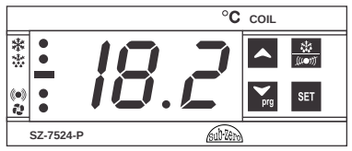
SZ-7524-P

Operating Instructions

Controlled cooling, always



Temperature Controller

Features :

- 2 NTC probes for cold room temp. + Evap. coil temperature.
- Range : -40.0°C to 50.0°C.
- Relay outputs : Compressor + Defrost + Evap. Fan.
- Compressor protection algoriithm.
- Auto/Man defrosting facility (Time/Temp based).
- Buzzer Output

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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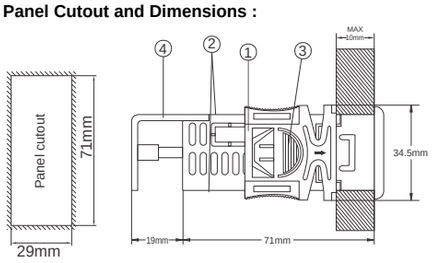
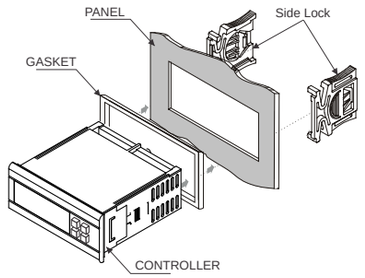
Installation : Fixing and dimensions of panel models:
To fix the unit, slide the fastener ① through the guides ② as per the position shown in the figure. Move the fastener in the direction of the arrow, pressing tab ③ it permits to move the fastener in the opposite direction of the arrow. Once the controller has been connected, they should be covered with the lid ④ Silicon sealant should be applied along the perimeter of the panel cut out or a rubber 'O' ring supplied before the unit is fitted to increase protection against water seepage.

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.

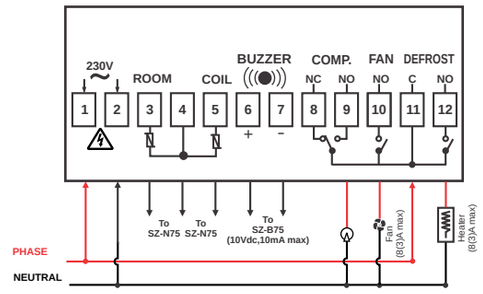
Panel Cutout and Dimensions :



Mounting :

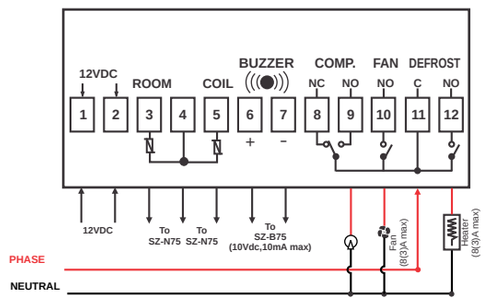


Suggested Wiring SZ-7524-P (230VAC)



Caution:Wiring for 230Vac load only

Suggested Wiring SZ-7524-P (12VDC)



TECHNICAL DATA

Housing	: Black, ABS Plastic, Auto-extinguish.
Front Lens	: Ploycarbonate plastic.
Dimensions	: Front - 75 x 34.5 mm, Depth- 71MM(w/o. back lid).
Panel Cutout	: 29X71mm.
Mounting	: Flush panel mounting with fasteners.
Protection	: Front panel is waterproof & I.P.65 rated.
Connection	: Screw terminal blocks. ≤ 2.5sq mm one wire/terminal only.
Display	: 3X14.2 MM (0.56")LED.
Data storage	: Non-volatile EEPROM memory
Power input	: 230Vac +/-15%, 50-60Hz, Other on request.
Operating temp.	: 5°C to 50°C(non-condensing).
Storage temp	: -20°C to 70°C(non-condensing).
Output	: 3 SPDT relay, 8(3)A, 250Vac.
Input	: NTC probe, SZ-N75.
Range	: -40.0°C to 50.0°C (0.1°C) -40°C to 50°C (1°C)
Resolution	: 1°C / 0.1°C.
Accuracy	: +/- 1°C.
Probe tolerance at 25°C :	+/- 0.3°C.
Alarm (Buzzer)	: SZ-B75. 10V,10mA.

USER INTERFACE

UP	In Program mode: **Scroll through parameters & Increases parameter value.**
Down/ Program	Press and hold for 2sec **to enter into program mode.** In program mode: **Decreases parameter value**
Mute/ Defrost	This key will mute the buzzer.
	This key will start a manual defrost cycle if pressed for 2 sec. Press again for 2 seconds it will come out of defrost mode and STOP defrost cycle. If E4 parameter is set to 0, or Coil temp. is greater than defrost stop temp. this key will remain inactive.
Set	In program mode: **set/save the changed value of parameter.**

INDEX

Sr. No.	Para.	Description
1	Set Point	Compressor relay set point.
2		Set other parameter.
3	P1	Set Heating or Cooling mode.
4	P2	High temperature limit.
5	P3	Low temperature limit.
6	P4	To set Differential (Hysterisis).
7	P5	Probe calibration.
8	P6	Time Delay (relay restart after cutoff).
9	P7	Drip time for defrost water to drain out.
10	P8	Compressor relay status.
11	P9	Power on defrost delay.
12	L1	Evap. fan stop temp.
13	L2	Time delay between Evap. fan relay restart time.
14	L3	Fan operation when compressor is OFF.
15	L4	Evap. Fan differential.
16	L5	To set probe 2 offset calibration.
17	L6	Evap. fan status during defrost.
18	E1	To set type of defrost.
19	E2	Computation for defrost time.
20	E3	Defrost frequency.
21	E4	Maximum Defrost duration.
22	E5	Defrost stop temperature.
23	E8	Defrost duration during Coil probe failure (Only manual).
24	AL	Power on time delay for Alarm.
25	FS	Revert to factory set parameter.
26	LP	Keypad Lock.
27	rS	Change the Resolution.
28	EP	End programming.
29		LED Indications
30		Operating Messages

Parameter List :

1 Set point — Function: To set the cut out point of the controller.

Press and hold the SET key for 2 Seconds.

Display will change to set value. The set point value can now be changed by using the UP/DOWN key. After setting the desired value, press the set key and you will see "- - -" which confirms that the set point has been stored in memory.

rS = 0			rS = 1		
Min	Max	Fac.	Min	Max	Fac.
P3+0.5	P2-0.5	0.0°C	P3+1	P2-1	0°C

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

Press & hold prg key for 2 seconds.

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

To change value use ▲ prg keys | To set value press SET key

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

Example : Setting this parameter at 25.0°C will not allow the set point to go above 25.0°C. Also, if the temperature reaches 25.0°C, the display will show Ht (High Temp.) indicating that the temperature has gone above the value in this parameter.

(Message on display) Ht

rS = 0			rS = 1		
Min	Max	Fac.	Min	Max	Fac.
SP+0.5	50.0°C	50.0°C	SP+1	50°C	50°C

SP = Set Point

5 P3 Parameter — Function: To set minimum allowable low temperature set point.

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

Example : Setting this parameter at -40.0°C will not allow the set point to go below -40.0°C. Also, if the temperature reaches -40.0°C, the display will show Lt (LowTemp.) indicating that the temperature has gone below the value in this parameter and at this point the buzzer will activate.

(Message on display) Lt

rS = 0			rS = 1		
Min	Max	Fac.	Min	Max	Fac.
-40.0°C	SP-0.5	-40.0°C	-40°C	SP-1	-40°C

6 P4 Parameter — Function: To set the differential.

Differential between cut out and cut in temperature can be set between 1°C to 20°C.

Example: If the set point is set at 10.0°C and differential is set at 2.0°C, then when the system reaches 10.0°C, the relay will cut out. Since the differential is 2.0, the relay will cut in (restart) at 12.0°C (10.0°C+2.0°C).

rS = 0			rS = 1		
Min	Max	Fac.	Min	Max	Fac.
0.5°C	20.0°C	2.0°C	1°C	20°C	2°C

7 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, you may need to add or minus the degrees required to achieve the correct temperature. Setting value is from -10.0°C to +10.0°C.

Example : The temperature on the display is 28.0°C, whereas the actual temperature is 30.0°C. You will need to set the P5 mode to 2.0, which means that once out of the programming mode, the temperature will show 30.0°C (28.0°C + 2.0°C).

rS = 0			rS = 1		
Min	Max	Fac.	Min	Max	Fac.
-10.0°C	10.0°C	0.0°C	-10°C	10°C	0°C

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

This parameter is used to protect the compressor from restarting in a short period of time and can be set between 0 to 20 minutes.

Example: If this parameter is set at 3 minutes, the relay will cut off at the set temperature, but will cut off at the set temperature, but 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 or even in applications where the probe is placed at places where there are sudden & short in temperature like above a cold room door.

Flashing — Time delay in progress

Min	Max	Fac.
0 Min	20 Min	3 Min

9 P7 Parameter — Function : To set drip time for defrost water to drain out.

This is the time for which the fan, compressor, heater will stay OFF so that the defrost water can drip & drain out.

Min	Max	Fac.
0 Min	99 Min	1 Min

10 P8 Parameter — Function: To set compressor relay status on room probe failure.

When set to
0 = Comp status is ON.
1 = Comp performs a duty cycle 10 minutes ON and 4 minutes OFF.
2 = Comp status is OFF.

Min	Max	Fac.
0	2	1

11 P9 Parameter — To set power on defrost delay.

Differential between cut out and cut in temperature can be set between 1°C to 20°C.

Example : If P9 parameter is 30 minutes then at power after 30 minutes defrosting will take place once.

Min	Max	Fac.
0 Min	99 Min	30 Min

12 L1 Parameter — Function: Evap. fan stop temp (Coil).

This setting is used to limit the max temperature beyond which the Evaporator fan will cut OFF.

rS = 0			rS = 1		
Min	Max	Fac.	Min	Max	Fac.
-40.0°C	50.0°C	2.0°C	-40°C	50°C	2°C

13 L2 Parameter — Function: To set time delay between Evap. fan relay restart time

Example : If this parameter sets at 3 minutes, the Evap. Fan relay will cutoff at the temp. set by L1 parameter but the fan will not come on for a minimum of 3 minutes even if L4 is achieved earlier.

Min	Max	Fac.
0 Min	20 Min	1 Min

14 L3 Parameter — Function: Fan operation when compressor is OFF.

0 = Evap. Fan is off when compressor is OFF.
1 = Evap. Fan will stay ON when compressor is OFF.

Min	Max	Fac.
0	1	1

15 L4 Parameter — Function: Evap. Fan differential (hysterisis).

Example: If L1 parameter is set to 2.0°C, and the L4 is set to 2.0°C, then Evap. fan will cut off at 2.0°C and restart only at 0.0°C

rS = 0			rS = 1		
Min	Max	Fac.	Min	Max	Fac.
0.5°C	20.0°C	2.0°C	1°C	20°C	2°C

16 L5 Parameter — Function: To set probe 2 offset calibration (Evap. fan coil probe).

In time it may be possible that the temp. on the display may be offset by a degree or so. To compensate for this error, you may need to add or minus the degrees required to achieve the correct temperature. Setting value is from -10.0°C to 10.0°C

rS = 0			rS = 1		
Min	Max	Fac.	Min	Max	Fac.
-10.0°C	10.0°C	0.0°C	-10°C	10°C	0°C

17 L6 Parameter — Function: Fan operation when compressor is OFF.

0 = Evap. fan will stay on during defrost.
1 = Evap. fan will stay off during defrost.

Min	Max	Fac.
0	1	1

18 E1 Parameter — Function : To set type of defrost.

0 = Heater defrost in which case compressor is OFF.
1 = Hot gas defrost where compressor is ON.

Min	Max	Fac.
0	1	0

19 E2 Parameter — Function: To set type of computation for defrost time.

0 = Total of real time.
For example if the unit goes into defrost at this moment, the calculation of time will start at that movement.
1 = Sum of total compressor operating times.
This means that for time calculation, the unit will add the total time the compressor has been in an ON mode. Controller keeps a record of the hours worked +/- half hour incase of a power failure.

Eg. If E3 is set to 6 hrs and 3½ hrs have passed after unit has started and power fails, then defrost cycle will start after 2½ hours when power resumes.

Min	Max	Fac.
0	1	0

20 E3 Parameter — Function : To set Defrost frequency.

This is the amount of time between two defrost cycles.

Min	Max	Fac.
1 Hr	31 Hrs	6 Hrs

21 E4 Parameter — Function: To set maximum Defrost duration.

This is the maximum amount of time allowed for a defrost.
If set to 0, there will be no defrost cycle.

Min	Max	Fac.
0 Min	99 Min	30 Min

22 E5 Parameter — Function : Defrost stop temperature (Evap. coil probe)

This is the maximum temperature allowable at which the defrost process will stop.

Defrost will stop according to E4 & E5 parameter, whichever is achieved earlier.

rS = 0			rS = 1		
Min	Max	Fac.	Min	Max	Fac.
-40.0°C	50.0°C	8.0°C	-40°C	50°C	8°C

23 E8 Parameter — Function: Defrost duration during Coil probe failure (Only manual).

Example: If this is set to 5 min, then manual defrost for 5 min will take place during Coil probe fail.

Min	Max	Fac.
1 Min	10 Min	5 Min

24 AL Parameter — Function : Power on time delay for Alarm.

Example : If you set this parameter to 20, once the power is switched on, the alarm will not activate for 20 minutes after the power is switched on. This is most useful to avoid the nuisance alarms when the ambients are high when the machine is switched on after a long time.

Min	Max	Fac.
0 Min	99 Min	30 Min

25 FS Parameter — Function : To restore default settings of the controller.

When set to 1 all parameters are programmed to factory set values.
Useful to debug setting related Problems.

Min	Max	Fac.
0	1	0

26 LP Parameter — Function: To lock keypad.

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

1 = Actives keypad lock.
0 = De-activates keypad lock.
On activation, all the parameters can only be viewed. but not modified.

LP
(Message on display)

Min	Max	Fac.
0	1	0

27 rS Parameter — Function : To change the resolution.

This parameter when set to 0, it will take all parameter in 0.1°C resolution.
This parameter when set to 1,it will take all parameter in 1°C resolution.

Note : Temperature and parameter will also change accordingly.

Min	Max	Fac.
0	1	0

28 EP Parameter — Function: To end programming.

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

29 LEDS

Compressor
ON: Compressor is ON.
OFF: Compressor is OFF.
FLASHING: Compressor is in time delay.

Fan
ON: Evaporator Fan is ON.
OFF: Evaporator Fan is OFF.
FLASHING: Evaporator Fan is in time delay.

Defrost
ON: Defrost in progress.

Buzzer
FLASHING: Buzzer (Ht, Lt, PP)

30 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 > 50.0°C or <-40.0°C when rS = 0 & > 50°C or <-40°C when rS = 1

LP Keypad lock
Keypad is locked

Warranty: This product is warranted against defects in materials and workmanship for a period of one year from the date of purchase. During the warranty period, product determined by us to be defective in form or function will be repaired or, at our option, replaced at no charge. This warranty does not apply if the product has been damaged by accident, abuse, and misuse or as a result of service or modification other than by the company. This warranty is in lieu of any other warranty expressed or implied. In no event shall the company be held liable for incidental or consequential damages, including lost revenue or lost business opportunity arising from the purchase of this product.

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Sub-Zero — Controlled cooling, always

Cold Room Controller
Chiller Controller
Two Compressor Controller
Heating Controller
Humidity Controller
Pressure Controller

CASTLE

Ball Valves
Globe Valves
Hand Valves
Flow Switches
Solenoid Valves

05 /20.03.17

Note :