Similar to illustration

# Circuit-breaker, 3p, 80A

**Part no.** NZMH2-AF80-NA
**Article no.** 269198

Powering Business Worldwide

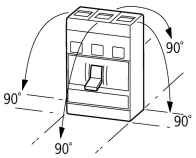
## Delivery program

| | | | |
|---|---|---|---|
| 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 | 80 |
| **Setting range** | | | |
| Overload trip | | | |
|  | $I_r$ | A | 80 - 80 |
| Short-circuit releases<br>  | | | |
| Non-delayed<br>  | $I_i = I_n$ x … | | Approx. 6 - 10 |

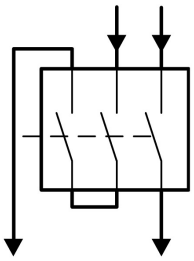
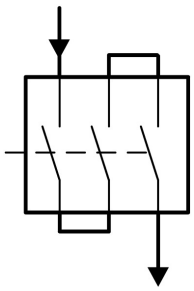
## Technical data

### General

| | | | |
|---|---|---|---|
| Standards | | | IEC/EN 60947 |
| Protection against direct contact | | | Finger and back of hand proof to VDE 0106 Part 100 |
| Climatic proofing | | | Damp heat, constant, to IEC 60068-2-78<br>Damp heat, cyclic, to IEC 60068-2-30 |
| Ambient temperature | | | |
| Ambient temperature, storage | | °C | - 40 - + 70 |
| Operation | | °C | -25 - +70 |
| Mechanical shock resistance (10 ms half-sinusoidal shock) according to IEC 60068-2-27 | | g | 20 (half-sinusoidal shock 20 ms) |
| Safe isolation to EN 61140 | | | |
| Between auxiliary contacts and main contacts | | V AC | 500 |
| between the auxiliary contacts | | V AC | 300 |
| Weight | | kg | 2.345 |
| Mounting position | | | |
| Mounting position | | | Vertical and 90° in all directions |

| | | | |
|---|---|---|---|
| | | |  <br>With residual-current release XFI:<br>- NZM1, N1, NZM2, N2: vertical and 90° in all directions<br>with plug-in adapter elements<br>- NZM1, N1, NZM2, N2: vertical, 90° right/left<br>with withdrawable unit:<br>- NZM3, N3: vertical, 90 ° 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 |
| 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 |
| Rated operational voltage | $U_e$ | V DC | 750 |
| | | | Details apply for 3 pole system protection circuit-breaker with thermomagnetic release NZMN(H)1(2)(3)-A… to 500 A.<br><br>For rated operating voltage switching via 3 contacts:<br><br>DC correction factor for instantaneous release response value: NZM1: 1.25, NZM2: 1.35, NZM3: 1.45<br><br>Set value for $I_i$ at DC = set value $I_i$ AC/correction factor DC<br><br>**Switching of one pole via two series contacts**<br>  <br>**Switching of one pole via three series contacts**<br>  |
| 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 | Ic | kA | 40 |
| Rated short-circuit breaking capacity $I_{cn}$ | $I_{cn}$ | | |
| Icu to IEC/EN 60947 test cycle O-t-CO | Icu | 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 |
| 500 V DC | $I_{cu}$ | kA | 60 |
| 750 V DC | $I_{cu}$ | kA | 60 |
| Ics to IEC/EN 60947 test cycle O-t-CO-t-CO | Ics | 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**<br>Switching capacity of NA switches (UL489, CSA 22.2 No. 5.1)<br>Short-circuit current rating SCCR | | | |
| SCCR 240 V 60 Hz | $I_{cu}$ | kA | 150 |
| 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 short-time withstand current | | | |
| t = 0.3 s | $I_{cw}$ | kA | 1.9 |
| t = 1 s | $I_{cw}$ | kA | 1.9 |
| Utilization category to IEC/EN 60947-2 | | | A |
| Rated making and breaking capacity | | | |
| Rated operational current | $I_e$ | A | |
| AC-1 | | | |
| 400/415 V 50/60 Hz | $I_e$ | A | 300 |
| 415 V | $I_e$ | A | 300 |
| 690 V 50/60 Hz | $I_e$ | A | 80 |
| AC--3 | | | |
| 400/415 V 50/60 Hz | $I_e$ | A | 80 |
| 690 V 50/60 Hz | $I_e$ | A | 80 |
| DC-1 | | | |
| 500 V DC | $I_e$ | CSA | 80 |
| 750 V DC | $I_e$ | CSA | 80 |
| DC - 3 | | | |
| 500 V DC | $I_e$ | CSA | 80 |
| 750 V DC | $I_e$ | CSA | 80 |
| 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 |
| DC-1 | | | |
| 500 V DC | | Operations | 7500 |
| 750 V DC | | Operations | 7500 |
| DC - 3 | | | |
| 500 V DC | Operations | | 3000 |
| 750 V DC | Operations | | 3000 |

| | | | |
|---|---|---|---|
| Max. operating frequency | | Ops/h | 120 |
| Total downtime in a short-circuit | | ms | < 10 |

## Terminal capacity

| | | | |
|---|---|---|---|
| Standard equipment | | | Screw connection |
| Round copper conductor | | | |
| Box terminal | | | |
| Solid | | $mm^2$ | 1 x (12 … 6) |
| Stranded | | $mm^2$ | 1 x (4 … 350) |
| Tunnel terminal | | | |
| Solid | | $mm^2$ | 1 x 16 |
| Stranded | | $mm^2$ | |
| Stranded | | $mm^2$ | 1 x (4 … 350) |
| Bolt terminal and rear-side connection | | | |
| Direct on the switch | | | |
| Solid | | $mm^2$ | 1 x (11 … 6) |
| Stranded | | $mm^2$ | 1 x (4 … 3/0) |
| Al conductors, Cu cable | | | |
| | | | |
| Solid | | $mm^2$ | 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 | | | |
| | | $mm^2$ | 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 | $I_n$ | A | 80 |
| Equipment heat dissipation, current-dependent | $P_{vid}$ | W | 20.54 |
| 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 6.0

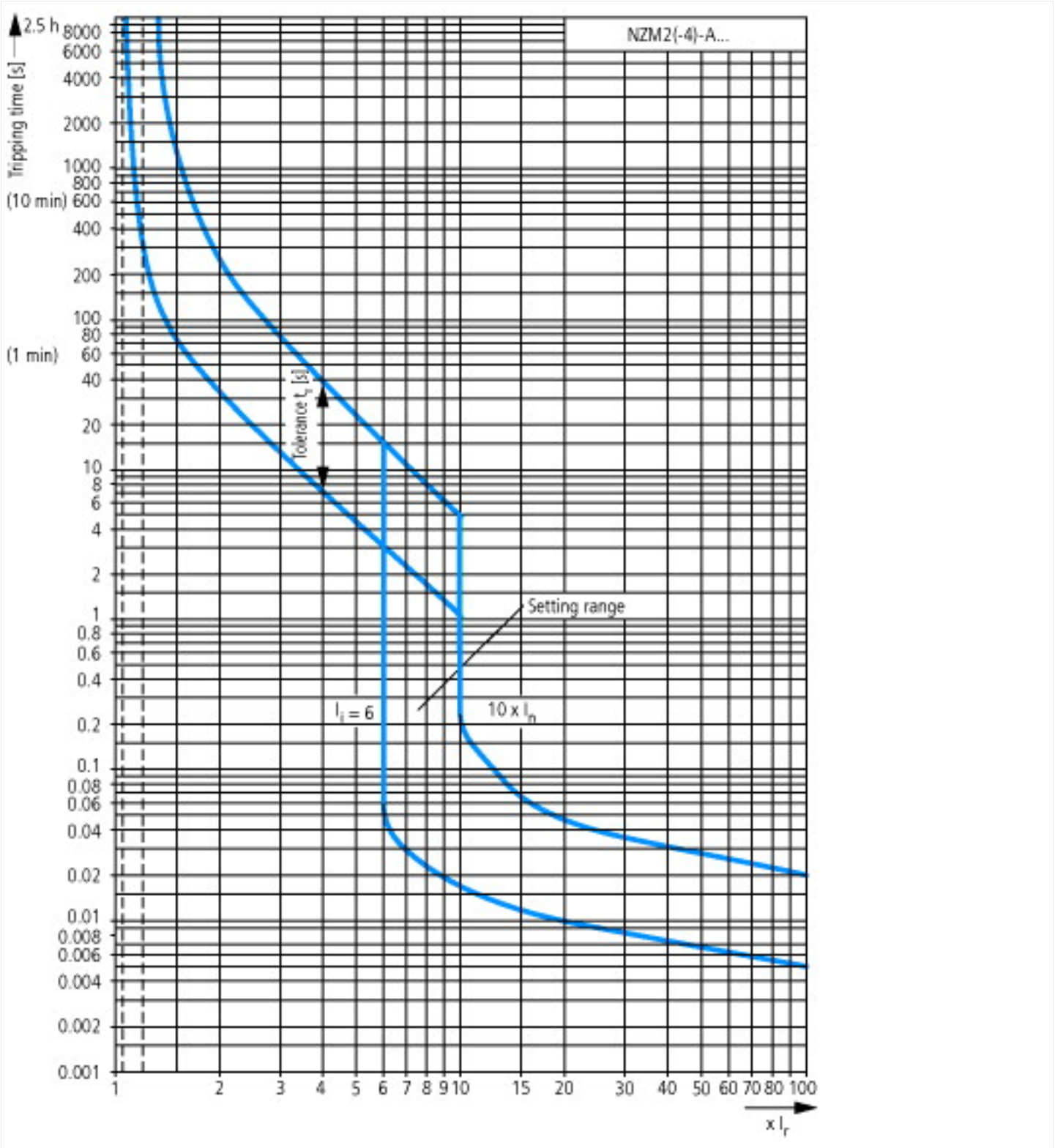
| | | |
|---|---|---|
| Low-voltage industrial components (EG000017) / Power circuit-breaker for trafo/generator/installation prot. (EC000228) | | |
| Electric engineering, automation, process control engineering / Low-voltage switch technology / Circuit breaker (LV < 1 kV) / Circuit breaker for power transformer, generator and system protection (ecl@ss8.1-27-37-04-09 [AJZ716010]) | | |
| Rated permanent current Iu | A | 80 |
| Rated voltage | V | 690 - 690 |
| Rated short-circuit breaking capacity Icu at 400 V, 50 Hz | kA | 150 |
| 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 | 480 - 800 |
| 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 |
| Switched-off indicator available | | 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 |

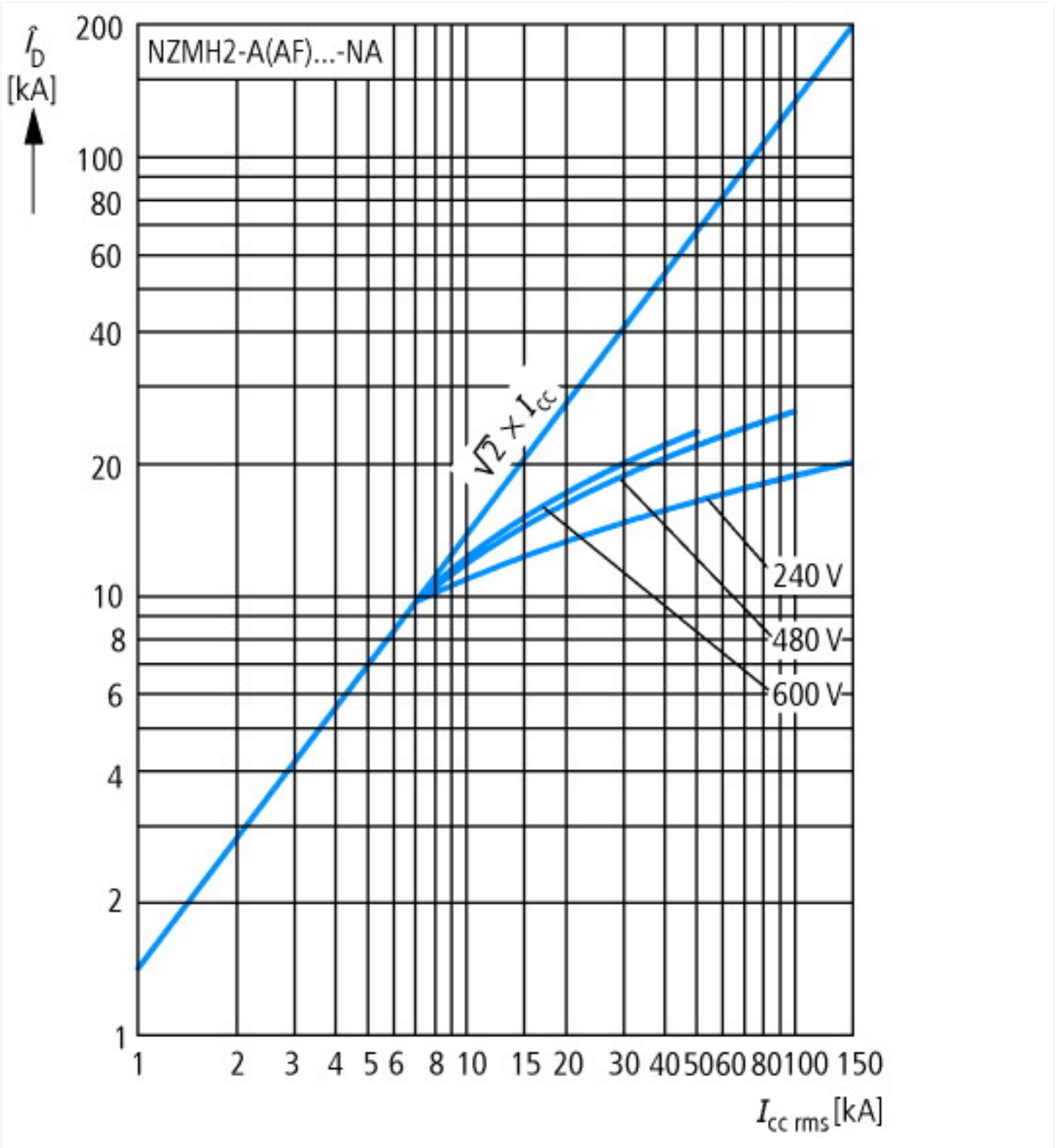
## Approvals

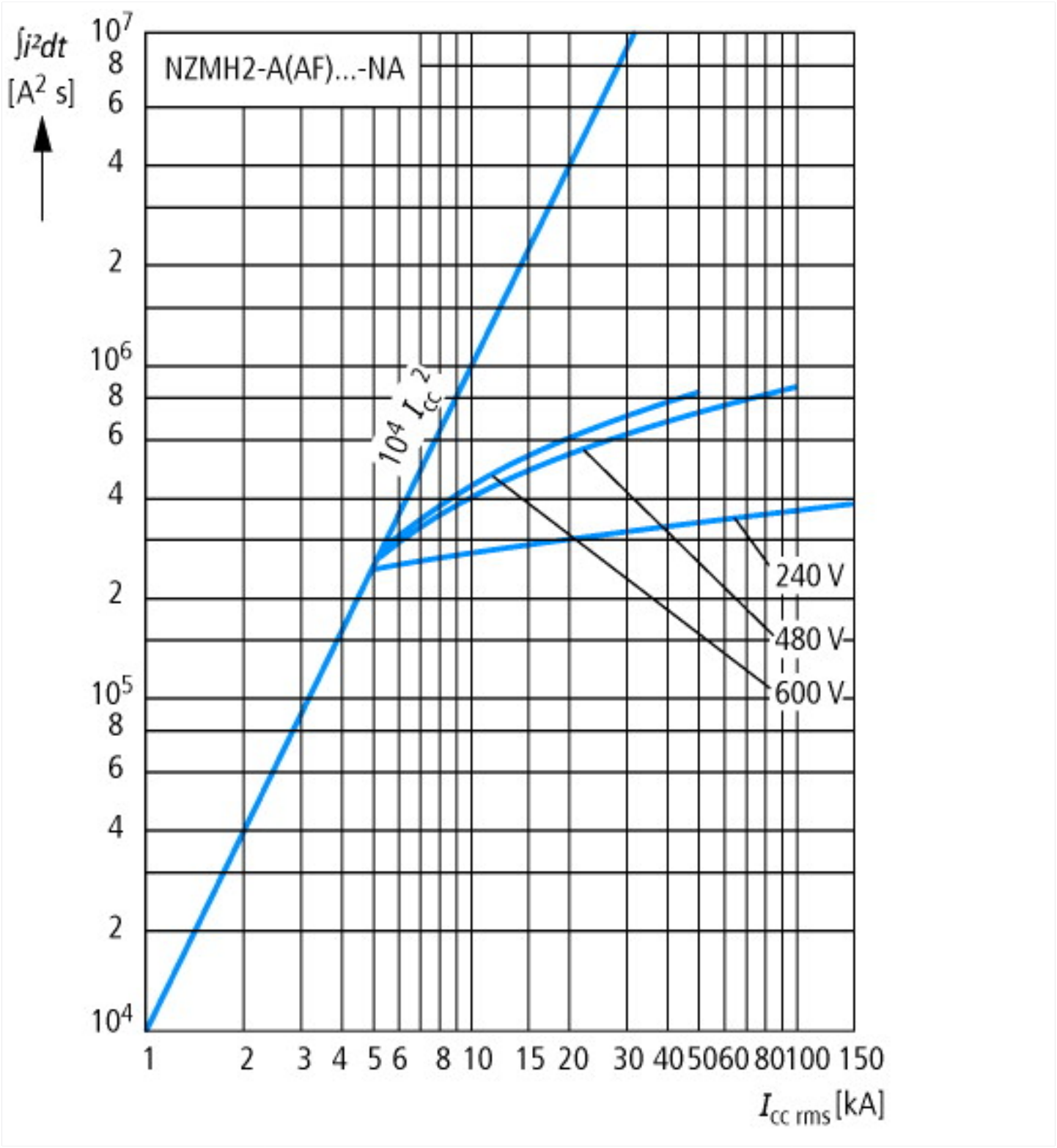
| | |
|---|---|
| Product Standards | UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking |
| UL File No. | E31593 |
| UL Category Control No. | DIVQ |
| CSA File No. | 022086 |
| CSA Class No. | 1432-01 |
| North America Certification | UL listed, CSA certified |
| Specially designed for North America | 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: - |

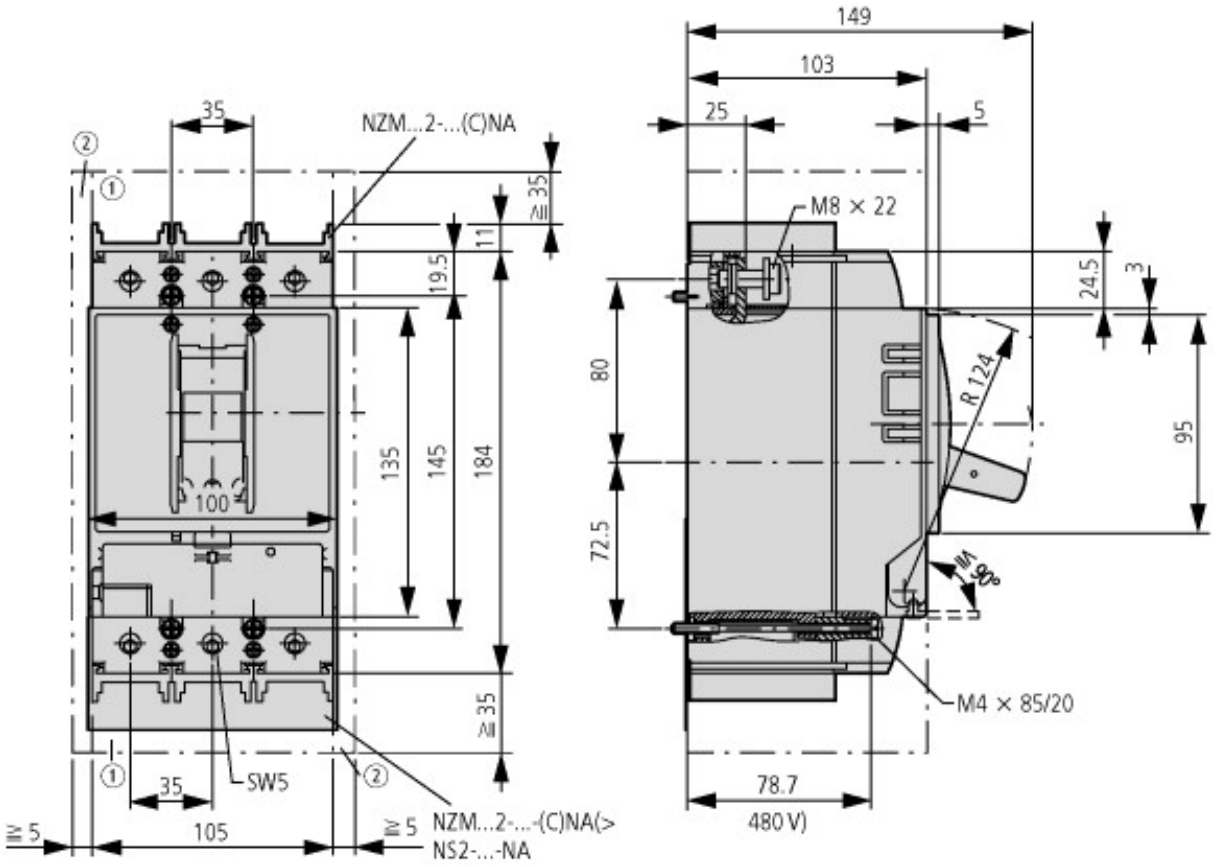
## Characteristics




NZMH2-A(AF)...-NA
$\hat{I}_D$ [kA]
200
100
80
60
40
20
10
8
6
4
2
1
$\sqrt{2} \times I_{cc}$
240 V
480 V~
600 V~
1
2
3
4
5
6
8
10
15
20
30
40
50
60
80
100
150
$I_{cc\ rms}$ [kA]

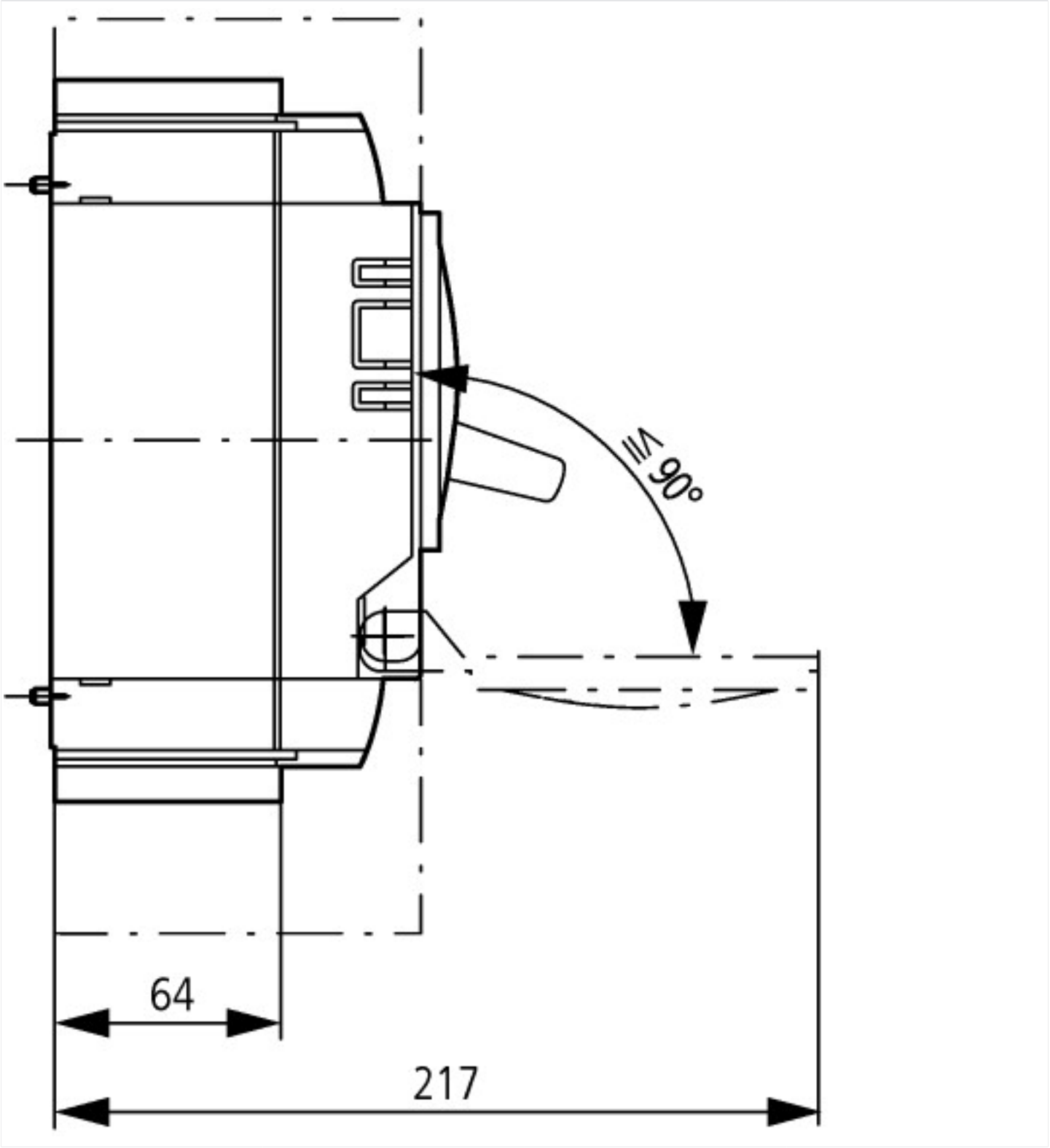

∫i²dt
[A² s]
NZMH2-A(AF)...-NA
10⁷
8
6
4
2
10⁶
8
6
4
2
10⁵
8
6
4
2
10⁴
10⁴ I_cc ²
240 V
480 V
600 V
1
2
3
4
5
6
8
10
15
20
30
40
50
60
80
100
150
I_cc rms [kA]

## 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 | ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL01206006Z2015_11.pdf |
| Weight | http://ecat.moeller.net/flip-cat/?edition=HPLEN&startpage=17.171 |
| Temperature dependency, Derating | http://ecat.moeller.net/flip-cat/?edition=HPLEN&startpage=17.172 |
| Effective power loss | http://ecat.moeller.net/flip-cat/?edition=HPLEN&startpage=17.174 |