




**Reversing starter, 24 V DC, 0,18 - 2,4 A, Push in terminals, SmartWire-DT slave**



**Part no.** EMS-RO-T-2,4-SWD  
**Catalog No.** 170108  
**Alternate Catalog No.** EMS-RO-T-2P4-SWD

**Delivery program**

|  |                |                |  |  |
|--|----------------|----------------|--|--|
|  |                |                |  | This item is only available for a limited time. Replacement item: Art. no. 192384, Type: EMS2-RO-T-3-SWD   |
| Product range  |                |                |  | Electronic motor starter   |
| Product range  |                |                |  | SmartWire-DT slave   |
| Subrange   |                |                |  | SmartWire-DT electronic motor starters   |
| Basic function   |                |                |  | Reversing starters (complete devices)  |
| Function   |                |                |  | For connecting to SmartWire-DT for expanded diagnostics.   |
| Description  |                |                |  | DOL starting<br>Reversing start<br>Motor protection<br>Circuit design: safety output stage with bypass, three-phase disconnect.<br>Motor current additionally adjustable via SmartWire-DT.   |
| Messages   |                |                |  | Operational readiness<br>Operating direction feedback<br>Motor current in %<br>Motor current in A<br>Thermal motor image in %<br>Overload prewarning<br>Trip indications (overload, phase failure, etc.)<br>Set short-circuit release value<br>Device Type |
| Commands   |                |                |  | Operating the motor starter<br>Manual reset<br>Automatic reset   |
| <b>Motor ratings</b>   |                |                |  |  |
| Max. rating for three-phase motors, 50 - 60 Hz                                     |                |                |  |  |
| AC-53a   |                |                |  |  |
| 380 V 400 V 415 V  | P              | kW             |  | 0.06 - 0.75  |
| Setting range of overload releases   | I <sub>r</sub> | A <sub>x</sub> |  | 0,18 - 2,4   |
|  |                |                |  |  |
| Actuating voltage  |                |                |  | 24 V DC  |
| Connection technique   |                |                |  | Push in terminals  |
| Connection to SmartWire-DT   |                |                |  | yes  |

**Technical data**

|  |            |    |              |                                  |
|--|------------|----|--------------|----------------------------------|
| <b>General</b>                                 |            |    |              |                                  |
| Standards                                      |            |    |              | IEC/EN 60947-4-2                 |
| Dimensions                                     |            |    |              |                                  |
| Width  |            | mm |              | 30                               |
| Height   |            | mm |              | 157                              |
| Depth  |            | mm |              | 124                              |
| Weight   |            | kg |              | 0.3                              |
| Mounting                                       |            |    |              | Top-hat rail IEC/EN 60715, 35 mm |
| Protection type (IEC/EN 60529, EN50178, VBG 4) |            |    |              | IP20                             |
| Mounting position                              |            |    |              | Vertical                         |
| Lifespan, electrical                           | Operations |    |              | 3 x 10 <sup>7</sup>              |
| Max. switching frequency                       |            |    | Operations/h | 3/200 (pulse pause time 50:50)   |

|                             |  |                 |                                   |
|-----------------------------|--|-----------------|-----------------------------------|
| Terminal capacity           |  |                 |                                   |
| Solid                       |  | mm <sup>2</sup> | 1 x (0.2 - 2.5)<br>1 x AWG20 - 14 |
| flexible, with ferrule      |  | mm <sup>2</sup> | 2 x (0.2 - 2.5)<br>1 x AWG24 - 14 |
| Notes                       |  |                 | Minimum length 10 mm.             |
| flexible, with twin ferrule |  | mm <sup>2</sup> | 2 x (0.2 - 1.5)<br>2 x AWG24 - 16 |
| Notes                       |  |                 | Minimum length 10 mm.             |

### Climatic environmental conditions

|                               |   |    |  |
|-------------------------------|---|----|--|
| Operating ambient temperature |   | °C | -5 - +60, in accordance with IEC 60068-2-1 |
| Storage                       | θ | °C | -40 - +80                                  |

### Main conducting paths

|  |                  |       |  |
|--|------------------|-------|--|
| Rated impulse withstand voltage  | U <sub>imp</sub> | V AC  | 6000   |
| Overvoltage category/pollution degree  |                  |       | III/2  |
| Rated operational voltage  | U <sub>e</sub>   | V     | 42 - 550   |
| Rated operational current  |                  |       |  |
| AC-51  | I <sub>e</sub>   | A     | 0.15 - 2.40  |
| AC-53a   | I <sub>e</sub>   | A     | 0.15 - 2.4   |
| Heat dissipation   | P <sub>V</sub>   | W     | 0.1 - 2  |
| Static heat dissipation, non-current-dependent   | P <sub>vs</sub>  | W     | 1  |
| Basic insulation to IEC/EN60947-1  |                  |       |  |
| between feedback signal output and switch voltage  |                  | V AC  | 500  |
| Current measurement  |                  |       |  |
| Setting range of overload releases   | I <sub>r</sub>   | A_x   | 0,18 - 2,4   |
| Release class  |                  | CLASS | 10   |
| Recovery time  | t <sub>W</sub>   | min.  | 2 (manual startup)<br>20 (automatic restart)   |
| Balance monitoring   |                  |       |  |
| Magnitude I <sub>max</sub> > I <sub>rated</sub> ((I <sub>max</sub> - I <sub>min</sub> )/I <sub>max</sub> )   |                  | %     | If ≥ 33, pick-up time of 120 s<br>If ≥ 67, pick-up time of 1.8 s   |
| Magnitude I <sub>max</sub> < I <sub>rated</sub> ((I <sub>max</sub> - I <sub>min</sub> )/I <sub>rated</sub> ) |                  | %     | If ≥ 33, pick-up time of 120 s<br>If ≥ 67, pick-up time of 1.8 s   |
| Stall protection   |                  |       |  |
| Pick-up time I (L1) or I (L3)  |                  | A     | 33   |
| Pick-up time   |                  | S     | 0.5  |
| Short-circuit rating   |                  |       |  |
| Type "1" coordination  |                  |       |  |
| Short-circuit protective device  |                  |       | 50 kA, 500 V AC: Fuse 16 A gG/gL<br>50 kA, 500 V AC: fuse 30 A CCMR<br>50 kA, 415 V AC: PKM0-4<br>15 kA, 415 V AC: PKM0-6,3<br>2.5 kA, 400 V AC: FAZ-B16/3 |

### Control section

|                                      |                  |      |                  |
|--------------------------------------|------------------|------|------------------|
| Input data                           |                  |      |                  |
| Supply voltage                       | U <sub>AUX</sub> | V DC | 24 (-15 - +20 %) |
| Residual ripple on the input voltage |                  | %    | ≤ 5              |
| Input current                        |                  | mA   | 70               |
| Current draw inrush                  |                  | mA   | 120              |
| Current draw (operation)             | U <sub>AUX</sub> | mA   | 50               |

### Electromagnetic compatibility (EMC)

|                                |  |     |   |
|--------------------------------|--|-----|---|
| Electrostatic discharge (ESD)  |  |     |   |
| applied standard               |  |     | IEC/EN 61000-4-2, Level 3                                 |
| Air discharge                  |  | kV  | 8   |
| Contact discharge              |  | kV  | 6   |
| Electromagnetic fields (RFI)   |  |     |   |
| applied standard               |  |     | IEC/EN 61000-4-3  |
|                                |  | V/m | 800 - 1000 MHz: 10<br>1.4 - 2 GHz: 10<br>2.0 - 2.7 GHz: 3 |
| Radio interference suppression |  |     | EN 55011, Class A (emitted interference, line-conducted)  |

|   |    |  |
|---|----|--|
| Note on use   |    | EN 61000-6-3, Class A (emitted interference, radiated)                     |
| Burst   | kV | 2<br>IEC/EN 61000-4-4, level 3   |
| power pulses (Surge)  |    | 1 kV (symmetrical)<br>2 kV (asymmetrical)<br>according to IEC/EN 61000-4-5 |
| Immunity to line-conducted interference to (IEC/EN 61000-4-6) | V  | 10   |

## Design verification as per IEC/EN 61439

| Technical data for design verification   |            |    |  |
|--|------------|----|--|
| Rated operational current for specified heat dissipation   | $I_n$      | A  | 2.4  |
| Heat dissipation per pole, current-dependent   | $P_{vid}$  | W  | 0.7  |
| Equipment heat dissipation, current-dependent  | $P_{vid}$  | W  | 2.1  |
| Static heat dissipation, non-current-dependent   | $P_{vs}$   | W  | 1  |
| Heat dissipation capacity  | $P_{diss}$ | W  | 0  |
| Operating ambient temperature min.   |            | °C | -5   |
| Operating ambient temperature max.   |            | °C | 60   |
| 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  |            |    | Does not apply, since the entire switchgear needs to be evaluated.   |
| 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. The specifications for the switchgear must be observed.                                   |
| 10.12 Electromagnetic compatibility  |            |    | Is the panel builder's responsibility. The specifications for the switchgear must be observed.                                   |
| 10.13 Mechanical function  |            |    | The device meets the requirements, provided the information in the instruction leaflet (IL) is observed.                         |

## Technical data ETIM 7.0

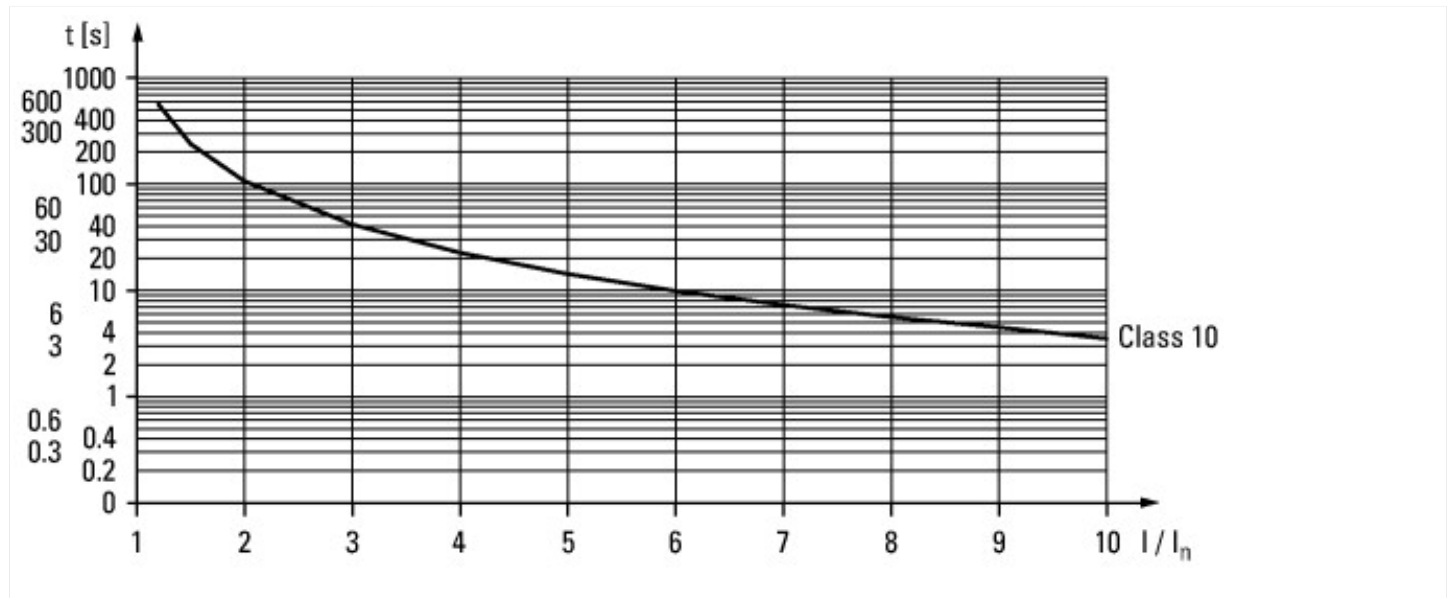
|  |  |   |                   |
|--|--|---|-------------------|
| Low-voltage industrial components (EG000017) / Motor starter/Motor starter combination (EC001037)  |  |   |                   |
| Electric engineering, automation, process control engineering / Low-voltage switch technology / Load breakout, motor breakout / Motor starter combination (ecl@ss10.0.1-27-37-09-05 [AJZ718013]) |  |   |                   |
| Kind of motor starter  |  |   | Reversing starter |
| With short-circuit release   |  |   | No                |
| Rated control supply voltage $U_s$ at AC 50HZ  |  | V | 0 - 0             |
| Rated control supply voltage $U_s$ at AC 60HZ  |  | V | 0 - 0             |
| Rated control supply voltage $U_s$ at DC   |  | V | 24 - 24           |

|  |    |                         |
|--|----|-------------------------|
| Voltage type for actuating   |    | DC                      |
| Rated operation power at AC-3, 230 V, 3-phase                            | kW | 0.37                    |
| Rated operation power at AC-3, 400 V                                     | kW | 0.75                    |
| Rated power, 460 V, 60 Hz, 3-phase                                       | kW | 0.736                   |
| Rated power, 575 V, 60 Hz, 3-phase                                       | kW | 0                       |
| Rated operation current I <sub>e</sub>                                   | A  | 2.4                     |
| Rated operation current at AC-3, 400 V                                   | A  | 2.4                     |
| Overload release current setting   | A  | 0.18 - 2.4              |
| Rated conditional short-circuit current, type 1, 480 Y/277 V             | A  | 0                       |
| Rated conditional short-circuit current, type 1, 600 Y/347 V             | A  | 0                       |
| Rated conditional short-circuit current, type 2, 230 V                   | A  | 0                       |
| Rated conditional short-circuit current, type 2, 400 V                   | A  | 0                       |
| Number of auxiliary contacts as normally open contact                    |    | 0                       |
| Number of auxiliary contacts as normally closed contact                  |    | 0                       |
| Ambient temperature, upper operating limit                               | °C | 60                      |
| Temperature compensated overload protection                              |    | Yes                     |
| Release class  |    | CLASS 10                |
| Type of electrical connection of main circuit                            |    | Spring clamp connection |
| Type of electrical connection for auxiliary- and control current circuit |    | Spring clamp connection |
| Rail mounting possible   |    | Yes                     |
| With transformer   |    | No                      |
| Number of command positions  |    | 0                       |
| Suitable for emergency stop  |    | No                      |
| Coordination class according to IEC 60947-4-3                            |    | Class 1                 |
| Number of indicator lights   |    | 4                       |
| External reset possible  |    | Yes                     |
| With fuse  |    | No                      |
| Degree of protection (IP)  |    | IP20                    |
| Degree of protection (NEMA)  |    | Other                   |
| Supporting protocol for TCP/IP   |    | No                      |
| Supporting protocol for PROFIBUS   |    | No                      |
| Supporting protocol for CAN  |    | No                      |
| Supporting protocol for INTERBUS   |    | No                      |
| Supporting protocol for ASI  |    | No                      |
| Supporting protocol for MODBUS   |    | No                      |
| 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                                |    | Yes                     |
| Width  | mm | 30                      |
| Height   | mm | 157                     |
| Depth  | mm | 139                     |

## Approvals

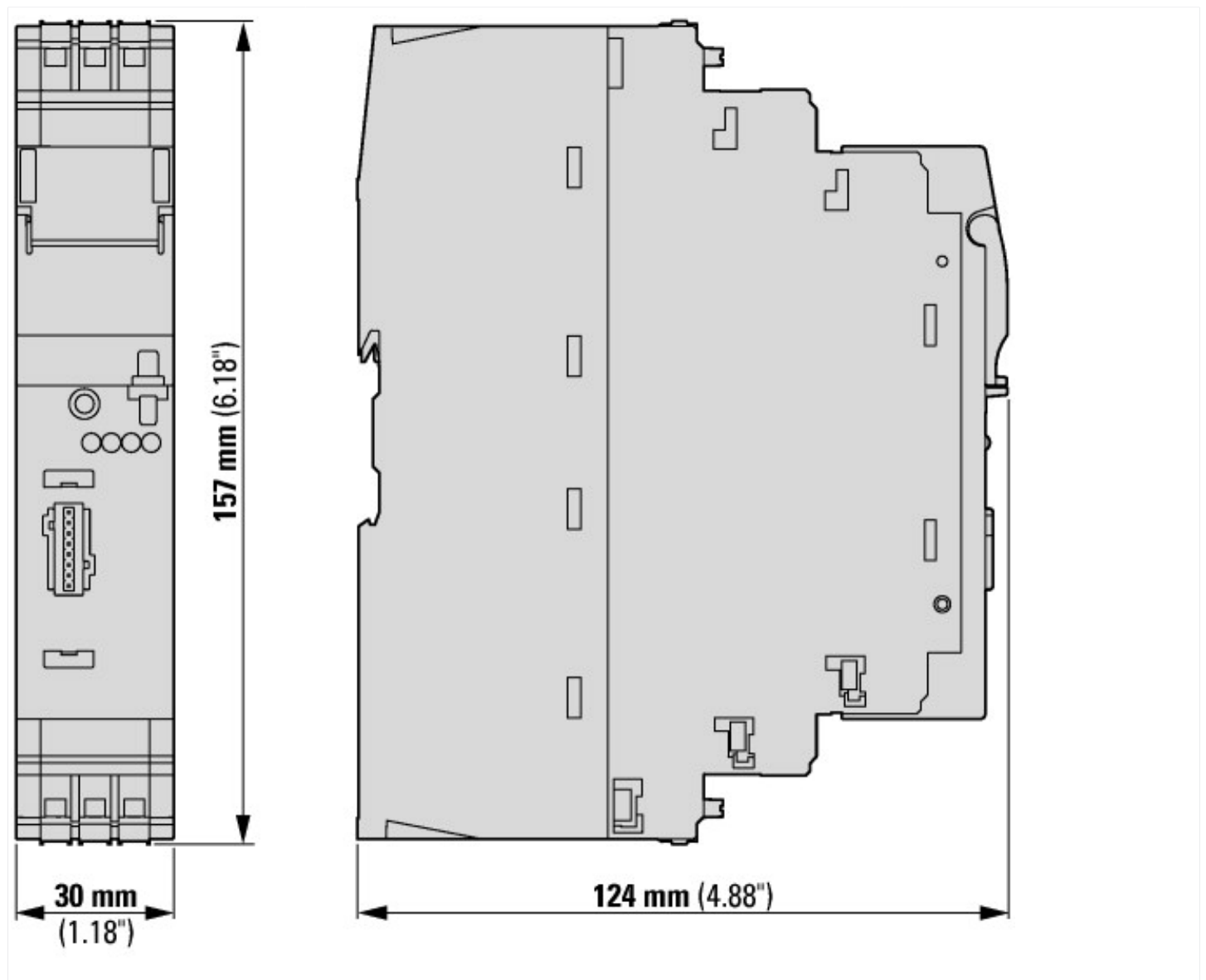
|                                      |  |  |
|--------------------------------------|--|--|
| Product Standards                    |  | IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14; CE marking |
| UL File No.                          |  | E29096   |
| UL Category Control No.              |  | NLDX, NLDX7  |
| CSA File No.                         |  | UL report applies to both US and Canada              |
| North America Certification          |  | UL listed, certified by UL for use in Canada         |
| Specially designed for North America |  | No   |

## Characteristics



Tripping characteristics  
CLASS 10  
set motor current  $\leq 4$  A

## Dimensions



## Additional product information (links)

### IL120002ZU Electronic motor starter with SWD connection

IL120002ZU Electronic motor starter with SWD connection [https://es-assets.eaton.com/DOCUMENTATION/AWA\\_INSTRUCTIONS/IL120002ZU2018\\_04.pdf](https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL120002ZU2018_04.pdf)

### MN034002ZU EMS-...-SWD electronic motor starter/EMS electronic motor starter

MN034002ZU EMS-...-SWD electronic motor starter/EMS electronic motor starter - Deutsch / English [https://es-assets.eaton.com/DOCUMENTATION/AWB\\_MANUALS/MN034002ZU\\_DE\\_EN.pdf](https://es-assets.eaton.com/DOCUMENTATION/AWB_MANUALS/MN034002ZU_DE_EN.pdf)

Produktinformation EMS, Hinweise zur Projektierung [http://www.eaton.eu/ecm/groups/public/@pub/@europe/@electrical/documents/content/pct\\_1040938\\_de.pdf](http://www.eaton.eu/ecm/groups/public/@pub/@europe/@electrical/documents/content/pct_1040938_de.pdf)