KY-96P-1123-1


# E-96P Series Universal Advanced Digital Controllers Quick Start Guide

**Manufacturer / Technical Support**
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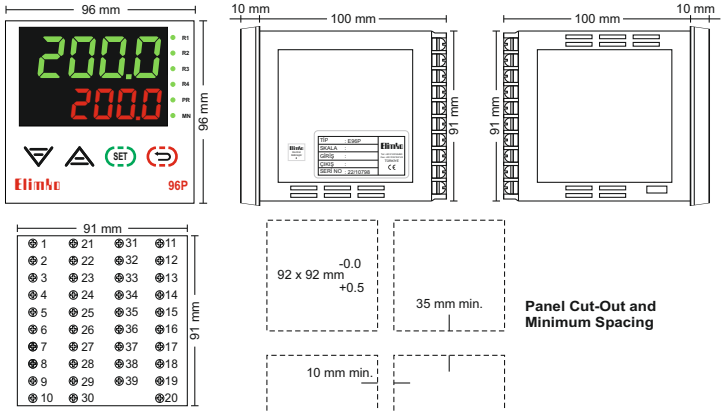
## 1. DESCRIPTION

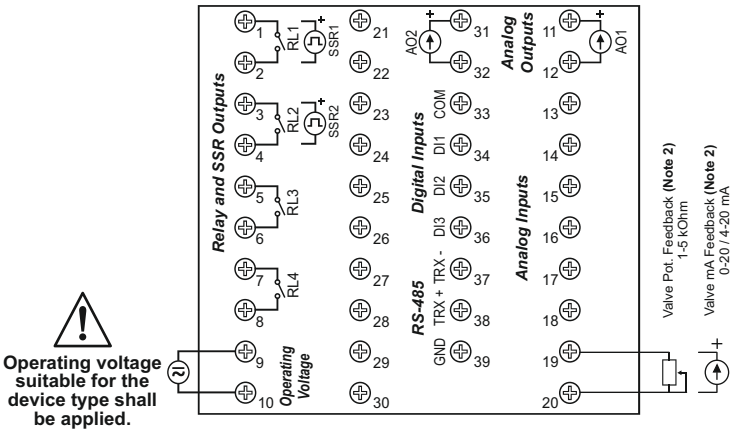
E-96P Series universal process controllers are industrial devices at 96x96 mm IEC/TR 60668 dimensions designed using new generation microcontrollers with on/off, PID and other control forms, where inputs and outputs can be easily programmed by the user.

In E-96P Series controllers, the set value and measured value can be displayed from -1999 to 9999 on two 4-digit displays; general purpose inputs (T/C, R/T, mV, mA) can be programmed.

## 2. DIMENSIONS and PANEL CUT-OUT




## 3. CONNECTION DIAGRAM

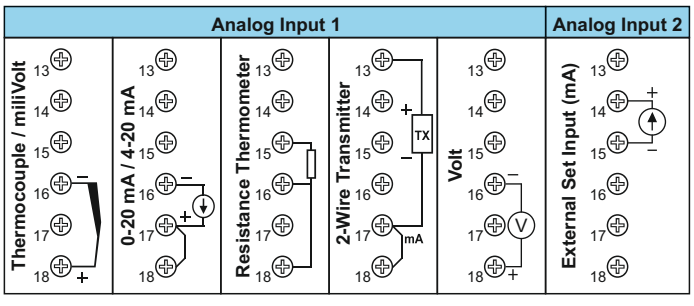



**Operating voltage suitable for the device type shall be applied.**

1st and 2nd control outputs can be selected as either Relay (RL1, RL2) or SSR (SSR1, SSR2).

Analog outputs (AO1, AO2 ) can be selected as either mA or 0-10 V DC.

Digital inputs are used by connecting a dry contact output between the COM terminal and the desired input (DI1, DI2 or DI3).




## 4. WARNINGS

E-96P controller is designed for panel mounting and should be used in an industrial environment.

- The package of E-96P controller contains; Controller, 2 pieces of mounting clamps, User manual and 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 flamable gases, that could cause explosion.
- 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.
- It is not used in medical applications.

**EU DIRECTIVE COMPLIANCE**

Low Voltage Directive EN 61010-1
EMC Directive EN 61326-1

K - Q TSE-ISO-EN 9000
**TS EN ISO 9001**
Quality Management System Certificate

## 5. TYPE CODING

E-96P Series Universal Advanced Controller — E-96P - W - X - Y - Z

**Relay Outputs**

| | W |
|---|---|
| 2 relays (RL1, RL2) | 2 |
| 3 relays (RL1, RL2, RL3) | 3 |
| 4 relays (RL1, RL2, RL3, RL4) | 4 |
| 1 SSR (SSR1) + 1 relay (RL2) | 5 |
| 1 SSR (SSR1) + 2 relays (RL2, RL3) | 6 |
| 1 SSR (SSR1) + 3 relays (RL2, RL3, RL4) | 7 |
| 2 SSR (SSR1, SSR2) + 1 relay (RL3) | 8 |
| 2 SSR (SSR1, SSR2) + 2 relays (RL3, RL4) | 9 |

**Analog Outputs ***

| | X |
|---|---|
| 1 x 0-20 / 4-20 mA (AO1) | 1 |
| 2 x 0-20 / 4-20 mA (AO1, AO2) | 2 |
| 1 x 0-10 V DC (AO1) | 3 |
| 2 x 0-10 V DC (AO1, AO2) | 4 |
| 1 x 0-20 / 4-20 mA (AO1) + 1 x 0-10 V DC (AO2) | 5 |

**Communication**

| | Y |
|---|---|
| None | 0 |
| RS-485 ** | 1 |

**Operating Voltage**

| | Z |
|---|---|
| 85-265 V AC / 85-375 V DC | 0 |
| 20-60 V AC / 20-60 V DC | 1 |

* Analog outputs are isolated from each other.
** When E-96P Series devices are ordered with communication, the E-IB-11 USB-RS485 converter can be used for PC connection. There are various control and monitoring software provided by Elimko.

## 6. TECHNICAL SPECIFICATIONS

| Parameter | Description |
|---|---|
| **Control Type** | On/Off, PID, Heat/Cool, Floating and Feedback Control of Valves |
| **Operating Voltage** | 20..60 V AC / 20..60 V DC or 85..265 V AC / 85..375 V DC |
| **Relays / SSR** | 4 pieces SPST - NO 250 V AC 5A relays or 24 V DC 25 mA (SSR) drives |
| **Dimensions (mm)** | 96 (Lenght) x 96 (Height) x 100 (Width) |
| **Panel Cut-Out (mm)** | 92 (Lenght) x 92 (Height) |
| **Analog Output** | 2 x 0..20 / 4..20 mA or 0..10 V DC optional |
| **Analog Input** | Universal **(Note 1),** 1 x External set (mA) |
| **Communication (RS-485)** | Available (optional) |
| **Digital Input** | 3 inputs |
| **Valve Feedback** | Available **(Note 2)** |
| **Transmitter Supply** | Available |
| **Weight** | 430 g |
| **Power Consumption** | Max. 7 W (10 VA) |
| **Operating Temperature** | - 10 °C ... 55 °C |
| **Storage Temperature** | - 25 °C ... 65 °C |
| **Memory** | Max. 100.000 write |
| **Protection Class** | IP-65 Front Panel, IP-20 Rear Case |

**Notes:**

**(1)** Universal Input :

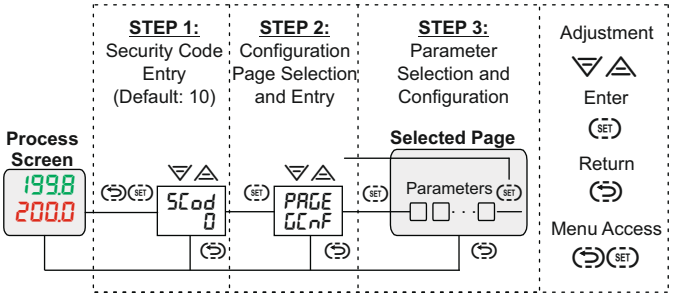
| | |
|---|---|
| Thermocouple | : B, E, J, K, L, N, R, S, T, U |
| Resistance Thermometer | : Pt-100 |
| Current | : 0-20 mA, 4-20 mA (Linear) |
| Voltage | : 0-50 mV, 0-1 V, 0.2- 1 V (Linear), 0-10 V DC, must be specified in the order. |
| Resolution | : 16 bit |
| Accuracy | : Thermocouple, Max. ±1.0 °C (Conversion and CJC error) Resistance Thermometer, Max. ±0.5 °C (Conversion and wire resistance compensation) Linear Input, Max. % 0.1 |

**(2)** Valve Feedback are supplied as potentiometer input in standard controllers. If the feedback type is requested as mA, it must be specified in the order.

## 7. PARAMETER TABLE

| | | Description | Min | Maks | Unit |
|---|---|---|---|---|---|
| INPUT SETTINGS | InPt | Analog Input 1 Type | Table 1 | | |
| | dP | Decimal Point | 0 | 3 | |
| | SCLo | Analog Input 1 Linear Scale Lower Value | -199.9 | 999.9 | EU |
| | SCH1 | Analog Input 1 Linear Scale Upper Value | -199.9 | 999.9 | EU |
| | Unit | Temperature Unit | °C | °F | |
| | oFSt | Analog Input 1 Offset Value | -100.0 | 100.0 | EU |
| | FLtr | Analog Input 1 Filter | 1 | 15 | s |
| | Snbr | Analog Input 1 Sensor Broken Behaviour | Lo | Hi | |
| | InP2 | Analog Input 2 Type | 0-20 | 4-20 | |
| | S2Lo | Analog Input 2 Linear Scale Lower Value | -199.9 | 999.9 | EU |
| | S2H1 | Analog Input 2 Linear Scale Upper Value | -199.9 | 999.9 | EU |
| | S2br | Analog Input 2 Sensor Broken Behaviour | Lo | Hi | |
| | AdrS | Modbus Adress | 1 | 127 | |
| | bAUd | Modbus Baud Rate [4.8, 9.6, 19.2, 38.4 kbaud] | 4.8 | 38.4 | |
| | PrtY | Modbus Parity [nonE, odd, EvEn] | | | |
| CONTROL SET SETTINGS | SPSr | Control Set Point Source | Table 2 | | |
| | SPLL | Control Set Point Lower Limit | -199.9 | SPHL | EU |
| | SPHL | Control Set Point Upper Limit | SPLL | 999.9 | EU |
| | SPrr | Control Set Point Ramping Rate | oFF | 60.0 | EU/min |
| | S-1 | 1. Step Set Value | SPLL | SPHL | EU |
| | t-1 | 1. Step Time | oFF | 999.9 | min |
| | S-2 | 2. Step Set Value | SPLL | SPHL | EU |
| | t-2 | 2. Step Time | oFF | 999.9 | min |
| | S-3 | 3. Step Set Value | SPLL | SPHL | EU |
| | t-3 | 3. Step Time | oFF | 999.9 | min |
| | SEt1 | Digital Input Selectable Set 1 | SPLL | SPHL | EU |
| | SEt2 | Digital Input Selectable Set 2 | SPLL | SPHL | EU |
| | SEt3 | Digital Input Selectable Set 3 | SPLL | SPHL | EU |
| | SEt4 | Digital Input Selectable Set 4 | SPLL | SPHL | EU |
| ALARM SETTINGS | A1tP | Alarm 1 Type | Table 3 | | |
| | A1SP | Alarm 1 Set Point | -199.9 | 999.9 | EU |
| | A1HY | Alarm 1 Hysteresis | 0.0 | 999.9 | EU |
| | A1Lt | Alarm 1 Lock | dSb | Enb | |
| | A2tP | Alarm 2 Type | Table 3 | | |
| | A2SP | Alarm 2 Set Point | -199.9 | 999.9 | EU |
| | A2HY | Alarm 2 Hysteresis | 0.0 | 999.9 | EU |
| | A2Lt | Alarm 2 Lock | dSb | Enb | |
| | A3tP | Alarm 3 Type | Table 3 | | |
| | A3SP | Alarm 3 Set Point | -199.9 | 999.9 | EU |
| | A3HY | Alarm 3 Hysteresis | 0.0 | 999.9 | EU |
| | A3Lt | Alarm 3 Lock | dSb | Enb | |
| | A4tP | Alarm 4 Type | Table 3 | | |
| | A4SP | Alarm 4 Hysteresis | -199.9 | 999.9 | EU |
| | A4HY | Alarm 4 Hysteresis | 0.0 | 999.9 | EU |
| | A4Lt | Alarm 4 Lock | dSb | Enb | |
| OUTPUTS | CtYP | Control Type | Table 4 | | |
| | CFrn | Control Form [dir, rEv] | dir | rEv | |
| | CPrd | Control Period | 1 | 250 | s |
| | mnPr | Manual Mode Selection | dSb | Enb | |
| | trtn | Floating Control Valve Travel Time | 10 | 2500 | s |
| | dbnd | Dead Band | 0.1 | 25.0 | % |
| | oLL | Control Output Lower Limit | 0.0 | oHL | % |
| | oHL | Control Output Upper Limit | oLL | 100.0 | % |
| | onr | Control Output Manual Reset | oLL | oHL | % |
| | PonC | PID Power On Behaviour | 0 | 4 | |
| | trLL | Retransmission Scale Lower Value | -199.9 | trHL | EU |
| | trHL | Retransmission Scale Upper Value | trLL | 999.9 | EU |
| | rL1d | Relay 1 Function | Table 5 | | |
| | rL2d | Relay 2 Function | Table 5 | | |
| | rL3d | Relay 3 Function | Table 5 | | |
| | rL4d | Relay 4 Function | Table 5 | | |
| | Ao1d | Analog Output 1 Function | Table 6 | | |
| | Ao1r | Analog Output 1 Type | Table 7.1 ve Table 7.2 | | |
| | Ao2d | Analog Output 2 Function | Table 6 | | |
| | Ao2r | Analog Output 2 Type | Table 7.1 ve Table 7.2 | | |
| | SruL | Feedback Valve Fully-Closed Position | | | |
| | SruH | Feedback Valve Fully-Open Position | | | |
| PID SETTINGS | At | PID Auto Tune | oFF | on | |
| | PId | PID Parameter Type | Std | Rdu | |
| | Pb-1 | Proportional Band + | 0.1 | 999.9 | EU |
| | Pb-2 | Proportional Band - | 0.1 | 999.9 | EU |
| | itH | Integral Time + | oFF | 9999 | s |
| | itC | Integral Time - | oFF | 9999 | s |
| | dtH | Derivative Time + | oFF | 2500 | s |
| | dtC | Derivative Time - | oFF | 2500 | s |
| | HYS | Hysteresis | 0.0 | 999.9 | EU |
| SECURITY | SCod | Security Code | 0 | 9999 | |
| | dPrL | Parameter Access Level | 0 | 9 | |
| | APrL | Parameter Setting Level | 0 | 9 | |
| | FCSt | Factory Settings [oFF, LoAd, SAvE, dFLt] | | | |

## 8. ACCESSING PARAMETERS




## 9. APPLICATION EXAMPLES

**1) Input:** Pt-100 **Relay / Alarm1:** 50 °C Low, **Relay2 / Alarm2:** 55 °C High
**AO1:** 4-20 mA PID Control Output

| InPt | A1tP | A1SP | A2tP | A2SP | CtYP | rL1d | rL2d | Ao1d | Ao1r |
|---|---|---|---|---|---|---|---|---|---|
| Pt | Lo | 50.0 | Hi | 55.0 | SCo | AL-1 | AL-2 | Co-1 | 4-20 |

**2) Input:** TC Type J, **Relay1:** On-Off Control Output, **Relay2 / Alarm2:** 350 °C High

| InPt | A2tP | A2SP | CtYP | rL1d | rL2d |
|---|---|---|---|---|---|
| J | Hi | 350.0 | SCo | do-1 | AL-2 |

**3) Input:** TC Type K, Profile Control (Ramp up to 400°C in 10 minutes and wait for 60 minutes), **Relay1:** PID Control Output, **AO1:** Retransmission Output (4-20 mA, 0-1200 °C)

| InPt | SPSr | S-1 | t-1 | S-2 | t-2 | CtYP | trLL | trHL | rL1d | rL2d | Ao1d | Ao1r |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| K | PrFL | 400 | 10.0 | 400 | 60.0 | SCo | 0 | 1200 | Co-1 | AL-2 | Putr | 4-20 |

**4) Input:** 4-20 mA, **Scale:** 0-600, **External Set Point:** 4-20 mA, **Scale:** 0-600,
Floating Valve Control (Travel Time 30 s), **Relay1:** Valve Open, **Relay2:** Valve Close

| InPt | SCLo | SCH1 | InP2 | S2Lo | S2H1 | CtYP | trtn | rL1d | rL2d |
|---|---|---|---|---|---|---|---|---|---|
| 4-20 | 0.0 | 600.0 | 4-20 | 0.0 | 600.0 | bnd | 30 | Co-1 | Co-2 |

| Table 1. Input Type Options | |
|---|---|
| b | Type B Thermocouple |
| E | Type E Thermocouple |
| J | Type J Thermocouple |
| K | Type K Thermocouple |
| L | Type L Thermocouple |
| n | Type N Thermocouple |
| r | Type R Thermocouple |
| S | Type S Thermocouple |
| t | Type T Thermocouple |
| U | Type U Thermocouple |
| Pt | Pt-100 |
| 0-20 | 0-20 mA |
| 4-20 | 4-20 mA |
| 0-50 | 0-50 mV |
| 0.0-1 | 0-1 V |
| 0.2-1 | 0.2-1 V |
| 0-10 | 0-10 V (*) |
| 2-10 | 2-10 V (*) |

(*) *Custom specified volt input*

| Table 2. Control Set Options | |
|---|---|
| Int | Internal adjustment with keys |
| PrFL | With Profile Control |
| Ert | External adjustment with AIN2 external input |
| d InP | With Digital Input |

| Table 3. Alarm Options | |
|---|---|
| oFF | Off |
| Lo | Low Alarm |
| Hi | High Alarm |
| Lod | Low Deviation |
| H id | High Deviation |
| Lob | Band Alarm (In) |
| H ib | Band Alarm (Out) |

| Table 4. Control Type Options | |
|---|---|
| oFF | No Control |
| SCo | Single (Heat) |
| dCo | Double (Heat/Cool) |
| bnd | Floating Control of Valve |
| PFb | Feedback Control of Valve |

| Tablo 5. Relay Output Options | |
|---|---|
| Co-1 | PID + (Heating) |
| Co-2 | PID - (Cooling) |
| do-1 | On-Off + (Heating) |
| do-2 | On-Off - (Cooling) |
| AL-1 | Alarm 1 |
| AL-2 | Alarm 2 |
| AL-3 | Alarm 3 |
| AL-4 | Alarm 4 |

| Table 6. Analog Output Options | |
|---|---|
| Co-1 | PID + (Heating) |
| Co-2 | PID - (Cooling) |
| Putr | Process Value |
| SPtr | Control Set Value |

| Table 7.1. Analog Output Range | |
|---|---|
| 0-20 | 0-20 mA |
| 20-0 | 20-0 mA |
| 4-20 | 4-20 mA |
| 20-4 | 20-4 mA |

| Table 7.2. Analog Output Range | |
|---|---|
| 0-10 | 0-10 V |
| 10-0 | 10-0 V |
| 2-10 | 2-10 V |
| 10-2 | 10-2 V |

*For detailed information, you can access the comprehensive user manual of the device under the heading "User Manuals" at www.elimko.com.tr. You can also use the QR Code on the front for this.*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