



# OASIS On-off SERIES

## Service Manual 2012



MS11M-09HRN1 / MO11M-09HN1  
MS11M-12HRN1 / MO11M-12HN1  
MS11M-18HRN1 / MO11M-18HN1  
MS11M-24HRN1 / MO11M-24HN1



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## 1. Precaution

### 1.1 Safety Precaution

■ **To prevent injury to the user or other people and property damage, the following instructions must be followed.**

- **Incorrect operation due to ignoring instruction will cause harm or damage.**
- **Before service the unit, be sure to read this service manual at first.**

### 1.2 Warning

#### ➤ Installation

■ **Do not use a defective or underrated circuit breaker. Use this appliance on a dedicated circuit.**

There is risk of fire or electric shock.

■ **For electrical work, contact the dealer, seller, a qualified electrician, or an authorized service center.**

Do not disassemble or repair the product, there is risk of fire or electric shock.

■ **Always ground the product.**

There is risk of fire or electric shock.

■ **Install the panel and the cover of control box securely.**

There is risk of fire of electric shock.

■ **Always install a dedicated circuit and breaker.**

Improper wiring or installation may cause fire or electric shock.

■ **Use the correctly rated breaker or fuse.**

There is risk of fire or electric shock.

■ **Do not modify or extend the power cable.**

There is risk of fire or electric shock.

■ **Do not install, remove, or reinstall the unit by yourself (customer).**

There is risk of fire, electric shock, explosion, or injury.

■ **Be caution when unpacking and installing the product.**

Sharp edges could cause injury, be especially careful of the case edges and the fins on the condenser and evaporator.

- **For installation, always contact the dealer or an authorized service center.**
- **Do not install the product on a defective installation stand.**
- **Be sure the installation area does not deteriorate with age.**

If the base collapses, the air conditioner could fall with it, causing property damage, product failure, and personal injury.

- **Do not let the air conditioner run for a long time when the humidity is very high and a door or a window is left open.**

- **Take care to ensure that power cable could not be pulled out or damaged during operation.**

There is risk of fire or electric shock.

- **Do not place anything on the power cable.**

There is risk of fire or electric shock.

- **Do not plug or unplug the power supply plug during operation.**

There is risk of fire or electric shock.

- **Do not touch (operation) the product with wet hands.**

- **Do not place a heater or other appliance near the power cable.**

There is risk of fire and electric shock.

- **Do not allow water to run into electrical parts.**

It may cause fire, failure of the product, or electric shock.

- **Do not store or use flammable gas or combustible near the product.**

There is risk of fire or failure of product.

- **Do not use the product in a tightly closed space for a long time.**

Oxygen deficiency could occur.

- **When flammable gas leaks, turn off the gas and open a window for ventilation before turn the product on.**

- **If strange sounds or smoke comes from product, turn the breaker off or disconnect the power supply cable.**

There is risk of electric shock or fire.

- **Stop operation and close the window in storm or hurricane. If possible, remove the product from the window before the hurricane arrives.**

There is risk of property damage, failure of product, or electric shock.

- **Do not open the inlet grill of the product during operation. (Do not touch the electrostatic filter, if the unit is so equipped.)**

There is risk of physical injury, electric shock, or product failure.

- **When the product is soaked, contact an authorized service center.**

There is risk of fire or electric shock.

- **Be caution that water could not enter the product.**

There is risk of fire, electric shock, or product damage.

- **Ventilate the product from time to time when operating it together with a stove etc.**

There is risk of fire or electric shock.

- **Turn the main power off when cleaning or maintaining the product.**

There is risk of electric shock.

- **When the product is not be used for a long time, disconnect the power supply plug or turn off the breaker.**

There is risk of product damage or failure, or unintended operation.

- **Take care to ensure that nobody could step on or fall onto the outdoor unit.**

This could result in personal injury and product damage.

## ➤ CAUTION

- **Always check for gas (refrigerant) leakage after installation or repair of product.**

Low refrigerant levels may cause failure of product.

- **Install the drain hose to ensure that water is drained away properly.**

A bad connection may cause water leakage.

- **Keep level even when installing the product.**

It can avoid vibration of water leakage.

- **Do not install the product where the noise or hot air from the outdoor unit could damage the neighborhoods.**

It may cause a problem for your neighbors.

- **Use two or more people to lift and transport the product.**

- **Do not install the product where it will be exposed to sea wind (salt spray) directly.**

It may cause corrosion on the product. Corrosion, particularly on the condenser and evaporator fins, could cause product malfunction or inefficient operation.

## ➤ Operational

- **Do not expose the skin directly to cool air for long time. (Do not sit in the draft).**
- **Do not use the product for special purposes, such as preserving foods, works of art etc.**

**It is a consumer air conditioner, not a precision refrigerant system.**

There is risk of damage or loss of property.

- **Do not block the inlet or outlet of air flow.**
- **Use a soft cloth to clean. Do not use harsh detergents, solvents, etc.**

There is risk of fire, electric shock, or damage to the plastic parts of the product.

■ **Do not touch the metal parts of the product when removing the air filter. They are very sharp.**

- **Do not step on or put anything on the product. (outdoor units)**
- **Always insert the filter securely. Clean the filter every two weeks or more often if**

**necessary.**

A dirty filter reduces the efficiency of the air conditioner and could cause product malfunction or damage.

■ **Do not insert hands or other objects through air inlet or outlet while the product is operated.**

- **Do not drink the water drained from the product.**
- **Use a firm stool or ladder when cleaning or maintaining the product.**

Be careful and avoid personal injury.

■ **Replace the all batteries in the remote control with new ones of the same type. Do not mix old and new batteries or different types of batteries.**

There is risk of fire or explosion.

- **Do not recharge or disassemble the batteries. Do not dispose of batteries in a fire.**

They may burn or explode.

■ **If the liquid from the batteries gets onto your skin or clothes, wash it well with clean water. Do not use the remote if the batteries have leaked.**

## 2. Function

### Model Names of Indoor/Outdoor Units

	Capacity	Indoor units	Outdoor units
On-Off	9k	MS11M-09HRN1	MO11M-09HN1
	12k	MS11M-12HRN1	MO11M-12HN1
	18k	MS11M-18HRN1	MO11M-18HN1
	24k	MS11M-24HRN1	MO11M-24HN1

### Indoor unit

- Filter
- Killer of Formaldehyde
- Plasma
- Silver Ion Filter
- Self-Clean
- Follow Me
- Auto restart
- Sleep mode
- Horizontal Swing Function
- Louver Position Memory Function

### Outdoor unit

- Refrigerant Leakage Detect
- Self-diagnostic Function
- Hydrophilic Aluminum Fin
- Anti-Rust Cabinet
- Valve Protection Cover
- Temperature compensation

### 3. Specification

Indoor			MS11M-09HRN1	MS11M-12HRN1
Outdoor			MO11M-09HN1	MO11M-12HN1
Power supply		Ph-V-Hz	220-240V~ 50Hz, 1Ph	220-240V~ 50Hz, 1Ph
Cooling	Capacity	Btu/h	9000	12000
		kW	2,64	3,52
	Input	W	820	1090
	Rated current	A	3.5	4.7
	EER	W/W	3.22	3.23
Heating	Capacity	Btu/h	9500	12500
		kW	2,78	3,66
	Input	W	770	1010
	Rated current	A	3.35	4.4
	COP	W/W	3.62	3.62
Moisture Removal		L/h	1.0	1.2
Max. input consumption		W	1300	1800
Max. current		A	6.0	8.0
Starting current		A	21.7	20.1
Compressor	Model		PA103M1C-4DZDE2	PA135G1C-4FTL
	Type		ROTARY	ROTARY
	Brand		GMCC	GMCC
	Capacity	Btu/h	8428/8530	11191/11362
	Input	W	830/860	1075/1100
	Rated current(RLA)	A	3.85/3.73	5.37/5.39
	Locked rotor Amp(LRA)	A	21.7	20.1
	Thermal protector		B160-135-241E	----
	Thermal protector position		EXTERNAL	INTERNAL
	Capacitor	uF	25	35
	Refrigerant oil/oil charge	ml	ESTER OIL VG74 350cc	ESTER OIL VG74/400
Indoor fan motor	Model		RPG13H	RPG20D
	Brand		Welling	Welling
	Input	W	34	43.3
	Capacitor	uF	1.2	1.5
	Speed(Hi/Mi/Lo)	r/min	1200/1000/700	1220/1000/800
Indoor coil	a.Number of rows		2	2
	b.Tube pitch(a)x row pitch(b)	mm	21x13.37	21x13.37
	c.Fin spacing	mm	1.3	1.3
	d.Fin type (code)		Hydrophilic aluminium	Hydrophilic aluminium
	e.Tube outside dia.and type	mm	∅7, innergroove tube	∅7, innergroove tube
	f.Coil length x height x width	mm	580x252x26.74	665x315x26.74
	g.Number of circuits		2	3
Indoor air flow (Hi/Mi/Lo)		m <sup>3</sup> /h	550/450/320	700/570/460
Indoor noise level (Hi/Mi/Lo)		dB(A)	41/37/29	43/39/32
Indoor unit	Dimension(W*D*H)	mm	750x198x280	835x198x280

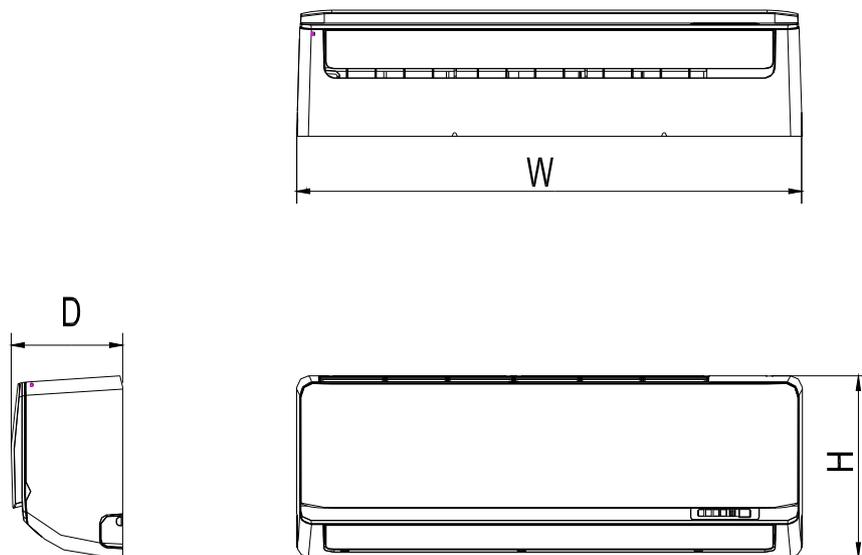
	Packing (W*D*H)	mm	830x270x355	910x270x355
	Net/Gross weight	Kg	8 / 10	9 / 11
Outdoor fan motor	Model		YDK24-6F(B)	YDK36-6
	Brand		Welling	Welling
	Input	W	63	70
	Capacitor	uF	2.5	2.5
	Speed	r/min	800 / -- / --	900 / -- / --
Outdoor coil	a.Number of rows		2	2
	b.Tube pitch(a)x row pitch(b)	mm	19.5x11.6	21x13.37
	c.Fin spacing	mm	1.2	1.5
	d.Fin type (code)		Hydrophilic aluminium	Hydrophilic aluminium
	e.Tube outside dia.and type	mm	∅5,innergroove tube	∅7,innergroove tube
	f.Coil length x height x width	mm	750x507x23.2	754x504x26.74
	g.Number of circuits		6	4
Outdoor air flow		m <sup>3</sup> /h	1800	1900
Outdoor noise level		dB(A)	54	55
Outdoor unit	Dimension(W*D*H)	mm	780x250x540	780x250x540
	Packing (W*D*H)	mm	910x335x585	910x335x585
	Net/Gross weight	Kg	27 / 29.5	30 / 32
Refrigerant type		g	R410A/810g	R410A/1250g
Design pressure		MPa	4.2/1.5	4.2/1.5
Refrigerant piping	Liquid side/ Gas side	mm(inch)	∅6.35/∅9.52(1/4"/3/8")	∅6.35/∅12.7(1/4"/1/2")
	Max. refrigerant pipe length	m	20	20
	Max. difference in level	m	8	8
Connection wiring			1.0(Optional)	1.5(Optional)
Plug type			1.0 / VDE	1.5 / VDE
Thermostat type			Remote Control	Remote Control
Operation temp		°C	17-30	17-30
Ambient temp (cooling/heating)		°C	18-43/-7-24	18-43/-7-24
Application area		m <sup>2</sup>	13-22	18-29

Indoor			MS11M-18HRN1	MS11M-24HRN1
Outdoor			MO11M-18HN1	MO11M-24HN1
Power supply		Ph-V-Hz	220-240V~ 50Hz, 1Ph	220-240V~ 50Hz, 1Ph
Cooling	Capacity	Btu/h	18000	24000
		kW	5,28	7,03
	Input	W	1643	2350
	Rated current	A	7.5	11.0
	EER	W/W	3.21	3.00
Heating	Capacity	Btu/h	18500	25000
		kW	5,42	7,33
	Input	W	1502	2100
	Rated current	A	7.2	10.7
	COP	W/W	3.61	3.49
Moisture Removal		L/h	1.8	2.6
Max. input consumption		W	2200	4000
Max. current		A	12.0	20.0
Starting current		A	31.8	60
Compressor	Model		PA200M2CS-4KU2	PA270G2CS-4MU1
	Type		ROTARY	ROTARY
	Brand		GMCC	GMCC
	Capacity	Btu/h	16581	23287/23458
	Input	W	1605	2235/2385
	Rated current(RLA)	A	7.45	10.55/11.15
	Locked rotor Amp(LRA)	A	31.8	60
	Thermal protector		----	---
	Thermal protector position		INTERNAL	INTERNAL
	Capacitor	uF	45	60
	Refrigerant oil/oil charge	ml	ESTER OIL VG74 750cc	ESTER OIL VG74/850 CC
Indoor fan motor	Model		RPG45C	RPG50C
	Brand		Broad Ocean	Broad Ocean
	Input	W	72	91
	Capacitor	uF	3.0	3.5
	Speed(Hi/Mi/Lo)	r/min	1250/900/700	1200/1100/1000
Indoor coil	a.Number of rows		2	2
	b.Tube pitch(a)x row pitch(b)	mm	21x13.37	21x13.37
	c.Fin spacing	mm	1.3	1.2
	d.Fin type (code)		Hydrophilic aluminium	Hydrophilic aluminium
	e.Tube outside dia.and type	mm	Ø7,innergroove tube	Ø7,innergroove tube
	f.Coil length x height x width	mm	760x315x26.74	904x399x26.74
	g.Number of circuits		5	6
Indoor air flow (Hi/Mi/Lo)		m <sup>3</sup> /h	1150/830/650	1400/1250/1150
Indoor noise level (Hi/Mi/Lo)		dB(A)	49/40/33	49/47/40
Indoor unit	Dimension(W*D*H)	mm	990x218x315	1186x258x340
	Packing (W*D*H)	mm	1065x300x400	1265x420x340

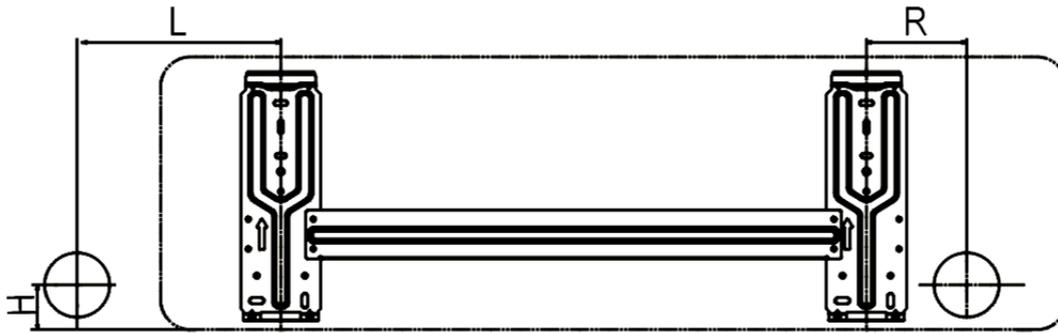
	Net/Gross weight	Kg	12.5 / 15.5	16 / 20
Outdoor fan motor	Model		YDK55-6H	YDK100-6D(B)
	Brand		Welling	Welling
	Input	W	106	177
	Capacitor	uF	3.0	5.0
	Speed	r/min	865 / -- / --	875 / -- / --
Outdoor coil	a.Number of rows		2	2
	b.Tube pitch(a)x row pitch(b)	mm	21x13.37	21x13.37
	c.Fin spacing	mm	1.4	1.4
	d.Fin type (code)		Hydrophilic aluminium	Hydrophilic aluminium
	e.Tube outside dia.and type	mm	∅7,innergroove tube	∅7,innergroove tube
	f.Coil length x height x width	mm	785x651x26.74	785x651x26.74
	g.Number of circuits		4	4
Outdoor air flow		m <sup>3</sup> /h	2500	2700
Outdoor noise level		dB(A)	57	60
Outdoor unit	Dimension(W*D*H)	mm	845x320x700	845x320x700
	Packing (W*D*H)	mm	965x395x755	965x395x755
	Net/Gross weight	Kg	42 / 45	50/53
Refrigerant type		g	R410A/1370g	R410A/1780g
Design pressure		MPa	4.2/1.5	4.2/1.5
Refrigerant piping	Liquid side/ Gas side	mm(inch)	∅6.35/∅12.7(1/4"/1/2")	∅9.52/∅16(3/8"/5/8")
	Max. refrigerant pipe length	m	25	25
	Max. difference in level	m	10	10
Connection wiring			1.5(Optional)	1.0(Optional)
Plug type			1.5 / ---	--
Thermostat type			Remote Control	Remote Control
Operation temp		°C	17-30	17-30
Ambient temp (cooling/heating)		°C	18-43/-7-24	18-43/-7-24
Application area		m <sup>2</sup>	26-44	35-58

## 4. Dimension

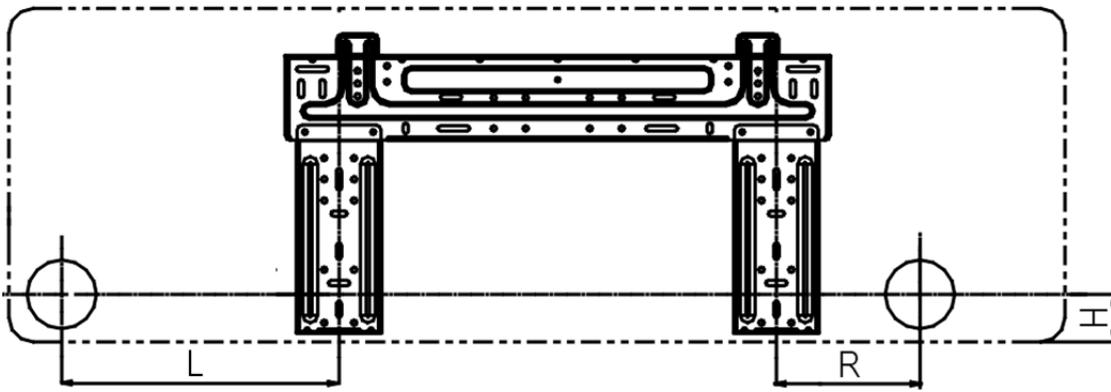
### 4.1 Indoor Unit



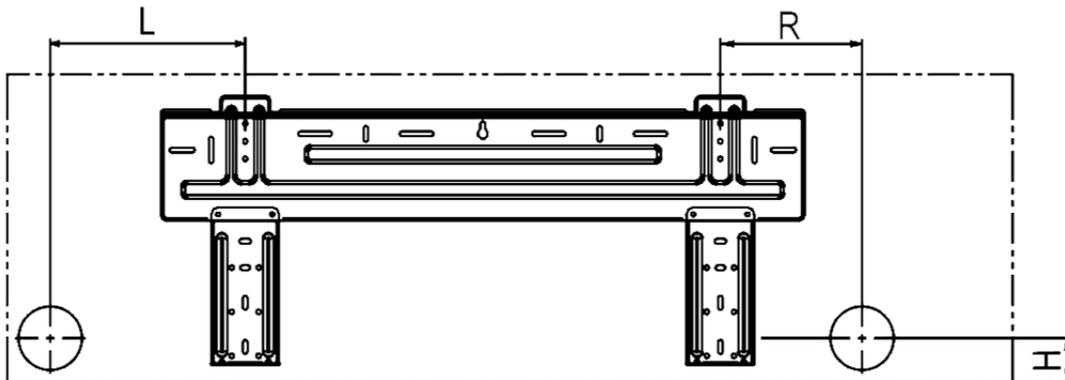
Model	W	D	H
MS11M-09HRN1	750	198	280
MS11M-12HRN1	835	198	280
MS11M-18HRN1	990	218	315
MS11M-24HRN1	1186	258	340



Model	L(mm)	R(mm)	H(mm)	Dimension of installation hole(mm)
MS11M-09HRN1	180	110	45	∅ 65
MS11M-12HRN1	140	110	45	

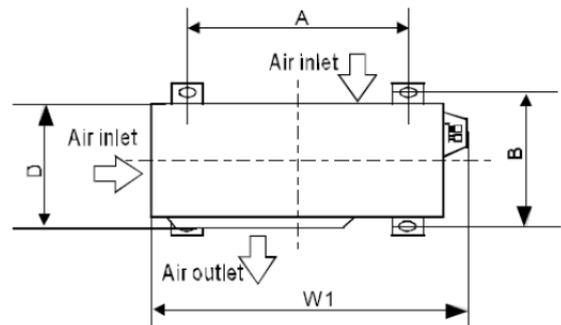
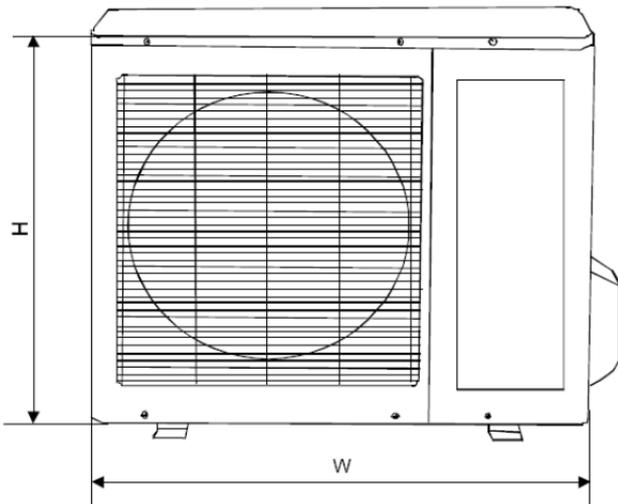
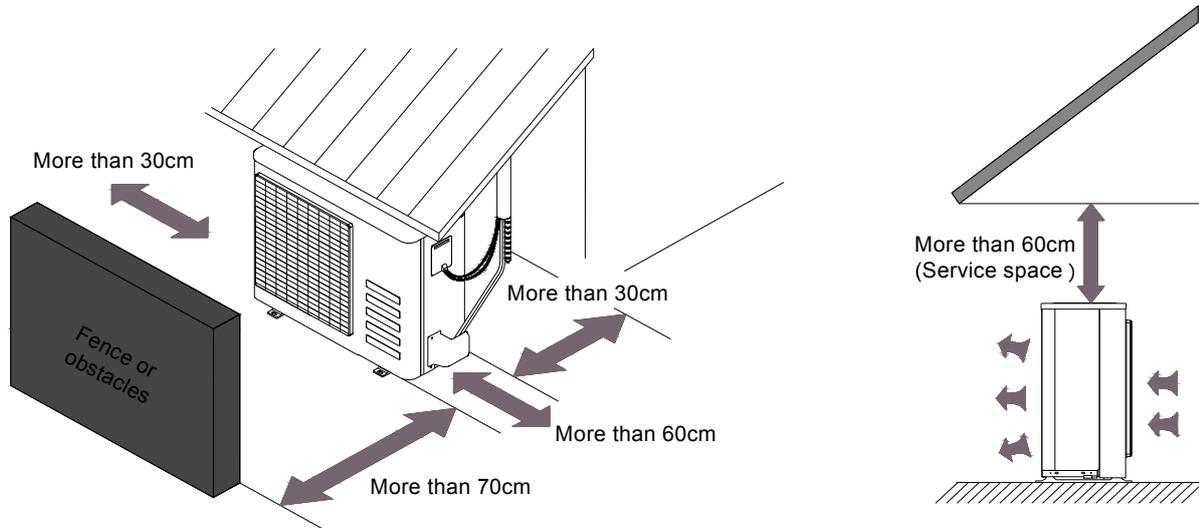


Model	L(mm)	R(mm)	H(mm)	Dimension of installation hole(mm)
MS11M-18HRN1	260	134.6	45	∅ 65



Model	L(mm)	R(mm)	H(mm)	Dimension of installation hole(mm)
MS11M-24HRN1	275	275	45	∅ 65

### 4.2 Outdoor Unit



Model	W	D	H	W1	A	B
MO11M-09HN1	780	250	540	843	549	276
MO11M-12HN1						
MO11M-18HN1	845	320	700	908	560	335
MO11M-24HN1						

## 5. Capacity tables

### MS11M-09HRN1 / MO11M-09HN1

#### Cooling

Cooling		Outdoor conditions (DB)				
Indoor Conditions	(kW)	18°C	21°C	28°C	35°C	43°C
21/15°C DB/WB	TC	2.85	2.72	2.59	2.46	2.35
	SC	2.05	2.01	1.99	1.96	1.97
	Input	2.58	2.67	2.90	3.03	3.12
24/17°C DB/WB	TC	2.90	2.80	2.67	2.53	2.38
	SC	2.12	2.10	2.08	2.05	2.00
	Input	2.61	2.83	3.03	3.16	3.32
27/19°C DB/WB	TC	2.96	2.85	2.72	<b>2.64</b>	2.46
	SC	2.13	2.11	2.09	2.06	2.01
	Input	2.70	2.90	3.06	<b>3.22</b>	3.38
32/23°C DB/WB	TC	3.01	2.90	2.80	2.75	2.53
	SC	2.50	2.47	2.43	2.42	2.36
	Input	2.90	3.03	3.16	3.38	3.51

#### Heating

Heating		Outdoor conditions				
Indoor Conditions (DB)	(kW)	24/18°C DB/WB	7/6°C DB/WB	2/1°C DB/WB	-5/-6°C DB/WB	-7/-8°C DB/WB
15°C	TC	3.61	2.92	2.39	2.17	2.03
	Input	3.91	3.37	2.90	2.72	2.57
20°C	TC	3.50	<b>2.78</b>	2.25	2.11	1.95
	Input	4.27	<b>3.62</b>	3.19	2.93	2.75
27°C	TC	3.28	2.61	2.11	2.06	1.83
	Input	4.53	3.91	3.44	3.19	2.97

#### Remark:

TC: Total capacity; kW

SC: Sensible heat capacity; kW

Input: Input power; kW

**MS11M-12HRN1 / MO11M-12HN1****Cooling**

Cooling		Outdoor conditions (DB)				
Indoor Conditions	(kW)	18°C	21°C	28°C	35°C	43°C
21/15°C DB/WB	TC	3.80	3.63	3.45	3.27	3.13
	SC	2.74	2.68	2.66	2.62	2.63
	Input	2.58	2.68	2.91	3.04	3.13
24/17°C DB/WB	TC	3.87	3.73	3.56	3.38	3.17
	SC	2.83	2.80	2.77	2.74	2.66
	Input	2.62	2.84	3.04	3.17	3.33
27/19°C DB/WB	TC	3.94	3.80	3.63	<b>3.52</b>	3.27
	SC	2.84	2.81	2.79	2.75	2.68
	Input	2.71	2.91	3.07	<b>3.23</b>	3.39
32/23°C DB/WB	TC	4.01	3.87	3.73	3.66	3.38
	SC	3.33	3.29	3.25	3.22	3.14
	Input	2.91	3.04	3.17	3.39	3.52

**Heating**

Heating		Outdoor conditions				
Indoor Conditions (DB)	(kW)	24/18°C DB/WB	7/6°C DB/WB	2/1°C DB/WB	-5/-6°C DB/WB	-7/-8°C DB/WB
15°C	TC	4.76	3.84	3.15	2.85	2.67
	Input	3.91	3.37	2.90	2.72	2.57
20°C	TC	4.61	<b>3.66</b>	2.96	2.78	2.56
	Input	4.27	<b>3.62</b>	3.19	2.93	2.75
27°C	TC	4.32	3.44	2.78	2.71	2.42
	Input	4.53	3.91	3.44	3.19	2.97

**Remark:**

TC: Total capacity; kW

SC: Sensible heat capacity; kW

Input: Input power; kW

**MS11M-18HRN1 / MO11M-18HN1****Cooling**

Cooling		Outdoor conditions (DB)				
Indoor Conditions	(kW)	18°C	21°C	28°C	35°C	43°C
21/15°C DB/WB	TC	5.70	5.44	5.17	4.91	4.70
	SC	4.11	4.02	3.98	3.93	3.95
	Input	2.57	2.66	2.89	3.02	3.11
24/17°C DB/WB	TC	5.81	5.60	5.33	5.07	4.75
	SC	4.24	4.20	4.16	4.11	3.99
	Input	2.60	2.82	3.02	3.15	3.31
27/19°C DB/WB	TC	5.91	5.70	5.44	<b>5.28</b>	4.91
	SC	4.26	4.22	4.19	4.12	4.03
	Input	2.70	2.89	3.05	<b>3.21</b>	3.37
32/23°C DB/WB	TC	6.02	5.81	5.60	5.49	5.07
	SC	5.00	4.94	4.87	4.83	4.71
	Input	2.89	3.02	3.15	3.37	3.50

**Heating**

Heating		Outdoor conditions				
Indoor Conditions (DB)	(kW)	24/18°C DB/WB	7/6°C DB/WB	2/1°C DB/WB	-5/-6°C DB/WB	-7/-8°C DB/WB
15°C	TC	7.05	5.69	4.66	4.23	3.96
	Input	3.90	3.36	2.89	2.71	2.56
20°C	TC	6.83	<b>5.42</b>	4.39	4.12	3.79
	Input	4.26	<b>3.61</b>	3.18	2.92	2.74
27°C	TC	6.40	5.09	4.12	4.01	3.58
	Input	4.51	3.90	3.43	3.18	2.96

**Remark:**

TC: Total capacity; kW

SC: Sensible heat capacity; kW

Input: Input power; kW

**MS11M-24HRN1 / MO11M-24HN1****Cooling**

Cooling		Outdoor conditions (DB)				
Indoor Conditions	(kW)	18°C	21°C	28°C	35°C	43°C
21/15°C DB/WB	TC	7.59	7.24	6.89	6.54	6.26
	SC	5.47	5.36	5.30	5.23	5.26
	Input	2.40	2.49	2.70	2.82	2.91
24/17°C DB/WB	TC	7.73	7.45	7.10	6.75	6.33
	SC	5.65	5.59	5.54	5.47	5.31
	Input	2.43	2.64	2.82	2.94	3.09
27/19°C DB/WB	TC	7.87	7.59	7.24	<b>7.03</b>	6.54
	SC	5.67	5.62	5.58	5.48	5.36
	Input	2.52	2.70	2.85	<b>3.00</b>	3.15
32/23°C DB/WB	TC	8.01	7.73	7.45	7.31	6.75
	SC	6.65	6.57	6.48	6.43	6.28
	Input	2.70	2.82	2.94	3.15	3.27

**Heating**

Heating		Outdoor conditions				
Indoor Conditions (DB)	(kW)	24/18°C DB/WB	7/6°C DB/WB	2/1°C DB/WB	-5/-6°C DB/WB	-7/-8°C DB/WB
15°C	TC	9.53	7.70	6.30	5.72	5.35
	Input	3.77	3.25	2.79	2.62	2.48
20°C	TC	9.24	<b>7.33</b>	5.94	5.57	5.13
	Input	4.12	<b>3.49</b>	3.07	2.83	2.65
27°C	TC	8.65	6.89	5.57	5.42	4.84
	Input	4.36	3.77	3.32	3.07	2.86

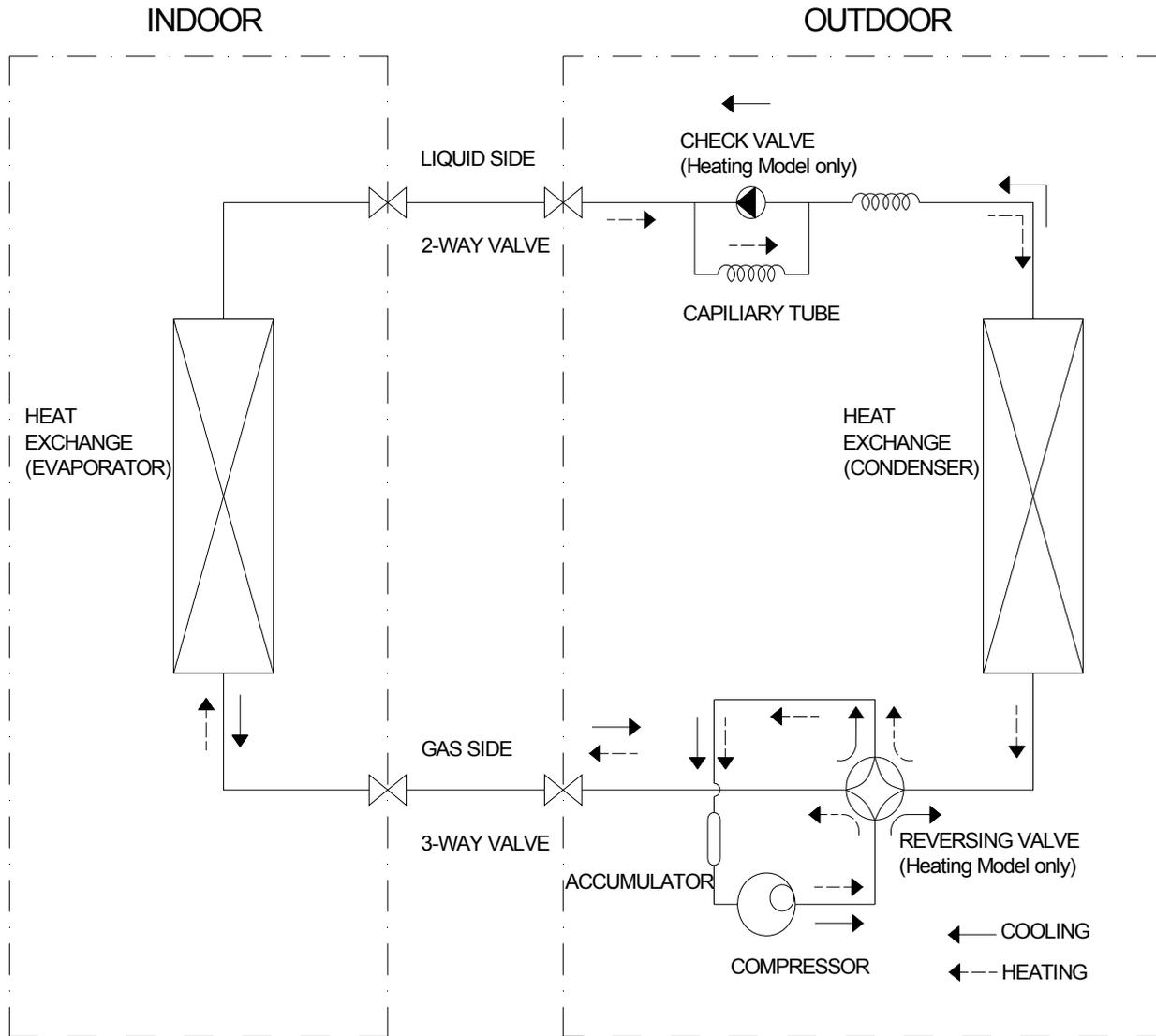
**Remark:**

TC: Total capacity; kW

SC: Sensible heat capacity; kW

Input: Input power; kW

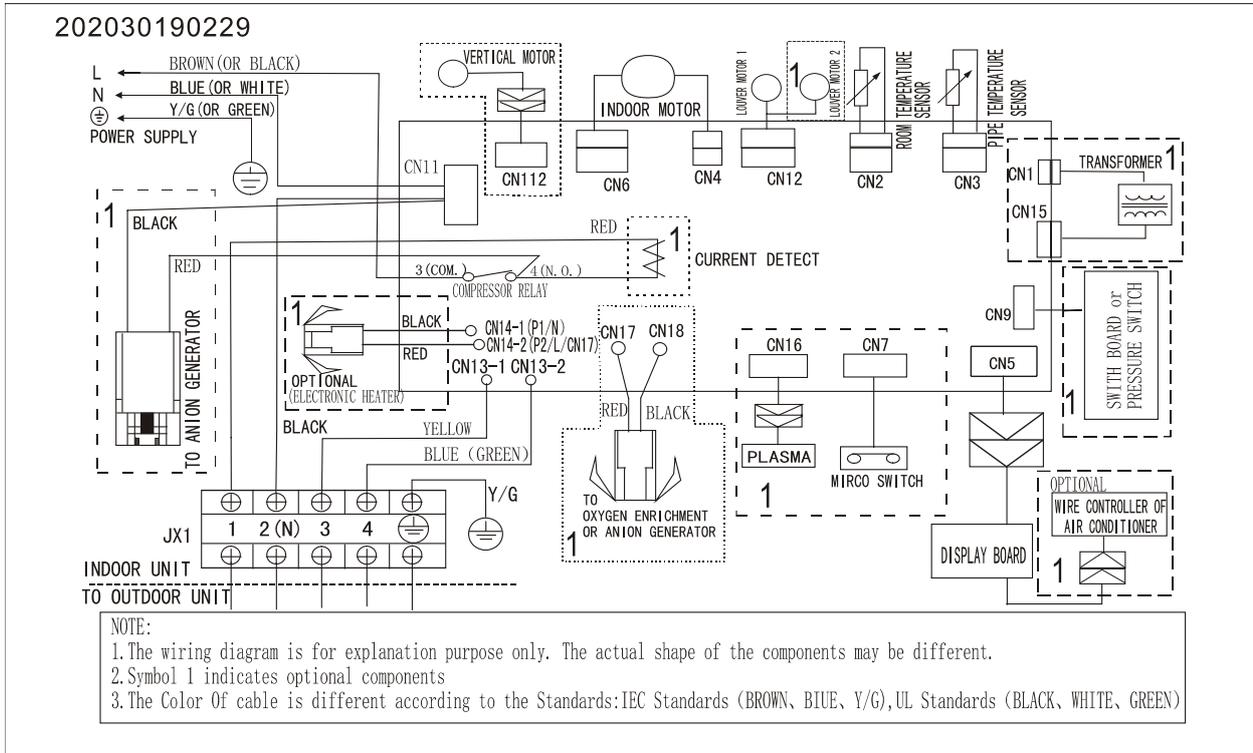
### 6. Refrigerant Cycle Diagram



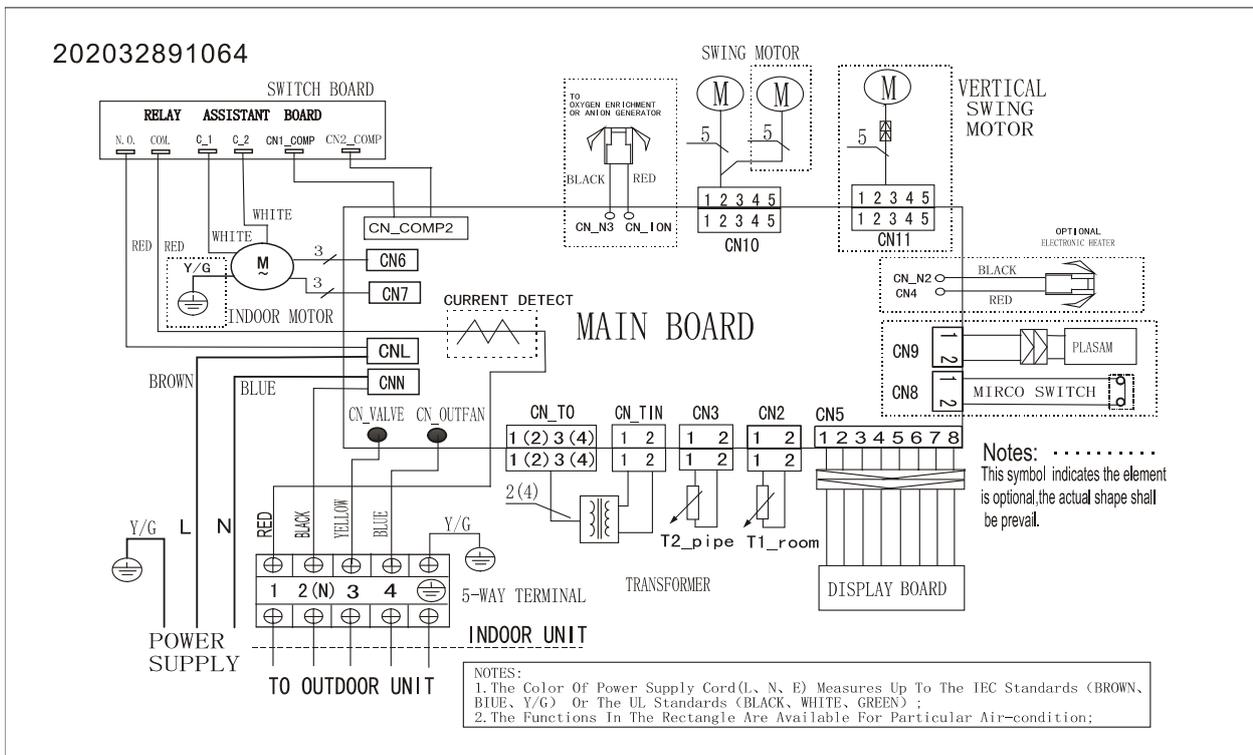
# 7. Wiring Diagram

## 7.1 Indoor Unit

### MS11M-09HRN1, MS11M-12HRN1

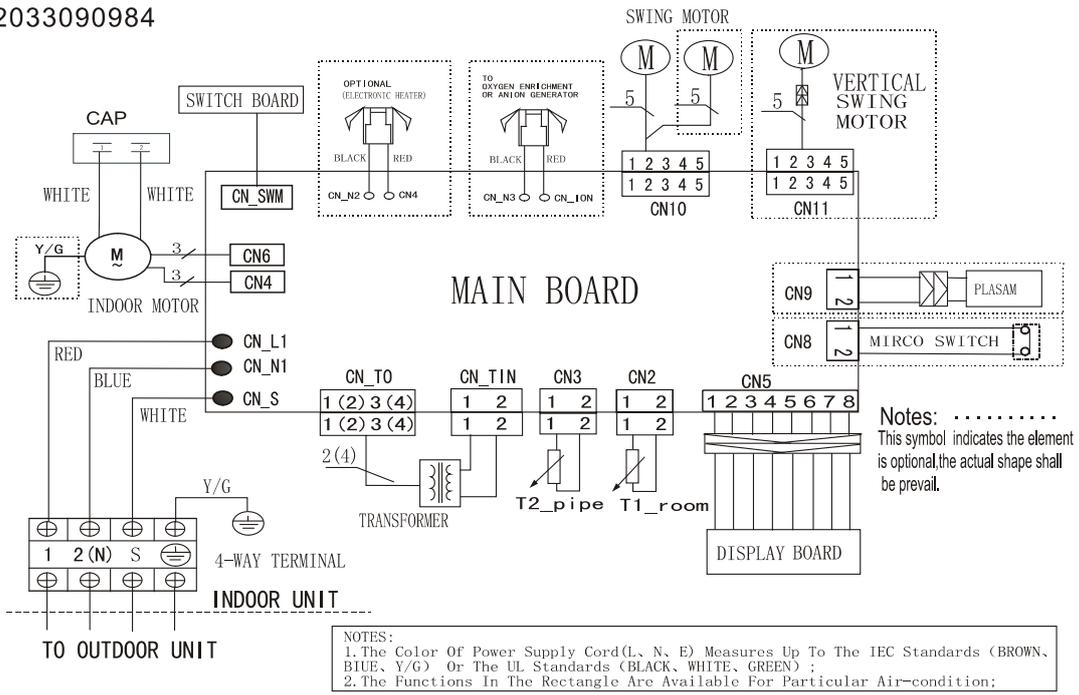


### MS11M-18HRN1



**MS11M-24HRN1**

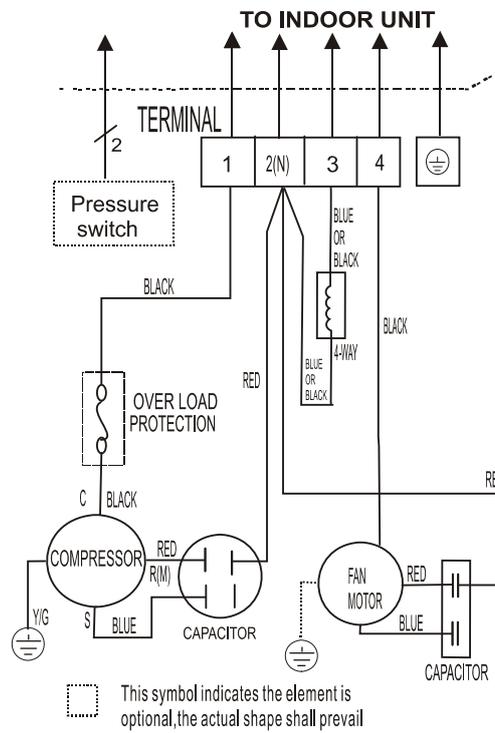
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## 7.2 Outdoor Unit

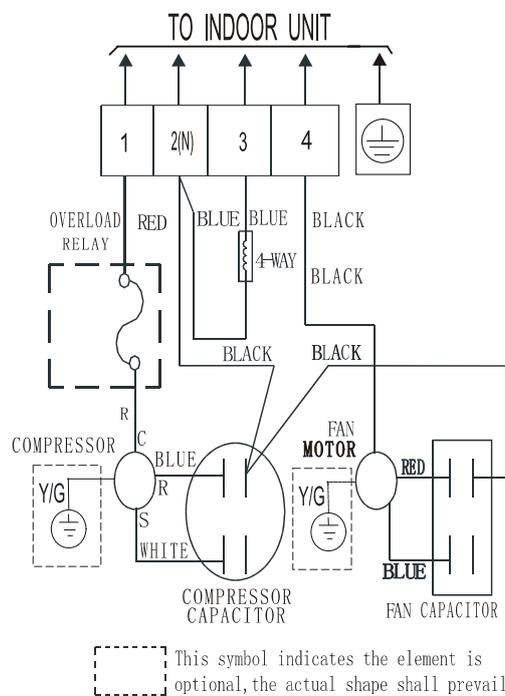
### MO11M-09HN1, MO11M-12HN1

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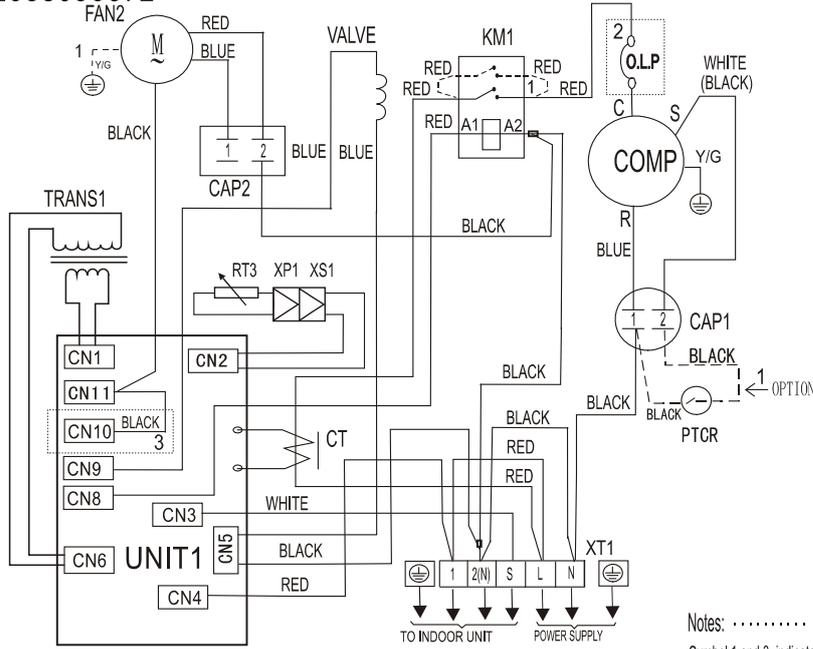
### MO11M-18HN1

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MO11M-24HN1

202038090672



CODE	PART NAME
UNIT1	OUTDOOR CONTROL PCB
COMP	COMPRESSOR
CAP1	COMPRESSOR RUN CAPACITOR
CAP2	OUTDOOR FAN CAPACITOR
FAN2	OUTDOOR FAN
XT1	TERMINAL
X2	MIDDLE TERMINAL
XP1, XS1	CONNECTORS
RT3	PIPE TEMPERATURE SENSOR
KM1	AC CONTACTOR
CT	CURRENT INDUCTOR
TRANS1	TRANSFORMER
CN1-CN11	PCB SOCKETS
VALVE	REVERSING VALVE

Notes: .....  
 Symbol 1 and 3 indicates the element is optional, the actual shape shall be prevail.  
 Symbol 2 indicates compressor internal or external components.

## 8 Installation Details

### 8.1 Wrench torque sheet for installation

Outside diameter		Torque	Additional tightening torque
mm	inch	N.cm	N.cm
Ø6.35	1/4	1500(153kgf.cm)	1600(163kgf.cm)
Ø9.52	3/8	2500(255kgf.cm)	2600(265kgf.cm)
Ø12.7	1/2	3500(357kgf.cm)	3600(367kgf.cm)
Ø16	5/8	4500(459kgf.cm)	4700(479kgf.cm)
Ø19	3/4	6500(663kgf.cm)	6700(683kgf.cm)

### 8.2 Connecting the cables

The power cord of connect should be selected according to the following specifications sheet.

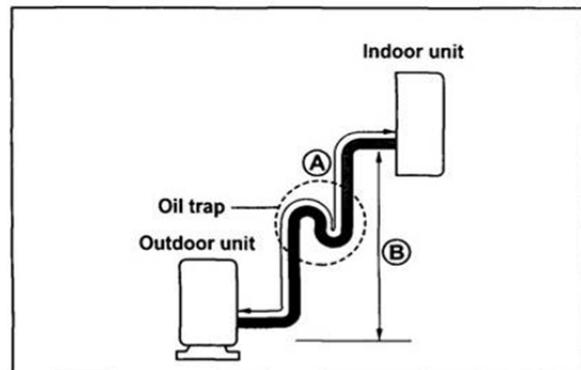
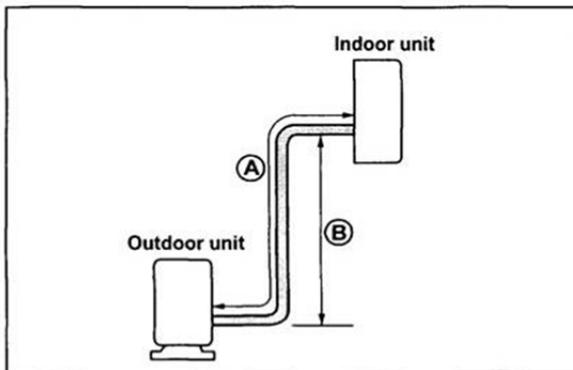
Rated current of appliance	Nominal cross-sectional area (mm <sup>2</sup> )
>3 and ≤6	0.75
>6 and ≤10	1
>10 and ≤16	1.5
>16 and ≤25	2.5

The cable size and the current of the fuse or switch are determined by the maximum current indicated on the nameplate which located on the side panel of the unit. Please refer to the nameplate before selecting the cable, fuse and switch.

### 8.3 Pipe length and the elevation

The pipe length and refrigerant amount:

Model	Pipe size		Standard length (m)	Max. Elevation B (m)	Max. Length A (m)	Additional refrigerant (g/m)
	Gas	Liquid				
MS11M-09HRN1 / MO11M-09HN1	3/8" Ø9.53	1/4" Ø6.35	5	8	20	20
MS11M-12HRN1 / MO11M-12HN1	1/2" Ø12.7	1/4" Ø6.35	5	8	20	20
MS11M-18HRN1 / MO11M-18HN1			5	10	25	20
MS11M-24HRN1 / MO11M-24HN1	5/8" Ø16.0	3/8" Ø9.53	5	10	25	40



#### Caution:

The capacity test is based on the standard length and the maximum permissible length is based on the system reliability.

The oil trap should be installed per 5-7 meters.

## 8.4 Installation for the first time

Air and moisture in the refrigerant system have undesirable effects as below:

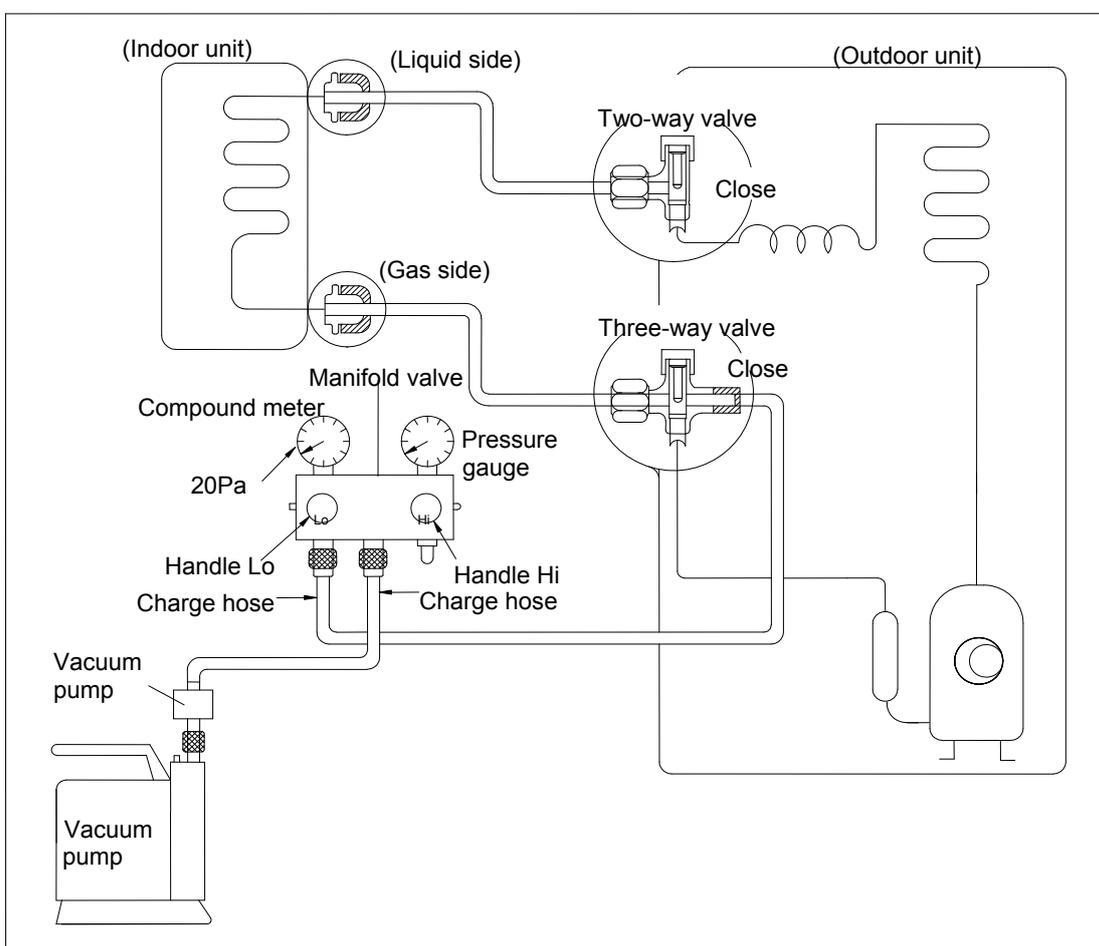
- Pressure in the system rises.
- Operating current rises.
- Cooling or heating efficiency drops.
- Moisture in the refrigerant circuit may freeze and block capillary tubing.
- Water may lead to corrosion of parts in the refrigerant system.

Therefore, the indoor units and the pipes between indoor and outdoor units must be leak tested and evacuated to remove gas and moisture from the system.

Gas leak check (Soap water method):

Apply soap water or a liquid neutral detergent on the indoor unit connections or outdoor unit connections by a soft brush to check for leakage of the connecting points of the piping. If bubbles come out, the pipes have leakage.

### 1. Air purging with vacuum pump



- 1) Completely tighten the flare nuts of the indoor and outdoor units, confirm that both the 2-way and 3-way valves are set to the closed position.
- 2) Connect the charge hose with the push pin of handle lo to the 3-way valves gas service port..
- 3) Connect the charge hose of handle hi connection to the vacuum pump.
- 4) Fully open the handle Lo of the manifold valve.
- 5) Operate the vacuum pump to evacuate.
- 6) Make evacuation for 30 minutes and check whether the compound meter indicates -0.1Mpa. If

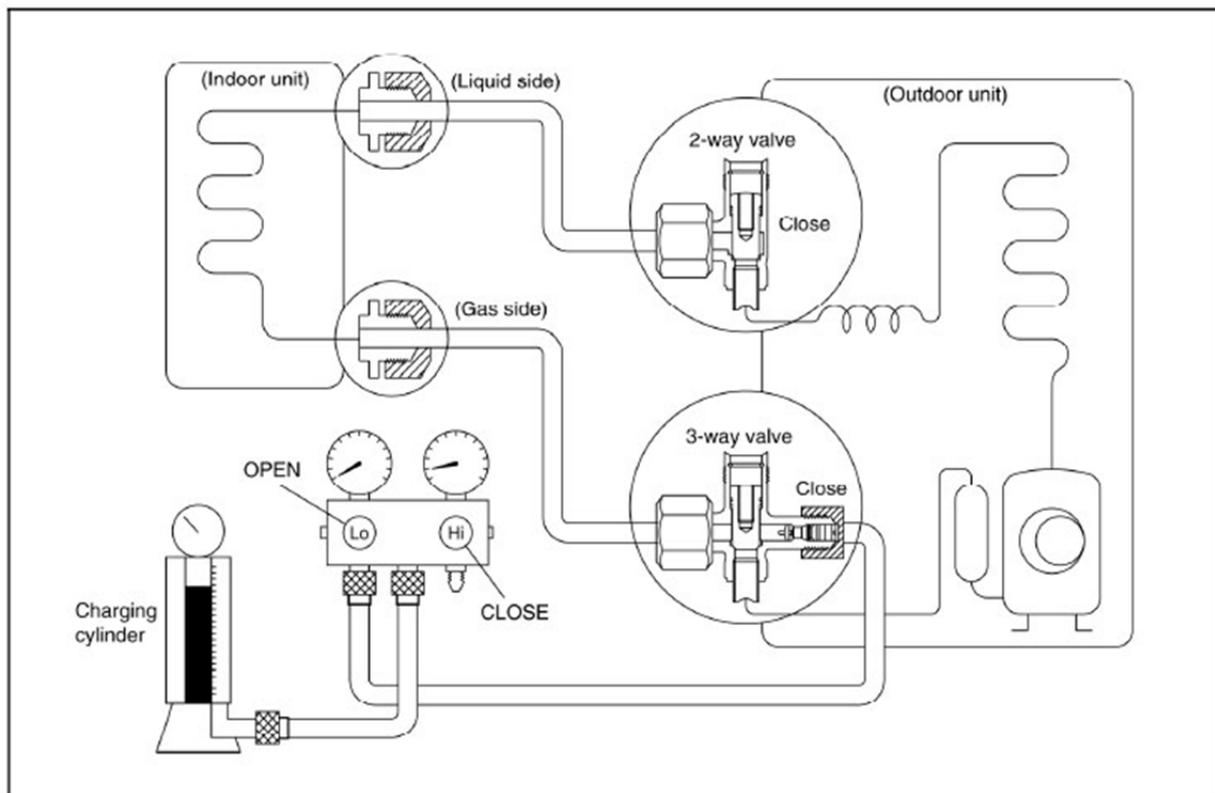
the meter does not indicate -0.1Mpa after pumping 30 minutes, it should be pumped 20 minutes more. If the pressure can't achieve -0.1Mpa after pumping 50 minutes, please check if there are some leakage points.

Fully close the handle Lo valve of the manifold valve and stop the operation of the vacuum pump. Confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).

7) Turn the flare nut of the 3-way valves about 45° counterclockwise for 6 or 7seconds after the gas coming out, then tighten the flare nut again. Make sure the pressure display in the pressure indicator is a little higher than the atmosphere pressure. Then remove the charge hose from the 3 way valve.

8) Fully open the 2 way valve and 3 way valve and securely tighten the cap of the 3 way valve.

## 2. Air purging by refrigerant



### Procedure:

- 1). Confirm that both the 2-way and 3-way valves are set to the closed position.
- 2). Connect the charge set and a charging cylinder to the service port of the 3-way valve.
- 3). Air purging.

Open the valves on the charging cylinder and the charge set. Purge the air by loosening the flare nut on the 2-way valve approximately 45° for 3 seconds then closing it for 1 minute; repeat 3 times.

After purging the air, use a torque wrench to tighten the flare nut on the 2-way valve.

- 4). Check the gas leakage.

Check the flare connections for gas leakage.

- 5). Discharge the refrigerant.

Close the valve on the charging cylinder and discharge the refrigerant by loosening the flare nut on the 2-way valve approximately 45° until the gauge indicates 0.3 to 0.5 Mpa.

6). Disconnect the charge set and the charging cylinder, and set the 2-way and 3-way valves to the open position.

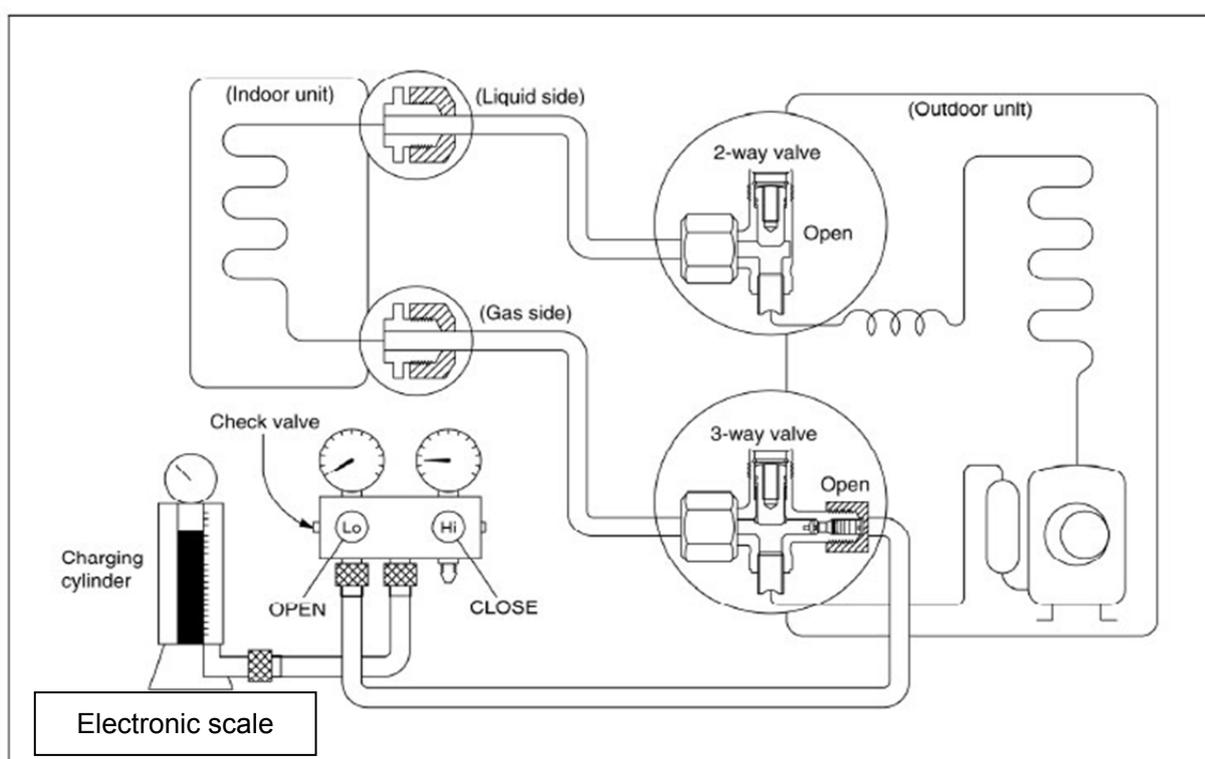
Be sure to use a hexagonal wrench to operate the valve stems.

7). Mount the valve stems nuts and the service port cap.

Be sure to use a torque wrench to tighten the service port cap to a torque 18N·m.

Be sure to check the gas leakage.

### 3. Adding the refrigerant if the pipe length >5m



#### Procedure:

1). Connect the charge hose to the charging cylinder, open the 2-way valve and the 3-way valve.

Connect the charge hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder bottom up to ensure the liquid charge.

2). Purge the air from the charge hose.

Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).

3) Put the charging cylinder onto the electronic scale and record the weight.

4) Operate the air conditioner at the cooling mode.

5) Open the valves (Low side) on the charge set and charge the system with liquid refrigerant.

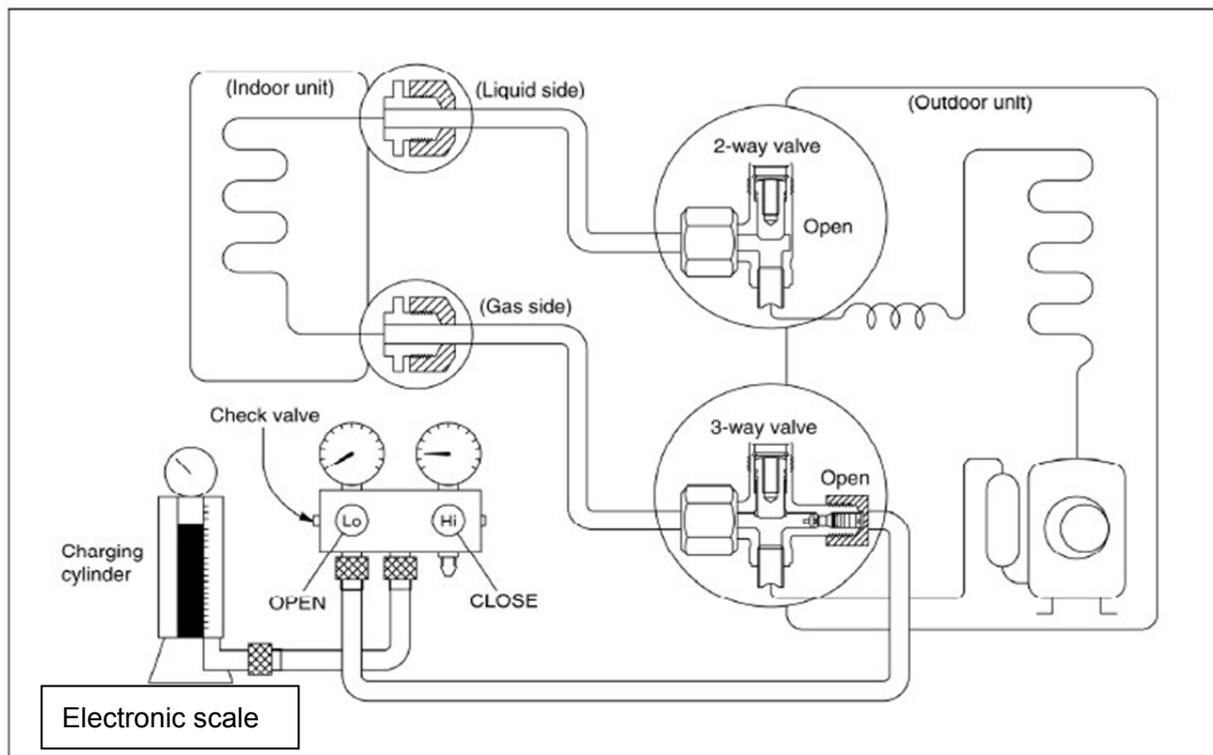
6). When the electronic scale displays the proper weight (refer to the table), disconnect the charge hose from the 3-way valve's service port immediately and turn off the air conditioner before disconnecting the hose.

7). Mount the valve stem caps and the service port

Use torque wrench to tighten the service port cap to a torque of 18N.m.

Be sure to check for gas leakage.

## 8.5 Adding the refrigerant after running the system for many years



### Procedure:

1). Connect the charge hose to the 3-way service port, open the 2-way valve and the 3-way valve.

Connect the charge hose to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder bottom up to ensure liquid charge.

2). Purge the air from the charge hose.

Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).

3) Put the charging cylinder onto the electronic scale and record the weight.

4) Operate the air conditioner at the cooling mode.

5) Open the valves (Low side) on the charge set and charge the system with liquid refrigerant.

6). When the electronic scale displays the proper weight (refer to the gauge and the pressure of the low side), disconnect the charge hose from the 3-way valve's service port immediately and turn off the air conditioner before disconnecting the hose.

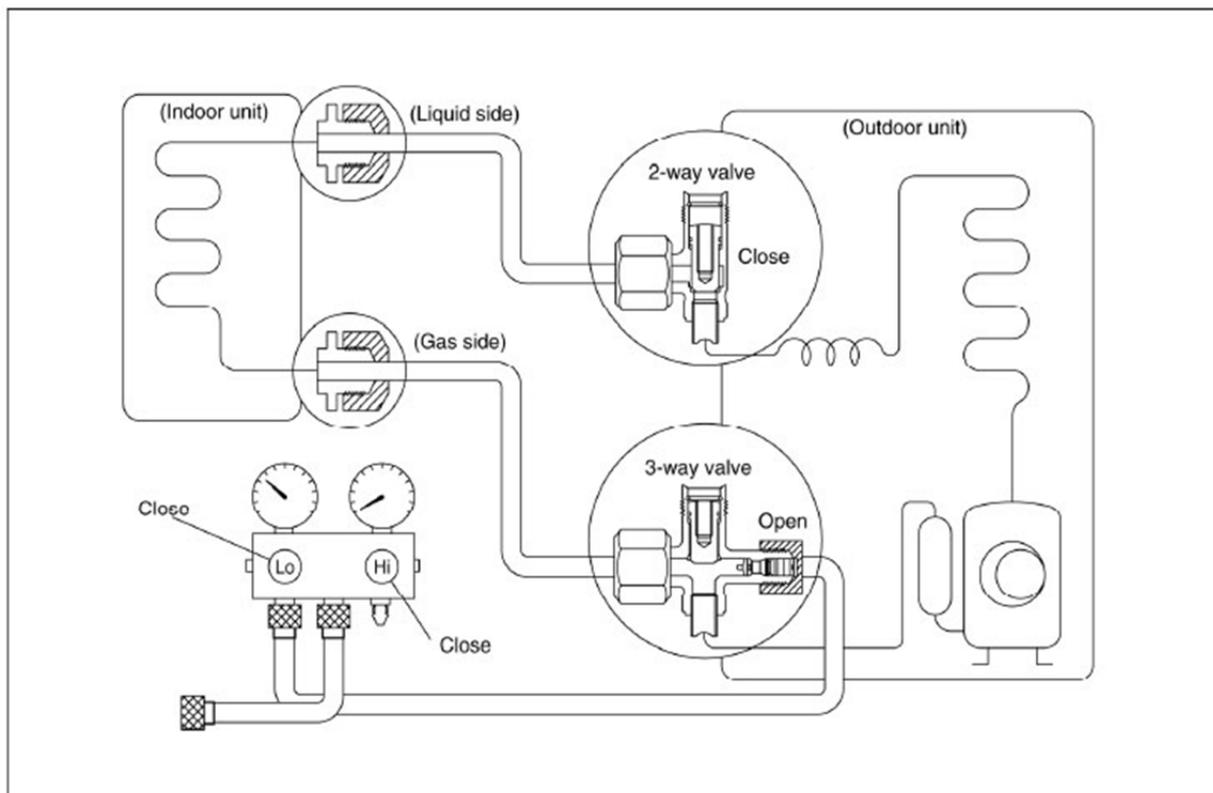
7). Mount the valve stem caps and the service port

Use torque wrench to tighten the service port cap to a torque of 18N.m.

Be sure to check for gas leakage.

## 8.6 Re-installation while the indoor unit need to be repaired

### 1. Collecting the refrigerant into the outdoor unit



#### Procedure

1). Confirm that both the 2-way and 3-way valves are set to the opened position

Remove the valve stem caps and confirm that the valve stems are in the opened position.

Be sure to use a hexagonal wrench to operate the valve stems.

2). Connect the charge hose with the push pin of handle Lo to the 3-way valves gas service port.

3). Air purging of the charge hose.

Open the handle Lo valve of the manifold valve slightly to purge air from the charge hose for 5 seconds and then close it quickly.

4). Set the 2-way valve to the close position.

5). Operate the air conditioner at the cooling cycle and stop it when the gauge indicates 0.1MPa.

6). Set the 3-way valve to the closed position immediately

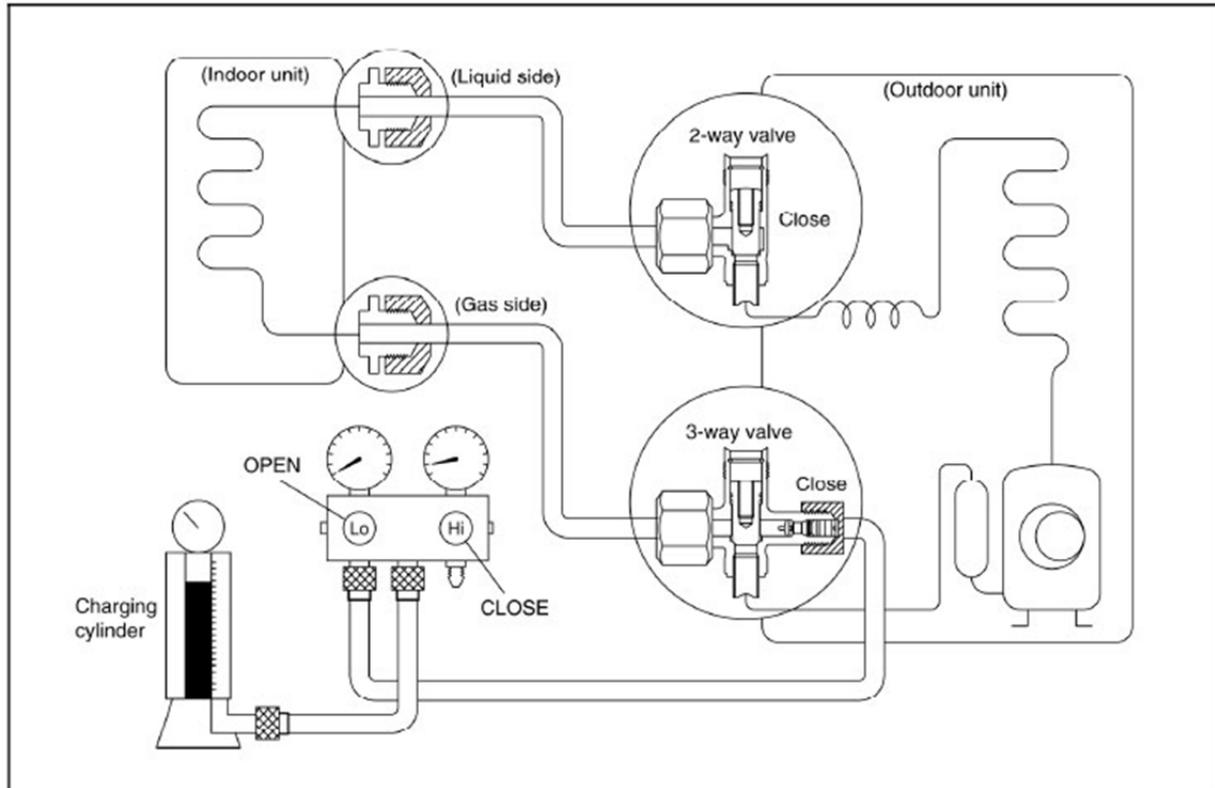
Do this quickly so that the gauge ends up indicating 0.3 to 0.5Mpa.

Disconnect the charge set, and tighten the 2-way and 3-way valve's stem nuts.

Use a torque wrench to tighten the 3-way valves service port cap to a torque of 1.8 kgf.m.

Be sure to check for gas leakage.

## 2. Air purging by the refrigerant



### Procedure:

1). Confirm that both the 2-way and 3-way valves are set to the closed position.

2). Connect the charge set and a charging cylinder to the service port of the 3-way valve

Leave the valve on the charging cylinder closed.

3). Air purging.

Open the valves on the charging cylinder and the charge set. Purge the air by loosening the flare nut on the 2-way valve approximately 45° for 3 seconds then closing it for 1 minute; repeat 3 times.

After purging the air, use a torque wrench to tighten the flare nut on the 2-way valve.

4). Check the gas leakage

Check the flare connections for gas leakage.

5). Discharge the refrigerant.

Close the valve on the charging cylinder and discharge the refrigerant by loosening the flare nut on the 2-way valve approximately 45' until the gauge indicates 0.3 to 0.5 Mpa.

6). Disconnect the charge set and the charging cylinder, and set the 2-way and 3-way valves to the open position

Be sure to use a hexagonal wrench to operate the valve stems.

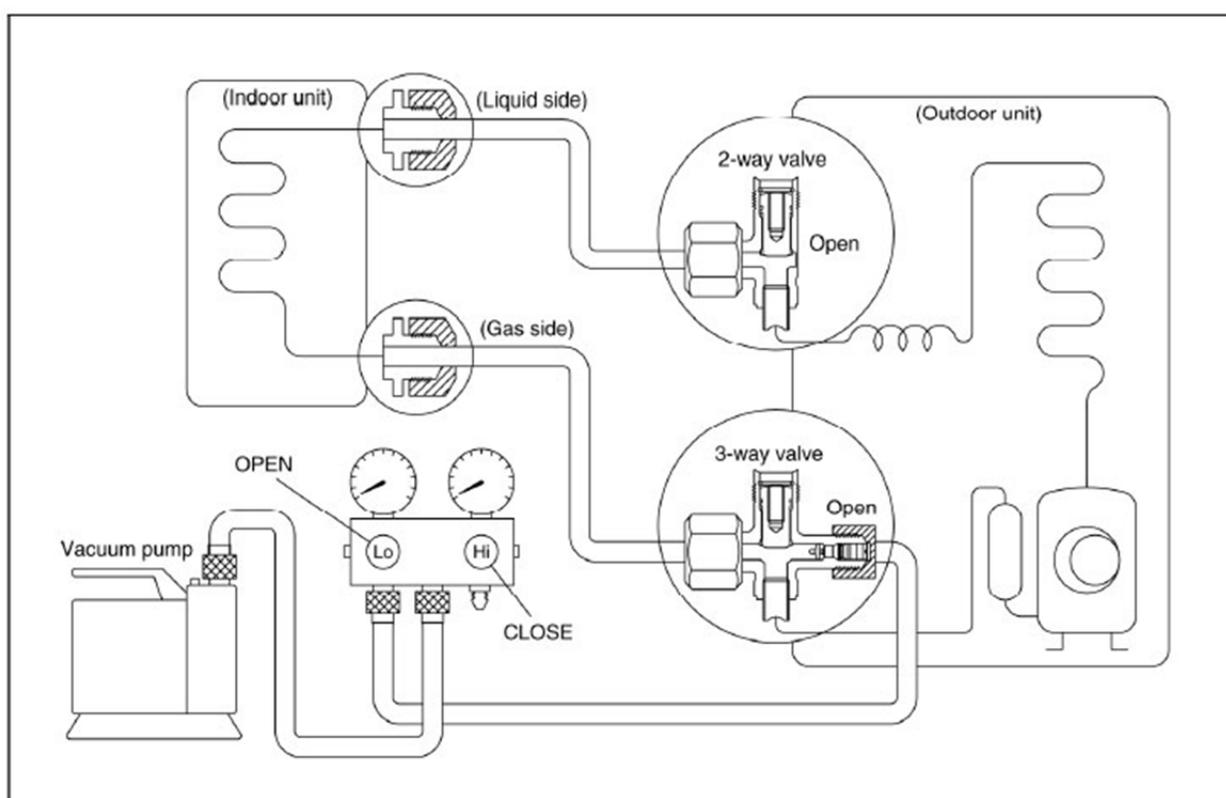
7). Mount the valve stems nuts and the service port cap

Be sure to use a torque wrench to tighten the service port cap to a torque 18N.m.

Be sure to check the gas leakage.

## 6.7 Re-installation while the outdoor unit need to be repaired

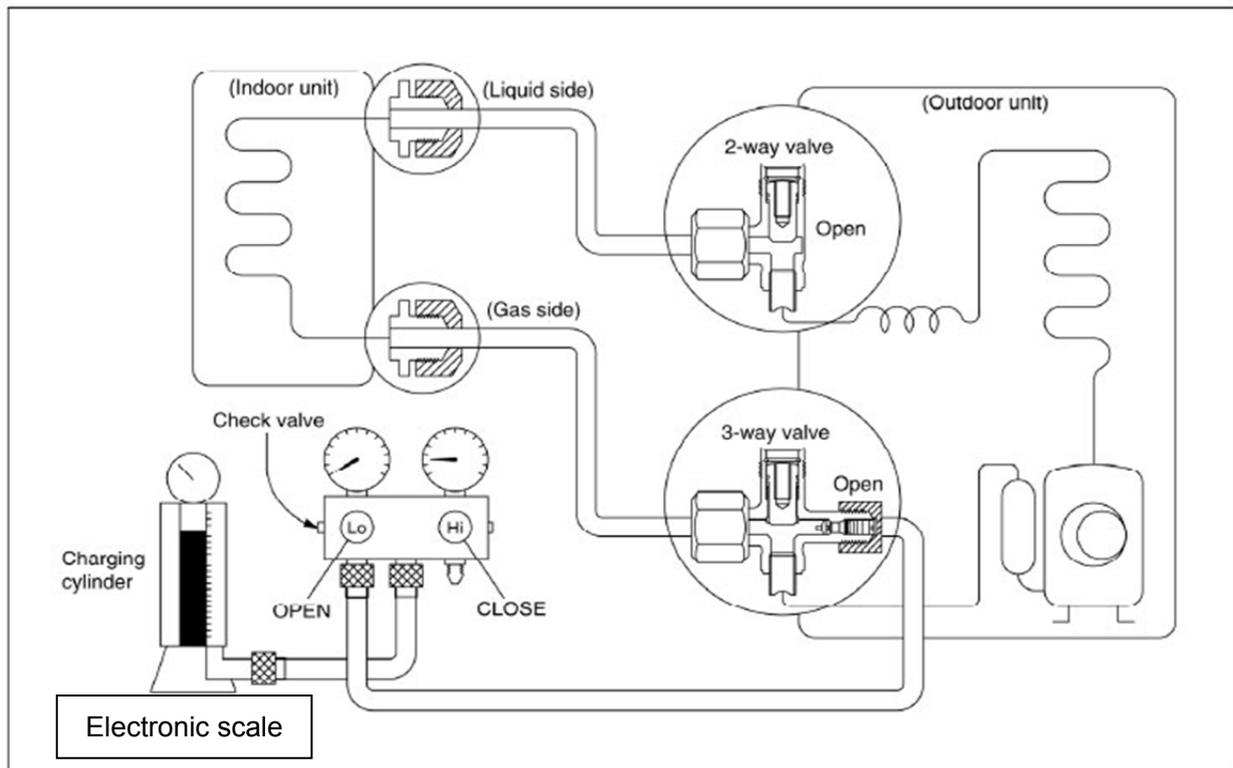
### 1. Evacuation for the whole system



#### Procedure:

- 1). Confirm that both the 2-way and 3-way valves are set to the opened position.
- 2). Connect the vacuum pump to 3-way valve's service port.
- 3). Evacuation for approximately one hour. Confirm that the compound meter indicates -0.1Mpa.
- 4). Close the valve (Low side) on the charge set, turn off the vacuum pump, and confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).
- 5). Disconnect the charge hose from the vacuum pump.

## 2. Refrigerant charging



### Procedure:

- 1). Connect the charge hose to the charging cylinder, open the 2-way valve and the 3-way valve  
Connect the charge hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder bottom up to ensure liquid charge.
- 2). Purge the air from the charge hose  
Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).
- 3) Put the charging cylinder onto the electronic scale and record the weight.
- 4). Open the valves (Low side) on the charge set and charge the system with liquid refrigerant  
If the system cannot be charge with the specified amount of refrigerant, or can be charged with a little at a time (approximately 150g each time) , operating the air conditioner in the cooling cycle; however, one time is not sufficient, wait approximately 1 minute and then repeat the procedure.
- 5).When the electronic scale displays the proper weight, disconnect the charge hose from the 3-way valve's service port immediately  
If the system has been charged with liquid refrigerant while operating the air conditioner, turn off the air conditioner before disconnecting the hose.
- 6). Mounted the valve stem caps and the service port

Use torque wrench to tighten the service port cap to a torque of 18N.m.

Be sure to check for gas leakage

## 9. Operation Characteristics

Temperature Mode	Cooling operation	Heating operation	Drying operation
Room temperature	17°C~32°C	0°C~30°C	10°C~32°C (<21000Btu/h models)
			17°C~32°C (≥21000Btu/h models)
Outdoor temperature	18°C~43°C	-7°C~24°C	11°C~43°C (<21000Btu/h models)
			18°C~43°C (≥21000Btu/h models)

### CAUTION:

1. If the air conditioner is used beyond the above conditions, certain safety protection features may come into operation and cause the unit to operate abnormally.
2. The room relative humidity should be less than 80%. If the air conditioner operates beyond this figure, the surface of the air conditioner may attract condensation. Please set the vertical air flow louver to its maximum angle (vertically to the floor), and set HIGH fan mode.
3. The optimum performance will be achieved during this operating temperature zone.

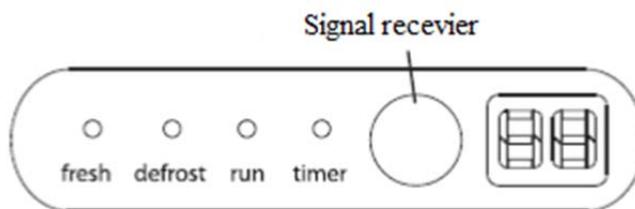
## 10. Electronic function

### 10.1 Abbreviation

- T1: Indoor room temperature
- T2: Coil temperature of evaporator
- T3: Coil temperature of condenser
- T4: Outdoor ambient temperature
- T5: Compressor discharge temperature

### 10.2 Display function

10.2.1 Icon explanation on indoor display board.



	FRESH indication lamp: This lamp illuminates when Clean Air feature is activated.
	DEFROST indication lamp: Lights up when the air conditioner starts defrosting automatically or when the warm air control feature is activated in heating operation.
	RUN indication lamp: This lamp illuminates when the air conditioner is in operation.
	TIMER indication lamp: Lights up during Timer operation.
	Temperature indicator: Displays the temperature settings when the air conditioner is operational. Displays the malfunction code.

## 10.3 Main Protection

### 10.3.1 Time Delay at restart for compressor.

### 10.3.2 Sensor protection at open circuit and breaking disconnection.

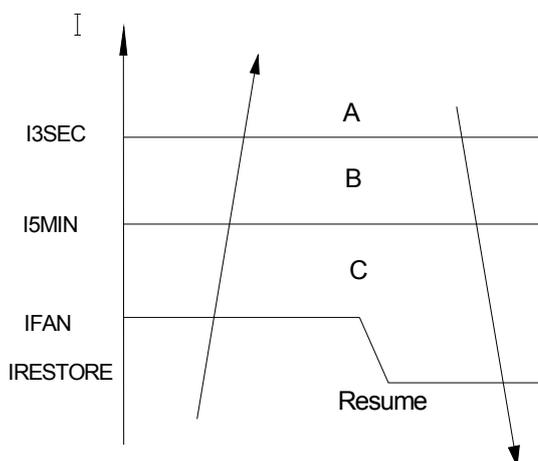
### 10.3.3 Zero crossing detection error protection

If AC cannot detect zero crossing signal for 4 minutes or the zero crossing signal time interval is not correct, the unit will stop and the LED will display the failure. The correct zero crossing signal time interval should be between 6-13ms.

### 10.3.4 Fan Speed is out of control

When Indoor Fan Speed is too low (lower than 300RPM) lasting 2 minutes, the unit stops and LED displays failure information and can't returns to normal operation automatically.

### 10.3.5 Current protection



A zone : The current exceeds  $I_{3SEC}$  for 5 seconds, the compressor and outdoor fan will shut off.

B zone: The current exceeds  $I_{5min}$  for 5 minutes, the compressor and outdoor fan will shut off.

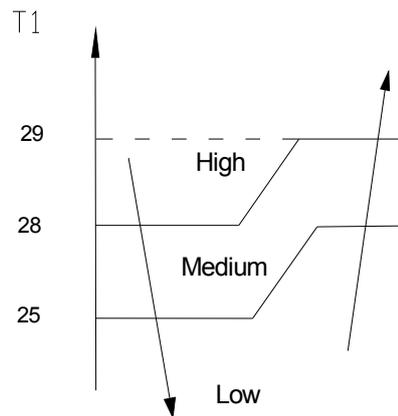
C zone: The current exceeds  $I_{FAN}$ , the outdoor fan will shut off if AC is in heating mode. If AC is in cooling mode, the indoor fan will run at low speed.

Model	$I_{3SEC}(A)$	$I_{5min}(A)$	$I_{FAN}(A)$	$I_{RESTORE}(A)$
MS11M-09HRN1 / MO11M-09HN1	10.0	8.5	5.8	4.8
MS11M-12HRN1 / MO11M-12HN1	10.0	9.0	8.0	6.5
MS11M-18HRN1 / MO11M-18HN1	17.0	15.0	11.0	9.0
MS11M-24HRN1 / MO11M-24HN1	21.0	19.0	17.0	12.0

## 10.4 Operation Modes and Functions

### 10.4.1 Fan mode

- (1) Outdoor fan and compressor stop.
- (2) Temperature setting function is disabled, and no setting temperature is displayed.
- (3) Indoor fan can be set to high/med/low/auto.
- (4) The louver operates the same as in cooling mode.
- (5) Auto fan:

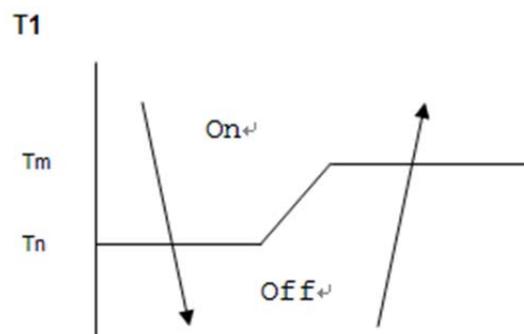


### 10.4.2 Cooling Mode

#### 10.4.2.1 Compressor running rules

Once the compressor starts up, it will run 5.5 minutes. And then it will follow the below rules:

When indoor room temp. T1 is lower than Tn, the compressor and outdoor fan will shut off. When T1 is higher than Tm, the compressor and outdoor fan will start up.



$$T_m = T_s, T_n = T_s - 2.$$

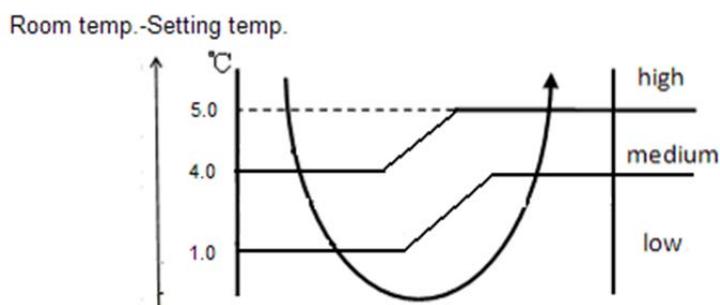
**10.4.2.2 Outdoor fan running rules**

The On-off outdoor units have single fan speed. The outdoor fan will run following the compressor except when AC is in evaporator high temp. protection in heating mode ,condenser high temp. protection in cooling mode, defrosting mode and the current protection.

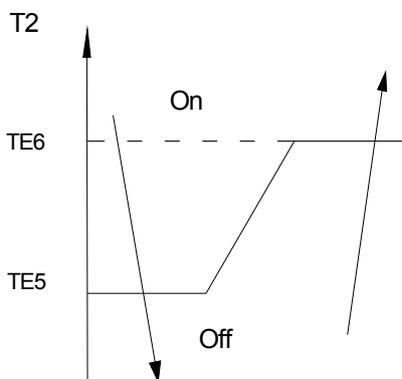
**10.4.2.3 Indoor fan running rules**

In cooling mode, indoor fan runs all the time and the speed can be selected as high, medium, low and auto.

The auto fan:



**10.4.2.4 Low evaporator coil temperature T2 protection**



When the evaporator coil temp.T2 keeps lower than TE5 for 5 minutes, the compressor and outdoor fan will shut off. When T2 is higher than TE6, the compressor and outdoor fan will restart up.

Model	TE5(°C)	TE6(°C)
MS11M-09HRN1 / MO11M-09HN1	2	7
MS11M-12HRN1 / MO11M-12HN1	3	12
MS11M-18HRN1 / MO11M-18HN1	3	14
MS11M-24HRN1 / MO11M-24HN1		

### 10.4.2.5 High condenser temperature T3 protection (MS11M-24HRN1 / MO11M-24HN1)

When  $T3 \geq 65^\circ\text{C}$ , the compressor will stop and restart until  $T3 < 55^\circ\text{C}$ .

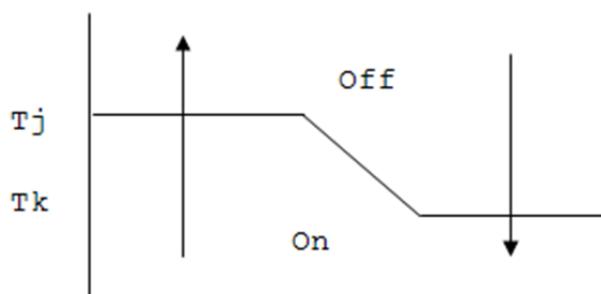
During the protection, the outdoor fan keeps working.

## 10.4.3 Heating Mode

### 10.4.3.1 Compressor running rules:

Once the compressor starts up, it will run 7 minutes. And then it will follow the below rules:

When indoor room temp.  $T1$  is higher than  $Tj$ , the compressor and outdoor fan will shut off. When  $T1$  is lower than  $Tk$ , the compressor and outdoor fan will start up.



While  $Tj = Ts + 4$ ;  $Tk = Ts + 2$

### 10.4.3.2 Outdoor fan running rules:

The outdoor units have single fan speed. The outdoor fan will run following the compressor except when AC is in evaporator high temp. protection in heating mode, condenser high temp. protection in cooling mode, defrosting mode and the current protection.

### 10.4.3.3 Indoor fan running rules:

When the compressor is on, the indoor fan can be set to high/med/low/auto. And the anti-cold wind function has the priority.

If the compressor stops caused by the room temperature rising, the indoor fan will be forced to run at breeze for 127 seconds. During this period, the anti-cold-wind is disabled.

#### Anti-cold wind function:

When evaporator coil temp.  $T2$  is getting higher,

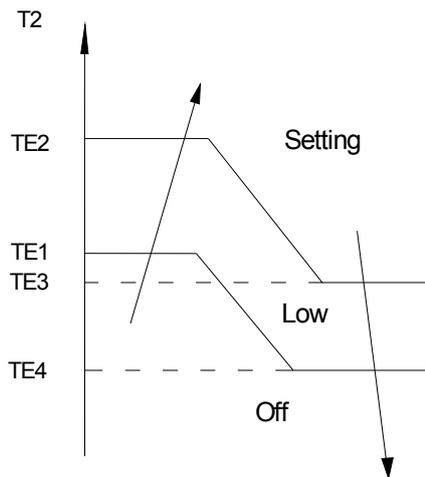
$T2 > TE2$ , the indoor fan will run at setting speed.

$TE1 < T2 < TE2$ , the indoor fan will run at low speed.

When  $T2$  is getting lower,

$TE4 < T2 < TE3$ , the indoor fan will run at low speed.

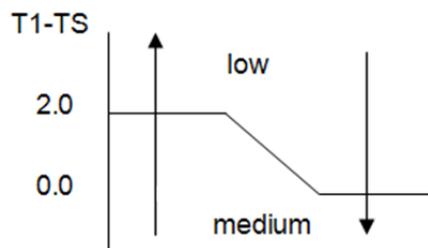
$T2 < TE4$ , the indoor fan will shut off.



While

Model	TE1	TE2	TE3	TE4
MS11M-09HRN1 / MO11M-09HN1	28	32	30	20
MS11M-12HRN1 / MO11M-12HN1	34	37	30	20
MS11M-18HRN1 / MO11M-18HN1	34	36	30	20
MS11M-24HRN1 / MO11M-24HN1	25	32	30	20

**Auto fan action:**



When  $T1-Ts > 2^{\circ}\text{C}$ , the indoor fan will run at low speed.

When  $T1-Ts \leq 0^{\circ}\text{C}$ , the indoor fan will run at medium speed.

#### 10.4.3.4 Defrosting mode:

**For the models except 24k model:**

- **Condition of defrosting:**

Defrosting starts when either of the following ①&②:

① A and B1 or A and B2 are satisfied:

A: The compressor keeps running for 45 minutes or more.

B1: The compressor keeps running for 45-120 minutes, and the difference between evaporator coil temperature and room temperature meets one of the following issues:

	T2-T1
High speed	< TH <sub>DEFROST</sub>
Medium speed	< TM <sub>DEFROST</sub>
Low speed	< TL <sub>DEFROST</sub>
Breeze/off	No need to compare the T2 and T1

B2: The compressor keeps running for 120 minutes or more, and the difference between evaporator coil temperature and room temperature meets one of the following:

	T2-T1
High speed	< TH <sub>DEFROST</sub> +2
Medium speed	< TM <sub>DEFROST</sub> +2
Low speed	< TL <sub>DEFROST</sub> +2
Breeze/off	No need to compare the T2 and T1

②From the end of the last defrosting mode, if the accumulated time reaches 90 minutes which the AC is in evaporator high temperature protection mode and the outdoor fan stopped while the compressor keep working,

**Defrosting time**

	condition	runtime (minute)	Defrosting time (minute)
Case 1	①A、 B1	runtime≤60	DT1
Case 2	①A、 B1	60<runtime≤80	DT1+1
Case 3	①A、 B1	80<runtime≤95	DT1+2
Case 4	①A、 B1	95<runtime≤110	DT1+3
Case 5	①A、 B1	110<runtime≤120	DT1+4
Case 6	①A、 B2		DT1+5
Case 7	②		DT1+5

- From case1 to case5, If the item B is satisfied before item A and it lasts until the item A is satisfied, it would be regarded as severe defrosting and the defrosting time is 10 minutes.
- If AC enters the defrosting mode from case 1 to case 5 for three times continuously, then the fourth defrosting time should be DT1 +5 minutes.

- The air conditioner will not detect whether it needs to run at defrosting mode until the compressor has run for no less than 6.5 minutes.

Model	DT1
MS11M-09HRN1 / MO11M-09HN1	7.5
MS11M-12HRN1 / MO11M-12HN1	
MS11M-18HRN1 / MO11M-18HN1	6.0

- **Condition of ending defrosting:**

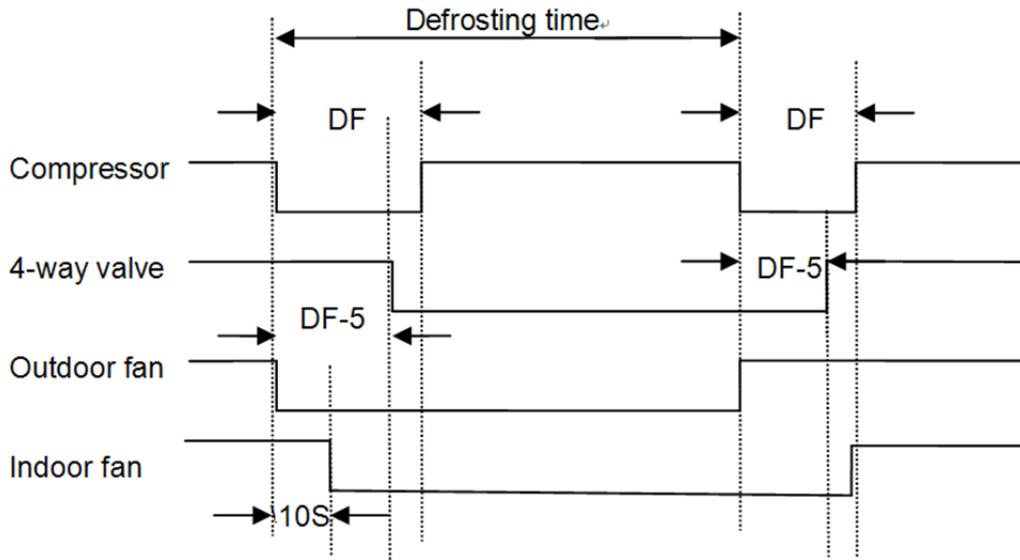
If one of following conditions is satisfied, the AC will end the defrosting mode and turn into heating mode:

A. The defrosting time has ended

B. The compressor current has reached or exceeded  $I_{\text{DEFROST}}$  for 7 seconds

Model	$I_{\text{DEFROST}}$
MS11M-09HRN1 / MO11M-09HN1	3.0
MS11M-12HRN1 / MO11M-12HN1	4.5
MS11M-18HRN1 / MO11M-18HN1	7.0

● **Defrosting action:**



Model	DF(s)
MS11M-09HRN1 / MO11M-09HN1	25
MS11M-12HRN1 / MO11M-12HN1	25
MS11M-18HRN1 / MO11M-18HN1	45

**For 24k model:**

● **Condition of defrosting:**

AC will enter defrosting mode if any of the following items is satisfied.

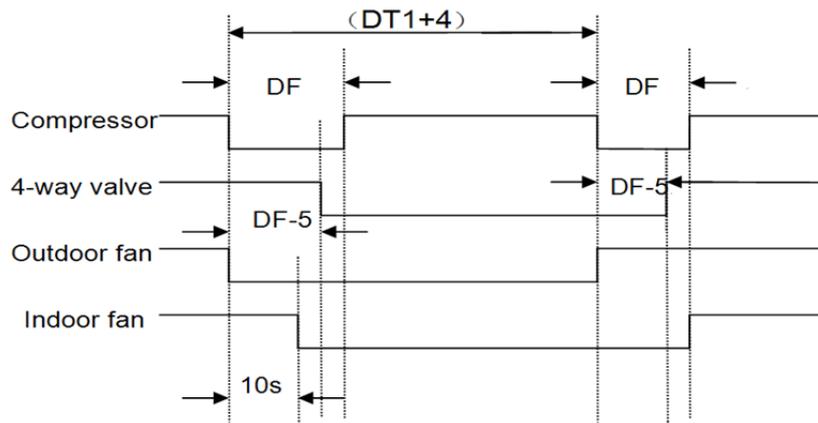
- (1) If the compressor keeps running over 45 minutes. Meanwhile  $T3 < TC3$  for 5 minutes.
- (2) After the last defrosting, the time that the outdoor fan is off but the compressor is on in high T2 protection cumulates up to 90 minutes.

● **Condition of ending defrosting:**

If any one of the following items is satisfied, the defrosting will terminate and the machine will turn to normal heating mode.

- (1) T3 rises to be higher than TC2.
- (2) The machine has run for 10 minutes in defrosting.

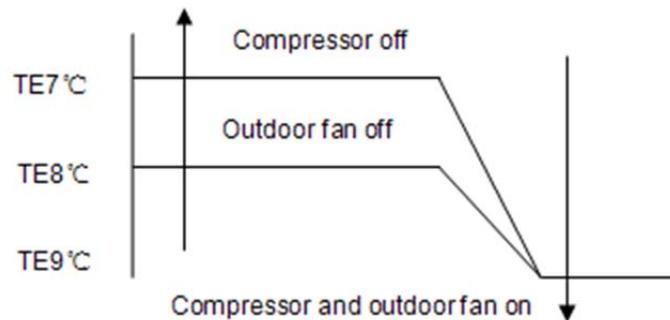
● Defrosting action:



While

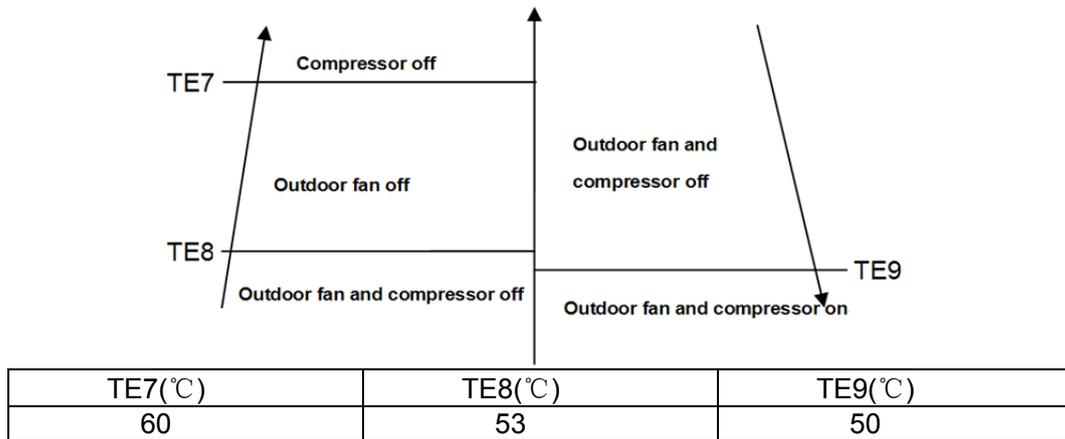
TC2(°C)	TC3(°C)	DT1(min)	DF(s)
20	-3	6	55

10.4.3.5 High evaporator coil temp.T2 protection:



Model	TE7	TE8	TE9
MS11M-09HRN1 / MO11M-09HN1	60	53	50
MS11M-12HRN1 / MO11M-12HN1	63	53	50
MS11M-18HRN1 / MO11M-18HN1	60	52	50

**For 24k model:**



**10.4.4 Auto-mode**

This mode can be chosen with remote controller and the setting temperature can be changed between 17~30°C.

In auto mode, the machine will choose cooling, heating or fan-only mode according to  $\Delta T$  ( $\Delta T = T1 - Ts$ ).

$\Delta T = T1 - Ts$	Running mode
$\Delta T > 2^\circ C$	Cooling
$-3 \leq \Delta T \leq 2^\circ C$	Fan-only
$\Delta T < -3^\circ C$	Heating

AC will run in auto mode in the below cases:

- (1) Pressing the forced auto button.
- (2) If AC is off, it will run in auto mode when the timer on function is active.
- (3) After setting the mode, AC will run in auto mode if the compressor keeps not running for 20 minutes.

**10.4.5 Drying mode**

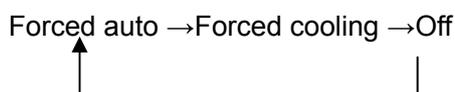
10.4.5.1 The compressor is cycled running with 10 minutes on and then 5 minutes off. The indoor fan will keep running at low speed.

10.4.5.2 In drying mode, if room temperature is lower than 10°C, the compressor will stop and not resume until room temperature exceeds 13°C.

10.4.5.3 The evaporator anti-freezing protection is the same as that in cooling mode.

**10.4.6 Forced operation function**

Press the touch button continually, the AC will run as below sequence:



Forced cooling mode:

The compressor and outdoor fan keep running and the indoor fan runs at low speed. After running for 30 minutes, AC will turn to auto mode with 24°C setting temperature.

Forced auto mode:

The action of forced auto mode is the same as normal auto mode with 24°C setting temperature.

- When AC receives signals, such as switch on, switch off, timer on, timer off, mode setting, fan speed setting, sleeping mode setting, follow me setting, it will quit the forced operation.
- The forced operation function cannot be memorized if power off.

#### **8.4.7 Timer function**

10.4.7.1 Timing range is 24 hours.

10.4.7.2 Timer on. The machine will turn on automatically when reaching the setting time.

10.4.7.3 Timer off. The machine will turn off automatically when reaching the setting time.

10.4.7.4 Timer on/off. The machine will turn on automatically when reaching the setting “on” time, and then turn off automatically when reaching the setting “off” time.

10.4.7.5 Timer off/on. The machine will turn off automatically when reaching the setting “off” time, and then turn on automatically when reaching the setting “on” time.

10.4.7.6 The timer function will not change the AC current operation mode. Suppose AC is off now, it will not start up firstly after setting the “timer off” function. And when reaching the setting time, the timer LED will be off and the AC running mode has not been changed.

10.4.7.7 The setting time is relative time.

10.4.7.8 The AC will quit the timer function when it has malfunction.

#### **10.4.8 Sleep function mode**

10.4.8.1 Operation time in sleep mode is 7 hours. After 7 hours the AC quits this mode and turns off.

10.4.8.2. Operation process in sleep mode is as follow:

When cooling, the setting temperature rises 1°C (be lower than 30°C) every one hour, 2 hours later the setting temperature stops rising and indoor fan is fixed as low speed.

When heating, the setting temperature decreases 1°C (be higher than 17°C) every one hour, 2 hours later the setting temperature stops rising and indoor fan is fixed as low speed. (Anti-cold wind function has the priority)

10.4.8.3 Timer setting is available

10.4.8.4 When user uses timer off function in sleep mode (or sleep function in timer off mode), if the

timing is less than 7 hours, sleep function will be cancelled when reaching the setting time. If the timing is more than 7 hours, the machine will not stop until reaches the setting time in sleep mode.

#### **10.4.9 Auto-Restart function**

The indoor unit is equipped with auto-restart function, which is carried out through an auto-restart module. In case of a sudden power failure, the module memorizes the setting conditions before the power failure. The unit will resume the previous operation setting (not including swing function) automatically after 3 minutes when power returns.

If the memorization condition is forced cooling mode, the unit will run in cooling mode for 30 minutes and turn to auto mode as 24°C setting temp.

If AC is off before power off and AC is required to start up now, the compressor will have 1 minute delay when power on. Other conditions, the compressor will have 3 minutes delay when restarts.

#### **10.4.10 Follow me**

1) If the indoor PCB receives the signal which results from pressing the FOLLOW ME button on remote controller, the buzzer will emit a sound and this indicates the follow me function is initiated. But when the indoor PCB receives signal which sent from remote controller every 3 minutes, the buzzer will not respond. When the unit is running with follow me function, the PCB will control the unit according to the temperature from follow me signal, and the temperature collection function of room temperature sensor will be shielded, but the error detective function of room temperature sensor will be still valid.

2) When the follow me function is available, the PCB will control the unit according to the room temperature from the remote controller and the setting temperature.

3) The PCB will take action to the mode change information from remote controller signal, but it will not be affected by the setting temperature.

4) When the unit is running with follow me function, if the PCB doesn't receive any signal from remote controller for 7 minutes or pressing FOLLOW ME button again, the follow me function will be turned off automatically, and the temperature collection function of room temperature sensor will be available, the PCB will control the unit according to the room temperature detected from its own room temperature sensor and setting temperature.

#### **10.4.11 Self clean**

For heat pump models which are provided with this function, after running in cooling or drying mode, if

the user press “Self Clean” button on remote controller, firstly, indoor unit runs in fan only mode for a while, then low heat operation and finally runs in fan only again. This function can keep the inside of indoor unit dry and prevent breeding of mold.

#### **10.4.12 Refrigerant Leakage Detection**

With this new technology, the display area will show “EC” when the outdoor unit detects refrigerant leakage.

#### **10.4.13 Louver Position Memory Function**

When starting the unit again after shutting down, its louver will restore to the angle originally set by the user, but the precondition is that the angle must be within the allowable range, if it exceeds, it will memorize the maximum angle of the louver. During operation, if the power fails or the end user shuts down the unit in the turbo mode, the louver will restore to the default angle.

#### **10.4.14 Clean Air function**

This air conditioner is equipped with Plasma Dust Collector. The Plasma Dust Collector generates a high voltage ionization zone, through which the air is converted to plasma. Inside the air most of the dust, smoke, and pollen particles are captured by the electrostatic filter.

## 11. Troubleshooting

### 11.1 Indoor Unit Error Display

Operation lamp	Timer lamp	Display	LED STATUS
☆ 1 time	X	E1	EEPROM parameter error
☆ 2 times	X	E2	Zero-crossing signal error
☆ 3 times	X	E3	Indoor fan speed has been out of control
☆ 5 times	X	E5	Open circuit or short circuit of indoor room temperature sensor
☆ 6 times	X	E6	Open circuit or short circuit of evaporator coil temperature sensor
☆ 7 times	X	E7	Open circuit or short circuit of condenser coil temperature sensor
☆ 2 times	O	EC	Refrigerant Leakage Detection
☆ 9 times	X	E9	Indoor / outdoor units communication error

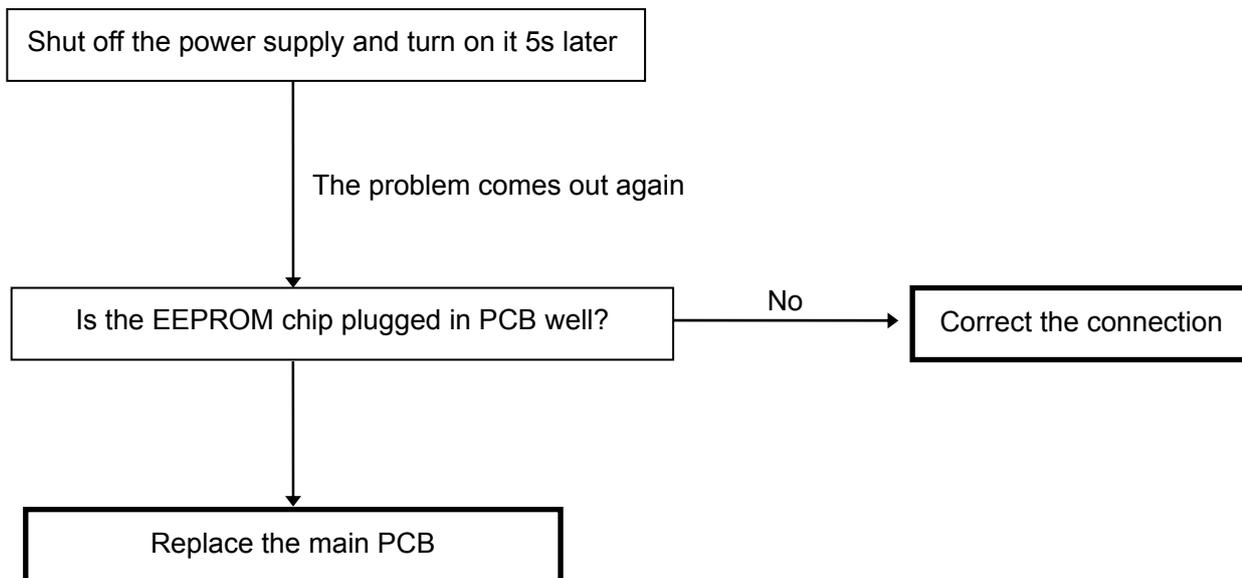
O (light)

X (off)

☆ (flash)

## 11.2 Diagnosis and Solution

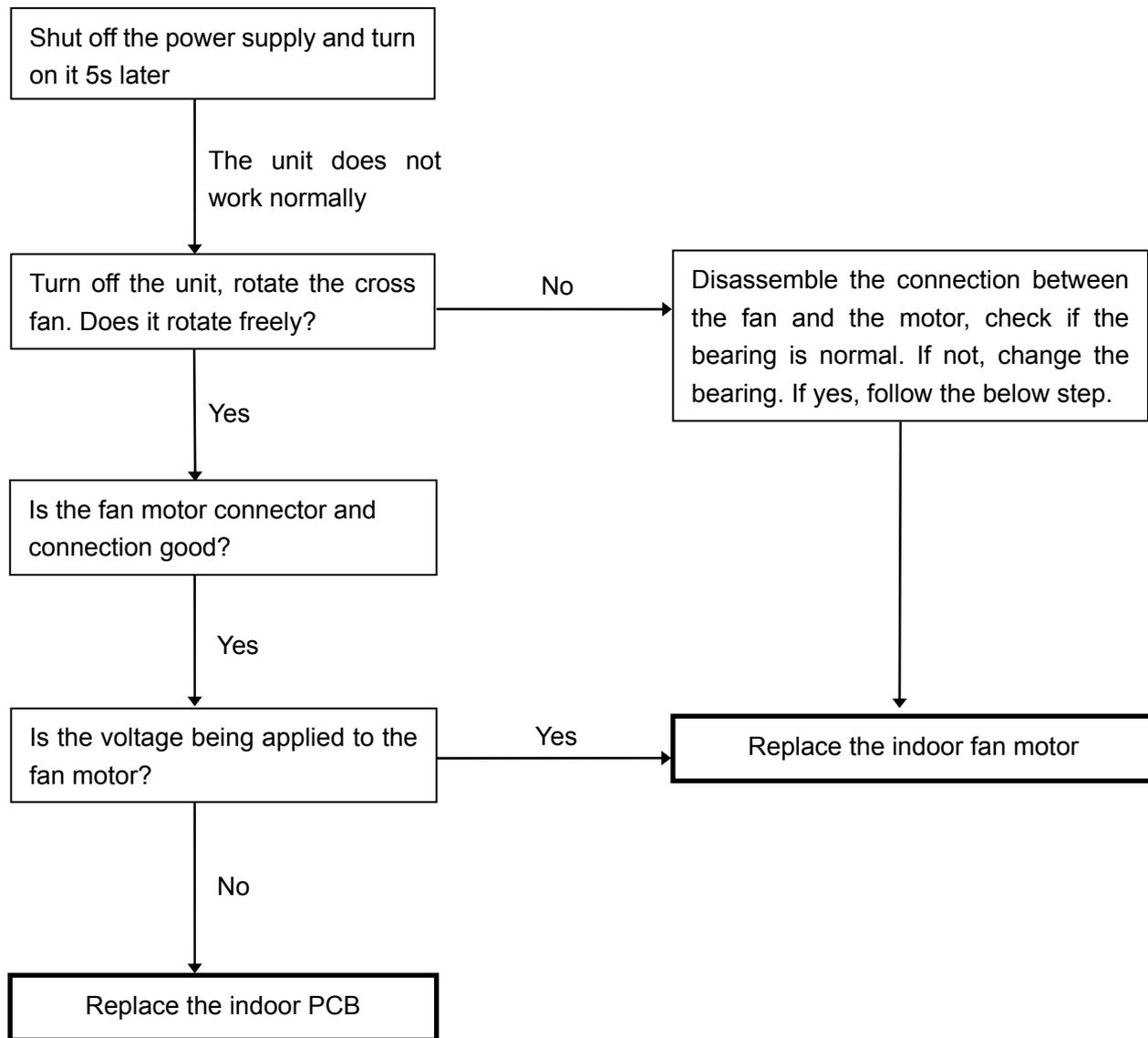
### 11.2.1 EEPROM parameter error diagnosis and solution



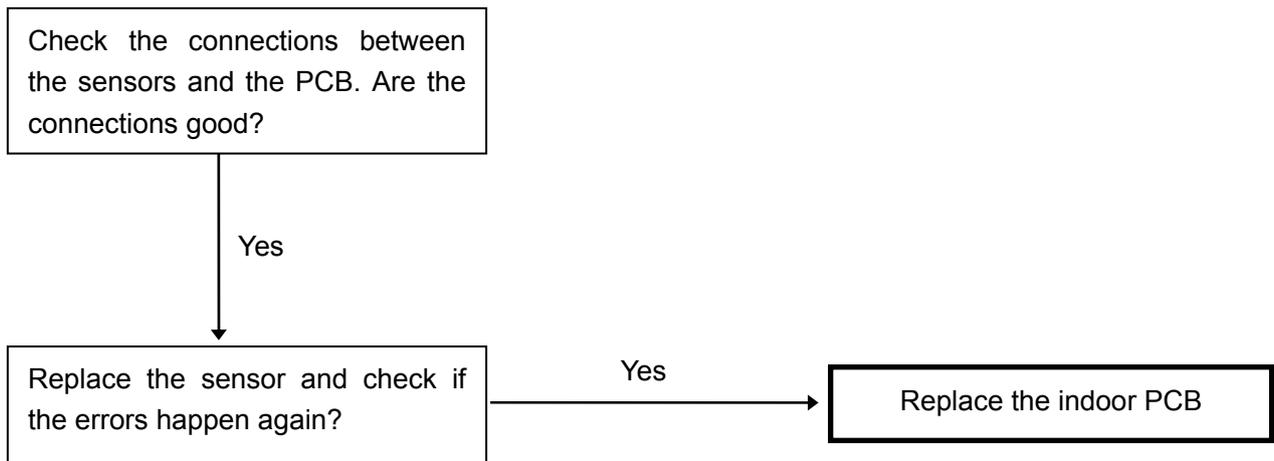
### 11.2.2 Zero crossing detection error

This is alarm signal when the main chip can't detect over-zero signal. When such failure occurs, the main control board must have fault.

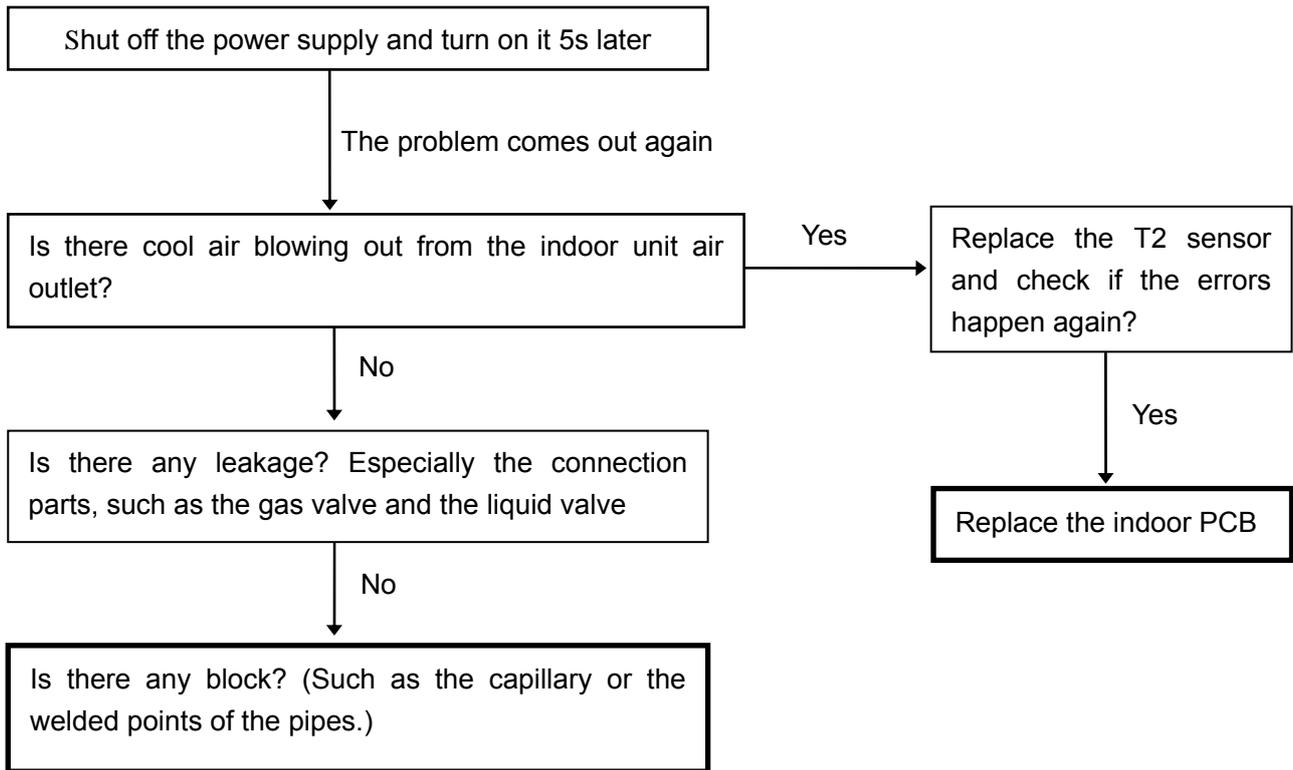
### 11.2.3 Indoor fan speed has been out of control diagnosis



### 11.2.4 Open or short circuit of temperature sensors diagnosis and solution



### 11.2.5 Refrigerant Leakage Detection



11.2.6 Indoor / outdoor units communication error

