Multi ECO SERIES

1.Features

1.1 Compact design

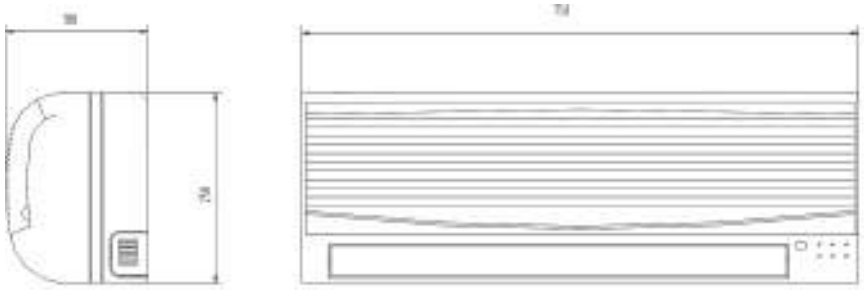
1.2 High efficiency and quiet operation

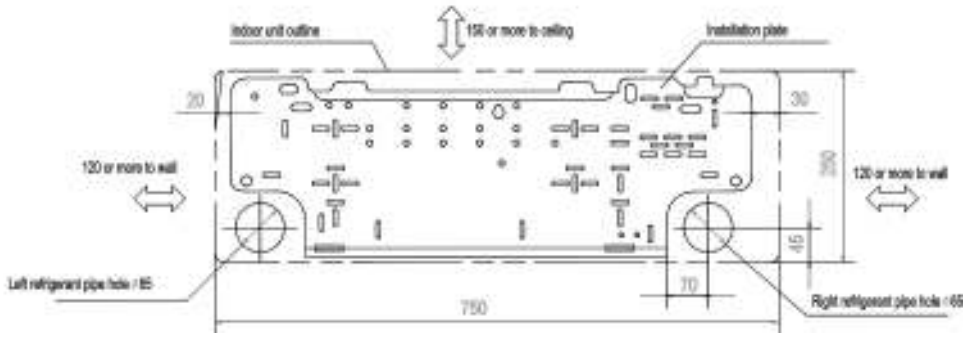
2.Specification

Model			**MS3G-30HRN2**	**MS3G-27HRN2**
Power supply		Ph-V-Hz	1Ph,220-240V~,50Hz	1Ph,220-240V~,50Hz
Cooling	Capacity	Btu/h	9000x2+12000	9000x2+10000
	Input	W	1800+1300	1800+1300
	Rated current	A	8.2+5.8	8.2+5.8
	EER	Btu/w.h	10+9.2	10+9.0
Heating	Capacity	Btu/h	10000x2+13000	10000x2+13000
	Input	W	1750+1250	1750+1250
	Rated current	A	8.0+5.6	8.0+5.6
	COP	Btu/w.h	11.6+10.4	11.6+9.4
Moisture Removal		L/h	1.0x2 +1.2	1.0x2 +1.2
Max. input consumption		W	2200+1800	2200+1800
Max. current		A	10.0 +8.2	10.0 +8.2
Starting current		A	40+30	40+30
Compressor	Model		PG295X2CS-4KU1;	PG295X2CS-4KU1;
	Type		Rotary / GD Toshiba	Rotary / GD Toshiba
	Capacity	Btu/h	18080; 13650	18080; 13650
	Input	W	1760; 1310	1760; 1310
	Rated	A	8.5; 6.1	8.5; 6.1
	Thermal protector		Internal	Internal
	Capacitor	uF	35uF/440VAC;	35uF/440VAC;
	Refrigerant oil	ml	750; 480	750; 480
Indoor fan motor	Model		RPG13H	RPG13H
	Input	W	36.5	36.5
	Capacitor	uF	1.2μF/450V	1.2μF/450V
	Speed(hi/mi/lo)	r/min	1350	1350
Indoor air flow (Hi/Mi/Lo)		m3/h	550	550
Indoor noise level (Hi/Mi/Lo)		dB(A)	38/35/31	38/35/31
Indoor unit	Dimension	mm	750×250×188	750×250×188
	Packing	mm	830X336X280	830X336X280
	Net/Gross weight	Kg	8.5/10	8.5/10
Outdoor fan motor	Model		YDK50-4G1	YDK50-4G1
	Input	W	107Wx2	107Wx2
	Capacitor	uF	4uFx2	4uFx2
	Speed	r/min	1150	1150
Outdoor air flow		m3/h	1450x2	1450x2
Outdoor noise level		dB(A)	57	57
Outdoor unit	Dimension(W*H*D)	mm	860X830X330	
	Packing (W*H*D)	mm	983X915X425	
	Net/Gross weight	Kg	81/88	
Refrigerant type		g	R407C 1470+820	R407C 1470+820
Design pressure		MPa	2.6	2.6
Refrigerant piping	Liquid side/ Gas	mm	Φ6.35/Φ9.53(A	
	Max. refrigerant	m	10 (each unit)	
	Max. difference in	m	5 (each unit)	
Operation temp		℃	17~30	17~30
Ambient temp		℃	-7~45	-7~45
Application area		m2	(14-21)x2.18-26	(14-21)x2.18-26

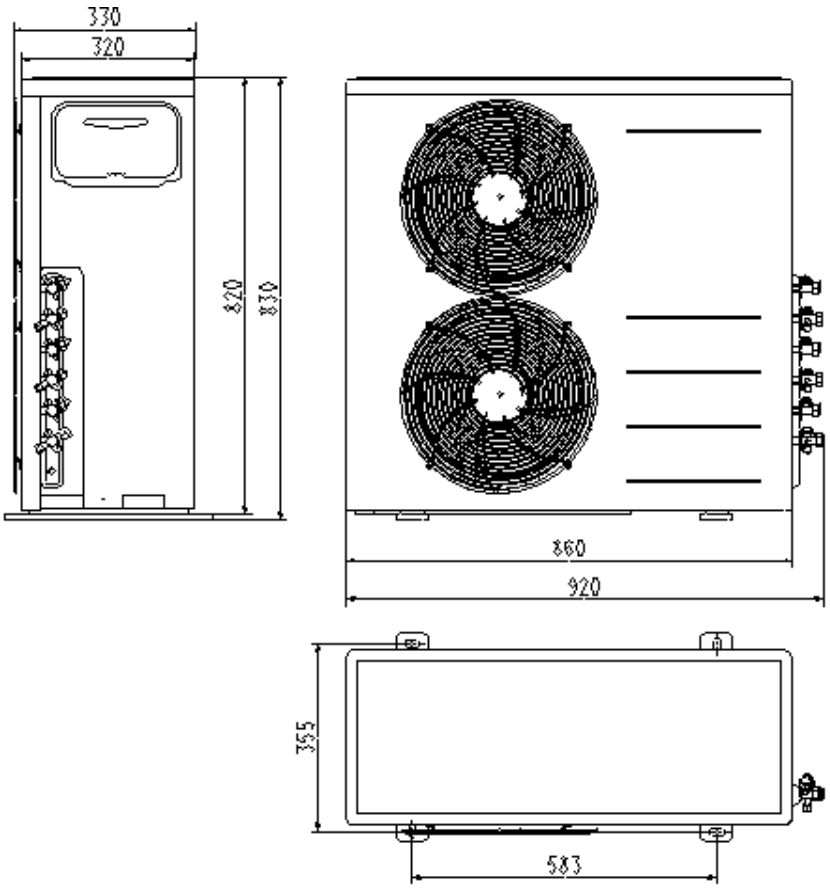
3.Dimensions

3.1 Indoor unit



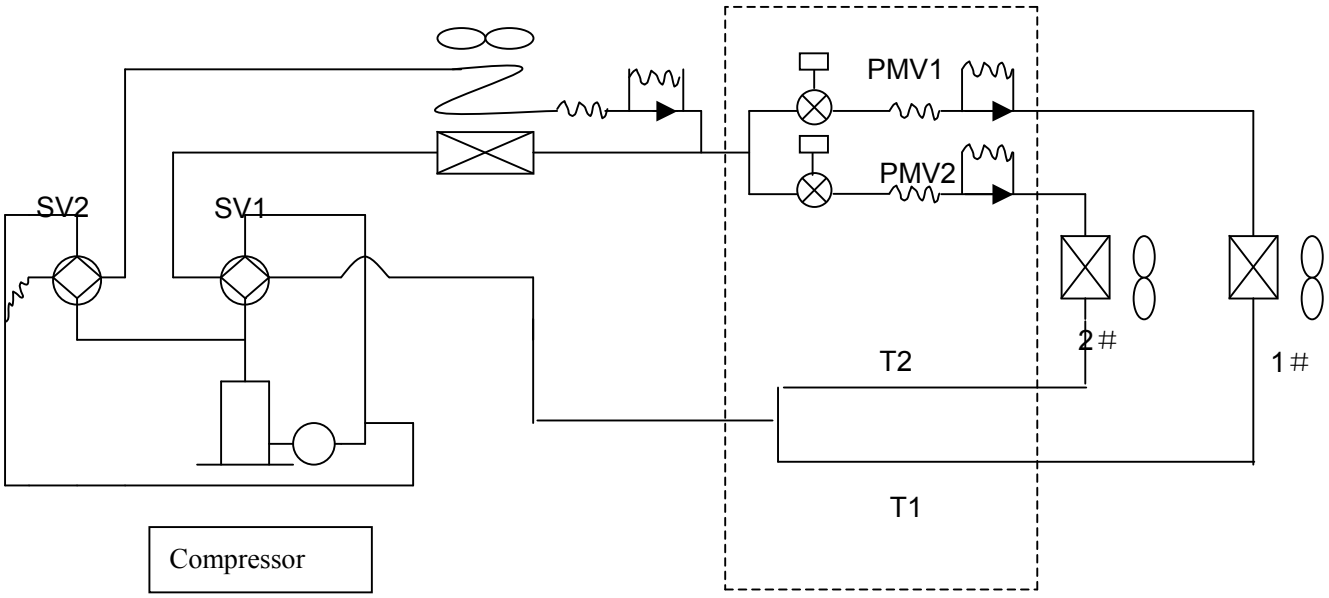


3.2 Outdoor unit



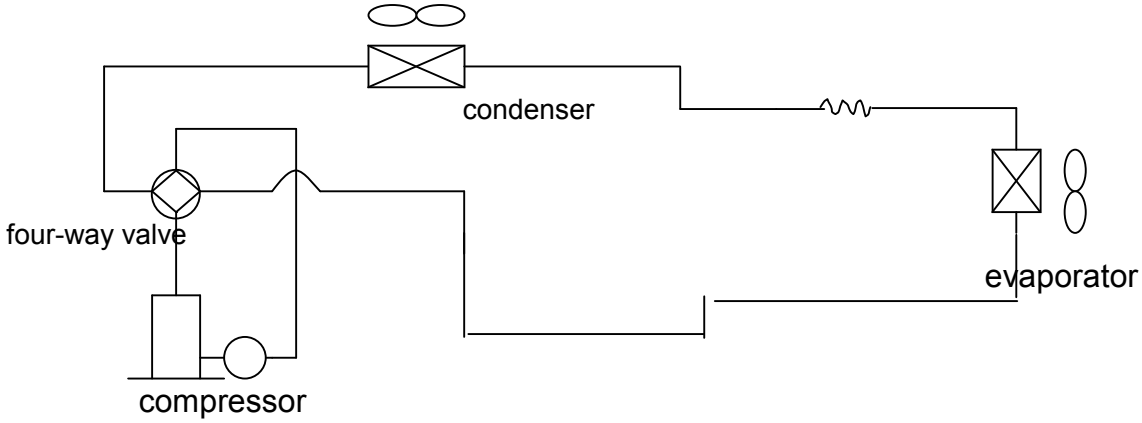
4.Refrigeration cycle diagram

“1 drive 3 system” is made up of one “1 drive 1 system” and one “1 drive 2 system”.



1 drive 2 system

SV1：Primary four-way valve SV2：Secondary four-way valve PMV1，PMV2：Electronic expansive valve T1，T2：Indoor pipe temperature sensor

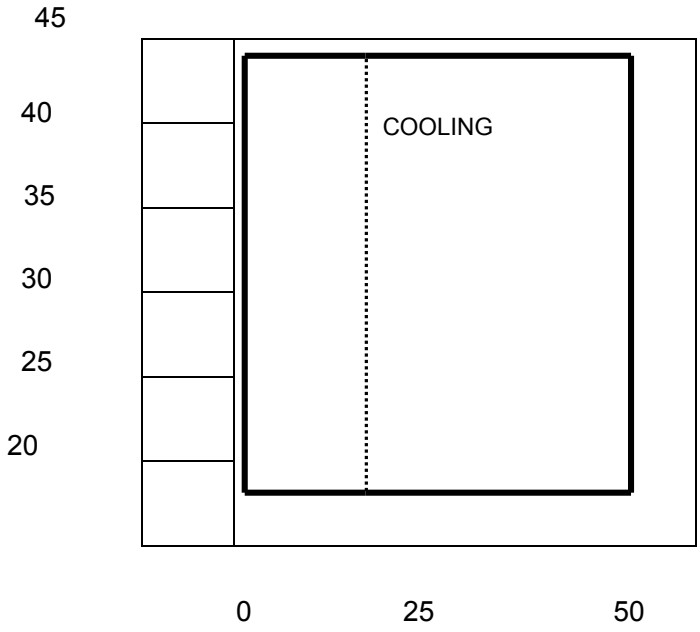


1 drive 1 system

5.Operation limits

5.1Cooling operation

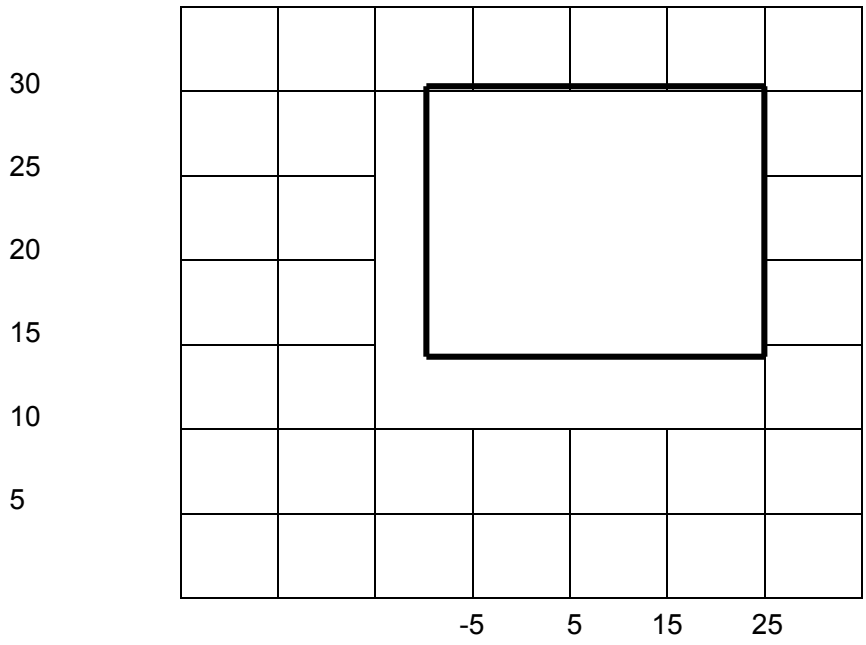
Outdoor unit air temp.℃ DB



Note : The chart is the result from the continuous operation under constant air temperature conditions. However, excludes the initial pull-down stage.

5.2Heating operation

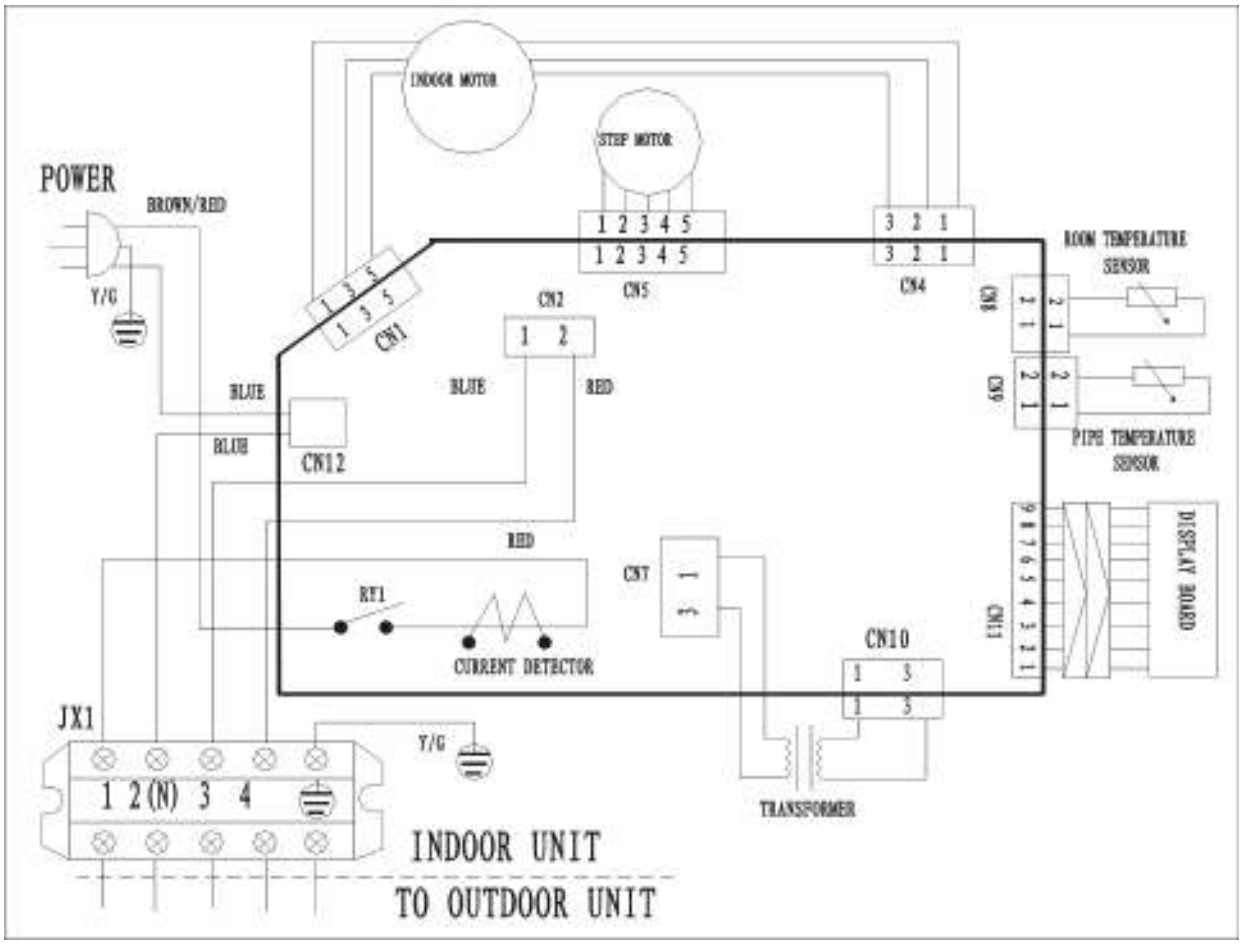
Indoor air temp. ℃ DB



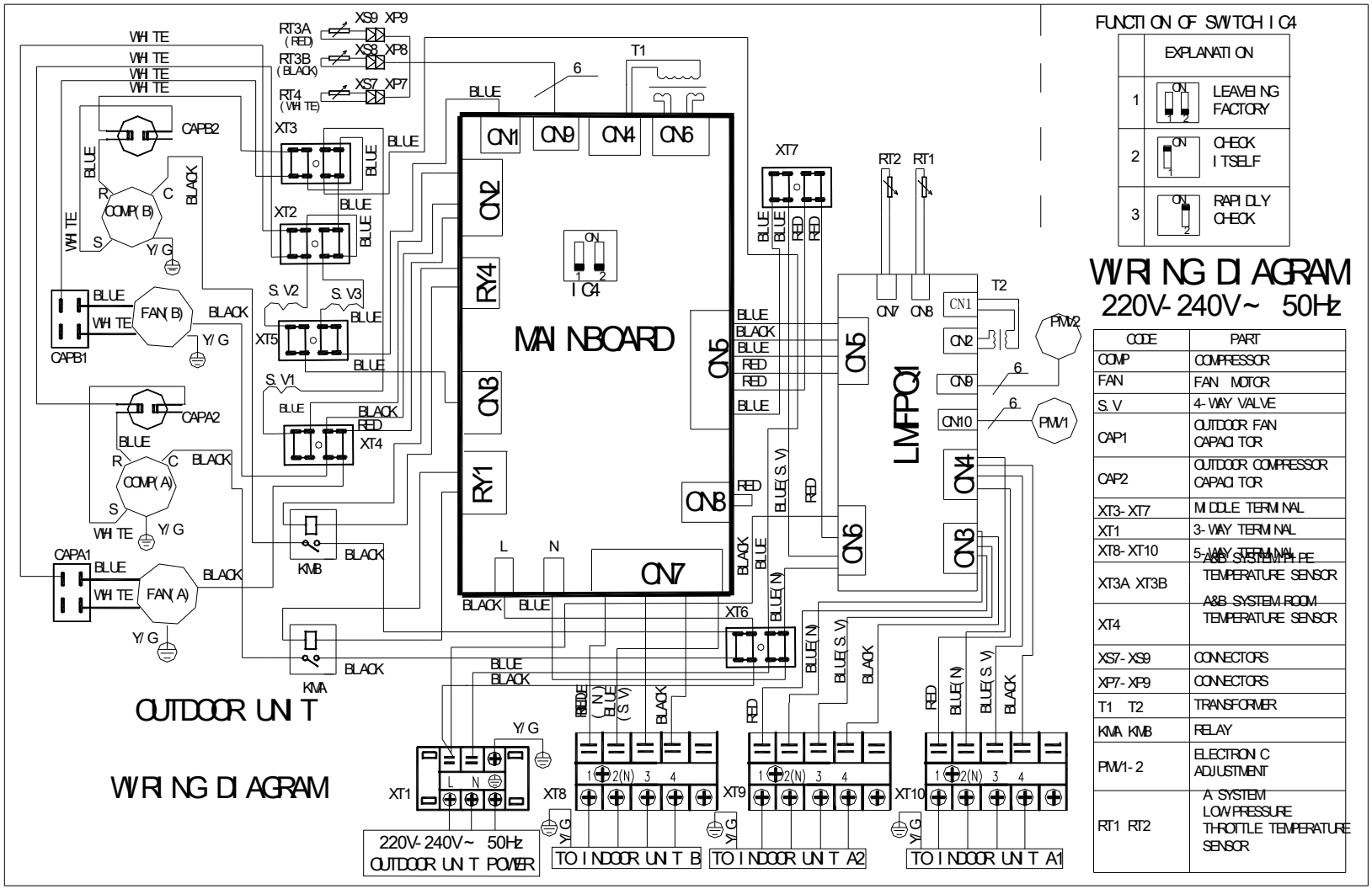
Note : The chart is the result from the continuous operation under constant air temperature conditions. However, excludes the initial pull-down stage.

6.Wiring diagram

Indoor unit



Outdoor unit



7.Troubleshooting

7.1 Indoor unit

Failure phenomenon	Operation lamp	Timer lamp
Indoor fan speed has been out of control for over 1 minute	☆	X
Indoor room temp. sensor or evaporator temp. sensor is open circuit or short circuit	☆	on
EEROM error	on	☆
Over current protection of the compressor occurs 4 times in 1h	X	☆

✕ Extinguish

☆ Flash at 5Hz

7.2 Outdoor unit (on mainboard)

Failure phenomenon	LED1	LED2	LED3	Sensor in outdoor unit
Condenser high temperature protection		☆	☆	RT3B or RT3A
RT3A sensor is open circuit or short circuit	☆			RT3A
RT4 sensor is open circuit or short circuit			☆	RT4
RT3B sensor is open circuit or short circuit		☆		RT3B

☆ Flash at 2Hz

Remark

	Standard by	a unit working	b unit working	a unit and b unit working
LED1	Blinking at 0.5 Hz	On	Off	On
LED2	Blinking at 0.5 Hz	Off	On	On
LED3	Blinking at 0.5 Hz	Off	Off	off

7.3 Outdoor unit (on LMFPQ1)

	Standard by	a or b unit working	RT2 or RT1 sensor is open circuit or short circuit
LED	Blinking at 0.5 Hz	On	Blinking at5 Hz

7.4 Failure and Related Causes of Remote Controller

Before requesting service or maintenance, please check the following items

Changing function can not be set		
Symptom	Checking Item	Cause
Fan speed can not be changed	Check if “Auto” mode is displayed	When “Auto” is chosen, indoor fan will choose “Auto” fan speed
	Check if “Dehumidification” is displayed	When dehumidification is chosen, indoor unit automatically chooses “Auto” fan speed. Fan speed can only be chosen under “cooling”, “heating” and “fan” mode.

Emission signal “” does not blink		
Symptom	Checking item	Cause
When pressing On/Off button, remote control signal is not emitted.	Check battery	Signal can not be emitted when there is no battery

Temperature display is dark		
Symptom	Checking item	Cause
Temperature display is dark	Check if “Fan” is chosen	Under Fan mode, temperature can not be set

Display disappears		
Symptom	Checking item	Cause
After a while, On/Off display disappears	Check if set time of the timer is already finished	Because set time is reached, A/C stops running
After a while, “Timer On” display disappears	Check if set time of the timer is already finished	When set time for A/C running is reached, A/C start running automatically and related display disappears

No sound for signal receipt		
Symptom	Checking item	Cause
When pressing On/Off button, A/C doesn’t give out receipt sound	When pressing the button, make sure that the emitter of the remote control is directed to the receiver of the A/C. Check if power supply is well connected	Direct the emitter to the receiver correctly and press the On/Off button repeatedly The A/C is turned off so it can not receive signals
Button on remote control doesn’t function	Check the remote display	The button is locked

8 Electronic function

8.1 Electric Control working environment

8.1.1 input voltage: 175~253V

8.1.2 Input power frequency:50Hz

8.1.3 Ambient temperature: -7°C~+43°C

8.1.4 Indoor fan normal working amp is less than 1A,

8.1.5 Outdoor fan. Normal working amp is less than 1.5A

8.1.6 Four-way valve normal working amp is less than 1A.

8.1.7 Swing motor: DC12V.

8.2 Proper symbols and their meanings:

TA: Indoor ambient temperature

TE: Indoor evaporator temperature

TS: Setting temperature through the remote controller

TE1: Anti-cold wind, from Fan Off to Breeze temperature

TE2: Anti-cold wind, from Breeze to Setting Fan Speed temperature

TE3: Anti-cold wind, from Setting Fan Speed to Breeze temperature

TE4: Anti-cold wind, from Breeze to Fan Off temperature

TE5: Evaporator low temperature protection entering temperature

TE6: Evaporator low temperature protection restoring temperature

TE7: Evaporator high temperature protection, compressor off temperature

TE8: Evaporator high temperature protection, fan off temperature

TE9: Evaporator high temperature protection, restoring temperature

T3: Outdoor unit pipe sensor

T4: Outdoor temperature sensor

8.3 Systematic functions.

Remote receiving.

Testing and forced run.

Position set for indoor unit wind vane.

LED displaying and alarm.

On or off Timer.

Protection for the compressor.

High temperature protection of indoor heat exchanger under heating mode.

Auto defrosting and heating recovery under heating mode.

Anti cold air under heating mode.

Anti frozen under cooling mode.

8.4 Protection

8.4.1 The compressor functions protection with a delay of three minutes.

8.4.2 High temp. protection of condenser.

8.4.3 Sensor protection at open circuit and breaking disconnection

8.4.4 Temperature Fuse break protection

8.4.5 Fan Speed is out of control. When Indoor Fan Speed is too high(higher than High Fan+300RPM)or too low(lower than 400RPM), the entire unit stops and LED displays failure information and can't returns to normal operation automatically.

8.5 Fan-only mode

Fan speed is high/mid/low/ Auto

8.6 Cooling mode

The 4-way valve is closed under cooling mode.

The action of the compressor and the outdoor fan:

	Condition	Compressor	Outdoor fan
Temp. up	TA>Ts+1	On	On
	TA<Ts+1	Off	Off
Temp. down	TA>Ts	On	On
	TA<Ts	Off	Off

Auto fan under cooling mode:

	Condition T=Indoor Temp.-Setting Temp.	Indoor fan speed
Temp. up	T<3℃	Low
	3℃<T<5℃	Med.
	T>5℃	High
Temp. down	T> 3℃	High
	1℃<T<3℃	Med.
	T<1℃	Low

Anti-freezing control to indoor evaporator under cooling mode

	Condition		Compressor	Outdoor fan
	Temp.	Time		
Temp. up	T> TE6		On	On
	T< TE6	>5 Minutes	Off	Off
Temp. down	T> TE5		On	On
	T< TE5	>5 Minutes	Off	Off

Condenser high-temperature protection under heating mode

T3 >65℃, turn off compressor; T3<60℃,Protection removed,Compressor turned on.

8.7 Dehumidifying mode

8.7.1 The 4-way valve is off in dehumidifying mode

8.7.2 Compressor and Indoor Fan actions in dehumidifying mode

Compressor run 5 minutes , and indoor fan run 5 minutes in low speed, then turn off the compressor, indoor fan run 5 minutes in low speed. And repeat on and off cycle.

8.7.3 Low room temperature protection:

When room temperature decreases to below 10℃, the compressor and the outdoor fan will stop(indoor fan is Breeze). Dehumidifying operation will be resumed when room temperature restores to over 13℃.

8.7.4 Under dehumidifying mode, the anti-freezing function of the indoor heat exchanger is the same as that of cooling mode.

8.8 Heating mode

8.8.1 Generally, the 4-way valve is open in heating mode, but it is closed in defrosting mode. 4-way valve must delay 2 minutes compared with compressor if the compressor changed into non-heating mode or turned off. 4-way valve doesn't delay in dehumidifying mode.

8.8.2 Generally, the outdoor fan is turned off with the on-off action of compressor in heating mode, except for the defrosting mode or the end of defrost.

8.8.3 Action conditions of compressor under heating mode: compressor must run for 7 minutes after starting and then judge temperature. Meanwhile other protections are still valid.

	Condition	Compressor	Outdoor fan
Room temp. up	TA>Ts+3	Off	Off
	TA<Ts+3	On	On
Room temp. down	TA<Ts+2	On	On
	TA>Ts+2	Off	Off

8.8.4 Indoor Fan actions under heating mode

Indoor Fan can be set at HIGH/MID/LOW/AUTO by using a remote controller, but Anti-cold wind function prevails.

Anti-cold wind control function under heating mode

	Condition TE	Indoor fan speed
Indoor exchanger temp. up	TE<TE1	Off
	TE1<TE<TE2	Breeze
	TE>TE2	Setting fan speed
Indoor exchanger temp. down	TE>TE3	Setting fan speed
	TE3<TE<TE4	Breeze
	TE<TE4	Off

8.8.5 Auto wind under heating mode

	Condition T=Indoor Temp.-Setting Temp.	Indoor fan speed
Room temp. up	T<2℃	High
	T>2℃	Med.
Room temp. down	T>0℃	Med.
	T<0℃	High

8.8.6 Indoor evaporator high-temperature protection under heating mode

	Condition	Compressor	Outdoor fan
Indoor exchanger temp. up	TE<TE8	On	On
	TE8<TE<TE7	On	Off
	TE>TE7	Off	Off
Indoor exchanger temp. down	TE>TE9	Off	Off
	TE<TE9	On	On

8.9 Defrosting operation (Available for heating only).

8.9.1 Defrosting condition:

When T3<0℃ and compressor runs 40 minutes.

T3: Temp. of condenser.

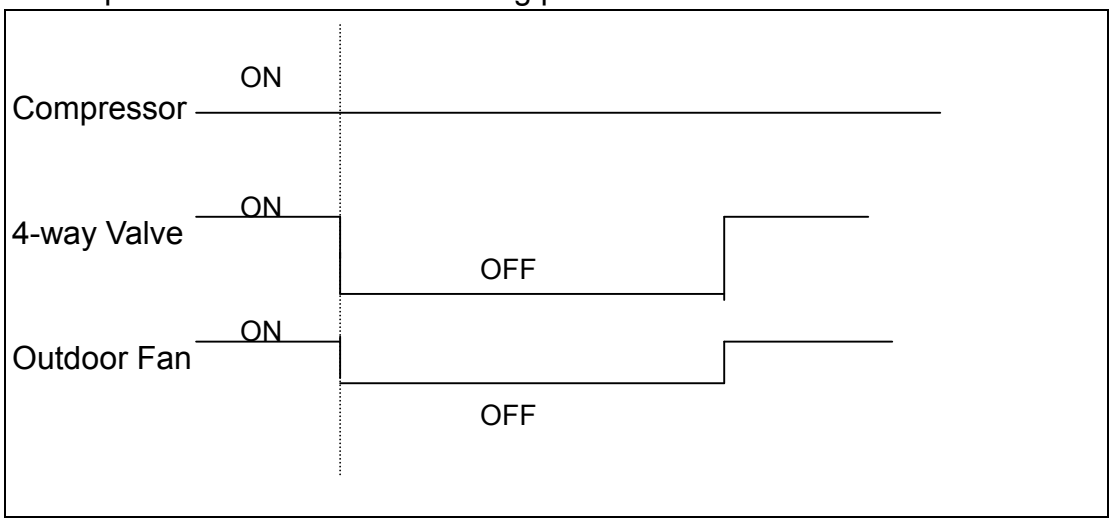
8.9.2 Ending condition of defrost

If one of following conditions is satisfied, end the defrost and turn into heating:

A.The defrost time has reached to 10 minutes.

B.T3>20. ℃

8.9.3 Time sequence of the whole defrosting procedure is as follows



8.10 Automatic operation mode

8.10.1 The air conditioner automatically selects one of the following operation modes: cooling, heating or ventilation according to the difference between room temp. (TA) and set temp. (TS).

TA—TS	Operation mode
TA—TS>2℃	Cooling
-1℃≤TA—TS≤+2℃	Fan-only
TA—TS<-1℃	Heating (Fan-only for cooling only type)

8.10.2 The indoor fan blows automatically in corresponding selected mode.

8.10.3 The motion of indoor fan's blade should accord with the selected operation mode.

8.10.4 One mode should be carried out for at least 15 minutes once selected. If the compressor cannot start for 15 minutes, reselect the operation mode according to the room temp. and set temp., or reselect when the set temp. varies.

8.11 Forced cooling function

8.11.1 Select forced cooling function with the forced cooling button or the switch.

8.11.2 The compressor is unconditionally turned on, after 30 minutes cooling operation whose fan mode is set as low, the A/C operates under the DRY mode with a set temp. of 24℃.

8.11.3 All protections of remote control cooling are available under forced cooling operation.

8.12 Forced Auto function

Select forced auto function with the forced auto button or the switch.

In forced auto status the A/C operates under remote control mode with a set temp. of 24℃.

8.13 Timer Function Requirement

The maximum length of timer is 24 hours and the minimum resolving power is 15 minutes.

8.14 Economic Running

8.14.1 The economic running function is available under cooling, heating or auto mode.

8.14.2 Cooling:

The set temperature rise 1℃ per hour. Two hours later, the set temperature will maintain as a constant and the air circulation is kept at low speed.

8.14.3 Heating:

The set temperature decrease 1℃ per hour. Two hours later, the set temperature will maintain as a constant and the air circulation is kept at low speed (Cold air proof function takes precedence over all).

8.14.4 Auto:

The economic running function operates in accordance with the selected running mode by the auto mode.

8.15 Outdoor fan motor

Fan Speed is only one SPEED.

8.16 Models and Parameters(Indoor unit)

Model	MS3G-30HRN2			
HSPEEDH	1100			
HSPEEDM	1050			
HSPEEDL	1000			
HSPEEDS	800			
CSPEEDH	1100			
CSPEEDM	1020			
CSPEEDL	950			
CSPEEDS	800			
TE1	28℃			
TE2	32℃			
TE3	30℃			
TE4	26℃			
TE5	2℃			
TE6	7℃			
TE7	60℃			
TE8	53℃			
TE9	50℃			