






Circuit-breaker, NZM1 TMTU, 3 pole, 20A, box terminal

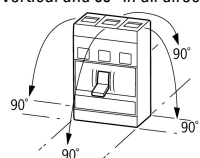
Part no. **NZMS1-A20**  
 Catalog No. **109933**

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		70
<b>Rated current = rated uninterrupted current</b>				
Rated current = rated uninterrupted current	$I_n = I_u$	A		20
<b>Setting range</b>				
Overload trip				
	$I_r$	A		15 - 20
Short-circuit releases				
				
Non-delayed	$I_i = I_n \times \dots$			350 A fixed
				

**Technical data**

<b>General</b>				
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
				 <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:</p>

- 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	20
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	198
400/415 V	$I_{cm}$	kA	154
440 V 50/60 Hz	$I_{cm}$	kA	77
525 V 50/60 Hz	$I_{cm}$	kA	44
690 V 50/60 H	$I_c$	kA	20
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	90
400/415 V 50/60 Hz	$I_{cu}$	kA	70
440 V 50/60 Hz	$I_{cu}$	kA	35
525 V 50/60 Hz	$I_{cu}$	kA	20
690 V 50/60 Hz	$I_{cu}$	kA	10
$I_{cs}$ to IEC/EN 60947 test cycle O-t-CO-t-CO	$I_{cs}$	kA	
240 V 50/60 Hz	$I_{cs}$	kA	90
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	10
690 V 50/60 Hz	$I_{cs}$	kA	7.5
			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			
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) 2 x (4 - 16)
Stranded		mm <sup>2</sup>	1 x (6 - 70) <sup>3)</sup> 2 x (4 - 25)

			<sup>3)</sup> Up to 95 mm <sup>2</sup> can be connected depending on the cable manufacturer.
<b>Tunnel terminal</b>			
Solid		mm <sup>2</sup>	1 x 16
Stranded			
1-hole		mm <sup>2</sup>	1 x (25 - 95)
<b>Bolt terminal and rear-side connection</b>			
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)
			<sup>3)</sup> Up to 95 mm <sup>2</sup> can be connected depending on the cable manufacturer.
<b>Al circular conductor</b>			
Tunnel terminal			
Solid		mm <sup>2</sup>	1 x 16
Stranded			
Stranded		mm <sup>2</sup>	1 x (25 - 95)
<b>Cu strip (number of segments x width x segment thickness)</b>			
Box terminal			
	min.	mm	2 x 9 x 0.8
	max.	mm	9 x 9 x 0.8
<b>Copper busbar (width x thickness)</b>		mm	
Bolt terminal and rear-side connection			
Screw connection			M6
Direct on the switch			
	min.	mm	12 x 5
	max.	mm	16 x 5
<b>Control cables</b>			
		mm <sup>2</sup>	1 x (0.75 - 2.5) 2 x (0.75 - 1.5)

## Design verification as per IEC/EN 61439

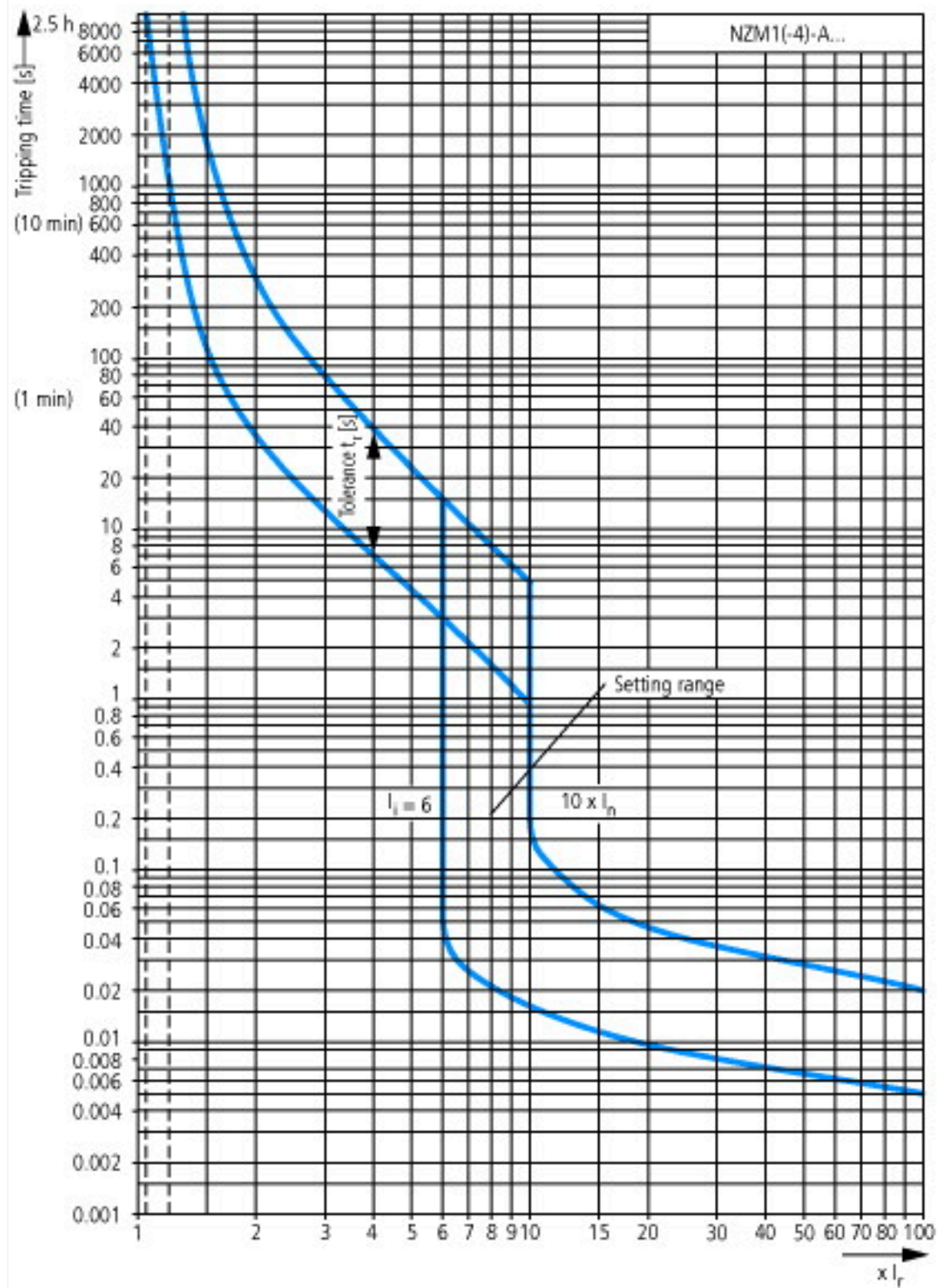
<b>Technical data for design verification</b>			
Rated operational current for specified heat dissipation	I <sub>n</sub>	A	20
Equipment heat dissipation, current-dependent	P <sub>vid</sub>	W	9.82
Operating ambient temperature min.		°C	-25
Operating ambient temperature max.		°C	70
<b>IEC/EN 61439 design verification</b>			
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			

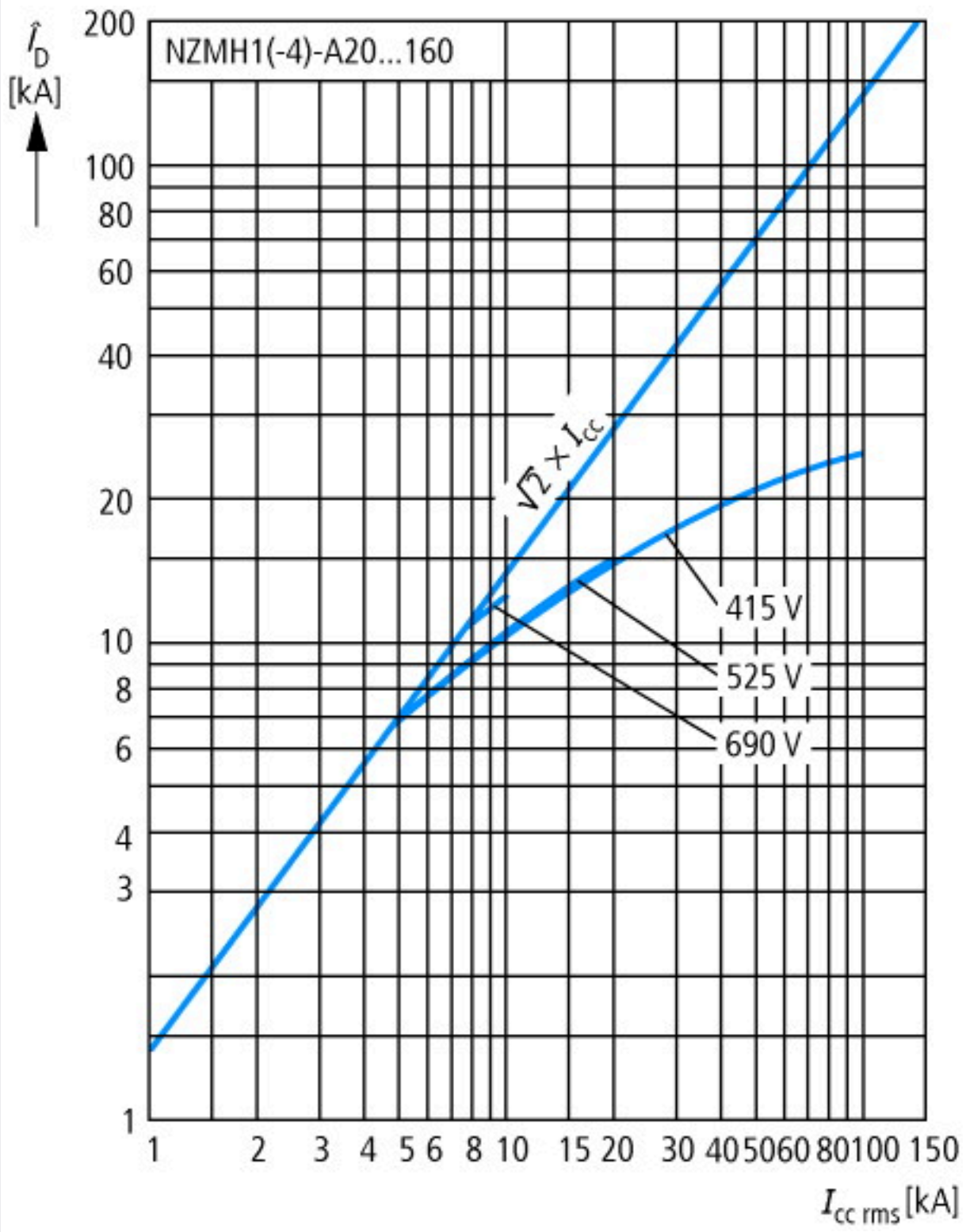
10.9.2 Power-frequency electric strength		Is the panel builder's responsibility.
10.9.3 Impulse withstand voltage		Is the panel builder's responsibility.
10.9.4 Testing of enclosures made of insulating material		Is the panel builder's responsibility.
10.10 Temperature rise		The panel builder is responsible 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

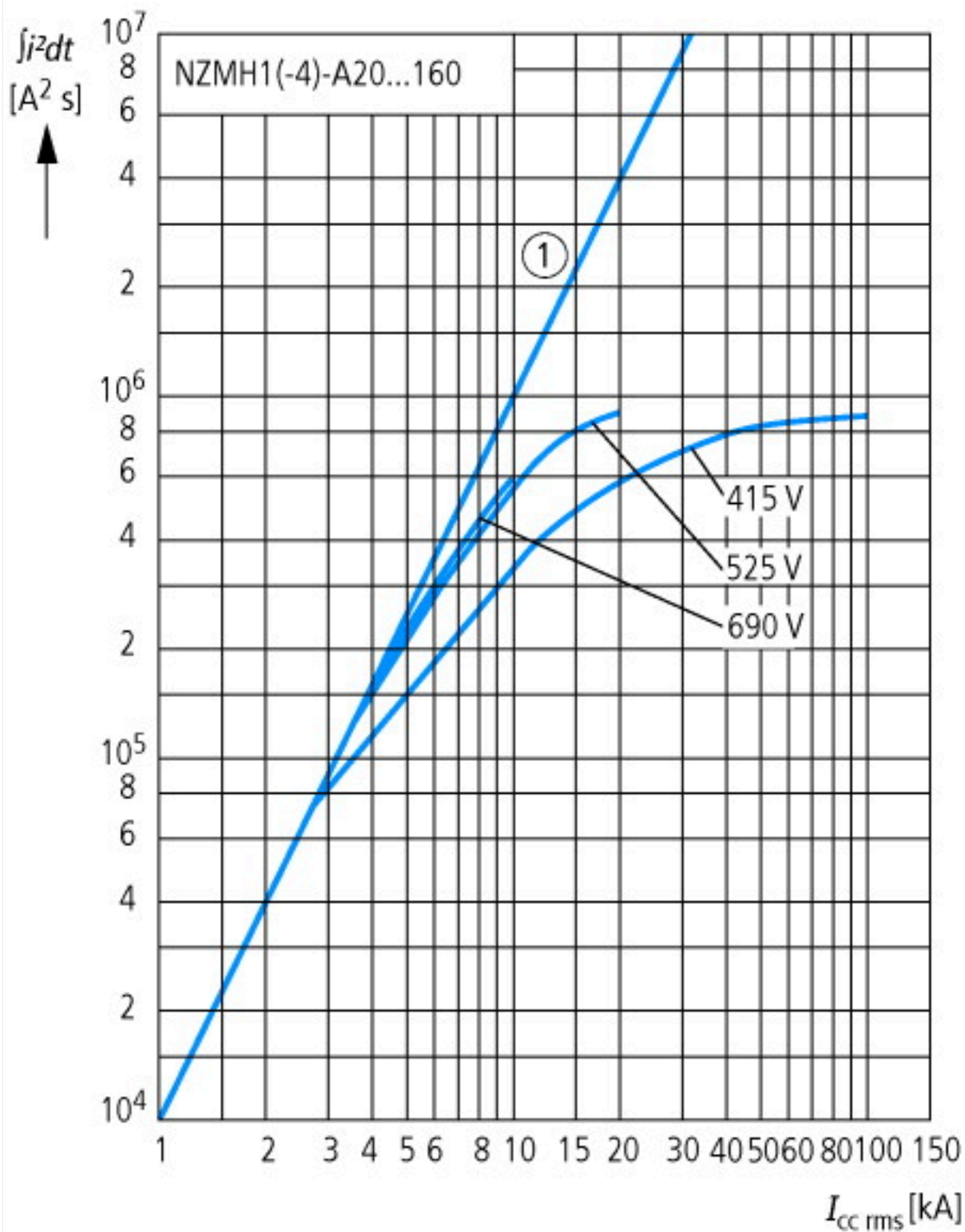
Low-voltage industrial components (EG000017) / Power circuit-breaker for trafo/generator/installation protection (EC000228)		
Electric engineering, automation, process control engineering / Low-voltage switch technology / Circuit breaker (LV < 1 kV) / Circuit breaker for power transformer, generator and system protection (ecI@ss10.0.1-27-37-04-09 [AJZ716013])		
Rated permanent current I <sub>u</sub>	A	20
Rated voltage	V	690 - 690
Rated short-circuit breaking capacity I <sub>cu</sub> at 400 V, 50 Hz	kA	70
Overload release current setting	A	15 - 20
Adjustment range short-term delayed short-circuit release	A	0 - 0
Adjustment range undelayed short-circuit release	A	350 - 350
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 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

# Characteristics





Let-through current



Let-through energy

### Additional product information (links)

Temperature dependency, Derating

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

additional technical information for NZM power switch

[https://es-assets.eaton.com/DOCUMENTATION/PDF/nzm\\_technic\\_de\\_en.pdf](https://es-assets.eaton.com/DOCUMENTATION/PDF/nzm_technic_de_en.pdf)