



191549  
NZMH3-VX400-AVE

- Overview
- Specifications
- Resources



Delivery program

Technical data

Design verification as  
per IEC/EN 61439

Technical data ETIM 7.0

Characteristics

Dimensions

## 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  
NZMB

Description  
LSI overload protection and delayed and non-

delayed short-circuit protective device  
R.m.s. value measurement and “thermal memory”  
USB interface for configuration and test function  
with Power Xpert Protection Manager software  
Optionally communication-capable with interface  
module and internal Modbus RTU module or CAM

Number of poles  
3 pole

Standard equipment  
Screw connection


## Switching capacity



400/415 V 50 Hz [ $I_{cu}$ ]  
150 kA



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

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

## Setting range

Overload trip  
 [ $I_r$ ]  
160 - 400 A

Short-circuit releases  [ $I_{rm}$ ]  
Non-delayed  [ $I_t = I_n \times \dots$ ]  
2 – 12

Short-circuit releases  [ $I_{rm}$ ]  
Delayed  [ $I_{sd} = I_r \times \dots$ ]  
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  
- 40 - + 70 °C

Ambient temperature  
Operation  
-25 - +70 °C

Mechanical shock resistance (10 ms half-sinusoidal shock) according to IEC 60068-2-27  
20 (half-sinusoidal shock 20 ms) g

Safe isolation to EN 61140  
Between auxiliary contacts and main contacts  
500 V AC

Safe isolation to EN 61140  
between the auxiliary contacts  
300 V AC

Weight  
6.34 kg

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

Direction of incoming supply  
as required

Degree of protection  
Device  
In the operating controls area: IP20 (basic degree  
of protection)

Degree of protection  
Enclosures  
With insulating surround: IP40  
With door coupling rotary handle: IP66

Degree of protection  
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 [ $I_n = I_u$ ]  
400 A

Rated surge voltage invariability [ $U_{imp}$ ]  
Main contacts  
8000 V

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

Rated operational voltage [ $U_e$ ]  
690 V AC

Overvoltage category/pollution degree  
III/3

Rated insulation voltage [ $U_i$ ]  
690 V

Use in unearthed supply systems

□ 690 V

## Switching capacity

Rated short-circuit making capacity [ $I_{cm}$ ]  
240 V [ $I_{cm}$ ]  
330 kA

Rated short-circuit making capacity [ $I_{cm}$ ]  
400/415 V [ $I_{cm}$ ]  
330 kA

Rated short-circuit making capacity [ $I_{cm}$ ]  
440 V 50/60 Hz [ $I_{cm}$ ]  
286 kA

Rated short-circuit making capacity [ $I_{cm}$ ]  
525 V 50/60 Hz [ $I_{cm}$ ]  
143 kA

Rated short-circuit making capacity [ $I_{cm}$ ]  
690 V 50/60 Hz [ $I_{cm}$ ]  
70 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 [ $I_{cu}$ ]  
150 kA

Rated short-circuit breaking capacity  $I_{cn}$  [ $I_{cn}$ ]  
 $I_{cu}$  to IEC/EN 60947 test cycle O-t-OO [ $I_{cu}$ ]  
400/415 V 50/60 Hz [ $I_{cu}$ ]  
150 kA

Rated short-circuit breaking capacity  $I_{cn}$  [ $I_{cn}$ ]  
 $I_{cu}$  to IEC/EN 60947 test cycle O-t-OO [ $I_{cu}$ ]  
440 V 50/60 Hz [ $I_{cu}$ ]  
130 kA

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

Rated short-circuit breaking capacity  $I_{cn}$  [ $I_{cn}$ ]  
 $I_{cu}$  to IEC/EN 60947 test cycle O-t-OO [ $I_{cu}$ ]  
690 V 50/60 Hz [ $I_{cu}$ ]  
35 kA

Rated short-circuit breaking capacity  $I_{cn}$  [ $I_{cn}$ ]  
Ics to IEC/EN 60947 test cycle O-t-CO-t-CO [ $I_{cs}$ ]  
240 V 50/60 Hz [ $I_{cs}$ ]  
150 kA

Rated short-circuit breaking capacity  $I_{cn}$  [ $I_{cn}$ ]  
Ics to IEC/EN 60947 test cycle O-t-CO-t-CO [ $I_{cs}$ ]  
400/415 V 50/60 Hz [ $I_{cs}$ ]  
150 kA

Rated short-circuit breaking capacity  $I_{cn}$  [ $I_{cn}$ ]  
Ics to IEC/EN 60947 test cycle O-t-CO-t-CO [ $I_{cs}$ ]  
440 V 50/60 Hz [ $I_{cs}$ ]  
130 kA

Rated short-circuit breaking capacity  $I_{cn}$  [ $I_{cn}$ ]  
Ics to IEC/EN 60947 test cycle O-t-CO-t-CO [ $I_{cs}$ ]  
525 V 50/60 Hz [ $I_{cs}$ ]  
33 kA

Rated short-circuit breaking capacity  $I_{cn}$  [ $I_{cn}$ ]  
Ics to IEC/EN 60947 test cycle O-t-CO-t-CO [ $I_{cs}$ ]  
690 V 50/60 Hz [ $I_{cs}$ ]  
9 kA

Rated short-circuit breaking capacity  $I_{cn}$  [ $I_{cn}$ ]  
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 [ $I_{cw}$ ]  
3.3 kA

Rated short-time withstand current  
 $t = 1$  s [ $I_{cw}$ ]  
3.3 kA

Utilization category to IEC/EN 60947-2  
A

Lifespan, mechanical (of which max. 50 % trip by shunt/undervoltage release) [Operations]  
15000

Lifespan, electrical  
AC-1  
400 V 50/60 Hz [Operations]

5000

Lifespan, electrical  
AC-1  
415 V 50/60 Hz [Operations]  
5000

Lifespan, electrical  
AC-1  
690 V 50/60 Hz [Operations]  
3000

Lifespan, electrical  
Max. operating frequency  
60 Ops/h

Total break time at short-circuit  
< 10 ms

### Terminal capacity

Standard equipment  
Screw connection

Accessories required  
NZMB-XAVS

Optional accessories  
Box terminal  
Tunnel terminal  
connection on rear

Round copper conductor  
Box terminal  
Solid  
2 x 16 mm<sup>2</sup>

Round copper conductor  
Box terminal  
Stranded  
1 x (35 - 240)  
2 x (25-120) mm<sup>2</sup>

Round copper conductor  
Tunnel terminal  
Solid  
1 x 16 mm<sup>2</sup>

Round copper conductor  
Tunnel terminal  
Stranded  
1-hole  
1 x (16 - 185) mm<sup>2</sup>

Round copper conductor  
Bolt terminal and rear-side connection  
Direct on the switch  
Solid  
1 x 16  
2 x 16 mm<sup>2</sup>

Round copper conductor  
Bolt terminal and rear-side connection  
Direct on the switch  
Stranded  
1 x (25 - 240)  
2 x (25 - 240) mm<sup>2</sup>

Round copper conductor  
Bolt terminal and rear-side connection  
Connection width extension  
Connection width extension  
2 x 300 mm<sup>2</sup>

Al circular conductor  
Tunnel terminal  
Solid  
1 x 16 mm<sup>2</sup>

Al circular conductor  
Tunnel terminal  
Stranded  
Stranded  
1 x (25 - 185) <sup>2)</sup> mm<sup>2</sup>

Al circular conductor  
Tunnel terminal  
Stranded  
Double hole  
1 x (50 - 240)  
2 x (50 - 240) mm<sup>2</sup>

Al circular conductor  
Tunnel terminal  
Stranded  
<sup>2)</sup> Up to 240 mm<sup>2</sup> can be connected depending on  
the cable manufacturer.

Qu strip (number of segments x width x segment  
thickness)



Box terminal [min.]  
6 x 16 x 0.8 mm

Cu strip (number of segments x width x segment thickness)  
Box terminal [max.]  
10 x 24 x 1.0  
+ 5 x 24 x 1.0  
(2 x) 8 x 24 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.]  
6 x 16 x 0.8 mm

Cu strip (number of segments x width x segment thickness)  
Bolt terminal and rear-side connection  
Flat copper strip, with holes [max.]  
10 x 32 x 1.0 + 5 x 32 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 50 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.]  
20 x 5 mm

Copper busbar (width x thickness) [mm]  
Bolt terminal and rear-side connection  
Direct on the switch [max.]  
30 x 10  
+ 30 x 5 mm

Copper busbar (width x thickness) [mm]  
Bolt terminal and rear-side connection  
Connection width extension  
Connection width extension [max.]  
2 x (10 x 50) 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 [ $I_n$ ]  
400 A

Equipment heat dissipation, current-dependent [ $P_{vid}$ ]  
48 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 (ec1@ss10.0.1-27-37-04-09 [AJZ716013])

Rated permanent current  $I_n$   
400 A

Rated voltage  
690 - 690 V

Rated short-circuit breaking capacity  $I_{cu}$  at 400 V,  
50 Hz  
150 kA

Overload release current setting  
160 - 400 A

Adjustment range short-term delayed short-circuit  
release  
2 - 10 A

Adjustment range undelayed short-circuit release  
2 - 12 A

Integrated earth fault protection  
No

Type of electrical connection of main circuit  
Other

Device construction  
Built-in device slide-in technique (withdrawable)

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

Motor drive integrated  
No

Motor drive optional  
Yes

Degree of protection (IP)  
IP20

## CHARACTERISTICS

Characteristic curve

Let-through current

Characteristic curve

Let-through energy

## DIMENSIONS

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

