

## Circuit-breaker, 3p, 250A, withdrawable unit

Part no. **NZMN3-VE250-T-AVE**  
 Catalog No. **113529**

Similar to illustration

## Delivery program

|                     |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------|--|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product range       |  |  | Circuit-breaker                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Protective function |  |  | Systems, cable, selectivity and generator protection<br>Earth-fault protection                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Standard/Approval   |  |  | IEC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Installation type   |  |  | Withdrawable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Release system      |  |  | Electronic release                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Construction size   |  |  | NZM3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Description         |  |  | R.m.s. value measurement and "thermal memory"<br>adjustable time delay setting to overcome current peaks $t_r$ : 2 – 20 s at 6 x $I_r$ also infinity (without overload releases)<br>Adjustable delay time $t_{sd}$ : Steps: 0, 20, 60, 100, 200, 300, 500, 750, 1000 ms<br>$i^2t$ constant function: switchable<br>Earth-fault release: Not dependent on mains and control voltages<br>$I_g = 0.35 - 0.4 - 0.5 - 0.6 - 0.7 - 0.8 - 0.9 - 1.0 \times I_n$<br>$t_g = 0 - 20 - 60 - 100 - 200 - 300 - 500 - 750 - 1000$ ms |
| Number of poles     |  |  | 3 pole                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Standard equipment  |  |  | Screw connection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

## Switching capacity

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

## Rated current = rated uninterrupted current

|                                             |             |   |     |
|---------------------------------------------|-------------|---|-----|
| Rated current = rated uninterrupted current | $I_n = I_u$ | A | 250 |
|---------------------------------------------|-------------|---|-----|

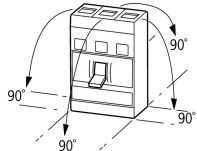
## Setting range

|                                                                                     |                             |   |           |
|-------------------------------------------------------------------------------------|-----------------------------|---|-----------|
| Overload trip                                                                       |                             |   |           |
|  | $I_r$                       | A | 125 - 250 |
| Short-circuit releases                                                              |                             |   |           |
|  |                             |   |           |
| Non-delayed                                                                         | $I_i = I_n \times \dots$    |   | 2 - 11    |
|  |                             |   |           |
| Delayed                                                                             | $I_{sd} = I_r \times \dots$ |   | 2 - 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<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    | 250   |
| Rated surge voltage invariability           | $U_{imp}$   |      |       |
| Main contacts                               |             | V    | 8000  |
| Auxiliary contacts                          |             | V    | 6000  |
| Rated operational voltage                   | $U_e$       | V AC | 690   |
| Overvoltage category/pollution degree       |             |      | III/3 |
| Rated insulation voltage                    | $U_i$       | V    | 1000  |
| Use in unearthed supply systems             |             | V    | ≤ 690 |

## Switching capacity

|                                                                             |            |    |                                                                                                                                                 |
|-----------------------------------------------------------------------------|------------|----|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Rated short-circuit making capacity                                         | $I_{cm}$   |    |                                                                                                                                                 |
| 240 V                                                                       | $I_{cm}$   | kA | 187                                                                                                                                             |
| 400/415 V                                                                   | $I_{cm}$   | kA | 105                                                                                                                                             |
| 440 V 50/60 Hz                                                              | $I_{cm}$   | kA | 74                                                                                                                                              |
| 525 V 50/60 Hz                                                              | $I_{cm}$   | kA | 53                                                                                                                                              |
| 690 V 50/60 H                                                               | $I_c$      | kA | 40                                                                                                                                              |
| Rated short-circuit breaking capacity $I_{cn}$                              | $I_{cn}$   |    |                                                                                                                                                 |
| $I_{cu}$ to IEC/EN 60947 test cycle O-t-CO                                  | $I_{cu}$   | kA |                                                                                                                                                 |
| 240 V 50/60 Hz                                                              | $I_{cu}$   | kA | 85                                                                                                                                              |
| 400/415 V 50/60 Hz                                                          | $I_{cu}$   | kA | 50                                                                                                                                              |
| 440 V 50/60 Hz                                                              | $I_{cu}$   | kA | 35                                                                                                                                              |
| 525 V 50/60 Hz                                                              | $I_{cu}$   | kA | 25                                                                                                                                              |
| 690 V 50/60 Hz                                                              | $I_{cu}$   | kA | 20                                                                                                                                              |
| $I_{cs}$ to IEC/EN 60947 test cycle O-t-CO-t-CO                             | $I_{cs}$   | kA |                                                                                                                                                 |
| 240 V 50/60 Hz                                                              | $I_{cs}$   | kA | 85                                                                                                                                              |
| 400/415 V 50/60 Hz                                                          | $I_{cs}$   | kA | 50                                                                                                                                              |
| 440 V 50/60 Hz                                                              | $I_{cs}$   | kA | 35                                                                                                                                              |
| 525 V 50/60 Hz                                                              | $I_{cs}$   | kA | 13                                                                                                                                              |
| 690 V 50/60 Hz                                                              | $I_{cs}$   | kA | 5                                                                                                                                               |
|                                                                             |            |    | Maximum back-up fuse, if the expected short-circuit currents at the installation location exceed the switching capacity of the circuit-breaker. |
| Rated short-time withstand current                                          |            |    |                                                                                                                                                 |
| $t = 0.3$ s                                                                 | $I_{cw}$   | kA | 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                                                                                          |
| <b>Terminal capacity</b>                                  |            |                 |                                                                                               |
| Standard equipment                                        |            |                 | Screw connection                                                                              |
| Accessories required                                      |            |                 | NZM3-XAVS                                                                                     |
| Optional accessories                                      |            |                 | Box terminal<br>Tunnel terminal<br>connection on rear                                         |
| Round copper conductor                                    |            |                 |                                                                                               |
| Box terminal                                              |            |                 |                                                                                               |
| Solid                                                     |            | mm <sup>2</sup> | 2 x 16                                                                                        |
| Stranded                                                  |            | mm <sup>2</sup> | 1 x (35 - 240)<br>2 x (25-120)                                                                |
| Tunnel terminal                                           |            |                 |                                                                                               |
| Solid                                                     |            | mm <sup>2</sup> | 1 x 16                                                                                        |
| Stranded                                                  |            |                 |                                                                                               |
| 1-hole                                                    |            | mm <sup>2</sup> | 1 x (16 - 185)                                                                                |
| Bolt terminal and rear-side connection                    |            |                 |                                                                                               |
| Direct on the switch                                      |            |                 |                                                                                               |
| Solid                                                     |            | mm <sup>2</sup> | 1 x 16<br>2 x 16                                                                              |
| Stranded                                                  |            | mm <sup>2</sup> | 1 x (25 - 240)<br>2 x (25 - 240)                                                              |
| Connection width extension                                |            | 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  | 250                                                                                                                              |
| Equipment heat dissipation, current-dependent                                                                          | P <sub>vid</sub> | W  | 18.75                                                                                                                            |
| Operating ambient temperature min.                                                                                     |                  | °C | -25                                                                                                                              |
| Operating ambient temperature max.                                                                                     |                  | °C | 70                                                                                                                               |
| IEC/EN 61439 design verification                                                                                       |                  |    |                                                                                                                                  |
| 10.2 Strength of materials and parts                                                                                   |                  |    |                                                                                                                                  |
| 10.2.2 Corrosion resistance                                                                                            |                  |    | Meets the product standard's requirements.                                                                                       |
| 10.2.3.1 Verification of thermal stability of enclosures                                                               |                  |    | Meets the product standard's requirements.                                                                                       |
| 10.2.3.2 Verification of resistance of insulating materials to normal heat                                             |                  |    | Meets the product standard's requirements.                                                                                       |
| 10.2.3.3 Verification of resistance of insulating materials to abnormal heat and fire due to internal electric effects |                  |    | Meets the product standard's requirements.                                                                                       |
| 10.2.4 Resistance to ultra-violet (UV) radiation                                                                       |                  |    | Meets the product standard's requirements.                                                                                       |
| 10.2.5 Lifting                                                                                                         |                  |    | Does not apply, since the entire switchgear needs to be evaluated.                                                               |
| 10.2.6 Mechanical impact                                                                                               |                  |    | Does not apply, since the entire switchgear needs to be evaluated.                                                               |
| 10.2.7 Inscriptions                                                                                                    |                  |    | Meets the product standard's requirements.                                                                                       |
| 10.3 Degree of protection of ASSEMBLIES                                                                                |                  |    | Does not apply, since the entire switchgear needs to be evaluated.                                                               |
| 10.4 Clearances and creepage distances                                                                                 |                  |    | Meets the product standard's requirements.                                                                                       |
| 10.5 Protection against electric shock                                                                                 |                  |    | Does not apply, since the entire switchgear needs to be evaluated.                                                               |
| 10.6 Incorporation of switching devices and components                                                                 |                  |    | Does not apply, since the entire switchgear needs to be evaluated.                                                               |
| 10.7 Internal electrical circuits and connections                                                                      |                  |    | Is the panel builder's responsibility.                                                                                           |
| 10.8 Connections for external conductors                                                                               |                  |    | Is the panel builder's responsibility.                                                                                           |
| 10.9 Insulation properties                                                                                             |                  |    |                                                                                                                                  |
| 10.9.2 Power-frequency electric strength                                                                               |                  |    | Is the panel builder's responsibility.                                                                                           |
| 10.9.3 Impulse withstand voltage                                                                                       |                  |    | Is the panel builder's responsibility.                                                                                           |
| 10.9.4 Testing of enclosures made of insulating material                                                               |                  |    | Is the panel builder's responsibility.                                                                                           |
| 10.10 Temperature rise                                                                                                 |                  |    | The panel builder is responsible for the temperature rise calculation. Eaton will provide heat dissipation data for the devices. |
| 10.11 Short-circuit rating                                                                                             |                  |    | Is the panel builder's responsibility. The specifications for the switchgear must be observed.                                   |
| 10.12 Electromagnetic compatibility                                                                                    |                  |    | Is the panel builder's responsibility. The specifications for the switchgear must be observed.                                   |
| 10.13 Mechanical function                                                                                              |                  |    | The device meets the requirements, provided the information in the instruction leaflet (IL) is observed.                         |

## Technical data ETIM 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 (ecI@ss10.0.1-27-37-04-09 [AJZ716013]) |  |    |                                                   |
| Rated permanent current I <sub>u</sub>                                                                                                                                                                                                      |  | A  | 250                                               |
| Rated voltage                                                                                                                                                                                                                               |  | V  | 690 - 690                                         |
| Rated short-circuit breaking capacity I <sub>cu</sub> at 400 V, 50 Hz                                                                                                                                                                       |  | kA | 50                                                |
| Overload release current setting                                                                                                                                                                                                            |  | A  | 125 - 250                                         |
| Adjustment range short-term delayed short-circuit release                                                                                                                                                                                   |  | A  | 250 - 2500                                        |
| Adjustment range undelayed short-circuit release                                                                                                                                                                                            |  | A  | 500 - 2750                                        |
| Integrated earth fault protection                                                                                                                                                                                                           |  |    | Yes                                               |
| 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                                       |  |  | 3            |
| 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         |