



**Circuit-breaker, 3p, 600A**

**Part no. NZMN4-VEF600-NA**  
**Catalog No. 271136**

Similar to illustration

## Delivery program

Product range			Circuit-breaker
Protective function			Systems, cable, selectivity and generator protection
Standard/Approval			UL/CSA, IEC
Release system			Electronic release
Installation type			Fixed
Description			Switches conform to UL/CSA as well as the IEC regulations. IEC switching performance values are contained on the rating plate. Fixed overload releases Ir R.m.s. value measurement and "thermal memory" adjustable time delay setting to overcome current peaks tr: 2 – 20 s at 6 x Ir Adjustable delay time tsd: Steps: 0, 20, 60, 100, 200, 300, 500, 750, 1000 ms i <sup>2</sup> t constant function: switchable
Frame size			NZM4
Number of poles			3 pole
Standard equipment			Screw connection





## Switching capacity

SCCR 480 V 60 Hz	$I_{cu}$	kA	42
SCCR 600 V 60 Hz	$I_{cu}$	kA	35

## Rated current = rated uninterrupted current

Rated current = rated uninterrupted current	$I_n = I_u$	A	600
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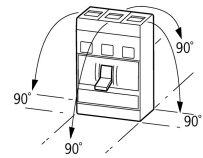
## Setting range

Overload trip			
			
Overload release, min.	$I_r$	A	600
Short-circuit releases			
			
Non-delayed	$I_i = I_n \times \dots$		2 - 12
			
Delayed	$I_{sd} = I_r \times \dots$		2 - 10
			

## 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	15 (half-sinusoidal shock 11 ms)

Safe isolation to EN 61140			
Between auxiliary contacts and main contacts	V AC	500	
between the auxiliary contacts	V AC	300	
Weight	kg	21	
Mounting position			
Mounting position			<p>Vertical and 90° in all directions</p>  <p>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</p>
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)			Weight Temperature dependency, Derating Effective power loss

### Circuit-breakers

Rated surge voltage invariability	$U_{imp}$		
Main contacts	V	8000	
Auxiliary contacts	V	6000	
Rated operational voltage	$U_e$	V AC	690
Overvoltage category/pollution degree			III/3
Rated insulation voltage	$U_i$	V	1000
Use in unearthed supply systems	V		$\leq 525$

### Switching capacity

Rated short-circuit making capacity	$I_{cm}$		
240 V	$I_{cm}$	kA	105
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 $I_{cn}$	$I_{cn}$		
$I_{cu}$ to IEC/EN 60947 test cycle O-t-CO	$I_{cu}$	kA	
240 V 50/60 Hz	$I_{cu}$	kA	50
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
$I_{cs}$ to IEC/EN 60947 test cycle O-t-CO-t-CO	$I_{cs}$	kA	
240 V 50/60 Hz	$I_{cs}$	kA	37
400/415 V 50/60 Hz	$I_{cs}$	kA	37
440 V 50/60 Hz	$I_{cs}$	kA	26
525 V 50/60 Hz	$I_{cs}$	kA	19
690 V 50/60 Hz	$I_{cs}$	kA	15
Maximum low-voltage h.b.c. fuse	A gG/gL		2 x 630
			Maximum back-up fuse, if the expected short-circuit currents at the installation location exceed the switching capacity of the circuit-breaker.

**Technical data that diverge from products for the IEC market**  
Switching capacity of NA switches (UL489, CSA 22.2 No. 5.1)

Short-circuit current rating SCCR			
SCCR 240 V 60 Hz	$I_{cu}$	kA	85
SCCR 480 V 60 Hz	$I_{cu}$	kA	42
SCCR 600 V 60 Hz	$I_{cu}$	kA	35
Rated short-time withstand current			
t = 0.3 s	$I_{cw}$	kA	19.2
t = 1 s	$I_{cw}$	kA	19.2
Utilization category to IEC/EN 60947-2			A
Lifespan, mechanical (of which max. 50 % trip by shunt/undervoltage release)			Operations 10000
Lifespan, electrical			
AC-1			
400 V 50/60 Hz	Operations		3000
690 V 50/60 Hz	Operations		2000
AC--3			
400 V 50/60 Hz	Operations		2000
415 V 50/60 Hz	Operations		2000
690 V 50/60 Hz	Operations		1000
Max. operating frequency		Ops/h	60
Total break time at short-circuit		ms	< 25 ≤ 415 V; < 35 > 415 V

### Terminal capacity

Standard equipment			Screw connection
Round copper conductor			
Tunnel terminal			
Stranded			
4-hole		mm <sup>2</sup>	4 x (1/0 - 500)
Bolt terminal and rear-side connection			
Direct on the switch			
Stranded			
		mm <sup>2</sup>	1 x (250 ... 350) 4 x (0 ... 350)
Module plate			
Single hole	min.	mm <sup>2</sup>	1 x (250 - 600)
Single hole	max.	mm <sup>2</sup>	2 x (3/0 - 600)
Module plate			
Double hole	min.	mm <sup>2</sup>	2 x (3/0 - 350)
Double hole	max.	mm <sup>2</sup>	4 x (2 - 350)
Connection width extension			
Connection width extension		mm <sup>2</sup>	4 x 600 6 x (3/0 - 500)
Al conductors, Cu cable			
Tunnel terminal			
Stranded			
4-hole		mm <sup>2</sup>	4 x (50 - 240)
Bolt terminal and rear-side connection			
Flat copper strip, with holes	min.	mm	(2 x) 10 x 50 x 1.0
Flat copper strip, with holes	max.	mm	(2 x) 10 x 50 x 1.0
Connection width extension		mm	(2 x) 10 x 80 x 1.0
Cu strip (number of segments x width x segment thickness)			
Flat conductor terminal			
	min.	mm	6 x 16 x 0.8
	max.	mm	(2 x) 10 x 32 x 1.0
Module plate			
Single hole		mm	(2 x) 10 x 50 x 1.0
Bolt terminal and rear-side connection			
Flat copper strip, with holes	min.	mm	(2 x) 10 x 50 x 1.0
Flat copper strip, with holes	max.	mm	(2 x) 10 x 50 x 1.0

Connection width extension		mm	(2 x) 10 x 80 x 1.0
Copper busbar (width x thickness)	mm		
Bolt terminal and rear-side connection			
Screw connection			M10
Direct on the switch			
	min.	mm	25 x 5
	max.	mm	2 x (50 x 10) 2 x (80 x 10)
Module plate			
Single hole	min.	mm	25 x 5
Single hole	max.	mm	2 x (50 x 10)
Module plate			
Double hole		mm	2 x (50 x 10)
Connection width extension		mm	
Connection width extension	min.	mm	60 x 10
Connection width extension	max.	mm	2 x (80 x 10)
Control cables			
		mm <sup>2</sup>	1 x (18 ... 14) 2 x (18 ... 16)

## Design verification as per IEC/EN 61439

Technical data for design verification			
Rated operational current for specified heat dissipation	I <sub>n</sub>	A	600
Equipment heat dissipation, current-dependent	P <sub>vid</sub>	W	39.96
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 7.0

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

Rated permanent current I <sub>u</sub>	A	600
Rated voltage	V	690 - 690
Rated short-circuit breaking capacity I <sub>cu</sub> at 400 V, 50 Hz	kA	50
Overload release current setting	A	600 - 600
Adjustment range short-term delayed short-circuit release	A	1200 - 6000
Adjustment range undelayed short-circuit release	A	1200 - 6000
Integrated earth fault protection		No
Type of electrical connection of main circuit		Screw connection
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		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 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		Yes
Degree of protection (IP)		IP20

## Approvals

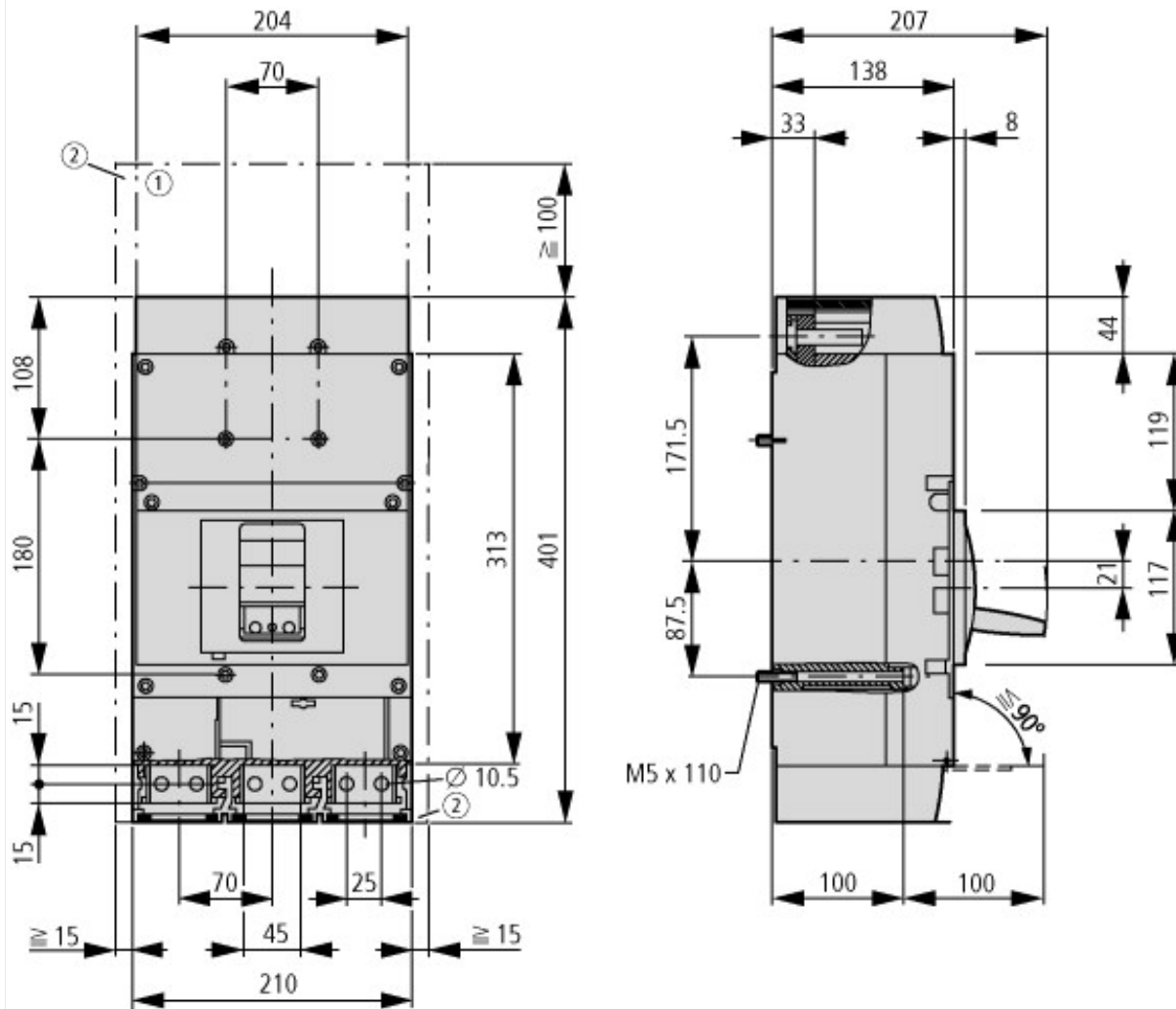
Product Standards		UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking
UL File No.		E31593
UL Category Control No.		DIVQ
CSA File No.		022086
CSA Class No.		1432-01
North America Certification		UL listed, CSA certified
Specially designed for North America		Yes
Suitable for		Feeder circuits, branch circuits
Current Limiting Circuit-Breaker		No
Max. Voltage Rating		600 V
Degree of Protection		IEC: IP20; UL/CSA Type: -

# Characteristics





## Dimensions



- ① Blow out area, minimum clearance to adjacent parts  
 U<sub>i</sub> ≤ 690 V: 100 mm  
 U<sub>i</sub> ≤ 1500 V: 200 mm
- ② Minimum clearance to adjacent parts  
 U<sub>i</sub> ≤ 1000 V: 15 mm  
 U<sub>i</sub> ≤ 1500 V: 70 mm

## Additional product information (links)

### IL01210010Z (AWA1230-2022) Circuit-Breaker, basic unit

IL01210010Z (AWA1230-2022) Circuit-Breaker, basic unit	<a href="https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL01210010Z2018_11.pdf">https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL01210010Z2018_11.pdf</a>
Weight	<a href="http://ecat.moeller.net/flip-cat/?edition=HPLEN&amp;startpage=17.171">http://ecat.moeller.net/flip-cat/?edition=HPLEN&amp;startpage=17.171</a>
Temperature dependency, Derating	<a href="http://ecat.moeller.net/flip-cat/?edition=HPLEN&amp;startpage=17.172">http://ecat.moeller.net/flip-cat/?edition=HPLEN&amp;startpage=17.172</a>
Effective power loss	<a href="http://ecat.moeller.net/flip-cat/?edition=HPLEN&amp;startpage=17.174">http://ecat.moeller.net/flip-cat/?edition=HPLEN&amp;startpage=17.174</a>
additional technical information for NZM power switch	<a href="https://es-assets.eaton.com/DOCUMENTATION/PDF/nzm_techinc_de_en.pdf">https://es-assets.eaton.com/DOCUMENTATION/PDF/nzm_techinc_de_en.pdf</a>