Circuit-breaker, 3p, 100A

NZMN1-A100 Part no. Catalog No. 259085

**EL-Nummer** (Norway)

4358710



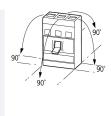
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Delivery program				
Product range			Circuit-breaker	
Protective function			System and cable protection	
Standard/Approval			IEC	
Installation type			Fixed	
Release system			Thermomagnetic release	
Construction size			NZM1	
Number of poles			3 pole	
Standard equipment			Box terminal	
Switching capacity				
400/415 V 50 Hz	I <sub>cu</sub>	kA	50	
Rated current = rated uninterrupted current				
Rated current = rated uninterrupted current	$I_n = I_u$	Α	100	
Setting range				
Overload trip				
中	l <sub>r</sub>	Α	80 - 100	
Short-circuit releases				
Non-delayed	I <sub>i</sub> = I <sub>n</sub> x		6 - 10	
Short-circuit releases	I <sub>rm</sub>	Α	600 - 1000	

## **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 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



With XFI earth-fault release:
- NZM1, N1, NZM2, N2: vertical and

 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 with remote operator:

- NZM2, N(S)2, NZM3, N(S)3, NZM4, N(S)4: vertical and 90° in all directions

	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 With door coupling rotary handle: IP66
Terminations	Tunnel terminal: IP10 Phase isolator and strip terminal: IP00
Other technical data (sheet catalogue)	Temperature dependency, Derating

#### **Circuit-breakers**

Rated current = rated uninterrupted current	$I_n = I_u$	Α	100
Rated surge voltage invariability	$U_{\text{imp}}$		
Main contacts		V	6000
Auxiliary contacts		V	6000
Rated operational voltage	U <sub>e</sub>	V AC	690
Rated operational voltage	U <sub>e</sub>	V DC	450

The following settings are required in order to ensure correct tripping:

The fast-response release will take longer to respond when used for DC applications. Because of this, the setting on the trip block inscription, which is specified for AC currents, must be set to a lower value for DC currents.

DC correction factor for instantaneous release response value:

o NZM1: 1.25

o NZM2: 1.35

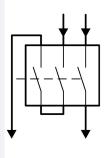
o NZM3: 1.45

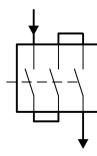
Example: NZM3 Ie = 500A. Desired DC tripping current: 10 \* Ie = 5000A.

#### Calculation:

- Desired DC value / correction factor = AC setting on trip block
- $\bullet$  5000A / 1.45 = 3448 A ~ 7 \* Ie = Value that needs to be set on the trip block

Permitted circuit configurations:





Overvoltage category/pollution degree			III/3
Rated insulation voltage	Ui	V	690
Use in unearthed supply systems		V	≦ 690
On the later and a section			

#### **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	40
690 V 50/60 H	Ic	kA	17
Rated short-circuit breaking capacity $I_{cn}$	I <sub>cn</sub>		

Icu to IEC/EN 60947 test cycle 0-t-C0	Icu	kA	
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	20
			10
690 V 50/60 Hz	Icu	kA	
450 V DC	I <sub>cu</sub>	kA	15
Ics to IEC/EN 60947 test cycle 0-t-C0-t-C0	lcs	kA	or.
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	10
690 V 50/60 Hz	I <sub>cs</sub>	kA	7.5
450 V DC	I <sub>cs</sub>	kA	15
			Maximum back-up fuse, if the expected short-circuit currents at the installation location exceed the switching capacity of the circuit-breaker.
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
DC-1			
450 V DC	Operations		10000
Max. operating frequency		Ops/h	120
Total break time at short-circuit		ms	<10
Terminal capacity Standard equipment			Box terminal
Optional accessories			Screw connection
			Tunnel terminal 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 (10 - 70) <sup>3)</sup> 2 x (6-25)
			3) Up to 95 mm² can be connected depending on the cable manufacturer.
Tunnel terminal			op to so mini our de connecteu depending on die cable manufacturer.
Solid		mm <sup>2</sup>	1 x 16
Stranded		mill	
1-hole		mm <sup>2</sup>	1 x (25 - 95)
Bolt terminal and rear-side connection		111111	
Direct on the switch			
Solid		mm <sup>2</sup>	1 x (10 - 16)
		111111	2 x (6 - 16)
Stranded		mm <sup>2</sup>	1 x (10 - 70) <sup>3)</sup>
			3) 11 - 1 - 27 -
Al circular conductor			<sup>3)</sup> Up to 95 mm <sup>2</sup> can be connected depending on the cable manufacturer.
Al circular conductor  Tunnel terminal			
Solid		2	1 x 16
		mm <sup>2</sup>	
Stranded Stranded			
Suanueu		2	1 v /25 - 95)
Bolt terminal and rear-side connection		mm <sup>2</sup>	1 x (25 - 95)

Direct on the switch			
Solid		mm <sup>2</sup>	1 x (10 - 16) 2 x (10 - 16)
Stranded		mm <sup>2</sup>	1 x (25 - 35) 2 x (25 - 35)
Cu strip (number of segments x width x segment thickness)			
Box terminal			
	min.	mm	2 x 9 x 0.8
	max.	mm	9 x 9 x 0.8
Copper busbar (width x thickness)	mm		
Bolt terminal and rear-side connection			
Screw connection			M6
Direct on the switch			
	min.	mm	12 x 5
	max.	mm	16 x 5
Control cables			
		mm <sup>2</sup>	1 x (0.75 - 2.5) 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	Α	100
Equipment heat dissipation, current-dependent	P <sub>vid</sub>	W	21.9
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 switch gear must be observed. $\label{eq:specification}$
10.12 Electromagnetic compatibility			Is the panel builder's responsibility. The specifications for the switch gear must be observed. $\label{eq:specification}$
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 (ecl@ss10.0.1-27-37-04-09 [AJZ716013])

Rated permanent current lu         A         300           Rated voltage         60 - 690         60 - 690           Rated voltage         60 - 690         60 - 690           Rated short-circuit breaking capacity lcu at 400 V.50 Hz         A         60 - 60           Overload release current setting         A         8 - 100           Adjustment range undelayed short-circuit release         A         9 - 0           Adjustment range undelayed short-circuit release         A         8 - 0           Letegrated earth fault protection         B         6 - 0           Type of electrical connection of main circuit         B         6 - 0           Device construction         Built-in device fixed built-in technique         Built-in device fixed built-in technique           Suitable for DIN rail (top hat rail) mounting         Built-in device fixed built-in technique         Built-in device fixed built-in technique           Number of auxiliary contacts as normally closed contact         Built-in device fixed built-in technique         Built-in device fixed built-in technique           Number of auxiliary contacts as normally closed contact         Built-in device fixed built-in technique         Built-in device fixed built-in technique           Number of auxiliary contacts as normally closed contact         Built-in device fixed built-in technique         Built-in device fixed built-in technique				
Rated short-circuit breaking capacity lou at 400 V, 50 Hz         KA         50           Overload release current setting         A         80 - 100           Adjustment range short-term delayed short-circuit release         A         0 - 0           Adjustment range undelayed short-circuit release         A         600 - 1000           Integrated earth fault protection         Frame clamp         No           Type of electrical connection of main circuit         Frame clamp           Device construction         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         9         0           Number of auxiliary contacts as change-over contact         9         0           With switched-off indicator         No         No           With switched-off indicator         No         No           With integrated under voltage release         No         No           Number of poles         3         3           Position of connection for main current circuit         Front side           Type of control element         Rocker lever           Complete device with protection unit         No           Motor drive integrated         No           <	Rated permanent current lu	A	A	300
Overload release current setting         A         80-100           Adjustment range short-term delayed short-circuit release         A         0 - 0           Adjustment range undelayed short-circuit release         A         600-1000           Integrated earth fault protection         Post         No           Type of electrical connection of main circuit         Frame clamp         Built-in device fixed built-in technique           Device construction         Built-in device fixed built-in technique         Williams           DIN rail (top hat rail) mounting optional         Yes           Number of auxiliary contacts as normally closed contact         0           Number of auxiliary contacts as change-over contact         Post           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         No	Rated voltage	V	V	690 - 690
Adjustment range short-term delayed short-circuit release Adjustment range undelayed short-circuit release Adjustment range undelayed short-circuit release Integrated earth fault protection Type of electrical connection of main circuit Device construction Suitable for DIN rail (top hat rail) mounting DIN rail (top hat rail) mounting optional DIN rail (top hat rail) mounting optional DIN rail (top hat rail) mounting optional  With switched-off indicator With switched-off indicator With integrated under voltage release Number of poles Position of connection for main current circuit Type of control element Complete device with protection unit Motor drive integrated Motor drive integrated Motor drive optional	Rated short-circuit breaking capacity Icu at 400 V, 50 Hz	k	kA	50
Adjustment range undelayed short-circuit release Integrated earth fault protection Type of electrical connection of main circuit Device construction Suitable for DIN rail (top hat rail) mounting DIN rail (top hat rail) mounting optional Suitable for DIN rail (top hat rail) mounting DIN rail (top hat rail) mounting optional Suitable for DIN rail (top hat rail) mounting OIN rail (top hat rail) mounting optional Suitable for DIN rail (top hat rail) mounting optional Suitable for DIN rail (top hat rail) mounting optional Suitable for DIN rail (top hat rail) mounting optional Suitable for DIN rail (top hat rail) mounting optional Suitable for DIN rail (top hat rail) mounting OIN rail (top	Overload release current setting	A	A	80 - 100
Integrated earth fault protection Type of electrical connection of main circuit Device construction Suitable for DIN rail (top hat rail) mounting DIN rail (top hat rail) mounting optional Number of auxiliary contacts as normally closed contact Number of auxiliary contacts as normally open contact Number of auxiliary contacts as change-over contact Number of of auxiliary contacts as change-over contact Number of of auxiliary contacts as change-over contact Number of of indicator Number of one contact of indicator Number of poles Number of poles Number of poles No	Adjustment range short-term delayed short-circuit release	A	A	0 - 0
Type of electrical connection of main circuit  Device construction  Device construction  Suitable for DIN rail (top hat rail) mounting  DIN rail (top hat rail) mounting optional  Number of auxiliary contacts as normally closed contact  Number of auxiliary contacts as normally open contact  Number of auxiliary contacts as normally open contact  Number of auxiliary contacts as change-over contact  With switched-off indicator  With integrated under voltage release  Number of poles  Number of poles  Position of connection for main current circuit  Type of control element  Complete device with protection unit  Motor drive integrated  Motor drive optional  Frame clamp  Roille, indexicle fixed built-in technique  Built-in device fixed built-in technique  No  No  No  O  O  O  O  No  O  No  O  O  Roille  Frane clamp  Roille  No  No  O  O  O  O  O  O  O  O  O  O  O  O  O	Adjustment range undelayed short-circuit release	A	А	600 - 1000
Device construction  Suitable for DIN rail (top hat rail) mounting  DIN rail (top hat rail) mounting optional  Number of auxiliary contacts as normally closed contact  Number of auxiliary contacts as normally open contact  Number of auxiliary contacts as change-over contact  No  No  With switched-off indicator  No  No  No  No  No  No  Position of connection for main current circuit  Type of control element  Complete device with protection unit  Motor drive integrated  Motor drive optional	Integrated earth fault protection			No
Suitable for DIN rail (top hat rail) mounting DIN rail (top hat rail) mounting optional Number of auxiliary contacts as normally closed contact Number of auxiliary contacts as normally open contact Number of auxiliary contacts as change-over contact Number of policitor No Notor drive integrated No	Type of electrical connection of main circuit			Frame clamp
DIN rail (top hat rail) mounting optional  Number of auxiliary contacts as normally closed contact  Number of auxiliary contacts as normally open contact  Number of auxiliary contacts as change-over contact  Number of auxiliary contacts as change-over contact  With switched-off indicator  With integrated under voltage release  No  Number of poles  Position of connection for main current circuit  Type of control element  Complete device with protection unit  Motor drive integrated  Motor drive optional	Device construction			Built-in device fixed built-in technique
Number of auxiliary contacts as normally closed contact  Number of auxiliary contacts as normally open contact  Number of auxiliary contacts as change-over contact  Number of auxiliary contacts as change-over contact  With switched-off indicator  With switched-off indicator  With integrated under voltage release  No  Number of poles  Position of connection for main current circuit  Type of control element  Complete device with protection unit  Motor drive integrated  Motor drive optional  O  O  O  O  O  O  O  O  O  O  O  O  O	Suitable for DIN rail (top hat rail) mounting			No
Number of auxiliary contacts as normally open contact  Number of auxiliary contacts as change-over contact  With switched-off indicator  With integrated under voltage release  No  No  Number of poles  Position of connection for main current circuit  Type of control element  Complete device with protection unit  Motor drive integrated  Motor drive optional  O  O  O  O  O  O  O  O  O  O  O  O  O	DIN rail (top hat rail) mounting optional			Yes
Number of auxiliary contacts as change-over contact  With switched-off indicator  With integrated under voltage release  No  Number of poles  Position of connection for main current circuit  Type of control element  Complete device with protection unit  Motor drive integrated  Motor drive optional  O  O  O  O  O  O  O  O  O  O  O  O  O	Number of auxiliary contacts as normally closed contact			0
With switched-off indicator With integrated under voltage release No Number of poles Number of connection for main current circuit Type of control element Complete device with protection unit Motor drive integrated Motor drive optional No	Number of auxiliary contacts as normally open contact			0
With integrated under voltage release  No  Number of poles  Societation of connection for main current circuit  Type of control element  Complete device with protection unit  Motor drive optional  No  No  No  No  No  No  No  No  No  N	Number of auxiliary contacts as change-over contact			0
Number of poles  Position of connection for main current circuit  Type of control element  Complete device with protection unit  Motor drive optional  3  Rocker lever  Rocker lever  Yes  No  No  No	With switched-off indicator			No
Position of connection for main current circuit  Type of control element  Complete device with protection unit  Motor drive optional  Front side  Rocker lever  Yes  No  No  No	With integrated under voltage release			No
Type of control element Complete device with protection unit Motor drive optional  Rocker lever  Yes  No  No  No	Number of poles			3
Complete device with protection unit  Yes  Motor drive optional  No  No	Position of connection for main current circuit			Front side
Motor drive optional No  Motor drive optional No	Type of control element			Rocker lever
Motor drive optional No	Complete device with protection unit			Yes
	Motor drive integrated			No
Degree of protection (IP) IP20	Motor drive optional			No
	Degree of protection (IP)			IP20