

# DATASHEET - NZMH2-AF40-NA



**Circuit-breaker, 3p, 40A**

**Part no.**

**NZMH2-AF40-NA**

**Catalog No.**

**269193**



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  |  |  | Screw connection                                                                                                                                             |

## Switching capacity

|                       |          |    |     |
|-----------------------|----------|----|-----|
| SCCR 480Y/277 V 60 Hz | $I_{cu}$ | kA | 150 |
| SCCR 480 V 60 Hz      | $I_{cu}$ | kA | 150 |
| SCCR 600Y/347 V 60 Hz | $I_{cu}$ | kA | 65  |

## Rated current = rated uninterrupted current

|                                             |             |   |    |
|---------------------------------------------|-------------|---|----|
| Rated current = rated uninterrupted current | $I_n = I_u$ | A | 40 |
|---------------------------------------------|-------------|---|----|

## Setting range

|                        |                          |   |         |
|------------------------|--------------------------|---|---------|
| Overload trip          |                          |   |         |
|                        | $I_r$                    | A | 40 - 40 |
| Short-circuit releases |                          |   |         |
|                        |                          |   |         |
| Non-delayed            | $I_l = I_n \times \dots$ |   | 8 - 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                                             |

|                                        |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------------------|--|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                        |  |  |  <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 $I_{cn}$                      | $I_{cn}$ |         |                                                                                                                                                 |
| $I_{cu}$ 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                                                                                                                                              |
| $I_{cs}$ 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. |
| <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      | 150                                                                                                                                             |
| SCCR 480V/277 V 60 Hz                                               | $I_{cu}$ | kA      | 150                                                                                                                                             |
| SCCR 480 V 60 Hz                                                    | $I_{cu}$ | kA      | 150                                                                                                                                             |
| SCCR 600V/347 V 60 Hz                                               | $I_{cu}$ | kA      | 65                                                                                                                                              |

|                                                                             |                 |       |       |
|-----------------------------------------------------------------------------|-----------------|-------|-------|
| 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                                        |      |                 | Screw connection                   |
| 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)                         | mm   |                 |                                    |
| 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  | 40                                                                                                                               |
| Equipment heat dissipation, current-dependent                                                                          | P <sub>vid</sub> | W  | 13.44                                                                                                                            |
| 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

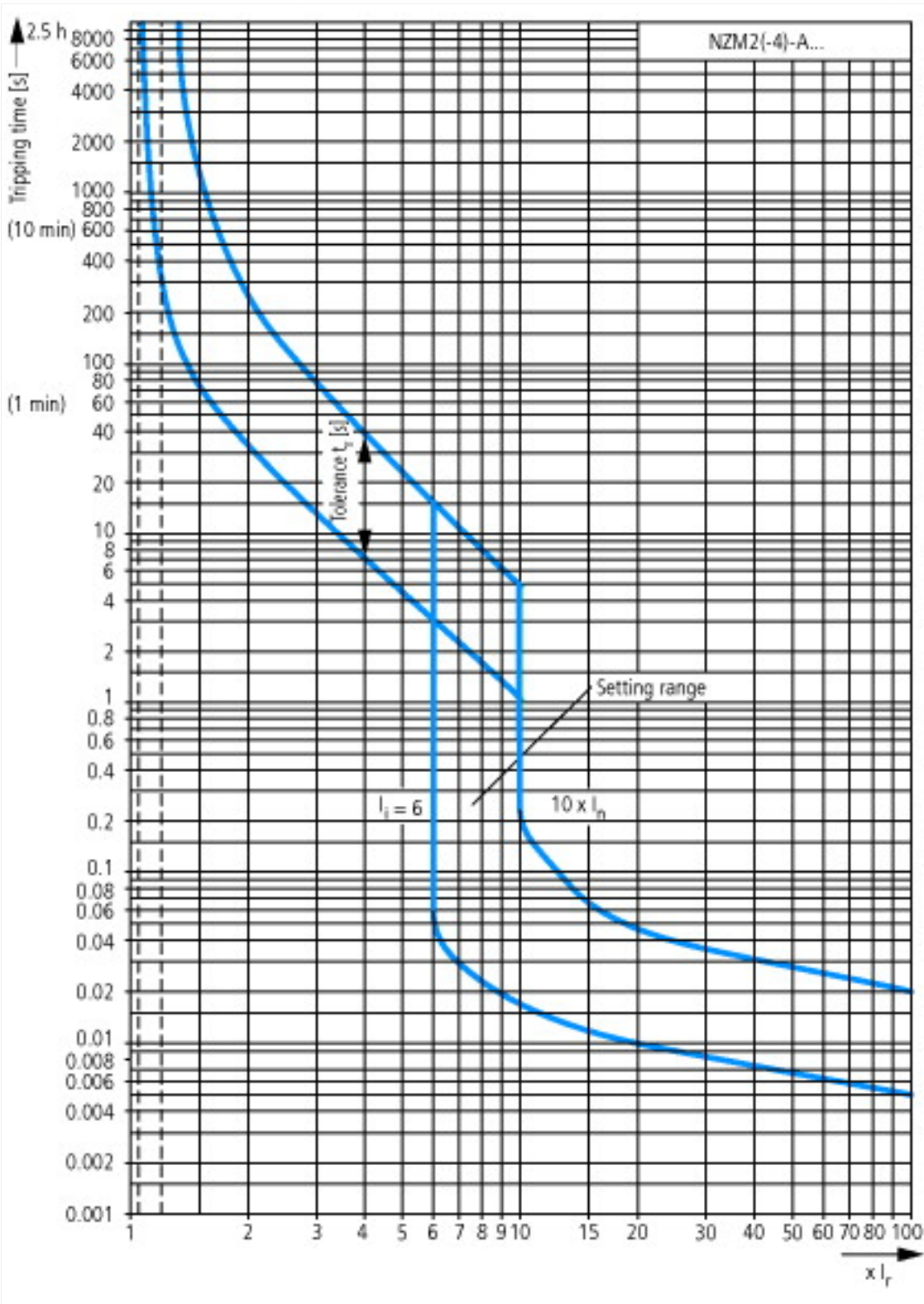
|                                                                                                                                                                                                                                            |  |    |                                          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----|------------------------------------------|
| 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  | 40                                       |
| 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  | 40 - 40                                  |
| Adjustment range short-term delayed short-circuit release                                                                                                                                                                                  |  | A  | 0 - 0                                    |
| Adjustment range undelayed short-circuit release                                                                                                                                                                                           |  | A  | 8 - 10                                   |
| Integrated earth fault protection                                                                                                                                                                                                          |  |    | No                                       |
| Type of electrical connection of main circuit                                                                                                                                                                                              |  |    | Screw connection                         |
| Device construction                                                                                                                                                                                                                        |  |    | Built-in device fixed built-in technique |
| Suitable for DIN rail (top hat rail) mounting                                                                                                                                                                                              |  |    | No                                       |
| DIN rail (top hat rail) mounting optional                                                                                                                                                                                                  |  |    | Yes                                      |
| Number of auxiliary contacts as normally closed contact                                                                                                                                                                                    |  |    | 0                                        |
| Number of auxiliary contacts as normally open contact                                                                                                                                                                                      |  |    | 0                                        |
| Number of auxiliary contacts as change-over contact                                                                                                                                                                                        |  |    | 0                                        |
| With switched-off indicator                                                                                                                                                                                                                |  |    | No                                       |
| With under voltage release                                                                                                                                                                                                                 |  |    | No                                       |
| Number of poles                                                                                                                                                                                                                            |  |    | 3                                        |
| Position of connection for main current circuit                                                                                                                                                                                            |  |    | Front side                               |
| Type of control element                                                                                                                                                                                                                    |  |    | Rocker lever                             |

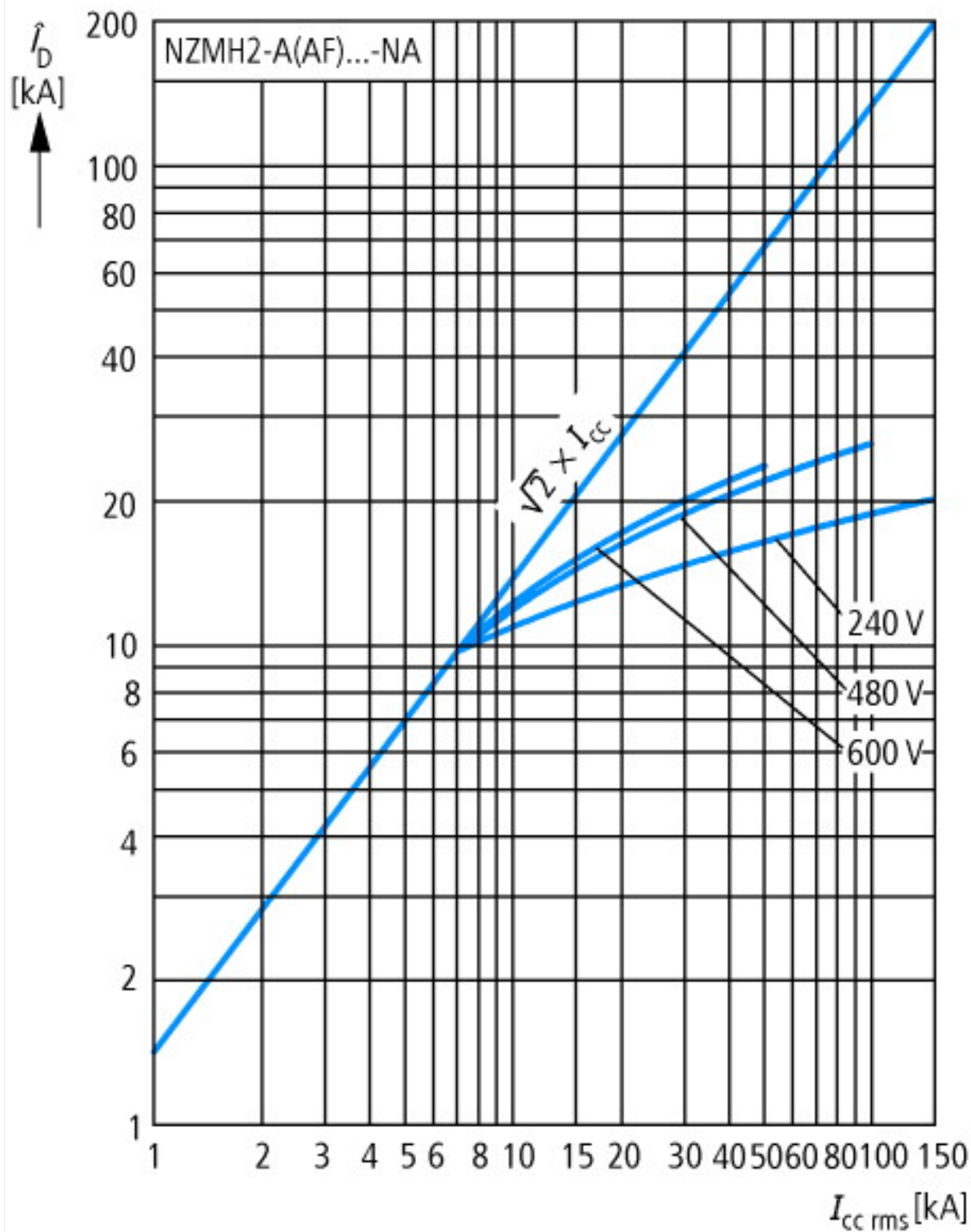
|                                      |  |  |      |
|--------------------------------------|--|--|------|
| Complete device with protection unit |  |  | Yes  |
| Motor drive integrated               |  |  | No   |
| Motor drive optional                 |  |  | Yes  |
| Degree of protection (IP)   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

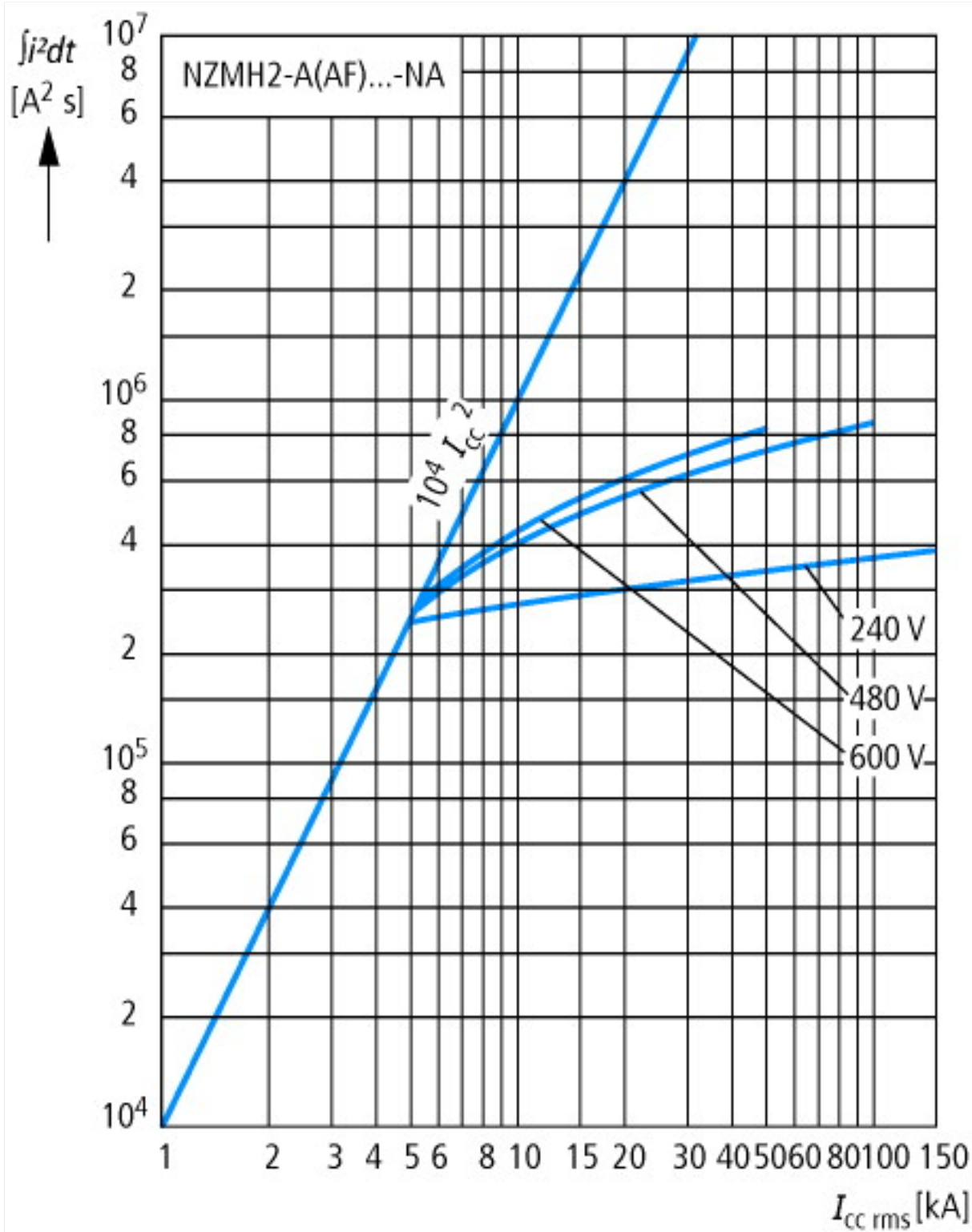
## Approvals

|                                      |  |  |                                                     |
|--------------------------------------|--|--|-----------------------------------------------------|
| 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: -                           |

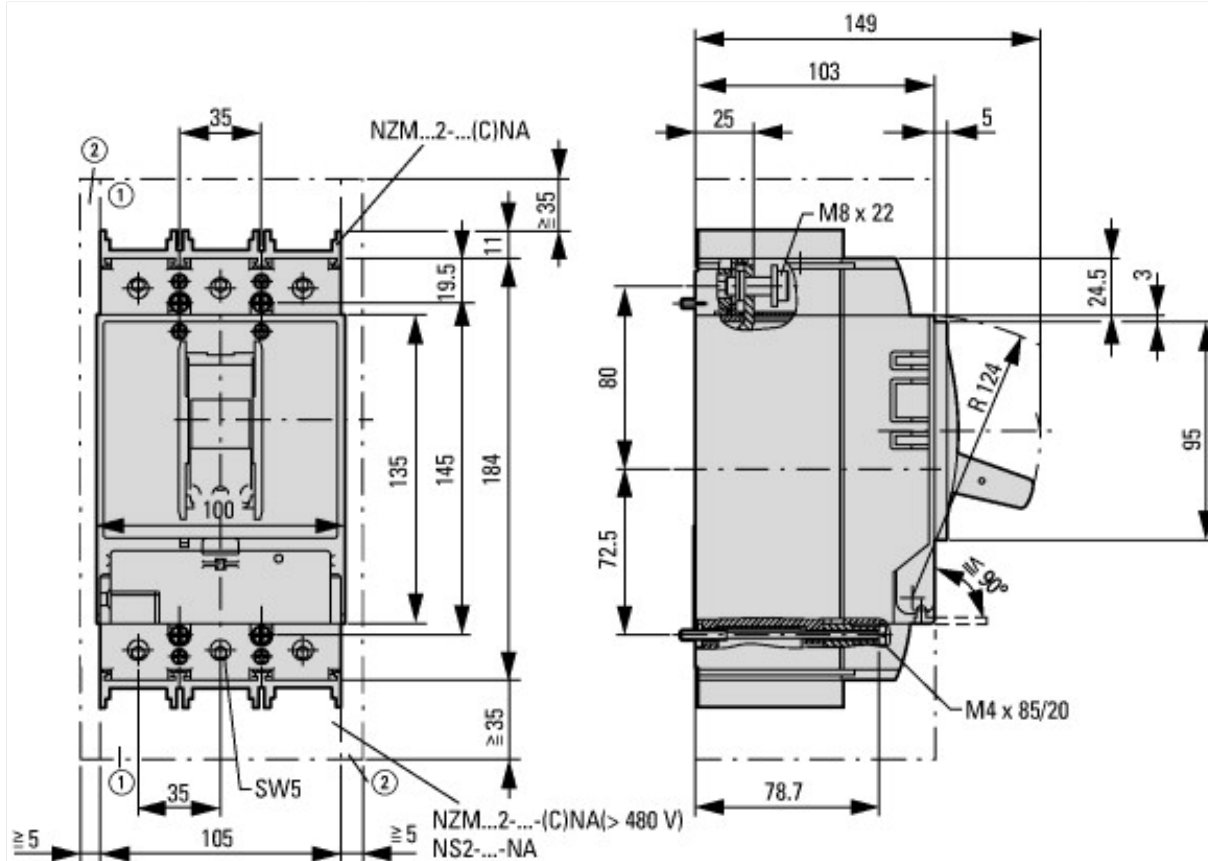
Characteristics



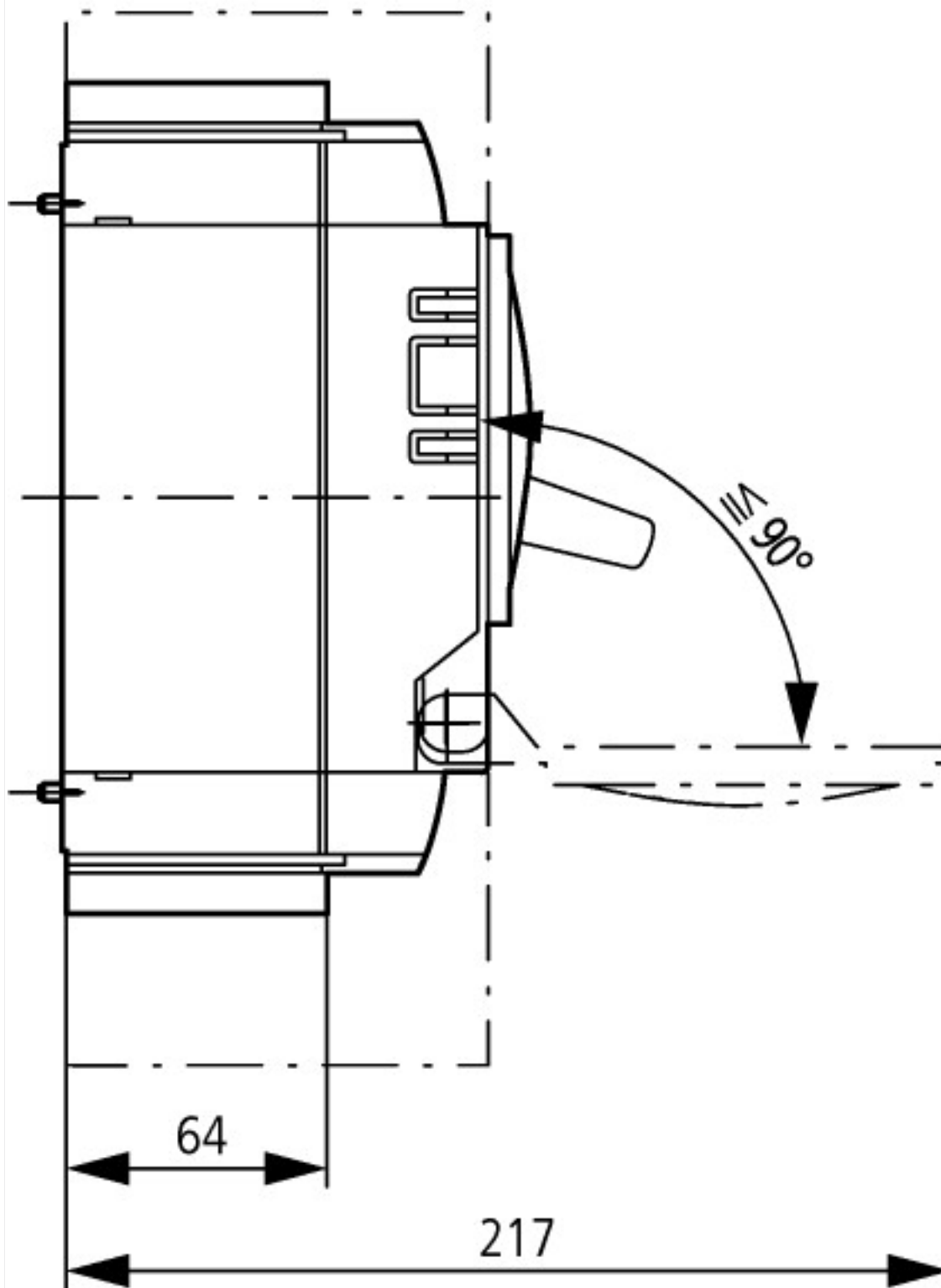




## Dimensions



- ① Blow out area, minimum clearance to adjacent parts
- ② Minimum clearance to adjacent parts



## 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_technik_de_en.pdf">ftp://ftp.moeller.net/DOCUMENTATION/PDF/nzm_technik_de_en.pdf</a>                             |