






**Circuit-breaker, 3p, 90A**

**Part no. NZMB1-AF90-NA**  
**Catalog No. 272251**

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 I <sub>r</sub> |
| Frame size  |                                       |    |  | NZM1   |
| Number of poles   |                                       |    |  | 3 pole   |
| Standard equipment  |                                       |    |  | Box terminal   |
| <b>Switching capacity</b>   |                                       |    |  |  |
| SCCR 480Y/277 V 60 Hz   | I <sub>cu</sub>                       | kA |  | 25   |
| <b>Rated current = rated uninterrupted current</b>                                  |                                       |    |  |  |
| Rated current = rated uninterrupted current   | I <sub>n</sub> = I <sub>u</sub>       | A  |  | 90   |
| <b>Setting range</b>  |                                       |    |  |  |
| Overload trip   |                                       |    |  |  |
|  | I <sub>r</sub>                        | A  |  | 90 - 90  |
| Short-circuit releases  |                                       |    |  |  |
|  |                                       |    |  |  |
| Non-delayed   | I <sub>i</sub> = I <sub>n</sub> x ... |    |  | Approx. 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   |  |      |  |  |
| 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    | 6000  |
| Auxiliary contacts                    |           | V    | 6000  |
| Rated operational voltage             | $U_e$     | V AC | 440   |
| Overvoltage category/pollution degree |           |      | III/3 |
| Rated insulation voltage              | $U_i$     | V    | 690   |
| Use in unearthed supply systems       |           | V    | ≤ 440 |

### Switching capacity

|  |            |         |   |
|--|------------|---------|---|
| Rated short-circuit making capacity  | $I_{cm}$   |         |   |
| 240 V  | $I_{cm}$   | kA      | 63  |
| 400/415 V  | $I_{cm}$   | kA      | 53  |
| 440 V 50/60 Hz   | $I_{cm}$   | kA      | 53  |
| 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      | 30  |
| 400/415 V 50/60 Hz   | $I_{cu}$   | kA      | 25  |
| 440 V 50/60 Hz   | $I_{cu}$   | kA      | 25  |
| $I_{cs}$ to IEC/EN 60947 test cycle O-t-CO-t-CO                              | $I_{cs}$   | kA      |   |
| 240 V 50/60 Hz   | $I_{cs}$   | kA      | 30  |
| 400/415 V 50/60 Hz   | $I_{cs}$   | kA      | 25  |
| 440 V 50/60 Hz   | $I_{cs}$   | kA      | 18.5  |
| Maximum low-voltage h.b.c. fuse  |            | A gG/gL | 200   |
|  |            |         | 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      | 35  |
| SCCR 480Y/277 V 60 Hz  | $I_{cu}$   | kA      | 25  |
| 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 |         | 7500  |
| 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 (25 - 70)<br>2 x 25            |
| Tunnel terminal   |      |                 |                                    |
| Solid   |      | mm <sup>2</sup> | 1 x (16 - 95)                      |
| Stranded  |      |                 |                                    |
| Stranded  |      | mm <sup>2</sup> | 1 x (4 ... 3/0)                    |
| Bolt terminal and rear-side connection                    |      |                 |                                    |
| Direct on the switch                                      |      |                 |                                    |
| Solid   |      | mm <sup>2</sup> | 1 x (12 ... 6)<br>2 x (9 ... 6)    |
| Stranded  |      | mm <sup>2</sup> | 1 x (4 ... 2/0)                    |
| Al conductors, Cu cable                                   |      |                 |                                    |
| Tunnel terminal   |      |                 |                                    |
| Solid   |      | mm <sup>2</sup> | 1 x 16                             |
| Cu strip (number of segments x width x segment thickness) |      |                 |                                    |
| Box terminal  |      |                 |                                    |
|   | min. | mm              | 2 x 9 x 0.8                        |
|   | max. | mm              | 9 x 9 x 0.8                        |
| Copper busbar (width x thickness)                         | mm   |                 |                                    |
| Bolt terminal and rear-side connection                    |      |                 |                                    |
| Screw connection  |      |                 | M8                                 |
| Direct on the switch                                      |      |                 |                                    |
|   | min. | mm              | 12 x 5                             |
|   | max. | mm              | 16 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  | 90   |
| Equipment heat dissipation, current-dependent  | P <sub>vid</sub> | W  | 17.74  |
| 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

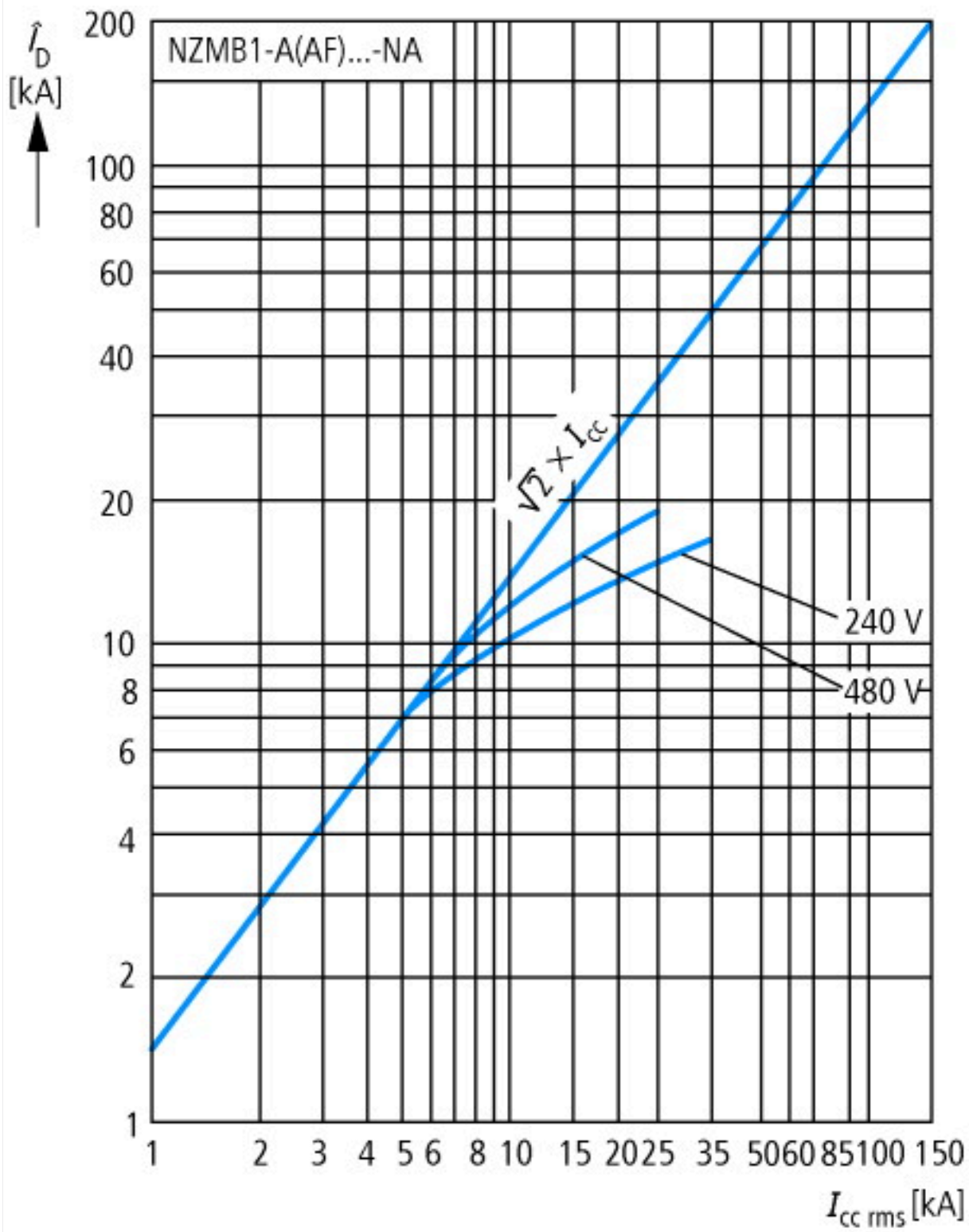
|  |    |  |
|--|----|--|
| Low-voltage industrial components (EG000017) / Power circuit-breaker for trafo/generator/installation protection (EC000228)  |    |  |
| Electric engineering, automation, process control engineering / Low-voltage switch technology / Circuit breaker (LV < 1 kV) / Circuit breaker for power transformer, generator and system protection (ec@ss10.0.1-27-37-04-09 [AJZ716013]) |    |  |
| Rated permanent current I <sub>u</sub>   | A  | 90                                       |
| Rated voltage  | V  | 440 - 440                                |
| Rated short-circuit breaking capacity I <sub>cu</sub> at 400 V, 50 Hz  | kA | 25                                       |
| Overload release current setting   | A  | 90 - 90                                  |
| Adjustment range short-term delayed short-circuit release  | A  | 0 - 0                                    |
| Adjustment range undelayed short-circuit release   | A  | 600 - 1000                               |
| 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   |    | No                                       |
| Degree of protection (IP)  |    | IP20                                     |

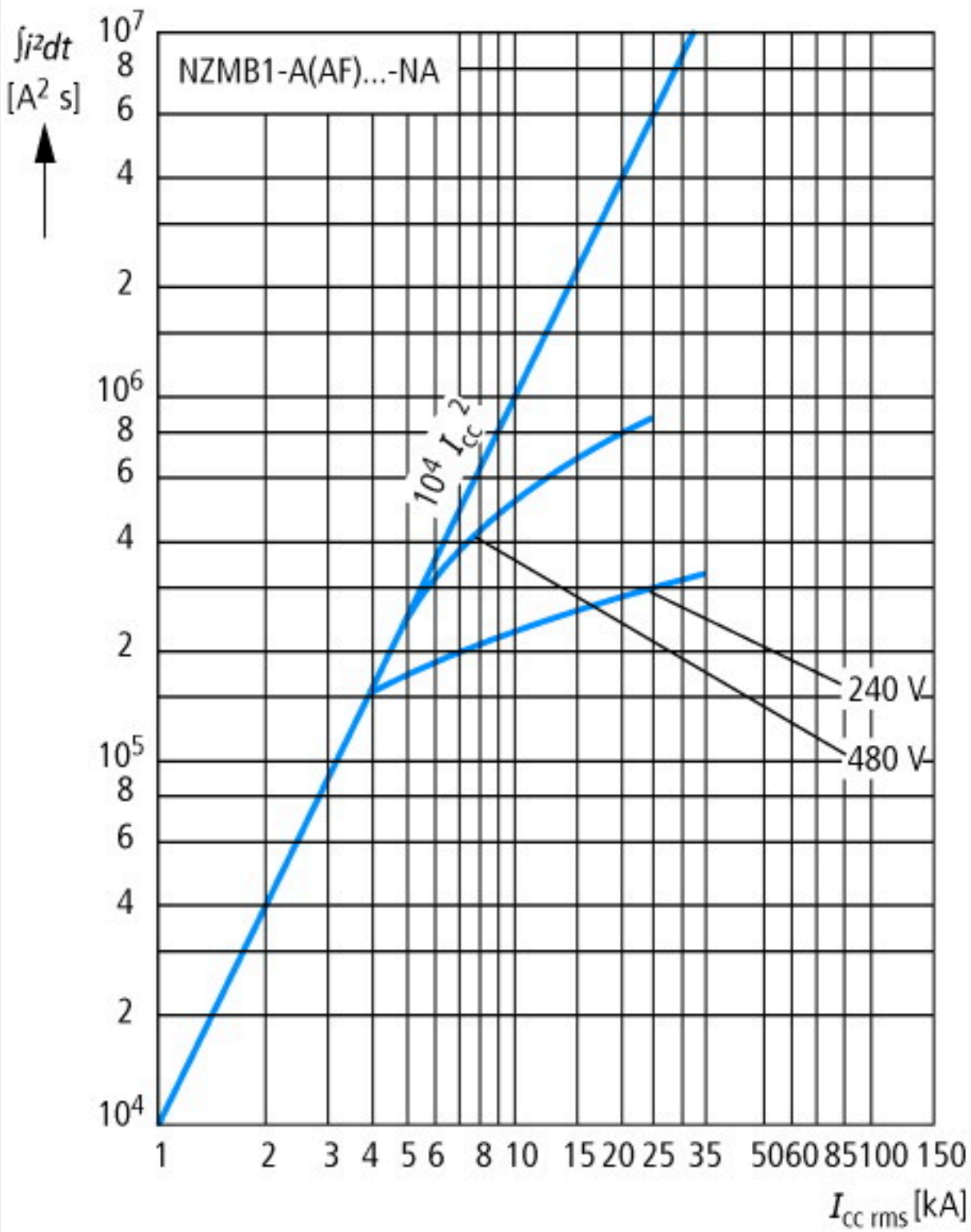
## Approvals

|                                      |  |   |
|--------------------------------------|--|---|
| 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                  |  | 480Y/277 V  |
| Degree of Protection                 |  | IEC: IP20; UL/CSA Type: -                           |

# Characteristics







## Dimensions



① Blow out area, minimum clearance to adjacent parts





### Additional product information (links)

#### IL01203004Z (AWA1230-1913) Circuit-breaker, Switch-Disconnecter

|   |   |
|---|---|
| IL01203004Z (AWA1230-1913) Circuit-breaker, Switch-Disconnecter | <a href="https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL01203004Z2015_11.pdf">https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL01203004Z2015_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="https://es-assets.eaton.com/DOCUMENTATION/PDF/nzm_technic_de_en.pdf">https://es-assets.eaton.com/DOCUMENTATION/PDF/nzm_technic_de_en.pdf</a>                             |