



Circuit-breaker, 4 p, 160A, plug-in module

Part no.	NZML2-4-VE160-SVE
Catalog No.	169028
Alternate Catalog No.	NZML2-4-VE160-SVE
EL-Nummer (Norway)	4357078

Similar to illustration

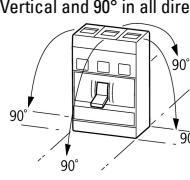
Delivery program

Product range	Circuit-breaker		
Protective function	Systems, cable, selectivity and generator protection		
Standard/Approval	IEC		
Installation type	Withdrawable		
Release system	Electronic release		
Construction size	NZM2		
Description	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) Adjustable delay time t_{sd} I^2t constant function: fixed OFF Set value in neutral conductor is synchronous with set value I_r of main pole.		
Number of poles	4 pole		
Standard equipment	Screw connection		
Switching capacity			
400/415 V 50 Hz	I_{cu}	kA	150
Rated current = rated uninterrupted current			
Rated current = rated uninterrupted current	$I_n = I_u$	A	160
Neutral conductor	% of phase conductor	%	100
Setting range			
Overload trip	I_r	A	80 - 160
			
Main pole	I_r	A	80 - 160
			
Short-circuit releases			
			
Non-delayed	$I_i = I_n \times \dots$		1920 A fixed
			
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	$^{\circ}\text{C}$	- 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		<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)		Temperature dependency, Derating	
Circuit-breakers			
Rated current = rated uninterrupted current	$I_n = I_u$	A	160
Rated surge voltage invariability	U_{imp}		
Main contacts		V	8000
Auxiliary contacts		V	6000
Rated operational voltage	U_e	V AC	690
Overtoltage 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	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	220
690 V 50/60 Hz	I_c	kA	176
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	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	100
690 V 50/60 Hz	I_{cu}	kA	80
I_{cs} to IEC/EN 60947 test cycle 0-t-CO-t-CO	I_{cs}	kA	
240 V 50/60 Hz	I_{cs}	kA	150
400/415 V 50/60 Hz	I_{cs}	kA	150
440 V 50/60 Hz	I_{cs}	kA	130
525 V 50/60 Hz	I_{cs}	kA	100
690 V 50/60 Hz	I_{cs}	kA	80
			Maximum back-up fuse, if the expected short-circuit currents at the installation location exceed the switching capacity of the circuit-breaker.
Rated short-time withstand current			
$t = 0.3 \text{ s}$	I_{cw}	kA	1.3
$t = 1 \text{ s}$	I_{cw}	kA	1.3

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	10000
415 V 50/60 Hz	Operations	10000
690 V 50/60 Hz	Operations	7500
AC-3		
400 V 50/60 Hz	Operations	6500
415 V 50/60 Hz	Operations	6500
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		Screw connection
Accessories required		NZM2-4-XSVS
Optional accessories		Box terminal Tunnel terminal connection on rear
Round copper conductor		
Box terminal		
Solid	mm ²	1 x (10 - 16) 2 x (6 - 16)
Stranded	mm ²	1 x (25 - 185) 2 x (25 - 70)
Tunnel terminal		
Solid	mm ²	1 x 16
Stranded	mm ²	
1-hole	mm ²	1 x (25 - 185)
Bolt terminal and rear-side connection		
Direct on the switch		
Solid	mm ²	1 x (10 - 16) 2 x (6 - 16)
Stranded	mm ²	1 x (25 - 185) 2 x (25 - 70)
Al circular conductor		
Tunnel terminal		
Solid	mm ²	1 x 16
Stranded	mm ²	
Stranded	mm ²	1 x (25 - 185)
Cu strip (number of segments x width x segment thickness)		
Box terminal		
	min.	mm
	max.	mm
		2 x 9 x 0.8
		10 x 16 x 0.8 (2x) 8 x 15.5 x 0,8
Bolt terminal and rear-side connection		
Flat copper strip, with holes	min.	mm
Flat copper strip, with holes	max.	mm
Copper busbar (width x thickness)	mm	
Bolt terminal and rear-side connection		
Screw connection		M8
Direct on the switch		
	min.	mm
	max.	mm
		16 x 5
		24 x 8
Control cables		
	mm ²	1 x (0.75 - 2.5) 2 x (0.75 - 1.5)

Design verification as per IEC/EN 61439

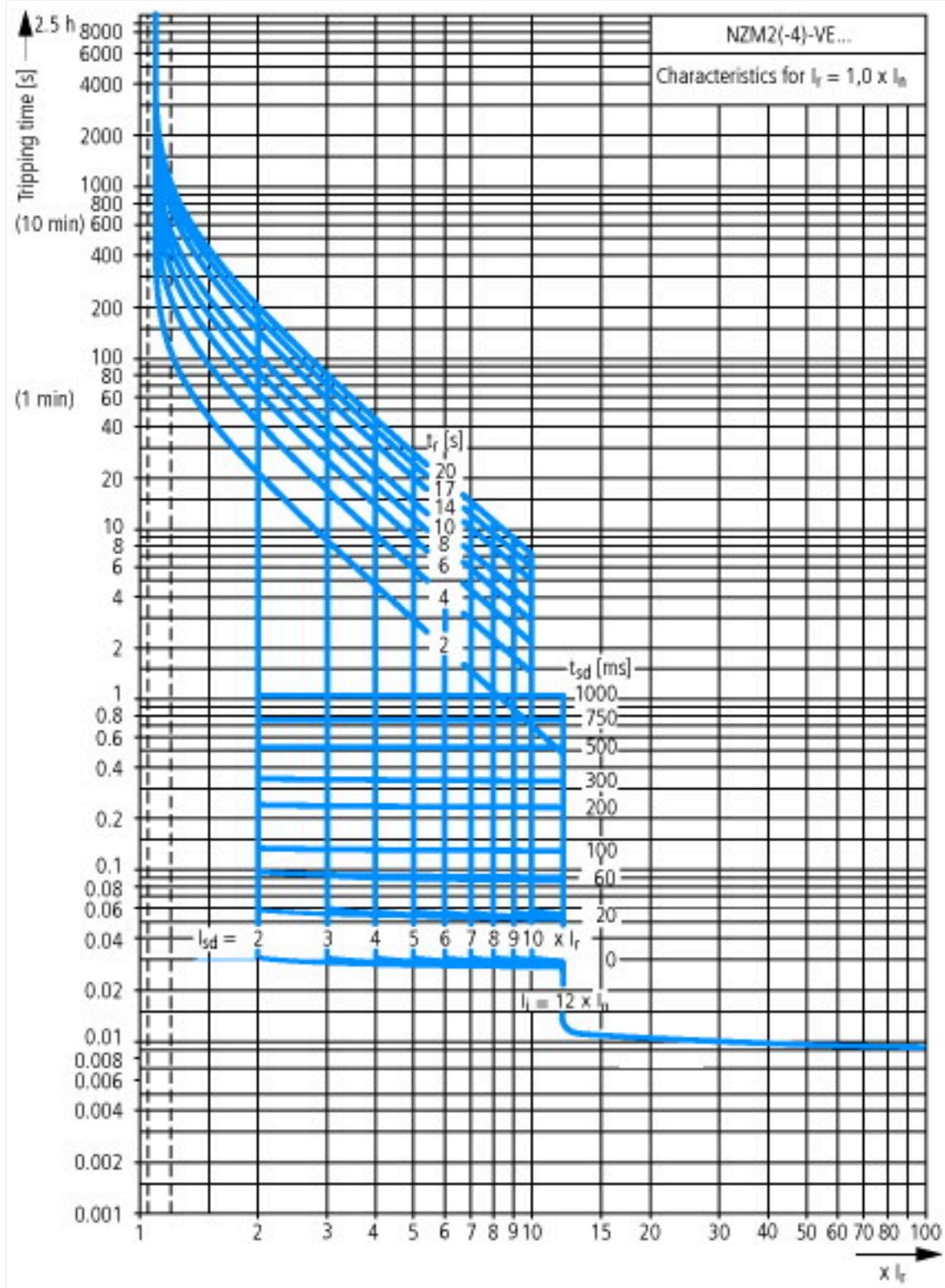
Technical data for design verification			
Rated operational current for specified heat dissipation	I_n	A	160
Equipment heat dissipation, current-dependent	P_{vid}	W	21.12
Operating ambient temperature min.		°C	-25
Operating ambient temperature max.		°C	70
IEC/EN 61439 design verification			
10.2 Strength 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.

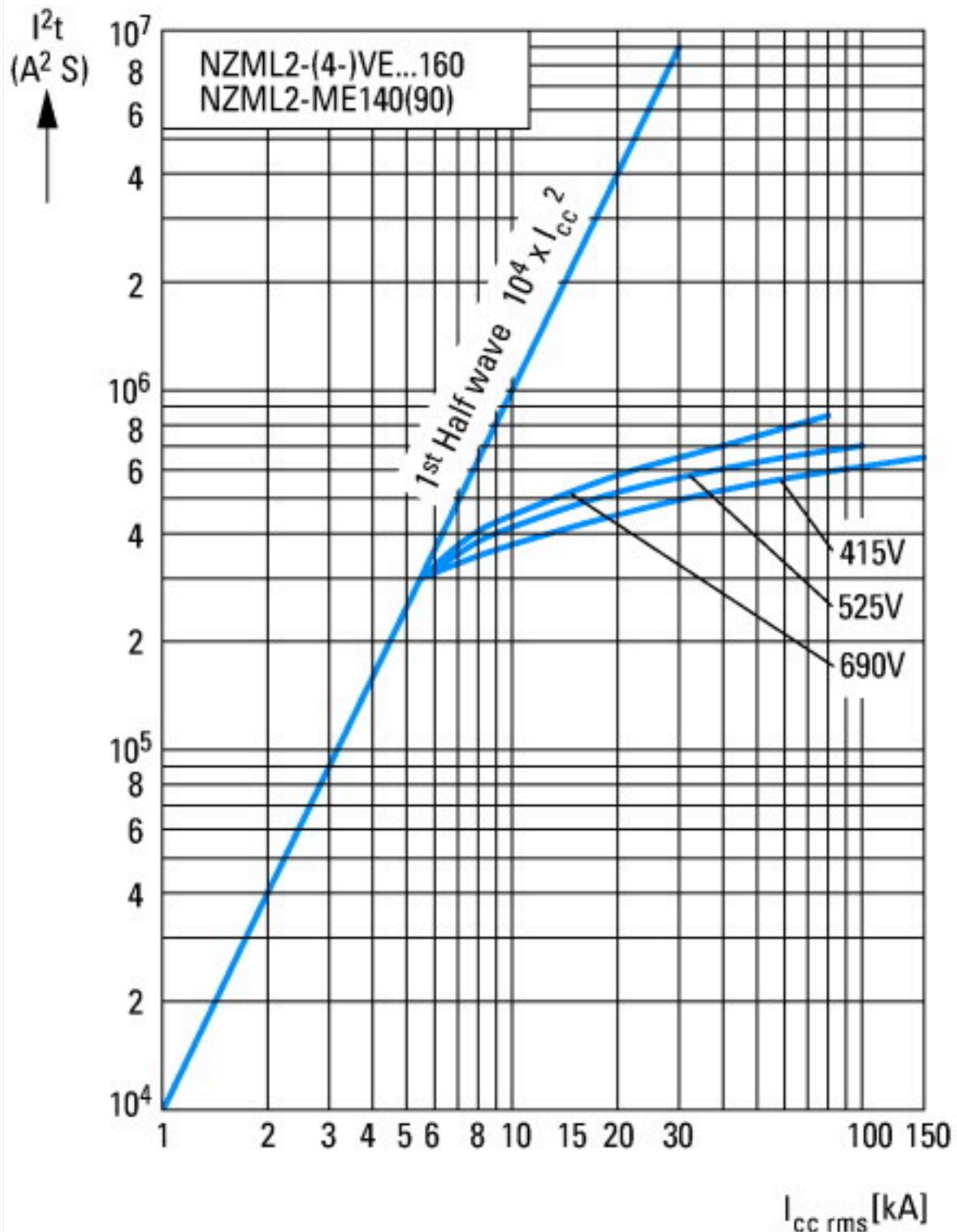
Technical data ETIM 7.0

Low-voltage industrial components (EG000017) / Power circuit-breaker for trafo/generator/installation protection (EC000228)		
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_p	A	160
Rated voltage	V	690 - 690
Rated short-circuit breaking capacity I_{cu} at 400 V, 50 Hz	kA	150
Overload release current setting	A	80 - 160
Adjustment range short-term delayed short-circuit release	A	160 - 1600
Adjustment range undelayed short-circuit release	A	1920 - 1920
Integrated earth fault protection		No
Type of electrical connection of main circuit		Screw connection
Device construction		Built-in device plug-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		4

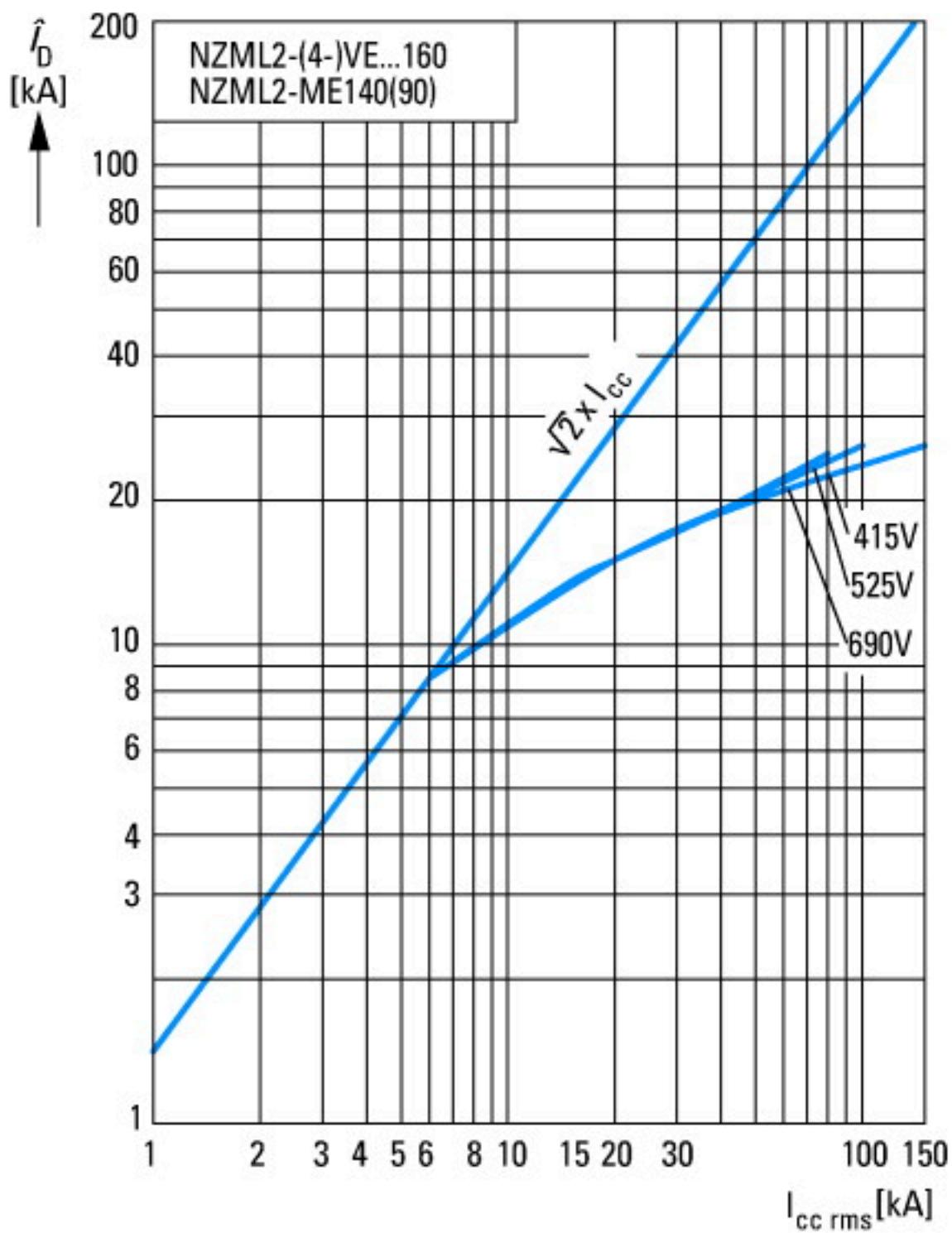
Position of connection for main current circuit	Front side
Type of control element	Rocker lever
Complete device with protection unit	Yes
Motor drive integrated	No
Motor drive optional	Yes
Degree of protection (IP)	IP20

Characteristics



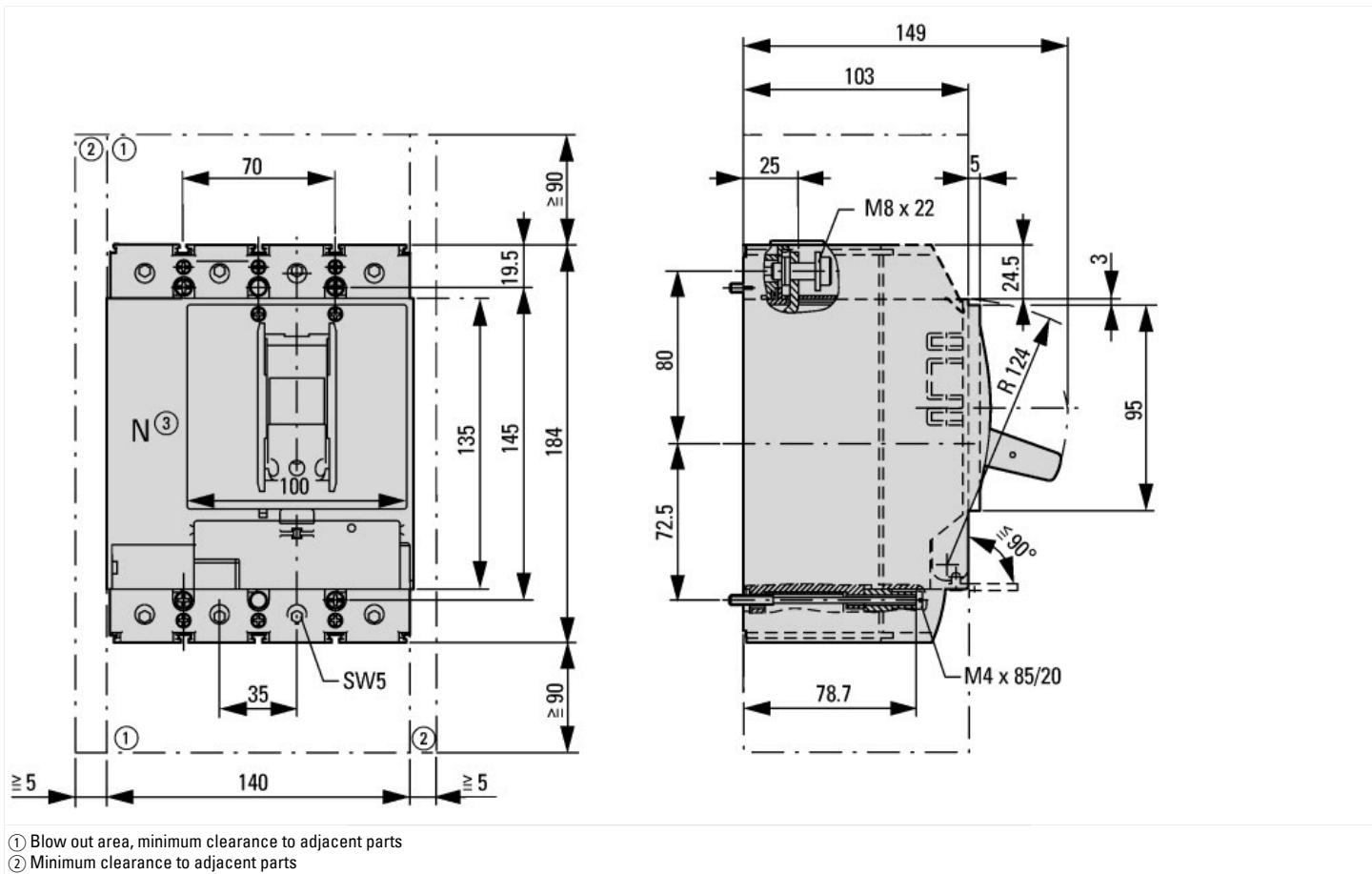


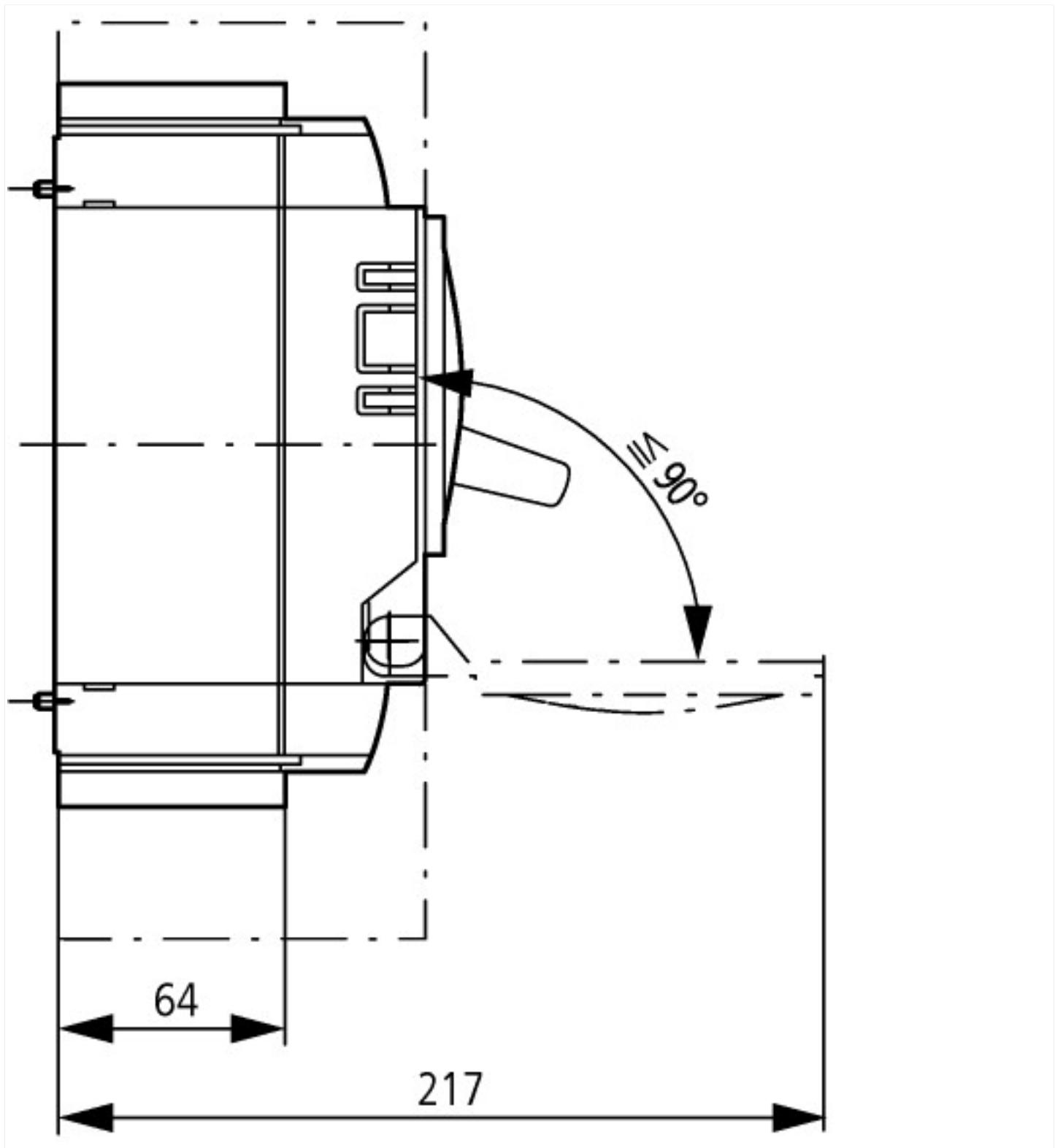
Let-through current

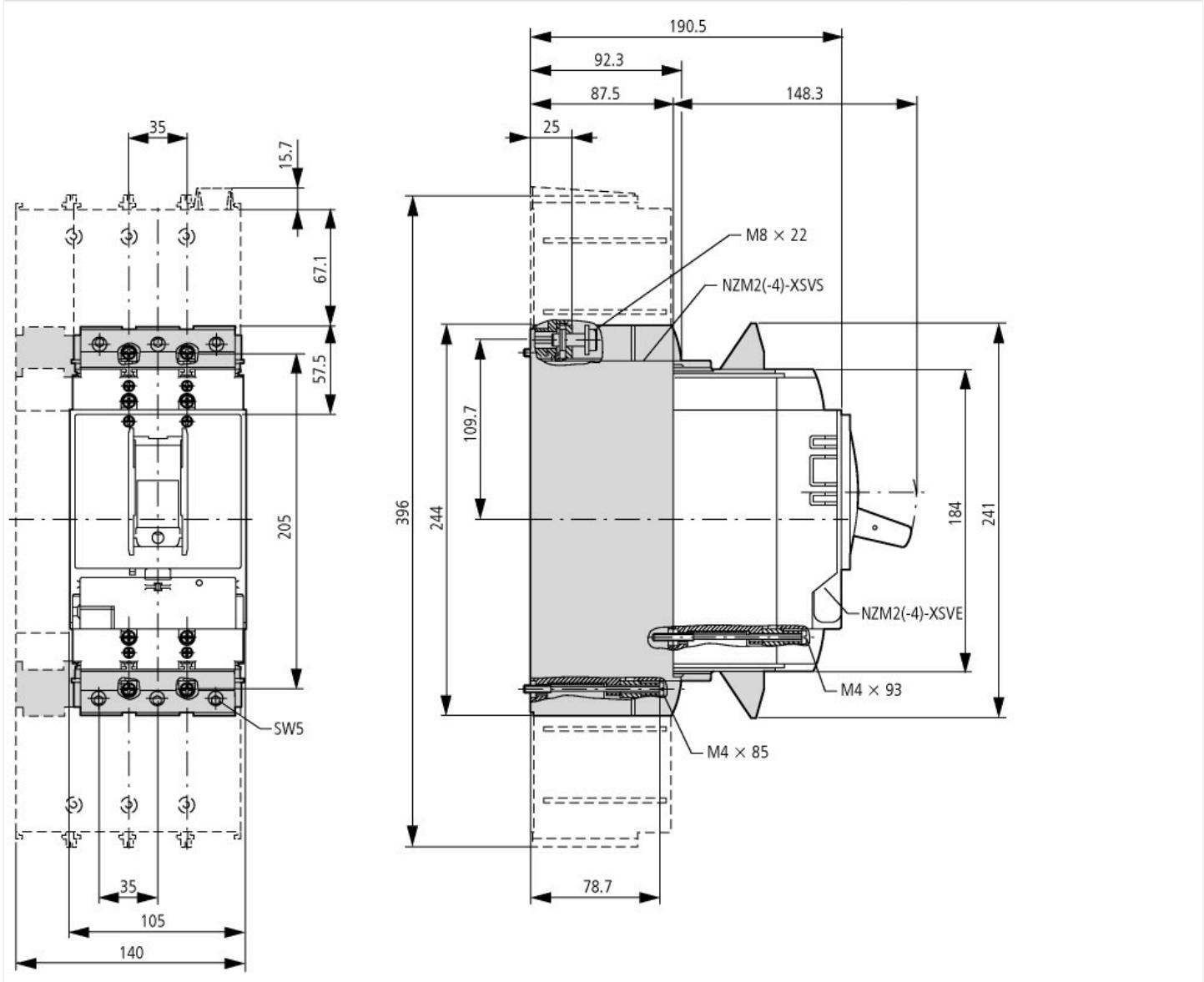


Let-through energy

Dimensions







Additional product information (links)

Temperature dependency, Derating

additional technical information for NZM power switch

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

https://es-assets.eaton.com/DOCUMENTATION/PDF/nzm_technic_de_en.pdf