SLA THERMO

TRUCK REFRIGERATION UNIT

OPERATING INSTRUCTION MANUAL

SLA 350

Operating Manual

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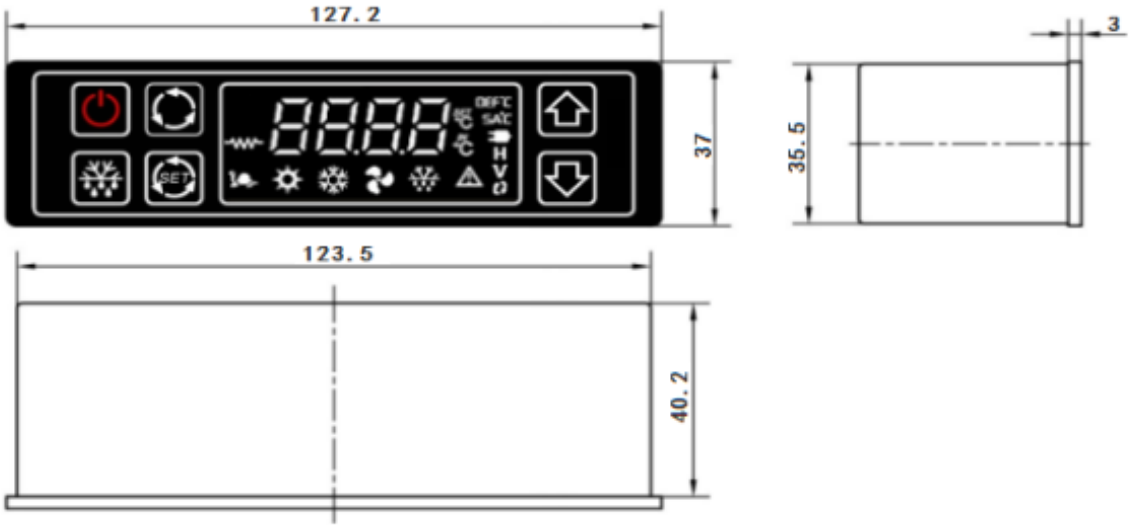
1. Technical requirements

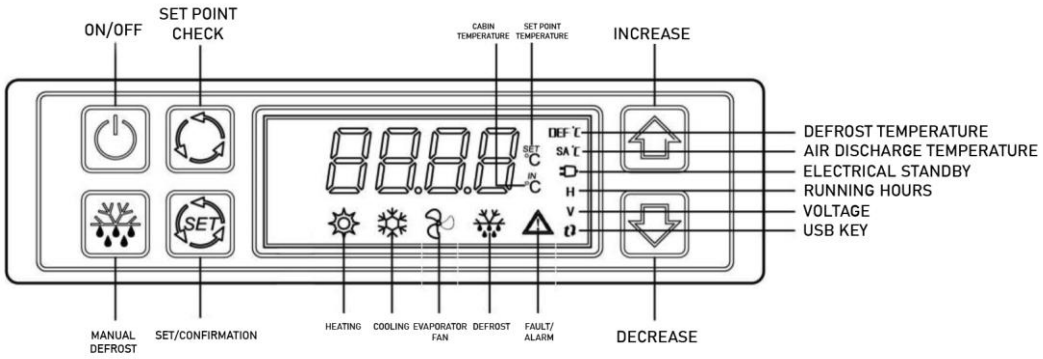


1.1

Technical specification：

1. Working voltage range: 10V ~ 32VDC, nominal working voltage 12/24 VDC；
2. Maximum output current: 600mA per circuit；
3. Cold storage temperature display range: -40℃ ~ 90℃, resolution of ±0.1℃。
   Temperature below -40℃ shows L, temperature above 90℃ shows H；
   Accuracy is ±1℃ at -20℃ ~ 60℃, and ±2℃ at other temperature points。
4. Defrost temperature display range: -40℃ ~ 90℃, resolution of ±0.1℃。
   Temperature below -40℃ shows L, temperature above 90℃ shows H；
   Accuracy is ±1℃ at -20℃ ~ 60℃, and ±2℃ at other temperature points。
5. Set temperature range: -40℃ ~ +40℃；

1.2 0peration interface：



2. Function and operation instructions：

Function	Description
The machine open closed	• In the power on, off state，  Backlit (red)，Other keys are backlit out。Short Press  Key，All backlights are lit (all other buttons are backlit in yellow-green)，Enter digital tube startup mode，The G segment of the 4 digital tubes flashes alternately in sequence，After 1S, the cold storage temperature will be displayed and the machine will be turned on。 • In the power-on state，longPress  Key 3s，Outputs show "OFF", Wait until all outputs are closed, system shut down.
interval	temperature setting： Set temperature range: -40℃ ~ +40℃； • In the normal storage temperature display state，Short Press  Key or  Key or  Key Go to the temperature Settings， Short Press  Key or  Key The temperature can be adjusted，longPress  Key or  Key Continuous temperature adjustment， Set to complete press  Key or  Key acknowledge ack， **Retur**n to the library temperature display state。 If no operation is carried out within 5S, the set temperature will be automatically saved and returned to the display state of library temperature Control Setting Panel：longPress  KEY，Enter the level 1 menu of user Settings，According to "F01 - F10"，Press  KEY or  KEY Select the level one menu that you want to set，AgainPRESS  KEY Enter the secondary menu，PRESS  KEY or  KEY Change corresponding parameters，To be modified，PRESS  KEY or Return to Level 1 menu after 5s without operation，Parameter setting ends when there is no operation for 5s in the level 1 menu, and the data is saved and returned to display the library temperature. Whether it's under a level 1 menu or a level 2 menu，PRESS  KEY or  KEY Will immediately confirm the save and return to the library temperature display。 RESTORE FACTORY SETTINGS：longPress  key or  key 5s，Restore all factory default parameters. Buzzer beeps 2 times.

code	Code meaning	parameter values	value
F01	Defrost temperature setting	0℃~F02-3℃(maximum 20℃) resolution 1℃	12℃
F02	Defrost termination temperature setting	F01+3℃~35℃ resolution 1℃	16℃
F03	Defrost working time setting	1 to 30 minutes resolution 1 minute	7 minutes
F04	Defrost interval time setting	Resolution of 1 ~ 10 hours 0.5 hours (controller in minutes)	2H
F05	Cold storage temperature deviation correction setting	-10℃~+10℃ resolution 0.1℃	0℃
F06	Refrigeration return temperature	1℃~10℃ Resolution 1℃	3℃
F07	System Voltage	Auto/12V/24V	Auto
F08	Operation mode of evaporation fan	AUTO (to the temperature stop)/ CONT (to the temperature continue running)/ ALON (to the temperature continue running)	Auto
F09	Heating return temperature	OFF(shielding heating function)/1℃~20℃ Resolution of 0.5℃	OFF
F10	Delay time for evaporation fan to continue running at temperature	1-240s resolution 1S	60S

other description：

① When the controller cold storage temperature exceeds the range of alarm, the minimum temperature display is lower than -40℃+F05, display L℃， Maximum temperature display exceeds 90℃+F05, H℃ display。In order to more accurately display the temperature inside the box, the user can correct the display deviation. Deviation correction range (F05)-10.0℃ -- +10.0℃, default 0.0℃

② **The modification of F04 defrost interval time has the following characteristics:**

a）It can be modified directly when defrosting is running。

b） When defrosting is not running, the setting time is greater than the original setting time, so as to run at the set time; If the set time is less than the original set time, the original set time shall prevail.

c) Updated to the modified set point during the next defrost cycle.

③ **The modification of F03 defrost working time has the following characteristics：**

a） It can be modified directly when defrosting is not running.

b） During defrost operation, the modified setting time is greater than the original setting time, and the modified setting time is used to run；If the modified setting time is less than the running setting time, the original setting time shall prevail.

c) The next defrost working time is updated to the modified set value。

Evaporation fan operation	There are three operating modes of the evaporation fan. AUTO (to temperature stop), CONT (to temperature continue operation) and ALON (to temperature continue operation) can be adjusted from the parameters of F08. For details, please see the parameter list. **Auto operation mode:** represents the evaporation fan to start and stop according to the normal temperature control process. **Cont operation mode:** the evaporation fan starts in accordance with the normal temperature control process, but it will delay and stop. The delay and stop time is the time set by parameter F10. **ALON operation mode:** as long as in the startup state, unless the power supply voltage is abnormal, the evaporation fan is always running.
refrigeration cycle	a) **Refrigeration start and stop conditions** When the cold storage temperature ≥ set temperature + refrigeration return temperature (F06), start refrigeration Cold storage temperature ≤ set temperature, stop refrigeration. b) **Refrigeration start sequence action flow** Refrigeration indicator light will be yellow when waiting for refrigeration. When it reaches the refrigeration state, the refrigeration indicator light will be blue. c) **Refrigeration shutdown sequence action flow** In the refrigeration state, the refrigeration indicator light goes off, and the compressor stops, the condensing fan stops, and the evaporation fan stops. Compressor into the 60 s delay launching state.
Heating cycle	a) **MODE SELECTION** When the heating return temperature (F09) parameter value is OFF, there is no heating function, and the controller is in single-cooled mode. When the heating return temperature (F09) parameter value is 1-20, it has the heating function, and the controller is in the cold and warm mode. b) **Heating start-stop conditions** When the cold storage temperature is less than or equal to the set temperature-heating return temperature (F09), the heating starts。 Cold storage temperature ≥ set temperature, stop heating.
reverse cycle defrosting	a) **Defrost working time setting** The user can set the defrost time range from 1 to 30 minutes (default 7 minutes). When the defrosting operation time reaches the set defrosting operation time, defrosting stops. b) **Defrost cycle setting** The user can set the defrosting cycle between 1 and 10 hours (default 2 hours, 0.5 hour step, controller in minutes, please convert). c) **Defrost termination temperature** The user can set the defrost termination temperature between 3℃ and 35℃ (the default is 16℃). Defrosting ends when the defrosting temperature is greater than or equal to the defrosting termination temperature. d) **Defrost function description** Defrost mode The defrosting of the controller can be divided into two kinds: 1) defrosting according to

<table>
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the defrosting interval time. 2), manual defrost.
e） Manually force exit defrost
longPress  key 3s Forced to exit defrosting from the defrosting process, the defrosting interval time is cleared to zero.
f） Defrost workflow
When the normal refrigeration work → after the defrost indicator light → the evaporation fan stops (at the same time the defrost solenoid valve is opened) → the condensation fan stops → the defrost start is completed.
Manual defrost and in the non-refrigeration work → after the defrost indicator light → after the defrost solenoid valve start → compressor start → defrost start complete.
g） Defrost shuts down the process
After defrosting ends (defrosting light goes off) → after compressor stops → defrosting solenoid valve closes (compressor, defrosting, evaporation fan and condensing fan stop output)
The compressor enters the 60s delay start state.
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<tr><td>Fault Alarm</td><td>
When the fault occurs, the "fault indicator icon" on the panel will light up and the buzzer will ring for 6 times. When the number of faults is 1, the fault code and the cold storage temperature will be displayed alternately. When the number of failures is greater than 1, the cold storage temperature, fault code and the number of failures are displayed alternately.
Example: When there are 3 failures, the following display should be displayed:
“Cold storage temperature "" fault code 1" "fault number"; "Failure Code 2" "Failure Quantity"; "Failure Code 3" "Failure Quantity";
"Cold storage temperature" "fault code 1" "fault number".....
When the fault is removed, the "fault indicator icon" light on the panel will turn off and return to the normal cold storage temperature display state. Fault code that is meaning in the following table:
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<tr><td>Fault Alarm</td><td>
<table>
<tr><th>Fault meanings</th><th>fault code</th></tr>
<tr><td>Cold storage temperature sensor open circuit</td><td>O P E 1</td></tr>
<tr><td>Cold storage temperature sensor short circuit</td><td>S H R 1</td></tr>
<tr><td>Defrost sensor open</td><td>O P E 2</td></tr>
<tr><td>Defrost sensor short circuit</td><td>S H R 2</td></tr>
<tr><td>High voltage switch fault</td><td>H P E R</td></tr>
<tr><td>Low voltage switch fault</td><td>L P E R</td></tr>
<tr><td>Power supply high voltage fault</td><td>H U E R (24V)</td></tr>
<tr><td>Power supply high voltage fault</td><td>H U E R (12V)</td></tr>
</table>
</td></tr>
<tr><td>System View</td><td>
Whether on or off，The user press  key Check defrost sensor temperature, system voltage and unit cumulative working time. In library temperature display mode, Short Press  key Enter defrost sensor temperature query，Short press again  key
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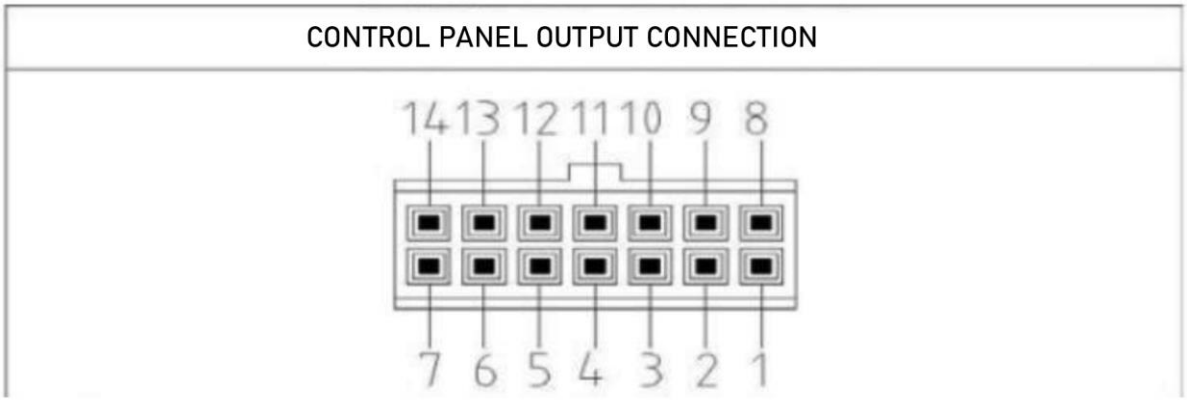
	Enter the system voltage query，Short press again key Enter the cumulative working hours of the unit to inquire, Short press again key Returns the library temperature display. No operation within 5S key，When the machine is turned on, the display of library temperature will be returned. When the machine is turned off, all the displays will be turned off.
Key-touch beep	Short stroke: Short stroke the key. If the key stroke is effective, the buzzer will sound 1 time. Long stroke: Long stroke the key, if the key stroke is effective, the buzzer will sound 2 times. Fault: If there is a fault, the buzzer will beep 6 times. Invalid keystrokes: Short or long keystrokes are not valid. The buzzer will sound 3 times.

3 interface specification



1	Low voltage input (grounded when normal)	8	positive pole
2	GND	9	High voltage input (grounded when normal)
3	Sensor common end (ground, optional）	10	Cold storage temperature sensor
4	Air outlet temperature sensor (spare)	11	Defrost temperature sensor
5	null	12	Evaporation fan control
6	Defrost solenoid valve control	13	Compressor Control
7	null	14	Condensing fan control

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