DATASHEET - NZML2-4-VE160/100-SVE

Circuit-breaker, 4 p, 160A, 100A in 4th pole, plug-in module

Part no.	**NZML2-4-VE160/100-SVE**
	169029
EL Number (Norway)	**4357079**

General specifications

Product name	Eaton Moeller series NZM molded case circuit breaker electronic
Part no.	NZML2-4-VE160/100-SVE
EAN	4015081655229
Product Length/Depth	180 millimetre
Product height	245 millimetre
Product width	140 millimetre
Product weight	3.57 kilogram
Compliances	RoHS conform
Certifications	IEC IEC/EN 60947
Product Tradename	NZM
Product Type	Molded case circuit breaker
Product Sub Type	Electronic

Delivery program

Application	Use in unearthed supply systems at 690 V
Type	Circuit breaker
Circuit breaker frame type	NZM2
Accessories required	NZM2-4-XSVS
Number of poles	Four-pole
Amperage Rating	160 A
Release system	Electronic release
Features	Protection unit Motor drive optional
Special features	Reduced neutral conductor protection Rated current = rated uninterrupted current: 160 A Set value in neutral conductor is synchronous with set value Ir of main pole. i^2t constant function: fixed OFF Adjustable delay time tsd Adjustable time delay setting to overcome current peaks tr at 6 x Ir also infinity (without overload releases) R.m.s. value measurement and “thermal memory” Maximum back-up fuse, if the expected short-circuit currents at the installation location exceed the switching capacity of the circuit breaker (Rated short-circuit breaking capacity Icn)

Technical Data - Electrical

Voltage rating	690 V - 690 V
Rated insulation voltage (Ui)	1000 V AC
Rated impulse withstand voltage (Uimp) at auxiliary contacts	6000 V
Rated impulse withstand voltage (Uimp) at main contacts	8000 V
Current rating of neutral conductor	60% of phase conductor 100 A
Rated short-time withstand current (t = 0.3 s)	1.3 kA
Rated short-time withstand current (t = 1 s)	1.3 kA
Instantaneous current setting (Ii) - min	1920 A
Instantaneous current setting (Ii) - max	1920 A
Overload current setting (Ir)	50 A - 100 A
Overload current setting (Ir) - min	80 A
Overload current setting (Ir) - max	160 A
Short delay current setting (Isd) - min	160 A
Short delay current setting (Isd) - max	1600 A
Short-circuit release delayed setting - min	160 A
Short-circuit release delayed setting - max	1600 A

Short-circuit release non-delayed setting - min	1920 A
Short-circuit release non-delayed setting - max	1920 A
Rated short-circuit breaking capacity Ics (IEC/EN 60947) at 230 V, 50/60 Hz	150 kA
Rated short-circuit breaking capacity Ics (IEC/EN 60947) at 400/415 V, 50/60 Hz	150 kA
Rated short-circuit breaking capacity Ics (IEC/EN 60947) at 440 V, 50/60 Hz	130 kA
Rated short-circuit breaking capacity Ics (IEC/EN 60947) at 525 V, 50/60 Hz	100 kA
Rated short-circuit breaking capacity Ics (IEC/EN 60947) at 690 V, 50/60 Hz	80 kA
Rated short-circuit making capacity Icm at 240 V, 50/60 Hz	330 kA
Rated short-circuit making capacity Icm at 400/415 V, 50/60 Hz	330 kA
Rated short-circuit making capacity Icm at 440 V, 50/60 Hz	286 kA
Rated short-circuit making capacity Icm at 525 V, 50/60 Hz	220 kA
Rated short-circuit making capacity Icm at 690 V, 50/60 Hz	176 kA
Short-circuit total breaktime	< 10 ms
Electrical connection type of main circuit	Screw connection
Isolation	500 V AC (between auxiliary contacts and main contacts) 300 V AC (between the auxiliary contacts)
Number of operations per hour - max	120
Handle type	Rocker lever
Utilization category	A (IEC/EN 60947-2)
Overvoltage category	III
Pollution degree	3
Lifespan, electrical	7500 operations at 690 V AC-1 6500 operations at 415 V AC-3 6500 operations at 400 V AC-3 10000 operations at 415 V AC-1 10000 operations at 400 V AC-1 5000 operations at 690 V AC-3
Direction of incoming supply	As required

Technical Data - Mechanical

Mounting Method	Built-in device plug-in technique Withdrawable DIN rail (top hat rail) mounting optional
Degree of protection	IP20 (basic degree of protection, in the operating controls area) IP20
Degree of protection (IP), front side	IP66 (with door coupling rotary handle) IP40 (with insulating surround)
Degree of protection (terminations)	IP10 (tunnel terminal) IP00 (terminations, phase isolator and strip terminal)
Protection against direct contact	Finger and back-of-hand proof to DIN EN 50274/VDE 0106 part 110
Shock resistance	20 g (half-sinusoidal shock 20 ms)
Number of auxiliary contacts (change-over contacts)	0
Number of auxiliary contacts (normally closed contacts)	0
Number of auxiliary contacts (normally open contacts)	0
Position of connection for main current circuit	Front side
Climatic proofing	Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30
Special features	Reduced neutral conductor protection Rated current = rated uninterrupted current: 160 A Set value in neutral conductor is synchronous with set value Ir of main pole. i^2t constant function: fixed OFF Adjustable delay time tsd Adjustable time delay setting to overcome current peaks tr at 6 x Ir also infinity (without overload releases) R.m.s. value measurement and “thermal memory” Maximum back-up fuse, if the expected short-circuit currents at the installation location exceed the switching capacity of the circuit breaker (Rated short-circuit breaking capacity Icn)
Lifespan, mechanical	20000 operations

Technical Data - Mechanical - Terminals

Standard terminals	Screw terminal
Optional terminals	Box terminal. Connection on rear. Tunnel terminal
Terminal capacity (control cable)	0.75 mm^2 - 2.5 mm^2 (1x) 0.75 mm^2 - 1.5 mm^2 (2x)
Terminal capacity (aluminum solid conductor/cable)	16 mm^2 (1x) at tunnel terminal

Terminal capacity (aluminum stranded conductor/cable)			25 mm^2 - 185 mm^2 (1x) at tunnel terminal
Terminal capacity (copper busbar)			Max. 24 mm x 8 mm direct at switch rear-side connection Min. 16 mm x 5 mm direct at switch rear-side connection M8 at rear-side screw connection
Terminal capacity (copper solid conductor/cable)			16 mm^2 (1x) at tunnel terminal 10 mm^2 - 16 mm^2 (1x) at box terminal 10 mm^2 - 16 mm^2 (1x) direct at switch rear-side connection 6 mm^2 - 16 mm^2 (2x) direct at switch rear-side connection 6 mm^2 - 16 mm^2 (2x) at box terminal
Terminal capacity (copper stranded conductor/cable)			25 mm^2 - 185 mm^2 (1x) at 1-hole tunnel terminal 25 mm^2 - 70 mm^2 (2x) at box terminal 25 mm^2 - 185 mm^2 (1x) direct at switch rear-side connection 25 mm^2 - 185 mm^2 (1x) at box terminal 25 mm^2 - 70 mm^2 (2x) direct at switch rear-side connection
Terminal capacity (copper strip)			Max. 10 segments of 16 mm x 0.8 mm at box terminal Min. 2 segments of 9 mm x 0.8 mm at box terminal Min. 2 segements of 16 mm x 0.8 mm at rear-side connection (punched) Max. 8 segments of 24 mm x 1 mm (2x) at box terminal Max. 10 segments of 24 mm x 0.8 mm at rear-side connection (punched)
Design verification as per IEC/EN 61439 - technical data			
Rated operational current for specified heat dissipation (In)			160 A
Equipment heat dissipation, current-dependent			21.12 W
Ambient operating temperature - min			-25 °C
Ambient operating temperature - max			70 °C
Ambient storage temperature - min			40 °C
Ambient storage temperature - max			70 °C
Design verification as per IEC/EN 61439			
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 Resist. of insul. mat. to abnormal heat/fire by internal elect. 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.
10.9.2 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.
Additional information			
Functions			Systems, cable, selectivity and generator protection

Technical data ETIM 9.0

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@ss13-27-37-04-09 [AJZ716018])

Rated permanent current Iu		A	160
Rated voltage		V	690 - 690
Rated short-circuit breaking capacity Icu at 400 V, 50 Hz		kA	150
Overload release current setting		A	80 - 160

Adjustment range short-term delayed short-circuit release		A	160 - 1600
Adjustment range undelayed short-circuit release		A	1920 - 1920
Power loss		W	21.12
Device construction			Built-in device plug-in technique
Integrated earth fault protection			No
Type of electrical connection of main circuit			Screw connection
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

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