EMKO

ON/OFF TEMPERATURE CONTROL UNIT



Eco LITE

Eco LITE, On/Off Temperature Control Unit
- 3 digit process (PV) and 4 digit set (SV) display
- Process input (TC,RTD)
- ON/OFF control form
- Selectable heating and cooling function
- Operating type selection with hysteresis
- Adjustment of temperature offset value
- Minimum pulling time adjustment for control outputs
- Password protection for programming mode

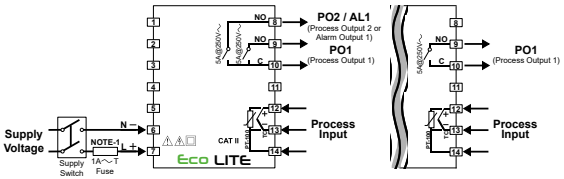
Eco series temperature controllers are designed for measuring and controlling temperature. They can be used in many applications with their TC and RTD temperature measurement input, On/Off control form and heating and cooling selection.
They are mainly used in glass, plastic, petro-chemistry, textile, automotive and machine production industries.

SPECIFICATIONS
Process Input: TC, RTD
Thermocouple (TC): J, K, R, S, T and L (IEC584.1)(ITS90)
Termoresistance (RTD): Cu-50 and PT-100 (IEC751)(ITS90)
Measurement Range: Please refer to process input type selection in process menu parameters section.
Accuracy:
Thermocouple (TC):(± 0.25% of full scale or ± 3ºC, which one is greater) ±1 digit max.
Thermoresistance (RTD):(± 0.25% of full scale or ± 2ºC, which one is greater) ±1 digit max.
Cold Junction Compensation: Automatically ±0.1°C/1°C
Line Compensation: Maximum 10 Ohm
Sensor Break Protection: Upscale
Sampling Cycle: 0.1 second
Input Filter: Programmable
Control Form: ON/OFF
ON/OFF Hysteresis: It can be configured for two control outputs

OUTPUT
Process Output - 1: Relay (5A@250V~ at resistive load)
Process Output - 2: Relay (5A@250V~ at resistive load)
SUPPLY VOLTAGE (It must be determined in order)
230V~ (±15%) 50/60Hz - 3.5VA
115V~ (±15%) 50/60Hz - 3.5VA
100-240V~ 50/60Hz - 3.5VA
24V~ (±%15) 50/60Hz - 3.5VA
24V⎓ (±%15) 50/60Hz - 3.5VA
10...30V⎓ - 3.5W
DISPLAY
Process Display: 16 mm Red 3 digit LED Display
Set Value Display: 9 mm Orange 4 digit LED Display
Led Indicators: PO1 (Process Output-1 Status Led), PO2 (Process Output-2 Status Led), ºC, ºF LEDs
ENVIRONMENTAL RATINGS and PHYSICAL SPECIFICATIONS
Operating Temperature: 0...50ºC
Humidity: 0-90%RH (none condensing)
Mechanical Impacts: 1Joule(IK06)
Protection Class: NEMA 4X (IP65 at front, IP20 at rear)
Weight: 150 gr.
Dimension: 48 x 48 mm, Depth: 86,5 mm
Panel CutOut: 46 x 46 mm

Electrical Wirings

The Device with Two Relays



The Device with One Relay

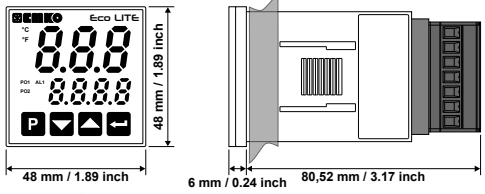
Note-1: External Fuse is recommended.
Note-2: Stranded cable cross section: 1,5mm², Solid cable cross-section: 2,5mm²
The stripping length is 7mm to 9mm.
Note-3: Supply cables must comply with the requirements of IEC 60277 or IEC 60245.

It is advised to use a two-pole supply switch, designated for this device, with open/closed positions marked, in order to cut the power. It must be placed on the supply input of the device at a place where the user can easily reach.

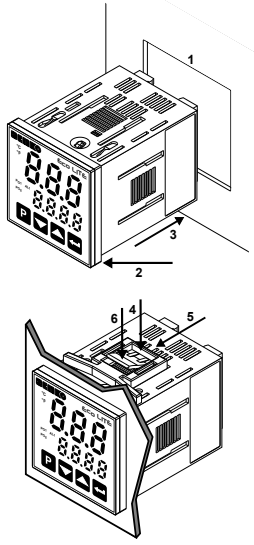
~ External fuse must be on phase connection of the supply input.
⎓ External fuse must be on (+) line connection of the supply input.
Make sure that the power supply voltage range is suitable for the device.
Switch on the power supply only after all the electrical connections are in place.

To reduce the effect of electrical noise on device, low voltage line (especially sensor input cable) wiring must be separetely from high current and voltage line. If possible, use shielded cable and shield must be connected to ground only one side.

Dimensions



Panel Mounting



1- Before mounting the device in your panel, make sure that the cutout is of the right size.

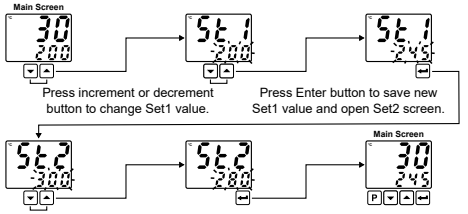
2- Check front panel gasket position.

3- Insert the device through the cutout. If the mounting clamps are on the unit, put out them before inserting the unit to the panel.

4- Insert the mounting clamps to the two of designated holes that located four sides of device.

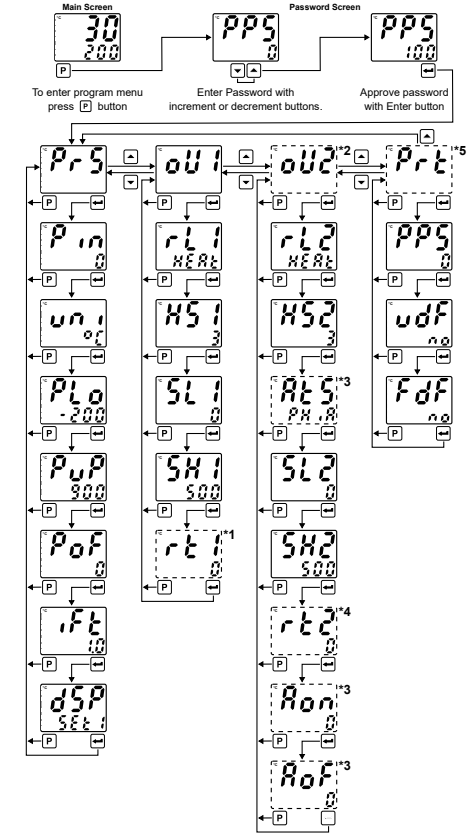
5- Drag the mounting clamps in direction 5 until the device completely immobile within the panel.
6 - In order to remove device push on the mounting clamp as shown with arrow 6 and pull back.

Access and Change Set Values



Note1: User can exit from set value section without saving the values by pressing P button. If no operation for 120 seconds, device automatically exits from Set Value section.
Note2: Displayed set value at main screen could be changed according to dSP parameter
Note3: Set values can be adjusted between Set Value Low and High Limits.

Easy Access Diagram For Program Parameters



*1 - Minimum pulling time parameter for Output-1(rt1) is not seen unless operation type selection for output-1 parameter(rL1) is set as Cool.
*2 - Out-2(oU2) parameters are not seen on devices with one relay.
*3 - Alarm parameters(At5, Aon and AoF) are not seen unless operation type selection for output-2 parameter(rL2) is set as ALr.
*4 - Minimum pulling time parameter for Output-2(rt2) is not seen unless operation type selection for output-2 parameter(rL2) is set as Cool.
*5 - If PPS is different from 0 and user enters to program menu without entering the password Prt menu is not seen.
Note: User can exit from any parameter screen without saving the values by pressing P button. If no operation for 120 seconds, device automatically return to the main screen.

PrS: Process Menu Parameters

PtyP: Process input type selection. (Default: 0)
0: J type (Fe,Cu,Ni) Thermocouple , -199ºC,900ºC ; -199ºF,999ºF
1: J type (Fe,Cu,Ni) Thermocouple , -19.9ºC,99.9ºC ; -19.9ºF,99.9ºF
2: K type (Ni,Cr,Ni) Thermocouple , -199ºC,999ºC ; -199ºF,999ºF
3: K type (Ni,Cr,Ni) Thermocouple , -19.9ºC,99.9ºC ; -19.9ºF,99.9ºF
4: R type (Pt13%RhPt) Thermocouple , 0ºC,999ºC ; 32ºF,999ºF
5: R type (Pt13%RhPt) Thermocouple , 0.0ºC,99.9ºC ; 32.0ºF,99.9ºF
6: S type (Pt10%RhPt) Thermocouple , 0ºC,999ºC ; 32ºF,999ºF
7: S type (Pt10%RhPt) Thermocouple , 0.0ºC,99.9ºC ; 32.0ºF,99.9ºF
8: T type (Cu,Cu,Ni) Thermocouple , -199ºC,400ºC ; -199ºF,752ºF
9: T type (Cu,Cu,Ni) Thermocouple , -19.9ºC,99.9ºC ; -19.9ºF,99.9
10: L type (Ni,Cr,Co / Ni,Fe,Mn,Cu) Thermocouple , -150ºC,800ºC ; -199ºF,999ºF
11: L type (Ni,Cr,Co / Ni,Fe,Mn,Cu) Thermocouple , -19.9ºC,99.9ºC ; -19.9ºF,99.9ºF
12: Cu-50 , -199ºC,200ºC ; -199ºF,392ºF
13: Cu-50 , -19.9ºC,99.9ºC ; -19.9ºF,99.9ºF
14: Pt-100 , -199ºC,650ºC ; -199ºF,999ºF
15: Pt-100 , -19.9ºC,99.9ºC ; -19.9ºF,99.9ºF
Unit: Unit Selection. ºC or ºF can be chosen. (Default: ºC)
PLo: Operation Scale minimum (Low Limit) value. It changes according to the process input type and scale. (Default: -199)
PuP: Operation Scale maximum (High Limit) value. It changes according to the process input type and scale. (Default: 900)
PoF: Display offset for process value. It can be adjusted from -10% of scale to 10% ofscale. It is added to the process display value. (Default: 0)
iFt: Define filter time(sec) for displayed value. (Default: 1.0)
dSP: Selection of which set value displayed at main screen. (Default: SEt1)

oU1: Output-1 Parameters

rL1: Operation Type Selection for Output-1. It can be HEAt or Cool. (Default: HEAt)
HS1: Hysteresis Value for Output-1. It can be adjusted from %0 to %50 of the Operation Scale (PuP - PLo). (Default: 3)
SL1: Set1 Value Low Limit. Minimum Set1 value is defined with this parameter. It can be adjusted from Operation Scale Low Limit(PLo) to Set1 High Limit(SH1). (Default: 0)
SH1: Set1 Value High Limit. Maximum Set1 value is defined with this parameter. It can be adjusted from Set1 Low Limit(SL1) to Operation Scale High Limit(PuP). (Default: 500)
rt1: Minimum Pulling Time for Output-1. When Output-1 is inactive this time must be expired for Output-1 to become active again. It can be adjusted from 0 to 100 seconds. (Default: 0)

oU2: Output-2 Parameters (Only for devices with two relays)

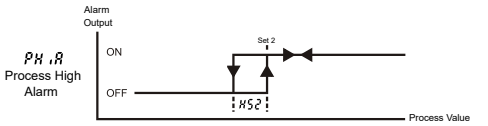
rL2: Operation Type Selection for Output-2. It can be HEAt, Cool or ALr (Default: HEAt)
HS2: Hysteresis Value for Output-2. It can be adjusted from %0 to %50 of the Operation Scale (PuP - PLo). (Default: 3)
AtS: Alarm type selection. See "Alarm Types" section. (Default: PH,A)
SL2: Set2 Value Low Limit. Minimum Set2 value is defined with this parameter. It can be adjusted from Operation Scale Low Limit(PLo) to Set1 High Limit(SH2). (Default: 0)
SH2: Set2 Value High Limit. Maximum Set2 value is defined with this parameter. It can be adjusted from Set2 Low Limit(SL2) to Operation Scale High Limit(PuP). (Default: 500)
rt2: Minimum Pulling Time for Output-2. When Output-2 is inactive this time must be expired for Output-2 to become active again. It can be adjusted from 0 to 100 seconds. (Default: 0)
Aon: Alarm on Delay Time. It can be adjusted from 0 to 9999 seconds. (Default: 0)
AoF: Alarm off Delay Time. It can be adjusted from 0 to 9998 seconds. If it is higher than 9998, LtCH is seen on the screen and alarm latching output is selected. In alarm latching output mode in order to make passive alarm outputs, press enter button at main screen. (Default: 0)

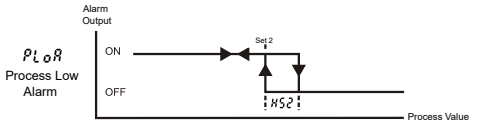
Prt: Protecion Menu Parameters

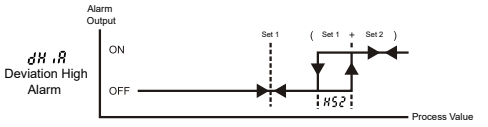
PPS: Password for accessing to the programming section. It can be adjusted from 0 to 9999.If PPS is 0, password screen is not seen. If PPS is different from 0 and user enters to the menu pages without entering the password, all menus can be seen except protection menu Prt. But device does not allow to do any changes in parameters. (Default: 0)
Udf: User default parameters. This parameter is used for saving all parameters to restore later or restore all parameters saved before. If SEt is chosen, all parameters saved before are restored. If SEt is chosen, all parameters saved to restore later. If no is chosen, nothing is changed. (Default: no)
FdF: This parameter is used for restore factory defaults. If SEt is chosen, factory defaults parameters restored. If no is chosen, nothing is changed. (Default: no)

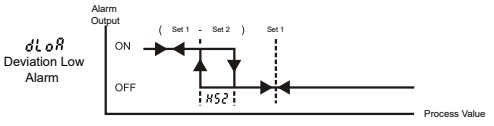
Remove all input/output connections on terminals before restoring parameters to user/factory defaults.

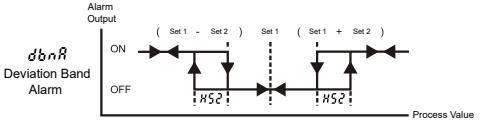
Alarm Types

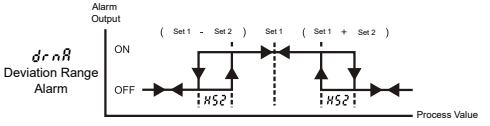


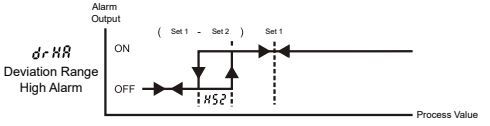












Error Messages



1-Sensor failure in analog inputs. Sensor connection is wrong or there is no sensor connection.



2-If programming section entering password is different from “0” and user accesses to the parameter by enter button without entering the password and wants to change a parameter, the warning message is shown on the bottom display as shown on the left. Device does not allow to do any changes without entering the password correctly.



3-If value that is read from the analog input is lower than process set low limit parameter value (PLo), value on the top display starts to blink as shown on the picture.



4-If value that is read from the analog input is higher than process set high limit parameter value (PuP), value on the top display starts to blink as shown on the picture.



5-If value that is read from the analog input is lower than sensor scale low limit, value on the top display starts to blink as shown on the picture.



6-If value that is read from the analog input is higher than sensor scale high limit, value on the top display starts to blink as shown on the picture.

Installation

Before beginning installation of this product, please read the instruction manual and warnings below carefully.

In package,
-One piece unit
-Two pieces mounting clamp
-One piece instruction manual

A visual inspection of this product for possible damage occured during shipment is recommended before installation. It is your responsibility to ensure that qualified mechanical and electrical technicians install this product.
If there is danger of serious accident resulting from a failure or defect in this unit, power off the system and the electrical connection of the device from the system.
The unit is normally supplied without a power switch or a fuse. Use power switch and fuse as required.
Be sure to use the rated power supply voltage to protect the unit against damage and to prevent failure.
Keep the power off until all of the wiring is completed so that electric shock and trouble with the unit can be prevented.
Never attempt to disassemble, modify or repair this unit. Tampering with the unit may results in malfunction, electric shock or fire.
Do not use the unit in combustible or explosive gaseous atmospheres. During the equipment is putted in hole on the metal panel while mechanical installation some metal burrs can cause injury on hands, you must be careful.
Montage of the product on a system must be done with it’s mounting clamp. Do not do the montage of the device with inappropriate mounting clamp. Be sure that device will not fall while doing the montage.
It is your responsibility if this equipment is used in a manner not specified in this instruction manual.

Warranty

EMKO Elektronik warrants that the equipment delivered is free from defects in material and workmanship. This warranty is provided for a period of two years. The warranty period starts from the delivery date.

This warranty is in force if duty and responsibilities which are determined in warranty document and instruction manual performs by the customer completely.

Maintenance

Repairs should only be performed by trained and specialized personnel. Cut power to the device before accessing internal parts. Do not clean the case with hydrocarbon-based solvents (Petrol, Trichlorethylene etc.). Use of these solvents can reduce the mechanical reliability of the device. Use a cloth dampened in ethyl alcohol or water to clean the external plastic case.

Other Informations

Manufacturer Information:
Emko Elektronik Sanayi ve Ticaret A.Ş.
Bursa Organize Sanayi Bölgesi, (Fethiye OSB Mah.) Turkuaz Cd. No:15 16215
BURSA/TÜRKİYE
Phone : +90 224 261 1900
Fax : +90 224 261 1912

Repair and Maintenance Service Information:
Emko Elektronik Sanayi ve Ticaret A.Ş.
Bursa Organize Sanayi Bölgesi, (Fethiye OSB Mah.) Turkuaz Cd. No:15 16215
BURSA/TÜRKİYE
Phone : +90 224 261 1900
Fax : +90 224 261 1912

Ordering Information

Eco LITE (48x48 DIN 1/16)	A	B	C	D	E
	4	.	.	. 0	. 0

A	Dimension
4	48x48 DIN 1/16

B	Supply Voltage
1	100-240V~ 50/60Hz - 3.5VA
2	24V≂ (±%15) 50/60Hz - 3.5VA
3	115V~ (±%15) 50/60Hz - 3.5VA
5	230V~ (±%15) 50/60Hz - 3.5VA
6	10...30V⎓ - 3.5W
7	24V~ (±%15) 50/60Hz - 3.5VA
9	Customer Specified

C	Outputs-1
1R	1 x Relay Output (5A@250V~ at Resistive Load) (NO,C)
2R	2 x Relay Output (5A@250V~ at Resistive Load) (NO,NO,C)

Before commissioning the device, parameters must be set in accordance with desired use. Incomplete or incorrect configuration can cause dangerous stiuations.

Because of limited mechanical life of relay output contact, SSR output is recommended which the device use PID control algoritm. The device with ON/OFF control algoritm, hysteresis parameter must be set a suitable value for your system, to avoid too much relay switching.

~ ⇒Vac,
⎓ ⇒Vdc,
≂ ⇒Vdc or Vac can be applied

EMKO Your Technology Partner

Thank you very much for your preference to use Emko Elektronik products, please visit our web page to download detailed user manual.
www.emkoelektronik.com.tr