DATASHEET - LN1-160-I



Switch-disconnector, 3 p, 160A, frame size 1

Part no. LN1-160-I Catalog No. 111997



Delivery program

- contact programs			
Product range			Switch-disconnectors
Protective function			Disconnectors/main switches
Standard/Approval			IEC
Installation type			Fixed
Construction size			LN1
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			1, +, 0
Rated current = rated uninterrupted current	$\boldsymbol{I}_n = \boldsymbol{I}_u$	Α	160
Short-circuit protection max. fuse gL-characteristic		A gL	160

Technical data

Switch-disconnectors

Rated surge voltage invariability	U_{imp}		
Main contacts		V	6000
Auxiliary contacts		V	6000
Rated operational voltage	Ue	V AC	690
Rated operating frequency	f	Hz	50/60
Rated current = rated uninterrupted current	$I_n = I_u$	Α	160
Overvoltage category/pollution degree			III/3
Rated insulation voltage	U _i	V	690
Use in unearthed supply systems		V	≦ 690
Rated short-circuit making capacity			
690 V 50/60 H	Ic	kA	2.8
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	PN1(N1)-63125: 125 PN1(N1)-160: 160
400 415 V	kA	100
690 V	kA	80
With downstream fuse	A gG/gL	PN1(N1)-63125: 125 PN1(N1)-160: 160
400 415 V	kA	100
690 V	kA	10

Rated making and breaking capacity

Rated operational current	l _e	Α	
415 V	I _e	Α	160
690 V	I _e	Α	160
415 V	I _e	Α	160
690 V	l _e	Α	160
Lifespan, mechanical	Operations		20000
Max. operating frequency		Ops/h	120

Lifespan, electrical

Enopul, Goodfour			
400 V 50/60 Hz	Operations		10000
415 V 50/60 Hz	Operations		10000
690 V 50/60 Hz	Operations		7500
400 V 50/60 Hz	Operations		7500
415 V 50/60 Hz	Operations		7500
690 V 50/60 Hz	Operations		5000
Total break time at short-circuit		ms	< 10
Terminal capacity			
Chandard assisment			Day tarminal

Terminal capacity			
Standard equipment			Box terminal
Round copper conductor			
Box terminal			
Solid		mm ²	1 x (10 - 16) 2 x (6 - 16)
Stranded		mm ²	1 x (25 - 70) Up to 95 mm² can be connected depending on the cable manufacturer. 2 x 25
Tunnel terminal			
Solid		mm^2	1 x 16
Stranded			
Stranded		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) 2 x 25
Al conductors, Cu cable			
Tunnel terminal			
Solid		mm ²	1 x 16
Stranded			
Stranded		mm^2	1 x (25 - 95)
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
Control cables			
		mm ²	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	In	Α	160
Equipment heat dissipation, current-dependent	P _{vid}	W	29.184
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 observed.
10.12 Electromagnetic compatibility	Is the panel builder's responsibility. The specifications for the switchgear must 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 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 [AKF060013])

Version as main switch 9	[AIX 0000 10])		
Version as aferty switch Version as emergency stop installation Version as emergency stop installation Version as reversing switch Number of switches Rated operation voltage Ue AC Rated operation current Lu Rated operation current at AC-23, 400 V Rated permanent current at AC-23, 400 V Rated permanent current at AC-21, 400 V Rated permanent current at AC-21, 400 V Rated operation power at AC-3, 400 V Routed of operation power at AC-3, 400 V Rated operation power at AC-3, 400 V Routed of operation power at AC-3, 400 V Routed of routed to uturent lq Routed operation power at AC-3, 400 V	Version as main switch		Yes
Version as emergency stop installation Version as reversing switch Number of switches Name of switches Name of switches Rated permanent current ta AC-23, 400 V Rated permanent current at AC-21, 400 V Rated operation power at AC-3, 400 V Routed operation power at AC-3, 400 V R	Version as maintenance-/service switch		Yes
Version as reversing switch Number of switches Max. rated operation voltage Ue AC Rated operation voltage Ue AC Rated operation voltage Ue AC Rated permanent current urant Lu Rated permanent current at AC-23, 400 V Rated permanent current at AC-23, 400 V Rated permanent current at AC-21, 400 V Rated permanent current at AC-21, 400 V Rated permanent current at AC-21, 400 V Rated permanent current teve AC-23, 400 V Rated permanent current teve AC-24, 400 V Rated permanent ac-24, 400	Version as safety switch		No
Number of switches V 40 Max. rated operation voltage Ue AC V 690 - 690 Rated operating voltage V 690 - 690 Rated permanent current to Machage A 160 Rated permanent current at AC-23, 400 V A 0 Rated operation power at AC-3, 400 V W 0 Rated operation power at AC-3, 400 V K 2 Rated operation power at AC-23, 400 V K 9 Rated operation power at AC-23, 400 V K 9 Switching power at 400 V KW 9 Conditioned rated short-circuit current Iq KW 10 Number of poles KW 10 Number of auxiliary contacts as normally closed contact KW 10 Number of auxiliary contacts as change-over contact K 10 Motor drive optional K Yes Motor drive optional K Yes Motor drive optional K Yes Suitable for front mounting 4-hole K Yes Suitable for front mounting 6-hole K	Version as emergency stop installation		Yes
Max. rated operation voltage Ue AC V 400 Rated operating voltage V 690 - 690 Rated permanent current Iu A 160 Rated permanent current at AC-23, 400 V A 0 Rated short-ine withstand current tow K 2 Rated short-ine withstand current tow K 2 Rated short-ine withstand current tow K 3 Rated short-ine withstand current tow K 9 Switching power at 400 V W 0 Switching power at 400 V W 0 Number of poles K 9 10 Number of swildiary contacts as normally closed contact K 9 10 Number of swildiary contacts as change-over contact K 9 Yes Motor drive optional K Yes Yes	Version as reversing switch		No
Rated operating voltage Rated permanent current lu Rated permanent current at AC-23, 400 V Rated permanent current at AC-21, 400 V Rated permanent current at AC-21, 400 V Rated operation power at AC-3, 400 V Rated operation power at AC-3, 400 V Rated operation power at AC-23, 400 V Routed operation power at AC-3, 400 V Rou	Number of switches		
Rated permanent current Iu A 160 Rated permanent current at AC-23, 400 V A 0 Rated operation power at AC-3, 400 V A 0 Rated operation power at AC-3, 400 V A 2 Rated operation power at AC-23, 400 V A 2 Rated operation power at AC-23, 400 V AW 9 Switching power at 400 V AW 0 Conditioned rated short-circuit current Iq AW 10 Number of auxiliary contacts as normally closed contact B 3 Number of auxiliary contacts as normally open contact B Yes Motor drive integrated B Yes Motor drive integrated B Yes Voltage release optional Bull-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 intermediate mounting Yes Suitable for intermediate mounting Yes Suitable for intermediate mounting Yes Suitable for interme	Max. rated operation voltage Ue AC	V	400
Rated permanent current at AC-23, 400 V Rated permanent current at AC-21, 400 V Rated operation power at AC-3, 400 V Rated short-time withstand current lcw Rated operation power at AC-23, 400 V Rothing power at 400 V Conditioned rated short-circuit current lq Number of poles Number of poles Number of auxiliary contacts as normally closed contact Number of auxiliary contacts as normally cone contact Number of auxiliary contacts as normally open contact Number of auxiliary contacts as normally open contact Number of auxiliary contacts as normally open contact Number of auxiliary contacts as change-over contact Notor drive optional Notor drive integrated Voltage release optional Device construction Suitable for ground mounting Suitable for front mounting 4-hole Suitable for front mounting 4-hole Suitable for distribution board installation Suitable for intermediate mounting Colour control element Suitable for intermediate mounting	Rated operating voltage	V	690 - 690
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 lcw kA 2 Rated operation power at AC-23, 400 V kW 90 Switching power at 400 V kW 0 Conditioned rated short-circuit current lq kA 100 Number of poles KA 100 Number of auxiliary contacts as normally closed contact C 0 Number of auxiliary contacts as change-over contact C 0 Motor drive optional Yes Motor drive integrated No Yes Voltage release optional Yes Suitable for ground mounting Yes Suitable for ground mounting Yes No Suitable for front mounting 4-hole No No Suitable for front mounting centre No No Suitable for distribution board installation Yes No Suitable for intermediate mounting Yes No Suitable for intermediate mounting Yes Yes <t< td=""><td>Rated permanent current lu</td><td>А</td><td>160</td></t<>	Rated permanent current lu	А	160
Rated operation power at AC-3, 400 V Rated short-time withstand current lcw Rated operation power at AC-23, 400 V Rothing power at 400 V Conditioned rated short-circuit current lq Number of poles Number of poles Number of auxiliary contacts as normally closed contact Number of auxiliary contacts as normally open contact Number of auxiliary contacts as change-over contact Number of auxiliary contacts as normally closed contact Numb	Rated permanent current at AC-23, 400 V	Α	
Rated short-time withstand current lcw Rated operation power at AC-23,400 V Switching power at 400 V Conditioned rated short-circuit current lq Number of poles Number of poles Number of auxiliary contacts as normally closed contact Number of auxiliary contacts as normally open contact Number of auxiliary contacts as change-over contact Notor drive optional Notor drive integrated Notor drive integrated Notage release optional Suitable for ground mounting Suitable for front mounting 4-hole Suitable for front mounting entre Suitable for front mounting centre Suitable for distribution board installation Suitable for intermediate mounting Court control element New Yes No No No No No No No No No N	Rated permanent current at AC-21, 400 V	А	0
Rated operation power at AC-23, 400 V Switching power at 400 V Conditioned rated short-circuit current Iq Number of poles Number of auxiliary contacts as normally closed contact Number of auxiliary contacts as normally open contact Number of auxiliary contacts as normally open contact Number of auxiliary contacts as change-over contact Notor drive integrated Notor drive integrated Notage release optional Device construction Suitable for ground mounting Suitable for ground mounting Suitable for front mounting 4-hole Suitable for front mounting entre Suitable for firont mounting entre Suitable for distribution board installation Suitable for intermediate mounting Collour control element Suitable for intermediate mounting	Rated operation power at AC-3, 400 V	kW	0
Switching power at 400 V kW 0 Conditioned rated short-circuit current Iq kA 100 Number of poles 3 3 Number of auxiliary contacts as normally closed contact 0 0 Number of auxiliary contacts as normally open contact 0 0 Number of auxiliary contacts as change-over contact 0 0 Motor drive optional Yes No Voltage release optional Yes Suitable for ground mounting Suitable for ground mounting Yes Built-in device fixed built-in technique Suitable for front mounting 4-hole No No Suitable for front mounting centre No No Suitable for distribution board installation Yes Yes Suitable for intermediate mounting Yes Yes	Rated short-time withstand current lcw	kA	2
Conditioned rated short-circuit current Iq kA 100 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 normally open contact 0 Number of auxiliary contacts as change-over contact 0 Motor drive optional Ves	Rated operation power at AC-23, 400 V	kW	90
Number of poles Number of auxiliary contacts as normally closed contact Number of auxiliary contacts as normally open contact Number of auxiliary contacts as normally open contact Number of auxiliary contacts as change-over contact Number of auxiliary contacts as change-over contact Notor drive optional Motor drive optional Notor drive integrated Notor dr	Switching power at 400 V	kW	0
Number of auxiliary contacts as normally open contact Number of auxiliary contacts as normally open contact Number of auxiliary contacts as change-over contact Number of auxiliary contacts as change-over contact Notor drive optional Motor drive integrated No Voltage release optional Pes Device construction Suitable for ground mounting Suitable for front mounting 4-hole Suitable for front mounting centre Suitable for distribution board installation Suitable for intermediate mounting Colour control element O O O O O O O O O O O O O	Conditioned rated short-circuit current Iq	kA	100
Number of auxiliary contacts as normally open contact Number of auxiliary contacts as change-over contact Number of auxiliary contacts as change-over contact Notor drive optional Motor drive integrated No Voltage release optional Device construction Suitable for ground mounting Suitable for front mounting 4-hole Suitable for front mounting entre Suitable for intermediate mounting Suitable for intermediate mounting Colour control element O O O O O O O O O O O O O	Number of poles		3
Number of auxiliary contacts as change-over contact Motor drive optional Motor drive integrated No Voltage release optional Pevice construction Suitable for ground mounting Suitable for front mounting 4-hole Suitable for front mounting centre Suitable for distribution board installation Suitable for intermediate mounting Colour control element O Yes Colour control element O O Yes Colour control element O O O O O O O O O O O O O	Number of auxiliary contacts as normally closed contact		0
Motor drive optional Motor drive integrated No Voltage release optional Ves Device construction Built-in device fixed built-in technique Suitable for ground mounting Yes Suitable for front mounting 4-hole No Suitable for distribution board installation Suitable for intermediate mounting	Number of auxiliary contacts as normally open contact		0
Motor drive integrated Voltage release optional Device construction Suitable for ground mounting Suitable for front mounting 4-hole Suitable for front mounting centre Suitable for distribution board installation Suitable for intermediate mounting Colour control element No No No Grey	Number of auxiliary contacts as change-over contact		0
Voltage release optional Device construction Suitable for ground mounting Suitable for front mounting 4-hole Suitable for front mounting centre Suitable for distribution board installation Suitable for intermediate mounting Colour control element Yes Suitable for front mounting tentre Suitable for distribution board installation Yes Colour control element Yes Grey	Motor drive optional		Yes
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 Grey Colour control element Built-in device fixed built-in technique No So Grey	Motor drive integrated		No
Suitable for ground mounting Suitable for front mounting 4-hole Suitable for front mounting centre No Suitable for distribution board installation Yes Suitable for intermediate mounting Yes Colour control element Yes Grey	Voltage release optional		Yes
Suitable for front mounting 4-hole No Suitable for front mounting centre No Suitable for distribution board installation Yes Suitable for intermediate mounting Colour control element No Yes Grey	Device construction		Built-in device fixed built-in technique
Suitable for front mounting centre No Suitable for distribution board installation Yes Suitable for intermediate mounting Yes Colour control element Grey	Suitable for ground mounting		Yes
Suitable for distribution board installation Yes Suitable for intermediate mounting Yes Colour control element Grey	Suitable for front mounting 4-hole		No
Suitable for intermediate mounting Yes Colour control element Grey	Suitable for front mounting centre		No
Colour control element Grey	Suitable for distribution board installation		Yes
·	Suitable for intermediate mounting		Yes
Type of control element Rocker lever	Colour control element		Grey
	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)	

Dimensions



