

Circuit-breaker, 3p, 450A



Powering Business Worldwide™

Part no. **NZMN3-ME450**
 Catalog No. **284468**

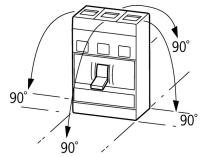
EL-Nummer
 (Norway) **4315588**

Delivery program

Product range		Circuit-breaker
Protective function		Motor protection
Standard/Approval		IEC
Installation type		Fixed
Release system		Electronic release
Construction size		NZM3
Description		IEC/EN 60947-4-1, IEC/EN 60947-2 The circuit-breaker fulfills all requirements for AC-3 switching category. R.m.s. value measurement and "thermal memory" Adjustable time delay setting to overcome current peaks tr at $6 \times I_r$ also infinity (without overload releases) All AC-3 rating data applies to direct switching by the circuit-breaker under normal operating conditions. If, for example, a contactor takes over AC-3 switching under normal operating conditions, the full rated uninterrupted current applies to the circuit-breaker, $I_n = I_u$.
Number of poles		3 pole
Standard equipment		Screw connection
Switching capacity		
400/415 V 50 Hz	I_{cu}	kA 50
Rated current = rated uninterrupted current	$I_n = I_u$	A 450
Setting range		
Overload trip		I_r A 225 - 450
Short-circuit releases		
Non-delayed		$I_i = I_n \times \dots$ 2 - 12
Motor rating AC-3 50/60 Hz		
380 V 400 V	P	kW 250
660 V 690 V	P	kW 450
Motor rating AC-3 50/60 Hz		
400 V	P	kW 250
660 V 690 V	P	kW 450
Rated operational current AC-3 50/60 Hz		
400 V	I_e	A 437
690 V		A 446

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	V AC	500
Between auxiliary contacts and main contacts	V AC	300
between the auxiliary contacts		
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

Circuit-breakers

Rated current = rated uninterrupted current	$I_n = I_u$	A	450
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 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	13
690 V 50/60 Hz	I_{cs}	kA	5
Rated short-time withstand current			Maximum back-up fuse, if the expected short-circuit currents at the installation location exceed the switching capacity of the circuit-breaker.
$t = 0.3 \text{ s}$	I_{cw}	kA	3.3

t = 1 s	I _{cw}	kA	3.3
Utilization category to IEC/EN 60947-2			A
Lifespan, mechanical (of which max. 50 % trip by shunt/undervoltage release)	Operations		15000
Lifespan, electrical			
AC-1			
400 V 50/60 Hz	Operations		5000
415 V 50/60 Hz	Operations		5000
690 V 50/60 Hz	Operations		3000
AC-3			
400 V 50/60 Hz	Operations		2000
415 V 50/60 Hz	Operations		2000
690 V 50/60 Hz	Operations		2000
Max. operating frequency		Ops/h	60
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	2 x 16
Stranded		mm ²	1 x (35 - 240) 2 x (25-120)
Tunnel terminal			
Solid		mm ²	1 x 16
Stranded		mm ²	
1-hole		mm ²	1 x (16 - 185)
Double hole fitting		mm ²	2 x (50 - 240)
Bolt terminal and rear-side connection			
Direct on the switch			
Solid		mm ²	1 x 16 2 x 16
Stranded		mm ²	1 x (25 - 240) 2 x (25 - 240)
Connection width extension		mm ²	
Connection width extension		mm ²	2 x 300
Al circular conductor			
Tunnel terminal			
Solid		mm ²	1 x 16
Stranded		mm ²	
Stranded		mm ²	1 x (25 - 185) ²⁾
Double hole		mm ²	1 x (50 - 240) 2 x (50 - 240)
2) Up to 240 mm ² can be connected depending on the cable manufacturer.			
Bolt terminal and rear-side connection			
Direct on the switch			
Solid		mm ²	1 x 16 2 x (10 - 16)
Stranded		mm ²	1 x (25 - 120) 2 x (25 - 120)
Cu strip (number of segments x width x segment thickness)			
Box terminal		min.	6 x 16 x 0.8
		max.	10 x 24 x 1.0 + 5 x 24 x 1.0 (2 x) 8 x 24 x 1.0
Bolt terminal and rear-side connection			

Flat copper strip, with holes	min.	mm	6 x 16 x 0.8
Flat copper strip, with holes	max.	mm	10 x 32 x 1.0 + 5 x 32 x 1.0
Connection width extension		mm	(2 x) 10 x 50 x 1.0
Copper busbar (width x thickness)	mm		
Bolt terminal and rear-side connection			
Screw connection			M10
Direct on the switch			
	min.	mm	20 x 5
	max.	mm	30 x 10 + 30 x 5
Connection width extension	mm		
Connection width extension	max.	mm	2 x (10 x 50)
Control cables		mm ²	
		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	450
Equipment heat dissipation, current-dependent	P _{vid}	W	60.75
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	225 - 450
Adjustment range undelayed short-circuit release	A	450 - 6300

With thermal protection		Yes
Phase failure sensitive		Yes
Switch off technique		Electronic
Rated operating voltage	V	690 - 690
Rated permanent current I_{th}	A	450
Rated operation power at AC-3, 230 V	kW	132
Rated operation power at AC-3, 400 V	kW	250
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	275
Width	mm	140
Depth	mm	166