## DATASHEET - NZMN1-A20



Circuit-breaker, 3p, 20A

NZMN1-A20 281231

0004358979



EL-Nummer (Norway)

Part no.

Catalog No.

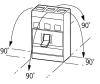
Similar to illustration

## **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	l <sub>cu</sub>	kA	50
Rated current = rated uninterrupted current			
Rated current = rated uninterrupted current	$I_n = I_u$	А	20
Setting range			
Overload trip			
L	l <sub>r</sub>	A	15 - 20
Short-circuit releases			
Non-delayed	I <sub>i</sub> = I <sub>n</sub> x		350 A fixed
Short-circuit releases			
min.		А	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	°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



90° 90°	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		
as required			
In the operating controls area: IP20 (basic degree of protection)			
With insulating surround: IP40 With door coupling rotary handle: IP66			
Tunnel terminal: IP10 Phase isolator and strip terminal: I	P00		

Temperature dependency, Derating

А	20
V	6000
V	6000
V AC	690
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

 $I_n = I_u$ U<sub>imp</sub>

Ue

Ue

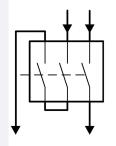
- o NZM2: 1.35
- o NZM3: 1.45
- Example: NZM3 le = 500A. Desired DC tripping current: 10 \* le = 5000A.

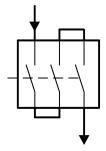
Calculation:

• Desired DC value / correction factor = AC setting on trip block

• 5000A / 1.45 = 3448 A ~ 7 \* Ie = Value that needs to be set on the trip block

Permitted circuit configurations:





Overvoltage category/pollution degree			111/3
Rated insulation voltage	Ui	V	690
Use in unearthed supply systems		V	≦ 690
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	lc	kA	17
Rated short-circuit breaking capacity I <sub>cn</sub>	I <sub>cn</sub>		

Direction of incoming supply

Degree of protection Device

Enclosures

Terminations

**Circuit-breakers** 

Main contacts Auxiliary contacts

Rated operational voltage Rated operational voltage

Other technical data (sheet catalogue)

Rated surge voltage invariability

Rated current = rated uninterrupted current

Icu to IEC/EN 60947 test cycle O-t-CO	lcu	kA	
240 V 50/60 Hz	l <sub>cu</sub>	kA	85
400/415 V 50/60 Hz	l <sub>cu</sub>	kA	50
440 V 50/60 Hz	l <sub>cu</sub>	kA	35
525 V 50/60 Hz	l <sub>cu</sub>	kA	20
690 V 50/60 Hz	I <sub>cu</sub>	kA	10
500 V DC	l <sub>cu</sub>	kA	15
Ics to IEC/EN 60947 test cycle 0-t-C0-t-C0	lcs	kA	
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	Ics	kA	10
690 V 50/60 Hz	Ics	kA	7.5
450 V DC	Ics	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 (6 - 16)
		mm-	2 x (4 - 16)
Stranded		mm <sup>2</sup>	1 x (6 - 70) <sup>3)</sup>
			2 x (4 - 25)
			$^{3)}$ Up to 95 mm² can be connected depending on the cable manufacturer.
Tunnel terminal			
Solid		mm <sup>2</sup>	1 x 16
Stranded			
1-hole		mm <sup>2</sup>	1 x (25 - 95)
Bolt terminal and rear-side connection			
Direct on the switch			
Solid		mm <sup>2</sup>	1 x (6 - 16)
			2 x (4 - 16)
Stranded		mm <sup>2</sup>	1 x (6 - 70) <sup>3)</sup> 2 x (4 - 25)
Al structure and other			<sup>3)</sup> Up to 95 mm <sup>2</sup> can be connected depending on the cable manufacturer.
Al circular conductor			
Tunnel terminal		0	110
Solid		mm <sup>2</sup>	1 x 16
Stranded			
Stranded		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 20 Rated operational current for specified heat dissipation I<sub>n</sub> А P<sub>vid</sub> W 9.82 Equipment heat dissipation, current-dependent °C -25 Operating ambient temperature min. °C Operating ambient temperature max. 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 Meets the product standard's requirements. and fire due to internal electric effects 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

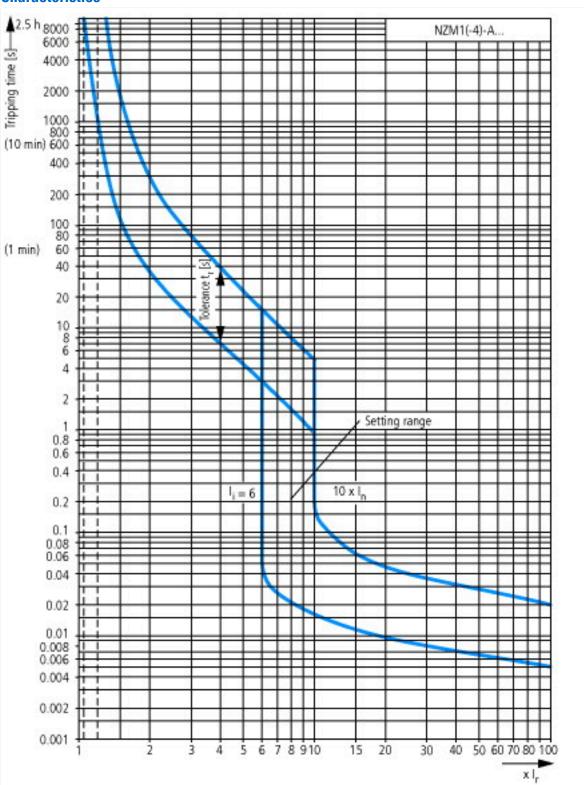
### **Technical data ETIM 7.0**

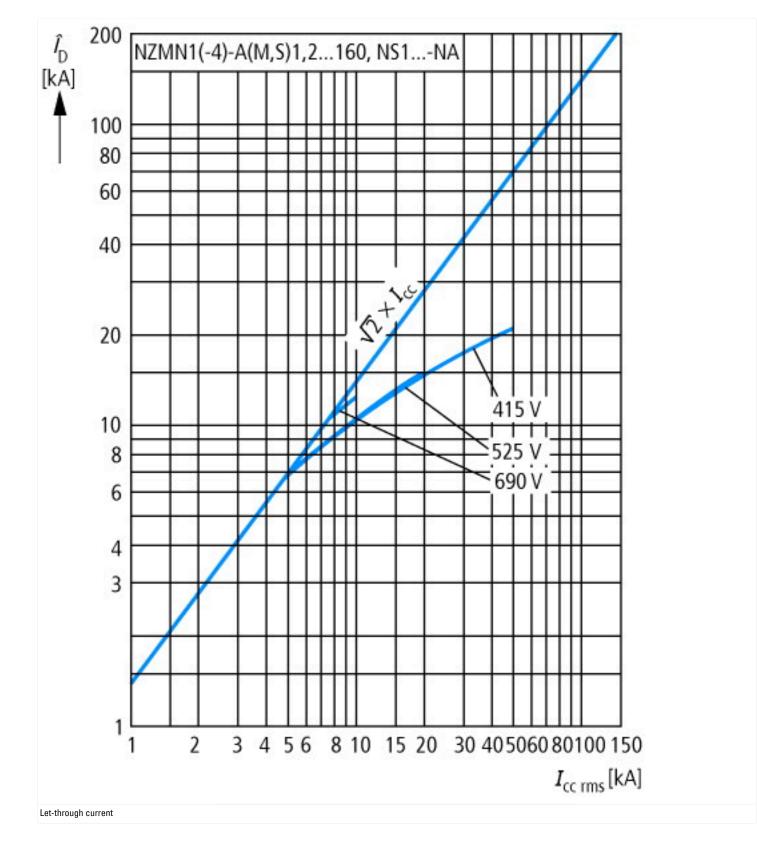
Low-voltage industrial components (EG000017) / Power circuit-breaker for trafo/generator/installation protection (EC000228)

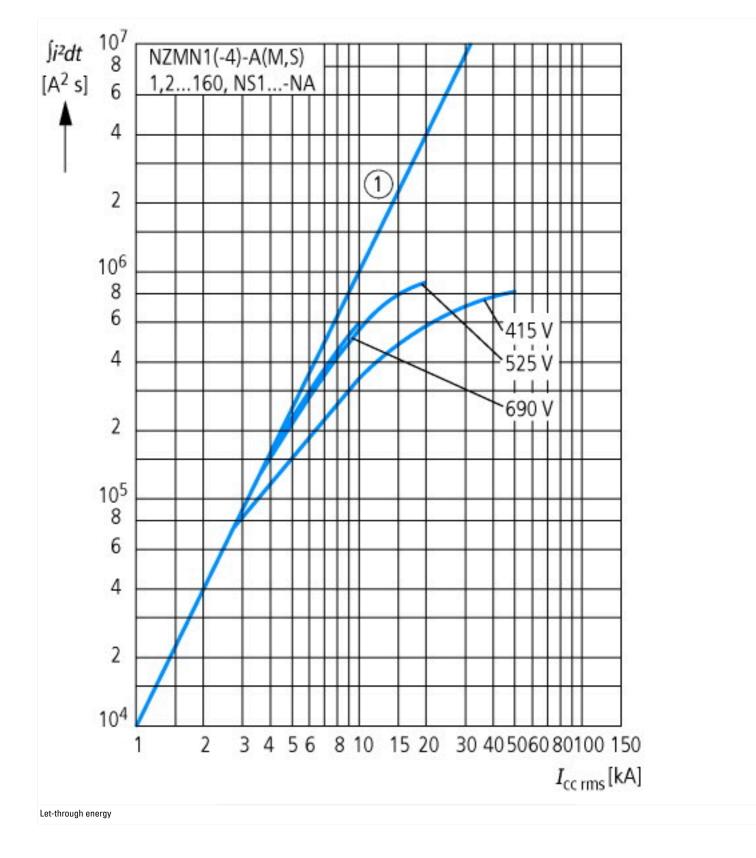
Electric engineering, automation, process control engineering / Low-voltage switch technology / Circuit breaker (LV < 1 kV) / Circuit breaker for power transformer, generator and system protection (ecl@ss10.0.1-27-37-04-09 [AJZ716013])

leaflet (IL) is observed.

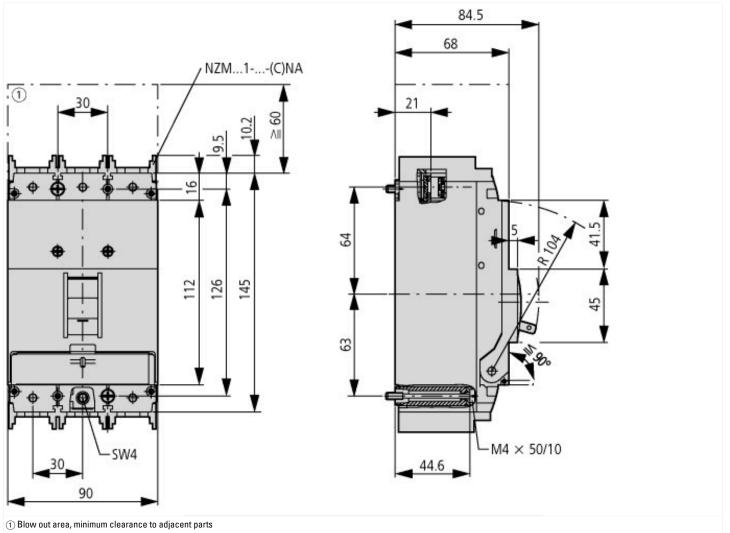
And votage         V         600         600           Rated short-circuit breaking capacity leu 4400 V, 50 Hz         KA         5           Overload release current setting         I         A         5         2           Adjustment range short-terrouit release         I         A         0         0           Adjustment range undelayed short-circuit release         I         A         50         50         50           Integrated earth fault protection         I         A         50			
Aread short-circuit breaking capacity lou at 400 V, 50 Hz         KA         50           Overload release current setting         6         A         5-20           Adjustment range short-terr delayed short-circuit release         A         0-0         0           Adjustment range undelayed short-circuit release         A         0-0         0           Adjustment range undelayed short-circuit release         A         0-0         0           Integrated eath fault protection         B         B         0-0         0           Type of electrical connection of main circuit         F	Rated permanent current lu	А	20
Overload release current setting         A         5 - 20           Adjustment range short-ter delayed short-circuit release         A         0           Adjustment range undelayed short-circuit release         A         350 - 350           Adjustment range undelayed short-circuit release         A         No           Type of electrical connection of main circuit         Image short ter circuit release         No           Divie of auxiliary contacts as normally closed contact         Image short ter circuit release         So           Number of auxiliary contacts as change-over contact         Image short ter circuit         Ves           Number of auxiliary contacts as change-over contact         Image short ter circuit         No           Number of auxiliary contacts as change-over contact         Image short ter circuit         Image short ter circuit           Number of poles         Image short ter circuit         No         No           Number of poles         Image short ter circuit         No         No           Number of poles         Image short ter circuit         No         No           Number of poles         Image short ter circuit         No         No           Number of poles         Image short ter circuit         No         No           Notor there inteir porteciron unit         Image short ter circuit	Rated voltage	V	690 - 690
Adjustment range short-terruit release     Adjustment range undelayed short-circuit release     Adjustment range undelayed range release     Adjustment range r	Rated short-circuit breaking capacity Icu at 400 V, 50 Hz	kA	50
Adjustment range undelayed short-circuit release       Adjustment range undelayed short-circuit release       Sol-350         Integrated earth fault protection       Frame clamp       Frame clamp         Device construction       Built-in device fixed built-in technique       Built-in device fixed built-in technique         Suitable for DIN raii (top hat raii) mounting optional       Yee       Sol-350         Number of auxiliary contacts as normally closed contact       Yee       Sol-350         Number of auxiliary contacts as change-over contact       Yee       Sol-300         With under voltage release       Yee       Sol-300         Number of poles       Yee       Sol-300         Position of connection formain current circuit       Yee       Sol-300         Type of control element       Yee       Sol-300         Complete device with protection unit       Yee       Sol-300         Motor drive integrated       Yee       Sol-300         Motor drive integrated       Yee       Sol-300         Motor drive integrated       Yee       Sol-300         Sol dott drive integrated	Overload release current setting	А	15 - 20
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       Ves         Number of auxiliary contacts as normally closed contact       Yes         Number of auxiliary contacts as normally closed contact       Yes         Number of auxiliary contacts as normally closed contact       Yes         Number of auxiliary contacts as change-over contact       Yes         With under voltage release       Yes         Number of poles       Yes         Position of connection for main current circuit       Yes         Type of control element       Yes         Complete device with protection unit       Yes         Motor drive integrated       Yes      <	Adjustment range short-term delayed short-circuit release	А	0 - 0
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         Yes           Number of auxiliary contacts as normally open contact         Yes           Number of auxiliary contacts as change-over contact         O           With under voltage release         No           Number of poles         Yes           Position of connection for main current circuit         Yes           Type of control element         Yes           Complete device with protection unit         Yes           Motor drive integrated         Yes           Motor drive integrated         Yes           Motor drive optional         Yes           Motor drive optional         Yes           Motor drive optional         Yes           Motor drive integrated         Yes           Motor drive integrated         Yes           Motor drive optional         Yes           Motor drive optional         Yes           Motor drive integrated         No <td>Adjustment range undelayed short-circuit release</td> <td>А</td> <td>350 - 350</td>	Adjustment range undelayed short-circuit release	А	350 - 350
Device construction         Maile 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         Yes           Number of auxiliary contacts as normally open contact         Yes           Number of auxiliary contacts as change-over contact         Yes           With switched-off indicator         Yes           Number of puss         No           Number of puss         No           Number of puss         Yes           Number of puss         Yes           Number of puss         Yes           Number of puss         No           Number of puss         Yes           Number of control for main current circuit         Yes           Type of control learent         Yes           Complete device with protection unit         Yes           Motor drive integrated         Yes           Motor drive puptonal         Yes           Motor drive optional         Yes           No         No	Integrated earth fault protection		No
Suitable for DIN rail (top hat rail) mounting       Image: Complete device with protection unit         Suitable for DIN rail (top hat rail) mounting optional       Image: Complete device with protection unit         Suitable for DIN rail (top hat rail) mounting optional       Image: Complete device with protection unit         Suitable for DIN rail (top hat rail) mounting optional       Image: Complete device with protection unit         Suitable for DIN rail (top hat rail) mounting optional       Image: Complete device optional         Suitable for DIN rail (top hat rail) mounting optional       Image: Complete device optional         Suitable for DIN rail (top hat rail) mounting optional       Image: Complete device optional         Suitable for DIN rail (top hat rail) mounting optional       Image: Complete device optional         Suitable for DIN rail (top hat rail) mounting optional       Image: Complete device optional         Suitable for DIN rail (top hat rail) mounting optional       Image: Complete device optional         Suitable for DIN rail (top hat rail) mounting optional       Image: Complete device optional         Suitable for DIN rail (top hat rail) mounting optional       Image: Complete device optional         Suitable for DIN rail (top hat rail) mounting optional       Image: Complete device optional         Suitable for DIN rail (top hat rail) mounting optional       Image: Complete device optional         Suitable for DIN rail (top hat rail) mounting optional       Im	Type of electrical connection of main circuit		Frame clamp
DIN rail (top hat rail) mounting optionalYesNumber of auxiliary contacts as normally closed contact0Number of auxiliary contacts as normally open contact0Number of auxiliary contacts as normally open contact0Number of auxiliary contacts as change-over contact0With switched-off indicatorNoWith under voltage releaseNoNumber of poles3Position of connection for main current circuitFront sideType of control elementKocker leverComplete device with protection unitKocker leverMotor drive pitogalNoMotor drive optionalKocker leverMotor drive optionalKocker leverMotor drive optionalNoMotor drive optionalNo	Device construction		Built-in device fixed built-in technique
Number of auxiliary contacts as normally closed contactImage: Contact as normally closed contactImage: Contact as normally closed contactNumber of auxiliary contacts as normally open contactImage: Contact as normally closed contactImage: Contact as closed contactNumber of auxiliary contacts as change-over contactImage: Contact as closed contactImage: Contact as closed contactWith switched-off indicatorImage: Contact as closed contactImage: Contact as closed contactImage: Contact as closed contactWith under voltage releaseImage: Contact as closed contactImage: Contact as closed contactImage: Contact as closed contactNumber of polesImage: Contact as closed contactImage: Contact as closed contactImage: Contact as closed contactPosition of connection for main current circuitImage: Contact as closed contactImage: Contact as closed contactType of control elementImage: Contact as closed contact as closed contactImage: Contact as closed contactComplete device with protection unitImage: Contact as closed contactImage: Contact as closed contactMotor drive integratedImage: Contact as closed contactImage: Contact as closed contactMotor drive optionalImage: Contact as closed contactImage: Contact as closed contactImage: Contact as closed contactImage: Contact as closed contact as clos	Suitable for DIN rail (top hat rail) mounting		No
Number of auxiliary contacts as normally open contactImage: Contact of auxiliary contacts as change-over contactImage: Contact of auxiliary contacts as change-over contactNumber of auxiliary contacts as change-over contactImage: Contact of auxiliary contacts as change-over contactImage: Contact of auxiliary contacts as change-over contactWith switched-off indicatorNoNoWith under voltage releaseImage: Contact of auxiliary contacts as change-over contactImage: Contact of auxiliary contacts as change-over contactNumber of polesImage: Contact of auxiliary contacts as change-over contactImage: Contact of auxiliary contacts as change-over contactNumber of polesImage: Contact of auxiliary contacts as change-over contactImage: Contact of auxiliary contacts as change-over contactNumber of polesImage: Contact of auxiliary contacts as change-over contactImage: Contact of auxiliary contacts as change-over contactNumber of polesImage: Contact of auxiliary contacts as change-over contactImage: Contact of auxiliary contacts as change-over contactNumber of control elementImage: Contact of auxiliary contacts as change-over cover con	DIN rail (top hat rail) mounting optional		Yes
Number of auxiliary contacts as change-over contactImage: Content of auxiliary contacts as change-over contactWith switched-off indicatorNoWith under voltage releaseNoNumber of poles3Position of connection for main current circuitFront sideType of control elementRocker leverComplete device with protection unitYesMotor drive integratedNoMotor drive optionalMoMotor drive optionalNo	Number of auxiliary contacts as normally closed contact		0
With switched-off indicatorNoWith switched-off indicatorNoWith under voltage releaseNoNumber of poles3Position of connection for main current circuitFont sideType of control elementRocker leverComplete device with protection unitYesMotor drive integratedNoMotor drive optionalNo	Number of auxiliary contacts as normally open contact		0
With under voltage releaseNoNumber of poles3Position of connection for main current circuitFront sideType of control elementRocker leverComplete device with protection unitYesMotor drive integratedNoMotor drive optionalSole	Number of auxiliary contacts as change-over contact		0
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     Sole	With switched-off indicator		No
Position of connection for main current circuit     Find side       Type of control element     Rocker lever       Complete device with protection unit     Yes       Motor drive integrated     No       Motor drive optional     Socker lever	With under voltage release		No
Type of control element     Rocker lever       Complete device with protection unit     Yes       Motor drive integrated     No       Motor drive optional     Sole	Number of poles		3
Complete device with protection unit     Moder       Motor drive integrated     Moder       Motor drive optional     Moder	Position of connection for main current circuit		Front side
Motor drive optional     Motor	Type of control element		Rocker lever
Motor drive optional No	Complete device with protection unit		Yes
	Motor drive integrated		No
Degree of protection (IP)	Motor drive optional		No
	Degree of protection (IP)		IP20

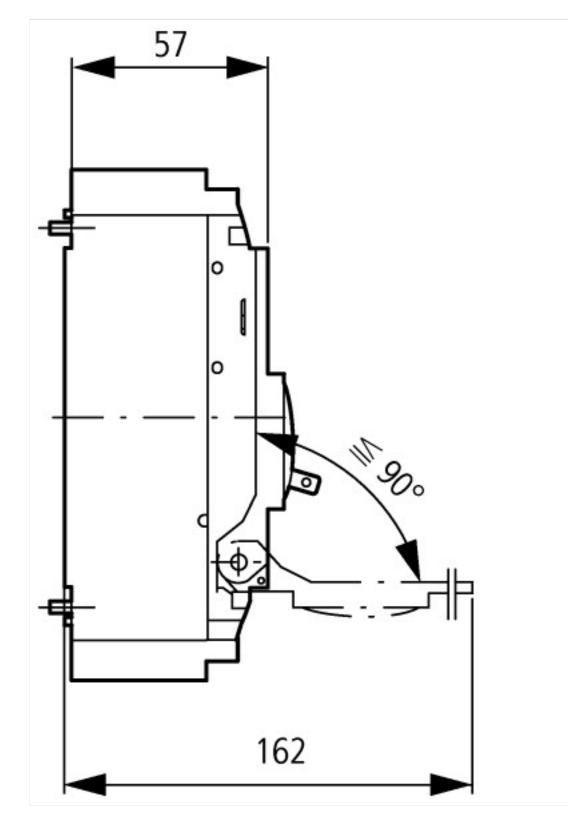












# Additional product information (links)

IL01203004Z (AWA1230-1913) Circuit-breaker, Switch-Disconnector		
IL01203004Z (AWA1230-1913) Circuit-breaker, Switch-Disconnector	https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL01203004Z2015_11.pdf	
Temperature dependency, Derating	http://ecat.moeller.net/flip-cat/?edition=HPLEN&startpage=17.172	
CurveSelect characteristics program	http://www.eaton.eu/DE/Europe/Electrical/CustomerSupport/ConfigurationTools/CharacteristicsProgram/index.htm	
additional technical information for NZM power switch	https://es-assets.eaton.com/DOCUMENTATION/PDF/nzm_technic_de_en.pdf	