Definition of basic parameters in this specification (unit ℃)

§ The temperature of the temperature sensing head in the box······ T ;
§ User - set temperature ···Ts ;
§ Compensation temperature ···Tb ;
§ Display temperature ·· Td =T+Tb ;
§ Boot temperature ··Tk =Ts+1 ;
§ Shutdown temperature ···Tt =Ts-1 .

1. Product basic features

1.1 Single-chip control ;

1.2 key operation ;

1.3 Thermistor senses temperature ;

1.4 Power on / off function ;

1.5 temperature compensation ;

1.6 Three-speed battery protection ;

1.7 Digital tube screen display ;

1.8 Bluetooth reservation ;

2. Technical parameter requirements

2.1 Rated voltage: DC12V/24V ;

2.2 Temperature setting range : -20 ℃ ~+10 ℃ ;

2.3 Power-off memory function: the working state (on-off state, working mode) before power-off , needs to be automatically restored after the next power-on;

2.4 The normal working temperature of the circuit board: -10 ℃ ~+60 ℃ ; Storage temperature: -40 ℃ ~+80 ℃ ;

2.5 Anti-positive and negative pole reverse connection function: The whole machine will not work if the positive and negative poles are reversed, and components cannot be damaged, etc. ;

2.6 Standby current : ≤ 35mA ;

3. Hardware configuration

3.1 display board 1 piece
➢ 1 A digital tube display;
➢ 4 a tact switch button;
➢ Sheet: FR-4 , double-sided;
➢ Buzzer: none
➢ USB Output: 5V/2.1A ;
➢ Lighting interface : 12V/24V ;

3.2 Lighting lamp : DC12~24V power supply ;

3.3 Temperature Sensor 1 indivual
➢ R25 ℃ =10K±1% , B(25/50)=3435K±1% .

3.4 load configuration
➢ compressor 1 (customer - prepared) ;
➢ compressor module 1 (customers bring their own) ;
➢ fan 1 (customer - prepared) ;

4. HMI

man-machine interface is as follows :

4.1 key operation

4.1.1 In standby mode, short press The "ON/OFF" button is pressed once to turn on the refrigerator; in the ON state, short press the "ON/OFF" button once, the refrigerator will be turned off .

4.1.2 Temperature setting method :

➢ In the power-on state, short press " UP ″or″DOWN , "displays the set temperature value and flashes, then short press " UP ″or″DOWN ″ to increase or decrease the set temperature. Press and hold when flashing, the set value will be set in seconds 4 Linear adjustment of degree (non-jump, no flicker during long press) .

4.1.3 Battery protection switch setting method:

➢ In the power-on state, long press the " SET " key 2 seconds, display the symbol of the current corresponding battery protection gear and

Flashing, short press " SET " to switch between protection voltage and Celsius / Fahrenheit setting , in the corresponding state, short press " UP " or " DOWN " to switch up or down the gear or Celsius / Fahrenheit Toggle (default is mid-range, default Celsius) ; 5S After no operation, exit the setting and save the data.

High-grade: H ; Mid-grade: M ; Low- grade: L (used when connecting to a solar panel or an external battery)

	12(V)		24(V)	
	stop voltage	starting voltage	stop voltage	starting voltage
upscale H	11.3	12.6	24.3	25.7
mid-range M	10.8	11.8	22.3	23.7
Solar gear /low files L	9.6V ~ 31.5V			
	Low voltage	Low voltage	High voltage	High voltage
	9.6	11.1	31.5	30.5

4.1.5 Temperature compensation setting method :

In the power-on state, press and hold the " UP " and " DOWN " keys at the same time 2 seconds, enter the temperature compensation setting, short press the " SET " key, you can F1/F2/F3 three parameters switch, short press under the corresponding parameter " UP " or " DOWN " to compensate temperature setting, it will automatically
return to standby state:
Compensation temperature
setting range: 10 ℃ ~-10 ℃.

parameter	Function	Setting range	Factory
E1	the temperature of the	-10 ℃～ +10 ℃	0 ℃
E2	-1 ℃ ≥ temperature sensor head	-10 ℃～ +10 ℃	0 ℃
E3	the temperature of the	-10 ℃～ +10 ℃	0 ℃

4.2 show

4.2.1 When the system is powered on , the display is fully lit 2 seconds , and then enter the normal display;

4.2.2 system is in standby state , the display screen has no display; when the setting is adjusted in the standby state, the corresponding function of the display screen lights up;

4.2.3 In the state of key setting, the corresponding function font on the digital screen lights up;

4.2.4 The temperature is displayed on the digital screen

4.2.5 The nixie tube font is bright white .

4.2.6 When entering the corresponding parameter setting, the current value will be displayed and flashing, and the setting will be saved after no operation flashes for five seconds.

4.2.7 The flicker frequency is 2Hz .

5. System Control (Operation Mode Definition)

5.1 Compressor speed :
➢ Compressor speed MAX: 3200r/min, ECO: 2000r/min;
➢ When the power is turned on or turned on for the first time , the compressor will 2000 turn run, 2 After a few minutes, it will switch to the set cooling mode operation;

5.2 compressor control
➢ Boot condition: the actual temperature in the box ≥ Tk ;
➢ Stop condition: the actual temperature in the box ≤ Tt ;
➢ Maintain the current state: Tt < actual temperature in the box < Tk .

6. fault display

When the refrigerator fails, the display shows the failure mode, as shown in the following table:

code	error type
E1	Low battery voltage protection (module input voltage is lower than the set value)
E2	Fan short circuit protection (fan load current greater than 1A)
E3	Compressor fault protection (motor stall or refrigeration system overpressure)
E4	The compressor motor speed is too low (the refrigeration system is overloaded, the motor cannot maintain the minimum speed of 1850r/min)
E5	Compressor control module over temperature protection
E6	Thermal head failure (compressor and fan stop)

FCC Caution.

§ 15.19 Labelling requirements.
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

§ 15.21 Information to user.
Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

§ 15.105 Information to the user.
Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
-Reorient or relocate the receiving antenna.
-Increase the separation between the equipment and receiver.
-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.