



266005  
PN2-160

Overview

Specifications

Resources



Delivery program

Technical data

Design verification as  
per IEC/EN 61439

Technical data ETIM 7.0

Dimensions

## DELIVERY PROGRAM

Product range  
Switch-disconnectors

Protective function  
Disconnectors/main switches

Standard/Approval  
IEC

Installation type  
Fixed

Construction size  
PN2

Description  
Main switch characteristics including positive drive  
to IEC/EN 60204 and VDE 0113.  
Isolating characteristics to IEC/EN 60947-3 and  
VDE 0660.  
Busbar tag shroud to VDE 0160 Part 100.

Number of poles  
3 pole

Standard equipment  
Screw connection

Switch positions  
I, 0

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

Short-circuit protection max. fuse gL-  
characteristic  
250 A gL

## TECHNICAL DATA

### General

Standards  
IEC/EN 60947

Protection against direct contact  
Finger and back-of-hand proof to DIN EN  
50274/VDE 0106 part 110

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

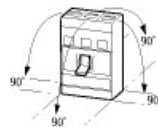
Mechanical shock resistance (10 ms half-  
sinusoidal shock) according to IEC 60068-2-27  
20 (half-sinusoidal shock 20 ms) g

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

Mounting position  
Mounting position

Vertical and 90° in all directions



With residual-current release  
XF:

- 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

Direction of incoming supply  
as required

Degree of protection  
Device

In the area of the HMI devices: IP20 (basic  
protection type)

Degree of protection  
Enclosures

With insulating surround: IP40

With door coupling rotary handle: IP66

Degree of protection  
Terminations

Tunnel terminal: IP10

Phase isolator and band terminal: IP00

## Switch-disconnectors

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

Rated operating frequency [ $f$ ]  
50/60 Hz

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

Overvoltage category/pollution degree  
III/3

Rated insulation voltage [ $U_i$ ]  
690 V

Use in unearthed supply systems  
☐ 690 V

Other technical data (sheet catalogue)  
Weight  
Temperature dependency, Derating  
Effective power loss

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

690 V 50/60 Hz [ $I_c$ ]  
5.5 kA

### Rated short-time withstand current

$t = 0.3 \text{ s}$  [ $I_{cw}$ ]  
3.5 kA

$t = 1 \text{ s}$  [ $I_{cw}$ ]  
3.5 kA

The rated short-time withstand current for FN2/N2  
in conjunction with earth-fault release NZM2-4-

XFI...lcw = 1.5 kA

### Rated conditional short-circuit current [kA]

With back-up fuse  
FN2(N2)-160...250: 250 A gG/gL

400 ... 415 V  
100 kA

690 V  
80 kA

With downstream fuse  
FN2(N2)-160...250: 250 A gG/gL

400 ... 415 V  
100 kA

690 V  
80 kA

### Rated making and breaking capacity

Rated operational current [ $I_e$ ]  
AC-22/23A  
415 V [ $I_e$ ]  
160 A

Rated operational current [ $I_e$ ]  
AC-22/23A  
690 V [ $I_e$ ]  
160 A

Lifespan, mechanical [Operations]  
20000

Max. operating frequency  
120 Ops/h

### Lifespan, electrical

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

10000

AC-1  
415 V 50/60 Hz [Operations]  
10000

AC-1  
690 V 50/60 Hz [Operations]  
7500

AC-3  
400 V 50/60 Hz [Operations]  
7500

AC-3  
415 V 50/60 Hz [Operations]  
7500

AC-3  
690 V 50/60 Hz [Operations]  
5000

## Terminal capacity

Standard equipment  
Screw connection

Optional accessories  
Box terminal  
Tunnel terminal  
connection on rear

Copper conductors and cables  
Box terminal  
Solid  
1 x (10 - 16)  
2 x (6 - 16) mm<sup>2</sup>

Copper conductors and cables  
Box terminal  
Stranded  
1 x (25 - 185)  
2 x (25 - 70) mm<sup>2</sup>

Copper conductors and cables  
Tunnel terminal  
Solid  
1 x 16 mm<sup>2</sup>

Copper conductors and cables  
Tunnel terminal  
Stranded  
1-hole  
1 x (25 - 185) mm<sup>2</sup>

Copper conductors and cables  
Bolt terminal and rear-side connection  
Direct on the switch  
Solid  
1 x (10 - 16)  
2 x (6 - 16) mm<sup>2</sup>

Copper conductors and cables  
Bolt terminal and rear-side connection  
Direct on the switch  
Stranded  
1 x (25 - 185)  
2 x (25 - 70) mm<sup>2</sup>

Al conductors, Al cable  
Tunnel terminal  
Solid  
1 x 16 mm<sup>2</sup>

Al conductors, Al cable  
Tunnel terminal  
Stranded  
1-hole  
1 x (25 - 185) mm<sup>2</sup>

Al conductors, Al cable  
Bolt terminal and rear-side connection  
Direct on the switch  
Solid  
1 x (10 - 16)  
2 x (10 - 16) mm<sup>2</sup>

Al conductors, Al cable  
Bolt terminal and rear-side connection  
Direct on the switch  
Stranded  
1 x (25 - 185)  
2 x (25 - 70) mm<sup>2</sup>

Qu strip (number of segments x width x segment  
thickness)  
Box terminal [min.]  
2 x 9 x 0.8 mm

Qu strip (number of segments x width x segment

thickness)  
Box terminal [max.]  
10 x 16 x 0.8  
(2x) 8 x 15.5 x 0.8 mm

Qu strip (number of segments x width x segment thickness)  
Bolt terminal and rear-side connection  
Flat copper strip, with holes [min.]  
2 x 16 x 0.8 mm

Qu strip (number of segments x width x segment thickness)  
Bolt terminal and rear-side connection  
Flat copper strip, with holes [max.]  
10 x 24 x 0.8 mm

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

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

Copper busbar (width x thickness) [mm]  
Bolt terminal and rear-side connection  
Direct on the switch [max.]  
24 x 8 mm

## DESIGN VERIFICATION AS PER IEC/EN 61439

### Technical data for design verification

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

Equipment heat dissipation, current-dependent [ $P_{vid}$ ]  
19.66 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) / Switch disconnecter (EC000216)

Electric engineering, automation, process control engineering / Low-voltage switch technology / Off-load switch, circuit breaker, control switch / Switch disconnecter (ecl@ss10.0.1-27-37-14-03 [AKF060013])

Version as main switch

Yes

Version as maintenance-/service switch

Yes

Version as safety switch

No

Version as emergency stop installation

Yes

Version as reversing switch

No

Number of switches

1

Max. rated operation voltage  $U_e$  AC

690 V

Rated operating voltage

690 - 690 V

Rated permanent current  $I_u$

160 A

Rated permanent current at AC-23, 400 V

0 A

Rated permanent current at AC-21, 400 V

0 A

Rated operation power at AC-3, 400 V  
0 kW

Rated short-time withstand current  $I_{cw}$   
3.5 kA

Rated operation power at AC-23, 400 V  
90 kW

Switching power at 400 V  
0 kW

Conditioned rated short-circuit current  $I_q$   
0 kA

Number of poles  
3

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

Motor drive optional  
No

Motor drive integrated  
No

Voltage release optional  
No

Device construction  
Built-in device fixed built-in technique

Suitable for ground mounting  
Yes

Suitable for front mounting 4-hole  
No

Suitable for front mounting centre  
No

Suitable for distribution board installation  
Yes

Suitable for intermediate mounting  
Yes

Colour control element  
Black

Type of control element  
Rocker lever

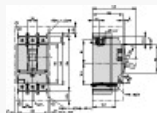
Interlockable  
Yes

Type of electrical connection of main circuit  
Screw connection

Degree of protection (IP), front side  
IP20

Degree of protection (NEMA)

## DIMENSIONS



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

