

OPERATING INSTRUCTIONS

SZ-7031D



GENERAL DESCRIPTION

The **SZ-7031D** are single setpoint temperature controllers. They have unique features and user friendly parameters. They are designed for Heating as well as Cooling applications. In Heating mode they can work in either Proportional or On-Off mode.

Additionally the SZ-7031D offer several protection features that are easily understood by the examples given in the instruction manual.

The controllers can be used for several applications with measuring range as below:

J type thermocouple : 0 °C to 700 °C
 K type thermocouple : 0 °C to 999 °C
 2 Wire RTD : -99 °C to 850 °C
 3 Wire RTD : -99.9 °C to 99.9 °C

INDEX

Parameter	Description	Pg. No.
	Viewing Set Point	1
<i>SEt</i>	To set Cutout value of the Controller.	1
<i>InPt</i>	To select the type of sensor.	2
<i>oUt</i>	To select type of output.	3
<i>H-C</i>	To set relay mode as per application.	3
<i>Ctrl</i>	To set Control Action of Output.	4
<i>P-bd</i>	To set Proportional Band. This parameter is activated in Proportional Mode only.	4
<i>HYS</i>	To set Hysterisis (differential). Activated in On-Off mode only.	5
<i>CYt</i>	To set cycle Time in seconds. Activated in Proportional mode only.	6
<i>oFS</i>	To set manual offset for proportional band. Activated in Proportional mode only.	6
<i>tDL</i>	To set Time Delay. This parameter is activated in On-Off Mode only.	7
<i>HSL</i>	To set maximum limit for set point as per the sensor selected.	8
<i>LSL</i>	To set minimum limit for set point as per the sensor selected.	8
<i>CAL</i>	To set Probe calibration.	9
<i>LOC</i>	To lock keypad.	10
<i>rES</i>	To restore default settings.	10
<i>End</i>	To end programming.	10
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Description of parameters and functions.					
Sr.No.	Parameter	Parameter setting method.	Range		
			Min	Max	Fact. Set
		SET mode			
	<p>SET</p> Press and hold SET key for 2 seconds and release. The lower (green) display will start blinking.				
	Set point(SET)	Function: To set Cutout value of relay/SSR.	LSLc	HSLc	0
	To change the "SET" parameter, press SET key. Use UP/DOWN keys to get desired value. After setting desired value press SET key & display will show "----" which confirms that value has been stored in memory. Once the set key is pressed, the control goes into the normal mode.				

1

Description of parameters and functions.					
Sr.No.	Parameter	Parameter setting method.	Range		
			Min	Max	Fact. Set
	To set other parameters	Program mode			
	<p>prg</p> Hold down/prg key for 2 seconds. The upper RED display will show "inPL" & flash. To go to other parameters, use up / down keys.				
1	Sensor Type	Function: To select the type of sensor.	tl-j	rtd3	tl-j
	To change the "inPL" parameter, press the SET key. Use UP/DOWN keys to get desired value. After setting desired value press SET key & display will show "----" which confirms that value has been stored in memory. tl-j : J type Thermocouple tl-p : K type Thermocouple rtd2 : 2 wire RTD rtd3 : 3 wire RTD Note : If sensor type is changed ,following parameters will be changed to their factory set values. HSL= 700(J) / 999(K) / 850(rtd2) / 99.9(rtd3) , LSLt = 0(J/K),-99(rtd2), -99.9(rtd3) CALb = 0 & SET = 0				

2

Description of parameters and functions.					
Sr.No.	Parameter	Parameter setting method.	Range		
			Min	Max	Fact. Set
2	Output Type	Function: To select the type of output.	rlY	SSr	rlY
	To change the "out" parameter, press the SET key. Use UP/DOWN keys to get desired value. After setting desired value press SET key & display will show "----" which confirms that value has been stored in memory. rlY - Relay SSr - SSR				
3	Relay mode	Function: To set relay mode as per application.	HErE	CoOL	HErE
	To change the "H-C" parameter, press the SET key. Use UP/DOWN keys to get desired value. After setting desired value press SET key & display will show "----" which confirms that value has been stored in memory. HErE - Heating (Forward) CoOL - Cooling (Reverse) Note: If "H-C" is selected as "Cool" (cooling mode), "Ctrl" parameter (Control action) will be set to "onoF".				

3

Description of parameters and functions.					
Sr.No.	Parameter	Parameter setting method.	Range		
			Min	Max	Fact. Set
4	Control Action	Function: To set Control Action of Output.	onoF	PrOP	PrOP
	To change the "Ctrl" parameter, press the SET key. Use UP/DOWN keys to get desired value. After setting desired value press SET key & display will show "----" which confirms that value has been stored in memory. onof - On - Off mode PrOP - Proportional mode Note : If "H-C" parameter is selected as "Cool", Control action can not be selected as "Prop"				
5	Proportional Band	Function: To set Proportional Band .This parameter is activated in Proportional Mode only.	0.1°C	99.9°C	10.0°C
	To change the "Prbd" Parameter, press the SET key. Use UP/DOWN keys to get desired value. After setting desired value press SET key & display will show "----" which confirms that value has been stored in memory. This is the proportional band set in degrees. Example: If Set point is 60°C & Proportional band(Prbd) is 10°C then, proportional action takes place between 50°C to 60°C.				

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Description of parameters and functions.					
Sr.No.	Parameter	Parameter setting method.	Range		
			Min	Max	Fact. Set
5.1	Hysteresis	Function: To set Hysteresis (differential) . Activated in On-Off mode only.	0.1°C	99.9°C	2.0°C
	To change the "H5L" parameter, press the SET key.	Use UP/DOWN keys to get desired value. After setting desired value press SET key & display will show " - - - " which confirms that value has been stored in memory. This parameter value is the differential between cut out and cut-in temperature. Example (In cooling mode): If the set point is 40.0°C and Hysteresis is set at 2.0°C then , when the system reaches 40.0°C, the comp. Relay will cut out. Since the Hysteresis is 2.0°C, the comp. Relay will cut in (restart) at 42.0 °C (40.0°C+2.0°C). (In Heating mode): If the set point is 40.0°C and Hysteresis is set at 2.0°C then, when the system reaches 40.0°C, the Relay will cut out. Since the Hysteresis is 2.0°C, the Relay will cut in (restart) at 38.0°C(40.0°C-2.0°C).			

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Description of parameters and functions.					
Sr.No.	Parameter	Parameter setting method.	Range		
			Min	Max	Fact. Set
6	Cycle time	Function: To set cycle Time in seconds. Activated in Proportional mode only.	1 sec	99 sec	20 sec
	To change the "C3L" parameter press the SET key.	Use UP/DOWN keys to get desired value. After setting desired value press SET key & display will show " - - - " which confirms that value has been stored in memory. Example: If Cycle Time is set to 10 sec, the duty cycle of Relay/SSr ON-OFF in proportional band will be 10 sec. ON time +OFF time = 10 sec			
7	Manual Offset	Function: To set manual offset for proportional band. Activated in Proportional mode only.	-99.9°C	99.9°C	0.0°C
	To change the "oFSt" parameter press the SET key.	Use UP/DOWN keys to get desired value. After setting desired value press SET key & display will show " - - - " which confirms that value has been stored in memory. This parameter decides the position of Proportional band.			

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Description of parameters and functions.					
Sr.No.	Parameter	Parameter setting method.	Range		
			Min	Max	Fact. Set
		Example: If "oFSt" is 0.0°C, Set point is 60°C, Prbd = 10.0 °C ,then proportional band is 50°C to 60°C (Proportional action will take place between 50°C to 60°C). But for the same settings of Set point and Prbd, if "oFSt" is set to 5.0°C, then proportional band will be 55°C to 65°C.			
8	Time Delay	Function: To set Time Delay This parameter is activated in On-Off Mode only.	0 Min	20 Min	0 Min
	To change the "tDLY" Parameter, press the SET key.	Use UP/DOWN keys to get desired value. After setting desired value press SET key & display will show " - - - " which confirms that value has been stored in memory. This parameter is used to protect the compressor from restarting in a short period of time. Example: If this parameter is set to 3 minutes, the Relay will cut off at the set temperature, but will not restart for 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 changes in temperature.			

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Description of parameters and functions.					
Sr.No.	Parameter	Parameter setting method.	Range		
			Min	Max	Fact. Set
9	Higher set limit	Function: To set maximum limit for set point as per the sensor selected	Set point	700°C (J) 999°C (K) 850°C (Rtd2) 99.9°C (rtd3)	700°C
	To change the "H5L" Parameter press the SET Key	Use UP/DOWN keys to get desired value. After setting desired value press SET key & display will show " - - - " which confirms that value has been stored in memory. Example: Setting this parameter at 60.0°C will not allow the set point to go above 60.0°C. Also, if the temperature reaches 60.0°C or above, the display will show Ht (High Temp) indicating that the temperature has gone above the range in this parameter.			
10	Lower set limit	Function: To set minimum limit for set point as per the sensor selected.	0°C (J) 0°C (K) -99°C (rtd2) -99.9°C (rtd3)	Set point	0°C
	To change the "L5L" Parameter press the SET key.	Use UP/DOWN keys to get desired value. After setting desired value press SET key & display will show " - - - " which confirms that value has been stored in memory.			

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Description of parameters and functions.					
Sr.No.	Parameter	Parameter setting method.	Range		
			Min	Max	Fact. Set
		Example: Setting this parameter at 20.0°C will not allow the set point to go below 20.0°C. Also, if the temperature reaches 20.0°C or goes below, the display will show <i>Lt</i> (Low Temp) indicating that the temperature has gone below the range in this parameter.			
11	Probe calibration	Function: To set Probe calibration.	-20°C/ -20.0 °C (rtd3)	20°C/ 20.0°C (rtd3)	0°C
	To change the " <i>CLb</i> " parameter press the SET key.	Use UP/DOWN keys to get desired value. After setting desired value press SET key & display will show " - - - " which confirms that value has been stored in memory. Example: The temperature on the display is 28.0°C, whereas the actual temperature is 30.0°C. You will need to set the "CALb" parameter 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)			

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Description of parameters and functions.					
Sr.No.	Parameter	Parameter setting method.	Range		
			Min	Max	Fact. Set
12	Keypad Lock	Function: To lock keypad.	<i>no</i>	<i>YES</i>	<i>no</i>
	To change the " <i>LOK</i> " parameter press the SET key.	Use UP/DOWN keys to set desired range. After setting the desired range, press the set key and you will see " - - - " which confirms that the value has been stored in memory. This parameter locks the keypad so that tampering is not possible by bystanders. <i>no</i> = keypad unlocked <i>YES</i> = keypad locked When locked ,all the parameters can only be viewed, but can't be modified & when you enter the parameter it will display " <i>LOK</i> " and then it will show the value of parameter.			
13	Reset parameter	Function: To restore default settings.	<i>no</i>	<i>YES</i>	<i>no</i>
	To change the " <i>rES</i> " parameter press the SET key.	When set to " <i>YES</i> ", all parameters are programmed to factory set values. Useful to debug setting related problems.			
14	END parameter.	Function: To end programming.			
	To end programming, press SET key.	Once the set key is pressed, the control goes into the normal mode.			

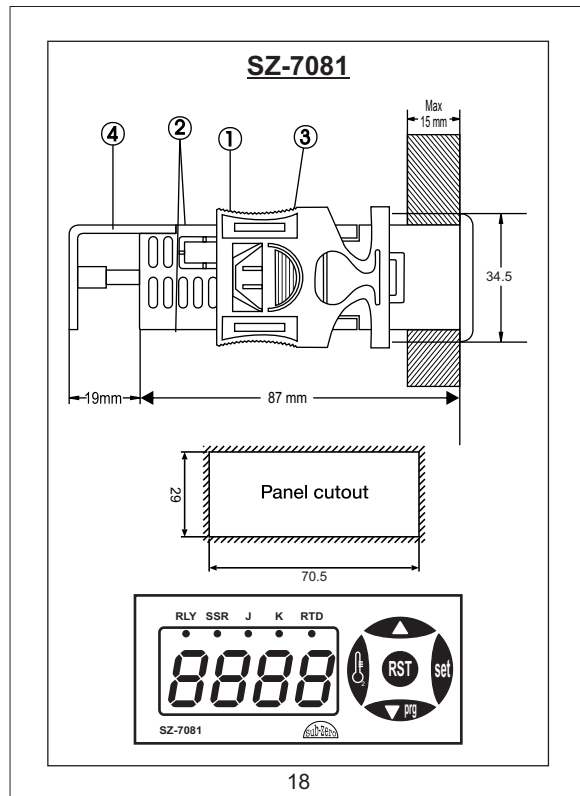
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Operating messages	
Message	Description
<i>Ht</i>	Temperature equal or above the maximum limit of the set point. (" <i>HSt</i> ")
<i>Lt</i>	Temperature equal or below the minimum limit of the set point. (" <i>LSt</i> ")
<i>SF</i>	Probe circuit open or without probe or temperature out of given range.

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Technical Data	
Housing	: Black, ABS Plastic
Dimensions	: SZ-7031:- Front - 96x96mm Depth- 65mm
Connection	: Screw terminal blocks. ≤ 1.5mm ² one Wire/terminal only.
Data Storage	: Non-Volatile EEPROM Memory
Storage temp	: -20°C to 70°C(non-condensing)
Accuracy	: ± 0.1% of full scale/ ± 1°C
Power Input	: 230Vac ± 10%, 50-60Hz
Operating Temp	: 5°C to 50°C(non-condensing)
Sensor Type	: RTD/ J / K
Resolution	: 0.1°C for 3 wire RTD & 1°C for 2 wire RTD ,J, K.
Display	: 4 digits display,size 0.56",RED (7 segments) 4 digit display,size 0.56",GREEN Upper RED display : for Process value(PV) Lower GREEN display : for Set value(SV)
LED status	: 1. Relay On/Off 2. SSR On/Off 3. "J" 4. "K" 5. "RTD"
Control Action	: 1. Proportional 2. On-Off
Relay Mode	: Heating / Cooling.
Input	: Tc J or Tc K or RTD 2/3 wires
Output	: 1 SPDT relay 5A/250Vac or SSR (selectable)
Probe Fail Action	: Relay OFF
Contacts	: C-NO-NC

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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 1.5 sq 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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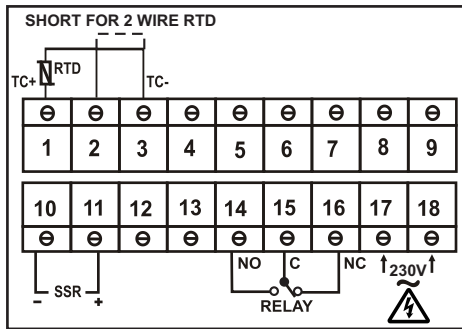
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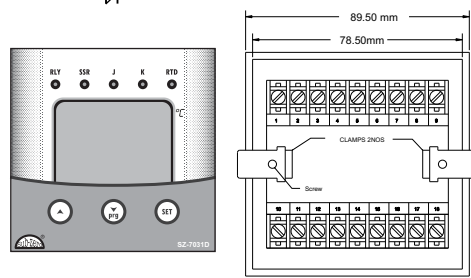
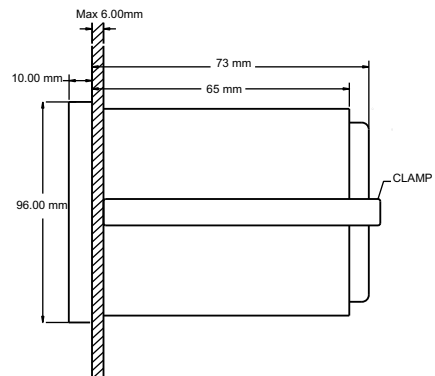
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**CONNECTION DIAGRAM
SZ-7031D**



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SZ-7031D



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OUR OTHER PRODUCTS



INDIA

- Cold Room Controller
- Chiller Controller
- Two Compressors Controller
- Heating Controller
- Humidity Controller
- Pressure Controller



- Ball Valves
- Globe Valves
- Hand Valves
- Flow Switches
- Solenoid Valves