



**Circuit-breaker, 3p, 450A, withdrawable unit**

**Part no. NZMH3-ME450-AVE**  
**Catalog No. 110857**

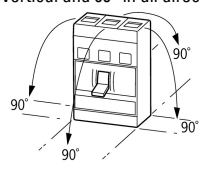
Similar to illustration

**Delivery program**


Product range				Circuit-breaker
Protective function				Motor protection
Standard/Approval				IEC
Installation type				Withdrawable
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 $t_r$ 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
<b>Switching capacity</b>				
400/415 V 50 Hz	$I_{cu}$	kA		150
Rated current = rated uninterrupted current	$I_n = I_u$	A		450
<b>Setting range</b>				
Overload trip				
	$I_r$	A		225 - 450
Short-circuit releases				
Non-delayed	$I_i = I_n \times \dots$			2 - 14
<b>Motor rating AC-3 50/60 Hz</b>				
380 V 400 V	P	kW		250
660 V 690 V	P	kW		450
<b>Motor rating AC-3 50/60 Hz</b>				
400 V	P	kW		250
660 V 690 V	P	kW		450
<b>Rated operational current AC-3 50/60 Hz</b>				
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			
Between auxiliary contacts and main contacts		V AC	500
between the auxiliary contacts		V AC	300
Weight		kg	6.34
Mounting position			Vertical and 90° in all directions  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
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 unearthed supply systems		V	 690

### Switching capacity

Rated short-circuit making capacity	$I_{cm}$		
240 V	$I_{cm}$	kA	330
400/415 V	$I_{cm}$	kA	330
440 V 50/60 Hz	$I_{cm}$	kA	286
525 V 50/60 Hz	$I_{cm}$	kA	143
690 V 50/60 Hz	$I_c$	kA	74
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	150
400/415 V 50/60 Hz	$I_{cu}$	kA	150
440 V 50/60 Hz	$I_{cu}$	kA	130
525 V 50/60 Hz	$I_{cu}$	kA	65
690 V 50/60 Hz	$I_{cu}$	kA	35
$I_{cs}$ to IEC/EN 60947 test cycle O-t-CO-t-CO	$I_{cs}$	kA	

240 V 50/60 Hz	I <sub>cs</sub>	kA	150
400/415 V 50/60 Hz	I <sub>cs</sub>	kA	150
440 V 50/60 Hz	I <sub>cs</sub>	kA	130
525 V 50/60 Hz	I <sub>cs</sub>	kA	33
690 V 50/60 Hz	I <sub>cs</sub>	kA	9
Maximum back-up fuse, if the expected short-circuit currents at the installation location exceed the switching capacity of the circuit-breaker.			
<b>Rated short-time withstand current</b>			
t = 0.3 s	I <sub>cw</sub>	kA	3.3
t = 1 s	I <sub>cw</sub>	kA	3.3
Utilization category to IEC/EN 60947-2			
Rated making and breaking capacity			
Rated operational current		I <sub>e</sub>	A
<b>AC-1</b>			
380 V 400 V	I <sub>e</sub>	A	450
415 V	I <sub>e</sub>	A	450
690 V	I <sub>e</sub>	A	450
<b>AC--3</b>			
380 V 400 V	I <sub>e</sub>	A	437
415 V	I <sub>e</sub>	A	437
660 V 690 V	I <sub>e</sub>	A	446
Lifespan, mechanical(of which max. 50 % trip by shunt/undervoltage release)		Operations	15000
Lifespan, electrical			
<b>AC-1</b>			
400 V 50/60 Hz	Operations		5000
415 V 50/60 Hz	Operations		5000
690 V 50/60 Hz	Operations		3000
<b>AC--3</b>			
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 downtime in a short-circuit		ms	< 10

### Terminal capacity

Standard equipment	Screw connection		
Accessories required	NZM3-XAVS		
Optional accessories	Box terminal Tunnel terminal connection on rear		
<b>Round copper conductor</b>			
<b>Box terminal</b>			
Solid	mm <sup>2</sup>		2 x 16
Stranded	mm <sup>2</sup>		1 x (35 - 240) 2 x (25-120)
<b>Tunnel terminal</b>			
Solid	mm <sup>2</sup>		1 x 16
Stranded	mm <sup>2</sup>		
1-hole	mm <sup>2</sup>		1 x (16 - 185)
2-hole	mm <sup>2</sup>		1 x (50 - 240) 2 x (50 - 240)
<b>Bolt terminal and rear-side connection</b>			
<b>Direct on the switch</b>			
Solid	mm <sup>2</sup>		1 x 16 2 x 16
Stranded	mm <sup>2</sup>		1 x (25 - 240) 2 x (25 - 240)

Connection width extension		mm <sup>2</sup>	
Connection width extension		mm <sup>2</sup>	2 x 300
Al conductors, Cu cable			
Solid		mm <sup>2</sup>	1 x 16
Stranded		mm <sup>2</sup>	
Stranded		mm <sup>2</sup>	1 x (25 - 185) <sup>2)</sup>
			<sup>2)</sup> Up to 240 mm <sup>2</sup> can be connected depending on the cable manufacturer.
2-hole		mm <sup>2</sup>	1 x (50 - 240) 2 x (50 - 240)
Cu strip (number of segments x width x segment thickness)			
Box terminal			
	min.	mm	6 x 16 x 0.8
	max.	mm	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)			
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 <sup>2</sup>	1 x (0.75 - 2.5) 2 x (0.75 - 1.5)

## Design verification as per IEC/EN 61439

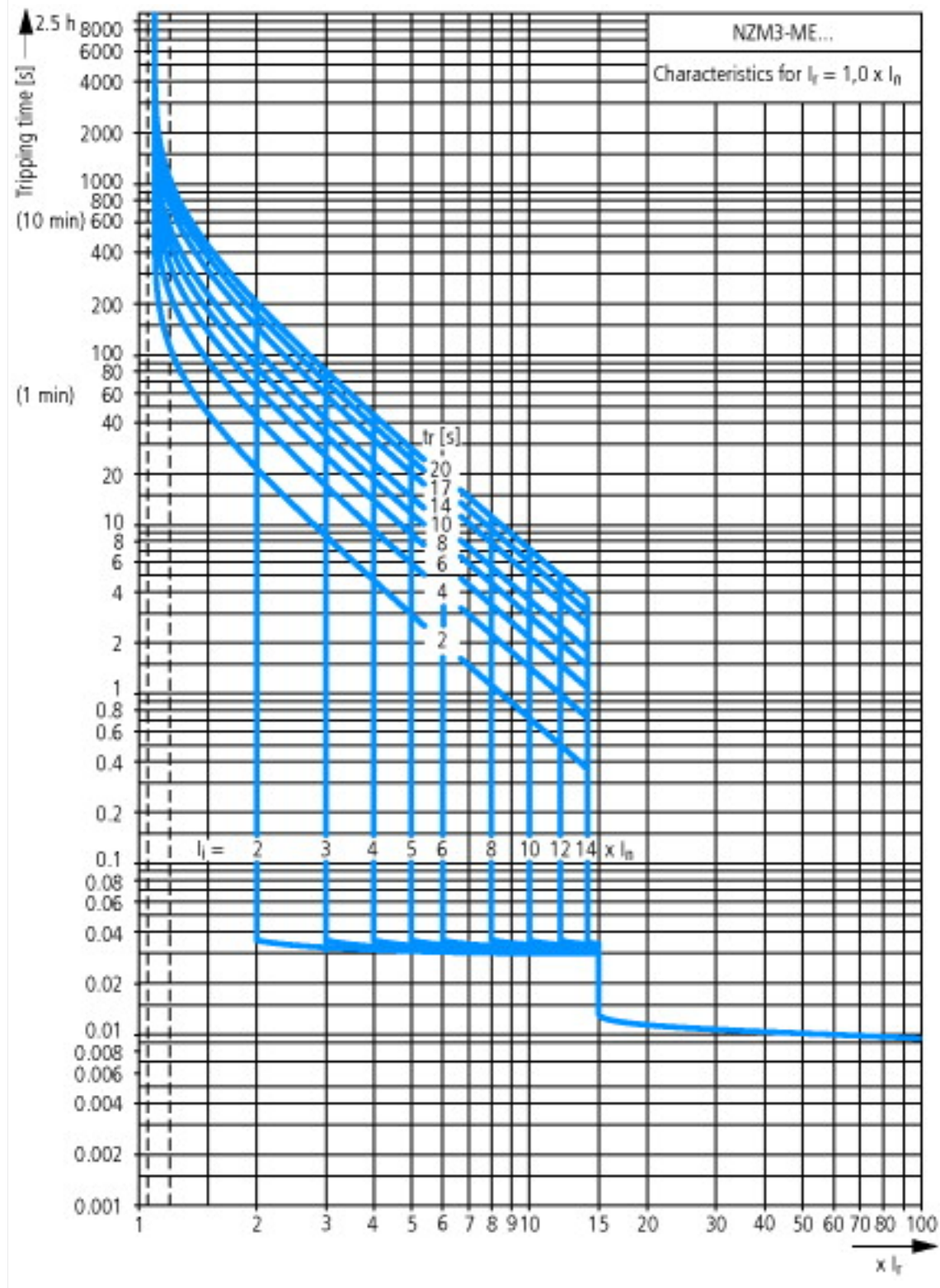
Technical data for design verification			
Rated operational current for specified heat dissipation	I <sub>n</sub>	A	450
Equipment heat dissipation, current-dependent	P <sub>vid</sub>	W	60.75
Operating ambient temperature max.		°C	-25
Operating ambient temperature max.		°C	70
IEC/EN 61439 design verification			
10.2 Strength of materials and parts			
10.2.2 Corrosion resistance			
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.

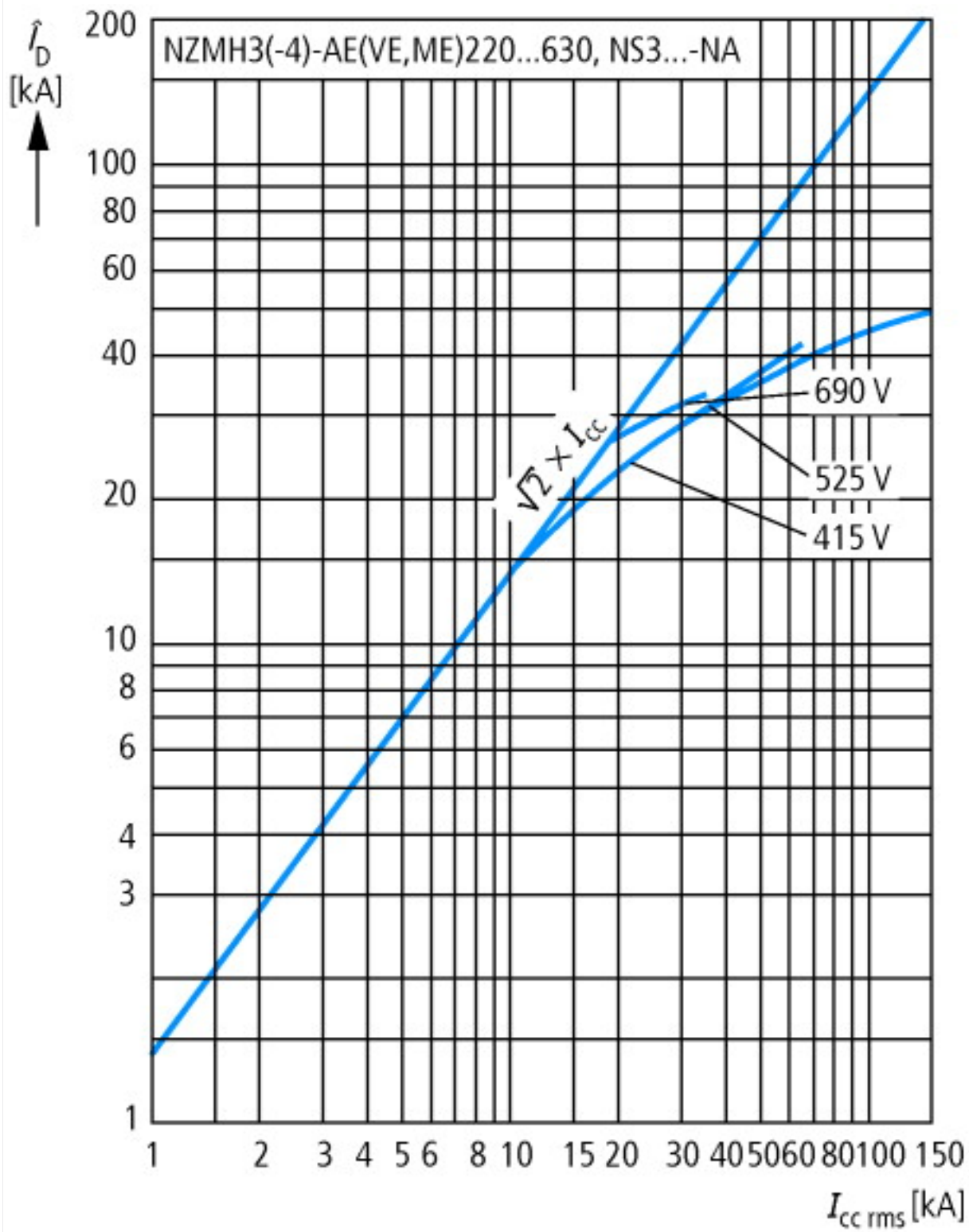
10.9 Insulation properties			
10.9.2 Power-frequency electric strength			Is the panel builder's responsibility.
10.9.3 Impulse withstand voltage			Is the panel builder's responsibility.
10.9.4 Testing of enclosures made of insulating material			Is the panel builder's responsibility.
10.10 Temperature 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 6.0

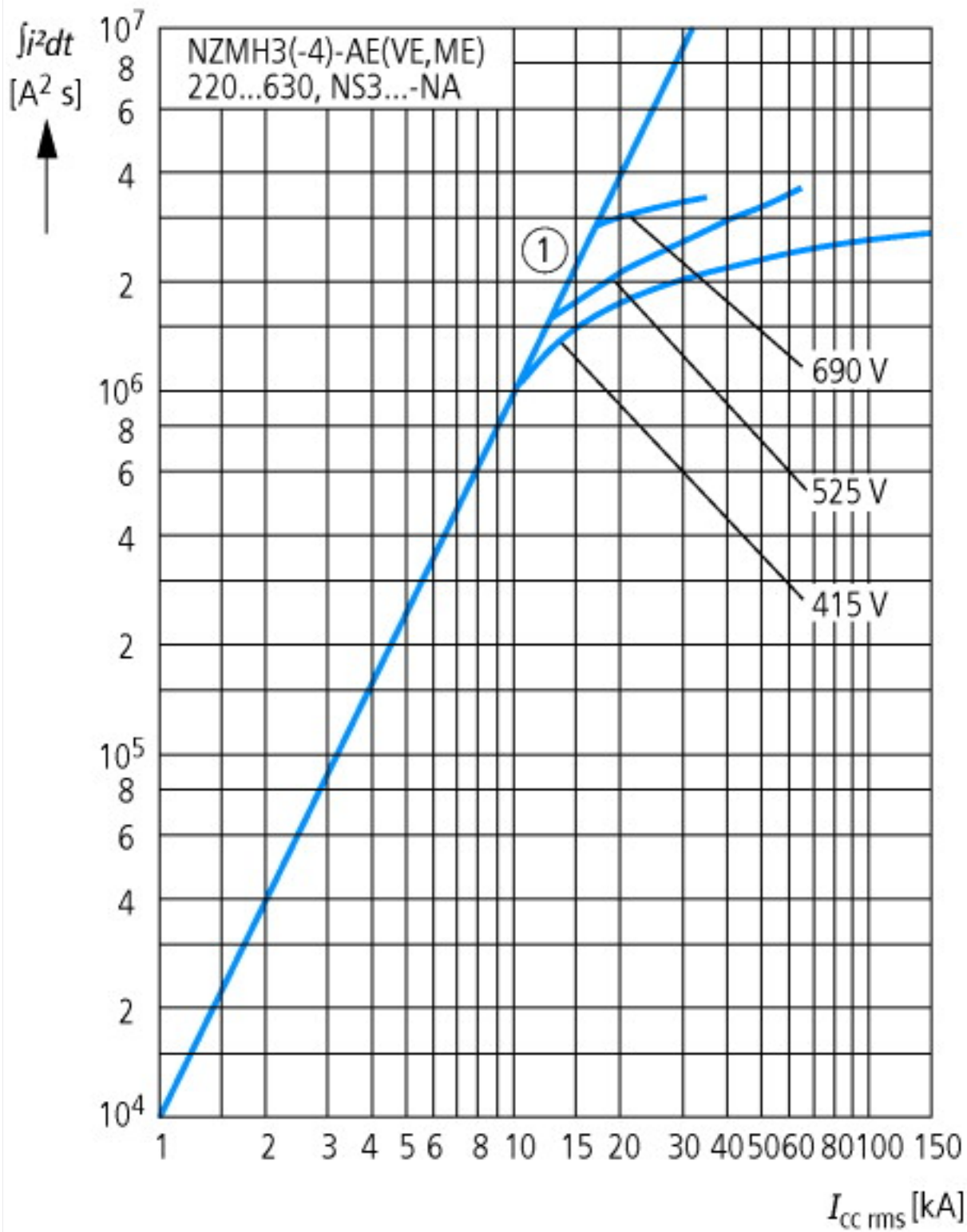
Low-voltage industrial components (EG000017) / Motor protection circuit-breaker (EC000074)			
Electric engineering, automation, process control engineering / Low-voltage switch technology / Circuit breaker (LV < 1 kV) / Motor protection circuit-breaker (ecl@ss8.1-27-37-04-01 [AGZ529013])			
Overload release current setting		A	225 - 450
Adjustment range undelayed short-circuit release		A	450 - 6300
Thermal protection			Yes
Phase failure sensitive			Yes
Switch off technique			Electronic
Rated operating voltage		V	690 - 690
Rated permanent current I <sub>u</sub>		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 slide-in technique (withdrawable)
With integrated auxiliary switch			No
With integrated under voltage release			No
Number of poles			3
Rated short-circuit breaking capacity I <sub>cu</sub> at 400 V, AC		kA	150
Degree of protection (IP)			IP20
Height		mm	346
Width		mm	185
Depth		mm	260

# Characteristics



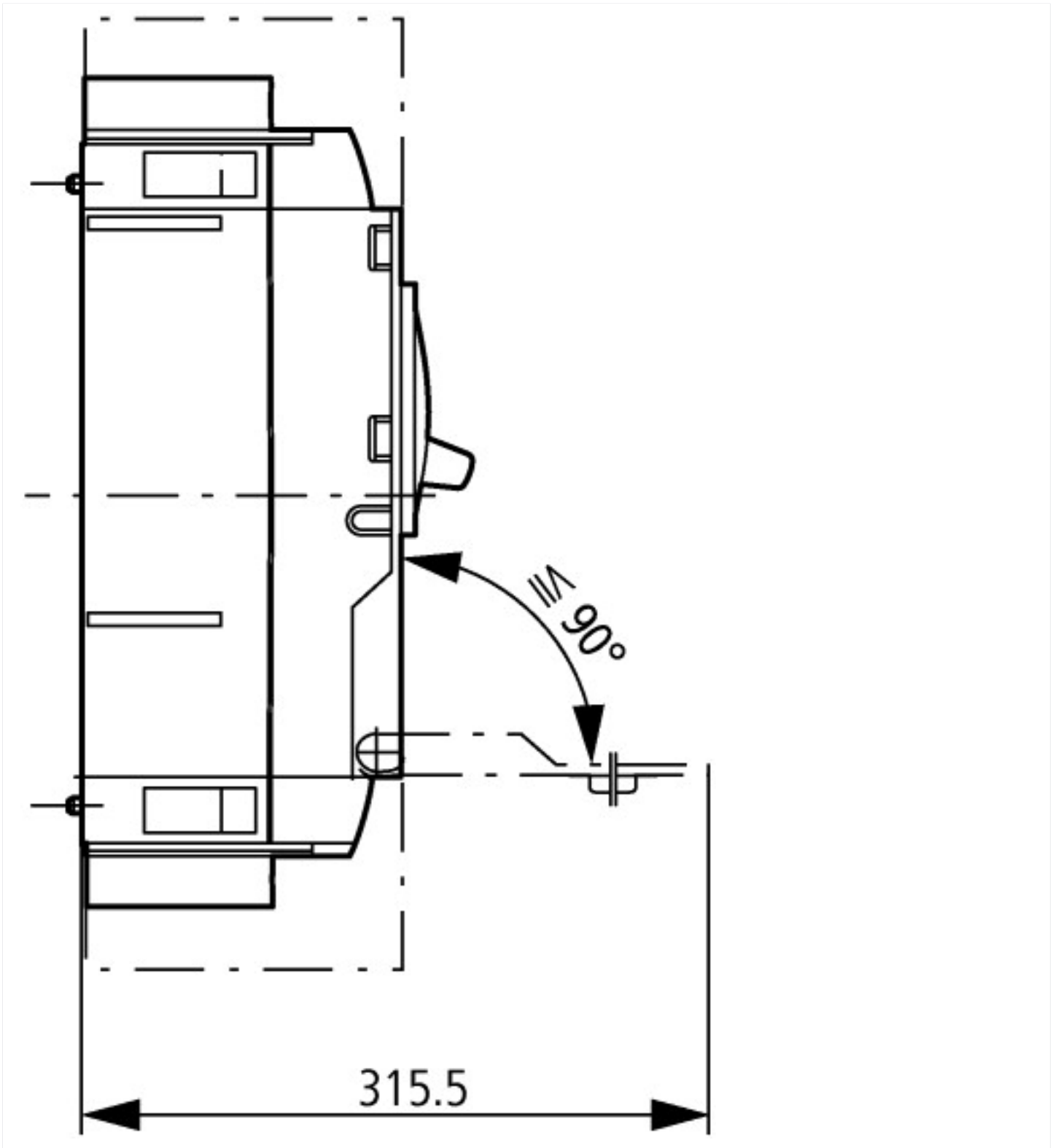


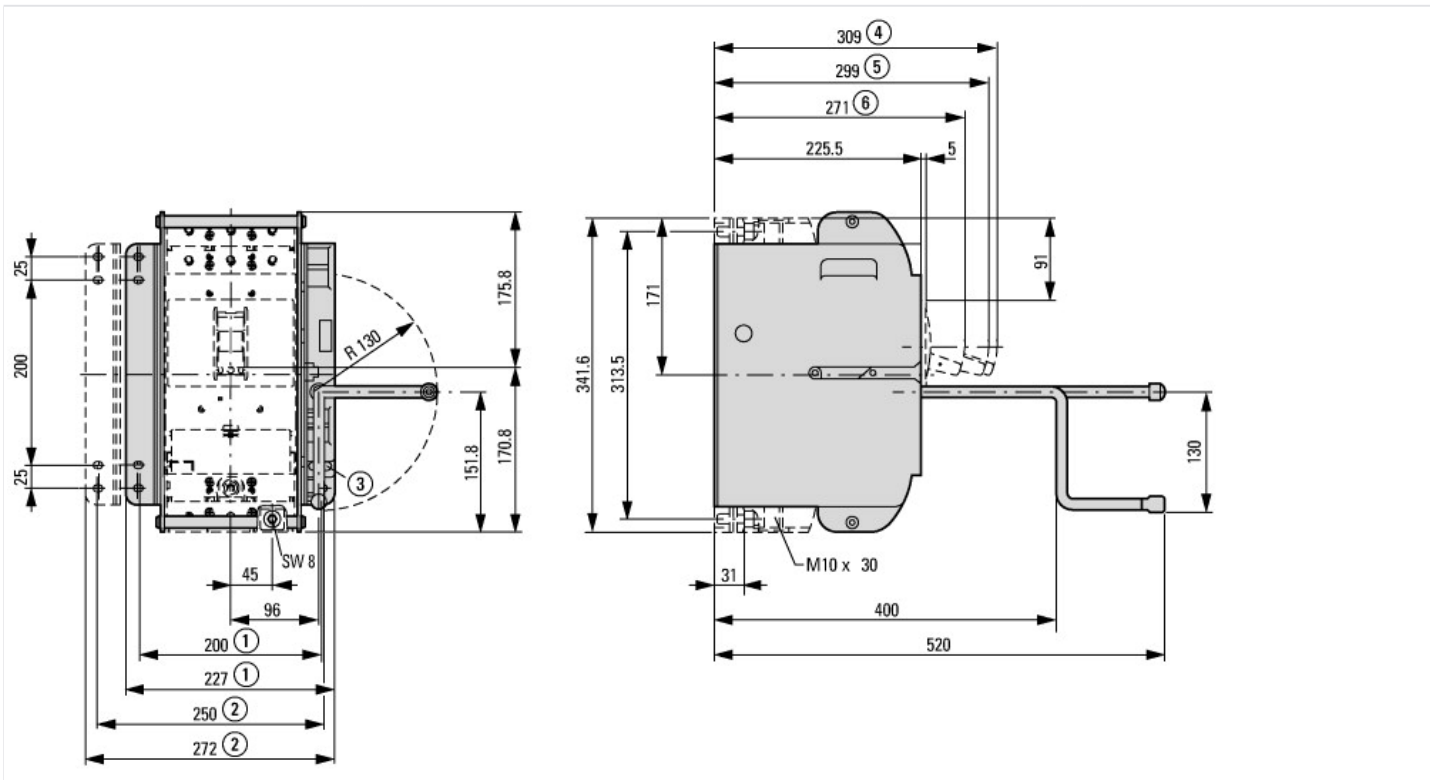
Let-through current



Let-through energy







## Additional product information (links)

### IL01208009Z (AWA1230-1992) Circuit-Breaker, basic unit

IL01208009Z (AWA1230-1992) Circuit-Breaker, basic unit [ftp://ftp.moeller.net/DOCUMENTATION/AWA\\_INSTRUCTIONS/IL01208009Z2017\\_01.pdf](ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL01208009Z2017_01.pdf)

Temperature dependency, Derating <http://ecat.moeller.net/flip-cat/?edition=HPLEN&startpage=17.172>