



9 - Limit switches

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Dimensions

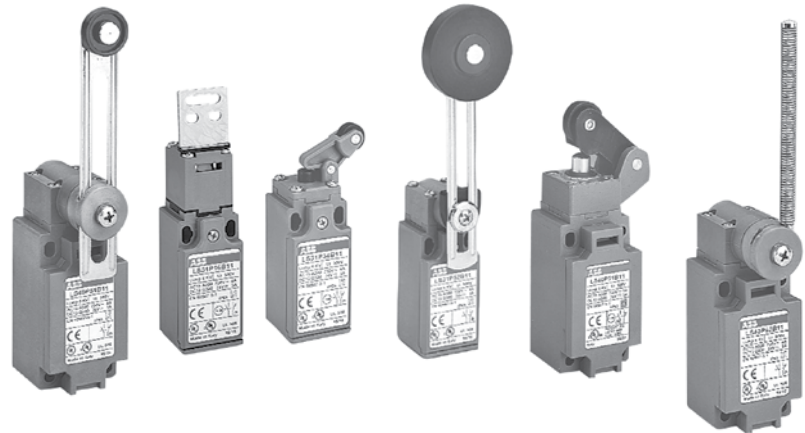
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Selection Guide

Limit switches



Limit Switches Selection Guide



Description

Limit switches can be mounted into remote locations so that they are actuated by an object other than a human operator. They are used for detecting presence/absence, counting, travel limit, and more.

Limit switches are made of reinforced UL-V0 thermoplastic fiberglass, offer double insulation \square and a degree of protection of IP 65 and UL Type 4.

Casings come in 4 dimensions:

- 30mm width
- 35mm width
- 40mm width
- 60mm width

Applications

Easy to use, electromechanical limit switches offer specific qualities:

- Visible operation
- Electrically separated contacts
- Precise operating points (consistency)
- Immune to electromagnetic disturbances

Limit switches used for these mechanical applications:

- Presence/absence
- Positioning and travel limit
- Objects passing/counting

UL Listed file #E191693

Selection guide

Plastic casing, 30mm, 40mm, & 60mm
IP65, UL Type 4

Plastic Casing NEMA 4, IP65 - Double Insulation 

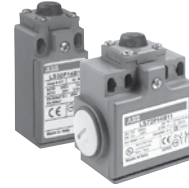
30 mm LS 3  P..B11 ^①









60 mm LS 7  P..B11 ^①

Width

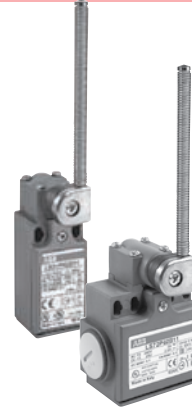
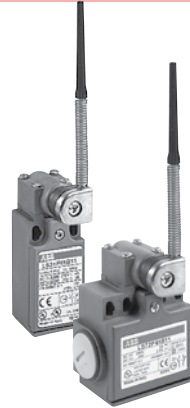
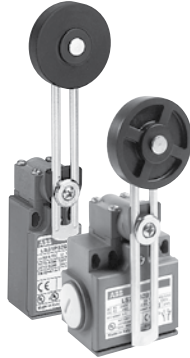
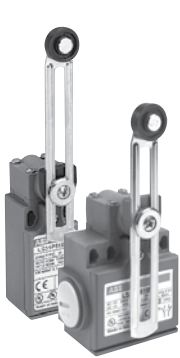
Electrical Connection













- 0** = Pg 13.5
- 1** = Pg 11
- 5** = 1/2" NPT




Type	LS..P10, LS..P11	LS..P12, LS..P13	LS..P14	LS..P31
Actuator	Plain plunger	Roller plunger	Plain plunger	Roller lever
Action type				
CENELEC Conformity / Positive opening operation	EN 50047 	EN 50047 	EN 50047 	EN 50047 

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LS..P51, LS..P53	LS..P52	LS..P55	LS..P61	LS..P62	LS..P71, LS..P72
Adjustable roller lever	Adjustable roller lever	Adjustable roller lever	Flexible lever	Flexible lever	Adjustable rod lever
					
N/A 	N/A 	N/A 	N/A 	N/A 	N/A 

Plastic Casing NEMA 4, IP65 Double Insulation 









40 mm LS 4  P..B11 ^①

Width

Electrical Connection

- 0** = Pg 13.5
- 5** = 1/2" NPT



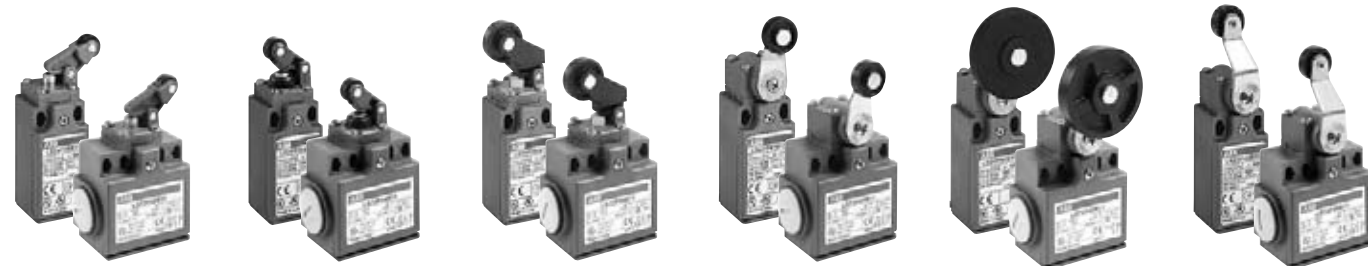
Type	LS..P11	LS..P13	LS..P31	LS..P41
Actuator	Plain plunger	Roller plunger	Roller lever	Roller Lever
Action type				
CENELEC Conformity / Positive opening operation	EN 50041 	EN 50041 	N/A 	EN 50041 

^① B11 = 1NO + 1NC Snap action contacts. Other contact configurations are available. Refer to catalog pages.

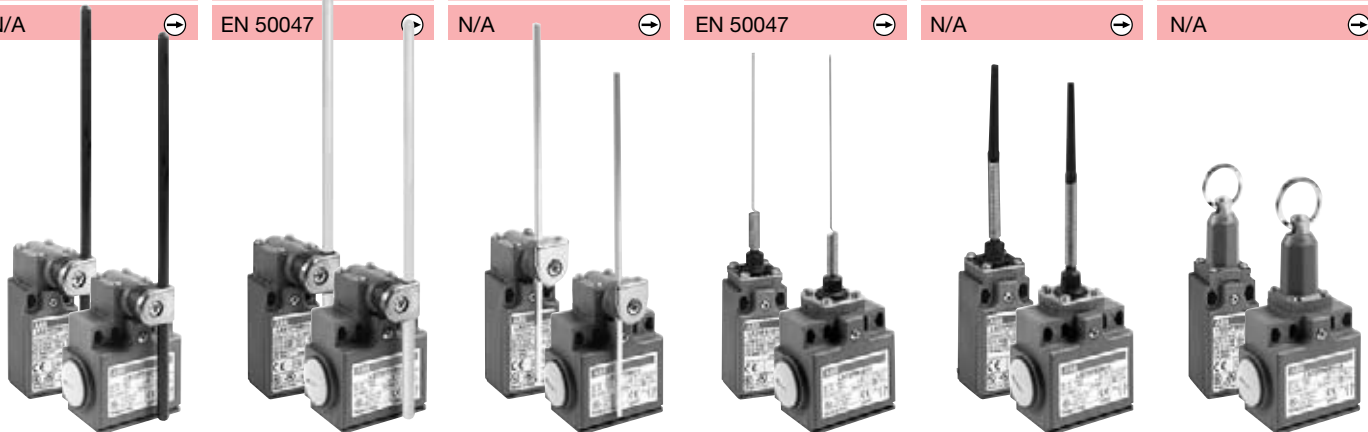
Selection guide

Plastic casing, 30mm, 40mm, & 60mm
IP65, UL Type 4

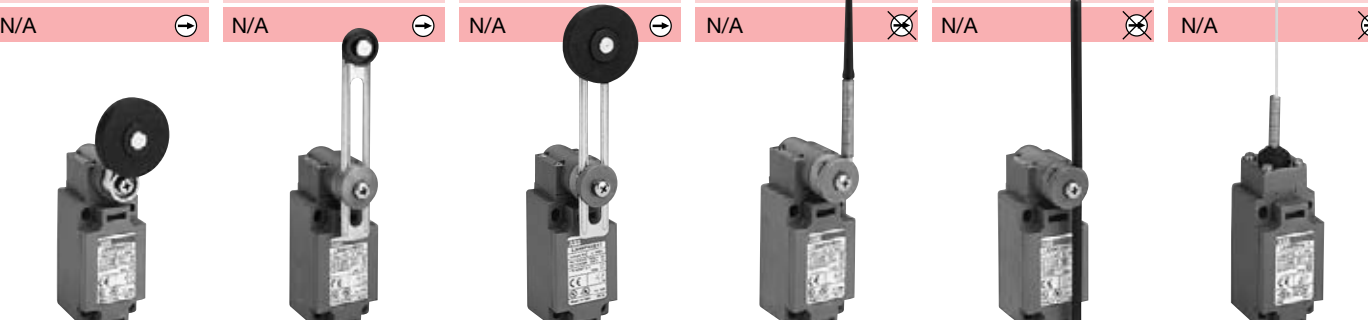
Limit switches



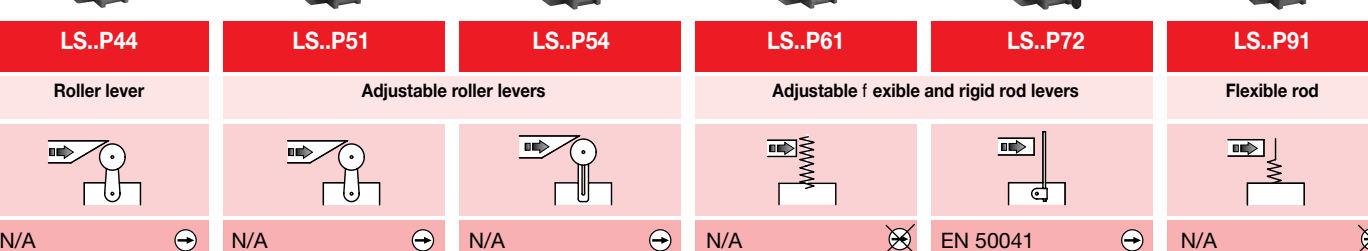
LS..P32	LS..P35	LS..P38	LS..P41, LS..P43	LS..P42	LS..P45, LS..P46
Roller lever	Roller lever	Roller lever	Roller lever	Roller lever	Roller lever
N/A	EN 50047	N/A	EN 50047	N/A	N/A



LS..P73	LS..P74	LS..P78	LS..P91	LS..P92	LS..P98B11-A
Adjustable rod lever	Adjustable rod lever	Adjustable rod lever	Flexible rod	Flexible rod	Pull action
N/A	N/A	N/A	N/A	N/A	N/A



LS..P44	LS..P51	LS..P54	LS..P61	LS..P72	LS..P91
Roller lever	Adjustable roller levers		Adjustable flexible and rigid rod levers		Flexible rod
N/A	N/A	N/A	N/A	EN 50041	N/A



Selection guide

Metal casing, 30mm, 40mm, & 60mm
IP66, UL Type 4X

Metal Casing NEMA 4X, IP66

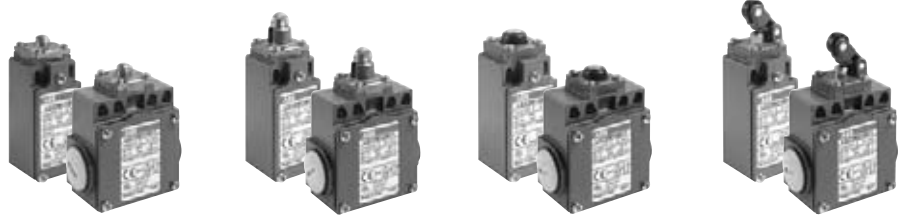
30 mm L S 3 M..B11^①

60 mm L S 7 M..B11^①

Width

Electrical Connection

- 0 = Pg 13.5
- 1 = Pg 11
- 5 = 1/2" NPT



Type	LS..M11	LS..M12, LS..M13	LS..M14	LS..M31
Actuator	Plain plunger	Roller plunger	Plain plunger	Roller lever
Action type				
CENELEC Conformity / Positive opening operation	EN 50047	EN 50047	EN 50047	EN 50047

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LS..M51, LS..M53	LS..M52	LS..M55	LS..M61	LS..M62	LS..M71, LS..M72
Adjustable roller lever	Adjustable roller lever	Adjustable roller lever	Flexible lever	Flexible lever	Adjustable rod lever
N/A	N/A	N/A	N/A	N/A	N/A

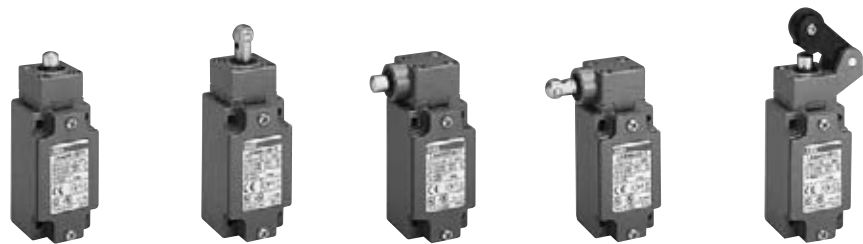
Metal Casing NEMA 4X, IP66

40 mm L S 4 M..B11^①

Width

Electrical Connection

- 0 = Pg 13.5
- 5 = 1/2" NPT



Type	LS..M11	LS..M13	LS..M21	LS..M22	LS..M31
Actuator	Plain plunger	Roller plunger	Plain plunger	Roller plunger	Roller lever
Action type					
CENELEC Conformity / Positive opening operation	EN 50041	EN 50041	EN 50041	EN 50041	N/A

① B11 = 1NO + 1NC Snap action contacts. Other contact configurations are available. Refer to catalog pages.

Selection guide

Metal casing, 30mm, 40mm, & 60mm
IP66, UL Type 4X

Limit switches



LS..M32

LS..M35

LS..M38

LS..M41, LS..M43

LS..M42

LS..M45, LS..M46

Roller lever

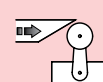
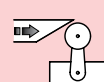
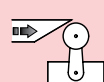
Roller lever

Roller lever

Roller lever

Roller lever

Roller lever



N/A

EN 50047

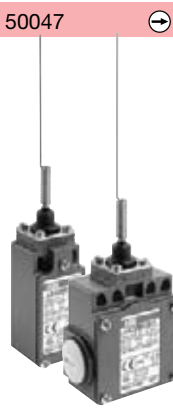
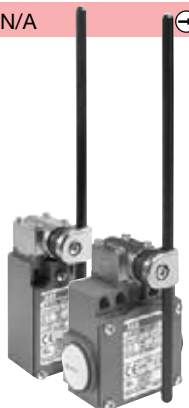
N/A

EN 50047

N/A

N/A

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LS..M73

LS..M74

LS..M78

LS..M91

LS..M92

LS..M98B11-A

Adjustable rod lever

Adjustable rod lever

Adjustable rod lever

Flexible rod

Flexible rod

Pull action



N/A

N/A

N/A

N/A

N/A

N/A



LS..M41

LS..M51

LS..M54

LS..M61

LS..M72

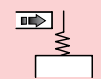
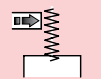
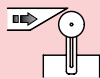
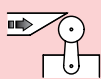
LS..M91

Roller lever

Adjustable roller levers

Adjustable flexible and rigid rod levers

Flexible rod



EN 50041

N/A

N/A

N/A

EN 50041

N/A

Selection guide

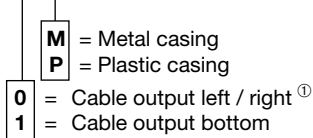
Miniature pre-wired, 30mm & 35mm
IP67, UL Type 4X, 6

30 mm width

Metal Casing NEMA 4, 4X, 6, IP67

Plastic Casing NEMA 1, IP67 – Double insulation

LS2 ... B11 - U01



Type	LS2..M11, LS2..P11	LS2..M12, LS2..P12	LS2..M13, LS2..P13	LS2..M14, LS2..P14
Actuator	Brass plain plunger	Steel roller plunger	Plastic roller plunger	Cross steel roller plunger
Action type				
CENELEC Conformity / Positive opening operation	N/A	N/A	N/A	N/A

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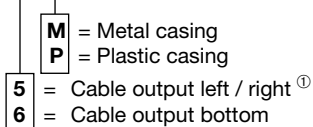
LS2..M41, LS2..P41	LS2..M42, LS2..P42	LS2..M45, LS2..P45	LS2..M46, LS2..P46	LS2..M51, LS2..P51	LS2..M54, LS2..P54
ø14 plastic roller lever	ø14 steel roller lever	ø18 plastic roller with bent lever	ø18 steel roller with bent lever	Adjustable ø18 plastic roller lever	Adjustable ø18 steel roller lever
N/A	N/A	N/A	N/A	N/A	N/A

35 mm width

Metal Casing NEMA 4, 4X, 6, IP67

Plastic Casing NEMA 1, IP67 – Double insulation

LS2 ... B11 - U01



Type	LS2..M11, LS2..P11	LS2..M12, LS2..P12	LS2..M14, LS2..P14	LS2..M21, LS2..P21
Actuator	Brass plain plunger	Steel roller plunger	Cross steel roller plunger	Brass plain plunger with fixing nuts
Action type				
CENELEC Conformity / Positive opening operation	N/A	N/A	N/A	N/A

^① Standard cable length 1m. Other lengths available.

Selection guide

Miniature pre-wired, 30mm & 35mm
IP67, UL Type 4X, 6

Limit switches

LS2..M15, LS2..P15	LS2..M21, LS2..P21	LS2..M22, LS2..P22	LS2..M23, LS2..P23	LS2..M24, LS2..P24	LS2..M25, LS2..P25
Cross plastic roller plunger	Brass plain plunger with fixing nuts	Steel roller plunger with fixing nuts	Plastic roller plunger with fixing nuts	Cross roller plunger with fixing nuts	Cross plastic roller plunger with fixing nuts
N/A	N/A	N/A	N/A	N/A	N/A
LS2..M71, LS2..P71	LS2..M72, LS2..P72	LS2..M73, LS2..P73	LS2..M78, LS2..P78	LS2..M91, LS2..P91	LS2..M92, LS2..P92
Adjustable ø3 steel rod lever	Adjustable ø3 fibre-glass rod lever	Adjustable ø6 polyamide rod lever	Adjustable ø3 steel rod lever	Spring rod	Flexible rod w/ insulated end
N/A	N/A	N/A	N/A	N/A	N/A
LS2..M22, LS2..P22	LS2..M24, LS2..P24	LS2..M41, LS2..P41	LS2..M51, LS2..P51	LS2..M71, LS2..P71	LS2..M91, LS2..P91
Steel roller plunger with fixing nuts	Cross steel roller lever with fixing nuts	ø14 Plastic roller lever	Adjustable ø18 plastic roller lever	Adjustable ø3 steel rod lever	Spring rod
N/A	N/A	N/A	N/A	N/A	N/A

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Selection guide

Key safety, 30mm, 40mm
Latch & manual reset, 30mm

Key Safety Limit Switches

(Key ordered separately)

30 mm
40 mm
Width

LS 3 ..B11[Ⓢ]-S
LS 4 ..B11[Ⓢ]-S

Electrical Connection
0 = Pg 13.5
5 = 1/2" NPT

P = Plastic casing
M = Metal casing



Limit Switches	LS3..P80..-S	LS3..M80..-S	LS3..P81..-S	LS3..M81..-S	LS4..P80..-S	LS4..M80..-S
Operating head options:	Adjustable head		Pivoting head		Adjustable head	
Action type: Translation with small latch (key)						
Positive opening operation						

Keys

(required for Key Safety Limit Switches)



Keys for LS3...Limit Switches	LSA30P03	LSA30P04	LSA30P05	LSA30P06	LSA30P07	LSA30P08	LSA30P09
Keys for LS4...Limit Switches			LSA40X05	LSA40X06	LSA40X07	LSA40X08	LSA40X09
Actuator	Right angle key	Straight key	Right angle key	Straight key	Right angle key + shock absorber	Straight key + shock absorber	Adjustable angle key
Mounting Width	22 mm	22 mm	13 mm	13 mm	15 mm	15 mm	40 mm

Latch and Manual Reset Switches

30 mm
Width

LS 3 ..B11[Ⓢ]-R

Electrical Connection
0 = Pg 13.5
5 = 1/2" NPT

P = Plastic casing
M = Metal casing



Type	LS3..P11..-R	LS3..M11..-R	LS3..P12..-R	LS3..M12..-R
Actuator	Galvanized steel plain plunger		Galvanized steel roller plunger	
Action type				
Positive opening operation				

Ⓢ B11 = 1NO + 1NC Snap action contacts. Other contact configurations are available. Refer to catalog pages.

Selection guide

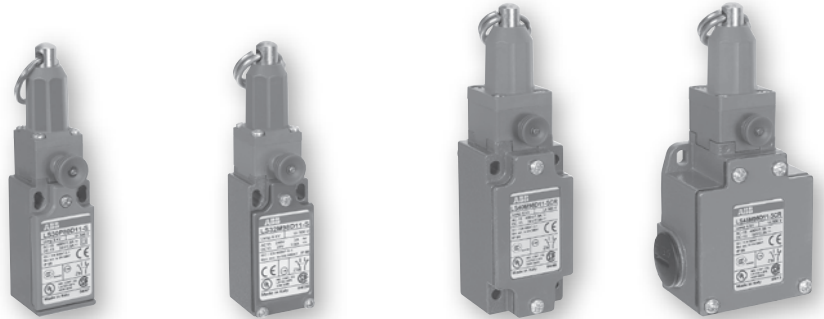
Pull cable, 30mm, 40mm, & 60mm

Rotative axis & lever, 30mm

Pull Cable Safety Limit Switches

30 mm Width **LS 3** P = Plastic casing
M = Metal casing
..B11^①-SCR
 Electrical Connection 0 = Pg 13.5
5 = 1/2" NPT

Metal only:
40 mm Width **LS 4** P = Plastic casing
M = Metal casing
M..B11^①-SCR
60 mm Width **LS 6** P = Plastic casing
M = Metal casing
M..B11^①-SCR
 Electrical Connection 0 = Pg 13.5
5 = 1/2" NPT



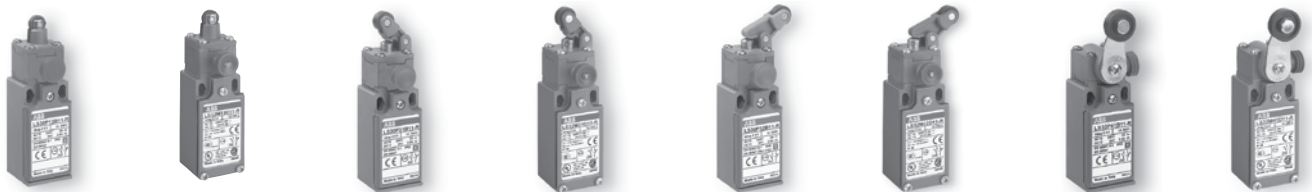
Limit Switches	LS3..P98..-SCR	LS3..M98..-SCR	LS4..M98..-SCR	LS6..M98..-SCR
Operating head options:	By red cable		By red cable	
Action type: Pulling				
Positive opening operation				

Rotative Axis and Lever Safety Limit Switches

30 mm Width **LS 3** P = Plastic casing
M = Metal casing
..B11^①-S
 Electrical Connection 0 = Pg 13.5
5 = 1/2" NPT



Limit Switches	LS3..P75..-S	LS3..M75..-S	LS3..P76..-S	LS3..M76..-S	LS3..P77..-S	LS3..M77..-S
Actuator:	Galvanized steel rotative axis		Stainless steel rotative axis		Galvanized steel lever	
Action type:						
Positive opening operation						



LS3..P13..-R	LS3..M13..-R	LS3..P31..-R	LS3..M31..-R	LS3..P32..-R	LS3..M32..-R	LS3..P41..-R	LS3..M41..-R
Plastic roller plunger		Plastic roller lever on galvanized steel plunger				Rotary lever with plastic roller	

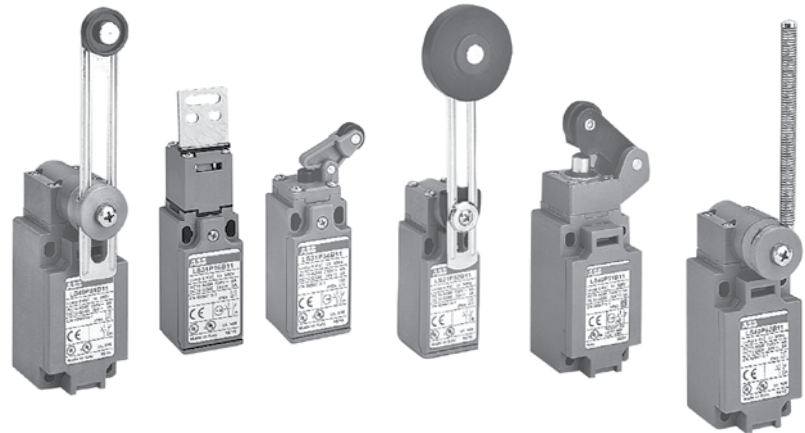
① B11 = 1NO + 1NC Snap action contacts. For other contact configurations available, consult ABB.

Plastic Limit switches

ABB

Limit Switches

Plastic casing, 30mm , 40mm, & 60mm
Assembled units
Components



Description

Limit switches are made of reinforced UL-V0 thermoplastic fiberglass, offer double insulation \square and a degree of protection of IP 65 and UL Type 4.

Casings come in 3 dimensions:

- 30mm width
– LS35P
- 40mm width
– LS45P
- 60mm width
– LS75P

Applications

Easy to use, electromechanical limit switches offer specific qualities:

- Visible operation
- Electrically separated contacts
- Precise operating points (consistency)
- Immune to electromagnetic disturbances

Limit switches used for these mechanical applications:

- Presence/absence
- Positioning and travel limit
- Objects passing/counting

UL Listed file #E191693

General information

30mm, 40mm & 60mm, IP65, UL Type 4

Applications


Easy to use, electromechanical limit switches offer specific qualities:

- Visible operation
- Able to switch strong currents (10 A conventional thermal current)
- Electrically separated contacts
- Precise operating points (consistency)
- Immune to electromagnetic disturbances

Limit switches used for these mechanical applications:

- Presence/absence
- Positioning and travel limit
- Objects passing/counting

Description

Limit switches, which are made of reinforced UL-V0 thermoplastic fiberglass, offer double insulation  and a degree of protection of IP 65 and UL type 4.

Casings come in 3 dimensions:

- 30mm width
– LS35P
- 40mm width
– LS45P
- 60mm width
– LS75P

9

30 or 40mm width casings with standardized dimensions corresponding to:

- EN 50047 for 30mm width
- EN 50041 for 40mm width

Mounting the casing

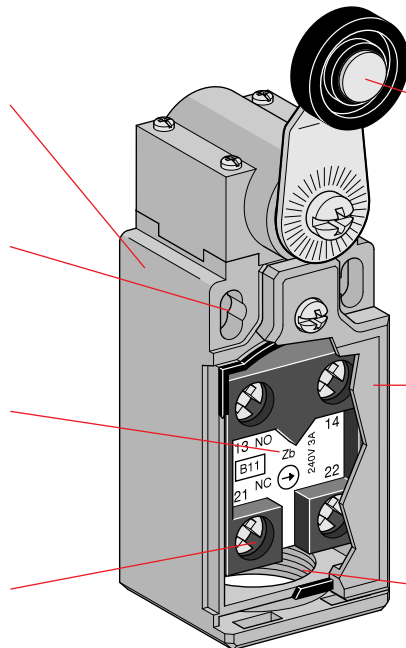
- 2 x M4 screws on top part for 30mm width
- 2 or 4 x M5 screws for 40mm width
- 2 or 4 x M5 screws for 60mm width

Block of 2 contacts

- Contact configuration: N.O. + N.C., 2 N.O., 2 N.C.
- Positive opening operation
- Snap action or slow action
- Zb shape: the 2 contacts are electrically separated

Connecting terminals

- M3.5 (+,-) pozidriv 2 screw
- Screw head with captive cable clamp
- Markings conform with IEC 947-1, IEC 947-5-1, EN 50005 and 50013 standards



A variety of operating heads

- Plain plunger
 - Roller plunger
 - Roller lever, adjustable or not, etc.
- Assembled using 4 x ø 3 screws for 30mm width
Assembled using 4 x ø 4 screws for 40mm width

Cover

- Closed using ø 3 screws for 30mm width
 - Self clipping closure for 40mm width
- One piece sealing gasket to ensure tightness

Electrical connection

- 1 x Pg 11 cable gland for LS31P
- 1 x Pg 13.5 cable gland for LS30P
- 1 x Pg 13.5 cable gland for LS40P
- 1 x 1/2" NPT cable gland for LS35P (standard)
- 1 x 1/2" NPT cable gland for LS45P (standard)

General information

30mm, 40mm & 60mm, IP65, UL Type 4
Catalog number explanation

Catalog number explanation

LS 3 5 P 41 B 11

Limit switch

Casing width

3: 30mm
4: 40mm
7: 60mm

Electrical connection

0: pg 13.5
1: pg 11
5: 1/2" NPT (standard)

Plastic casing

Operating heads (see selection guides)

Use codes 40 or 50 to indicate casings without operating heads, (see page 9.19)

Contact block

11: 1 N.O. contact + 1 N.C. contact
20: 2 N.O. contacts
02: 2 N.C. contacts

Contact type

B: Zb Snap action
L: Zb Slow action (contact dependent)
D: Zb Slow action non-overlapping late make
C: Zb Slow action overlapping early make

Assembled 30mm, IP 65, UL Type 4

Movement to be detected

Key translation, on end or lateral

On end



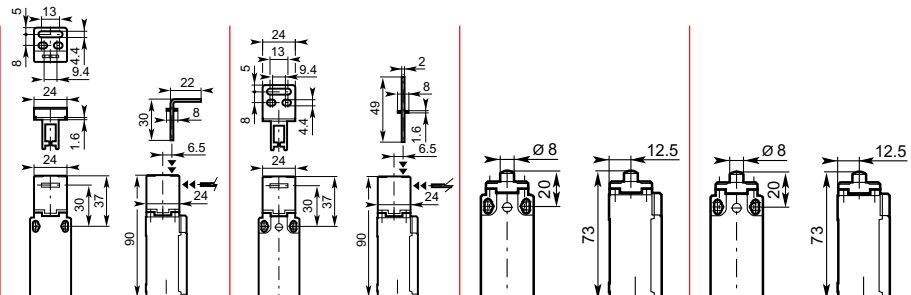
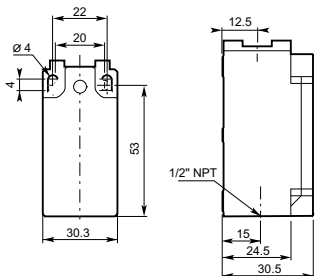
Operating head type

	Right angle key	Straight key	Plain thermoplastic plunger	Plain steel plunger
Conformity / (N.C. contact with positive opening operation)			EN 50 047	EN 50 047
Maximum actuation speed m/s	0.5	0.5	0.5	0.5
Min. force: - actuation N	18	18	9	9
- positive opening operation N	60	60	44	44

9

		LS35P15B11 \$ 46.50	LS35P16B11 \$ 49.50	LS35P10B11 \$ 33	LS35P11B11 \$ 33
Snap action contacts	Catalog number List price	LS35P15B11 \$ 46.50	LS35P16B11 \$ 49.50	LS35P10B11 \$ 33	LS35P11B11 \$ 33
	Operation diagram				
Non-overlapping Slow action contacts	Catalog number List price	LS35P15D11 49.50	LS35P16D11 52.50	LS35P10D11 34.50	LS35P11D11 34.50
	Operation diagram				
Overlapping Slow action contacts	Catalog number List price	LS35P15C11 51	LS35P16C11 54	LS35P10C11 36	LS35P11C11 36
	Operation diagram				
Slow action contacts	Catalog number List price	LS35P15L02 51	LS35P16L02 54	LS35P10L02 36	LS35P11L02 36
	Operation diagram				
Slow action contacts	Catalog number List price	LS35P15L20 51	LS35P16L20 54	LS35P10L20 36	LS35P11L20 36
	Operation diagram				
Snap action contacts	Catalog number List price	LS35P15B02 51	LS35P16B02 54	LS35P10B02 36	LS35P11B02 36
	Operation diagram				
Weight (packing per unit)	kg	0.085	0.085	0.065	0.070

Approximate dimensions (mm)



Assembled 30mm, IP 65, UL Type 4

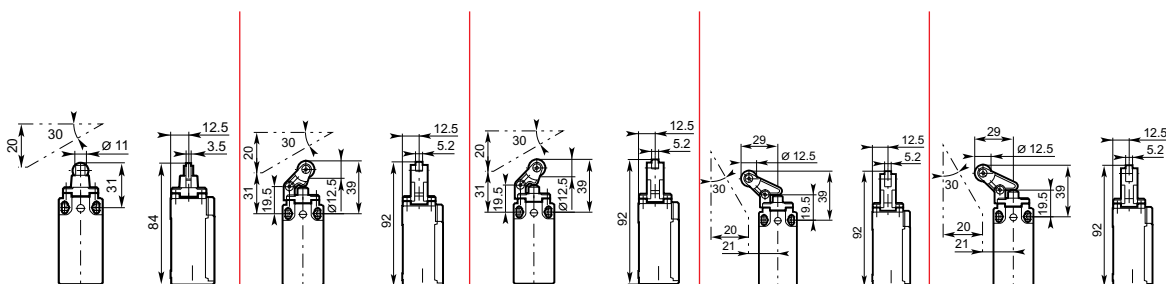
Plastic
Limit switches

30° Cam Translat. 30° Unidirectional Cam Translation Movement



Plastic roller plunger	Plastic roller lever on plastic plunger	Plastic roller lever on steel plunger	Plastic roller lever on steel plunger	Plastic roller lever on plastic plunger
EN 50 047	EN 50 047	EN 50 047		
0.3	1	1	1	1
12	7	7	3	3
41	24	24	24	24

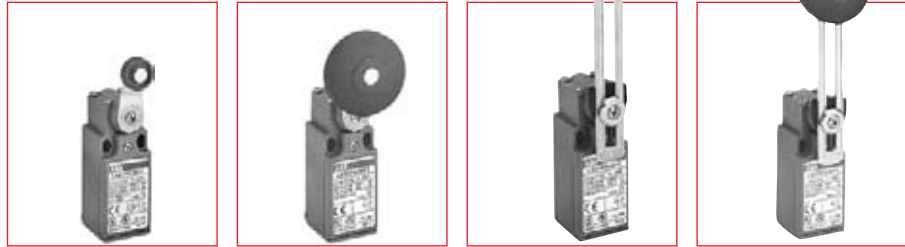
LS35P13B11 \$ 37.50 0 1.4 3.3 7.8 11.2 mm 21-22 13-14 13-14 21-22 13-14 13-14	LS35P30B11 \$ 36 0 3.0 7.1 16.9 24.4 mm 21-22 13-14 13-14 21-22 13-14 13-14	LS35P31B11 \$ 37.50 0 3.0 7.1 16.9 24.4 mm 21-22 13-14 13-14 21-22 13-14 13-14	LS35P32B11 \$ 36 0 2.6 6.2 14.7 21.3 mm 21-22 13-14 13-14 21-22 13-14 13-14	LS35P34B11 \$ 37.50 0 2.6 6.2 14.7 21.3 mm 21-22 13-14 13-14 21-22 13-14 13-14
LS35P13D11 39 0 2.6 5.1 11.4 mm 21-22 13-14 13-14 21-22 13-14 13-14	LS35P30D11 37.50 0 5.6 10.9 24.4 mm 21-22 13-14 13-14 21-22 13-14 13-14	LS35P31D11 39 0 5.6 10.9 24.4 mm 21-22 13-14 13-14 21-22 13-14 13-14	LS35P32D11 37.50 0 4.9 9.4 21.1 mm 21-22 13-14 13-14 21-22 13-14 13-14	LS35P34D11 39 0 4.9 9.4 21.1 mm 21-22 13-14 13-14 21-22 13-14 13-14
LS35P13C11 40.50 0 4.6 7.0 11.4 mm 21-22 13-14 13-14 21-22 13-14 13-14	LS35P30C11 39 0 9.8 15.0 24.4 mm 21-22 13-14 13-14 21-22 13-14 13-14	LS35P31C11 40.50 0 9.8 15.0 24.4 mm 21-22 13-14 13-14 21-22 13-14 13-14	LS35P32C11 39 0 8.5 13.0 21.1 mm 21-22 13-14 13-14 21-22 13-14 13-14	LS35P34C11 40.50 0 8.5 13.0 21.1 mm 21-22 13-14 13-14 21-22 13-14 13-14
LS35P13L02 40.50 0 2.3 4.7 11.4 mm 11-12 21-22 13-14 11-12 21-22 13-14	LS35P30L02 39 0 4.9 10.1 24.4 mm 11-12 21-22 13-14 11-12 21-22 13-14	LS35P31L02 40.50 0 4.9 10.1 24.4 mm 11-12 21-22 13-14 11-12 21-22 13-14	LS35P32L02 39 0 4.2 8.8 21.1 mm 11-12 21-22 13-14 11-12 21-22 13-14	LS35P34L02 40.50 0 4.2 8.8 21.1 mm 11-12 21-22 13-14 11-12 21-22 13-14
LS35P13L20 40.50 0 2.3 11.4 mm 13-14 23-24 13-14 13-14 23-24 13-14	LS35P30L20 39 0 4.9 24.4 mm 13-14 23-24 13-14 13-14 23-24 13-14	LS35P31L20 40.50 0 4.9 24.4 mm 13-14 23-24 13-14 13-14 23-24 13-14	LS35P32L20 39 0 4.2 21.1 mm 13-14 23-24 13-14 13-14 23-24 13-14	LS35P34L20 40.50 0 4.2 21.1 mm 13-14 23-24 13-14 13-14 23-24 13-14
LS35P13B02 40.50 0 1.4 3.3 7.8 11.2 mm 11-12 21-22 13-14 13-14 11-12 21-22 13-14 13-14	LS35P30B02 39 0 3.0 7.1 16.9 24.4 mm 11-12 21-22 13-14 13-14 11-12 21-22 13-14 13-14	LS35P31B02 40.50 0 3.0 7.1 16.9 24.4 mm 11-12 21-22 13-14 13-14 11-12 21-22 13-14 13-14	LS35P32B02 39 0 2.6 6.2 14.7 21.3 mm 11-12 21-22 13-14 13-14 11-12 21-22 13-14 13-14	LS35P34B02 40.50 0 2.6 6.2 14.7 21.3 mm 11-12 21-22 13-14 13-14 11-12 21-22 13-14 13-14
0.070	0.065	0.070	0.075	0.070



Assembled 30mm, IP 65, UL Type 4

Movement to be detected

30° Cam translation movement



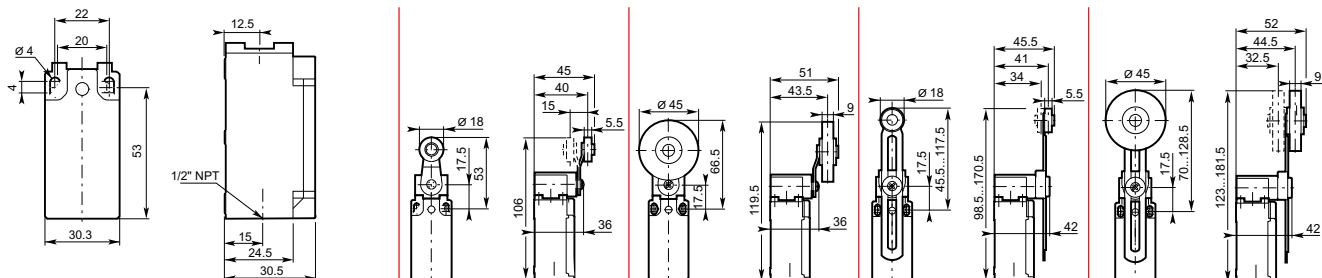
Operating head type

	Ø 18 Polyamide roller lever	Ø 45 Rubber roller lever	Adjustable Ø 18 polyamide roller lever	Adjustable Ø 45 rubber roller lever
Conformity / (N.C. contact with positive opening operation)	EN 50 047			
Maximum actuation speed	m/s 1.5	1.5	1.5	1.5
Min. torque: - actuation	N.m 0.10	0.10	0.10	0.10
- positive opening operation	N.m 0.32	—	—	—

9 Additional technical data

Contacts	Catalog number	List price	LS35P41B11	LS35P42B11	LS35P51B11	LS35P52B11
Snap action contacts	LS35P41B11	\$ 39	LS35P42B11	\$ 40.50	LS35P51B11	LS35P52B11
Operation diagram						
Non-overlapping slow action contacts	LS35P41D11	40.50	LS35P42D11	43.50	LS35P51D11	LS35P52D11
Operation diagram						
Overlapping slow action contacts	LS35P41C11	42	LS35P42C11	45	LS35P51C11	LS35P52C11
Operation diagram						
Slow action contacts	LS35P41L02	42	LS35P42L02	45	LS35P51L02	LS35P52L02
Operation diagram						
Slow action contacts	LS35P41L20	42	LS35P42L20	45	LS35P51L20	LS35P52L20
Operation diagram						
Snap action contacts	LS35P41B02	42	LS35P42B02	45	LS35P51B02	LS35P52B02
Operation diagram						
Weight (packing per unit)	kg	0.090	0.120	0.100	0.130	

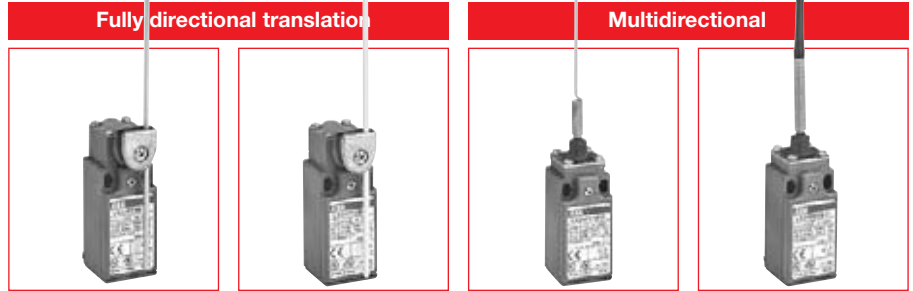
Dimensions (mm)



Assembled 30mm, IP 65, UL Type 4

Plastic
Limit switches

Movement to be detected



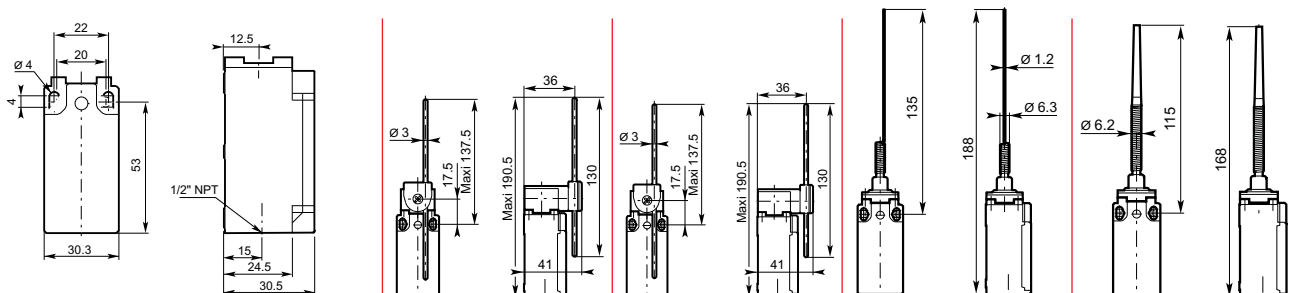
Operating head type

	Adjustable ø 3 stainless steel rod lever	Adjustable ø 3 fiber-glass rod lever	Spring rod	Flexible rod with insulated end
Conformity / (N.C. contact with positive opening operation)				
Maximum actuation speed	m/s 1.5	m/s 1.5	m/s 1	m/s 1
Min. torque: - actuation	N.m 0.10	N.m 0.10	N.m 0.12	N.m 0.12
- positive opening operation	N.m -	N.m -	N.m -	N.m -

9

	Catalog number	LS35P71B11	LS35P72B11	LS35P91B11	LS35P92B11
Snap action contacts	List price	\$ 40.50	\$ 40.50	\$ 37.50	\$ 37.50
	Operation diagram				
Non-overlapping Slow action contacts	List price	42	42	40.50	40.50
	Operation diagram				
Overlapping Slow action contacts	List price	43.50	43.50	40.50	40.50
	Operation diagram				
Slow action contacts	List price	43.50	43.50	40.50	40.50
	Operation diagram				
Slow action contacts	List price	43.50	43.50	40.50	40.50
	Operation diagram				
Snap action contacts	List price	43.50	43.50	40.50	40.50
	Operation diagram				
Weight (packing per unit)	kg	0.100	0.100	0.080	0.080

Dimensions (mm)



Components

Catalog number explanation

30mm, IP 65, UL Type 4



LS35P40B11

Casings with contact block and angular motion head (without actuator)

	LS	35	P	40	B11	
Limit Switch.....	LS					
Casing width 30 mm		3				
Cable inlet						
1 cable inlet for Pg 13.5 cable gland				0		
1 cable inlet for Pg 11 cable gland				1		
1 cable inlet by 1/2" NPT plastic adaptor.....				5		
Plastic casing.....			P			
Operating heads (without actuator)						
With angular movement for non-adjustable roller levers.....				40		
With angular movement for adjustable roller or rod levers.....				50		
						Contacts
						11 1 N.O. + 1 N.C. contacts
						02 2 N.C. contacts
						20 2 N.O. contacts
						Snap action
						B .....Zb Snap
						Dependent (slow) action
						L .....Zb Slow / Simultaneous
						D .....Zb Non-overlapping late make
						C .....Zb Overlapping early make

Separate actuators (lever, key)

	LS	A	30	X	41	
Limit Switch.....	LS					
Actuator (lever, key)		A				
Casing width: 30 mm			30			
						Actuator:
						05, 06 .....key
						41, 42 .....non-adjustable roller lever
						51, 52 .....adjustable roller lever
						71, 72, 73, 74 .....adjustable rod lever
						For casing of:
						M Metal
						P Plastic
						X Plastic or metal



LSA30X41

Separate contact blocks

	LS	C	30	X	D	11	
Limit Switch.....	LS						
Contact blocks		C					
Casing width 30 mm			30				
For casing of:							Contacts
Metal.....					M		11 1 N.O. + 1 N.C. contacts
Plastic.....					P		02 2 N.C. contacts
Plastic or metal.....					X		20 2 N.O. contacts
							Snap action
							B .....Zb Snap
							Dependent (slow) action
							L .....Zb Slow / Simultaneous
							D .....Zb Non-overlapping late make
							C .....Zb Overlapping early make



LSC30XD11

Components

Selection guide

30mm, IP 65, UL Type 4

Plastic
Limit switches

Non-adjustable actuators



LSA30X42



LSA30X41 (A Shape)

Roller levers (non-adjustable)

Adjustable actuators



LSA30X52



LSA30X51

Adjustable roller levers



LSA30X71

Adjustable rod levers



LSA30X72



LSA30X73



LSA30X74

Casings



LS35P40 casings (equipped with angular motion head) for roller levers (**non-adjustable**)

- ⊕ LS35P40B11, LS35P40D11, LS35P40C11, LS35P40L02, LS35P40B02
- ⊗ LS35P40L20



LS30P50 ... LS35P50 (equipped with angular motion head) for **adjustable** roller or rod levers

- ⊗ LS35P50B11, LS35P50D11, LS35P50C11, LS35P50L02, LS35P50L20, LS35P50B02

Contact blocks



- ⊕ LSC30XB11, LSC30XD11, LSC30XC11, LSC30XL02, LSC30XB02
- ⊗ LSC30XL20

⊕ Suitable for positive opening operation (IEC 60947-5-1 and EN 50041).
Warning! The positive opening operation of limit switch is only guaranteed if the elements noted with ⊕ are fitted.

Components

Casings with angular motion head 30mm, IP 65, UL Type 4

Casings with angular motion head for non-adjustable roller levers, delivered without actuator

⊕ "N.C." contact with positive opening operation or element (subassembly, head, lever) suitable for positive opening operation.

Warning! The positive opening operation of limit switch is only guaranteed if the elements noted with ⊕ are fitted.



LS35P40B11

Contact blocks						Positive opening operation	Actuation speed max. m/s	Unit weight kg (1 pc)	Catalog number	List price
B11	D11	C11	L02	L20	B02					
1						⊕	1.5	0.092	LS35P40B11	\$ 34.50
	1					⊕	1.5	0.092	LS35P40D11	36.00
		1				⊕	1.5	0.092	LS35P40C11	37.50
			1			⊕	1.5	0.092	LS35P40L02	37.50
				1		⊗	1.5	0.092	LS35P40L20	37.50
					1	⊕	1.5	0.092	LS35P40B02	37.50

Components

Casings with angular motion head 30mm, IP 65, UL Type 4

⊕ "N.C." contact with positive opening operation or element (subassembly, head, lever) suitable for positive opening operation.

Warning! The positive opening operation of limit switch is only guaranteed if the elements noted with ⊕ are fitted.



LS35P50B11



LSA30X41

LSA30X42



LSA30X51

LSA30X71



LSA30P05

LSA30P06



LSC30XD11

LSR1305

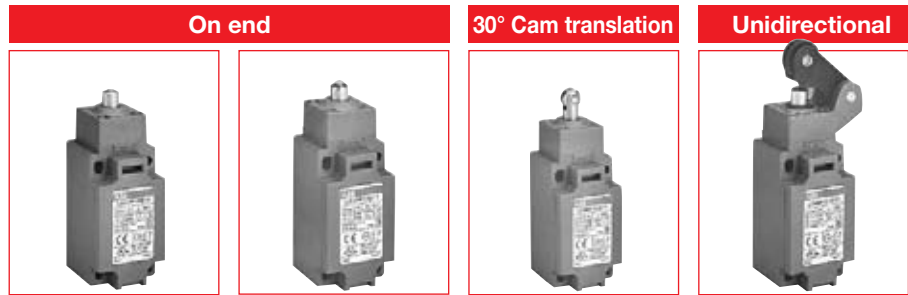
Casings with angular motion head for adjustable rod or roller levers, delivered without actuator

Contact blocks						Positive opening operation	Actuation speed max. m/s	Unit weight kg (1 pc)	Catalog number	List price
B11	D11	C11	L02	L20	B02					
1						⊗	1.5	0.092	LS35P50B11	\$ 34.50
	1					⊗	1.5	0.092	LS35P50D11	36.00
		1				⊗	1.5	0.092	LS35P50C11	37.50
			1			⊗	1.5	0.092	LS35P50L02	37.50
				1		⊗	1.5	0.092	LS35P50L20	37.50
					1	⊗	1.5	0.092	LS35P50B02	37.50
Actuators for LS35P40 (delivered with M3.5 screw)										
To be actuated by 30° cam										
ø 18mm polyamide roller lever ⊕						⊕	—	0.012	LSA30X41	4.50
ø 45mm rubber roller lever ⊕						⊗	—	0.026	LSA30X42	7.50
Actuators for LS35P50 (delivered with M3.5 screw and adaptation parts)										
To be actuated by 30° cam										
ø 18mm adjustable polyamide roller lever ⊕						⊗	—	0.022	LSA30X51	7.50
ø 45mm adjustable rubber roller lever ⊕						⊗	—	0.035	LSA30X52	9.00
To be actuated by fully directional translation movement										
ø 3mm adjustable inox rod lever, 170mm ⊕						⊗	—	0.021	LSA30X71	7.50
ø 3mm adjustable fiberglass rod lever, 170mm ⊕						⊗	—	0.015	LSA30X72	7.50
ø 6mm adjustable polyamide rod lever, 195mm ⊕						⊗	—	0.018	LSA30X73	7.50
ø 6mm adjustable fiberglass rod lever, 195mm ⊕						⊗	—	0.022	LSA30X74	9.00
Right angle key for LS35P15										
Right angle key (mounting 13mm)						⊕	—	0.013	LSA30P05	7.50
Straight key for LS35P16										
Straight key (mounting 13mm)						⊕	—	0.013	LSA30P06	7.50
Separate contact blocks										
1 NC & 1 NO 2-pole snap action						⊕	—	0.025	LSC30XB11	21.00
1 NC & 1 NO 2-pole non-overlapping slow action						⊕	—	0.025	LSC30XD11	21.00
1 NO & 1 NC 2-pole non-overlapping slow action						⊕	—	0.025	LSC30XC11	24.00
2 NC 2-pole simultaneous slow action						⊕	—	0.025	LSC30XL02	24.00
2 NO 2-pole simultaneous slow action						⊗	—	0.025	LSC30XL20	24.00
2 NC 2-pole snap action						⊕	—	0.025	LSC30XB02	24.00
1/2" NPT plastic adaptors										
1 piece						—	—	0.007	LSR1305	7.50

⊕ Free position adjustment of lever 10° by 10° over 360°.

Assembled 40mm, IP 65, UL Type 4

Movement to be detected



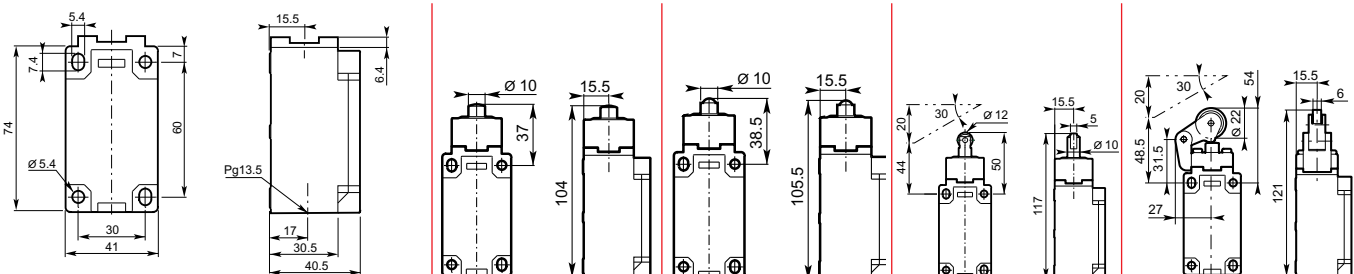
Operating head type

	Steel plain plunger	Steel ball plunger	Steel roller plunger	Polyamide roller lever
Conformity / \odot (N.C. contact with positive opening operation)	EN 50 041 \odot	EN 50 041 \odot	EN 50 041 \odot	\odot
Maximum actuation speed m/s	0.5	0.5	0.5	1
Min. force/torque:				
- actuation	22 N	22 N	16 N	12 N
- positive opening operation	66 N	66 N	48 N	40 N

9

Contacts	Catalog number	List price	LS45P11B11	LS45P12B11	LS45P13B11	LS45P31B11
<p>13 21 14 22</p> <p>Zb</p>	Catalog number	List price	LS45P11B11 \$ 45	LS45P12B11 \$ 48	LS45P13B11 \$ 55.50	LS45P31B11 \$ 51
	Operation diagram		0 0.8 1.9 4.5 6.5 mm 	0 0.8 1.9 4.5 6.5 mm 	0 1.5 3.5 8.4 12.1 mm 	0 1.9 4.6 10.9 15.8 mm
<p>13 21 14 22</p> <p>Zb</p>	Catalog number	List price	LS45P11D11 48	LS45P12D11 51	LS45P13D11 58.50	LS45P31D11 54
	Operation diagram		0 1.5 2.9 6.5 mm 2.7 	0 1.5 2.9 6.5 mm 2.7 	0 3.5 6.8 15.2 mm 6.3 	0 3.0 5.8 13.0 mm 5.4
<p>13 21 14 22</p> <p>Zb</p>	Catalog number	List price	LS45P11C11 49.50	LS45P12C11 52.50	LS45P13C11 60	LS45P31C11 55.50
	Operation diagram		0 2.6 4.0 6.5 mm 1.5 	0 2.6 4.0 6.5 mm 1.5 	0 6.1 9.3 15.2 mm 3.5 	0 5.2 8.0 13.0 mm 3.0
<p>11 21 12 22</p> <p>Zb</p>	Catalog number	List price	LS45P11L02 49.50	LS45P12L02 52.50	LS45P13L02 60	LS45P31L02 55.50
	Operation diagram		0 1.3 2.7 6.5 mm 	0 1.3 2.7 6.5 mm 	0 3.0 6.3 15.2 mm 	0 2.6 5.4 13.0 mm
<p>13 23 14 24</p> <p>Zb</p>	Catalog number	List price	LS45P11L20 49.50	LS45P12L20 52.50	LS45P13L20 60	LS45P31L20 55.50
	Operation diagram		0 1.3 6.5 mm 	0 1.3 6.5 mm 	0 3.0 15.2 mm 	0 2.6 13.0 mm
<p>11 21 12 22</p> <p>Zb</p>	Catalog number	List price	LS45P11B02 49.50	LS45P12B02 52.50	LS45P13B02 60	LS45P31B02 55.50
	Operation diagram		0 0.8 1.9 4.5 6.5 mm 	0 0.8 1.9 4.5 6.5 mm 	0 1.5 3.5 8.4 12.1 mm 	0 1.9 4.6 10.9 15.8 mm
Weight (packing per unit)	kg		0.140	0.140	0.145	0.175

Dimensions (mm)





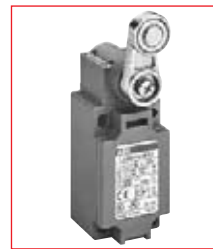
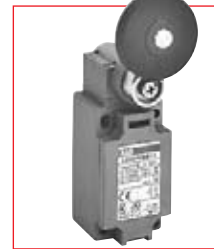








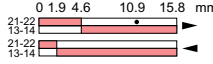
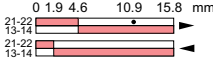
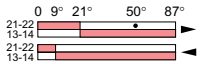
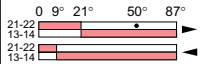
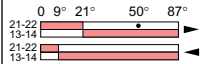
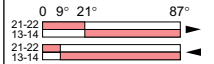
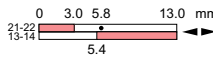
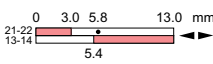
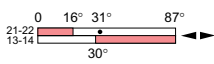
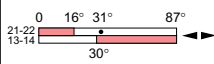
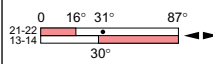
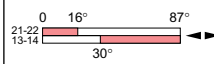
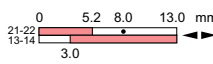
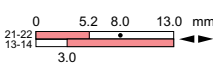
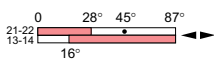
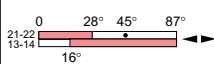
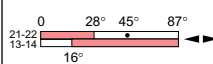
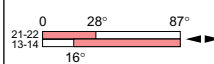
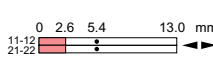
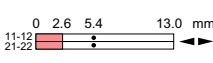
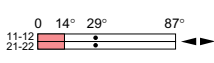
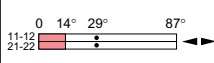

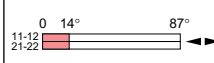
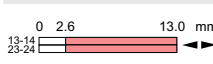
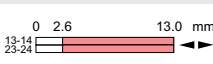
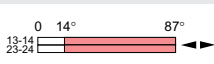
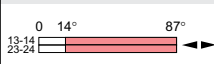
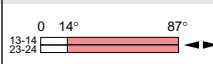
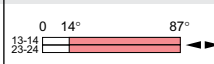
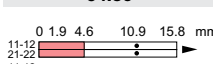
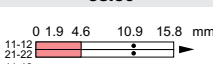
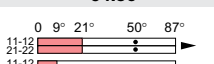
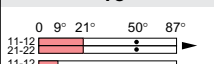
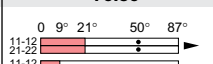
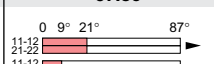
Assembled 40mm, IP 65, UL Type 4

Plastic
Limit switches

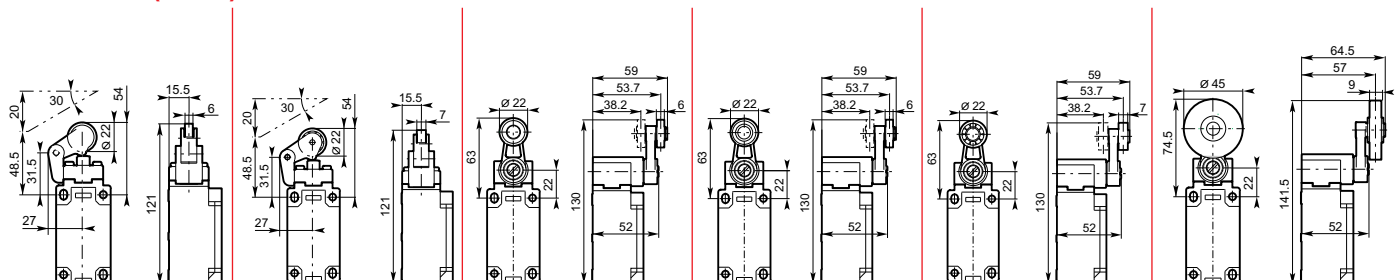
30° Cam transl.

30° Cam translation movement

					
Stainless steel roller lever	Ball-bearing roller lever	Ø 22 Polyamide roller lever	Ø 22 Stainless steel roller lever	Ø 22 Ball-bearing roller lever	Ø 45 Rubber roller lever
					
1 12 N 40 N	1 12 N 40 N	EN 50 041 1.5 0.15 N.m 0.44 N.m	EN 50 041 1.5 0.15 N.m 0.44 N.m	EN 50 041 1.5 0.15 N.m 0.44 N.m	1.5 0.15 N.m -

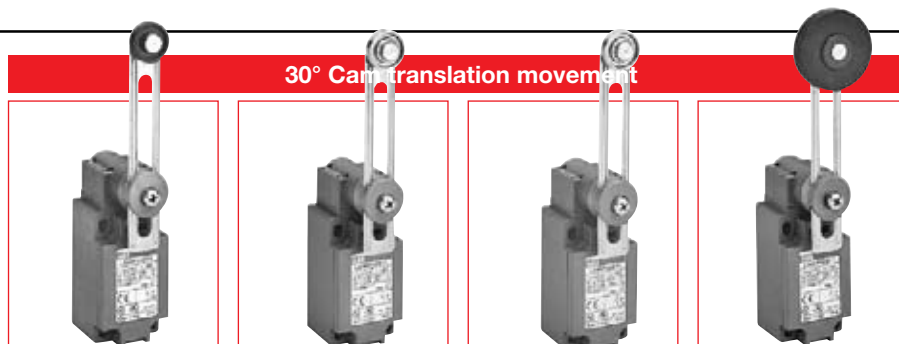
LS45P32B11 \$ 58.50	LS45P33B11 \$ 54	LS45P41B11 \$ 58.50	LS45P42B11 \$ 70.50	LS45P43B11 \$ 63	LS45P44B11 \$ 61.50
					
LS45P32D11 63	LS45P33D11 57	LS45P41D11 63	LS45P42D11 75	LS45P43D11 67.50	LS45P44D11 66
					
LS45P32C11 64.50	LS45P33C11 58.50	LS45P41C11 64.50	LS45P42C11 78	LS45P43C11 70.50	LS45P44C11 67.50
					
LS45P32L02 64.50	LS45P33L02 58.50	LS45P41L02 64.50	LS45P42L02 78	LS45P43L02 70.50	LS45P44L02 67.50
					
LS45P32L20 64.50	LS45P33L20 58.50	LS45P41L20 64.50	LS45P42L20 78	LS45P43L20 70.50	LS45P44L20 67.50
					
LS45P32B02 64.50	LS45P33B02 58.50	LS45P41B02 64.50	LS45P42B02 78	LS45P43B02 70.50	LS45P44B02 67.50
					
0.185	0.185	0.185	0.195	0.195	0.205

Dimensions (in mm)



Assembled 40mm, IP 65, UL Type 4

Movement to be detected



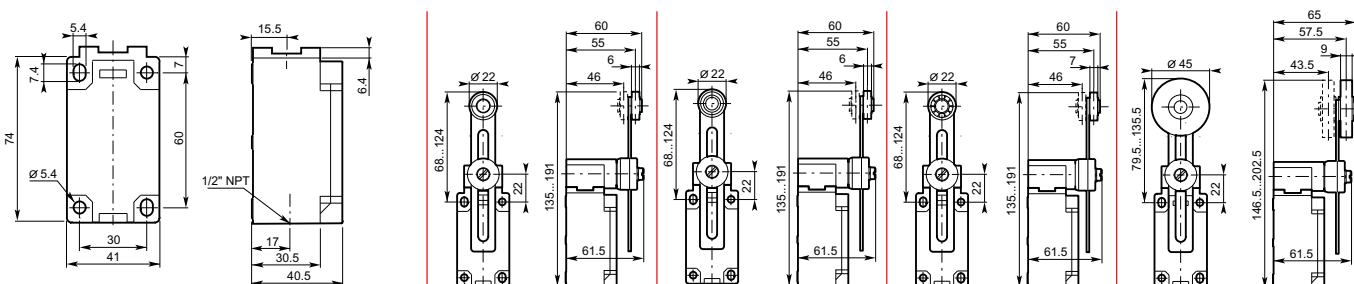
Operating head type

	Adjustable Ø 22 polyamide roller lever	Adjustable Ø 22 stainless steel roller lever	Adjustable Ø 22 stainless steel ball-bearing roller lever	Adjustable Ø 45 rubber roller lever
Conformity / (N.C. contact with positive opening operation)				
Maximum actuation speed	m/s 1.5	m/s 1.5	m/s 1.5	m/s 1.5
Min. torque: - actuation	N.m 0.15	N.m 0.15	N.m 0.15	N.m 0.15
- positive opening operation	N.m -	N.m -	N.m -	N.m -

9

Snap action contacts	Catalog number List price	LS45P51B11 \$ 58.50	LS45P52B11 \$ 70.50	LS45P53B11 \$ 64.50	LS45P54B11 \$ 61.50
Zb	Operation diagram				
Non-overlapping Slow action contacts	Catalog number List price	LS45P51D11 63	LS45P52D11 75	LS45P53D11 69	LS45P54D11 66
Zb	Operation diagram				
Overlapping Slow action contacts	Catalog number List price	LS45P51C11 64.50	LS45P52C11 78	LS45P53C11 70.50	LS45P54C11 67.50
Zb	Operation diagram				
Slow action contacts	Catalog number List price	LS45P51L02 64.50	LS45P52L02 78	LS45P53L02 70.50	LS45P54L02 67.50
Zb	Operation diagram				
Slow action contacts	Catalog number List price	LS45P51L20 64.50	LS45P52L20 78	LS45P53L20 70.50	LS45P54L20 67.50
Zb	Operation diagram				
Snap action contacts	Catalog number List price	LS45P51B02 64.50	LS45P52B02 78	LS45P53B02 70.50	LS45P54B02 67.50
Zb	Operation diagram				
Weight (packing per unit)	kg	0.190	0.200	0.200	0.200

Dimensions (in mm)

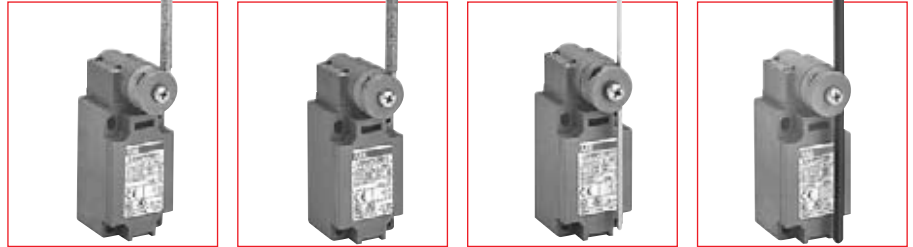


Assembled 40mm, IP 65, UL Type 4

Plastic
Limit switches

Movement to be detected

Fully directional translation movement

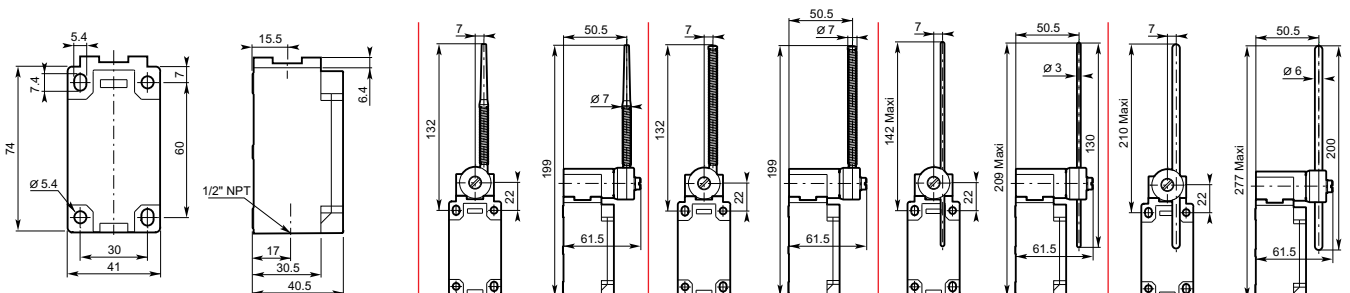


Operating head type

	Flexible lever with insulated end	Coil spring lever	Adjustable Ø 3 stainless steel rod lever	Adjustable ø 6 polyamide rod lever
Conformity / (N.C. contact with positive opening operation)			EN 50 041	EN 50 041
Maximum actuation speed	m/s 1.5	1.5	1.5	1.5
Min. torque: - actuation	N.m 0.15	0.15	0.15	0.15
- positive opening operation	N.m -	-	-	-

		LS45P61B11 \$ 61.50	LS45P62B11 \$ 61.50	LS45P71B11 \$ 57	LS45P72B11 \$ 57
Snap action contacts	Catalog number List price	LS45P61B11 \$ 61.50	LS45P62B11 \$ 61.50	LS45P71B11 \$ 57	LS45P72B11 \$ 57
	Operation diagram				
Non-overlapping Slow action contacts	Catalog number List price	LS45P61D11 66	LS45P62D11 66	LS45P71D11 61.50	LS45P72D11 61.50
	Operation diagram				
Overlapping Slow action contacts	Catalog number List price	LS45P61C11 69	LS45P62C11 67.50	LS45P71C11 64.50	LS45P72C11 63
	Operation diagram				
Slow action contacts	Catalog number List price	LS45P61L02 69	LS45P62L02 67.50	LS45P71L02 64.50	LS45P72L02 63
	Operation diagram				
Slow action contacts	Catalog number List price	LS45P61L20 69	LS45P62L20 67.50	LS45P71L20 64.50	LS45P72L20 63
	Operation diagram				
Snap action contacts	Catalog number List price	LS45P61B02 69	LS45P62B02 78.00	LS45P71B02 64.50	LS45P72B02 63
	Operation diagram				
Weight (packing per unit)	kg	0.190	0.190	0.185	0.185

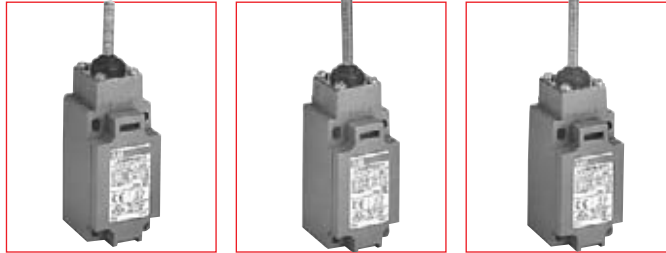
Dimensions (in mm)



Assembled 40mm, IP 65, UL Type 4

Movement to be detected

Multidirectional



Spring rod

Flexible rod
with insulated end

Coil spring rod

Operating head type

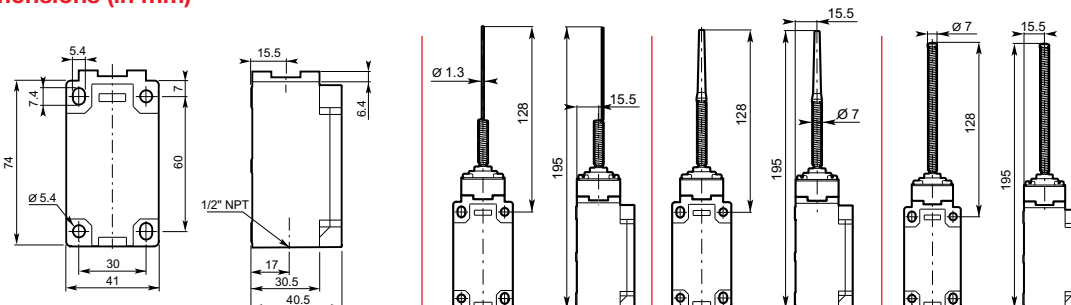
Conformity / (N.C. contact with positive opening operation)
 Maximum actuation speed m/s
 Min. torque: - actuation N.m
 - positive opening operation N.m

	Spring rod	Flexible rod with insulated end	Coil spring rod
Conformity / (N.C. contact with positive opening operation)			
Maximum actuation speed	1	1	1
Min. torque: - actuation	0.18	0.18	0.18
- positive opening operation	-	-	-

9

Snap action contacts	Catalog number	LS45P91B11	LS45P92B11	LS45P93B11
List price		\$ 48	\$ 52.50	\$ 49.50
Operation diagram				
Non-overlapping Slow action contacts	Catalog number	LS45P91D11	LS45P92D11	LS45P93D11
List price		51	55.50	52.50
Operation diagram				
Overlapping Slow action contacts	Catalog number	LS45P91C11	LS45P92C11	LS45P93C11
List price		52.50	57	55.50
Operation diagram				
Slow action contacts	Catalog number	LS45P91L02	LS45P92L02	LS45P93L02
List price		52.50	57	55.50
Operation diagram				
Slow action contacts	Catalog number	LS45P91L20	LS45P92L20	LS45P93L20
List price		52.50	57	55.50
Operation diagram				
Snap action contacts	Catalog number	LS45P91B02	LS45P92B02	LS45P93B02
List price		51.00	57	55.50
Operation diagram				
Weight (packing per unit)	kg	0.135	0.140	0.145

Dimensions (in mm)



Components

Catalog number explanation

40mm, IP 65, UL Type 4

Bodies with contact block for rectilinear or angular motion heads



LS45P00B11

LS 45 P 00 B 11

Limit Switch.....LS

Casing width 40 mm4

Cable inlet
1 cable inlet for Pg 13.5 cable gland0
1 cable inlet for 1/2" NPT5

Plastic casing.....P

Without operating head00

Contacts
111 N.O. + 1 N.C. contacts
022 N.C. contacts
202 N.O. contacts

Snap action
BZb Snap

Dependent (slow) action
LZb Slow / Simultaneous
DZb Non-overlapping late make
CZb Overlapping early make



LSTH41

Operating heads

LS T H 41

Limit Switch.....LS

Operating headT

For plastic casing 40 mm width40

Operator head:
11 ... 14, 19with rectilinear movement (plain plunger, steel ball plunger or roller plunger)
31 ... 37with rectilinear movement (roller lever on steel plunger)
40with angular movement (without actuator) actuator to be ordered separately
41 ... 44with angular movement (roller lever)
50with angular movement (without actuator) actuator to be ordered separately
51 ... 54with angular movement (adjustable roller lever)
61, 62flexible lever (spring)
71, 72, 73adjustable lever (rod)
91 ... 93multidirectional angular movement (spring rod)



LSA40X51

Separate actuators (roller lever, adjustable roller or rod levers, etc.)

LS A 40 X 51

Limit Switch.....LS

Actuator (roller)A

Casing width: 40 mm40

Actuator:
41 ... 44non-adjustable roller lever
51 ... 54adjustable roller lever
61, 62flexible lever (spring)
71, 72, 73adjustable lever (rod)

For casing of:
MMetal
PPlastic
XPlastic or metal



LSC40XC11

Separate contact blocks

LS C 40 X C 11

Limit Switch.....LS

Contact blocksC

Casing width: 40 mm40

Contacts
111 N.O. + 1 N.C. contacts
022 N.C. contacts
202 N.O. contacts

For casing of:
Metal.....M
Plastic.....P
Plastic or metal.....X

Snap action:
BZb Snap

Dependent (slow) action:
LZb Slow / Simultaneous
DZb Non-overlapping late make
CZb Overlapping early make

Components

Selection guide

40mm, IP 65, UL Type 4

9

Rectilinear motion



LSTH37 ⊕



LSTH33 ⊕



LSTH36 ⊕



LSTH12 ⊕
(B Shape)



LSTH32 ⊕



LSTH19 ⊕
(C Shape)



LSTH14 ⊕
(B Shape)



LSTH35 ⊕



LSTH13 ⊕
(C Shape)



LSTH11 ⊕
(B Shape)



LSTH31 ⊕

Angular motion



LSTH54 ⊗



LSTH93 ⊗



LSTH72 ⊗
(D Shape)



LSTH44 ⊗



LSTH53 ⊗



LSTH71 ⊗
(D Shape)



LSTH43 ⊗
(A Shape)



LSTH52 ⊗



LSTH92 ⊗



LSTH62 ⊗



LSTH42 ⊗
(A Shape)



LSTH51 ⊗



LSTH91 ⊗



LSTH61 ⊗

LSTH... rectilinear motion heads

- To be actuated from end.
With plunger (plain or with ball): LSTH11, LSTH12 and LSTH14.
- To be actuated by 30° cam translation.
With roller plunger: LSTH13, LSTH19.
- To be actuated unidirectionally by 30° cam translation.
With roller lever on steel plunger: LSTH31 ... LSTH37.

LSTH... angular motion heads

- To be actuated by 30° cam translation.
With roller lever: LSTH41 ... LSTH54.
- To be actuated by fully directional translation movement.
With rod or spring lever: LSTH61 ... LSTH72.
- To be actuated multidirectionally.
With spring rod: LSTH91 ... LSTH93.



Bodies with contact block

- ⊕ LS45P00B11, LS45P00D11, LS45P00C11, LS45P00L02, LS45P00B02

- ⊗ LS45P00L20
Suitable for positive opening operation (IEC 60947-5-1 and EN 50041).

Warning! The positive opening operation of limit switch is only guaranteed if the elements noted with ⊕ are fitted.

Components

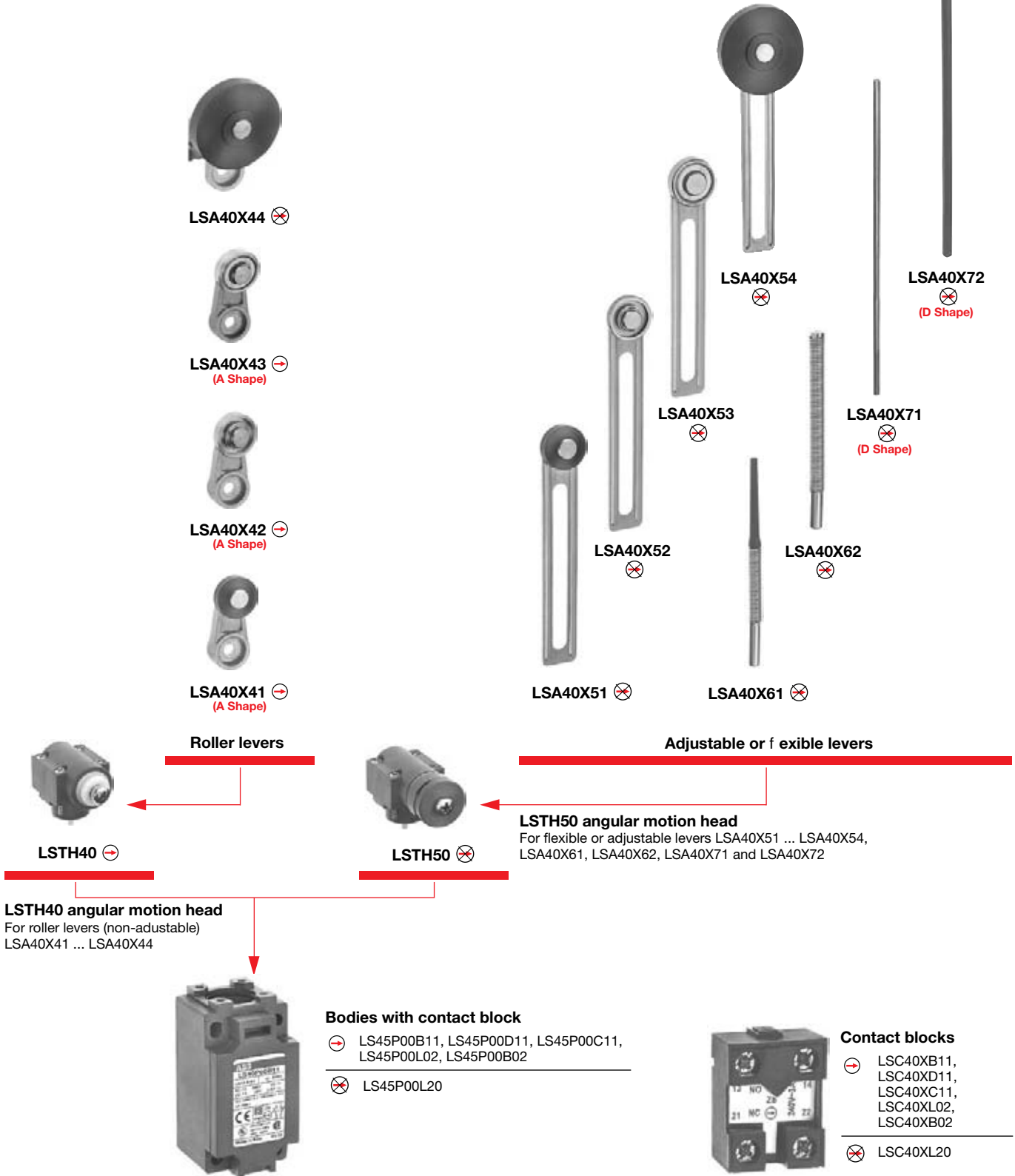
Selection guide

40mm, IP 65, UL Type 4

Plastic
Limit switches

Angular motion

9



⊕ : Suitable for positive opening operation (IEC 60947-5-1 and EN 50041)

Warning! The positive opening operation of limit switch is only guaranteed if the elements noted with ⊕ are fitted.

Components

40mm, IP 65, UL Type 4

⊕ "N.C." contact with positive opening operation or element (subassembly, head, lever) suitable for positive opening operation.

Warning! The positive opening operation of limit switch is only guaranteed if the elements noted with ⊕ are fitted.



LS45P00B11



LSTH11



LSTH19



LSTH31



LSTH37

Bodies with contact block for rectilinear or angular motion heads

Contact blocks						Positive opening operation	Actuation speed max. m/s	Unit weight kg (1 pc)	Catalog number	List price
B11	D11	C11	L02	L20	B02					
1						⊕	—	0.108	LS45P00B11	\$ 34.50
	1					⊕	—	0.108	LS45P00D11	36.00
		1				⊕	—	0.108	LS45P00C11	37.50
			1			⊕	—	0.108	LS45P00L02	37.50
				1		⊗	—	0.108	LS45P00L20	37.50
					1	⊕	—	0.108	LS45P00B02	37.50

Rectilinear motion heads with actuator

To be actuated by end

Steel plain plunger (zinc-plated)	⊕	0.5	0.042	LSTH11	13.50
Steel plain plunger (zinc-plated) and dust protection cup	⊕	0.5	0.043	LSTH14	18.00
Steel ball plunger	⊕	0.5	0.042	LSTH12	16.50

To be actuated by 30° cam

Steel roller plunger (zinc-plated)	⊕	0.5	0.048	LSTH13	24.00
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Steel roller plunger (zinc-plated) and dust protection cup	⊕	0.5	0.048	LSTH19	28.50
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To be actuated unidirectionally by 30° cam

∅ 22mm polyamide roller lever on steel plunger (zinc-plated)	⊕	1.5	0.046	LSTH31	22.50
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∅ 22mm polyamide roller lever on steel plunger (zinc-plated) & dust protection cup	⊕	1.5	0.049	LSTH35	27.00
------------------------------------------------------------------------------------	---	-----	-------	--------	-------

∅ 22mm stainless steel roller lever on steel plunger (zinc-plated).	⊕	1.5	0.055	LSTH32	30.00
---------------------------------------------------------------------	---	-----	-------	--------	-------

∅ 22mm stainless steel roller lever on steel plunger (zinc-plated) & dust protection cup	⊕	1.5	0.058	LSTH36	34.50
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∅ 22mm steel ball-bearing roller lever on steel plunger (zinc-plated)	⊕	1.5	0.057	LSTH33	25.50
-----------------------------------------------------------------------	---	-----	-------	--------	-------

∅ 22mm steel ball-bearing roller lever on steel plunger (zinc-plated) & dust protection cup	⊕	1.5	0.060	LSTH37	30.00
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Components

40mm, IP 65, UL Type 4

Plastic
Limit switches

⊕ "N.C." contact with positive opening operation or element (sub-assembly, head, lever) suitable for positive opening operation.

Warning! The positive opening operation of limit switch is only guaranteed if the elements noted with ⊕ are fitted.



LSTH41



LSTH51



LSTH92



LSTH40



LSA40X41



LSA40X43

Bodies with contact block for rectilinear or angular motion heads

Contact blocks	Positive opening operation	Actuation speed max. m/s	Unit weight kg (1 pc)	Catalog number	List price
Angular motion heads with actuator					
To be actuated by 30° cam					
ø 22mm polyamide roller lever ①	⊕	1.5	0.082	LSTH41	\$ 30.00
ø 22mm stainless steel roller lever ①	⊕	1.5	0.091	LSTH42	42.00
ø 22mm steel ball-bearing roller lever ①	⊕	1.5	0.093	LSTH43	34.50
ø 45mm rubber roller lever ①	⊗	1.5	0.098	LSTH44	33.00
ø 22mm adjustable polyamide roller lever ①	⊗	1.5	0.088	LSTH51	30.00
ø 22mm adjustable stainless steel roller lever ①	⊗	1.5	0.098	LSTH52	42.00
ø 22mm adjustable steel ball-bearing roller lever ①	⊗	1.5	0.100	LSTH53	36.00
ø 45mm adjustable rubber roller lever ①	⊗	1.5	0.105	LSTH54	33.00
To be actuated by fully directional translation movement					
Stainless steel flexible lever with insulated end ①	⊗	1	0.083	LSTH61	33.00
Stainless steel coil spring lever ①	⊗	1	0.089	LSTH62	33.00
ø 3mm adjustable stainless steel rod lever, 195mm ①	⊗	1	0.087	LSTH71	28.50
ø 6mm adjustable polyamide rod lever, 195mm ①	⊗	1	0.083	LSTH72	28.50
ø 6mm adjustable fiberglass rod lever, 195mm ①	⊗	1	0.087	LSTH73	30.00
Multidirectional angular motion heads (to be actuated by fully directional translation movement)					
Stainless steel spring rod	⊗	1	0.046	LSTH91	19.50
Stainless steel flexible rod with insulated end	⊗	1	0.049	LSTH92	24.00
Stainless steel coil spring rod	⊗	1	0.055	LSTH93	21.00
Angular motion head without actuator for non-adjustable roller levers (delivered with M5 screw and washer)					
	⊕	1.5	0.050	LSTH40	21.00
Actuators for angular motion head LSTH40					
ø 22mm polyamide roller lever ①	⊕	—	0.032	LSA40X41	9.00
ø 22mm stainless steel roller lever ①	⊕	—	0.042	LSA40X42	21.00
ø 22mm steel ball-bearing roller lever ①	⊕	—	0.044	LSA40X43	13.50
ø 45mm rubber roller lever ①	⊗	—	0.050	LSA40X44	12.00

① Free position adjustment of lever 9° by 9° over 360°.

9

Components

40mm, IP 65, UL Type 4

⊖ "N.C." contact with positive opening operation or element (sub-assembly, head, lever) suitable for positive opening operation.

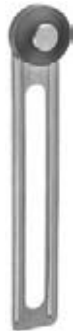
Warning! The positive opening operation of limit switch is only guaranteed if the elements noted with ⊕ are fitted.



LSTH50



LSA40X72



LSA40X51

	Positive opening operation	Actuation speed max. m/s	Unit weight kg (1 pc)	Catalog number	List price
Angular motion head without actuator, for flexible or adjustable levers (delivered with M5 screw, washer & adaptation parts)					
	⊖	—	0.058	LSTH50	\$ 22.50
Actuators for angular motion head LSTH50					
∅ 22mm adjustable polyamide roller lever ①	⊖	—	0.023	LSA40X51	7.50
∅ 22mm adjustable stainless steel roller lever ①	⊖	—	0.032	LSA40X52	19.50
∅ 22mm adjustable steel ball-bearing roller lever ①	⊖	—	0.034	LSA40X53	13.50
∅ 45mm adjustable rubber roller lever ①	⊖	—	0.039	LSA40X54	10.50
Stainless steel flexible lever with insulated end ①	⊖	—	0.017	LSA40X61	10.50
Stainless steel coil spring lever ①	⊖	—	0.023	LSA40X62	10.50
∅ 3mm adjustable stainless steel rod lever, 195mm ①	⊖	—	0.014	LSA40X71	25.50
∅ 6mm adjustable polyamide rod lever, 195mm ①	⊖	—	0.010	LSA40X72	6.00
∅ 6mm adjustable fiberglass rod lever, 195mm ①	⊖	—	0.014	LSA40X73	7.50
Contact blocks (with adaptor)					
1 NC & 1 NO 2-pole snap action	⊕	—	0.032	LSC40XB11	22.50
1 NC & 1 NO 2-pole non-overlapping slow action	⊕	—	0.032	LSC40XD11	22.50
1 NO & 1 NC 2-pole overlapping slow action	⊕	—	0.032	LSC40XC11	25.50
2 NC 2-pole simultaneous slow action	⊕	—	0.032	LSC40XL02	25.50
2 NO 2-pole simultaneous slow action	⊕	—	0.032	LSC40XL20	25.50
2 NC 2-pole snap action	⊕	—	0.032	LSC40XB02	25.50

① Free position adjustment of lever 9° by 9° over 360°.

Components

40mm, IP 65, UL Type 4

Plastic
Limit switches

⊕ "N.C." contact with positive opening operation or element (sub-assembly, head, lever) suitable for positive opening operation.

Warning! The positive opening operation of limit switch is only guaranteed if the elements noted with ⊕ are fitted.

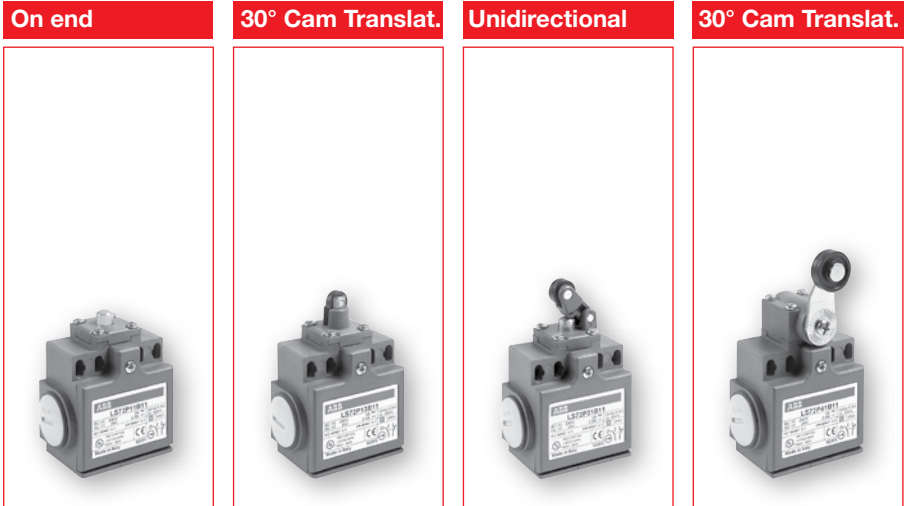


LSC40XB11

	Positive opening operation	Actuation speed max. m/s	Unit weight kg (1 pc)	Catalog number	List price
Contact blocks (with adaptor)					
1 NC & 1 NO 2-pole snap action	⊕	—	0.032	LSC40XB11	\$ 22.50
1 NC & 1 NO 2-pole non-overlapping slow action	⊕	—	0.032	LSC40XD11	22.50
1 NO & 1 NC 2-pole overlapping slow action	⊕	—	0.032	LSC40XC11	25.50
2 NC 2-pole simultaneous slow action	⊕	—	0.032	LSC40XL02	25.50
2 NO 2-pole simultaneous slow action	⊗	—	0.032	LSC40XL20	25.50
2 NC 2-pole snap action	⊕	—	0.032	LSC40XB02	25.50

Assembled 60mm, IP 65, UL Type 4

Movement to be detected



9

Actuator

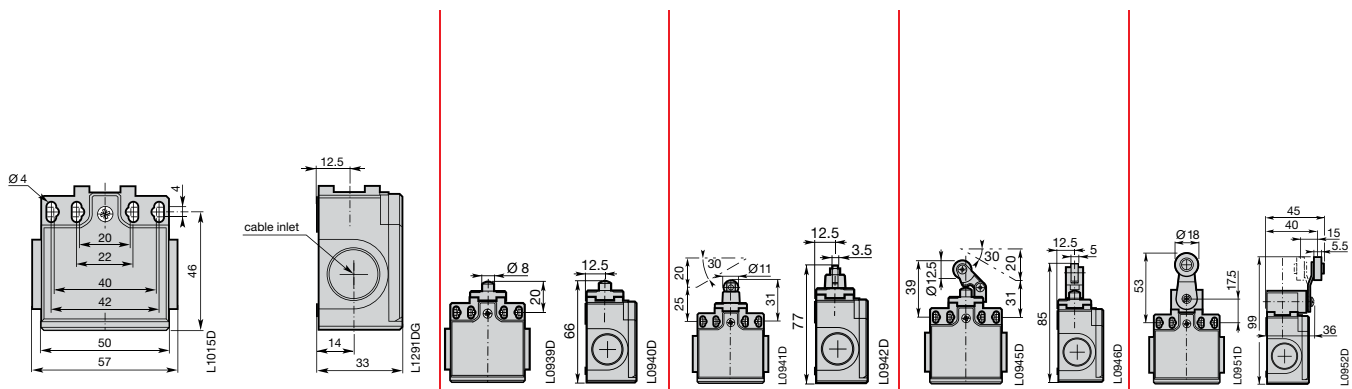
	Metal plunger	ø11 plastic roller plunger	ø12.5 plastic roller lever on steel plunger	ø18 plastic roller lever
Conformity / (N.C. contact with positive opening operation)	–	–	–	–
Maximum actuation speed	0.5 m/s	0.3 m/s	1 m/s	1.5 m/s
Min. force / torque: - actuation	15 N	12 N	7 N	0.1 N.m
- positive opening operation	45 N	41 N	24 N	0.32 N.m

Snap action contacts	Catalog Number List Price	LS75P11B11 \$ 51	LS75P13B11 \$ 56	LS75P31B11 \$ 57	LS75P41B11 \$ 59
	Operation diagram				
Non-overlapping Slow action contacts	Catalog Number List Price	LS75P11D11 55	LS75P13D11 59	LS75P31D11 61	LS75P41D11 63
	Operation diagram				
Weight (packing per unit)	kg	0.100	0.100	0.105	0.125

Special heads, accessories and special contact arrangement or particular function: please consult us.

Closed contact / Open contact

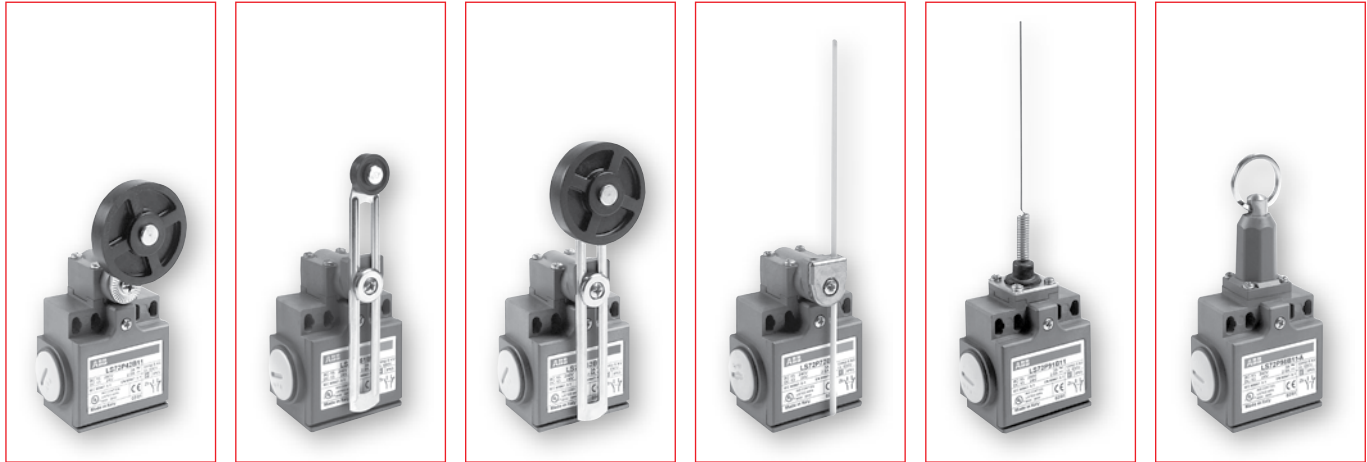
Dimensions (mm)



Assembled 60mm, IP 65, UL Type 4

Plastic
Limit switches

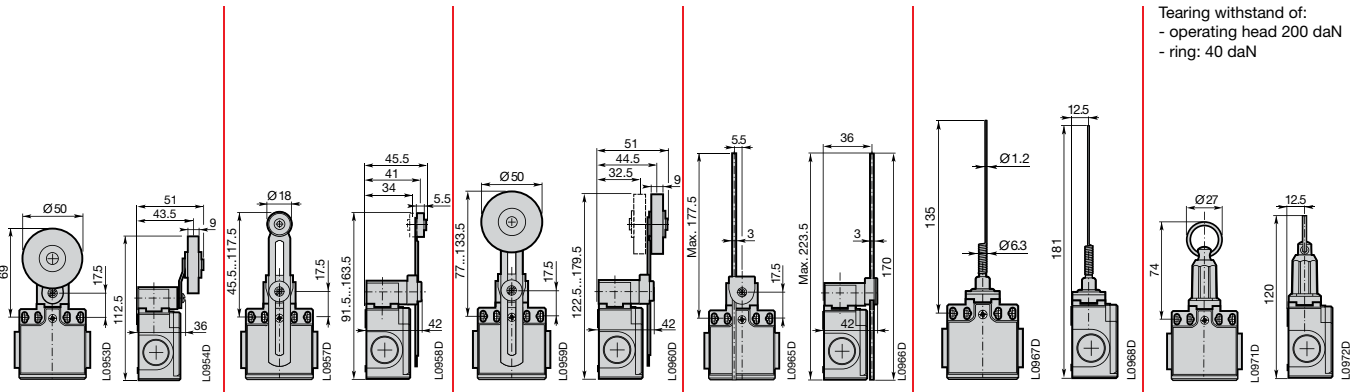
30° Cam Translation Movement **Fully Direction Trans.** **Multidirectional** **Pull action**



ø50 rubber roller lever	Adjustable ø18 plastic roller lever	Adjustable ø50 rubber roller lever	Adjustable ø3 fibre-glass rod lever	Spring rod lever	Pull action with ring
1.5 m/s 0.1 N.m 0.32 N.m	1.5 m/s 0.1 N.m 0.32 N.m	1.5 m/s 0.1 N.m 0.32 N.m	1.5 m/s 0.1 N.m 0.32 N.m	1 m/s 0.12 N.m -	0.5 m/s 30 N -

LS75P42B11 \$ 67	LS75P51B11 \$ 61	LS75P52B11 \$ 61	LS75P72B11 \$ 65	LS75P91B11 \$ 59	LS75P98B11-A \$ 78
0 17° 31° 47° 74° 21-22 13-14 21-22 13-14	0 17° 31° 47° 74° 21-22 13-14 21-22 13-14	0 17° 31° 47° 74° 21-22 13-14 21-22 13-14	0 17° 31° 47° 74° 21-22 13-14 21-22 13-14	0 12° 23° 36° 21-22 13-14 21-22 13-14	0 0.9 2.0 5.6 mm 21-22 13-14 21-22 13-14
LS75P42D11 71	LS75P51D11 65	LS75P52D11 73	LS75P72D11 69	LS75P91D11 63	LS75P98D11-A 83
0 21° 37° 74° 30° 21-22 13-14	0 21° 37° 74° 30° 21-22 13-14	0 21° 37° 74° 30° 21-22 13-14	0 21° 37° 74° 30° 21-22 13-14	0 14° 36° 21° 21-22 13-14	0 1.0 5.6 mm 1.9 21-22 13-14
0.145	0.135	0.155	0.120	0.110	0.145

Special heads, accessories and special contact arrangement or particular function: please consult us. ■ Closed contact / ■ Open contact



Tearing withstand of:
- operating head 200 daN
- ring: 40 daN

Technical data

IP 65, UL Type 4

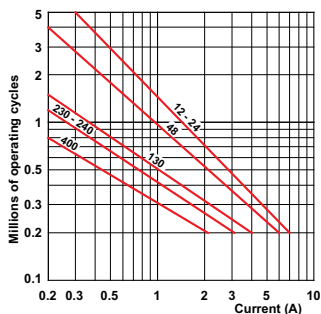
General technical data

Standards	Devices conform with international IEC 947-5-1 and European EN 60 947-5-1 standards	
Certifications - Approvals	UL & CSA	
Air temperature near the device (IEC)	°C	- 25 ... + 70
- during operation	°C	- 30 ... + 80
- for storage		
Climatic withstand	According to IEC 68-2-3 and salty mist according to IEC 68-2-11	
Mounting positions	All positions are authorized	
Shock withstand (according to IEC 68-2-27 and EN 60 068-2-27)	50g ① (1/2 sinusoidal shock for 11 ms) no change in contact position	
Resistance to vibrations (acc. to IEC 68-2-6 and EN 60 068-2-6)	25g (10 – 500 Hz) no change in position of contacts greater than 100 µs	
Protection against electrical shocks (acc. to IEC 536)	Class II	
Degree of protection	UL Type 4 & IP 65	
Consistency (measured over 1 million operations)	0.1 mm (upon closing point)	
Minimum actuation speed	m/s	Slow action contacts 0.060 / Snap action contacts 0.001

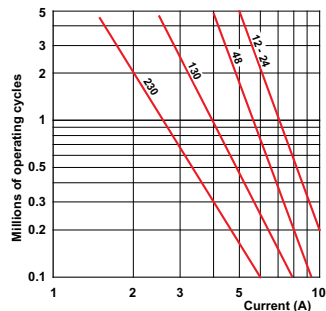
Electrical Data

9	Rated insulation voltage U_i - according to IEC 947-1 and EN 60-947-1 - according to UL 508 and CSA C22-2 n° 24	500 V (degree of pollution 3) A 600, Q 600				
	Rated impulse withstand voltage U_{imp} (according to IEC 947-1 and EN 60 947-1)	kV	6			
Conventional free air thermal current I_{th} (according to IEC 947-5-1) $q \leq 40$ °C	A	10				
Short-circuit protection $U_o \leq 500$ V a.c. - gG (gl) type fuses	A	10				
Rated operational current I_o / AC-15 (according to IEC 947-5-1)	24 V - 50/60 Hz	A	10			
	130 V - 50/60 Hz	A	5.5			
	230 V - 50/60 Hz	A	3.1			
	240 V - 50/60 Hz	A	3			
	400 V - 50/60 Hz	A	1.8			
I_o / DC-13 (according to IEC 947-5-1)	24 V - d.c.	A	2.8			
	110 V - d.c.	A	0.6			
	250 V - d.c.	A	0.27			
Switching frequency	Cycles/h	3600				
Load factor		0.5				
Resistance between contacts	mW	25				
Connecting terminals		M3.5 (+, -) pozidriv 2 screw with cable clamp				
Terminal for protective conductor		-				
Connecting capacity	1 or 2 x mm ²	0.5 ... 2.5				
Terminal marking		According to EN 50 013				
Mechanical durability	Millions of operations	15	LS	P	10 – 12; 30 – 34	
		10				13; 41 – 44; 51– 54; 61 – 72
		5				91– 93
		> 1				15; 16
Electrical durability (according to IEC 947-5-1)		Utilization categories AC-15 and DC-13 (Load factor of 0.5 according to curves below)				

AC-15 – Snap action



AC-15 – Slow action



DC-13	Snap action	Slow action
	Power breaking for a durability of 5 million operating cycles	
Voltage 24 V	9.5 W	12 W
Voltage 48 V	6.8 W	9 W
Voltage 110 V	3.6 W	6 W

① except for LS30/31/35 (P42): 25g

Metal Limit switches

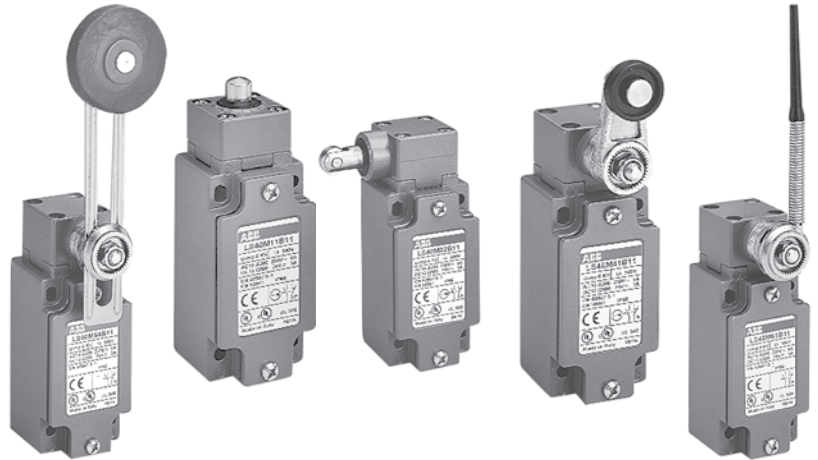
ABB

Limit Switches

Metal casing, 30mm, 40mm & 60mm

Assembled units

Components



Description

Limit switches are made of aluminum alloy and have a degree of protection of IP 66 and UL type 4X.

The casings come in 3 dimensions:

- LS35M, 30mm width.
- LS45M, 40mm width.
- LS75M, 60mm width.

UL Listed #E191693

Applications

Easy to use, electromechanical limit switches offer specific qualities:

- Visible operation.
- Able to switch strong currents (10 A conventional thermal current).
- Electrically separated contacts.
- Precise operating points (consistency).
- Immune to electromagnetic disturbances.

Limit switches used for these mechanical applications:

- Presence/absence.
- Positioning and travel limit.
- Objects passing/counting.

General information

IP66, UL Type 4X

30mm, 40mm & 60mm

Applications

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The casings come in 3 dimensions:

- 30mm width
– LS35M
- 40mm width
– LS45M
- 60mm width
– LS65M

9

Casing

- 30mm width with standardized dimensions according to EN 50047
- 40mm width with standardized dimensions according to EN 50041
- 60mm width

Mounting the casing

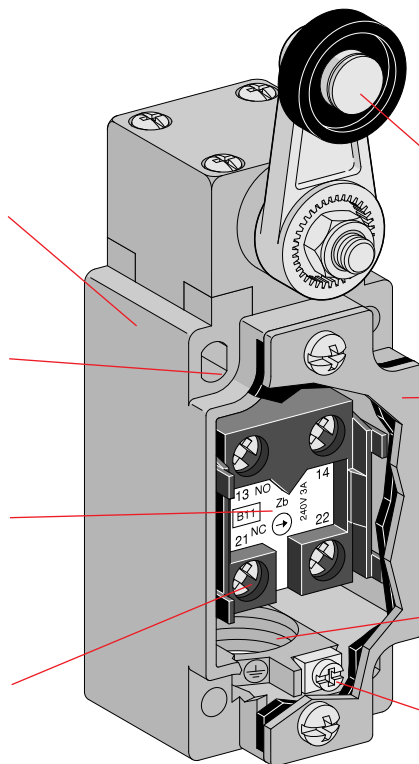
- 2 x M4 screws for 30mm width
- 2 or 4 x M5 screws for 40mm width
- 2 or 4 x M5 screws for 60mm width

Block of 2 contacts

- Contact configuration: N.O. + N.C., 2 N.O., 2 N.C.
- Positive opening operation
- Snap action or slow action
- Zb shape: the 2 contacts are electrically separated

Connecting terminals

- M3.5 (+,-) pozidriv 2 screw
- Screw heads with captive cable clamp
- Markings conform with IEC 947-1, IEC 947-5-1, EN 50005 and 50013 standards



A variety of operating heads

- Plain plunger
- Roller plunger
- Roller lever, adjustable or not, etc.
- Assembled using 4 x M3 screws for 30mm widths
- Assembled using 4 x M4 screws for 40 & 60mm widths

Cover

- Closed using 2 x M4 screws for 40mm width
- Closed using 4 x M4 screws for 60mm width
- One piece sealing gasket to ensure tightness

Electrical connection

- 1 x pg 13.5 cable gland for 40mm width – LS40M
- 1 x 1/2" NPT cable gland – LS45M
- 3 x pg 13.5 cable glands for 60mm width – LS70M
- 3 x 1/2" NPT cable glands for 60mm width – LS75M

Terminal for protective conductor placed near the cable inlet and marked \perp

- M3.5 (+,-) pozidriv 2 screw
- Screw head with captive cable clamp

General information
 IP66, UL Type 4X
 30mm, 40mm & 60mm

Catalog number explanation

LS 4 5 M 41 B 11

Limit switch

Casing width

- 3: 30mm
- 4: 40mm
- 7: 60mm

Electrical connection

- 0: pg 13.5
- 1: pg 11
- 5: 1/2" NPT

Metal casing

Operating heads: codes 11 – 93 (see selection guide)

Contact block

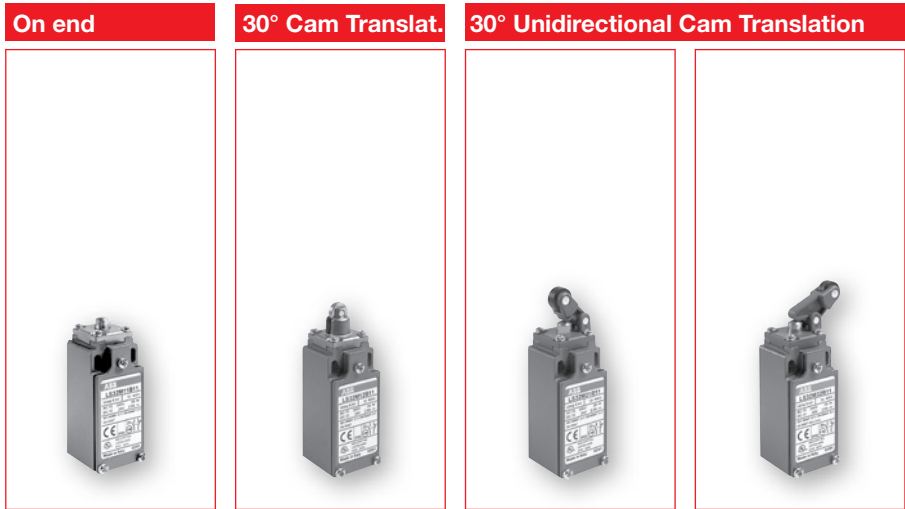
- 11: 1 N.O. contact + 1 N.C. contact
- 20: 2 N.O. contacts
- 02: 2 N.C. contacts

Contact type

- B: Zb Snap action
- L: Zb Slow action (contact dependent)
- D: Zb Slow action non—overlapping late make
- C: Zb Slow action overlapping early make

**Assembled
IP66, UL Type 4X
30mm**

Movement to be detected



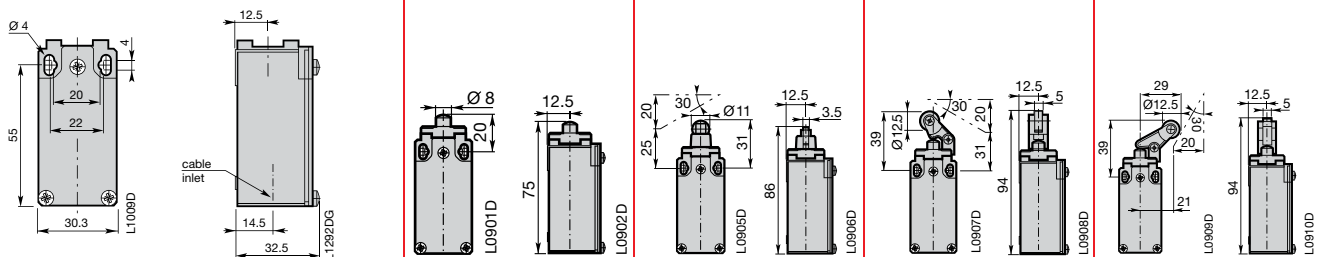
9

Actuator	Metal plunger	Metal roller plunger	Ø12.5 plastic roller lever on steel plunger	Ø12.5 plastic roller lever on steel plunger
Conformity / (N.C. contact with positive opening operation)	EN 50047 (B shape)	EN 50047 (C shape)	EN 50047 (E shape)	-
Maximum actuation speed	0.5 m/s	0.3 m/s	1 m/s	1 m/s
Min. force / torque: - actuation	15 N	12 N	7 N	7 N
- positive opening operation	45 N	41 N	24 N	24 N

Snap action contacts	Catalog number	LS35M11B11	LS35M12B11	LS35M31B11	LS35M32B11
List price		\$ 51	\$ 51	\$ 51	\$ 53
Operation diagram		0 1.7 2.7 4.3 5.6 mm	0 3.0 4.8 7.7 9.6 mm	0 4.9 9.0 14.5 21.0 mm	0 4.9 9.0 14.5 21.0 mm
Non-overlapping Slow action contacts	Catalog number	LS35M11D11	LS35M12D11	LS35M31D11	LS35M32D11
List price		49	55	55	56
Operation diagram		0 1.9 3.5 5.6 mm	0 3.4 6.3 9.6 mm	0 6.0 10.5 21.0 mm	0 6.0 10.5 21.0 mm
Weight (packing per unit)	kg	0.180	0.185	0.175	0.175

■ Closed contact / □ Open contact

Dimensions (mm)



Assembled IP66, UL Type 4X 30mm

Metal
Limit switches

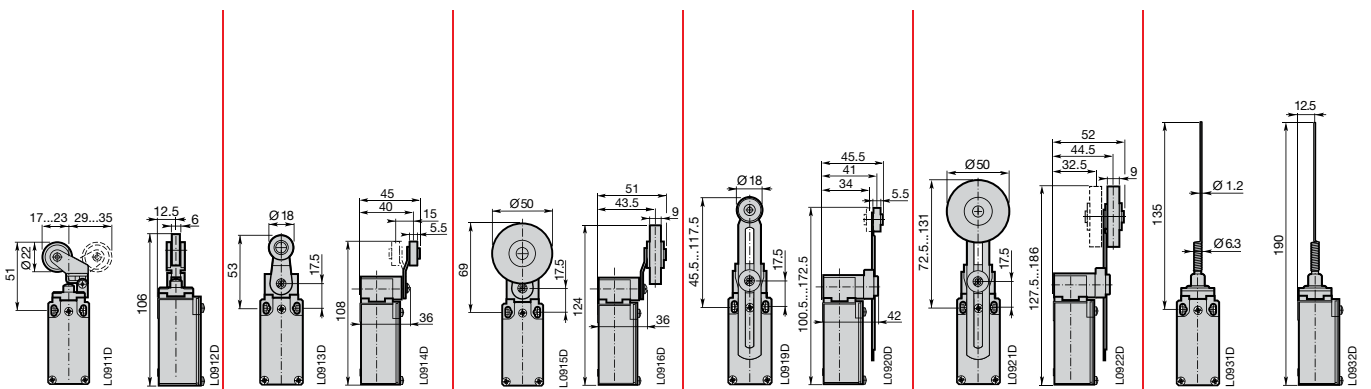
Unidirectional 30° Cam Translation Movement Multidirectional



ø22 plastic roller lever on steel plunger	ø18 plastic roller lever	ø50 rubber roller lever	Adjustable ø18 plastic roller lever	Adjustable ø50 rubber roller lever	Spring rod lever
1 m/s 7 N 24 N	EN 50047 (A shape) 1.5 m/s 0.1 N.m 0.32 N.m	1.5 m/s 0.1 N.m 0.32 N.m	1.5 m/s 0.1 N.m 0.32 N.m	1.5 m/s 0.1 N.m 0.32 N.m	1 m/s 0.12 N.m -

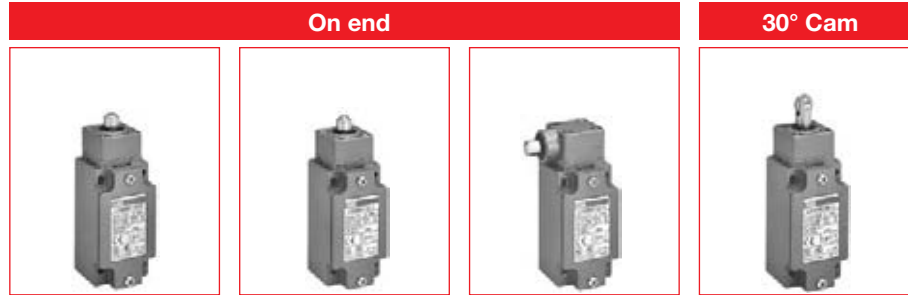
LS35M38B11 \$ 55	LS35M41B11 \$ 57	LS35M42B11 \$ 63	LS35M51B11 \$ 59	LS35M52B11 \$ 66	LS35M91B11 \$ 53
0 8.8 15.0 23.2 32.0 mm 21-22 13-14	0 17° 31° 47° 74° 21-22 13-14	0 17° 31° 47° 74° 21-22 13-14	0 17° 31° 47° 74° 21-22 13-14	0 17° 31° 47° 74° 21-22 13-14	0 12° 23° 36° 21-22 13-14
LS35M38D11 59	LS35M41D11 60	LS35M42D11 67	LS35M51D11 63	LS35M52D11 71	LS35M91D11 71
0 10.6 18.5 32.0 mm 15.1 21-22 13-14	0 21° 37° 74° 30° 21-22 13-14	0 21° 37° 74° 30° 21-22 13-14	0 21° 37° 74° 30° 21-22 13-14	0 21° 37° 74° 30° 21-22 13-14	0 14° 36° 21° 21-22 13-14
0.180	0.230	0.255	0.240	0.265	0.180

■ Closed contact / □ Open contact



**Assembled
IP66, UL Type 4X
40mm**

Movement to be detected



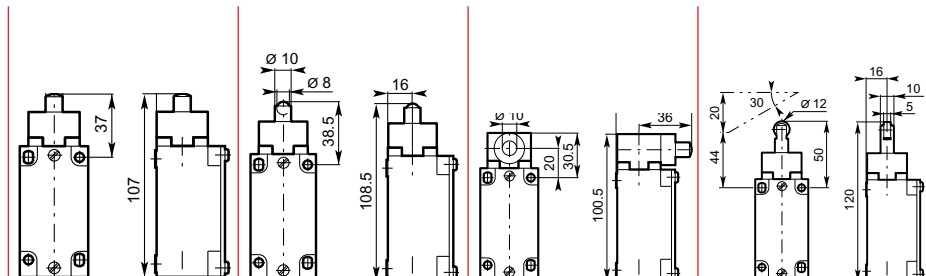
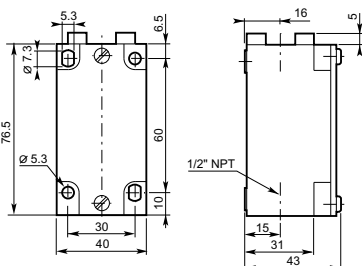
Operating head type

	Stainless steel plain plunger	Stainless steel ball plunger	Stainless steel lateral plain plunger	Stainless steel roller plunger
Conformity / (N.C. contact with positive opening operation)	EN 50 041	EN 50 041	EN 50 041	EN 50 041
Maximum actuation speed m/s	0.5	0.5	0.5	0.5
Min. force: - actuation	22	22	30	16
- positive opening operation	66	66	70	48

9

		LS45M11B11 \$ 57	LS45M12B11 \$ 61.50	LS45M21B11 \$ 61.50	LS45M13B11 \$ 66
Snap action contacts	Catalog number List price	LS45M11B11 \$ 57	LS45M12B11 \$ 61.50	LS45M21B11 \$ 61.50	LS45M13B11 \$ 66
	Operation diagram				
Non-overlapping Slow action contacts	Catalog number List price	LS45M11D11 61.50	LS45M12D11 66	LS45M21D11 66	LS45M13D11 72
	Operation diagram				
Overlapping Slow action contacts	Catalog number List price	LS45M11C11 63	LS45M12C11 67.50	LS45M21C11 67.50	LS45M13C11 73.50
	Operation diagram				
Slow action contacts	Catalog number List price	LS45M11L02 63	LS45M12L02 67.50	LS45M21L02 67.50	LS45M13L02 73.50
	Operation diagram				
Slow action contacts	Catalog number List price	LS45M11L20 63	LS45M12L20 67.50	LS45M21L20 67.50	LS45M13L20 73.50
	Operation diagram				
Snap action contacts	Catalog number List price	LS45M11B02 63	LS45M12B02 67.50	LS45M21B02 67.50	LS45M13B02 73.50
	Operation diagram				
Weight (packing per unit)	kg	0.240	0.240	0.260	0.240

Dimensions (mm)

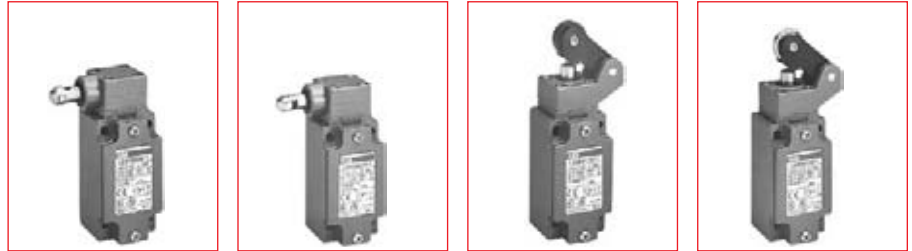


Assembled IP66, UL Type 4X 40mm

Metal
Limit switches

Movement to be detected

30° Cam translation movement



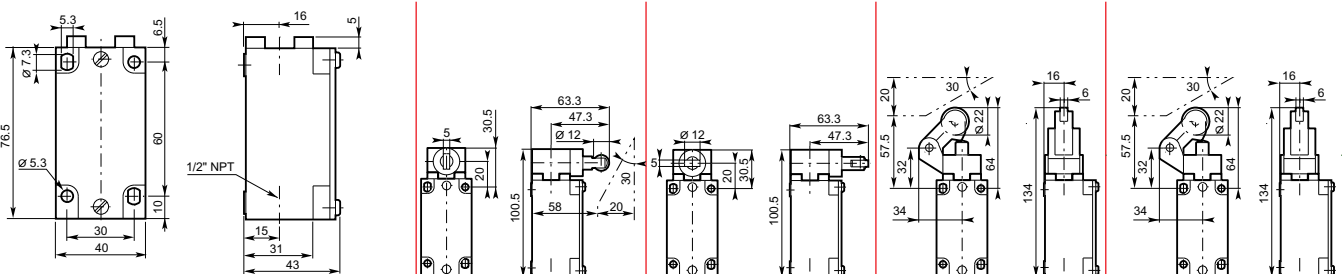
Operating head type

	Lateral plunger with vertical roller	Lateral plunger with horizontal roller	ø 22 Polyamide roller lever	ø 22 Stainless steel roller lever
Conformity / (N.C. contact with positive opening operation)	EN 50 041	EN 50 041		
Maximum actuation speed m/s	0.5	0.5	1.5	1.5
Min. force: - actuation	30	30	12	12
- positive opening operation	70	70	40	40

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Snap action contacts	Catalog number	LS45M22B11	LS45M23B11	LS45M31B11	LS45M32B11
List price		\$ 67.50	\$ 67.50	\$ 64.50	\$ 75
Operation diagram					
Non-overlapping Slow action contacts	Catalog number	LS45M22D11	LS45M23D11	LS45M31D11	LS45M32D11
List price		72	72	69	79.50
Operation diagram					
Overlapping Slow action contacts	Catalog number	LS45M22C11	LS45M23C11	LS45M31C11	LS45M32C11
List price		75	75	70.50	82.50
Operation diagram					
Slow action contacts	Catalog number	LS45M22L02	LS45M23L02	LS45M31L02	LS45M32L02
List price		75	75	70.50	82.50
Operation diagram					
Slow action contacts	Catalog number	LS45M22L20	LS45M23L20	LS45M31L20	LS45M32L20
List price		75	75	70.50	82.50
Operation diagram					
Snap action contacts	Catalog number	LS45M22B02	LS45M23B02	LS45M31B02	LS45M32B02
List price		75	75	70.50	82.50
Operation diagram					
Weight (packing per unit)	kg	0.265	0.265	0.275	0.280

Dimensions (mm)



**Assembled
IP66, UL Type 4X
40mm**

Movement to be detected



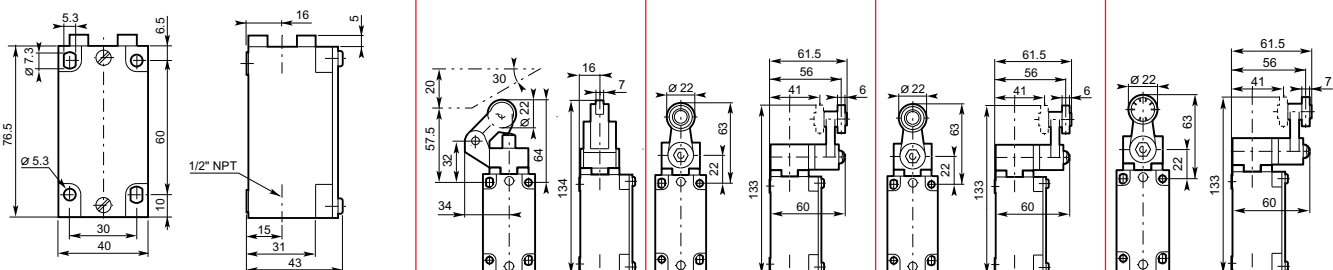
Operating head type

	ø 22 Ball-bearing roller lever	ø 22 Polyamide roller lever	ø 22 Stainless steel roller lever	ø 22 Ball-bearing roller lever
Conformity / (N.C. contact with positive opening operation)		EN 50 041	EN 50 041	EN 50 041
Maximum actuation speed m/s	1.5	1.5	1.5	1.5
Min. force/torque: - actuation	12 N	0.15 N.m	0.15 N.m	0.15 N.m
- positive opening operation	40 N	0.44 N.m	0.44 N.m	0.44 N.m

9

	Catalog number	LS45M33B11	LS45M41B11	LS45M42B11	LS45M43B11
Snap action contacts	List price	\$ 67.50	\$ 75	\$ 85.50	\$ 79.50
	Operation diagram				
Non-overlapping slow action contacts	List price	73.50	79.50	91.50	85.50
	Operation diagram				
Overlapping slow action contacts	List price	75	82.50	94.50	87
	Operation diagram				
Slow action contacts	List price	75	82.50	94.50	87
	Operation diagram				
Slow action contacts	List price	75	82.50	94.50	87
	Operation diagram				
Snap action contacts	List price	75	82.50	94.50	87
	Operation diagram				
Weight (packing per unit)	kg	0.280	0.280	0.280	0.280

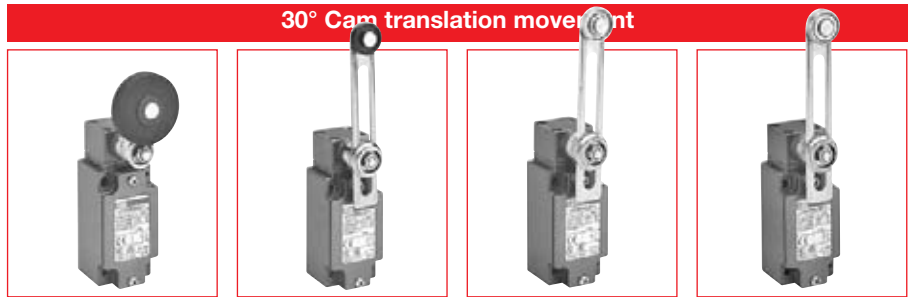
Dimensions (mm)



Assembled IP66, UL Type 4X 40mm

Metal
Limit switches

Movement to be detected

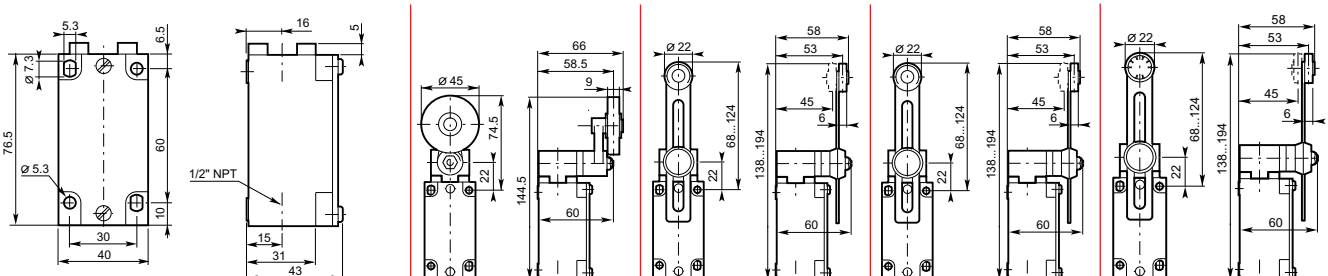


Operating head type

	ø 45 Rubber roller lever	Adjustable ø 22 polyamide roller lever	Adjustable ø 22 stainless steel roller lever	Adjustable ø 22 stainless steel ball-bearing roller lever
Conformity / (N.C. contact with positive opening operation)				
Maximum actuation speed	m/s 1.5	1.5	1.5	1.5
Min. torque: - actuation	N.m 0.15	0.15	0.15	0.15
- positive opening operation	N.m -	-	-	-

		LS45M44B11 \$ 76.50	LS45M51B11 \$ 76.50	LS45M52B11 \$ 88.50	LS45M53B11 \$ 82.50
Snap action contacts	Catalog number	LS45M44B11	LS45M51B11	LS45M52B11	LS45M53B11
	List price	\$ 76.50	\$ 76.50	\$ 88.50	\$ 82.50
	Operation diagram				
Non-overlapping slow action contacts	Catalog number	LS45M44D11	LS45M51D11	LS45M52D11	LS45M53D11
	List price	82.50	82.50	94.50	88.50
	Operation diagram				
Overlapping slow action contacts	Catalog number	LS45M44C11	LS45M51C11	LS45M52C11	LS45M53C11
	List price	85.50	85.50	97.50	91.50
	Operation diagram				
Slow action contacts	Catalog number	LS45M44L02	LS45M51L02	LS45M52L02	LS45M53L02
	List price	85.50	85.50	97.50	91.50
	Operation diagram				
Slow action contacts	Catalog number	LS45M44L20	LS45M51L20	LS45M52L20	LS45M53L20
	List price	85.50	85.50	97.50	91.50
	Operation diagram				
Snap action contacts	Catalog number	LS45M44B02	LS45M51B02	LS45M52B02	LS45M53B02
	List price	85.50	85.50	97.50	91.50
	Operation diagram				
Weight (packing per unit)	kg	0.310	0.290	0.300	0.300

Dimensions (mm)



**Assembled
IP66, UL Type 4X
40mm**

Movement to be detected



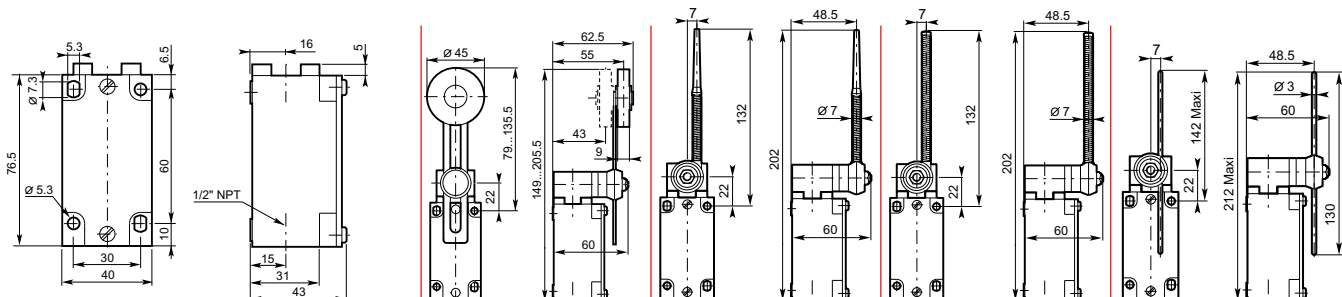
Operating head type

	Adjustable ø 45 rubber roller lever	Flexible lever with insulated end	Coil spring lever	Adjustable ø 3 stainless steel rod lever
Conformity / (N.C. contact with positive opening operation)				EN 50 041
Maximum actuation speed	m/s 1.5	1.5	1.5	0.5
Min. torque: - actuation	N.m 0.15	0.15	0.15	0.15
- positive opening operation	N.m -	-	-	-

9

		LS45M54B11 \$ 79.50	LS45M61B11 \$ 75	LS45M62B11 \$ 75	LS45M71B11 \$ 70.50
Snap action contacts	Catalog number List price	LS45M54B11 \$ 79.50	LS45M61B11 \$ 75	LS45M62B11 \$ 75	LS45M71B11 \$ 70.50
	Operation diagram				
Non-overlapping Slow action contacts	Catalog number List price	LS45M54D11 85.50	LS45M61D11 79.50	LS45M62D11 79.50	LS45M71D11 76.50
	Operation diagram				
Overlapping Slow action contacts	Catalog number List price	LS45M54C11 87	LS45M61C11 82.50	LS45M62C11 82.50	LS45M71C11 79.50
	Operation diagram				
Slow action contacts	Catalog number List price	LS45M54L02 87	LS45M61L02 82.50	LS45M62L02 82.50	LS45M71L02 79.50
	Operation diagram				
Slow action contacts	Catalog number List price	LS45M54L20 87	LS45M61L20 82.50	LS45M62L20 82.50	LS45M71L20 79.50
	Operation diagram				
Snap action contacts	Catalog number List price	LS45M54B02 87	LS45M61B02 82.50	LS45M62B02 82.50	LS45M71B02 79.50
	Operation diagram				
Weight (packing per unit)	kg	0.315	0.290	0.295	0.285

Dimensions (mm)



Assembled IP66, UL Type 4X 40mm

Metal
Limit switches

Movement to be detected

Translation (cont.)



Multidirectional

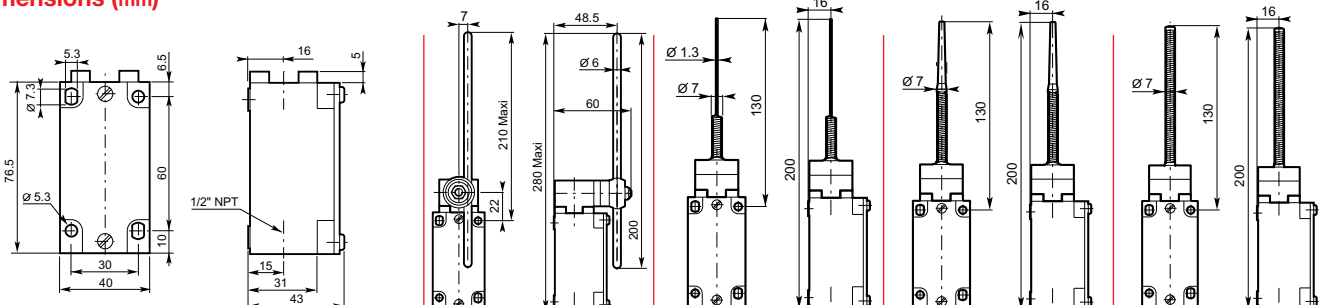


Operating head type

	Adjustable Ø 6 polyamide rod lever	Spring rod	Flexible rod with insulated end	Coil spring rod
Conformity / (N.C. contact with positive opening operation)	EN 50 041			
Maximum actuation speed	m/s 1.5	1	1	1
Min. torque: - actuation	N.m 0.15	0.18	0.18	0.18
- positive opening operation	N.m -	-	-	-

		LS45M72B11 \$ 70.50	LS45M91B11 \$ 61.50	LS45M92B11 \$ 64.50	LS45M93B11 \$ 63
Snap action contacts	Catalog number	LS45M72B11	LS45M91B11	LS45M92B11	LS45M93B11
	List price	\$ 70.50	\$ 61.50	\$ 64.50	\$ 63
	Operation diagram				
Non-overlapping Slow action contacts	Catalog number	LS45M72D11	LS45M91D11	LS45M92D11	LS45M93D11
	List price	75	64.50	69	67.50
	Operation diagram				
Overlapping Slow action contacts	Catalog number	LS45M72C11	LS45M91C11	LS45M92C11	LS45M93C11
	List price	78	67.50	70.50	70.50
	Operation diagram				
Slow action contacts	Catalog number	LS45M72L02	LS45M91L02	LS45M92L02	LS45M93L02
	List price	78	67.50	70.50	70.50
	Operation diagram				
Slow action contacts	Catalog number	LS45M72L20	LS45M91L20	LS45M92L20	LS45M93L20
	List price	78	67.50	70.50	70.50
	Operation diagram				
Snap action contacts	Catalog number	LS45M72B02	LS45M91B02	LS45M92B02	LS45M93B02
	List price	78	67.50	70.50	70.50
	Operation diagram				
Weight (packing per unit)	kg	0.285	0.235	0.235	0.235

Dimensions (mm)



Components

Catalog number explanation

IP66, UL Type 4X, 40mm



LS45M00B11

Casings with contact block for rectilinear or angular motion heads

	LS	45	M	00	B 11
Limit Switch	LS				
Casing width: 40 mm		4			
Cable inlet:					
1 cable inlet for Pg 13.5 cable gland				0	
1 cable inlet for 1/2" NPT				5	
Metal casing			M		
Without operating head				00	

					Contacts
					11 1 N.O. + 1 N.C. contacts
					02 2 N.C. contacts
					20 2 N.O. contacts
					Snap action
					B Zb Snap
					Dependent (slow) action
					L Zb Slow / Simultaneous
					D Zb Non-overlapping late make
					C Zb Overlapping early make

Operating heads

	LS	T	E	41
Limit Switch	LS			
Operating head		T		
For Metal casing 40 mm or 60 mm width			E	

				Actuator heads:
			11 ... 13	.....with rectilinear movement (plain plunger, steel ball plunger or roller plunger)
			21 ... 23	.....with rectilinear movement (with lateral plain or roller plunger)
			31 ... 33	.....with rectilinear movement (with roller lever on steel plunger)
			40	.....with angular movement (without actuator) actuator to be ordered separately
			41 ... 44	.....with angular movement (roller lever)
			50	.....with angular movement (without actuator)
			51 ... 54	.....with angular movement (adjustable roller lever)
			61, 62	.....flexible lever (spring)
			71, 72, 73	.....adjustable lever (rod)
			91 ... 93	.....multidirectional angular movement (spring rod)

Separate actuators (Roller lever, adjustable roller or rod levers, etc.)

	LS	A	40	X	54
Limit Switch	LS				
Actuator (roller)		A			
Casing width: 40 mm			40		

				Actuator heads:
			41 ... 44	.....non-adjustable roller lever
			51 ... 54	.....adjustable roller lever
			61, 62	.....flexible lever (spring)
			71, 72, 73	.....adjustable lever (rod)
				For casing of:
			M	..... Metal
			P	..... Plastic
			X	..... Plastic or metal

Separate contact blocks

	LS	C	40	X	B 11
Limit Switch	LS				
Contact blocks		C			
Casing width: 40 mm			40		

					Contacts
					11 1 N.O. + 1 N.C. contacts
					02 2 N.C. contacts
					20 2 N.O. contacts
					Snap action:
					B Zb Snap
					Dependent (slow) action:
					L Zb Slow / Simultaneous
					D Zb Non-overlapping late make
					C Zb Overlapping early make



LSC40XB11

Components

Selection guide

IP66, UL Type 4X, 40mm

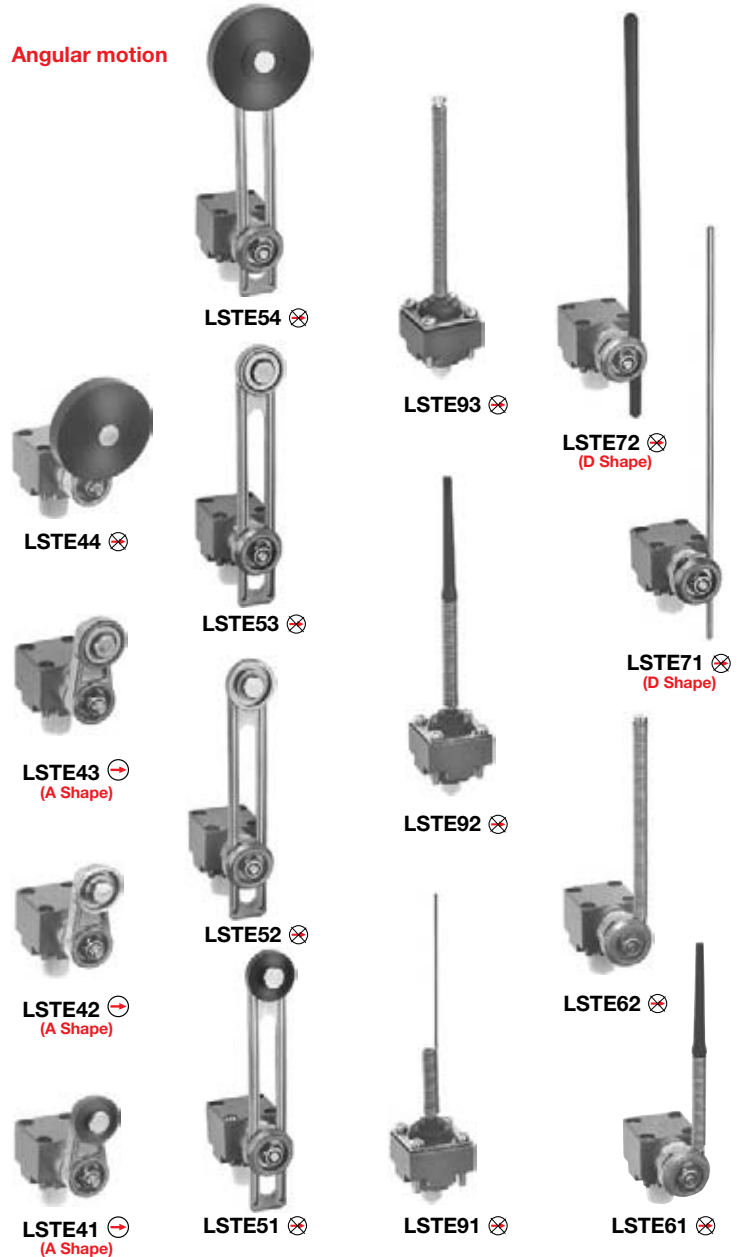
Metal
Limit switches

Actuators:

Rectilinear motion



Angular motion



9

Casings:

LSTE... rectilinear motion heads

- To be actuated from end. With plunger (plain, lateral plain or ball): LSTE11, LSTE12 and LSTE21.
- To be actuated by 30° cam translation. With roller plunger: LSTE13, LSTE22 and LSTE23.
- To be actuated unidirectionally by 30° cam translation. With roller lever on stainless steel plunger: LSTE31 ... LSTE33.

LSTE... angular motion heads

- To be actuated by 30° cam translation. With roller lever: LSTE41 ... LSTE54.
- To be actuated by fully directional translation movement. With rod or spring lever: LSTE61 ... LSTE72.
- To be actuated multidirectionally. With spring rod: LSTE91 ... LSTE93.



Bodies with contact block

- ⊕ LS45M00B11, LS45M00D11, LS45M00C11, LS45M00L02, LS45M00B02
- ⊗ LS45M00L20

⊕ : Suitable for positive opening operation (IEC 60947-5-1 and EN 50041).

Warning! The positive opening operation of limit switch is only guaranteed if the elements noted with ⊕ are fitted.

Components

IP66, UL Type 4X
40mm

9

Non-Adjustable actuators



LSA40X44 ⊗



LSA40X43 ⊕



LSA40X42 ⊕



LSA40X41 ⊕

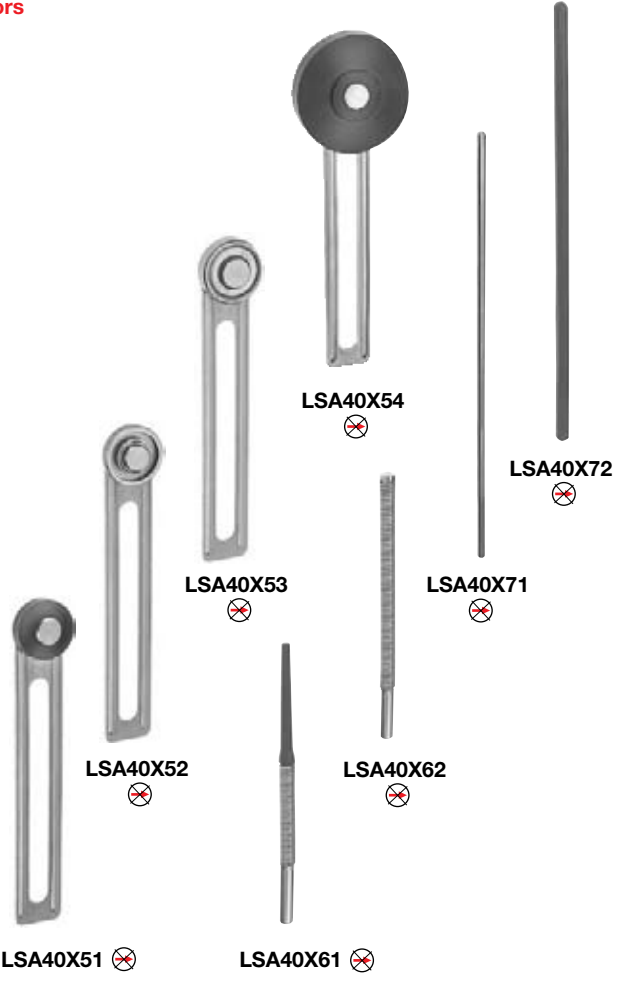
Non-Adjustable Roller levers



LSTE40 ⊕

LSTE40 angular motion head
For roller levers (non-adjustable)
LSA40X41 ... LSA40X44

Adjustable actuators



LSA40X51 ⊗

LSA40X52 ⊗

LSA40X53 ⊗

LSA40X54 ⊗

LSA40X61 ⊗

LSA40X62 ⊗

LSA40X71 ⊗

LSA40X72 ⊗

Adjustable or flexible levers



LSTE50 ⊗

LSTE50 angular motion head
For flexible or adjustable levers LSA40X51 ... LSA40X54,
LSA40X61, LSA40X62, LSA40X71 and LSA40X72.



Bodies with contact block

- ⊕ LS45M00B11, LS45M00D11, LS45M00C11, LS45M00L02, LS45M00B02
- ⊗ LS45M00L20



Contact blocks

- ⊕ LSC40XB11, LSC40XD11, LSC40XC11, LSC40XL02, LSC40XB02
- ⊗ LSC40XL20

⊕ : Suitable for positive opening operation (IEC 60947-5-1)
Warning! The positive opening operation of limit switch is only guaranteed if the elements noted with ⊕ are fitted.

Components

IP66, UL Type 4X

40mm

Metal
Limit switches

⊖ "N.C." contact with positive opening operation or element (sub-assembly, head, lever) suitable for positive opening operation.

Warning! The positive opening operation of limit switch is only guaranteed if the elements noted with ⊖ are fitted.



LS40M00B11



LSTE11



LSTE21



LSTE13

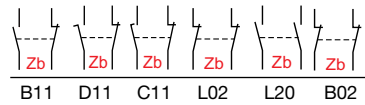


LSTE22



LSTE32

Contact blocks



Positive opening operation

Actuation speed max. m/s

Unit weight kg (1 pc)

Catalog number

List price

Bodies with contact block for rectilinear or angular motion heads

	B11	D11	C11	L02	L20	B02	Positive opening operation	Actuation speed max. m/s	Unit weight kg (1 pc)	Catalog number	List price
1							⊖	—	0.168	LS45M00B11	\$ 42.00
	1						⊖	—	0.168	LS45M00D11	43.50
		1					⊖	—	0.168	LS45M00C11	45.00
			1				⊖	—	0.168	LS45M00L02	45.00
				1			⊗	—	0.168	LS45M00L20	45.00
					1		⊖	—	0.168	LS45M00B02	45.00

Rectilinear motion heads with actuator

To be actuated from end

Stainless steel plain plunger	⊖	0.5	0.077	LSTE11	21.00
Stainless steel ball plunger	⊖	0.5	0.076	LSTE12	25.50
Stainless steel lateral plain plunger	⊖	0.5	0.093	LSTE21	25.50

To be actuated by 30° cam

Stainless steel roller plunger	⊖	0.5	0.084	LSTE13	30.00
Stainless steel lateral plunger with vertical roller	⊖	0.5	0.098	LSTE22	31.50
Stainless steel lateral plunger with horizontal roller	⊖	0.5	0.098	LSTE23	31.50

To be actuated unidirectionally by 30° cam

∅ 22mm polyamide roller lever on stainless steel plunger	⊖	1.5	0.111	LSTE31	28.50
∅ 22mm stainless steel roller lever on stainless steel plunger	⊖	1.5	0.121	LSTE32	39.00
∅ 22mm steel ball-bearing roller lever on stainless steel plunger	⊖	1.5	0.122	LSTE33	31.50

9

Components

IP66, UL Type 4X

40mm

⊕ "N.C." contact with positive opening operation or element (sub-assembly, head, lever) suitable for positive opening operation.

Warning! The positive opening operation of limit switch is only guaranteed if the elements noted with ⊕ are fitted.



LSTE41



LSTE52



LSTE72 LSTE91



LSTE40



LSA40X41

	Positive opening operation	Actuation speed max. m/s	Unit weight kg (1 pc)	Catalog number	List price
Angular motion heads with actuator					
To be actuated by 30° cam					
⊕ 22mm polyamide roller lever ①	⊕	1.5	0.134	LSTE41	\$ 39.00
⊕ 22mm stainless steel roller lever ①	⊕	1.5	0.142	LSTE42	51.00
⊕ 22mm steel ball-bearing roller lever ①	⊕	1.5	0.145	LSTE43	43.50
⊕ 45mm rubber roller lever ①	⊗	1.5	0.162	LSTE44	42.00
⊕ 22mm adjustable polyamide roller lever ①	⊗	1.5	0.152	LSTE51	40.50
⊕ 22mm adjustable stainless steel roller lever ①	⊗	1.5	0.161	LSTE52	52.50
⊕ 22mm adjustable steel ball-bearing roller lever ①	⊗	1.5	0.163	LSTE53	46.50
⊕ 45mm adjustable rubber roller lever ①	⊗	1.5	0.168	LSTE54	43.50
To be actuated by fully directional translation movement					
⊕ Stainless steel flexible lever with insulated end ①	⊗	1	0.145	LSTE61	43.50
⊕ Stainless steel coil spring lever ①	⊗	1	0.152	LSTE62	43.50
⊕ 3mm stainless steel rod lever, 195mm ①	⊗	1	0.150	LSTE71	39.00
⊕ 6mm polyamide rod lever, 195mm ①	⊗	1	0.145	LSTE72	39.00
⊕ 6mm fiberglass rod lever, 195mm ①	⊗	1	0.149	LSTE73	40.50
Multidirectional angular motion heads (to be actuated by fully directional translation movement)					
⊗ Stainless steel spring rod	⊗	1	0.066	LSTE91	25.50
⊗ Stainless steel flexible rod with insulated end	⊗	1	0.068	LSTE92	28.50
⊗ Stainless steel coil spring rod	⊗	1	0.075	LSTE93	27.00
Angular motion head without actuator, for non-adjustable roller levers (delivered with M5 nylon stop nut)					
⊕	⊕	1.5	0.102	LSTE40	30.00
Actuators for angular motion head LSTE40					
⊕ 22mm polyamide roller lever ①	⊕	—	0.032	LSA40X41	9.00
⊕ 22mm stainless steel roller lever ①	⊕	—	0.042	LSA40X42	21.00
⊕ 22mm steel ball-bearing roller lever ①	⊕	—	0.044	LSA40X43	13.50
⊕ 45mm rubber roller lever ①	⊗	—	0.050	LSA40X44	12.00

① Free position adjustment of lever by 9° over 360°

Components

IP66, UL Type 4X

40mm

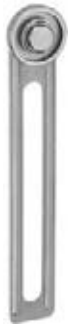
Metal
Limit switches

⊖ "N.C." contact with positive opening operation or element (sub-assembly, head, lever) suitable for positive opening operation.

Warning! The positive opening operation of limit switch is only guaranteed if the elements noted with ⊖ are fitted.



LSTE50



LSA40X52



LSA40X71



LSA40X61



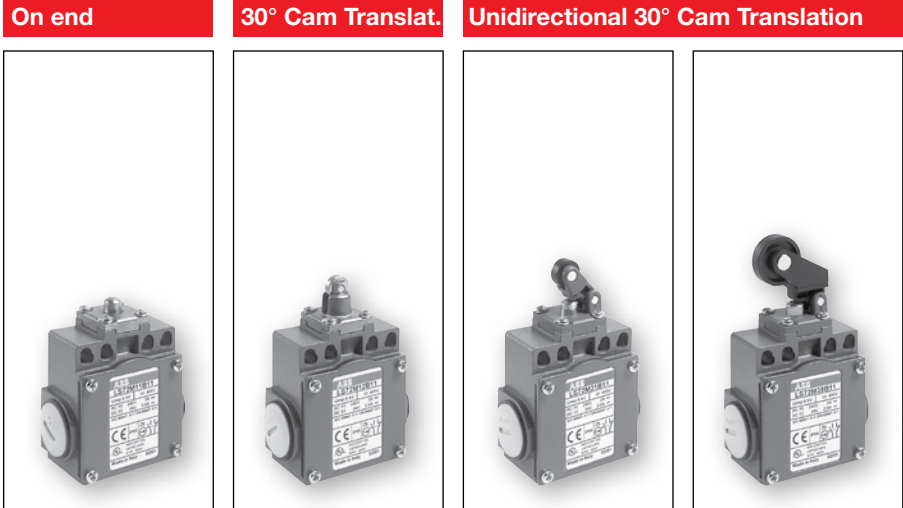
LSC40XB11

	Positive opening operation	Actuation speed max. m/s	Unit weight kg (1 pc)	Catalog number	List price
Angular motion head without actuator, for flexible or adjustable levers (delivered with M5 nylon stop nut & adaptation parts)					
	⊖	1 - 1.5 ②	0.121	LSTE50	\$ 33.00
Actuators for angular motion head LSTE50					
∅ 22mm adjustable polyamide roller lever ①	⊗	—	0.023	LSA40X51	7.50
∅ 22mm adjustable stainless steel roller lever ①	⊗	—	0.032	LSA40X52	19.50
∅ 22mm adjustable steel ball-bearing roller lever ①	⊗	—	0.034	LSA40X53	13.50
∅ 45mm adjustable rubber roller lever ①	⊗	—	0.039	LSA40X54	10.50
Stainless steel flexible lever with insulated end ①	⊗	—	0.017	LSA40X61	10.50
Stainless steel coil spring lever ①	⊗	—	0.023	LSA40X62	10.50
∅ 3mm adjustable stainless steel rod lever, 195mm ①	⊗	—	0.014	LSA40X71	25.50
∅ 6mm adjustable polyamide rod lever, 195mm ①	⊗	—	0.010	LSA40X72	6.00
∅ 6mm adjustable fiberglass rod lever, 195mm ①	⊗	—	0.014	LSA40X73	7.50
Contact blocks (with adaptor)					
1 NC & 1 NO 2-pole snap action	⊖	—	0.032	LSC40XB11	22.50
1 NC & 1 NO 2-pole non-overlapping slow action	⊖	—	0.032	LSC40XD11	22.50
1 NO & 1 NC 2-pole overlapping slow action	⊖	—	0.032	LSC40XC11	25.50
2 NC 2-pole simultaneous slow action	⊖	—	0.032	LSC40XL02	25.50
2 NO 2-pole simultaneous slow action	⊗	—	0.032	LSC40XL20	25.50
Bipolar 2 NC 2-pole snap action	⊖	—	0.032	LSC40XB02	25.50

① Free position adjustment of lever by 9° over 360°
 ② According to lever.

Assembled
IP66, UL Type 4X
60mm

Movement to be detected:



9

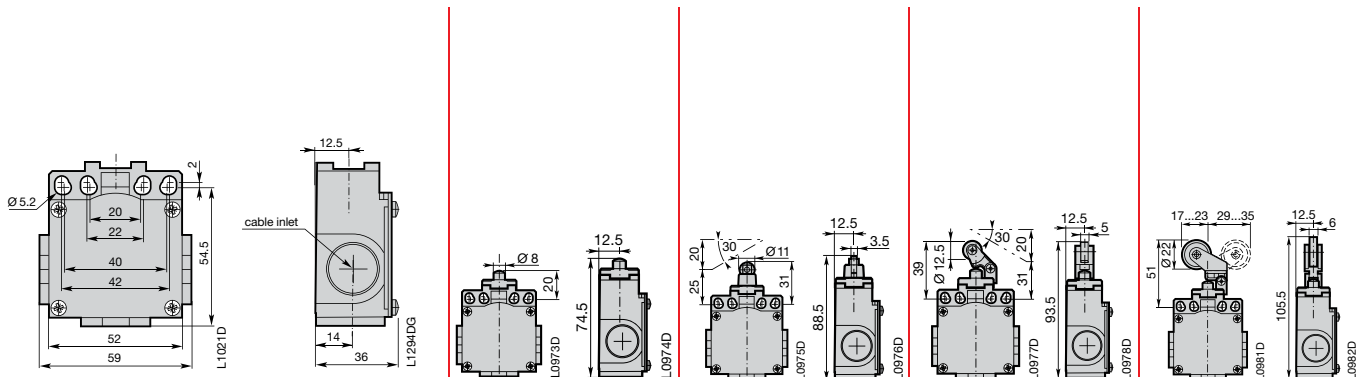
Actuator

	On end	30° Cam Translat.	Unidirectional 30° Cam Translation	
	Metal plunger	ø11 metal roller plunger	ø12.5 plastic roller lever on steel plunger	ø22 plastic roller lever on steel plunger
Conformity / (N.C. contact with positive opening operation)	-	-	-	-
Maximum actuation speed	0.5 m/s	0.3 m/s	1 m/s	1 m/s
Min. force / torque: - actuation	15 N	12 N	7 N	7 N
- positive opening operation	45 N	41 N	24 N	24 N

Snap action contacts	Catalog number	LS75M11B11	LS75M12B11	LS75M31B11	LS75M38B11
Operation diagram	List price	\$ 54	\$ 59	\$ 59	\$ 63
Operation diagram		0 1.7 2.7 4.3 5.6 mm	0 3.0 4.8 7.7 9.6 mm	0 4.9 9.0 14.5 21.0 mm	0 8.8 15.0 23.2 32.0 mm
Non-overlapping Slow action contacts	Catalog number	LS75M11D11	LS75M12D11	LS75M31D11	LS75M38D11
Operation diagram	List price	58	63	63	68
Operation diagram		0 1.9 3.5 5.6 mm	0 3.4 6.3 9.6 mm	0 6.0 10.5 21.0 mm	0 10.6 18.5 32.0 mm
Weight (packing per unit)	kg	0.270	0.280	0.265	0.270

■ Closed contact / □ Open contact

Dimensions (mm)



Assembled IP66, UL Type 4X 60mm

Metal
Limit switches

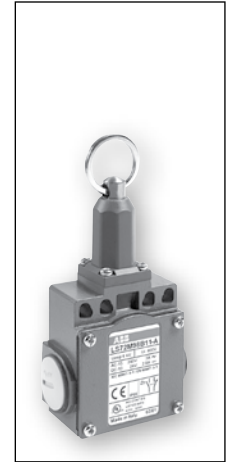
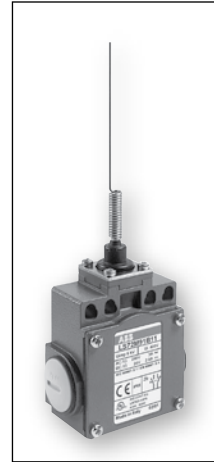
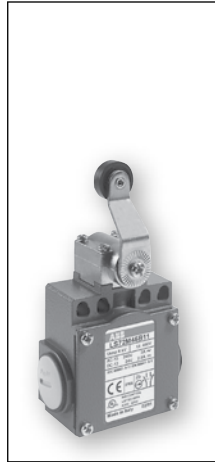
Movement to be detected:

30° Cam Translat.

Fully directional Trans.

Multidirectional

Pull action



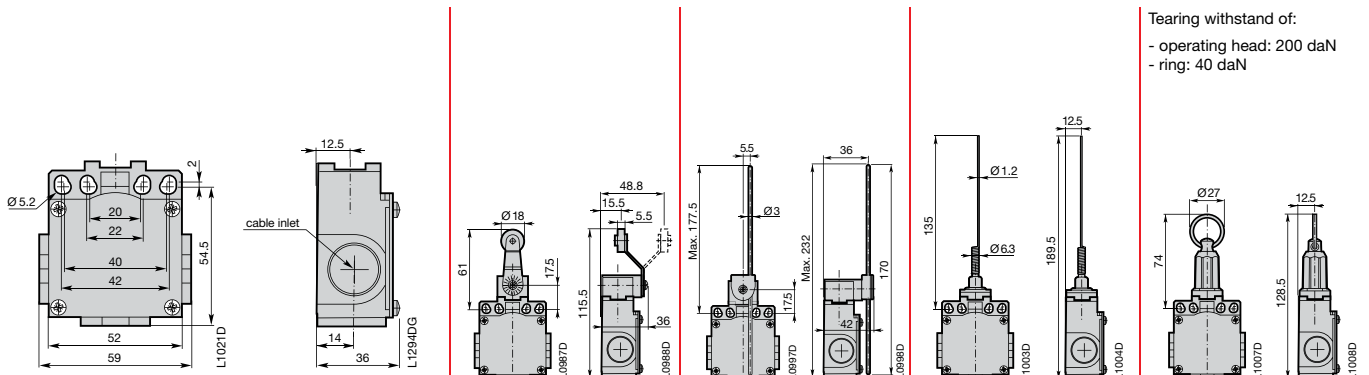
Actuator

	ø18 plastic roller with bent lever	Adjustable ø3 stainless steel rod lever	Spring rod	Pull action with ring
Conformity / \ominus (N.C. contact with positive opening operation)	-	\ominus	-	-
Maximum actuation speed	1.5 m/s	1.5 m/s	1 m/s	0.5 m/s
Min. force / torque: - actuation	0.1 N.m	0.1 N.m	0.12 N.m	30 N
- positive opening operation	0.32 N.m	0.32 N.m	-	-

Snap action contacts	Catalog number	LS75M45B11	LS75M71B11	LS75M91B11	LS75M98B11-A
Operation diagram	List price	\$ 67	\$ 72	\$ 61	\$ 83
Non-overlapping Slow action contacts	Catalog number	LS75M45D11	LS75M71D11	LS75M91D11	LS75M98D11-A
Operation diagram	List price	72	77	65	85
Weight (packing per unit)	kg	0.335	0.380	0.315	0.350

■ Closed contact / □ Open contact

Dimensions (mm)



Components

Catalog number explanation

IP66, UL Type 4X, 60mm



LS65M00B11

Bodies with contact block for rectilinear or angular motion heads

	LS	75	M	00	B11	
Limit Switch.....	LS					Contacts
Casing width: 60 mm		7				11 .....1 N.O. + 1 N.C. contacts
Cable inlet:						02 .....2 N.C. contacts
3 cable inlets for Pg 13.5 cable gland				0		20 .....2 N.O. contacts
3 cable inlets M20 x 1.5 for ISO 20 cable gland.....				3		
3 cable inlets for 1/2" NPT.....				5		
Metal casing			M			Snap action:
Without operating head				00		B .....Zb Snap
						Dependent (slow) action:
						L .....Zb Slow / Simultaneous
						D .....Zb Non-overlapping late make
						C .....Zb Overlapping early make

Operating heads

	LS	T	E	41	
Limit Switch.....	LS				Actuator heads:
Operating head		T			11 ... 13 .....with rectilinear movement (plain plunger, steel.....ball plunger and roller plunger
For Metal casing: 40 mm or 60 mm width			E		21 ... 23 .....with rectilinear movement (with lateral plain or.....roller plunger)
					31 ... 33 .....with rectilinear movement (with roller lever on steel.....plunger)
					40 .....with angular movement (without actuator) actuator.....to be ordered separately
					41 ... 44 .....with angular movement (roller lever)
					50 .....with angular movement (without actuator)
					51 ... 54 .....with angular movement (adjustable roller lever)
					61, 62 .....flexible lever (spring)
					71, 72, 73 .....adjustable lever (rod)
					91 ... 93 .....multidirectional angular movement (spring rod)

Separate actuators (Roller lever, adjustable roller or rod levers, etc.)

	LS	A	40	X	51	
Limit Switch.....	LS					Actuator heads::
Actuator (roller)		A				41 ... 44 .....non-adjustable roller lever
Casing width: 40 mm			40			51 ... 54 .....adjustable roller lever
The reference 40 is common to all casings (LS40P, LS40M and LS60M)						61, 62 .....flexible lever (spring)
						71, 72, 73 .....adjustable lever (rod)
						For casing:
						M Metal
						P Plastic
						X Plastic or metal

Separate contact blocks

	LS	C	40	X	D	11	
Limit Switch.....	LS						Contacts
Contact blocks		C					11 .....1 N.O. + 1 N.C. contacts
Casing width: 40 mm			40				02 .....2 N.C. contacts
The reference 40 is common to all casings (LS40P, LS40M and LS60M)							20 .....2 N.O. contacts
For casing of:							Snap action:
Metal.....				M			B .....Zb Snap
Plastic.....					P		Dependent (slow) action:
Plastic or metal.....					X		L .....Zb Slow / Simultaneous
							D .....Zb Non-overlapping late make
							C .....Zb Overlapping early make



LSC40XD11

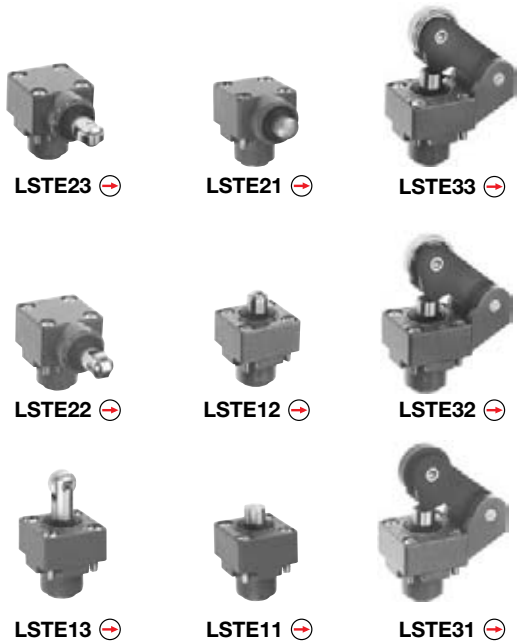
Components

Selection guide

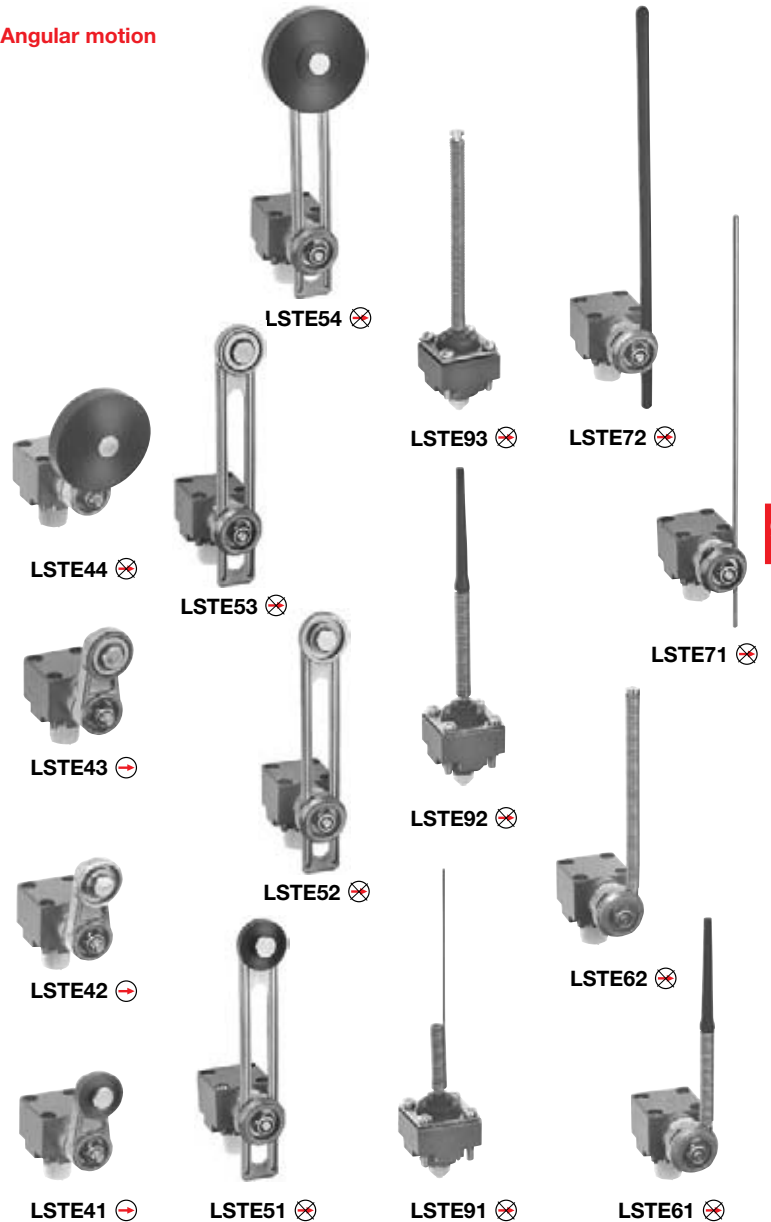
IP66, UL Type 4X, 60mm

Metal
Limit switches

Rectilinear motion



Angular motion



LSTE... rectilinear motion heads

- To be actuated from end. With plunger (plain, lateral plain or ball): LSTE11, LSTE12 and LSTE21.
- To be actuated by 30° cam translation. With roller plunger: LSTE13, LSTE22 and LSTE23.
- To be actuated unidirectionally by 30° cam translation. With roller lever on stainless steel plunger: LSTE31 ... LSTE33.

LSTE... angular motion heads

- To be actuated by 30° cam translation. With roller lever: LSTE41 ... LSTE54.
- To be actuated by fully directional translation movement. With rod or spring lever: LSTE61 ... LSTE72.
- To be actuated multidirectionally. With spring rod: LSTE91 ... LSTE93.



Bodies with contact block

⊕ LS75M00B11, LS75M00D11, LS75M00C11, LS75M00L02, LS75M00B02

⊗ LS75M00L20

⊕: Suitable for positive opening operation (IEC 60947-5-1).

Warning! The positive opening operation of limit switch is only guaranteed if the elements noted with ⊕ are fitted.

Components

Selection guide

IP66, UL Type 4X, 60mm

Non-Adjustable actuators



LSA40X44 ⊗



LSA40X43 ⊕



LSA40X42 ⊕



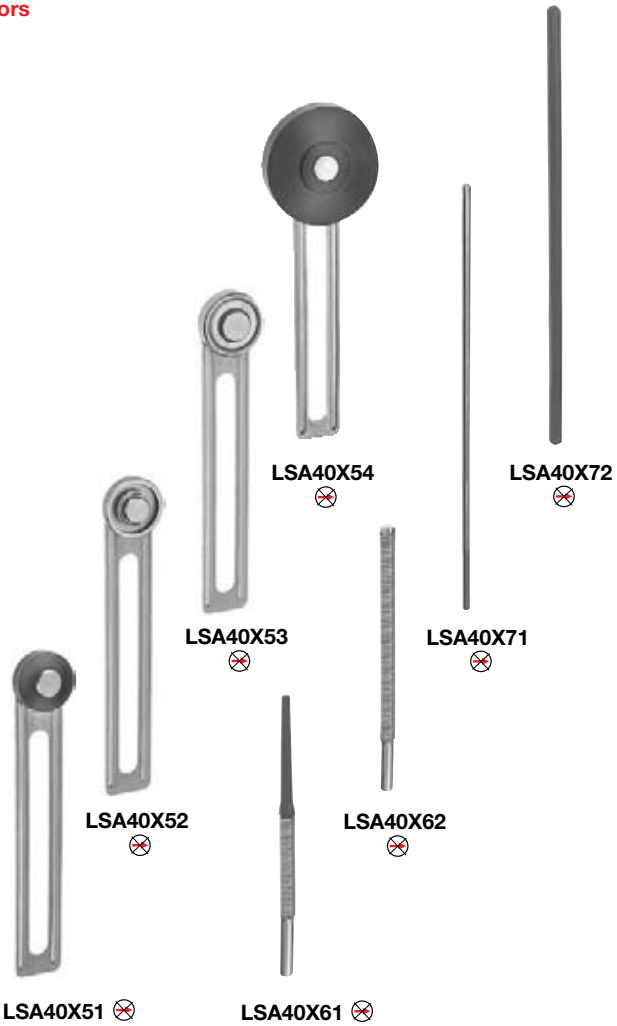
LSA40X41 ⊕

Roller levers



LSTE40 ⊕

Adjustable actuators



LSA40X51 ⊗

LSA40X52 ⊗

LSA40X53 ⊗

LSA40X54 ⊗

LSA40X61 ⊗

LSA40X62 ⊗

LSA40X71 ⊗

LSA40X72 ⊗

Adjustable or flexible levers



LSTE50 ⊗

LSTE50 angular motion head

For flexible or adjustable levers LSA40X51 ... LSA40X54, LSA40X61, LSA40X62, LSA40X71 and LSA40X72.

LSTE40 angular motion head

For roller levers (non-adjustable) LSA40X41 ... LSA40X44

Bodies with contact block

- ⊕ LS75M00B11, LS75M00D11, LS75M00C11, LS75M00L02, LS75M00B02
- ⊗ LS75M00L20



Contact blocks

- ⊕ LSC40XB11, LSC40XD11, LSC40XC11, LSC40XL02, LSC40XB02
- ⊗ LSC40XL20



⊕ : Suitable for positive opening operation (IEC 60947-5-1)

Warning! The positive opening operation of limit switch is only guaranteed if the elements noted with ⊕ are fitted.

Components

IP66, UL Type 4X

60mm

Metal
Limit switches

⊕ "N.C." contact with positive opening operation or element (subassembly, head, lever) suitable for positive opening operation.

Warning! The positive opening operation of limit switch is only guaranteed if the elements noted with ⊕ are fitted.



LS70M00B11



LSTE11 LSTE13



LSTE12 LSTE23

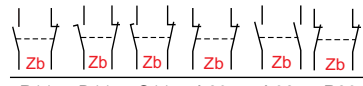


LSTE31 LSTE42



LSTE54 LSTE52

Contact blocks



B11 D11 C11 L02 L20 B02

Positive opening operation

Actuation speed max. m/s

Unit weight kg (1 pc)

Catalog number

List price

Bodies with contact block for rectilinear or angular motion heads

1	1	1	1	1	1	⊕	—	0.198	LS75M00B11	\$ 43.00
	1					⊕	—	0.198	LS75M00D11	43.00
		1				⊕	—	0.198	LS75M00C11	45.00
			1			⊕	—	0.198	LS75M00L02	43.00
				1		⊗	—	0.198	LS75M00L20	45.00
					1	⊕	—	0.198	LS75M00B02	45.00

Rectilinear motion heads

To be actuated from end

Stainless steel plain plunger ⊕

Stainless steel ball plunger ⊕

Stainless steel lateral plain plunger ⊕

To be actuated by 30° cam

Stainless steel roller plunger ⊕

Stainless steel lateral plunger with vertical roller ⊕

Stainless steel lateral plunger with horizontal roller ⊕

To be actuated unidirectionally by 30° cam

⊕ ⌀ 22mm polyamide roller lever on stainless steel plunger

⊕ ⌀ 22mm stainless steel roller lever on stainless steel plunger

⊕ ⌀ 22mm steel ball-bearing roller lever on stainless steel plunger

Angular motion heads with actuator

To be actuated by 30° cam

⊕ ⌀ 22mm polyamide roller lever ①

⊕ ⌀ 22mm stainless steel roller lever ①

⊕ ⌀ 22mm steel ball-bearing roller lever ①

⊗ ⌀ 45mm rubber roller lever ①

⊗ ⌀ 22mm adjustable polyamide roller lever ①

⊗ ⌀ 22mm adjustable stainless steel roller lever ①

⊗ ⌀ 22mm steel ball-bearing roller lever ①

⊗ ⌀ 45mm adjustable rubber roller lever ①

① Free position adjustment of lever 9° by 9° over 360°.

Components

IP66, UL Type 4X

60mm

⊖ "N.C." contact with positive opening operation or element (sub-assembly, head, lever) suitable for positive opening operation.

Warning! The positive opening operation of limit switch is only guaranteed if the elements noted with ⊕ are fitted.



LSTE61



LSTE71

LSTE93



LSTE40

LSA40X42



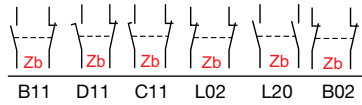
LSTE50



LSA40X53

LSA40X62

Contact blocks



Positive opening operation

Actuation speed max. m/s

Unit weight kg (1 pc)

Catalog number

List price

To be actuated by fully directional translation movement

Stainless steel flexible lever with insulated end ①	⊕	1	0.145	LSTE61	\$ 43.50
Stainless steel coil spring lever ①	⊕	1	0.152	LSTE62	43.50
∅ 3mm adjustable stainless steel rod lever, 195mm ①	⊕	1	0.150	LSTE71	39.00
∅ 3mm adjustable polyamide rod lever, 195mm ①	⊕	1	0.145	LSTE72	39.00
∅ 6mm adjustable fiberglass rod lever, 195mm ①	⊕	1	0.149	LSTE73	40.50

Multidirectional angular motion head (to be actuated by fully directional translation movement)

Stainless steel spring rod	⊗	1	0.066	LSTE91	25.50
Stainless steel flexible rod with insulated end	⊗	1	0.068	LSTE92	28.50
Stainless steel coil spring rod	⊗	1	0.075	LSTE93	27.00

Angular motion head without actuator, for non-adjustable roller levers (delivered with M5 nylon stop nut)

	⊕	1.5	0.102	LSTE40	30.00
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Actuator for angular motion head LSTE40

∅ 22mm polyamide roller lever ①	⊕	—	0.032	LSA40X41	9.00
∅ 22mm stainless steel roller lever ①	⊕	—	0.042	LSA40X42	21.00
∅ 22mm steel ball-bearing roller lever ①	⊕	—	0.044	LSA40X43	13.50
∅ 45mm rubber roller lever ①	⊗	—	0.050	LSA40X44	12.00

Angular motion head without actuator for flexible or adjustable levers (delivered with M5 nylon stop nut & adaptation parts)

	⊗	1 - 1.5 ②	0.121	LSTE50	33.00
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Actuators for angular motion head LSTE50

∅ 22mm adjustable polyamide roller lever ①	⊗	—	0.023	LSA40X51	7.50
∅ 22mm adjustable stainless steel roller lever ①	⊗	—	0.032	LSA40X52	19.50
∅ 45mm adjustable steel ball-bearing roller lever ①	⊗	—	0.034	LSA40X53	13.50
∅ 45mm adjustable rubber roller lever ①	⊗	—	0.039	LSA40X54	10.50
Stainless steel flexible lever with insulated end ①	⊗	—	0.017	LSA40X61	10.50
Stainless steel coil spring lever ①	⊗	—	0.023	LSA40X62	10.50
∅ 3mm adjustable stainless steel rod lever, 195mm ①	⊗	—	0.014	LSA40X71	25.50
∅ 6mm adjustable polyamide rod lever, 195mm ①	⊗	—	0.010	LSA40X72	25.50
∅ 6mm adjustable fiberglass rod lever, 195mm ①	⊗	—	0.014	LSA40X73	25.50

① Free position adjustment of lever by 9° over 360°.

② According to lever.

Components

IP66, UL Type 4X

60mm

Metal
Limit switches

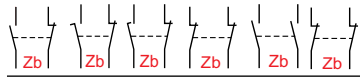
⊖ "N.C." contact with positive opening operation or element (sub-assembly, head, lever) suitable for positive opening operation.

Warning! The positive opening operation of limit switch is only guaranteed if the elements noted with ⊖ are fitted.



LSC40XB11

Contact blocks



B11 D11 C11 L02 L20 B02

Contact blocks (with adaptor)

1 NC & 1 NO 2-pole snap action	⊖
1 NC & 1 NO 2-pole non-overlapping slow action	⊖
1 NO & 1 NC 2-pole overlapping slow action	⊖
2 NC 2-pole simultaneous slow action	⊖
2 NO 2-pole simultaneous slow action	⊗
2 NC 2-pole snap action	⊖

Positive opening operation

Actuation speed max. m/s

Unit weight kg (1 pc)

Catalog number

List price

1 NC & 1 NO 2-pole snap action	⊖	—	0.032	LSC40XB11 \$ 22.50
1 NC & 1 NO 2-pole non-overlapping slow action	⊖	—	0.032	LSC40XD11 22.50
1 NO & 1 NC 2-pole overlapping slow action	⊖	—	0.032	LSC40XC11 25.50
2 NC 2-pole simultaneous slow action	⊖	—	0.032	LSC40XL02 25.50
2 NO 2-pole simultaneous slow action	⊗	—	0.032	LSC40XL20 25.50
2 NC 2-pole snap action	⊖	—	0.032	LSC40XB02 25.50

① Free position adjustment of lever by 9° over 360°.

Technical data IP 65, UL Type 4

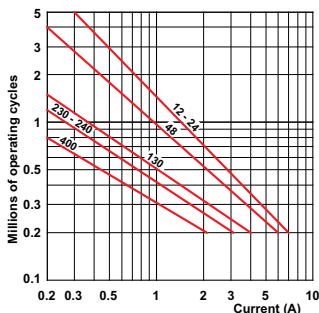
General technical data

Standards	Devices conform with international IEC 947-5-1 and European EN 60 947-5-1 standards	
Certifications - Approvals	UL & CSA	
Air temperature near the device (IEC) - during operation - for storage	°C °C	- 25 ... + 70 - 30 ... + 80
Climatic withstand	According to IEC 68-2-3 and salty mist according to IEC 68-2-11	
Mounting positions	All positions are authorized	
Shock withstand (according to IEC 68-2-27 and EN 60 068-2-27)	50g ① (1/2 sinusoidal shock for 11 ms) no change in contact position	
Resistance to vibrations (acc. to IEC 68-2-6 and EN 60 068-2-6)	25g (10 – 500 Hz) no change in position of contacts greater than 100 µs	
Protection against electrical shocks (acc. to IEC 536)	Class I	
Degree of protection	UL Type 4X & IP 66	
Consistency (measured over 1 million operations)	0.05 mm (upon closing point)	
Minimum actuation speed	m/s	Slow action contacts 0.060 / Snap action contacts 0.001

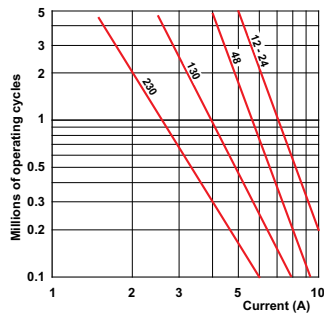
Electrical Data

Rated insulation voltage U_i - according to IEC 947-1 and EN 60-947-1 - according to UL 508 and CSA C22-2 n° 14	500 V (degree of pollution 3) A 600, Q 600		
	kV	6	
Rated impulse withstand voltage U_{imp} (according to IEC 947-1 and EN 60 947-1)	kV	6	
Conventional free air thermal current I_{th} (according to IEC 947-5-1) $q \leq 40$ °C	A	10	
Short-circuit protection $U_p \leq 500$ V a.c. - gG (gl) type fuses	A	10	
Rated operational current I_o / AC-15 (according to IEC 947-5-1)	24 V - 50/60 Hz	A	10
	130 V - 50/60 Hz	A	5.5
	230 V - 50/60 Hz	A	3.1
	240 V - 50/60 Hz	A	3
	400 V - 50/60 Hz	A	1.8
I_o / DC-13 (according to IEC 947-5-1)	24 V - d.c.	A	2.8
	110 V - d.c.	A	0.6
	250 V - d.c.	A	0.27
Switching frequency	Cycles/h	3600	
Load factor		0.5	
Resistance between contacts	mW	25	
Connecting terminals	M3.5 (+, -) pozidriv 2 screw with cable clamp		
Terminal for protective conductor	M3.5 (+, -) pozidriv 2 screw with cable clamp		
Connecting capacity	1 or 2 x mm ²	0.5 ... 2.5	
Terminal marking	According to EN 50 013		
Mechanical durability	Millions	30 } 40 } M { 11 - 13; 21 - 23; 31 - 33	
	of operations	25 } 60 } M { 41 - 44; 51 - 54; 61 - 72	
		10 } 60 } M { 91 - 93	
Electrical durability (according to IEC 947-5-1)	Utilization categories AC-15 and DC-13 (Load factor of 0.5 according to curves below)		

AC-15 – Snap action



AC-15 – Slow action



DC-13	Snap action		Slow action	
	Power breaking for a durability of 5 million operating cycles			
Voltage 24 V	9.5 W	12 W		
Voltage 48 V	6.8 W	9 W		
Voltage 110 V	3.6 W	6 W		

① except for LS30/31/35 (P42): 25g

Miniature Limit switches



Limit switches

Miniature pre-wired

30mm & 35mm

Metal & plastic casings



9

Description

Plastic limit switches are made of reinforced UL-VO thermoplastic fiberglass, offering double insulation <square image> and protection of IP67 and NEMA Type 1.

Metal limit switches are made of zinc alloy and have a degree of protection of IP67 and NEMA Type 4, 4X.

Casings come in 2 dimensions:

- 30mm width
- 35mm width

Applications

Easy to use, electromechanical limit switches offer specific qualities:

- Visible operation
- Able to switch strong currents (5A thermal)
- Electrically separated contacts (Zb shape)
- Precise operating points (consistency)
- Immune to electromagnetic disturbances

Limit switches used for these mechanical applications:


- Presence/absence
 - Positioning and travel limit
 - Objects passing/counting
- UL Listed file #E191693

General information

Metal & plastic

Pre-wired

Description

LS20P ... LS26P limit switches, made of fiberglass reinforced UL-V0 thermoplastic material, sealed with epoxy resin at the base on the body, offer double insulation  and a degree of protection IP67, NEMA Type 1.


LS20M ... LS26M limit switches, made of zinc alloy (zamack), sealed with epoxy resin at the base on the body, offer a degree of protection IP67, NEMA 4, 4X.

The casings come in 2 dimensions:

- LS20 ... LS21, 30 mm width,
- LS25 ... LS26, 35 mm width.

Applications

Easy to use, electromechanical limit switches offer specific qualities:

- Visible operation.
- Able to switch strong currents (5 A conventional thermal current).
- Electrically separated contacts (Zb shape).
- Contact blocks with positive opening operation of the "N.C." normally closed contact(s) (symbol .
- Precise operating points (consistency).
- Immune to electromagnetic disturbances.

They are exceptional detection devices thanks to these characteristics:

- Presence/absence.
- Positioning and travel limit.
- Objects passing/counting.

9

A variety of operating heads:

- Plain plunger
- Roller plunger
- Roller lever, adjustable or not, etc.


Assembled using 2 x ø3 screws for LS20P...LS26P

Assembled using 2 x M3 screws for LS20M...LS26M

Casing:

- 30 mm or 35 mm width

Contact blocks:

- Contact configuration: 1 N.O. + 1 N.C.
- Positive opening operation 
- Snap action or slow action
- Zb shape: the 2 contacts are electrically separated

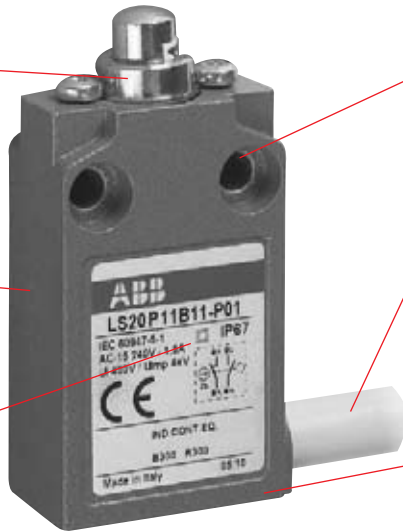
Mounting the casing:

- 2 x M4 screws on the top part

Electrical connection:

- Cable output left/right or cable output bottom: for LS20P...LS26P
 - cable IEC 20/22 II PVC 4 x 0.75 mm²
 - cable UL 62 PVC 4 x AWG 18
- for LS20M...LS26M
 - cable IEC 20/22 II PVC 5 x 0.75 mm²
 - cable UL 62 PVC 5 x AWG 18
- Standard length: 1 m (other lengths on request)
- Other outputs (on request):
 - connector M12 or 7/8" NPT
 - cable with end connector

- Compounding with epoxy resin for IP67 protection degree



Catalog number explanation

Example : **LS 2 5 M 51 D 11 - U 02**

Limit Switch, prewiredLS2

30 mm width: cable output left / right 0

30 mm width: cable output bottom 1

35 mm width: cable output left / right 5

35 mm width: cable output bottom 6

Plastic casing.....P

Metal casingM

Operating heads:

Codes10...98

Cable length:

011 m

022 m

033 m

055 m

1010 m (Max. for UL cable)

U cable UL 62 - PVC

Contact types:

11 1 N.O. + 1 N.C. contacts

Snap action:

BZb Snap

Dependent (slow) action:

DZb Non-overlapping late make

Assembled

Plastic casing (NEMA1) & metal casing - (NEMA 4, 4X)

Pre-wired, 30mm

Miniature
limit switches

Movement to be detected:

For Plastic Casing:

Cable: 4 x 0.75 mm² / 4 x AWG 18

Length: 1 m ⊕

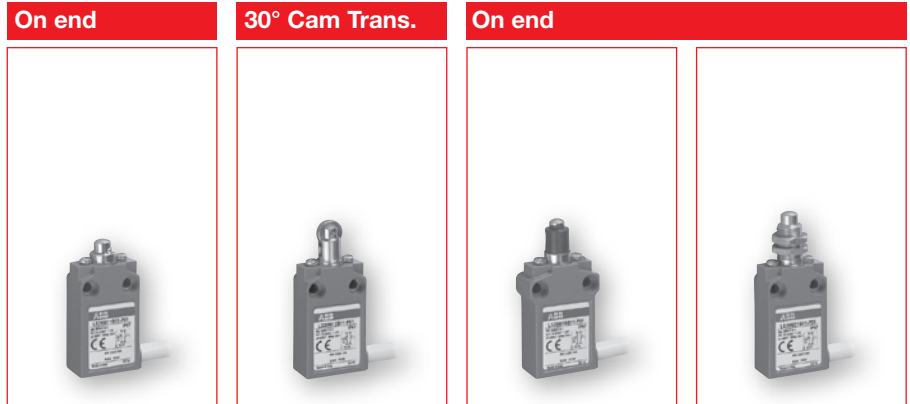
(Other lengths see ordering details)

For Metal Casing:

Cable: 5 x 0.75 mm² / 5 x AWG 18

Length: 1 m ⊕

(Other lengths see ordering details)



Actuator

	Metal plunger	Metal Roller plunger	Metal plunger (with dust protection cup)	Metal plunger with fixing nuts
⊕ (N.C. contact with positive opening operation)	⊕	⊕	⊕	⊕
Maximum actuation speed	0.5 m/s	0.1 m/s	0.5 m/s	0.5 m/s
Min. force / torque: - actuation	15 N	10 N	15 N	15 N
- positive opening operation	30 N	30 N	30 N	30 N

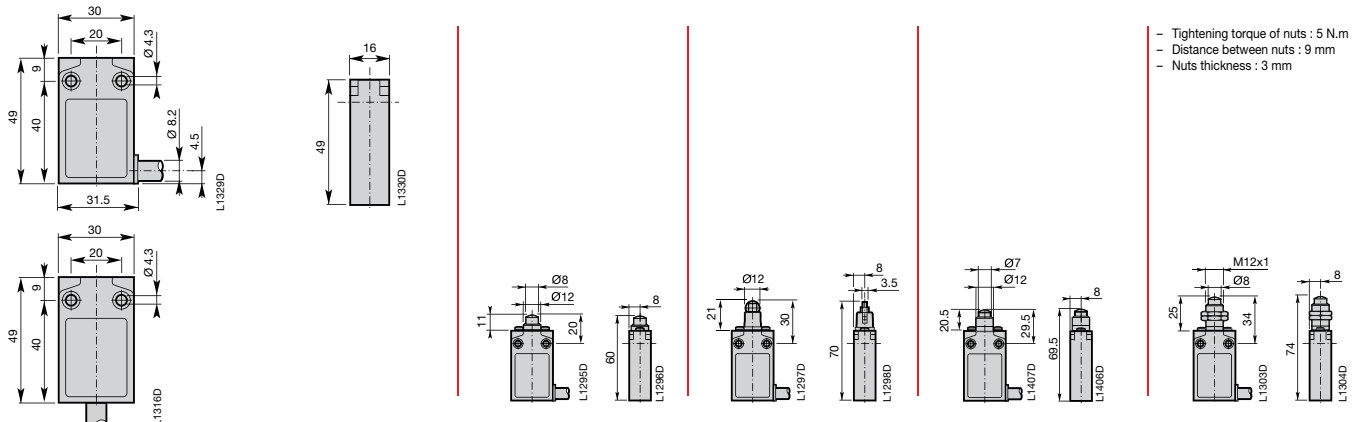
Additional technical data

Cable output left / right code.....	0 } Does not affect pricing.
Cable output bottom code.....	1 }
Plastic casing.....	P
Metal casing.....	M
Type to be completed with the above codes <input type="checkbox"/>	

Snap action contacts	Catalog number List price (plastic/metal)	LS2 □ □ 11B11- U 01 \$ 66 \$ 66	LS2 □ □ 12B11- U 01 \$ 75 \$ 81	LS2 □ □ 16B11- U 01 \$ 74 \$ 80	LS2 □ □ 21B11- U 01 \$ 70 \$ 76
	Operation diagram				
Non-overlapping Slow action contacts	Catalog number List price (plastic/metal)	LS2 □ □ 11D11- U 01 66 72	LS2 □ □ 12D11- U 01 75 81	LS2 □ □ 16D11- U 01 74 76	LS2 □ □ 21D11- U 01 76 74
	Operation diagram				
Weight ⊕ (packing per unit)	kg	0.125	0.130	0.125	0.140

■ Closed contact / □ Open contact

Dimensions (mm)



- Tightening torque of nuts : 5 N.m
- Distance between nuts : 9 mm
- Nuts thickness : 3 mm

⊕ Other cable lengths available. Replace last two digits "01" with: 02-2m, 05-5m, 10-10m.
 ⊕ add 0.050 kg with metal casing.

Assembled

Plastic casing (NEMA1) & metal casing - (NEMA 4, 4X)

Pre-wired, 30mm

Movement to be detected:

For Plastic Casing:

Cable: 4 x 0.75 mm² / 4 x AWG 18
Length: 1 m^①
(Other lengths see ordering details)

For Metal Casing:

Cable: 5 x 0.75 mm² / 5 x AWG 18
Length: 1 m^①
(Other lengths see ordering details)

30° Cam Translation Movement



Multidirectional



Actuator

⊖ (N.C. contact with positive opening operation)
Maximum actuation speed
Min. force / torque: - actuation
- positive opening operation

Metal Roller plunger with fixing nuts

⊖
0.1 m/s
10 N
30 N

14mm plastic roller lever

⊖
1.5 m/s
0.08 N.m
0.28 N.m

Adjustable 18mm plastic roller lever

⊖
1.5 m/s
0.08 N.m
0.28 N.m

Spring rod

-
1.0 m/s
0.10 N.m
-

Additional Technical Data

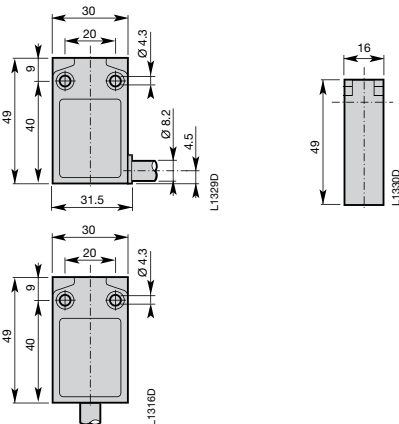
Cable output left / right code..... 0
Cable output bottom code..... 1 } Does not affect pricing.
Plastic casing..... P
Metal casing..... M

Type to be completed with the above codes

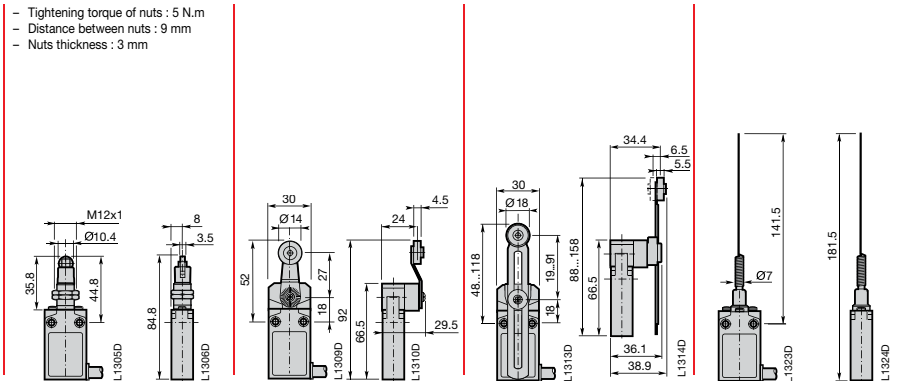
Snap action contacts	Catalog number List price (plastic/metal)	LS2 □ □ 22B11- U 01 \$ 79 \$ 85	LS2 □ □ 41B11- U 01 \$ 68 \$ 73	LS2 □ □ 51B11- U 01 \$ 70 \$ 75	LS2 □ □ 91B11- U 01 \$ 74 \$ 80
	Operation diagram				
Non-overlapping Slow action contacts	Catalog number List price (plastic/metal)	LS2 □ □ 22D11- U 01 79 85	LS2 □ □ 41D11- U 01 68 73	LS2 □ □ 51D11- U 01 70 75	-
	Operation diagram				-
Weight ^② (packing per unit)	kg	0.145	0.175	0.190	0.190

■ Closed contact / □ Open contact

Dimensions (mm)



- Tightening torque of nuts : 5 N.m
- Distance between nuts : 9 mm
- Nuts thickness : 3 mm



① Other cable lengths available. Replace last two digits "01" with: 02-2m, 05-5m, 10-10m.
② add 0.050 kg with metal casing.

Assembled

Plastic casing (NEMA1) & metal casing - (NEMA 4, 4X)

Pre-wired, 35mm

Miniature
limit switches

Movement to be detected:

For Plastic Casing:

Cable: 4 x 0.75 mm² / 4 x AWG 18

Length: 1 m[Ⓞ]

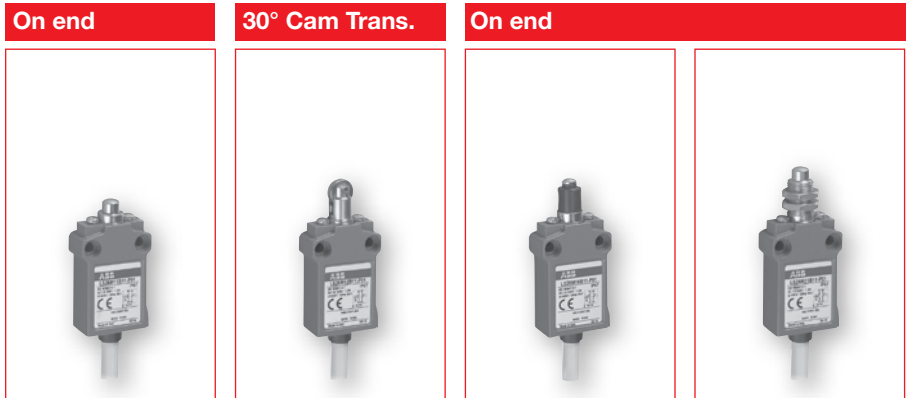
(Other lengths see ordering details)

For Metal Casing:

Cable: 5 x 0.75 mm² / 5 x AWG 18

Length: 1 m[Ⓞ]

(Other lengths see ordering details)



Actuator

	Metal plunger	Metal Roller plunger	Metal plunger (with dust protection cup)	Metal plunger with fixing nuts
⊖ (N.C. contact with positive opening operation)	⊖	⊖	⊖	⊖
Maximum actuation speed	0.5 m/s	0.1 m/s	0.5 m/s	0.5 m/s
Min. force / torque: - actuation	15 N	10 N	15 N	15 N
- positive opening operation	30 N	30 N	30 N	30 N

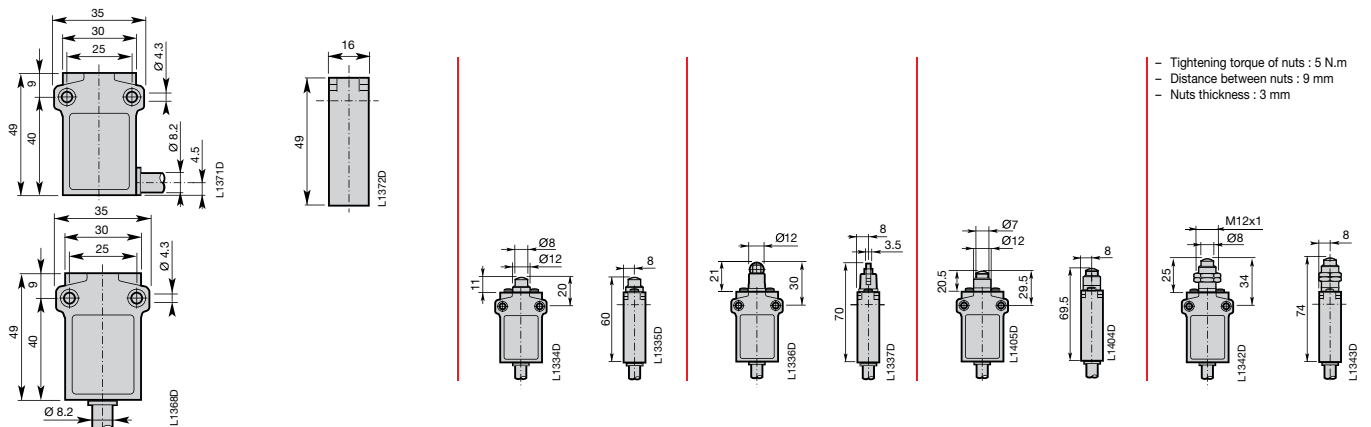
Additional Technical Data

Cable output left / right code.....	5	} Does not affect pricing.
Cable output bottom code.....	6	
Plastic casing.....	P	
Metal casing.....	M	
Type to be completed with the above codes <input type="checkbox"/>		

Snap action contacts	Catalog number List price (plastic/metal)	LS2 □ □ 11B11- U 01 \$ 77 \$ 83	LS2 □ □ 12B11- U 01 \$ 86 \$ 92	LS2 □ □ 16B11- U 01 \$ 85 \$ 91	LS2 □ □ 21B11- U 01 \$ 81 \$ 87
	Operation diagram				
Non-overlapping Slow action contacts	Catalog number List price (plastic/metal)	LS2 □ □ 11D11- U 01 77 83	LS2 □ □ 12D11- U 01 86 92	LS2 □ □ 16D11- U 01 85 91	LS2 □ □ 21D11- U 01 87 81
	Operation diagram				
Weight ② (packing per unit)	kg	0.125	0.130	0.125	0.140

■ Closed contact / □ Open contact

Dimensions (mm)



- Tightening torque of nuts : 5 N.m
- Distance between nuts : 9 mm
- Nuts thickness : 3 mm

① Other cable lengths available. Replace last two digits "01" with: 02-2m, 05-5m, 10-10m.
② add 0.050 kg with metal casing.

Assembled

Plastic casing (NEMA1) & metal casing - (NEMA 4, 4X)
Pre-wired, 35mm

Movement to be detected:

For Plastic Casing:

Cable: 4 x 0.75 mm² / 4 x AWG 18
Length: 1 m^①
(Other lengths see ordering details)

For Metal Casing:

Cable: 5 x 0.75 mm² / 5 x AWG 18
Length: 1 m^①
(Other lengths see ordering details)

30° Cam Translation

Multidirectional



Actuator

Metal Roller plunger with fixing nuts

ø14 plastic roller lever

Adjustable ø18 plastic roller lever

Spring rod

⊖ (N.C. contact with positive opening operation)

Maximum actuation speed
Min. force / torque: - actuation
- positive opening operation

⊖
0.1 m/s
10 N
30 N

⊖
1.5 m/s
0.08 N.m
0.28 N.m

⊖
1.5 m/s
0.08 N.m
0.28 N.m

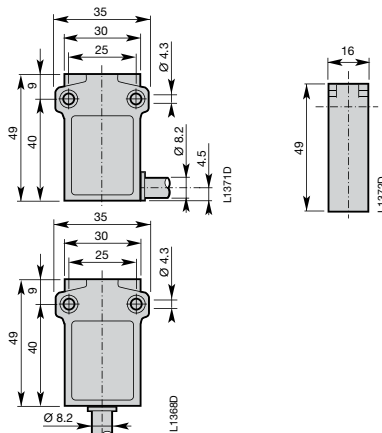
-
1.0 m/s
0.10 N.m
-

Additional Technical Data

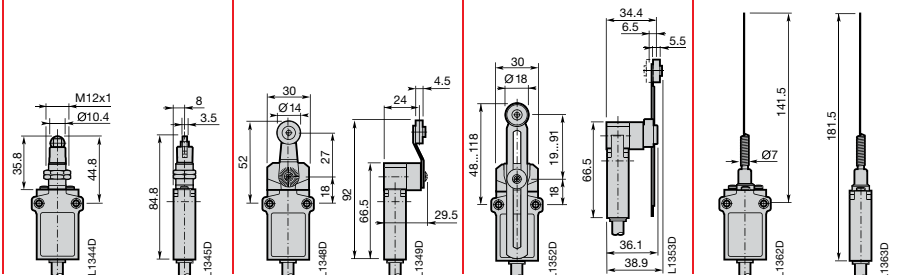
Cable output left / right code.....	5	} Does not affect pricing.
Cable output bottom code.....	6	
Plastic casing.....	P	
Metal casing.....	M	
Type to be completed with the above codes <input type="checkbox"/>		

Snap action contacts	Catalog number List price (plastic/metal)	LS2 □ □ 22B11- U 01 \$ 90 \$ 96	LS2 □ □ 41B11- U 01 \$ 79 \$ 84	LS2 □ □ 51B11- U 01 \$ 81 \$ 86	LS2 □ □ 91B11- U 01 \$ 85 \$ 91
	Operation diagram				
Non-overlapping Slow action contacts	Catalog number List price (plastic/metal)	LS2 □ □ 22D11- U 01 90 96	LS2 □ □ 41D11- U 01 79 84	LS2 □ □ 51D11- U 01 81 86	-
	Operation diagram				-
Weight ^② (packing per unit)	kg	0.200	0.200	0.230	0.235

Dimensions (mm)



- Tightening torque of nuts : 5 N.m
- Distance between nuts : 9 mm
- Nuts thickness : 3 mm



■ Closed contact / □ Open contact-

① Other cable lengths available. Replace last two digits "01" with: 02-2m, 05-5m, 10-10m.
② add 0.050 kg with metal casing.

Technical data

Plastic & metal casing

30mm & 35mm

Miniature
limit switches

General Technical Data

	Plastic Casing	Metal Casing
Standards	IEC 60947-1, IEC 60947-5-1, EN 60947-1, EN 60947-5-1, UL 508 and CSA C22-2 n° 14	
Certifications - Approvals	UL - CSA (only with UL62-1581 cable)	
Air temperature near the device		
- during operation	°C - 25 ... + 70	- 25 ... + 70
- for storage	°C - 40 ... + 70	- 40 ... + 70
Climatic withstand	According to IEC 68-2-3 and salty mist according to IEC 68-2-11	
Mounting positions	All positions are authorized	
Shock withstand (according to IEC 68-2-27 and EN 60068-2-27)	25g* (1/2 sinusoidal shock for 11 ms) no change in contact position	
Resistance to vibrations (acc. to IEC 68-2-6 and EN 60068-2-6)	25g** (10 ... 500 Hz) no change in position of contacts greater than 100 µs	
Protection against electrical shocks (acc. to IEC 536)	Class II	Class I
Degree of protection (according to IEC 529 and EN 60529)	IP67	
Degree of protection (according to UL 50 and NEMA)	Type 1 Enclosure (indoor use)	Type 4 - 4x - 6 Enclosure (Outdoor use)
Consistency (measured over 1 million operations)	0.1 mm (upon closing point)	

Electrical Data

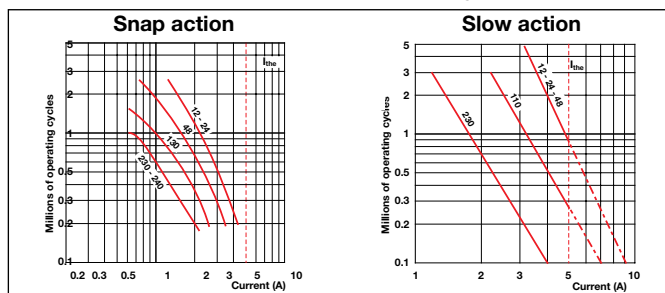
Rated insulation voltage U_i		V	400 (degree of pollution 3)
- according to IEC 60947-1 and EN 60947-1		V	300
- according to UL 508, CSA C22-2 n° 14			
Rated impulse withstand voltage U_{imp}		kV	4
(according to IEC 60947-1 and EN 60947-1)			
Conventional enclosed thermal current I_{th}		A	5
(according to IEC 60947-5-1 and EN 60947-5-1) $\theta \leq 40^\circ\text{C}$			
Short-circuit protection gG type fuses		A	6
Rated operational current			
I_e / AC-15 - acc. to IEC 60947-5-1	24 V - 50/60 Hz	A	5.0
	120 V - 50/60 Hz	A	3.0
	240 V - 50/60 Hz	A	1.5
- acc. to UL 508, CSA C22 n° 14			B 300
I_e / DC-13 - acc. to IEC 60947-5-1	24 V - d.c.	A	1.1
	125 V - d.c.	A	0.22
	250 V - d.c.	A	0.1
- acc. to UL 508, CSA C22 n° 14			R 300
Positivity	Contacts with positive opening operation as per IEC 60947-5-1 chapter 3 and EN 60947-5-1		
Resistance between contacts		mΩ	25
Pre-wired connection	mm² / AWG		4 x 0.75 mm ² / 4 x AWG 18 5 x 0.75 mm ² / 5 x AWG 18
Type of cable			
- UL 62-1581 (PVC)			Black - Ø ext. 7.20 ± 0.2
- IEC 20/22 II (PVC) (no flame propagation)			Black - Ø ext. 7.20 ± 0.2 Grey - Ø ext. 8.20 ± 0.2
Terminal marking	According to EN 50013		
Mechanical durability	10 Millions of operations		
Electrical durability (according to IEC 60947-5-1 appendix C)	Utilization categories AC-15 and DC-13 (See curves and values below)		
- max. switching frequency		Cycles/h	3600
- load factor			0.5

* Shock: 25g for LS20P/M..., ... LS26P/M.. with D11 contact block

5g for LS20P/M..., ... LS26P/M.. with B11 contact block

** Vibrations: except for LS20P/M93 ... LS26P/M93 : 15 g

Electrical durability for AC-15 utilization category



Electrical durability for DC-13 utilization category

	Snap action	Slow action
	Power breaking for a durability of 5 million operating cycles	
Voltage 24 V	5.7 W	7.2 W
Voltage 48 V	4.1 W	5.4 W
Voltage 110 V	2.2 W	3.6 W

Technical data

Plastic & metal casing

30mm & 35mm

General Technical Data

	Plastic Casing	Metal Casing
Standards	IEC 60947-1, IEC 60947-5-1, EN 60947-1, EN 60947-5-1, UL 508 and CSA C22-2 n° 14	
Certifications - Approvals	UL - CSA - CCC	
Air temperature near the device		
- during operation	°C - 25 ... + 70	- 25 ... + 70
- for storage	°C - 30 ... + 80	- 30 ... + 80
Climatic withstand	According to IEC 68-2-3 and salty mist according to IEC 68-2-11	
Mounting positions	All positions are authorized	
Shock withstand (according to IEC 68-2-27 and EN 60068-2-27)	50g* (1/2 sinusoidal shock for 11 ms) no change in contact position	
Resistance to vibrations (acc. to IEC 68-2-6 and EN 60068-2-6)	25g (10 ... 500 Hz) no change in position of contacts greater than 100 µs	
Protection against electrical shocks (acc. to IEC 536)	Class II	Class I
Degree of protection (according to IEC 529 and EN 60529)	IP65	IP66 **
Consistency (measured over 1 million operations)	0.1 mm (upon closing point)	0.1 mm (upon closing point)

Electrical Data

Rated insulation voltage U_i																									
- according to IEC 60947-1 and EN 60947-1	V	500 (degree of pollution 3)	400 (LS3..M. & LS7..M.), 500 (LS4xM.) - (degree of pollution 3)																						
- according to UL 508, CSA C22-2 n° 14	V	600	300 (LS3..M. & LS7..M.), 600 (LS4..M.)																						
Rated impulse withstand voltage U_{imp}	kV	6																							
(according to IEC 60947-1 and EN 60947-1)																									
Conventional enclosed thermal current I_{the}	A	10																							
(according to IEC 60947-5-1 and EN 60947-5-1) $\theta \leq 40^\circ\text{C}$																									
Short-circuit protection gG type fuses	A	10																							
Rated operational current																									
$I_g / \text{AC-15}$ - acc. to IEC 60947-5-1																									
24 V - 50/60 Hz	A	10																							
130 V - 50/60 Hz	A	5.5																							
230 V - 50/60 Hz	A	3.1																							
240 V - 50/60 Hz	A	3																							
400 V - 50/60 Hz	A	1.8																							
- acc. to UL 508, CSA C22 n° 14		A 600	A 300 (LS3..M. & LS7..M.), A 600 (LS4..M.)																						
$I_g / \text{DC-13}$ - acc. to IEC 60947-5-1																									
24 V - d.c.	A	2.8																							
110 V - d.c.	A	0.6																							
250 V - d.c.	A	0.27																							
- acc. to UL 508, CSA C22 n° 14		Q 600	Q 300 (LS3..M. & LS7..M.), Q 600 (LS4..M.)																						
Positivity	Contacts with positive opening operation as per IEC 60947-5-1 chapter 3 and EN 60947-5-1																								
Resistance between contacts	mΩ	25																							
Mechanical durability	Millions of operations	<table border="0"> <tr> <td>15</td> <td rowspan="3">} LS</td> <td rowspan="3">} 3x</td> <td rowspan="3">} P</td> <td rowspan="3">} 10...12 ; 30...38</td> <td rowspan="3">} 15</td> <td rowspan="3">} LS</td> <td rowspan="3">} 3x</td> <td rowspan="3">} M</td> <td rowspan="3">} 11...12 ; 31...38</td> </tr> <tr> <td>10</td> <td rowspan="3">} 7x</td> <td rowspan="3">} 13 ; 41...46 ; 51...55 ; 61...78</td> <td rowspan="3">} 10</td> <td rowspan="3">} 13 ; 41...46 ; 51...55 ; 61...78</td> </tr> <tr> <td>> 5</td> <td rowspan="3">} 14 ; 91...92 ; 98</td> <td rowspan="3">} > 5</td> <td rowspan="3">} 14 ; 91...92 ; 98</td> </tr> </table>	15	} LS	} 3x	} P	} 10...12 ; 30...38	} 15	} LS	} 3x	} M	} 11...12 ; 31...38	10	} 7x	} 13 ; 41...46 ; 51...55 ; 61...78	} 10	} 13 ; 41...46 ; 51...55 ; 61...78	> 5	} 14 ; 91...92 ; 98	} > 5	} 14 ; 91...92 ; 98				
15	} LS	} 3x	} P										} 10...12 ; 30...38					} 15				} LS	} 3x	} M	} 11...12 ; 31...38
10																									
> 5				} 14 ; 91...92 ; 98	} > 5	} 14 ; 91...92 ; 98																			
Millions of operations	<table border="0"> <tr> <td>15</td> <td rowspan="3">} LS</td> <td rowspan="3">} 4x</td> <td rowspan="3">} P</td> <td rowspan="3">} 11 ; 12 ; 31...33</td> <td rowspan="3">} 30</td> <td rowspan="3">} LS</td> <td rowspan="3">} 4x</td> <td rowspan="3">} M</td> <td rowspan="3">} 11...13 ; 21...23 ; 31...33</td> </tr> <tr> <td>10</td> <td rowspan="3">} 13 ; 41...44 ; 51...55 ; 61...74</td> <td rowspan="3">} 25</td> <td rowspan="3">} 41...44 ; 51...55 ; 61...74</td> </tr> <tr> <td>> 5</td> <td rowspan="3">} 14 ; 19 ; 34...36 ; 91...93</td> <td rowspan="3">} 10</td> <td rowspan="3">} 91...93</td> </tr> </table>	15	} LS				} 4x	} P	} 11 ; 12 ; 31...33	} 30	} LS	} 4x	} M	} 11...13 ; 21...23 ; 31...33	10	} 13 ; 41...44 ; 51...55 ; 61...74	} 25	} 41...44 ; 51...55 ; 61...74	> 5	} 14 ; 19 ; 34...36 ; 91...93	} 10	} 91...93			
15	} LS	} 4x													} P				} 11 ; 12 ; 31...33				} 30	} LS	} 4x
10				} 13 ; 41...44 ; 51...55 ; 61...74	} 25	} 41...44 ; 51...55 ; 61...74																			
> 5			} 14 ; 19 ; 34...36 ; 91...93				} 10	} 91...93																	
Electrical durability (according to IEC 60947-5-1 appendix C)		Utilization categories AC-15 and DC-13 (see curves and values below)																							
- max. switching frequency	Cycles/h	3600																							
- load factor		0.5																							

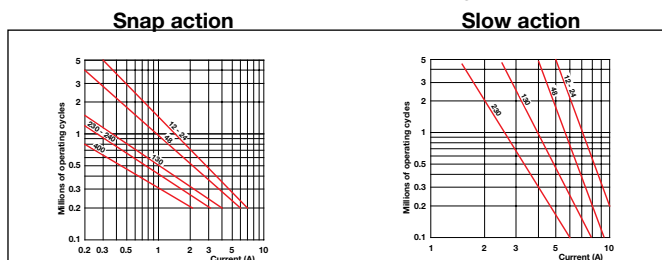
Connecting data of contact blocks

Connecting terminals	M3.5 (+,-) pozidriv 2 screw with cable clamp
Connecting capacity	1 or 2 x mm ² / AWG
Terminal marking	0.5 mm ² / AWG 20 to 2.5 mm ² / AWG 14
	According to EN 50013

* Except for LS3..M42, M52 and M55 - LS3..P42, P52 and P55 - LS7..M42, M52 and M55 - LS7..P42, P52 and P55: 25g

** Except for LS3..M52, M55, M73, M74 and M92 - LS7..M52, M55, M73, M74 and M92 - LS4..M54, M72, M92 and M93 : the degree of protection is IP65.

Electrical durability for AC-15 utilization category



Electrical durability for DC-13 utilization category

	Snap action	Slow action
Power breaking for a durability of 5 million operating cycles		
Voltage	24 V	12 W
Voltage	48 V	9 W
Voltage	110 V	6 W

Safety Limit switches

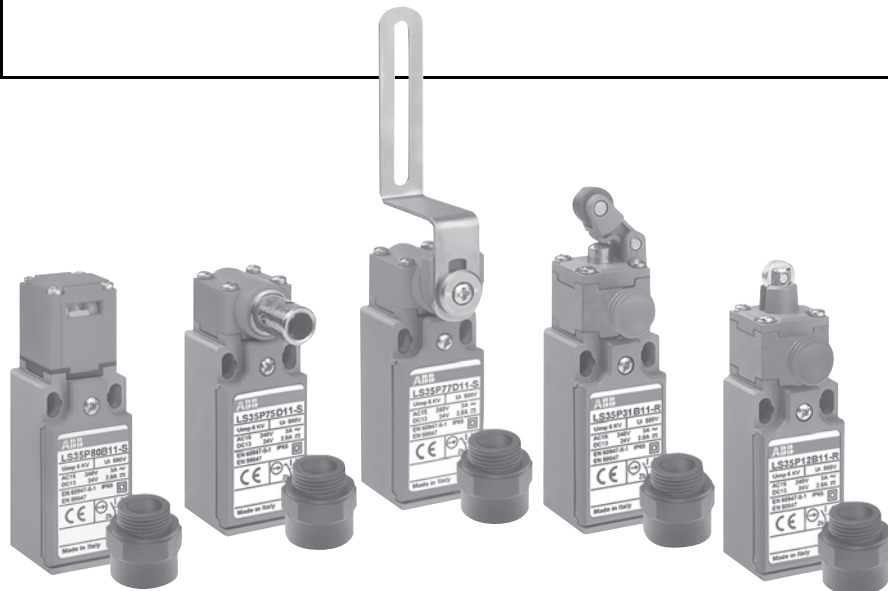


Safety limit switches

Latch key

Rotative axis

Latch & manual reset



9

Description of Red Safety Range

30mm limit switches for safety applications, conforming to the IEC/EN 60947-5-1, EN1088 and EN954-1 standards, are available with a red casing in three types:

- **Latch key** – The key being straight or with a right angle, with or without shock absorber.
- **Stainless steel rotative axis** – Some limit switches come with a flush mounting lever. They offer double insulation with plastic casing (UL Type 4, IP65) and mechanical positive drive.
- **Latch & manual reset range** – These models offer double insulation with a grey plastic casing (UL Type 4, IP65). Available actuators include plunger, roller plunger, roller lever on plunger and rotary lever.



Latch key safety limit switches


Description

Safety limit switches with small latch (key), made of fiberglass reinforced UL-V0 thermoplastic material, offer double insulation and a degree of protection IP65. They are equipped with 1 N.C. + 1 N.O. or 2 N.C. contact blocks with dependent action and positive opening operation of the "N.C." contact(s).

These specific features make the limit switches ideal for monitoring and protection of industrial machines without inertia in which downtime is less than access time to the dangerous area. Use on sliding or pivoting protectors (covers, cases, doors, grids, etc.).

Applications

Easy to use, the limit switches with small latch (key) offer specific qualities:

- Visible operation.
- Capability for strong current switching (conventional thermal current 10 A).
- Opening guaranteed of the "N.C." contact(s) when the small latch is withdrawn from the limit switch.
- Contact blocks with dependent action and positive opening operation of the "N.C." normally closed contact(s) (symbol ).
- Electrically separated contacts (Zb shape).
- Precision on operation positions (consistency).
- Immunity to electromagnetic disturbances.

- They contribute to protection of operators working on dangerous machines, by opening the control circuit. Withdrawal of the small latch (key) by opening the mobile protector causes immediate stopping of the machine drive.
- Associated with other standard limit switches and safety switching devices, they produce automatic control circuits meeting standard EN 954-1.
- They comply with the requirements of European Directives (Low Voltage, Machines and Electromagnetic Compatibility) and are conform to European and international standards.


2 operating head options:

- Adjustable every 90° (4 x ø 3 screws with (+,-) pozidriv 1 head)
- Pivoting from 0° to 360° (1 x M3 screw with Phillips head No. 1)

Casing

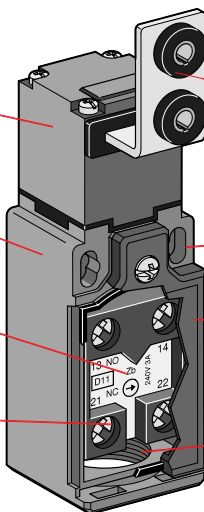
- 30 mm wide with standardised dimensions corresponding to EN 50047

Blocks of 2 contacts

- Contact configuration: 1 N.O. + 1 N.C. or 2 N.C.
- Positive opening operation 
- Contact dependent action
- Zb shape: the 2 contacts are electrically separated

Connecting terminals

- M3.5 screw with (+,-) pozidriv 2 head
- Screw heads with captive cable clamps
- Marking conform to IEC 60947-1, IEC 60947-5-1, EN 50005 and EN 50013 standards



7 small latch (key) options to be ordered separately:

- Right angle key (13 or 22 mm fixing)
- Straight key (13 or 22 mm fixing)
- Straight key or right angle key with shock absorber
- Adjustable right angle key

Casing fixing

- 2 x M4 screws in the top part

Cover

- Closure by 1 x ø 3 screw with (+,-) pozidriv 1 head
- Gasket made in one part to prevent tightness breaks

Electrical connection in various options:

- 1 x Pg 13.5 cable gland for LS30P
- 1 x Pg 11 cable gland for LS31P
- 1 x 1/2" NPT adaptor delivered not mounted for LS35P

Catalog number explanation

Example : **LS 35 P 80 D 11 - S**

Limit Switch	LS					S	Safety device
Casing width: 30 mm		3					
Cable inlet:							Contact types:
1 cable inlet for Pg 13.5 cable gland							11
1 cable inlet for Pg 11 cable gland							02
1 x 1/2" NPT (adaptor) cable inlet							2 N.C. contacts
Plastic casing			P				Snap action:
							B
							Zb Snap
Operating heads:							Dependent (slow) action:
Adjustable every 90°				80			L
Continuously pivoting from 0° to 360°				81			Zb Slow / Simultaneous
							D
							Zb Non-overlapping late make
							C
							Zb Overlapping early make

Latch key safety limit switches

30mm

Head rotates in 90° increments

Movement to be detected

Small Latch (Key), Front or Vertical Translation

Casing

- Plastic
- 30 mm width
- Degree of protection IP65

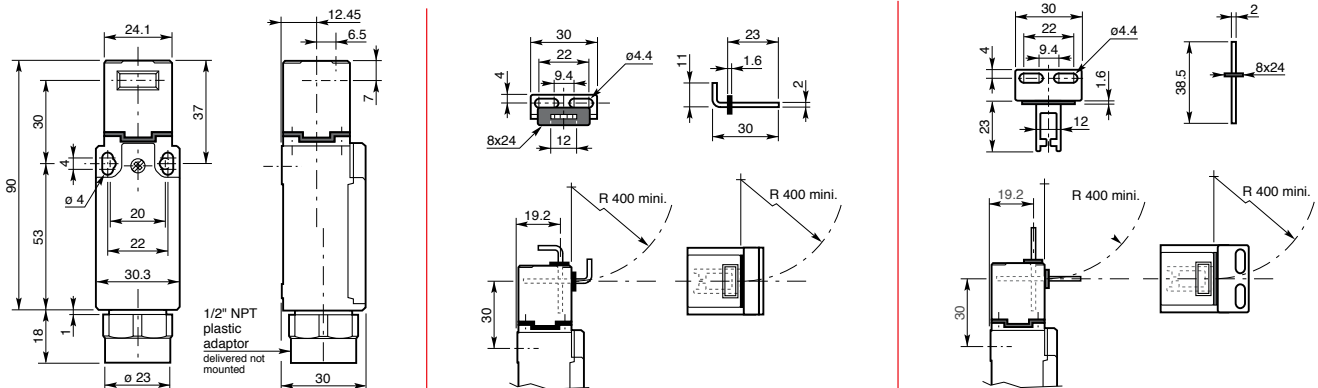


Actuator

9

		Right angle key (22 mm mounting)	Straight key (22 mm mounting)
NC contact with positive opening operation	⊕	⊕	⊕
Actuation speed: maximal / minimal	m/s	0.5 / 0.01	0.5 / 0.01
Min. force: - for insertion of the key	N	15	15
- for extraction of the key	N	10	10
- positive opening operation	N	30	30
Non-overlapping slow action contacts	Catalog number List price	LS35P80D11-S \$ 64.50	LS35P80D11-S \$ 64.50
	Operation diagram		
Overlapping slow action contacts	Catalog number List price	LS35P80C11-S 64.50	LS35P80C11-S 64.50
	Operation diagram		
Simultaneous slow action contacts	Catalog number List price	LS35P80L02-S 64.50	LS35P80L02-S 64.50
	Operation diagram		
Weight with 1/2" NPT adaptor (packing per unit)	kg	0.087	0.087
Small Latch (Key)			
To order separately	Catalog number List price	LSA30P03 7.50	LSA30P04 7.50
Weight (packing per unit)	kg	0.009	0.009

Dimensions (in mm)



Latch key safety limit switches


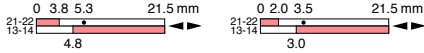
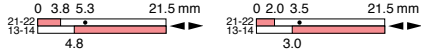
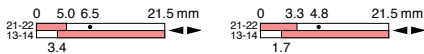

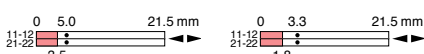
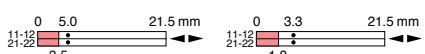
30mm

Head rotates in 90° increments

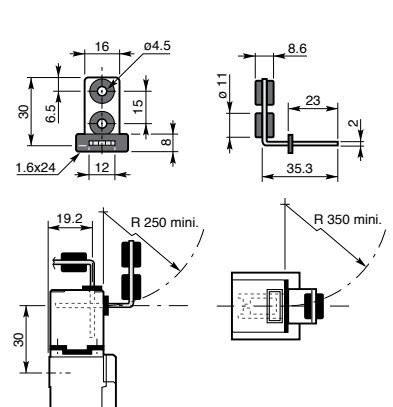
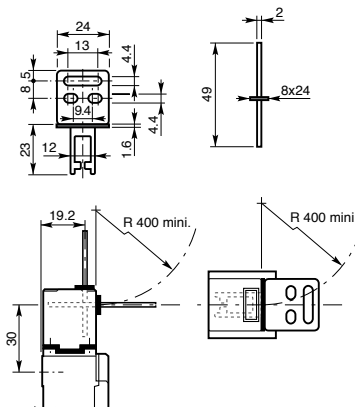
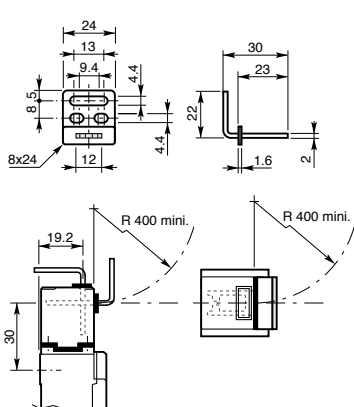
Safety
limit switches

Small latch (key), front or vertical translation



Right angle key (13mm mounting)	Straight key (13mm mounting)	Right angle key with shock absorber
 0.5 / 0.01 15 10 30	 0.5 / 0.01 15 10 30	 0.5 / 0.01 15 10 30
LS35P80D11-S \$ 64.50	LS35P80D11-S \$ 64.50	LS35P80D11-S \$ 64.50
		
LS35P80C11-S 64.50	LS35P80C11-S 64.50	LS35P80C11-S 64.50
		
LS35P80L02-S 64.50	LS35P80L02-S 64.50	LS35P80L02-S 64.50
		
0.087	0.011	0.014
LSA30P05 7.50	LSA30P06 7.50	LSA30P07 13.50
0.011	0.011	0.014

Dimensions (in mm)



Latch key safety limit switches

30mm

Head rotates in 90° increments

Movement to be detected

Small Latch (Key), Front or Vertical Translation

Casing

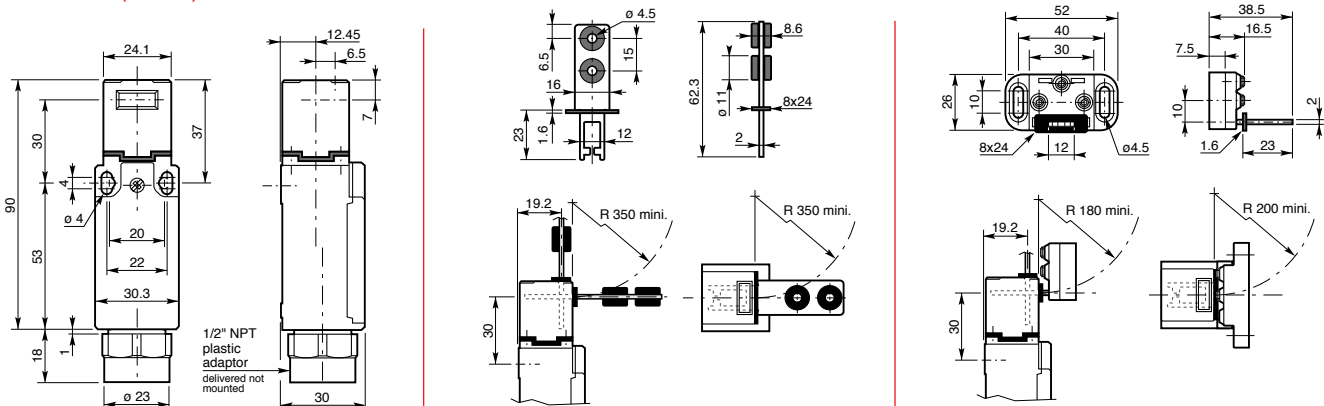
- Plastic
- 30 mm width
- Degree of protection IP65



Actuator

		Right angle key (22 mm mounting)	Straight key (22 mm mounting)
9	NC contact with positive opening operation	⊙	⊙
	Actuation speed: maximal / minimal	m/s 0.5 / 0.01	0.5 / 0.01
	Min. force: - for insertion of the key	N 15	15
	- for extraction of the key	N 10	10
	- positive opening operation	N 30	30
Non-overlapping slow action contacts	Catalog number List price	LS35P80D11-S \$ 64.50	LS35P80D11-S \$ 64.50
	Operation diagram		
Overlapping slow action contacts	Catalog number List price	LS35P80C11-S 64.50	LS35P80C11-S 64.50
	Operation diagram		
Simultaneous slow action contacts	Catalog number List price	LS35P80L02-S 64.50	LS35P80L02-S 64.50
	Operation diagram		
Weight with 1/2" NPT adaptor (packing per unit)	kg	0.087	0.087
Small Latch (Key)			
To order separately	Catalog number List price	LSA30P08 13.50	LSA30P09 16.50
Weight (packing per unit)	kg	0.014	0.022

Dimensions (in mm)



Notes

Safety
limit switches

Latch key safety limit switches

30mm

Head rotates 360°

Movement to be detected

Small Latch (Key), Front or Vertical Translation

Casing

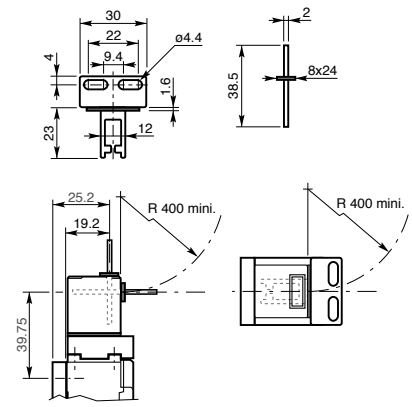
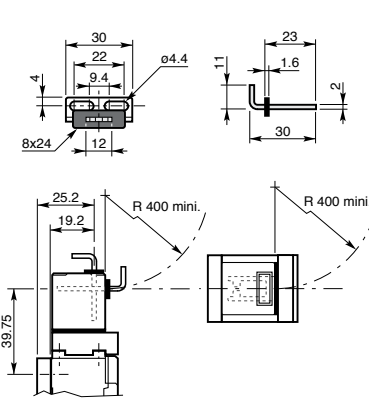
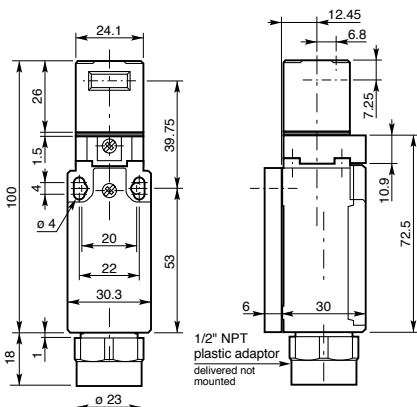
- Plastic
- 30 mm width
- Degree of protection IP65



Actuator

		Right angle key (22 mm mounting)	Straight key (22 mm mounting)
9 "N.C." contact with positive opening operation	Actuation speed: maximal / minimal	0.5 / 0.01	0.5 / 0.01
	Min. force: - for insertion of the key - for extraction of the key - positive opening operation	N N N	15 10 30
Non-overlapping slow action contacts	Catalog number List price Operation diagram	LS35P81D11-S \$ 78 	LS35P81D11-S 78
Overlapping slow action contacts	Catalog number List price Operation diagram	LS35P81C11-S 78 	LS35P81C11-S 78
Simultaneous slow action contacts	Catalog number List price Operation diagram	LS35P81L02-S 78 	LS35P81L02-S 78
Weight with 1/2" NPT adaptor (packing per unit)	kg	0.097	0.097
Small Latch (Key)			
To order separately	Catalog number List price	LSA30P03 7.50	LSA30P04 7.50
Weight (packing per unit)	kg	0.009	0.009

Dimensions (in mm)









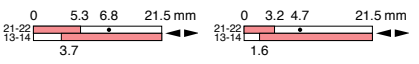



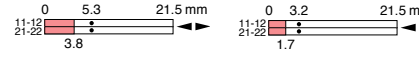

Latch key safety limit switches

30mm
Head rotates 360°

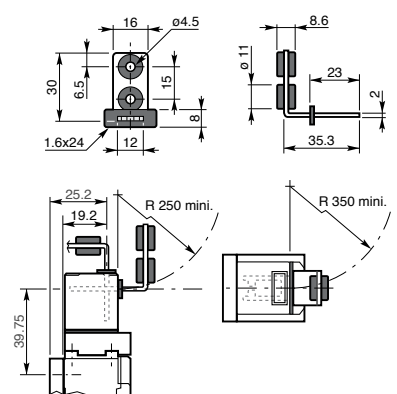
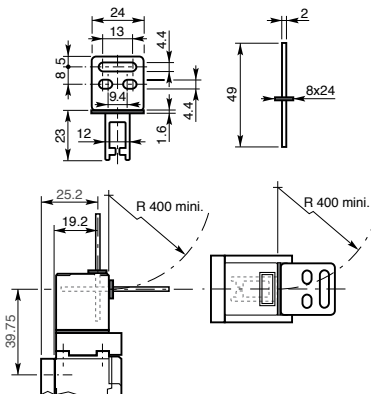
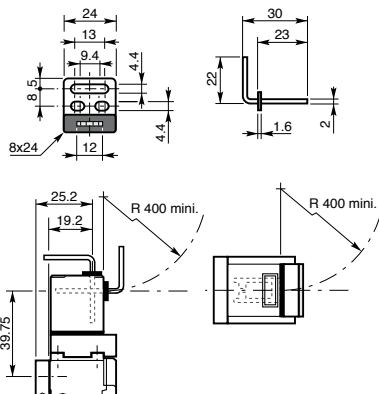
Safety
limit switches

Small Latch (Key), Front or Vertical Translation



Right angle key (13 mm fixing)	Straight key (13 mm fixing)	Right angle key with shock absorber
 0.5 / 0.01 15 10 30	 0.5 / 0.01 15 10 30	 0.5 / 0.01 15 10 30
LS35P81D11-S \$ 78	LS35P81D11-S \$ 78	LS35P81D11-S \$ 78
		
LS35P81C11-S 78	LS35P81C11-S 78	LS35P81C11-S 78
		
LS35P81L02-S 78	LS35P81L02-S 78	LS35P81L02-S 78
		
0.097	0.097	0.097
LSA30P05 7.50	LSA30P06 7.50	LSA30P07 13.50
0.011	0.011	0.014

Dimensions (in mm)



Latch key safety limit switches

30mm

Head rotates 360°

Movement to be detected

Small Latch (Key), Front or Vertical Translation

Casing

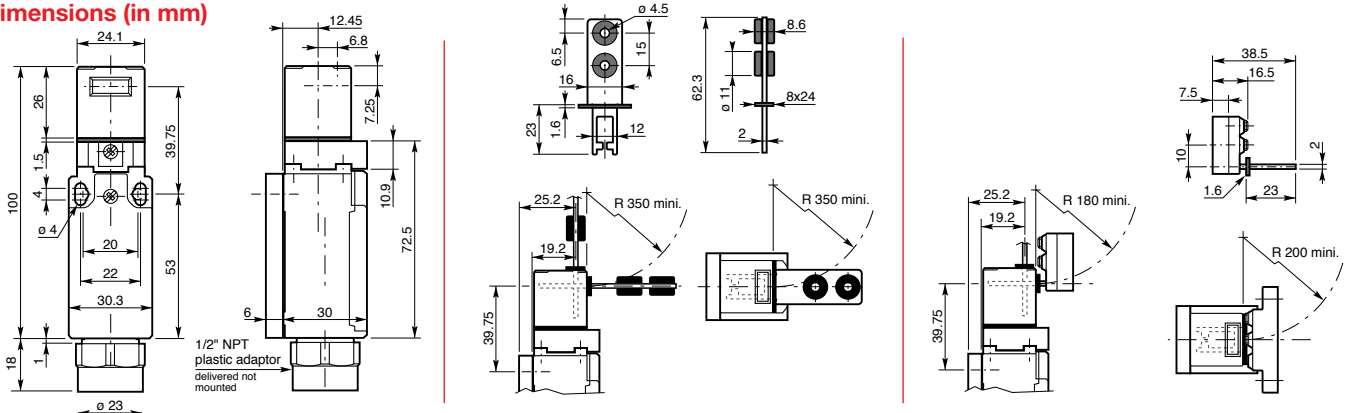
- Plastic
- 30 mm width
- Degree of protection IP65



Actuator

		Straight key with shock absorber	Adjustable angle key
9	"N.C." contact with positive opening operation	↔	↔
	Actuation speed: maximal / minimal	m/s 0.5 / 0.01	0.5 / 0.01
	Min. force: – for insertion of the key	N 15	15
	– for extraction of the key	N 10	10
	– positive opening operation	N 30	30
Non-overlapping slow action contacts	Catalog number List price	LS35P81D11-S \$ 78	LS35P81D11-S \$ 78
	Operation diagram		
Overlapping slow action contacts	Catalog number List price	LS35P81C11-S 78	LS35P81C11-S 78
	Operation diagram		
Simultaneous slow action contacts	Catalog number List price	LS35P81L02-S 78	LS35P81L02-S 78
	Operation diagram		
Weight with 1/2" NPT adaptor (packing per unit)	kg	0.097	0.097
Small Latch (Key)			
To order separately	Catalog number List price	LSA30P08 13.50	LSA30P09 16.50
Weight (packing per unit)	kg	0.014	0.022

Dimensions (in mm)



Description

Safety limit switches made of fibre-glass reinforced UL-V0 thermoplastic material, with rotative axis or flush mounting right angle lever, offer double insulation and a degree of protection IP65. They are equipped with 1 N.C. + 1 N.O. or 2 N.C. contact blocks with dependent action and positive opening operation of the "N.C." contact(s).

Applications

Easy to use, the limit switches with rotative axis or lever offer specific qualities:

- Visible operation.
- Capability for strong current switching (conventional thermal current 10 A).
- Opening of the "N.C." contact(s) for a very small rotation angle: 7°.
- Contact blocks with dependent action and positive opening operation of the "N.C." normally closed contact(s) (symbol \ominus).
- Electrically separated contacts (Zb shape).

- Precision on operating positions (consistency).
- Immunity to electromagnetic disturbances.

These specific features make the limit switches ideal for monitoring and protection of light industrial machines without inertia equipped with angular movement protectors (doors, hinged grids, rotative covers or cases, etc.). Detection by the rotative axis or by means of a lever.

- Opening of the mobile protector guarantees operator protection by immediately stopping the machine drive.
- These switches are suitable for conformity of the existing installed machine base, as they can be mounted on protection devices already installed.
- Associated with other standard limit switches and safety switching devices, they produce automatic control circuits meeting standard EN 954-1.
- They comply with the requirements of European Directives (Low Voltage, Machines and Electromagnetic Compatibility) and are conform to European and international standards.

Casing

- 30 mm wide with standardised dimensions corresponding to EN 50047

Casing fixing

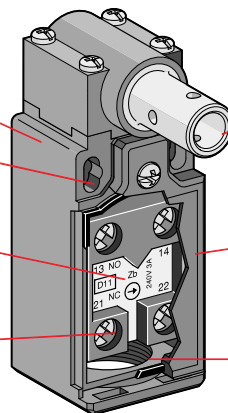
- 2 x M4 screws in the top part

Blocks of 2 contacts

- Contact configuration: 1 N.O. + 1 N.C. or 2 N.C.
- Positive opening operation \ominus
- Contact dependent action
- Zb shape: the 2 contacts are electrically separated

Connecting terminals

- M3.5 screw with (+,-) pozidriv 2 head
- Screw heads with captive cable clamps
- Marking conform to IEC 60947-1, IEC 60947-5-1, EN 50005 and EN 50013 standards



3 operating head options:

- Galvanised steel rotative axis
 - Stainless steel rotative axis
 - Galvanised steel flush mounting right angle lever
- Assembly by 4 x \varnothing 3 screws with (+,-) pozidriv 1 head

Cover

- Closure by 1 x \varnothing 3 screw with (+,-) pozidriv 1 head
- Gasket made in one part to prevent tightness breaks

Electrical connection in various options:

- 1 x Pg 13.5 cable gland for LS30P
- 1 x Pg 11 cable gland for LS31P
- 1 x 1/2" NPT adaptor delivered not mounted for LS35P

Catalog number explanation

Example : **LS 35 P 75 D11 S**

Limit Switch.....	LS					S	Safety device
Casing width: 30 mm.....		3					
Cable inlet:							Contact types:
1 cable inlet for Pg 13.5 cable gland							11
1 cable inlet for Pg 11 cable gland							02
1 x 1/2" NPT (adaptor) cable inlet							1 N.O. + 1 N.C. contacts
							2 N.C. contacts
Plastic casing.....			P				Snap action:
							B
Operating heads:							Zb Snap
Galvanised steel rotative axis							Dependent (slow) action:
Stainless steel rotative axis							L
Galvanised steel flush mounting right angle lever							Zb Slow / Simultaneous
							D
							Zb Non-overlapping late make
							C
							Zb Overlapping early make

Rotative axis safety limit switches 30mm

Movement to be detected

Angular Around Rotative Axis

Casing

- Plastic
- 30 mm width
- Degree of protection IP65

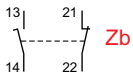


9

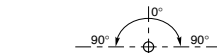
Actuator

"N.C." contact with positive opening operation
 Actuation speed: maximal / minimal m/s
 Min. torque: - actuation N.m
 - positive opening operation N.m

Non-overlapping
slow action contacts



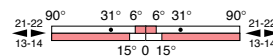
Catalog number
List price



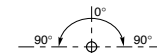
Galvanized steel rotative axis

0.5 / 0.01
 0.12
 0.60

LS35P75D11-S
\$ 76.50



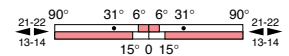
Operation
diagram



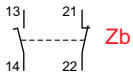
Stainless steel rotative axis

0.5 / 0.01
 0.12
 0.60

LS35P76D11-S
\$ 85.50

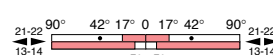


Overlapping
slow action contacts



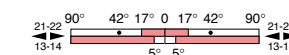
Catalog number
List price

LS35P75C11-S
76.50



Operation
diagram

LS35P76C11-S
\$ 85.50

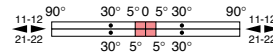


Simultaneous
slow action contacts



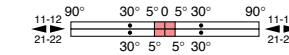
Catalog number
List price

LS35P75L02-S
76.50



Operation
diagram

LS35P76L02-S
\$ 85.50

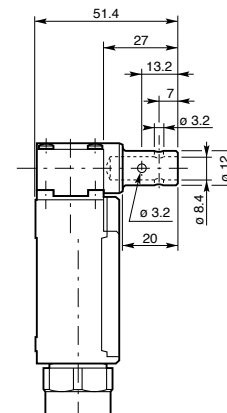
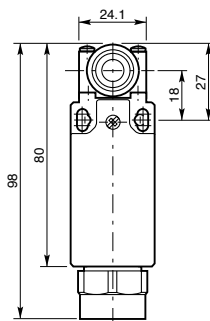
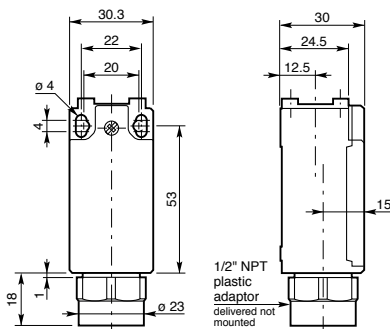


Weight with 1/2" NPT adaptor (packing per unit) kg

0.097

0.097

Dimensions (in mm)



Rotative axis safety limit switches

30mm

Safety
limit switches

Movement to be detected

Angular with Lever

Casing

- Plastic
- 30 mm width
- Degree of protection IP65



Lever adjusted to the left
(by user)



Lever in central position
(factory assembled)



Lever adjusted to the right
(by user)

Actuator

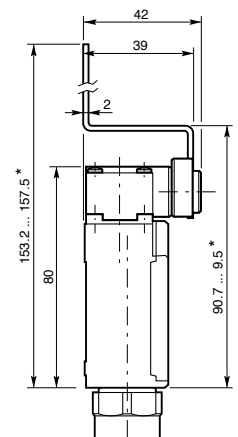
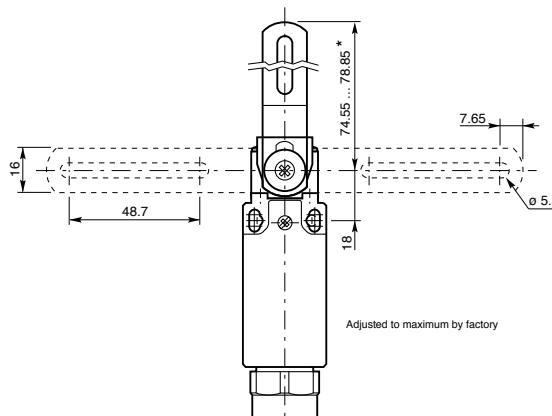
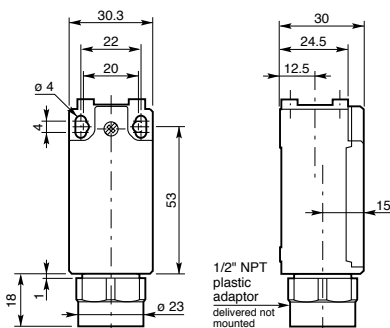
Galvanized steel flush mounting right angle lever

"N.C." contact with positive opening operation \odot
 Actuation speed: maximal / minimal m/s
 Min. torque: – actuation N.m
 – positive opening operation N.m

\odot
 0.5 / 0.01
 0.12
 0.60

Non-overlapping slow action contacts	Catalog number List price	Operation diagram	LS35P77D11-S \$ 78	Operation diagram
Overlapping slow action contacts	Catalog number List price	Operation diagram	LS35P77C11-S 78	Operation diagram
Simultaneous slow action contacts	Catalog number List price	Operation diagram	LS35P77L02-S 84	Operation diagram
Weight with 1/2" NPT adaptor (packing per unit) kg		0.117		

Dimensions (in mm)





Latch & manual reset Safety limit switches

Description

Limit switches with latch and manual reset are equipped with operating heads with plunger, roller plunger or roller lever, used to detect rectilinear or angular movements.

Made of fiberglass reinforced UL-V0 thermoplastic material, they offer double insulation and a degree of protection IP65.

Limit switches with latch and manual reset are equipped with 1 N.C. + 1 N.O. or 2 N.C. contact blocks with positive opening operation of the "N.C." contact(s). After actuating the control device and overshooting the latching point, the N.C. safety contact(s) remain in the open position. Return to the initial operating state takes place by voluntary action on the reset button.

Applications

Easy to use, the limit switches for safety applications with latch and manual reset offer specific qualities:

- Visible operation (fault memorization).
- Capability for strong current switching (conventional thermal current 10 A).

- Contact blocks with positive opening operation of the "N.C." normally closed contact(s) (symbol \ominus).
- Electrically separated contacts (Zb shape).
- Precision on operating positions (consistency).
- Immunity to electromagnetic disturbances.

These specific features make the limit switches ideal for detection and monitoring of faults in hoisting machines, electric lifts, freight elevators, escalators, conveyor belts, etc.

Limit switches with latch and manual reset comply with the requirements of standard EN 81-1: safety rules for the construction and installations of electric lifts. In this application they detect or monitor: cabin overtravel, cabin speed by means of a speed limiting device, energization of the parachute block on detection of excessive speed with respect to the set-point value, etc.

They comply with the requirements of European Directives (Low Voltage, Machines and Electromagnetic Compatibility) and are conform to European and international standards.

9

Casing

- 30 mm wide with standardized dimensions corresponding to EN 50047

Casing fixing

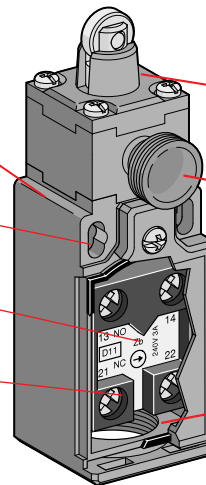
- 2 M4 screws in the top part

Blocks of 2 contacts

- Contact configuration: 1 N.O. + 1 N.C. or 2 N.C.
- Positive opening operation \ominus
- Snap or dependent action
- Zb shape: the 2 contacts are electrically separated

Connecting terminals

- M3.5 screw with (+,-) pozidriv 2 head
- Screw heads with captive cable clamps
- Marking conform to IEC 60947-1, IEC 60947-5-1, EN 50005 and EN 50013 standards



4 operating head options:

- Plain plunger
- Roller plunger
- Roller lever on plunger
- Rotative roller lever

Assembly by 4 x \emptyset 3 screws with (+,-) pozidriv 1 head

Blue manual reset button

Cover

- Closure by 1 x \emptyset 3 screw with (+,-) pozidriv 1 head
- Gasket made in one part to prevent tightness breaks

Electrical connection in various options:

- 1 x Pg 13.5 cable gland for LS30P
- 1 x Pg 11 cable gland for LS31P
- 1 x 1/2" NPT adaptor delivered not mounted for LS35P

Catalog number explanation

Example:	LS	35	P	13	D11	R
Limit Switch.....	LS					R .....Reset Device
Casing width: 30 mm.....		3				
Cable inlet:						
1 cable inlet for Pg 13.5 cable gland.....						0
1 cable inlet for Pg 11 cable gland.....						1
1 x 1/2" NPT (adaptor) cable inlet.....						5
Plastic casing.....			P			
Operating heads:						
Galvanised steel plain plunger.....	11					
Galvanised steel roller plunger.....	12					
Plastic roller plunger.....	13					
Plastic roller lever on plunger (hori. act.).....			31			
Plastic roller lever on plunger (ver. act.).....			32			
Rotative lever with plastic roller.....			41			
Contact types:						
11.....	1 N.O. + 1 N.C. contacts					
02.....	2 N.C. contacts					
Snap action:						
B.....	Zb Snap					
Dependent (slow) action:						
L.....	Zb Slow / Simultaneous					
D.....	Zb Non-overlapping late make					
C.....	Zb Overlapping early make					

Latch & manual reset 30mm

Movement to be detected

On End

On End or 30° Cam Translation



Casing

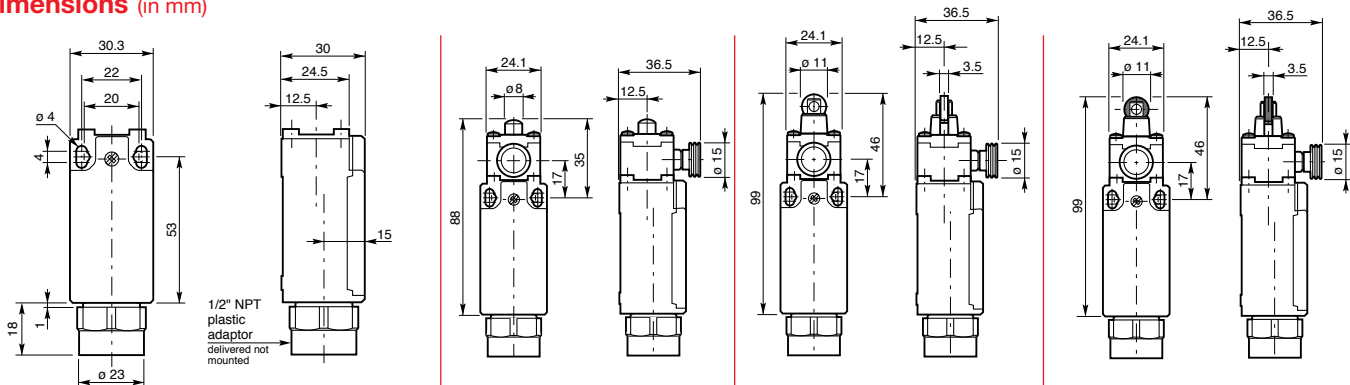
- Plastic
- 30 mm width
- Degree of protection IP65

Actuator

9

		Galvanized steel plain plunger	Galvanized steel roller plunger	Plastic roller plunger
"N.C." contact with positive opening operation				
Maximum actuation speed	m/s	0.5	0.3	0.3
Min. force: - actuation	N	9	12	12
- positive opening operation	N	44	41	41
Non-overlapping slow action contacts 	Catalog number	LS35P11D11-R	LS35P12D11-R	LS35P13D11-R
	List price	\$ 58.50	\$ 64.50	\$ 61.50
Simultaneous slow action contacts 	Catalog number	LS35P11L02-R	LS35P12L02-R	LS35P13L02-R
	List price	65.00	64.50	61.50
Snap action contacts 	Catalog number	LS35P11B02-R	LS35P12B02-R	LS35P13B02-R
	List price	58.50	61.50	61.50
Weight (packing per unit)	kg	0.097	0.102	0.097

Dimensions (in mm)



Latch & manual reset 30mm

Safety
limit switches

Movement to be detected

30° Unidirectional Cam Translation Movement

30° Cam Translation

Casing

- Plastic
- 30 mm width
- Degree of protection IP65



Actuator

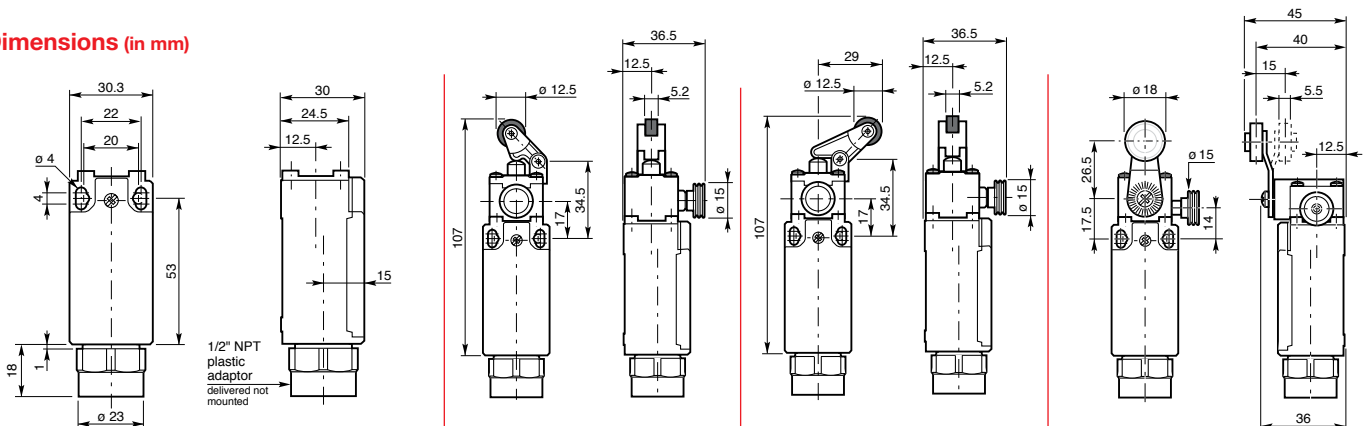
Plastic roller lever
on galvanized steel plunger

Plastic roller lever
on galvanized steel plunger

Rotary lever
with plastic roller

		30° Unidirectional Cam Translation Movement	30° Unidirectional Cam Translation Movement	30° Cam Translation
"N.C." contact with positive opening operation				
Maximum actuation speed m/s		1	1	1.5
Min. force / torque:		7 N 24 N	3 N 24 N	0.10 N.m 0.32 N.m
Non-overlapping slow action contacts	Catalog number List price	LS35P31D11-R \$ 64.50	LS35P32D11-R \$ 64.50	LS35P41D11-R \$ 64.50
	Operation diagram			
Simultaneous slow action contacts	Catalog number List price	LS35P31L02-R 70.00	LS35P32L02-R 64.50	LS35P41L02-R 64.50
	Operation diagram			
Snap action contacts	Catalog number List price	LS35P31B02-R 64.50	LS35P32B02-R 64.50	LS35P41B02-R 64.50
	Operation diagram			
Weight with 1/2" NPT adaptor (packing per unit) kg		0.102	0.102	0.102

Dimensions (in mm)



Safety limit switches

Technical data

Specifications, directives, standards & EC conformity

Definitions

The ABB limit switches listed in this catalogue are developed and manufactured according to the rules set out in IEC international publications and EN European standards. In most countries, the devices are not subject to further obligation for approval. In some countries, however, the law stipulates obligation for approval.

Specifications

International Specifications

The International Electrotechnical Commission, IEC, which is part of the International Standards Organization, ISO, publishes IEC publications which act as a basis for the world market.

European Specifications

The European Committee for Electrotechnical Standardization (CENELEC), grouping 18 European countries, publishes EN standards for low voltage industrial apparatus. These European standards vary very little from IEC international standards and use a similar numbering system. The same is true of national standards. Contradicting national standards are withdrawn.

Harmonized European Specifications

The European Committees for Standardization (CEN and CENELEC), grouping 18 European countries, publish EN standards relating to safety of machinery.

Specifications in Canada and the USA

These are equivalent, but differ markedly from IEC, UTE, VDE and BS specifications.


UL Underwriters Laboratories (USA)

CSA Canadian Standards Association (Canada)

Remark concerning the label issued by the UL (USA). Two levels of acceptance between devices must be distinguished:


"Recognized"

Authorized to be included in equipment, if the equipment in question has been entirely mounted and wired by qualified personnel. They are not valid for use as "General purpose products" as their possibilities are limited.

They bear the mark: 

"Listed"

Authorized to be included in equipment and for separate sale as "General purpose products" components in the USA.

They bear the mark: 

European directives

The guarantee of free movement of goods within the European Community assumes elimination of any regulatory differences between the member states. European Directives set up common rules that are included in the legislation of each state while contradictory regulations are cancelled.

There are three main directives:

- **Low Voltage Directive 73/23/EEC**, amended by Directive 93/68/EEC concerning electrical equipment from 50 to 1000 V a.c. and from 75 to 1500 VDC. This specifies that compliance with the requirements that it sets out is acquired once the equipment conforms to the standards harmonized at European level: EN 60947-1 and EN 60947-5-1 for limit switches.
- **Machines Directives - 89/392/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC** - defining main safety and health requirements concerning design and manufacture of the machines and other equipment including safety components in European Union countries.
- **Electromagnetic Compatibility Directive 89/336/EEC**, amended by Directive 92/31/EEC and Directive 93/68/EEC concerning all electrical devices likely to create electromagnetic disturbances.

Signification of CE marking:

CE marking must not be confused with a quality label.

CE marking placed on a product is proof of conformity with the European Directives concerning the product.

CE marking is part of an administrative procedure and guarantees free movement of the product within the European Community.

Standards

International standards

IEC 60947-1	Low-voltage switchgear and controlgear – Part 1: General Rules (NFC 63-001).
IEC 60947-5-1	Low-voltage switchgear and controlgear – Part 5: Control circuit devices and switching elements – Section 1: Electromechanical control circuit devices (NFC 63-146) – Chapter 3: Special requirements for control switches with positive opening operation.
IEC 60204-1	Electrical equipment of industrial machines – Part 1: General requirements (≈ NFC 79-130).
IEC 60204-2	Electrical equipment of industrial machines – Part 2: Item designation and examples of drawings, diagrams, tables and instructions (Appendices D and E of Publications IEC 60204-1).

European Standards

EN 50005	Low-voltage switchgear and controlgear for industrial use – Terminal marking and distinctive number: General rules (NFC 63-030).
EN 50013	Low-voltage switchgear and controlgear for industrial use – Terminal marking and distinctive number for particular control switches (NFC 63-033).
EN 50041	Low-voltage switchgear and controlgear for industrial use – Control switches – Position switches 42.5 x 80 – Dimensions and characteristics.
EN 50047	Low-voltage switchgear and controlgear for industrial use – Control switches – Position switches 30 x 55 – Dimensions and characteristics.
EN 60947-1	Low-voltage switchgear and controlgear for industrial use – Part 1: General rules (NFC 63-001).
EN 60947-5-1	Low-voltage switchgear and controlgear for industrial use – Part 5: Control circuit devices and switching elements – Section 1: Electromechanical control circuit devices (NFC 63-146) – Chapter 3: Special requirements for control switches with positive opening operation.

• **Harmonized European Standards**

These standards are common to all European Union and EFTA (European Free Trade Association) countries. They were prepared (prEN project) and written (EN final text) by the European standardization committees CEN or CENELEC. Harmonized European standards were drawn up to allow definition of the rules and technical means to be used to satisfy the main safety requirements on machines and thus guarantee conformity with the Machines Directive. Compliance with a harmonized European standard is presumption of conformity with the relevant Directive. European standards relating to machine safety are divided into groups (A, B and C types).

Type A standards:	basic standards: setting out design principles and the general aspects valid for all machine types.
EN 292-1	Safety of machinery – Basic concepts, general principles for design – Part 1: Basic terminology, methodology.
EN 292-2 and	Safety of machinery – Basic concepts, general principles for design – Part 2: Technical principles and specifications.
EN 292-2/A1	
EN 1050	Safety of machinery – Principles for risk assessment.
Type B standards:	group standards:
B1: dealing with specific safety aspects.	
EN 60204-1	Safety of machinery – Electrical equipment of machines – Part 1: General requirements.
EN 954-1	Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design.
B2: dealing with components and devices determining safety.	
EN 1088	Safety of machinery – Interlocking devices associated with guards – Principles for design and selection.
Type C standards:	specific standards or standards per machine family giving detailed safety specifications applicable to a machine or to a group of machines.
EN 81-1	Safety rules for the construction and installations of lifts – Part 1: Electric lifts.

Content of the "EC" Declaration of Conformity for Safety Components

The "EC" Declaration of Conformity is intended to certify that the safety component complies with the main safety and health requirements of Machines Directive 89/392/EEC.

It must contain the following information:

- the name and address of the manufacturer or his representative established in the European Community,
- the description of the safety component (brand, type, serial number, etc.),
- the safety function performed by the safety component if this is not obvious from the description,
- when needed, the name and address of the notified organization and the number of the type "CE" certificate,
- when needed, the name and address of the notified organization to which the file has been sent as per article 8, paragraph 2, point c), first hyphen,
- when needed, the name and address of the notified organization who performed the check referred to in article 8, paragraph 2, point c), second hyphen,
- when needed, the reference to the harmonized standards,
- when needed, the national technical standards and specifications used,
- identification of the signatory authorized to hire the manufacturer or his representative established in the European Community.

Safety limit switches

Technical data

Control system categories as per EN 954-1

The main aim of all machine designers is to guarantee that the faults on safety-related control system parts or external disturbances cannot result in a dangerous situation or a dangerous event on the machine.

The summarizing table below determines the category of the safety-related control system parts.

Categories	Summary of control system requirements	Control system behavior	Main principle for ensuring safety
B	The parts of the safety-related control system and / or its devices must be designed, manufactured, selected, mounted and combined according to proper procedures so as to withstand expected influences.	If a fault occurs, it may lead to possible loss of the safety function.	By selection of components conforming to relevant standards.
1	The requirements formulated in category B are combined with use of tried and tested safety components and principles.	– Occurrence of a fault may lead to possible loss of the safety function, but this is less probable than in category B.	By choice and use of safety components and principles.
2	The requirements formulated in category B and use of tried and tested safety principles apply. The safety function(s) must be tested regularly by the machine control system. Test frequency must be adapted to the machine and to its application.	– Occurrence of a fault may lead to possible loss of the safety function between the periodic test intervals. – Loss of the safety function is detected at each test.	By improvement of safety circuit structure.
3	The requirements formulated in category B and use of tried and tested safety principles apply. The control system must be designed so that: a) a single fault in the control does not lead to loss of the safety function and... (see paragraph b). b) if this is reasonably feasible, the single fault must be detected by appropriate technical means.	– When a single fault occurs, the safety function is always guaranteed. – Some faults will be detected, but not all. – Accumulation of undetected faults may lead to loss of the safety function.	By improvement of safety circuit structure.
4	The requirements formulated in category B and use of tried and tested safety principles must be applied. The control system must be designed so that: a) a single fault in the control does not lead to loss of the safety function and... (see paragraph b). b) if possible the single fault must be detected as soon as or before the next tripping of the safety function or... (see paragraph c). c) if this was not possible, an accumulation of faults must not lead to loss of the safety function.	– When faults occur, the safety function is always guaranteed. – The faults will be detected in time to prevent loss of the safety function.	By improvement of safety circuit structure.

Important: The safety categories apply to the entire control system and not to the individually considered safety components.

Safety limit switches

Technical data

Risk assessment & determination of control system categories

Classification of a machine into categories to EN 954-1

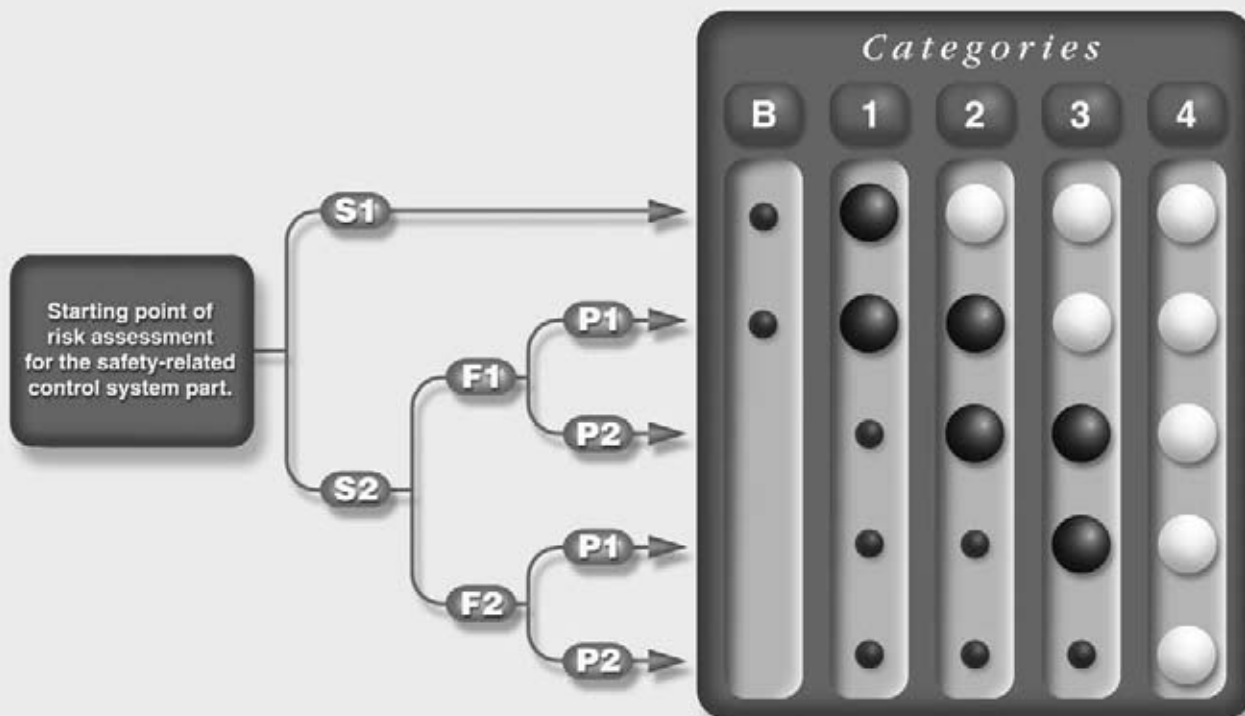
Pursuant to the Machinery Directive 89/392/EEC, every machine must comply with the relevant Directives and standards. Measures must be taken to keep the risk to persons below a tolerable extent.

In the first step, the project planner performs a risk evaluation to EN 1050 "Risk Assessment". This must take into consideration the machine's ambient conditions for instance. Any overall risk must then be assessed. This risk assessment must be conducted in such a form as to allow documentation of the procedure and the result

achieved. The risk, dangers and possible technical measures to reduce risks and dangers must be stipulated in this risk assessment. After stipulating the extent on the risk, the category on the basis of which the safety circuits are to be designed is determined with the aid of EN 954-1 "Safety-Related Components of Controls".

This determined category defines the technical requirements applicable to the design of the safety equipment. There are five categories (B, 1, 2, 3 and 4) whereby B (standing for basic category) defines the lowest risk and, thus, also the minimum requirements applicable to the controller.

9



S Gravity of injury

- S1** Minor injury (normally reversible)
- S2** Major injury (normally irreversible), including death

F Frequency and / or length of exposure to the dangerous phenomenon




- F1** Rare to fairly frequent and / or short exposure time
- F2** Frequent to continuous and / or long exposure time

P Possibility to avoid the dangerous phenomenon

- P1** Possible under certain conditions
- P2** Rarely possible

Category selection

B, 1 to 4 Categories for the safety-related control system parts

-  Preferential categories for the reference points
-  Measures that can be oversized for the risk concerned
-  Categories that may require additional measures

Latch key safety limit switches

Technical data

Safety
limit switches

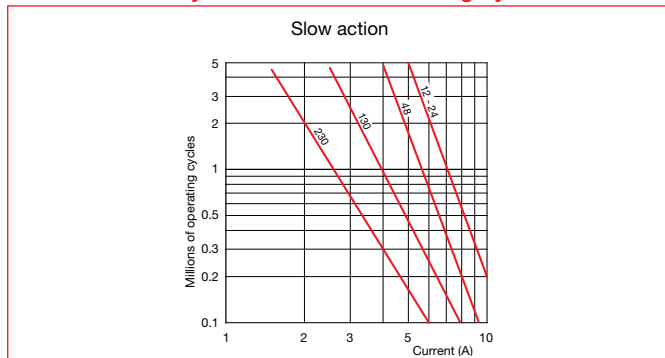
General Data

Standards		IEC 60947-1, IEC 60947-5-1, EN 60947-1, EN 60947-5-1, UL 508, and CSA C22-2 No. 14
Certifications - Approvals		UL and CSA
Air temperature near the device		
- during operation	°C	-25 ... +70
- for storage	°C	-30 ... +80
Climatic withstand		According to IEC 68-2-3 and salty mist according to IEC 68-2-11
Mounting positions		All positions are authorised
Shock withstand (according to IEC 68-2-27 and EN 60068-2-27) (1/2 sinusoidal shock for 11 ms) no change in contact position	g	Limit switch with small latch (key): 10 g Limit switch with rotative axis or lever: 40 g
Resistance to vibrations	g	5 g (10 ... 500 Hz) no change in position of contacts > 100 µs
Protection against electrical shocks (acc. to IEC 536)		Class II
Degree of protection (according to IEC 529 and EN 60529)		UL Type 4 & IP65
Minimum actuation speed	m/s	Slow action contacts 0.060 / Snap action contacts 0.001

Electrical Data

Rated insulation voltage U_i			
- according to IEC 60947-1 and EN 60947-1	V	690 (degree of pollution 3)	
- according to UL 508, CSA C22-2 No. 14		A600, Q600	
Rated impulse withstand voltage U_{imp} (according to IEC 60947-1 and EN 60947-1)	kV	6	
Conventional free air thermal current I_{th} (according to IEC 60947-5-1 and EN 60947-5-1) ($0 \leq 40$ °C)	A	10	
Short-circuit protection - gG type fuses	A	10	
Rated operational current			
I_g / AC-15 - acc. to IEC 60947-5-1			
24 V - 50/60 Hz	A	10	
130 V - 50/60 Hz	A	5.5	
230 V - 50/60 Hz	A	3.1	
240 V - 50/60 Hz	A	3	
400 V - 50/60 Hz	A	1.8	
- according to UL 508, CSA C22 No.14		A600	
I_g / DC-13 - acc. to IEC 60947-5-1			
24 V - d.c.	A	2.8	
110 V - d.c.	A	0.6	
250 V - d.c.	A	0.27	
- according to UL 508, CSA C22 No.14	Q600		
Positivity		Contacts with positive opening operation as per IEC 60947-5-1 chapter 3 and EN 60947-5-1	
Resistance between contacts	mΩ	25	
Mechanical durability	Millions of operations	> 1 million of operating cycles	
Max. switching frequency	Cycles/h	600	
Electrical durability (according to IEC 60947-5-1 appendice C)		Utilization categories AC-15 and DC-13 (see curves and values below)	
- Max. switching frequency	Cycles/h	3600	
- Load factor		0.5	

Electrical durability for AC-15 utilization category



Electrical durability for DC-13 utilization category

Slow action		
Power breaking for a durability of 5 million operating cycles		
Voltage	24 V	12 W
Voltage	48 V	9 W
Voltage	110 V	6 W

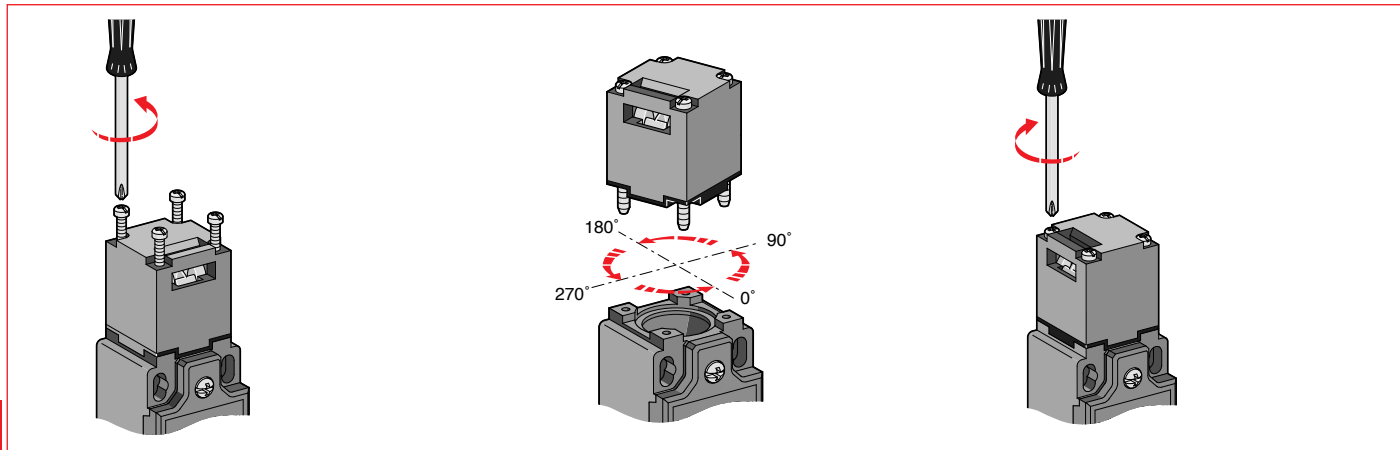
Latch key safety limit switches

Technical data

Implementation

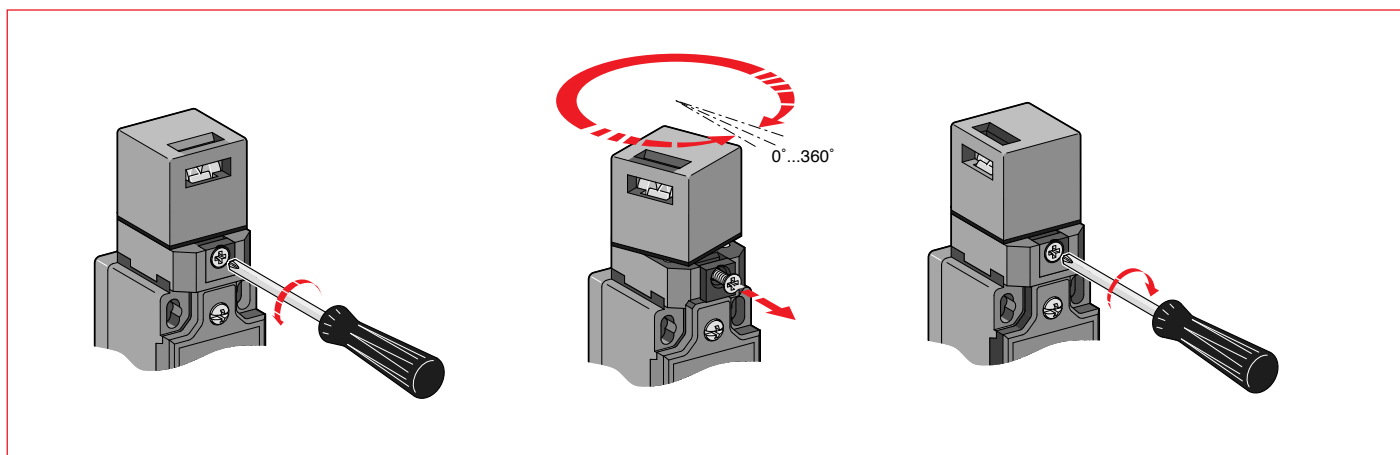
Limit switches with small latch (key) LS30P80...-S, LS31P80...-S and LS35P80...-S

- Head adjustment every 90°.



Limit switches with small latch (key) LS30P81...-S, LS31P81...-S and LS35P81...-S

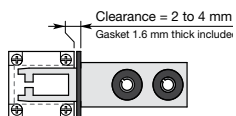
- Pivoting head continuous between 0° to 360°.



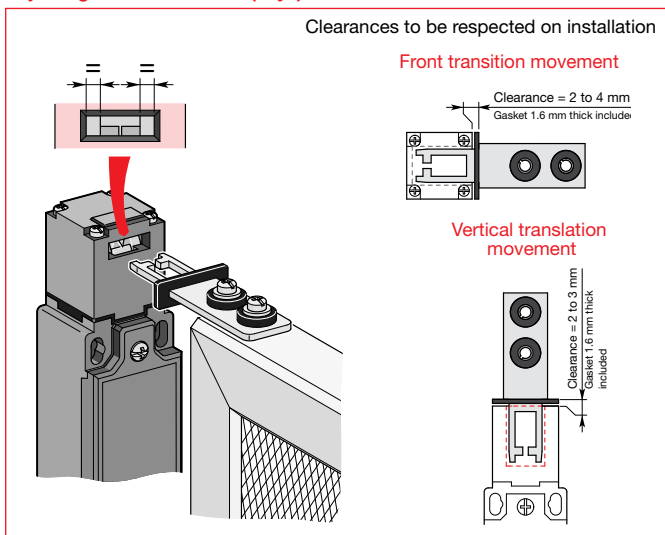
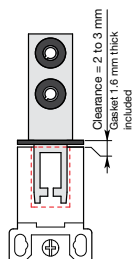
Adjusting the small latches (keys)

Clearances to be respected on installation

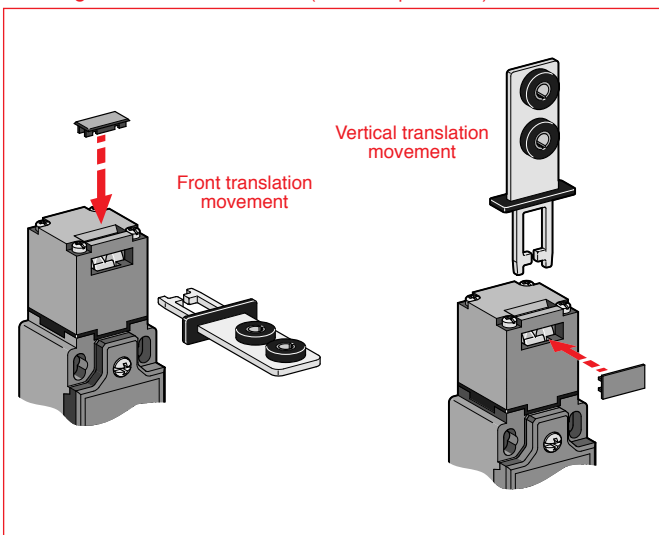
Front transition movement



Vertical translation movement



Blanking off the window not used (NEMA 4x protection)



Rotative axis safety limit switches

Technical data

Safety
limit switches

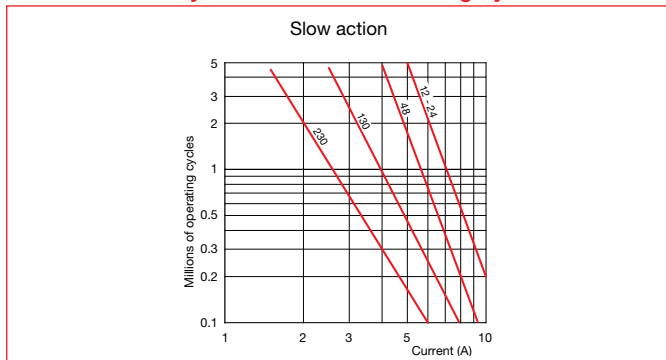
General Data

Standards	IEC 60947-1, IEC 60947-5-1, EN 60947-1, EN 60947-5-1, UL 508, and CSA C22-2 No. 14	
Certifications - Approvals	UL and CSA	
Air temperature near the device	°C	-25 ... +70
- during operation	°C	-30 ... +80
- for storage		
Climatic withstand	According to IEC 68-2-3 and salty mist according to IEC 68-2-11	
Mounting positions	All positions are authorised	
Shock withstand (according to IEC 68-2-27 and EN 60068-2-27) (1/2 sinusoidal shock for 11 ms) no change in contact position	g	Limit switch with small latch (key): 10 g Limit switch with rotative axis or lever: 40 g
Resistance to vibrations	g	5 g (10 ... 500 Hz) no change in position of contacts > 100 µs
Protection against electrical shocks (acc. to IEC 536)	Class II	
Degree of protection (according to IEC 529 and EN 60529)	UL Type 4 & IP65	
Minimum actuation speed	m/s	Slow action contacts 0.060 / Snap action contacts 0.001

Electrical Data

Rated insulation voltage U_i	V	690 (degree of pollution 3) A600, Q600
- according to IEC 60947-1 and EN 60947-1		
- according to UL 508, CSA C22-2 No. 14		
Rated impulse withstand voltage U_{imp} (according to IEC 60947-1 and EN 60947-1)	kV	6
Conventional free air thermal current I_{th} (according to IEC 60947-5-1 and EN 60947-5-1) ($0 \leq 40$ °C)	A	10
Short-circuit protection - gG type fuses	A	10
Rated operational current		
I_g / AC-15 - acc. to IEC 60947-5-1	24 V - 50/60 Hz A 130 V - 50/60 Hz A 230 V - 50/60 Hz A 240 V - 50/60 Hz A 400 V - 50/60 Hz A	10 5.5 3.1 3 1.8
- according to UL 508, CSA C22 No.14		A600
I_g / DC-13 - acc. to IEC 60947-5-1	24 V - d.c. A 110 V - d.c. A 250 V - d.c. A	2.8 0.6 0.27
- according to UL 508, CSA C22 No.14	Q600	
Positivity	Contacts with positive opening operation as per IEC 60947-5-1 chapter 3 and EN 60947-5-1	
Resistance between contacts	mΩ	25
Mechanical durability	Millions of operations	> 1 million of operating cycles
Max. switching frequency	Cycles/h	600
Electrical durability (according to IEC 60947-5-1 appendice C)	Utilization categories AC-15 and DC-13 (see curves and values below)	
- Max. switching frequency	Cycles/h	3600
- Load factor		0.5

Electrical durability for AC-15 utilization category



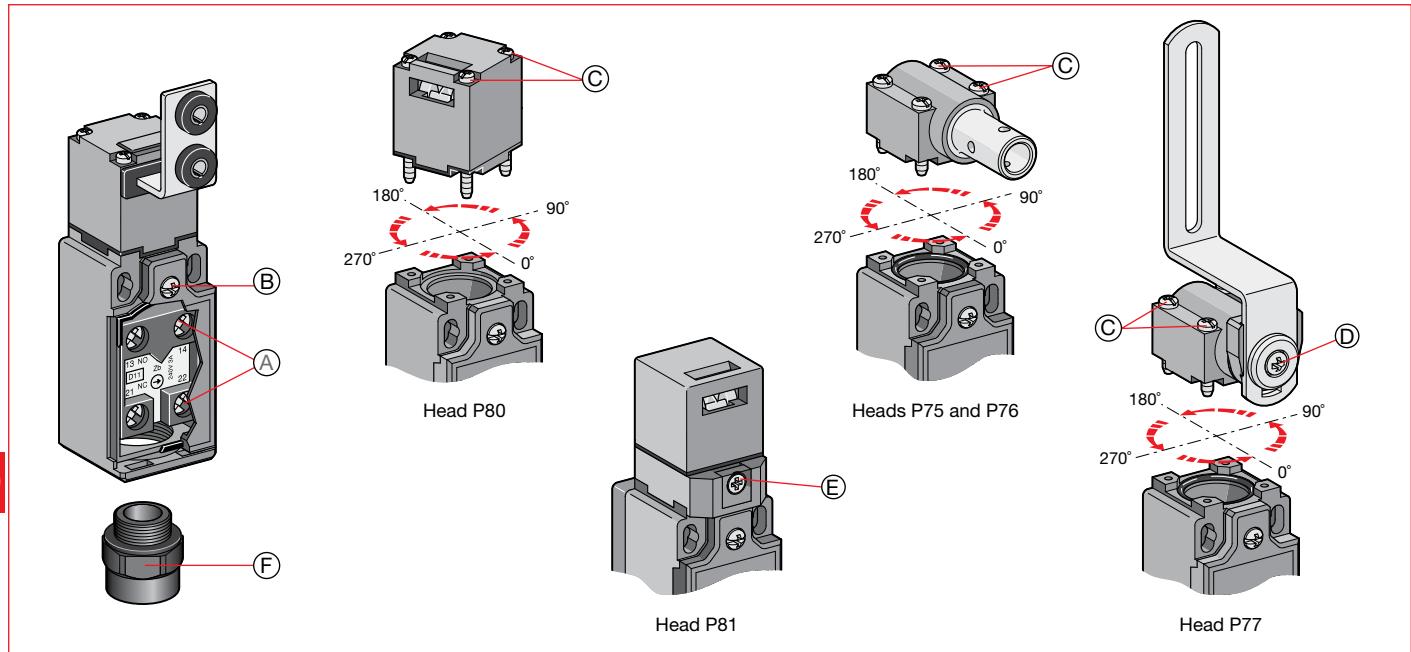
Electrical durability for DC-13 utilization category

Slow action	
Power breaking for a durability of 5 million operating cycles	
Voltage	24 V 12 W
Voltage	48 V 9 W
Voltage	110 V 6 W

Rotative axis safety limit switches

Technical data

Tightening torques



9

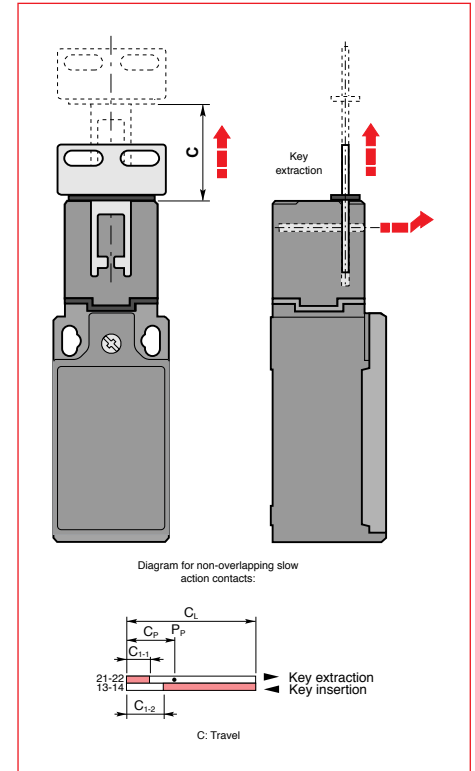
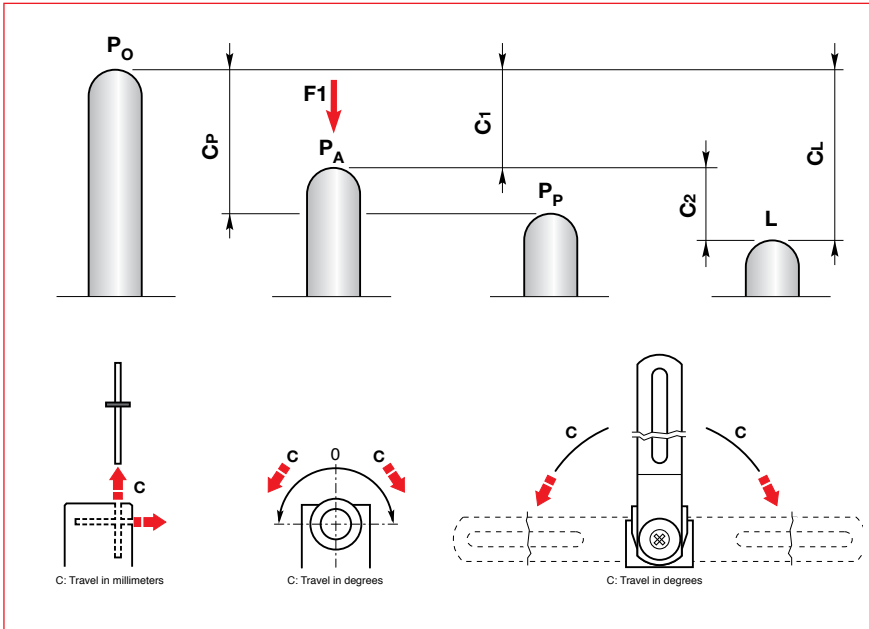
	A		B		C		D		E		F	
	Contact block connecting terminals		Closing the cover		Assembling the operating head		Assembling the flush mounting right angle lever		Adjusting the pivoting head		Cable inlet by 1/2" NPT adaptor	
Screws	M3.5 ± pozidriv 2		ø3 ± pozidriv 1		ø3 ± pozidriv 1		M3.5 pozidriv 2		M3 Philips No. 1		-	
Tightening torque	Recommended	Max.	Recommended	Max.	Recommended	Max.	Recommended	Max.	Recommended	Max.	Recommended	Max.
Limit switches												
LS35P80...-S	0.8 / 7	0.9	0.5 / 4.3	0.8	0.5 / 4.3	0.8	-	-	-	-	17 / 150	18
LS35P81...-S	0.8 / 7	0.9	0.5 / 4.3	0.8	-	-	-	-	0.3 / 2.63	0.5	17 / 150	18
LS35P75...-S	0.8 / 7	0.9	0.5 / 4.3	0.8	0.5 / 4.3	0.8	-	-	-	-	17 / 150	18
LS35P76...-S	0.8 / 7	0.9	0.5 / 4.3	0.8	0.5 / 4.3	0.8	-	-	-	-	17 / 150	18
LS35P77...-S	0.8 / 7	0.9	0.5 / 4.3	0.8	0.5 / 4.3	0.8	0.5 / 4.3	0.8	-	-	17 / 150	18

Connecting data of contact blocks

Connecting terminals	M3.5 (+,-) pozidriv 2 screw with cable clamp	
Connecting capacity	1 or 2 x mm ² / AWG	0.5 mm ² / AWG 20 to 2.5 mm ² / AWG 14
Terminal marking	According to EN 50013	

Rotative axis safety limit switches

Technical data



P_0 Free position:
position of the switch actuator when no external force is exerted on it.

P_A Operating position:
position of the switch actuator, under the effect of force F_1 , when the contacts leave their initial free position.

P_P Positive opening position:
position of the switch actuator from which positive opening is ensured.

L Max. travel position:
maximum acceptable travel position of the switch actuator under the effect of a force F_1 .

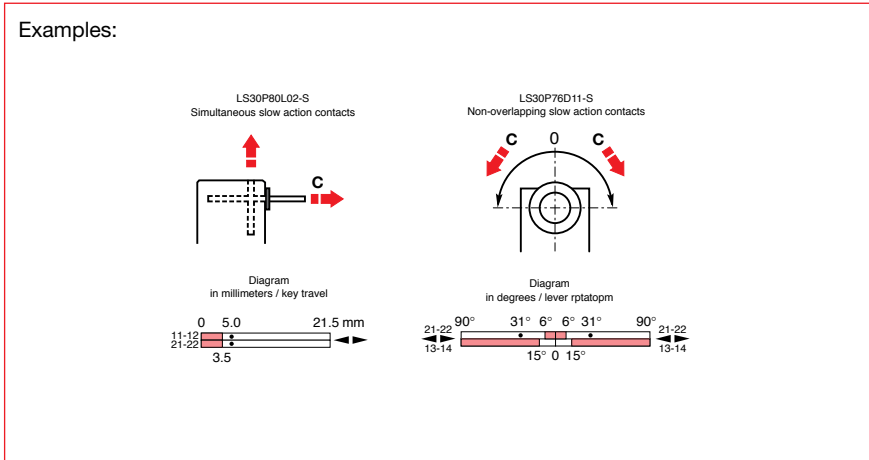
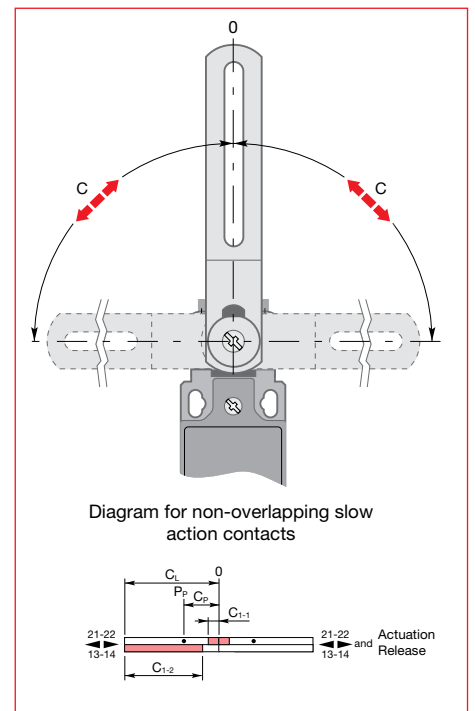
C_1 Pre-travel (average travel):
distance between the free position P_0 and the operating position P_A .

C_p Positive opening travel:
minimum travel of the switch actuator, from the free position, to ensure positive opening operation of the normally closed contact (N.C.).

C_2 Over-travel (average travel):
distance between the operating position P_A and the max. travel position L .

C_L Max. travel (maximum travel):
distance between the free position P_0 and the max. travel position L .

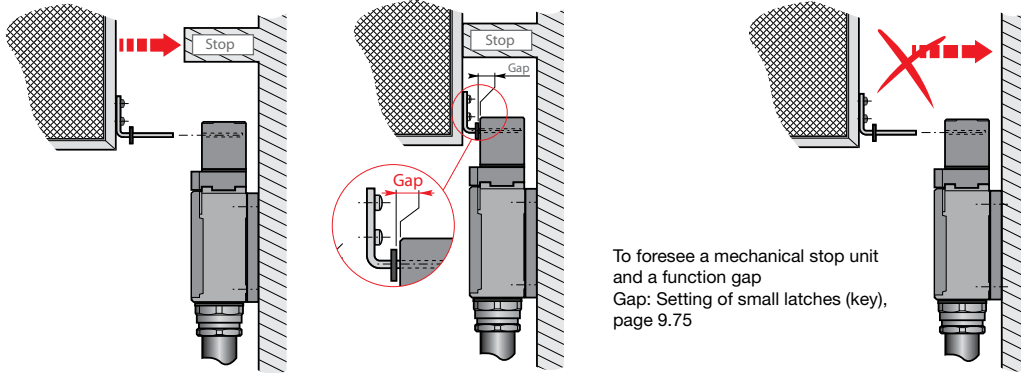
Note: C_{1-1} = pre-travel of contact 21-22,
 C_{1-2} = pre-travel of contact 13-14.



Rotative axis safety limit switches

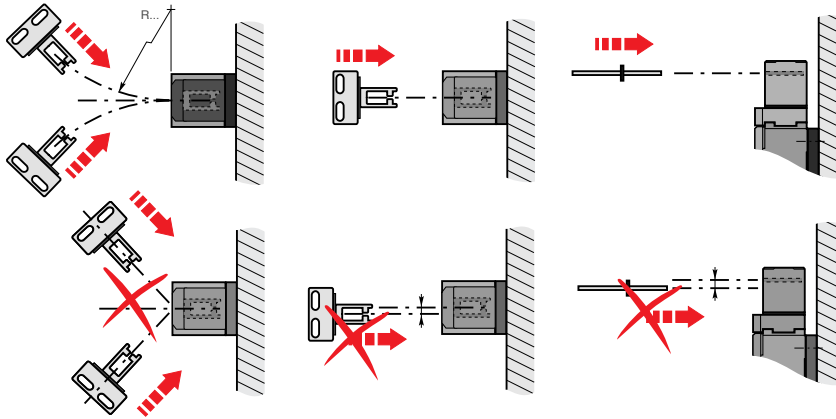
Technical data

Utilization cautions

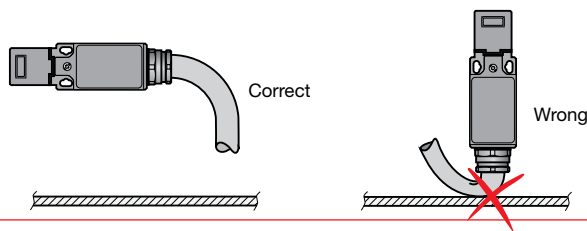


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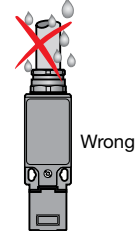
The small latch (key) shall be presented in the axis of the control head.



Curve of connecting cable



Cable gland orientation



Rotative axis safety limit switches

Technical data

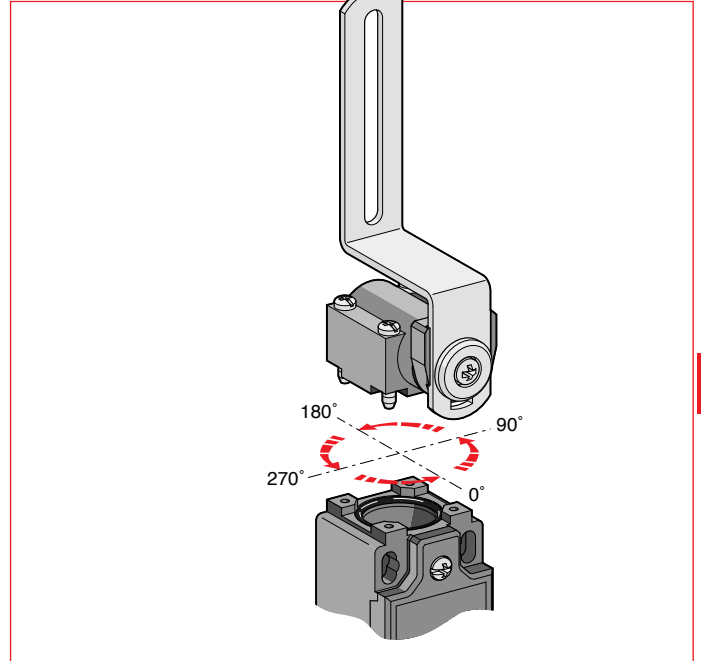
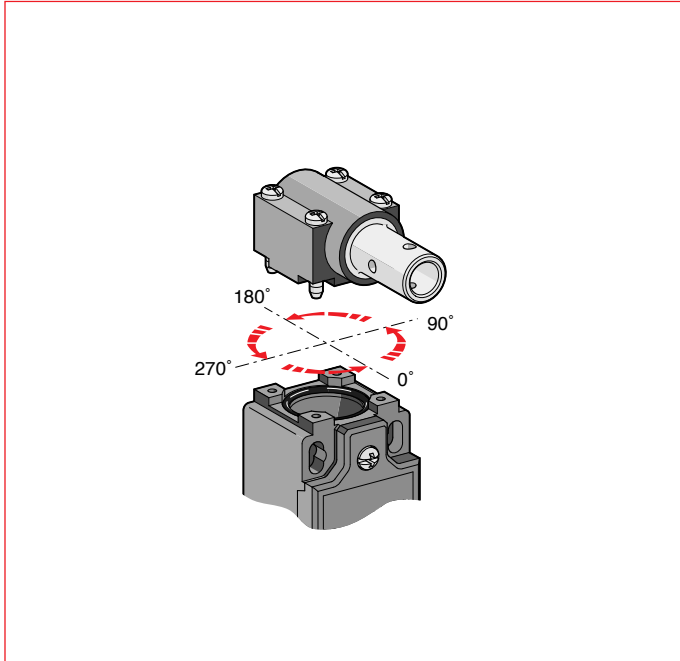
Implementation

Limit switches with rotative axis
LS35P75...-S, LS35P76...-S

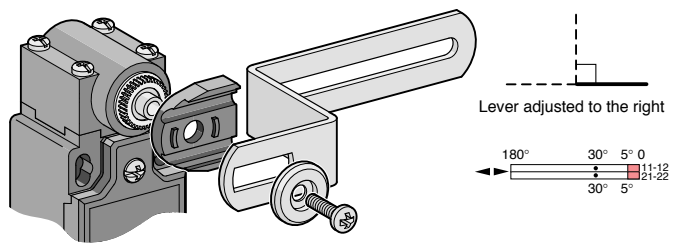
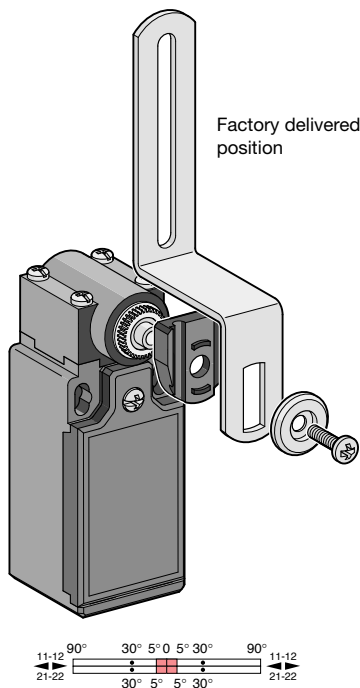
- Head adjustment every 90°

Limit switches with flush mounting right angle lever
LS35P77...-S

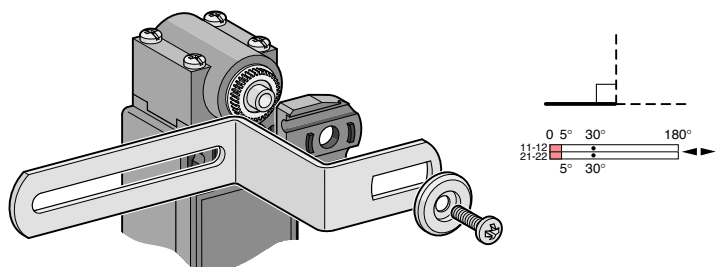
- Head adjustment every 90°



Each lever adjustment has a specific operation diagram.
(In these examples, the diagrams correspond to an L02 contact block.)



Lever adjustment by the user



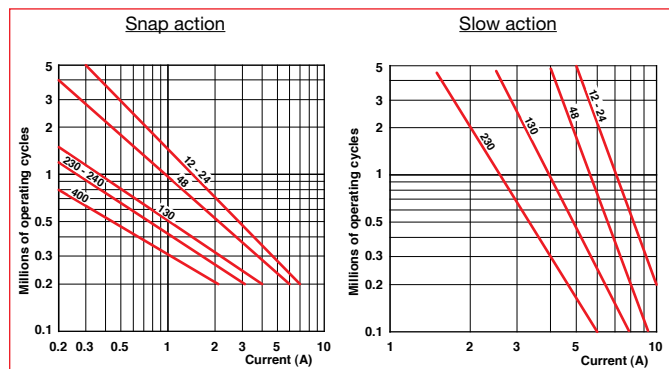
Latch & manual reset

Technical data

General Data

Standards	IEC 60947-1, IEC 60947-5-1, EN 60947-1, EN 60947-5-1, UL 508, CSA C22-2 No.14	
Certifications - Approvals	UL and CSA	
Air temperature near the device	°C	-25 ... +70
- during operation	°C	-30 ... +80
- for storage		
Climatic withstand	According to IEC 68-2-3 and salty mist according to IEC 68-2-11	
Mounting positions	All positions are authorised	
Shock withstand (according to IEC 68-2-27 and EN 60068-2-27)	g	50 g (1/2 sinusoidal shock for 11 ms) no change in contact position
Resistance to vibrations (acc. to IEC 68-2-6 and EN 60068-2-6)	g	25 g (10 ... 500 Hz) no change in position of contacts > 100 µs
Protection against electrical shocks (acc. to IEC 536)		Class II
Degree of protection (according to IEC 529 et EN 60529)		IP65
Consistency		0.1 mm upon closing points
Minimum actuation speed	m/s	Slow action contacts 0.060 / Snap action contacts 0.001
Electrical Data		
Rated insulation voltage U_i	V	690 (degree of pollution 3) A600, Q600
- according to IEC 60947-1 and EN 60947-1		
- according to UL 508, CSA C22-2 No.14		
Rated impulse withstand voltage U_{imp} (according to IEC 60947-1 and EN 60947-1)	kV	6
Conventional free air thermal current I_{th} (according to IEC 60947-5-1 and EN 60947-5-1) ($\varnothing \leq 40$ °C)	A	10
Short-circuit protection gG type fuses	A	10
Rated operational current		
I_o / AC-15 - acc. to IEC 60947-5-1	24 V - 50/60 Hz A 130 V - 50/60 Hz A 230 V - 50/60 Hz A 240 V - 50/60 Hz A 400 V - 50/60 Hz A	10 5.5 3.1 3 1.8
- according to UL 508, CSA C22 No.14		A600
I_o / DC-13 - according to IEC 60947-5-1	24 V - d.c. A 110 V - d.c. A 250 V - d.c. A	2.8 0.6 0.27
- according to UL 508, CSA C22 No.14	Q600	
Positivity	Contacts with positive opening operation as per IEC 60947-5-1 chapter 3 and EN 60947-5-1	
Resistance between contacts	mΩ	25
Mechanical durability	Millions of operations	> 1 million of operating cycles
Max. switching frequency	Cycles/h	600
Electrical durability (according to IEC 60947-5-1 appendice C)		Utilization categories AC-15 and DC-13 (see curves and values below)
- Max. switching frequency	Cycles/h	3600
- Load factor		0.5

Electrical durability for AC-15 utilization category



Electrical durability for DC-13 utilization category

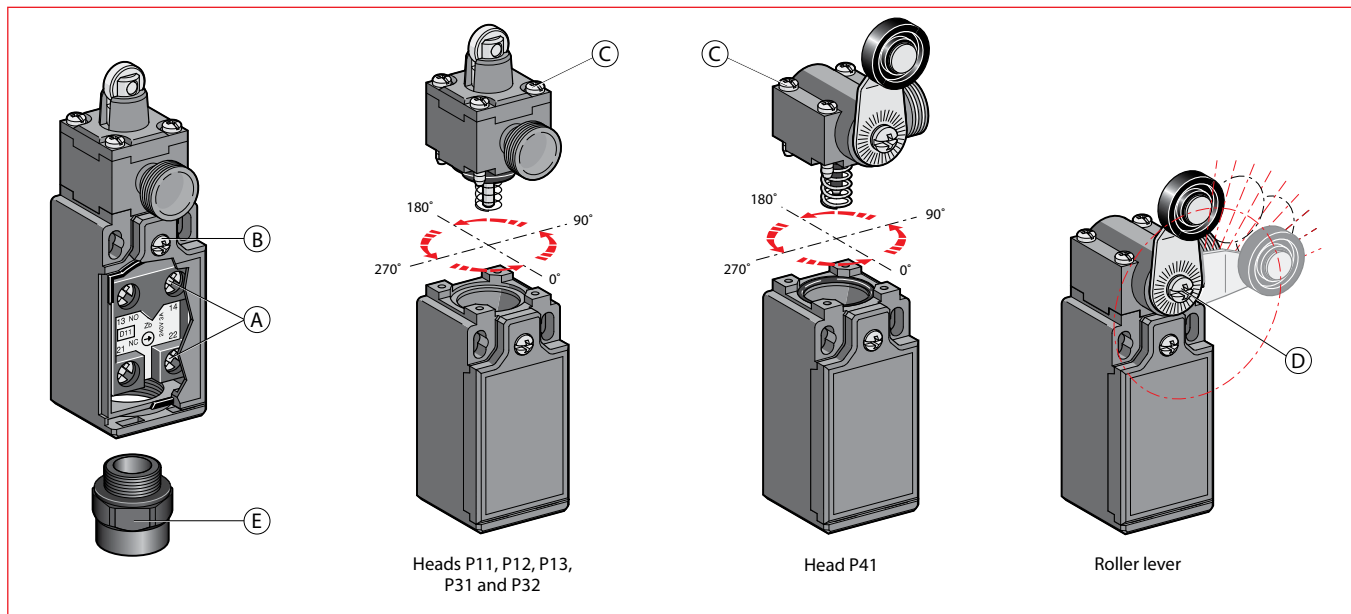
	Snap action		Slow action	
Power breaking for a durability of 5 million operating cycles				
Voltage	24 V	9.5 W	12 W	
Voltage	48 V	6.8 W	9 W	
Voltage	110 V	3.6 W	6 W	

Latch & manual reset

Technical data

Safety
limit switches

Tightening Torques



9

	A		B		C		D		E	
	Contact block connecting terminals		Closing the cover		Assembling the operating head		Assembling or adjusting the lever with plastic roller		Cable inlet by 1/2" NPT adaptor	
Screws	M3.5 ± pozidriv 2		ø3 ± pozidriv 1		ø3 ± pozidriv 1		ø4 ± Philips No. 2		-	
Tightening torque	Recommended N.m / lb.in	Max. N.m	Recommended N.m / lb.in	Max. N.m	Recommended N.m / lb.in	Max. N.m	Recommended N.m / lb.in	Max. N.m	Recommended N.m / lb.in	M a x . N.m
Limit switches										
LS35P11...-R	0.8 / 7	0.9	0.5 / 4.3	0.8	0.5 / 4.3	0.8	-	-	17 / 150	18
LS35P12...-R	0.8 / 7	0.9	0.5 / 4.3	0.8	0.5 / 4.3	0.8	-	-	17 / 150	18
LS35P13...-R	0.8 / 7	0.9	0.5 / 4.3	0.8	0.5 / 4.3	0.8	-	-	17 / 150	18
LS35P31...-R	0.8 / 7	0.9	0.5 / 4.3	0.8	0.5 / 4.3	0.8	-	-	17 / 150	18
LS35P32...-R	0.8 / 7	0.9	0.5 / 4.3	0.8	0.5 / 4.3	0.8	-	-	17 / 150	18
LS35P41...-R	0.8 / 7	0.9	0.5 / 4.3	0.8	0.5 / 4.3	0.8	0.5 / 4.3	0.8	17 / 150	18

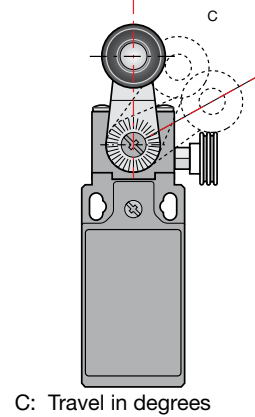
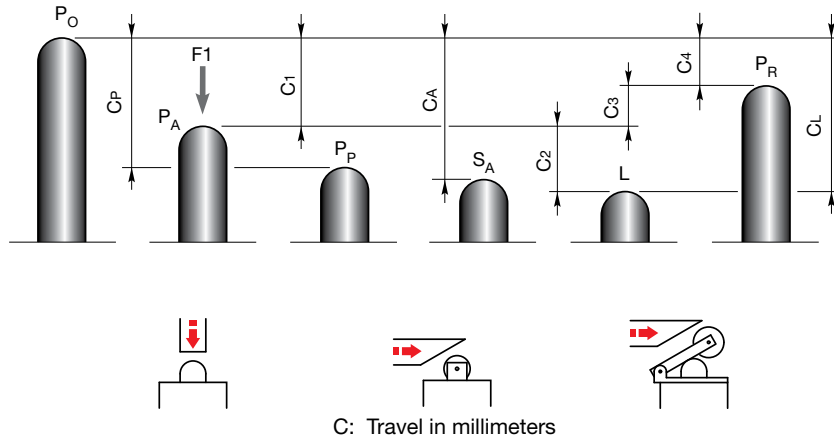
Connecting data of contact blocks

Connecting terminals	M3.5 (+,-) pozidriv 2 screw with cable clamp
Connecting capacity	1 or 2 x mm ² / AWG 0.5 mm ² / AWG 20 to 2.5 mm ² / AWG 14
Terminal marking	According to EN 50013

Latch & manual reset

Technical data

Travel and operation diagrams



9

P_O Free position:

position of the switch actuator when no external force is exerted on it.

P_A Operating position:

position of the switch actuator, under the effect of force F1, when the contacts leave their initial free position.

P_P Positive opening position:

position of the switch actuator from which positive opening is ensured.

S_A Latching point:

point of no return of the switch actuator beyond which the opened status of the (N.C.) contact(s) is maintained. Unlocking will only occur after deliberate action on the reset button.

L Max. travel position:

maximum acceptable travel position of the switch actuator under the effect of a force F1.

P_R Release position:

position of the switch actuator when the contacts return to their initial free position.

C₁ Pre-travel (average travel):

distance between the free position P_O and the operating position P_A.

C_P Positive opening travel:

minimum travel of the switch actuator, from the free position, to ensure positive opening operation of the normally closed contact (N.C.).

C_A Latching travel (average travel):

distance between the free position P_O and the latching point S_A.

C₂ Over-travel (average travel):

distance between the operating position P_A and the max. travel position L.

C_L Max. travel (maximum travel):

distance between the free position P_O and the max. travel position L.

C₃ Differential travel (C_L-C_P) (average travel):

travel difference of the switch actuator between the operating position P_A and the release position P_R.

C₄ Release travel (average travel):

distance between the release position P_R and the free position P_O.

Diagram for snap action contacts:

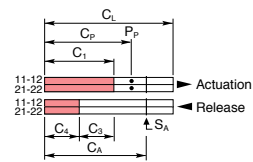
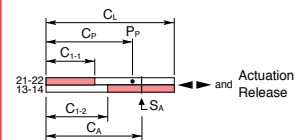


Diagram for non-overlapping slow action contacts:



Contacts position

21-22 Contact closed
 21-22 Contact open
 ↑ Contacts identification (example)

Note: for slow action contacts, C₃ = 0, C_{1,1} = pre-travel of contact 21-22, C_{1,2} = pre-travel of contact 13-14.

Examples:

LS30P13D11-R
non-overlapping slow action contacts

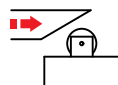
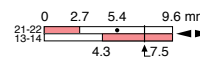


Diagram in millimetres / cam travel



LS30P41L02-R
simultaneous slow action contacts

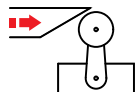
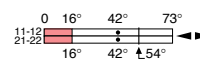


Diagram in degrees / lever rotation



LS30P11B02-R
snap action contacts

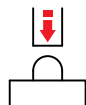
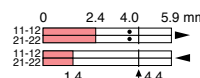


Diagram in millimetres / plunger travel



Latch & manual reset

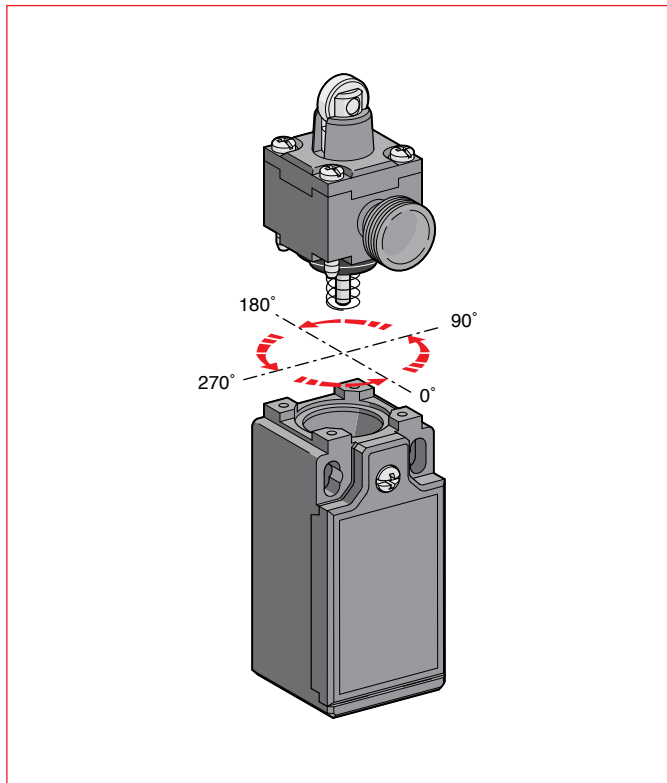
Technical data

Implementation

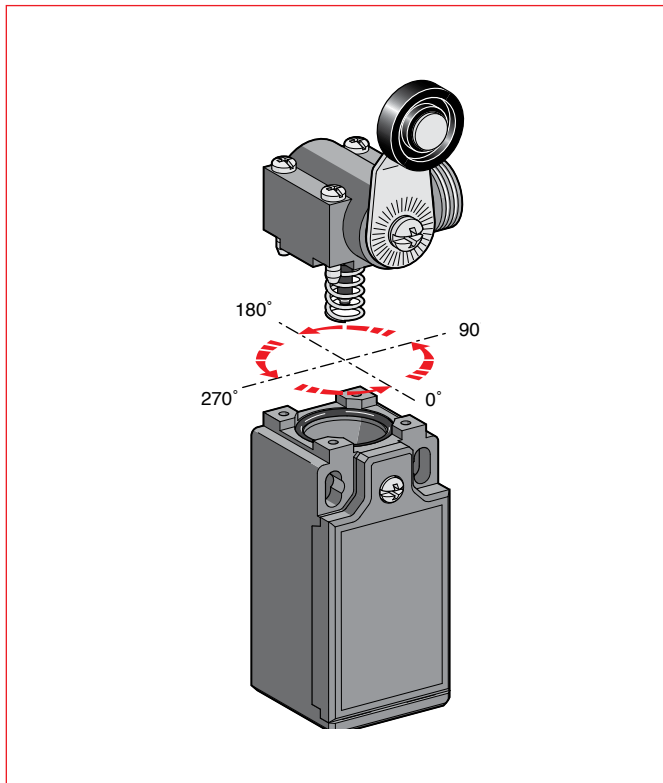
Implementation

Limit switches with latch and manual reset
LS35P...-R.

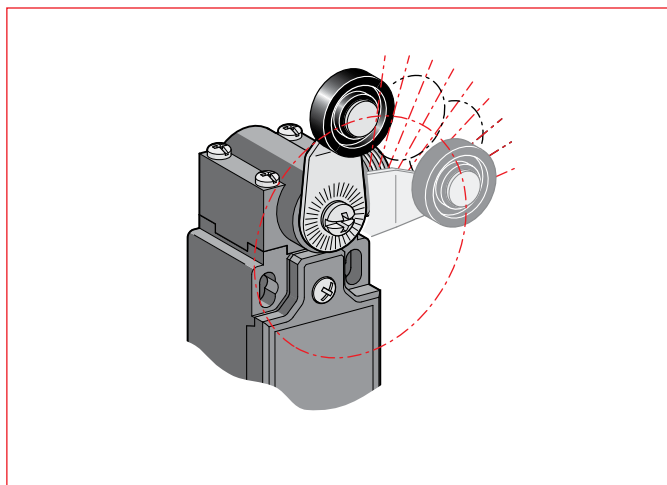
● Adjustment of the heads reference P11, P12, P13, P31 and P32.



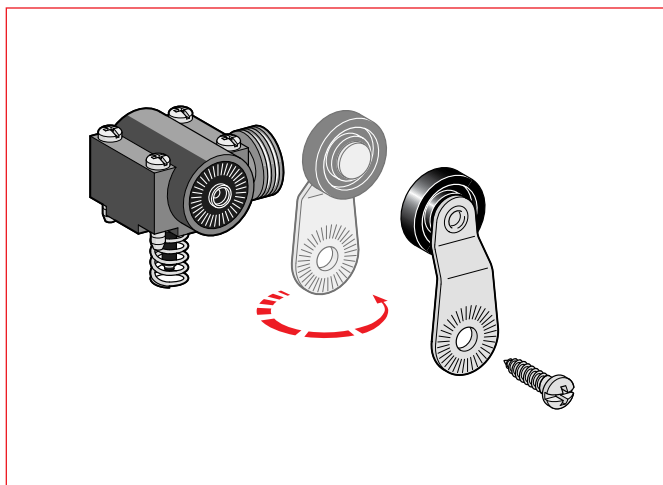
● Adjustment of the head reference P41.

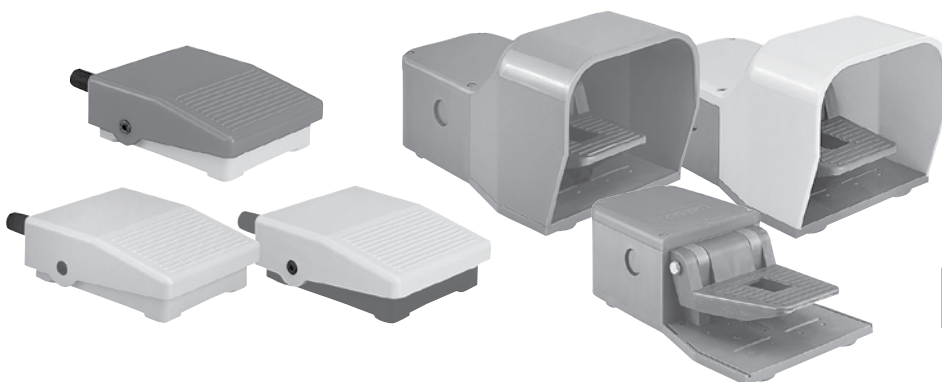


● Angular adjustment 10° in 10° of the lever on head P41.



● Lever round turning on head P41.





Description of Mini foot switches

- Reduced dimensions: 100 x 75 x 34 mm.
- Materials: cover and base made of self-extinguishing ABS.
- Color choice: black or grey base; black, grey, yellow or red cover.

Description of foot switches with covers

- Dimensions: 285 x 140 x 145.
- Materials: base, cover and pedal made of shock resistant Bayblend® FR 90 material (alloyed polycarbonate and ABS).
- Color choice: grey base; grey, yellow or red cover.
- Variations: grey base, half-red cover. Especially used for emergency stop function.

Note: this emergency stop function must never contain the «locked in neutral position» device.

UL Listed file #E191693

Application

Foot switch-operated machines such as: shearing machines, folding machines, spinning lathes, machine tools, wrapping machines, riveting presses, etc.

Foot switches with covers come in three operation formats:

- **Free movement:** contact position follows pedal movement: actuated when the pedal is pushed down, released when pedal is in a state of rest.
- **Foot switch locked in neutral position:** same operation as above, after unlocking the pedal with the end of the foot.
- **Foot switch latched in low position:** same operation as free movement, except that a state of rest is obtained only after having unlatched the pedal with the end of the foot.

General information

IPM Mini foot switches, IPS Foot switches with covers

Description

Application

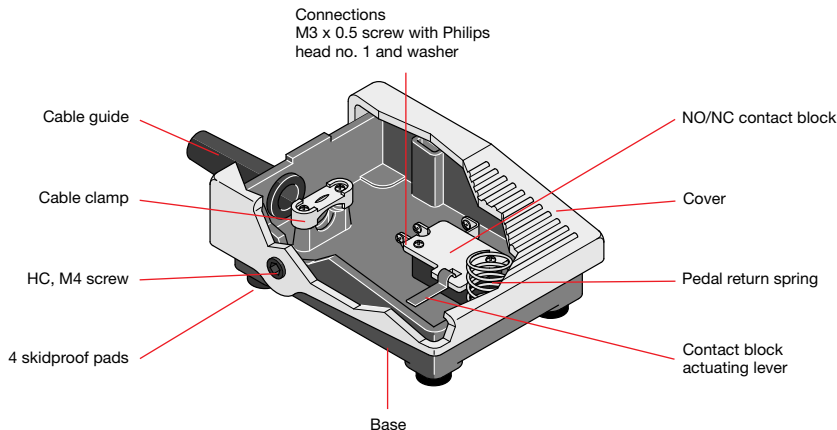
Foot switch-operated machines such as: shearing machines, folding machines, spinning lathes, machine tools, wrapping machines, riveting presses, etc.

Foot switches with covers come in three operation formats:

- **Free movement** (momentary): contact position follows pedal movement: actuated when the pedal is pushed down, released when pedal is in a state of rest.
- **Foot switch locked in neutral position:** same operation as above, after unlocking the pedal with the end of the foot.
- **Foot switch latched in low position** (maintained): same operation as free movement, except that a state of rest is obtained only after having unlatched the pedal with the end of the foot.

Description of Mini foot switches

- Reduced dimensions: 100 x 75 x 34 mm.
- Materials: cover and base made of self-extinguishing ABS.
- Color choice: black or grey base; black, grey, yellow or red cover.

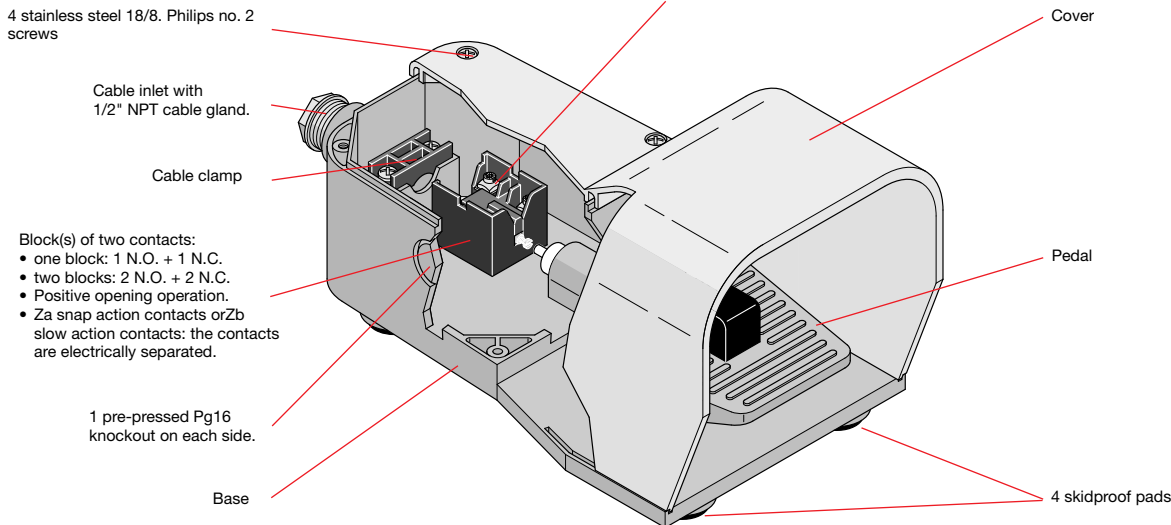


Description of foot switches with covers

- Dimensions: 285 x 140 x 145.
- Materials: base, cover and pedal made of shock resistant Bayblend® FR 90 material (alloyed polycarbonate and ABS).
- Color choice: grey base; grey, yellow or red cover.
- Variations: grey base, half-red cover. Especially used for emergency stop function.

Note: this emergency stop function must never contain the «locked in neutral position» device.

- Connecting terminals
- M 3.5 (+, -) Philips no. 1 screw
 - Screw head with captive cable clamp.
 - Markings conform with IEC 947-1, IEC 947-5-1, EN 50 005 and 50 013 standards.



Comment: Foot switches with covers can be assembled on a plate and equipped with a transportation handle. Upon request, instead of the handle an emergency stop button can be installed above a tube that allows for connection cable passage.

Foot switches

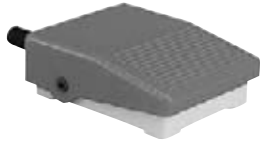
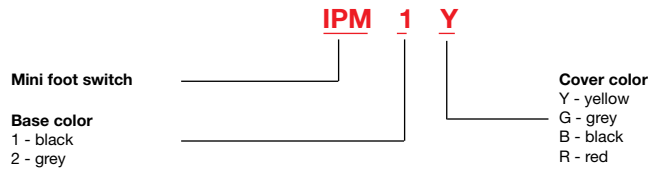
Mini foot switches, IP 40

Foot switches

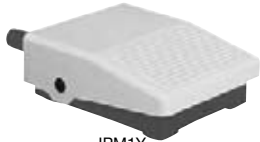
IPM Mini foot switches

		Cover color	Unit weight in kg Packing 1 piece	Catalog number	List price
Black base					
1		Yellow	0.130	IPM1Y	\$ 42
1		Grey	0.130	IPM1G	
1		Black	0.130	IPM1B	
1		Red	0.130	IPM1R	
Grey base					
1		Yellow	0.130	IPM2Y	42
1		Grey	0.130	IPM2G	
1		Black	0.130	IPM2B	
1		Red	0.130	IPM2R	

Catalog number explanation



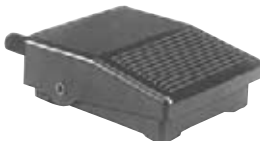
IPM1R



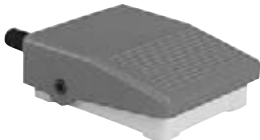
IPM1Y



IPM1G



IPM1B



IPM1R

Foot switches

Foot switches with covers, IP 65



IPSY1A11



IPSR1A11



IPSG1A11



IPSZ1A11

IPS foot switches

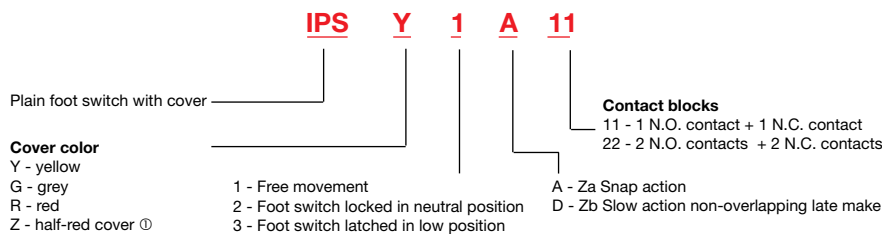
Contact blocks (set of 1 N.O. + 1 N.C.)				Unit weight in kg	Catalog number	List price
Snap action		Non-overlapping slow action				
Za	Za	Zb	Zb	Packing 1 piece		
Free movement						
1	—	1	—	1.100	IPSA1A11	\$ 114
—	1 + 1	—	—	1.100	IPSA1D11	114
—	—	—	1 + 1	1.100	IPSA1A22	132
—	—	—	—	1.100	IPSA1D22	132
Locked in neutral position						
1	—	1	—	1.100	IPSA2A11	124
—	1 + 1	—	—	1.100	IPSA2D11	124
—	—	—	1 + 1	1.100	IPSA2A22	136
—	—	—	—	1.100	IPSA2D22	136
Latched in low position						
1	—	1	—	1.100	IPSA3A11	122
—	1 + 1	—	—	1.100	IPSA3D11	122
—	—	—	1 + 1	1.100	IPSA3A22	140
—	—	—	—	1.100	IPSA3D22	140
Free movement foot switch with half-red cover						
1	—	1	—	0.800	IPSZ1A11	127.50
—	1 + 1	—	—	0.800	IPSZ1D11	127.50
—	—	—	1 + 1	0.800	IPSZ1A22	145.50
—	—	—	—	0.800	IPSZ1D22	145.50
Foot switch latched in low position with half-red cover						
1	—	1	—	0.800	IPSZ3A11	135.00
—	1 + 1	—	—	0.800	IPSZ3D11	135.00
—	—	—	1 + 1	0.800	IPSZ3A22	153.00
—	—	—	—	0.800	IPSZ3D22	153.00

Color code

To select a foot switch color, substitute the appropriate color code for the Δ in the catalog number

Yellow	Y
Grey	G
Red	R

Catalog number explanation



① Incompatible with locked in neutral position function.

Components

Double Insulation - Protection Cover in ABS - IP65

Foot switches

⊕ "N.C." contact with positive opening operation.



IPSXG



IPSXZ

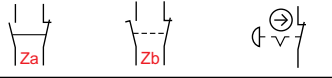


IPSXCA11



IPSXCD11

Contact blocks



B11

D11

C11

Protection cover for foot switch

Grey cover

Yellow cover

Red cover

Half red cover

Contact block for IPS... foot switches

1NC & 1NO (Za) snap action

1

—

—

1NC & 1NO (Zb) slow action non-overlapping late make

—

1

—

Positive opening operation

Catalog number

List price

Contact blocks	Positive opening operation	Catalog number	List price
Protection cover for foot switch Grey cover Yellow cover Red cover Half red cover	— — — —	IPSXG IPSXY IPSXR IPSXZ	\$ 42.00
Contact block for IPS... foot switches 1NC & 1NO (Za) snap action 1 — —	⊕	IPSXCA11	25.50
1NC & 1NO (Zb) slow action non-overlapping late make — 1 —	⊕	IPSXCD11	25.50

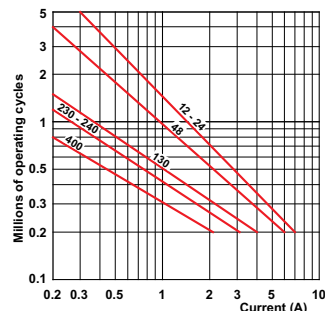
General technical data

	Mini foot switch	Foot switch with cover
Standards	IEC 1058-1	IEC 947-5-1
Certifications & Approvals	—	UL - CSA - BG
Air temperature near the device		
– during operation	°C	– 10 ... + 70
– for storage	°C	– 25 ... + 80
Climatic withstand	—	according to IEC 68-2-3 and salty mist according to IEC 68-2-11
Shock withstand (according to IEC 68-2-27 and EN 60 068-2-27)	g	50g (1/2 sinusoidal shock for 11 ms) no change in contact position
Degree of protection (according to IEC 529 and EN 60 529)	IP 40	IP 65
Actuation torque	N.m	0.25
Operating angle	Degree	2 to 4
Cable inlet	Cable guide ø min. 6mm; ø max. 8.5 mm	Pg 16

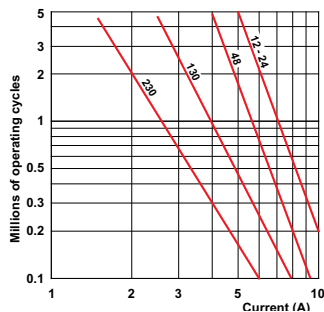
Electrical data

Rated insulation voltage U_i	V	250	500 (according to IEC 947-1 and EN 60-947-1) Degree of pollution 3
Rated impulse withstand voltage U_{imp} (according to IEC 947-1 and EN 60 947-1)	kV	1	6
Conventional free air thermal current I_{th} ($q < 40$ °C)	A	15	10 (according to IEC 947-1)
Short-circuit protection $U_g < 500$ V a.c. - gG (gl) type fuses	A	10	10
Rated operational current	A	3 (250 V a.c.) 0.06 (230 V d.c.)	A 600 (according to UL 508 and CSA C22-2 n° 14) Q 600 (according to UL 508 and CSA C22-2 n° 14)
AC-15 acc. to IEC 947-5-1	24 V 130 V 230 V 240 V 400 V	A A A A A	10 5.5 3.1 3 1.8
DC-13 acc. to IEC 947-5-1	24 V 110 V 250 V	A A A	2.8 0.6 0.27
Resistance between contacts	mΩ	30	25
Connecting terminals		M3 x 0.5 screw with Philips head no. 1 and washer	M3.5 (+, -) screw with Philips head no. 1 with cable clamp
Positive opening operation (according to IEC 947-5-1)		—	⊕
Connecting capacity	1 or 2 x mm ²	—	0.5 – 2.5
Terminal marking		—	According to EN 50 013
Mechanical durability	Millions of operations	10	30
Electrical durability	Operations	100,000	According to IEC 947-5-1, utilization categories AC-15 and DC-13 (Load factor of 0.5 according to curves below)

AC-15 – Snap action



AC-15 – Slow action



DC-13		Snap action	Slow action
		Power breaking for a durability of 5 million operating cycles	
Voltage	24 V	9.5 W	12 W
Voltage	48 V	6.8 W	9 W
Voltage	110 V	3.6 W	6 W

Technical data & approximate dimensions

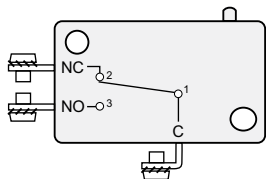
Mini-footswitches

Foot switches

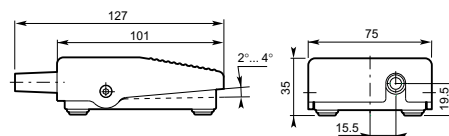
IPM Mini foot switches

Base color		Yellow cover	Grey cover	Black cover	Red cover
Black base	Catalog number	IPM1Y	IPM1G	IPM1B	IPM1R
Grey base	Catalog number	IPM2Y	IPM2G	IPM2B	IPM2R
Weight (packing per unit)	kg	0.130	0.130	0.130	0.130

N.O. + N.C. Contact block



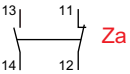
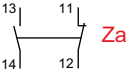
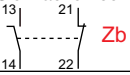
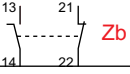
Dimensions (mm)



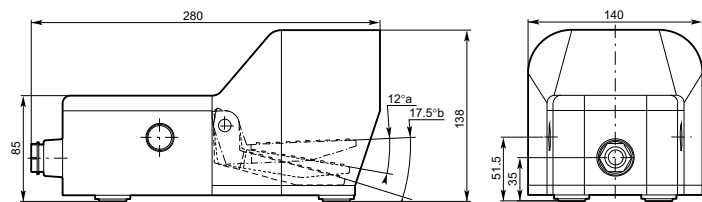
Technical data & approximate dimensions

Foot switches with covers

IPS Foot switches

		Free movement	Locked in neutral position	Latched in low position
Snap action contacts	Catalog number	IPS1A11	IPS2A11	IPS3A11
 Za	⊖ (Positive opening operation of the N.C. contact)	⊖	⊖	⊖
Snap action contacts	Catalog number	IPS1A22	IPS2A22	IPS3A22
 Za	⊖ (Positive opening operation of the N.C. contact)	⊖	⊖	⊖
Non-overlapping Slow action contacts	Catalog number	IPS1D11	IPS2D11	IPS3D11
 Zb	⊖ (Positive opening operation of the N.C. contact)	⊖	⊖	⊖
Non-overlapping Slow action contacts	Catalog number	IPS1D22	IPS2D22	IPS3D22
 Zb	⊖ (Positive opening operation of the N.C. contact)	⊖	⊖	⊖
Weight (packing per unit)	kg	1.10	1.10	1.10

Dimensions (mm)

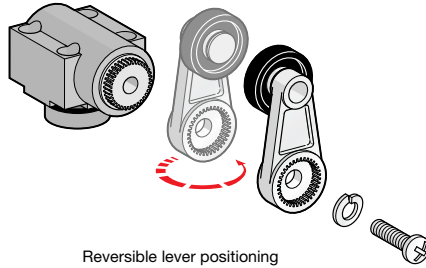


Plain foot switch
a = pre-travel
b = total travel

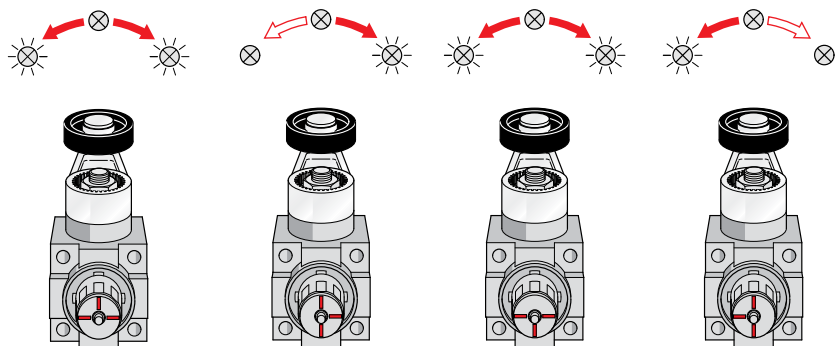
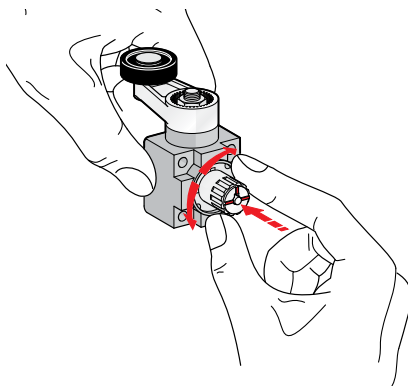
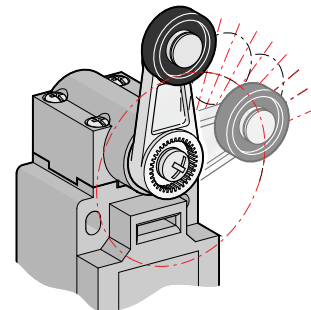
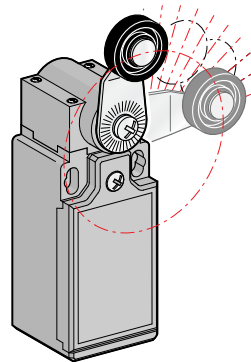
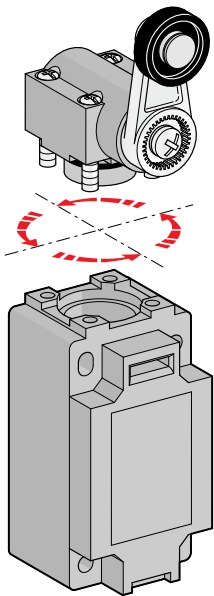


General technical data
Limit switches

Technical data Implementation



9




Double insulation

Class II materials, according to IEC 536, are designed with double insulation. This measure consists in doubling the functional insulation with an additional layer of insulation so as to eliminate the risk of electric shock and thus not having to protect elsewhere. No conductive part of "double insulated" material should be connected to a protective conductor.

Positive opening operation

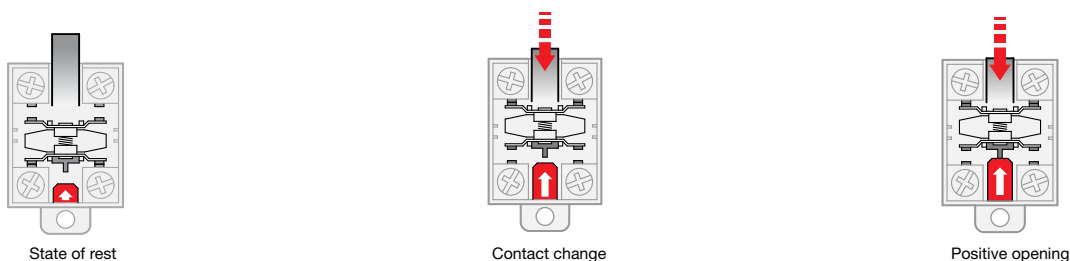
A control switch, with one or more break-contact elements, has a positive opening operation when the switch actuator ensures full contact opening of the break-contact. For the part of travel that separates the contacts, there must be a positive drive, with no resilient member (e.g. springs), between the moving contacts and the point of the actuator to which the actuating force is applied.

The positive opening operation does not deal with N.O. contacts.

Control switches with positive opening operation may be provided with either snap action or slow action contact elements. To use several contacts on the same control switch with positive opening operation, they must be electrically separated from each other, if not, only one may be used. Every control switch with positive opening operation must be indelibly marked on the outside with the symbol: .

Snap action

Snap action contacts are characterized by a release position that is distinct from the operating position (differential travel). Snap breaking of moving contacts is independent of the switch actuator's speed and contributes to regular electric performance even for slow switch actuator speeds.



Slow action

Slow action contacts are characterized by a release position that is the same as the operating position. The switch actuator's speed directly conditions the travel speed of contacts.



Contact shape according to IEC 947-5-1.

Change-over contact elements with 4 terminals must be indelibly marked with the corresponding **Za** or **Zb** symbol as in the diagrams below.



Utilization category

AC-15: switching of electromagnetic loads of electromagnets using an alternating current (>72 VA).

DC-13: switching of electromagnets using a direct current.

Terminals

Limit switches with metal casings must have a terminal, for a protective conductor, that is placed inside the casing very close to the cable inlet and must be indelibly marked.

Minimum actuation force/torque

The minimum amount of force/torque that is to be applied to the switch actuator to produce a change in contact position.

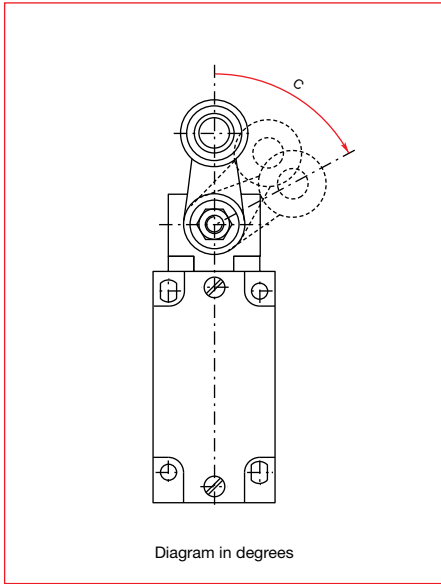
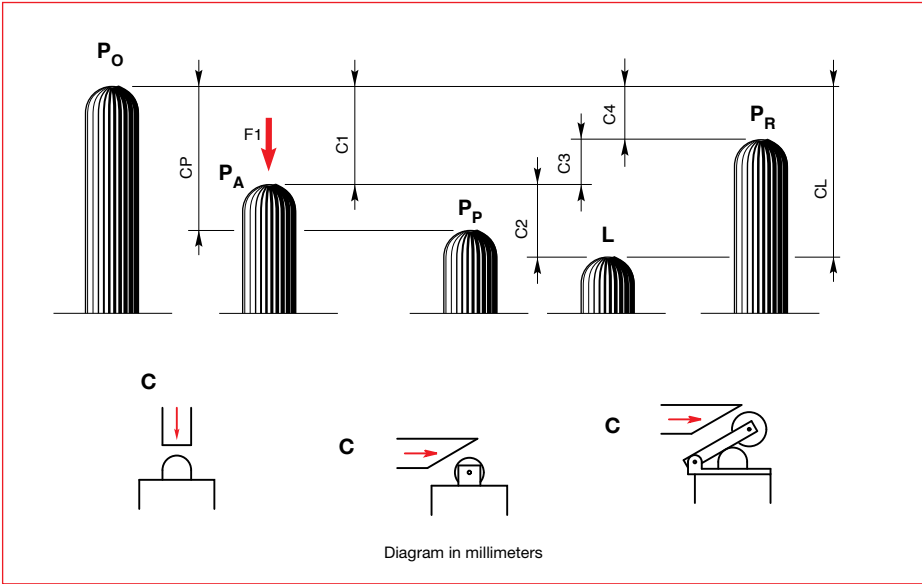
Minimum force/torque to achieve positive opening operation

The minimum amount of force/torque that is to be applied to the switch actuator to ensure positive opening operation of the N.C. contact.

Technical data

Travel and operation diagrams

9



P₀ Free position

Position of the switch actuator when no external force is exerted on it.

P_A Operating position

Position of the switch actuator, under the effect of force F₁, when the contacts leave their initial free position.

P_P Positive opening position

Position of the switch actuator from which positive opening is ensured.

L Max. travel position

Maximum acceptable travel position of the switch actuator under the effect of a force F₁.

P_R Release position

Position of the switch actuator when the contacts return to their initial free position.

C₁ Pre-travel

Distance between the free position P₀ and the operating position P_A.

C_P Positive opening travel

Minimum travel of the switch actuator, from the free position, to ensure positive opening operation of the normally closed contact.

C₂ Over-travel

Distance between the operating position P_A and the max. travel position L.

C_L Max. travel

Distance between the free position P₀ and the max. travel position L.

C₃ Differential travel (C1-C4)

Travel difference of the switch actuator between the operating position P_A and the release position P_R.

C₄ Release travel

Distance between the release position P_R and the free position P₀.

Diagram for snap action contacts:

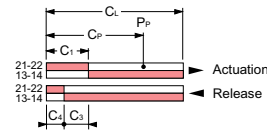
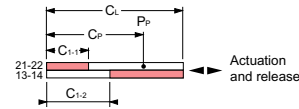


Diagram for non-overlapping slow action contacts:



Note: for slow action contacts, C₃ = 0, C₁₋₁ = pre-travel of contact 21-22, C₁₋₂ = pre-travel of contact 13-14.

Examples:

LS45M13B11
(snap action contacts)

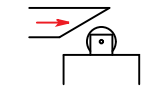
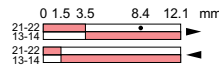


Diagram in millimeters/cam travel



LS45M41B11
(snap action contacts)

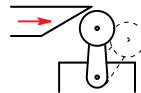


Diagram in degrees/lever rotation



LS45M11D11
(non-overlapping slow action contacts)

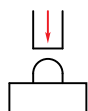
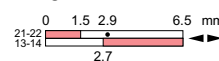


Diagram in millimeters/plunger travel



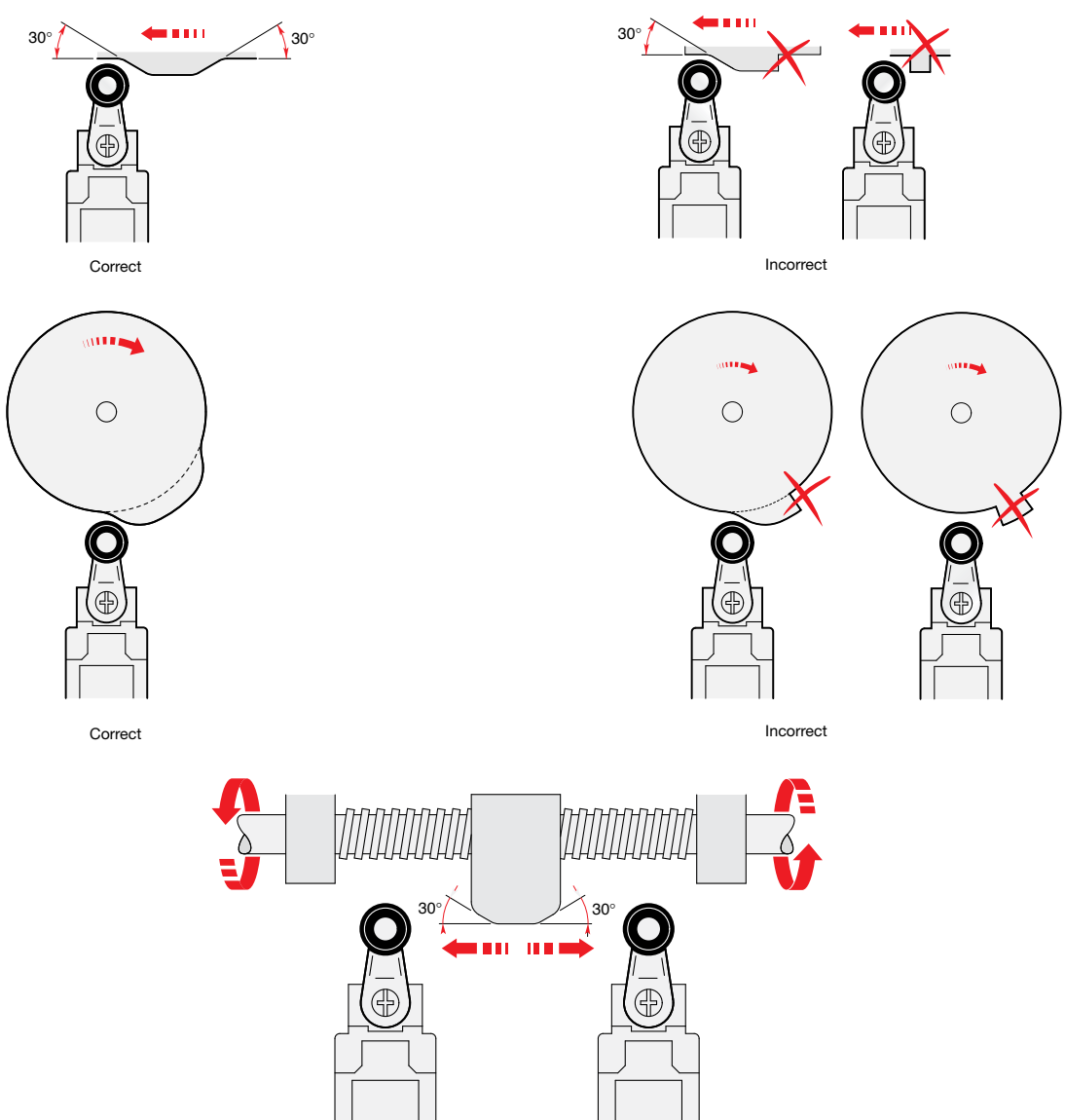
Technical data

Utilization precautions

Plain plunger



Roller plunger or roller lever



For a relatively slow movement of the switch actuator, a limit switch with a snap action contact block is preferred.

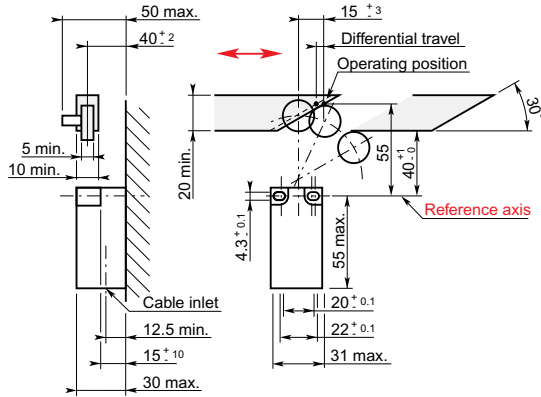
Technical data EN 50047 standard

The European Committee for Electrotechnical Standardization (CENELEC), which groups together 18 European countries, publishes EN standards.

The present standard defines dimensions and mechanical data for limit switches (30 x 55mm).

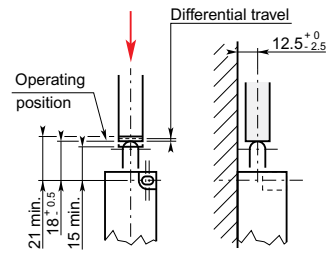
A Shape

Roller lever operating heads



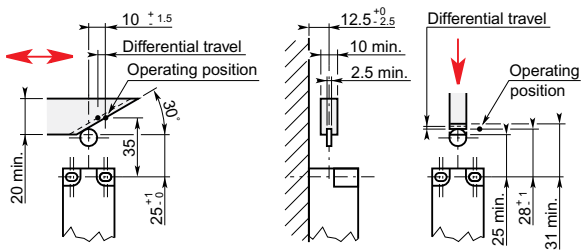
B Shape

Rounded plunger operating heads



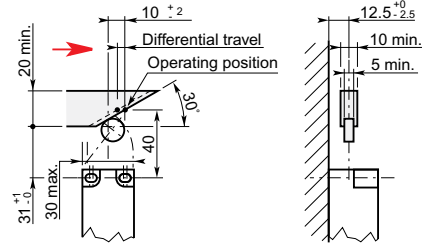
C Shape

Roller plunger operating heads



E Shape

Roller lever operating heads

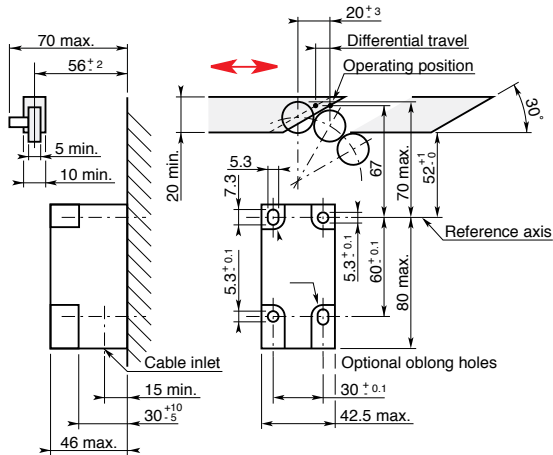


Technical data EN 50041 standard

The European Committee for Electrotechnical Standardization (CENELEC), which groups together 18 European countries, publishes EN standards.

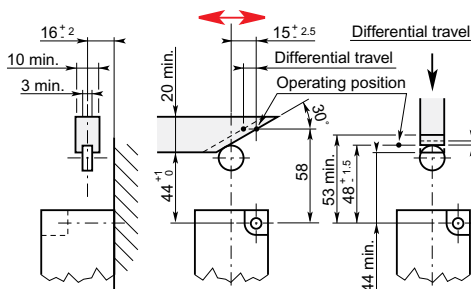
A Shape

Roller lever operating heads



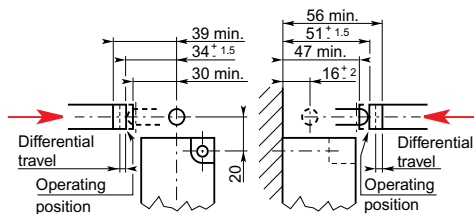
C Shape

Roller plunger operating heads



F Shape

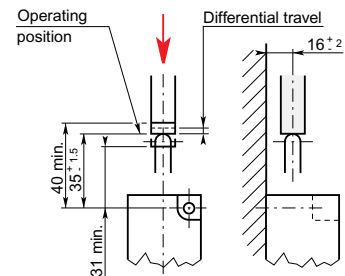
Rounded lateral plunger operating heads



The present standard defines dimensions and mechanical data for limit switches (42.5 x 80 mm).

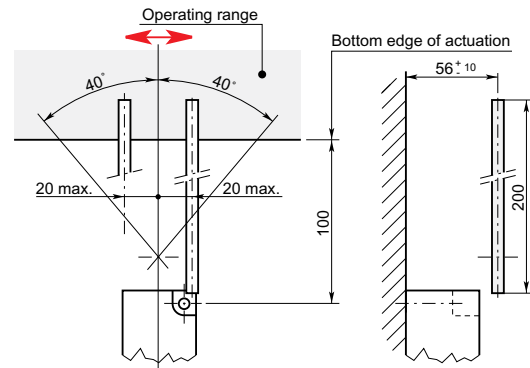
B Shape

Rounded plunger operating heads



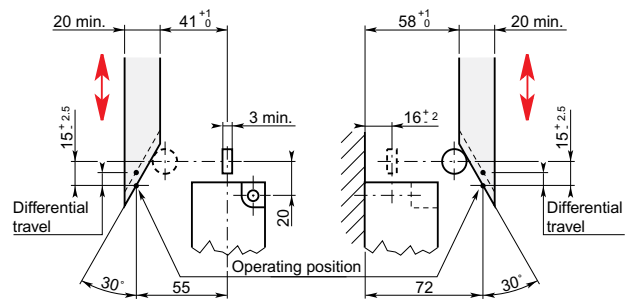
D Shape

Rod operating heads



G Shape

Lateral roller plunger operating heads - Lateral actuation



Lateral roller plunger operating heads - Front actuation

