







Circuit-breaker, 3p, 450A, withdrawable unit

Part no. **NZMH3-ME450-AVE**  
 Catalog No. **110857**

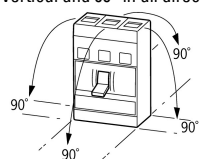
Similar to illustration

## Delivery program

|   |                          |    |  |   |
|---|--------------------------|----|--|---|
| Product range   |                          |    |  | Circuit-breaker   |
| Protective function   |                          |    |  | Motor protection  |
|   |                          |    |  |   |
| Standard/Approval   |                          |    |  | IEC   |
| Installation type   |                          |    |  | Withdrawable  |
| Release system  |                          |    |  | Electronic release  |
| Construction size   |                          |    |  | NZM3  |
| Description   |                          |    |  | IEC/EN 60947-4-1, IEC/EN 60947-2<br><br>The circuit-breaker fulfills all requirements for AC-3 switching category.<br><br>R.m.s. value measurement and "thermal memory"<br>Adjustable time delay setting to overcome current peaks $t_r$ at $6 \times I_r$ also infinity (without overload releases)<br>All AC-3 rating data applies to direct switching by the circuit-breaker under normal operating conditions. If, for example, a contactor takes over AC-3 switching under normal operating conditions, the full rated uninterrupted current applies to the circuit-breaker, $I_n = I_u$ . |
| Number of poles   |                          |    |  | 3 pole  |
| Standard equipment  |                          |    |  | Screw connection  |
| <b>Switching capacity</b>   |                          |    |  |   |
| 400/415 V 50 Hz   | $I_{cu}$                 | kA |  | 150   |
| Rated current = rated uninterrupted current   | $I_n = I_u$              | A  |  | 450   |
| <b>Setting range</b>  |                          |    |  |   |
| Overload trip   |                          |    |  |   |
|  | $I_r$                    | A  |  | 225 - 450   |
| Short-circuit releases  |                          |    |  |   |
|  |                          |    |  |   |
| Non-delayed   | $I_i = I_n \times \dots$ |    |  | 2 - 14  |
|  |                          |    |  |   |
| <b>Motor rating AC-3 50/60 Hz</b>   |                          |    |  |   |
| 380 V 400 V   | P                        | kW |  | 250   |
| 660 V 690 V   | P                        | kW |  | 450   |
| <b>Motor rating AC-3 50/60 Hz</b>   |                          |    |  |   |
| 400 V   | P                        | kW |  | 250   |
| 660 V 690 V   | P                        | kW |  | 450   |
| <b>Rated operational current AC-3 50/60 Hz</b>                                      |                          |    |  |   |
| 400 V   | $I_e$                    | A  |  | 437   |
| 690 V   |                          | A  |  | 446   |

## 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   | 6.34   |
| Mounting position   |  |      | Vertical and 90° in all directions<br> <ul style="list-style-type: none"> <li>With XFI earth-fault release:           <ul style="list-style-type: none"> <li>- NZM1, N1, NZM2, N2: vertical and 90° in all directions with plug-in unit</li> <li>- NZM1, N1, NZM2, N2: vertical, 90° right/left with withdrawable unit</li> <li>- NZM3, N3: vertical, 90° right/left</li> <li>- NZM4, N4: vertical with remote operator:               <ul style="list-style-type: none"> <li>- NZM2, N(S)2, NZM3, N(S)3, NZM4, N(S)4: vertical and 90° in all directions</li> </ul> </li> </ul> </li> </ul> |
| 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)  |  |      | Temperature dependency, Derating   |

### Circuit-breakers

|   |             |      |       |
|---|-------------|------|-------|
| Rated current = rated uninterrupted current | $I_n = I_u$ | A    | 450   |
| 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 | 143 |
| 690 V 50/60 H                                   | $I_c$    | kA | 74  |
| 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 | 65  |
| 690 V 50/60 Hz                                  | $I_{cu}$ | kA | 35  |
| $I_{cs}$ to IEC/EN 60947 test cycle O-t-CO-t-CO | $I_{cs}$ | kA |     |

|   |                 |       |                  |
|---|-----------------|-------|------------------|
| 240 V 50/60 Hz  | I <sub>cs</sub> | kA    | 150              |
| 400/415 V 50/60 Hz  | I <sub>cs</sub> | kA    | 150              |
| 440 V 50/60 Hz  | I <sub>cs</sub> | kA    | 130              |
| 525 V 50/60 Hz  | I <sub>cs</sub> | kA    | 33               |
| 690 V 50/60 Hz  | I <sub>cs</sub> | kA    | 9                |
| Maximum back-up fuse, if the expected short-circuit currents at the installation location exceed the switching capacity of the circuit-breaker. |                 |       |                  |
| Rated short-time withstand current  |                 |       |                  |
| t = 0.3 s   | I <sub>cw</sub> | kA    | 3.3              |
| t = 1 s   | I <sub>cw</sub> | kA    | 3.3              |
| Utilization category to IEC/EN 60947-2  |                 |       | A                |
| Lifespan, mechanical(of which max. 50 % trip by shunt/undervoltage release)   |                 |       | Operations 15000 |
| Lifespan, electrical  |                 |       |                  |
| AC-1  |                 |       |                  |
| 400 V 50/60 Hz  | Operations      |       | 5000             |
| 415 V 50/60 Hz  | Operations      |       | 5000             |
| 690 V 50/60 Hz  | Operations      |       | 3000             |
| AC--3   |                 |       |                  |
| 400 V 50/60 Hz  | Operations      |       | 2000             |
| 415 V 50/60 Hz  | Operations      |       | 2000             |
| 690 V 50/60 Hz  | Operations      |       | 2000             |
| Max. operating frequency  |                 | Ops/h | 60               |
| Total break time at short-circuit   |                 | ms    | < 10             |

### Terminal capacity

|   |  |                 |   |
|---|--|-----------------|---|
| Standard equipment  |  |                 | Screw connection                                      |
| Accessories required  |  |                 | NZM3-XAVS   |
| Optional accessories  |  |                 | Box terminal<br>Tunnel terminal<br>connection on rear |
| Round copper conductor  |  |                 |   |
| Box terminal  |  |                 |   |
| Solid   |  | mm <sup>2</sup> | 2 x 16  |
| Stranded  |  | mm <sup>2</sup> | 1 x (35 - 240)<br>2 x (25-120)                        |
| Tunnel terminal   |  |                 |   |
| Solid   |  | mm <sup>2</sup> | 1 x 16  |
| Stranded  |  |                 |   |
| 1-hole  |  | mm <sup>2</sup> | 1 x (16 - 185)  |
| Bolt terminal and rear-side connection  |  |                 |   |
| Direct on the switch  |  |                 |   |
| Solid   |  | mm <sup>2</sup> | 1 x 16<br>2 x 16                                      |
| Stranded  |  | mm <sup>2</sup> | 1 x (25 - 240)<br>2 x (25 - 240)                      |
| Connection width extension  |  |                 |   |
| Connection width extension  |  | mm <sup>2</sup> | 2 x 300   |
| Al circular conductor   |  |                 |   |
| Tunnel terminal   |  |                 |   |
| Solid   |  | mm <sup>2</sup> | 1 x 16  |
| Stranded  |  |                 |   |
| Stranded  |  | mm <sup>2</sup> | 1 x (25 - 185) <sup>2)</sup>                          |
| Double hole   |  | mm <sup>2</sup> | 1 x (50 - 240)<br>2 x (50 - 240)                      |
| <sup>2)</sup> Up to 240 mm <sup>2</sup> can be connected depending on the cable manufacturer. |  |                 |   |
| Cu strip (number of segments x width x segment thickness)                                     |  |                 |   |
| Box terminal  |  |                 |   |

|  |      |                 |   |
|--|------|-----------------|---|
|  | min. | mm              | 6 x 16 x 0.8  |
|  | max. | mm              | 10 x 24 x 1.0<br>+ 5 x 24 x 1.0<br>(2 x) 8 x 24 x 1.0 |
| Bolt terminal and rear-side connection |      |                 |   |
| Flat copper strip, with holes          | min. | mm              | 6 x 16 x 0.8  |
| Flat copper strip, with holes          | max. | mm              | 10 x 32 x 1.0 + 5 x 32 x 1.0                          |
| Connection width extension             |      | mm              | (2 x) 10 x 50 x 1.0                                   |
| Copper busbar (width x thickness)      |      |                 |   |
| Bolt terminal and rear-side connection |      |                 |   |
| Screw connection                       |      |                 | M10   |
| Direct on the switch                   |      |                 |   |
|  | min. | mm              | 20 x 5  |
|  | max. | mm              | 30 x 10<br>+ 30 x 5                                   |
| Connection width extension             |      | mm              |   |
| Connection width extension             | max. | mm              | 2 x (10 x 50)   |
| Control cables                         |      |                 |   |
|  |      | mm <sup>2</sup> | 1 x (0.75 - 2.5)<br>2 x (0.75 - 1.5)                  |

## Design verification as per IEC/EN 61439

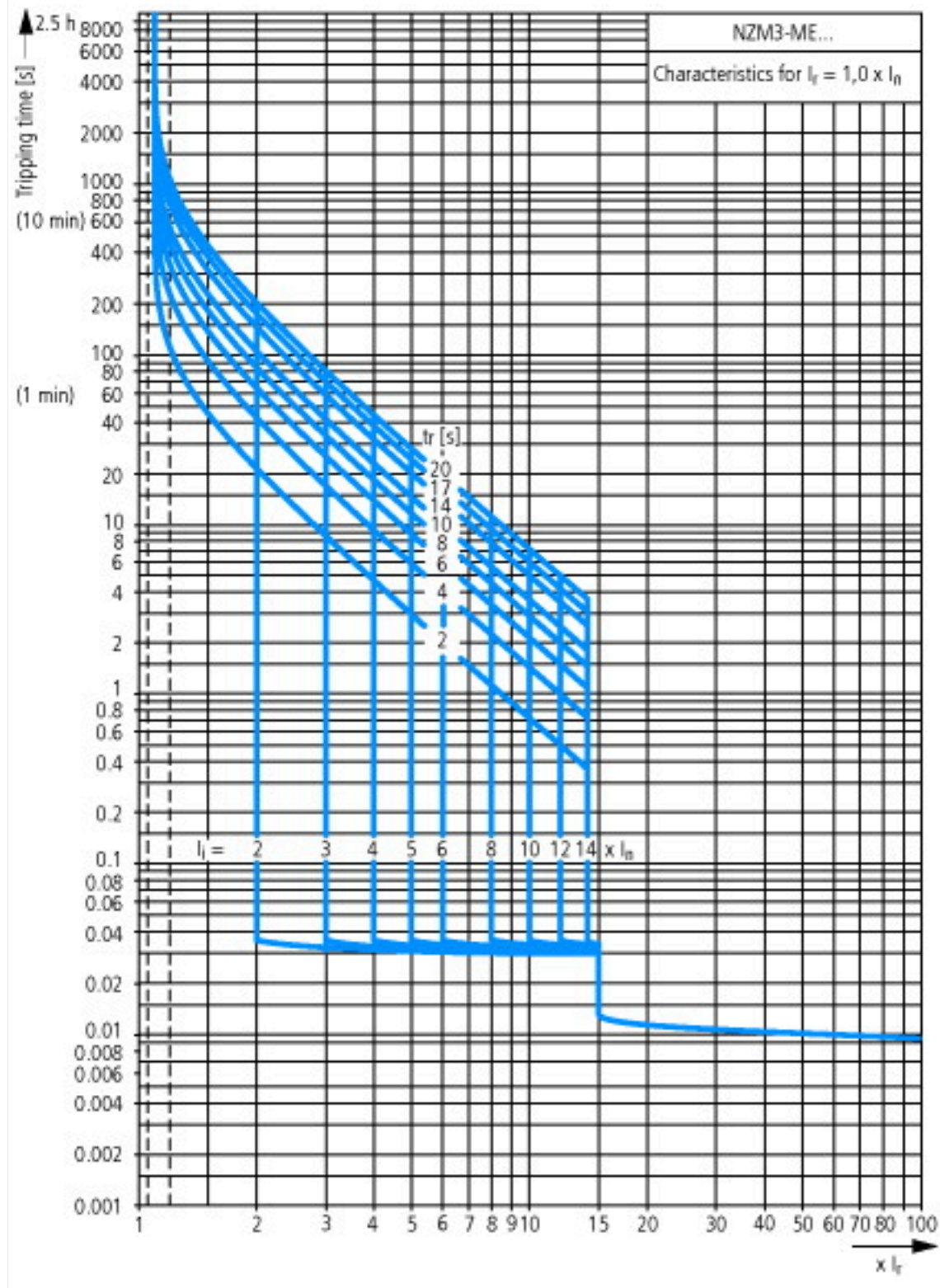
|  |                  |    |  |
|--|------------------|----|--|
| Technical data for design verification   |                  |    |  |
| Rated operational current for specified heat dissipation   | I <sub>n</sub>   | A  | 450  |
| Equipment heat dissipation, current-dependent  | P <sub>vid</sub> | W  | 60.75  |
| 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) / Motor protection circuit-breaker (EC000074)

|  |    |   |
|--|----|---|
| Overload release current setting                                   | A  | 225 - 450   |
| Adjustment range undelayed short-circuit release                   | A  | 450 - 6300  |
| With thermal protection  |    | Yes   |
| Phase failure sensitive  |    | Yes   |
| Switch off technique   |    | Electronic  |
| Rated operating voltage  | V  | 690 - 690   |
| Rated permanent current I <sub>u</sub>                             | A  | 450   |
| Rated operation power at AC-3, 230 V                               | kW | 132   |
| Rated operation power at AC-3, 400 V                               | kW | 250   |
| Type of electrical connection of main circuit                      |    | Screw connection                                  |
| Type of control element  |    | Rocker lever                                      |
| Device construction  |    | Built-in device slide-in technique (withdrawable) |
| With integrated auxiliary switch                                   |    | No  |
| With integrated under voltage release                              |    | No  |
| Number of poles  |    | 3   |
| Rated short-circuit breaking capacity I <sub>cu</sub> at 400 V, AC | kA | 150   |
| Degree of protection (IP)  |    | IP20  |
| Height   | mm | 346   |
| Width  | mm | 185   |
| Depth  | mm | 260   |

# Characteristics





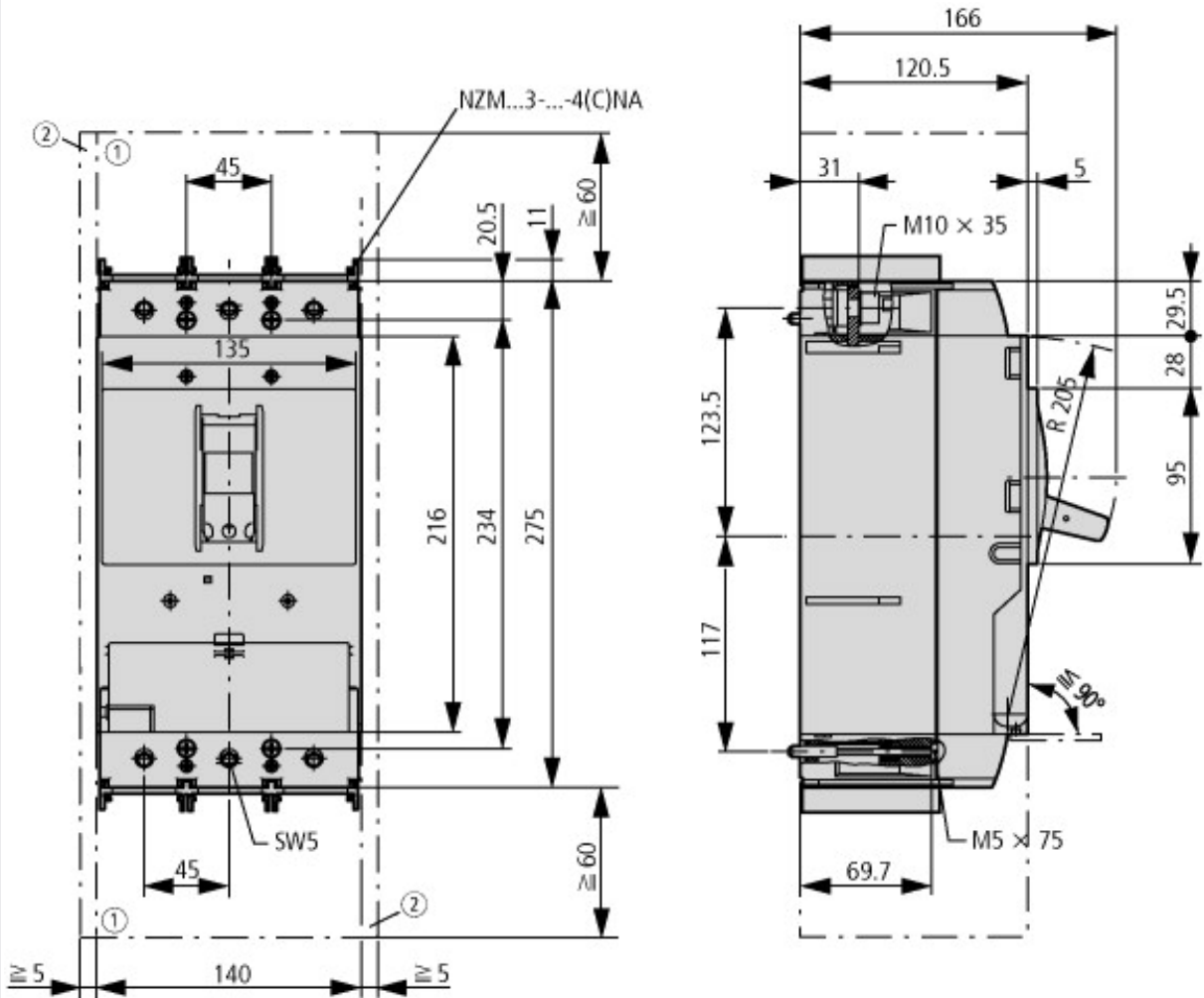
Let-through current



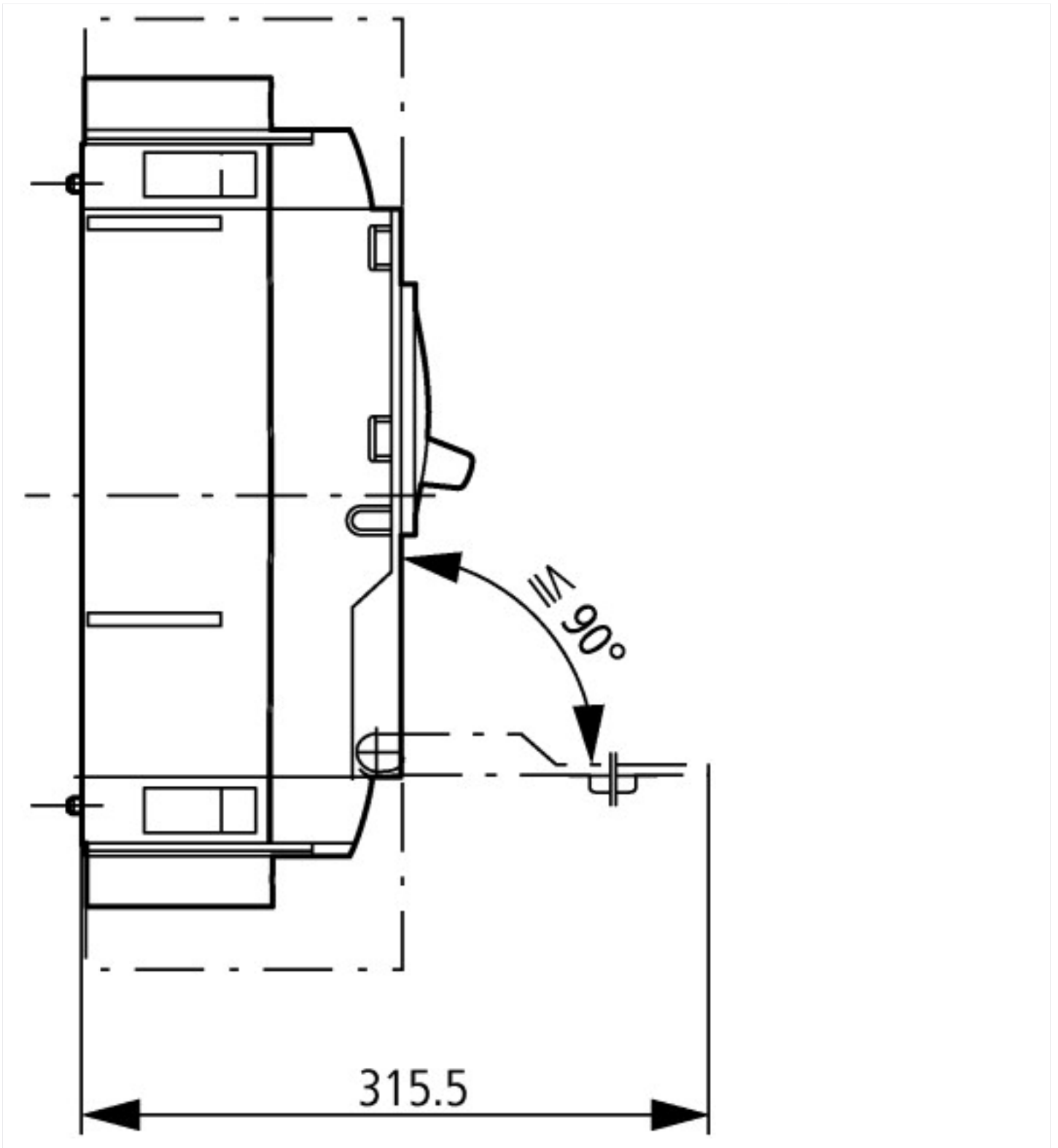
Let-through energy

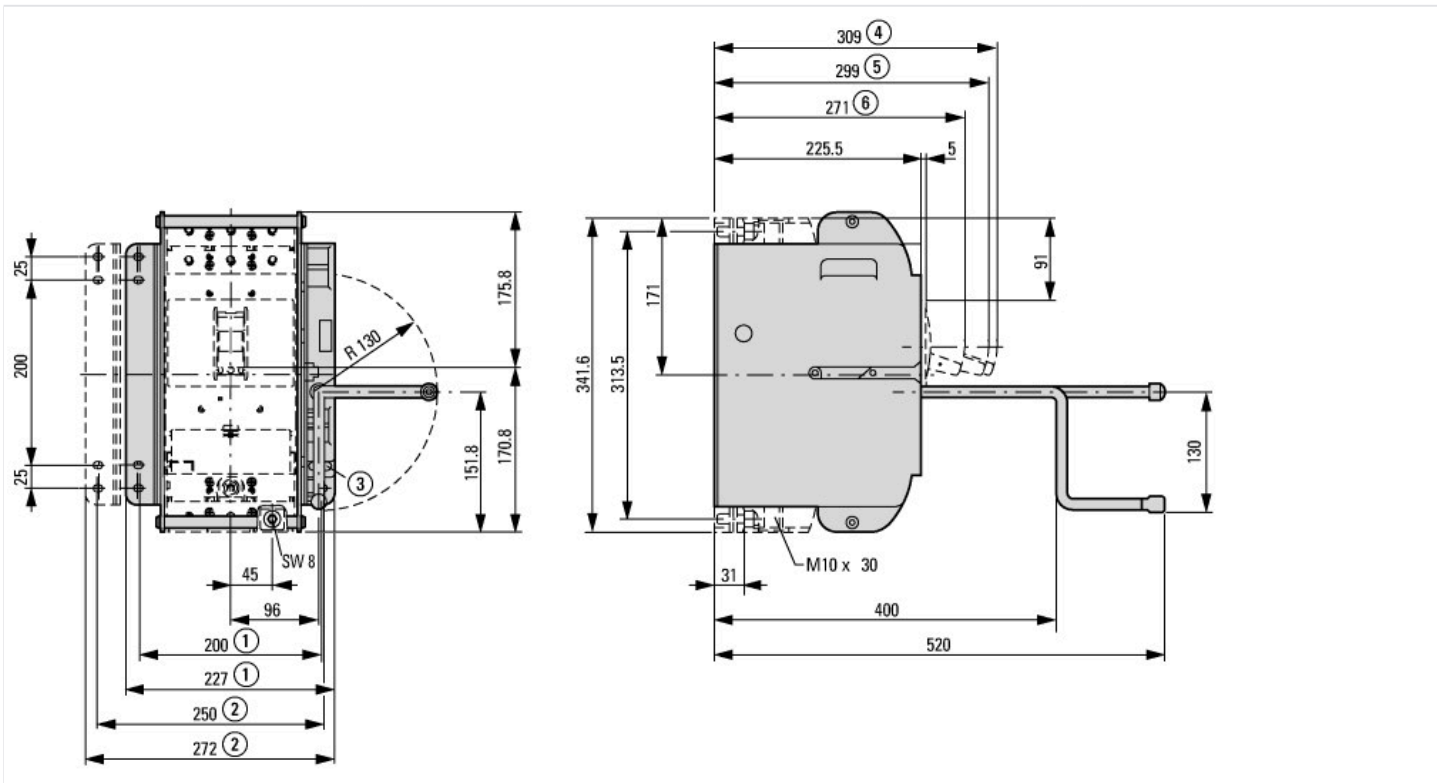


# Dimensions



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





## Additional product information (links)

### IL01208009Z (AWA1230-1992) Circuit-Breaker, basic unit

IL01208009Z (AWA1230-1992) Circuit-Breaker, basic unit

[ftp://ftp.moeller.net/DOCUMENTATION/AWA\\_INSTRUCTIONS/IL01208009Z2018\\_11.pdf](ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL01208009Z2018_11.pdf)

Temperature dependency, Derating

<http://ecat.moeller.net/flip-cat/?edition=HPLEN&startpage=17.172>

additional technical information for NZM power switch

[ftp://ftp.moeller.net/DOCUMENTATION/PDF/nzm\\_techinc\\_de\\_en.pdf](ftp://ftp.moeller.net/DOCUMENTATION/PDF/nzm_techinc_de_en.pdf)