DATASHEET - NZML3-4-VE400-AVE

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

Part no. **NZML3-4-VE400-AVE**
155419

General specifications

Product name	Eaton Moeller series NZM molded case circuit breaker electronic
Part no.	NZML3-4-VE400-AVE
EAN	4015081521296
Product Length/Depth	260 millimetre
Product height	346 millimetre
Product width	230 millimetre
Product weight	22.4 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	NZM3
Accessories required	NZM3-4-XAVS
Number of poles	Four-pole
Amperage Rating	400 A
Release system	Electronic release
Features	Motor drive optional Protection unit
Special features	Terminal capacity hint: Up to 240 mm^2 can be connected depending on the cable manufacturer. Rated current = rated uninterrupted current: 400 A Set value in neutral conductor is synchronous with set value Ir of main pole. i^2t constant function: switchable 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	200% of phase conductor
Rated short-time withstand current (t = 0.3 s)	2.8 kA
Rated short-time withstand current (t = 1 s)	2.8 kA
Instantaneous current setting (Ii) - min	800 A
Instantaneous current setting (Ii) - max	4400 A
Overload current setting (Ir)	200 A - 400 A
Overload current setting (Ir) - min	200 A
Overload current setting (Ir) - max	400 A
Short delay current setting (Isd) - min	400 A
Short delay current setting (Isd) - max	4000 A
Short-circuit release delayed setting - min	400 A
Short-circuit release delayed setting - max	4000 A
Short-circuit release non-delayed setting - min	800 A

Short-circuit release non-delayed setting - max	4400 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	50 kA
Rated short-circuit breaking capacity Ics (IEC/EN 60947) at 690 V, 50/60 Hz	20 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	60
Handle type	Rocker lever
Utilization category	A (IEC/EN 60947-2)
Overvoltage category	III
Pollution degree	3
Lifespan, electrical	5000 operations at 400 V AC-1 3000 operations at 690 V AC-1 2000 operations at 415 V AC-3 5000 operations at 415 V AC-1 2000 operations at 690 V AC-3 2000 operations at 400 V AC-3
Direction of incoming supply	As required

Technical Data - Mechanical

Mounting Method	Withdrawable Built-in device slide-in technique (withdrawable)
Degree of protection	IP20 IP20 (basic degree of protection, in the operating controls area)
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, cyclic, to IEC 60068-2-30 Damp heat, constant, to IEC 60068-2-78
Special features	Terminal capacity hint: Up to 240 mm^2 can be connected depending on the cable manufacturer. Rated current = rated uninterrupted current: 400 A Set value in neutral conductor is synchronous with set value Ir of main pole. i^2t constant function: switchable 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	10000 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 - 1.5 mm^2 (2x) 0.75 mm^2 - 2.5 mm^2 (1x)
Terminal capacity (aluminum solid conductor/cable)	16 mm^2 (1x) at tunnel terminal
Terminal capacity (aluminum stranded conductor/cable)	50 mm^2 - 240 mm^2 (1x) at 2-hole tunnel terminal 25 mm^2 - 185 mm^2 (1x) at tunnel terminal

	50 mm² - 240 mm² (2x) at 2-hole tunnel terminal
Terminal capacity (copper busbar)	Max. 10 mm x 50 mm (2x) at rear-side width extension Max. 30 mm x 10 mm + 30 mm x 5 mm direct at switch rear-side connection M10 at rear-side screw connection Min. 20 mm x 5 mm direct at switch rear-side connection
Terminal capacity (copper solid conductor/cable)	16 mm² (2x) direct at switch rear-side connection 16 mm² (1x) at tunnel terminal 16 mm² (2x) at box terminal 16 mm² (1x) direct at switch rear-side connection 300 mm² (2x) at rear-side width extension
Terminal capacity (copper stranded conductor/cable)	25 mm² - 240 mm² (2x) direct at switch rear-side connection 35 mm² - 240 mm² (1x) at box terminal 25 mm² - 120 mm² (2x) at box terminal 25 mm² - 240 mm² (1x) direct at switch rear-side connection 16 mm² - 185 mm² (1x) at 1-hole tunnel terminal
Terminal capacity (copper strip)	10 segments of 50 mm x 1 mm (2x) at rear-side width extension Max. 10 segments of 32 mm x 1 mm + 5 segments of 32 mm x 1 mm at rear-side connection (punched) Min. 6 segments of 16 mm x 0.8 mm at box terminal Max. 10 segments of 24 mm x 1 mm + 5 segments of 24 mm x 1 mm Min. 6 segments 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
Design verification as per IEC/EN 61439 - technical data	
Rated operational current for specified heat dissipation (In)	400 A
Equipment heat dissipation, current-dependent	72 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	400
Rated voltage	V	690 - 690

Rated short-circuit breaking capacity Icu at 400 V, 50 Hz		kA	150
Overload release current setting		A	200 - 400
Adjustment range short-term delayed short-circuit release		A	400 - 4000
Adjustment range undelayed short-circuit release		A	800 - 4400
Power loss		W	
Device construction			Built-in device slide-in technique (withdrawable)
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			No
Number of auxiliary contacts as normally closed contact			0
Number of auxiliary contacts as normally open contact			0
Number of auxiliary contacts as change-over contact			0
With switched-off indicator			No
With integrated under voltage release			No
Number of poles			4
Position of connection for main current circuit			Front side
Type of control element			Rocker lever
Complete device with protection unit			Yes
Motor drive integrated			No
Motor drive optional			Yes
Degree of protection (IP)			IP20

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