to the compressor internal temperature over high, and mechanical error including in the scroll badly worn, scroll jammed, and so on. For external performance, the motor inside compressor resistance may be normal, but large noise will be produced after the compressor start. When the error compressor starts, the pressure difference between compressor suction and discharge ports is zero. If it is confirmed that there are mechanical errors, then it must to replace the compressor.
2. Electrical error

   The compressor electrical error mainly is that the compressor was burned and the wiring terminals are blew out. Under this case, after power on the compressor, compressor still is without any response. At this time, it should cut off the electricity, and then open the compressor wiring box for visual inspection or using a multimeter to check the compressor resistance. If there is any electrical error, it is necessary to change the compressor.

✧ When compressor happens to completed burned, replace compressor and it also should be replace drier-filter, and check the expansion valve. If there is any error, it also should be replaced. Before the replacement, clean the system is necessary by right method. When changing the compressor the skin must be avoided to directly contact with the refrigerant or lubricating oil, otherwise it will cause severe frostbiting the skin, and it must wear protective gloves for handling the contaminated components. After replace the compressor it must do serious analysis and exclusion of the compressor error reasons, otherwise it may lead the new compressor to be burned again.

1. Cut off the power supply.
2. Separate insert the suction pipe needle valve and discharge needle valve on the low pressure and high pressure connectors of the pressure gauge, and to release the refrigerant.
3. Disconnect the electrical connection of the compressor.
4. Loosen the threading connectors in the suction pipe and discharge pipe of the compressor.
5. Remove the error compressor.
6. If the compressor was completely burned, it should clean the refrigeration system pipelines, and replace the drier-filter and liquid sight glass.
7. Install the new compressor in place, and connect the pipeline connectors and electrical circuit well.
8. According to the requirements of the debugging to vacuum the system and add refrigerant.
9. As the normal trial run to power on the system, check whether the system operation parameters are normal. Through the liquid sight glass to observe the refrigerant status, and combining with the system pressure and temperature parameters to confirm the adding amount of refrigerant, until the system runs normally.

7.9 Outdoor fan maintenance

Check whether the fan operates normally, noisily, vibrates or blocks the bearing, etc.

8. Trouble shooting

When the system is suddenly having a demand, but there is a failure or invalidation which led to non-workable, and then it cannot meet environmental needs. So it is necessary to periodically do the functional test for the system components. Controller provides field manual opening and closing function for all parts, and use for self-detecting the functional components' states of the system. Detailed operations can be checked by system self-diagnostic function.

During the device operation, the internal unit may have a deadly high voltage. It only allow specialized technical person to do the unit maintenance operation, and must be especially careful during the troubleshooting with electricity.

✧ Common faults and handling methods of indoor fan

Symptom	Probable reason	Check items or handling methods
Fan no working	No main power supply	Check the voltage between A, B, C.
	Overload, air switch is broken off	Manual reset, check the average current value.
	Contactor cannot contact together	Check whether has 24V AC voltage between 28 and 03. (Wire numbers) If it has, then the contactor has error, change it.
	Control panel error	Check whether has 24V AC voltage between 28 and 03. If not, the control panel has error.
	Air flow lost switch alarm (activate)	Check whether the belt has loosened or fan motor has error, if not, then check whether the air flow collecting plastic pip has abnormal position.
	Fan error.	Replace it.

✧ Common faults and handling methods of dehumidification system

Symptom	Probable reason	Check items or handling methods
No dehumidification effect	System does not require carrying out dehumidification.	Check the control system status.
	Contactor of compressor cannot contact together.	Refers to refrigerant system handling methods.
	Compressor does not operate, the air switch broke off.	Check the air switch, contacting points, check the air switch voltage.
	Dehumidification solenoid valve error	1, Check whether has 24V voltage between wire 33 and wire 03. 2, Check whether reliable installs the wires and valves.

✧ Common faults and handling methods of humidification system

Symptom	Probable reason	Check items or handling methods
No humidification effect	No water filling in the humidification tank or low filling water pressure.	Check the water source.
		Check the water inlet solenoid valve is open.
		Check whether the water inlet pipe has blocked.
	No humidification requirement.	Check manual operator.
	No 24V AC input at controlling sire side of humidification contactor.	Controller error.
		Wiring from controller to the humidification contactor controlling wire port is loose.

✧ Common faults and handling methods of heating system

Symptom	Probable reason	Check items or handling methods
Heating system does not operates, contactor do not contact together.	No heating requirement.	Check the controller status.
	Heating temperature controller is broken off and not reset.	1. Wait for the controller reset. 2. Change a new controller.
The contactor contacted together, but no heating effect.	Heater error.	Turn off the power, check the heating pipe and wire.

✧ Common faults and handling methods of refrigeration system

Symptom	Probable reason	Check items or handling methods
Compressor cannot run.	Power off. (Off the unit.)	Check the main power switch, fuse and connecting wires.
	Power overload and the air switch broke off.	Manual reset, check the current and air switch.
	Electrical circuit connection is loose.	Fasten the connection.
	Compressor wire circuit has burnt.	Check the compressor terminal.
	The built-in protector of compressor has broken off.	Check whether the compressor wire circuit is open. If open, cool down the protector, then automatically reset.

Symptom	Probable reason	Check items or handling methods
Compressor cannot run.	Power off. (Off the unit.)	Check the main power switch, fuse and connecting wires.
	Power overload and the air switch broke off.	Manual reset, check the current and air switch.
	Electrical circuit connection is loose.	Fasten the connection.
	Compressor wire circuit has burnt.	Check the compressor terminal.
	The built-in protector of compressor has broken off.	Check whether the compressor wire circuit is open. If open, cool down the protector, then automatically reset.
	The contactor cannot contact together. No 24V voltage input for the compressor control wires. Or not reach the operating conditions of compressor.	Check the manual operator parameters setting correct or not. Check whether the controller is error, or wiring from controller to compressor port is loose.

Symptom	Probable reason	Check items or handling methods
Air suction and exhausting pressure have no difference after operation.	Reverse the compressor or inner air mixed up.	When the compressor was reversed, change any two L wires. Inner air mixed up, change the compressor, Check the leakage and maintain, and add refrigerant, change the drier-filter.

Symptom	Probable reason	Check items or handling methods
High air exhausting temperature	Refrigerant leakage.	Check whether the leakage and maintain, and add refrigerant.

Symptom	Probable reason	Check items or handling methods
High air exhausting pressure	Condenser has been blocked.	Clean the condenser.
	Condenser fan cannot run.	1, Check the wiring was correct or not. 2, Check whether it has 3~10V DC between wire 22 and wire 05. If has, the outdoor inverter is error. And if no, check the indoor unit controller.
	Too much refrigerant adding amount.	Fasten the connection.

Symptom	Probable reason	Check items or handling methods
Low air suction pressure or return liquid.	Lack of refrigerant in system.	Check the leakage and maintain, add refrigerant.
	Air filter too dirty	Change the air filter.
	Drier-filter is blocked.	Change the drier-filter.
	Non-correct overheat adjustment	Strictly accord to the adjustment steps to adjust the thermal expansion valve.
	Expansion valve error.	1, Check the temperature sensor and the balance pipe whether have leakage. 2, Check the expansion valve whether has serious frosting.
	Condensed pressure too low	Check the fan operates normally or not.
	Belt creep	Check the belt and adjust it.

Symptom	Probable reason	Check items or handling methods
Large compressor noise.	Return liquid.	Refers to Low air suction pressure or return liquid.
	Lubricating oil lost and cause bearing damaged.	Add the lubricating oil.
	Compressor or pipe line is loose.	Fasten the connection.

✧ Common faults and handling methods of outdoor fan system

Both error and alarm are the abnormal working states of inverter. But there are different. Inverter will self-check during operation. If there is error, the inverter will display error code, and cut off

the inverter output to stop the motor and make it stay free running condition. If there is alarm, the inverter will display alarm code, and will not cut off the inverter output during alarm state, the motor still be controlled by the inverter.

Many methods of inverter error reset: Press the **Reset** button in keypad of inverter, reset function of terminals, or if necessary, power off the main power for a while then can reset the error. If error has been solved, the inverter will recover to normal operation. If error still not has been solved, the inverter will trip out again.

The alarm reset of inverter only effect by operate the **Esc** button in keypad of inverter.

When no display after power on:

1. Use the multimeter to check whether input power of inverter is same as the rated voltage.
2. Check whether the ***Charge*** lamp whether lights up.
3. If the above are normal, then maybe the power switch has error.

When the inverter does not run after the motor operation:

Cut off the connecting wire between inverter and motor, operate the inverter in 50Hz, and use multimeter to check whether there is equivalent AC between U, V and W. Use simulate voltage meter for measurement (the range is AC500V). If there is not equivalent voltage or no voltage, then the inverter had been damaged.

Notes:

Between U, V and W are high –frequency impulse.

Code	Type	Error reason	Solutions
E001	Over current error, current is higher than 150% of Maximum current.	Speed up and down times too short.	Extend the speed up and down time.
		The inverter power is too small	Select a large power inverter.
		Voltage is too low.	Check the input voltage.
E002	Power module error	Speed up and down time is too short.	Extend the speed up and down time.
		The inverter output side is short circuit.	Check the insulation of motor.
		Power module is damaged	Replace the module.
		Outer disturb.	Find out disturb and eliminate it.
E003	Bus overvoltage error, the value is more than 570V.	Speed down time is too short, regenerated energy too large.	Extend the speed down time.
		Voltage is too high.	Check the input voltage.
		Load inertia is too large, regenerated energy too large.	Select a large power inverter.
E004	Bus voltage error, the value is less than 171V.	Voltage of power supply is too low.	Check the input voltage.
E005	Motor load error, the motor current is higher than standard inverter current.	Voltage is too low.	Check the input voltage.
		Load inertia is too large.	Check the load inertia, adjust torque lifting capacity.
		Not correct standard current setting of motor.	Reset the standard current of motor.

		The inverter power is too small.	Select a large power inverter.
E006	Inverter overheat error, the temperature is higher than 90°C.	Ambient temperature is too high.	Check the ambient temperature.
		Ventilation of inverter is not well.	Improve the ventilation environment.
		Cooling fan error.	Check the cooling fan work or not.
		Temperature detection circuit error.	Replace the detection.
E007	Soft start error	Soft start circuit or contactor is damage.	Replace soft start.
E009	Output with lack of phase error	Current of 3-phase output side is asymmetric	Check the output connecting wire and motor insulation.
E010	Out device error	Out error signal input terminal activates.	Check the outer error reason.
		The stop key is set to be emergency stop.	Check the stop key.
E012	Current detection circuit error	Current detecting components are damaged.	Replace the detection.
E013	EEprom read and write error	Control panel components of inverter are damaged.	Change the inverter
		Outer disturb.	Find out disturb and eliminate it.
E015	CPU disturb error	Outer disturb	Find out disturb and eliminate it.
E030	Error alarm	This is an alarm; the inverter output will not stop.	Press **Esc** key to exit the alarm status.

9. Accessories

Indoor unit

Name	Quantity	Shape	
User's manual of indoor unit	1		
Installation frame for water leakage sensor	1		
Switch panel component	1		
Door key	1		(Placed on the door plate.)

Outdoor unit

Name	Quantity	Shape	
User's manual of outdoor unit	1		
Bottom components	4		For horizontal install
Screws components	24		For horizontal install

Annex I: Alarm table

Alarm display	Result	Probable reason
Low pressure compressor 1	Switch off the compressor 1.	10s after the low pressure switch is trigged.
Lose of airflow (Serious Alarm) UNIT OFF	Switch off the unit	10s after the airflow switch from close to open.
Main fan overload(Serious Alarm) UNIT OFF	Switch off the unit	Indoor fan motor protector acts.
EL heater1 overload	Switch off the E-heater 1	The overload protector of E-heat 1 acts.
EL heater2 overload	Switch off the E-heater 2	The overload protector of E-heat 1 acts.
Fire / Smoke detected(Serious Alarm) UNIT OFF	Switch off the unit	Fire/smoke protector acts.
Power alarm	Switch off the unit	Phase sequence protector is trigged.
High room temperature		It keeps 10s after difference between Ta and Ts is higher than design value. The unit will alarm.
Low room temperature		It keeps 10s after difference between Ta and Ts is lower than design value. The unit will alarm.
High room humidity		It keeps 10s after difference between Ha and Hs is higher than design value. The unit will alarm.
Low room humidity		It keeps 10s after difference between Ha and Hs is lower than design value. The unit will alarm.
Operating hour threshold reached for compressor 1		Only remind, need to cancel alarm.
Operating hour threshold reached for mail fan		Only remind, need to cancel alarm.
Room temperature probe faulty or disconnected	Switch off E-heater and compressor	a、 When Ta is lower than -30°C and keeping 60s, alarms and switches off all the E-heater. When Ta is lower than 50°C, 999.9°C will be displayed. b、 When Ta is higher than 80°C and keeping 60s, alarm and switch off compressor. When Ta is higher than 95°C, 999.9°C will be displayed.
Supply temperature probe faulty or disconnected		a、 When Ts is lower than -30°C and keeps 60s, unit will alarm. When Ts is lower than -50°C, -999.9°C will be displayed. b、 When the supply air temperature is higher than 80°C and keeps 60s, unit will alarm. When it is higher than 95°C, 999.9°C will be displayed.
Room humidity probe faulty or disconnected	Switch off humidifier and compressor	a、 When Ha is lower than 5% and it keeps 60s, unit will alarm and switch off humidifier. b、 When Ha is higher than 90% and it keeps 60s, unit will alarm and switch off compressor.
Condenser 1 pressure probe faulty or disconnected	Switch off compressor	a. When discharge pressure displayed is lower than -3.4bar and it keeps 60s, the unit will alarm. b. When discharge pressure displayed is higher than 37.4bar and it keeps 60s, unit will alarm.

Built-in humidifier: high current	Switch off humidifier	Actual current of humidifier is 130% higher than standard current for long time.
Built-in humidifier: no water in the cylinder(cylinder off)	Switch off humidifier	After water inlet valve is opened, actual current in humidification state cannot reach current of evaporating.
Built-in humidifier: low current	Switch off humidifier	Conductivity of water inside humidifier is lower than 75μS/cm.
High pressure compressor 1 thermal overload	Switch off compressor 1	Discharge pressure 1 is higher than top limit of pressure sensor.
High pressure + compressor 1 thermal overload	Switch off compressor 1	Pressure protection of compressor 1 is trigged.
Operating hour threshold reached for humidifier		Only remind, need to cancel alarm.
Clogged filter		When sensor of filter is trigged and it keeps 10s, unit alarms.
Water under floor(Serious Alarm)	Switch off unit	Water leakage sensor is trigged.
pLAN disconnected		a. When unit from address U2 to U8 is disconnected from group and it keeps 60s, unit will alarms. b. Controller of pLAN address (except address 1/0) is disconnected with controller of address 1 and it keeps 60s, unit alarms.
Built-in humidifier: high conductivity alarm	Switch off humidifier	Conductivity of water inside humidifier is higher than 2000μS/cm.
Built-in humidifier: high conductivity pre-alarm		Conductivity of water inside humidifier is higher than 1500μS/cm.
Built-in humidifier: low steam production	Switch off humidifier	
Built-in humidifier: water drain alarm(cylinder off）	Switch off humidifier	After water outlet valve opened, operates with high current in humidification state.
Built-in humidifier: cylinder full alarm(cylinder off)	Switch off humidifier	Non-humidification, the sensor of water level is trigged.
Built-in humidifier: cylinder being depleted signal		Humidifier should be maintained.
Built-in humidifier: presence of foam		Foam produce because of alkalescency water inside humidifier.
Built-in humidifier: cylinder depleted		Humidifier should be maintained.
Built-in humidifier: compulsory maintenance alarm Cylinder 1		Humidifier already works for 10000h.
Built-in humidifier: recommended maintenance signal Cylinder 1		Humidifier already works for 2000h. It should be maintained.

Note:

Ambient temperature: Ta

Setting temperature: Ts

Ambient relative humidity: Ha

Setting relative humidity: Hs