






**Circuit-breaker, 3p, 80A**

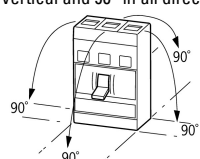
**Part no. NZMN1-AF80-NA**  
**Catalog No. 274234**

Similar to illustration

**Delivery program**

|                                                                                     |                          |    |  |                             |
|-------------------------------------------------------------------------------------|--------------------------|----|--|-----------------------------|
| Product range                                                                       |                          |    |  | Circuit-breaker             |
| Protective function                                                                 |                          |    |  | System and cable protection |
| Standard/Approval                                                                   |                          |    |  | IEC, UL                     |
| Release system                                                                      |                          |    |  | Thermomagnetic release      |
| Installation type                                                                   |                          |    |  | Fixed                       |
| Description                                                                         |                          |    |  | Fixed overload releases Ir  |
| Frame size                                                                          |                          |    |  | NZM1                        |
| Number of poles                                                                     |                          |    |  | 3 pole                      |
| Standard equipment                                                                  |                          |    |  | Box terminal                |
| <b>Switching capacity</b>                                                           |                          |    |  |                             |
| SCCR 480Y/277 V 60 Hz                                                               | $I_{cu}$                 | kA |  | 35                          |
| <b>Rated current = rated uninterrupted current</b>                                  |                          |    |  |                             |
| Rated current = rated uninterrupted current                                         | $I_n = I_u$              | A  |  | 80                          |
| <b>Setting range</b>                                                                |                          |    |  |                             |
| Overload trip                                                                       |                          |    |  |                             |
|  | $I_r$                    | A  |  | 80 - 80                     |
| Short-circuit releases                                                              |                          |    |  |                             |
|  |                          |    |  |                             |
| Non-delayed                                                                         | $I_i = I_n \times \dots$ |    |  | 6 - 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                                                                                                                                                                                                                                                                                                                 |
| Mounting position                                                                     |  |      |  |                                                                                                                                                                                                                                                                                                                     |
| Mounting position                                                                     |  |      |  | Vertical and 90° in all directions<br><br>With XFI earth-fault release:<br>- NZM1, N1, NZM2, N2: vertical and 90° in all directions with plug-in unit<br>- 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 | 690   |
| Overvoltage category/pollution degree |           |      | III/3 |
| Rated insulation voltage              | $U_i$     | V    | 690   |
| 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      | 40                                                                                                                                              |
| 690 V 50/60 Hz                                                              | $I_c$      | kA      | 17                                                                                                                                              |
| 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      | 20                                                                                                                                              |
| 690 V 50/60 Hz                                                              | $I_{cu}$   | kA      | 10                                                                                                                                              |
| $I_{cs}$ 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      | 10                                                                                                                                              |
| 690 V 50/60 Hz                                                              | $I_{cs}$   | kA      | 7.5                                                                                                                                             |
| 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      | 85                                                                                                                                              |
| SCCR 480Y/277 V 60 Hz                                                       | $I_{cu}$   | kA      | 35                                                                                                                                              |
| 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                                                                                                                                            |
| Max. operating frequency                                                    |            | Ops/h   | 120                                                                                                                                             |

|                                                           |      |                 |                                    |
|-----------------------------------------------------------|------|-----------------|------------------------------------|
| Total break time at short-circuit                         |      | ms              | < 10                               |
| <b>Terminal capacity</b>                                  |      |                 |                                    |
| 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  | 80                                                                 |
| Equipment heat dissipation, current-dependent                                                                          | P <sub>vid</sub> | W  | 16.32                                                              |
| 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)

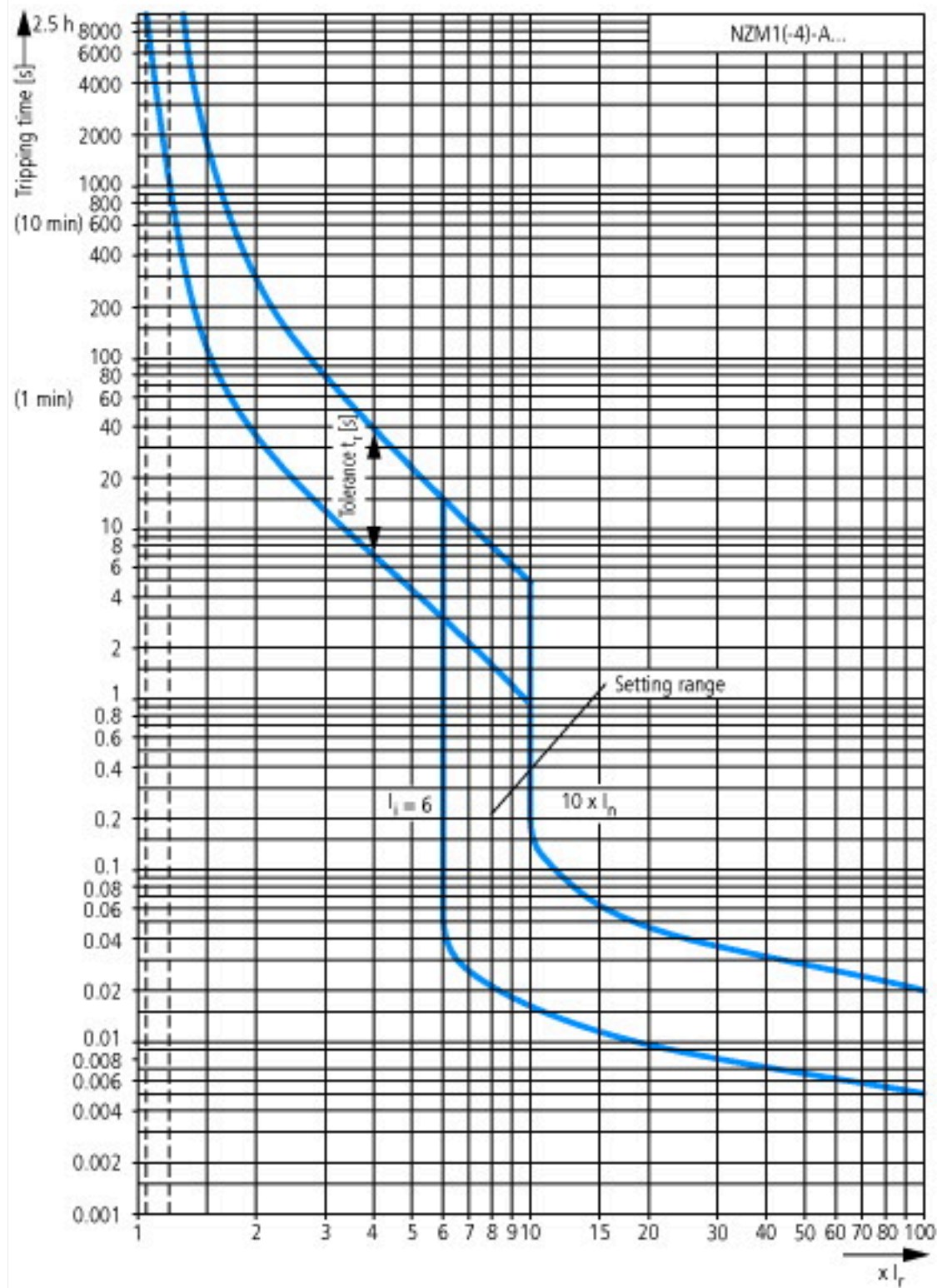
Electric engineering, automation, process control engineering / Low-voltage switch technology / Circuit breaker (LV < 1 kV) / Circuit breaker for power transformer, generator and system protection (ecl@ss10.0.1-27-37-04-09 [AJZ716013])

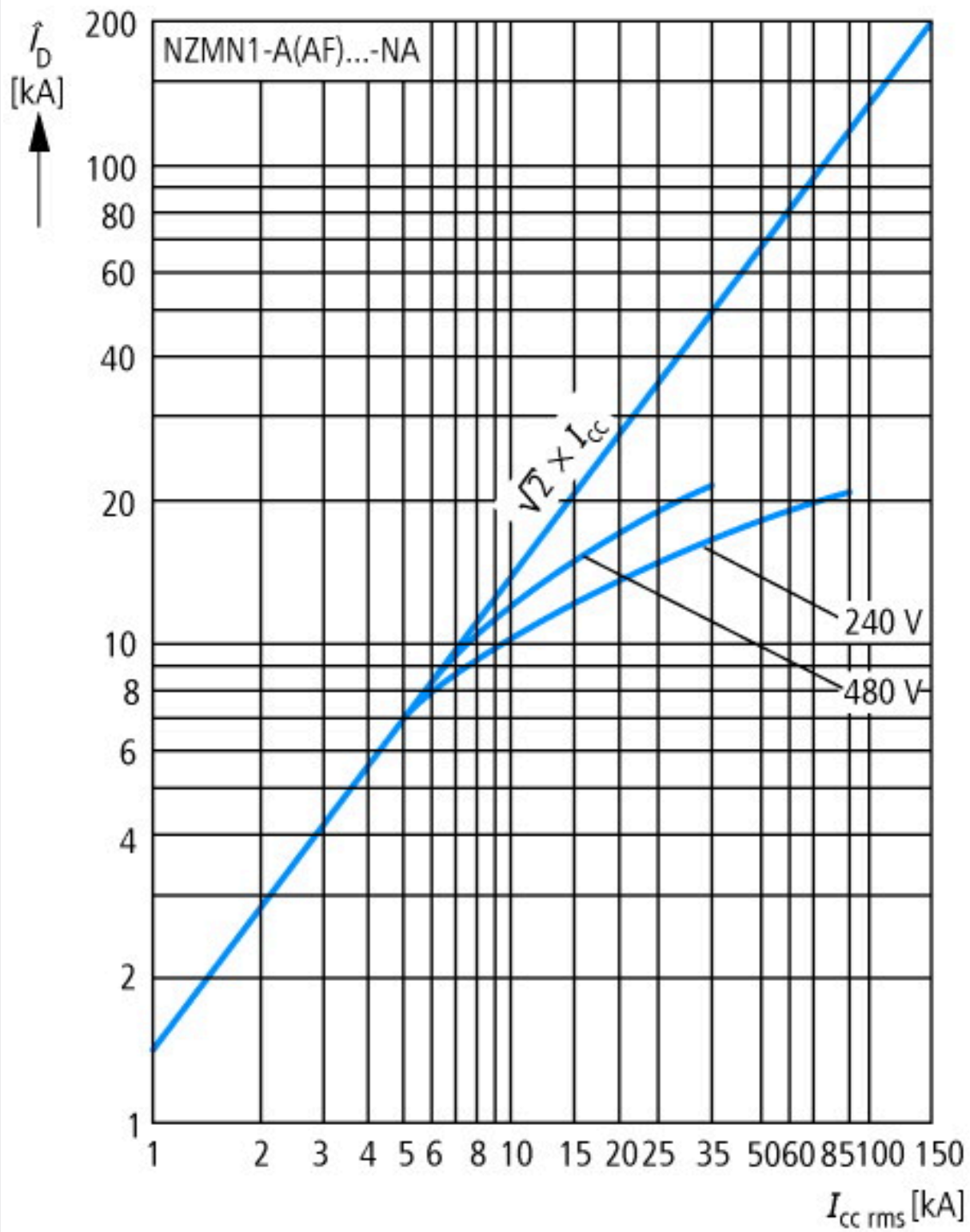
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|-----------------------------------------------------------------------|----|------------------------------------------|
| Rated permanent current I <sub>u</sub>                                | A  | 80                                       |
| Rated 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  | 80 - 80                                  |
| 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                                                  |    | No                                       |
| Degree of protection (IP)                                             |    | IP20                                     |

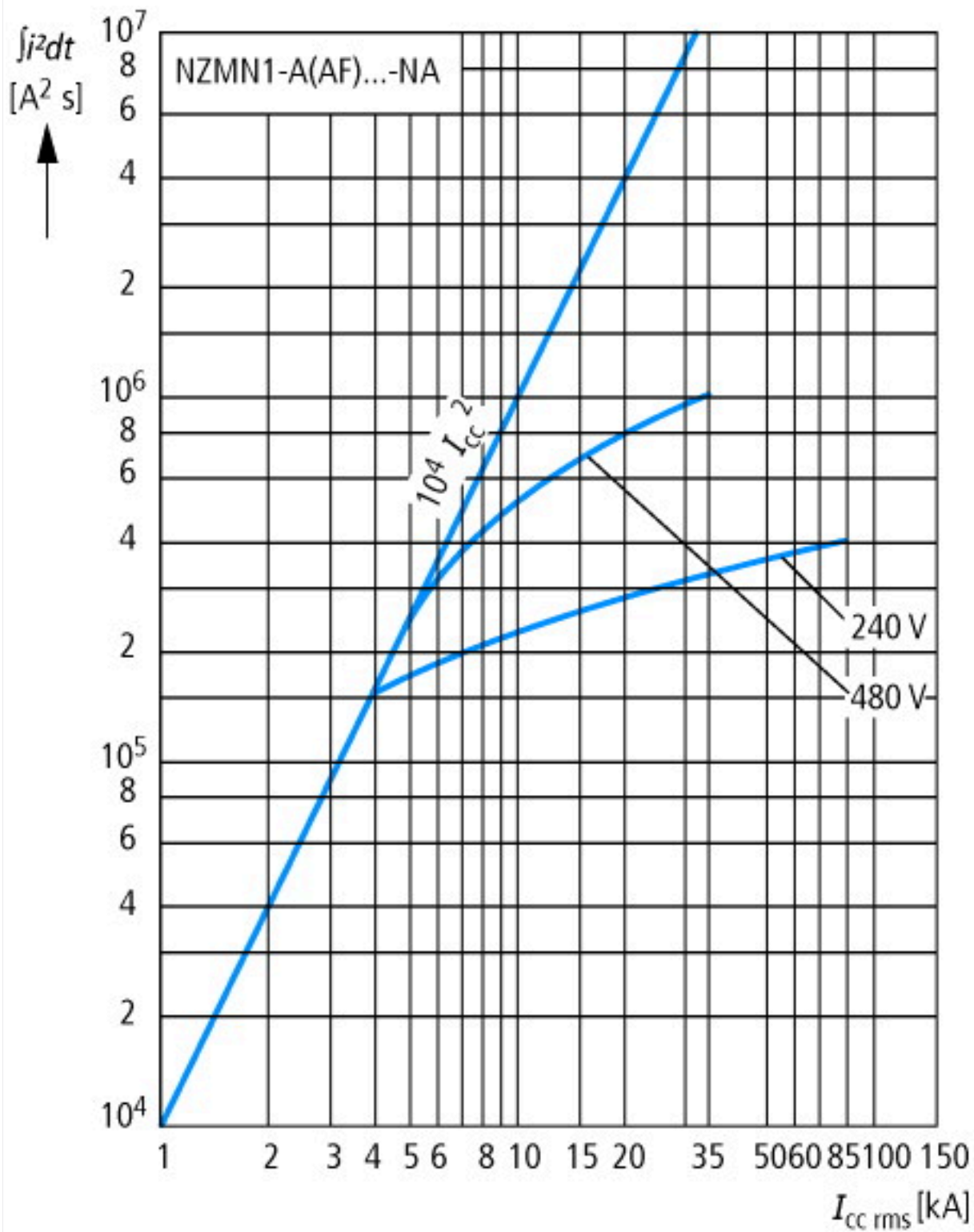
## Approvals

|                                      |  |                                  |
|--------------------------------------|--|----------------------------------|
| Product Standards                    |  | UL 489; IEC 60947-2; CE marking  |
| UL File No.                          |  | E31593                           |
| UL Category Control No.              |  | DIVQ                             |
| North America Certification          |  | UL listed                        |
| 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

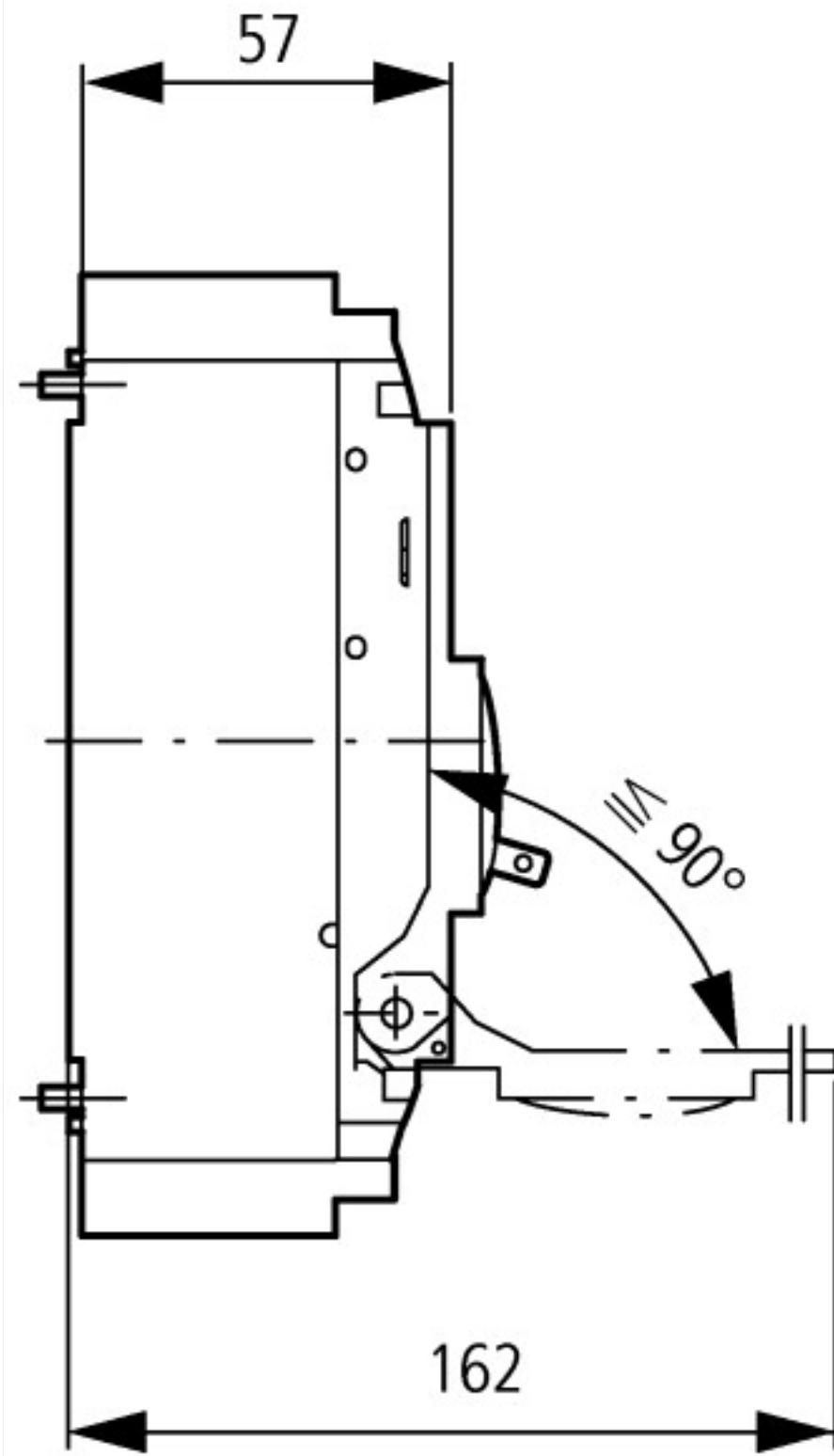












### Additional product information (links)

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