# DATASHEET - NZMN2-A160-SVE



Part no. Catalog No.

NZMN2-A160-SVE 113244

Circuit-breaker, 3p, 160A, plug-in module

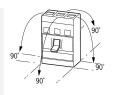


Similar to illustration

| Delivery program                            |                                   |    |                             |
|---|-----------------------------------|----|-----------------------------|
| Product range                               |                                   |    | Circuit-breaker             |
| Protective function                         |                                   |    | System and cable protection |
| Standard/Approval                           |                                   |    | IEC                         |
| Installation type                           |                                   |    | Plug-in units               |
| Release system                              |                                   |    | Thermomagnetic release      |
| Construction size                           |                                   |    | NZM2                        |
| Number of poles                             |                                   |    | 3 pole                      |
| Standard equipment                          |                                   |    | Screw connection            |
| Switching capacity                          |                                   |    |                             |
| 400/415 V 50 Hz                             | I <sub>cu</sub>                   | kA | 50                          |
| Rated current = rated uninterrupted current |                                   |    |                             |
| Rated current = rated uninterrupted current | $I_n = I_u$                       | А  | 160                         |
| Setting range                               |                                   |    |                             |
| Overload trip                               |                                   |    |                             |
| с‡  | l <sub>r</sub>                    | A  | 125 - 160                   |
| Short-circuit releases                      |                                   |    |                             |
| Non-delayed                                 | I <sub>i</sub> = I <sub>n</sub> x |    | 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 | °C   | - 40 - + 70  |
| Operation   | c | °C   | -25 - +70  |
| Mechanical shock resistance (10 ms half-sinusoidal shock) according to IEC 60068-2-27 | Ç | g    | 20 (half-sinusoidal shock 20 ms)   |
| Safe isolation to EN 61140  |   |      |  |
| Between auxiliary contacts and main contacts  | ١ | V AC | 500  |
| between the auxiliary contacts  | ١ | V AC | 300  |
| Weight  | k | kg   | 2.345  |
| Mounting position   |   |      | Vertical and 90° in all directions   |



With XFI earth-fault release: - NZM1, N1, NZM2, N2: vertical and 90° in all directions with plug-in unit - NZM1, N1, NZM2, N2: vertical, 90° right/left with withdrawable unit: - NZM3, N3: vertical, 90° right/left - NZM4, N4: vertical

|   |                  |      | - NZM4, N4: vertical<br>with remote operator:<br>- NZM2, N(S)2, NZM3, N(S)3,<br>NZM4, N(S)4: vertical and 90° in all<br>directions                      |
|---|------------------|------|---|
| Direction of incoming supply  |                  |      | as required   |
| Degree of protection  |                  |      |   |
| Device  |                  |      | In the operating controls area: IP20 (basic degree of protection)   |
| Enclosures  |                  |      | With insulating surround: IP40<br>With door coupling rotary handle: IP66  |
| Terminations  |                  |      | Tunnel terminal: IP10<br>Phase isolator and strip terminal: IP00  |
| Other technical data (sheet catalogue)                                      |                  |      | Temperature dependency, Derating  |
| Circuit-breakers  |                  |      |   |
| Rated current = rated uninterrupted current                                 | $I_n = I_u$      | A    | 160   |
| Rated surge voltage invariability   | U <sub>imp</sub> |      |   |
| Main contacts   |                  | V    | 8000  |
| Auxiliary contacts  |                  | V    | 6000  |
| Rated operational voltage   | Ue               | V AC | 690   |
| Overvoltage category/pollution degree                                       |                  |      | III/3   |
| Rated insulation voltage  | Ui               | V    | 1000  |
| Use in unearthed supply systems   |                  | V    | ≦ 690   |
| Switching capacity  |                  |      |   |
| Rated short-circuit making capacity   | I <sub>cm</sub>  |      |   |
| 240 V   | I <sub>cm</sub>  | kA   | 187   |
| 400/415 V   | I <sub>cm</sub>  | kA   | 105   |
| 440 V 50/60 Hz  | I <sub>cm</sub>  | kA   | 74  |
| 525 V 50/60 Hz  | I <sub>cm</sub>  | kA   | 53  |
| 690 V 50/60 H   | lc               | kA   | 40  |
| Rated short-circuit breaking capacity I <sub>cn</sub>                       |                  | KA . | 40  |
|   | I <sub>cn</sub>  | 1.4  |   |
| Icu to IEC/EN 60947 test cycle O-t-CO                                       | lcu              | kA   | ar.   |
| 240 V 50/60 Hz  | I <sub>cu</sub>  | kA   | 85  |
| 400/415 V 50/60 Hz  | I <sub>cu</sub>  | kA   | 50  |
| 440 V 50/60 Hz  | I <sub>cu</sub>  | kA   | 35  |
| 525 V 50/60 Hz  | I <sub>cu</sub>  | kA   | 25  |
| 690 V 50/60 Hz  | I <sub>cu</sub>  | kA   | 20  |
| Ics to IEC/EN 60947 test cycle 0-t-C0-t-C0                                  | lcs              | kA   |   |
| 240 V 50/60 Hz  | I <sub>cs</sub>  | kA   | 85  |
| 400/415 V 50/60 Hz  | I <sub>cs</sub>  | kA   | 50  |
| 440 V 50/60 Hz  | I <sub>cs</sub>  | kA   | 35  |
| 525 V 50/60 Hz  | I <sub>cs</sub>  | kA   | 25  |
| 690 V 50/60 Hz  |                  | kA   | 5   |
|   | I <sub>cs</sub>  | is a | J<br>Maximum back-up fuse, if the expected short-circuit currents at the installation<br>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   | 85  |
| Utilization category to IEC/EN 60947-2                                      | · U W            |      | A   |
| Lifespan, mechanical(of which max. 50 % trip by shunt/undervoltage release) | Operations       |      | 20000   |
| Lifespan, mechanicator which max. 50 % trip by shundundervoltage release)   | operations       |      | 2000  |
| AC-1  |                  |      |   |
|   | Operations       |      | 10000   |
| 400 V 50/60 Hz  | Operations       |      | 10000   |

| 415 V 50/60 Hz  | Operations |                 | 10000   |
|---|------------|-----------------|---|
| 690 V 50/60 Hz  | Operations |                 | 7500  |
| AC3   | operations |                 |   |
| 400 V 50/60 Hz  | Operations |                 | 6500  |
| 415 V 50/60 Hz  | Operations |                 | 6500  |
| 690 V 50/60 Hz  | Operations |                 | 5000  |
| Max. operating frequency                                  | operations | Ops/h           | 120   |
| Total break time at short-circuit                         |            | ms              | < 10  |
| Terminal capacity   |            | 1110            |   |
| Standard equipment  |            |                 | Screw connection                                      |
| Accessories required                                      |            |                 | NZM2-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)   |
|   |            |                 | 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 | In               | А  | 160  |
| Equipment heat dissipation, current-dependent            | P <sub>vid</sub> | W  | 38.4 |
| Operating ambient temperature min.                       |                  | °C | -25  |

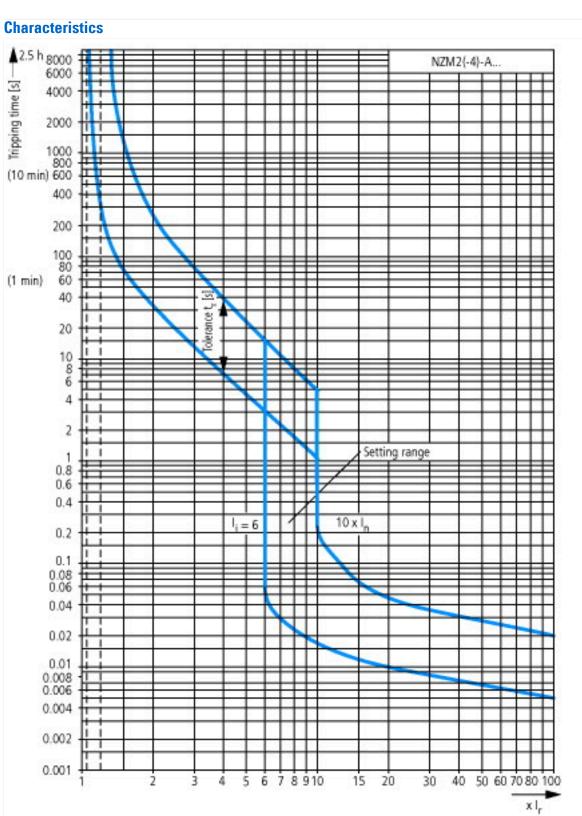
| Operating ambient temperature max.   | °C | 70   |
|--|----|--|
| EC/EN 61439 design verification  |    |  |
| 10.2 Strength of materials and parts   |    |  |
| 10.2.2 Corrosion resistance  |    | Meets the product standard's requirements.   |
| 10.2.3.1 Verification of thermal stability of enclosures   |    | 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 observed.                                      |
| 10.12 Electromagnetic compatibility  |    | Is the panel builder's responsibility. The specifications for the switchgear must observed.                                      |
| 10.13 Mechanical function  |    | The device meets the requirements, provided the information in the instruction leaflet (IL) is observed.                         |

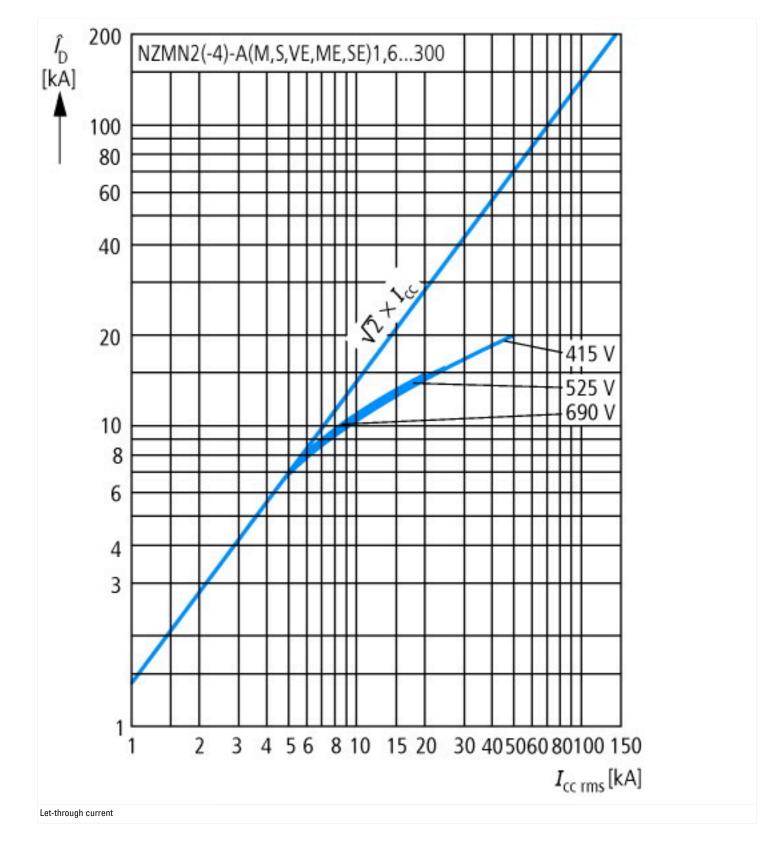
### **Technical data ETIM 7.0**

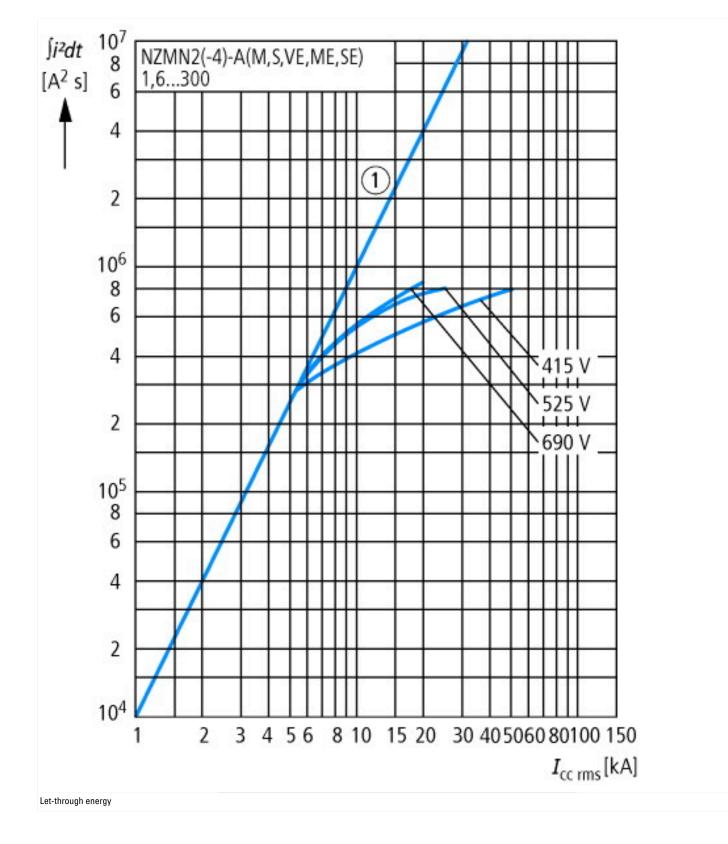
Low-voltage industrial components (EG000017) / Power circuit-breaker for trafo/generator/installation protection (EC000228)

| Electric engineering, automation, process control engineering / Low-voltage switch technology / Circuit breaker (LV < 1 kV) / Circuit breaker for power transformer, generator and system |
|---|
| protection (ecl@ss10.0.1-27-37-04-09 [AJZ716013])   |

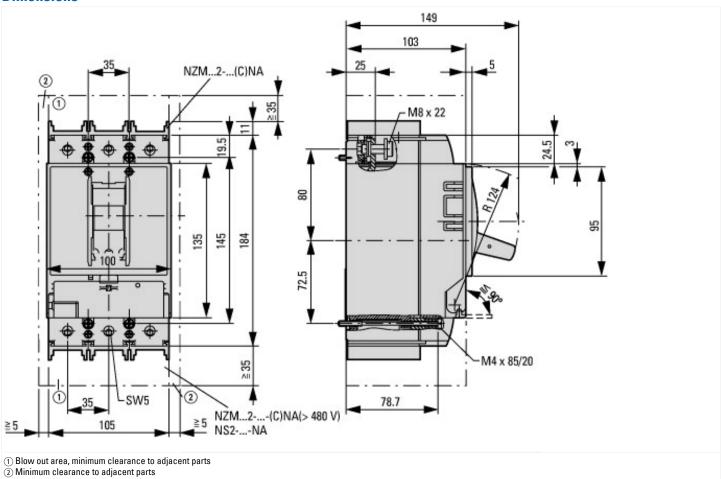
| P   |    |                                   |
|---|----|-----------------------------------|
| Rated permanent current lu                                | А  | A 160                             |
| Rated voltage   | V  | V 690 - 690                       |
| Rated short-circuit breaking capacity Icu at 400 V, 50 Hz | kA | <a 50<="" td=""></a>              |
| Overload release current setting                          | А  | A 125 - 160                       |
| Adjustment range short-term delayed short-circuit release | А  | A 0 - 0                           |
| Adjustment range undelayed short-circuit release          | А  | A 960 - 1600                      |
| 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 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                              |
|   |    |                                   |

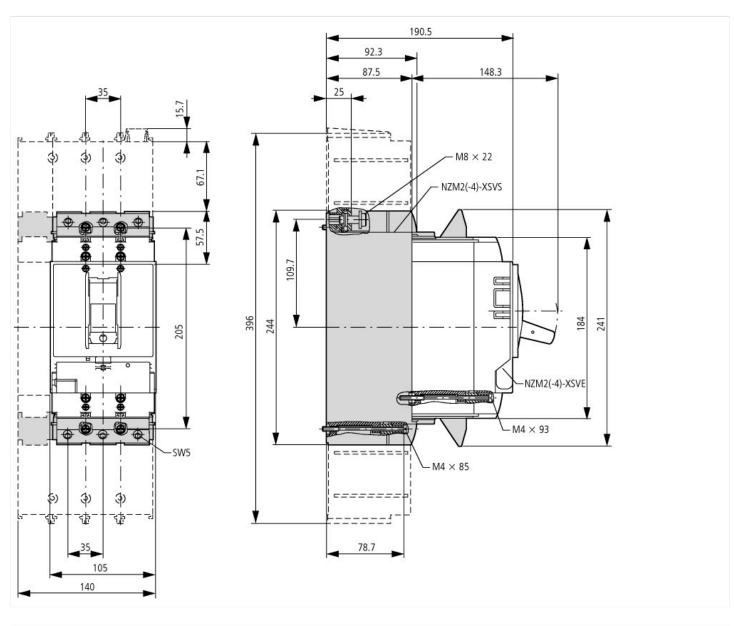






### Dimensions





# Additional product information (links)

| Temperature dependency, Derating                      | http://ecat.moeller.net/flip-cat/?edition=HPLEN&startpage=17.172   |
|---|--|
| CurveSelect characteristics program                   | http://www.eaton.eu/DE/Europe/Electrical/CustomerSupport/ConfigurationTools/CharacteristicsProgram/<br>index.htm |
| additional technical information for NZM power switch | ftp://ftp.moeller.net/DOCUMENTATION/PDF/nzm_technic_de_en.pdf  |