DATASHEET - LS-02



Position switch, Rounded plunger, Basic device, expandable, 2 NC, Cage Clamp, Yellow, Insulated material, -25 - +70 $^{\circ}$ C



Part no. LS-02 Catalog No. 266107 Alternate Catalog LS-02

No.

EL-Nummer 4356034

(Norway)

Delivery program

Delivery program		
Basic function		Position switches Safety position switches
Part group reference		LS(M)
Product range		Rounded plunger
Degree of Protection		IP66, IP67
Features		Basic device, expandable
Ambient temperature	°C	-25 - +70
Contacts		
N/C = Normally closed		2 NC →
Notes		= safety function, by positive opening to IEC/EN 60947-5-1
Contact sequence		0
Contact travel = Contact closed = Contact open		0 3.0 6.1 11-12 NC 21-22 NC 3.0 Zw = 4.5 mm
Positive opening (ZW)		yes
Colour		
Enclosure covers		Yellow
Enclosure covers		
Housing		Insulated material
Connection type		Cage Clamp
Notes		Cage-Clamp is a registered trademark of Wago Kontakttechnik, 32432 Minden, Germany. Accessories for the Cage-Clamp terminals from Wago:power comb, gray, Wago Article No. 264-402

Technical data General

delicial		
Standards		IEC/EN 60947
Climatic proofing		Damp heat, constant, to IEC 60068-2-78; damp heat, cyclical, to IEC 60068-2-30
Ambient temperature	°C	-25 - +70
Mounting position		As required
Degree of Protection		IP66, IP67
Terminal capacities	mm^2	
Solid	mm^2	1 x (0.5 - 2.5)
Flexible with ferrule	mm^2	1 x (0.5 - 1.5)

Contacts/switching capacity Contacts/switching capacity Ump VAC 4000 Rated insulation voltage Ump VAC 400 Overvoltage category/pollution degree III/3 III/3 Rated operational current In AC AC-15 In AC 24 V In AC 24 V In AC 380 V 400 V 415 V In AC 24 V In AC 110 V In AC 24 V In AC 110 V In AC 110 V In AC 220 V	Repetition accuracy		mm	0.15
Name of mentals withstand voltage Uimpow Vimbor			111111	0.13
National insulation voltage Overvoltage category/pollution degree Rated grantenial current AC-15 24 V		Uimn	V AC	4000
Overvoltage category/pollution degree I/IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII				
AC-15 24 V	-	U _I	٧	
AC-15 24 V				111/3
24 V 230 V 240 V	·	I _e	А	
220 V 230 V 240 V 240 V 241 V 240 V 240 V 241 V 240 V 240 V 241 V 240 V 250 V 240 V 250 V 240				
10C-13	24 V	l _e	Α	6
DC-13	220 V 230 V 240 V	l _e	Α	6
10	380 V 400 V 415 V	l _e	Α	4
110 V le A 0.6 220 V lo 10 A 0.3 Control circuit reliability at 24 V D C/5 mA HF Fault probability	DC-13			
Z20 V Control circuit reliability at 24 V DC/5 mA HF Fault probability at 5 V DC/1 mA HF Fault probability 5 x 10 °, < 1 fault in 10 ° operations Supply frequency Short-circuit rating to IEC/EN 69947-5-1 max. fuse Rated conditional short-circuit current Mechanical variables Lifespan, mechanical Contact temperature of roller head Mechanical shock resistance (half-sinusoidal shock, 20 ms) Standard-action contact Operating frequency Actuation Mechanical Actuating force at beginning/end of stroke Actuating force at beginning/end of stroke Actuating forque of rotary drives Max. operating speed with DIN cam Mechanics shock resistance (half-sinusoidal shock actual in 10 ° operations probability 10 ° 7 < 1 fault in 10 ° operations Fault probability 5 x 10 °, < 1 failure at 5 x 10 ° operations max. 400 Max. operating speed with DIN cam Mechanical Mechanical Mex. operating speed with DIN cam Mechanical Mex. operating speed with DIN cam Mechanical shock resistance (half-sinusoidal shock, 20 ms) Mex. operating speed with DIN cam Mex. operating speed with DIN cam Mechanical Mex. operating speed with DIN cam Mechanical	24 V	l _e	Α	3
Control circuit reliability at 24 V DC/5 mA ### Fault rprobability at 5 V DC/1 mA ###################################	110 V	l _e	Α	0.6
HF Fault probability 10 -7 , < 1 fault in 10 operations at 5 V DC/1 mA HF Fault probability 10 -7 , < 1 fault in 10 operations Supply frequency Supply frequency Short-circuit rating to IEC/EN 60947-5-1 max. fuse Rated conditional short-circuit current Mechanical variables Lifespan, mechanical Contact temperature of roller head Mechanical shock resistance (half-sinusoidal shock, 20 ms) Standard-action contact Operations Yeartions Standard-action contact Operations Mechanical Actuation Mechanical Actuating force at beginning/end of stroke Actuating torque of rotary drives Max. operating speed with DIN cam HF Fault probability 10 -7 , < 1 fault in 10 operations Fault on -7 , < 1 fault in 10 operations Fault on -7 , < 1 fault in 10 operations Fault on -7 , < 1 fault in 10 operations Pax 400 Actuating fore at beginning/end of stroke Actuating force at beginning/end of stroke Actuating torque of rotary drives Max. operating speed with DIN cam HF Fault probability Fault on -7 , < 1 fault in 10 operations Fax 400 Actuating force at beginning/end of stroke Na 1.0/8.0 Na 0.2 Max. operating speed with DIN cam HE Fault probability Fax 10 -7 , < 1 failure at 5 x 10 operations max. 400 Actuation of text in 10 operations Fax 400 Actuation of text in 10 operations Fax 4 gG/gL Actuating force at beginning/end of stroke Na 1.0/8.0	220 V	l _e	Α	0.3
at 5 V DC/1 mA HF Fault probability 15 x 10-6, <1 failure at 5 x 10-6 operations Supply frequency Short-circuit rating to IEC/EN 60947-5-1 max. fuse Rated conditional short-circuit current Mechanical variables Lifespan, mechanical Contact temperature of roller head Mechanical shock resistance (half-sinusoidal shock, 20 ms) Standard-action contact Operations/ Standard-action contact Operations/ Actuation Mechanical Actuating force at beginning/end of stroke Actuating force at beginning/end of stroke Actuating forque of rotary drives Max. operating speed with DIN cam HF Fault probability Fault at 5 x 10-6 Fault and Audo Fault at 5 x 10-6 Fault at 400 Fault at 5 x 10-6 Fault at 5 x 10-6 Fault at 5 x 10-6 Fault at 400 Fault at 5 x 10-6 Fault at 5 x 10-6 Fault at 400 Fault at 400 Fault at 5 x 10-6 Fault at 400 Fault at 400 Fault at 5 x 10-6 Fault at 400 Fault at 400 Fault at 5 x 10-6 Fault at 400 Fault at 5 x 10-6 Fault at 400 Fault at 5 x 10-6 Fault at 400 Fault at	Control circuit reliability			
Supply frequency Short-circuit rating to IEC/EN 60947-5-1 max. fuse Rated conditional short-circuit current Mechanical variables Lifespan, mechanical Contact temperature of roller head Mechanical shock resistance (half-sinusoidal shock, 20 ms) Standard-action contact Operating frequency Operating frequen	at 24 V DC/5 mA	H _F	probabilit	ty
Short-circuit rating to IEC/EN 60947-5-1 max. fuse Rated conditional short-circuit current Mechanical variables Lifespan, mechanical Contact temperature of roller head Mechanical shock resistance (half-sinusoidal shock, 20 ms) Standard-action contact Operations y 10 Standard-action contact Operations y 25 Operations frequency Operations i 2 5 Operations frequency Actuation Mechanical Actuating force at beginning/end of stroke Actuating torque of rotary drives Max. operating speed with DIN cam N 1,08.0 N 1,08.0 N 1,08.0	at 5 V DC/1 mA	H _F	Fault probabilit	$< 5 \times 10^{-6}$, < 1 failure at 5×10^{6} operations
max. fuse A gG/gL Rated conditional short-circuit current kA gG/gL Rated conditional short-circuit current kA gG/gL Rechanical variables Lifespan, mechanical Operations x 10 ⁶ 8 Contact temperature of roller head Contact t	Supply frequency		Hz	max. 400
Rated conditional short-circuit current Mechanical variables Lifespan, mechanical Contact temperature of roller head Mechanical shock resistance (half-sinusoidal shock, 20 ms) Standard-action contact Operations/n g 25 Operations/n ≤ 6000 Actuation Mechanical Actuating force at beginning/end of stroke Actuating torque of rotary drives Max. operating speed with DIN cam Na. 02 Max. operating speed with DIN cam	Short-circuit rating to IEC/EN 60947-5-1			
Mechanical variables Lifespan, mechanical Contact temperature of roller head Mechanical shock resistance (half-sinusoidal shock, 20 ms) Standard-action contact Operations/h Standard-action contact Operations/h Actuation Mechanical Actuation Actuation Actuating force at beginning/end of stroke Actuating torque of rotary drives Max. operating speed with DIN cam Operations/h Nm 0.2 m/s 1/0.5	max. fuse		A gG/gL	6
Lifespan, mechanical Contact temperature of roller head Contact temperature of roller head Mechanical shock resistance (half-sinusoidal shock, 20 ms) Standard-action contact Operations/h Actuation Mechanical Actuating force at beginning/end of stroke Actuating torque of rotary drives Max. operating speed with DIN cam Operations x 106 2 5 6000 Actuation N 1.0/8.0 0.2 Mm/s 1/0.5	Rated conditional short-circuit current		kA	1
Contact temperature of roller head **C \$\geq 100\$ Mechanical shock resistance (half-sinusoidal shock, 20 ms) Standard-action contact **Operations/h **Operations/h **Actuation** Mechanical **Actuating force at beginning/end of stroke **Actuating torque of rotary drives **Max. operating speed with DIN cam** **Actuation** **Nm** **Operations/h **Operati	Mechanical variables			
Mechanical shock resistance (half-sinusoidal shock, 20 ms) Standard-action contact Q 25 Operating frequency Actuation Mechanical Actuating force at beginning/end of stroke Actuating torque of rotary drives Max. operating speed with DIN cam Actual shock resistance (half-sinusoidal shock, 20 ms) Q 25 Operations/h ≤ 6000 N 1.0/8.0 N 0.2 m/s 1/0.5	Lifespan, mechanical	Operations	x 10 ⁶	8
Standard-action contact Operating frequency Operations/h Actuation Mechanical Actuating force at beginning/end of stroke Actuating torque of rotary drives Max. operating speed with DIN cam g 25 6000 1.0/8.0 N 1.0/8.0 Nm 0.2 m/s 1/0.5	Contact temperature of roller head		°C	≦ 100
Operating frequency Operations/h ≤ 6000 Actuation Mechanical N 1.0/8.0 Actuating force at beginning/end of stroke N 0.2 Max. operating speed with DIN cam m/s 1/0.5	Mechanical shock resistance (half-sinusoidal shock, 20 ms)			
Actuation Mechanical Actuating force at beginning/end of stroke Actuating torque of rotary drives Max. operating speed with DIN cam N 1.0/8.0 Nm 0.2 Max. operating speed with DIN cam m/s 1/0.5	Standard-action contact		g	25
Mechanical Actuating force at beginning/end of stroke N 1.0/8.0 Actuating torque of rotary drives Nm 0.2 Max. operating speed with DIN cam m/s 1/0.5	Operating frequency	Operations/h		≦ 6000
Actuating force at beginning/end of stroke N 1.0/8.0 Actuating torque of rotary drives Nm 0.2 Max. operating speed with DIN cam m/s 1/0.5	Actuation			
Actuating torque of rotary drives Nm 0.2 Max. operating speed with DIN cam m/s 1/0.5	Mechanical			
Max. operating speed with DIN cam m/s 1/0.5	Actuating force at beginning/end of stroke		N	1.0/8.0
	Actuating torque of rotary drives		Nm	0.2
Notes for angle of actuation $\alpha = 0^{\circ}/30^{\circ}$	Max. operating speed with DIN cam		m/s	1/0.5
	Notes			for angle of actuation α = 0°/30°

Design verification as per IEC/EN 61439

Technical data for design verification			
Rated operational current for specified heat dissipation	In	Α	6
Heat dissipation per pole, current-dependent	P _{vid}	W	0.17
Equipment heat dissipation, current-dependent	P _{vid}	W	0
Static heat dissipation, non-current-dependent	P _{vs}	W	0
Heat dissipation capacity	P _{diss}	W	0
Operating ambient temperature min.		°C	-25
Operating ambient temperature max.		°C	70
EC/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.

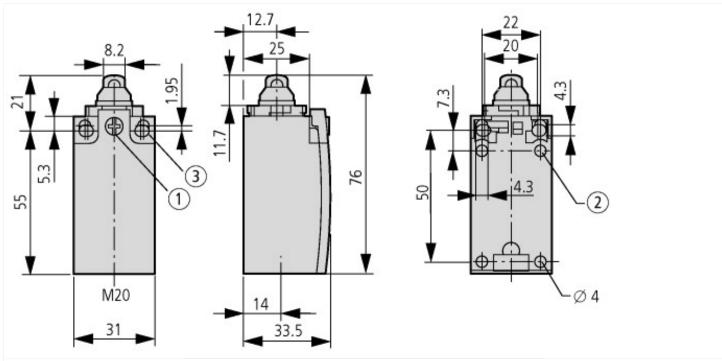
10.3 Degree of protection of ASSEMBLIES	Does not apply, since the entire switchgear needs to be evaluated.
10.4 Clearances and creepage distances	Meets the product standard's requirements.
10.5 Protection against electric shock	Does not apply, since the entire switchgear needs to be evaluated.
10.6 Incorporation 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 7.0

Fechnical data ETIM 7.0			
Sensors (EG000026) / End switch (EC000030)			
Electric engineering, automation, process control engineering / Binary sensor technology, safety-related sensor technology / Position switch / Position switch (Type 1) (ecl@ss10.0.1-27-27-06-01 [AGZ382015])			nsor technology / Position switch / Position switch (Type 1)
Width sensor	m	nm	31
Diameter sensor	m	nm	0
Height of sensor	m	nm	61
Length of sensor	m	nm	33.5
Rated operation current le at AC-15, 24 V	А		6
Rated operation current le at AC-15, 125 V	А	L	6
Rated operation current le at AC-15, 230 V	А	L	6
Rated operation current le at DC-13, 24 V	А		3
Rated operation current le at DC-13, 125 V	А		0.8
Rated operation current le at DC-13, 230 V	А		0.3
Switching function			Slow-action switch
Switching function latching			No
Output electronic			No
Forced opening			Yes
Number of safety auxiliary contacts			2
Number of contacts as normally closed contact			2
Number of contacts as normally open contact			0
Number of contacts as change-over contact			0
Type of interface			None
Type of interface for safety communication			None
Construction type housing			Cuboid
Material housing			Plastic
Coating housing			Other
Type of control element			Plunger
Alignment of the control element			Other
Type of electric connection			Other
With status indication			No
Suitable for safety functions			Yes
Explosion safety category for gas			None
Explosion safety category for dust			None
Ambient temperature during operating	°C	С	25 - 70
Degree of protection (IP)			IP67
Degree of protection (NEMA)			4X

Approvals	
Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14; CE marking
UL File No.	E29184
UL Category Control No.	NKCR
CSA File No.	12528
CSA Class No.	3211-03
North America Certification	UL listed, CSA certified
Degree of Protection	IEC: IP66, 67, UL/CSA Type 3R, 4X (indoor use only), 12, 13

Dimensions



- ① Tightening torque of cover screws: 0.8 Nm \pm 0.2 Nm ② only with LS (insulated version) ③ Fixing screws $2 \times M4 \ge 30$ $M_A = 1.5$ Nm

