

## Microcomputer Temperature Controller ETC-400




### Inspection before use and installing requirements:

- ◆ Power supply must be the same as the power labeling on the products and ensure the power supply stably
- ◆ Prohibit to use in water and humidity environment, prohibit to use under the environments of high temperature、 high electromagnetism interference and high corruption.
- ◆ Down-leads of sensor and power should be kept away from each other
- ◆ Sensor down-lead、 power wire and interface of output relay must be distinguished strictly. Prohibit to overload the relay.
- ◆ Sensor installing place should keep away from the defrosting heater for ensuring to measure the average storage temperature and avoid stopping the defrosting in advance.

### Specification and Technical parameters:

- ◆ Panel size: 75×34.5 (Unit: mm)
- ◆ Installing hole size: 70.1×28.5 (Unit: mm)
- ◆ Environment temperature: 0℃~60℃
- ◆ Relative humidity: 20%~85% (No condensation)
- ◆ Main technical parameters:
  - ◇ Power supply voltage: 220VAC±10%,50~60Hz
  - ◇ Watt consumption: < 3W
  - ◇ Temperature measuring and controlling range:-45℃~+50℃
  - ◇ Accuracy: ±0.5℃(-10℃~+10℃), within other range: ±1℃
  - ◇ Resolution: 0.1℃
  - ◇ Relay contact capacity: 7A/240VAC
- ◆ Main Functions:
  - ◇ Temperature measuring and controlling
  - ◇ Defrosting control: Electric heating or Thermal defrost
  - ◇ Enforced defrosting
  - ◇ Fan control: Fan lags to start/stop for 30 seconds after compressor start/stop
  - ◇ Compressor delay time adjustable
  - ◇ Storage temperature calibration
  - ◇ Defrosting water-drop time: 2 minutes
  - ◇ Alarm delay time: 1 minute
  - ◇ Dual control of temperature and time when defrosting ends
  - ◇ System auto-controls the start/stop proportionably when sensor error occurs

### Descriptions of indicating lights:

	Red light on	Compressor under work
	Red blink slowly	Compressor delay start
	Red light on	Defrosting under work
	Red blink quickly	Manually defrosting(Enforced defrosting)
	Red light on	Fan under work
	Red blink slowly	Parameter setting

### Key Function:

- ◆ Under normal storage temperature displaying status:
  - ◇ ▲ key: press and release, display set temperature upper limit value with LED blinking and 2 seconds later display normal temperature.
  - ◇ ▼ key: press and release, display set temperature lower limit value with LED blinking and 2 seconds later display normal temperature.
  - ◇ SET key: Under non-defrosting status, press and release the key to display defrosting cycle、 defrosting time with LED blinking and Display normal temperature after 2 seconds Under defrosting status, press and release the key to display defrosting temperature and defrosting left time with LED blinking and Display normal temperature after 2 seconds Press the key for more than 3 seconds into parameter setting or quit from parameter setting
- Notice: when under exceeding temperature limit status the blinking speed of set value is a little faster than what in normal status.*
- ◇ Press and release immediately to display defrosting sensor temperature、 defrosting left time with LED blinking and Display normal temperature after 2 seconds. Press for more than 3 seconds into starting or quitting from manual defrosting

### Operation instruction:

- ◆ Lock/open the key: When electrified press▲+▼ for more than 3 seconds, LED displays "POF" showing Key locked, after 2 seconds to display normal temperature. Under key locked situation press▲+▼ for more than 3 seconds, LED displays "PON" showing key open, after 2 seconds to display normal temperature. This moment turns to press keys to see or reset the parameters.
- ◆ Parameters calibration:
  - ◇ when under key-open conditions, press SET key for more than 3 seconds, the fan light blinks slowly showing into parameters setting status. This moment shows the parameters code, press▲or▼ key to calibrate parameters F01,F02 . . .
  - ◇ After into parameter setting status, press⌘ key to display former parameters, press▲or▼ to change the parameter value, and then press SET key again the changed parameters will be stored temporarily if with no change turn into former parameters. Press▲ or ▼ to display next parameter(press⌘key can display former parameters again), press▲ or ▼ to change parameters, then press SET key to store the changed parameters temporarily and return to former parameters. By this way all the parameters can be set.

- ◇ When all the parameters calibration finished, press SET key for more than 3 seconds to confirm and quit parameter setting status and turn to temperature measuring status. If all the parameters calibration finished without press SET key for 3 seconds to confirm "quit". With no press for more than 30 seconds, system will quit parameters setting status and return to measuring status, but system will not store the changed parameters, the system will run under former setting parameters.

◆ Main function instructions:

◇ Refrigeration function:

1. When storage temperature  $\geq$  upper limit refrigeration starts; when storage temperature  $\leq$  lower limit refrigeration stops. When storage sensor invalid the compressor simultaneously

start/stop by fixed proportional time (Example: start 15 minutes stop 30 minutes)

2. Compressor start delay protection: Time between the stop and restart of the compressor should  $\geq$  delay time in whatever conditions
3. After defrosting no matter whether compressor delay time running out or not, it will delay 2 more minutes to start (if need to start).

◇ Defrosting function:

1. Defrosting-Start controlled by defrosting cycle (calculated by add-up working time); defrosting-stop dually controlled by defrosting time or defrosting cycle.
2. Manually defrost: no matter under what conditions (except defrosting function cancelled) can enter and quit manually defrosting status. When in manual-defrosting status, the former defrosting cycle clears to "0".
3. Cancel defrosting: when defrosting time or defrosting cycle becomes "0", or defrosting end temperature  $\leq$  defrosting sensor temperature, defrosting function not run

◇ Fan Control

1. Fan start/stop lags compressor 30 seconds, the fan doesn't work when defrosting.
2. Compressor starts and fan stops when defrosting sensor temperature  $\geq$  Fan ending temperature.

**Alarm Instruction:**

◆ Sensor error alarm:

1. When storage temperature sensor error, LED to display E1 with buzzer;
2. When defrosting sensor error, LED displays E2 and current storage temperature alternately with buzzer.
3. LED displays "E1" and "E2" alternately and buzzer when store temperature and defrosting sensor error.

◆ Alarm when temperature exceeds the limit (when defrosting sensor error)

Measuring temperature displays blinkingly with buzzer when measuring temperature  $\geq$  upper

limit value + temperature limit exceeding setting value or measuring temperature  $\leq$  lower limit value - temperature limit exceeding setting value.

◆ Alarm when exceeding measuring range:

Alarm with buzzer when storage sensor measuring temperature  $> +50^{\circ}\text{C}$  or  $< -45^{\circ}\text{C}$  and the machine displays E3 or E4.

◆ Clear the alarming sound

**Error code:**

E1	Storage Temp. sensor error	Display code 、 buzzer loud continually、 compressor control start/stop by the presetting proportional time.
E2	Defrosting sensor error	Display code and temperature alternately 、 buzzer loud continually and defrost by presetting time
E3	Exceeding upper Temp. limit Alarm	Code blinking-display、 buzzer loud continually、 compressor control no-output
E4	Exceeding lower Temp. limit Alarm	Code blinking-display、 buzzer loud continually、 compressor control no-output

Code	Parameters	Setting range	Unit	Default
F01	Temp. upper limit setting	-45~+50	$^{\circ}\text{C}$	-15
F02	Temp. lower limit setting	-45~+49	$^{\circ}\text{C}$	-20
F03	Exceeding temp. alarm	0~20	$^{\circ}\text{C}$	10
F04	Compressor starts delay time	0~9	Minute	3
F05	Defrost cycle	0~99	Hour	6
F06	Defrost time	0~99	Minute	30
F07	Defrost ending temperature	-45~+50	$^{\circ}\text{C}$	10
F08	Storage temp. calibration	-5~+5	$^{\circ}\text{C}$	0
F09	Fan ending temp.	-50~+50	$^{\circ}\text{C}$	2
F10	Defrost mode	0: Electronic heating 1: Thermal		0
F11	Fan mode	0: Start/stop with compressor simultaneously 1: Continually Run		0

**Elementary Diagram and front panel:**

