

## Circuit-breaker, 3p, 160A



Powering Business Worldwide™

Part no. **NZMB1-A160**  
 Catalog No. **281230**

EL-Nummer  
 (Norway) **4358978**

Similar to illustration

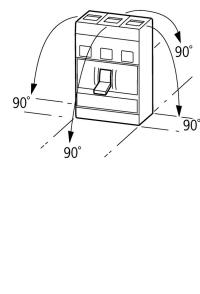
## Delivery program

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		
<b>Switching capacity</b>			
400/415 V 50 Hz	$I_{cu}$	kA	25
<b>Rated current = rated uninterrupted current</b>			
Rated current = rated uninterrupted current	$I_n = I_u$	A	160
<b>Setting range</b>			
Overload trip		$I_r$	A
			125 - 160
Short-circuit releases			
Non-delayed		$I_i = I_n \times \dots$	1280 A fixed
Short-circuit releases			
max.		A	1280

## 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	160
Rated surge voltage invariability	$U_{imp}$		
Main contacts		V	6000
Auxiliary contacts		V	6000
Rated operational voltage	$U_e$	V AC	440
Overtoltage category/pollution degree			III/3
Rated insulation voltage	$U_i$	V	690
Use in unearthing supply systems		V	$\leq 440$

### Switching capacity

Rated short-circuit making capacity	$I_{cm}$		
240 V	$I_{cm}$	kA	63
400/415 V	$I_{cm}$	kA	53
440 V 50/60 Hz	$I_{cm}$	kA	53
Rated short-circuit breaking capacity $I_{cn}$	$I_{cn}$		
$I_{cu}$ to IEC/EN 60947 test cycle 0-t-CO	$I_{cu}$	kA	
240 V 50/60 Hz	$I_{cu}$	kA	30
400/415 V 50/60 Hz	$I_{cu}$	kA	25
440 V 50/60 Hz	$I_{cu}$	kA	25
$I_{cs}$ to IEC/EN 60947 test cycle 0-t-CO-t-CO	$I_{cs}$	kA	
240 V 50/60 Hz	$I_{cs}$	kA	30
400/415 V 50/60 Hz	$I_{cs}$	kA	25
440 V 50/60 Hz	$I_{cs}$	kA	18.5
			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		7500
415 V 50/60 Hz	Operations		7500
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		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 mm <sup>2</sup> can be connected depending on the cable manufacturer.				
Tunnel terminal				
Solid		mm <sup>2</sup>	1 x 16	
Stranded		mm <sup>2</sup>		
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 (10 - 16) 2 x (6 - 16)	
Stranded		mm <sup>2</sup>	1 x (10 - 70) <sup>3)</sup> 2 x 25	
3) Up to 95 mm <sup>2</sup> can be connected depending on the cable manufacturer.				
Al circular conductor				
Tunnel terminal				
Solid		mm <sup>2</sup>	1 x 16	
Stranded		mm <sup>2</sup>		
Stranded		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 (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	I <sub>h</sub>	A	160
Equipment heat dissipation, current-dependent	P <sub>vid</sub>	W	36.1
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 $I_{\text{p}}$	A	160
Rated voltage	V	440 - 440
Rated short-circuit breaking capacity $I_{\text{cu}}$ at 400 V, 50 Hz	kA	25
Overload release current setting	A	125 - 160
Adjustment range short-term delayed short-circuit release	A	0 - 0
Adjustment range undelayed short-circuit release	A	960 - 1600
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