

Circuit-breaker, 3p, 160A

Part no. **NZMN2-S160**
 Catalog No. **265740**

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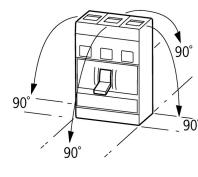
Delivery program

Product range		Circuit-breaker
Protective function		Short-circuit protection
Standard/Approval		IEC
Installation type		Fixed
Release system		Thermomagnetic release
Construction size		NZM2
Description		Motor protection in conjunction with overload relay With short-circuit release Without overload release Ir IEC/EN 60947-4-1, IEC/EN 60947-2 The circuit-breaker fulfills all requirements for AC-3 switching category.
Number of poles		3 pole
Standard equipment		Screw connection
Rated current = rated uninterrupted current	$I_n = I_u$	A 160
Switching capacity		
400/415 V 50 Hz	I_{cu}	kA 50
Setting range		
Short-circuit releases		
Non-delayed	$I_i = I_n \times \dots$	8 - 14
Motor rating AC-3 at 400 V 50/60 Hz		
380 V 400 V	P	kW 75
Rated operational current AC-3 at 400 V 50/60 Hz		
400 V	I_e	A 134

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

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	160
Rated surge voltage invariability	U_{imp}		
Main contacts		V	8000
Auxiliary contacts		V	6000
Rated operational voltage	U_e	V AC	690
Overtoltage category/pollution degree			III/3
Rated insulation voltage	U_i	V	1000
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	53
690 V 50/60 Hz	I_c	kA	40
Rated short-circuit breaking capacity I_{cn}	I_{cn}		
Icu to IEC/EN 60947 test cycle 0-t-CO	I_{cu}	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	25
690 V 50/60 Hz	I_{cu}	kA	20
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	25
690 V 50/60 Hz	I_{cs}	kA	5
			Maximum back-up fuse, if the expected short-circuit currents at the installation location exceed the switching capacity of the circuit-breaker.
Rated short-time withstand current	I_{cw}		
t = 0.3 s	I_{cw}	kA	1.9
t = 1 s	I_{cw}	kA	1.9
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
AC--3		
400 V 50/60 Hz	Operations	6500
415 V 50/60 Hz	Operations	6500
690 V 50/60 Hz	Operations	5000
Max. operating frequency	Ops/h	120
Total break time at short-circuit	ms	< 10

Terminal capacity

Standard equipment			Screw connection
Optional accessories			Box terminal Tunnel terminal connection on rear
Round copper conductor			
Box terminal			
Solid	mm ²	1 x (10 - 16) 2 x (6 - 16)	
Stranded	mm ²	1 x (25 - 185) 2 x (25 - 70)	
Tunnel terminal			
Solid	mm ²	1 x 16	
Stranded	mm ²		
1-hole	mm ²	1 x (25 - 185)	
Bolt terminal and rear-side connection			
Direct on the switch			
Solid	mm ²	1 x (10 - 16) 2 x (6 - 16)	
Stranded	mm ²	1 x (25 - 185) 2 x (25 - 70)	
Al circular conductor			
Tunnel terminal			
Solid	mm ²	1 x 16	
Stranded	mm ²		
Stranded	mm ²	1 x (25 - 185)	
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 - 50) 2 x (25 - 50)	
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 (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 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	160
Equipment heat dissipation, current-dependent	P_{vid}	W	38.4
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) / Motor protection circuit-breaker (EC000074)			
Electric engineering, automation, process control engineering / Low-voltage switch technology / Circuit breaker (LV < 1 kV) / Motor protection circuit-breaker (ecl@ss10.0.1-27-37-04-01 [AGZ529016])			
Overload release current setting		A	0 - 0
Adjustment range undelayed short-circuit release		A	8 - 14
With thermal protection			No
Phase failure sensitive			No
Switch off technique			Magnetic
Rated operating voltage		V	690 - 690
Rated permanent current I_L		A	160
Rated operation power at AC-3, 230 V		kW	45
Rated operation power at AC-3, 400 V		kW	75
Type of electrical connection of main circuit			Screw connection
Type of control element			Rocker lever
Device construction			Built-in device fixed built-in technique
With integrated auxiliary switch			No
With integrated under voltage release			No
Number of poles			3
Rated short-circuit breaking capacity I_{cu} at 400 V, AC		kA	35
Degree of protection (IP)			IP20

Height	mm	184
Width	mm	105
Depth	mm	149