






Circuit-breaker, 3p, 50A, box terminals

Part no. **NZMN2-AF50-BT-NA**  
 Catalog No. **107638**

Similar to illustration

## Delivery program

|   |                          |    |  |  |
|---|--------------------------|----|--|--|
| Product range   |                          |    |  | Circuit-breaker  |
| Protective function   |                          |    |  | System and cable protection  |
| Standard/Approval   |                          |    |  | UL/CSA, IEC  |
| Release system  |                          |    |  | Thermomagnetic release   |
| Installation type   |                          |    |  | Fixed  |
| Description   |                          |    |  | Switches conform to UL/CSA as well as the IEC regulations. IEC switching performance values are contained on the rating plate.<br>Fixed overload releases Ir |
| Frame size  |                          |    |  | NZM2   |
| Number of poles   |                          |    |  | 3 pole   |
| Standard equipment  |                          |    |  | Box terminal   |
| <b>Switching capacity</b>   |                          |    |  |  |
| SCCR 480Y/277 V 60 Hz   | $I_{cu}$                 | kA |  | 35   |
| SCCR 480 V 60 Hz  | $I_{cu}$                 | kA |  | 35   |
| SCCR 600Y/347 V 60 Hz   | $I_{cu}$                 | kA |  | 25   |
| <b>Rated current = rated uninterrupted current</b>                                  |                          |    |  |  |
| Rated current = rated uninterrupted current   | $I_n = I_u$              | A  |  | 50   |
| <b>Setting range</b>  |                          |    |  |  |
| Overload trip   |                          |    |  |  |
|  | $I_r$                    | A  |  | 50 - 50  |
| Short-circuit releases  |                          |    |  |  |
|  |                          |    |  |  |
| Non-delayed   | $I_j = I_n \times \dots$ |    |  | 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  |
| Weight  |  | kg   |  | 2.345  |
| Mounting position   |  |      |  |  |
| Mounting position   |  |      |  | Vertical and 90° in all directions   |



With XFI earth-fault release:

- NZM1, N1, NZM2, N2: vertical and 90° in all directions with plug-in unit
- NZM1, N1, NZM2, N2: vertical, 90° right/left with withdrawable unit:
- NZM3, N3: vertical, 90° right/left
- NZM4, N4: vertical with remote operator:
- 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) |  | Weight<br>Temperature dependency, Derating<br>Effective power loss       |

### Circuit-breakers

|                                       |           |      |       |
|---------------------------------------|-----------|------|-------|
| 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      | 187   |
| 400/415 V   | $I_{cm}$ | kA      | 105   |
| 440 V 50/60 Hz  | $I_{cm}$ | kA      | 74  |
| 525 V 50/60 Hz  | $I_{cm}$ | kA      | 53  |
| 690 V 50/60 Hz  | $I_c$    | 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      | 85  |
| 400/415 V 50/60 Hz  | $I_{cu}$ | kA      | 50  |
| 440 V 50/60 Hz  | $I_{cu}$ | kA      | 35  |
| 525 V 50/60 Hz  | $I_{cu}$ | kA      | 25  |
| 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      | 85  |
| 400/415 V 50/60 Hz  | $I_{cs}$ | kA      | 50  |
| 440 V 50/60 Hz  | $I_{cs}$ | kA      | 35  |
| 525 V 50/60 Hz  | $I_{cs}$ | kA      | 25  |
| 690 V 50/60 Hz  | $I_{cs}$ | kA      | 5   |
| Maximum low-voltage h.b.c. fuse                                     |          | A gG/gL | 355   |
|   |          |         | Maximum back-up fuse, if the expected short-circuit currents at the installation location exceed the switching capacity of the circuit-breaker. |
| <b>Technical data that diverge from products for the IEC market</b> |          |         |   |
| Switching capacity of NA switches (UL489, CSA 22.2 No. 5.1)         |          |         |   |
| Short-circuit current rating SCCR                                   |          |         |   |
| SCCR 240 V 60 Hz  | $I_{cu}$ | kA      | 85  |
| SCCR 480Y/277 V 60 Hz   | $I_{cu}$ | kA      | 35  |
| SCCR 480 V 60 Hz  | $I_{cu}$ | kA      | 35  |
| SCCR 600Y/347 V 60 Hz   | $I_{cu}$ | kA      | 25  |

|   |                 |       |                  |
|---|-----------------|-------|------------------|
| Rated short-time withstand current  |                 |       |                  |
| t = 0.3 s   | I <sub>cw</sub> | kA    | 1.9              |
| t = 1 s   | I <sub>cw</sub> | 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            |
| 690 V 50/60 Hz  | Operations      |       | 7500             |
| AC--3   |                 |       |                  |
| 400 V 50/60 Hz  | Operations      |       | 6500             |
| 415 V 50/60 Hz  | Operations      |       | 6500             |
| 690 V 50/60 Hz  | Operations      |       | 5000             |
| Max. operating frequency  |                 | Ops/h | 120              |
| Total break time at short-circuit   |                 | ms    | < 10             |

### Terminal capacity

|   |      |                 |                                    |              |
|---|------|-----------------|------------------------------------|--------------|
| Standard equipment  |      |                 |                                    | Box terminal |
| Round copper conductor                                    |      |                 |                                    |              |
| Box terminal  |      |                 |                                    |              |
| Solid   |      | mm <sup>2</sup> | 1 x (12 ... 6)                     |              |
| Stranded  |      | mm <sup>2</sup> | 1 x (4 ... 350)                    |              |
| Tunnel terminal   |      |                 |                                    |              |
| Solid   |      | mm <sup>2</sup> | 1 x 16                             |              |
| Stranded  |      |                 |                                    |              |
| Stranded  |      | mm <sup>2</sup> | 1 x (4 ... 350)                    |              |
| Bolt terminal and rear-side connection                    |      |                 |                                    |              |
| Direct on the switch                                      |      |                 |                                    |              |
| Solid   |      | mm <sup>2</sup> | 1 x (11 ... 6)                     |              |
| Stranded  |      | mm <sup>2</sup> | 1 x (4 ... 3/0)                    |              |
| Al conductors, Cu cable                                   |      |                 |                                    |              |
| Tunnel terminal   |      |                 |                                    |              |
| Solid   |      | mm <sup>2</sup> | 1 x 16                             |              |
| 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 16 x 0.8                      |              |
| 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                      |              |
| 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 16 x 0.8                      |              |
| Copper busbar (width x thickness)                         |      |                 |                                    |              |
| Bolt terminal and rear-side connection                    |      |                 |                                    |              |
| Screw connection  |      |                 | M8                                 |              |
| Direct on the switch                                      |      |                 |                                    |              |
|   | min. | mm              | 16 x 5                             |              |
|   | max. | mm              | 20 x 5                             |              |
| Control cables  |      |                 |                                    |              |
|   |      | mm <sup>2</sup> | 1 x (18 ... 14)<br>2 x (18 ... 16) |              |

### 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  |                  |    | 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) / 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 (ecl@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 | 50                                       |
| Overload release current setting  |  | A  | 50 - 50                                  |
| Adjustment range short-term delayed short-circuit release   |  | A  | 0 - 0                                    |
| Adjustment range undelayed short-circuit release  |  | A  | 6 - 10                                   |
| Integrated earth fault protection   |  |    | No                                       |
| Type of electrical connection of main circuit   |  |    | Frame clamp                              |
| 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                             |

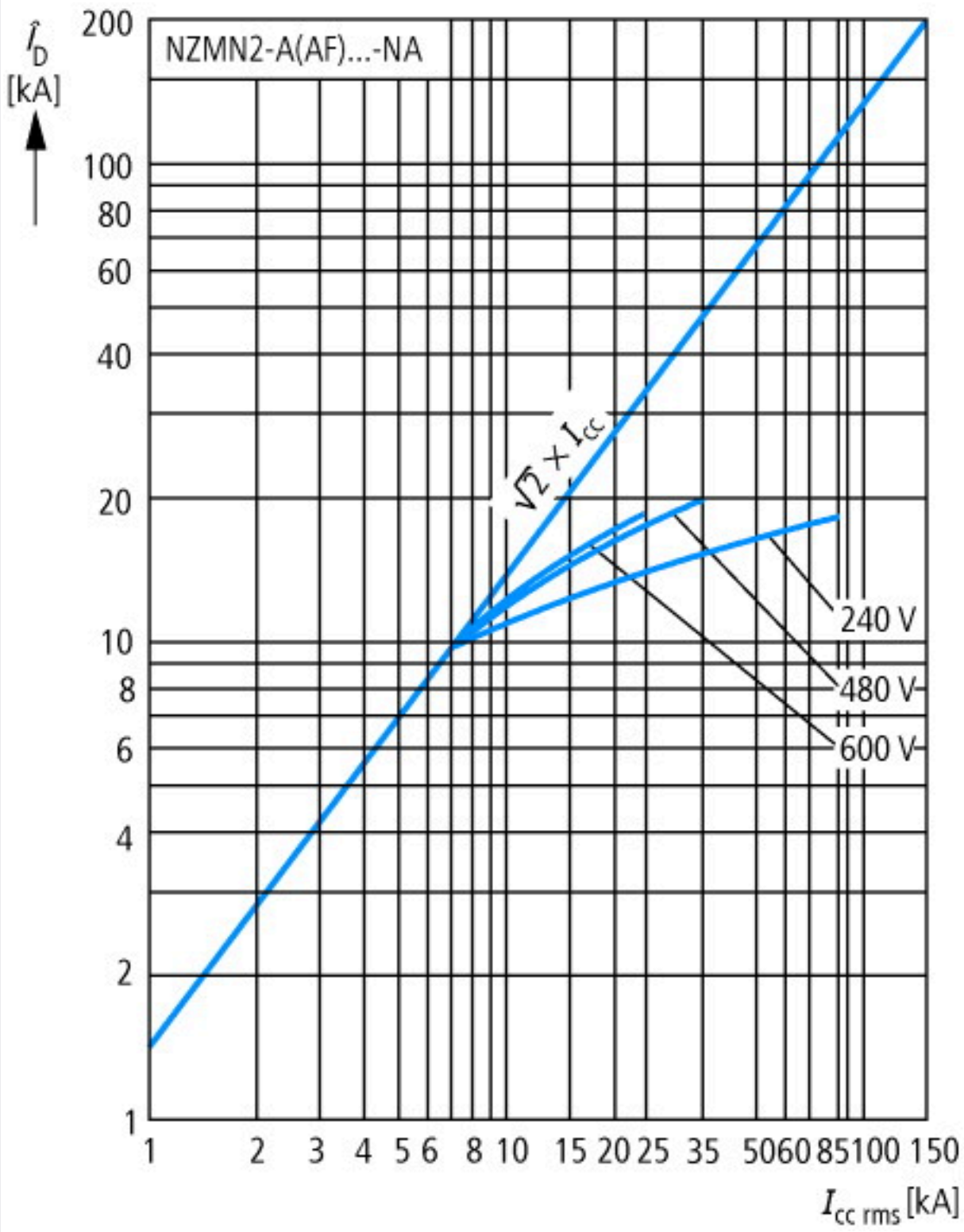
|                                      |  |      |
|--------------------------------------|--|------|
| Complete device with protection unit |  | Yes  |
| Motor drive integrated               |  | No   |
| Motor drive optional                 |  | Yes  |
| Degree of protection (IP)            |  | IP20 |

## Approvals

|                                      |  |   |
|--------------------------------------|--|---|
| Product Standards                    |  | UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking |
| UL File No.                          |  | E31593  |
| UL Category Control No.              |  | DIVQ  |
| CSA File No.                         |  | 022086  |
| CSA Class No.                        |  | 1432-01   |
| North America Certification          |  | UL listed, CSA certified                            |
| Specially designed for North America |  | Yes   |
| Suitable for                         |  | Feeder circuits, branch circuits                    |
| Current Limiting Circuit-Breaker     |  | Yes   |
| Max. Voltage Rating                  |  | 600Y/347 V, 480 V                                   |
| Degree of Protection                 |  | IEC: IP20; UL/CSA Type: -                           |

# Characteristics













### Additional product information (links)

#### IL01206006Z (AWA1230-1916) Circuit-Breaker, basic unit

|  |   |
|--|---|
| IL01206006Z (AWA1230-1916) Circuit-Breaker, basic unit | <a href="ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL01206006Z2015_11.pdf">ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL01206006Z2015_11.pdf</a> |
| Weight   | <a href="http://ecat.moeller.net/flip-cat/?edition=HPLEN&amp;startpage=17.171">http://ecat.moeller.net/flip-cat/?edition=HPLEN&amp;startpage=17.171</a>               |
| Temperature dependency, Derating                       | <a href="http://ecat.moeller.net/flip-cat/?edition=HPLEN&amp;startpage=17.172">http://ecat.moeller.net/flip-cat/?edition=HPLEN&amp;startpage=17.172</a>               |
| Effective power loss                                   | <a href="http://ecat.moeller.net/flip-cat/?edition=HPLEN&amp;startpage=17.174">http://ecat.moeller.net/flip-cat/?edition=HPLEN&amp;startpage=17.174</a>               |
| additional technical information for NZM power switch  | <a href="ftp://ftp.moeller.net/DOCUMENTATION/PDF/nzm_techinc_de_en.pdf">ftp://ftp.moeller.net/DOCUMENTATION/PDF/nzm_techinc_de_en.pdf</a>                             |