

## Circuit-breaker, 4p, 400A, withdrawable unit

Part no. **NZMH3-4-A400-AVE**  
 Catalog No. **113580**

Similar to illustration

## Delivery program

|                     |  |  |                                                                                  |
|---------------------|--|--|----------------------------------------------------------------------------------|
| Product range       |  |  | Circuit-breaker                                                                  |
| Protective function |  |  | System and cable protection                                                      |
| Standard/Approval   |  |  | IEC                                                                              |
| Installation type   |  |  | Withdrawable                                                                     |
| Release system      |  |  | Thermomagnetic release                                                           |
| Construction size   |  |  | NZM3                                                                             |
| Description         |  |  | Set value in neutral conductor is synchronous with set value $I_r$ of main pole. |
| Number of poles     |  |  | 4 pole                                                                           |
| Standard equipment  |  |  | Screw connection                                                                 |

## Switching capacity

|                 |          |    |     |
|-----------------|----------|----|-----|
| 400/415 V 50 Hz | $I_{cu}$ | kA | 150 |
|-----------------|----------|----|-----|

## Rated current = rated uninterrupted current

|                                             |                      |   |     |
|---------------------------------------------|----------------------|---|-----|
| Rated current = rated uninterrupted current | $I_n = I_u$          | A | 400 |
| Neutral conductor                           | % of phase conductor | % | 100 |

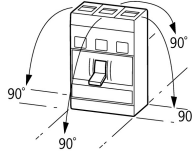
## Setting range

|                                                                                                               |                          |   |           |
|---------------------------------------------------------------------------------------------------------------|--------------------------|---|-----------|
| Overload trip                                                                                                 |                          |   |           |
|                            | $I_r$                    | A | 320 - 400 |
| Main pole<br>              | $I_r$                    | A | 320 - 400 |
| Short-circuit releases<br> |                          |   |           |
| Non-delayed<br>            | $I_i = I_n \times \dots$ |   | 6 - 10    |

## Technical data

## General

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

|                                        |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------------------|--|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                        |  |  |  <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    | 400   |
| Rated surge voltage invariability           | $U_{imp}$   |      |       |
| Main contacts                               |             | V    | 8000  |
| Auxiliary contacts                          |             | V    | 6000  |
| Rated operational voltage                   | $U_e$       | V AC | 690   |
| Overvoltage category/pollution degree       |             |      | III/3 |
| Rated insulation voltage                    | $U_i$       | V    | 1000  |
| Use in unearthed supply systems             |             | V    | ≤ 690 |

## Switching capacity

|                                                                             |            |    |                                                                                                                                                 |
|-----------------------------------------------------------------------------|------------|----|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Rated short-circuit making capacity                                         | $I_{cm}$   |    |                                                                                                                                                 |
| 240 V                                                                       | $I_{cm}$   | kA | 330                                                                                                                                             |
| 400/415 V                                                                   | $I_{cm}$   | kA | 330                                                                                                                                             |
| 440 V 50/60 Hz                                                              | $I_{cm}$   | kA | 286                                                                                                                                             |
| 525 V 50/60 Hz                                                              | $I_{cm}$   | kA | 143                                                                                                                                             |
| 690 V 50/60 H                                                               | $I_c$      | kA | 74                                                                                                                                              |
| Rated short-circuit breaking capacity $I_{cn}$                              | $I_{cn}$   |    |                                                                                                                                                 |
| $I_{cu}$ to IEC/EN 60947 test cycle O-t-CO                                  | $I_{cu}$   | kA |                                                                                                                                                 |
| 240 V 50/60 Hz                                                              | $I_{cu}$   | kA | 150                                                                                                                                             |
| 400/415 V 50/60 Hz                                                          | $I_{cu}$   | kA | 150                                                                                                                                             |
| 440 V 50/60 Hz                                                              | $I_{cu}$   | kA | 130                                                                                                                                             |
| 525 V 50/60 Hz                                                              | $I_{cu}$   | kA | 65                                                                                                                                              |
| 690 V 50/60 Hz                                                              | $I_{cu}$   | kA | 35                                                                                                                                              |
| $I_{cs}$ to IEC/EN 60947 test cycle O-t-CO-t-CO                             | $I_{cs}$   | kA |                                                                                                                                                 |
| 240 V 50/60 Hz                                                              | $I_{cs}$   | kA | 150                                                                                                                                             |
| 400/415 V 50/60 Hz                                                          | $I_{cs}$   | kA | 150                                                                                                                                             |
| 440 V 50/60 Hz                                                              | $I_{cs}$   | kA | 130                                                                                                                                             |
| 525 V 50/60 Hz                                                              | $I_{cs}$   | kA | 33                                                                                                                                              |
| 690 V 50/60 Hz                                                              | $I_{cs}$   | kA | 9                                                                                                                                               |
|                                                                             |            |    | Maximum back-up fuse, if the expected short-circuit currents at the installation location exceed the switching capacity of the circuit-breaker. |
| Rated short-time withstand current                                          |            |    |                                                                                                                                                 |
| $t = 0.3$ s                                                                 | $I_{cw}$   | kA | 3.3                                                                                                                                             |
| $t = 1$ s                                                                   | $I_{cw}$   | kA | 3.3                                                                                                                                             |
| Utilization category to IEC/EN 60947-2                                      |            |    | A                                                                                                                                               |
| Lifespan, mechanical(of which max. 50 % trip by shunt/undervoltage release) | Operations |    | 15000                                                                                                                                           |
| Lifespan, electrical                                                        |            |    |                                                                                                                                                 |
| AC-1                                                                        |            |    |                                                                                                                                                 |
| 400 V 50/60 Hz                                                              | Operations |    | 5000                                                                                                                                            |

|                                   |            |      |
|-----------------------------------|------------|------|
| 415 V 50/60 Hz                    | Operations | 5000 |
| 690 V 50/60 Hz                    | Operations | 3000 |
| AC--3                             |            |      |
| 400 V 50/60 Hz                    | Operations | 2000 |
| 415 V 50/60 Hz                    | Operations | 2000 |
| 690 V 50/60 Hz                    | Operations | 2000 |
| Max. operating frequency          | Ops/h      | 60   |
| Total break time at short-circuit | ms         | < 10 |

### Terminal capacity

|                                                           |      |                 |                                                                                               |
|-----------------------------------------------------------|------|-----------------|-----------------------------------------------------------------------------------------------|
| Standard equipment                                        |      |                 | Screw connection                                                                              |
| Accessories required                                      |      |                 | NZM3-4-XAVS                                                                                   |
| Optional accessories                                      |      |                 | Box terminal<br>Tunnel terminal<br>connection on rear                                         |
| Round copper conductor                                    |      |                 |                                                                                               |
| Box terminal                                              |      |                 |                                                                                               |
| Solid                                                     |      | mm <sup>2</sup> | 2 x 16                                                                                        |
| Stranded                                                  |      | mm <sup>2</sup> | 1 x (35 - 240)<br>2 x (25-120)                                                                |
| Tunnel terminal                                           |      |                 |                                                                                               |
| Solid                                                     |      | mm <sup>2</sup> | 1 x 16                                                                                        |
| Stranded                                                  |      |                 |                                                                                               |
| 1-hole                                                    |      | mm <sup>2</sup> | 1 x (16 - 185)                                                                                |
| Bolt terminal and rear-side connection                    |      |                 |                                                                                               |
| Direct on the switch                                      |      |                 |                                                                                               |
| Solid                                                     |      | mm <sup>2</sup> | 1 x 16<br>2 x 16                                                                              |
| Stranded                                                  |      | mm <sup>2</sup> | 1 x (25 - 240)<br>2 x (25 - 240)                                                              |
| Connection width extension                                |      | mm <sup>2</sup> |                                                                                               |
| Connection width extension                                |      | mm <sup>2</sup> | 2 x 300                                                                                       |
| Al circular conductor                                     |      |                 |                                                                                               |
| Tunnel terminal                                           |      |                 |                                                                                               |
| Solid                                                     |      | mm <sup>2</sup> | 1 x 16                                                                                        |
| Stranded                                                  |      |                 |                                                                                               |
| Stranded                                                  |      | mm <sup>2</sup> | 1 x (25 - 185) <sup>2)</sup>                                                                  |
| Double hole                                               |      | mm <sup>2</sup> | 1 x (50 - 240)<br>2 x (50 - 240)                                                              |
|                                                           |      |                 | <sup>2)</sup> Up to 240 mm <sup>2</sup> can be connected depending on the cable manufacturer. |
| Cu strip (number of segments x width x segment thickness) |      |                 |                                                                                               |
| Box terminal                                              |      |                 |                                                                                               |
|                                                           | min. | mm              | 6 x 16 x 0.8                                                                                  |
|                                                           | max. | mm              | 10 x 24 x 1.0<br>+ 5 x 24 x 1.0<br>(2 x) 8 x 24 x 1.0                                         |
| Bolt terminal and rear-side connection                    |      |                 |                                                                                               |
| Flat copper strip, with holes                             | min. | mm              | 6 x 16 x 0.8                                                                                  |
| Flat copper strip, with holes                             | max. | mm              | 10 x 32 x 1.0 + 5 x 32 x 1.0                                                                  |
| Connection width extension                                |      | mm              | (2 x) 10 x 50 x 1.0                                                                           |
| Copper busbar (width x thickness)                         | mm   |                 |                                                                                               |
| Bolt terminal and rear-side connection                    |      |                 |                                                                                               |
| Screw connection                                          |      |                 | M10                                                                                           |
| Direct on the switch                                      |      |                 |                                                                                               |
|                                                           | min. | mm              | 20 x 5                                                                                        |
|                                                           | max. | mm              | 30 x 10<br>+ 30 x 5                                                                           |
| Connection width extension                                |      | mm              |                                                                                               |
| Connection width extension                                | max. | mm              | 2 x (10 x 50)                                                                                 |

|                |  |                 |                                      |
|----------------|--|-----------------|--------------------------------------|
| Control cables |  |                 |                                      |
|                |  | mm <sup>2</sup> | 1 x (0.75 - 2.5)<br>2 x (0.75 - 1.5) |

## Design verification as per IEC/EN 61439

|                                                                                                                        |                  |    |                                                                                                                                  |
|------------------------------------------------------------------------------------------------------------------------|------------------|----|----------------------------------------------------------------------------------------------------------------------------------|
| Technical data for design verification                                                                                 |                  |    |                                                                                                                                  |
| Rated operational current for specified heat dissipation                                                               | I <sub>n</sub>   | A  | 400                                                                                                                              |
| Equipment heat dissipation, current-dependent                                                                          | P <sub>vid</sub> | W  | 96.48                                                                                                                            |
| 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 8.0

|                                                                                                                                                                                                                                             |  |    |                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----|---------------------------------------------------|
| 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 (ecl@ss10.0.1-27-37-04-09 [AJZ716013]) |  |    |                                                   |
| Rated permanent current I <sub>u</sub>                                                                                                                                                                                                      |  | A  | 400                                               |
| Rated voltage                                                                                                                                                                                                                               |  | V  | 690 - 690                                         |
| Rated short-circuit breaking capacity I <sub>cu</sub> at 400 V, 50 Hz                                                                                                                                                                       |  | kA | 150                                               |
| Overload release current setting                                                                                                                                                                                                            |  | A  | 320 - 400                                         |
| Adjustment range short-term delayed short-circuit release                                                                                                                                                                                   |  | A  | 0 - 0                                             |
| Adjustment range undelayed short-circuit release                                                                                                                                                                                            |  | A  | 6 - 10                                            |
| Integrated earth fault protection                                                                                                                                                                                                           |  |    | No                                                |
| Type of electrical connection of main circuit                                                                                                                                                                                               |  |    | Screw connection                                  |
| Device construction                                                                                                                                                                                                                         |  |    | Built-in device slide-in technique (withdrawable) |
| Suitable for DIN rail (top hat rail) mounting                                                                                                                                                                                               |  |    | No                                                |
| DIN rail (top hat rail) mounting optional                                                                                                                                                                                                   |  |    | No                                                |
| 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 integrated 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                            |  | Yes          |
| Degree of protection (IP)                       |  | IP20         |