SZ-7548T

Operating Instructions

sub-Zero® Controlled cooling, always

Touch Sensitive Temperature Controller

Introduction :

The SZ-7548T are aesthetically superior versions of their predecessors. The SZ-7548T are two relay controllers.

SZ-7548T are specifically designed for the panel A/C,oil cooler, package a/c and similar kind of applications.

The controllers have special features like power on time delay for alarms. Additionally these series offer several protection features that are easily understood by the examples in the instructions below.

A number of parameters are displayed alphanumerically to set up the instrument for each specific application.
SZ-7548T can be used for several applications with a measuring range from -9°C to 99°C.

CAUTION

WIRING: The probe and its corresponding wires should never be installed in a conduit next to control or power supply lines. The electrical wiring should be done as shown in the diagram. The power supply circuit should be connected to a protection switch. The terminals admit wires of upto 2.5sq mm.

WARNING: Improper wiring may cause irreparable damage and personal injury. Kindly ensure that wiring is done by qualified personnel only.

Maintenance: Cleaning: Clean the surface of the controller with a soft moist cloth. Do not use abrasive detergents, petrol, alcohol or solvents.
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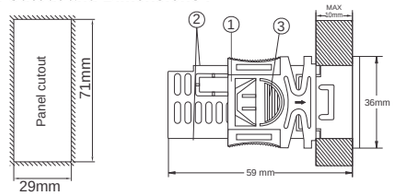
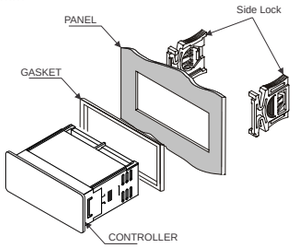
Installation : Fixing and dimensions of panel models:
To fix the unit, slide the fastener ① through the guides ② as per the position shown in the figure. Move the fastener in the direction of the arrow, pressing tab ③ it permits to move the fastener in the opposite direction of the arrow.

Controller :Controller should be installed in a place protected by vibration, water and corrosive gasses and where ambient temperature does not exceed the values specified in the technical data.

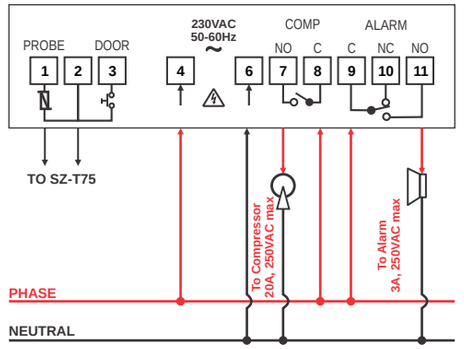
Probe : To give a correct reading, the probe must be installed in a place protected from thermal influences, which may affect the temperature to be controlled.

Panel Cutout and Dimensions :





Suggested Wiring



Caution:Wiring for 230Vac load only

USER INTERFACE

^ **UP**	In Program mode: **Scroll through parameters** & **Increases parameter value.** In Set mode : **Increases parameter value.**
PRG **Down/ Program**	Touch and hold for 2sec **to enter into program mode.** In program mode and set mode: **Decreases parameter value**
RST Reset	To Mute the Alarm Relay / To Reset the Manual Reset Fault. When RST key is pressed for 2 seconds, Alarm Relay will be OFF and Manual Reset Fault is cleared. (Alarm Relay will not be OFF incase di Fault is present). Also used to exit from program mode.
SET Set	Touch and hold for 2sec **to enter into set mode**. In program mode and set mode: **set/save the changed value of parameter.**

TECHNICAL DATA

Housing	: Black ABS Plastic, Auto-extinguish
Front Cover	: Polycarbonate Plastic
Dimensions	: Frontal : 78 X 36mm, Depth : 59mm
Panel Cutout	: 29 X 71mm
Mounting	: Flush panel mounting with fasteners
Protection	: IP65 Front (with gasket)
Connections	: Screw terminal blocks. ≤ 2.5sq mm terminal only.
Display	: 2 X 17mm 7 segment display & 5 LEDs for Indication
Data storage	: Non-volatile EEPROM memory
Power input	: 230 Vac ±15 % , 50-60Hz.
Relay output	: Comp SPST relay 20A, 250Vac Alarm SPDT relay 3A, 250Vac
Operating temp.	: 0°C to 60°C (non-condensing)
Operating humidity	: 20% to 85% (non-condensing)
Storage temp	: -25°C to 60°C (non-condensing)
Measuring Range	: -9°C to 99°C
Analog Input	: NTC probe, SZ-T75
Resolution	: +/- 1°C
Accuracy	: +/- 1°C
Digital Input (Potential Free) :	Door Open Fault

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Parameter List :

1 Set point — Function: To set compressor relay set point.

Touch & hold SET key for 2 seconds.

Display will show set value. The set point value can now be modified by using the UP/DOWN key. After selecting the desired value, touch the set key and user can see "- -" which confirms that the set point has been stored in memory.

Min	Max	Fac.1	Fac.2	Fac.3
LS+1	HS-1	28°C	35°C	28°C

2 To set other Parameters. — Display will flash "P2". To select other parameters, use UP/DOWN keys.

Touch & hold PRG key for 2 seconds.

3 P2 Parameter — Function: To set maximum allowable high temperature limit.

Example: If this parameter is set to 40°C and the temperature reaches or goes above 40°C, display will show Ht (High Temp.) indicating that the temperature has reached or gone above the value set in this parameter.

(Message on display) Ht

Min	Max	Fac. 1	Fac. 2	Fac. 3
P3+1	50°C	40°C	40°C	40°C

4 P3 Parameter — Function: To set minimum allowable low temperature limit.

Example: If this parameter is set to 24°C and the temperature reaches or goes below 24°C, display will show Lt (Low temp) indicating that the temperature has reached or gone below the value set in this parameter.

Note: LT fault will get activated only if A2 = 1.

(Message on display) Lt

Min	Max	Fac. 1	Fac. 2	Fac. 3
0°C	P2-1	24°C	24°C	23°C

5 HS Parameter — Function: To set Maximum set point limit.

Once set at a particular value, this will not allow the set point to go above this value.

Example: Setting this parameter at 25°C will not allow the set point to go above 24°C (HS-1).

SP = Set Point	Min	Max	Fac. 1	Fac. 2	Fac. 3
	SP+1	50°C	40°C	40°C	40°C

6 LS Parameter — Function: To set Minimum set point limit.

Once set at a particular value, this will not allow the set point to go below this value.

Example: Setting this parameter at -10°C will not allow the set point to go below -9°C (LS+1).

SP = Set Point	Min	Max	Fac. 1	Fac. 2	Fac. 3
	0°C	SP-1	24°C	24°C	23°C

7 P4 Parameter — Function: To set the differential for compressor relay ON condition.

Example : If the set point is set at 10°C and differential is set at 2°C, then when the system reaches 10°C, the compressor relay will go OFF. Since the differential is 2°C, the compressor relay will come ON (restart) at 12°C (10°C +2°C).

Min	Max	Fac. 1	Fac. 2	Fac. 3
1°C	20°C	3°C	2°C	2°C

8 P5 Parameter — Function: To set probe calibration.

In time it may be possible that the display may be offset by a degree or so.
To compensate for this error, user may need to add or minus the degrees required to achieve the correct temperature.

Example : The temperature on the display is 28°C, whereas the actual temperature is 30°C. User will have to set the P5 parameter to 2, which means that once out of the programming mode, the temperature on display will be 30°C (28°C+ 2°C).

Min	Max	Fac. 1	Fac. 2	Fac. 3
-9°C	10°C	0°C	0°C	0°C

9 P6 Parameter — Function: To set time delay between compressor relay restart.

This parameter is used to protect the compressor from restarting in a short period of time.

Example: If this parameter is set at 3 minutes, the compressor relay goes OFF at the set point, it will not restart for a minimum of 3 minutes, even if the differential is achieved earlier. This parameter is good to protect the life of the compressor.

Flashing — Time delay in progress

Min	Max	Fac. 1	Fac. 2	Fac. 3
0 Min	3 Min	3 Min	3 Min	3 Min

10 ot Parameter — Function: Minimum ON Time For Compressor relay.

This parameter is used to protect the compressor so that there is enough time for oil to return back to the compressor. This delay starts once the compressor relay is ON.

Example: If this parameter is set at 1 minute and if the temperature is achieved before 1 minute, then the compressor relay will remain ON for minimum 1 minute, though set point is achieved.

Min	Max	Fac. 1	Fac. 2	Fac. 3
0 Min	20 Min	0 Min	0 Min	0 Min

11 P7 Parameter — Function : To set power on time delay for alarm relay.

This parameter sets a time delay on power on for the high & low temperature alarm.

Example : If this parameter is set to 20min once the unit is powered on the alarm relay will not activate for 20 minutes even if there is a fault. This is very useful to eliminate the nuisance alarm when a unit is switched on and the ambient is above the max set limit in P2.
This delay is applicable for High and Low temperature alarms .

Min	Max	Fac. 1	Fac. 2	Fac. 3
0 Min	30 Min	20 Min	20 Min	20 Min

12 LP Parameter | Function: To lock keypad.

This parameter is used to lock the keypad so that tampering is not possible by by-standers.

0 = keypad unlocked
1 = keypad locked

When locked all parameters can only be viewed, but not modified.

Note : If LP parameter is set to 1 and if user tries to change any parameter value, " LP" will flash on the display.

LP Flashing

Min	Max	Fac. 1	Fac. 2	Fac. 3
0	1	0	0	0

13 AL Parameter | Function: To activate alarm relay.

Once set to on, the alarm relay will come on incase the temperature reaches or goes above or below the points set in parameter P2 & P3 and if the probe fails.
0= De-activates alarm relay.
1 =Activates alarm relay on HT & LT.
2 =Activates alarm relay only on HT.
3 =Activates alarm relay only on LT.

Note : Alarm relay on LT will get activated only if A2 = 1.

ON

Min	Max	Fac. 1	Fac. 2	Fac. 3
0	3	2	1	1

14 A2 Parameter | Function : To activate LT alarm relay.

If this parameter set to,

0 = No indication for LT
1 = Indication for LT

Min	Max	Fac. 1	Fac. 2	Fac. 3
0	1	0	0	0

15 E1 Parameter | Function : Compressor relay status in case of Probe Failure.

When set to
0 = Comp. relay status is ON.
1 = Comp. relay performs a duty cycle for Cn for minutes OFF and Cy for minutes ON.
2 = Comp. relay status is OFF.

Min	Max	Fac. 1	Fac. 2	Fac. 3
0	2	1	1	1

16 Cn Parameter | Function : Compressor relay OFF Time during probe fault.

(This will be considered only when E1 is selected 2) .

Example : If this parameter is set to 4 minutes, then compressor relay will be OFF for 4 minutes while performing the duty cycle.

Min	Max	Fac. 1	Fac. 2	Fac. 3
1 Min	99 Min	4 Min	4 Min	4 Min

17 Cy Parameter | Function : Compressor relay ON Time during probe fault.

(This will be considered only when E1 is selected 2) .

Example : If this parameter is set to 10 minutes, then compressor relay will be ON for 10 minutes while performing the duty cycle.

Min	Max	Fac. 1	Fac. 2	Fac. 3
1 Min	99 Min	10 Min	10 Min	10 Min

18 PA Parameter | Function : To change Password.

User cannot enter into program mode & set mode, if correct password is not entered.

If the password is kept other then 0, user need to enter correct password to enter into set/program mode.

If password is 0, user can directly access set/program mode.

Min	Max	Fac. 1	Fac. 2	Fac. 3
-9	99	11	99	99

19 dO Parameter | Function : Digital Input fault status.

When set to,

0 = Open as fault, Close is healthy.
1 = Close as fault, Open is healthy.

Min	Max	Fac. 1	Fac. 2	Fac. 3
0	1	0	0	0

20 di Parameter | Function : Activate door open.

When set to,

0 = Digital Input disabled.
1 = Digital Input enabled (Auto reset)
2 = Digital Input enabled (Manual reset)

Min	Max	Fac. 1	Fac. 2	Fac. 3
0	2	0	1	1

21 FS Parameter | Function : To restore default settings of the controller.

When set to 1 all parameters are programmed to default values.

Useful to debug setting related problems.

When Sets to,
0 = NO
1 = Fac. Set 1
2 = Fac. Set 2
3 = Fac. Set 3

Min	Max	Fac.
0	3	0

22 EP Parameter | Function: To end programming.

To end programming press "**SET**" key | Once the key is pressed, the controller goes into the normal mode and displays the temperature and all settings are recorded.

LEDS

Compressor
ON: Compressor is ON.
OFF: Compressor is OFF.

Alarm
ON: Alarm relay ON.
OFF: Alarm relay OFF.

Time Delay
ON: Compressor is ON and in time delay for switching OFF. (Ot parameter)
FLASHING: Compressor is in time delay and about to start.

Door Open
ON: Door Open fault.

°C ON: When temperature is displayed.

OPERATING MESSAGES

Ht **High temperature alarm** Temperature above the maximum high temperature limit.	**Lt** **Low temperature alarm** Temperature below the minimum low temperature limit.
PP **Probe fail** Probe short circuit, circuit open or without probe, or temperature is > 99°C or <-9°C	**LP** **Keypad lock** Keypad is locked
LL **Last low temperature** Last low temperature logged.	**LH** **Last high temperature** Last high temperature logged.
rS In log function: When LL and LH values are cleared.	**di** **Digital Input** Door open fault.

Password function

Touch & hold " PRG " key for 2sec. Display will flash "0".

Use " ^ "and " PRG " keys to enter the password. On entering correct value, display will flash the first parameter "P2". User can scroll through parameters using " ^ " or " PRG " keys.

High and Low temperature logging function

- **How to see the logged values:**
  LL : Last Low temperature
  LH : Last High temperature
  Touch and hold "^" key for 1sec. display will flash “LL” and the corresponding temperature for 4 seconds. After this, display will flash “LH” and the corresponding temperature for 4 seconds and come out of Log mode and will display Control probe temperature.
- **How to reset the Logged values**
  While the display is showing the logged values, if user touches & holds the "**SET**" key for 1sec, the logged values will be cleared and "**rS**" will be displayed.

Log Values will get reset after Power ON/OFF.

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