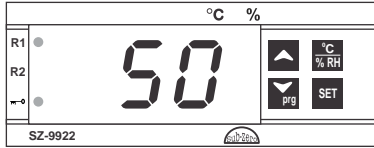
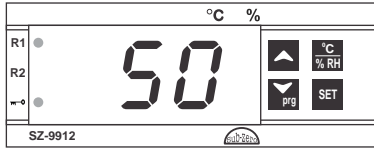


# SZ-9912 / SZ-9922



## Operating Instructions



### Temperature + Humidity Controller

#### Introduction :

The SZ-9912 and SZ-9922 is two set point controller. One is for Humidity control and another is for Temperature control.

A number of parameters are displayed alphanumerically to set the controller for specific application.

This controller can be used for several applications with a measuring Humidity range from 30% to 90% RH. and 0°C to 99.9°C temperature range for SZ-9912.

Humidity range from 0% to 99% RH. and 0°C to 99.9°C temperature range for SZ-9922.

#### 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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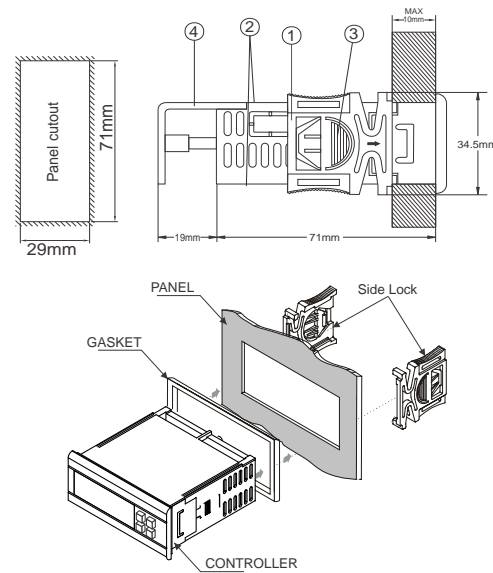
#### Installation : Fixing and dimensions of panel models:

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.

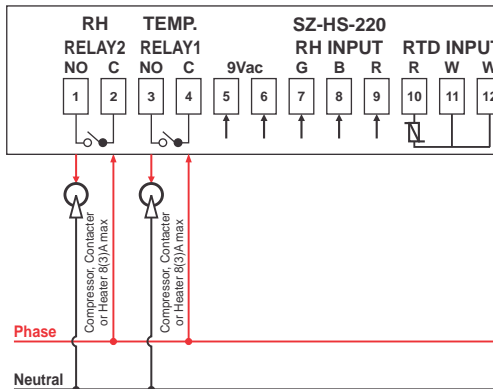
**Controller :** Controller should be installed in a place protected by vibration, water and corrosive gasses and where ambient temperature does not exceed the values specified in the technical data.

**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.

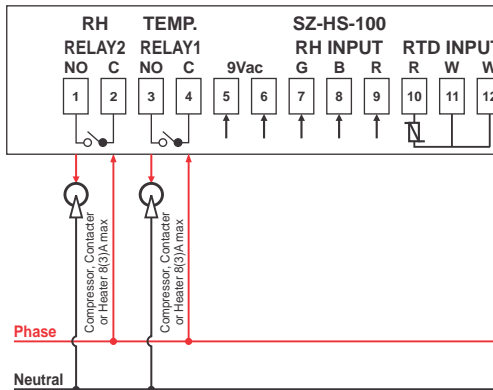
#### Panel Cutout and Dimensions :



#### Suggested Wiring SZ-9912



#### Suggested Wiring SZ-9922



#### TECHNICAL DATA

**Housing :** Black ABS plastic.  
**Front cover :** Polycarbonate plastic.  
**Dimensions :** Front - 75 X 34.5 mm, Depth 71 mm (w/o back lid).  
**Panel Cutout :** 29 X 71 mm  
**Mounting :** Flush panel mounting with fasteners.  
**Protection :** IP65 Frontal.  
**Connections :** Screw terminal blocks.  
 < 2.5sq mm one wire/terminal only.  
**Display :** 3X10 mm (0.39") LED.  
**Data storage :** Non-volatile EEPROM memory  
**Power input :** 230Vac +/-10%, 50-60Hz. Others on request.  
**Operating temp.:** 5°C to 50°C(non-condensing).  
**Storage temp :** -20°C to 70°C(non-condensing).  
**Range :** RH : 30 to 90% (SZ-9912)  
 RH : 0 to 99% (SZ-9922)  
 Temperature : 0 to 99.9°C  
**Resolution Accuracy :** 1% for Humidity, 0.1°C for Temperature.  
 +/-5% for Humidity, +/-0.1°C for Temp. (SZ-9912)  
 +/-3% for Humidity, +/-0.1°C for Temp. (SZ-9922)  
**Output Input :** R1,R2 8(3)A/250Vac  
 Humidity Sensor(SZ-HS-220) for SZ-9912  
 Humidity Sensor(SZ-HS-100) for SZ-9922  
 Temperature Sensor(RTD)

#### USER INTERFACE

	UP	In Program mode: <b>Scroll through parameters &amp; Increases parameter value.</b>
	Down/Program	Press and hold for 2sec to enter into program mode. In program mode: <b>Decreases parameter value</b>
	Set	In program mode : <b>set/save the changed value of parameter.</b>
	Temp. / RH	This key used to <b>changed the display between Temperature and RH.</b>

#### INDEX

Sr. No.	Para.	Description
1		To set the Set Point.
2	t1	Cut out point of the controller for Temp.
3	t2	Cut out point of the controller for Humidity.
4	EP	End Programming
5		Set other parameter.
6	P1	Set Heating or Cooling mode.
7	P2	High temperature limit.
8	P3	Low temperature limit.
9	P4	To set Differential (Hysteresis).
10	P5	Probe calibration.
11	P6	Time Delay (relay restart after cutoff).
12	H1	To set controller Dehu./Humidi. mode.
13	H2	High Humidity limit.
14	H3	Low Humidity limit.
15	H4	To set Differential (Hysteresis) for Humidity.
16	H5	Probe calibration for Humidity.
17	H6	Time Delay Humidity (relay restart after cutoff).
18	LP	Keypad lock.
19	EO	Switch display between Temp. & Humidity.
20	E1	Display selection Temp. & Humidity.
21	FS	Restore Default Setting controller.
22	EP	End Programming
23		LED Indications
24		Operating Messages


#### Parameter List :

<b>1 To set the Set point</b>	Function: To set the point of the controller.						
Press & hold  key for 2 Seconds.	Display will show t1 & flash. To go to other parameters, use UP/DOWN keys.						
<b>2 t1 Parameter</b>	Function: To set the cut out point of the controller for Temp.						
To change value use  keys	To set value press  key						
Display will show set value & flash. 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.							
	<table border="1"> <tr><th>Min</th><th>Max</th><th>Fac.</th></tr> <tr><td>P3+1</td><td>P2-1</td><td>40.0°C</td></tr> </table>	Min	Max	Fac.	P3+1	P2-1	40.0°C
Min	Max	Fac.					
P3+1	P2-1	40.0°C					
<b>3 t2 Parameter</b>	Function: To set the cut out point of the controller for Humidity						
Display will show value & flash. 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 value has been stored in memory.							
	<table border="1"> <tr><th>Min</th><th>Max</th><th>Fac.</th></tr> <tr><td>H3+1</td><td>H2-1</td><td>70%</td></tr> </table>	Min	Max	Fac.	H3+1	H2-1	70%
Min	Max	Fac.					
H3+1	H2-1	70%					
<b>4 EP Parameter</b>	Function: To end programming.						
To end programming press  key	Once the key is pressed, the controller goes into the normal mode and displays the temperature / humidity and all settings are recorded.						
<b>5 To set other Parameters.</b>	Display will flash "P1". To select other parameters, use UP/DOWN keys.						
Press & hold  key for 2 seconds.							
<b>6 P1 Parameter</b>	Function: To set controller for heating or cooling.						
To change value use  keys	To set value press  key						
0 = Cooling mode 1 = Heating mode.							
	<table border="1"> <tr><th>Min</th><th>Max</th><th>Fac.</th></tr> <tr><td>0</td><td>1</td><td>0</td></tr> </table>	Min	Max	Fac.	0	1	0
Min	Max	Fac.					
0	1	0					
<b>7 P2 Parameter</b>	Function: To set maximum allowable high temperature limit.						
Once set at a particular value, this will not allow the set point to go above this value.							
<b>Example:</b> Setting this parameter at 60.0°C will not allow the set point to go above 60.0°C. Also if the temperature/humidity reaches 60.0°C, the display will show <i>HL</i> (High Temp.) indicating that the temperature/humidity has gone above the value in this parameter.							
	<table border="1"> <tr><th>Min</th><th>Max</th><th>Fac.</th></tr> <tr><td>XX°C</td><td>99.9°C</td><td>99.9°C</td></tr> </table> <p>XX = Set Point+1</p>	Min	Max	Fac.	XX°C	99.9°C	99.9°C
Min	Max	Fac.					
XX°C	99.9°C	99.9°C					

**8 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 20.0°C will not allow the set point to go below 20.0°C. Also, if the temperature/humidity reaches 20.0°C, the display will show Lt (LowTemp.) indicating that the temperature/humidity has gone below the value in this parameter.

 (Message on display)	Min	Max	Fac.
	0.0°C	XX°C-1	0.0°C
	XX = Set Point-1		

**9 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 (in cooling mode) :**

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°C, the relay will cut in (restart) at 12.0°C (10.0°C+2.0°C).

Min	Max	Fac.
1.0°C	20.0°C	1.0°C

**10 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.

**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°C, which means that once out of the programming mode, the temperature will show 30.0°C (28.0°C + 2.0°C).

Min	Max	Fac.
-9.9°C	10.0°C	0.0°C

**11 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 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 when there are power fluctuations and the compressor is switched off and on within a few seconds.

 Flashing Time delay in progress	Min	Max	Fac.
	0 Min	20 Min	1 Min

**12 H1 Parameter** Function: To set controller in Dehumidification / Humidification Mode.


0 = Dehumidification.  
1 = Humidification.

Min	Max	Fac.
0	1	0

**13 H2 Parameter** Function : To set maximum allowable high humidity limit.

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


**Example :** Setting this parameter at 80% will not allow the set point to go above 80%. Also, if the humidity reaches 80% the display will show HH (High Humidity) indicating that the Humidity has gone above the range in this parameter.

 (Message on display)	<b>SZ-9912</b>			<b>SZ-9922</b>		
	Min	Max	Fac.	Min	Max	Fac.
	XX%	90%	90%	XX%	99%	90%
	XX = Set Point +1					

**14 H3 Parameter** Function: To set minimum allowable low humidity limit .

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

**Example :** Setting this parameter at 40% will not allow the set point to go below 40%. Also, if the humidity reaches 40%, the display will show LH (Low Humidity) indicating that the Humidity has gone below the range in this parameter.

 (Message on display)	<b>SZ-9912</b>			<b>SZ-9922</b>		
	Min	Max	Fac.	Min	Max	Fac.
	30%	XX%	30%	1%	XX%	30%
	XX = Set Point -1					

**15 H4 Parameter** Function: To set the differential(Hysteresis).

**Example :** (in dehumidification mode) : If the set point is set at 60% and differential is set at 3, then when the system reaches 60%, the Relay will cut out. Since the differential is 3, the relay will cut in (restart) at 63% (60% + 3%).

Min	Max	Fac.
1%	10%	1%

**16 H5 Parameter** Function: To set probe offset calibration.

In time it may be possible that the display may be offset by a % RH or more.

To compensate for this error, you may need to add or minus the %RH required to achieve the correct Humidity.

**Example :** The Humidity on the display is 40%, whereas the actual Humidity is 42%. You will need to set the H5 parameter to 2, which means that once out of the programming mode, the Humidity will show 42%(40% + 2%).

Min	Max	Fac.
-10%	10%	0%

**17 H6 Parameter** Function: To set time delay between relay restart time.

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

**Example :** If this parameter is set at 1 minutes, the relay will cut off at the set Humidity, but will not restart for a minimum of 1 minutes, even if the differential is achieved earlier. This parameter is good to protect the life of the Dehumidifier / Humidifier or even in applications where the probe is placed at places where there are sudden & short changes in Humidity.

Min	Max	Fac.
0 Min	20 Min	1 Min

**18 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.

 ON Keypad Locked	Min	Max	Fac.
	0	1	1


**19 EO Parameter** Function: To toggle display between Temperature and Humidity.

This parameter is used to change the display between Temperature and Humidity.


**Example:** If this parameter is set at 10 seconds, the display will toggle between Temperature and Humidity for 10 seconds. If it is set to 0sec, this feature is disabled and user will have to toggle the display between Temperature and Humidity manually with  the key.

Min	Max	Fac.
0 sec	20 sec	0 sec

**20 E1 Parameter** Function : Power ON Display selection humidity or temperature.

E1 parameter is used to select the front display after power ON. If E1 parameter is kept is 0 ,temperature will be the default display, if E1 parameter is kept 1 humidity will be the default display. Use  key to select either display.

0 = Temperature will be the default display.  
1 = Humidity will be the default display.

Use  key to select either display

Min	Max	Fac.
0	1	0

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

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


Min	Max	Fac.
0	1	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.

**23 LED INDICATION**

<p><b>R1 Temperature Relay</b></p> <p>ON: Temperature relay is ON.</p> <p>OFF: Temperature relay is OFF.</p> <p>FLASHING : Temperature relay is in time delay.</p>	<p><b>R2 Humidity Relay</b></p> <p>ON: Humidity relay is ON.</p> <p>OFF: Humidity relay is OFF.</p> <p>FLASHING : Humidity relay is in time delay.</p>
--	--

 **Keypad Lock**  
ON: Keypad is lock.  
OFF: Keypad is unlock.

**24 OPERATING MESSAGES**

<p><b>Ht High temperature alarm</b></p> <p>Temperature above the maximum high temperature limit (P2).</p>	<p><b>Lt Low temperature alarm</b></p> <p>Temperature below the minimum low temperature limit (P3).</p>
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<p><b>HH High humidity alarm</b></p> <p>Humidity above the maximum limit of the set value (H2)</p>	<p><b>LH Low humidity alarm</b></p> <p>Humidity below the minimum limit of the set value (H3)</p>
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**PP Probe fail**  
Probe short circuit, circuit open or without probe, or for temperature >99.9°C or <0.0°C & for Humidity >90% and <30%.

If the display has changed to show Humidity and that time if probe fail or HT/LT error for Temperature occurs then with the Humidity display it will show the error for Temperature and vice versa.

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Two Compressor Controller  
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Pressure Controller

Ball Valves  
Globe Valves  
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