

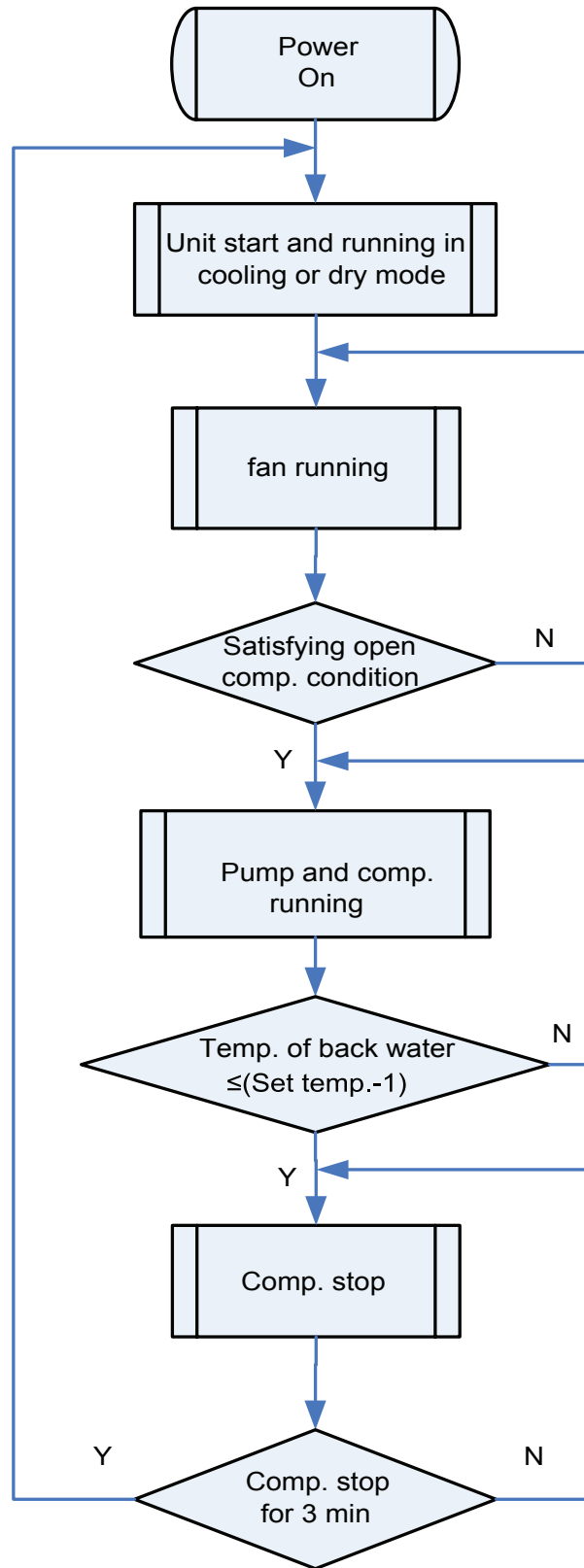


## MARINE AIR CONDITIONERS SERVICE MANUAL

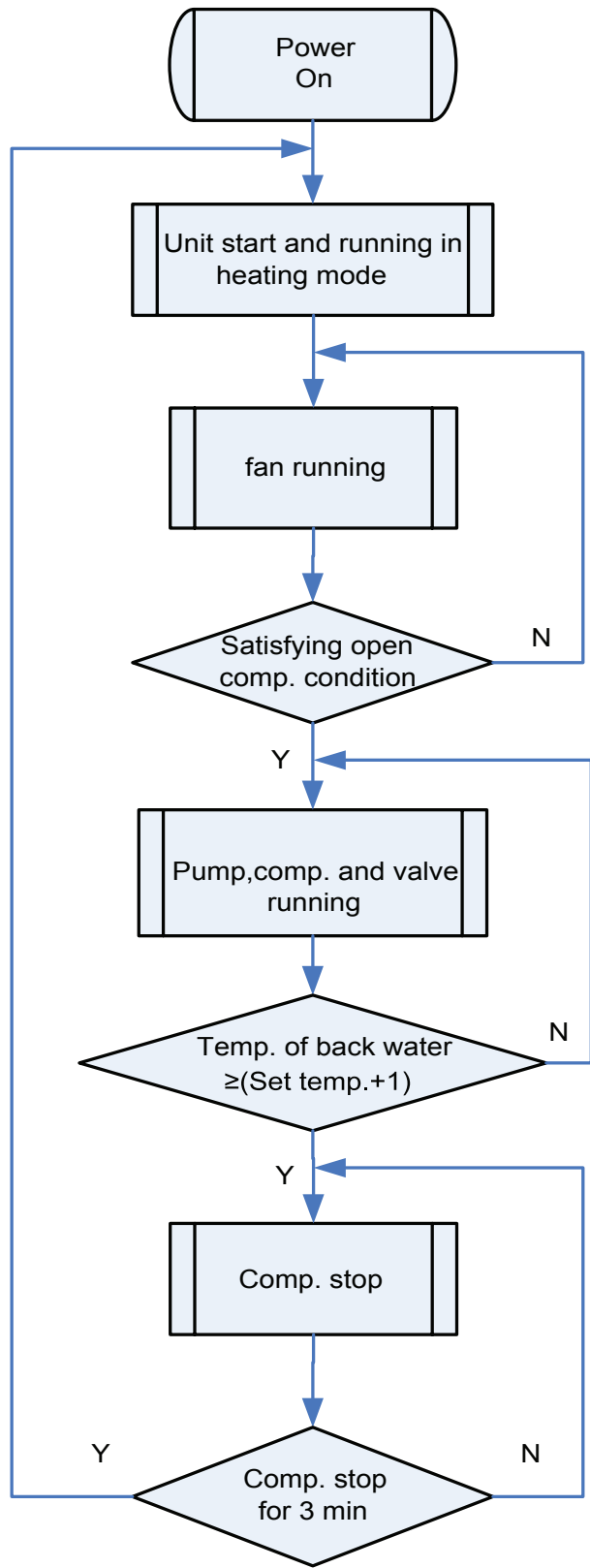
**T1/R410A/50Hz&60Hz  
(GC201202-I)**

# CONTROL

**CONTROL**  
**1 OPERATION FLOWCHART**  
1.1 Cooling/Dry Operation



### 1.2 Heating Operation



## 2 MAIN LOGIC

### 2.1 Cooling/Dry Mode

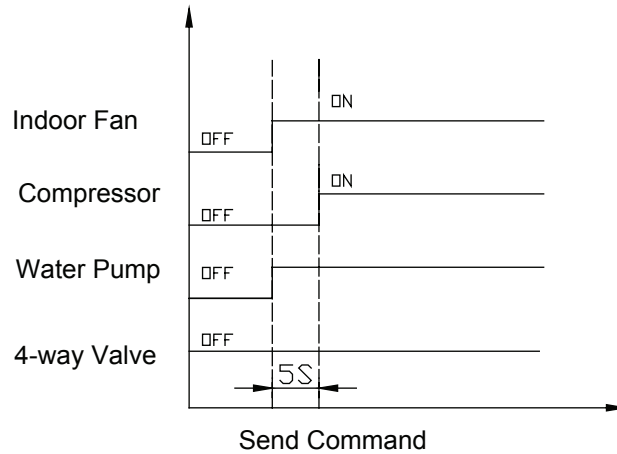
#### 2.1.1 Cooling ON

Condition: Compressor ON:  $T_{amb} \geq T_{set} + 1\text{ }^{\circ}\text{C}$  and no error at the same time. When cooling is entered (they are just conditions for compressor ON, if they can't be met, only indoor fan is running when startup of the unit while water pump and compressor are not running).

##### Description

- Water pump starts up after the cooling command is sent.
- After indoor fan has been running at high speed for 5s, it turns to low speed.
- Compressor is ON after water pump has started up for 5s
- 4-way valve closes.

##### Sequence Chart



#### 2.1.2 Betweenness of Cooling

Condition:  $T_{set} - 1\text{ }^{\circ}\text{C} < T_{amb} < T_{set} + 1\text{ }^{\circ}\text{C}$

##### Description

- Indoor fan keeps the original status.
- Water pump keeps the original status.
- Compressor keeps the original status.
- Other loads don't need to work,

#### 2.1.3 Cooling OFF

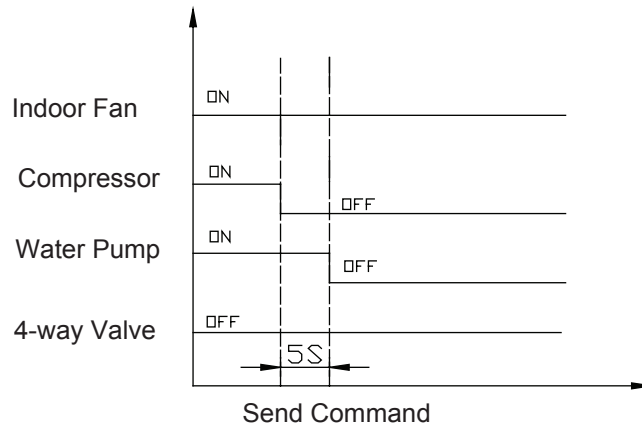
##### Condition:

$T_{amb} \leq T_{set} - 1\text{ }^{\circ}\text{C}$  and no error at the same time ( if there is error, handle it according to troubleshooting sequence).

##### Description

- Indoor fan is running at setting speed.
- Compressor stops
- Water pump stops after the compressor has stopped for 5s.

##### Sequence Chart

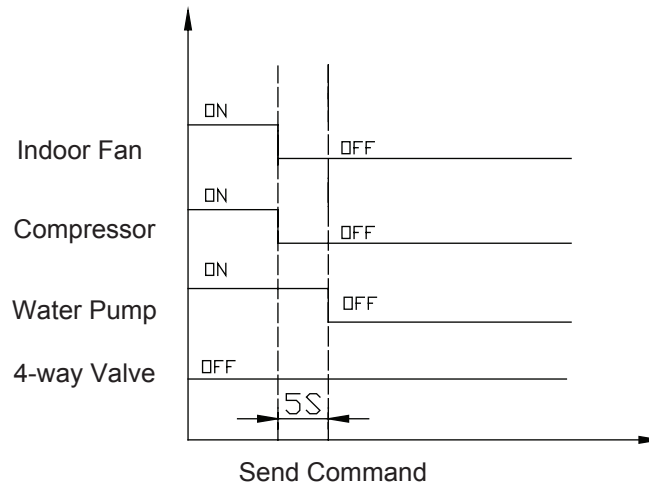


2.1.4 Cooling OFF

**Description**

- a. After the command is sent, the compressor stops.
- b. Indoor unit and indoor fan stop at the same time.
- c. 5s later water pump stops.

Sequence Chart



2.2 Heating Mode(Defrosting/ Auxiliary Electric Heater)

2.2.1 Heating ON

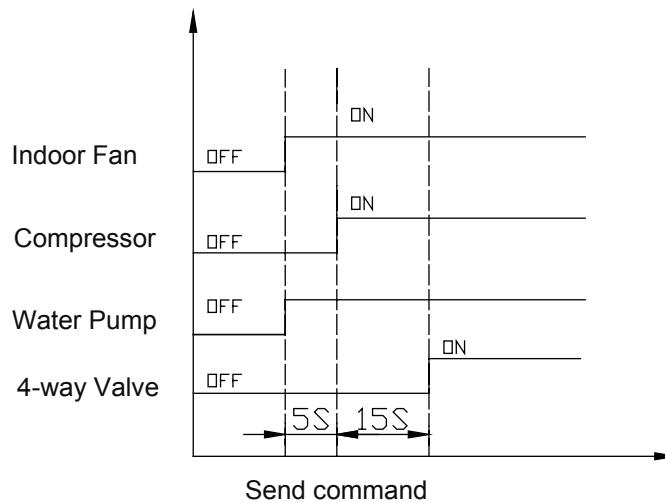
**Condition:**

Compressor ON: if  $T_{amb} \leq T_{set} - 1^\circ C$  and there is no error at the same time, the heating will be entered.

**Description**

- a. The indoor unit starts up when the command has been sent.
- b. Water pump starts up at the same time.
- c. Compressor starts up when the water pump has started up for 5s.
- d. When compressor firstly starts up for 15s, 4-way valve is energized.

Sequence Chart



2.2.2 Betweenness of Heating

**Condition:**

$T_{set} - 1^\circ C < T_{amb} < T_{set} + 1^\circ C$  and no error at the same time(( if there is error, handle it according to troubleshooting sequence).

**Description**

- a. Indoor fan keeps original status.
- b. Water pump keeps original status.
- c. Compressor keeps original status.
- d. 4-way valve keeps original status.

### 2.2.3 Heating OFF

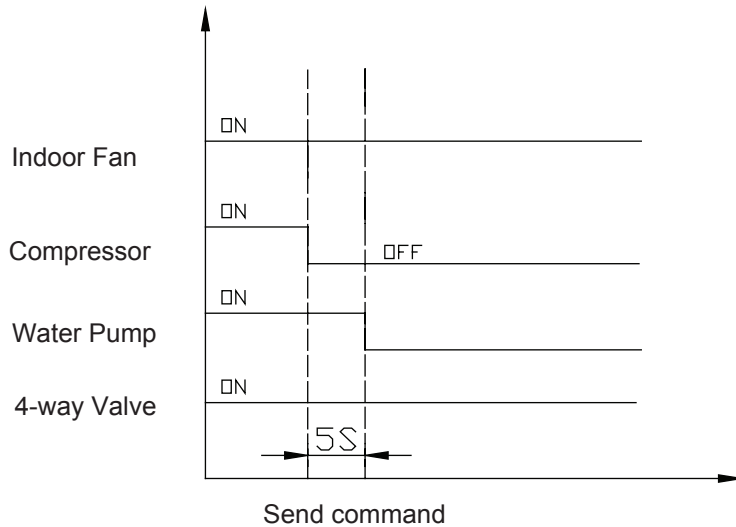
**Condition**

$T_{amb} \geq T_{set} + 1 \text{ } ^\circ\text{C}$  and and no error at the same time(( if there is error, handle it according to troubleshooting sequence).

**Description**

- a. Indoor fan is running at setting speed.
- b. Compressor stops.
- c. 5s later, water pump stops.
- d. 4-way valve keeps being energized.

Sequence Chart

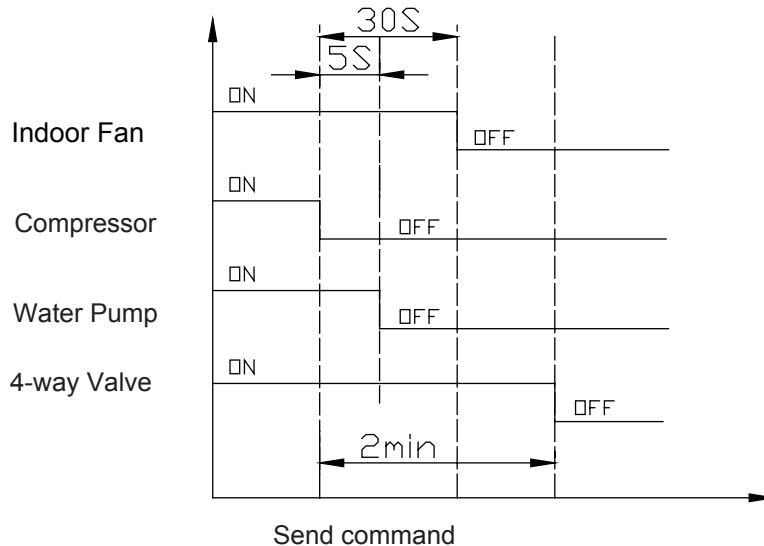


### 2.2.4 Heating OFF

**Description**

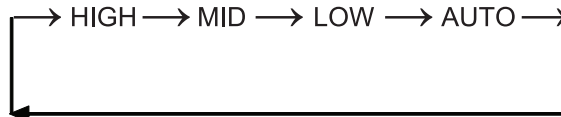
- a. Compressor stops after command is sent.
- b. 5s later, water pump stops.
- c. 30s later after the stop of compressor, indoor fan stops.
- d. 4-way valve is deenergized after the compressor has stopped for 2min.

Sequence Chart



### 2.3 Fan Mode

Indoor fan is running at setting speed and there are three options for the speed.



Auto Air Speed

**a.Heating**

If  $T_{amb} \geq T_{set}$ , it is automatically set to be low speed.  
 If  $T_{set} - 2^{\circ}C < T_{amb} < T_{set}$ , it is automatically set to be mediate speed.  
 If  $T_{amb} \leq T_{set} - 2^{\circ}C$ , it is automatically set to be high speed.  
 During this course, there must be 30s delay at least.

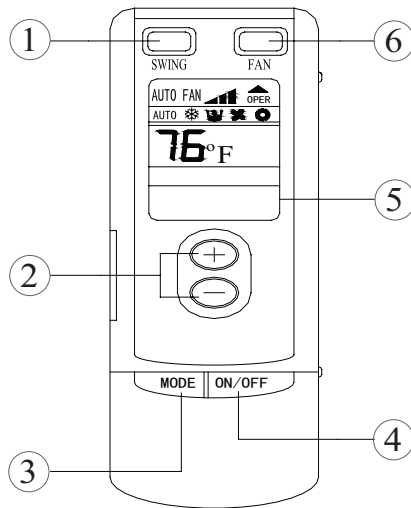
**b.Cooling**

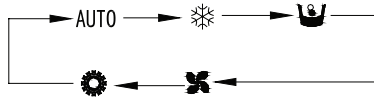

If  $T_{amb} \leq T_{set}^{\circ}C$ , it is automatically set to be low speed.  
 If  $T_{set} < T_{amb} < T_{set} + 3^{\circ}C$  it is automatically set to be mediate speed.  
 If  $T_{amb} \geq T_{set} + 3^{\circ}C$  it is automatically set to be high speed.

**3 REMOTE CONTROLLER**

**3.1 Wireless Remote Controller**

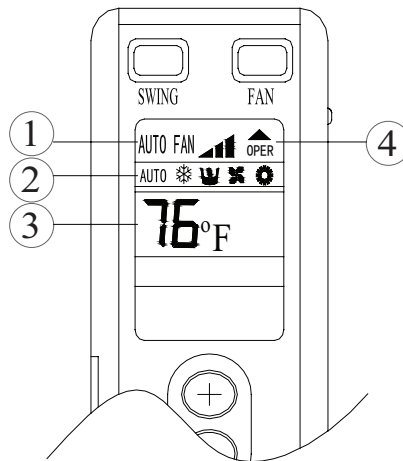
3.1.1 Operation View



NO.	Name	Function description
①	SWING button	There is no swing function in this A/C unit.
②	TEMP button	TEMP. increase 1° by pressing ⊕ button once, and decreases 1° by pressing ⊖ button once. COOL MODE SET Temp. 61 °F -86 °F or 16°C -30°C HEAT MODE SET Temp. 61 °F -86 °F or 16°C -30°C DEHUMIDIFY MODE 61 °F -86 °F or 16°C -30°C
③	MODE button	Press this button to change the operation mode in order of  Note: the cooling only without ⚙ mode.
④	ON/OFF button	Press this button to turn on or turn off the unit.
⑤	LCD	It shows all the setting contents. Note: Cover remove will not change the display contents.
⑥	FAN button	Press this button to change the fan speed: 



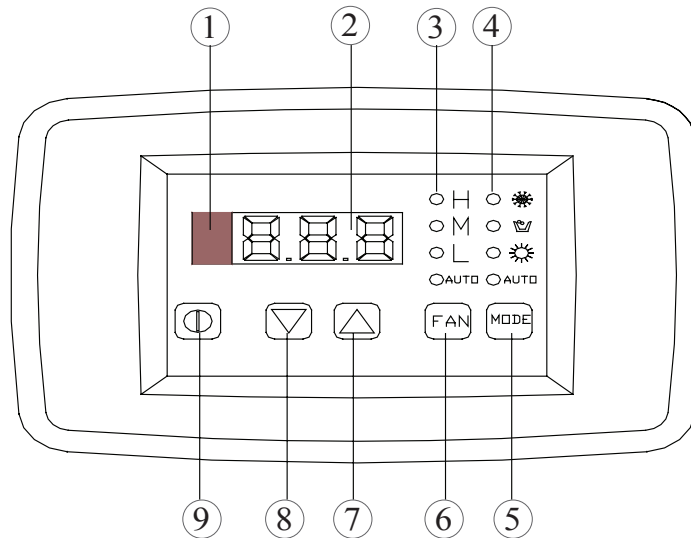
### 3.1.2 Display View




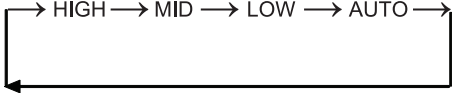
NO.	Display	Function description
1	Fan speed display	HIGH-MID-LOW and AUTO speed
2	Display of mode operation	AUTO:Run automatically; ❄️:Cooling; 🌬️:Dry; 🌀:Only fan run; ☀️:Heating Cooling only type without heat mode
3	Digital display	Display of set temperature
4	Display of ON/OFF	/

## 3.2 Wired Remote Controller

### 3.2.1 Operation View



NO.	Name	Function description
①	Remote receiver	Receive the signal from the mainboard
②	Digital display	Display of set temperature
③	Fan speed display	Display of HIGH-MID-LOW or AUTO speed

④	Display of mode operation (COOL-DEHUMIDIFY-HEAT and AUTO)	<p>In "COOL" mode, the LED marked ❄️ will be light if the set temperature is lower than room temperature. If set temperature is higher than room temperature, only the fan will run.</p> <p>In "DEHUMIDIFY" mode, the LED marked 💧 will be light and fan will work at low speed within a certain temperature range. Dehumidifying is more efficient than in cooling mode and it will save energy.</p> <p>In "HEAT" mode, the LED marked ☀️ will be light when the set temperature is higher than the room temperature. When the setting temperature is lower than the room temperature, it will not run.</p> <p>In "FAN" mode, the room temperature will be displayed and the temperature cannot be set.</p> <p>In "AUTO" mode, the LED marked AUTO will be light and the room temperature will be displayed. The temperature cannot be set, as the system will run automatically in the appropriate mode according to the contrast between room temperature and set temperature.</p>
⑤	Mode button	<p>Press this key to change the operation mode in order of</p> <p>→ COOL → DEHUMIDIFY → FAN → HEAT → AUTO →</p> 
⑥	Fan control button	<p>Press the FAN button, the fan speed will change in the following order:</p> <p>→ HIGH → MID → LOW → AUTO →</p>  <p>In "DEHUMIDIFY" mode, the fan will work at low speed automatically.</p>
⑦	Temp. Setting button (Increasing)	To increase in 1o increments
⑧	Temp. Setting button (Decreasing)	To decrease in 1o increments
⑨	ON/OFF button	<p>Press ON/OFF button to turn the unit on</p> <p>Pressing the ON/OFF button a second time will turn the unit off</p>

### 3.3 Display Fahrenheit or Centigrade

Pressing the ▲ and ▼ key simultaneously, will switch between Fahrenheit and Centigrade modes.

### 3.4 Key Lock

- Press ▼ and FAN key simultaneously, all keys are locked. Press ▼ and FAN key simultaneously again, to unlock the keys.
- When keys are locked, the controller is locked out of system operation. "EE" will be displayed.

### 3.5 Starting Interval Setting

- If there are several A/C units in a yacht, you can set starting time interval between one by one.
- When the manual controller power on, and there isn't any operation, to press
- the ▲ button and fan speed button simultaneously, the starting interval can be set, the nixie tube will flash a number in every 0.5s, then pressing ▼ and ▲ buttons to set up, after the setting, to press the ▲ button and fan speed button simultaneously, to confirm the set up value; if not to press ▲ button and fan button again simultaneously, the figure will flash 10s, and then the controller will quit from starting interval setting, the setting number is not available.
- The value be displayed by nixie tube is the figure of interval time, each interval time is 20s, for example the set up value is 128, it means that the actual setting interval time should be 128×20=2560s.
- When the value be displayed by flashing nixie tube, then to shield each signal of wireless remote controller, excepting to press the ▲ button and fan speed button at the same time, and to shield other buttons.
- After manual controller powered on, if there is wireless remote controller or at the same time to press other buttons except the ▲ button and fan speed button simultaneously, and then press the ▲ button and fan speed button simultaneously, it will display the figure of interval time for 5s. During the period, if there is wireless remote controller or other remote controller signal, it will directly quit the display interface of starting interval time.
- The new setting starting interval time would be executed after manual controller re-powered on.
- The setting range of starting interval value is 0-255; accordingly, the setting range of starting interval

time is 0-5100s(85min).

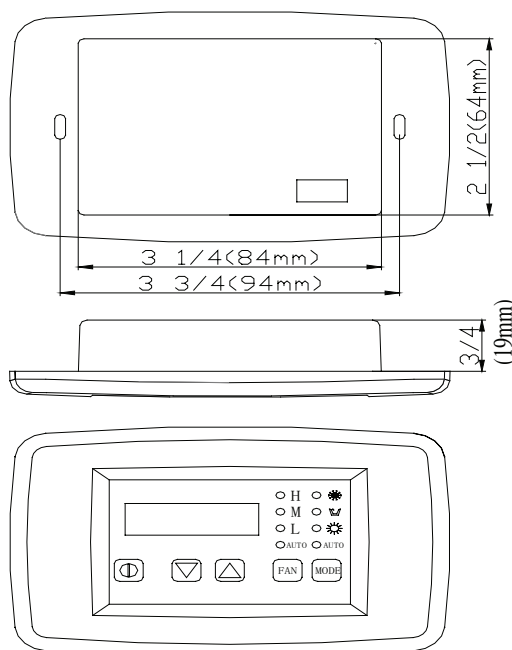
- If there is malfunction happened, cannot set up or display the time of starting interval.

### 3.6 Auto –off function of the manual controller

The display of ambient temperature will automatically blank in 5-minute lag if there is no operation on the manual controller.

- After receiving the signal from the manual controller, the indicator will light on automatically, in which case, the unit will not operation at all and the manual controller can be active after it lights on.
  - After receiving the signal from remote controller, the display of temperature on the manual controller will light on; meanwhile, the unit carries out corresponding operation.
- After the unit stops, there is no display on the manual controller.
  - Powered on again if the unit status is on before power off, temperature indicator and mode indicator of the manual controller will light on automatically.
  - If the unit receives the stop signal, it will directly blank off the temperature indicator and mode indicator of the manual controller.

### 3.7 Dimension



### 3.8 Installation

Before mounting the manual controller, consider the location. The manual controller should be mounted on an inside wall, slightly higher than mid-height of the cabin. The cut out size for the manual controller is 2 1/2" (64mm) wide by 3 5/16" (84mm). Do not mount the manual controller in direct sunlight, near any heat producing appliances or in a bulkhead where temperatures radiating from behind the panel may affect performance. Do not mount the manual controller in the supply air stream. Do not mount the manual controller above or below a supply or return air grille. Do not mount the manual controller behind a door, in a corner, under a stairwell or any place where there is no freely circulating air. Mount the manual controller within display cable length (custom lengths available) of the air conditioner. Plug the display cable into the circuit board in the electric box and into the back of the manual controller.