Safety and Reliability – Monitoring and Indication
LS-Titan® Position Switches

xCommand

Command and signalling – ergonomic shape, attractive design. Switching control circuit currents reliably and precisely.

RMQ command and signalling devices
FAK foot and palm switches
SL signal towers
LS-Titan position switches
T/P rotary switches
ETR timing relays
EMR measuring relays
ESR safety relays

Selection Guide

LS-Titan® position switch
LSE-Titan® position switch

MOELLER

Think future. Switch to green.

LS-Titan® Position Switch
Quick and Flexible

Metal or plastic versions
The LS-Titan position switches are optionally available in robust metal enclosures or in light insulated enclosures. Exchangeable metal or plastic operating heads make the LS-Titan position switch particularly flexible.
Modular design, vibration proof and maintenance-free Cage-Clamp terminations guarantee extremely fast installation.

Electronic position switch with programmable operating point
The highlight is the world's first electronic position switch, the LSE-Titan. Its freely programmable operating point can be set individually at any time:
Move to the operating point – press the Set key – ready!

The devices are suitable for use with safety applications designed to protect persons or processes.

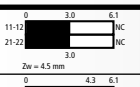
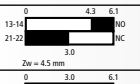
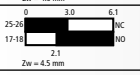
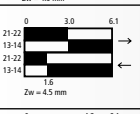
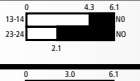
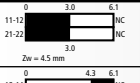
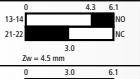
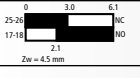
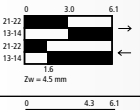
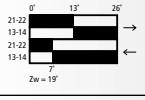
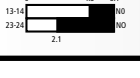
LS-Titan® Position Switch

UL/CSA 4X, 13
IP 66

Contacts
M = Make
B = Break
⊖ = Safety function with positively opening contacts to IEC/EN 60947-5-1

Contact sequence diagram for plunger and roller plunger

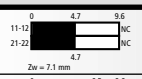
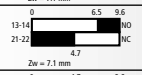
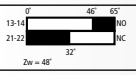
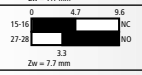
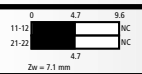
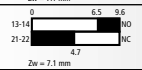
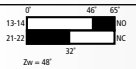
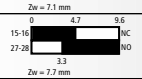
Contact sequence contact
■ **closed**
□ **open**
Zw = Positive opening clearance

				Contact sequence diagram for plunger and roller plunger	Plunger EN 50 047	Roller plunger EN 50 047	Contact sequence diagram for spring rod
plastic version	–	2B⊖			**LS-02**		
	1M	1B⊖			**LS-11**	**LS-11/P**	
	1M	1B⊖			**LS-11D**		
	1M	1B⊖			**LS-11S***	**LS-11S/P***	
	2M	–			**LS-20**		
metal version	–	2B⊖			**LSM-02**		
	1M	1B⊖			**LSM-11**	**LSM-11/P**	
	1M	1B⊖			**LSM-11D**		
	1M	1B⊖			**LSM-11S***	**LSM-11S/P***	
	2M	–			**LSM-20**		

* LS/LSM-..S = Snap-Action contact

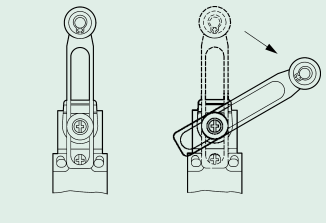
LSE-Titan® electronic position switch
Setting a variable operating point
The LSE electronic position switch has an operating point that can be set variably. Two fast and bounce-free PNP switch outputs enable high switching frequencies. They are protected against short-circuit and overload and are equipped with an abrupt switching behaviour. This guarantees a defined and reproducible operating point. The actual operation point is in a range between 0.5 mm to 5.5 mm (supplied ex-works = 3 mm).

The setting to the "new" operating point is performed as follows: The plunger must be moved from the "old" to the "new" operating position. Now the set button should be pressed for a duration of 1 sec. The LED now flashes with a higher pulse frequency and the new operation point is set retentively.

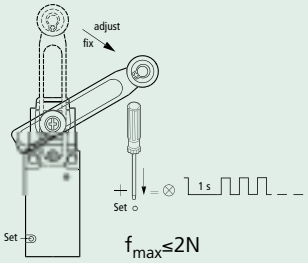
Spring-Rod	Contact sequence diagram for roller lever	Roller lever EN 50 047	Contact sequence diagram for rotary lever, adjustable roller lever and actuating rod	Rotary lever EN 50 047	Adjustable roller lever	Actuating rod
						
		LS-02/L				
		LS-11/L		LS-11/RL	LS-11/RLA	
		LS-11D/L				
LS-11S/S*		LS-11S/L*		LS-11S/RL*	LS-11S/RLA*	LS-11S/RR*
		LSM-02/L				
		LSM-11/L		LSM-11/RL	LSM-11/RLA	
		LSM-11D/L				
LSM-11S/S*		LSM-11S/L*		LSM-11S/RL*	LSM-11S/RLA*	LSM-11S/RR*

Limit switch electronic -LSE-

Individual adjustment of switching point



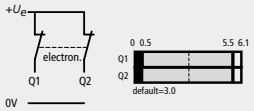
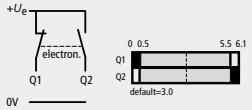
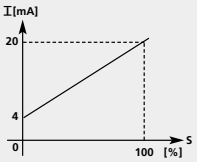
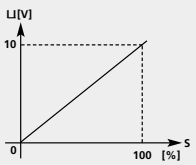
switching point setup



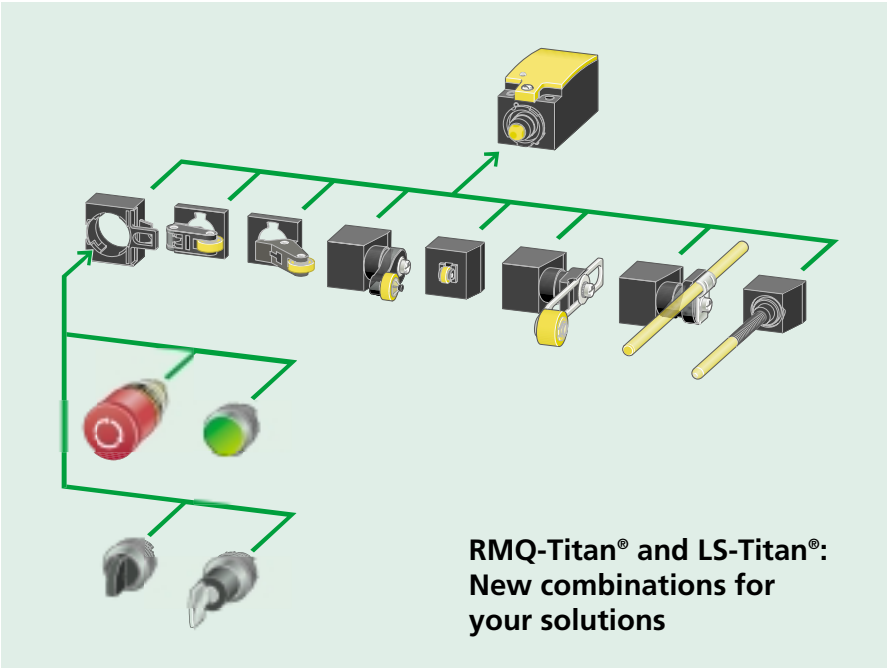
$f_{max} \leq 2N$

TÜV Rheinland — Bauart geprüft — Functional Safety — Type approved

Simply snap on the RMQ-Titan command device
A further unique feature is the ability to combine a control circuit device from the RMQ-Titan range with the LS-Titan position switches. Pushbutton actuators, selector switches or emergency-stop buttons can be simply snapped on directly as the operating heads on each position switch. The combined unit maintains the degree of protection IP66 on both the front and rear.

LSE-Titan® Position Switch	Contact sequence diagram for plunger	Optical status display
Plastic version 		**LSE-02**
		**LSE-11**
Plastic version 		**LSE-AI 4 - 20 mA**
		**LSE-AU 0 - 10 V**

LS-Titan® operating heads, accessories	Roller lever	Angled roller lever	Roller plunger
Plastic version			
	LS-XL	**LS-XLA**	**LS-XP**
Metal version			
	LSM-XL	**LSM-XLA**	**LSM-XP**



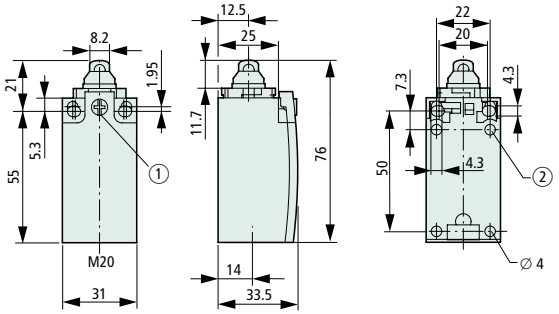
RMQ-Titan® and LS-Titan®: New combinations for your solutions

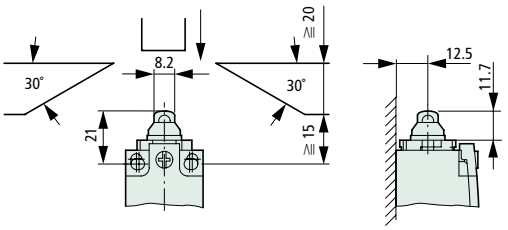
The operating head can be attached in all four directions (4 x 90°) and can be installed quickly and securely with a bayonet fitting.

Rotary lever	Adjustable roller lever d=18mm	Adjustable-roller lever d=30mm	Adjustable roller lever d=40mm	Adjustable roller lever d=40mm (Rubber)	Plastic actuating rod	Metal actuating rod	Spring rod actuator	RMQ-Titan fixing adapter
								
LS-XRL	**LS-XRLA**	**LS-XRLA30**	**LS-XRLA40**	**LS-XRLA40R**	**LS-XRR**	**LS-XRRM**	**LS-XS**	**M22-LS**
								
LSM-XRL	**LSM-XRLA**				**LSM-XRR**	**LSM-XRRM**	**LSM-XS**	

Dimensions
LS-Titan® Position Switches

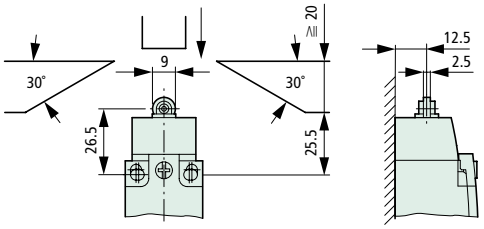
Position switches
LS-..., LSM-..., LSE-..



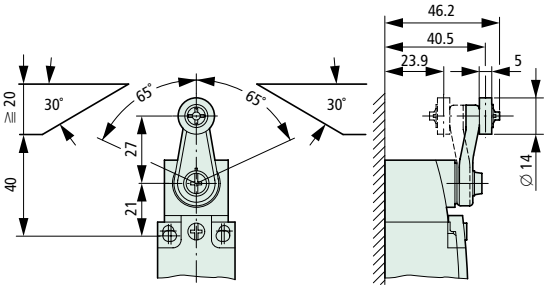


① Tightening torque of cover screw: 1.0 Nm ± 0.2 Nm ② Only with LS (plastic design)

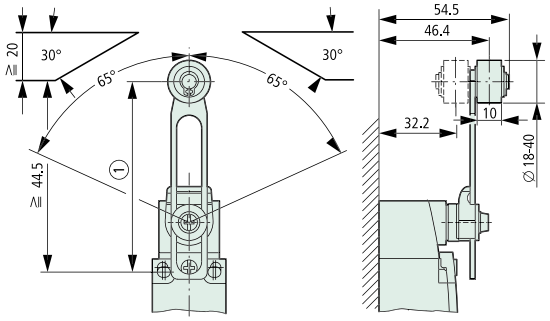
LS-11 (S)/P



LS(M)-11(S)/RL

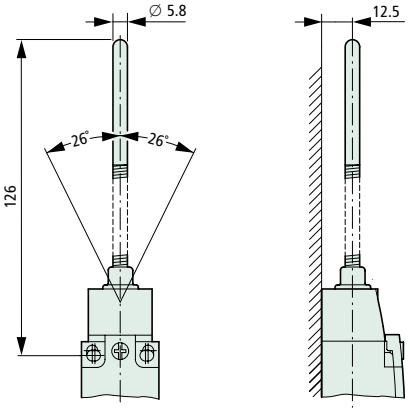


LS(M)-11(S)/RLA

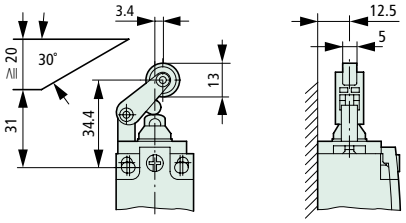


① Setting range from 54.5 to 97

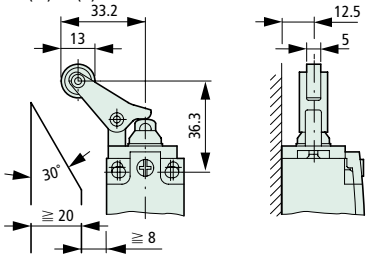
LS(M)-11S/S



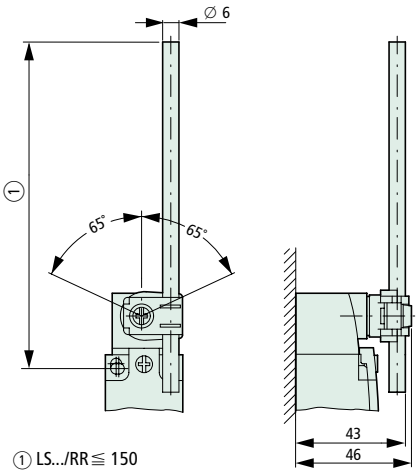
LS(M)-.../L



LS(M)-XL(A)



LS(M)-11S/RR



① LS.../RR ≦ 150
LS.../RRM ≦ 210

Technical Data

			Complete unit to IP66 LS, LSM	LSE-11, LSE-11	LSE-AI	LSE-AU
General						
Standards and regulations			IEC/EN 60947	IEC/EN 60947, EN 61000-4	IEC/EN 60947, EN 61000-4	IEC/EN 60947, EN 61000-4
Climatic proofing			Damp heat, constant to IEC 60068-2-3, Damp heat, cyclic to IEC 60068-2-30			
Ambient temperature	°C		-25/+70	-25/+70	-25/+70	-25/+70
Mounting position			as required	as required	as required	as required
Degree of protection			IP66	IP66	IP66	IP66
Cage Clamp terminal capacity						
solid		mm^2	1 x (0.5 – 2.5)	1 x (0.5 – 2.5)	1 x (0.5 – 2.5)	1 x (0.5 – 2.5)
flexible with ferrule DIN 46228		mm^2	1 x (0.5 – 1.5)	1 x (0.5 – 1.5)	1 x (0.5 – 1.5)	1 x (0.5 – 1.5)
Power Supply						
Rated voltage	U_e	V DC	–	12 – 30	24 (–15%/+20%)	24 (–15%/+20%)
Rated operational current						
12 V	I	mA	–	15	–	–
24 V	I	mA	–	18	28 – 45	24
30 V	I	mA	–	19	–	–
Conductors/Switching capacity						
Rated impulse withstand voltage	U_{imp}	V AC	4000	–	–	–
Rated isolation	U_i	V	400	–	–	–
Overvoltage category/ pollution degree			III/3	III/3	III/3	III/3
Rated operational current						
AC-15 24 V	I_e	A	6	–	–	–
230 V/240 V	I_e	A	6	–	–	–
400 V/415 V	I_e	A	4	–	–	–
DC-13 24 V	I_e	A	10	0.2	–	–
110 V	I_e	A	1	–	–	–
220 V	I_e	A	0.5	–	–	–
Analog output Q1						
Output voltage		V DC	–	–	–	0 – 10
Output current		mA	–	–	4 – 20	–
Resolution		Steps	–	–	100	100
Step tolerance		Step	–	–	< 1	< 1
Load impedance, resistive load		Ω	–	–	< 400	> 1000
Digital diagnostic output Q2						
Normal operation		V	–	–	approx. U_e	approx. U_e
		m A	–	–	< 200	< 200
Fault scenario		V	–	–	0	0
Control circuit reliability						
at 24 V DC/5 mA	H_F	Fault-frequency	< 10^{-7}, < 1 fault in 10^7 operations	–	–	–
at 5 V DC/1 mA	H_F	Fault-frequency	< 10^{-6}, < 1 fault in 5 x 10^6 operations	–	–	–
Mains frequency		Hz	max. 400	–	–	–
Short-circuit rating in closed state (IEC/EN 60947-5-1)						
Fuseless		Type	PKZM 0-10 PXL-B6/1	non-inherently short-circuit proof, after reset switch back on	non-inherently short-circuit proof, after reset switch back on	non-inherently short-circuit proof, after reset switch back on
Max. fuse		A gG/gl	10	–	–	–
Short-circuit rating to IEC/EN 60947-5-1						
Max. fuse		A gG/gl	6	–	–	–
Repetition accuracy		mm	± 0.02	± 0.02	± 0.02	± 0.02

Note

The following applies for LSE-11, LSE-02: Ensure that the voltage supply is not interrupted when setting the switching point.
Cage-Clamp is a registered trademark of Wago Kontakttechnik, 32423 Minden, Germany.
Accessories and actuation tools for the Cage-Clamp connection available from Wago:
Actuation tool, 2-way, Wago article no. 280-432
Screwdriver short, angled, Wago article no. 210-258
Jumper insert, grey, Wago article no. 264-402

Technical Data

			Complete unit to IP66			
			LS, LSM	LSE-11, LSE-02	LSE-AI	LSE-AU
Mechanical Features						
Life						
Slow action contact	operations	x 10^6	3	–	–	–
Snap-action contact	operations	x 10^6	3	3 (electronic)	–	–
Contact temperature of the roller head		°C	≦ 100	≦ 100	≦ 100	≦ 100
Mechanical shock resistance (half-sinusoidal shock 20 ms)						
Slow action contact		g	25	–	–	–
Snap-action contact		g	2	–	–	–
Basic unit		g	–	30	30	30
Operating frequency	operations/h		≦ 6000	≦ 3000	≦ 3000	≦ 3000
Switching point				0.5 – 5.5 mm, adjustable	–	–
Hysterysis		mm	–	0.4	0.4	0.4
Resolution		mm	–	0.04	0.06	0.06
Drive						
Mechanical						
Actuating force travel start/end						
Basic unit		N	1.0/8.0	3.5/8.0	3.5/8.0	3.5/8.0
LS(M)-XP		N	1.0/8.0	1.0/8.0	1.0/8.0	1.0/8.0
LS(M)-XL		N	1.0/8.0	1.0/8.0	1.0/8.0	1.0/8.0
LS(M)-XLA		N	1.0/8.0	1.0/8.0	1.0/8.0	1.0/8.0
Rotary drive actuation torque		Nm	0.2	0.2	0.2	0.2
Max. operating speed with DIN cams						
Basic unit with angle speed of operation	α = 0°/30°	m/s	1/0.5	1/0.5	1/0.5	1/0.5
LS(M)-XRL with angle speed of operation	α = 0°	m/s	1.5	1.5	1.5	1.5
LS(M)-XRLA with angle speed of operation	α = 30°, L = 125 mm	m/s	1.5	1.5	1.5	1.5
LS(M)-XRR with	L = 130 mm	m/s	1.5	1.5	1.5	1.5
LS(M)-XL with angle speed of operation	α = 30°/45°	m/s	1	1	1	1
LS(M)-XLA with angle speed of operation	α = 30°/45°	m/s	1	1	1	1
LS(M)-XP with angle speed of operation	α = 0°/30°	m/s	1/1	1/1	1/1	1/1
Electromagnetic Compatibility (EMC)						
Electrostatic discharge (IEC/EN 61000-4-2, Level 3, ESD)						
Air discharge		kV	–	8	8	8
Contact discharge		kV	–	4	4	4
Electromagnetic fields (IEC/EN 61000-4-3, Level 3, RFI)		V/m	–	10	10	10
Burst Impulse (IEC/EN 61000-4-4, Level 3)						
Supply lines		kV	–	2	2	2
Signal lines		kV	–	2	2	2
Surge (IEC/EN 61000-4-5)		kV	–	0.5	0.5	0.5
Immunity to line-conducted interference (IEC/EN 61000-4-6)		V	–	10	10	10

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