



**290379**  
**NZMH4-VE1600-S1**

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## DELIVERY PROGRAM

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  $6 \times I_r$  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

NZM...S1 terminal type: NZM...XKSA cover required

Number of poles

3 pole

Standard equipment

Screw connection

Rated current = rated uninterrupted current [ $I_n = I_u$ ]

1600 A

## Switching capacity

1000 V 50/60 Hz [ $I_{cu}$ ]

20 kA

## Setting range

Overload trip

 [ $I_r$ ]


800 - 1600 A

Short-circuit releases  [ $I_{rm}$ ]

Non-delayed  [ $I_t = I_n \times \dots$ ]

2 - 12

Short-circuit releases  [ $I_{rm}$ ]

Delayed  [ $I_{sd} = I_t \times \dots$ ]

2 - 10

# TECHNICAL DATA

## Circuit-breakers

Rated surge voltage invariability [ $U_{imp}$ ]

Main contacts

8000 V

Rated surge voltage invariability [ $U_{imp}$ ]  
Auxiliary contacts  
6000 V

Rated operational voltage [ $U_e$ ]  
1000 V AC

Rated current = rated uninterrupted current [ $I_n = I_u$ ]  
1600 A

Overvoltage category/pollution degree  
III/3

Rated insulation voltage [ $U_i$ ]  
1000 V

Utilization category  
B

Ambient temperature  
Ambient temperature, storage  
- 40 - + 70 °C

Ambient temperature  
Operation  
-25 - +70 °C

### Rated short-circuit making capacity [ $I_{cm}$ ]

240 V 50/60 Hz [ $I_{cm}$ ]  
275 kA

400/415 V 50/60 Hz [ $I_{cm}$ ]  
187 kA

440 V 50/60 Hz [ $I_{cm}$ ]  
187 kA

525 V 50/60 Hz [ $I_{cm}$ ]  
143 kA

690 V 50/60 H [ $I_c$ ]

100 kA

1000 V 50/60 Hz [ $I_{cn}$ ]  
40 kA

### Rated short-circuit breaking capacity $I_{cn}$ [ $I_{cn}$ ]

$I_{cu}$  to IEC/EN 60947 test cycle O-t-OO [ $I_{cu}$ ]  
240 V 50/60 Hz [ $I_{cu}$ ]  
125 kA

$I_{cu}$  to IEC/EN 60947 test cycle O-t-OO [ $I_{cu}$ ]  
400/415 V 50 Hz [ $I_{cu}$ ]  
85 kA

$I_{cu}$  to IEC/EN 60947 test cycle O-t-OO [ $I_{cu}$ ]  
440 V 50/60 Hz [ $I_{cu}$ ]  
85 kA

$I_{cu}$  to IEC/EN 60947 test cycle O-t-OO [ $I_{cu}$ ]  
525 V 50/60 Hz [ $I_{cu}$ ]  
65 kA

$I_{cu}$  to IEC/EN 60947 test cycle O-t-OO [ $I_{cu}$ ]  
690 V 50/60 Hz [ $I_{cu}$ ]  
50 kA

$I_{cu}$  to IEC/EN 60947 test cycle O-t-OO [ $I_{cu}$ ]  
1000 V 50/60 Hz [ $I_{cu}$ ]  
20 kA

$I_{cs}$  to IEC/EN 60947 test cycle O-t-OO-t-OO [ $I_{cs}$ ]  
230 V 50/60 Hz [ $I_{cs}$ ]  
63 kA

$I_{cs}$  to IEC/EN 60947 test cycle O-t-OO-t-OO [ $I_{cs}$ ]  
400/415 V 50/60 Hz [ $I_{cs}$ ]  
50 kA

$I_{cs}$  to IEC/EN 60947 test cycle O-t-OO-t-OO [ $I_{cs}$ ]  
440 V 50/60 Hz [ $I_{cs}$ ]  
50 kA

$I_{cs}$  to IEC/EN 60947 test cycle O-t-OO-t-OO [ $I_{cs}$ ]  
525 V 50/60 Hz [ $I_{cs}$ ]  
50 kA

Ics to IEC/EN 60947 test cycle O-t-CO-t-CO [Ics]  
690 V 50/60 Hz [Ics]  
37 kA

Ics to IEC/EN 60947 test cycle O-t-CO-t-CO [Ics]  
1000 V AC [Ics]  
15 kA

### Rated short-time withstand current

t = 0.3 s [I<sub>cs</sub>]  
19.2 kA

t = 1 s [I<sub>cs</sub>]  
19.2 kA

Lifespan, mechanical [Operations]  
10000

Max. operating frequency  
60 Ops/h

Lifespan, mechanical: of which max. 50 % trip by  
shunt/undervoltage release

### Lifespan, electrical

1000 V 50/60 Hz [Operations]  
500

### Terminal capacity

Standard equipment  
Screw connection

Round copper conductor  
Tunnel terminal  
Stranded  
4-hole  
4 x (50 - 240)  
mm<sup>2</sup>

Round copper conductor  
Bolt terminal and rear-side connection

Module plate  
Single hole [min.]  
1 x (185 - 240) mm<sup>2</sup>

Round copper conductor  
Bolt terminal and rear-side connection  
Module plate  
Single hole [max.]  
2 x (70 - 185) mm<sup>2</sup>

Round copper conductor  
Bolt terminal and rear-side connection  
Module plate  
Double hole [min.]  
4 x 50 mm<sup>2</sup>

Round copper conductor  
Bolt terminal and rear-side connection  
Module plate  
Double hole [max.]  
4 x (35 - 185) mm<sup>2</sup>

Round copper conductor  
Bolt terminal and rear-side connection  
Connection width extension  
Connection width extension  
2 x 240  
6 x (70 - 240) mm<sup>2</sup>

Al conductors, Cu cable  
Tunnel terminal  
Stranded  
4-hole  
4 x (50 - 240)  
mm<sup>2</sup>

Cu strip (number of segments x width x segment  
thickness)  
Flat conductor terminal [min.]  
6 x 16 x 0.8 mm

Cu strip (number of segments x width x segment  
thickness)  
Flat conductor terminal [max.]  
(2 x) 10 x 32 x 1.0 mm

Cu strip (number of segments x width x segment  
thickness)  
Module plate  
Single hole  
(2 x) 10 x 50 x 1.0 mm

Cu strip (number of segments x width x segment thickness)  
Bolt terminal and rear-side connection  
Flat copper strip, with holes [min.]  
(2 x) 10 x 50 x 1.0 mm

Cu strip (number of segments x width x segment thickness)  
Bolt terminal and rear-side connection  
Flat copper strip, with holes [max.]  
(2 x) 10 x 50 x 1.0 mm

Cu strip (number of segments x width x segment thickness)  
Bolt terminal and rear-side connection  
Connection width extension  
(2 x) 10 x 80 x 1.0 mm

Copper busbar (width x thickness) [mm]  
Bolt terminal and rear-side connection  
Screw connection  
M10

Copper busbar (width x thickness) [mm]  
Bolt terminal and rear-side connection  
Direct on the switch [min.]  
25 x 5 mm

Copper busbar (width x thickness) [mm]  
Bolt terminal and rear-side connection  
Direct on the switch [max.]  
2 x (50 x 10)  
2 x (80 x 10) mm

Copper busbar (width x thickness) [mm]  
Bolt terminal and rear-side connection  
Module plate  
Single hole [min.]  
25 x 5 mm

Copper busbar (width x thickness) [mm]  
Bolt terminal and rear-side connection  
Module plate  
Single hole [max.]  
2 x (50 x 10)  
mm

Copper busbar (width x thickness) [mm]  
Bolt terminal and rear-side connection  
Module plate  
Double hole  
2 x (50 x 10) mm

Copper busbar (width x thickness) [mm]  
Bolt terminal and rear-side connection  
Connection width extension  
Connection width extension [min.]  
60 x 10 mm

Copper busbar (width x thickness) [mm]  
Bolt terminal and rear-side connection  
Connection width extension  
Connection width extension [max.]  
2 x (80 x 10) mm

Control cables  
1 x (0.75 - 2.5)  
2 x (0.75 - 1.5) mm<sup>2</sup>

## DESIGN VERIFICATION AS PER IEC/EN 61439

### Technical data for design verification

Rated operational current for specified heat  
dissipation [ $I_n$ ]  
1600 A

Equipment heat dissipation, current-dependent  
[ $P_{vid}$ ]  
284 W

Operating ambient temperature min.  
-25 °C

Operating ambient temperature max.  
+70 °C

### 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 Strength of materials and parts  
10.2.3.1 Verification of thermal stability of  
enclosures  
Meets the product standard's requirements.



10.2 Strength of materials and parts  
10.2.3.2 Verification of resistance of insulating materials to normal heat  
Meets the product standard's requirements.

10.2 Strength of materials and parts  
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 Strength of materials and parts  
10.2.4 Resistance to ultra-violet (UV) radiation  
Meets the product standard's requirements.

10.2 Strength of materials and parts  
10.2.5 Lifting  
Does not apply, since the entire switchgear needs to be evaluated.

10.2 Strength of materials and parts  
10.2.6 Mechanical impact  
Does not apply, since the entire switchgear needs to be evaluated.

10.2 Strength of materials and parts  
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 Insulation properties  
10.9.3 Impulse withstand voltage  
Is the panel builder's responsibility.

10.9 Insulation properties  
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<sub>n</sub>  
1600 A

Rated voltage  
1000 - 1000 V

Rated short-circuit breaking capacity I<sub>cu</sub> at 400 V,  
50 Hz  
85 kA

Overload release current setting  
800 - 1600 A

Adjustment range short-term delayed short-circuit  
release  
1600 - 16000 A

Adjustment range undelayed short-circuit release  
3200 - 19200 A

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

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

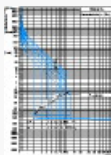
Mbtor drive integrated  
No

Mbtor drive optional  
Yes

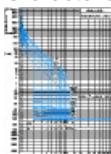
Degree of protection (IP)  
IP20

## CHARACTERISTICS

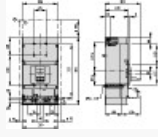
Characteristic curve



Characteristic curve



## DIMENSIONS



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



