







Circuit-breaker, 3p, 250A, box terminals

Part no. **NZMH2-VEF250-BT-NA**  
 Catalog No. **107842**

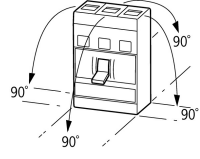
Similar to illustration

## Delivery program

|   |  |    |  |   |
|---|--|----|--|---|
| Product range   |  |    |  | Circuit-breaker   |
| Protective function   |  |    |  | Systems, cable, selectivity and generator protection  |
| Standard/Approval   |  |    |  | UL/CSA, IEC   |
| Release system  |  |    |  | Electronic 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><br>R.m.s. value measurement and "thermal memory"<br>adjustable time delay setting to overcome current peaks t <sub>r</sub> : 2 – 20 s at 6 x I <sub>r</sub><br>Adjustable delay time t <sub>sd</sub> : Steps: 0, 20, 60, 100, 200, 300, 500, 750, 1000 ms<br>i <sup>2</sup> t constant function: fixed OFF |
| Frame size  |  |    |  | NZM2  |
| Number of poles   |  |    |  | 3 pole  |
| Standard equipment  |  |    |  | Box terminal  |
| <b>Switching capacity</b>   |  |    |  |   |
| SCCR 480Y/277 V 60 Hz   | I <sub>cu</sub>                        | kA |  | 100   |
| SCCR 480 V 60 Hz  | I <sub>cu</sub>                        | kA |  | 100   |
| SCCR 600Y/347 V 60 Hz   | I <sub>cu</sub>                        | kA |  | 50  |
| <b>Rated current = rated uninterrupted current</b>                                  |  |    |  |   |
| Rated current = rated uninterrupted current   | I <sub>n</sub> = I <sub>u</sub>        | A  |  | 250   |
| <b>Setting range</b>  |  |    |  |   |
| Overload trip   |  |    |  |   |
|  |  |    |  |   |
| Overload release, min.  | I <sub>r</sub>                         | A  |  | 250   |
| Short-circuit releases  |  |    |  |   |
|  |  |    |  |   |
| Non-delayed   | I <sub>i</sub> = I <sub>n</sub> x ...  |    |  | 3000 A fixed  |
|  |  |    |  |   |
| Delayed   | I <sub>sd</sub> = I <sub>r</sub> x ... |    |  | 2 - 10  |
|  |  |    |  |   |

## Technical data

|                                   |  |    |  |  |
|-----------------------------------|--|----|--|--|
| <b>General</b>                    |  |    |  |  |
| 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   |  |      | <p>Vertical and 90° in all directions</p>  <p>With XFI earth-fault release:<br/> - NZM1, N1, NZM2, N2: vertical and 90° in all directions<br/> with plug-in unit<br/> - NZM1, N1, NZM2, N2: vertical, 90° right/left<br/> with withdrawable unit:<br/> - NZM3, N3: vertical, 90° right/left<br/> - NZM4, N4: vertical<br/> with remote operator:<br/> - NZM2, N(S)2, NZM3, N(S)3, NZM4, N(S)4: vertical and 90° in all directions</p> |
| 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      | 330   |
| 400/415 V                                      | $I_{cm}$ | kA      | 330   |
| 440 V 50/60 Hz                                 | $I_{cm}$ | kA      | 286   |
| 525 V 50/60 Hz                                 | $I_{cm}$ | kA      | 105   |
| 690 V 50/60 H                                  | $I_c$    | kA      | 40  |
| Rated short-circuit breaking capacity $I_{cn}$ | $I_{cn}$ |         |   |
| Icu to IEC/EN 60947 test cycle O-t-CO          | $I_{cu}$ | kA      |   |
| 240 V 50/60 Hz                                 | $I_{cu}$ | kA      | 150   |
| 400/415 V 50/60 Hz                             | $I_{cu}$ | kA      | 150   |
| 440 V 50/60 Hz                                 | $I_{cu}$ | kA      | 130   |
| 525 V 50/60 Hz                                 | $I_{cu}$ | kA      | 50  |
| 690 V 50/60 Hz                                 | $I_{cu}$ | kA      | 20  |
| Ics to IEC/EN 60947 test cycle O-t-CO-t-CO     | $I_{cs}$ | kA      |   |
| 240 V 50/60 Hz                                 | $I_{cs}$ | kA      | 150   |
| 400/415 V 50/60 Hz                             | $I_{cs}$ | kA      | 150   |
| 440 V 50/60 Hz                                 | $I_{cs}$ | kA      | 130   |
| 525 V 50/60 Hz                                 | $I_{cs}$ | kA      | 37.5  |
| 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. |

**Technical data that diverge from products for the IEC market**

Switching capacity of NA switches (UL489, CSA 22.2 No. 5.1)

Short-circuit current rating SCCR

|   |                 |            |       |
|---|-----------------|------------|-------|
| SCCR 240 V 60 Hz  | I <sub>cu</sub> | kA         | 150   |
| SCCR 480Y/277 V 60 Hz   | I <sub>cu</sub> | kA         | 100   |
| SCCR 480 V 60 Hz  | I <sub>cu</sub> | kA         | 100   |
| SCCR 600Y/347 V 60 Hz   | I <sub>cu</sub> | kA         | 50    |
| 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  | 250  |
| Equipment heat dissipation, current-dependent  | P <sub>vid</sub> | W  | 51.56  |
| 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  |                  |    |  |
| 10.2.3.1 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

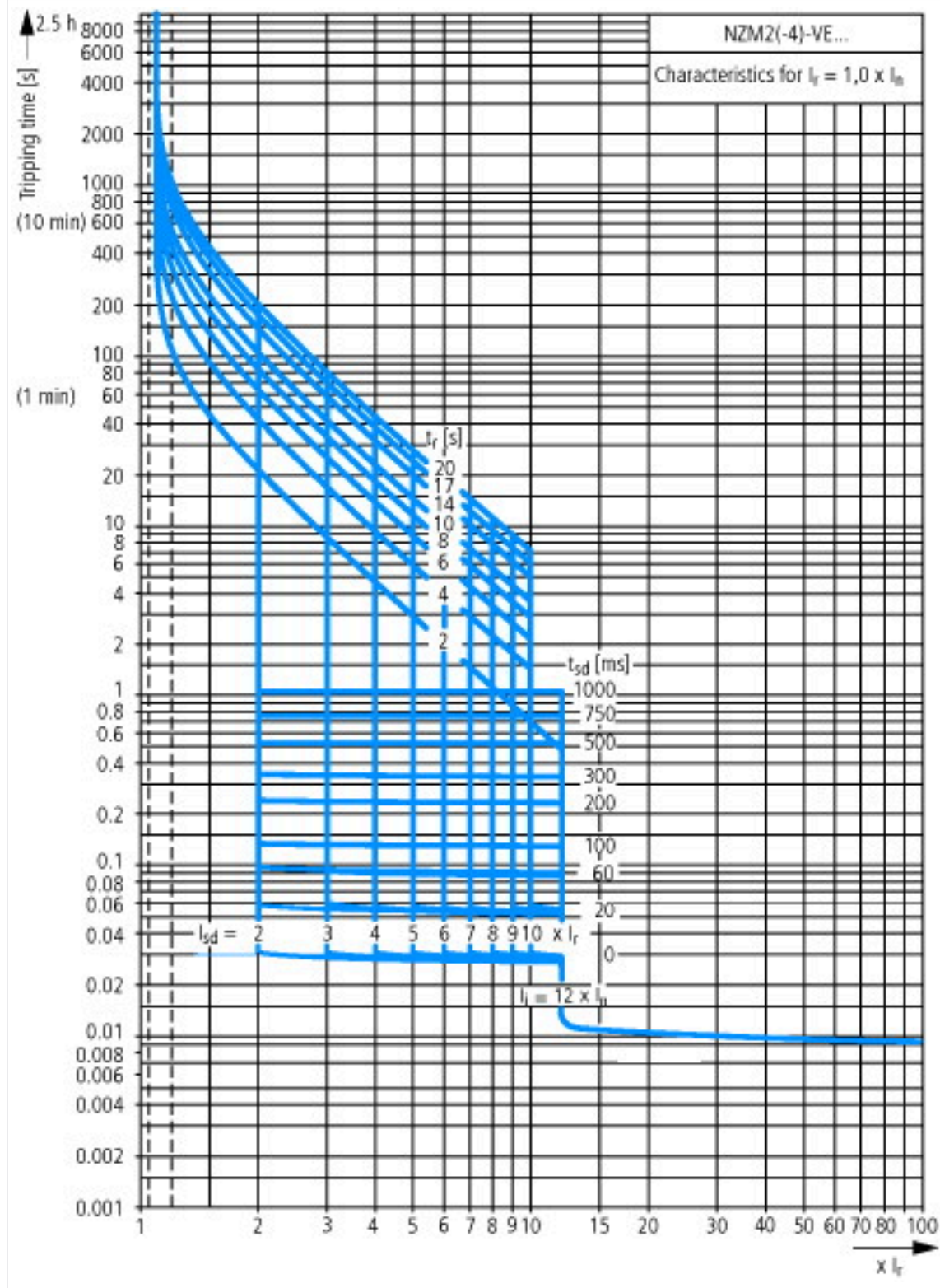
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|---|--|----|--|
| Low-voltage industrial components (EG000017) / Power circuit-breaker for trafo/generator/installation protection (EC000228)   |  |    |  |
| Electric engineering, automation, process control engineering / Low-voltage switch technology / 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  | 250                                      |
| Rated voltage   |  | V  | 690 - 690                                |
| Rated short-circuit breaking capacity I <sub>cu</sub> at 400 V, 50 Hz   |  | kA | 150                                      |
| Overload release current setting  |  | A  | 250 - 250                                |
| Adjustment range short-term delayed short-circuit release   |  | A  | 500 - 2500                               |
| Adjustment range undelayed short-circuit release  |  | A  | 3000 - 3000                              |
| 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  |

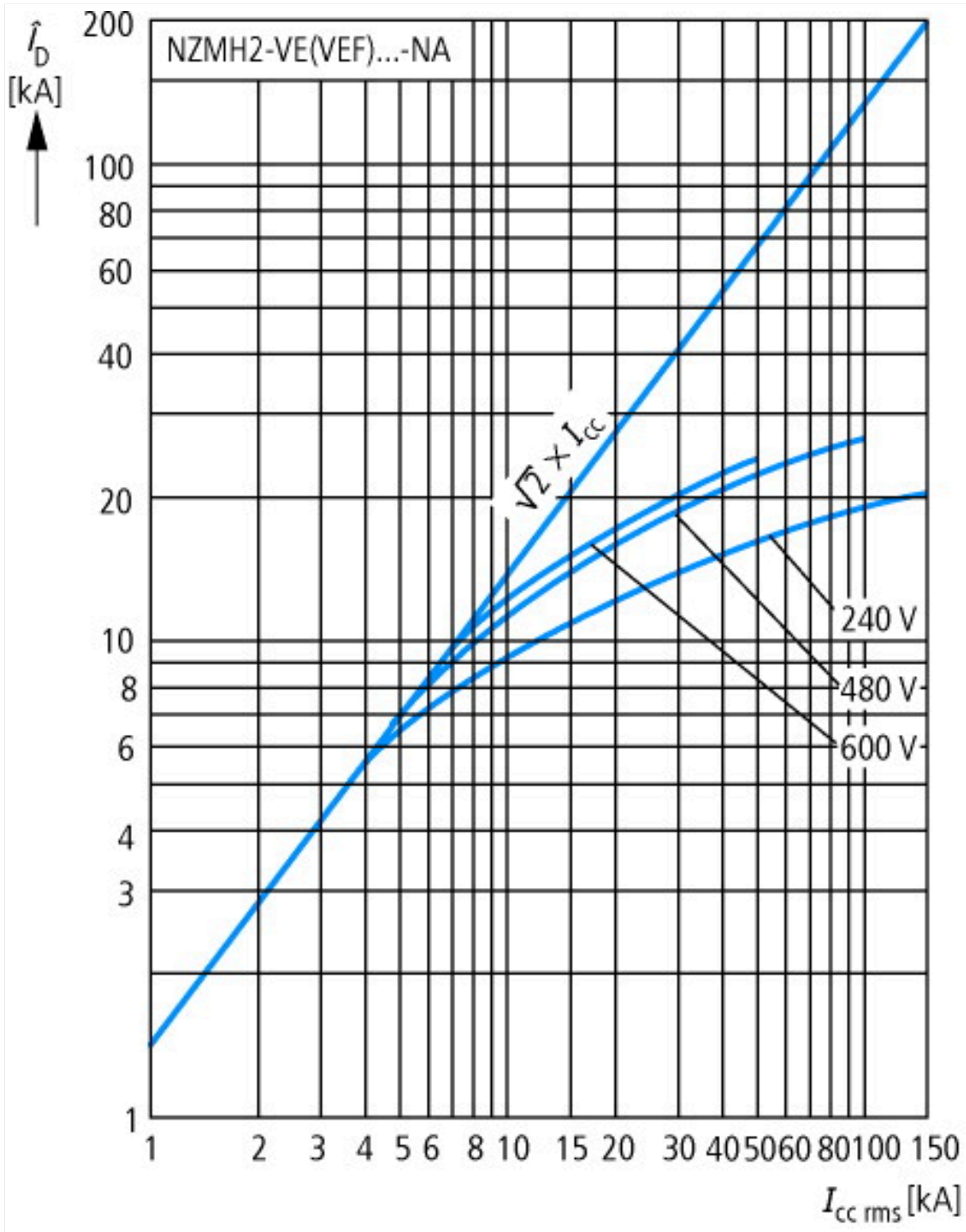
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|---|--|--------------|
| With switched-off indicator                     |  | No           |
| With under voltage release                      |  | No           |
| Number of poles                                 |  | 3            |
| Position of 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         |

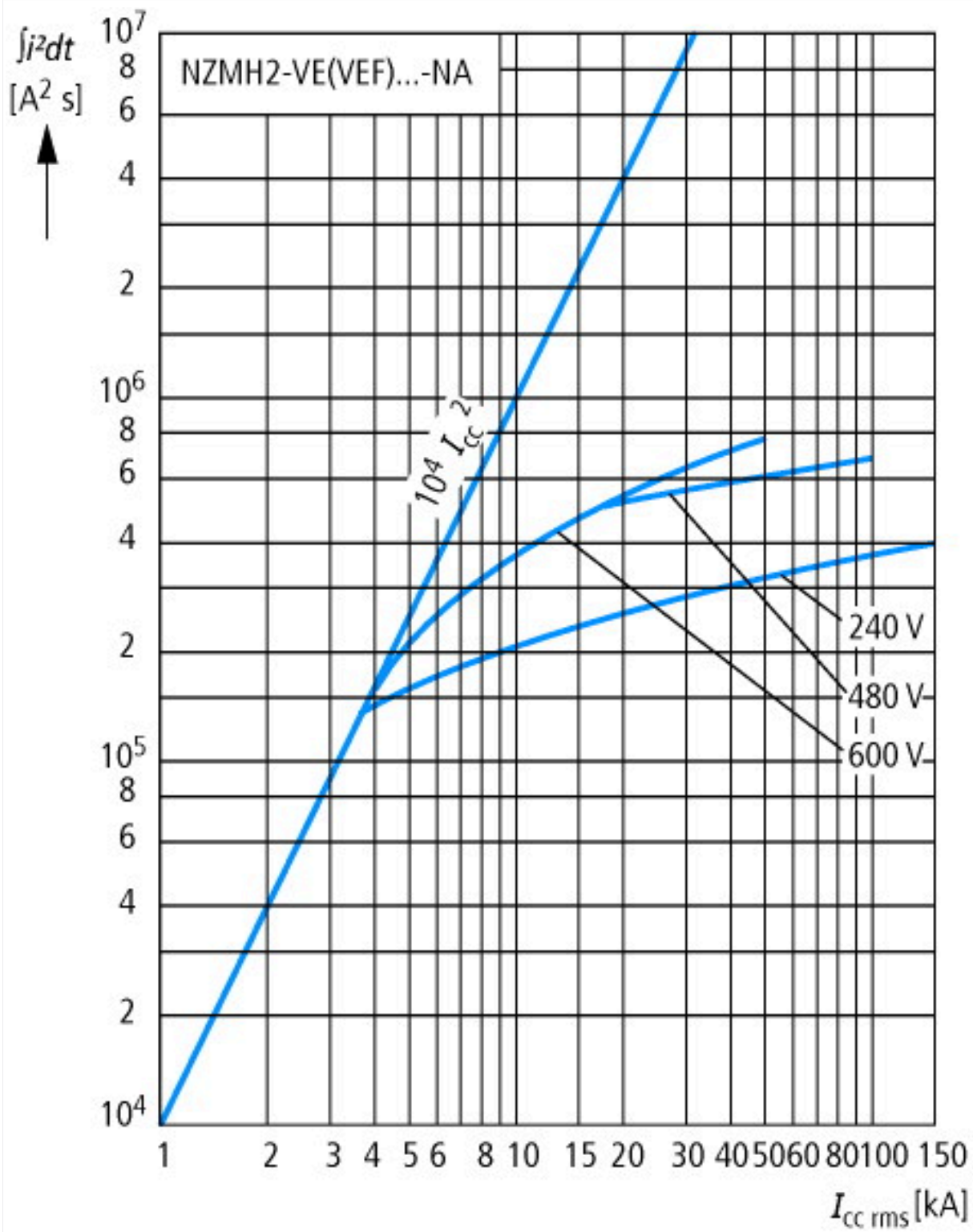
## Approvals

|                                      |  |   |
|--------------------------------------|--|---|
| 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>                             |