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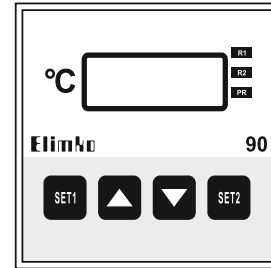


TS EN ISO 9001:2008
Quality Management System
Certificate

KY-90-0515-0

Elimko

E-90 Digital Controller User Manual



Manufacturer / Technical Support: Elimko Co. Ltd.
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Elimko _____ E-90

E-90 controller is designed for panel mounting and should be used in an industrial environment.



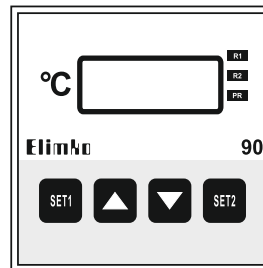
- The package of E-90 controller contains; Controller, 2 pieces of mounting clamps, User manual, Guarantee certificate
- After opening the package, please check the contents with the above list. If the delivered product is wrong type, any item is missing or there are visible defects, contact the vendor from which you purchased the product.
- Before installing and operating the controller, please read the user manual thoroughly.
- The installation and configuration of the controller must only be performed by a person qualified in instrumentation.
- Keep the unit away from flammable gases, that could cause explosions.
- Do not use alcohol or other solvents to clean the controller. Use a clean cloth soaked in water tightly squeezed to gently wipe the outer surface of the controller.
- The product life of this instrument is 10 years.



- This controller complies with the European Low Voltage Directive 2006/95/EC, by the application of safety standard TS EN 61010-1. (Pollution degree 2)
- This controller complies with the EMC Directive 2004/108/EC, by the application of EMC standard TS EN 61326.

E-90 _____ Elimko

1. DESCRIPTION



- Economical
- Simple Operation
- Input Types: Thermocouple (J, K, L, S) Resistance Thermometre (Pt-100) 4 - 20 mA
- On-Off and PID Control
- 4 Digit Display
- 96x96 mm (IEC/TR 60668)
- IP 66 Front Panel
- Security Code for parameters

E-90 is a low cost, simple to use controller that can be used as an On-Off or PID controller.

Standard input types to the controller are Thermocouple (Type J,K, L, S), Pt-100 Resistance Thermometer and 4-20 mA.

The controller has two set points that can be easily adjusted from the front panel buttons.

Accessing the other control parameters is protected by a security code.

2. TYPE CODING

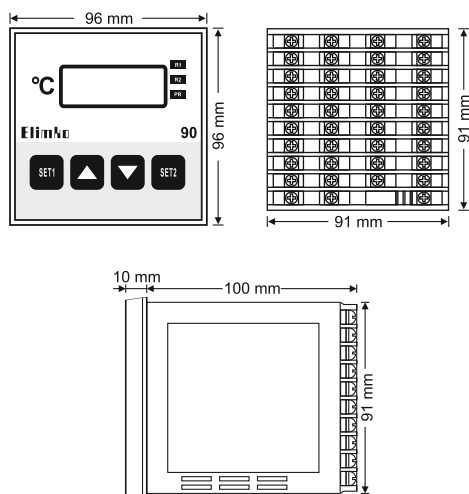
E - 90 - W - X - 0 - Z

W Output	X Input Types	Z Operating Voltage
0 None	1 J Type TC (0-400°C)	0 220 V AC
1 1 Relay	2 L Type TC (0-400°C)	1 24 V AC
2 2 Relay	3 K Type TC (0-1200°C)	
3 1 Pulse for SSR	4 S Type TC (0-1600°C)	
4 1 Pulse for SSR, 1 Relay	5 Pt-100 (0- 200°C)	
	6 4-20 mA	
	7 Custom	

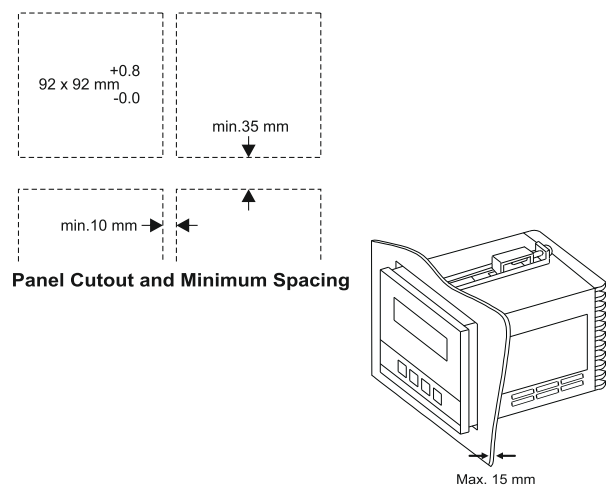
3. TECHNICAL SPECIFICATIONS

Input Types	Thermocouple (TC); Resistance Thermometer (RT); 4 - 20mA
Control Output	Relay : SPDT-NA-O-NK 250 V AC, 5 A Pulse : 24 V DC, 25 mA (for SSR)
Alarm Outputs	Relay : SPDT-NA-O-NK 250 V AC, 5A
Display Type	4 digit 14 mm 7 segment led display
Accuracy	TC and RT : (±0.5% of the reading value or ±2 °C) ±1 digit max. mA : ±0.5% FS ±1 digit max.
Analog Digital Converter	16 bit
Control Type	On - Off, PID
Operating Voltage	220 V AC ± %10; 50-60 Hz 24 V AC ± %10; 50-60 Hz
Power Consumption	2.5 W (4 VA)
Protection Class	Front Panel : IP 66 (NEMA 4X) Rear Case : IP 20
Operating Temperature	0 °C, +55 °C (with no condensation or icing)
Storage Temperature	-25 °C, +65 °C (with no condensation or icing)
Relay Mechanical Life	10 000 000 operations
Relay Electrical Life	>1 000 000 operations (under 1/10 of load)
Memory	EEPROM (100.000 max. write-erase)
Weight	495 g

4. DIMENSIONS



5. PANEL MOUNTING



Panel Cutout and Minimum Spacing

5. PANO MONTAJI

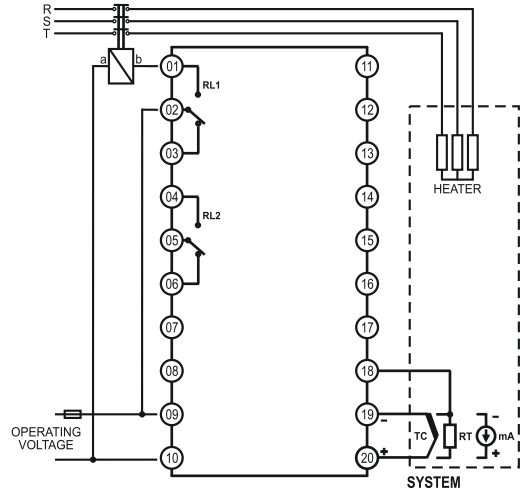
- E-90 controller should be installed inside a suitable grounded metal enclosure (panel). This must prevent the live parts being accessible to human hands and metal tools.
- E-90 controller does not include a power switch. Therefore, the power supply to the controller and power outputs must be wired through the proper fuse or circuit breaker.
- To minimize the pick-up of electrical noise, the wiring of low voltage lines, particularly the sensor input should be routed away from the high-current power cables. Where it is not possible, use shielded cables with the shield grounded at both ends.
- The cables used for powering the controller and the power outputs must conform to the standards IEC 60245 and IEC 60227.



- Cut a hole in the panel. (See the figure for overall dimensions.)
- Slide the controller into the cutout from the front of the panel.
- Fit the mounting clamps to the controller, ensuring the lugs are located in their slots.
- Fasten the mounting clamps using the retaining screws.

6. CONNECTION DIAGRAM

A typical connection diagram is given below.



6. CONNECTION DIAGRAM

- For thermocouple inputs, be sure to use the proper compensation cables and pay attention to the polarity of the connection.
- For 2-wire resistance thermometer, short the terminals 18 and 19 and connect the leads of resistance thermometer to the terminals 19 and 20. For 3-wire resistance thermometer, connection cables must be the same type and length.

The labels on the sides of the controller identify the ordering code (Type), serial number and wiring connections. The controller options are also indicated on the connection diagram.

- The terminals 01 to 10 are electrically live. While the instrument is powered, never touch to these terminals.
- Before operating the controller, ensure that the controller is correctly configured. Incorrect configuration could result in damage to the process being controlled.



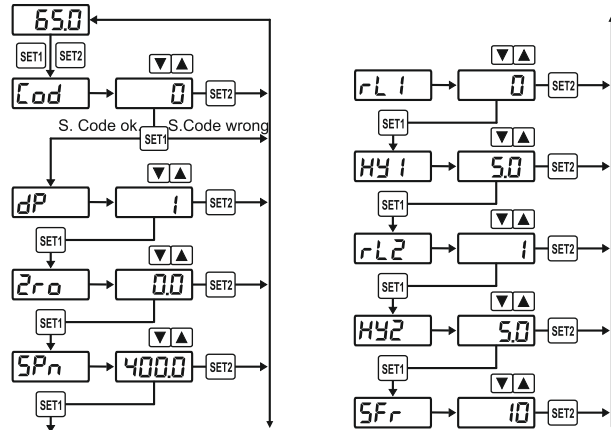
7. OPERATION

The front panel view of the E-90 controller is given in 1. DESCRIPTION section. The leds R1 and R2 indicates the output states of the controller that drive the relays RL1 and RL2 respectively. PR led lights while in configuration mode. In normal operation, the four digit display displays the process value. The set points are adjusted by \downarrow and \uparrow while the corresponding SET button (\square or \square) is pressed. The other parameters are configured in configuration mode.

- In order to access the configuration mode, \square and \square buttons must be pressed simultaneously.
- Just after this operation, EoD message is displayed for one second duration, D is displayed in the display. The security code must be entered \downarrow and \uparrow buttons in order to access the parameters.
- The entered security code must be correct, otherwise pressing \square button will revert to normal operation.
- The factory setting value of security code is "10". The security code is defined by 5Fr parameter; user can edit this parameter to define a new security code. If the value of security code is forgotten, pressing \square and \square buttons simultaneously at least 10 seconds, makes possible to access the parameters.
- If the entered security code is correct, pressing \square key will select the first parameter.
- While a parameter is selected, the parameter value is adjusted by \uparrow and \downarrow buttons. Pressing \square button will select the next parameter. Pressing \square button exist the configuration mode.
- The flow chart of configuration modes depending upon the form are given in the following figures.

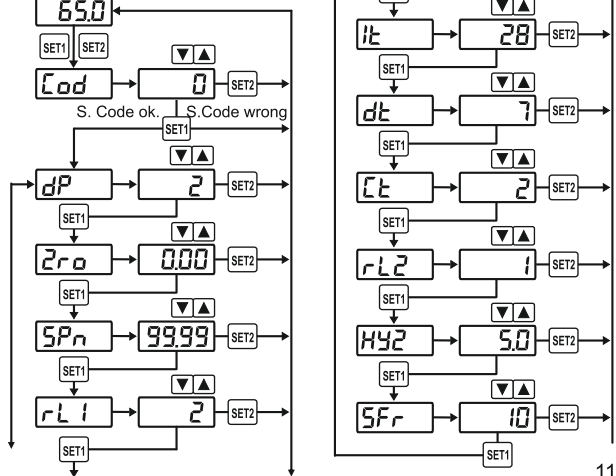
7. OPERATION

RL1 = 0 or 1 (On-Off)



7. OPERATION

RL1 = 2 or 3 (PID)



8. EXPLANATION OF PARAMETERS

- Cod** : Security code is asked with this parameter. It can be adjusted between -1999 and 9999.
- dP** : Only displayed if the input type is 4-20 mA. It defines the decimal point location for process value, 2ro, SPn, HY1, Pb and HY2 parameters. It can be adjusted between 0 and 3.
- 2ro** : Only displayed if the input type is 4-20 mA. It defines the process value corresponding to 4 mA input. This parameter also defines the lower limits of set points. The parameter can be adjusted between -1999 and 5Pn value.
- SPn** : Only displayed if the input type is 4-20 mA. It defines the process value corresponding to 20 mA input. This parameter also defines the upper limits of set points. The parameter can be adjusted between 2ro value and 9999 value.
- rL1** : Defines the control form of RL1 output, generated according to the first set point (SET1). The assignable values and corresponding control forms are given below.
 0 : On-Off Control (Reverse)
 1 : On-Off Control (Direct)
 2 : PID Control (Reverse)
 3 : PID Control (Direct)
- HY1** : Only displayed if rL1 parameter is selected 0 or 1. The parameter defines the hysteresis for the RL1 output. It can be adjusted 0 and 9999.

8. EXPLANATION OF PARAMETERS

- Pb** : Only displayed if rL1 parameter is selected as 2 or 3. The parameter defines the proportional band for PID control. The parameter can be adjusted between 0 and 9999.
- It** : Only displayed if rL1 parameter is selected as 2 or 3. The parameter defines the integral action time for PID control. The parameter can be adjusted between 0 and 9999 seconds. Integral action is disabled if the parameter is adjusted as 0.
- dt** : Only displayed if rL1 parameter is selected as 2 or 3. The parameter defines the derivative action time for PID control. The parameter can be adjusted between 0 and 9999 seconds. Derivative action is disabled if the parameter is adjusted as 0.
- Ct** : Only displayed if rL1 parameter is selected as 2 or 3. The parameter defines the cycle time of PID control. The parameter can be adjusted between 1 and 32 seconds.
- rL2** : Defines the control form of RL2 output, generated according to the second set point (SET2). The assignable values and corresponding control forms are given below.
 0 : Low Alarm, 1 : High Alarm
- HY2** : The parameter defines the hysteresis for the RL2 output. It can be adjusted between 0 and 9999.
- SFr** : Define the security code. Parameter can be adjusted between -1999 and 9999.