



Circuit-breaker, NZM2 TMTU, 3 pole, 50A, Screw terminal

Part no. **NZMS2-A50**  
 Catalog No. **109959**

Similar to illustration

**Delivery program**

|                     |  |  |                             |
|---------------------|--|--|-----------------------------|
| Product range       |  |  | Circuit-breaker             |
| Protective function |  |  | System and cable protection |
| Standard/Approval   |  |  | IEC                         |
| Installation type   |  |  | Fixed                       |
| Release system      |  |  | Thermomagnetic release      |
| Construction size   |  |  | NZM2                        |
| Number of poles     |  |  | 3 pole                      |
| Standard equipment  |  |  | Screw connection            |

**Switching capacity**

|                 |          |    |    |
|-----------------|----------|----|----|
| 400/415 V 50 Hz | $I_{cu}$ | kA | 70 |
|-----------------|----------|----|----|

**Rated current = rated uninterrupted current**

|   |             |   |    |
|---|-------------|---|----|
| Rated current = rated uninterrupted current | $I_n = I_u$ | A | 50 |
|---|-------------|---|----|

**Setting range**

|                        |                          |   |         |
|------------------------|--------------------------|---|---------|
| Overload trip          |                          |   |         |
|                        | $I_r$                    | A | 40 - 50 |
| Short-circuit releases |                          |   |         |
|                        |                          |   |         |
| Non-delayed            | $I_i = I_n \times \dots$ |   | 6 - 10  |
|                        |                          |   |         |

**Technical data**

**General**

|   |  |      |  |
|---|--|------|--|
| Standards   |  |      | IEC/EN 60947   |
| Protection against direct contact   |  |      | Finger and back of hand proof to VDE 0106 Part 100                             |
| Climatic proofing   |  |      | Damp heat, constant, to IEC 60068-2-78<br>Damp heat, cyclic, to IEC 60068-2-30 |
| Ambient temperature   |  |      |  |
| Ambient temperature, storage  |  | °C   | - 40 - + 70  |
| Operation   |  | °C   | -25 - +70  |
| Mechanical shock resistance (10 ms half-sinusoidal shock) according to IEC 60068-2-27 |  | g    | 20 (half-sinusoidal shock 20 ms)   |
| Safe isolation to EN 61140  |  |      |  |
| Between auxiliary contacts and main contacts  |  | V AC | 500  |
| between the auxiliary contacts  |  | V AC | 300  |

|                   |  |  |   |
|-------------------|--|--|---|
| Mounting position |  |  | Vertical and 90° in all directions<br><ul style="list-style-type: none"> <li>With XFI earth-fault release:                     <ul style="list-style-type: none"> <li>- NZM1, N1, NZM2, N2: vertical and 90° in all directions with plug-in unit</li> <li>- NZM1, N1, NZM2, N2: vertical, 90° right/left with withdrawable unit:</li> <li>- NZM3, N3: vertical, 90° right/left</li> <li>- NZM4, N4: vertical with remote operator:</li> </ul> </li> </ul> |
|-------------------|--|--|---|

- NZM2, N(S)2, NZM3, N(S)3,  
NZM4, N(S)4: vertical and 90° in all  
directions

|  |  |  |  |
|--|--|--|--|
| Direction of incoming supply           |  |  | as required  |
| Degree of protection                   |  |  |  |
| Device                                 |  |  | In the operating controls area: IP20 (basic degree of protection)        |
| Enclosures                             |  |  | With insulating surround: IP40<br>With door coupling rotary handle: IP66 |
| Terminations                           |  |  | Tunnel terminal: IP10<br>Phase isolator and strip terminal: IP00         |
| Other technical data (sheet catalogue) |  |  | Temperature dependency, Derating   |

### Circuit-breakers

|   |             |      |       |
|---|-------------|------|-------|
| Rated current = rated uninterrupted current | $I_n = I_u$ | A    | 50    |
| Rated surge voltage invariability           | $U_{imp}$   |      |       |
| Main contacts                               |             | V    | 8000  |
| Auxiliary contacts                          |             | V    | 6000  |
| Rated operational voltage                   | $U_e$       | V AC | 690   |
| Overvoltage category/pollution degree       |             |      | III/3 |
| Rated insulation voltage                    | $U_i$       | V    | 1000  |
| Use in unearthed supply systems             |             | V    | ≤ 690 |

### Switching capacity

|   |            |       |   |
|---|------------|-------|---|
| Rated short-circuit making capacity   | $I_{cm}$   |       |   |
| 240 V   | $I_{cm}$   | kA    | 220   |
| 400/415 V   | $I_{cm}$   | kA    | 154   |
| 440 V 50/60 Hz  | $I_{cm}$   | kA    | 143   |
| 525 V 50/60 Hz  | $I_{cm}$   | kA    | 80  |
| 690 V 50/60 H   | $I_c$      | kA    | 40  |
| Rated short-circuit breaking capacity $I_{cn}$                              | $I_{cn}$   |       |   |
| $I_{cu}$ to IEC/EN 60947 test cycle O-t-CO                                  | $I_{cu}$   | kA    |   |
| 240 V 50/60 Hz  | $I_{cu}$   | kA    | 100   |
| 400/415 V 50/60 Hz  | $I_{cu}$   | kA    | 70  |
| 440 V 50/60 Hz  | $I_{cu}$   | kA    | 65  |
| 525 V 50/60 Hz  | $I_{cu}$   | kA    | 36  |
| 690 V 50/60 Hz  | $I_{cu}$   | kA    | 20  |
| $I_{cs}$ to IEC/EN 60947 test cycle O-t-CO-t-CO                             | $I_{cs}$   | kA    |   |
| 240 V 50/60 Hz  | $I_{cs}$   | kA    | 100   |
| 400/415 V 50/60 Hz  | $I_{cs}$   | kA    | 70  |
| 440 V 50/60 Hz  | $I_{cs}$   | kA    | 65  |
| 525 V 50/60 Hz  | $I_{cs}$   | kA    | 36  |
| 690 V 50/60 Hz  | $I_{cs}$   | kA    | 6   |
|   |            |       | Maximum back-up fuse, if the expected short-circuit currents at the installation location exceed the switching capacity of the circuit-breaker. |
| Rated short-time withstand current  |            |       |   |
| $t = 0.3$ s   | $I_{cw}$   | kA    | 1.9   |
| $t = 1$ s   | $I_{cw}$   | kA    | 1.9   |
| Utilization category to IEC/EN 60947-2                                      |            |       | A   |
| Lifespan, mechanical(of which max. 50 % trip by shunt/undervoltage release) | Operations |       | 20000   |
| Lifespan, electrical  |            |       |   |
| AC-1  |            |       |   |
| 400 V 50/60 Hz  | Operations |       | 10000   |
| 415 V 50/60 Hz  | Operations |       | 10000   |
| AC--3   |            |       |   |
| 415 V 50/60 Hz  | Operations |       | 6500  |
| Max. operating frequency  |            | Ops/h | 120   |
| Total break time at short-circuit   |            | ms    | < 10  |

## Terminal capacity

|   |      |                 |   |
|---|------|-----------------|---|
| Standard equipment  |      |                 | Screw connection                                      |
| Optional accessories                                      |      |                 | Box terminal<br>Tunnel terminal<br>connection on rear |
| Round copper conductor                                    |      |                 |   |
| Box terminal  |      |                 |   |
| Solid   |      | mm <sup>2</sup> | 1 x (10 - 16)<br>2 x (6 - 16)                         |
| Stranded  |      | mm <sup>2</sup> | 1 x (25 - 185)<br>2 x (25 - 70)                       |
| Tunnel terminal   |      |                 |   |
| Solid   |      | mm <sup>2</sup> | 1 x 16  |
| Stranded  |      |                 |   |
| 1-hole  |      | mm <sup>2</sup> | 1 x (25 - 185)  |
| Bolt terminal and rear-side connection                    |      |                 |   |
| Direct on the switch                                      |      |                 |   |
| Solid   |      | mm <sup>2</sup> | 1 x (10 - 16)<br>2 x (6 - 16)                         |
| Stranded  |      | mm <sup>2</sup> | 1 x (25 - 185)<br>2 x (25 - 70)                       |
| Al circular conductor                                     |      |                 |   |
| Tunnel terminal   |      |                 |   |
| Solid   |      | mm <sup>2</sup> | 1 x 16  |
| Stranded  |      |                 |   |
| Stranded  |      | mm <sup>2</sup> | 1 x (25 - 185)  |
| Cu strip (number of segments x width x segment thickness) |      |                 |   |
| Box terminal  |      |                 |   |
|   | min. | mm              | 2 x 9 x 0.8   |
|   | max. | mm              | 10 x 16 x 0.8<br>(2x) 8 x 15.5 x 0,8                  |
| Bolt terminal and rear-side connection                    |      |                 |   |
| Flat copper strip, with holes                             | min. | mm              | 2 x 16 x 0.8  |
| Flat copper strip, with holes                             | max. | mm              | 10 x 24 x 0.8   |
| Copper busbar (width x thickness)                         |      | mm              |   |
| Bolt terminal and rear-side connection                    |      |                 |   |
| Screw connection  |      |                 | M8  |
| Direct on the switch                                      |      |                 |   |
|   | min. | mm              | 16 x 5  |
|   | max. | mm              | 24 x 8  |
| Control cables  |      |                 |   |
|   |      | mm <sup>2</sup> | 1 x (0.75 - 2.5)<br>2 x (0.75 - 1.5)                  |

## Design verification as per IEC/EN 61439

|  |                  |    |  |
|--|------------------|----|--|
| Technical data for design verification   |                  |    |  |
| Rated operational current for specified heat dissipation   | I <sub>n</sub>   | A  | 50   |
| Equipment heat dissipation, current-dependent  | P <sub>vid</sub> | W  | 17.03                                      |
| Operating ambient temperature min.   |                  | °C | -25  |
| Operating ambient temperature max.   |                  | °C | 70   |
| IEC/EN 61439 design verification   |                  |    |  |
| 10.2 Strength of materials and parts   |                  |    |  |
| 10.2.2 Corrosion resistance  |                  |    |  |
| 10.2.2.1 Verification of thermal stability of enclosures   |                  |    | Meets the product standard's requirements. |
| 10.2.2.2 Verification of resistance of insulating materials to normal heat   |                  |    | Meets the product standard's requirements. |
| 10.2.2.3 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) / Power circuit-breaker for trafo/generator/installation protection (EC000228)   |    |  |
| Electric engineering, automation, process control engineering / Low-voltage switch technology / Circuit breaker (LV < 1 kV) / Circuit breaker for power transformer, generator and system protection (ecf@ss10.0.1-27-37-04-09 [AJZ716013]) |    |  |
| Rated permanent current I <sub>u</sub>  | A  | 50                                       |
| Rated voltage   | V  | 690 - 690                                |
| Rated short-circuit breaking capacity I <sub>cu</sub> at 400 V, 50 Hz   | kA | 70                                       |
| Overload release current setting  | A  | 40 - 50                                  |
| Adjustment range short-term delayed short-circuit release   | A  | 0 - 0                                    |
| Adjustment range undelayed short-circuit release  | A  | 300 - 500                                |
| Integrated earth fault protection   |    | No                                       |
| Type of electrical connection of main circuit   |    | Screw connection                         |
| Device construction   |    | Built-in device fixed built-in technique |
| Suitable for DIN rail (top hat rail) mounting   |    | No                                       |
| DIN rail (top hat rail) mounting optional   |    | Yes                                      |
| Number of auxiliary contacts as normally closed contact   |    | 0  |
| Number of auxiliary contacts as normally open contact   |    | 0  |
| Number of auxiliary contacts as change-over contact   |    | 0  |
| With switched-off indicator   |    | No                                       |
| With under voltage release  |    | No                                       |
| Number of poles   |    | 3  |
| Position of connection for main current circuit   |    | Front side                               |
| Type of control element   |    | Rocker lever                             |
| Complete device with protection unit  |    | Yes                                      |
| Motor drive integrated  |    | No                                       |
| Motor drive optional  |    | Yes                                      |
| Degree of protection (IP)   |    | IP20                                     |

# Characteristics





Let-through current



Let-through energy







### Additional product information (links)

Temperature dependency, Derating

<http://ecat.moeller.net/flip-cat/?edition=HPLEN&startpage=17.172>

additional technical information for NZM power switch

[https://es-assets.eaton.com/DOCUMENTATION/PDF/nzm\\_techinc\\_de\\_en.pdf](https://es-assets.eaton.com/DOCUMENTATION/PDF/nzm_techinc_de_en.pdf)