



**Control relays easyE4 with display (expandable, Ethernet), 24 V DC, Inputs Digital: 8, of which can be used as analog: 4, screw terminal**




**Part no. EASY-E4-DC-12TC1**  
**Catalog No. 197213**

**EL-Nummer 4500548**  
**(Norway)**

**Delivery program**

|                                |  |  |  |
|--------------------------------|--|--|--|
| Basic function                 |  |  | easyE4 base device   |
| Description                    |  |  | Electronic control relay with display with Ethernet interface Expandable with the easyE4 series of digital input/output expansions with easy-E4-CONNECT1 connector (Item Y7-197225) Rated operating voltage 24V DC 8 digital inputs, No. of these can be used as analog inputs - 4 Digital outputs: 4 transistor Screw terminals Delivery with customized user program is possible via Item (Y7) -2010781 EASY-COMBINATION |
| <b>Inputs</b>                  |  |  |  |
| Digital                        |  |  | 8  |
| of which can be used as analog |  |  | 4  |
| <b>Outputs</b>                 |  |  |  |
| Quantity of outputs            |  |  | Transistor: 4  |
| <b>Additional features</b>     |  |  |  |
| Real time clock                |  |  | #  |
| Display & keypad               |  |  | #  |
| Expansions                     |  |  | Expandable networkable (Ethernet)  |
| Supply voltage                 |  |  | 24 V DC  |
| Software                       |  |  | EASYSOFT-SWLIC/easySoft 7  |
| Connection type                |  |  | screw terminal   |

**Technical data**

|                         |  |    |  |
|-------------------------|--|----|--|
| <b>General</b>          |  |    |  |
| Standards               |  |    | EN 61000-6-2<br>EN 61000-6-3<br>IEC 60068-2-6<br>IEC 60068-2-27<br>IEC 60068-2-30<br>IEC 61131-2<br>EN 61010<br>EN 50178 |
| Approvals               |  |    |  |
| Approvals certificate   |  |    | cULus<br>CE  |
| shipping classification |  |    | DNV GL   |
|                         |  |    |                                      |
| Dimensions (W x H x D)  |  | mm | 71.5 x 90 x 58   |
| Weight                  |  | kg | 0.178  |
| Mounting                |  |    | Top-hat rail IEC/EN 60715, 35 mm or screw fixing using fixing brackets ZB4-101-GF1 (accessories)                         |
| Connection type         |  |    | screw terminal   |
| Ethernet                |  |    |  |
| Connections             |  |    | RJ45 plug, 8-pin   |
| Cable                   |  |    | CAT5   |

**Terminal capacities**

|                 |  |  |  |
|-----------------|--|--|--|
| Screw terminals |  |  |  |
|-----------------|--|--|--|

|   |  |                 |           |
|---|--|-----------------|-----------|
| Solid                                     |  | mm <sup>2</sup> | 0.2 - 4   |
| flexible                                  |  | mm <sup>2</sup> | 0.2 - 2.5 |
| Solid or flexible conductor, with ferrule |  | mm <sup>2</sup> | 0,2 - 2,5 |
| Solid or stranded                         |  | AWG             | 22 - 12   |
| Standard screwdriver                      |  | mm              | 0.8 x 3.5 |
| Tightening torque                         |  | Nm              | 0.5 - 0.7 |
| Stripping length                          |  | mm              | 6.5       |

## Display

|                    |  |  |            |
|--------------------|--|--|------------|
| Display - Type     |  |  | Monochrome |
| Lines x characters |  |  | 6 x 16     |

## Climatic environmental conditions

|                               |   |     |   |
|-------------------------------|---|-----|---|
| Operating ambient temperature |   | °C  | -25 to 55, cold as per IEC 60068-2-1, heat as per IEC 60068-2-2 |
| Condensation                  |   |     | Take appropriate measures to prevent condensation               |
| LCD display (clearly legible) |   | °C  | 0 - 55  |
| Storage                       | θ | °C  | -40 - +70   |
| relative humidity             |   | %   | in accordance with IEC 60068-2-30, IEC 60068-2-78<br>5 - 95     |
| Air pressure (operation)      |   | hPa | 795 - 1080  |

## Ambient conditions, mechanical

|  |             |         |  |
|--|-------------|---------|--|
| Protection type (IEC/EN 60529, EN50178, VBG 4)                             |             |         | IP20   |
| Vibrations   |             | Hz      | In accordance with IEC 60068-2-6<br>constant amplitude 0.15 mm: 10 - 57<br>constant acceleration 2 g: 57 - 150 |
| Mechanical shock resistance (IEC/EN 60068-2-27) semi-sinusoidal 15 g/11 ms |             | Impacts | 18   |
| Drop to IEC/EN 60068-2-31  | Drop height | mm      | 50   |
| Free fall, packaged (IEC/EN 60068-2-32)                                    |             | m       | 0.3  |
| Mounting position  |             |         | Vertical or horizontal   |

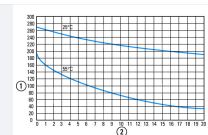
## Electromagnetic compatibility (EMC)

|   |  |     |  |
|---|--|-----|--|
| Overvoltage category/pollution degree                         |  |     | III/2  |
| Electrostatic discharge (ESD)                                 |  |     |  |
| applied standard  |  |     | according to IEC EN 61000-4-2  |
| Air discharge   |  | kV  | 8  |
| Contact discharge   |  | kV  | 6  |
| Electromagnetic fields (RFI) to IEC EN 61000-4-3              |  | V/m | 0.8 - 1.0 GHz: 10<br>1.4 - 2 GHz: 3<br>2.0 - 2.7 GHz: 1  |
| Radio interference suppression                                |  |     | EN 61000-6-3 Class B   |
| Burst   |  | kV  | according to IEC/EN 61000-4-4<br>Supply cables: 2<br>Signal cables: 2                                      |
| power pulses (Surge)  |  |     | according to IEC/EN 61000-4-5<br>0.5 kV (supply cables, symmetrical)<br>1 kV (supply cables, asymmetrical) |
| Immunity to line-conducted interference to (IEC/EN 61000-4-6) |  | V   | 10   |

## Insulation resistance

|   |  |  |   |
|---|--|--|---|
| Clearance in air and creepage distances |  |  | nach EN 50178, EN 61010-2-201, UL61010-2-201, CSA-C22.2 NO. 61010-2-201 |
| Insulation resistance                   |  |  | per EN 50178, EN 61010-2-201, UL61010-2-201, CSA-C22.2 NO. 61010-2-201  |

## Back-up of real-time clock

|                                       |  |       |  |
|---------------------------------------|--|-------|--|
| Back-up of real-time clock            |  |       |  <p>① Backup time (hours) with fully charged double layer capacitor<br/>② Service life (years)</p> |
| Accuracy of real-time clock to inputs |  | s/day | typ. ± 2 (± 0.2 h/Year)<br><br>depending on ambient air temperature fluctuations of up to ± 5 s/day (± 0.5 h/year) are possible  |

## Repetition accuracy of timing relays

|                                       |  |    |        |
|---------------------------------------|--|----|--------|
| Accuracy of timing relays (of values) |  | %  | ± 0.02 |
| Resolution                            |  |    |        |
| Range "S"                             |  | ms | 5      |

|             |  |     |   |
|-------------|--|-----|---|
| Range "M:S" |  | s   | 1 |
| Range "H:M" |  | min | 1 |

### Power supply

|                                      |                |    |                              |
|--------------------------------------|----------------|----|------------------------------|
| Rated operational voltage            | U <sub>e</sub> | V  | 24 DC (-15/+20%)             |
| Permissible range                    | U <sub>e</sub> |    | 20.4 - 28.8 V DC             |
| Residual ripple                      |                | %  | ≤ 5                          |
| Protection against polarity reversal |                |    | yes                          |
| Input current                        |                |    | max. 80 mA at U <sub>e</sub> |
| Voltage dips                         |                | ms | ≤ 10                         |
| Fuse                                 |                | A  | ≥ 1A (T)                     |
| Power loss                           | P              | W  | Normally 2                   |
| Heat dissipation at 24 V DC          |                | W  | 2                            |

### Digital inputs 24 V DC

|                                     |                |      |   |
|-------------------------------------|----------------|------|---|
| Number                              |                |      | 8   |
| Inputs can be used as analog inputs |                |      | 4 (I5, I6, I7, I8)  |
| Status Display                      |                |      | LCD-Display   |
| Potential isolation                 |                |      | from power supply: no<br>to the memory card: no<br>to Ethernet: yes<br>between inputs: no<br>from the outputs: yes<br>to expansion devices: yes |
| Rated operational voltage           | U <sub>e</sub> | V DC | 24  |
| Input voltage                       |                | V DC | Signal 0: ≤ 5 (I1 - I8)<br>Condition 1: ≥ 15 (I1 - I8)  |
| Input current at signal 1           |                | mA   | 3.3 (I1 - I4)<br>1.8 (I5 - I8)  |
| Deceleration time                   |                | ms   | 20 (0 -> 1/1 -> 0, Debounce ON)<br>type 0.015 (0 -> 1/1 -> 0, Debounce OFF)   |
| Cable length                        |                | m    | 100 (unshielded)  |
| Frequency counter                   |                |      |   |
| Number                              |                |      | 4 (I1, I2, I3, I4)  |
| Counter frequency                   |                | kHz  | ≤ 5   |
| Pulse shape                         |                |      | Square  |
| Pulse pause ratio                   |                |      | 1:1   |
| Cable length                        |                | m    | ≤ 20 (screened)   |
| Incremental counter                 |                |      |   |
| Number of counter inputs            |                |      | 2 (I1 + I2, I3 + I4)  |
| Value range                         |                |      | -2147483648 to +2147483647  |
| Counter frequency                   |                | kHz  | ≤ 5   |
| Pulse shape                         |                |      | Square  |
| Signal offset                       |                |      | 90°   |
| Pulse pause ratio                   |                |      | 1:1   |
| Cable length                        |                | m    | ≤ 20 (screened)   |
| Rapid counter inputs                |                |      |   |
| Number                              |                |      | 4 (I1, I2, I3, I4)  |
| Value range                         |                |      | -2147483648 to +2147483647  |
| Counter frequency                   |                | kHz  | ≤ 10  |
| Pulse shape                         |                |      | Square  |
| Pulse pause ratio                   |                |      | 1:1   |
| Cable length                        |                | m    | ≤ 20 (screened)   |

### Analog inputs

|                     |  |  |   |
|---------------------|--|--|---|
| Number              |  |  | 4 (I5, I6, I7, I8)  |
| Potential isolation |  |  | from power supply: no<br>to the memory card: no<br>to Ethernet: yes<br>between inputs: no<br>from the outputs: yes<br>to expansion devices: yes |
| Input type          |  |  | DC voltage  |
| Signal range        |  |  | 0-10 V DC   |

|                                 |  |    |                         |
|---------------------------------|--|----|-------------------------|
| Resolution                      |  |    | 12 Bit (value 0 - 4095) |
| Input impedance                 |  | kΩ | 13.3                    |
| Accuracy of actual value        |  |    |                         |
| two devices from series         |  | %  | ± 3 , ± 0.12 V          |
| Within a single device          |  | %  | ± 2 , ± 0.12 V          |
| Conversion time, analog/digital |  | ms | each CPU cycle          |
| Input current                   |  | mA | < 1                     |
| Cable length                    |  | m  | ≅ 30, screened          |

### Transistor outputs

|  |       |             |  |
|--|-------|-------------|--|
| Number   |       |             | 4  |
| Rated operational voltage  | $U_e$ | V DC        | 24   |
| Permissible range  | $U_e$ |             | 20.4 - 28.8 V DC   |
| Residual ripple  |       | %           | 5  |
| Supply current   |       | mA          | Norm./max. 15  |
| Protection against polarity reversal   |       |             | Yes (Caution: A short circuit will occur if a supply voltage of the wrong polarity is applied to the outputs.)   |
| Potential isolation  |       |             | from power supply: yes<br>to the memory card: yes<br>to Ethernet: yes<br>From the inputs: yes<br>to control buttons: yes<br>between the outputs: no<br>to expansion devices: yes |
| Rated operational current at signal „1“ DC per channel   | $I_e$ | A           | Max. 0.5   |
| Residual current on 0 signal per channel   |       | mA          | < 0.005  |
| Max. output voltage  |       | V           | 1 (at status 0 per channel)<br>$U = U_e - 1$ V (signal 1 at $I_e = 0.5$ A)   |
| Short-circuit protection   |       |             | yes, electronic (Q1 - Q4)  |
| Short-circuit tripping current for $R_a \leq 10$ mΩ  |       | A           | $0.7 \leq I_e \leq 1.7$ per output<br>depending on number of active channels and their load  |
| Total short-circuit current  |       | A           | 6.8  |
| Thermal cutout   |       |             | Yes  |
| Max. operating frequency with constant resistive load  |       | Operationsh | abhängig von der Zykluszeit des Basisgeräts und bei Erweiterungsgeräten auch von deren Übertragungszeit  |
| Parallel connection of outputs   |       |             |  |
| With resistive load, inductive load with external suppressor circuit, combination within a group |       |             | Group 1: Q1 to Q4  |
| Number of outputs  | max.  |             | 4  |
| Max. total current   |       | A           | 2  |
| Output status indication   |       |             | LCD-display  |
| Inductive load to EN 60947-5-1   |       |             |  |
| Without external suppressor circuit  |       |             |  |
| DC-13, $T_{0.95} = 72$ ms, $R = 48$ Ω, $L = 1.15$ H  |       |             |  |
| Utilization factor   |       | g           | 0.25   |
| Duty factor  |       | % DF        | 100  |
| $T_{0.95} = 15$ ms, $R = 48$ Ω, $L = 0.24$ H   |       |             |  |
| Utilization factor   |       | g           | 0.25   |
| Duty factor  |       | % DF        | 100  |
| With external suppressor circuit   |       |             |  |
| Utilization factor   |       | g           | 1  |
| Duty factor  |       | % DF        | 100  |
| Max. switching frequency, max. duty factor   |       | Operationsh | Depending on the suppressor circuit  |

### Supply voltage $U_{Aux}$

|            |   |   |   |
|------------|---|---|---|
| Power loss | P | W | 2 |
|------------|---|---|---|

### Ethernet

|                    |  |        |                  |
|--------------------|--|--------|------------------|
| Data transfer rate |  | Mbit/s | 10/100           |
| Connections        |  |        | RJ45 plug, 8-pin |
| Cable              |  |        | CAT5             |

## Design verification as per IEC/EN 61439

| Technical data for design verification   |                 |    |  |
|--|-----------------|----|--|
| Static heat dissipation, non-current-dependent   | P <sub>vs</sub> | W  | 2  |
| Operating ambient temperature min.   |                 | °C | -25  |
| Operating ambient temperature max.   |                 | °C | 55   |
| IEC/EN 61439 design verification   |                 |    |  |
| 10.2 Strength of materials and parts   |                 |    |  |
| 10.2.2 Corrosion resistance  |                 |    | Meets the product standard's requirements.   |
| 10.2.3.1 Verification of thermal stability of enclosures   |                 |    | Meets the product standard's requirements.   |
| 10.2.3.2 Verification of resistance of insulating materials to normal heat   |                 |    | Meets the product standard's requirements.   |
| 10.2.3.3 Verification of resistance of insulating materials to abnormal heat and fire due to internal electric effects |                 |    | Meets the product standard's requirements.   |
| 10.2.4 Resistance to ultra-violet (UV) radiation   |                 |    | Meets the product standard's requirements.   |
| 10.2.5 Lifting   |                 |    | Does not apply, since the entire switchgear needs to be evaluated.   |
| 10.2.6 Mechanical impact   |                 |    | Does not apply, since the entire switchgear needs to be evaluated.   |
| 10.2.7 Inscriptions  |                 |    | Meets the product standard's requirements.   |
| 10.3 Degree of protection of ASSEMBLIES  |                 |    | Meets the product standard's requirements.   |
| 10.4 Clearances and creepage distances   |                 |    | Meets the product standard's requirements.   |
| 10.5 Protection against electric shock   |                 |    | Does not apply, since the entire switchgear needs to be evaluated.   |
| 10.6 Incorporation of switching devices and components   |                 |    | Does not apply, since the entire switchgear needs to be evaluated.   |
| 10.7 Internal electrical circuits and connections  |                 |    | Is the panel builder's responsibility.   |
| 10.8 Connections for external conductors   |                 |    | Is the panel builder's responsibility.   |
| 10.9 Insulation properties   |                 |    |  |
| 10.9.2 Power-frequency electric strength   |                 |    | Is the panel builder's responsibility.   |
| 10.9.3 Impulse withstand voltage   |                 |    | Is the panel builder's responsibility.   |
| 10.9.4 Testing of enclosures made of insulating material   |                 |    | Is the panel builder's responsibility.   |
| 10.10 Temperature rise   |                 |    | The panel builder is responsible for the temperature rise calculation. Eaton will provide heat dissipation data for the devices. |
| 10.11 Short-circuit rating   |                 |    | Is the panel builder's responsibility.   |
| 10.12 Electromagnetic compatibility  |                 |    | Is the panel builder's responsibility.   |
| 10.13 Mechanical function  |                 |    | The device meets the requirements, provided the information in the instruction leaflet (IL) is observed.                         |

## Technical data ETIM 7.0

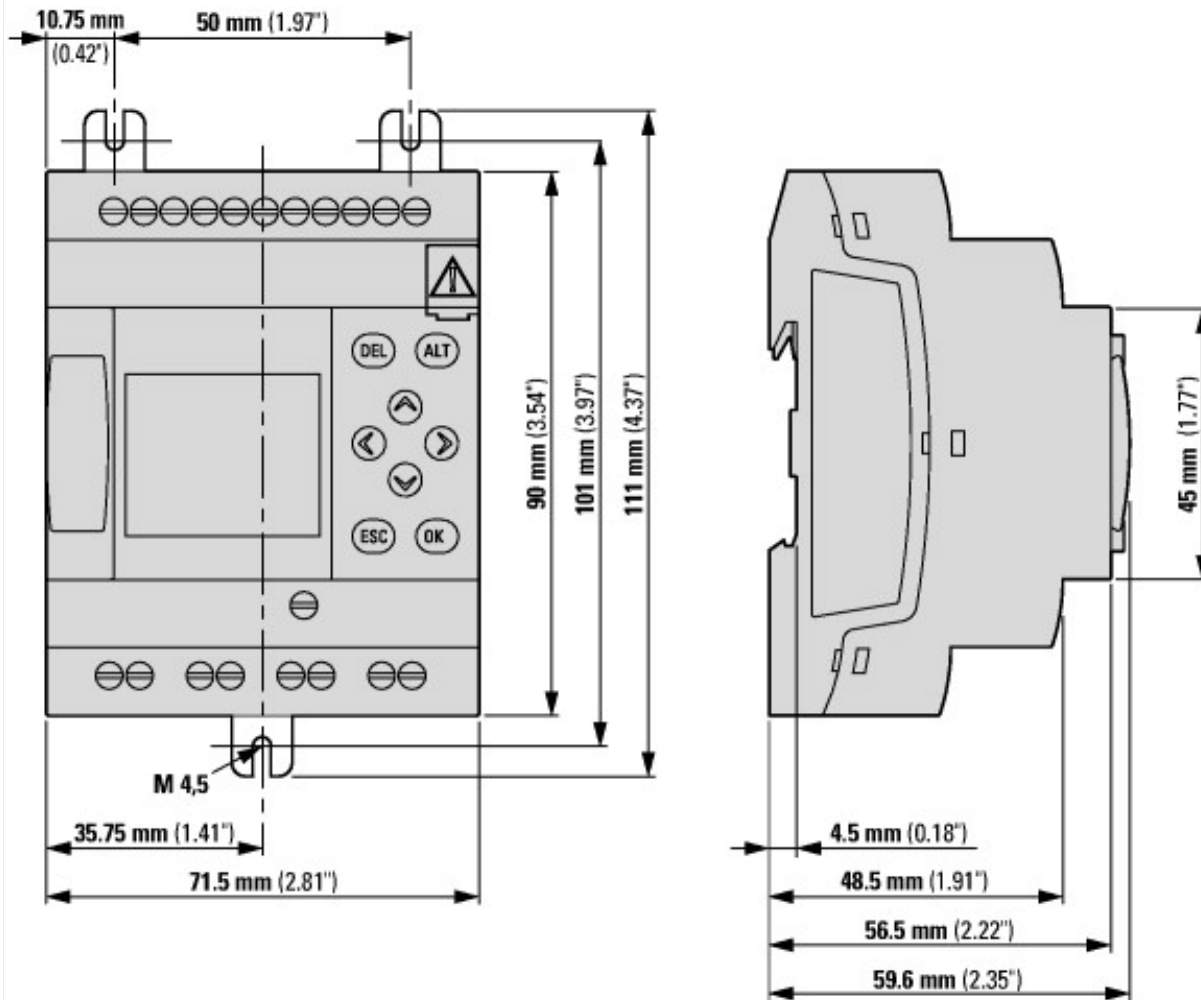
| PLC's (EG000024) / Logic module (EC001417)   |  |   |             |
|--|--|---|-------------|
| Electric engineering, automation, process control engineering / Control / Programmable logic control (SPS) / Logic module (ecl@ss10.0.1-27-24-22-16 [AKE539014]) |  |   |             |
| Supply voltage AC 50 Hz  |  | V | 0 - 0       |
| Supply voltage AC 60 Hz  |  | V | 0 - 0       |
| Supply voltage DC  |  | V | 20.4 - 28.8 |
| Voltage type of supply voltage   |  |   | DC          |
| Switching current  |  | A | 0.5         |
| Number of analogue inputs  |  |   | 4           |
| Number of analogue outputs   |  |   | 0           |
| Number of digital inputs   |  |   | 8           |
| Number of digital outputs  |  |   | 4           |
| With relay output  |  |   | No          |
| Number of HW-interfaces industrial Ethernet  |  |   | 1           |
| Number of interfaces PROFINET  |  |   | 0           |
| Number of HW-interfaces RS-232   |  |   | 0           |
| Number of HW-interfaces RS-422   |  |   | 0           |
| Number of HW-interfaces RS-485   |  |   | 0           |
| Number of HW-interfaces serial TTY   |  |   | 0           |
| Number of HW-interfaces USB  |  |   | 0           |
| Number of HW-interfaces parallel   |  |   | 0           |
| Number of HW-interfaces Wireless   |  |   | 0           |
| Number of HW-interfaces other  |  |   | 1           |

|   |    |      |
|---|----|------|
| With optical interface                              |    | No   |
| Supporting protocol for TCP/IP                      |    | Yes  |
| Supporting protocol for PROFIBUS                    |    | No   |
| Supporting protocol for CAN                         |    | No   |
| Supporting protocol for INTERBUS                    |    | No   |
| Supporting protocol for ASI                         |    | No   |
| Supporting protocol for KNX                         |    | No   |
| Supporting protocol for MODBUS                      |    | Yes  |
| Supporting protocol for Data-Highway                |    | No   |
| Supporting protocol for DeviceNet                   |    | No   |
| Supporting protocol for SUCONET                     |    | No   |
| Supporting protocol for LON                         |    | No   |
| Supporting protocol for PROFINET IO                 |    | No   |
| Supporting protocol for PROFINET CBA                |    | No   |
| Supporting protocol for SERCOS                      |    | No   |
| Supporting protocol for Foundation Fieldbus         |    | No   |
| Supporting protocol for EtherNet/IP                 |    | No   |
| Supporting protocol for AS-Interface Safety at Work |    | No   |
| Supporting protocol for DeviceNet Safety            |    | No   |
| Supporting protocol for INTERBUS-Safety             |    | No   |
| Supporting protocol for PROFIsafe                   |    | No   |
| Supporting protocol for SafetyBUS p                 |    | No   |
| Supporting protocol for other bus systems           |    | No   |
| Radio standard Bluetooth                            |    | No   |
| Radio standard WLAN 802.11                          |    | No   |
| Radio standard GPRS                                 |    | No   |
| Radio standard GSM                                  |    | No   |
| Radio standard UMTS                                 |    | No   |
| IO link master                                      |    | No   |
| Redundancy  |    | No   |
| With display  |    | Yes  |
| Degree of protection (IP)                           |    | IP20 |
| Basic device  |    | Yes  |
| Expandable  |    | Yes  |
| Expansion device                                    |    | No   |
| With timer  |    | Yes  |
| Rail mounting possible                              |    | Yes  |
| Wall mounting/direct mounting                       |    | Yes  |
| Front build in possible                             |    | Yes  |
| Rack-assembly possible                              |    | No   |
| Suitable for safety functions                       |    | No   |
| Category according to EN 954-1                      |    | None |
| SIL according to IEC 61508                          |    | None |
| Performance level acc. EN ISO 13849-1               |    | None |
| Appendant operation agent (Ex ia)                   |    | No   |
| Appendant operation agent (Ex ib)                   |    | No   |
| Explosion safety category for gas                   |    | None |
| Explosion safety category for dust                  |    | None |
| Width   | mm | 71.5 |
| Height  | mm | 90   |
| Depth   | mm | 58   |

## Approvals

|                         |  |         |
|-------------------------|--|---------|
| UL File No.             |  | E205091 |
| UL Category Control No. |  | NRAQ/7  |

## Dimensions



## Additional product information (links)

### assembly instructions easyE4 IL050020ZU

assembly instructions easyE4 IL050020ZU [https://es-assets.eaton.com/DOCUMENTATION/AWA\\_INSTRUCTIONS/IL050020ZU.pdf](https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL050020ZU.pdf)

### easyE4 (MN050009) manual

easyE4 – Handbuch (MN050009) - Deutsch [https://es-assets.eaton.com/DOCUMENTATION/AWB\\_MANUALS/MN050009\\_DE.pdf](https://es-assets.eaton.com/DOCUMENTATION/AWB_MANUALS/MN050009_DE.pdf)

easyE4 (MN050009) manual - English [https://es-assets.eaton.com/DOCUMENTATION/AWB\\_MANUALS/MN050009\\_EN.pdf](https://es-assets.eaton.com/DOCUMENTATION/AWB_MANUALS/MN050009_EN.pdf)

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f1=1454&f2=1174&f3=1755;Download Software easySoft V7 <http://applications.eaton.eu/sdlc?LX=11&f1=1454&f2=1174&f3=1755>

Product overview (WEB) <http://www.eaton.eu/easyE4>