## DATASHEET - NZMH2-A160-BT



Circuit-breaker, 3p, 160A, box terminals

NZMH2-A160-BT 110293

Powering Business Worldwide"

**EL-Nummer** (Norway)

Part no. Catalog No.

4358760

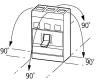
Similar to illustration

## **Delivery program**

Product range			Circuit-breaker
Protective function			System and cable protection
Standard/Approval			IEC
Installation type			Fixed
Release system			Thermomagnetic release
Construction size			NZM2
Number of poles			3 pole
Standard equipment			Box terminal
Switching capacity			
400/415 V 50 Hz	l <sub>cu</sub>	kA	150
Rated current = rated uninterrupted current			
Rated current = rated uninterrupted current	$I_n = I_u$	А	160
Setting range			
Overload trip			
с¢Г	l <sub>r</sub>	A	125 - 160
Short-circuit releases			
Non-delayed	I <sub>i</sub> = I <sub>n</sub> x		6 - 10
Short-circuit releases	I <sub>rm</sub>	A	960 - 1600

# **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 A	AC 500
between the auxiliary contacts	V A	AC 300
Mounting position		Vertical and 90° in all directions



90° 90° 90°	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		
as required			
In the operating controls area: IP2	0 (basic degree of protection)		
With insulating surround: IP40 With door coupling rotary handle: IP66			
Tunnel terminal: IP10 Phase isolator and strip terminal: IP00			
Temperature dependency, Deratin	g		

А	160
V	8000
V	6000
V AC	690
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.

DC correction factor for instantaneous release response value:

o NZM1: 1.25

 $I_n = I_u$ U<sub>imp</sub>

Ue

Ue

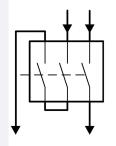
- o NZM2: 1.35
- o NZM3: 1.45
- Example: NZM3 le = 500A. Desired DC tripping current: 10 \* le = 5000A.

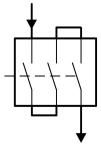
Calculation:

• Desired DC value / correction factor = AC setting on trip block

• 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	Ui	V	1000
Use in unearthed supply systems		V	≦ 690
Switching capacity			
Rated short-circuit making capacity	I <sub>cm</sub>		
240 V	I <sub>cm</sub>	kA	330
400/415 V	I <sub>cm</sub>	kA	330
440 V 50/60 Hz	I <sub>cm</sub>	kA	286
525 V 50/60 Hz	I <sub>cm</sub>	kA	105
690 V 50/60 H	Ic	kA	40
Rated short-circuit breaking capacity I <sub>cn</sub>	I <sub>cn</sub>		

Direction of incoming supply Degree of protection Device Enclosures

Terminations

**Circuit-breakers** 

Main contacts Auxiliary contacts Rated operational voltage

Rated operational voltage

Other technical data (sheet catalogue)

Rated surge voltage invariability

Rated current = rated uninterrupted current

Icu to IEC/EN 60947 test cycle 0-t-C0	lcu	kA	
240 V 50/60 Hz	I <sub>cu</sub>	kA	150
400/415 V 50/60 Hz	I <sub>cu</sub>	kA	150
440 V 50/60 Hz	I <sub>cu</sub>	kA	130
525 V 50/60 Hz	I <sub>cu</sub>	kA	50
690 V 50/60 Hz	I <sub>cu</sub>	kA	20
500 V DC		kA	60
750 V DC	I <sub>cu</sub>		
	l <sub>cu</sub>	kA kA	60
Ics to IEC/EN 60947 test cycle 0-t-C0-t-C0 240 V 50/60 Hz	lcs	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>		
	I <sub>cs</sub>	kA	37.5
690 V 50/60 Hz	I <sub>cs</sub>	kA	5
500 V DC	I <sub>cs</sub>	kA	15
750 V DC	I <sub>cs</sub>	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 <sub>cw</sub>	kA	1.9
t = 1 s	I <sub>cw</sub>	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 AC3	Operations		7500
400 V 50/60 Hz	Operations		6500
400 V 50/60 Hz 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 Optional accessories			Box terminal Screw terminal Tunnel terminal connection on rear
Round copper conductor			
Box terminal			
Solid		mm <sup>2</sup>	1 x (10 - 16) 2 x (6 - 16)
Stranded		mm <sup>2</sup>	1 x (25 - 185) 2 x (25 - 70)
Tunnel terminal			
Solid		mm <sup>2</sup>	1 x 16
Stranded			
1-hole		mm <sup>2</sup>	1 x (25 - 185)

Direct on the switch			
Solid		mm <sup>2</sup>	1 x (10 - 16) 2 x (6 - 16)
Stranded		mm <sup>2</sup>	1 x (25 - 185) 2 x (25 - 70)
Al circular conductor			
Tunnel terminal			
Solid		mm <sup>2</sup>	1 x 16
Stranded			
Stranded		mm <sup>2</sup>	1 x (25 - 185)
Cu strip (number of segments x width x segment thickness)			
Box terminal			
	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	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			M8
Direct on the switch			
	min.	mm	16 x 5
	max.	mm	24 x 8
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	In	А	160
Equipment heat dissipation, current-dependent	P <sub>vid</sub>	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.

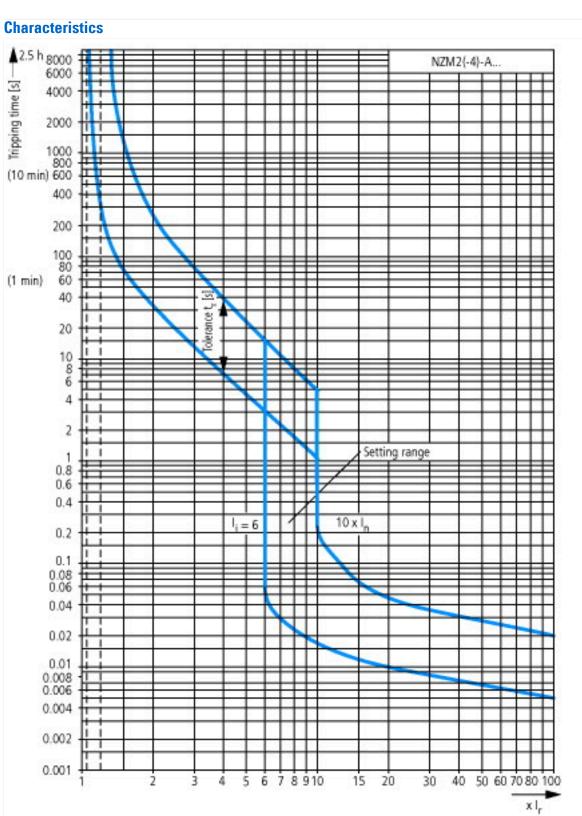
10.11 Short-circuit rating	Is the panel builder's responsibility. The specifications for the switchgear must be observed.
10.12 Electromagnetic compatibility	Is the panel builder's responsibility. The specifications for the switchgear must be observed.
10.13 Mechanical function	The device meets the requirements, provided the information in the instruction leaflet (IL) is observed.

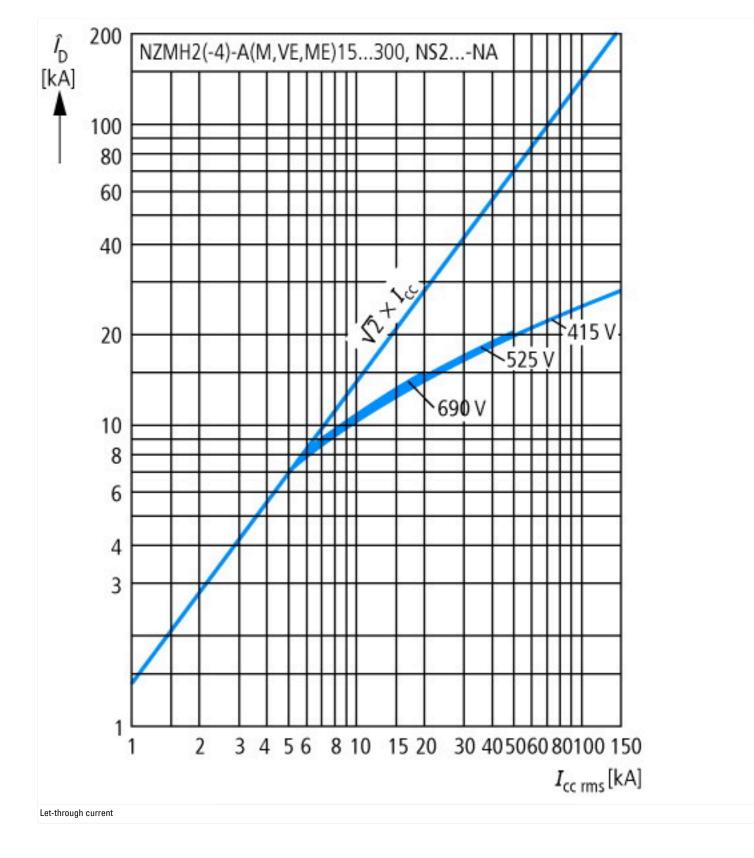
### **Technical data ETIM 7.0**

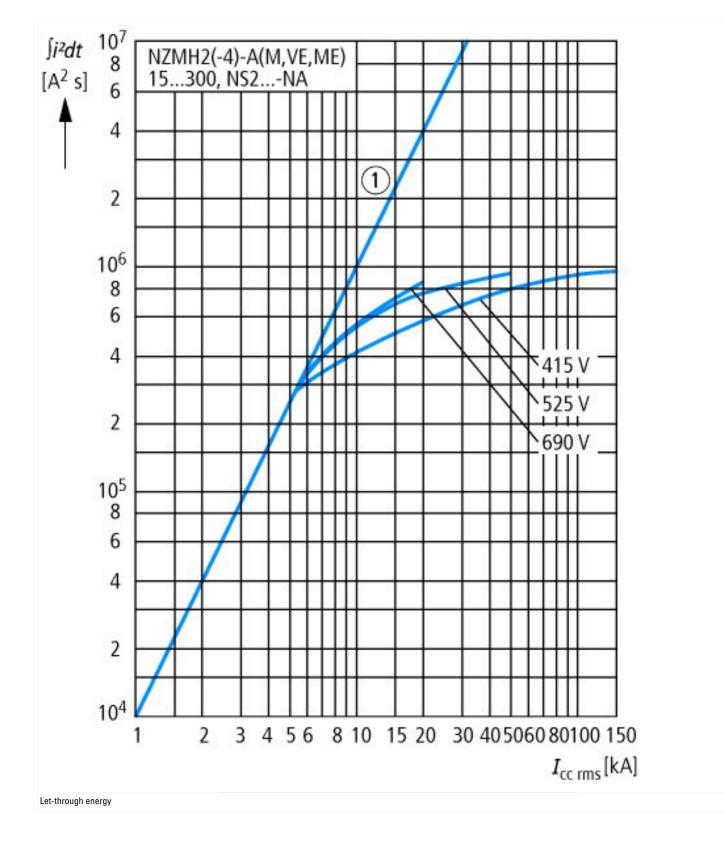
Low-voltage industrial components (EG000017) / Power circuit-breaker for trafo/generator/installation protection (EC000228)

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])

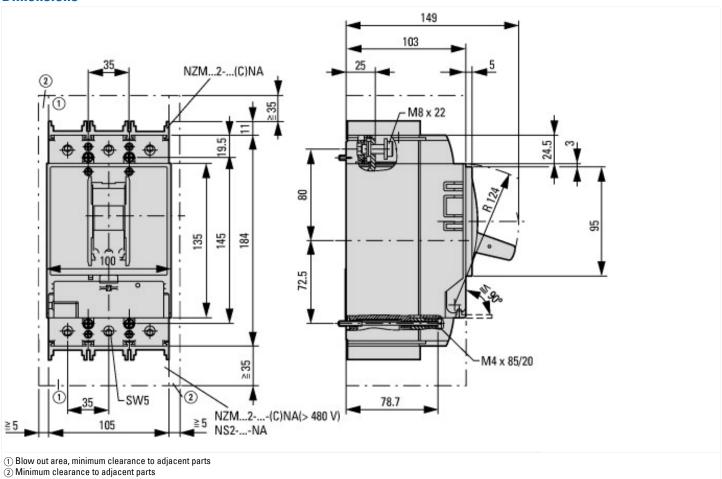
At         A         Bit           Rated prime end using a pacity for a 400 % 50 %         50 % 60 %           Rated short-circuit reaking capacity for a 400 % 50 %         50 % 60 %           Adjustnar ange a pacity for a 400 % 50 %         50 % 60 %           Adjustnar ange and end y short-circuit release         60 % 60 %           Adjustnar ange and end y short-circuit release         60 % 60 %           Adjustnar ange and end y short-circuit release         60 % 60 %           Algot and transport of a 40 % 50 %         60 %           Algot and transport of a 40 % 50 %         60 %           Boy concretion of an aritic transport of a 40 %         60 %           Boy concretion of a 40 %         60 %	protection (eci@ss10.0.1-27-37-04-09 [AJZ716013])		
Rate abort-circuit preaking capacity lou at 400 V, 50 Hz         Non-           Adjustment range short-term delayed short-circuit release         A         55           Adjustment range undelayed short-circuit release         A         0           Adjustment range undelayed short-circuit release         A         500           Adjustment range undelayed short-circuit release         A         500           Integrated earth fult protection         A         500           Type of eletrical connection of main circuit         B         Built-in device fixed built-in technique           Divice construction         B         Built-in device fixed built-in technique           Number of auxiliary contacts as normally closed contact         M         No           Number of auxiliary contacts as change-over contact         M         No           With under voltage release         M         No           Number of poles         F         No           No <td>Rated permanent current lu</td> <td>А</td> <td>160</td>	Rated permanent current lu	А	160
Overload release current setting         A         25 - 160           Adjustment range short-term delayed short-circuit release         A         0           Adjustment range undelayed short-circuit release         A         800 - 1600           Integrated earth fault protection         Fame clamp         No           Type of electrical connection of main circuit         Fame clamp         Built-in device fixed built-in technique           Divice construction         Fame clamp         No           Divice for DIN rail (top hat rail) mounting optional         Fame clamp           Number of auxiliary contacts as normally closed contact         Fame clamp           Number of auxiliary contacts as change-over contact         Fame clamp           Number of auxiliary contacts as change-over contact         Fame clamp           Number of pales         Fort side           Number of pales         Fort side           Number of pales         Fort side           Type of control element         Fort side           Complete device with protection unit         Fort side           Motor drive integrated         Fame clamp           Number of pales         Fo	Rated voltage	V	690 - 690
Adjustment range undelayed short-circuit release     Adjustment range undelayed	Rated short-circuit breaking capacity Icu at 400 V, 50 Hz	kA	150
Adjustment range undelayed short-circuit release       P0<-1600	Overload release current setting	А	125 - 160
Integrated earth fault protection       No         Type of electrical connection of main circuit       Frame clamp         Davice construction       Built-in device fixed built-in technique         Suitable for DIN rail (top hat rail) mounting       No         DIN rail (top hat rail) mounting optional       No         Number of auxiliary contacts as normally closed contact       No         Number of auxiliary contacts as normally closed contact       No         Number of auxiliary contacts as normally closed contact       No         Number of auxiliary contacts as normally closed contact       No         Number of auxiliary contacts as normally closed contact       No         Number of auxiliary contacts as normally closed contact       No         Number of auxiliary contacts as change-over contact       No         With under voltage release       No         Number of poles       No         Position of connection for main current circuit       No         Type of control element       Francise         Complete device with protection unit       No         Nord rive integrated       Yes         Motor drive integrated       No         Motor drive integrated       No	Adjustment range short-term delayed short-circuit release	А	0 - 0
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       O         Number of auxiliary contacts as normally contact       O         Number of auxiliary contacts as change-over contact       O         With under voltage release       No         Number of formain current circuit       Yes         Type of control element       So Contact         Complete device with protection unit       No         Moor drive optional       Yes	Adjustment range undelayed short-circuit release	А	960 - 1600
Device construction       Model         Suitable for DIN rail (top hat rail) mounting       No         DIN rail (top hat rail) mounting optional       Ves         Number of auxiliary contacts as normally closed contact       0         Number of auxiliary contacts as normally open contact       0         Number of auxiliary contacts as normally open contact       0         Number of auxiliary contacts as normally open contact       0         Number of auxiliary contacts as normally open contact       0         Number of auxiliary contacts as normally open contact       0         Number of auxiliary contacts as normally open contact       0         Number of auxiliary contacts as normally open contact       0         Number of auxiliary contacts as normally open contact       No         Number of auxiliary contacts as normally open contact       No         Number of auxiliary contacts as normally open contact       No         Number of auxiliary contacts as normally contact       No         Number of auxiliary contacts as normally contact       No         Number of poles       No         No control element       Fort side         Nord rive integrated       No         Motor drive optional       No         No       No	Integrated earth fault protection		No
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 contact         0           Number of auxiliary contacts as change-over contact         0           Number of auxiliary contacts as change-over contact         0           Number of auxiliary contacts as normally contact         No           Number of auxiliary contacts as normally contact         No           Number of auxiliary contacts as normally contact         No           Number of auxiliary contacts as normally contact         Forn side           Number of poles         No           Notor drive integrated         No           Notor drive potional         No           Notor drive optional         Yes	Type of electrical connection of main circuit		Frame clamp
DIN rail (top hat rail) mounting optionalYesNumber of auxiliary contacts as normally closed contact0Number of auxiliary contacts as normally open contact0Number of auxiliary contacts as change-over contact0Number of auxiliary contacts as change-over contact0With switched-off indicatorNoWith under voltage releaseNoNumber of connection for main current circuitFront sideType of control elementRocker leverComplete device with protection unitYesMotor drive integratedNoMotor drive optionalYesMotor drive optionalYes	Device construction		Built-in device fixed built-in technique
Number of auxiliary contacts as normally closed contact         Image: Content of auxiliary contacts as normally open contact         Image: Content of auxiliary contacts as normally open contact         Image: Content of auxiliary contacts as normally open contact         Image: Content of auxiliary contacts as normally open contact         Image: Content of auxiliary contacts as normally open contact         Image: Content of auxiliary contacts as normally open contact         Image: Content of auxiliary contacts as normally open contact         Image: Content of auxiliary contacts as normally open contact         Image: Content of auxiliary contacts as normally open contact         Image: Content of auxiliary contacts as normally open contact         Image: Content of auxiliary contacts as normally open contact         Image: Content of auxiliary contacts as normally open contact         Image: Content of auxiliary contacts as normally open contact         Image: Content of auxiliary contacts as normally open contact         Image: Content of auxiliary contacts as normally open contact         Image: Content of auxiliary contacts as normally open contact         Image: Content of auxiliary contacts as normally open contact         Image: Content of auxiliary contacts as normally open contact         Image: Content of auxiliary contacts as normally content of auxiliary content of auxiliary content of auxiliary content of auxiliary contact and auxiliary content of auxiliary contact and auxi	Suitable for DIN rail (top hat rail) mounting		No
Number of auxiliary contacts as normally open contactImage: Content of auxiliary contacts as change-over contacts as change-over contacts as change-over contactImage: Content of auxiliary contacts as change-over contacts as change-o	DIN rail (top hat rail) mounting optional		Yes
Number of auxiliary contacts as change-over contact       Image: Content of auxiliary contacts as change-over contact         With switched-off indicator       Image: Content of auxiliary contacts as change-over contact         With under voltage release       Image: Content of auxiliary contacts as change-over contact         Number of poles       Image: Content of auxiliary contacts as change-over contacts         Position of connection for main current circuit       Image: Content of auxiliary contacts         Type of control element       Image: Content of auxiliary contacts         Complete device with protection unit       Image: Content of auxiliary contacts         Motor drive integrated       Image: Content of auxiliary contacts         Motor drive optional       Image: Content of auxiliary content of auxiliary contacts <td>Number of auxiliary contacts as normally closed contact</td> <td></td> <td>0</td>	Number of auxiliary contacts as normally closed contact		0
With switched-off indicatorNoWith under voltage releaseNoNumber of polesNoPosition of connection for main current circuitSoType of control elementSoComplete device with protection unitSoMotor drive integratedSoMotor drive optionalSoS	Number of auxiliary contacts as normally open contact		0
With under voltage releaseNoNumber of poles3Position of connection for main current circuitFont sideType of control elementRocker leverComplete device with protection unitYesNotor drive integratedNoMotor drive optionalSector Sector Sec	Number of auxiliary contacts as change-over contact		0
Number of poles       3         Position of connection for main current circuit       Ford side         Type of control element       Rocker lever         Complete device with protection unit       Solo         Motor drive integrated       Solo         Motor drive optional       Solo         Solo       Yes	With switched-off indicator		No
Position of connection for main current circuit     Find side       Type of control element     Fond side       Complete device with protection unit     Fond side       Motor drive integrated     Fond side       Motor drive optional     Sole Side	With under voltage release		No
Type of control element     Rocker lever       Complete device with protection unit     Yes       Motor drive integrated     No       Motor drive optional     Yes	Number of poles		3
Complete device with protection unit     Yes       Motor drive integrated     No       Motor drive optional     Sea	Position of connection for main current circuit		Front side
Motor drive optional     Motor	Type of control element		Rocker lever
Motor drive optional Yes	Complete device with protection unit		Yes
	Motor drive integrated		No
Degree of protection (IP) IP20	Motor drive optional		Yes
	Degree of protection (IP)		IP20

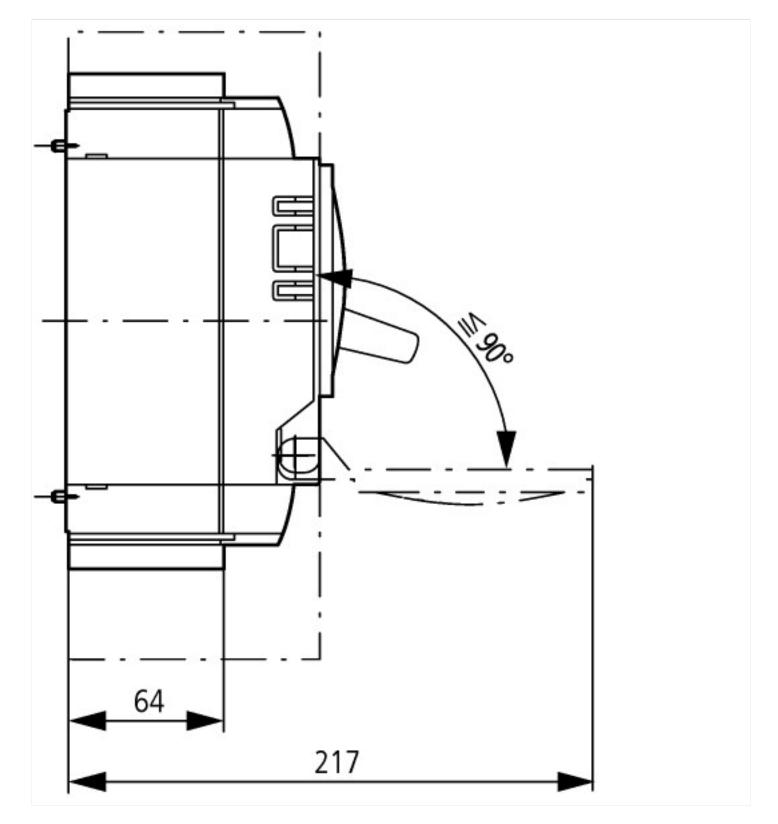






## Dimensions





# Additional product information (links)

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