

User Manual of STC-9100 Thermostat

Refrigeration & Defrosting & Alarm Output Controller

(Version 22.01.05GEN)

The STC-9100 temperature controller controls the power supply status of the connected Refrigeration device, defrosting unit, and the Alarm output, typically suited to ultra-low temperature walk-in freezer room; It could wires an external alarm apparatus to remind users once error.

1. Package

Controller: 1PCS Sensor: 2PCS Clips: 2PCS Manual: 1 PCS Waterproof Cover: 1PCS

2. Specification

Input Power	220V AC $\pm 10\%$ 50/60HZ; (12/24/48/110V Option)
Maximum current	8A (Default) under 250V AC
Thermistor / Sensor	NTC, 25°C /10 K Ω , the sensor cable 200cm
Protection Class	IP65 to the front panel
Storage	-10°C ~ 60°C, RH<90%, without condensation
Temperature Range	Measurable: -50.0°C ~ +50.0°C; Controllable: -50.0°C ~ +50.0°C
Resolution	0.1°C
Accuracy	$\pm 1^\circ\text{C}$ from -40°C to +50°C; $\pm 2^\circ\text{C}$ in other range
Power Consumption	$\leq 3\text{W}$

3. Environmental Information



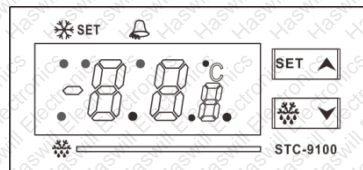
The package's material is 100% recyclable. Just dispose of it through specialized recyclers.
The electro components can be recycled if it is disassembled for specialized companies.
Please do not burn or throw the controllers in domestic garbage; observe the respective law in your region concerning the environmentally responsible manner of disposing of its devices.

4. Appearance & Operation

4.1. Front Panel & Operation

Under normal status, the screen shows room sensor temp.

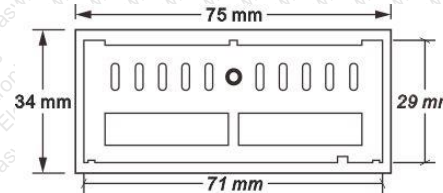
- Hold the **SET** for 3s to enter/exit the user setting interface to check and modify the set-point and the hysteresis here.
- Hold the **▲** and **▼** key at the same time for 10s to lock/unlock the admin menu:
off = unlock, editable
on = locked, only can check the value, not editable.
- Hold the **SET** and **▼** keys for 10s to enter admin interface; Press the **SET** to check current data, and press the **▲** or **▼** key to change the data; Press the **SET** again to save data and back to menu list; If without operated in 10s, the new data will be auto-saved.
- Hold the **▼** for 3s to check the defrost temp.
- Hold the **▲** for 3s to trigger the forced refrigeration mode manually (must past the compressor delay time); do it again to quit.
- Hold the **❄** for 3s to trigger the forced defrosting mode manually (must past the defrost delay time); do it again to enter defrosting water dripping status.



4.2. Indicator / Character in Display

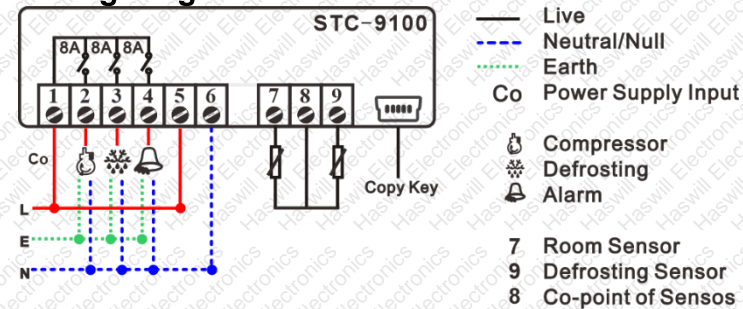
Indicator		SET		
Meaning	Compressor status	Setting Status	Alarm Status	Defrosting status
On	Working	Setting	Working	Working
Hide	Stop	Normal	Normal	Stop
Wink	Time Delay	N/A	N/A	Dripping Water
Fast Wink	Manually Refrigeration	N/A	N/A	Manually Defrosting

4.3. Dimensions & Installation



- Mount size: 71*29*85 mm (W*H*D);
- Detach the slide fasteners, put the controller into the hole, and wire it.
- Install the fasteners and the waterproof cover.

4.4. Wiring Diagram



- 10K NTC sensor, need not distinguish + or -.
- The input voltage must be within the voltage value marked in the diagram $\pm 10\%$ value.

$$\text{C. Suggest Load Power} \leq \frac{\text{Voltage} \times \text{Max current of Relay}}{\text{Factor}}$$

4.5. Copykey (Optional)

- Upload to Controller
 - Insert the Copykey, Press the **▲** key, the display shows "uPL";
 - Now Press the **Set** key to upload data will show "End" once finished;
 - Shut down the controller and pull out the Copykey.
- Download from Controller
 - Assure controller being shut down and insert the Copykey, then starting up
 - The controller will scan the Copykey and download data automatically, shows "dOL" when downloading, and shows "End" once finished.
 - Restart the controller; it will work according to the new data.

Attention:

- Part of the parameters will be executed in the next cycle; please power off the controller and power back to start a new process for running by the new data without a wait.
- If a parameter in Copykey exists error or is in the wrong format, the display shows Err.

5. Configurations

5.1. Code and Function Menu

Hold the **SET** + **▼** keys at the same time for 10s to enter the Admin Interface

The codes **5EE** and **H4** (**F01** and **F02**) are the user menu. Others are admin menu, ref 4.1 A & C

Cate.	EN	F	Function	Min	Max	Default	Unit
Temp.	5EE	F01	SP (Temperature Set-Point)	LS	US	-5.0	°C
	H4	F02	Temperature Hysteresis / Return Difference	1.0	25.0	2.0	°C
	U5	F03	Upper limit for SP	5EE	50.0	20.0	°C
	LS	F04	Lower limit for SP	-50.0	5EE	-20.0	°C
	RC	F05	Delay Time for Compressor; Delay Time for Defrosting (only for hot gas $\Delta T/F$ ID)	0	50	3	Min
Defr.	dF	F06	Cycle / Interval / Span Time	0	120	6	Hour
	ndF	F07	Lasting Time / Duration	0	255	30	Min
	dE	F08	Stop Temperature	-50.0	50.0	10.0	°C
	FdE	F09	Water dripping Time	0	10.0	2	Min
	dF	F10	Defrosting Mode				
			EL/0 Electric-Heating;	EL/0	HEG/1	EL/1	N/A
			HEG/1 Hot Gas from the compressor reverse working.				
	dE	F11	Count mode of defrost cycle				
			rE/0 Cumulative time from the controller power on;	rE/0	CoH/1	rE/0	N/A
			CoH/1 The cumulative time from the compressor works				
	dFd	F12	Display mode when defrosting:				
			rE/0 Shows the room sensor temperature display	rE/0	LE/1	rE/1	N/A
			LE/1 Shows the evaporator sensor temp. (continue showing 10 minutes once defrosting over)				
Alarm	dno	F13	Alarm output options:				
			n-C/0 N/A, alarm output function was banned.				
			A-C/1 follow the status of the buzzer	n-C/0	A-C/1	n-C/2	N/A
			A-A/2 press any key to stops It cannot be canceled before fixed all errors.				
	ELL	F14	Defrost sensor temp. to trigger Alarm	-50.0	ELU	-50.0	°C
	Eod	F15	Time delay	0	255	0	Min
	ELU	F16	Upper Limit	ELL	50.0	50.0	°C
	RLU	F17	Room sensor temp. to trigger Alarm	ALL	50.0	50.0	°C
	RLU	F18	Lower Limit	-50.0	RLU	-50.0	°C
	RLd	F19	Time delay	0	99	15	Min
Cali.	oE	F20	Temperature Calibration = Real Temp. - Measured	-10.0	10.0	0.0	°C

The EN code menu and the F code menu are same, just for satisfy different clients.

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z 1 2 3 4 5 6 7 8 9 °C
 A b c d e f g h i j k l m n o p q r s t u v w x y z 1 2 3 4 5 6 7 8 9 °C

5.2. When will the Defrosting Starts / Stops?

- A. Defrost relay will **close/on** when reaching all the below conditions
- The time should later than: the compressor last stops moment + $RC/F05$ if the defrosting Mode was thermal air / Hot Gas ($\Delta T/F$ ID = HEG).
 - The defrost sensor temperature < Defrost stop temperature (in $dE/F08$)
 - Time passed the defrosting cycle time ($dF/F06$) or forced defrosting beginning
- B. Defrost relay will **open/off** when reaching any one of the below conditions
- The defrost sensor temperature \geq Defrost stop temperature (in $dE/F08$)
 - Passed the defrosting Lasting Time ($ndF/F07$)

5.3. When will the Compressor Starts / Stop?

The room temperature was supposed to keep at the range from "5EE (F01)" to "5EE+H4 (F01+F02)." The time should be later than the compressor last stops moment + $RC/F05$, and then

- A. If $\Delta T/F$ ID = EL/0 (like an electric heating wire wound around the evaporator)

Controller Status	Working Condition	Stops Condition
Manual turn on the forced cooling	Room Temp \geq 5EE/F01	Room Temp < 5EE/F01; or defrosting beginning ;
Not in defrosting	Room Temp \geq 5EE/F01 + H4/F02	or forced Refrigeration is over.

- B. If $\Delta T/F$ ID = HEG/1 (Hot Gas from the compressor Reverse Rotary), 1 more status than A

Controller Status	Working Condition	Stops Condition
Manual turn on the forced cooling	Room Temp \geq 5EE/F01	Room Temp < 5EE/F01; or defrosting beginning ;
Not in defrosting	Room Temp \geq 5EE/F01 + H4/F02	or forced Refrigeration is over
In defrosting	Evaporation Temp > $dE/F08$	and won't defrost at once.

5.4. When will the Alarming Starts / Stop?

Once alarming, the readout flashing and buzzer screaming press any key to stop the buzzer ticktick, but the error code in the display will not disappear until all errors have been fixed.

Code	Troublesome From	Reason
E01	Room Sensor	Open or short
E03		Temperature not in the measurable range
rH		$RLU/F17 < \text{Temp.} < \text{Max measurable limits } 50^\circ\text{C}$
rL		$ALL/F18 > \text{Temp.} > \text{Min measurable limits } -50^\circ\text{C}$
E02	Defrost Sensor	Open or short
E04		Temperature not in the measurable range
EH		$ELU/F16 < \text{Temp.} < \text{Max measurable limits } 50^\circ\text{C}$
EL		$ELL/F14 > \text{Temp.} > \text{Min measurable limits } -50^\circ\text{C}$

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