

Model Number: KFR18K048D
Name: DC Air Conditioner
Type: Split Wall Mounting
Cooling Type: Heat Pump
Rated Power Supply: 48VDC

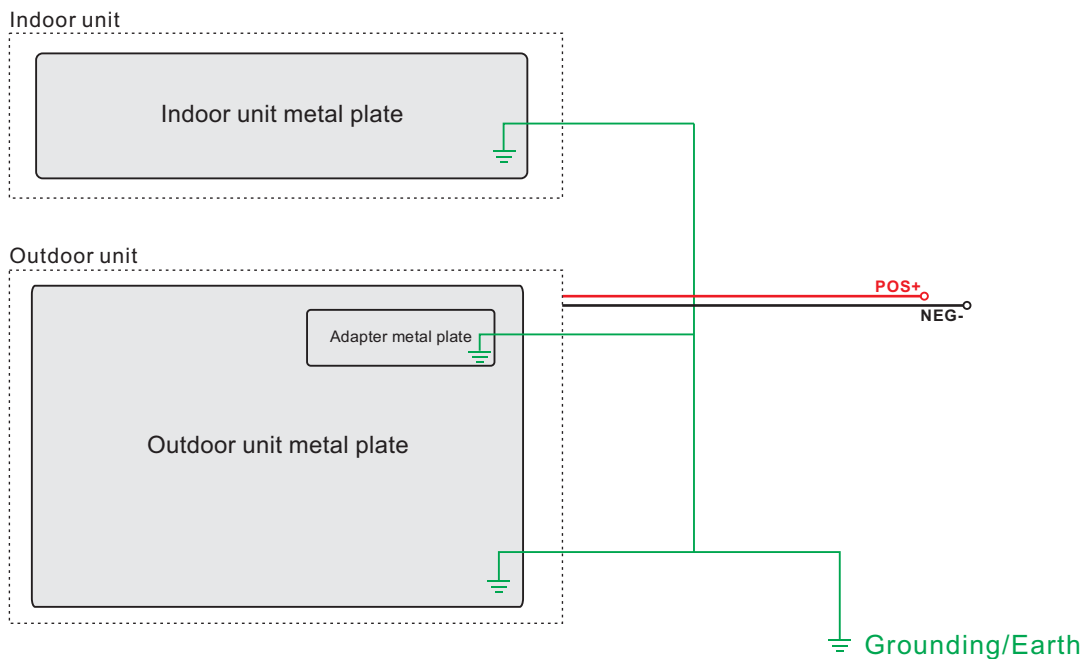
SPECIFICATION SHEET SERVICES MANUAL





WARNING

- This air conditioner is designed for definite applications, such as telecom, outdoor camping room, unattended operation..etc; require of independent dc power source, such as solar power, battery or converter dc power sources...etc; normally does not allow directly using this air conditioner as home appliances.
- **Grounding Notices:**
This air conditioner already has grounding wires, the indoor unit metal plate, outdoor metal plate, adapter metal plate are series-connected by grounding wire.
This air conditioner working under dc power source, but shall be grounded this air conditioner with earth.



- **Please install, repair or maintain this air conditioner under your local distributor's trained professional service; If reverse connect the DC+(POS+) and DC-(NEG-) wires, could directly damage air conditioner, and could damage or burn out the dc power source; If reverse connect the inner wires inside of this air conditioner, could directly damage or burnout air conditioner parts.**

1. Operation Range

		Indoor Air Intake Temperature	Outdoor Air Intake Temperature
COOLING	Maximum	32°C D.B. / 23°C W.B.	43°C D.B. / 26°C W.B.
	Minimum	21°C D.B. / 15°C W.B.	21°C D.B. / 15°C W.B.
HEATING	Maximum	27°C D.B. / 18°C W.B.	24°C D.B. / 18°C W.B.
	Minimum	20°C D.B. / 15°C W.B.	-7°C D.B. / -8°C W.B.

2. Specification

Model Number		KFR18K048D	
Function		COOLING	HEATING
Rated Power Supply		DC48V	
Capacity	Capacity	2.5kW - 5.3kW OR 8530Btu/H - 18000Btu/H	3.0kW - 6.0kW OR 10240Btu/H - 20000Btu/H
	Dehumidification	1.8l/h	-
	Air flow	800m ³ /h	850m ³ /h
Electrical Data	Rated current	28.5A	29.0A
	MAX.current	37.5A	37.5A
	Rated input power	1368W	1392W
	MAX. input power	1800W	1800W
EER/COP		4.96W/W (Max.)	4.50 W/W (Max.)
MAX.operating pressure	High	4.15MPa	
Size	Indoor unit	106X37X27cm (LXWXH)	
	Outdoor unit	91x37x102cm (LXWXH)	
Weight	Indoor unit/Outdoor unit	12kg/52kg	
Special Remarks	Refrigerant	R410A	
	Refrigerant filling capacity	1.28kg	
	Indoor unit sound level	45dBA	
	Outdoor unit sound level	47dBA	
	Throttle mode	CAPILLARY	

Test Conditions:

Cooling: Indoor:DB27°C/WB19°C Outdoor:DB35°C/WB24°C

Heating: Indoor:DB20°C/WB15°C Outdoor:DB7°C/WB6°C

*1: This air conditioner used variable speed compressor inside, and adopts smart temperature sensing control technology, this air conditioner has variable cooling capacity or heating capacity flow by the environment temperatures. Suit for the air conditioning needs of cooling capacity from 2.5kw (8530Btu/H) to 5.3kw(18000Btu/H) and heating capacity from 3.0kw(10240Btu/H) to 6.0kw(20000Btu/H). This air conditioner has nominal rated cooling capacity 4.8kw(16000Btu/H) and nominal rated heating cooling capacity 5.0kw(17000Btu/H), but the nominal capacity is only for lab tests or related production development purpose only.

*2: Due to concern this air conditioner could connect with solar PV panels, battery or telecom DC power systems, the air conditioner system already integrated current protection function as default controls inside, this control could protect the dc power source effectively. When system input exceed 37.5A, the control will reduce compressor frequency automatically.

3. Major Components

Indoor Fan Motor

Motor model	ASU11D40WL
Power source	DC48V-DC300V
Rated load output	40W
Rated speed	1400r/min
Poles	8

Outdoor Fan Motor

Motor model	ASU-ZWF40
Power source	DC48V-DC380V
Rated load output	40W
Speed range	0 - 2500r/min
Poles	8

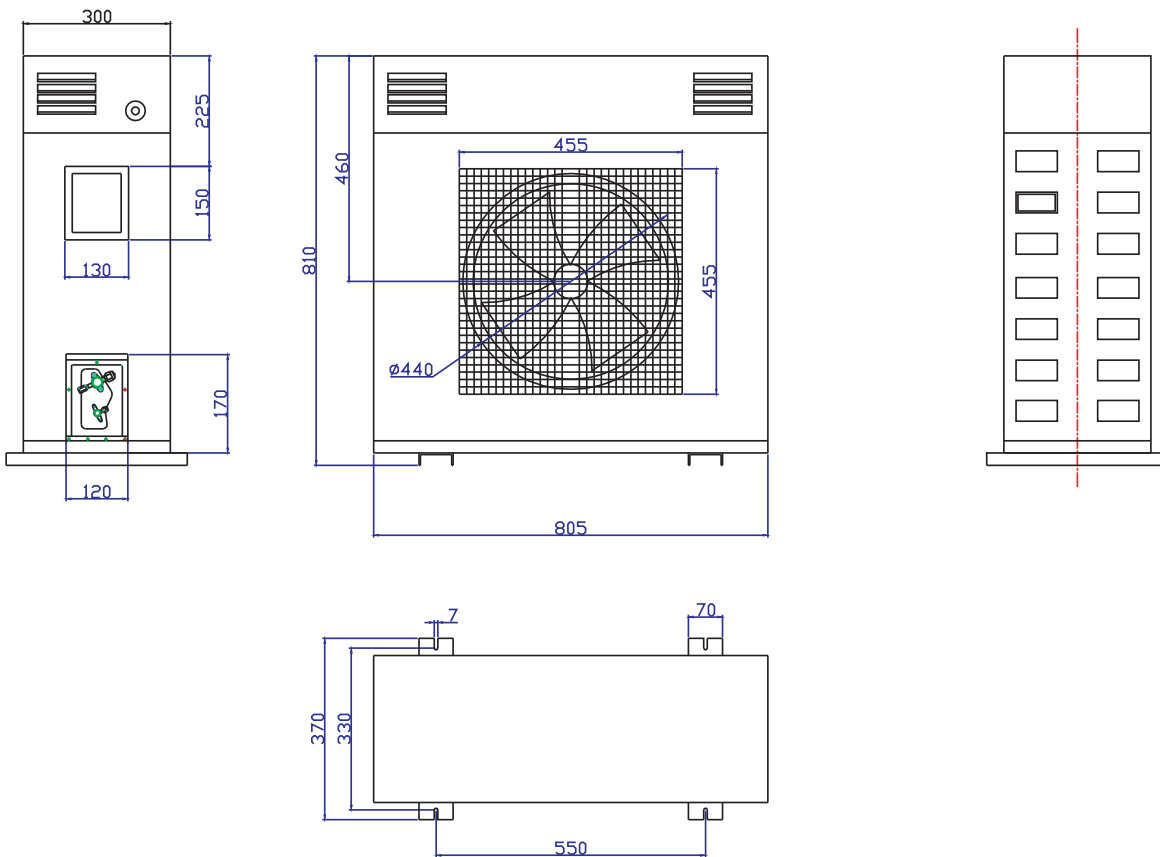
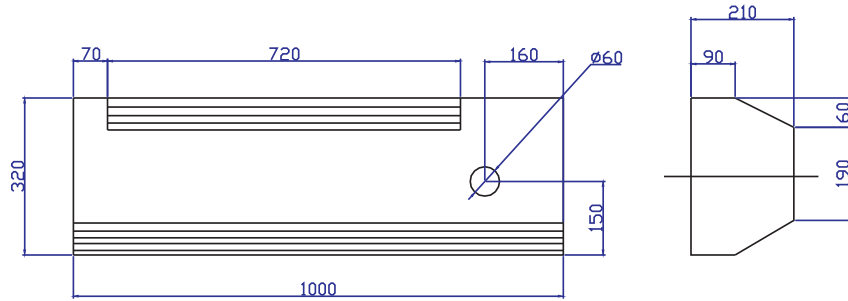
Stepper Motor

Motor model	28BYJ48N4
Power source	DC12V
Number of phase	4
Drive mode	½ phase excitation unipolar drive
Resistance per phase	200 Ω ±7%

Compressor

Model number	SNB130FGYMC
Brand	Mitsubishi
Motor type	BLDC
Rolling type	2 cylinder rotary
Nominal input power	900W
Running revolution	10-130rps
Oil type	FV50S
Oil charge	350cm ³

4. Outlines And Dimensions



4. Electrical Wiring Diagrams

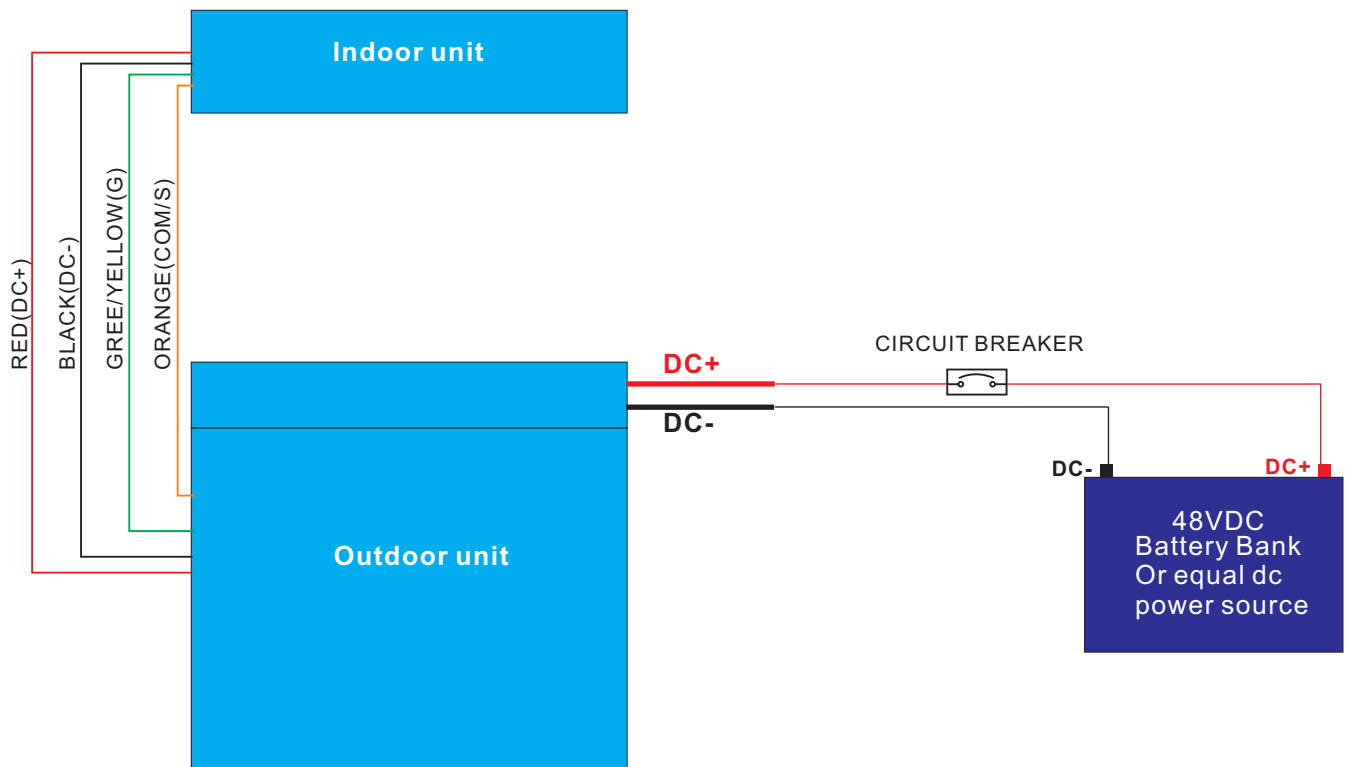
Important

This air conditioner connect with DC power source only!
There is marked 'DC+' and 'DC-' on the drawing, it is meaning the unit can connect with pure dc power source such as battery or converter dc power source. The 'DC+' is same meaning with 'POS+' and 'DC-' is same meaning 'NEG-'.

Important

The power source connection terminals of this air conditioner already marked in RED and BLACK. RED terminal is POS+ pole and BLACK terminal is NEG- pole.

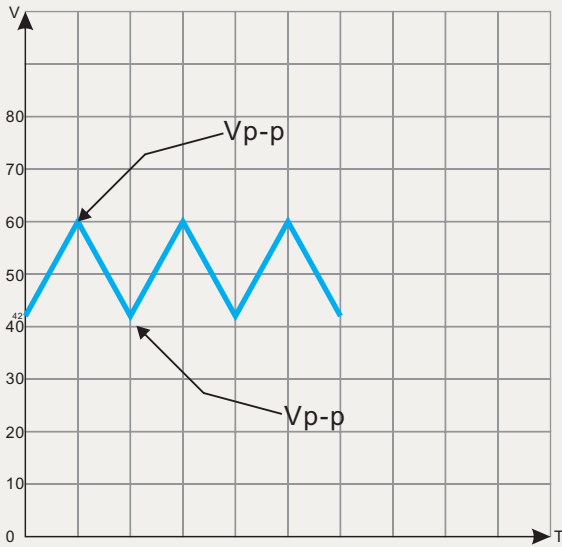
NEVER REVERSE CONNECT RED(POS+) TERMINALS AND BLACK (NEG-)TERMINALS WITH POWER SOURCE POS+ POLE AND NEG- POLE. OTHERWISE, COULD CAUSE BURN AIR CONDITIONER OR POWER SOURCE!



Please double check the power source POS+ and NEG- poles connected correct before turn on the circuit breaker.

⚠ Important

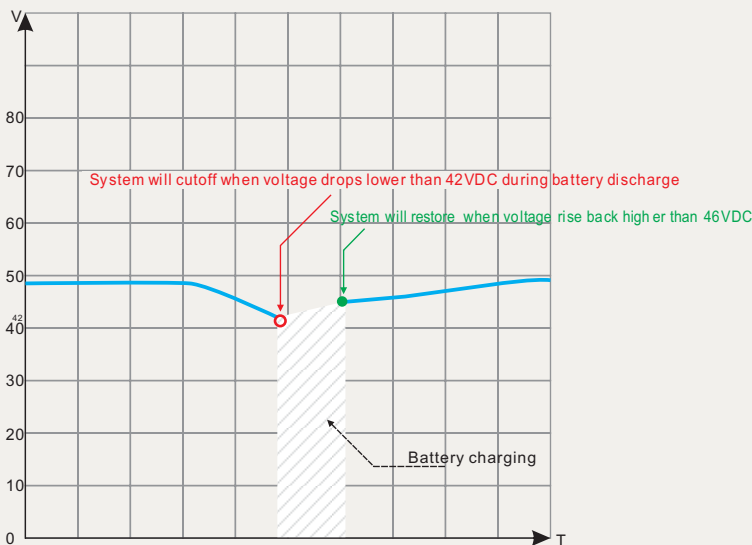
This air conditioner can work with pure dc power source or industrial dc power source, please refer to below graphic to choose power source or make controls:



User may use industrial or telecom dc power source to run this air conditioner, if the power source is not a pure dc power source.

Please make sure the Vp-p not higher than 60V and smaller than 42V; Otherwise could reduce the use life of this air conditioner or damage this air conditioner.

Or please make sure it is a 48VDC (+/- 1%) precision dc power source.



If use pure dc power source or battery to run this air conditioner.

When battery voltage drops lower than 42VDC during battery discharge, this air conditioner will cut off system automatically to protect power source, and only after voltage rise back higher than 46VDC, air conditioner system will restore automatically.

4. Function and Remote Control

Function:

AUTORUN (A)

if user selected autorun mode, air conditioner will automatically run depend on setting temperature and indoor room ambient temperature.

When remote panel setting temperature \leq indoor room ambient temperature, air conditioner start cooling mode;

When remote panel setting temperature $>$ indoor room ambient temperature, air conditioner start heating mode;

Notices: when setting temperature changed, air conditioner will re-select run mode depend on the setting temperature and room temperature; But if indoor room ambient temperature changed, air conditioner will still run 10 minutes and then re-select run mode.

COOLING (❄)

Air conditioner will start cooling run mode, the lowest setting temperature is 16°C.

Air conditioner will automatically run with a system selected compressor frequency depend on the setting temperature and actual indoor room ambient temperature.

At this working mode, suggested setting temperature is 25°C, 26°C or 27°C to save energy or let battery can load with more longer time.

At this working mode, If outdoor ambient temperature too high or too lower, could cause electronic components un-normal or refrigeration circuit works

overload. System already integrated protection inside, if outdoor ambient temperature too high or too lower, system will comes into low frequency run state.

At this working mode, user can control the fan speed in four level, high fan speed, medium fan speed, low fan speed or automatic.

DEHUMIDIFICATION (▲)

Air conditioner will start dehumidification run mode, the general controls is same as cooling mode

At this working mode, if indoor room temperature lower than 10°C, compressor will stop; when indoor room temperature higher than 12°C, compressor will restore running.

At this working mode, system automatically select compressor running frequency.

HEATING (☀)

Air conditioner will start heating run mode, the highest setting temperature is 30°C.

Air conditioner will automatically run with a system selected compressor frequency depend on the setting temperature and actual indoor room ambient temperature.

At this working mode, suggested setting temperature is 26°C or 27°C to save energy or let battery can load with more longer time.

At this working mode, if indoor unit pipe temperature too lower, to avoid the indoor unit blow cool air, the indoor unit fan motor will run at lowest speed until pipe temperature restore.

At this working mode, If outdoor ambient in a low temperature, the outdoor unit pipe could frost. System will automatically come into defrost mode, and LED display 'H1' (due to safety standards concerns, some unit produced may not display this symbol), indoor unit will close fan blower, until defrost finished, system will restore.

At this working mode, If outdoor ambient temperature too high, could cause electronic components un-normal or refrigeration circuit works overload. System already integrated protection inside, if outdoor ambient temperature too high or too lower, system will comes into low frequency run state.

At this working mode, user can control the fan speed in four level, high fan speed, medium fan speed, low fan speed or automatic.

DEFROST

This air conditioner will start defrost mode automatically when meet either of below 3 conditions:

- 1: system run more than 40 minutes of outdoor unit pipe temperature lower than 3°C, outdoor unit pipe temperature lower than -6°C and more than 3 minutes;
- 2: system run more than 80 minutes of outdoor unit pipe temperature lower than 3°C, outdoor unit pipe temperature lower than -4°C and more than 3 minutes;
- 3: system run more than 120 minutes of outdoor unit pipe temperature lower than 3°C, outdoor unit pipe temperature lower than -3°C and more than 3 minutes;

This air conditioner will end defrost mode and automatically restore to heating mode when meet either of below 3 conditions:

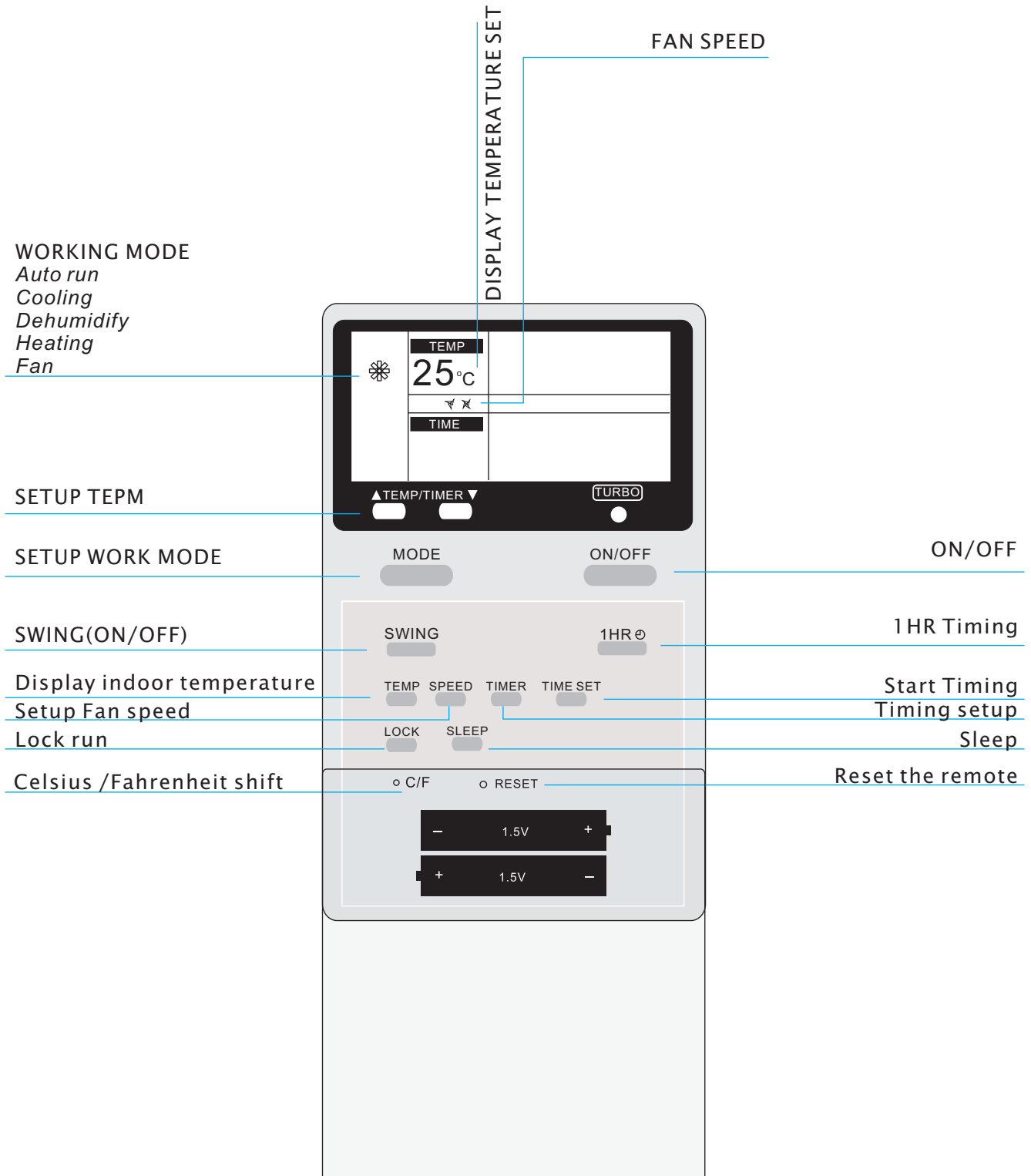
- 1: When outdoor unit pipe rise back higher than 15°C;
- 2: When outdoor unit pipe rise back higher than 8°C and keep more than 80 seconds;
- 3: When defrost mode running already more than 10 minutes;

OTHER FUNCTIONS

This air conditioner also has other functions, for example, timing, sleep, celsius and fahrenheit temperature display shift. Please refer to remote panel indication or ask with local after-service.

This air conditioner also has lock compressor frequency function for lab tests purposes, if user unconsciously entry into the lock frequency function, press any key on remote panel will quit.

Remote Panel:



4. Fails ,Code And Protection

Below fails code will display on the LED of indoor unit when system meet the fails:

Fails Code	Content
E1	Indoor unit ambient temperature sensor fail
E2	Indoor unit pipe temperature sensor fail
E3	Indoor unit fan motor fail
E4	Communication fail
E5	Fan motor feedback fail
F1	Outdoor unit ambient temperature sensor fail
F2	Outdoor unit pipe temperature sensor fail
F3	Compressor discharge temperature sensor fail
F6	Compressor driving fail
F7	Outdoor unit fan motor fail
P1	IPM protection
P3	Driving un-normal
P4	Over-current protection
P5	Voltage protection
H1	Defrost: When system entry into defrost program, LED will display 'H1', and after defrost finished, display will restore automatically.

Adapter protection and fails:



Important

There is an adapter inside of this air conditioner for manage dc power source, the adapter has integrated input voltage protection program and already limited input voltage range between 42VDC to 60VDC. If the dc power source voltage reduce down lower than 42VDC or rise higher than 60VDC, the adapter will automatically shut off system.

If use a battery as dc power source, this air conditioner program already has considered the battery charge and discharge interval. It is, If use a full charged 48V battery load for this air conditioner working, the battery will discharge and begin reduce down voltage, when battery voltage becomes lower than 42VDC, adapter will cut off, and reserve a time for battery re-charge, when battery voltage restore higher than 46VDC, adapter will restore automatically, and air conditioner will restore also.

LED NAME	State and Content	
Input LED	illuminated green	Input normal working
	flashed red	Input undervoltage
	illuminated red	Input over voltage
Output LED	illuminated red	System overload
	flashed red	System overheating
	un-illuminate	Normal working