

# DATASHEET - NZMC1-4-A160



**Circuit-breaker, 4p, 160A**

**Part no.**

**NZMC1-4-A160**

**Catalog No.**

**283306**



Similar to illustration

## Delivery program

|                     |  |  |                                                                                  |
|---------------------|--|--|----------------------------------------------------------------------------------|
| Product range       |  |  | Circuit-breaker                                                                  |
| Protective function |  |  | System and cable protection                                                      |
| Standard/Approval   |  |  | IEC                                                                              |
| Installation type   |  |  | Fixed                                                                            |
| Release system      |  |  | Thermomagnetic release                                                           |
| Construction size   |  |  | NZM1                                                                             |
| Description         |  |  | Set value in neutral conductor is synchronous with set value $I_r$ of main pole. |
| Number of poles     |  |  | 4 pole                                                                           |
| Standard equipment  |  |  | Box terminal                                                                     |

## Switching capacity

|                 |          |    |    |
|-----------------|----------|----|----|
| 400/415 V 50 Hz | $I_{cu}$ | kA | 36 |
|-----------------|----------|----|----|

## Rated current = rated uninterrupted current

|                                             |                      |     |     |
|---------------------------------------------|----------------------|-----|-----|
| Rated current = rated uninterrupted current | $I_n = I_u$          | A   | 160 |
| Neutral conductor                           | % of phase conductor | CSA | 100 |

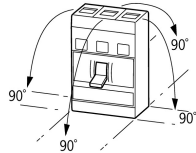
## Setting range

|                        |                          |   |              |
|------------------------|--------------------------|---|--------------|
| Overload trip          |                          |   |              |
|                        | $I_r$                    | A | 125 - 160    |
| Main pole              |                          |   |              |
|                        | $I_r$                    | A | 125 - 160    |
| Short-circuit releases |                          |   |              |
|                        |                          |   |              |
| Non-delayed            | $I_i = I_n \times \dots$ |   | 1280 A fixed |
|                        |                          |   |              |
| Short-circuit releases |                          |   |              |
|                        |                          |   |              |
| max.                   |                          | A | 1280         |

## 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 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    | 6000  |
| Auxiliary contacts                          |             | V    | 6000  |
| Rated operational voltage                   | $U_e$       | V AC | 690   |
| Overvoltage category/pollution degree       |             |      | III/3 |
| Rated insulation voltage                    | $U_i$       | V    | 690   |
| Use in unearthed supply systems             |             | V    | ≤ 690 |

## Switching capacity

|                                                                             |            |    |                                                                                                                                                 |
|-----------------------------------------------------------------------------|------------|----|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Rated short-circuit making capacity                                         | $I_{cm}$   |    |                                                                                                                                                 |
| 240 V                                                                       | $I_{cm}$   | kA | 121                                                                                                                                             |
| 400/415 V                                                                   | $I_{cm}$   | kA | 76                                                                                                                                              |
| 440 V 50/60 Hz                                                              | $I_{cm}$   | kA | 63                                                                                                                                              |
| 525 V 50/60 Hz                                                              | $I_{cm}$   | kA | 24                                                                                                                                              |
| 690 V 50/60 H                                                               | $I_c$      | kA | 14                                                                                                                                              |
| 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 | 55                                                                                                                                              |
| 400/415 V 50/60 Hz                                                          | $I_{cu}$   | kA | 36                                                                                                                                              |
| 440 V 50/60 Hz                                                              | $I_{cu}$   | kA | 30                                                                                                                                              |
| 525 V 50/60 Hz                                                              | $I_{cu}$   | kA | 12                                                                                                                                              |
| 690 V 50/60 Hz                                                              | $I_{cu}$   | kA | 8                                                                                                                                               |
| $I_{cs}$ to IEC/EN 60947 test cycle O-t-CO-t-CO                             | $I_{cs}$   | kA |                                                                                                                                                 |
| 240 V 50/60 Hz                                                              | $I_{cs}$   | kA | 55                                                                                                                                              |
| 400/415 V 50/60 Hz                                                          | $I_{cs}$   | kA | 36                                                                                                                                              |
| 440 V 50/60 Hz                                                              | $I_{cs}$   | kA | 22.5                                                                                                                                            |
| 525 V 50/60 Hz                                                              | $I_{cs}$   | kA | 6                                                                                                                                               |
| 690 V 50/60 Hz                                                              | $I_{cs}$   | kA | 4                                                                                                                                               |
|                                                                             |            |    | Maximum back-up fuse, if the expected short-circuit currents at the installation location exceed the switching capacity of the circuit-breaker. |
| 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 |    | 7500                                                                                                                                            |
| 415 V 50/60 Hz                                                              | Operations |    | 7500                                                                                                                                            |

|                                   |            |      |
|-----------------------------------|------------|------|
| 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                                        |      |                 | Box terminal                                                                                 |
| Optional accessories                                      |      |                 | Screw connection<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 (10 - 70) <sup>3)</sup><br>2 x (6-25)                                                    |
|                                                           |      |                 | <sup>3)</sup> Up to 95 mm <sup>2</sup> can be connected depending on the cable manufacturer. |
| Tunnel terminal                                           |      |                 |                                                                                              |
| Solid                                                     |      | mm <sup>2</sup> | 1 x 16                                                                                       |
| Stranded                                                  |      |                 |                                                                                              |
| 1-hole                                                    |      | mm <sup>2</sup> | 1 x (25 - 95)                                                                                |
| 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 (10 - 70) <sup>3)</sup><br>2 x 25                                                        |
|                                                           |      |                 | <sup>3)</sup> Up to 95 mm <sup>2</sup> can be connected depending on the cable manufacturer. |
| Al circular conductor                                     |      |                 |                                                                                              |
| Tunnel terminal                                           |      |                 |                                                                                              |
| Solid                                                     |      | mm <sup>2</sup> | 1 x 16                                                                                       |
| Stranded                                                  |      |                 |                                                                                              |
| Stranded                                                  |      | mm <sup>2</sup> | 1 x (25 - 95)                                                                                |
| 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 - 35)<br>2 x (25 - 35)                                                               |
| Cu strip (number of segments x width x segment thickness) |      |                 |                                                                                              |
| Box terminal                                              |      |                 |                                                                                              |
|                                                           | min. | mm              | 2 x 9 x 0.8                                                                                  |
|                                                           | max. | mm              | 9 x 9 x 0.8                                                                                  |
| Copper busbar (width x thickness)                         | mm   |                 |                                                                                              |
| Bolt terminal and rear-side connection                    |      |                 |                                                                                              |
| Screw connection                                          |      |                 | M6                                                                                           |
| Direct on the switch                                      |      |                 |                                                                                              |
|                                                           | min. | mm              | 12 x 5                                                                                       |
|                                                           | max. | mm              | 16 x 5                                                                                       |
| 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

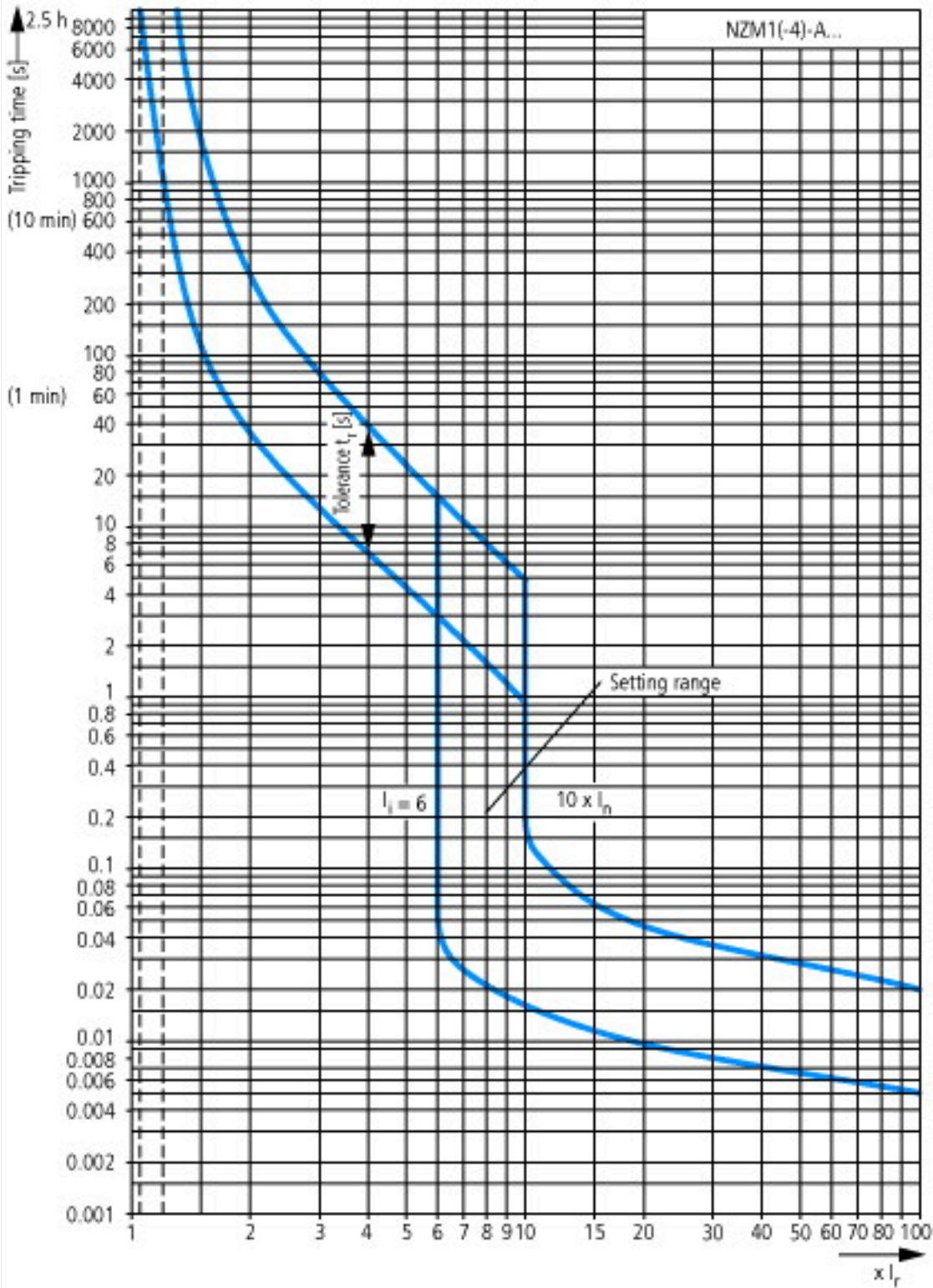
|                                                          |                  |    |      |
|----------------------------------------------------------|------------------|----|------|
| Technical data for design verification                   |                  |    |      |
| Rated operational current for specified heat dissipation | I <sub>n</sub>   | A  | 160  |
| Equipment heat dissipation, current-dependent            | P <sub>vid</sub> | W  | 36.1 |
| Operating ambient temperature min.                       |                  | °C | -25  |
| Operating ambient temperature max.                       |                  | °C | 70   |
| IEC/EN 61439 design verification                         |                  |    |      |

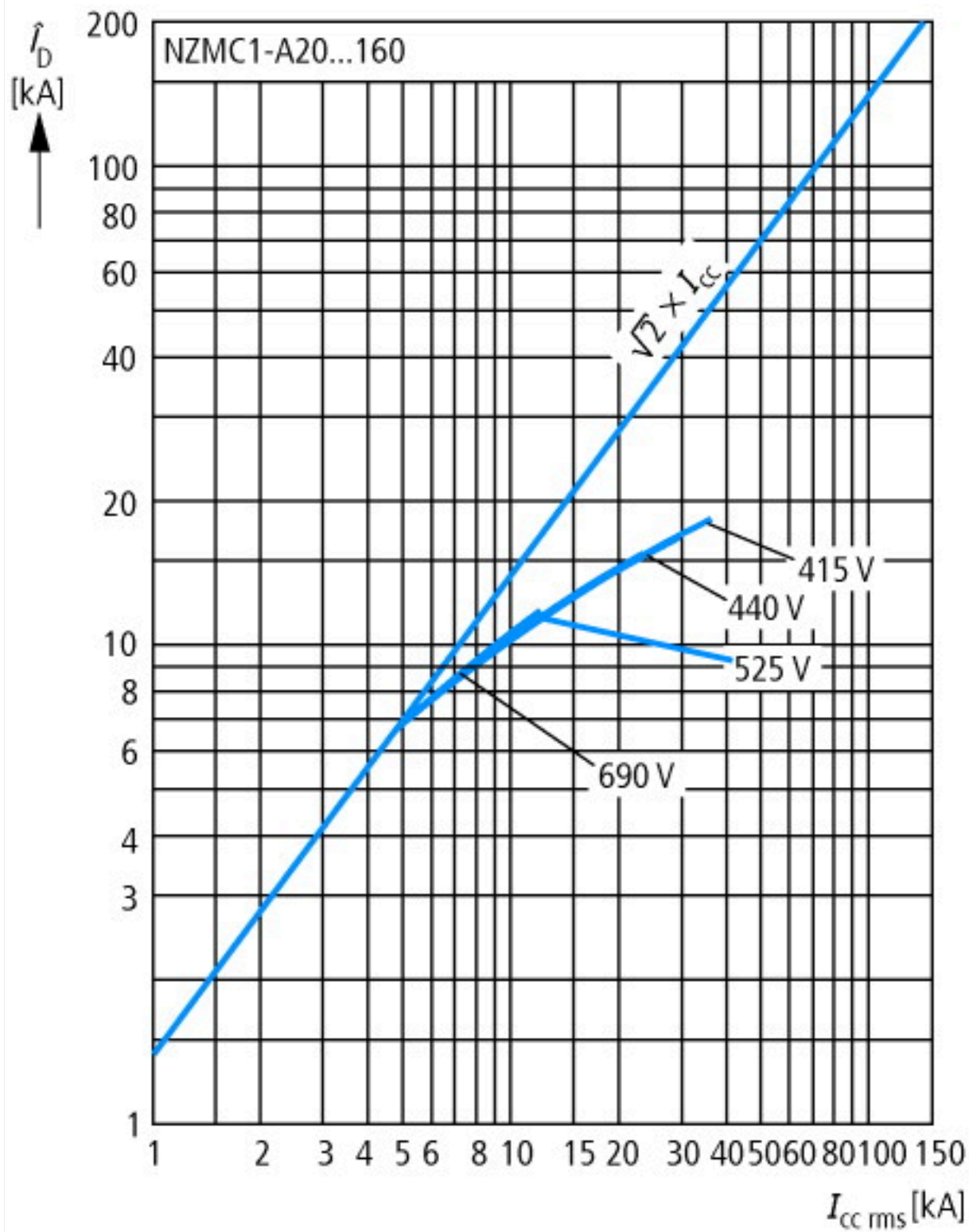
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|------------------------------------------------------------------------------------------------------------------------|--|--|----------------------------------------------------------------------------------------------------------------------------------|
| 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

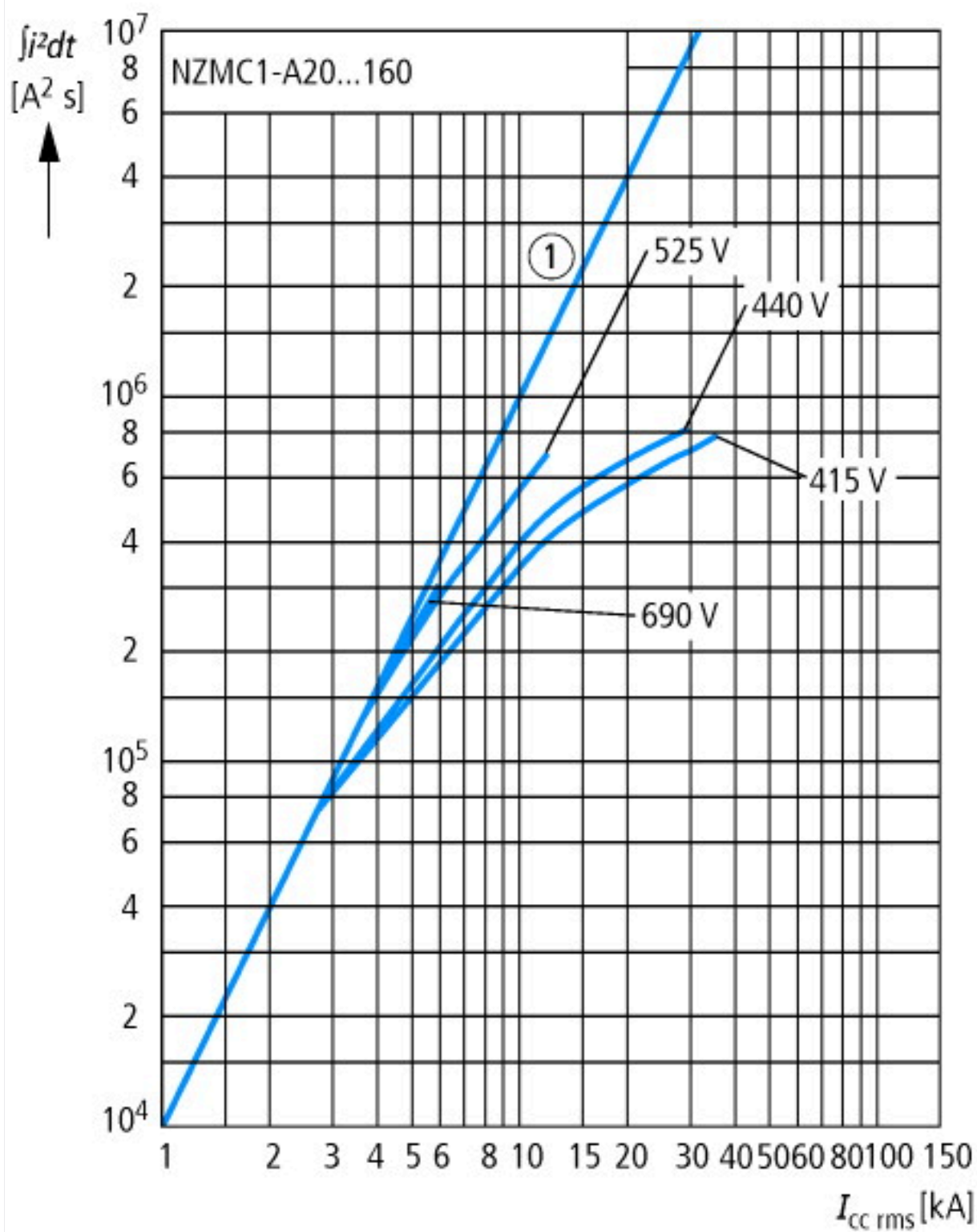
|                                                                                                                                                                                                                                             |    |  |                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|--|------------------------------------------|
| 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 (ecI@ss10.0.1-27-37-04-09 [AJZ716013]) |    |  |                                          |
| Rated permanent current I <sub>u</sub>                                                                                                                                                                                                      | A  |  | 160                                      |
| Rated voltage                                                                                                                                                                                                                               | V  |  | 690 - 690                                |
| Rated short-circuit breaking capacity I <sub>cu</sub> at 400 V, 50 Hz                                                                                                                                                                       | kA |  | 36                                       |
| Overload release current setting                                                                                                                                                                                                            | A  |  | 125 - 160                                |
| Adjustment range short-term delayed short-circuit release                                                                                                                                                                                   | A  |  | 0 - 0                                    |
| Adjustment range undelayed short-circuit release                                                                                                                                                                                            | A  |  | 1280 - 1280                              |
| Integrated earth fault protection                                                                                                                                                                                                           |    |  | No                                       |
| Type of electrical connection of main circuit                                                                                                                                                                                               |    |  | Frame clamp                              |
| Device construction                                                                                                                                                                                                                         |    |  | Built-in device fixed built-in technique |
| Suitable for DIN rail (top hat rail) mounting                                                                                                                                                                                               |    |  | No                                       |
| DIN rail (top hat rail) mounting optional                                                                                                                                                                                                   |    |  | Yes                                      |
| Number of auxiliary contacts as normally closed contact                                                                                                                                                                                     |    |  | 0                                        |
| Number of auxiliary contacts as normally open contact                                                                                                                                                                                       |    |  | 0                                        |
| Number of auxiliary contacts as change-over contact                                                                                                                                                                                         |    |  | 0                                        |
| With switched-off indicator                                                                                                                                                                                                                 |    |  | No                                       |
| With under voltage release                                                                                                                                                                                                                  |    |  | No                                       |
| Number of poles                                                                                                                                                                                                                             |    |  | 4                                        |
| Position of connection for main current circuit                                                                                                                                                                                             |    |  | Front side                               |
| Type of control element                                                                                                                                                                                                                     |    |  | Rocker lever                             |
| Complete device with protection unit                                                                                                                                                                                                        |    |  | Yes                                      |
| Motor drive integrated                                                                                                                                                                                                                      |    |  | No                                       |
| Motor drive optional                                                                                                                                                                                                                        |    |  | No                                       |
| Degree of protection (IP)                                                                                                                                                                                                                   |    |  | IP20                                     |

Characteristics



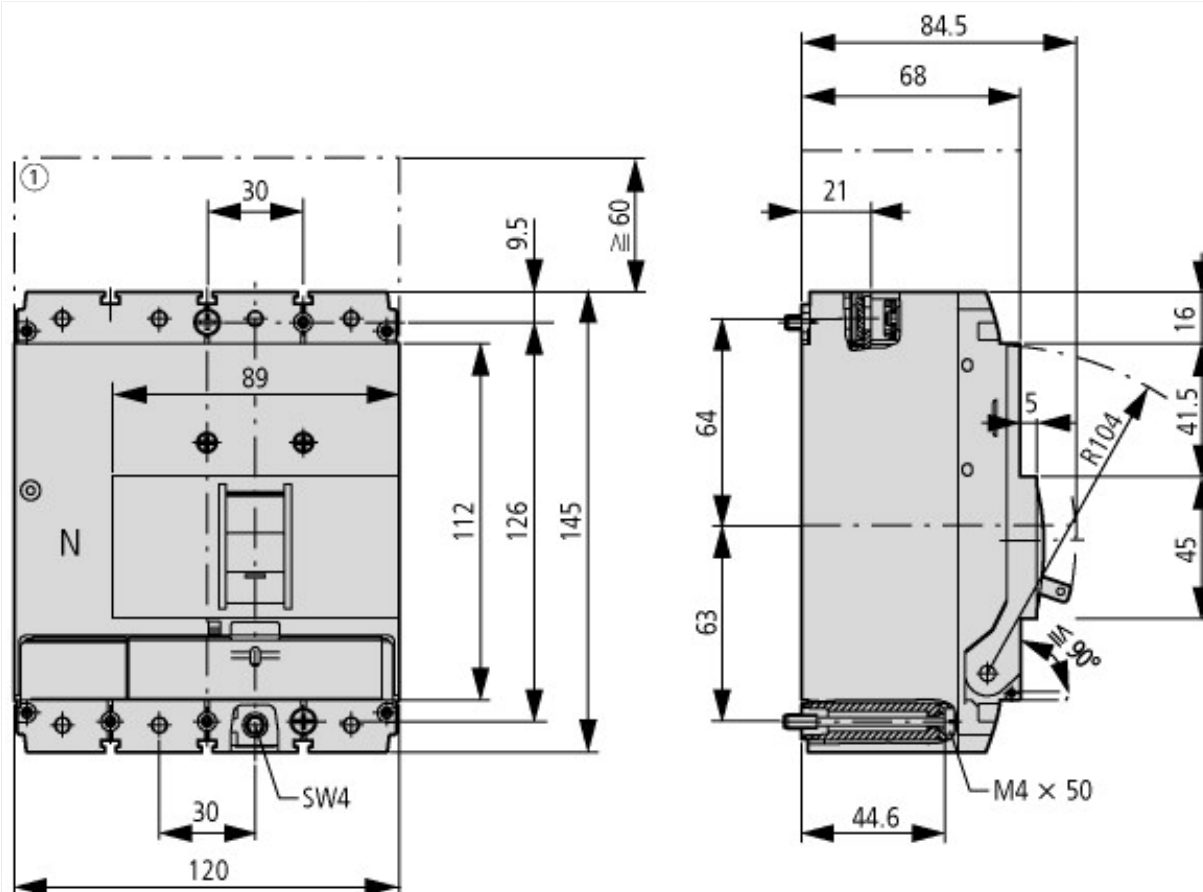


Let-through current



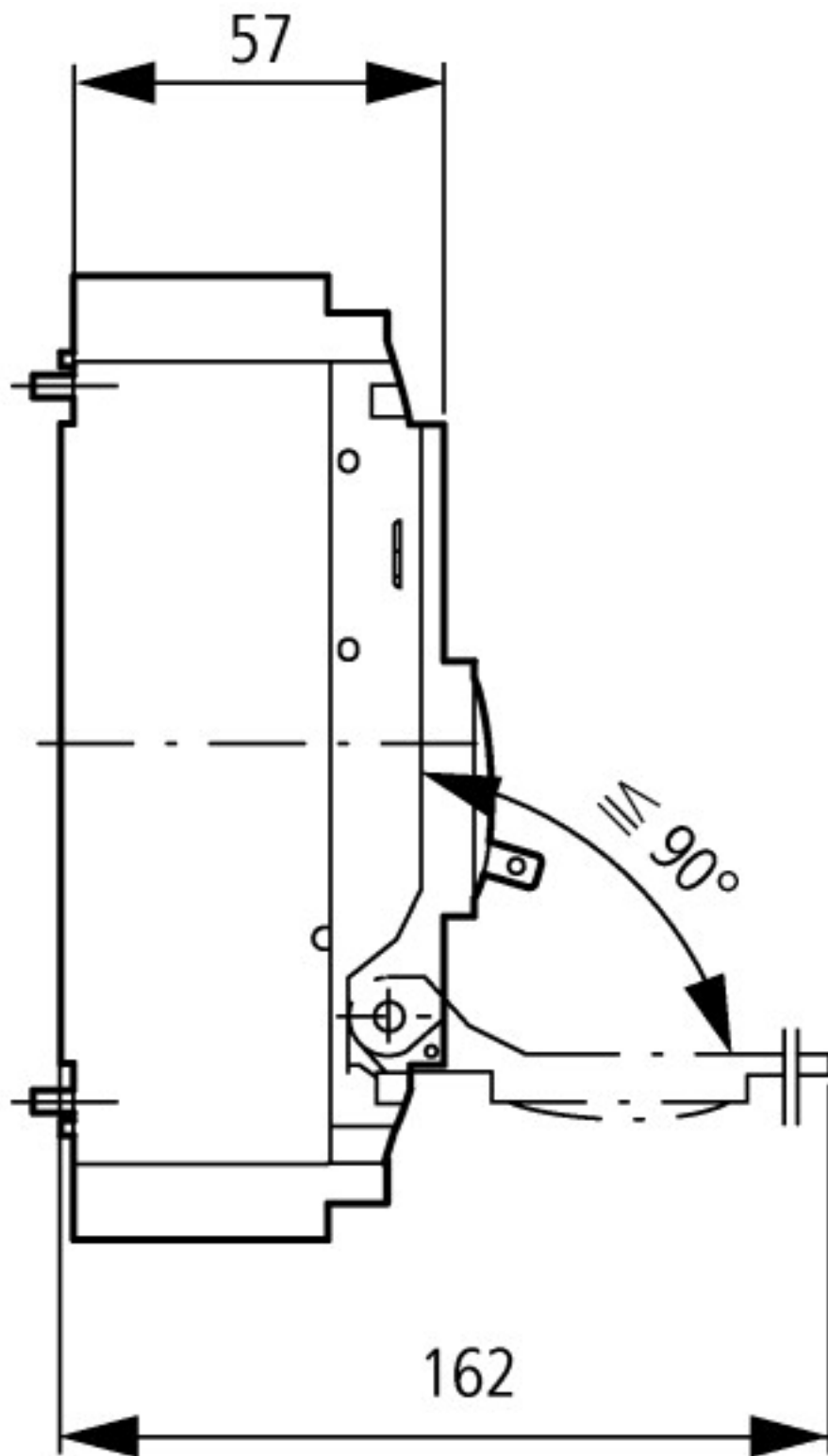
Let-through energy

## Dimensions



① Blow out area, minimum clearance to adjacent parts





### Additional product information (links)

|                                                       |                                                                                                                                                                                                                                         |
|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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>                                                                                 |
| CurveSelect characteristics program                   | <a href="http://www.eaton.eu/DE/Europe/Electrical/CustomerSupport/ConfigurationTools/CharacteristicsProgram/index.htm">http://www.eaton.eu/DE/Europe/Electrical/CustomerSupport/ConfigurationTools/CharacteristicsProgram/index.htm</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>                                                                                               |