

Circuit-breaker, 3p, 20A



Powering Business Worldwide™

Part no. **NZMN1-A20**Catalog No. **281231**EL-Nummer **4358979**
(Norway)

Similar to illustration

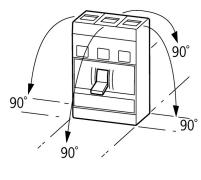
Delivery program

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_{cu}	kA	50		
Rated current = rated uninterrupted current					
Rated current = rated uninterrupted current	$I_n = I_u$	A	20		
Setting range					
Overload trip					
	I_r	A	15 - 20		
Short-circuit releases					
					
Non-delayed	$I_i = I_n \times \dots$	350 A fixed			
					
Short-circuit releases					
					
min.	A	350			

Technical data

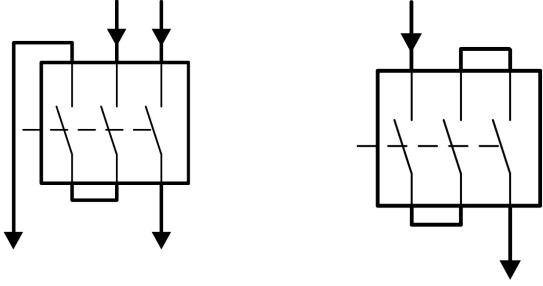
General			
Standards	IEC/EN 60947		
Protection against direct contact	Finger and back of hand proof to VDE 0106 Part 100		
Climatic proofing	Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30		
Ambient temperature			
Ambient temperature, storage	$^{\circ}\text{C}$	- 40 - + 70	
Operation	$^{\circ}\text{C}$	- 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		

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



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

Circuit-breakers

Rated current = rated uninterrupted current	$I_n = I_u$	A	20	
Rated surge voltage invariability	U_{imp}			
Main contacts		V	6000	
Auxiliary contacts		V	6000	
Rated operational voltage	U_e	V AC	690	
Rated operational voltage	U_e	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 $I_e = 500A$. Desired DC tripping current: $10 * I_e = 5000A$. Calculation: • Desired DC value / correction factor = AC setting on trip block • $5000A / 1.45 = 3448 A \sim 7 * I_e =$ Value that needs to be set on the trip block Permitted circuit configurations: 
Overvoltage category/pollution degree			III/3	
Rated insulation voltage	U_i	V	690	
Use in unearthing supply systems		V	≤ 690	
Switching capacity				
Rated short-circuit making capacity	I_{cm}			
240 V	I_{cm}	kA	187	
400/415 V	I_{cm}	kA	105	
440 V 50/60 Hz	I_{cm}	kA	74	
525 V 50/60 Hz	I_{cm}	kA	40	
690 V 50/60 Hz	I_c	kA	17	
Rated short-circuit breaking capacity I_{cn}	I_{cn}			

Icu to IEC/EN 60947 test cycle 0-t-CO	Icu	kA	
240 V 50/60 Hz	I _{cu}	kA	85
400/415 V 50/60 Hz	I _{cu}	kA	50
440 V 50/60 Hz	I _{cu}	kA	35
525 V 50/60 Hz	I _{cu}	kA	20
690 V 50/60 Hz	I _{cu}	kA	10
450 V DC	I _{cu}	kA	15
Ics to IEC/EN 60947 test cycle 0-t-CO-t-CO	I _{cs}	kA	
240 V 50/60 Hz	I _{cs}	kA	85
400/415 V 50/60 Hz	I _{cs}	kA	50
440 V 50/60 Hz	I _{cs}	kA	35
525 V 50/60 Hz	I _{cs}	kA	10
690 V 50/60 Hz	I _{cs}	kA	7.5
450 V DC	I _{cs}	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 ²	1 x (6 - 16) 2 x (4 - 16)	
Stranded	mm ²	1 x (6 - 70) ³⁾ 2 x (4 - 25)	
		3) Up to 95 mm ² can be connected depending on the cable manufacturer.	
Tunnel terminal			
Solid	mm ²	1 x 16	
Stranded	mm ²	1 x (25 - 95)	
Bolt terminal and rear-side connection			
Direct on the switch			
Solid	mm ²	1 x (6 - 16) 2 x (4 - 16)	
Stranded	mm ²	1 x (6 - 70) ³⁾ 2 x (4 - 25)	
		3) Up to 95 mm ² can be connected depending on the cable manufacturer.	
Al circular conductor			
Tunnel terminal			
Solid	mm ²	1 x 16	
Stranded	mm ²	1 x (25 - 95)	
Bolt terminal and rear-side connection			

Direct on the switch			
Solid		mm ²	1 x (10 - 16) 2 x (10 - 16)
Stranded		mm ²	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 ²	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	I _n	A	20
Equipment heat dissipation, current-dependent	P _{vid}	W	9.82
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 (ecl:ss10.0.1-27-37-04-09 [AJZ716013])

Rated permanent current I _u	A	100
Rated voltage	V	690 - 690
Rated short-circuit breaking capacity I _{cu} at 400 V, 50 Hz	kA	50
Overload release current setting	A	15 - 20
Adjustment range short-term delayed short-circuit release	A	0 - 0
Adjustment range undelayed short-circuit release	A	350 - 350
Integrated earth fault protection		No
Type of electrical connection of main circuit		Frame clamp
Device construction		Built-in device fixed built-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		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
Degree of protection (IP)		IP20