

Circuit-breaker, 4p, 250A, 160A in 4th pole, plug-in module

Part no. **NZMH2-4-VE250/160-SVE**  
 Catalog No. **113394**

EL-Nummer **4357069**  
 (Norway)

Similar to illustration

### Delivery program

|                     |  |  |  |  |
|---------------------|--|--|--|--|
| Product range       |  |  |  | Circuit-breaker  |
| Protective function |  |  |  | Systems, cable, selectivity and generator protection   |
| Standard/Approval   |  |  |  | IEC  |
| Installation type   |  |  |  | Plug-in units  |
| Release system      |  |  |  | Electronic release   |
| Construction size   |  |  |  | NZM2   |
| Description         |  |  |  | R.m.s. value measurement and "thermal memory"<br>Adjustable time delay setting to overcome current peaks $t_r$ at $6 \times I_r$ also infinity (without overload releases)<br>Adjustable delay time $t_{sd}$<br>$i^2 t$ constant function: fixed OFF<br>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 |  | 250                                  |
| Neutral conductor                           | % of phase conductor | % |  | 100                                  |
| Reduced neutral conductor protection        |                      | A |  | 160                                  |
| Neutral conductor protection                |                      |   |  | Reduced neutral conductor protection |

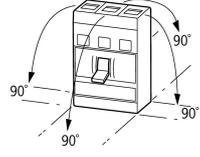
### Setting range

|  |                             |   |  |              |
|--|-----------------------------|---|--|--------------|
| Overload trip  |                             |   |  |              |
|                 | $I_r$                       | A |  | 125 - 250    |
| Main pole<br>   | $I_r$                       | A |  | 80 - 160     |
| Short-circuit releases   |                             |   |  |              |
|                 |                             |   |  |              |
| Non-delayed<br> | $I_i = I_n \times \dots$    |   |  | 3000 A fixed |
| Delayed<br>     | $I_{sd} = I_r \times \dots$ |   |  | 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   |      | <p>Vertical and 90° in all directions</p>  <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 | 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 | 105   |
| 690 V 50/60 Hz                                  | $I_c$    | 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 | 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 | 50  |
| 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 | 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 | 37.5  |
| 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 <sub>cw</sub> | kA    | 1.9   |
| t = 1 s  | I <sub>cw</sub> | kA    | 1.9   |
| Utilization category to IEC/EN 60947-2                                       |                 |       | A     |
| Lifespan, mechanical (of which max. 50 % trip by shunt/undervoltage release) | Operations      |       | 20000 |
| Lifespan, electrical   |                 |       |       |
| AC-1   |                 |       |       |
| 400 V 50/60 Hz   | Operations      |       | 10000 |
| 415 V 50/60 Hz   | Operations      |       | 10000 |
| 690 V 50/60 Hz   | Operations      |       | 7500  |
| AC--3  |                 |       |       |
| 400 V 50/60 Hz   | Operations      |       | 6500  |
| 415 V 50/60 Hz   | Operations      |       | 6500  |
| 690 V 50/60 Hz   | Operations      |       | 5000  |
| Max. operating frequency   |                 | Ops/h | 120   |
| Total break time at short-circuit  |                 | ms    | < 10  |

### Terminal capacity

|   |      |                 |   |
|---|------|-----------------|---|
| Standard equipment  |      |                 | Screw connection                                      |
| Accessories required                                      |      |                 | NZM2-4-XSVS   |
| Optional accessories                                      |      |                 | Box terminal<br>Tunnel terminal<br>connection on rear |
| Round copper conductor                                    |      |                 |   |
| Box terminal  |      |                 |   |
| Solid   |      | mm <sup>2</sup> | 1 x (10 - 16)<br>2 x (6 - 16)                         |
| Stranded  |      | mm <sup>2</sup> | 1 x (25 - 185)<br>2 x (25 - 70)                       |
| Tunnel terminal   |      |                 |   |
| Solid   |      | mm <sup>2</sup> | 1 x 16  |
| Stranded  |      |                 |   |
| 1-hole  |      | mm <sup>2</sup> | 1 x (25 - 185)  |
| Bolt terminal and rear-side connection                    |      |                 |   |
| Direct on the switch                                      |      |                 |   |
| Solid   |      | mm <sup>2</sup> | 1 x (10 - 16)<br>2 x (6 - 16)                         |
| Stranded  |      | mm <sup>2</sup> | 1 x (25 - 185)<br>2 x (25 - 70)                       |
| Al circular conductor                                     |      |                 |   |
| Tunnel terminal   |      |                 |   |
| Solid   |      | mm <sup>2</sup> | 1 x 16  |
| Stranded  |      |                 |   |
| Stranded  |      | mm <sup>2</sup> | 1 x (25 - 185)  |
| Cu strip (number of segments x width x segment thickness) |      |                 |   |
| Box terminal  |      |                 |   |
|   | min. | mm              | 2 x 9 x 0.8   |
|   | max. | mm              | 10 x 16 x 0.8<br>(2x) 8 x 15.5 x 0,8                  |
| Bolt terminal and rear-side connection                    |      |                 |   |
| Flat copper strip, with holes                             | min. | mm              | 2 x 16 x 0.8  |
| Flat copper strip, with holes                             | max. | mm              | 10 x 24 x 0.8   |
| Copper busbar (width x thickness)                         | mm   |                 |   |
| Bolt terminal and rear-side connection                    |      |                 |   |
| Screw connection  |      |                 | M8  |
| Direct on the switch                                      |      |                 |   |
|   | min. | mm              | 16 x 5  |
|   | max. | mm              | 24 x 8  |
| Control cables  |      |                 |   |

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

## Design verification as per IEC/EN 61439

| Technical data for design verification   |                  |    |  |
|--|------------------|----|--|
| Rated operational current for specified heat dissipation   | I <sub>n</sub>   | A  | 250  |
| Equipment heat dissipation, current-dependent  | P <sub>vid</sub> | W  | 51.56  |
| 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 (ecf@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 | 150                               |
| 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  | 3000 - 3000                       |
| Integrated earth fault protection   |  |    | No                                |
| Type of electrical connection of main circuit   |  |    | Screw connection                  |
| Device construction   |  |    | Built-in device plug-in technique |
| Suitable for DIN rail (top hat rail) mounting   |  |    | No                                |
| DIN rail (top hat rail) mounting optional   |  |    | Yes                               |
| Number of auxiliary contacts as normally closed contact   |  |    | 0                                 |
| Number of auxiliary contacts as normally open contact   |  |    | 0                                 |
| Number of auxiliary contacts as change-over contact   |  |    | 0                                 |
| With switched-off indicator   |  |    | No                                |

|   |  |  |              |
|---|--|--|--------------|
| With 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         |