



## Circuit-breaker, 3p, 1600A

Part no.

NZMN4-VE1600

Article no.

265772

Similar to illustration

## Delivery programme

Product range			Circuit-breaker
Protective function			Systems, cable, selectivity and generator protection
Standard/Approval			IEC
Installation type			Fixed
Release system			Electronic release
Construction size			NZM4
Description			R.m.s. value measurement and "thermal memory" adjustable time delay setting to overcome current peaks $t_r$ : 2 – 20 s at 6 x $I_r$ also infinity (without overload releases) Adjustable delay time $t_{sd}$ : Steps: 0, 20, 60, 100, 200, 300, 500, 750, 1000 ms $i^2t$ constant function: switchable
Number of poles			3 pole
Standard equipment			Screw connection





## Switching capacity

400/415 V 50/60 Hz	$I_{cu}$	kA	50
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## Rated current = rated uninterrupted current

Rated current = rated uninterrupted current	$I_n = I_u$	A	1600
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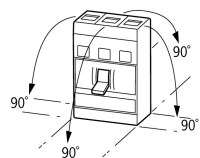
## Setting range

Overload trip			
	$I_r$	A	800 - 1600
Short-circuit releases			
			
Non-delayed	$I_i = I_n \times \dots$		2 - 12
			
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		°C	- 40 - + 80
Operation		°C	-25 - +70
Mechanical shock resistance (10 ms half-sinusoidal shock) according to IEC 60068-2-27		g	15 (half-sinusoidal shock 11 ms)
Safe isolation to EN 61140			
Between auxiliary contacts and main contacts		V AC	500
between the auxiliary contacts		V AC	300

Weight		kg	21
Mounting position			Vertical and 90° in all directions  <p>With residual-current release XFI:            - NZM1, N1, NZM2, N2: vertical and 90° in all directions            with plug-in adapter elements            - NZM1, N1, NZM2, N2: vertical, 90° right/left            with withdrawable unit:            - NZM3, N3: vertical, 90 ° 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)			Weight Temperature dependency, Derating Effective power loss

## Circuit-breakers

Rated current = rated uninterrupted current	$I_n = I_u$	A	1600
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	$\leq 525$

## Switching capacity

Rated short-circuit making capacity	$I_{cm}$		
240 V	$I_{cm}$	kA	105
400/415 V	$I_{cm}$	kA	105
440 V 50/60 Hz	$I_{cm}$	kA	74
525 V 50/60 Hz	$I_{cm}$	kA	53
690 V 50/60 H	$I_c$	kA	40
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	50
400/415 V 50/60 Hz	$I_{cu}$	kA	50
440 V 50/60 Hz	$I_{cu}$	kA	35
525 V 50/60 Hz	$I_{cu}$	kA	25
$I_{cs}$ to IEC/EN 60947 test cycle O-t-CO-t-CO	$I_{cs}$	kA	
240 V 50/60 Hz	$I_{cs}$	kA	37
400/415 V 50/60 Hz	$I_{cs}$	kA	37
440 V 50/60 Hz	$I_{cs}$	kA	26
525 V 50/60 Hz	$I_{cs}$	kA	19
690 V 50/60 Hz	$I_{cs}$	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	19.2
t = 1 s	$I_{cw}$	kA	19.2
Utilization category to IEC/EN 60947-2			A
Rated making and breaking capacity			
Rated operational current	$I_e$	A	

AC-1			
380 V 400 V	I <sub>e</sub>	A	1600
415 V	I <sub>e</sub>	A	1600
690 V	I <sub>e</sub>	A	1600
AC--3			
380 V 400 V	I <sub>e</sub>	A	1600
415 V	I <sub>e</sub>	A	1600
660 V 690 V	I <sub>e</sub>	A	1600
			For AC--3 rated operational current with NZM4 the following applies: 400 V: max. 650 kW; 690 V: max. 600 kW
Lifespan, mechanical(of which max. 50 % trip by shunt/undervoltage release)	Operations		10000
Lifespan, electrical			
AC-1			
400 V 50/60 Hz	Operations		3000
415 V 50/60 Hz	Operations		3000
690 V 50/60 Hz	Operations		2000
AC--3			
400 V 50/60 Hz	Operations		2000
415 V 50/60 Hz	Operations		2000
690 V 50/60 Hz	Operations		1000
Max. operating frequency		Ops/h	60
Current heat losses per pole at I <sub>u</sub> are based on the maximum rated operational current of the frame size.		W	97
			For current heat loss per pole the specification refers to the maximum rated operational current of the frame size.
Total downtime in a short-circuit		ms	< 25 $\leq$ 415 V; < 35 > 415 V

## Terminal capacity

Standard equipment			Screw connection				
Overview			Basic equipment				
			Box terminal	●	-	-	-
			Screw connection	-	●	●	●
			Accessories				
			Box terminal	-	●	●	-
			Screw connection	●	-	-	●
			Tunnel terminal	●	●	●	●
			Connection on rear	●	●	●	●
			Flat conductor terminal	-	-	-	●
	Round copper conductor						
Tunnel terminal							
Stranded		mm <sup>2</sup>					
4-hole		mm <sup>2</sup>	4 x (50 - 240)				
Bolt terminal and rear-side connection							
Direct on the switch							
Stranded		mm <sup>2</sup>	1 x (120 - 185) 4 x (50 - 185)				
Module plate							
Single hole	min.	mm <sup>2</sup>	1 x (120 - 300)				
Single hole	max.	mm <sup>2</sup>	2 x (95 - 300)				
Module plate							
Double hole	min.	mm <sup>2</sup>	2 x (95 - 185)				
Double hole	max.	mm <sup>2</sup>	4 x (35 - 185)				
Connection width extension		mm <sup>2</sup>					

Connection width extension		mm <sup>2</sup>	4 x 300 6 x (95 - 240)
Al conductors, Cu cable			
Solid		mm <sup>2</sup>	1600
Stranded		mm <sup>2</sup>	
4-hole		mm <sup>2</sup>	4 x (50 - 240)
Bolt terminal and rear-side connection			
Flat copper strip, with holes	min.	mm	(2 x) 10 x 50 x 1.0
Flat copper strip, with holes	max.	mm	(2 x) 10 x 50 x 1.0
Connection width extension		mm	(2 x) 10 x 80 x 1.0
Cu strip (number of segments x width x segment thickness)			
Flat conductor terminal			
	min.	mm	6 x 16 x 0.8
	max.	mm	(2 x) 10 x 32 x 1.0
Module plate			
Single hole		mm	(2 x) 10 x 50 x 1.0
Bolt terminal and rear-side connection			
Flat copper strip, with holes	min.	mm	(2 x) 10 x 50 x 1.0
Flat copper strip, with holes	max.	mm	(2 x) 10 x 50 x 1.0
Connection width extension		mm	(2 x) 10 x 80 x 1.0
Copper busbar (width x thickness)	mm		
Bolt terminal and rear-side connection			
Screw connection			M10
Direct on the switch			
	min.	mm	25 x 5
	max.	mm	2 x (50 x 10)
Module plate			
Single hole	min.	mm	25 x 5
Single hole	max.	mm	2 x (50 x 10)
Module plate			
Double hole		mm	2 x (50 x 10)
Connection width extension		mm	
Connection width extension	min.	mm	60 x 10
Connection width extension	max.	mm	2 x (80 x 10)
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

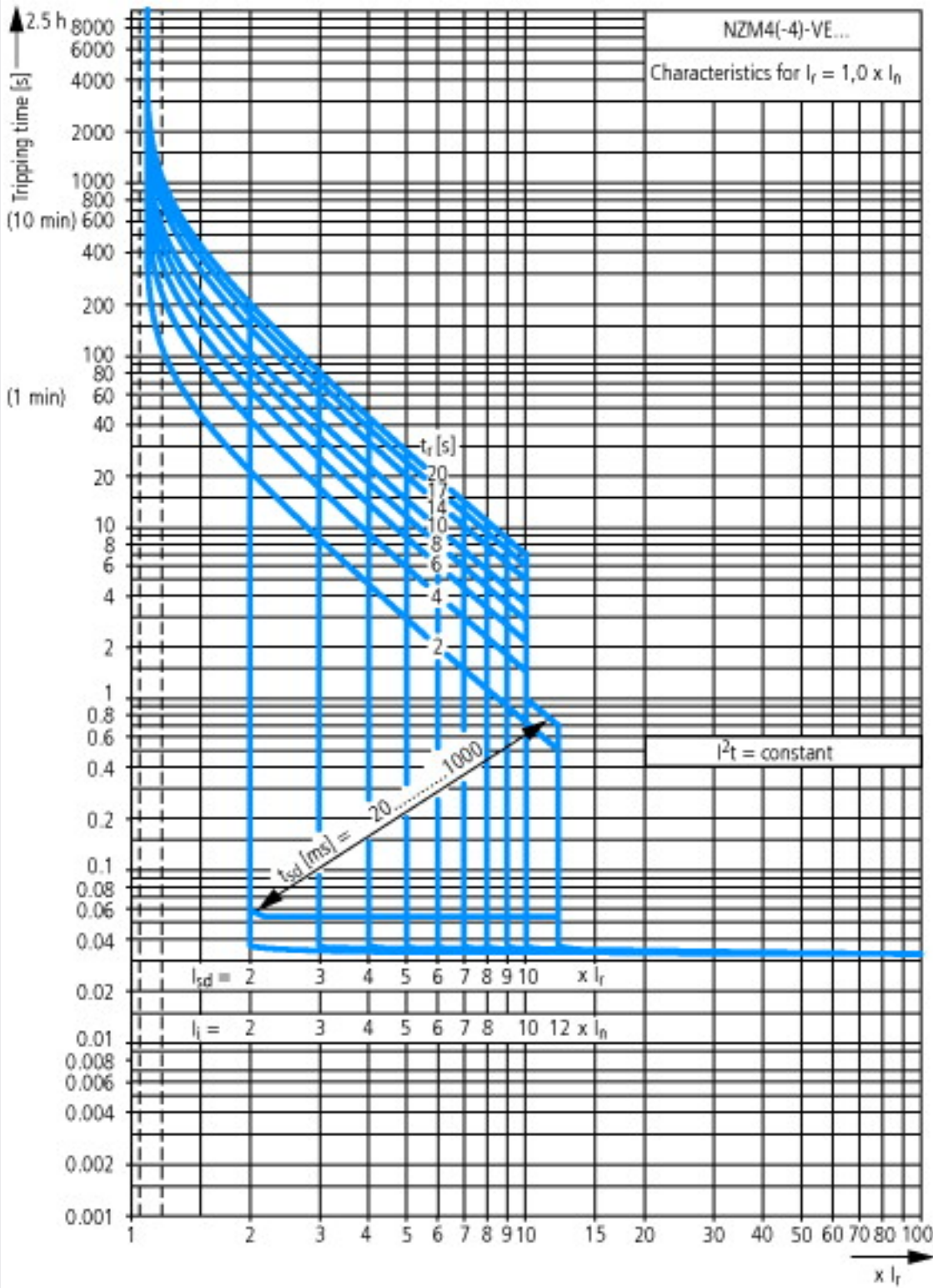
Technical data for design verification			
Rated operational current for specified heat dissipation	I <sub>n</sub>	A	1600
Equipment heat dissipation, current-dependent	P <sub>vid</sub>	W	284.16
Operating ambient temperature min.		°C	-25
Operating ambient temperature max.		°C	70
IEC/EN 61439 design verification			
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.

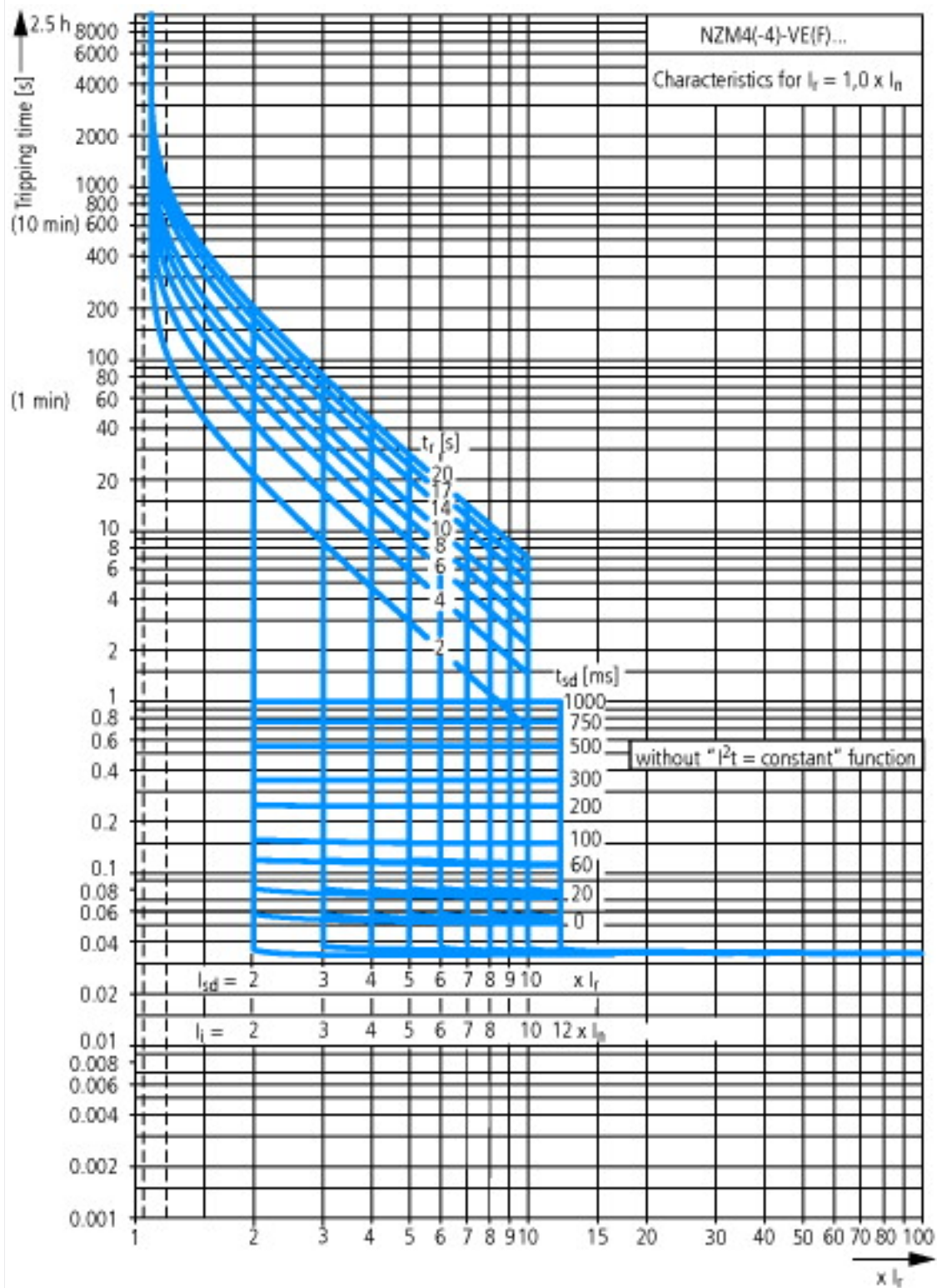
10.3 Degree of protection of ASSEMBLIES		Does not apply, since the entire switchgear needs to be evaluated.
10.4 Clearances and creepage distances		Meets the product standard's requirements.
10.5 Protection against electric shock		Does not apply, since the entire switchgear needs to be evaluated.
10.6 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 6.0

Low-voltage industrial components (EG000017) / Power circuit-breaker for trafo/generator/installation prot. (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@ss8.1-27-37-04-09 [AJZ716010])		
Rated permanent current I <sub>u</sub>	A	1600
Rated voltage	V	690 - 690
Rated short-circuit breaking capacity I <sub>cu</sub> at 400 V, 50 Hz	kA	50
Overload release current setting	A	800 - 1600
Adjustment range short-term delayed short-circuit release	A	1600 - 16000
Adjustment range undelayed short-circuit release	A	3200 - 19200
Integrated earth fault protection		No
Type of electrical connection of main circuit		Screw connection
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		No
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
Switched-off indicator available		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		Yes
Degree of protection (IP)		IP20

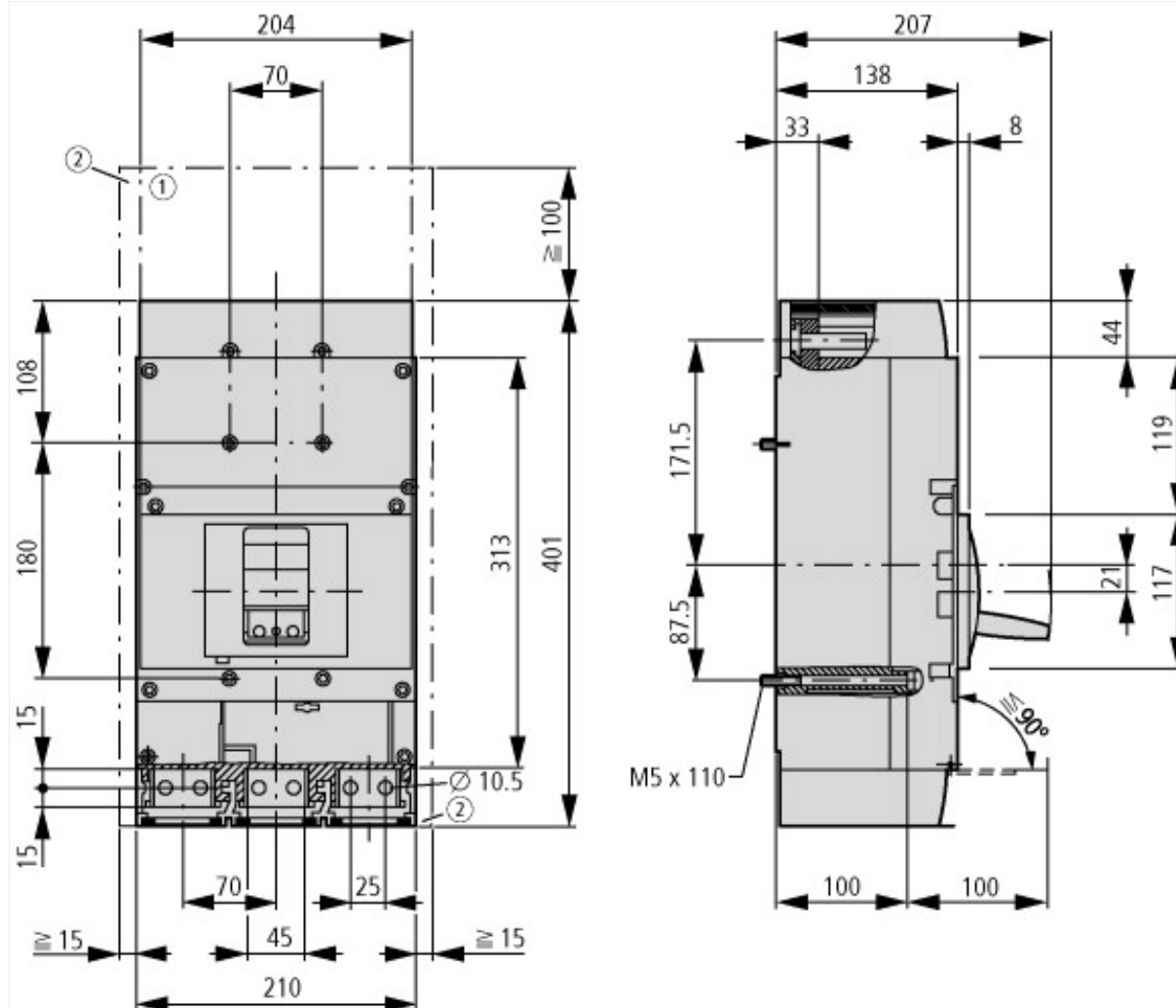
Characteristics







## Dimensions



- ①** Blow out area, minimum clearance to adjacent parts  
 $U_i \leq 690 \text{ V}$ : 100 mm  
 $U_i \leq 1500 \text{ V}$ : 200 mm
- ②** Minimum clearance to adjacent parts  
 $U_i \leq 1000 \text{ V}$ : 15 mm  
 $U_i \leq 1500 \text{ V}$ : 70 mm

### Additional product information (links)

**IL01210010Z (AWA1230-2022) Circuit-Breaker, basic unit**

IL01210010Z (AWA1230-2022) Circuit-Breaker, basic unit	<a href="ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL01210010Z2014_07.pdf">ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL01210010Z2014_07.pdf</a>
Weight	<a href="http://ecat.moeller.net/flip-cat/?edition=HPLEN&amp;startpage=17.171">http://ecat.moeller.net/flip-cat/?edition=HPLEN&amp;startpage=17.171</a>
Temperature dependency, Derating	<a href="http://ecat.moeller.net/flip-cat/?edition=HPLEN&amp;startpage=17.172">http://ecat.moeller.net/flip-cat/?edition=HPLEN&amp;startpage=17.172</a>
Effective power loss	<a href="http://ecat.moeller.net/flip-cat/?edition=HPLEN&amp;startpage=17.174">http://ecat.moeller.net/flip-cat/?edition=HPLEN&amp;startpage=17.174</a>
Setting-Specific Representation of Tripping Characteristics and Competent Assessment of their Interaction	<a href="http://www.moeller.net/binary/ver_techpapers/ver943en.pdf">http://www.moeller.net/binary/ver_techpapers/ver943en.pdf</a>
Busbar Component Adapters for modern Industrial control panels	<a href="http://www.moeller.net/binary/ver_techpapers/ver960en.pdf">http://www.moeller.net/binary/ver_techpapers/ver960en.pdf</a>