

Switch-disconnector 3p 160A

Part no.	N1-160
Catalog No.	281236
EL-Nummer (Norway)	4359001



Powering Business Worldwide™

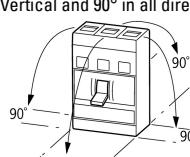
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Delivery program

Product range	Switch-disconnectors		
Protective function	Disconnectors/main switches		
Standard/Approval	IEC		
Installation type	Fixed		
Construction size	N1		
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	Box terminal		
Switch positions	I, +, 0		
Rated current = rated uninterrupted current	$I_n = I_u$	A	160
Short-circuit protection max. fuse gL-characteristic		A gL	160

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: ${}^{\circ}\text{C}$ -40 - +70 Operation: ${}^{\circ}\text{C}$ -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 AC 500 between the auxiliary contacts: V AC 300		
Mounting position	Mounting position: Vertical and 90° in all directions  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		
Direction of incoming supply	as required		
Degree of protection	In the area of the HMI devices: IP20 (basic protection type) With insulating surround: IP40 With door coupling rotary handle: IP66		
Device			
Enclosures			
Terminations	Tunnel terminal: IP10 Phase isolator and band terminal: IP00		

Switch-disconnectors

Rated surge voltage invariability	U_{imp}
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Main contacts	V	6000
Auxiliary contacts	V	6000
Rated operational voltage	U _e	V AC 690
Rated operating frequency	f	Hz 50/60
Rated current = rated uninterrupted current	I _n = I _u	A 160
Oversupply voltage category/pollution degree		III/3
Rated insulation voltage	U _i	V 690
Use in unearthed supply systems		V \leq 690
Other technical data (sheet catalogue)		Weight Temperature dependency, Derating Effective power loss

Rated short-circuit making capacity

690 V 50/60 Hz	I _c	kA	2.8
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Rated short-time withstand current

t = 0.3 s	I _{cw}	kA	2
t = 1 s	I _{cw}	kA	2

Rated conditional short-circuit current

With back-up fuse	A gG/gL	gR: 160
400 ... 415 V	kA	100
690 V	kA	80
With downstream fuse	A gG/gL	gR: 160
400 ... 415 V	kA	100
690 V	kA	10

Rated making and breaking capacity

Rated operational current	I _e	A	
AC-22/23A			
415 V	I _e	A	160
690 V	I _e	A	160
Lifespan, mechanical	Operations		20000
Max. operating frequency		Ops/h	120

Lifespan, electrical

AC-1			
400 V 50/60 Hz	Operations		7500
415 V 50/60 Hz	Operations		7500
690 V 50/60 Hz	Operations		5000
AC-23A			
400 V 50/60 Hz	Operations		1000
415 V 50/60 Hz	Operations		1000
690 V 50/60 Hz	Operations		1000

Terminal capacity

Standard equipment			Box terminal
Optional accessories			Screw connection Tunnel terminal connection on rear
Copper conductors and cables			
Box terminal			
Solid	mm ²	1 x (10 - 16) 2 x (6 - 16)	
Stranded	mm ²	1 x (10 - 70) ³⁾ 2 x (6 - 25)	
			³⁾ Up to 95 mm ² can be connected depending on the cable manufacturer.
Tunnel terminal			
Solid	mm ²	1 x 16	
Stranded	mm ²		
1-hole	mm ²	1 x (25 - 95)	
Bolt terminal and rear-side connection			
Direct on the switch			
Solid	mm ²	1 x (10 - 16)	

			2 x (6 - 16)
Stranded	mm ²	1 x (25 - 70) ³⁾ 2 x 25	
			³⁾ Up to 95 mm ² can be connected depending on the cable manufacturer.
Al conductors, Al cable			
Tunnel terminal			
Solid	mm ²	1 x 16	
Stranded	mm ²	1 x (25 - 95)	
1-hole	mm ²		
Bolt terminal and rear-side connection			
Direct on the switch			
Solid	mm ²	1 x (10 - 16) 2 x (10 - 16)	
Stranded	mm ²	1 x (25 - 70) ³⁾ 2 x 25	
Cu strip (number of segments x width x segment thickness)			
Box terminal	min.	mm	2 x 9 x 0.8
	max.	mm	9 x 9 x 0.8
Copper busbar (width x thickness)	mm		
Bolt terminal and rear-side connection			
Screw connection			M6
Direct on the switch			
	min.	mm	12 x 5
	max.	mm	16 x 5

Design verification as per IEC/EN 61439

Technical data for design verification			
Rated operational current for specified heat dissipation	I _n	A	160
Equipment heat dissipation, current-dependent	P _{vid}	W	29.18
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 8.0

Low-voltage industrial components (EG000017) / Switch disconnector (EC000216)		
Electric engineering, automation, process control engineering / Low-voltage switch technology / Off-load switch, circuit breaker, control switch / Switch disconnector (ecl@ss10.0.1-27-37-14-03 [AKFO60013])		
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 Ue AC	V	690
Rated operating voltage	V	690 - 690
Rated permanent current Iu	A	160
Rated permanent current at AC-23, 400 V	A	0
Rated permanent current at AC-21, 400 V	A	0
Rated operation power at AC-3, 400 V	kW	0
Rated short-time withstand current Icw	kA	2
Rated operation power at AC-23, 400 V	kW	90
Switching power at 400 V	kW	0
Conditioned rated short-circuit current Iq	kA	0
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		Yes
Device construction		Built-in device fixed built-in technique
Suitable for floor 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		Frame clamp
Degree of protection (IP), front side		IP20
Degree of protection (NEMA)		