# Specifications




**Photo is representative**





## Eaton 191603

Eaton Moeller series NZM - Molded Case Circuit Breaker. NZM3 PXR20 circuit breaker, 400A, 3p, screw terminal, N, 3

| General specifications | |
|---|---|
| **PRODUCT NAME** | Eaton Moeller series NZM molded case circuit breaker electronic |
| **CATALOG NUMBER** | 191603 |
| **MODEL CODE** | NZMN3-VX400 |
| **EAN** | 4015081921157 |
| **PRODUCT LENGTH/DEPTH** | 166 mm |
| **PRODUCT HEIGHT** | 275 mm |
| **PRODUCT WIDTH** | 140 mm |
| **PRODUCT WEIGHT** | 6.989 kg |
| **COMPLIANCES** | RoHS conform |
| **CERTIFICATIONS** | IEC/EN 60947<br>IEC |

## Additional information

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| **FUNCTIONS** | Systems, cable, selectivity and generator protection |

## Delivery program

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| **AMPERAGE RATING** | 400 A |
| **APPLICATION** | Use in unearthed supply systems at 690 V |
| **CIRCUIT BREAKER FRAME TYPE** | NZM3 |
| **FEATURES** | Motor drive optional<br>Protection unit |
| **NUMBER OF POLES** | Three-pole |
| **RELEASE SYSTEM** | Electronic release |
| **SPECIAL FEATURES** | • LSI overload protection and delayed and non-delayed short-circuit protective device<br>• R.m.s. value measurement and “thermal memory”<br>• USB interface for configuration and test function with Power Xpert Protection Manager software<br>• Optionally communication-capable with interface module and internal Modbus RTU module or CAM<br>• Maximum back-up fuse, if the expected short-circuit currents at the installation location exceed the switching capacity of the circuit breaker (Rated short-circuit breaking capacity Icn)<br>• Rated current = rated uninterrupted current: 400 A<br>• Terminal capacity hint: Up to 240 mm² can be connected depending on the cable manufacturer. |
| **TYPE** | Circuit breaker |

## Design verification as per IEC/EN 61439

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| **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. |
| **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 BY INTERNAL ELECT. 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. |

## Design verification as per IEC/EN 61439 - technical data

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| **AMBIENT OPERATING TEMPERATURE - MAX** | 70 °C |
| **AMBIENT STORAGE TEMPERATURE - MAX** | 70 °C |
| **AMBIENT OPERATING TEMPERATURE - MIN** | -25 °C |
| **AMBIENT STORAGE TEMPERATURE - MIN** | 40 °C |
| **EQUIPMENT HEAT DISSIPATION, CURRENT-DEPENDENT** | 48 W |
| **RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)** | 400 A |

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| **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. |

## Technical data - electrical

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| **AMPERAGE RATING** | 400 A |
| **DIRECTION OF INCOMING SUPPLY** | As required |
| **ELECTRICAL CONNECTION TYPE OF MAIN CIRCUIT** | Screw connection |
| **HANDLE TYPE** | Rocker lever |
| **INSTANTANEOUS CURRENT SETTING (II) - MAX** | 12 A |
| **INSTANTANEOUS CURRENT SETTING (II) - MIN** | 2 A |
| **ISOLATION** | 500 V AC (between auxiliary contacts and main contacts)<br>300 V AC (between the auxiliary contacts) |
| **LIFESPAN, ELECTRICAL** | 5000 operations at 400 V AC-1<br>5000 operations at 415 V AC-1<br>3000 operations at 690 V AC-1 |
| **NUMBER OF OPERATIONS PER HOUR - MAX** | 60 |
| **OVERLOAD CURRENT SETTING (IR) - MAX** | 400 A |
| **OVERLOAD CURRENT SETTING (IR) - MIN** | 160 A |
| **OVERVOLTAGE CATEGORY** | III |
| **POLLUTION DEGREE** | 3 |
| **RATED IMPULSE WITHSTAND VOLTAGE (UIMP) AT AUXILIARY CONTACTS** | 6000 V |
| **RATED IMPULSE WITHSTAND VOLTAGE (UIMP) AT MAIN CONTACTS** | 8000 V |
| **RATED INSULATION VOLTAGE (UI)** | 690 V AC |
| **RATED SHORT-CIRCUIT BREAKING CAPACITY ICS (IEC/EN 60947) AT 230 V, 50/60 HZ** | 85 kA |
| **RATED SHORT-CIRCUIT BREAKING CAPACITY ICS (IEC/EN 60947) AT 400/415 V, 50/60 HZ** | 50 kA |
| **RATED SHORT-CIRCUIT BREAKING CAPACITY ICS (IEC/EN 60947) AT 440 V, 50/60 HZ** | 35 kA |
| **RATED SHORT-CIRCUIT BREAKING CAPACITY ICS (IEC/EN 60947) AT 525 V, 50/60 HZ** | 13 kA |

## Technical data - mechanical

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| **CLIMATIC PROOFING** | Damp heat, constant, to IEC 60068-2-78<br>Damp heat, cyclic, to IEC 60068-2-30 |
| **DEGREE OF PROTECTION** | IP20 (basic degree of protection, in the operating controls area)<br>IP20 |
| **DEGREE OF PROTECTION (IP), FRONT SIDE** | IP66 (with door coupling rotary handle)<br>IP40 (with insulating surround) |
| **DEGREE OF PROTECTION (TERMINATIONS)** | IP00 (terminations, phase isolator and strip terminal)<br>IP10 (tunnel terminal) |
| **LIFESPAN, MECHANICAL** | 15000 operations |
| **MOUNTING METHOD** | Fixed<br>Built-in device fixed built-in technique |
| **NUMBER OF AUXILIARY CONTACTS (CHANGE-OVER CONTACTS)** | 0 |
| **NUMBER OF AUXILIARY CONTACTS (NORMALLY CLOSED CONTACTS)** | 0 |
| **NUMBER OF AUXILIARY CONTACTS (NORMALLY OPEN CONTACTS)** | 0 |
| **POSITION OF CONNECTION FOR MAIN CURRENT CIRCUIT** | Front side |
| **PROTECTION AGAINST DIRECT CONTACT** | Finger and back-of-hand proof to DIN EN 50274/VDE 0106 part 110 |
| **SHOCK RESISTANCE** | 20 g (half-sinusoidal shock 20 ms) |
| **SPECIAL FEATURES** | • LSI overload protection and delayed and non-delayed short-circuit protective device<br>• R.m.s. value measurement and “thermal memory”<br>• USB interface for configuration and test function with Power Xpert Protection Manager software<br>• Optionally communication-capable with interface module and internal Modbus RTU module or CAM<br>• Maximum back-up fuse, if the expected short-circuit currents at the installation location exceed the |

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| **RATED SHORT-CIRCUIT BREAKING CAPACITY ICS (IEC/EN 60947) AT 690 V, 50/60 HZ** | 5 kA |
| **RATED SHORT-CIRCUIT MAKING CAPACITY ICM AT 240 V, 50/60 HZ** | 187 kA |
| **RATED SHORT-CIRCUIT MAKING CAPACITY ICM AT 400/415 V, 50/60 HZ** | 110 kA |
| **RATED SHORT-CIRCUIT MAKING CAPACITY ICM AT 440 V, 50/60 HZ** | 77 kA |
| **RATED SHORT-CIRCUIT MAKING CAPACITY ICM AT 525 V, 50/60 HZ** | 55 kA |
| **RATED SHORT-CIRCUIT MAKING CAPACITY ICM AT 690 V, 50/60 HZ** | 40 kA |
| **RATED SHORT-TIME WITHSTAND CURRENT (T = 0.3 S)** | 3.3 kA |
| **RATED SHORT-TIME WITHSTAND CURRENT (T = 1 S)** | 3.3 kA |
| **SHORT DELAY CURRENT SETTING (ISD) - MAX** | 10 A |
| **SHORT DELAY CURRENT SETTING (ISD) - MIN** | 2 A |
| **SHORT-CIRCUIT RELEASE DELAYED SETTING - MAX** | 4000 A |
| **SHORT-CIRCUIT RELEASE DELAYED SETTING - MIN** | 320 A |
| **SHORT-CIRCUIT RELEASE NON-DELAYED SETTING - MAX** | 4800 A |
| **SHORT-CIRCUIT RELEASE NON-DELAYED SETTING - MIN** | 800 A |
| **SHORT-CIRCUIT TOTAL BREAKTIME** | < 10 ms |
| **UTILIZATION CATEGORY** | A (IEC/EN 60947-2) |
| **VOLTAGE RATING** | 690 V - 690 V |

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| | switching capacity of the circuit breaker (Rated short-circuit breaking capacity Icn)<br>• Rated current = rated uninterrupted current: 400 A<br>• Terminal capacity hint: Up to 240 mm² can be connected depending on the cable manufacturer. |

## Technical data - mechanical - terminals

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| **OPTIONAL TERMINALS** | Box terminal. Connection on rear. Tunnel terminal |
| **STANDARD TERMINALS** | Screw terminal |
| **TERMINAL CAPACITY (ALUMINUM SOLID CONDUCTOR/CABLE)** | 16 mm² (1x) at tunnel terminal |
| **TERMINAL CAPACITY (ALUMINUM STRANDED CONDUCTOR/CABLE)** | 50 mm² - 240 mm² (2x) at 2-hole tunnel terminal<br>25 mm² - 185 mm² (1x) at tunnel terminal<br>50 mm² - 240 mm² (1x) at 2-hole tunnel terminal |
| **TERMINAL CAPACITY (CONTROL CABLE)** | 0.75 mm² - 1.5 mm² (2x)<br>0.75 mm² - 2.5 mm² (1x) |
| **TERMINAL CAPACITY (COPPER BUSBAR)** | M10 at rear-side screw connection<br>Max. 30 mm x 10 mm + 30 mm x 5 mm direct at switch rear-side connection<br>Max. 10 mm x 50 mm (2x) at rear-side width extension<br>Min. 20 mm x 5 mm direct at switch rear-side connection |
| **TERMINAL CAPACITY (COPPER SOLID CONDUCTOR/CABLE)** | 16 mm² (1x) direct at switch rear-side connection<br>16 mm² (1x) at tunnel terminal<br><br>16 mm² (2x) at box terminal<br>16 mm² (2x) direct at switch rear-side connection<br>300 mm² (2x) at rear-side width extension |
| **TERMINAL CAPACITY (COPPER STRANDED CONDUCTOR/CABLE)** | 35 mm² - 240 mm² (1x) at box terminal<br>25 mm² - 240 mm² (2x) direct at switch rear-side connection<br>16 mm² - 185 mm² (1x) at 1-hole tunnel terminal<br>25 mm² - 120 mm² (2x) at box terminal<br>25 mm² - 240 mm² (1x) direct at switch rear-side connection |
| **TERMINAL CAPACITY (COPPER STRIP)** | Max. 10 segments of 32 mm x 1 mm + 5 segments of 32 mm x 1 mm at rear-side connection (punched)<br>10 segments of 50 mm x 1 mm (2x) at rear-side width extension<br>Max. 10 segments of 24 mm x 1 mm + 5 segments of 24 mm x 1 mm<br>Max. 8 segments of 24 mm x 1 mm (2x) at box terminal<br>Min. 6 segments of 16 mm x 0.8 mm at box terminal<br>Min. 6 segments of 16 mm x 0.8 mm at rear-side connection (punched) |

## Resources

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|---|---|
| **BROCHURES** | eaton-feerum-the-whole-grain-solution-success-story-en-us.pdf<br><br>eaton-digital-nzm-brochure-br013003en-en-us.pdf |
| **CATALOGUES** | eaton-digital-nzm-catalog-ca013003en-en-us.pdf |
| **CHARACTERISTIC CURVE** | eaton-circuit-breaker-nzm-mccb-characteristic-curve-011.eps<br><br>eaton-circuit-breaker-nzm-mccb-characteristic-curve-029.eps<br><br>eaton-circuit-breaker-nzm-mccb-characteristic-curve-015.eps |
| **DECLARATIONS OF CONFORMITY** | eaton-molded-case-switches-declaration-uk251455en.pdf<br><br>eaton-molded-case-circuit-breaker-declaration-of-conformity-eu250293en.pdf |
| **DRAWINGS** | eaton-circuit-breaker-switch-nzm-mccb-dimensions-016.eps<br><br>eaton-circuit-breaker-nzm-mccb-dimensions-020.eps |
| **INSTALLATION INSTRUCTIONS** | eaton-circuit-breaker-basic-unit-bg3-il012100zu.pdf |
| **INSTALLATION VIDEOS** | Introduction of the new digital circuit breaker NZM<br><br>The new digital NZM Range |
| **MCAD MODEL** | eaton-molded-case-switches-mcad-drawings-nzm3-3p.dwg<br><br>eaton-molded-case-switches-mcad-3d-models-nzm3-3p.stp |
| **PEP ECO-PASSPORT** | eaton-molded-case-switches-pep-eato-00251-v0101-en.pdf |
| **TECHNICAL DATA SHEETS** | eaton-nzm-technical-information-sheet |

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

**Eaton Corporation plc** Eaton House
30 Pembroke Road
Dublin 4, Ireland
Eaton.com

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