sub-zero®
INDIA
www.pvrcontrols.com

OPERATING INSTRUCTIONS

sub-zero®

SZ-4040

Introduction :

The SZ-4040 are aesthetically superior version of their predecessors.

The SZ-4040 are single set point controllers. They are specifically designed for RH control applications wherein the output relay cuts off at set point and is restarted at a RH of set point plus differential in direct control action(P1=0).

Additionally the SZ-4040 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 instruments for each specific application.

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Set point	Function: To set the cut out point of the controller.
Press and hold the SET key for 2 seconds Min: P3 +1% | Max: P2 -1% | Fac.: 70% SET	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.

To set other parameters	
Press & hold DOWN(prg) key for 2 seconds. prg	Display will show P1 & flash. To go to other parameters, use UP/DOWN keys.

P1 Parameter	Function: To select control action type (Inverse / Direct).
To change the P1 parameter, press the SET key.	P1=0 Direct action If the RH increases and reaches set point plus differential the Relay1 is Started. And then turn off when the RH reaches the set point value again.
Min / Max / Fac. 0 / 1 / 0	P 1 = 1 Inverse action If the RH decreases and reaches set point minus differential the Relay1 is activated and then turn off when RH reaches the set point value again.

HL Parameter	Function : To set High scaling limit of sensor.
To change the HL parameter, press the SET key.	Use UP/DOWN keys to set desired value.
Min / Max / Fac. P2 +1% / 100% / 100%	**Example :** If this set to HL 100% and LL set to 0% then at sensor value will be 0-100% over output (0-1Vdc) value.

LL Parameter	Function : To set Low scaling limit of sensor.
To change the LL parameter press the SET key.	Use UP/DOWN keys to set desired value.
Min / Max / Fac. 0% / P3 -1% / 0%	**Example :** If this set to HL 100% and LL set to 0% then at sensor value will be 0-100% over output (4-20mA) value.

P2 Parameter	Function: To set High alarm set point.
To change the P2 parameter, press the SET key.	Use UP/DOWN keys to set desired value. Once set at a particular value, this will not allow the set point to go above this value.
Min / Max / Fac. SP +1% / HL -1% / 70%	**Example :** If P2 = 90% and RH increase above then alarm relay will be activated and display will show “HA” High Alarm.
“HA” (Message on display)	

P3 Parameter	Function: To set Low alarm set point.
To change the P3 parameter, press the SET key.	Use UP/DOWN keys to set desired value. Once set at a particular value, this will not allow the set point to go below this value.
Min / Max / Fac. LL +1% / SP -1% / 30%	**Example :** If P3 = 30% and RH decreases below P3 then alarm relay will be activated. And display will show “LA” Low Alarm.
“LA” (Message on display)	

P4 Parameter	Function: To set the differential.
To change the P4 parameter, press the SET key.	Use UP/DOWN keys to set desired value. Differential between cut out and cut in, RH can be set between 1% to 20%.
Min / Max / Fac. 1% / 20% / 2%	**Example (in direct mode) :** If the set point is set at 60% and differential is set at 2%, then when the system reaches 60%, the relay will cut out. Since the differential is 2%, the relay will cut in (restart) at 62% (60%+2%).

P5 Parameter	Function: To set probe calibration.
To change the P5 parameter, press the SET key.	Use UP/DOWN keys to set desired value. In time it may be possible that the display may be offset by a percentages or so. To compensate for this error, you may need to add or minus the percentages required to achieve the correct RH. Setting value is from -10% to + 10%.
Min / Max / Fac. -10% / 10% / 0%	**Example :** The RH on the display is 52%, whereas the actual RH is 52%. You will need to set the P5 mode to 2%, which means that once out of the programming mode, the RH will show 52% (50%+2%).

P6 Parameter	Function : To set time delay between relay restart time.
To change the P6 parameter, press the SET key.	Use UP/DOWN keys to set desired value. This parameter is used to protect the relay from restarting in a short period of time and can be set between 0 to 30 minutes.
Min / Max / Fac. 0 Min / 30 Min / 1 Min	**Example :** If this parameter is set at 1 minutes, the relay will cut off at the set point, 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 load on relay or even in applications where the probe is placed at places where there are sudden & short changes in RH like above a cold room door.
R1 	

AL Parameter	Function: To set power on alarm delay for HA/LA.
To change the AL parameter press the SET key.	Use the UP/Down key to set desired value.
Min / Max / Fac. 0 Min / 30 Min / 1 Min	**Example :** If you set this parameter to 1min, once the power is switch on, the alarm for HA/LA will not activate for 1 minutes after the power is switched on. This is most useful to avoid the nuisance alarms.

E1 Parameter	Function : Relay status on Probe Failure.
To change the E1 parameter press the SET key.	Use UP/DOWN keys to set desired value. When set to 0 = The relay status is OFF. 1 = The relay status is ON.
Min / Max / Fac. 0 / 1 / 0	

PA Parameter	Function: To change password.
To change the PA parameter, press the set key when display shows PA .	Use UP/DOWN keys to change password. User can not enter into program mode, if correct password is not entered.
Min / Max / Fac. 0 / 999 / -	

LP Parameter	Function: To lock keypad.
To change the LP parameter press the SET key.	Use UP/DOWN keys to set desired value. This parameter can 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.
Min / Max / Fac. 0 / 1 / 1	
"LP" (Message on display)	

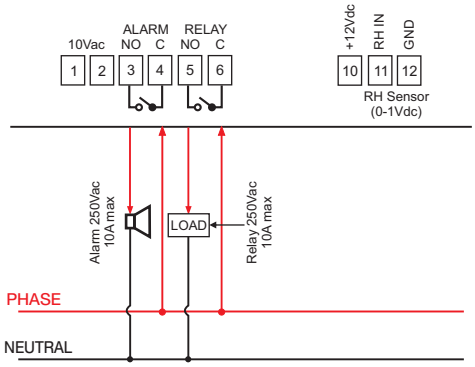
FS Parameter			Function : To restore default settings of the controller.
To change the FS parameter press the SET key.			When set to 1 all parameters are programmed to factory values. Useful to debug setting related problems.
Min	Max	Fac.	
0	1	0	
EP Parameter			Function: To end programming.
To end programming press the SET key			Once the set key is pressed, the controller goes into the normal mode and displays the RH and all settings are recorded.

Operating messages and Icon status		
Message	**Description**	**Parameter**
PP	Probe short circuit, circuit open or without probe, or RH > 0% or < 100%	HL, LL
R1 ● On/Off	R1 Relay on/off	SP, P4
R1 ☀ Flashing	Time delay in progress	P6
"HA" Flashing	High Alarm	P2
"LA" Flashing	Low Alarm	P3
"LP" Flashing	Keypad locked/unlocked	LP
🔔 ☀ Flashing		AL

Technical data

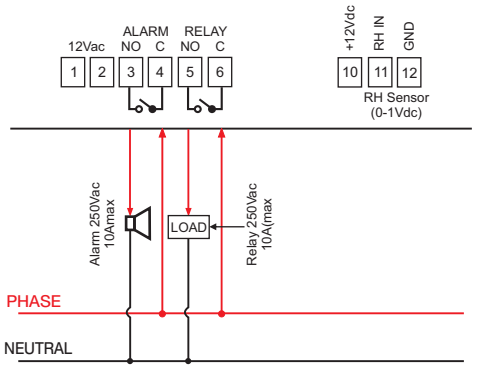
Housing : Black ABS plastic.
Front cover : Red Polycarbonate Plastic.
Dimensions : Front - 75 X 34.5 mm,
Depth - 71 mm (w/o back lid).
Panel Cutout : 29 X 71mm
Mounting : Flush panel mounting with fasteners
Front Protection : Front panel is waterproof& I.P 65 rated
Connections : Screw terminal blocks.
≤ 2.5sq mm terminal only.
Display : 3x14.2 mm (0.56") LED.
Data storage : Non-volatile EEPROM memory.
Power input : 10VAC, 12VAC or 24VAC.
Operating temp. : 5°C to 50°C(non-condensing).
Storage temp : -20°C to 70°C(non-condensing).
Relay Output : 10A/250Vac, C-NO
Alarm : 10A/250Vac, C-NO
Input : RH sensor (0-1Vdc).
Range : LL-HL(0-100%).
Resolution : 1%.

Suggested Wiring Diagram for 10Vac



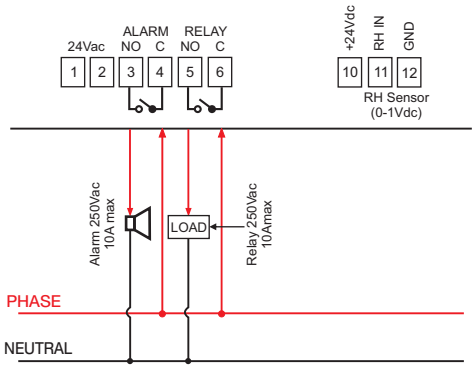
Caution : Wiring for 230Vac load only

Suggested Wiring Diagram for 12Vac

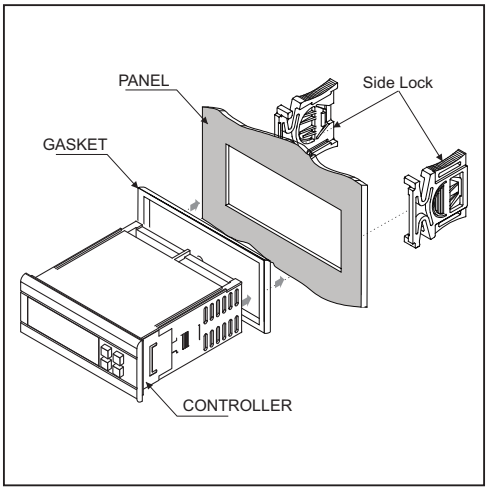


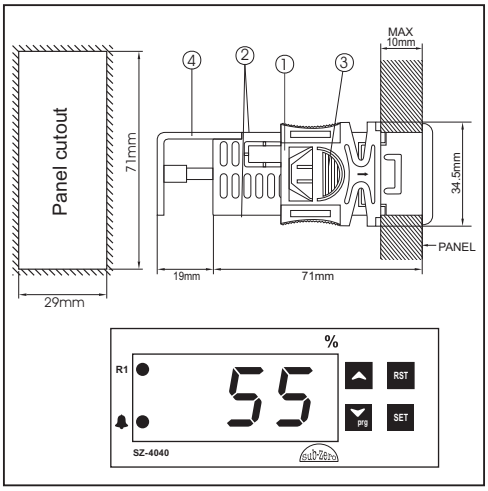
Caution : Wiring for 230Vac load only

Suggested Wiring Diagram for 24Vac



Caution : Wiring for 230Vac load only





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 Backlid ④ (Optional). 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 obtain IP65 grade.

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.

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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