

LS-Titan Miniature DIN Switches



Contents

Description	Page
LS-Titan Miniature DIN Switches	
Product Identification	2
Product Selection	3
LS-Titan Plastic Safety Switches	3
LS-Titan Plastic Electronic Safety Position Switches	6
LS-Titan Metal Safety Switches	10
Understanding LS-Titan Electronic Safety Position Switches	12
Accessories	13
Technical Data and Specifications	14
Contact Travel Diagrams	17
Dimensions	20

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.

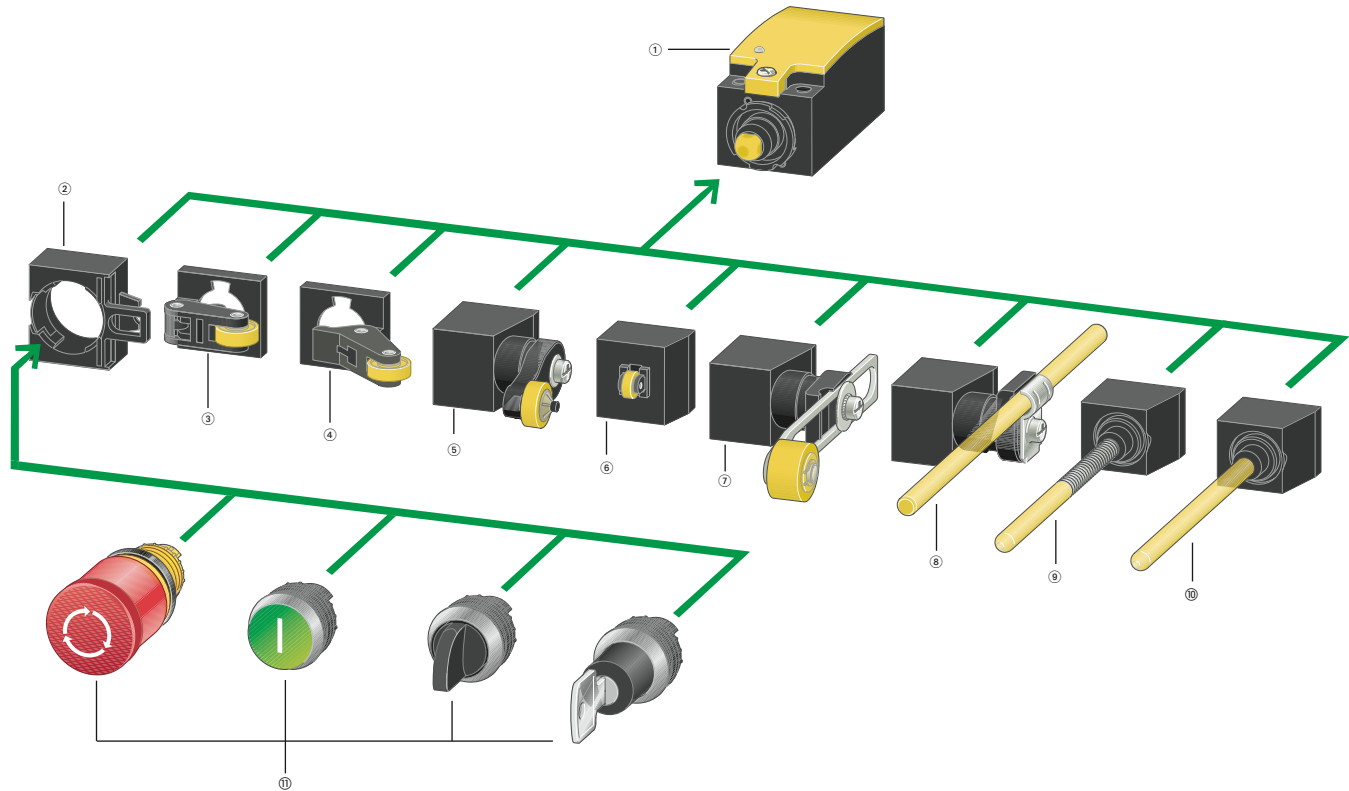
2.3

Limit Switches

LS-Titan Miniature DIN Switches

Product Identification

2



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



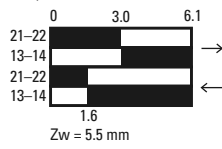
⑩ **Actuating rod** (see **Pages 5, 9 and 11**)
 Withdrawable mechanism from front

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 Switches			
Plastic Safety Switch Bodies		Switch Body Catalog Number	LS-S02	LS-S20A	LS-S11S
Assembled Switch		Output Function	2NC with Positive Opening Contacts	2NO with Slow Make/Break	1NO and 1NC with Positive Opening Contact
		Terminal Connection	Screw Terminal ①	Screw Terminal ①	Screw Terminal ①
		Contact Sequence			
		Contact Travel			
		Operating Head Type ②	Catalog Numbers		
		Catalog Numbers Heads Only	Assembled Switches		
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

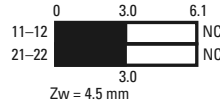
Operating Head Type ^②

Catalog Numbers Heads Only

LS-S02

2NC with Positive Opening Contacts

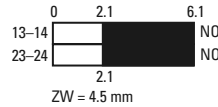
Screw Terminal ^①



LS-S20A

2NO with Slow Make/Break

Screw Terminal ^①



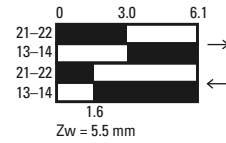
LS-S11S

1NO and 1NC with Positive Opening Contact

Screw Terminal ^①



Snap-Action Contact



Catalog Numbers Assembled Switches

Adjustable Roller Lever (with 18 mm Roller)



LS-XRLA

LS-S02-RLA

LS-S20A-RLA

LS-S11S-RLA

Adjustable Roller Lever (with 30 mm Roller)



LS-XRLA30

LS-S02-RLA30

LS-S20A-RLA30

LS-S11S-RLA30

Adjustable Roller Lever (with 40 mm Roller)



LS-XRLA40

LS-S02-RLA40

LS-S20A-RLA40

LS-S11S-RLA40

Adjustable Roller Lever (with 40 mm Rubber Roller)



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 Switches, continued

Plastic Safety Switch Bodies



Assembled Switch



Switch Body Catalog Number

Output Function

Terminal Connection

Contact Sequence

Contact Travel

- = contact closed
- = contact open

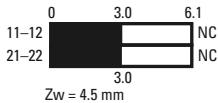
Operating Head Type ②

Catalog Numbers Heads Only

LS-S02

2NC with Positive Opening Contacts

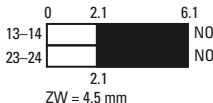
Screw Terminal ①



LS-S20A

2NO with Slow Make/Break

Screw Terminal ①



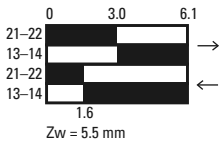
LS-S11S

1NO and 1NC with Positive Opening Contact

Screw Terminal ①



Snap-Action Contact



Catalog Numbers Assembled Switches

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.

2.3

Limit Switches

LS-Titan Miniature DIN Switches

LS-Titan Plastic Electronic Safety Position Switches

2 Plastic Electronic Safety Position Switch Bodies



Assembled Switch



Plastic Electronic Safety Position Switches

Switch Body

Catalog Number

LSE-11

LSE-02

Output Function

1NO and 1 NC

2NC

Terminal Connections

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.

LSE-AI

Analog 4–20 mA

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 +U₀. Certified by TÜV to EN 954-1, Category 3 or 4. Suitable for protection of people or processes.

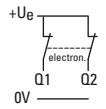
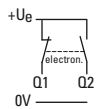
LSE-AU

Analog 0–10V

Cage Clamp ①



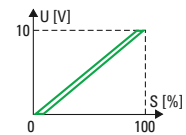
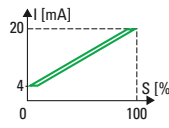
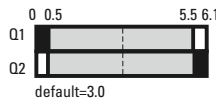
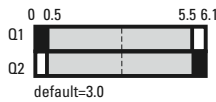
Contact Sequence



Contact Travel

■ = contact closed

□ = contact open



Operating Head Type ②

Top Push Roller Plunger



Catalog Numbers Heads Only

Catalog Numbers Assembled Switches

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 Switches, continued

Plastic Electronic Safety Position Switch Bodies



Assembled Switch



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

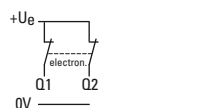
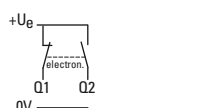
Safety Functions and Approvals

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



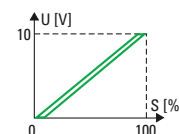
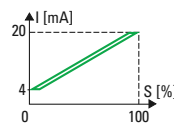
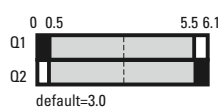
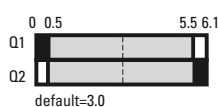
Analog 4–20 mA

Analog 0–10V

Contact Travel

■ = contact closed

□ = contact open



Operating Head Type ②

Catalog Numbers Heads Only

Catalog 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**.

2.3

Limit Switches

LS-Titan Miniature DIN Switches

2

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

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

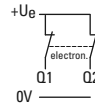
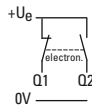
Safety Functions and Approvals

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

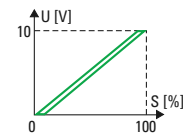
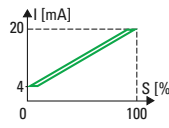
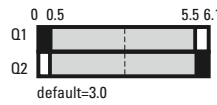
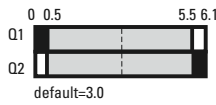


Analog 4–20 mA

Analog 0–10V

Contact Travel

■ = contact closed
□ = contact open



Operating Head Type ②

Catalog Numbers Heads Only

Catalog 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 ①

Cage Clamp ①

Cage Clamp ①

Cage Clamp ①

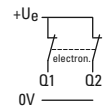
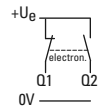
Safety Functions and Approvals

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

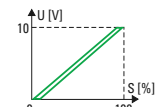
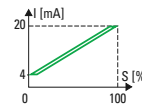
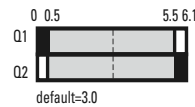
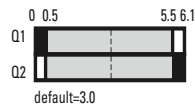


Analog 4–20 mA

Analog 0–10V

Contact Travel

■ = contact closed
□ = contact open



Operating Head Type ②

Catalog Numbers Heads Only

Catalog 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



Metal Safety Switches

Switch Body Catalog Number

Output Function

Terminal Connection

Contact Sequence

Contact Travel

■ = contact closed

□ = contact open

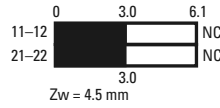
Operating Head Type ①

Catalog Numbers
Heads Only

LSM-02

2NC with Positive
Opening Contacts

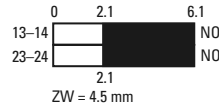
Cage Clamp



LSM-20A

2NO with Slow
Make/Break

Cage Clamp



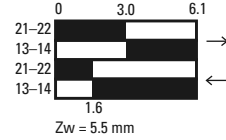
LSM-11S

1NO and 1NC with
Positive Opening Contact

Cage Clamp



Snap-Action Contact



Top Push Roller
Plunger



LSM-XP

LSM-02-P

LSM-20A-P

LSM-11S-P

Long Roller Lever



LSM-XL

LSM-02-L

LSM-20A-L

LSM-11S-L

Angled Roller



LSM-XLA

LSM-02-LA

LSM-20A-LA

LSM-11S-LA

Rotary Lever



LSM-XRL

LSM-02-RL

LSM-20A-RL

LSM-11S-RL

Adjustable Roller Lever



LSM-XRLA

LSM-02-RLA

LSM-20A-RLA

LSM-11S-RLA

Note

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

Metal Safety Switches, continued

Metal Safety Switch Bodies



Assembled Switch



Switch Body Catalog Number

Output Function

Terminal Connection

Contact Sequence

Contact Travel

- = contact closed
- = contact open

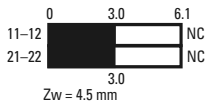
Operating Head Type ①

Catalog Numbers Heads Only

LSM-02

2NC with Positive Opening Contacts

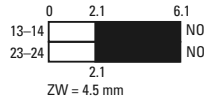
Cage Clamp



LSM-20A

2NO with Slow Make/Break

Cage Clamp



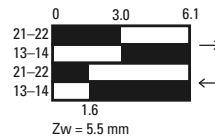
LSM-11S

1NO and 1NC with Positive Opening Contact

Cage Clamp



Snap-Action Contact



Plastic Rod Lever



LSM-XRR

LSM-02-RR

LSM-20A-RR

LSM-11S-RR

Metal Rod Lever



LSM-XRRM

LSM-02-RRM

LSM-20A-RRM

LSM-11S-RRM

Spring Rod (Wobble)



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.

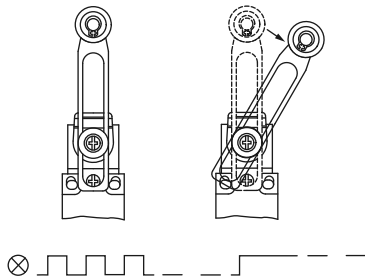
The LSE-AI (4–20 mA) and LSE-AU (0–10V) analog position switches take position data and convert to an analog current or voltage value that can then be continuously fed into an automation system. These two switches also feature a diagnostic output for additional data processing.

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.

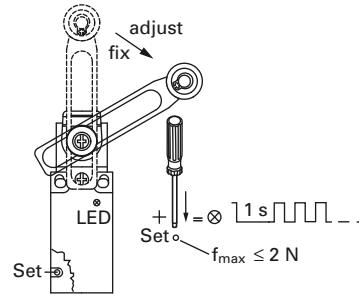
Like the electromechanical position switches, LS-Titan electronic position switches meet Category 3 or 4 of the EN 954-1 standard for machine safety when configured as a redundant system. All devices are thus suitable for safety applications that are used for the protection of persons or processes.

Operating Point Adjustment

LSE-11

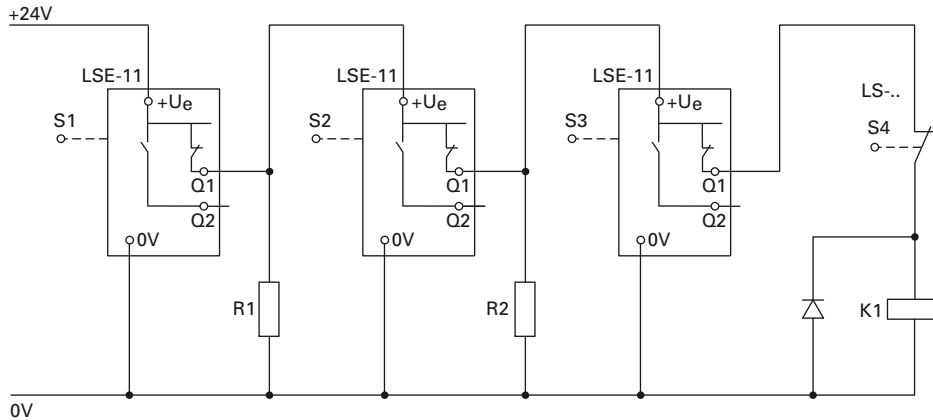


LSE-02



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

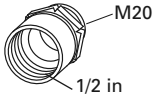

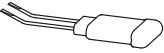
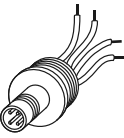
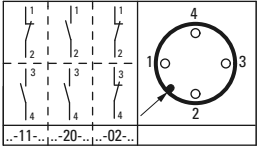
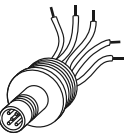
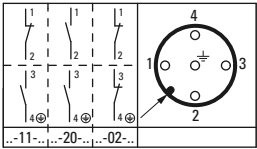
Example of LS-Titan LSE Models in a Safety-Oriented Circuit



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

2.3

Limit Switches

LS-Titan Miniature DIN Switches

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	–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)	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)	1 x (0.5–1.5)
Power Supply						
Rated voltage		U _e Vdc	N/A	12–30	24 (–15%/+20%)	24 (–15%/+20%)
Burden current						
12V		I _e mA	N/A	15	N/A	N/A
24V		I _e mA	N/A	18	28–45	24
30V		I mA	N/A	19	N/A	N/A
Contacts/Switching Capacity						
Rated impulse withstand voltage		U _{imp} Vac	4000	N/A	N/A	N/A
Rated insulation voltage		U _i V	400	N/A	N/A	N/A
Overvoltage category/ pollution degree			III/3	III/3	N/A	N/A
Rated Operational Current						
AC-15						
24V		I _e A	6	N/A	N/A	N/A
230V/240V		I _e A	6	N/A	N/A	N/A
400V/415V		I _e A	4	N/A	N/A	N/A
DC-13						
24V		I _e A	3	0.2	N/A	N/A
110V		I _e A	0.8	N/A	N/A	N/A
220V		I _e A	0.3	N/A	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 5×10^6 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.

2.3

Limit Switches

LS-Titan Miniature DIN Switches

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	$\alpha = 0^\circ/30^\circ$	m/s 1/0.5	1/0.5	1/0.5	1/0.5
LS(M)-XRL for angle of actuation	$\alpha = 0^\circ$	m/s 1.5	1.5	1.5	1.5
LS(M)-XRLA for angle of actuation	$\alpha = 30^\circ, L = 125 \text{ mm}$	m/s 1.5	1.5	1.5	1.5
LS(M)-XRR for angle of actuation	$L = 130 \text{ mm}$	m/s 1.5	1.5	1.5	1.5
LS(M)-XL for angle of actuation	$\alpha = 30^\circ/45^\circ$	m/s 1	1	1	1
LS(M)-XLA for angle of actuation	$\alpha = 30^\circ/45^\circ$	m/s 1	1	1	1
LS(M)-XP for angle of actuation	$\alpha = 0^\circ/30^\circ$	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 61000-4-6)	V		10	10	10

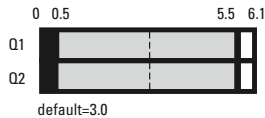
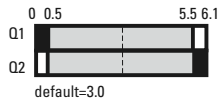
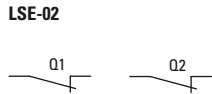
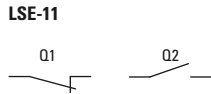
Contact Travel Diagrams

LSE

Contact Travel
 ■ = contact closed
 □ = contact open

Description

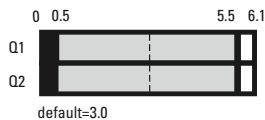
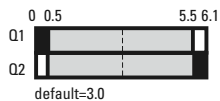
Basic Units



Operating Heads

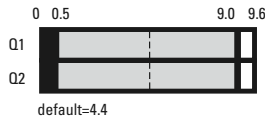
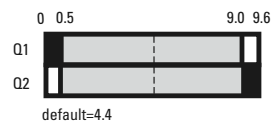
Roller plunger

LS-XP
 LSM-XP



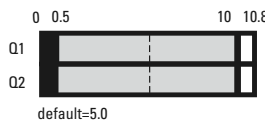
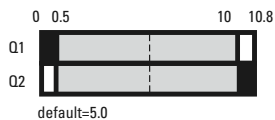
Roller lever

LS-XL
 LSM-XL
 LS-XL
 LS-XLB



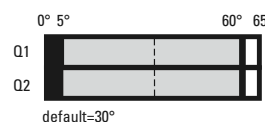
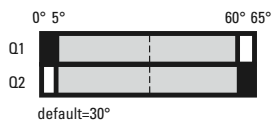
Angled roller lever

LS-XLA
 LSM-XLA



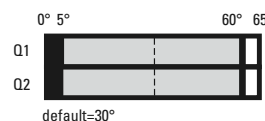
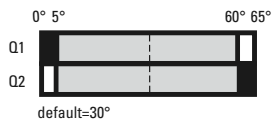
Rotary lever

LS-XRL
 LSM-XRL



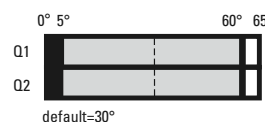
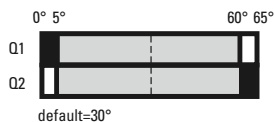
Adjustable roller lever

LS-XRLA
 LSM-XRLA
 LS-XRLA30
 LS-XRLA40
 LS-XRLA40R



Actuating rod

LS-XRR
 LSM-XRR
 LS-XRRM
 LSM-XRRM



Spring rod

LS-XS
 LSM-XS



2.3

Limit Switches

LS-Titan Miniature DIN Switches

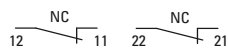
LS and LSM

2

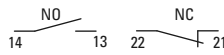
Contact Travel

■ = contact closed
□ = contact open

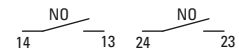
LS-02, LS-S02, LSM-02



LS-11S, LS-S11S, LSM-11S

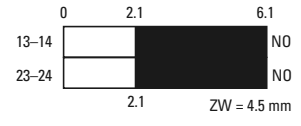
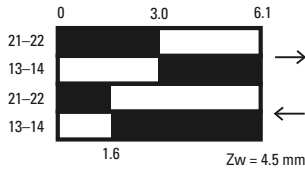
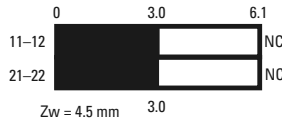


LS-20A, LS-S20A, LSM-20A



Description

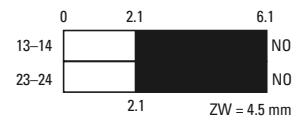
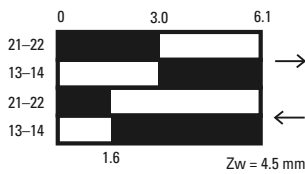
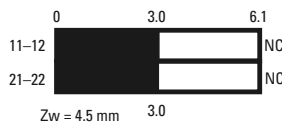
Basic Units



Operating Heads

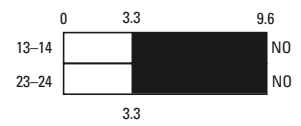
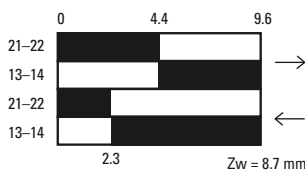
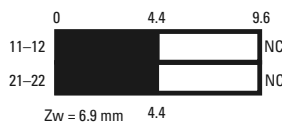
Roller plunger

LS-XP, LSM-XP



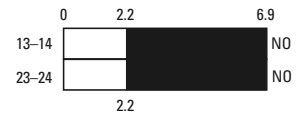
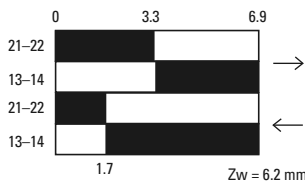
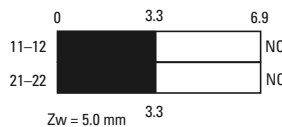
Roller lever

LS-XL, LSM-XL



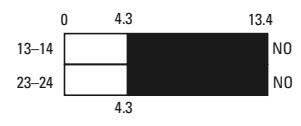
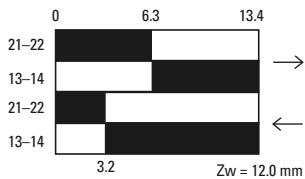
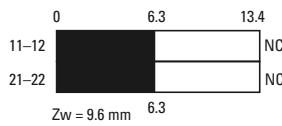
Roller lever, short

LS-XLS



Roller lever, large

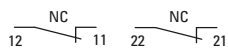
LS-XLB



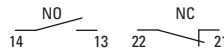
LS and LSM, continued

Contact Travel
 ■ = contact closed
 □ = contact open

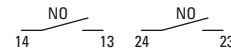
LS-02, LS-S02, LSM-02



LS-11S, LS-S11S, LSM-11S



LS-20A, LS-S20A, LSM-20A

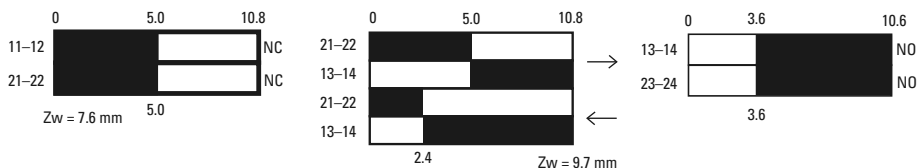


Description

Operating Heads

Angled roller lever

LS-XLA, LSM-XLA

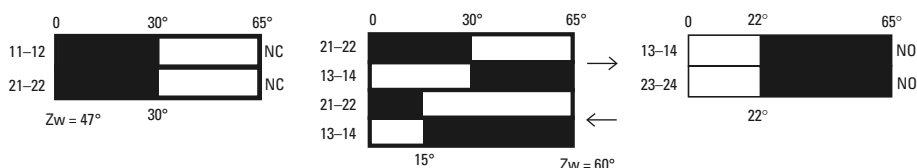


Rotary lever

LS-XRL, LSM-XRL

Adjustable roller lever

LS-XRLA, LSM-XRLA
 LS-XRLA30, LS-XRLA40
 LS-XRLA40R

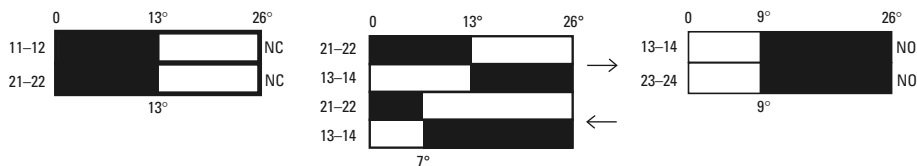


Actuating rod

LS-XRR, LSM-XRR
 LS-XRRM, LSM-XRRM

Spring rod

LS-XS, LSM-XS



2.3

Limit Switches

LS-Titan Miniature DIN Switches

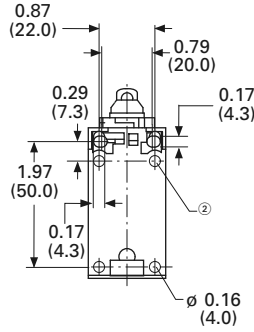
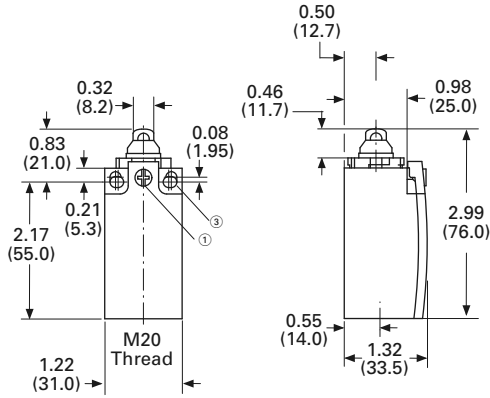
Dimensions

Approximate Dimensions in Inches (mm)

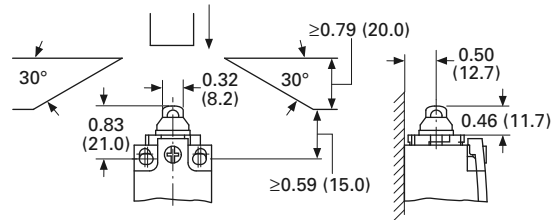
2

Position Switches

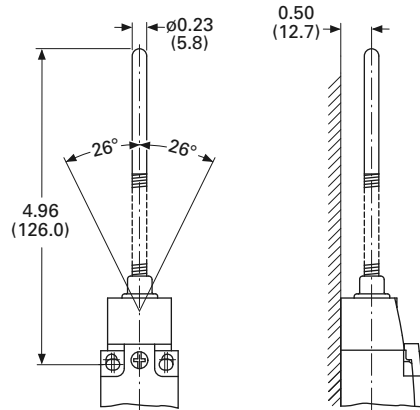
LS-..., LSM-..., LSE-...



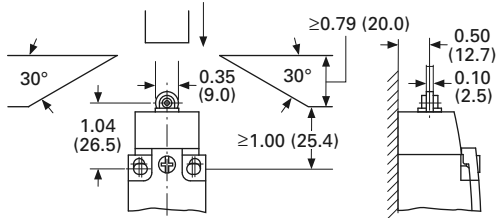
LS-..., LSM-..., LSE-...



LS(M)-.../S



LS(M)-.../P



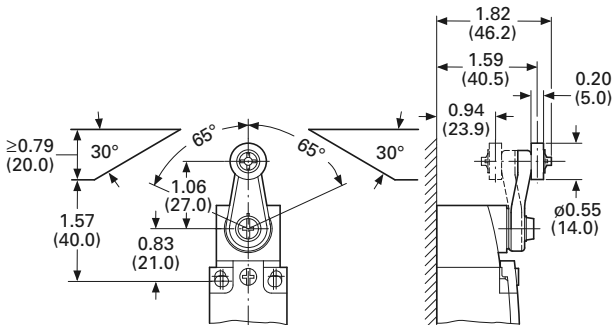
Notes

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

Approximate Dimensions in Inches (mm)

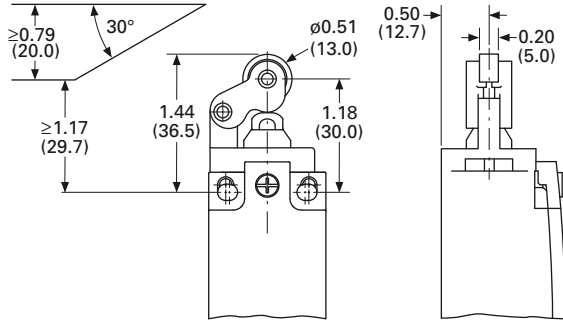
Rotary Lever

LS(M)-.../RL



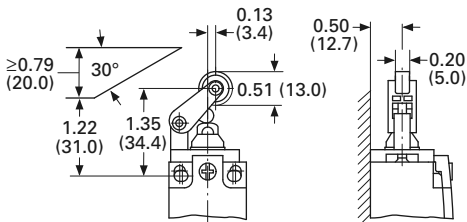
Roller Lever, Short

LS(M)-.../LS



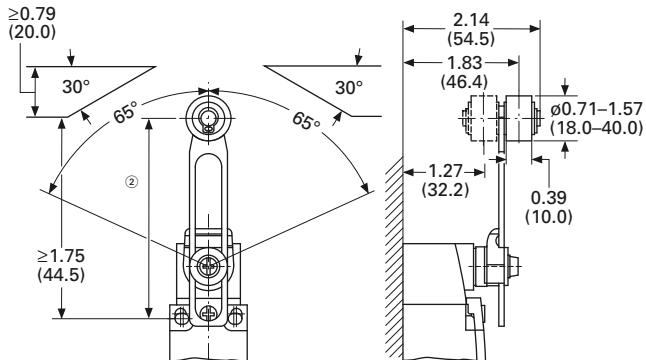
Roller Lever

LS(M)-.../L



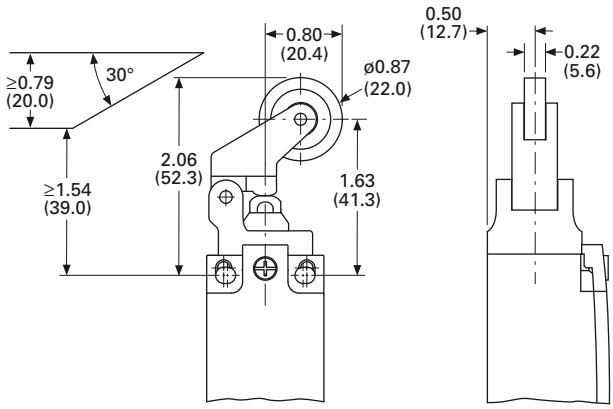
Adjustable Roller Lever

LS(M)-.../RLA



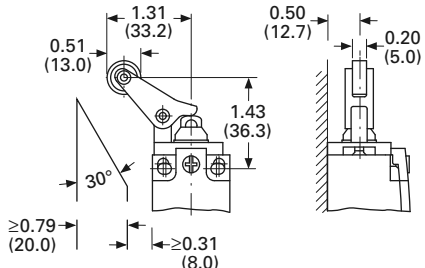
Roller Lever, Large

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

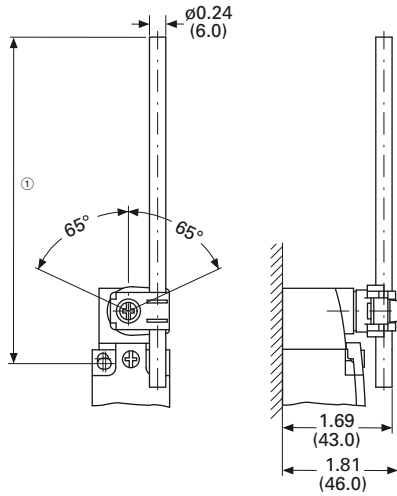
LS-Titan Miniature DIN Switches

Approximate Dimensions in Inches (mm)

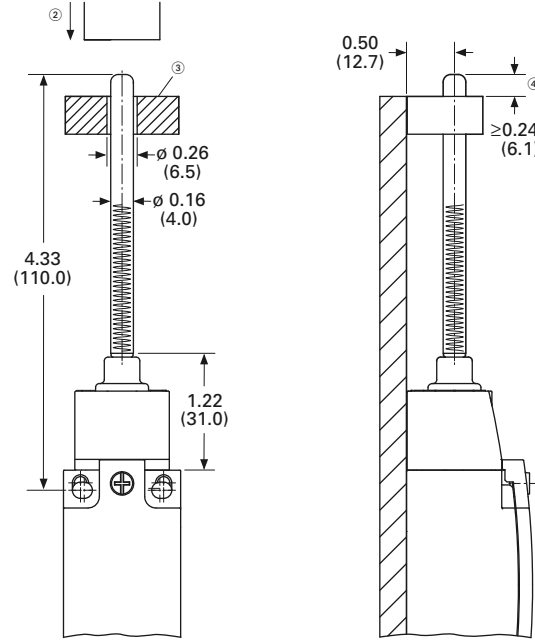
2

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.