

LS-Titan Miniature DIN Switches



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LS-Titan Miniature DIN Switches

Product Description

Eaton’s LS-Titan® limit switch line is a complete offering of safety position switches designed for worldwide application. Economical insulated plastic or rugged metal enclosures and modular, plug-in operating heads and bodies make LS-Titan a flexible switching solution.

A highlight of the LS-Titan switch line is the world’s first electronic position switch (LSE models). These switches feature freely programmable operating points that can be set individually at any time. Additional LSE models provide analog outputs proportional to the actuator position.

LS-Titan switches are suitable for use in safety applications designed to protect persons or processes.

Features

- Modular, plug-in system (head and body components)
- Positive opening NC contacts for safety applications
- Wide variety of economical plastic and rugged metal versions available
- Operating heads can be rotated 90 degrees to suit specific direction of operation
- Unique electronic safety position switches (LSE models) provide analog (0–10 Vdc or 4–20 mA) outputs proportional to the actuator position and allow for easy configuration of a custom trip point
- Can be ordered as separate components (head and body) or as completely assembled switches
- Screw and Cage Clamp® (standard on LSE models and optionally available on mechanical models) connections provide larger wiring areas for easier installation
- Approved for worldwide application

Standards and Certifications

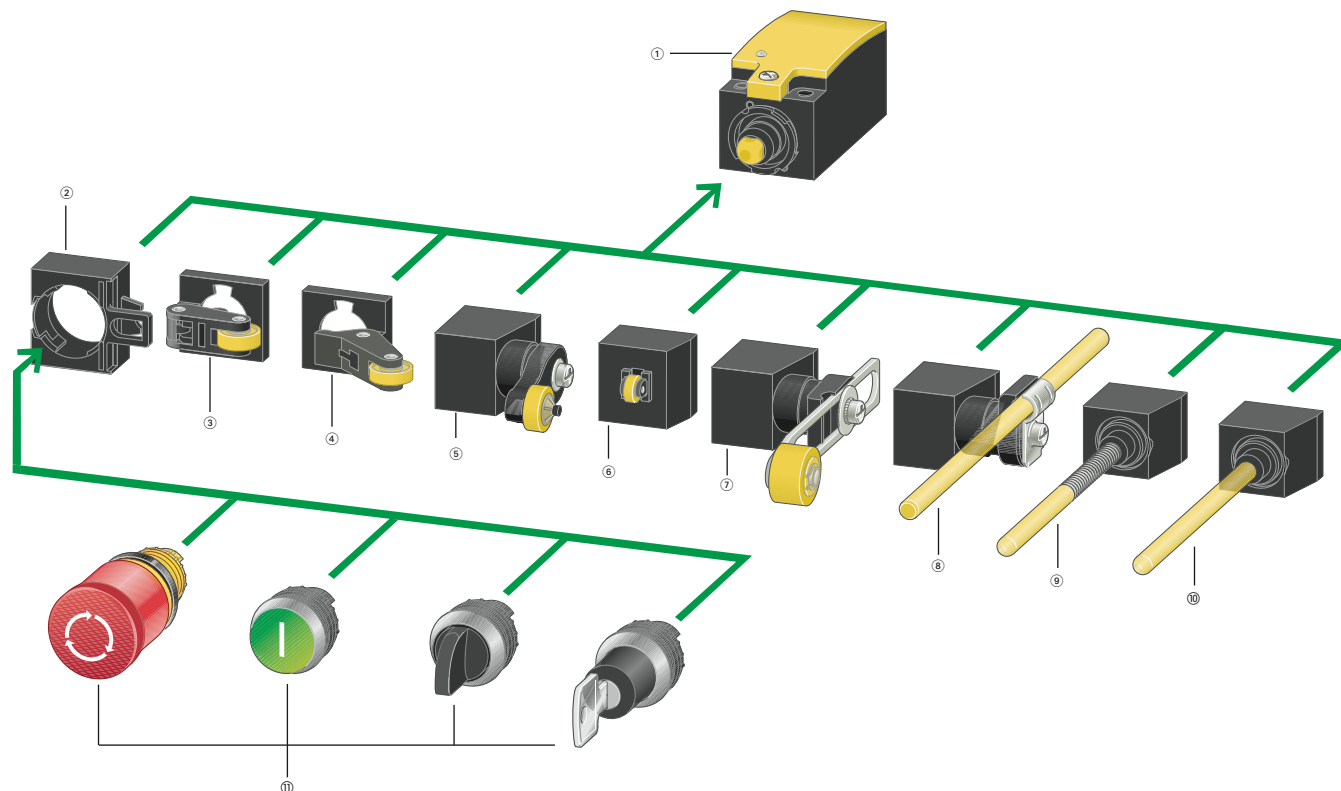
- Safety function by positive opening contacts per IEC/EN 60947-5-1 up to Category 4 per EN 954-1
- TÜV-Rheinland Certified for Functional-Safety (LSE models)
- CSA® certified
- UL® listed
- CE
- CCC



Note: Cage Clamp is a registered trademark of Wago Kontakttechnik, 32423 Minden, Germany.

Product Identification

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Notes

① **Basic device** (see **Pages 3–11**)
 According to EN 50047
 With screw-on cover
 Contacts: 1NO/1NC, 2NO, 2NC
 Cage Clamp, screw terminal
 As snap-action or standard-action switch
 As electronic snap-action switch
 (individually adjustable)
 As 4–20 mA analog signal encoder
 As 0–10 Vdc analog signal encoder

② **Fixing adapter** (see M22 catalog
 CA04716001E, Page 60, or
www.eaton.com/m22)
 Allows mounting of M22 pushbuttons

③ **Roller lever** (see **Pages 3 and 6**)
 For one-sided operation with higher
 operating speed

④ **Angled roller lever**
 (see **Pages 3, 6 and 10**)
 For actuation along the unit axis

⑤ **Rotary lever** (see **Pages 3, 7 and 10**)
 For actuation from the side, for
 pendulum movements

⑥ **Roller plunger** (see **Pages 3, 6 and 10**)
 For actuation from the side with low
 actuating force

⑦ **Adjustable roller lever**
 (see **Pages 4, 7, 8 and 10**)
 For length adjustment as required

⑧ **Actuating rod** (see **Pages 5, 9 and 11**)
 On conveyor belts for lightweight goods

⑨ **Spring-rod** (see **Pages 5, 9 and 11**)
 For flexible actuation from all sides

⑩ **Actuating rod** (see **Pages 5, 9 and 11**)
 Withdrawable mechanism from front

⑪ **Pushbuttons** from the M22 family; see
 M22 catalog (CA04716001E) or
www.eaton.com/m22

**Operating heads can be rotated
 by 90 degrees.**

Product Selection

LS-Titan Plastic Safety Switches

Plastic Safety Switch Bodies



Assembled Switch



Plastic Safety Switches

Switch Body Catalog Number

Output Function

Terminal Connection

Contact Sequence

Contact Travel

■ = contact closed
□ = contact open

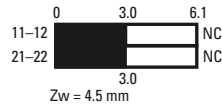
Operating Head Type ②

Catalog Numbers
Heads Only

LS-S02

2NC with Positive
Opening Contacts

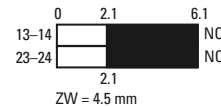
Screw Terminal ①



LS-S20A

2NO with Slow
Make/Break

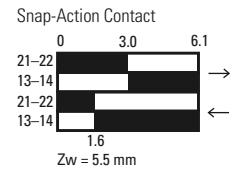
Screw Terminal ①



LS-S11S

1NO and 1NC with
Positive Opening Contact

Screw Terminal ①

Top Push Roller
Plunger

LS-XP

LS-S02-P

LS-S20A-P

LS-S11S-P

Long Roller Lever



LS-XL

LS-S02-L

LS-S20A-L

LS-S11S-L

Short Roller Lever



LS-XLS

LS-S02-LS

LS-S20A-LS

LS-S11S-LS

Large Roller Lever



LS-XLB

LS-S02-LB

LS-S20A-LB

LS-S11S-LB

Angled Roller



LS-XLA

LS-S02-LA

LS-S20A-LA

LS-S11S-LA

Rotary Lever



LS-XRL

LS-S02-RL

LS-S20A-RL

LS-S11S-RL

Notes

① Cage Clamp versions available. Contact Application Engineering.

② For operating head dimensions, see **Page 20**.

2.3

Limit Switches

LS-Titan Miniature DIN Switches

2

Plastic Safety Switch Bodies



Assembled Switch



Plastic Safety Switches, continued

Switch Body Catalog Number

Output Function

Terminal Connection

Contact Sequence

Contact Travel

■ = contact closed
□ = contact open

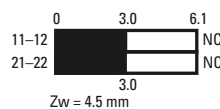
Operating Head Type ②

Catalog Numbers Heads Only

LS-S02

2NC with Positive
Opening Contacts

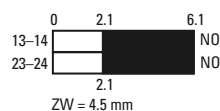
Screw Terminal ①



LS-S20A

2NO with Slow
Make/Break

Screw Terminal ①



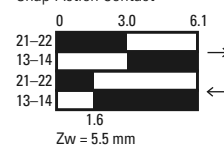
LS-S11S

1NO and 1NC with
Positive Opening Contact

Screw Terminal ①



Snap-Action Contact



Adjustable Roller Lever (with 18 mm Roller)



Adjustable Roller Lever (with 30 mm Roller)



Adjustable Roller Lever (with 40 mm Roller)



Adjustable Roller Lever (with 40 mm Rubber Roller)



Catalog Numbers Heads Only	Catalog Numbers Assembled Switches	Catalog Numbers Assembled Switches	Catalog Numbers Assembled Switches
LS-XRLA	LS-S02-RLA	LS-S20A-RLA	LS-S11S-RLA
LS-XRLA30	LS-S02-RLA30	LS-S20A-RLA30	LS-S11S-RLA30
LS-XRLA40	LS-S02-RLA40	LS-S20A-RLA40	LS-S11S-RLA40
LS-XRLA40R	LS-S02-RLA40R	LS-S20A-RLA40R	LS-S11S-RLA40R

Notes

① Cage Clamp versions available. Contact Application Engineering.

② For operating head dimensions, see **Page 20**.

Plastic Safety
Switch Bodies

Assembled Switch



Plastic Safety Switches, continued

Switch Body Catalog Number

Output Function

Terminal Connection

Contact Sequence

Contact Travel

■ = contact closed

□ = contact open

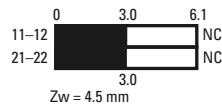
Operating Head Type ②

Catalog Numbers
Heads Only

LS-S02

2NC with Positive
Opening Contacts

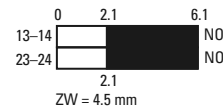
Screw Terminal ①



LS-S20A

2NO with Slow
Make/Break

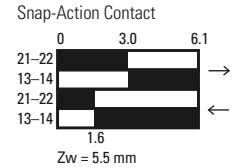
Screw Terminal ①



LS-S11S

1NO and 1NC with
Positive Opening Contact

Screw Terminal ①



Plastic Rod Lever



LS-XRR

LS-S02-RR

LS-S20A-RR

LS-S11S-RR

Metal Rod



LS-XRRM

LS-S02-RRM

LS-S20A-RRM

LS-S11S-RRM

Spring Rod (Wobble) ③



LS-XS

LS-S02-S

LS-S20A-S

LS-S11S-S

Actuating Rod



LS-XOR

LS-S02-OR

LS-S20A-OR

LS-S11S-OR

Notes

① Cage Clamp versions available. Contact Application Engineering.

② For operating head dimensions, see **Page 20**.

③ Not to be used as a safety position switch. Use only in conjunction with snap-action contact.

LS-Titan Plastic Electronic Safety Position Switches

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Plastic Electronic Safety Position Switch Bodies**Assembled Switch****Plastic Electronic Safety Position Switches****Switch Body****Catalog Number****Output Function****Terminal Connections****Safety Functions and Approvals****LSE-11**

1NO and 1 NC

Cage Clamp ①

LSE-02

2NC

Cage Clamp ①

These models may be used in safety-oriented circuits. Visual status LED indication is comparable to positive opening contacts. Certified by TÜV as a "Functional-Safety" device. Suitable for protection of people or processes.

**LSE-AI**

Analog 4–20 mA

Cage Clamp ①

LSE-AU

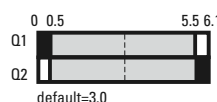
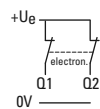
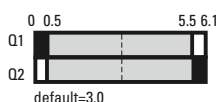
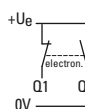
Analog 0–10V

Cage Clamp ①

Additional diagnostic output that registers a 0V signal in the event of a fault. Self-test function continuously tests both outputs for overloads, short circuits to 0V and short circuits to +U_e. Certified by TÜV to EN 954-1, Category 3 or 4. Suitable for protection of people or processes.

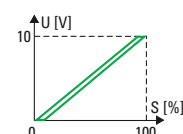
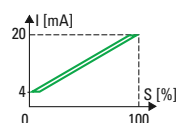
**Contact Sequence****Contact Travel**

■ = contact closed
□ = contact open



Analog 4–20 mA

Analog 0–10V

**Operating Head Type ②****Catalog Numbers Heads Only****Catalog Numbers Assembled Switches****Top Push Roller Plunger****LS-XP****LSE-11-P****LSE-02-P****LSE-AI-P****LSE-AU-P****Long Roller Lever****LS-XL****LSE-11-L****LSE-02-L****LSE-AI-L****LSE-AU-L****Short Roller Lever****LS-XLS****LSE-11-LS****LSE-02-LS****LSE-AI-LS****LSE-AU-LS****Large Roller Lever****LS-XLB****LSE-11-LB****LSE-02-LB****LSE-AI-LB****LSE-AU-LB****Angled Roller****LS-XLA****LSE-11-LA****LSE-02-LA****LSE-AI-LA****LSE-AU-LA****Notes**

① A compatible Cage Clamp tool is available as an accessory on **Page 13**.

② For operating head dimensions, see **Page 20**.

Plastic Electronic
Safety Position
Switch Bodies

Assembled Switch



Plastic Electronic Safety Position Switches, continued

Switch Body
Catalog Number

LSE-11

LSE-02

LSE-AI

LSE-AU

Output Function

1NO and 1NC

2NC

Analog 4–20 mA

Analog 0–10V

Terminal Connections

Cage Clamp ①

Cage Clamp ①

Cage Clamp ①

Cage Clamp ①

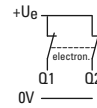
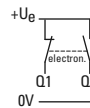
Safety Functions
and Approvals

These models may be used in safety-oriented circuits. Visual status LED indication is comparable to positive opening contacts. Certified by TÜV as a "Functional-Safety" device. Suitable for protection of people or processes.

Additional diagnostic output that registers a 0V signal in the event of a fault. Self-test function continuously tests both outputs for overloads, short circuits to 0V and short circuits to +U_e. Certified by TÜV to EN 954-1, Category 3 or 4. Suitable for protection of people or processes.



Contact Sequence

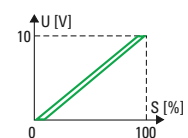
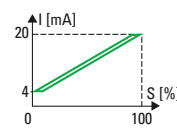
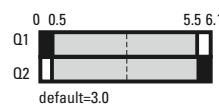
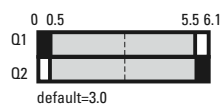


Analog 4–20 mA

Analog 0–10V

Contact Travel

■ = contact closed
□ = contact open



Operating Head Type ②

Catalog Numbers
Heads OnlyCatalog Numbers
Assembled Switches

Rotary Lever



LS-XRL

LSE-11-RL

LSE-02-RL

LSE-AI-RL

LSE-AU-RL

Adjustable
Roller Lever
(with 18 mm Roller)

LS-XRLA

LSE-11-RLA

LSE-02-RLA

LSE-AI-RLA

LSE-AU-RLA

Adjustable
Roller Lever
(With 30 mm Roller)

LS-XRLA30

LSE-11-RLA30

LSE-02-RLA30

LSE-AI-RLA30

LSE-AU-RLA30

Notes

① A compatible Cage Clamp tool is available as an accessory on **Page 13**.

② For operating head dimensions, see **Page 20**.

Plastic Electronic
Safety Position
Switch Bodies

Assembled Switch

Adjustable
Roller Lever
(With 40 mm Roller)Adjustable
Roller Lever
(With 40 mm Roller)

Plastic Rod Lever



Plastic Electronic Safety Position Switches, continued

Switch Body
Catalog Number

Output Function

Terminal Connections

Safety Functions
and Approvals

LSE-11

1NO and 1NC

Cage Clamp ①

LSE-02

2NC

Cage Clamp ①

LSE-AI

Analog 4–20 mA

Cage Clamp ①

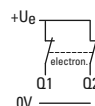
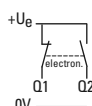
LSE-AU

Analog 0–10V

Cage Clamp ①



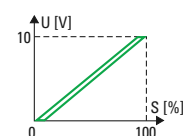
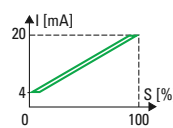
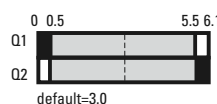
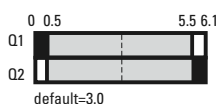
Contact Sequence



Contact Travel

■ = contact closed

□ = contact open



Operating Head Type ②

Catalog Numbers
Heads OnlyCatalog Numbers
Assembled Switches

LS-XRLA40

LSE-11-RLA40

LSE-02-RLA40

LSE-AI-RLA40

LSE-AU-RLA40

LS-XRLA40R

LSE-11-RLA40R

LSE-02-RLA40R

LSE-AI-RLA40R

LSE-AU-RLA40R

LS-XRR

LSE-11-RR

LSE-02-RR

LSE-AI-RR

LSE-AU-RR

Notes

① A compatible Cage Clamp tool is available as an accessory on **Page 13**.② For operating head dimensions, see **Page 20**.

Plastic Electronic
Safety Position
Switch Bodies

Assembled Switch



Plastic Electronic Safety Position Switches, continued

Switch Body

Catalog Number

LSE-11

LSE-02

LSE-AI

LSE-AU

Output Function

1NO and 1NC

2NC

Analog 4–20 mA

Analog 0–10V

Terminal Connections

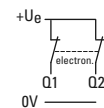
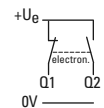
Cage Clamp ^①Cage Clamp ^①Cage Clamp ^①Cage Clamp ^①Safety Functions
and Approvals

These models may be used in safety-oriented circuits. Visual status LED indication is comparable to positive opening contacts. Certified by TÜV as a "Functional-Safety" device. Suitable for protection of people or processes.

Additional diagnostic output that registers a 0V signal in the event of a fault. Self-test function continuously tests both outputs for overloads, short circuits to 0V and short circuits to +U_e. Certified by TÜV to EN 954-1, Category 3 or 4. Suitable for protection of people or processes.



Contact Sequence

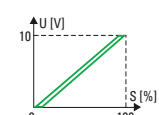
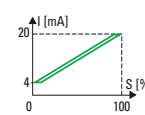
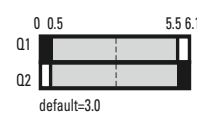
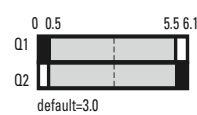


Analog 4–20 mA

Analog 0–10V

Contact Travel

■ = contact closed
□ = contact open

Operating Head Type ^②Catalog Numbers
Heads OnlyCatalog Numbers
Assembled Switches

Metal Rod



LS-XRRM

LSE-11-RRM

LSE-02-RRM

LSE-AI-RRM

LSE-AU-RRM

Spring Rod (Wobble) ^③

LS-XS

LSE-11-S

LSE-02-S

LSE-AI-S

LSE-AU-S

Actuating Rod



LS-XOR

LSE-11-OR

LSE-02-OR

LSE-AI-OR

LSE-AU-OR

Notes

^① A compatible Cage Clamp tool is available as an accessory on **Page 13**.

^② For operating head dimensions, see **Page 20**.

^③ Not to be used as a safety position switch. Use only in conjunction with snap-action contact.

2.3

Limit Switches

LS-Titan Miniature DIN Switches

LS-Titan Metal Safety Switches

2

Metal Safety Switch Bodies



Assembled Switch



Top Push Roller Plunger



Long Roller Lever



Angled Roller



Rotary Lever



Adjustable Roller Lever



Metal Safety Switches

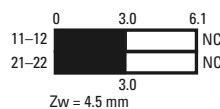
Switch Body Catalog Number
Output Function

Terminal Connection
Contact Sequence

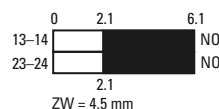
Contact Travel
■ = contact closed
□ = contact open

Operating Head Type ①
Catalog Numbers
Heads Only

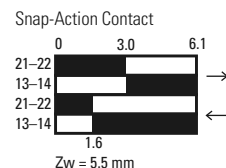
LSM-02
2NC with Positive
Opening Contacts
Cage Clamp



LSM-20A
2NO with Slow
Make/Break
Cage Clamp



LSM-11S
1NO and 1NC with
Positive Opening Contact
Cage Clamp



LSM-XP

LSM-02-P

LSM-20A-P

LSM-11S-P

LSM-XL

LSM-02-L

LSM-20A-L

LSM-11S-L

LSM-XLA

LSM-02-LA

LSM-20A-LA

LSM-11S-LA

LSM-XRL

LSM-02-RL

LSM-20A-RL

LSM-11S-RL

LSM-XRLA

LSM-02-RLA

LSM-20A-RLA

LSM-11S-RLA

Note

① For operating head dimensions, see **Page 20**.

Metal Safety Switch Bodies



Assembled Switch



Plastic Rod Lever



Metal Rod Lever



Spring Rod (Wobble)



Metal Safety Switches, continued

Switch Body Catalog Number

Output Function

Terminal Connection

Contact Sequence

Contact Travel

■ = contact closed

□ = contact open

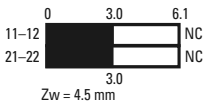
Operating Head Type ①

Catalog Numbers
Heads Only

LSM-02

2NC with Positive
Opening Contacts

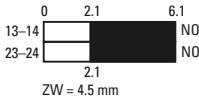
Cage Clamp



LSM-20A

2NO with Slow
Make/Break

Cage Clamp



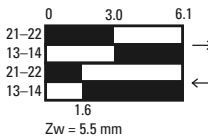
LSM-11S

1NO and 1NC with
Positive Opening Contact

Cage Clamp



Snap-Action Contact



LSM-XRR

LSM-02-RR

LSM-20A-RR

LSM-11S-RR

LSM-XRRM

LSM-02-RRM

LSM-20A-RRM

LSM-11S-RRM

LSM-XS

LSM-02-S

LSM-20A-S

LSM-11S-S

Note

① For operating head dimensions, see Page 20.

2.3

Limit Switches

LS-Titan Miniature DIN Switches

2

Understanding LS-Titan Electronic Safety Position Switches

All four LS-Titan LSE switch bodies are safety-rated products. The LSE-11 and LSE-02 switch bodies both have a freely programmable operating point and can be individually adjusted to suit the application, and can be changed as often as required. These devices feature an LED on the body, providing simple indication during programming and operation.

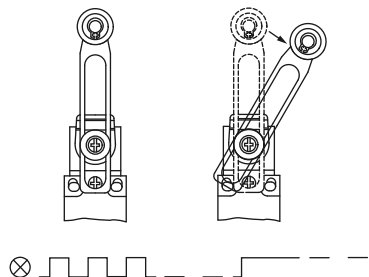
The LSE-AI (4–20 mA) and LSE-AU (0–10V) analog position switches take position data and convert to an analog current or voltage value that can then be continuously fed into an automation system. These two switches also feature a diagnostic output for additional data processing.

This ensures that a safe operating state can be monitored and evaluated at any time. A self-test function is also present on these models. Outputs Q1 and Q2 are continuously tested for overloads, short circuits to 0V and short circuits to $+U_e$.

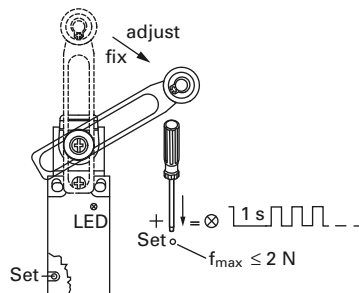
Like the electromechanical position switches, LS-Titan electronic position switches meet Category 3 or 4 of the EN 954-1 standard for machine safety when configured as a redundant system. All devices are thus suitable for safety applications that are used for the protection of persons or processes.

Operating Point Adjustment

LSE-11

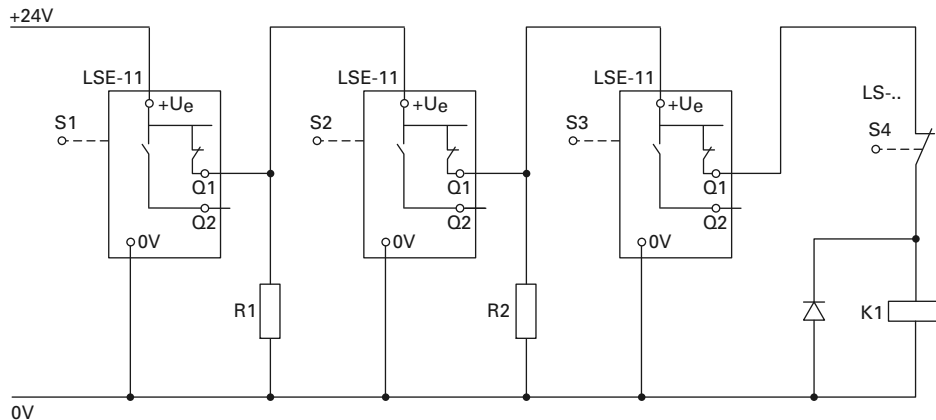


LSE-02



Note: LSE-11 and LSE-02—individual operating point adjustment.

Example of LS-Titan LSE Models in a Safety-Oriented Circuit



Note: LSE-11 and LSE-02 can be used in safety circuits.

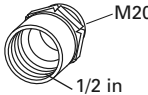
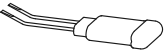
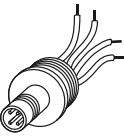
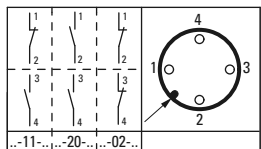
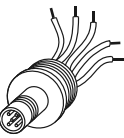
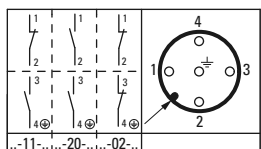
S1 is connected to 24 Vdc

S2, S3 each switch with a delay of 0.7s

R1, R2, e.g., series element M22-XLED60 (2820 ohms/0.5W)

Accessories

LS-Titan Safety Switches

	For Use With	Description	Notes	Catalog Number
V1-2-M20 	Any	M20 screw terminal in 1/2". For use with American pipe thread, metal.	The screw connection must be earthed. Not total insulation.	V1-2-M20-NA
	Any	M20 screw terminal in 1/2". For use with American pipe thread, molded material.	—	V1-2-M20
EMS20 	Any	M20 diaphragm bolt. With internal push-through membrane. Will fit cable with an external diameter of up to 13 mm. Rated IP65 with cable inserted.	—	EMS20
LS-XTW 	Any	Cage Clamp tool.	—	LS-XTW
MS12A 	LS-Titan plastic bodies (LS-)	Plug connector, 12 mm, 4-pin male connector M12x1 (M12x1). Rated IP65. Molded material. Color coded to IEC/EN 60947-5-2.		MS12A
MS12A5 	LS-Titan metal bodies (LSM-)	Plug connector, 12 mm, 5-pin male connector (M12x1). Rated IP65. Molded material. Color coded to IEC/EN 60947-5-2.		MS12A5

Technical Data and Specifications

LS-Titan Miniature DIN Switches—IP66, IP67 Complete Units

2

Units			LS, LSM	LSE-11/LSE-02	LSE-AI ①	LSE-AU ①
General						
Standards			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 60068-2-78; damp heat, cyclical, to IEC 60068-2-30	Damp heat, constant, to IEC 60068-2-78; damp heat, cyclical, to IEC 60068-2-30	Damp heat, constant, to IEC 60068-2-78; damp heat, cyclical, to IEC 60068-2-30	Damp heat, constant, to IEC 60068-2-78; damp heat, cyclical, to IEC 60068-2-30
Ambient temperature			°C	–25 to +70	–25 to +70	–25 to +70
Mounting position			As required	As required	As required	As required
Protection type			IP66, IP67	IP66, IP67	IP66, IP67	IP66, IP67
Terminal capacity of screw terminal and Cage Clamp						
Solid			mm ²	1 x (0.5–2.5)	1 x (0.5–2.5)	1 x (0.5–2.5)
Flexible with ferrules to DIN 46228			mm ²	1 x (0.5–1.5)	1 x (0.5–1.5)	1 x (0.5–1.5)
Power Supply						
Rated voltage			U _e Vdc	N/A	24 (–15%/+20%)	24 (–15%/+20%)
Burden current						
12V			I _e mA	N/A	N/A	N/A
24V			I _e mA	N/A	28–45	24
30V			I mA	N/A	N/A	N/A
Contacts/Switching Capacity						
Rated impulse withstand voltage			U _{imp} Vac	4000	N/A	N/A
Rated insulation voltage			U _i V	400	N/A	N/A
Overvoltage category/ pollution degree				III/3	N/A	N/A
Rated Operational Current						
AC–15						
24V			I _e A	6	N/A	N/A
230V/240V			I _e A	6	N/A	N/A
400V/415V			I _e A	4	N/A	N/A
DC–13						
24V			I _e A	3	N/A	N/A
110V			I _e A	0.8	N/A	N/A
220V			I _e A	0.3	N/A	N/A

Note

① The following applies for LSE-11 and LSE-02: ensure that the power supply operates correctly when setting the operating point.

LS-Titan Miniature DIN Switches—IP66, IP67 Complete Units. continued

Units		LS, LSM	LSE-11/LSE-02	LSE-AI ①	LSE-AU ①
Burden Current, continued					
Analog output Q1					
Output voltage (max. 10 mA)	Vdc	N/A	N/A		0–10
Output current	mA	N/A	N/A	4–20	
Fault scenario	V	N/A	N/A	0	0
Resolution	Steps	N/A	N/A	100	100
Step tolerance	Steps	N/A	N/A	1	1
Shunt resistor, resistive load	ohms	N/A	N/A	<400	>1000
Digital diagnostics output Q2 (switching to + pole PNP)					
Response threshold	V	N/A	N/A	Approx. U_E	Approx. U_E
	mA	N/A	N/A	<200	<200
Control circuit reliability					
At 24 Vdc/5 mA	H_F	Fault probability	<10 ⁻⁷ , <1 fault in 10 ⁷ operations	N/A	N/A
At 5 Vdc/1 mA	H_F	Fault probability	<10 ⁻⁶ , <1 failure at 5 x 10 ⁶ operations	N/A	N/A
Supply frequency	Hz	Max. 400	N/A	N/A	N/A
Short-circuit rating to IEC/EN 60947-5-1					
Maximum fuse	A gG/gL	6	N/A	N/A	N/A
Repetition accuracy	mm	±0.02	±0.02	±0.02	±0.02

Note

① The following applies for LSE-11 and LSE-02: ensure that the power supply operates correctly when setting the operating point.

LS-Titan Miniature DIN Switches—IP66, IP67 Complete Units

2

Units		LS, LSM		LSE-11/LSE-02	LSE-AI/LSE-AU	LSE-AI/LSE-AU
Mechanical Variables						
Lifespan						
Standard-action contact	Operations	X 10 ⁶	8	N/A	N/A	N/A
Snap-action contact	Operations	X 10 ⁶	8	3 (electronic)	N/A	N/A
Contact temperature of roller head		°C	≤100	≤100	≤100	≤100
Mechanical shock resistance (half-sinusoidal shock, 20 ms)						
Standard-action contact		g	25	N/A	N/A	N/A
Snap-action contact		g	N/A	N/A	N/A	N/A
Basic unit		g	N/A	30	30	30
Operating frequency	Operations/h		≤6000	≤3000	≤3000	≤3000
Switching point			N/A	0.5–5.5 mm freely adjustable	N/A	N/A
Hysteresis		mm	N/A	0.4	0.4	0.4
Contact sequence (contact closed open Zw = positive opening clearance)		mm	N/A	0.04	0.06	0.06
Actuation						
Mechanical						
Actuating force at beginning/ end of stroke						
Basic units		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
Actuating torque of rotary drives		Nm	0.2	0.2	0.2	0.2
Maximum operating speed with DIN cam						
Basic units for angle of actuation	α = 0°/30°	m/s	1/0.5	1/0.5	1/0.5	1/0.5
LS(M)-XRL for angle of actuation	α = 0°	m/s	1.5	1.5	1.5	1.5
LS(M)-XRLA for angle of actuation	α = 30°, L = 125 mm	m/s	1.5	1.5	1.5	1.5
LS(M)-XRR for angle of actuation	L = 130 mm	m/s	1.5	1.5	1.5	1.5
LS(M)-XL for angle of actuation	α = 30°/45°	m/s	1	1	1	1
LS(M)-XLA for angle of actuation	α = 30°/45°	m/s	1	1	1	1
LS(M)-XP for angle of actuation	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 61000-403, RFI)		V/m		10	10	10
Burst pulses (IEC/EN 61000-4-4, Level 3)						
Supply cables		kV		2	2	2
Signal lines		kV		2	2	2
High-energy pulses (surge) (IEC/EN 61000-4-5)		kV		0.5	0.5	0.5
Immunity to line-conducted interference to (IEC/EN 610000-4-6)		V		10	10	10

Contact Travel Diagrams

LSE

Description	Contact Travel	LSE-11		LSE-02	
	= contact closed = contact open	Q1 Q2	Q1 Q2	Q1 Q2	Q1 Q2
Basic Units		00.55.6.1 Q1 Q2 default=3.0	00.55.6.1 Q1 Q2 default=3.0	00.55.6.1 Q1 Q2 default=3.0	00.55.6.1 Q1 Q2 default=3.0
Operating Heads					
Roller plunger					
LS-XP		00.55.6.1 Q1 Q2 default=3.0	00.55.6.1 Q1 Q2 default=3.0	00.55.6.1 Q1 Q2 default=3.0	00.55.6.1 Q1 Q2 default=3.0
LSM-XP		00.55.6.1 Q1 Q2 default=3.0	00.55.6.1 Q1 Q2 default=3.0	00.55.6.1 Q1 Q2 default=3.0	00.55.6.1 Q1 Q2 default=3.0
Roller lever					
LS-XL		00.59.0.9.6 Q1 Q2 default=4.4	00.59.0.9.6 Q1 Q2 default=4.4	00.59.0.9.6 Q1 Q2 default=4.4	00.59.0.9.6 Q1 Q2 default=4.4
LSM-XL		00.59.0.9.6 Q1 Q2 default=4.4	00.59.0.9.6 Q1 Q2 default=4.4	00.59.0.9.6 Q1 Q2 default=4.4	00.59.0.9.6 Q1 Q2 default=4.4
LS-XL		00.59.0.9.6 Q1 Q2 default=4.4	00.59.0.9.6 Q1 Q2 default=4.4	00.59.0.9.6 Q1 Q2 default=4.4	00.59.0.9.6 Q1 Q2 default=4.4
LS-XLB		00.59.0.9.6 Q1 Q2 default=4.4	00.59.0.9.6 Q1 Q2 default=4.4	00.59.0.9.6 Q1 Q2 default=4.4	00.59.0.9.6 Q1 Q2 default=4.4
Angled roller lever					
LS-XLA		00.510.10.10.8 Q1 Q2 default=5.0	00.510.10.10.8 Q1 Q2 default=5.0	00.510.10.10.8 Q1 Q2 default=5.0	00.510.10.10.8 Q1 Q2 default=5.0
LSM-XLA		00.510.10.10.8 Q1 Q2 default=5.0	00.510.10.10.8 Q1 Q2 default=5.0	00.510.10.10.8 Q1 Q2 default=5.0	00.510.10.10.8 Q1 Q2 default=5.0
Rotary lever					
LS-XRL		0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°
LSM-XRL		0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°
Adjustable roller lever					
LS-XRLA		0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°
LSM-XRLA		0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°
LS-XRLA30		0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°
LS-XRLA40		0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°
LS-XRLA40R		0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°
Actuating rod					
LS-XRR		0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°
LSM-XRR		0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°
LS-XRRM		0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°
LSM-XRRM		0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°	0°5°60°65° Q1 Q2 default=30°
Spring rod					
LS-XS		0°3°23°26° Q1 Q2 default=13°	0°3°23°26° Q1 Q2 default=13°	0°3°23°26° Q1 Q2 default=13°	0°3°23°26° Q1 Q2 default=13°
LSM-XS		0°3°23°26° Q1 Q2 default=13°	0°3°23°26° Q1 Q2 default=13°	0°3°23°26° Q1 Q2 default=13°	0°3°23°26° Q1 Q2 default=13°

2.3

Limit Switches

LS-Titan Miniature DIN Switches

LS and LSM

2

	Contact Travel	LS-02, LS-S02, LSM-02	LS-11S, LS-S11S, LSM-11S	LS-20A, LS-S20A, LSM-20A
Description	= contact closed	NC 12 11 NC 22 21	NO 14 13 NC 22 21	NO 14 13 NO 24 23
	= contact open			
Basic Units		0 3.0 6.1 11-12 21-22 NC NC Zw = 4.5 mm 3.0	0 3.0 6.1 21-22 13-14 21-22 13-14 1.6 Zw = 4.5 mm	0 2.1 6.1 13-14 23-24 NO NO 2.1 ZW = 4.5 mm
Operating Heads				
Roller plunger				
LS-XP, LSM-XP		0 3.0 6.1 11-12 21-22 NC NC Zw = 4.5 mm 3.0	0 3.0 6.1 21-22 13-14 21-22 13-14 1.6 Zw = 4.5 mm	0 2.1 6.1 13-14 23-24 NO NO 2.1 ZW = 4.5 mm
Roller lever				
LS-XL, LSM-XL		0 4.4 9.6 11-12 21-22 NC NC Zw = 6.9 mm 4.4	0 4.4 9.6 21-22 13-14 21-22 13-14 2.3 Zw = 8.7 mm	0 3.3 9.6 13-14 23-24 NO NO 3.3
Roller lever, short				
LS-XLS		0 3.3 6.9 11-12 21-22 NC NC Zw = 5.0 mm 3.3	0 3.3 6.9 21-22 13-14 21-22 13-14 1.7 Zw = 6.2 mm	0 2.2 6.9 13-14 23-24 NO NO 2.2
Roller lever, large				
LS-XLB		0 6.3 13.4 11-12 21-22 NC NC Zw = 9.6 mm 6.3	0 6.3 13.4 21-22 13-14 21-22 13-14 3.2 Zw = 12.0 mm	0 4.3 13.4 13-14 23-24 NO NO 4.3

LS and LSM, continued

	Contact Travel	LS-02, LS-S02, LSM-02	LS-11S, LS-S11S, LSM-11S	LS-20A, LS-S20A, LSM-20A
Description	= contact closed = contact open	NC 12 11 NC 22 21	NO 14 13 NC 22 21	NO 14 13 NO 24 23
	Operating Heads			
Angled roller lever				
LS-XLA, LSM-XLA	0 5.0 10.8 11-12 NC 21-22 NC Zw = 7.6 mm 5.0	0 5.0 10.8 21-22 13-14 21-22 13-14 2.4 Zw = 9.7 mm	0 3.6 10.6 13-14 NO 23-24 NO 3.6	
Rotary lever				
LS-XRL, LSM-XRL	0 30° 65° 11-12 NC 21-22 NC Zw = 47° 30°	0 30° 65° 21-22 13-14 21-22 13-14 15° Zw = 60°	0 22° 65° 13-14 NO 23-24 NO 22°	
Adjustable roller lever				
LS-XRLA, LSM-XRLA LS-XRLA30, LS-XRLA40 LS-XRLA40R	0 30° 65° 11-12 NC 21-22 NC Zw = 47° 30°	0 30° 65° 21-22 13-14 21-22 13-14 15° Zw = 60°	0 22° 65° 13-14 NO 23-24 NO 22°	
Actuating rod				
LS-XRR, LSM-XRR LS-XRRM, LSM-XRRM	0 13° 26° 11-12 NC 21-22 NC 13°	0 13° 26° 21-22 13-14 21-22 13-14 7°	0 9° 26° 13-14 NO 23-24 NO 9°	
Spring rod				
LS-XS, LSM-XS	0 13° 26° 11-12 NC 21-22 NC 13°	0 13° 26° 21-22 13-14 21-22 13-14 7°	0 9° 26° 13-14 NO 23-24 NO 9°	

2.3

Limit Switches

LS-Titan Miniature DIN Switches

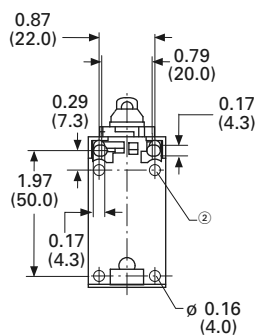
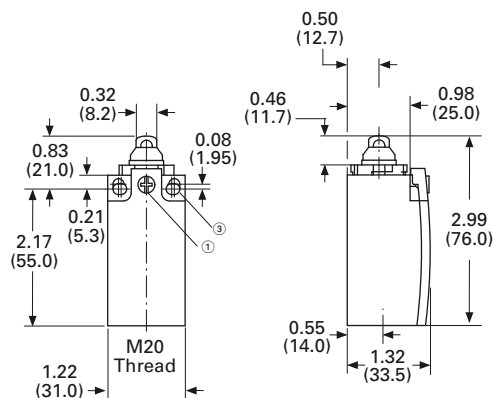
Dimensions

Approximate Dimensions in Inches (mm)

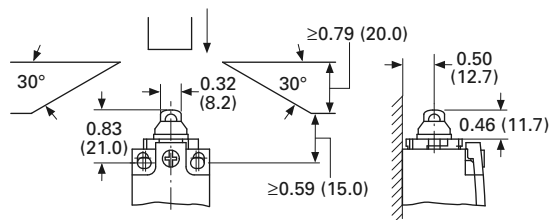
2

Position Switches

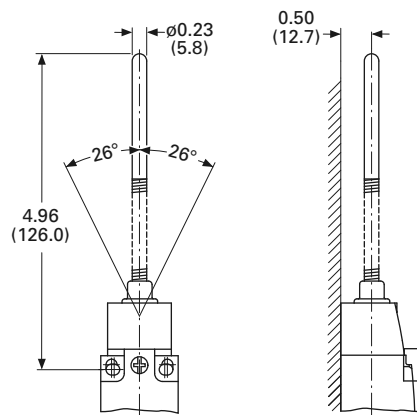
LS-..., LSM-..., LSE-...



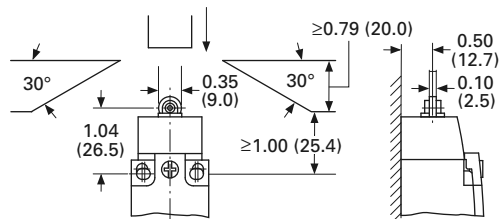
LS-..., LSM-..., LSE-...



LS(M)-.../S



LS(M)-.../P



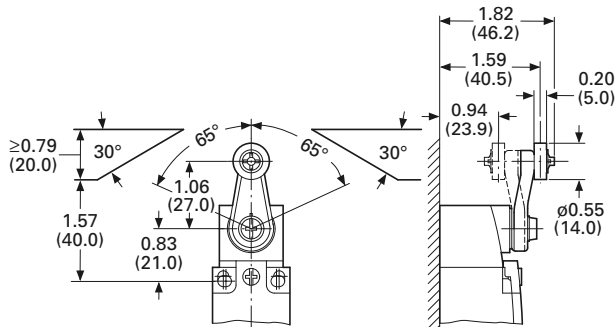
Notes

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

Approximate Dimensions in Inches (mm)

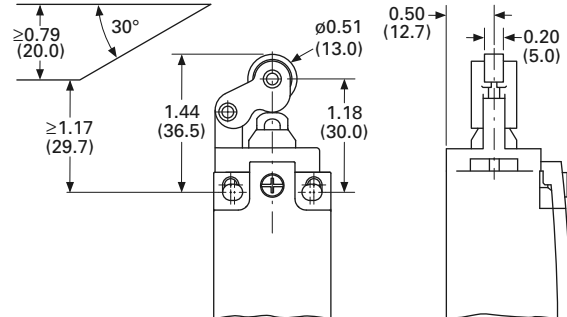
Rotary Lever

LS(M)-.../RL



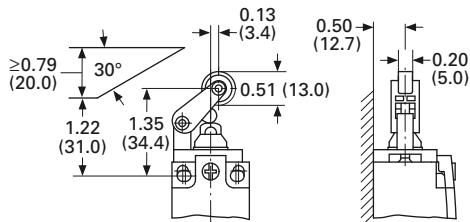
Roller Lever, Short

LS(M)-.../LS



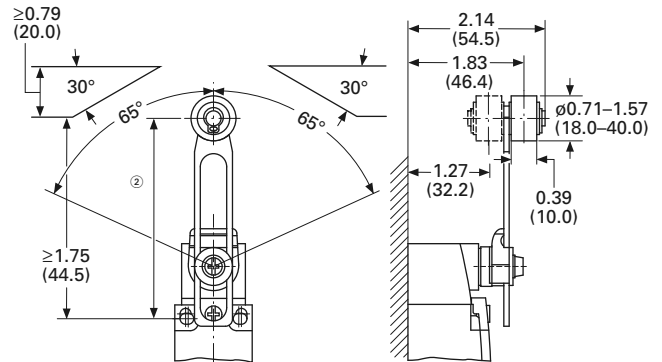
Roller Lever

LS(M)-.../L



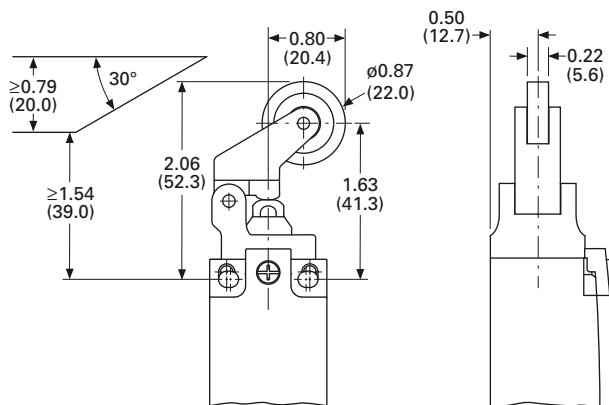
Adjustable Roller Lever

LS(M)-.../RLA



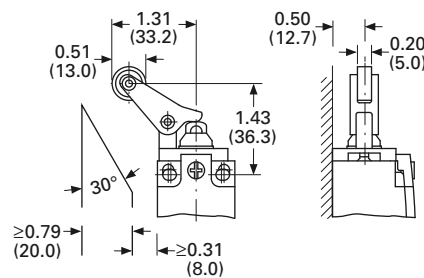
Roller Lever, Large

LS(M)-.../LB ①



Angled Roller Lever

LS(M)-.../XLA



Notes

- ① Tightening torque of cover screws: 0.8 Nm $\pm$ 0.2 Nm.
- ② Setting range of 54.5 to 97.

2.3

Limit Switches

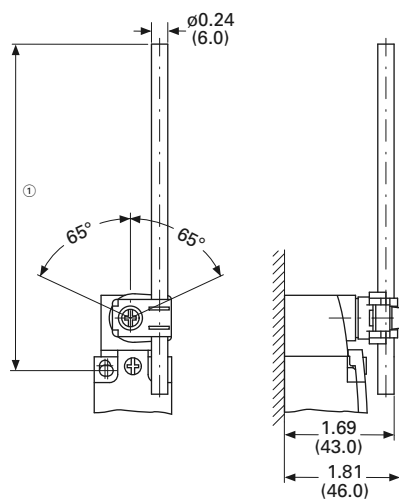
LS-Titan Miniature DIN Switches

Approximate Dimensions in Inches (mm)

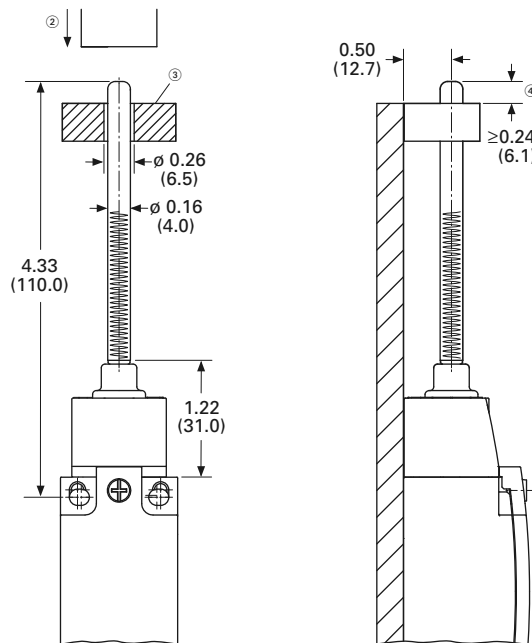
2

Actuating Rod

LS(M)-.../RR



LS(M)-.../OR



Notes

- ① LS.../RR ≤ 150
LS.../RRM ≤ 210
- ② Approach direction, vertical.
- ③ Guide is done by customer, not included.
- ④ Maximum push-through.