DATASHEET - NZMH2-A160



Circuit-breaker, 3p, 160A

Part no. NZMH2-A160 Catalog No. 259101



Similar to illustration

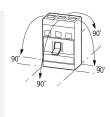
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Delivery program			
Product range			Circuit-breaker
Protective function			System and cable protection
Standard/Approval			IEC
Installation type			Fixed
Release system			Thermomagnetic release
Construction size			NZM2
Number of poles			3 pole
Standard equipment			Screw connection
Switching capacity			
400/415 V 50 Hz	I _{cu}	kA	150
Rated current = rated uninterrupted current			
Rated current = rated uninterrupted current	$I_n = I_u$	Α	160
Setting range			
Overload trip			
中	I _r	Α	125 - 160
Short-circuit releases			
Non-delayed	$I_i = I_n \times \dots$		6 - 10
Short-circuit releases	I _{rm}	A	960 - 1600

Technical data

General

delicial		
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	2.345
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

	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	$I_n = I_u$	Α	160
Rated surge voltage invariability	U_{imp}		
Main contacts		٧	8000
Auxiliary contacts		V	6000
Rated operational voltage	U _e	V AC	690
Rated operational voltage	U _e	V DC	750

The following settings are required in order to ensure correct tripping:

The fast-response release will take longer to respond when used for DC applications. Because of this, the setting on the trip block inscription, which is specified for AC currents, must be set to a lower value for DC currents.

 $\ensuremath{\mathsf{DC}}$ correction factor for instantaneous release response value:

o NZM1: 1.25

o NZM2: 1.35

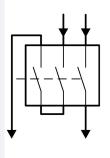
o NZM3: 1.45

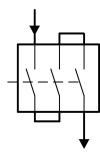
Example: NZM3 Ie = 500A. Desired DC tripping current: 10 * Ie = 5000A.

Calculation:

- Desired DC value / correction factor = AC setting on trip block
- \bullet 5000A / 1.45 = 3448 A ~ 7 * Ie = Value that needs to be set on the trip block

Permitted circuit configurations:





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			
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	105
690 V 50/60 H	Ic	kA	40
Rated short-circuit breaking capacity I_{cn}	I _{cn}		

Icu to IEC/EN 60947 test cycle 0-t-C0	lcu	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	50
690 V 50/60 Hz	I _{cu}	kA	20
500 V DC	I _{cu}	kA	60
750 V DC	I _{cu}	kA	60
Ics to IEC/EN 60947 test cycle 0-t-C0-t-C0	Ics	kA	
240 V 50/60 Hz	I _{cs}	kA	150
400/415 V 50/60 Hz		kA	150
	I _{cs}		
440 V 50/60 Hz	I _{cs}	kA	130
525 V 50/60 Hz	I _{cs}	kA	37.5
690 V 50/60 Hz	I _{cs}	kA	5
500 V DC	I _{cs}	kA	15
750 V DC	I _{cs}	kA	15
			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 s	I _{cw}	kA	1.9
t = 1 s	I _{cw}	kA	1.9
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
AC3			
400 V 50/60 Hz	Operations		6500
415 V 50/60 Hz	Operations		6500
690 V 50/60 Hz	Operations		5000
DC-1	·		
500 V DC	Operations		7500
750 V DC	Operations		7500
DC - 3			
500 V DC	Operations		3000
750 V DC	Operations		3000
Max. operating frequency		Ops/h	120
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	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			
1-hole		mm ²	1 x (25 - 185)
Bolt terminal and rear-side connection		111111	
DOLE GELIUITAL AND LEAT-210G CONNECTION			

Direct on the switch				
	Direct on the switch			
Al circular conductor	Solid		mm ²	
Tunnel terminal Solid mm² 1 x 16	Stranded		mm ²	
Solid	Al circular conductor			
Stranded	Tunnel terminal			
Stranded mm² 1 x (25 - 185)	Solid		mm^2	1 x 16
Bolt terminal and rear-side connection Direct on the switch Solid Stranded mm² 1 x (10 - 16) 2 x (25 - 50) 2 x	Stranded			
Direct on the switch	Stranded		mm^2	1 x (25 - 185)
Name	Bolt terminal and rear-side connection			
Stranded Cu strip (number of segments x width x segment thickness) Box terminal min. mm 2x 9x 0.8 max. mm 10x 16x 0.8 (2x) 8 x 15.5 x 0.8 Bolt terminal and rear-side connection Flat copper strip, with holes Flat copper strip, with holes Flat copper strip, with holes Bolt terminal and rear-side connection Flat copper strip with holes Flat copper strip with holes Max. mm 10x 24 x 0.8 Copper busbar (width x thickness) mm Bolt terminal and rear-side connection Screw connection Direct on the switch min. mm 16x 5 max. mm 24x 8 Control cables	Direct on the switch			
Cu strip (number of segments x width x segment thickness) Box terminal min. mm 2x 9 x 0.8 max. mm 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 2 x 16 x 0.8 Flat copper strip, with holes max. mm 10 x 24 x 0.8 Copper busbar (width x thickness) mm Bolt terminal and rear-side connection Screw connection Direct on the switch min. mm 16 x 5 max. mm 24 x 8 Control cables	Solid		mm ²	1 x (10 - 16) 2 x (10 - 16)
Box terminal min. mm 2x 9 x 0.8 max. mm 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 2 x 16 x 0.8 Flat copper strip, with holes max. mm 10 x 24 x 0.8 Copper busbar (width x thickness) mm Bolt terminal and rear-side connection Screw connection Direct on the switch min. mm 16 x 5 max. mm 24 x 8 Control cables	Stranded		mm ²	1 x (25 - 50) 2 x (25 - 50)
min. mm 2 x 9 x 0.8 max. mm 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 Flat copper strip, with holes max. mm 2 x 16 x 0.8 Copper busbar (width x thickness) Bolt terminal and rear-side connection Screw connection Direct on the switch min. mm 16 x 5 max. mm 24 x 8 Control cables	Cu strip (number of segments x width x segment thickness)			
max. mm 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 2 x 16 x 0.8 Flat copper strip, with holes max. mm 10 x 24 x 0.8 Copper busbar (width x thickness) mm Bolt terminal and rear-side connection Screw connection Direct on the switch min. mm 16 x 5 max. mm 24 x 8 Control cables	Box terminal			
Bolt terminal and rear-side connection Flat copper strip, with holes Flat copper strip, with holes min. mm 2x 16 x 0.8 Flat copper strip, with holes max. mm 10 x 24 x 0.8 Copper busbar (width x thickness) mm Bolt terminal and rear-side connection Screw connection Screw connection Direct on the switch min. mm 16 x 5 max. mm 24 x 8 Control cables		min.	mm	2 x 9 x 0.8
Flat copper strip, with holes Flat copper strip, with holes max. mm 10 x 24 x 0.8 Copper busbar (width x thickness) mm Bolt terminal and rear-side connection Screw connection Direct on the switch min. mm 16 x 5 max. mm 2 x 16 x 0.8 mm 10 x 24 x 0.8 10 x 24 x 0.8 10 x 24 x 0.8 11 x (0.75 - 2.5)		max.	mm	
Flat copper strip, with holes max. mm 10 x 24 x 0.8 Copper busbar (width x thickness) mm Bolt terminal and rear-side connection Screw connection Direct on the switch min. mm 16 x 5 max. mm 24 x 8 Control cables mm² 1 x (0.75 - 2.5)	Bolt terminal and rear-side connection			
Copper busbar (width x thickness) Bolt terminal and rear-side connection Screw connection Direct on the switch min. mm 16 x 5 max. mm 24 x 8 Control cables mm² 1 x (0.75 - 2.5)	Flat copper strip, with holes	min.	mm	2 x 16 x 0.8
Bolt terminal and rear-side connection Screw connection Direct on the switch min. mm 16 x 5 max. mm 24 x 8 Control cables mm² 1 x (0.75 - 2.5)	Flat copper strip, with holes	max.	mm	10 x 24 x 0.8
M8 M8 M8 M8 M8 M8 M8 M9 M9	Copper busbar (width x thickness)	mm		
Direct on the switch min. mm 16 x 5 max. mm 24 x 8 Control cables mm² 1 x (0.75 - 2.5)	Bolt terminal and rear-side connection			
min. mm 16 x 5 max. mm 24 x 8 Control cables mm ² 1 x (0.75 - 2.5)	Screw connection			M8
max. mm 24 x 8 Control cables mm ² 1 x (0.75 - 2.5)	Direct on the switch			
Control cables mm ² 1 x (0.75 - 2.5)		min.	mm	16 x 5
$_{\rm mm}^2$ 1 x (0.75 - 2.5)		max.	mm	24 x 8
mm ² 1 x (0.75 - 2.5) 2 x (0.75 - 1.5)	Control cables			
			mm ²	

Design verification as per IEC/EN 61439

Technical data for design verification			
Rated operational current for specified heat dissipation	In	Α	160
Equipment heat dissipation, current-dependent	P _{vid}	W	38.4
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			

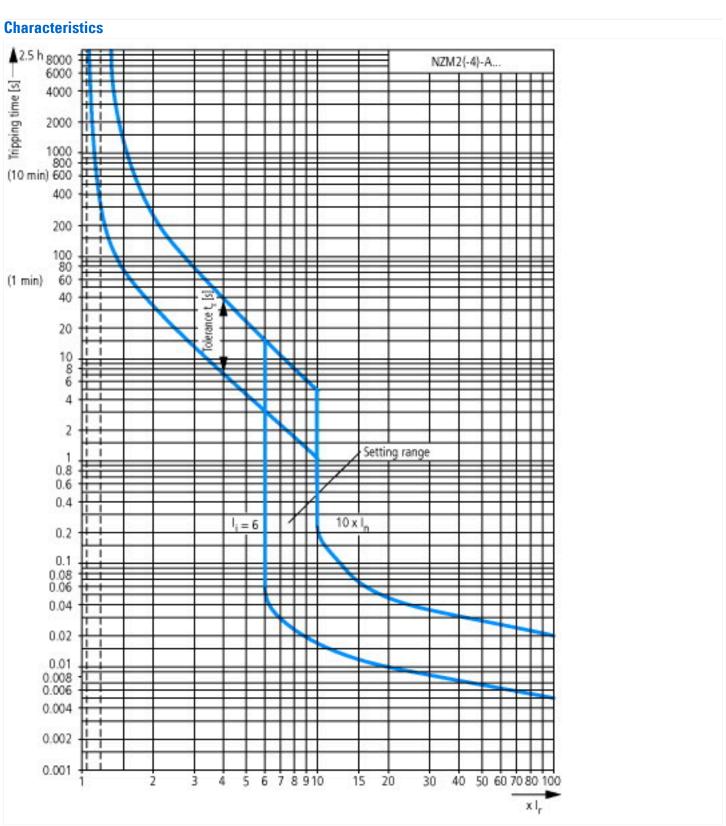
10.9.2 Power-frequency electric strength	Is the panel builder's responsibility.
10.9.3 Impulse withstand voltage	Is the panel builder's responsibility.
10.9.4 Testing of enclosures made of insulating material	Is the panel builder's responsibility.
10.10 Temperature rise	The panel builder is responsible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

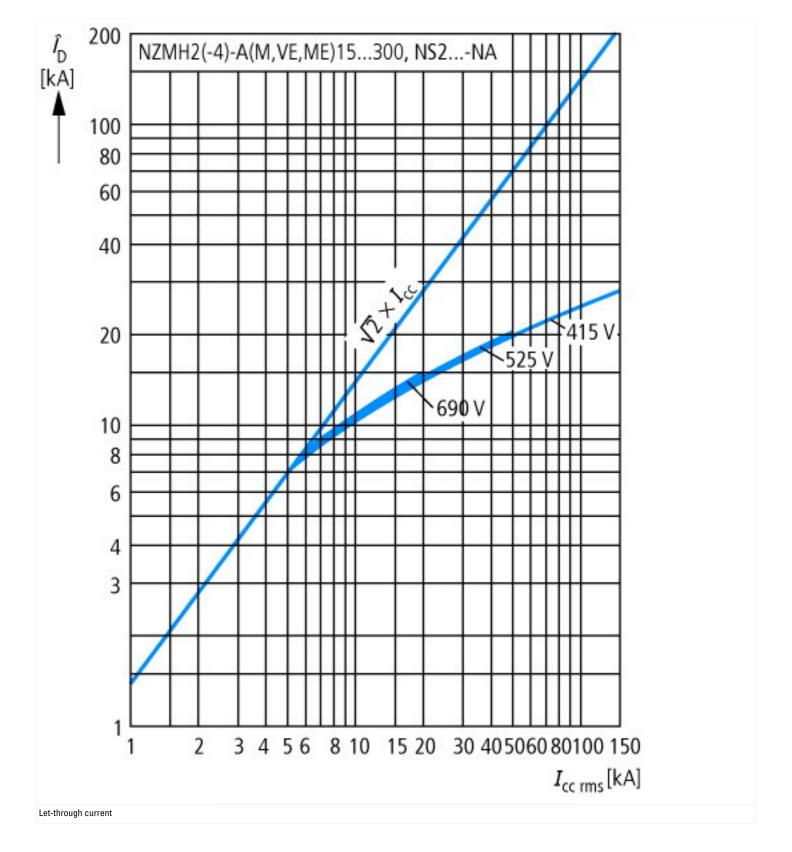
Technical data ETIM 7.0

Low-voltage industrial components (EG000017) / Power circuit-breaker for trafo/generator/installation protection (EC000228)

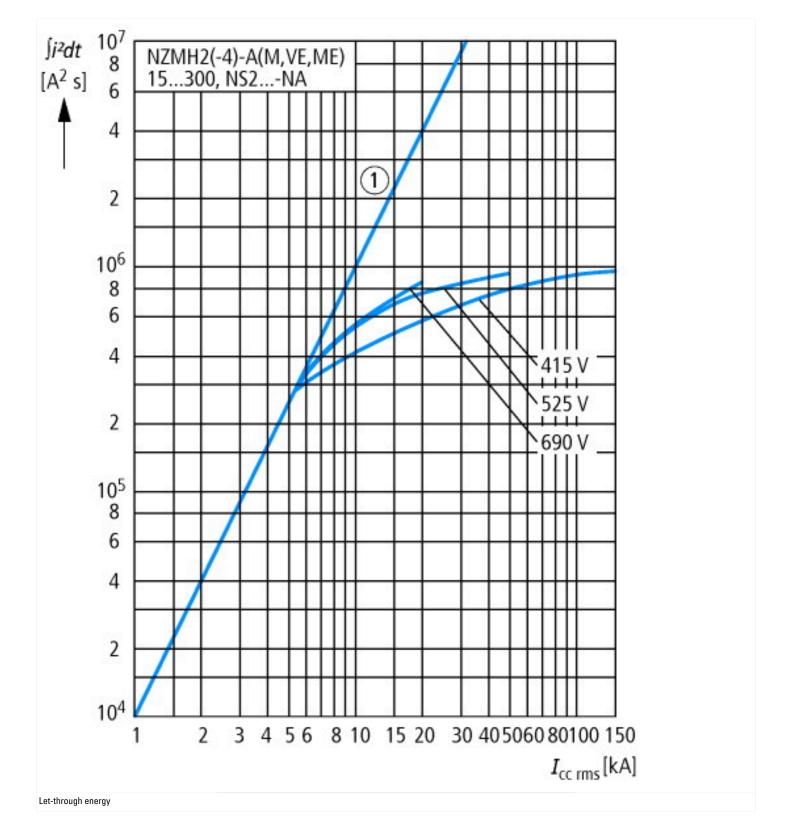
Electric engineering, automation, process control engineering / Low-voltage switch technology / Circuit breaker (LV < 1 kV) / Circuit breaker for power transformer, generator and system protection (ecl@ss10.0.1-27-37-04-09 [AJZ716013])

А	160
V	690 - 690
kA	150
А	125 - 160
Α	0 - 0
Α	960 - 1600
	No
	Screw connection
	Built-in device fixed built-in technique
	No
	Yes
	0
	0
	0
	No
	No
	3
	Front side
	Rocker lever
	Yes
	No
	Yes
	IP20
	V kA A

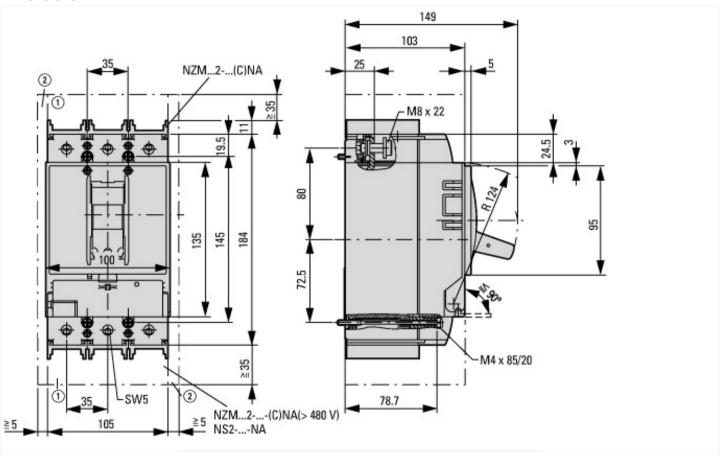




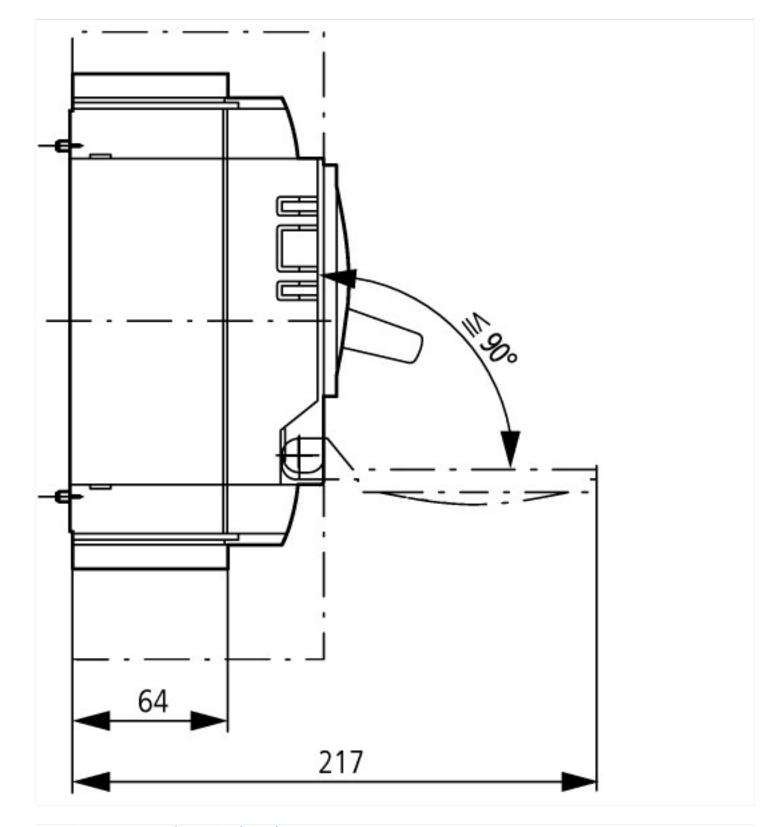
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Dimensions



Blow out area, minimum clearance to adjacent parts
 Minimum clearance to adjacent parts



Additional product information (links)

IL01206006Z (AWA1230-1916) Circuit-Breaker, basic unit	
IL01206006Z (AWA1230-1916) Circuit-Breaker, basic unit	ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL01206006Z2015_11.pdf
Temperature dependency, Derating	http://ecat.moeller.net/flip-cat/?edition=HPLEN&startpage=17.172
CurveSelect characteristics program	http://www.eaton.eu/DE/Europe/Electrical/CustomerSupport/ConfigurationTools/CharacteristicsProgram/index.htm
additional technical information for NZM power switch	ftp://ftp.moeller.net/DOCUMENTATION/PDF/nzm_technic_de_en.pdf