

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



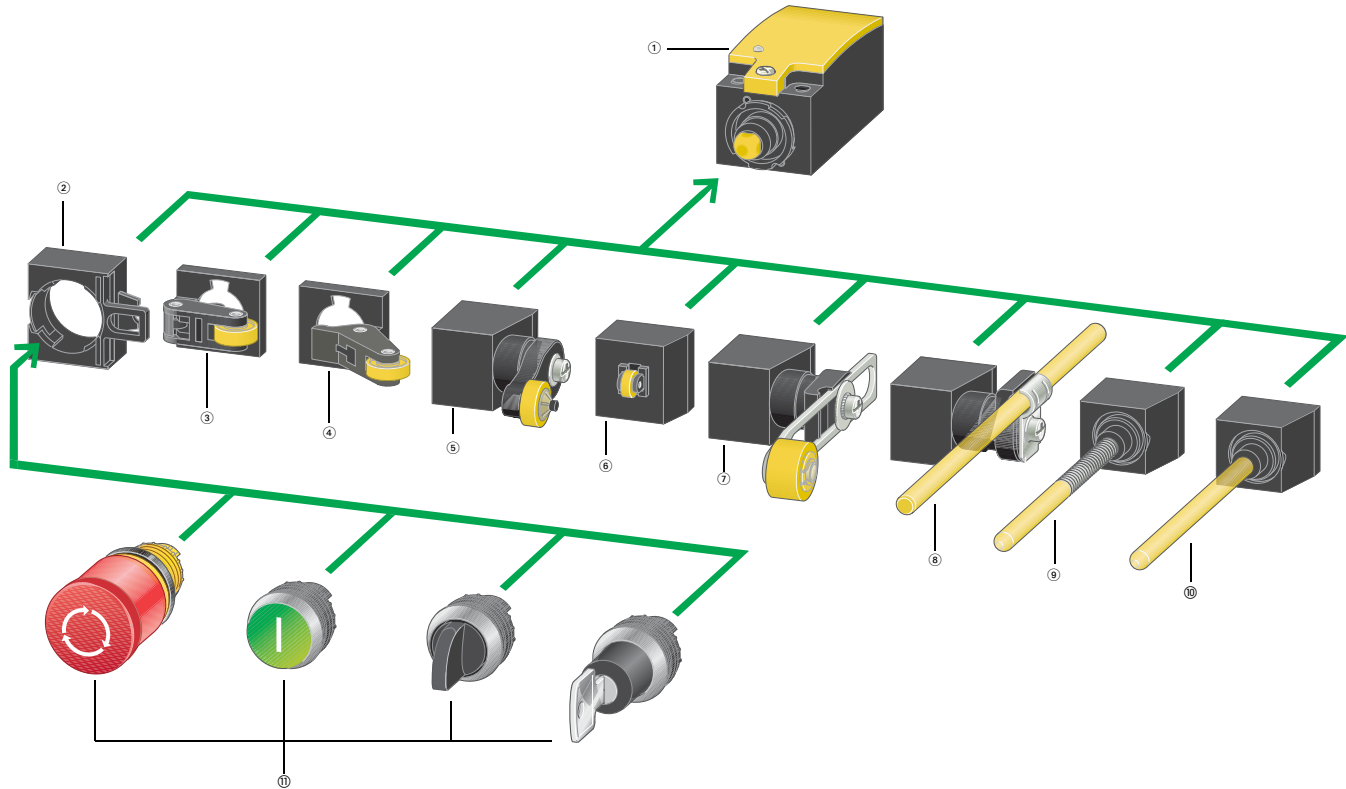
Note: Cage Clamp is a registered trademark of Wago Kontakttechnik, 32423 Minden, Germany.

For the most current information on this product, visit our Web site: www.eaton.com

For Customer Service in the U.S. call 1-877-ETN CARE (386-2273), in Canada call 1-800-268-3578. For Application Assistance in the U.S. and Canada call 1-800-426-9184.

Product Identification

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Notes

- ① **Basic device** (see Pages V8-T2-23 to V8-T2-31)
 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 Page V8-T2-33)
 Allows mounting of M22 pushbuttons
- ③ **Roller lever** (see Pages V8-T2-23 and V8-T2-26)
 For one-sided operation with higher operating speed
- ④ **Angled roller lever** (see Pages V8-T2-23, V8-T2-26 and V8-T2-30)
 For actuation along the unit axis
- ⑤ **Rotary lever** (see Pages V8-T2-23, V8-T2-27 and V8-T2-30)
 For actuation from the side, for pendulum movements
- ⑥ **Roller plunger** (see Pages V8-T2-23, V8-T2-26 and V8-T2-30)
 For actuation from the side with low actuating force
- ⑦ **Adjustable roller lever** (see Pages V8-T2-24, V8-T2-27, V8-T2-28 and V8-T2-30)
 For length adjustment as required
- ⑧ **Actuating rod** (see Pages V8-T2-25, V8-T2-29 and V8-T2-31)
 On conveyor belts for lightweight goods
- ⑨ **Spring-rod** (see Pages V8-T2-25, V8-T2-29 and V8-T2-31)
 For flexible actuation from all sides
- j **Actuating rod** (see Pages V8-T2-25, V8-T2-29 and V8-T2-31)
 Withdrawable mechanism from front
- k 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 Body		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	Assembled Switch Catalog Number		
Head Only Catalog Number					
	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 V8-T2-40**.

2.3

Limit Switches

LS-Titan Miniature DIN Switches

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Plastic Safety Switch Body



Assembled Switch



Plastic Safety Switches, continued

Switch Body Catalog Number

Output Function

Terminal Connection

Contact Sequence

Contact Travel

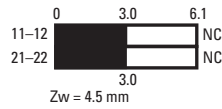
■ = contact closed

□ = contact open

LS-S02

2NC with positive opening contacts

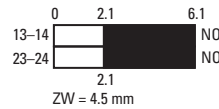
Screw terminal ①



LS-S20A

2NO with slow make/break

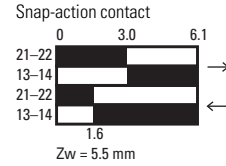
Screw terminal ①



LS-S11S

1NO and 1NC with positive opening contact

Screw terminal ①



Operating Head Type ②

Head Only Catalog Number

Assembled Switch Catalog Number

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 V8-T2-40.

Plastic Safety Switches, continued

Plastic Safety Switch Body



Assembled Switch



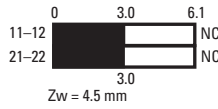
Switch Body Catalog Number
Output Function

Terminal Connection
Contact Sequence

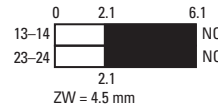
Contact Travel
 ■ = contact closed
 □ = contact open

Operating Head Type ②
Head Only Catalog Number

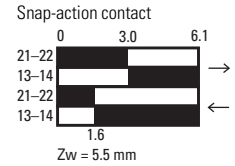
LS-S02
2NC with positive opening contacts
Screw terminal ①



LS-S20A
2NO with slow make/break
Screw terminal ①



LS-S11S
1NO and 1NC with positive opening contact
Screw terminal ①



Assembled Switch Catalog Number

Plastic Rod Lever



LS-XRR	LS-S02-RR	LS-S20A-RR	LS-S11S-RR
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Metal Rod



LS-XRRM	LS-S02-RRM	LS-S20A-RRM	LS-S11S-RRM
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Spring Rod (Wobble) ③



LS-XS	LS-S02-S	LS-S20A-S	LS-S11S-S
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Actuating Rod



LS-XOR	LS-S02-OR	LS-S20A-OR	LS-S11S-OR
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Notes

- ① Cage Clamp versions available. Contact Application Engineering.
- ② For operating head dimensions, see Page V8-T2-40.
- 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 Body



Assembled Switch



Plastic Electronic Safety Position Switches

Switch Body

Catalog Number

LSE-11

LSE-02

LSE-AI

LSE-AU

Output Function

1NO and 1 NC

2NC

Analog 4–20 mA

Analog 0–10V

Terminal Connections

Cage Clamp ①

Cage Clamp ①

Cage Clamp ①

Cage Clamp ①

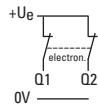
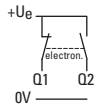
Safety Functions and Approvals

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



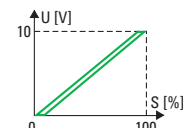
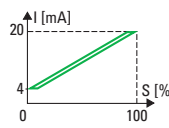
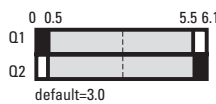
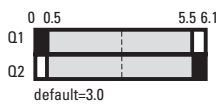
Analog 4–20 mA

Analog 0–10V

Contact Travel

■ = contact closed

□ = contact open



Operating Head Type ②

Head Only

Catalog Number

Assembled Switch

Catalog Number

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 V8-T2-33](#).

② For operating head dimensions, see [Page V8-T2-40](#).

Plastic Electronic Safety Position Switches, continued

Plastic Electronic Safety Position Switch Body

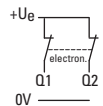
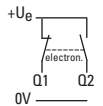


Assembled Switch



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

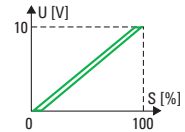
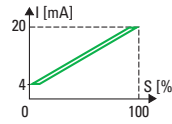
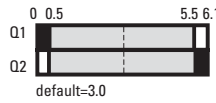
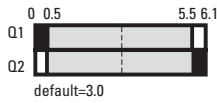


Analog 4–20 mA

Analog 0–10V

Contact Travel

■ = contact closed
□ = contact open



Operating Head Type ②

Head Only Catalog Number	Assembled Switch Catalog Number
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Rotary Lever



LS-XRL	LSE-11-RL	LSE-02-RL	LSE-AI-RL	LSE-AU-RL
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Adjustable Roller Lever (with 18 mm Roller)



LS-XRLA	LSE-11-RLA	LSE-02-RLA	LSE-AI-RLA	LSE-AU-RLA
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Adjustable Roller Lever (With 30 mm Roller)



LS-XRLA30	LSE-11-RLA30	LSE-02-RLA30	LSE-AI-RLA30	LSE-AU-RLA30
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Notes

- ① A compatible Cage Clamp tool is available as an accessory on Page V8-T2-33.
- ② For operating head dimensions, see Page V8-T2-40.

Plastic Electronic Safety Position Switch Body



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

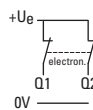
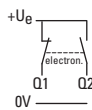
Safety Functions and Approvals

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

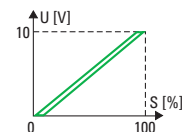
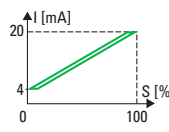
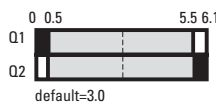
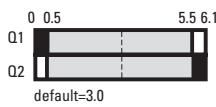


Analog 4–20 mA

Analog 0–10V

Contact Travel

■ = contact closed
□ = contact open



Operating Head Type ②

**Head Only
Catalog Number**

**Assembled Switch
Catalog Number**

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



LS-XRLA40

LSE-11-RLA40

LSE-02-RLA40

LSE-AI-RLA40

LSE-AU-RLA40

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



LS-XRLA40R

LSE-11-RLA40R

LSE-02-RLA40R

LSE-AI-RLA40R

LSE-AU-RLA40R

Plastic Rod Lever



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 V8-T2-33**.
- ② For operating head dimensions, see **Page V8-T2-40**.

Plastic Electronic Safety Position Switches, continued

Plastic Electronic Safety Position Switch Body



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.	

Assembled Switch



Operating Head Type ②	Head Only Catalog Number	Assembled Switch Catalog Number	LS-XRRM	LSE-11-RRM	LSE-02-RRM	LSE-AI-RRM	LSE-AU-RRM
Contact Sequence							
Contact Travel							
Contact Sequence Diagram							
Contact Travel Diagram							

Metal Rod



Spring Rod (Wobble) ③



Actuating Rod



Notes

- ① A compatible Cage Clamp tool is available as an accessory on Page V8-T2-33.
- ② For operating head dimensions, see Page V8-T2-40.
- 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 Body



Assembled Switch



Metal Safety Switches

Switch Body Catalog Number

Output Function

Terminal Connection

Contact Sequence

Contact Travel

■ = contact closed

□ = contact open

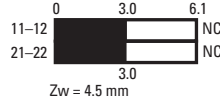
Operating Head Type ①

Head Only Catalog Number

LSM-02

2NC with positive opening contacts

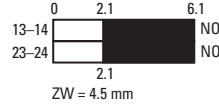
Cage Clamp



LSM-20A

2NO with slow make/break

Cage Clamp



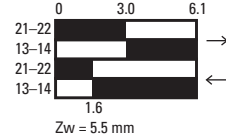
LSM-11S

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 V8-T2-40**.

Metal Safety Switches, continued

Metal Safety Switch Body



Assembled Switch



Switch Body Catalog Number

Output Function

Terminal Connection

Contact Sequence

Contact Travel

- = contact closed
- = contact open

Operating Head Type ①

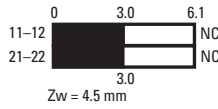
Head Only

Catalog Number

LSM-02

2NC with positive opening contacts

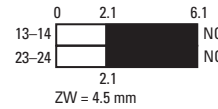
Cage Clamp



LSM-20A

2NO with slow make/break

Cage Clamp



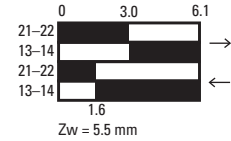
LSM-11S

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 V8-T2-40**.

2.3

Limit Switches

LS-Titan Miniature DIN Switches

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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.

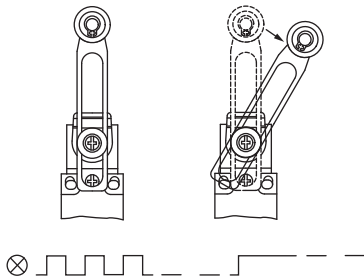
The LSE-AI (4–20 mA) and LSE-AU (0–10V) analog position switches take position data and convert to an analog current or voltage value that can then be continuously fed into an automation system. These two switches also feature a diagnostic output for additional data processing.

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.

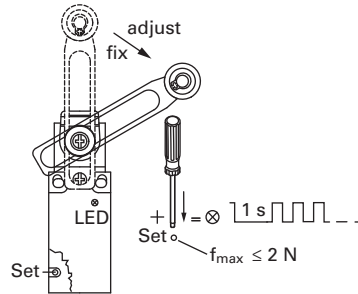
Like the electromechanical position switches, LS-Titan electronic position switches meet Category 3 or 4 of the EN 954-1 standard for machine safety when configured as a redundant system. All devices are thus suitable for safety applications that are used for the protection of persons or processes.

Operating Point Adjustment

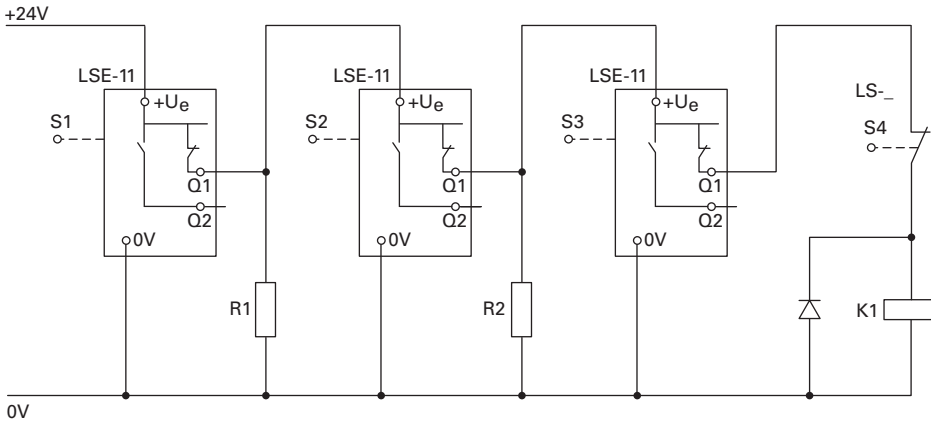
LSE-11



LSE-02



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



Notes

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

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

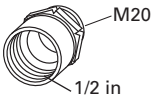

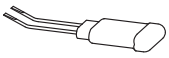
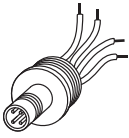
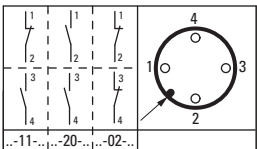
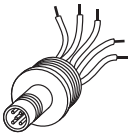
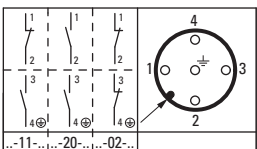
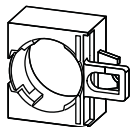
S1 is connected to 24 Vdc

S2, S3 each switch with a delay of 0.7s

R1, R2, for example, 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 in. 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 in. 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
M12A 	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.		M12A
M12A5 	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.		M12A5
M22-LS 	Any	Allows mounting of M22 pushbuttons. (See the M22 catalog, CA04716001E, for a full selection of pushbuttons.)	—	M22-LS

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		°F (°C)	−13° to 158°F (−25° to 70°C)	−13° to 158°F (−25° to 70°C)	−13° to 158°F (−25° to 70°C)	−13° to 158°F (−25° to 70°C)
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					
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_{θ}	Approx. U_{θ}
	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.

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

	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
LS(M)-XRL for angle of actuation	$\alpha = 0^\circ$	m/s	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
LS(M)-XRR for angle of actuation	$L = 130 \text{ mm}$	m/s	1.5	1.5	1.5
LS(M)-XL for angle of actuation	$\alpha = 30^\circ/45^\circ$	m/s	1	1	1
LS(M)-XLA for angle of actuation	$\alpha = 30^\circ/45^\circ$	m/s	1	1	1
LS(M)-XP for angle of actuation	$\alpha = 0^\circ/30^\circ$	m/s	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

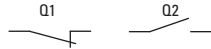
Contact Travel Diagrams

LSE

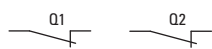
Contact Travel

■ = contact closed
□ = contact open

LSE-11

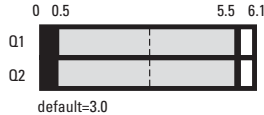
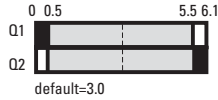


LSE-02



Description

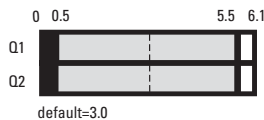
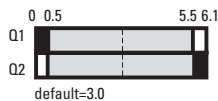
Basic Units



Operating Heads

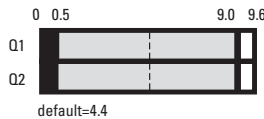
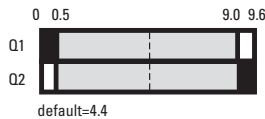
Roller plunger

LS-XP
LSM-XP



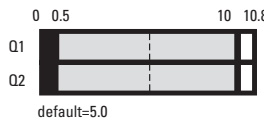
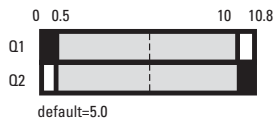
Roller lever

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



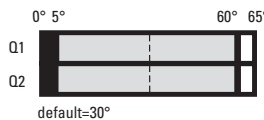
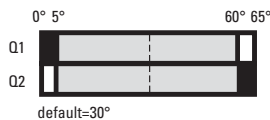
Angled roller lever

LS-XLA
LSM-XLA



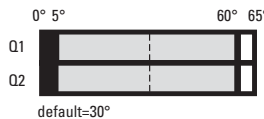
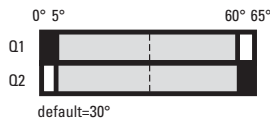
Rotary lever

LS-XRL
LSM-XRL



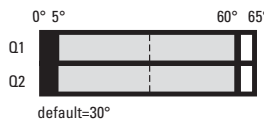
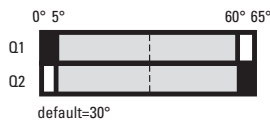
Adjustable roller lever

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



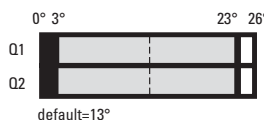
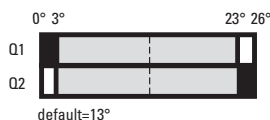
Actuating rod

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



Spring rod

LS-XS
LSM-XS



2.3

Limit Switches

LS-Titan Miniature DIN Switches

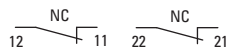
LS and LSM

2

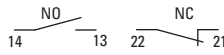
Contact Travel

■ = contact closed
□ = contact open

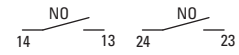
LS-02, LS-S02, LSM-02



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

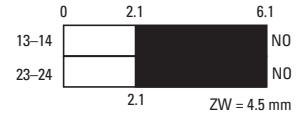
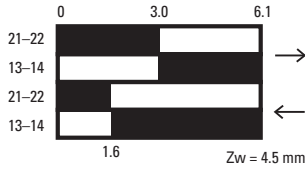
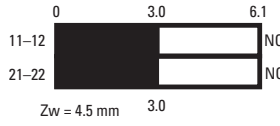


LS-20A, LS-S20A, LSM-20A



Description

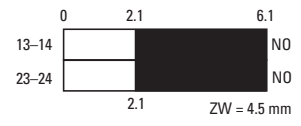
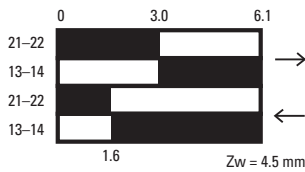
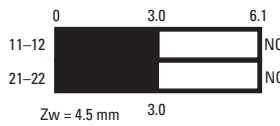
Basic Units



Operating Heads

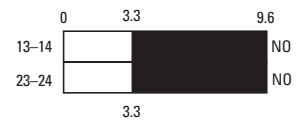
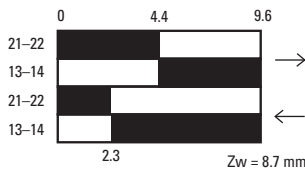
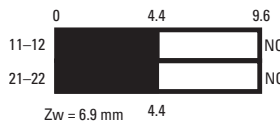
Roller plunger

LS-XP, LSM-XP



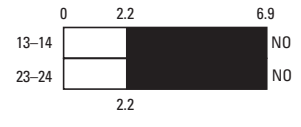
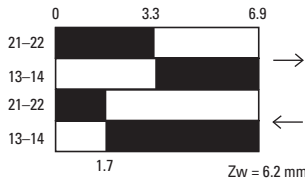
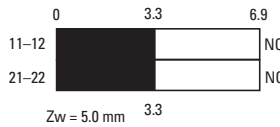
Roller lever

LS-XL, LSM-XL



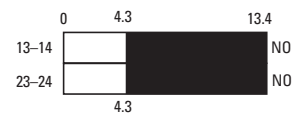
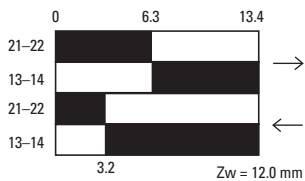
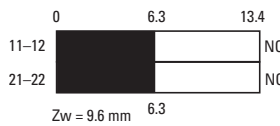
Roller lever, short

LS-XLS



Roller lever, large

LS-XLB



LS and LSM, continued

	Contact Travel	LS-02, LS-S02, LSM-02	LS-11S, LS-S11S, LSM-11S	LS-20A, LS-S20A, LSM-20A
Description	■ = contact closed □ = contact open			
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

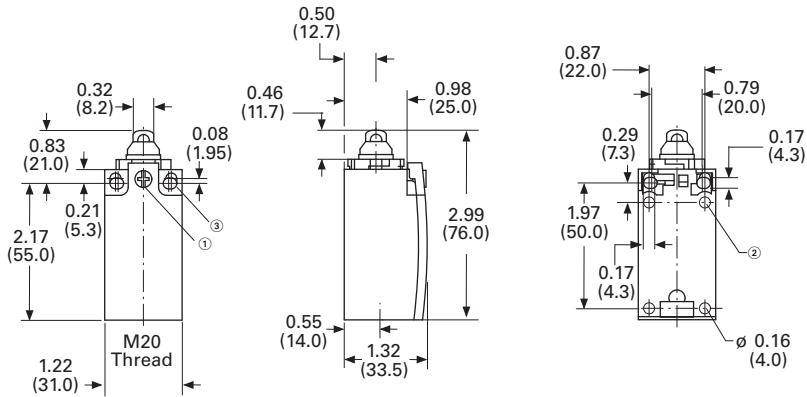
Dimensions

Approximate Dimensions in Inches (mm)

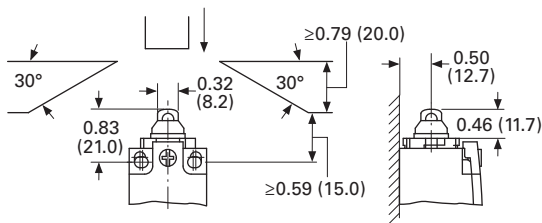
2

Position Switches

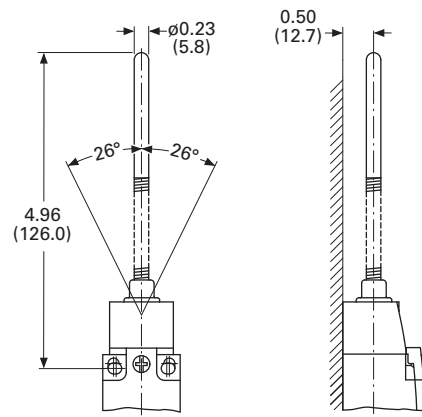
LS-_, LSM-_, LSE-_



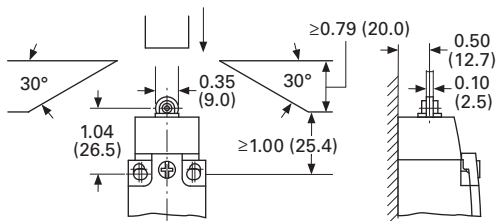
LS-_, LSM-_, LSE-_



LS(M)-_/S



LS(M)-_/P



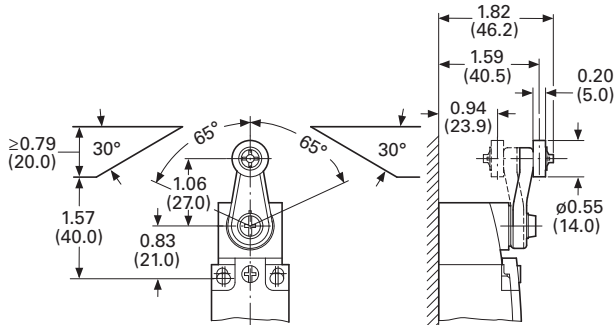
Notes

- ① Tightening torque of cover screws: 0.8 Nm \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)

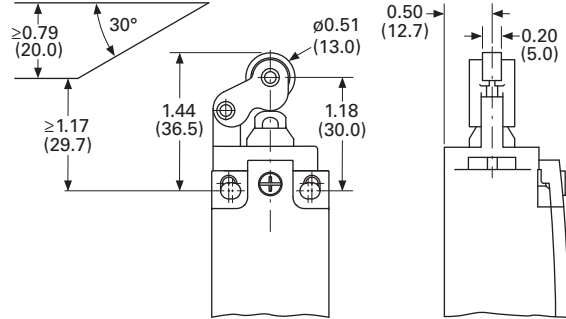
Rotary Lever

LS(M)-_RL



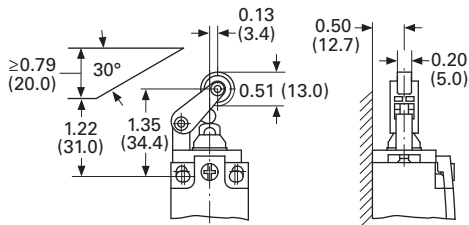
Roller Lever, Short

LS(M)-_LS



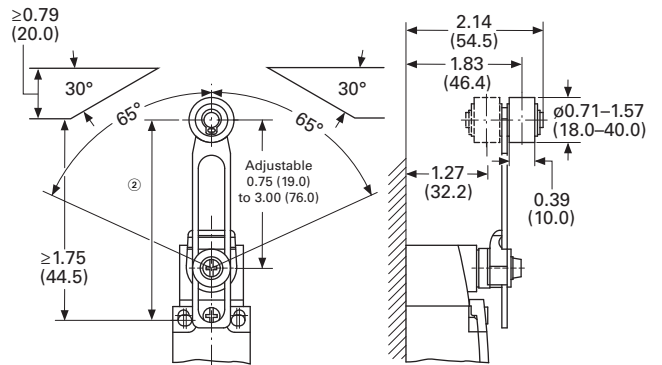
Roller Lever

LS(M)-_L



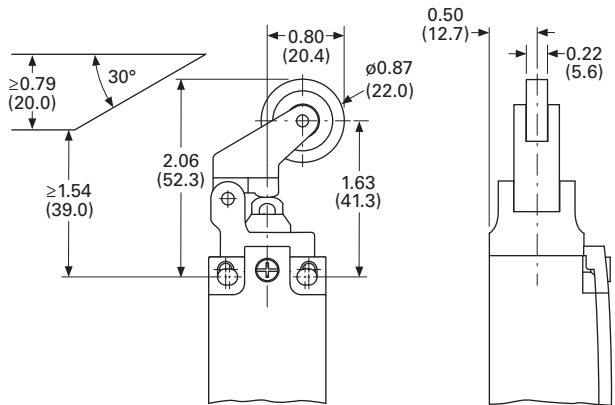
Adjustable Roller Lever

LS(M)-_RLA



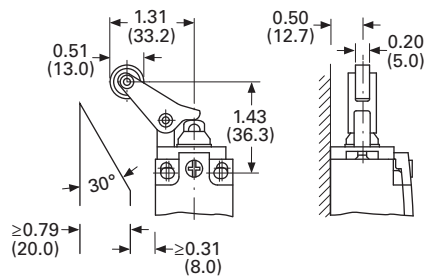
Roller Lever, Large

LS(M)-_LB ①



Angled Roller Lever

LS(M)-_XLA



Notes

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

2.3

Limit Switches

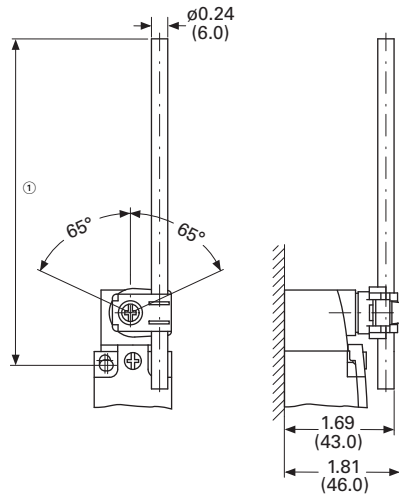
LS-Titan Miniature DIN Switches

Approximate Dimensions in Inches (mm)

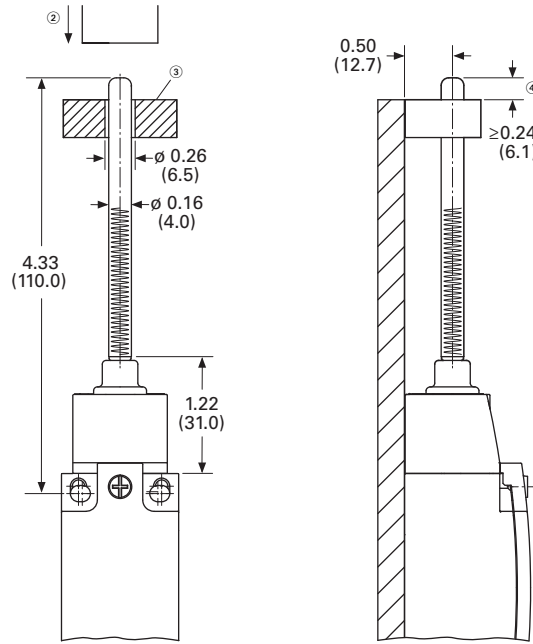
2

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.