

## DATASHEET - NZMN2-M160



**Circuit-breaker, 3p, 160A**

**Part no.** NZMN2-M160  
**Catalog No.** 265724

**EL-Nummer (Norway)** 0004315568



Similar to illustration

## Delivery program

|                     |  |  |                                                                                                                                           |
|---------------------|--|--|-------------------------------------------------------------------------------------------------------------------------------------------|
| Product range       |  |  | Circuit-breaker                                                                                                                           |
| Protective function |  |  | Motor protection                                                                                                                          |
|                     |  |  |                                                                                                                                           |
| Standard/Approval   |  |  | IEC                                                                                                                                       |
| Installation type   |  |  | Fixed                                                                                                                                     |
| Release system      |  |  | Thermomagnetic release                                                                                                                    |
| Construction size   |  |  | NZM2                                                                                                                                      |
| Description         |  |  | Tripping class 10 A<br>IEC/EN 60947-4-1, IEC/EN 60947-2<br><br>The circuit-breaker fulfills all requirements for AC-3 switching category. |
| Number of poles     |  |  | 3 pole                                                                                                                                    |
| Standard equipment  |  |  | Screw connection                                                                                                                          |

## Switching capacity

|                                             |             |    |     |
|---------------------------------------------|-------------|----|-----|
| 400/415 V 50 Hz                             | $I_{cu}$    | kA | 50  |
| Rated current = rated uninterrupted current | $I_n = I_u$ | A  | 160 |

## Setting range

|                        |                          |   |           |
|------------------------|--------------------------|---|-----------|
| Overload trip          |                          |   |           |
|                        | $I_r$                    | A | 125 - 160 |
| Short-circuit releases |                          |   |           |
|                        |                          |   |           |
| Non-delayed            | $I_i = I_n \times \dots$ |   | 8 - 14    |
|                        |                          |   |           |

## Motor rating AC-3 50/60 Hz

|             |   |    |    |
|-------------|---|----|----|
| 380 V 400 V | P | kW | 75 |
|-------------|---|----|----|

## Motor rating AC-3 50/60 Hz

|       |   |    |    |
|-------|---|----|----|
| 400 V | P | kW | 75 |
|-------|---|----|----|

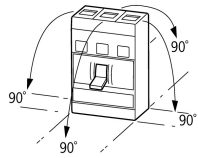
## Rated operational current AC-3 50/60 Hz

|       |       |   |     |
|-------|-------|---|-----|
| 400 V | $I_e$ | A | 134 |
|-------|-------|---|-----|

## 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                                                                     |  |      | Vertical and 90° in all directions<br> <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)                                                |  |      | Temperature dependency, Derating                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

## Circuit-breakers

|                                             |             |      |       |
|---------------------------------------------|-------------|------|-------|
| Rated current = rated uninterrupted current | $I_n = I_u$ | A    | 160   |
| 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 | 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 | 53                                                                                                                                              |
| 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 | 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 | 25                                                                                                                                              |
| 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 | 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 | 25                                                                                                                                              |
| 690 V 50/60 Hz                                  | $I_{cs}$ | kA | 5                                                                                                                                               |
|                                                 |          |    | 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                                     | $I_{cw}$ | 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 |
| 415 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                                      |
| Optional accessories                                      |      |                 | Box terminal<br>Tunnel terminal<br>connection on rear |
| Round copper conductor                                    |      |                 |                                                       |
| Box terminal                                              |      |                 |                                                       |
| Solid                                                     |      | mm <sup>2</sup> | 1 x (10 - 16)<br>2 x (6 - 16)                         |
| Stranded                                                  |      | mm <sup>2</sup> | 1 x (25 - 185)<br>2 x (25 - 70)                       |
| Tunnel terminal                                           |      |                 |                                                       |
| Solid                                                     |      | mm <sup>2</sup> | 1 x 16                                                |
| Stranded                                                  |      |                 |                                                       |
| 1-hole                                                    |      | mm <sup>2</sup> | 1 x (25 - 185)                                        |
| Bolt terminal and rear-side connection                    |      |                 |                                                       |
| Direct on the switch                                      |      |                 |                                                       |
| Solid                                                     |      | mm <sup>2</sup> | 1 x (10 - 16)<br>2 x (6 - 16)                         |
| Stranded                                                  |      | mm <sup>2</sup> | 1 x (25 - 185)<br>2 x (25 - 70)                       |
| Al circular conductor                                     |      |                 |                                                       |
| Tunnel terminal                                           |      |                 |                                                       |
| Solid                                                     |      | mm <sup>2</sup> | 1 x 16                                                |
| Stranded                                                  |      |                 |                                                       |
| Stranded                                                  |      | mm <sup>2</sup> | 1 x (25 - 185)                                        |
| Bolt terminal and rear-side connection                    |      |                 |                                                       |
| Direct on the switch                                      |      |                 |                                                       |
| Solid                                                     |      | mm <sup>2</sup> | 1 x (10 - 16)<br>2 x (10 - 16)                        |
| Stranded                                                  |      | mm <sup>2</sup> | 1 x (25 - 50)<br>2 x (25 - 50)                        |
| 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<br>(2x) 8 x 15.5 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 24 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              | 24 x 8                               |
| 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

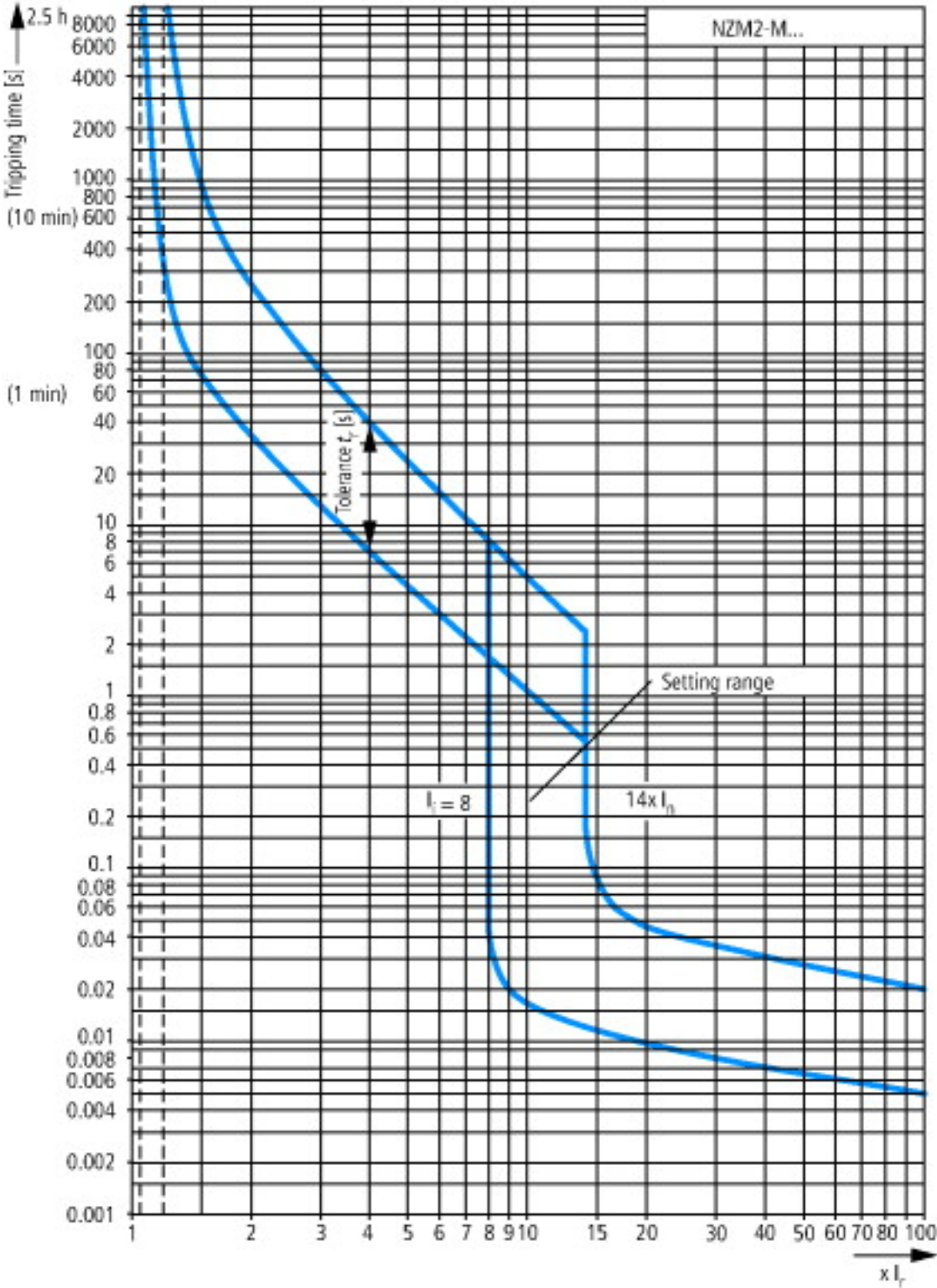
|                                                                                                                        |                  |    |                                                                                                                                  |
|------------------------------------------------------------------------------------------------------------------------|------------------|----|----------------------------------------------------------------------------------------------------------------------------------|
| Technical data for design verification                                                                                 |                  |    |                                                                                                                                  |
| Rated operational current for specified heat dissipation                                                               | I <sub>n</sub>   | A  | 160                                                                                                                              |
| Equipment heat dissipation, current-dependent                                                                          | P <sub>vid</sub> | W  | 38.4                                                                                                                             |
| 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.                         |

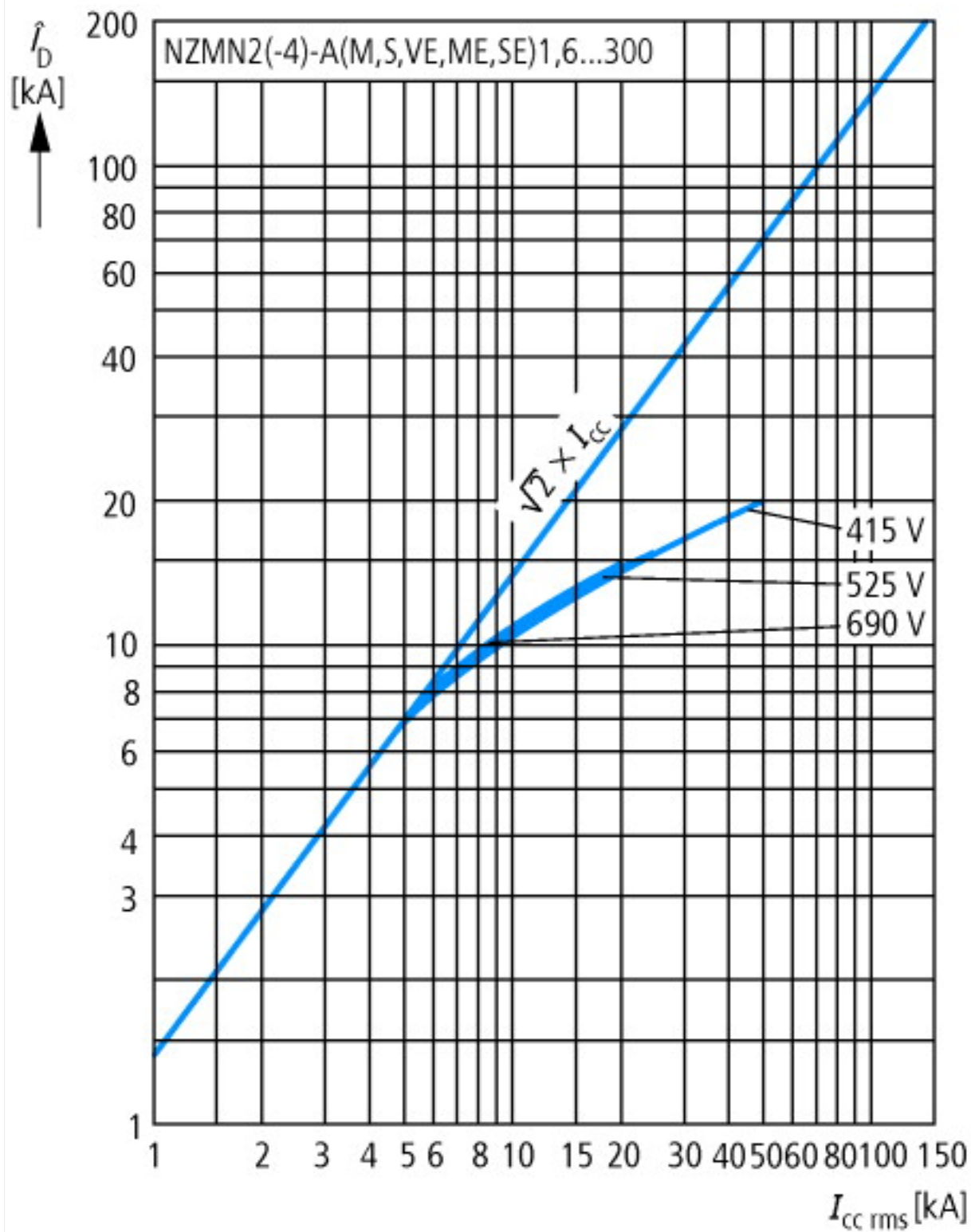
## Technical data ETIM 7.0

|                                                                                                                                                                                                       |  |    |                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----|------------------------------------------|
| Low-voltage industrial components (EG000017) / Motor protection circuit-breaker (EC000074)                                                                                                            |  |    |                                          |
| Electric engineering, automation, process control engineering / Low-voltage switch technology / Circuit breaker (LV < 1 kV) / Motor protection circuit-breaker (ecl@ss10.0.1-27-37-04-01 [AGZ529016]) |  |    |                                          |
| Overload release current setting                                                                                                                                                                      |  | A  | 125 - 160                                |
| Adjustment range undelayed short-circuit release                                                                                                                                                      |  | A  | 1280 - 2240                              |
| With thermal protection                                                                                                                                                                               |  |    | Yes                                      |
| Phase failure sensitive                                                                                                                                                                               |  |    | No                                       |
| Switch off technique                                                                                                                                                                                  |  |    | Thermomagnetic                           |
| Rated operating voltage                                                                                                                                                                               |  | V  | 690 - 690                                |
| Rated permanent current I <sub>u</sub>                                                                                                                                                                |  | A  | 160                                      |
| Rated operation power at AC-3, 230 V                                                                                                                                                                  |  | kW | 45                                       |
| Rated operation power at AC-3, 400 V                                                                                                                                                                  |  | kW | 90                                       |
| Type of electrical connection of main circuit                                                                                                                                                         |  |    | Screw connection                         |
| Type of control element                                                                                                                                                                               |  |    | Rocker lever                             |
| Device construction                                                                                                                                                                                   |  |    | Built-in device fixed built-in technique |

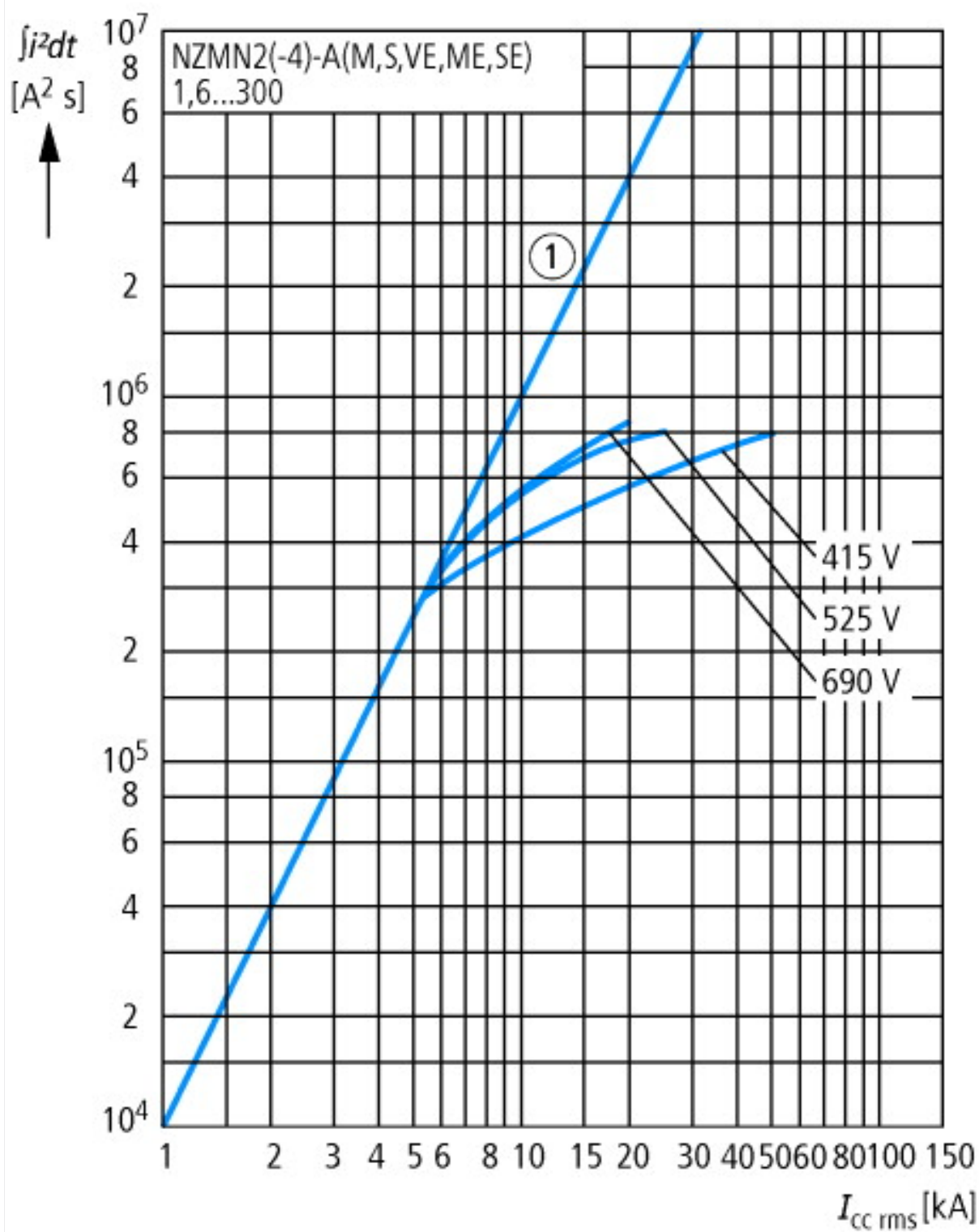
|                                                        |    |      |
|--------------------------------------------------------|----|------|
| With integrated auxiliary switch                       |    | No   |
| With integrated under voltage release                  |    | No   |
| Number of poles                                        |    | 3    |
| Rated short-circuit breaking capacity Icu at 400 V, AC | kA | 50   |
| Degree of protection (IP)                              |    | IP20 |
| Height                                                 | mm | 184  |
| Width                                                  | mm | 105  |
| Depth                                                  | mm | 149  |

### Characteristics



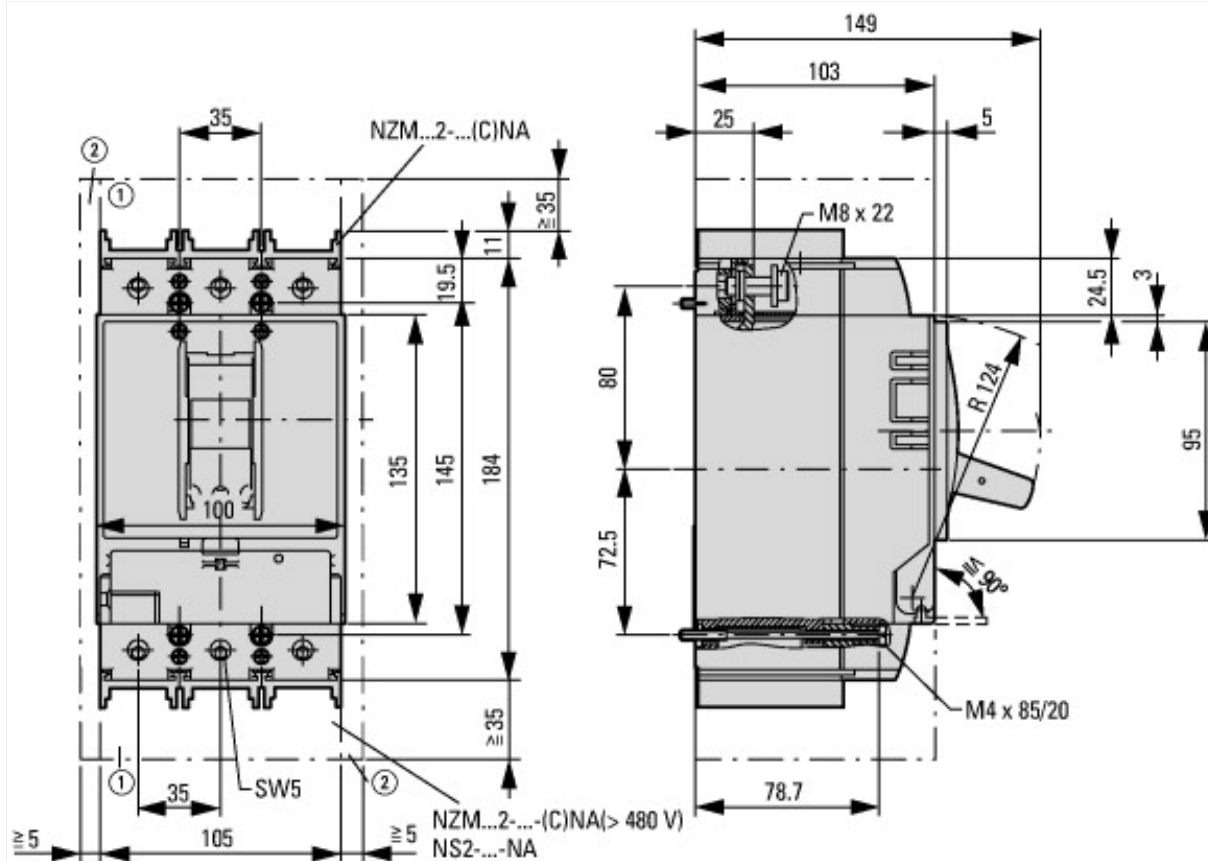


Let-through current

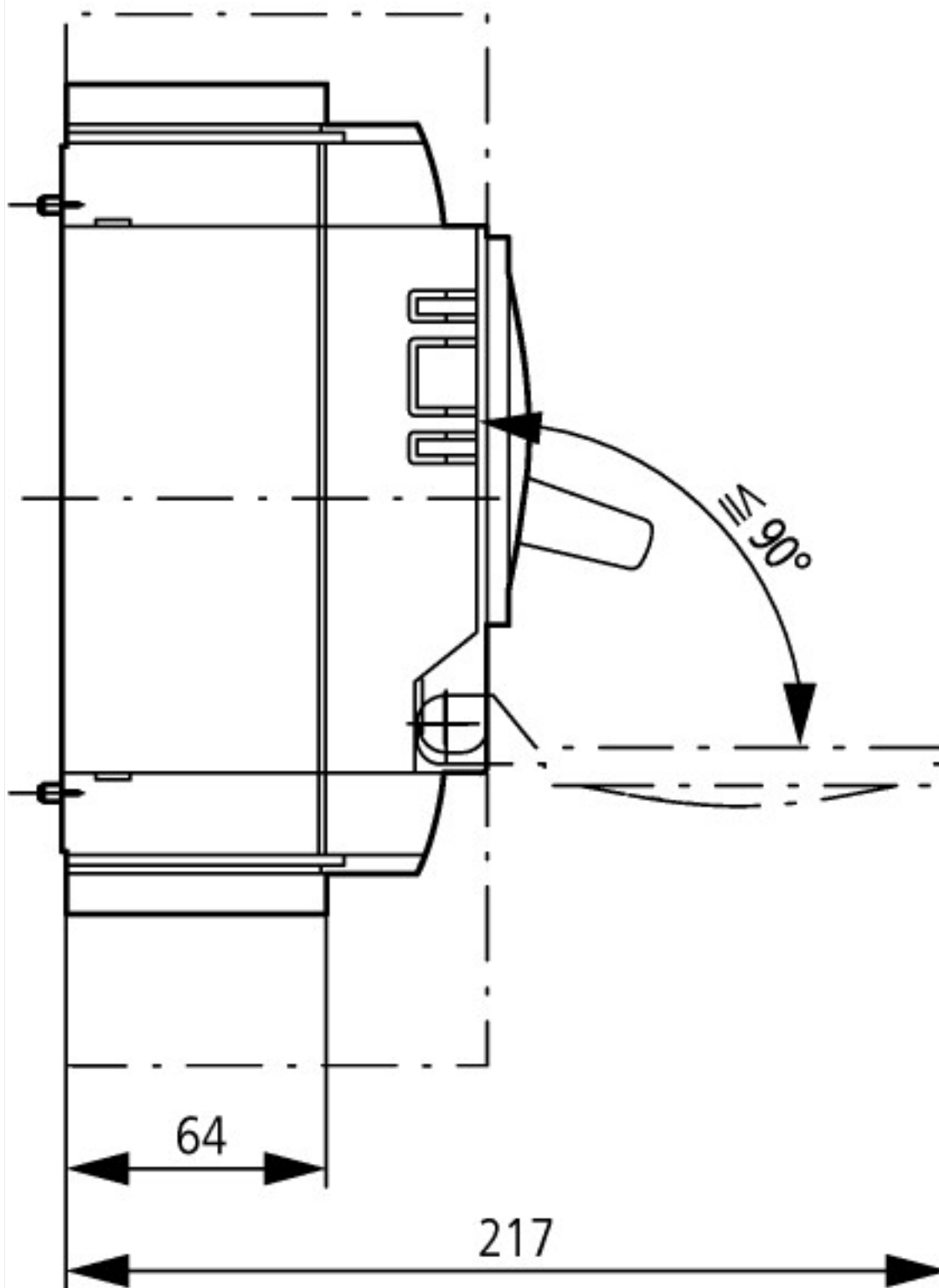


Let-through energy

## Dimensions



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



## Additional product information (links)

### IL01206006Z (AWA1230-1916) Circuit-Breaker, basic unit

|                                                        |                                                                                                                                                                                   |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IL01206006Z (AWA1230-1916) Circuit-Breaker, basic unit | <a href="https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL01206006Z2015_11.pdf">https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL01206006Z2015_11.pdf</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>                           |
| additional technical information for NZM power switch  | <a href="https://es-assets.eaton.com/DOCUMENTATION/PDF/nzm_technik_de_en.pdf">https://es-assets.eaton.com/DOCUMENTATION/PDF/nzm_technik_de_en.pdf</a>                             |