# Specifications

## Eaton 197163

Eaton Moeller® series EMS2 Reversing starter, 24 V DC, 0,18 - 3 A, Screw terminals, Controlled stop, PTB 19 ATEX 3000 EMS2-ROS-Z-3-24VDC

### General specifications

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| **PRODUCT NAME** | Eaton Moeller® series EMS2 Reversing starter |
| **CATALOG NUMBER** | 197163 |
| **MODEL CODE** | EMS2-ROS-Z-3-24VDC |
| **EAN** | 4015080896043 |
| **PRODUCT LENGTH/DEPTH** | 114.5 mm |
| **PRODUCT HEIGHT** | 99 mm |
| **PRODUCT WIDTH** | 22.5 mm |
| **PRODUCT WEIGHT** | 0.287 kg |
| **CERTIFICATIONS** | EN ISO 13849<br>IEC/EN 60947-4-2<br>IEC 61508<br>UL508<br>UL File No.: E338590<br>UL Category Control No.: NLDX, NLDX7<br>PTB 19 ATEX 3000<br>UL 60947-4-1<br>CSA-C22.2 No. 60947-4-1-14<br>CE marking<br>UL listed<br>Certified by UL for use in Canada<br>UL report applies to both US and Canada |

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## Features & Functions

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| **FUNCTIONS** | DOL starting<br>Reversing start<br>Controlled stop<br>Temperature compensated overload protection<br>Motor protection |

## General

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| **CLASS** | CLASS 10 |
| **CONNECTION TO SMARTWIRE-DT** | No |
| **DEGREE OF PROTECTION** | IP20<br>NEMA Other |
| **MODEL** | Reversing starter |
| **MOUNTING METHOD** | Top-hat rail fixing (according to IEC/EN 60715, 35 mm)<br>Rail mounting possible |
| **MOUNTING POSITION** | Motor feeder at bottom<br>Vertical |
| **OVERLOAD RELEASE CURRENT SETTING - MIN** | 0.18 A |
| **OVERLOAD RELEASE CURRENT SETTING - MAX** | 3 A |
| **PRODUCT CATEGORY** | Electronic motor starter |
| **RESIDUAL RIPPLE** | ≤ 5 % (input voltage) |
| **TERMINAL CAPACITY** | 0.14 - 2.5 $mm^2$, Control circuit cables<br>0.2 - 2.5 $mm^2$, Main cables<br>0.2 - 2.5 $mm^2$, Main cables, Push-in terminals |
| **TERMINAL CAPACITY (AWG)** | 24 - 14, Main cables<br>26 - 14, Control circuit cables |
| **TYPE** | Reversing starter (complete device) |
| **VOLTAGE TYPE** | DC |

## Climatic environmental conditions

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| **AMBIENT OPERATING TEMPERATURE - MIN** | -25 °C |
| **AMBIENT OPERATING TEMPERATURE - MAX** | 70 °C |
| **AMBIENT STORAGE TEMPERATURE - MIN** | 40 °C |
| **AMBIENT STORAGE TEMPERATURE - MAX** | 80 °C |

## Electro magnetic compatibility

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| **RADIO INTERFERENCE CLASS** | Class A (EN 61000-6-3, emitted interference, radiated)<br>EN 55011 |

## Electrical rating

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| **RATED ACTUATING CURRENT (IC)** | 5 mA |
| **RATED CONDITIONAL SHORT-CIRCUIT CURRENT (IQ), TYPE 2, 380 V, 400 V, 415 V** | 0 A |
| **RATED CONTROL SUPPLY CURRENT IS** | 40 mA |
| **RATED CONTROL SUPPLY VOLTAGE** | 19.2 - 30 V DC |
| **RATED CONTROL VOLTAGE (UC)** | 24 V (Actuating circuit ON, L, R) |
| **RATED CONTROL SUPPLY VOLTAGE (US) AT AC, 50 HZ - MIN** | 0 V |
| **RATED CONTROL SUPPLY VOLTAGE (US) AT AC, 50 HZ - MAX** | 0 V |
| **RATED CONTROL SUPPLY VOLTAGE (US) AT AC, 60 HZ - MIN** | 0 V |
| **RATED CONTROL SUPPLY VOLTAGE (US) AT AC, 60 HZ - MAX** | 0 V |
| **RATED CONTROL SUPPLY VOLTAGE (US) AT DC - MIN** | 24 V |
| **RATED CONTROL SUPPLY VOLTAGE (US) AT DC - MAX** | 24 V |
| **RATED OPERATIONAL CURRENT (IE)** | 3 A |
| **RATED OPERATIONAL CURRENT (IE) AT AC-15, 220 V, 230 V, 240 V** | 2 A |
| **RATED OPERATIONAL CURRENT (IE) AT AC-3, 380 V, 400 V, 415 V** | 3 A |
| **RATED OPERATIONAL CURRENT (IE) AT AC-51** | 3 A |
| **RATED OPERATIONAL CURRENT (IE) AT AC-53A - MAX** | 3 A |
| **RATED OPERATIONAL CURRENT (IE) AT DC-13, 24 V** | 2 A |
| **RATED OPERATIONAL POWER AT AC-3, 220/230** | 0.55 kW |

## Contacts

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| **NUMBER OF AUXILIARY CONTACTS (NORMALLY CLOSED CONTACTS)** | 1 |
| **NUMBER OF AUXILIARY CONTACTS (NORMALLY OPEN CONTACTS)** | 1 |
| **NUMBER OF CONTACTS (CHANGE-OVER CONTACTS)** | 1 |

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| **V, 50 HZ** | |
| **RATED OPERATIONAL POWER AT AC-3, 380/400 V, 50 HZ** | 1.1 kW |
| **RATED OPERATIONAL POWER AT AC-53A, 380/400 V, 50 HZ** | 1.1 kW |
| **RATED OPERATIONAL VOLTAGE** | 500 V AC<br>42 - 550 V |
| **SWITCHING LEVEL** | 19.2 - 30 V DC, Switching level "High", Actuating circuit (ON, L, R)<br>-3 - 9.6 V DC, Switching level "Low", Actuating circuit (ON, L, R)<br>< 5 V DC, Switching level "confirm Off", Actuating circuit (ON, L, R) |

## Safety

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| **EXPLOSION SAFETY CATEGORY FOR DUST** | ATEX dust-ex-protection, II (2) D [Ex t] [Ex p]<br>ATEX dust-ex-protection, II (2) G [Ex e] [Ex d] [Ex px] |
| **SAFETY PARAMETER (EN ISO 13849-1)** | PL e, Performance level (safe switch off)<br>3 (safe switch off), Category<br>60 (safe switch off) / 70 (motor protection) years; MTTFD |
| | Λdd [FIT]: 580 (Safe switch off) / 601 (Motor protection)<br>99 % (safe switch off) / 98 % (motor protection), DC<br>Λsd [FIT]: 0<br>Λdu [FIT]: 2.3 (Safe switch off) / 11 (Motor protection) |
| **SAFETY PARAMETER (IEC 62061)** | 99 %, SFF<br>Opening delay [ms]: 200 (safe switch off) / Class 10 (motor protection)<br>PFHd [FIT]: 2.3 (Safe switch off)<br>SIL 3 (Safe switch off) / SIL 2 (Motor protection)<br>Λsu [FIT]: 1072 (Safe switch off) / 969 (Motor protection) |

## Design verification

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| **EQUIPMENT HEAT DISSIPATION, CURRENT-DEPENDENT PVID** | 2.5 W |
| **HEAT DISSIPATION CAPACITY PDISS** | 0 W |
| **HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID** | 0 W |
| **RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)** | 3 A |
| **STATIC HEAT DISSIPATION, NON-CURRENT-DEPENDENT PVS** | 2 W |
| **HEAT DISSIPATION DETAILS** | If necessary, Allow for derating |
| **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 RESIST. OF INSUL. MAT. TO ABNORMAL HEAT/FIRE** | Meets the product standard's requirements. |

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| **BY INTERNAL ELECT. EFFECTS** | |
| **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. |
| **10.9.2 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 |

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| | 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. |

## Resources

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| **APPLICATION NOTES** | eaton-motor-starter-ems2-setting-motor-protection-twincat3-ap034001-en-us.pdf |
| **BROCHURES** | eaton-ems2-electronic-motorstarter-brochure-br034001en-en-us.pdf |
| **CHARACTERISTIC CURVE** | eaton-contactors-ems2-reversing-starter-characteristic-curve.eps |
| **DECLARATIONS OF CONFORMITY** | DA-DC-00004948.pdf<br>DA-DC-00004947.pdf<br>DA-DC-00004126.pdf |
| **DRAWINGS** | eaton-contactors-ems2-reversing-starter-dimensions-002.eps<br>eaton-contactors-ems2-reversing-starter-3d-drawing-002.eps |
| **ECAD MODEL** | DA-CE-ETN.EMS2-ROS-Z-3-24VDC |
| **INSTALLATION INSTRUCTIONS** | IL034089ZU |
| **INSTALLATION VIDEOS** | Eaton's electronic motor starter EMS2 |
| **MANUALS AND USER GUIDES** | eaton-electronic-motor-starter-ems2-manual-mn034003en-us.pdf |
| **MCAD MODEL** | DA-CS-ems2_dos_ros_z_24_230v<br>DA-CD-ems2_dos_ros_z_24_230v |
| **SALES NOTES** | eaton-ems2-electronic-motorstarter-flyer-fl034007en-en-us.pdf |

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|---|---|
| **PROJECT NAME:** | |
| **PROJECT NUMBER:** | |
| **PREPARED BY:** | |
| **DATE:** | |

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