# DATASHEET - NZMN2-M160

**Circuit-breaker, 3p, 160A**

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| **Part no.** | **NZMN2-M160** |
| | **265724** |
| **EL Number (Norway)** | **4315568** |

Powering Business Worldwide™

## General specifications

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|---|---|
| Product name | Eaton Moeller series NZM molded case circuit breaker thermo-magnetic |
| Part no. | NZMN2-M160 |
| EAN | 4015082657246 |
| Product Length/Depth | 149 millimetre |
| Product height | 184 millimetre |
| Product width | 105 millimetre |
| Product weight | 2.325 kilogram |
| Compliances | RoHS conform |
| Certifications | IEC<br>IEC/EN 60947 |
| Product Tradename | NZM |
| Product Type | Molded case circuit breaker |
| Product Sub Type | Thermo-magnetic |

## Delivery program

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| Application | Use in unearthed supply systems at 690 V |
| Type | Circuit breaker |
| Circuit breaker frame type | NZM2 |
| Connection | Screw |
| Number of poles | Three-pole |
| Amperage Rating | 160 A |
| Release system | Thermomagnetic release |
| Special features | 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: 160 A<br>Tripping class 10 A<br>IEC/EN 60947-4-1, IEC/EN 60947-2<br>The circuit-breaker fulfills all requirements for AC-3 switching category. |
| Fitted with: | Thermal protection |

## Technical Data - Electrical

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| Voltage rating | 690 V - 690 V |
| Rated insulation voltage (Ui) | 1000 V |
| Rated impulse withstand voltage (Uimp) at auxiliary contacts | 6000 V |
| Rated impulse withstand voltage (Uimp) at main contacts | 8000 V |
| Rated operational current | 134 A (400 V AC-3) |
| Rated short-time withstand current (t = 0.3 s) | 1.9 kA |
| Rated short-time withstand current (t = 1 s) | 1.9 kA |
| Instantaneous current setting (Ii) - min | 1280 A |
| Instantaneous current setting (Ii) - max | 2240 A |
| Overload current setting (Ir) - min | 125 A |
| Overload current setting (Ir) - max | 160 A |
| Short-circuit release non-delayed setting - min | 1280 A |
| Short-circuit release non-delayed setting - max | 2240 A |
| 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 | 35 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 | 25 kA |
| 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 |

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| Rated short-circuit making capacity Icm at 400/415 V, 50/60 Hz | 105 kA |
| Rated short-circuit making capacity Icm at 440 V, 50/60 Hz | 74 kA |
| Rated short-circuit making capacity Icm at 525 V, 50/60 Hz | 53 kA |
| Rated short-circuit making capacity Icm at 690 V, 50/60 Hz | 40 kA |
| Rated operating power at AC-3, 230 V | 45 kW |
| Rated operating power at AC-3, 400 V | 90 kW |
| Short-circuit total breaktime | < 10 ms |
| Electrical connection type of main circuit | Screw connection |
| Isolation | 300 V AC (between the auxiliary contacts)<br>500 V AC (between auxiliary contacts and main contacts) |
| Number of operations per hour - max | 120 |
| Handle type | Rocker lever |
| Utilization category | A (IEC/EN 60947-2) |
| Overvoltage category | III |
| Pollution degree | 3 |
| Lifespan, electrical | 7500 operations at 690 V AC-1<br>10000 operations at 400 V AC-1<br>10000 operations at 415 V AC-1<br>6500 operations at 415 V AC-3<br>6500 operations at 400 V AC-3<br>5000 operations at 690 V AC-3 |
| Direction of incoming supply | As required |

## Technical Data - Mechanical

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| Mounting Method | Fixed<br>Built-in device fixed built-in technique |
| Degree of protection | IP20<br>IP20 (basic degree of protection, in the operating controls area) |
| Degree of protection (IP), front side | IP66 (with door coupling rotary handle)<br>IP40 (with insulating surround) |
| Degree of protection (terminations) | IP10 (tunnel terminal)<br>IP00 (terminations, phase isolator and strip terminal) |
| Protection against direct contact | Finger and back-of-hand proof to VDE 0106 part 100 |
| Shock resistance | 20 g (half-sinusoidal shock 20 ms) |
| Switch off technique | Thermomagnetic |
| Climatic proofing | Damp heat, constant, to IEC 60068-2-78<br>Damp heat, cyclic, to IEC 60068-2-30 |
| Special features | 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: 160 A<br>Tripping class 10 A<br>IEC/EN 60947-4-1, IEC/EN 60947-2<br>The circuit-breaker fulfills all requirements for AC-3 switching category. |
| Lifespan, mechanical | 20000 operations |

## Technical Data - Mechanical - Terminals

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| Standard terminals | Screw terminal |
| Optional terminals | Box terminal. Connection on rear. Tunnel terminal |
| Terminal capacity (control cable) | 0.75 $mm^2$ - 2.5 $mm^2$ (1x)<br>0.75 $mm^2$ - 1.5 $mm^2$ (2x) |
| Terminal capacity (aluminum solid conductor/cable) | 10 $mm^2$ - 16 $mm^2$ (1x) direct at switch rear-side connection<br>16 $mm^2$ (1x) at tunnel terminal<br>10 $mm^2$ - 16 $mm^2$ (2x) direct at switch rear-side connection |
| Terminal capacity (aluminum stranded conductor/cable) | 25 $mm^2$ - 50 $mm^2$ (2x) direct at switch rear-side connection<br>25 $mm^2$ - 185 $mm^2$ (1x) at tunnel terminal<br>25 $mm^2$ - 50 $mm^2$ (1x) direct at switch rear-side connection |
| Terminal capacity (copper busbar) | Min. 16 mm x 5 mm direct at switch rear-side connection<br>M8 at rear-side screw connection<br>Max. 24 mm x 8 mm direct at switch rear-side connection |
| Terminal capacity (copper solid conductor/cable) | 6 $mm^2$ - 16 $mm^2$ (2x) at box terminal<br>6 $mm^2$ - 16 $mm^2$ (2x) direct at switch rear-side connection<br>10 $mm^2$ - 16 $mm^2$ (1x) at box terminal<br>16 $mm^2$ (1x) at tunnel terminal<br>10 $mm^2$ - 16 $mm^2$ (1x) direct at switch rear-side connection |
| Terminal capacity (copper stranded conductor/cable) | 25 $mm^2$ - 185 $mm^2$ (1x) at box terminal<br>25 $mm^2$ - 70 $mm^2$ (2x) direct at switch rear-side connection<br>25 $mm^2$ - 185 $mm^2$ (1x) at 1-hole tunnel terminal<br>25 $mm^2$ - 185 $mm^2$ (1x) direct at switch rear-side connection<br>25 $mm^2$ - 70 $mm^2$ (2x) at box terminal |

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| Terminal capacity (copper strip) | | | Max. 10 segments of 24 mm x 0.8 mm at rear-side connection (punched)<br>Min. 2 segments of 9 mm x 0.8 mm at box terminal<br>Max. 8 segments of 24 mm x 1 mm (2x) at box terminal<br>Min. 2 segements of 16 mm x 0.8 mm at rear-side connection (punched)<br>Max. 10 segments of 16 mm x 0.8 mm at box terminal |
| **Design verification as per IEC/EN 61439 - technical data** | | | |
| Rated operational current for specified heat dissipation (In) | | | 160 A |
| Equipment heat dissipation, current-dependent | | | 38.4 W |
| Ambient operating temperature - min | | | -25 °C |
| Ambient operating temperature - max | | | 70 °C |
| Ambient storage temperature - min | | | 40 °C |
| Ambient storage temperature - max | | | 70 °C |
| **Design verification as per IEC/EN 61439** | | | |
| 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. |
| 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. |
| **Additional information** | | | |
| Functions | | | Motor protection |

## Technical data ETIM 9.0

Low-voltage industrial components (EG000017) / Motor protection circuit-breaker (EC000074)

Electric engineering, automation, process control engineering / Low-voltage switch technology / Circuit breaker (LV < 1 kV) / Motor protection circuit-breaker (ecl@ss13-27-37-04-01 [AGZ529021])

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| Overload release current setting | | A | 125 - 160 |
| Adjustment range undelayed short-circuit release | | A | 1280 - 2240 |
| With thermal overload protection | | | Yes |
| Phase failure sensitive | | | No |
| Switch off technique | | | Thermomagnetic |
| Rated operating voltage | | V | 690 - 690 |
| Rated permanent current Iu | | A | 160 |
| Rated operation power at AC-3, 230 V | | kW | 45 |
| Rated operation power at AC-3, 400 V | | kW | 90 |
| Power loss | | W | 38.4 |
| Type of electrical connection of main circuit | | | Screw connection |
| Type of control element | | | Rocker lever |
| Device construction | | | Built-in device fixed built-in technique |

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| With integrated auxiliary switch | | | No |
| With integrated under voltage release | | | No |
| Number of poles | | | 3 |
| Rated short-circuit breaking capacity Icu at 400 V, AC | | kA | 35 |
| Degree of protection (IP) | | | IP20 |
| Height | | mm | 184 |
| Width | | mm | 105 |
| Depth | | mm | 149 |