

## DATASHEET - NZMH1-M50



**Circuit-breaker, 3p, 50A, motor protection**

**Part no.** NZMH1-M50  
**Catalog No.** 115451

**EL-Nummer (Norway)** 4363491



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   |  |  | NZM1                                                                                                                                                                        |
| Description         |  |  | With phase-failure sensitivity<br>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  |  |  | Box terminal                                                                                                                                                                |

### Switching capacity

|                                             |             |    |     |
|---------------------------------------------|-------------|----|-----|
| 400/415 V 50 Hz                             | $I_{cu}$    | kA | 100 |
| Rated current = rated uninterrupted current | $I_n = I_u$ | A  | 50  |

### Setting range

|                        |                          |   |         |
|------------------------|--------------------------|---|---------|
| Overload trip          |                          |   |         |
|                        | $I_r$                    | A | 40 - 50 |
| 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 | 22 |
|-------------|---|----|----|

### Motor rating AC-3 50/60 Hz

|       |   |    |    |
|-------|---|----|----|
| 400 V | P | kW | 22 |
|-------|---|----|----|

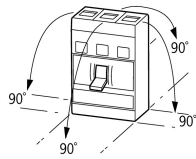
### Rated operational current AC-3 50/60 Hz

|       |       |   |    |
|-------|-------|---|----|
| 400 V | $I_e$ | A | 41 |
|-------|-------|---|----|

## 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:</p> <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:</li> <li>- NZM2, N(S)2, NZM3, N(S)3, NZM4, N(S)4: vertical and 90° in all directions</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    | 50    |
| 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 | 220                                                                                                                                             |
| 400/415 V                                                                   | $I_{cm}$   | kA | 220                                                                                                                                             |
| 440 V 50/60 Hz                                                              | $I_{cm}$   | kA | 154                                                                                                                                             |
| 525 V 50/60 Hz                                                              | $I_{cm}$   | kA | 40                                                                                                                                              |
| 690 V 50/60 H                                                               | $I_c$      | kA | 17                                                                                                                                              |
| 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 | 100                                                                                                                                             |
| 400/415 V 50/60 Hz                                                          | $I_{cu}$   | kA | 100                                                                                                                                             |
| 440 V 50/60 Hz                                                              | $I_{cu}$   | kA | 35                                                                                                                                              |
| 525 V 50/60 Hz                                                              | $I_{cu}$   | kA | 20                                                                                                                                              |
| 690 V 50/60 Hz                                                              | $I_{cu}$   | kA | 10                                                                                                                                              |
| $I_{cs}$ to IEC/EN 60947 test cycle O-t-CO-t-CO                             | $I_{cs}$   | kA |                                                                                                                                                 |
| 240 V 50/60 Hz                                                              | $I_{cs}$   | kA | 100                                                                                                                                             |
| 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 | 10                                                                                                                                              |
| 690 V 50/60 Hz                                                              | $I_{cs}$   | kA | 7.5                                                                                                                                             |
|                                                                             |            |    | 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 |       | 10000 |
| 415 V 50/60 Hz                    | Operations |       | 10000 |
| 690 V 50/60 Hz                    | Operations |       | 7500  |
| AC--3                             |            |       |       |
| 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 mm² 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 mm² 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)                                                                    |
| 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)   2 x (0.75 - 1.5)                                              |

### Design verification as per IEC/EN 61439

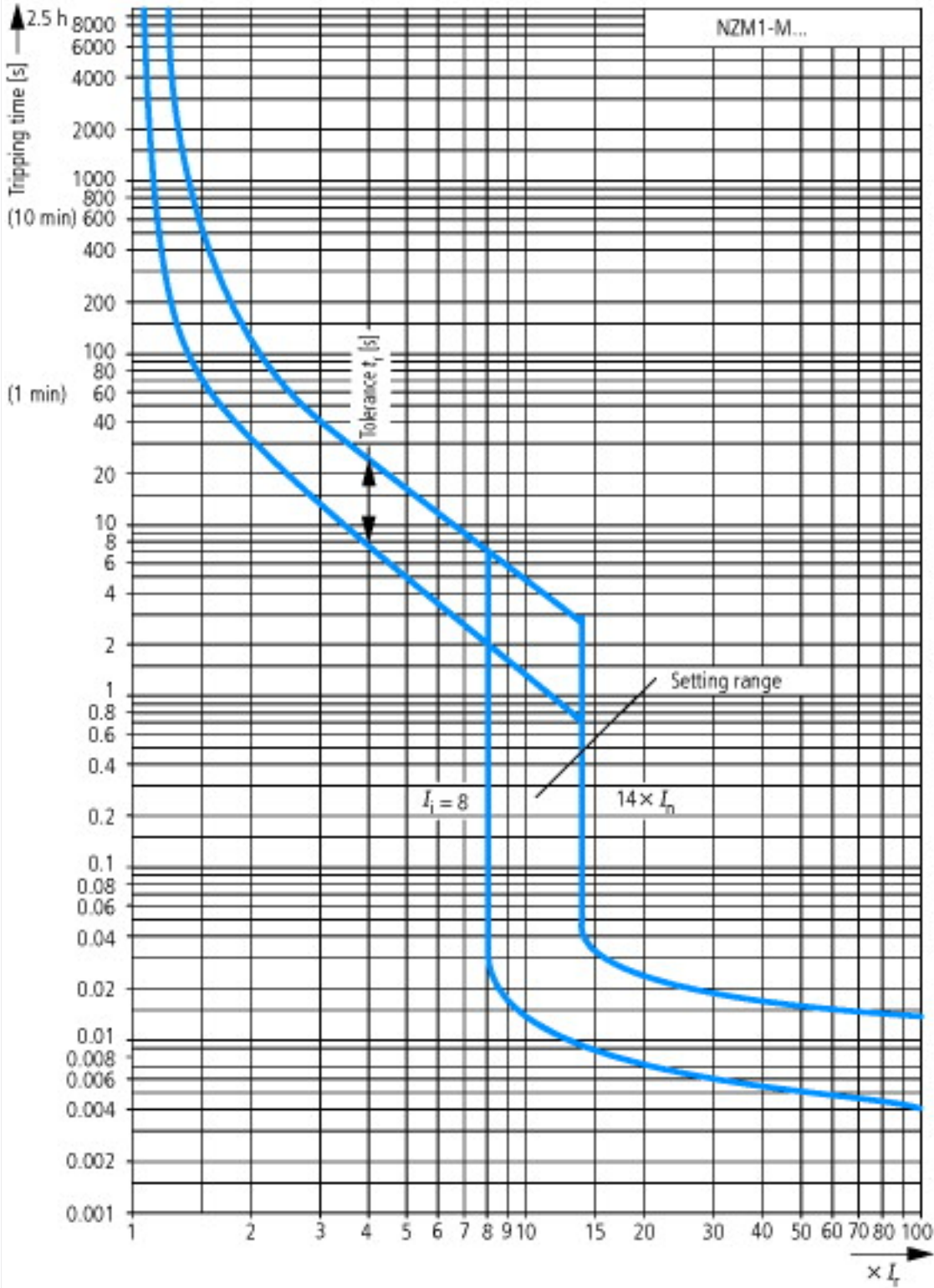
|                                                          |                  |    |      |
|----------------------------------------------------------|------------------|----|------|
| Technical data for design verification                   |                  |    |      |
| Rated operational current for specified heat dissipation | I <sub>n</sub>   | A  | 50   |
| Equipment heat dissipation, current-dependent            | P <sub>vid</sub> | W  | 14.1 |
| Operating ambient temperature min.                       |                  | °C | -25  |

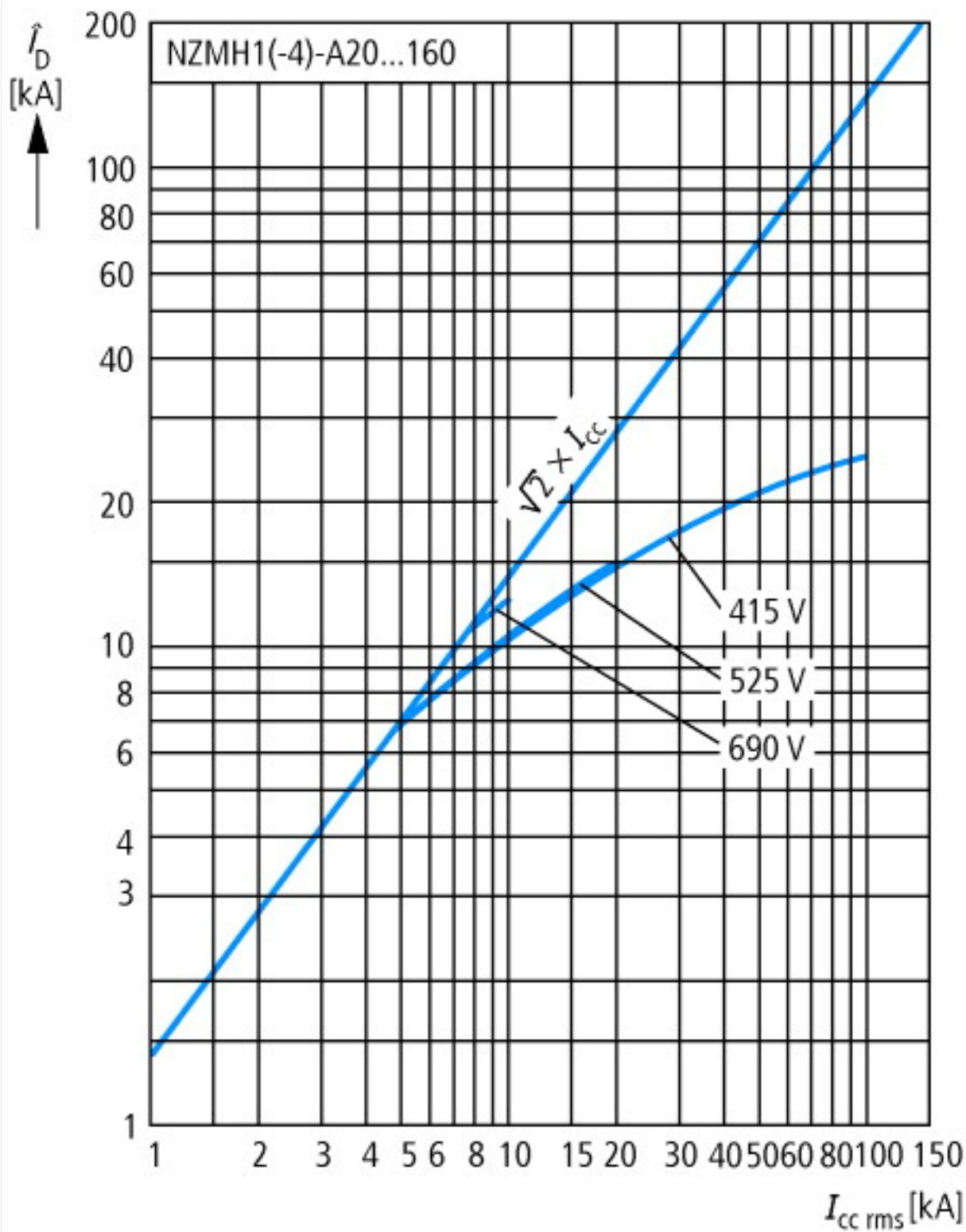
|                                                                                                                        |  |    |                                                                                                                                  |
|------------------------------------------------------------------------------------------------------------------------|--|----|----------------------------------------------------------------------------------------------------------------------------------|
| 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  |  | 40 - 50                                  |
| Adjustment range undelayed short-circuit release                                                                                                                                                      | A  |  | 400 - 700                                |
| With thermal protection                                                                                                                                                                               |    |  | Yes                                      |
| Phase failure sensitive                                                                                                                                                                               |    |  | Yes                                      |
| Switch off technique                                                                                                                                                                                  |    |  | Thermomagnetic                           |
| Rated operating voltage                                                                                                                                                                               | V  |  | 690 - 690                                |
| Rated permanent current Iu                                                                                                                                                                            | A  |  | 50                                       |
| Rated operation power at AC-3, 230 V                                                                                                                                                                  | kW |  | 15                                       |
| Rated operation power at AC-3, 400 V                                                                                                                                                                  | kW |  | 22                                       |
| Type of electrical connection of main circuit                                                                                                                                                         |    |  | Other                                    |
| 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 |  | 100                                      |
| Degree of protection (IP)                                                                                                                                                                             |    |  | IP20                                     |
| Height                                                                                                                                                                                                | mm |  | 145                                      |
| Width                                                                                                                                                                                                 | mm |  | 90                                       |
| Depth                                                                                                                                                                                                 | mm |  | 88                                       |

Characteristics

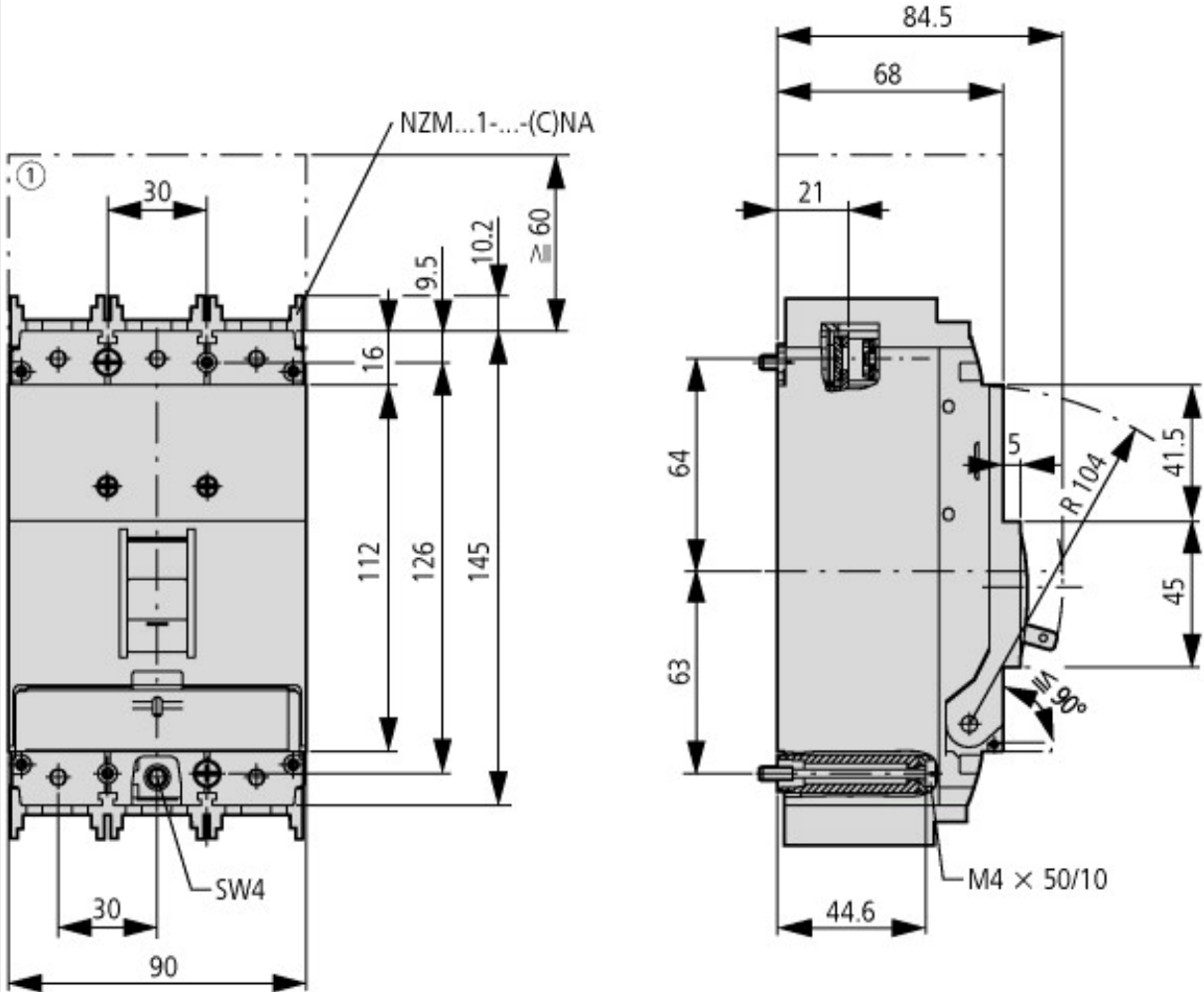




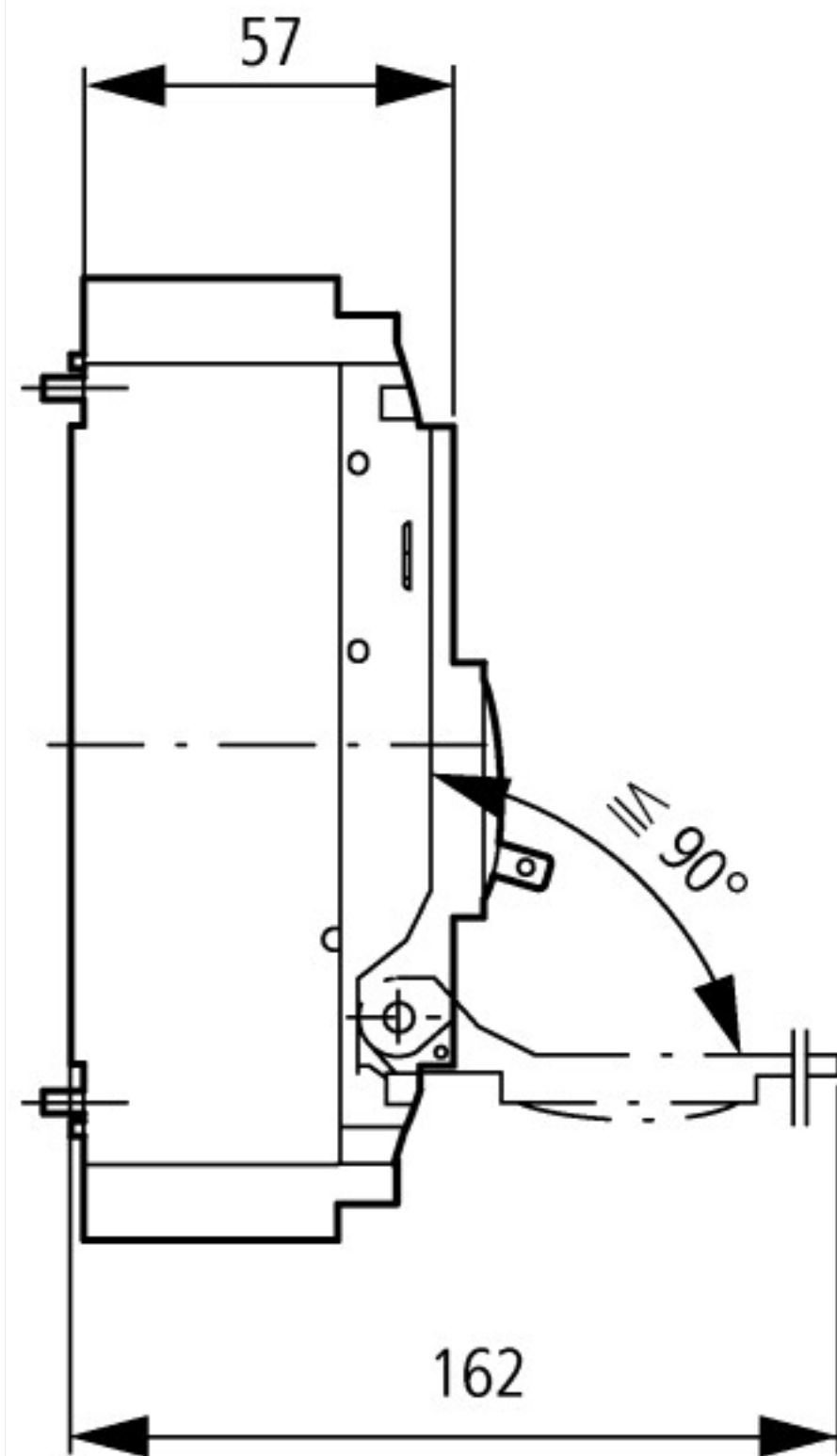
Let-through current

Let-through energy

Dimensions



① Blow out area, minimum clearance to adjacent parts



### Additional product information (links)

Temperature dependency, Derating

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

additional technical information for NZM power switch

[https://es-assets.eaton.com/DOCUMENTATION/PDF/nzm\\_technik\\_de\\_en.pdf](https://es-assets.eaton.com/DOCUMENTATION/PDF/nzm_technik_de_en.pdf)