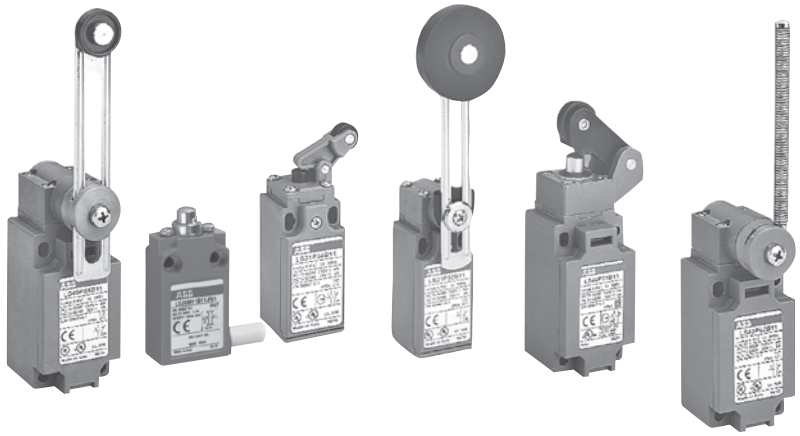
Limit switches
Index

8 - Limit switches

Notes

Limit Switches
General information



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 ⧈ and a degree of protection of IP 65 and UL Type 4.

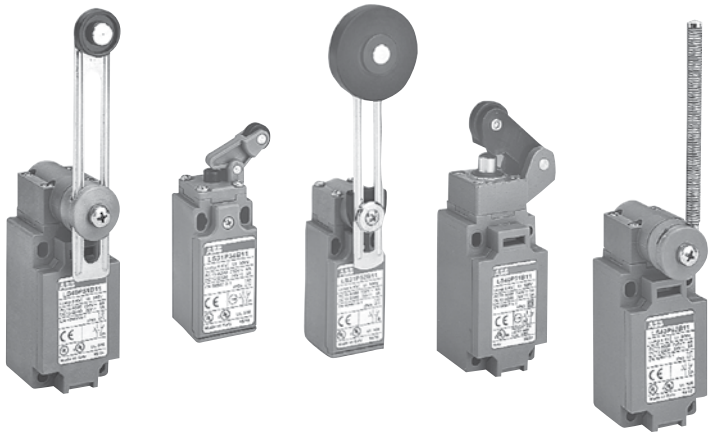
Casings come in 4 dimensions:
- 30mm width
- 35mm width (miniature prewired only)
- 40mm width
- 60mm width

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

Limit Switches
Plastic casing, 30mm , 40mm, & 60mm



Description
Limit switches 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

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

Plastic Limit switches

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.

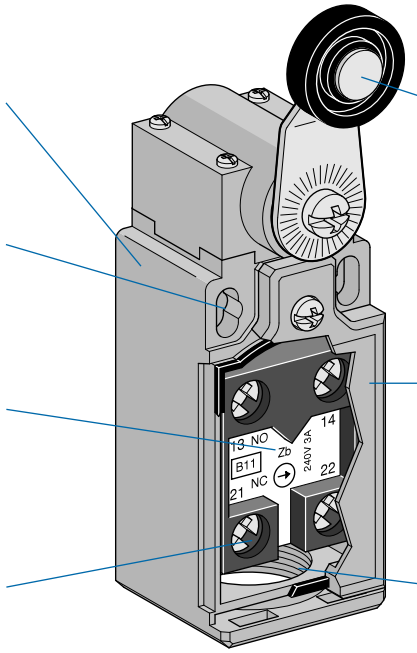
Casings come in 3 dimensions:
- 30mm width
  – LS35P
- 40mm width
  – LS45P
- 60mm width
  – LS75P

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)
30mm = codes 10...92
40mm = codes 11...92
60mm = codes 11...98 ①

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

① For 60mm components, contact factory.

30mm, IP 65, UL Type 4, PG 13.5 and 1/2" NPT

Movement to be detected

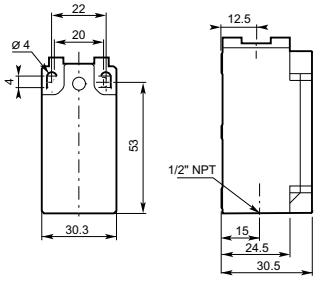
On end

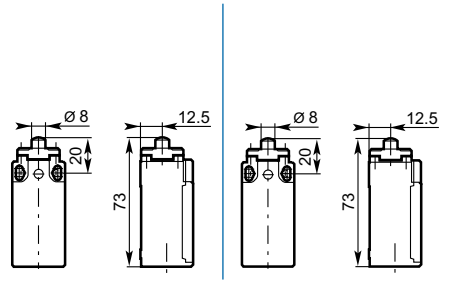
Operating head type

		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
Min. force: - actuation	N	9	9
- positive opening operation	N	44	44

B11 = Snap action contacts 13 21 Zb 14 22	Catalog number	LS35P10B11	LS35P11B11
	Operation diagram	0 0.8 1.9 4.5 6.5 mm 21-22 / 13-14 21-22 / 13-14	0 0.8 1.9 4.5 6.5 mm 21-22 / 13-14 21-22 / 13-14
D11 = Non-overlapping slow action contacts 13 21 Zb 14 22	Catalog number	LS35P10D11	LS35P11D11
	Operation diagram	0 1.5 2.9 6.5 mm 21-22 / 13-14 2.7	0 1.5 2.9 6.5 mm 21-22 / 13-14 2.7
C11 = Overlapping slow action contacts 13 21 Zb 14 22 Zb	Catalog number	LS35P10C11	LS35P11C11
	Operation diagram	0 2.6 4.0 6.5 mm 21-22 / 13-14 1.5	0 2.6 4.0 6.5 mm 21-22 / 13-14 1.5
L02 = Slow action contacts 11 21 Zb 12 22	Catalog number	LS35P10L02	LS35P11L02
	Operation diagram	0 1.3 2.7 6.5 mm 11-12 / 21-22	0 1.3 2.7 6.5 mm 11-12 / 21-22
L20 = Slow action contacts 13 23 Zb 14 24 Zb	Catalog number	LS35P10L20	LS35P11L20
	Operation diagram	0 1.3 6.5 mm 13-14 / 23-24	0 1.3 6.5 mm 13-14 / 23-24
B02 = Snap action contacts 11 21 Zb 12 22	Catalog number	LS35P10B02	LS35P11B02
	Operation diagram	0 0.8 1.9 4.5 6.5 mm 11-12 / 21-22 11-12 / 21-22	0 0.8 1.9 4.5 6.5 mm 11-12 / 21-22 11-12 / 21-22
Weight (packing per unit)	oz.	2.29	2.46

Approximate dimensions (mm)





30mm, IP 65, UL Type 4, PG 13.5 and 1/2" NPT

30° Cam Translat.

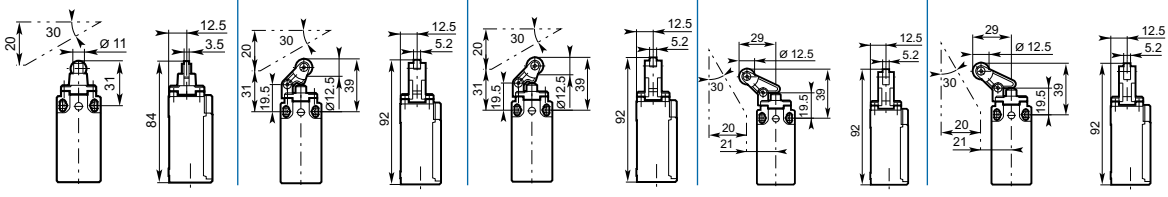
30° Unidirectional Cam Translation Movement





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	LS35P30B11	LS35P31B11	LS35P32B11	LS35P34B11
0 1.4 3.3 7.8 11.2 mm	0 3.0 7.1 16.9 24.4 mm	0 3.0 7.1 16.9 24.4 mm	0 2.6 6.2 14.7 21.3 mm	0 2.6 6.2 14.7 21.3 mm
21-22 13-14	21-22 13-14	21-22 13-14	21-22 13-14	21-22 13-14
21-22 13-14	21-22 13-14	21-22 13-14	21-22 13-14	21-22 13-14
LS35P13D11	LS35P30D11	LS35P31D11	LS35P32D11	LS35P34D11
0 2.6 5.1 11.4 mm	0 5.6 10.9 24.4 mm	0 5.6 10.9 24.4 mm	0 4.9 9.4 21.1 mm	0 4.9 9.4 21.1 mm
21-22 13-14	21-22 13-14	21-22 13-14	21-22 13-14	21-22 13-14
4.7	10.1	10.1	8.8	8.8
LS35P13C11	LS35P30C11	LS35P31C11	LS35P32C11	LS35P34C11
0 4.6 7.0 11.4 mm	0 9.8 15.0 24.4 mm	0 9.8 15.0 24.4 mm	0 8.5 13.0 21.1 mm	0 8.5 13.0 21.1 mm
21-22 13-14	21-22 13-14	21-22 13-14	21-22 13-14	21-22 13-14
2.6	5.6	5.6	4.9	4.9
LS35P13L02	LS35P30L02	LS35P31L02	LS35P32L02	LS35P34L02
0 2.3 4.7 11.4 mm	0 4.9 10.1 24.4 mm	0 4.9 10.1 24.4 mm	0 4.2 8.8 21.1 mm	0 4.2 8.8 21.1 mm
11-12 21-22	11-12 21-22	11-12 21-22	11-12 21-22	11-12 21-22
LS35P13L20	LS35P30L20	LS35P31L20	LS35P32L20	LS35P34L20
0 2.3 11.4 mm	0 4.9 24.4 mm	0 4.9 24.4 mm	0 4.2 21.1 mm	0 4.2 21.1 mm
13-14 23-24	13-14 23-24	13-14 23-24	13-14 23-24	13-14 23-24
LS35P13B02	LS35P30B02	LS35P31B02	LS35P32B02	LS35P34B02
0 1.4 3.3 7.8 11.2 mm	0 3.0 7.1 16.9 24.4 mm	0 3.0 7.1 16.9 24.4 mm	0 2.6 6.2 14.7 21.3 mm	0 2.6 6.2 14.7 21.3 mm
11-12 21-22	11-12 21-22	11-12 21-22	11-12 21-22	11-12 21-22
11-12 21-22	11-12 21-22	11-12 21-22	11-12 21-22	11-12 21-22
2.46	2.29	2.46	2.64	2.46

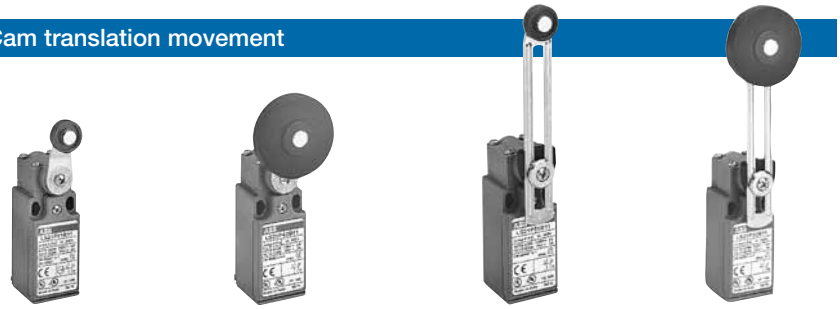
Approximate dimensions (in mm)



30mm, IP 65, UL Type 4, PG 13.5 and 1/2" NPT

Movement to be detected

30° Cam translation movement



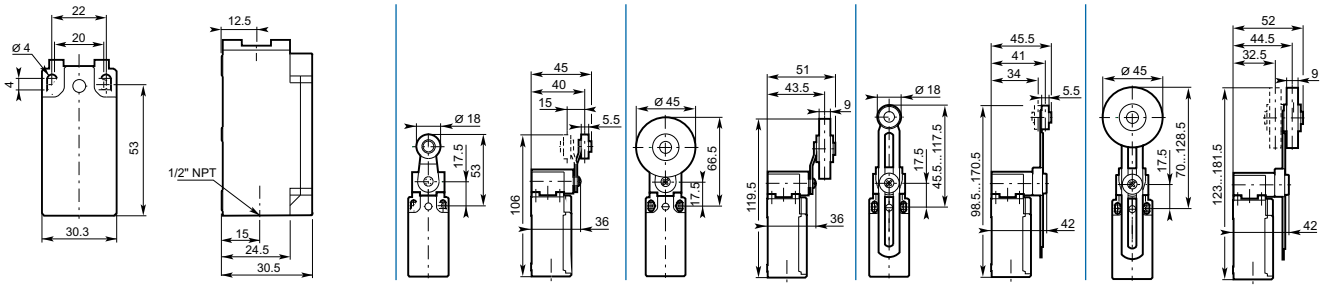
Operating head type

		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	—	—	—

Additional technical data

B11 = Snap action contacts	Catalog number	LS35P41B11	LS35P42B11	LS35P51B11	LS35P52B11
13 21 Zb 14 22	Operation diagram	0 9 23 55 77 / 21-22 13-14 / 21-22 13-14	0 9 23 77 / 21-22 13-14 / 21-22 13-14	0 9 23 77 / 21-22 13-14 / 21-22 13-14	0 9° 23° 77° / 21-22 13-14 / 21-22 13-14
D11 = Non-overlapping slow action contacts	Catalog number	LS35P41D11	LS35P42D11	LS35P51D11	LS35P52D11
13 21 Zb 14 22	Operation diagram	0 18 34 77 / 21-22 13-14 / 32	0 18 77 / 21-22 13-14 / 32	0 18 77 / 21-22 13-14 / 32	0 18° 77° / 21-22 13-14 / 32°
C11 = Overlapping slow action contacts	Catalog number	LS35P41C11	LS35P42C11	LS35P51C11	LS35P52C11
13 21 Zb 14 22	Operation diagram	0 30 49 77 / 21-22 13-14 / 18	0 30 77 / 21-22 13-14 / 18	0 30 77 / 21-22 13-14 / 18	0 30° 77° / 21-22 13-14 / 18°
L02 = Slow action contacts	Catalog number	LS35P41L02	LS35P42L02	LS35P51L02	LS35P52L02
11 21 Zb 12 22	Operation diagram	0 15 31 77 / 11-12 21-22	0 15 77 / 11-12 21-22	0 15 77 / 11-12 21-22	0 15° 77° / 11-12 21-22
L20 = Slow action contacts	Catalog number	LS35P41L20	LS35P42L20	LS35P51L20	LS35P52L20
13 23 Zb ⊗ 14 24	Operation diagram	0 15 77 / 13-14 23-24	0 15 77 / 13-14 23-24	0 15 77 / 13-14 23-24	0 1.3 6.5 mm / 13-14 23-24
B02 = Snap action contacts	Catalog number	LS35P41B02	LS35P42B02	LS35P51B02	LS35P52B02
11 21 Zb 12 22	Operation diagram	0 9 23 55 77 / 11-12 21-22 / 11-12 21-22	0 9 23 77 / 11-12 21-22 / 11-12 21-22	0 9 23 77 / 11-12 21-22 / 11-12 21-22	0 9 23 77 / 11-12 21-22 / 11-12 21-22
Weight (packing per unit)	oz.	3.17	4.23	3.52	4.58

Approximate dimensions (mm)

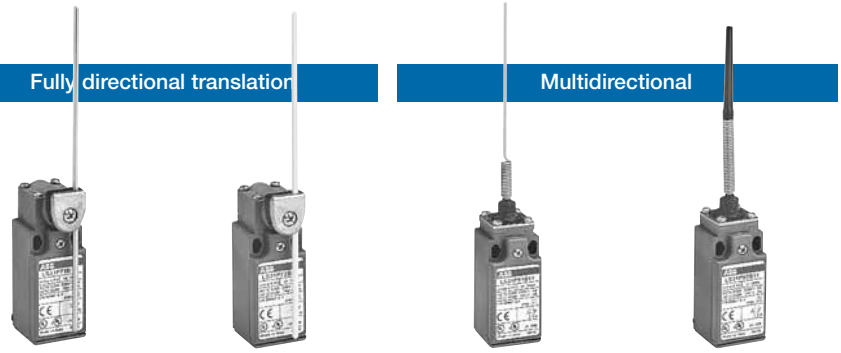


1SXU000023C0202 Rev. A

30mm, IP 65, UL Type 4, PG 13.5 and 1/2" NPT

Movement to be detected

Fully directional translation | Multidirectional



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	1.5	1	1
Min. torque: - actuation	N.m	0.10	0.10	0.12	0.12
- positive opening operation	N.m	—	—	—	—

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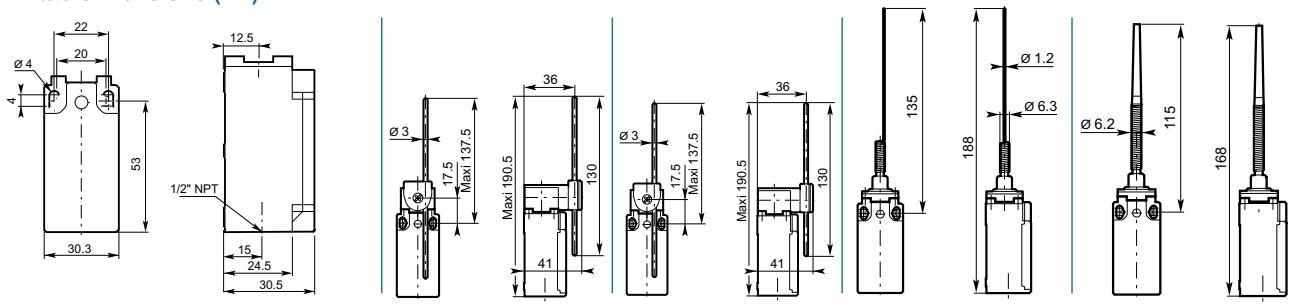
B11 = Snap action contacts	Catalog number	LS35P71B11	LS35P72B11	LS35P91B11	LS35P92B11
13 21 Zb 14 22	Operation diagram	0 9 23 77 / 21-22 13-14 / 21-22 13-14	0 9 23 77 / 21-22 13-14 / 21-22 13-14	0 6 16 52 / 21-22 13-14 / 21-22 13-14	0 6 16 52 / 21-22 13-14 / 21-22 13-14
D11 = Non-overlapping Slow action contacts	Catalog number	LS35P71D11	LS35P72D11	LS35P91D11	LS35P92D11
13 21 Zb 14 22	Operation diagram	0 18 77 / 21-22 13-14 / 32	0 18 77 / 21-22 13-14 / 32	0 12 50 / 21-22 13-14 / 21	0 12 50 / 21-22 13-14 / 21
C11 = Overlapping Slow action contacts	Catalog number	LS35P71C11	LS35P72C11	LS35P91C11	LS35P92C11
13 21 Zb 14 22	Operation diagram	0 30 77 / 21-22 13-14 / 18	0 30 77 / 21-22 13-14 / 18	0 19° 50° / 21-22 13-14 / 12°	0 19 50 / 21-22 13-14 / 12
L02 = Slow action contacts	Catalog number	LS35P71L02	LS35P72L02	LS35P91L02	LS35P92L02
11 21 Zb 12 22	Operation diagram	0 15 77 / 11-12 21-22	0 15 77 / 11-12 21-22	0 10 50 / 11-12 21-22	0 10 50 / 11-12 21-22
L20 = Slow action contacts	Catalog number	LS35P71L20	LS35P72L20	LS35P91L20	LS35P92L20
13 23 Zb ⇹ 14 24	Operation diagram	0 15 77 / 13-14 23-24	0 15 77 / 13-14 23-24	0 10 50 / 13-14 23-24	0 10 50 / 13-14 23-24
B02 = Snap action contacts	Catalog number	LS35P71B02	LS35P72B02	LS35P91B02	LS35P92B02
11 21 Zb 12 22	Operation diagram	0 9 23 77 / 11-12 21-22 / 11-12 21-22	0 9 23 77 / 11-12 21-22 / 11-12 21-22	0 6 16 52 / 11-12 21-22 / 11-12 21-22	0 6 16 52 / 11-12 21-22 / 11-12 21-22
Weight (packing per unit)	oz.	3.52	3.52	2.82	2.82

Approximate dimensions (mm)



40mm, IP 65, UL Type 4, PG 13.5 and 1/2" NPT

Movement to be detected

On end		30° Cam translation	Unidirectional

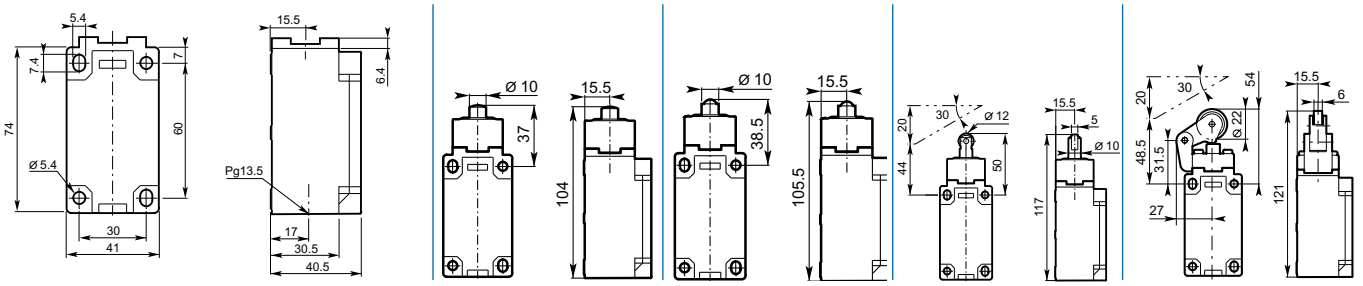



Operating head type

	Steel plain plunger	Steel ball plunger	Steel roller plunger	Polyamide roller lever
Conformity / ⊖ (N.C. contact with positive opening operation)	EN 50 041 ⊖	EN 50 041 ⊖	EN 50 041 ⊖	⊖
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

B11 = Snap action contacts	Catalog number	LS45P11B11	LS45P12B11	LS45P13B11	LS45P31B11
13 21 Zb 14 22	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
D11 = Non-overlapping Slow action contacts	Catalog number	LS45P11D11	LS45P12D11	LS45P13D11	LS45P31D11
13 21 Zb 14 22	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)
C11 = Overlapping Slow action contaacts	Catalog number	LS45P11C11	LS45P12C11	LS45P13C11	LS45P31C11
13 21 Zb 14 22	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)
L02 = Slow action contacts	Catalog number	LS45P11L02	LS45P12L02	LS45P13L02	LS45P31L02
11 21 Zb 12 22	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
L20 = Slow action contacts	Catalog number	LS45P11L20	LS45P12L20	LS45P13L20	LS45P31L20
13 23 Zb ⊗ 14 24	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
B02 = Snap action contacts	Catalog number	LS45P11B02	LS45P12B02	LS45P13B02	LS45P31B02
11 21 Zb 12 22	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)	oz	4.93	4.93	5.11	6.17

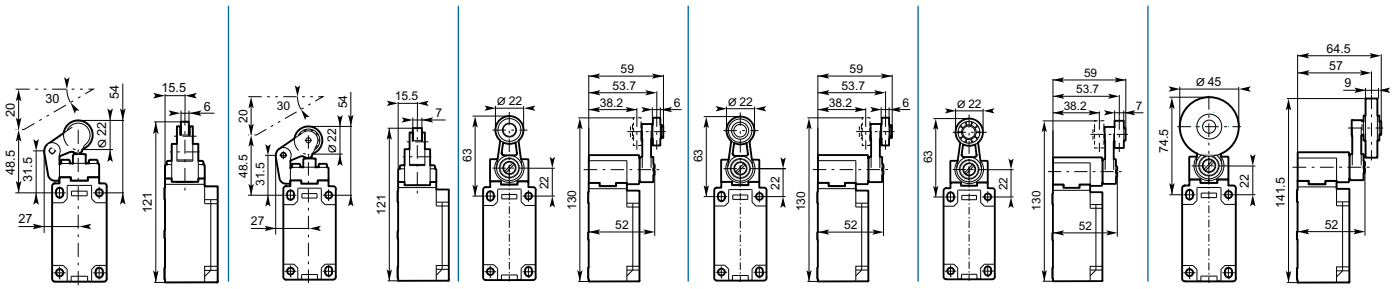
Approximate dimensions (mm)



40mm, IP 65, UL Type 4, PG 13.5 and 1/2" NPT

30° Cam translat.	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	LS45P33B11	LS45P41B11	LS45P42B11	LS45P43B11	LS45P44B11
LS45P32D11	LS45P33D11	LS45P41D11	LS45P42D11	LS45P43D11	LS45P44D11
LS45P32C11	LS45P33C11	LS45P41C11	LS45P42C11	LS45P43C11	LS45P44C11
LS45P32L02	LS45P33L02	LS45P41L02	LS45P42L02	LS45P43L02	LS45P44L02
LS45P32L20	LS45P33L20	LS45P41L20	LS45P42L20	LS45P43L20	LS45P44L20
LS45P32B02	LS45P33B02	LS45P41B02	LS45P42B02	LS45P43B02	LS45P44B02
6.52	6.52	6.52	6.87	6.87	7.23

Approximate dimensions (in mm)



40mm, IP 65, UL Type 4, PG 13.5 and 1/2" NPT

Movement to be detected

30° Cam translation movement

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	1.5	1.5	1.5
Min. torque: - actuation	N.m	0.15	0.15	0.15	0.15
- positive opening operation	N.m	—	—	—	—

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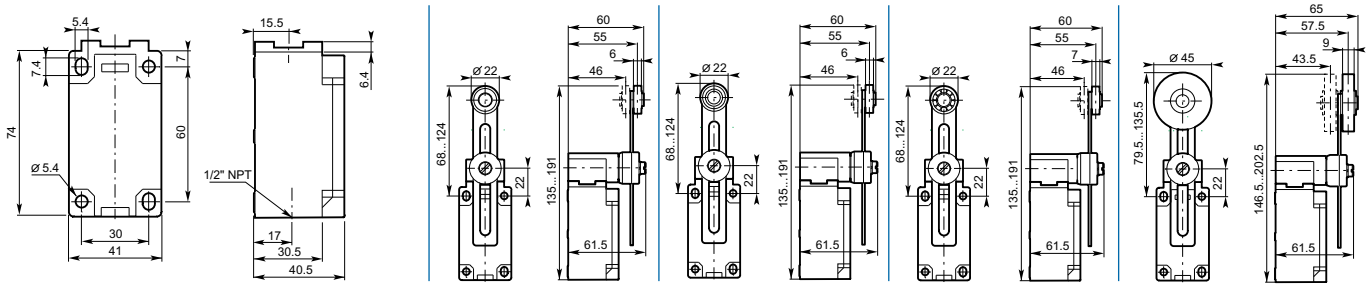
B11 = Snap action contacts	Catalog number	LS45P51B11	LS45P52B11	LS45P53B11	LS45P54B11
13 21 Zb 14 22	Operation diagram	0 9 21 87	0 9 21 87	0 9° 21° 87°	0 9 21 87
D11 = Non-overlapping Snap action contacts	Catalog number	LS45P51D11	LS45P52D11	LS45P53D11	LS45P54D11
13 21 Zb 14 22	Operation diagram	0 16 87 (30)	0 16 87 (30)	0 16° 87° (30°)	0 16 87 (30)
C11 = Overlapping Slow action contacts	Catalog number	LS45P51C11	LS45P52C11	LS45P53C11	LS45P54C11
13 21 Zb 14 22	Operation diagram	0 28 87 (16)	0 28 87 (16)	0 28° 87° (16°)	0 28 87 (16)
L02 - Slow action contacts	Catalog number	LS45P51L02	LS45P52L02	LS45P53L02	LS45P54L02
11 21 Zb 12 22	Operation diagram	0 14 87	0 14 87	0 14° 87°	0 14 87
L20 = Slow action contacts	Catalog number	LS45P51L20	LS45P52L20	LS45P53L20	LS45P54L20
13 23 Zb ⊖ 14 24	Operation diagram	0 14 87	0 14 87	0 14° 87°	0 14 87
B02 = Snap action contacts	Catalog number	LS45P51B02	LS45P52B02	LS45P53B02	LS45P54B02
11 21 Zb 12 22	Operation diagram	0 9 21 87	0 9 21 87	0 9° 21° 87°	0 9 21 87
Weight (packing per unit) oz		6.70	7.05	7.05	7.05

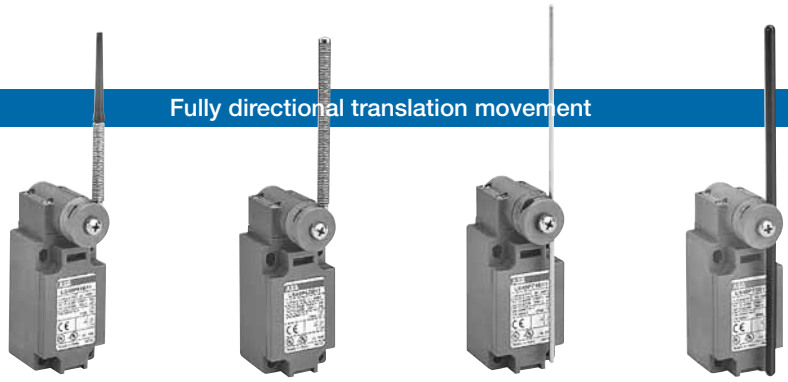
Approximate dimensions (in mm)



40mm, IP 65, UL Type 4, PG 13.5 and 1/2" NPT

Movement to be detected

Fully directional translation movement

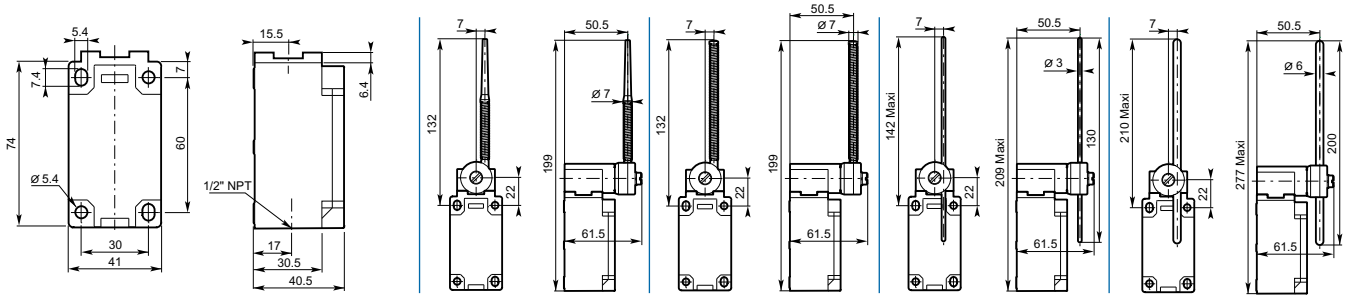


Operating head type

		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	–	–	–	–

B11 = Snap action contacts	Catalog number	LS45P61B11	LS45P62B11	LS45P71B11	LS45P72B11
13 21 Zb 14 22	Operation diagram	0 9 21 87 / 21-22 13-14 / 21-22 13-14	0 9 21 87 / 21-22 13-14 / 21-22 13-14	0 9 21 87 / 21-22 13-14 / 21-22 13-14	0 9 21 87 / 21-22 13-14 / 21-22 13-14
D11 = Non-overlapping Slow action contacts	Catalog number	LS45P61D11	LS45P62D11	LS45P71D11	LS45P72D11
13 21 Zb 14 22	Operation diagram	0 16 87 / 21-22 13-14 / 30	0 16 87 / 21-22 13-14 / 30	0 16 87 / 21-22 13-14 / 30	0 16 87 / 21-22 13-14 / 30
C11 = Overlapping Slow action contacts	Catalog number	LS45P61C11	LS45P62C11	LS45P71C11	LS45P72C11
13 21 Zb 14 22	Operation diagram	0 28 87 / 21-22 13-14 / 16	0 28 87 / 21-22 13-14 / 16	0 28 87 / 21-22 13-14 / 16	0 28 87 / 21-22 13-14 / 16
L02 - Slow action contacts	Catalog number	LS45P61L02	LS45P62L02	LS45P71L02	LS45P72L02
11 21 Zb 12 22	Operation diagram	0 14 87 / 11-12 21-22	0 14 87 / 11-12 21-22	0 14 87 / 11-12 21-22	0 14 87 / 11-12 21-22
L20 = Slow action contacts	Catalog number	LS45P61L20	LS45P62L20	LS45P71L20	LS45P72L20
13 23 Zb ⊖ 14 24	Operation diagram	0 14 87 / 13-14 23-24	0 14 87 / 13-14 23-24	0 14 87 / 13-14 23-24	0 14 87 / 13-14 23-24
B02 = Snap action contacts	Catalog number	LS45P61B02	LS45P62B02	LS45P71B02	LS45P72B02
11 21 Zb 12 22	Operation diagram	0 9 21 87 / 11-12 21-22 / 11-12 21-22	0 9 21 87 / 11-12 21-22 / 11-12 21-22	0 9 21 87 / 11-12 21-22 / 11-12 21-22	0 9 21 87 / 11-12 21-22 / 11-12 21-22
Weight (packing per unit)	oz	6.70	6.70	6.52	6.52

Approximate dimensions (in mm)



40mm, IP 65, UL Type 4, PG 13.5 and 1/2" NPT

Movement to be detected

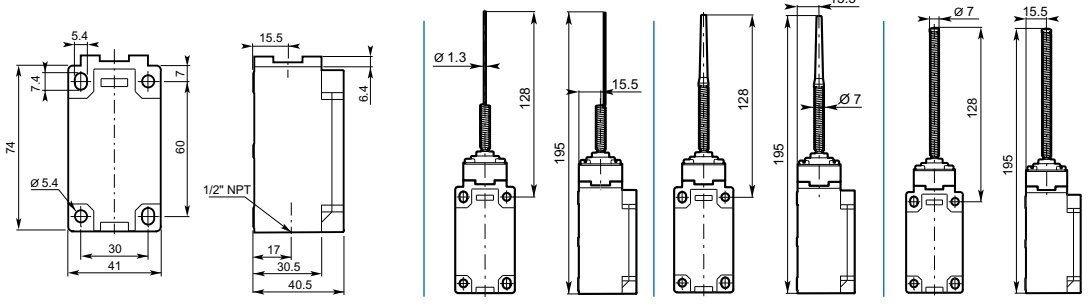
Multidirectional

Operating head type

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

B11 = Snap action contacts	Catalog number	LS45P91B11	LS45P92B11	LS45P93B11
13 21 Zb 14 22	Operation diagram	0 6 14 59; 21-22 13-14; 21-22 13-14	0 6 14 59; 21-22 13-14; 21-22 13-14	0 6 14 59; 21-22 13-14; 21-22 13-14
D11 = Non-overlapping Slow action contacts	Catalog number	LS45P91D11	LS45P92D11	LS45P93D11
13 21 Zb 14 22	Operation diagram	0 12 65; 21-22 13-14; 23	0 12 65; 21-22 13-14; 23	0 12 65; 21-22 13-14; 23
C11 = Overlapping Slow action contacts	Catalog number	LS45P91C11	LS45P92C11	LS45P93C11
13 21 Zb 14 22	Operation diagram	0 21 65; 21-22 13-14; 12	0 21 65; 21-22 13-14; 12	0 21 65; 21-22 13-14; 12
L02 = Slow action contacts	Catalog number	LS45P91L02	LS45P92L02	LS45P93L02
11 21 Zb 12 22	Operation diagram	0 11 65; 11-12 21-22	0 11 65; 11-12 21-22	0 11 65; 11-12 21-22
L20 = Slow action contacts	Catalog number	LS45P91L20	LS45P92L20	LS45P93L20
13 23 Zb ⊖ 14 24	Operation diagram	0 11 65; 13-14 23-24	0 11 65; 13-14 23-24	0 11 65; 13-14 23-24
B02 = Snap action contacts	Catalog number	LS45P91B02	LS45P92B02	LS45P93B02
11 21 Zb 12 22	Operation diagram	0 6 14 59; 11-12 21-22; 11-12 21-22	0 6 14 59; 11-12 21-22; 11-12 21-22	0 6 14 59; 11-12 21-22; 11-12 21-22
Weight (packing per unit)	oz	4.76	4.93	5.11

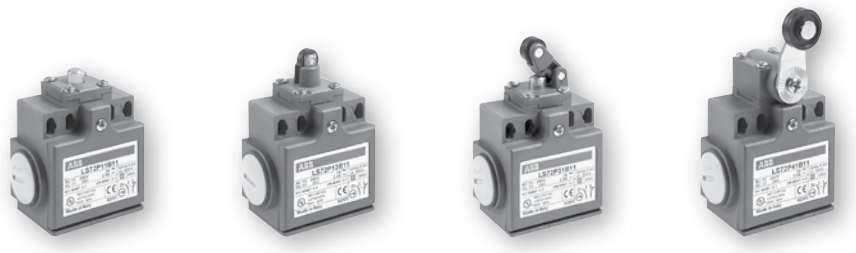
Approximate dimensions (in mm)



Notes

60mm, IP 65, UL Type 4, PG 13.5 and 1/2" NPT

Movement to be detected	On end	30° Cam Translat.	Unidirectional	30° Cam Translat.



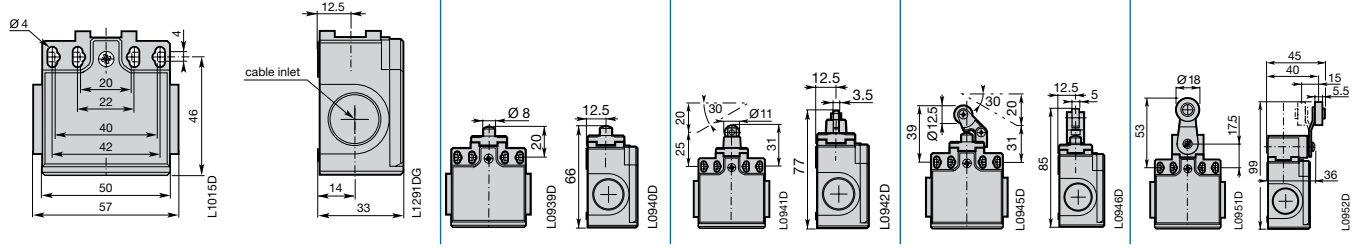
Actuator	Metal plunger	ø11 plastic roller plunger	ø12.5 plastic roller lever on steel plunger	ø18 plastic roller lever
Conformity / ⊖ (N.C. contact with positive opening operation) –	⊖ –	⊖ –	⊖ –	⊖
Maximum actuation speed	0.5 m/s	0.3 m/s	1 m/s	1.5 m/s
Min. force / torque: - actuation	15 N	12 N	7 N	0.1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

B11 = Snap action contacts	Catalog Number	LS75P11B11	LS75P13B11	LS75P31B11	LS75P41B11
13 21 Zb 14 22	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 17° 31° 47° 74°
D11 = Non-overlapping Slow action contacts	Catalog Number	LS75P11D11	LS75P13D11	LS75P31D11	LS75P41D11
13 21 Zb 14 22	Operation diagram	0 1.9 3.5 5.6 mm, 2.8	0 3.4 6.3 9.6 mm, 5.1	0 6.0 10.5 21.0 mm, 8.6	0 21° 37° 74°, 30°
Weight (packing per unit)	oz	3.52	3.52	3.70	4.40

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

Closed contact / Open contact

Approximate dimensions (mm)



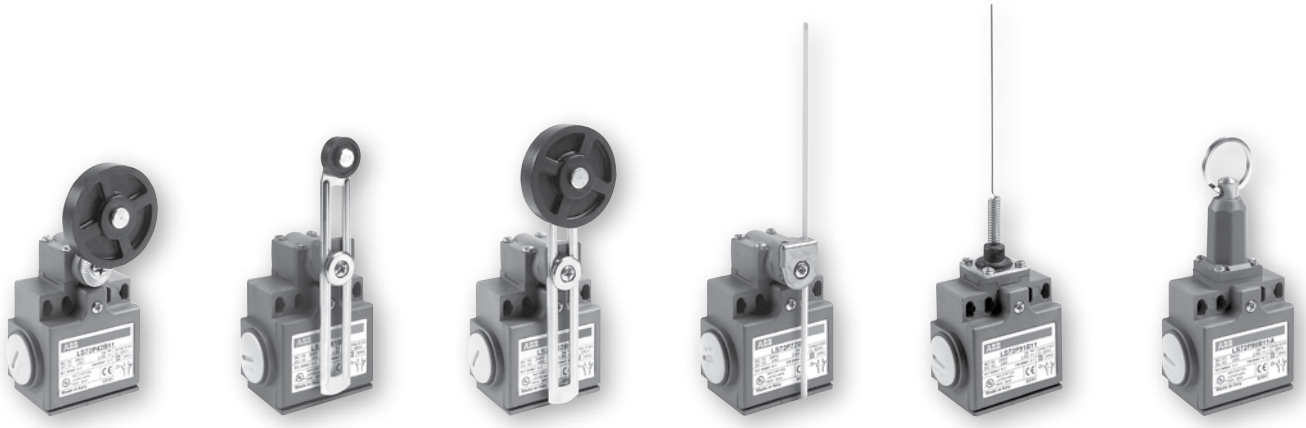
60mm, IP 65, UL Type 4, PG 13.5 and 1/2" NPT

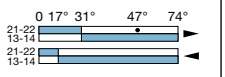
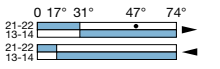
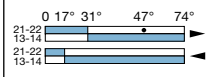
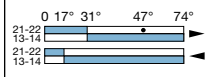
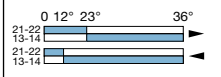
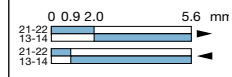
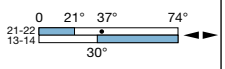
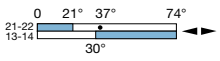
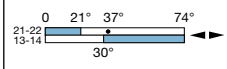
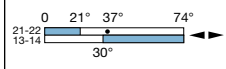
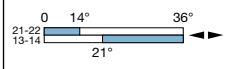
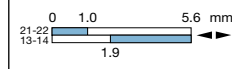
30° Cam Translation Movement

Fully Direction Trans.

Multidirectional

Pull action

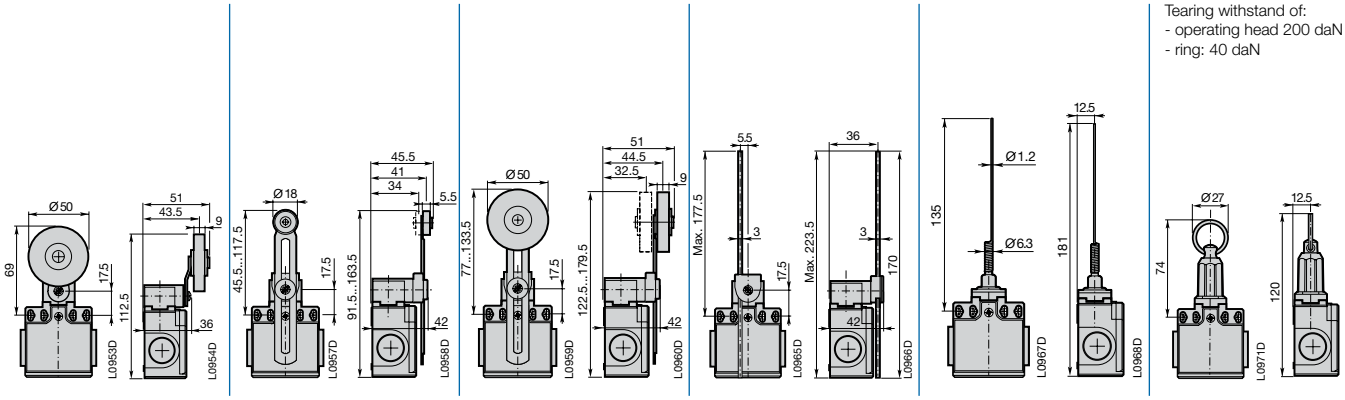


ø50 rubber roller lever	Adjustable ø18 plastic roller lever	Adjustable ø50 rubber roller lever	Adjustable ø3 fibre-glass rod lever	Spring rod lever	Pull action with ring
– ⊕ –	– ⊕ –	– ⊕ –	– ⊕ –	– –	– –
1.5 m/s 0.1 N.m 0.32 N.m	1.5 m/s 0.1 N.m 0.32 N.m	1.5 m/s 0.1 N.m 0.32 N.m	1.5 m/s 0.1 N.m 0.32 N.m	1 m/s 0.12 N.m –	0.5 m/s 30 N –
LS75P42B11	LS75P51B11	LS75P52B11	LS75P72B11	LS75P91B11	LS75P98B11-A
					
LS75P42D11	LS75P51D11	LS75P52D11	LS75P72D11	LS75P91D11	LS75P98D11-A
					
5.11	4.76	5.46	4.23	3.88	5.11

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

Closed contact / Open contact

Approximate dimensions (in mm)



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

Notes

① For 60mm components, contact factory.

Components
Catalog number explanation
30mm, IP 65, UL Type 4

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

LS35P40B11

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)

LSA30X41

LS A 30 X 41

Limit Switch ..... **LS**

Actuator (lever, key) ..... **A**

Casing width: 30 mm **30**

For casing of:
M ..... **M**etal
P ..... **P**lastic
X ..... Plastic or metal

Actuator:
05, 06 ..... key
41, 42 ..... non-adjustable roller lever
51, 52 ..... adjustable roller lever
71, 72, 73, 74 ..... adjustable rod lever

Separate contact blocks

LSC30XD11

LS C 30 X D 11

Limit Switch ..... **LS**

Contact blocks ..... **C**

Casing width 30 mm **30**

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

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

Components
Selection guide
30mm, IP 65, UL Type 4

Non-adjustable actuators

LSA30X42 ⊗

LSA30X41 ⊗ (A Shape)

Roller levers (non-adjustable)

Adjustable actuators

LSA30X52 ⊗

LSA30X51 ⊗

Adjustable roller levers

LSA30X71 ⊗

LSA30X72 ⊗

LSA30X73 ⊗

LSA30X74 ⊗

Adjustable rod levers

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

LS35P40B11

⊖ "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.

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

Contact blocks						Positive opening operation	Actuation speed max. m/s	Unit weight oz. (1 pc)	Catalog number
Zb	Zb	Zb	Zb	Za	Zb				
B11	D11	C11	L02	L20	B02				
1						⊖	1.5	3.24	LS35P40B11
	1					⊖	1.5	3.24	LS35P40D11
		1				⊖	1.5	3.24	LS35P40C11
			1			⊖	1.5	3.24	LS35P40L02
				1		⊗	1.5	3.24	LS35P40L20
					1	⊖	1.5	3.24	LS35P40B02

LS35P50B11

LSA30X41

LSA30X42

LSA30X51

LSA30X71

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 oz (1 pc)	Catalog number
Zb	Zb	Zb	Zb	Za	Zb				
B11	D11	C11	L02	L20	B02				
1						⊗	1.5	3.24	LS35P50B11
	1					⊗	1.5	3.24	LS35P50D11
		1				⊗	1.5	3.24	LS35P50C11
			1			⊗	1.5	3.24	LS35P50L02
				1		⊗	1.5	3.24	LS35P50L20
					1	⊗	1.5	3.24	LS35P50B02
Actuators for LS35P40 (delivered with M3.5 screw)									
To be actuated by 30° cam									
ø 18mm polyamide roller lever ①						⊖	–	0.42	LSA30X41
ø 45mm rubber roller lever ①						⊗	–	0.91	LSA30X42
Actuators for LS35P50 (delivered with M3.5 screw and adaptation parts)									
To be actuated by 30° cam									
ø 18mm adjustable polyamide roller lever ①						⊗	–	0.77	LSA30X51
ø 45mm adjustable rubber roller lever ①						⊗	–	1.23	LSA30X52
To be actuated by fully directional translation movement									
ø 3mm adjustable inox rod lever, 170mm ①						⊗	–	0.74	LSA30X71
ø 3mm adjustable fiberglass rod lever, 170mm ①						⊗	–	0.52	LSA30X72
ø 6mm adjustable polyamide rod lever, 195mm ①						⊗	–	0.63	LSA30X73
ø 6mm adjustable fiberglass rod lever, 195mm ①						⊗	–	0.77	LSA30X74
Right angle key for LS35P15									
Right angle key (mounting 13mm)						⊖	–	0.45	LSA30P05
Straight key for LS35P16									
Straight key (mounting 13mm)						⊖	–	0.45	LSA30P06
Separate contact blocks									
1 NC & 1 NO 2-pole snap action						⊖	–	0.88	LSC30XB11
1 NC & 1 NO 2-pole non-overlapping slow action						⊖	–	0.88	LSC30XD11
1 NO & 1 NC 2-pole non-overlapping slow action						⊖	–	0.88	LSC30XC11
2 NC 2-pole simultaneous slow action						⊖	–	0.88	LSC30XL02
2 NO 2-pole simultaneous slow action						⊗	–	0.88	LSC30XL20
2 NC 2-pole snap action						⊖	–	0.88	LSC30XB02
1/2" NPT plastic adaptors									
1 piece						–	–	0.24	LSR1305

① Free position adjustment of lever 10° by 10° over 360°.

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 mm **4**

Cable inlet
1 cable inlet for Pg 13.5 cable gland **0**
1 cable inlet for 1/2" NPT **5**

Plastic casing ..... **P**

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

8

Operating heads

LSTH41

LS T H 41

Limit Switch ..... **LS**

Operating head ..... **T**

For plastic casing 40 mm width **40**

Operator head:
11 ... 14, 19 .... with rectilinear movement (plain plunger, steel ball plunger or roller plunger
31 ... 37 ..... with rectilinear movement (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) actuator to be ordered separately
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.)

LSA40X51

LS A 40 X 51

Limit Switch ..... **LS**

Actuator (roller) ..... **A**

Casing width: 40 mm **40**

For casing of:
M ..... **M**etal
P ..... **P**lastic
X ..... Plastic or metal

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

Separate contact blocks

LSC40XC11

LS C 40 X C 11

Limit Switch ..... **LS**

Contact blocks ..... **C**

Casing width: 40 mm **40**

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

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

Components
Selection guide
40mm, IP 65, UL Type 4

Rectilinear motion


LSTH37 ⊖


LSTH33 ⊖


LSTH36 ⊖


LSTH32 ⊖


LSTH12 ⊖
(B Shape)


LSTH35 ⊖


LSTH19 ⊖
(C Shape)


LSTH14 ⊖
(B Shape)


LSTH31 ⊖


LSTH13 ⊖
(C Shape)


LSTH11 ⊖
(B Shape)

Angular motion


LSTH54 ⊗


LSTH93 ⊗


LSTH72 ⊗
(D Shape)


LSTH53 ⊗


LSTH44 ⊗


LSTH71 ⊗
(D Shape)


LSTH92 ⊗


LSTH43 ⊖
(A Shape)


LSTH52 ⊗


LSTH62 ⊗


LSTH42 ⊖
(A Shape)


LSTH51 ⊗


LSTH91 ⊗


LSTH61 ⊗


LSTH41 ⊖
(A Shape)

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

Angular motion

LSA40X44 ⊗

LSA40X43 ⊖
(A Shape)

LSA40X42 ⊖
(A Shape)

LSA40X41 ⊖
(A Shape)

LSA40X54 ⊗

LSA40X72 ⊗
(D Shape)

LSA40X53 ⊗

LSA40X71 ⊗
(D Shape)

LSA40X52 ⊗

LSA40X62 ⊗

LSA40X51 ⊗

LSA40X61 ⊗

Roller levers

LSTH40 ⊖

Adjustable or flexible levers

LSTH50 ⊗

LSTH50 angular motion head
For flexible or adjustable levers LSA40X51 ... LSA40X54, LSA40X61, LSA40X62, LSA40X71 and LSA40X72

LSTH40 angular motion head
For roller levers (non-adustable)
LSA40X41 ... LSA40X44

Bodies with contact block

⊖ LS45P00B11, LS45P00D11, LS45P00C11, LS45P00L02, LS45P00B02

⊗ LS45P00L20

Contact blocks

⊖ LSC40XB11, LSC40XD11, LSC40XC11, LSC40XL02, LSC40XB02

⊗ LSC40XL20

⊖ : 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 oz (1 pc)	Catalog number
Zb	Zb	Zb	Zb	Za	Zb				
B11	D11	C11	L02	L20	B02				
1						⊖	—	3.80	LS45P00B11
	1					⊖	—	3.80	LS45P00D11
		1				⊖	—	3.80	LS45P00C11
			1			⊖	—	3.80	LS45P00L02
				1		⊗	—	3.80	LS45P00L20
					1	⊖	—	3.80	LS45P00B02
Rectilinear motion heads with actuator									
To be actuated by end									
Steel plain plunger (zinc-plated)						⊖	0.5	1.48	LSTH11
Steel plain plunger (zinc-plated) and dust protection cup						⊖	0.5	1.51	LSTH14
Steel ball plunger						⊖	0.5	1.48	LSTH12
To be actuated by 30° cam									
Steel roller plunger (zinc-plated)						⊖	0.5	1.69	LSTH13
Steel roller plunger (zinc-plated) and dust protection cup						⊖	0.5	1.69	LSTH19
To be actuated unidirectionally by 30° cam									
ø 22mm polyamide roller lever on steel plunger (zinc-plated)						⊖	1.5	1.62	LSTH31
ø 22mm polyamide roller lever on steel plunger (zinc-plated) & dust protection cup						⊖	1.5	1.72	LSTH35
ø 22mm stainless steel roller lever on steel plunger (zinc-plated).						⊖	1.5	1.94	LSTH32
ø 22mm stainless steel roller lever on steel plunger (zinc-plated) & dust protection cup						⊖	1.5	2.04	LSTH36
ø 22mm steel ball-bearing roller lever on steel plunger (zinc-plated)						⊖	1.5	2.01	LSTH33
ø 22mm steel ball-bearing roller lever on steel plunger (zinc-plated) & dust protection cup						⊖	1.5	2.11	LSTH37

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.


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 oz (1 pc)	Catalog number
Angular motion heads with actuator				
To be actuated by 30° cam				
ø 22mm polyamide roller lever ①	⊖	1.5	2.89	LSTH41
ø 22mm stainless steel roller lever ①	⊖	1.5	3.20	LSTH42
ø 22mm steel ball-bearing roller lever ①	⊖	1.5	3.28	LSTH43
ø 45mm rubber roller lever ①	⊗	1.5	3.45	LSTH44
ø 22mm adjustable polyamide roller lever ①	⊗	1.5	3.10	LSTH51
ø 22mm adjustable stainless steel roller lever ①	⊗	1.5	3.45	LSTH52
ø 22mm adjustable steel ball-bearing roller lever ①	⊗	1.5	3.52	LSTH53
ø 45mm adjustable rubber roller lever ①	⊗	1.5	3.70	LSTH54
To be actuated by fully directional translation movement				
Stainless steel flexible lever with insulated end ①	⊗	1	2.92	LSTH61
Stainless steel coil spring lever ①	⊗	1	3.13	LSTH62
ø 3mm adjustable stainless steel rod lever, 195mm①	⊗	1	3.06	LSTH71
ø 6mm adjustable polyamide rod lever, 195mm ①	⊗	1	2.92	LSTH72
ø 6mm adjustable fiberglass rod lever, 195mm ①	⊗	1	3.06	LSTH73
Multidirectional angular motion heads (to be actuated by fully directional translation movement)				
Stainless steel spring rod	⊗	1	1.62	LSTH91
Stainless steel flexible rod with insulated end	⊗	1	1.72	LSTH92
Stainless steel coil spring rod	⊗	1	1.94	LSTH93
Angular motion head without actuator for non-adjustable roller levers (delivered with M5 screw and washer)	⊖	1.5	1.76	LSTH40
Actuators for angular motion head LSTH40				
ø 22mm polyamide roller lever ①	⊖	—	1.12	LSA40X41
ø 22mm stainless steel roller lever ①	⊖	—	1.48	LSA40X42
ø 22mm steel ball-bearing roller lever ①	⊖	—	1.55	LSA40X43
ø 45mm rubber roller lever ①	⊗	—	1.76	LSA40X44

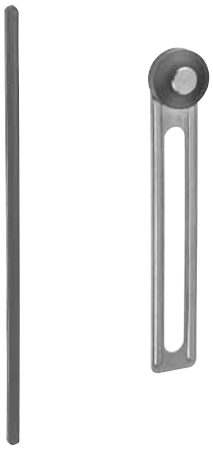
① Free position adjustment of lever 9° by 9° over 360°.

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.

LSTH50



LSA40X72 LSA40X51

LSC40XB11

	Positive opening operation	Actuation speed max. m/s	Unit weight oz (1 pc)	Catalog number
Angular motion head without actuator, for flexible or adjustable levers (delivered with M5 screw, washer & adaptation parts)	⊗	–	2.04	LSTH50
Actuators for angular motion head LSTH50				
ø 22mm adjustable polyamide roller lever ①	⊗	–	0.81	LSA40X51
ø 22mm adjustable stainless steel roller lever ①	⊗	–	1.12	LSA40X52
ø 22mm adjustable steel ball-bearing roller lever ①	⊗	–	1.19	LSA40X53
ø 45mm adjustable rubber roller lever ①	⊗	–	1.37	LSA40X54
Stainless steel flexible lever with insulated end ①	⊗	–	0.59	LSA40X61
Stainless steel coil spring lever ①	⊗	–	0.81	LSA40X62
ø 3mm adjustable stainless steel rod lever, 195mm ①	⊗	–	0.49	LSA40X71
ø 6mm adjustable polyamide rod lever, 195mm ①	⊗	–	0.35	LSA40X72
ø 6mm adjustable fiberglass rod lever, 195mm ①	⊗	–	0.49	LSA40X73
Contact blocks (with adaptor)				
1 NC & 1 NO 2-pole snap action	⊖	–	1.12	LSC40XB11
1 NC & 1 NO 2-pole non-overlapping slow action	⊖	–	1.12	LSC40XD11
1 NO & 1 NC 2-pole overlapping slow action	⊖	–	1.12	LSC40XC11
2 NC 2-pole simultaneous slow action	⊖	–	1.12	LSC40XL02
2 NO 2-pole simultaneous slow action	⊗	–	1.12	LSC40XL20
2 NC 2-pole snap action	⊖	–	1.12	LSC40XB02

	Positive opening operation	Actuation speed max. m/s	Unit weight oz (1 pc)	Catalog number
Contact blocks (with adaptor)				
1 NC & 1 NO 2-pole snap action	⊖	–	1.12	LSC40XB11
1 NC & 1 NO 2-pole non-overlapping slow action	⊖	–	1.12	LSC40XD11
1 NO & 1 NC 2-pole overlapping slow action	⊖	–	1.12	LSC40XC11
2 NC 2-pole simultaneous slow action	⊖	–	1.12	LSC40XL02
2 NO 2-pole simultaneous slow action	⊗	–	1.12	LSC40XL20
2 NC 2-pole snap action	⊖	–	1.12	LSC40XB02

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

Technical data
Plastic limit switches
30mm, 40mm & 60mm

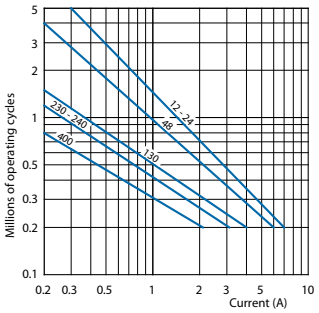
Technical data
Plastic limit switches

Technical data
IP 65, UL Type 4

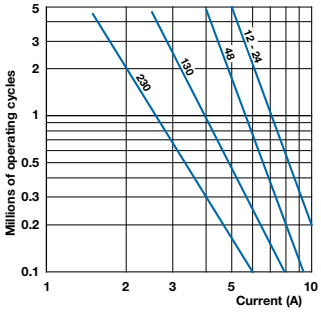
General technical data

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 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			
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
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 ≤ 40 °C		A	10
Short-circuit protection U_e ≤ 500 V a.c. - gG (gl) type fuses		A	10
Rated operational current I_e / AC-15 (according to IEC 947-5-1)	24 V - 50/60 Hz 130 V - 50/60 Hz 230 V - 50/60 Hz 240 V - 50/60 Hz 400 V - 50/60 Hz	A A A A A	 10 5.5 3.1 3 1.8
I_e / DC-13 (according to IEC 947-5-1)	24 V - d.c. 110 V - d.c. 250 V - d.c.	A A A	2.8 0.6 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 of operations	15, 10, 5, > 1 } LS | 30, 31, 40 } P { 10 – 12; 30 – 34 13; 41 – 44; 51– 54; 61 – 72 91– 93 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



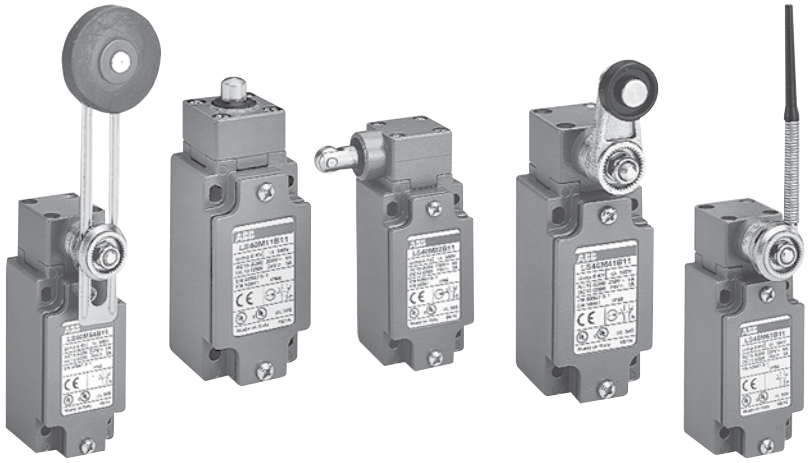
AC-15 — Slow action



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

Limit Switches
Metal casing, 30mm, 40mm & 60mm



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 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.

Metal Limit switches

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

Applications

Easy to use, electromechanical limit switches offer specific qualities:

- Visible operation.
- Able to switch strong currents (10 A conventional thermal current).
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Limit switches used for these mechanical applications:

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

Description

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

The casings come in 3 dimensions:

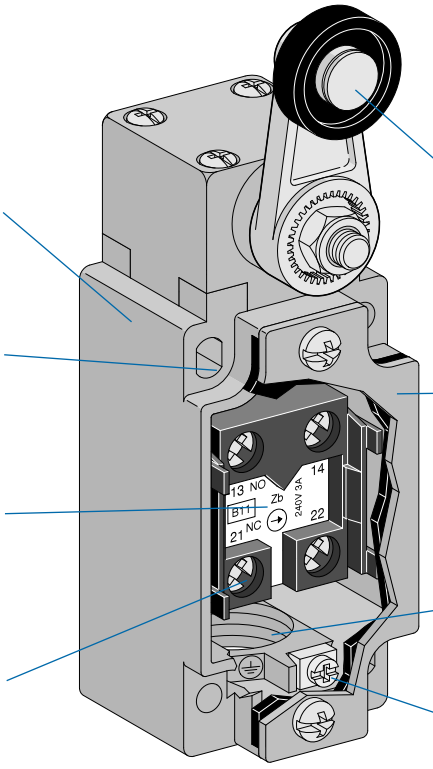
- 30mm width
  – LS35M
- 40mm width
  – LS45M
- 60mm width
  – LS65M

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 3 x M3 screws for 30mm width
- 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 ⏚
- 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 eonnection
0: pg 13.5
1: pg 11
5: 1/2" NPT

Metal casing

Operating heads (see selection guides)
30mm = codes 10...91
40mm = codes 11...92
60mm = codes 11...91 ①

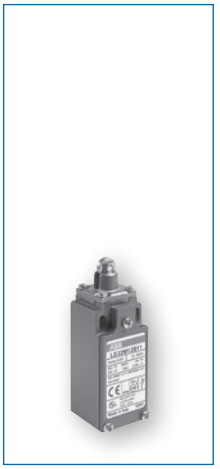
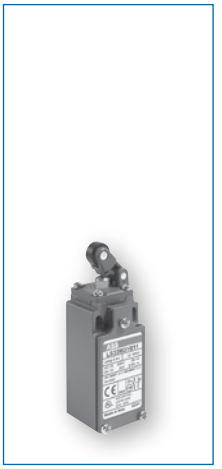
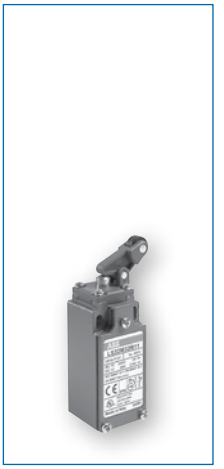
Contact block
11: 1 N.O. contact + 1 N.C. contact
20: 2 N.O. contacts
02: 2 N.C. contacts

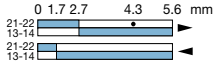
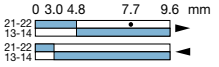
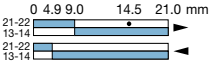
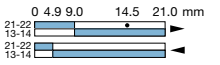
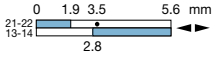
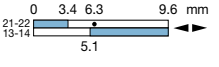
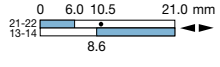
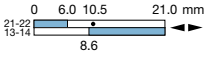
Contact type
B: Zb Snap action
L: Zb Slow action (contact dependent)
D: Zb Slow action non—overlapping late make
C: Zb Slow action overlapping early make

① For 60mm components, contact factory.

30mm, IP66, UL Type 4X, PG 13.5 and 1/2" NPT

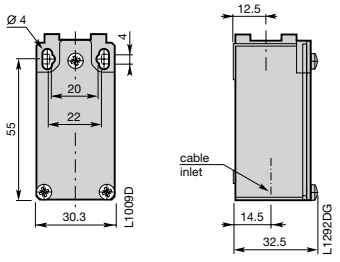
Movement to be detected

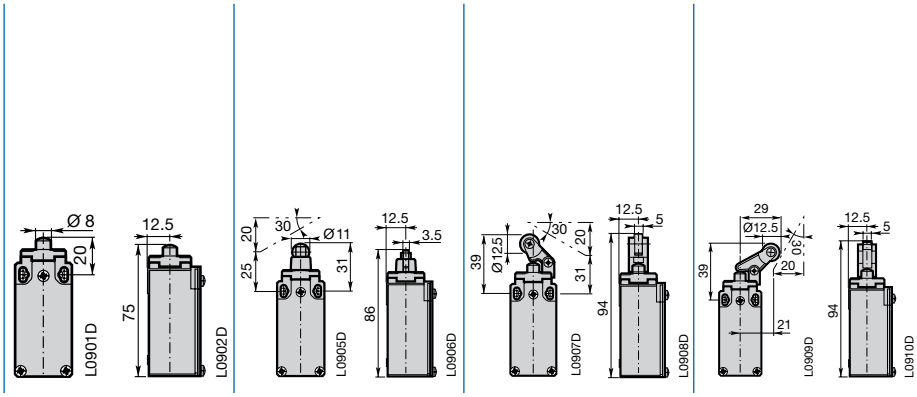
	On end	30° Cam Translat.	30° Unidirectional Cam Translation	
				
Actuator	**Metal plunger**	**Metal roller plunger**	**ø12.5 plastic roller lever on steel plunger**	**ø12.5 plastic roller lever on steel plunger**
Conformity / ⊖ (N.C. contact with positive opening operation)	EN 50047 (B shape) ⊖	EN 50047 (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

B11 = Snap action contacts	Catalog number	LS35M11B11	LS35M12B11	LS35M31B11	LS35M32B11
 Zb	Operation diagram				
D11 = Non-overlapping Slow action contacts	Catalog number	LS35M11D11	LS35M12D11	LS35M31D11	LS35M32D11
 Zb	Operation diagram				
Weight (packing per unit)	oz	6.34	6.52	6.17	6.17

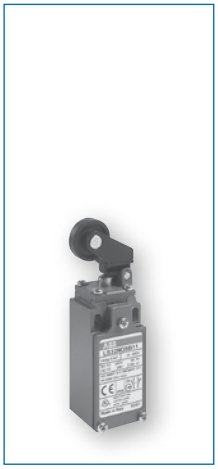
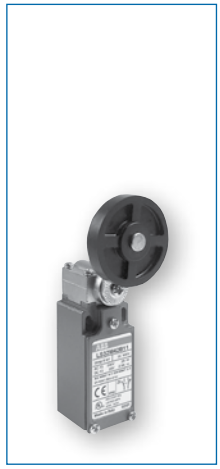
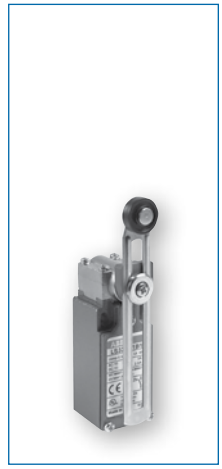
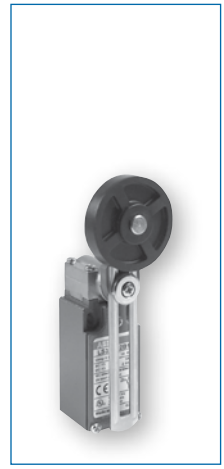
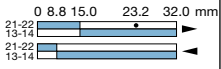
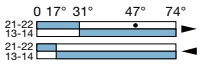
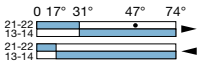
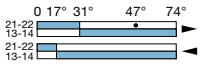
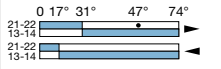
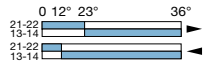
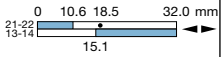
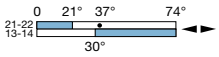
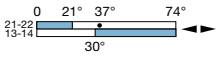
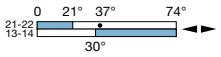
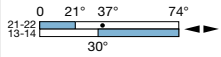
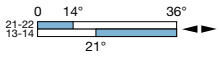
Closed contact / Open contact

Dimensions (mm)

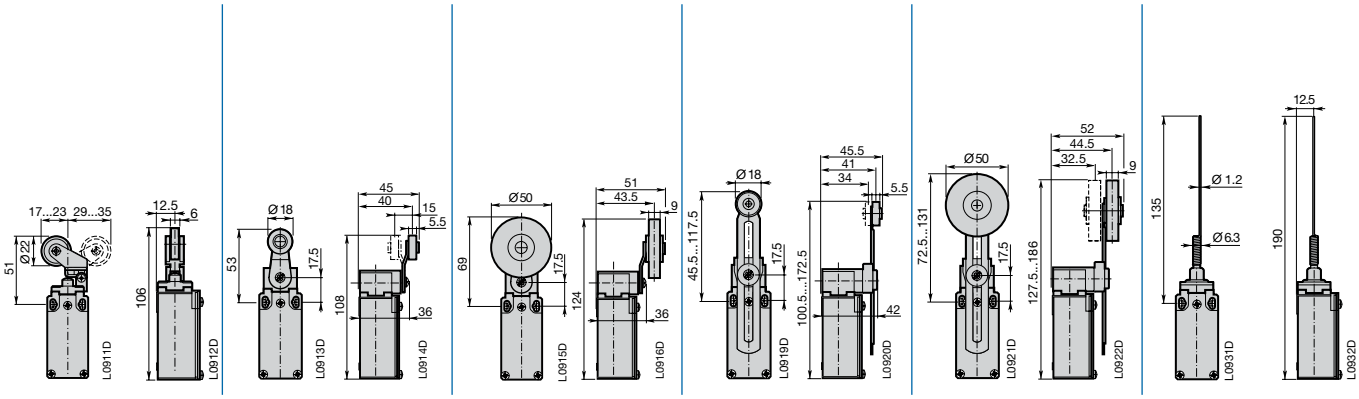




30mm, IP66, UL Type 4X, PG 13.5 and 1/2" NPT

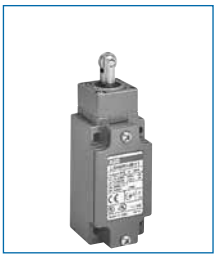
Unidirectional	30° Cam Translation Movement				Multidirectional
					
ø22 plastic roller lever on steel plunger	ø18 plastic roller lever	ø50 rubber roller lever	Adjustable ø18 plastic roller lever	Adjustable ø50 rubber roller lever	Spring rod lever
–	EN 50047 (A shape)	–	–	–	–
1 m/s	1.5 m/s	1.5 m/s	1.5 m/s	1.5 m/s	1 m/s
7 N	0.1 N.m	0.1 N.m	0.1 N.m	0.1 N.m	0.12 N.m
24 N	0.32 N.m	0.32 N.m	0.32 N.m	0.32 N.m	–
LS35M38B11	LS35M41B11	LS35M42B11	LS35M51B11	LS35M52B11	LS35M91B11
					
LS35M38D11	LS35M41D11	LS35M42D11	LS35M51D11	LS35M52D11	LS35M91D11
					
6.34	8.11	8.99	8.46	9.34	6.34

Closed contact / Open contact



40mm, IP66, UL Type 4X, PG 13.5 and 1/2" NPT

Movement to be detected

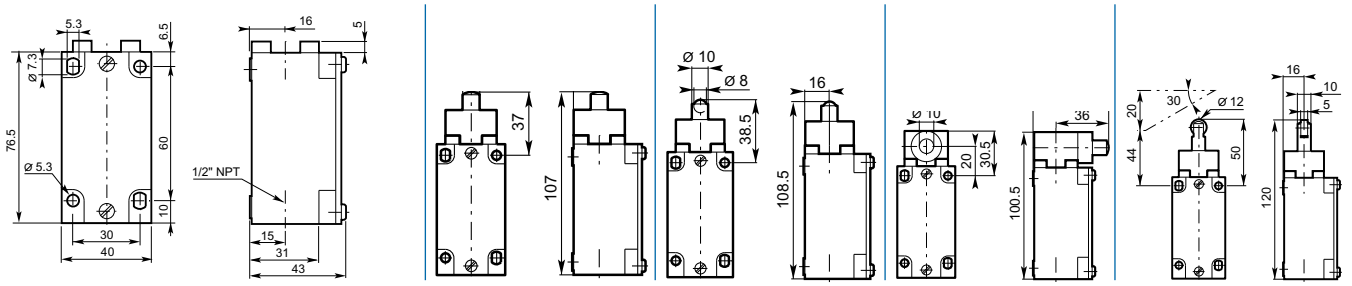
On end			30° Cam
			

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	N	22	22	30	16
- positive opening operation	N	66	66	70	48

B11 = Snap action contacts	Catalog number	LS45M11B11	LS45M12B11	LS45M21B11	LS45M13B11
13 21 / 14 22 Zb	Operation diagram	0 0.8 1.9 4.5 6.5 mm 21-22 13-14 21-22 13-14	0 0.8 1.9 4.5 6.5 mm 21-22 13-14 21-22 13-14	0 0.9 2.1 4.9 7.1 mm 21-22 13-14 21-22 13-14	0 1.5 3.5 8.4 12.1 mm 21-22 13-14 21-22 13-14
D11 = Non-overlapping Slow action contacts	Catalog number	LS45M11D11	LS45M12D11	LS45M21D11	LS45M13D11
13 21 / 14 22 Zb	Operation diagram	0 1.5 2.9 6.5 mm 21-22 13-14 2.7	0 1.5 2.9 6.5 mm 21-22 13-14 2.7	0 1.8 3.5 7.9 mm 21-22 13-14 3.2	0 3.5 6.8 15.2 mm 21-22 13-14 6.3
C11 = Overlapping Slow action contacts	Catalog number	LS45M11C11	LS45M12C11	LS45M21C11	LS45M13C11
13 21 / 14 22 Zb	Operation diagram	0 2.6 4.0 6.5 mm 21-22 13-14 1.5	0 2.6 4.0 6.5 mm 21-22 13-14 1.5	0 3.2 4.9 7.9 mm 21-22 13-14 1.8	0 6.1 9.3 15.2 mm 21-22 13-14 3.5
L02 = Slow action contacts	Catalog number	LS45M11L02	LS45M12L02	LS45M21L02	LS45M13L02
11 21 / 12 22 Zb	Operation diagram	0 1.3 2.7 6.5 mm 11-12 21-22	0 1.3 2.7 6.5 mm 11-12 21-22	0 1.6 3.3 7.9 mm 11-12 21-22	0 3.0 6.3 15.2 mm 11-12 21-22
L20 = Slow action contacts	Catalog number	LS45M11L20	LS45M12L20	LS45M21L20	LS45M13L20
13 23 / 14 24 Zb ⊗	Operation diagram	0 1.3 6.5 mm 13-14 23-24	0 1.3 6.5 mm 13-14 23-24	0 1.6 7.9 mm 13-14 23-24	0 3.0 15.2 mm 13-14 23-24
B02 = Snap action contacts	Catalog number	LS45M11B02	LS45M12B02	LS45M21B02	LS45M13B02
11 21 / 12 22 Zb	Operation diagram	0 0.8 1.9 4.5 6.5 mm 11-12 21-22 11-12 21-22	0 0.8 1.9 4.5 6.5 mm 11-12 21-22 11-12 21-22	0 0.9 2.1 4.9 7.1 mm 11-12 21-22 11-12 21-22	0 1.5 3.5 8.4 12.1 mm 11-12 21-22 11-12 21-22
Weight (packing per unit)	oz	8.46	8.46	9.17	8.46

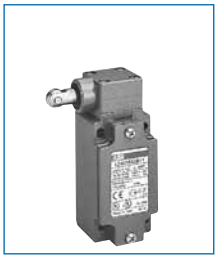
Dimensions (mm)



40mm, IP66, UL Type 4X, PG 13.5 and 1/2" NPT

Movement to be detected

30° Cam translation movement



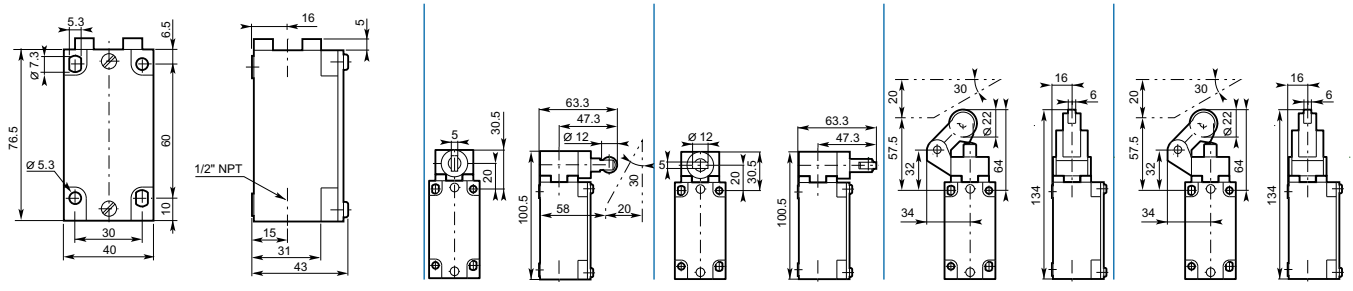

Operating head type

		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	N	30	30	12	12
- positive opening operation	N	70	70	40	40

8

B11 = Snap action contacts	Catalog number	LS45M22B11	LS45M23B11	LS45M31B11	LS45M32B11
13 21 Zb 14 22	Operation diagram	0 1.6 3.8 9.0 13.0 mm; 21-22 13-14	0 1.6 3.8 9.0 13.0 mm; 21-22 13-14	0 1.9 4.6 10.9 15.8 mm; 21-22 13-14	0 1.9 4.6 10.9 15.8 mm; 21-22 13-14
D11 = Non-overlapping Slow action contacts	Catalog number	LS45M22D11	LS45M23D11	LS45M31D11	LS45M32D11
13 21 Zb 14 22	Operation diagram	0 4.2 8.1 18.1 mm; 21-22 13-14; 7.5	0 4.2 8.1 18.1 mm; 21-22 13-14; 7.5	0 3.0 5.8 13.0 mm; 21-22 13-14; 5.4	0 3.0 5.8 13.0 mm; 21-22 13-14; 5.4
C11 = Overlapping Slow action contacts	Catalog number	LS45M22C11	LS45M23C11	LS45M31C11	LS45M32C11
13 21 Zb 14 22	Operation diagram	0 7.2 11.1 18.1 mm; 21-22 13-14; 4.2	0 7.2 11.1 18.1 mm; 21-22 13-14; 4.2	0 5.2 8.0 13.0 mm; 21-22 13-14; 3.0	0 5.2 8.0 13.0 mm; 21-22 13-14; 3.0
L02 = Slow action contacts	Catalog number	LS45M22L02	LS45M23L02	LS45M31L02	LS45M32L02
11 21 Zb 12 22	Operation diagram	0 3.6 7.5 18.1 mm; 11-12 21-22	0 3.6 7.5 18.1 mm; 11-12 21-22	0 2.6 5.4 13.0 mm; 11-12 21-22	0 2.6 5.4 13.0 mm; 11-12 21-22
L20 = Slow action contacts	Catalog number	LS45M22L20	LS45M23L20	LS45M31L20	LS45M32L20
13 23 Zb ⊗ 14 24	Operation diagram	0 3.6 18.1 mm; 13-14 23-24	0 3.6 18.1 mm; 13-14 23-24	0 2.6 13.0 mm; 13-14 23-24	0 2.6 13.0 mm; 13-14 23-24
B02 = Snap action contacts	Catalog number	LS45M22B02	LS45M23B02	LS45M31B02	LS45M32B02
11 21 Zb 12 22	Operation diagram	0 1.6 3.8 9.0 13.0 mm; 11-12 21-22	0 1.6 3.8 9.0 13.0 mm; 11-12 21-22	0 1.9 4.6 10.9 15.8 mm; 11-12 21-22	0 1.9 4.6 10.9 15.8 mm; 11-12 21-22
Weight (packing per unit)	oz	9.34	9.34	9.70	0.9.87

Dimensions (mm)



40mm, IP66, UL Type 4X, PG 13.5 and 1/2" NPT

Movement to be detected

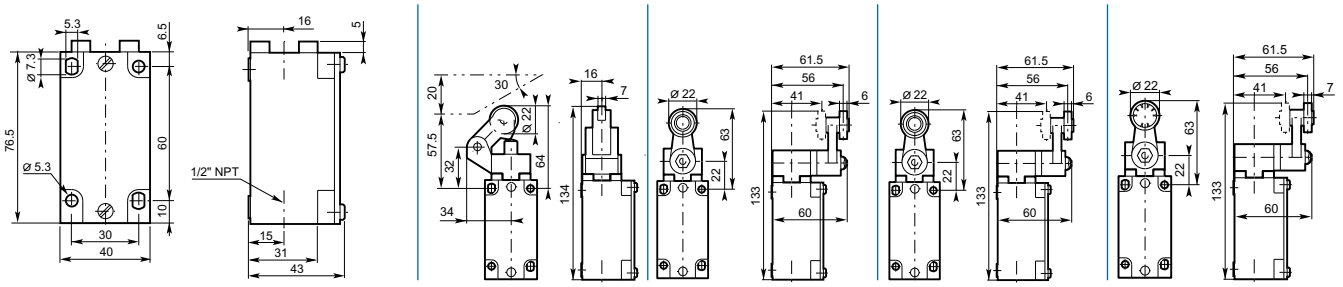
Unidirectional	30° Cam translation movement		
			

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

B11 = Snap action contacts	Catalog number	LS45M33B11	LS45M41B11	LS45M42B11	LS45M43B11
	List price				
13 21 Zb 14 22	Operation diagram	0 1.9 4.6 10.9 15.8 mm	0 9 21 50 87	0 9 21 50 87	0 9 21 50 87
D11 = Non-overlapping slow action contacts	Catalog number	LS45M33D11	LS45M41D11	LS45M42D11	LS45M43D11
	List price				
13 21 Zb 14 22	Operation diagram	0 3.0 5.8 13.0 mm (5.4)	0 16 31 87 (30)	0 16 31 87 (30)	0 16 31 87 (30)
C11 = Overlapping slow action contacts	Catalog number	LS45M33C11	LS45M41C11	LS45M42C11	LS45M43C11
	List price				
13 21 Zb 14 22	Operation diagram	0 5.2 8.0 13.0 mm (3.0)	0 28 45 87 (16)	0 28 45 87 (16)	0 28 45 87 (16)
L02 = Slow action contacts	Catalog number	LS45M33L02	LS45M41L02	LS45M42L02	LS45M43L02
	List price				
11 21 Zb 12 22	Operation diagram	0 2.6 5.4 13.0 mm	0 14 29 87	0 14 29 87	0 14 29 87
L20 = Slow action contacts	Catalog number	LS45M33L20	LS45M41L20	LS45M42L20	LS45M43L20
	List price				
13 23 Zb ⊗ 14 24	Operation diagram	0 2.6 13.0 mm	0 14 87	0 14 87	0 14 87
B02 = Snap action contacts	Catalog number	LS45M33B02	LS45M41B02	LS45M42B02	LS45M43B02
	List price				
11 21 Zb 12 22	Operation diagram	0 1.9 4.6 10.9 15.8 mm	0 9 21 50 87	0 0.9 2.1 4.9 7.1 mm	0 9 21 50 87
Weight (packing per unit)	oz	9.87	9.87	9.87	9.87

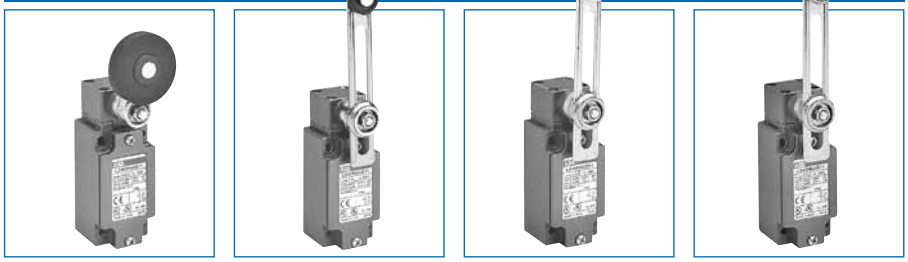
Dimensions (mm)



40mm, IP66, UL Type 4X, PG 13.5 and 1/2" NPT

Movement to be detected

30° Cam translation movement



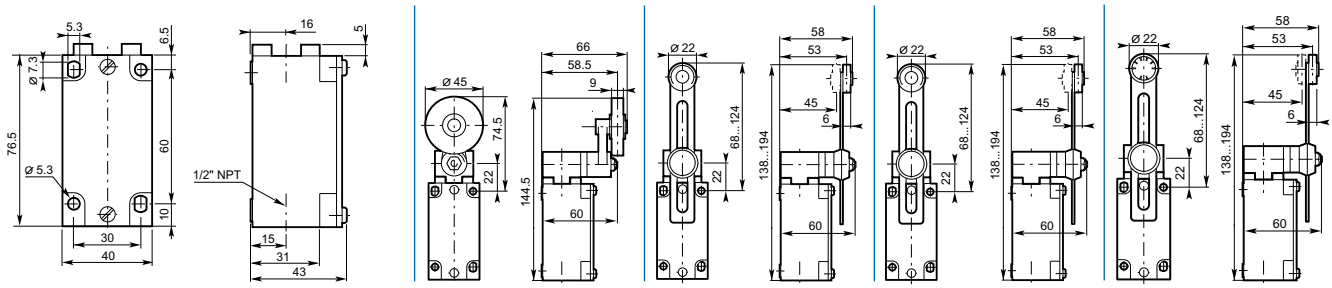
Operating head type

		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	–	–	–	–

8

B11 = Snap action contacts	Catalog number	LS45M44B11	LS45M51B11	LS45M52B11	LS45M53B11
13 21 Zb 14 22	Operation diagram	0 9 21 87 / 21-22 13-14 / 21-22 13-14	0 9 21 87 / 21-22 13-14 / 21-22 13-14	0 9 21 87 / 21-22 13-14 / 21-22 13-14	0 9 21 87 / 21-22 13-14 / 21-22 13-14
D11 = Non-overlapping slow action contacts	Catalog number	LS45M44D11	LS45M51D11	LS45M52D11	LS45M53D11
13 21 Zb 14 22	Operation diagram	0 16 87 / 21-22 13-14 / 30	0 16 87 / 21-22 13-14 / 30	0 16 87 / 21-22 13-14 / 30	0 16 87 / 21-22 13-14 / 30
C11 = Overlapping slow action contacts	Catalog number	LS45M44C11	LS45M51C11	LS45M52C11	LS45M53C11
13 21 Zb 14 22	Operation diagram	0 28 87 / 21-22 13-14 / 16	0 28 87 / 21-22 13-14 / 16	0 28 87 / 21-22 13-14 / 16	0 28 87 / 21-22 13-14 / 16
L02 = Slow action contacts	Catalog number	LS45M44L02	LS45M51L02	LS45M52L02	LS45M53L02
11 21 Zb 12 22	Operation diagram	0 14 87 / 11-12 21-22	0 14 87 / 11-12 21-22	0 14 87 / 11-12 21-22	0 14 87 / 11-12 21-22
L20 = Slow action contacts	Catalog number	LS45M44L20	LS45M51L20	LS45M52L20	LS45M53L20
13 23 Zb ⊗ 14 24	Operation diagram	0 14 87 / 13-14 23-24	0 14 87 / 13-14 23-24	0 14 87 / 13-14 23-24	0 14 87 / 13-14 23-24
B02 = Snap action contacts	Catalog number	LS45M44B02	LS45M51B02	LS45M52B02	LS45M53B02
11 21 Zb 12 22	Operation diagram	0 9 21 87 / 11-12 21-22 / 11-12 21-22	0 9 21 87 / 11-12 21-22 / 11-12 21-22	0 9 21 87 / 11-12 21-22 / 11-12 21-22	0 9 21 87 / 11-12 21-22 / 11-12 21-22
Weight (packing per unit)	oz	10.93	10.22	10.58	10.58

Dimensions (mm)



40mm, IP66, UL Type 4X, PG 13.5 and 1/2" NPT

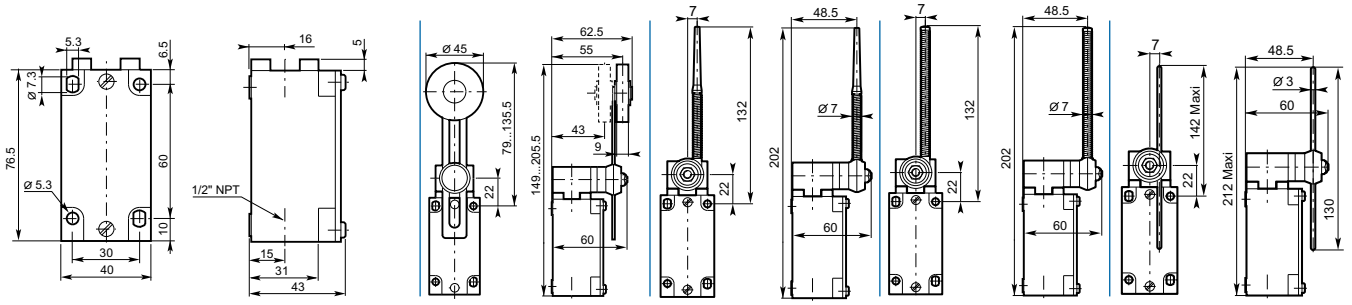
Movement to be detected

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	–	–	–	–

B11 = Snap action contacts	Catalog number	LS45M54B11	LS45M61B11	LS45M62B11	LS45M71B11
13 21 Zb 14 22	Operation diagram	0 9 21 87 / 21-22 13-14 / 21-22 13-14	0 9 21 87 / 21-22 13-14 / 21-22 13-14	0 9 21 87 / 21-22 13-14 / 21-22 13-14	0 9 21 87 / 21-22 13-14 / 21-22 13-14
D11 = Non-overlapping Slow action contacts	Catalog number	LS45M54D11	LS45M61D11	LS45M62D11	LS45M71D11
13 21 Zb 14 22	Operation diagram	0 16 87 / 21-22 13-14 / 30	0 16 87 / 21-22 13-14 / 30	0 16 87 / 21-22 13-14 / 30	0 16 87 / 21-22 13-14 / 30
C11 = Overlapping Slow action contacts	Catalog number	LS45M54C11	LS45M61C11	LS45M62C11	LS45M71C11
13 21 Zb 14 22	Operation diagram	0 28 87 / 21-22 13-14 / 16	0 28 87 / 21-22 13-14 / 16	0 28 87 / 21-22 13-14 / 16	0 28 87 / 21-22 13-14 / 16
L02 = Slow action contacts	Catalog number	LS45M54L02	LS45M61L02	LS45M62L02	LS45M71L02
11 21 Zb 12 22	Operation diagram	0 14 87 / 11-12 21-22	0 14 87 / 11-12 21-22	0 14 87 / 11-12 21-22	0 14 87 / 11-12 21-22
L20 = Slow action contacts	Catalog number	LS45M54L20	LS45M61L20	LS45M62L20	LS45M71L20
13 23 Zb ⊗ 14 24	Operation diagram	0 14 87 / 13-14 23-24	0 14 87 / 13-14 23-24	0 14 87 / 13-14 23-24	0 14 87 / 13-14 23-24
B02 = Snap action contacts	Catalog number	LS45M54B02	LS45M61B02	LS45M62B02	LS45M71B02
11 21 Zb 12 22	Operation diagram	0 9 21 87 / 11-12 21-22 / 11-12 21-22	0 9 21 87 / 11-12 21-22 / 11-12 21-22	0 9 21 87 / 11-12 21-22 / 11-12 21-22	0 9 21 87 / 11-12 21-22 / 11-12 21-22
Weight (packing per unit)	oz	11.11	10.22	10.40	10.05

Dimensions (mm)



40mm, IP66, UL Type 4X, PG 13.5 and 1/2" NPT

Movement to be detected

Translation (cont.)

Multidirectional

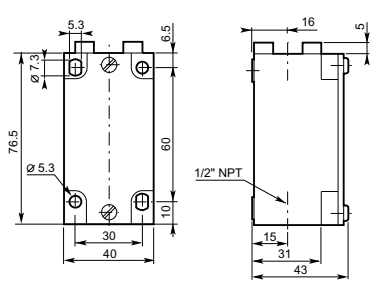
Operating head type

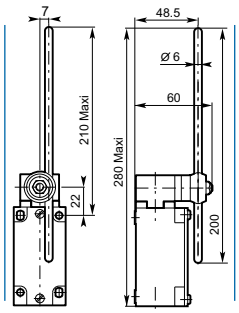
		Adjustable Ø 6 polyamide rod lever	Spring rod	Flexible rod with insulated end	Coil spring rod
Conformity / ⊖ (N.C. contact with positive opening operation)		EN 50 041			
Maximum actuation speed	m/s	1.5	1	1	1
Min. torque: - actuation	N.m	0.15	0.18	0.18	0.18
- positive opening operation	N.m	–	–	–	–

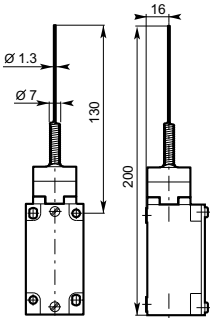
8

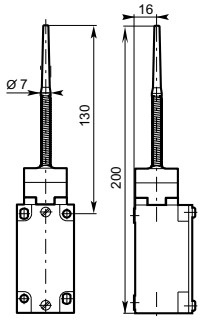
B11 = Snap action contacts	Catalog number	LS45M72B11	LS45M91B11	LS45M92B11	LS45M93B11
13 21 Zb 14 22	Operation diagram	0 9 21 87 / 21-22 13-14 / 21-22 13-14	0 6 14 59 / 21-22 13-14 / 21-22 13-14	0 6 14 59 / 21-22 13-14 / 21-22 13-14	0 6 14 59 / 21-22 13-14 / 21-22 13-14
D11 = Non-overlapping Slow action contacts	Catalog number	LS45M72D11	LS45M91D11	LS45M92D11	LS45M93D11
13 21 Zb 14 22	Operation diagram	0 16 87 / 21-22 13-14 / 30	0 12 65 / 21-22 13-14 / 23	0 12 65 / 21-22 13-14 / 23	0 12 65 / 21-22 13-14 / 23
C11 = Overlapping Slow action contacts	Catalog number	LS45M72C11	LS45M91C11	LS45M92C11	LS45M93C11
13 21 Zb 14 22	Operation diagram	0 28 87 / 21-22 13-14 / 16	0 21 65 / 21-22 13-14 / 12	0 21 65 / 21-22 13-14 / 12	0 21 65 / 21-22 13-14 / 12
L02 = Slow action contacts	Catalog number	LS45M72L02	LS45M91L02	LS45M92L02	LS45M93L02
11 21 Zb 12 22	Operation diagram	0 14 87 / 11-12 21-22	0 11 65 / 11-12 21-22	0 11 65 / 11-12 21-22	0 11 65 / 11-12 21-22
L20 = Slow action contacts	Catalog number	LS45M72L20	LS45M91L20	LS45M92L20	LS45M93L20
13 23 Zb ⊗ 14 24	Operation diagram	0 14 87 / 13-14 23-24	0 11 65 / 13-14 23-24	0 11 65 / 13-14 23-24	0 11 65 / 13-14 23-24
B02 = Snap action contacts	Catalog number	LS45M72B02	LS45M91B02	LS45M92B02	LS45M93B02
11 21 Zb 12 22	Operation diagram	0 9 21 87 / 11-12 21-22 / 11-12 21-22	0 6 14 59 / 11-12 21-22 / 11-12 21-22	0 6 14 59 / 11-12 21-22 / 11-12 21-22	0 6 14 59 / 11-12 21-22 / 11-12 21-22
Weight (packing per unit)	oz	10.05	8.28	8.28	8.28

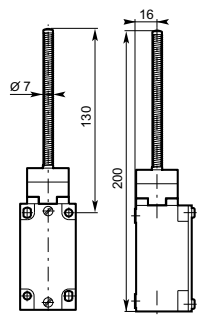
Dimensions (mm)





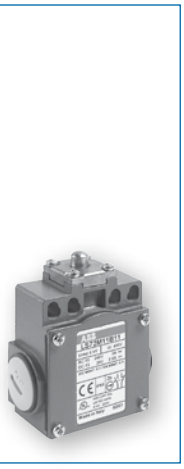
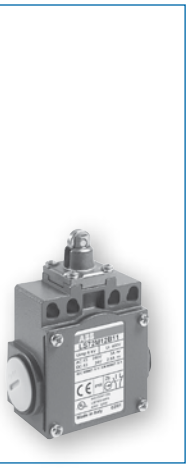
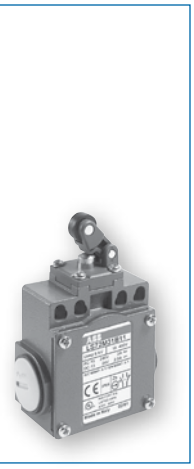






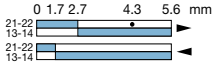
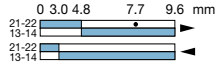
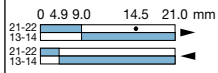
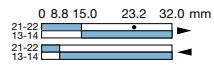
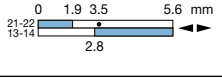
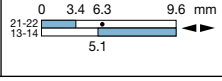
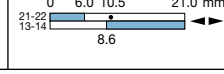
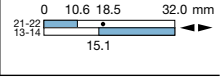
60mm, IP66, UL Type 4X, PG 13.5 and 1/2" NPT

Movement to be detected:

On end	30° Cam Translat.	Unidirectional 30° Cam Translation	
			

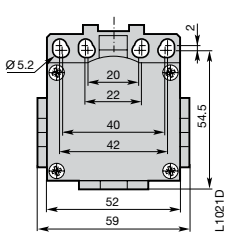
Actuator

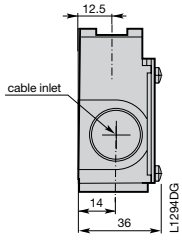
	Metal plunger	ø11 metal roller plunger	ø12.5 plastic roller lever on steel plunger	ø22 plastic roller lever on steel plunger
Conformity / ⊖ (N.C. contact with positive opening operation)	– ⊖ –	– ⊖ –	– ⊖ –	⊖
Maximum actuation speed	0.5 m/s	0.3 m/s	1 m/s	1 m/s
Min. force / torque: - actuation	15 N	12 N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

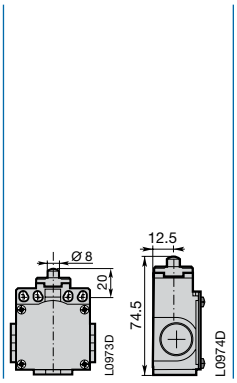
B11 - Snap action contacts	Catalog number	LS75M11B11	LS75M12B11	LS75M31B11	LS75M38B11
 Zb	Operation diagram				
D11 = Non-overlapping Slow action contacts	Catalog number	LS75M11D11	LS75M12D11	LS75M31D11	LS75M38D11
 Zb	Operation diagram				
Weight (packing per unit)	oz	9.52	9.87	9.34	9.52

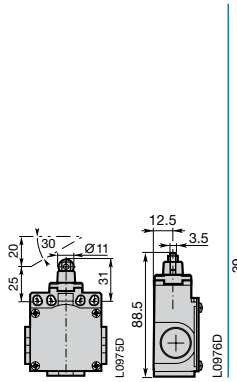
Closed contact / Open contact

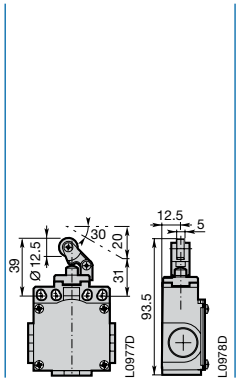
Dimensions (mm)

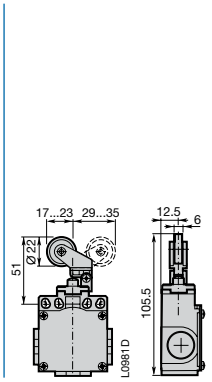






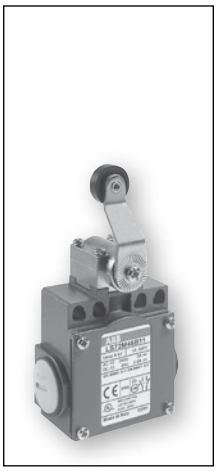
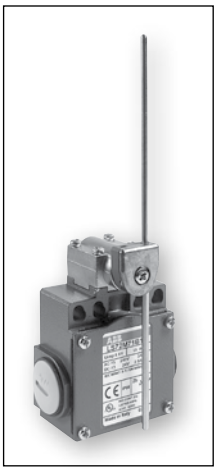
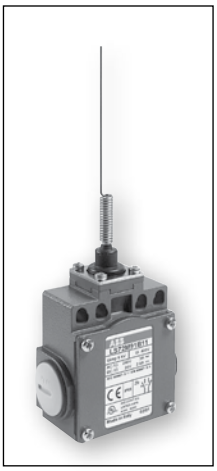
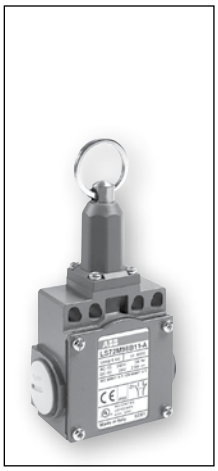




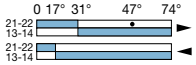
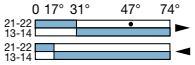
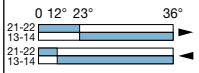
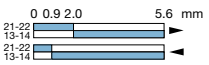
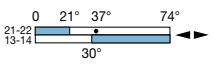
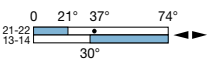
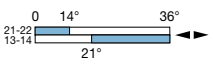
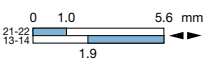


60mm, IP66, UL Type 4X, PG 13.5 and 1/2" NPT

Movement to be detected:

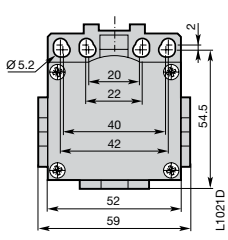
30° Cam Translat.	Fully directional Trans.	Multidirectional	Pull action
			

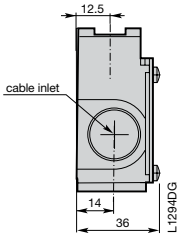
Actuator

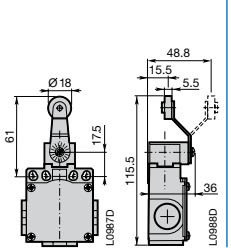
	ø18 plastic roller with bent lever	Adjustable ø3 stainless steel rod lever	Spring rod	Pull action with ring
Conformity / ⊖ (N.C. contact with positive opening operation)	⊖ –	⊖ –	– –	–
Maximum actuation speed	1.5 m/s	1.5 m/s	1 m/s	0.5 m/s
Min. force / torque: - actuation	0.1 N.m	0.1 N.m	0.12 N.m	30 N
- positive opening operation	0.32 N.m	0.32 N.m	–	–
B11 = Snap action contacts — Catalog number	LS75M45B11	LS75M71B11	LS75M91B11	LS75M98B11-A
Zb — Operation diagram				
D11 = Non-overlapping Slow action contacts — Catalog number	LS75M45D11	LS75M71D11	LS75M91D11	LS75M98D11-A
Zb — Operation diagram				
Weight (packing per unit) oz	0.335	0.380	0.315	0.350

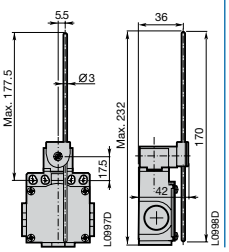
Closed contact / Open contact

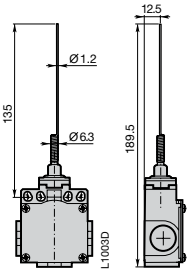
Dimensions (mm)





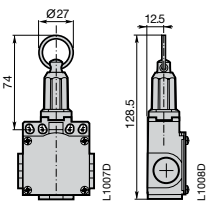






Tearing withstand of:

- operating head: 200 daN
- ring: 40 daN



Notes

Components
Metal limit switches
40mm & 60mm ①

① Components for 30mm metal switches are not available.

Components
Catalog number explanation
IP66, UL Type 4X, 40mm

Casings with contact block for rectilinear or angular motion heads

LS45M00B11

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


LSTE41

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)


LSA40X54

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

LS A 40 X 54

Limit Switch ..... LS

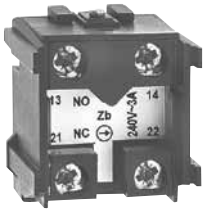
Actuator (roller) ..... A

Casing width: 40 mm 40

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

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

Separate contact blocks



LSC40XB11

LS C 40 X B 11

Limit Switch ..... LS

Contact blocks C

Casing width: 40 mm 40

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

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

Components
Selection guide
IP66, UL Type 4X, 40mm

Actuators:

Rectilinear motion


LSTE23 ⊖
(G Shape)


LSTE21 ⊖
(F Shape)


LSTE33 ⊖


LSTE22 ⊖
(G Shape)


LSTE12 ⊖
(B Shape)


LSTE32 ⊖


LSTE13 ⊖
(C Shape)


LSTE11 ⊖
(B Shape)


LSTE31 ⊖

Angular motion


LSTE54 ⊗

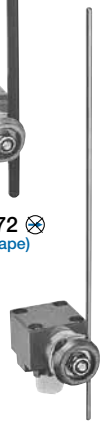

LSTE93 ⊗


LSTE72 ⊗
(D Shape)


LSTE44 ⊗


LSTE53 ⊗


LSTE92 ⊗


LSTE71 ⊗
(D Shape)


LSTE43 ⊖
(A Shape)


LSTE52 ⊗


LSTE62 ⊗


LSTE42 ⊖
(A Shape)


LSTE51 ⊗


LSTE91 ⊗


LSTE61 ⊗


LSTE41 ⊖
(A Shape)

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

Non-Adjustable actuators

LSA40X44 ⊗

LSA40X43 ⊖

LSA40X42 ⊖

LSA40X41 ⊖

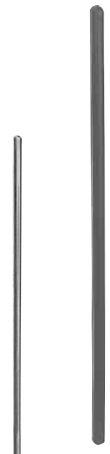
Adjustable actuators

LSA40X54 ⊗

LSA40X53 ⊗

LSA40X52 ⊗

LSA40X51 ⊗



LSA40X72 ⊗

LSA40X71 ⊗

LSA40X62 ⊗

LSA40X61 ⊗

Non-Adjustable Roller levers

LSTE40 ⊖

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

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

⊖ "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.

LS40M00B11


LSTE11


LSTE21


LSTE13


LSTE22


LSTE32

Contact blocks Zb Zb Zb Zb Zb Zb B11 D11 C11 L02 L20 B02							Positive opening operation	Actuation speed max. m/s	Unit weight kg (1 pc)	Catalog number
Bodies with contact block for rectilinear or angular motion heads										
1							⊖	—	0.168	LS45M00B11
	1						⊖	—	0.168	LS45M00D11
		1					⊖	—	0.168	LS45M00C11
			1				⊖	—	0.168	LS45M00L02
				1			⊗	—	0.168	LS45M00L20
					1		⊖	—	0.168	LS45M00B02
Rectilinear motion heads with actuator										
To be actuated from end										
Stainless steel plain plunger							⊖	0.5	0.077	LSTE11
Stainless steel ball plunger							⊖	0.5	0.076	LSTE12
Stainless steel lateral plain plunger							⊖	0.5	0.093	LSTE21
To be actuated by 30° cam										
Stainless steel roller plunger ⊖							0.5	0.084	LSTE13	
Stainless steel lateral plunger with vertical roller							⊖	0.5	0.098	LSTE22
Stainless steel lateral plunger with horizontal roller							⊖	0.5	0.098	LSTE23
To be actuated unidirectionally by 30° cam										
ø 22mm polyamide roller lever on stainless steel plunger							⊖	1.5	0.111	LSTE31
ø 22mm stainless steel roller lever on stainless steel plunger							⊖	1.5	0.121	LSTE32
ø 22mm steel ball-bearing roller lever on stainless steel plunger							⊖	1.5	0.122	LSTE33

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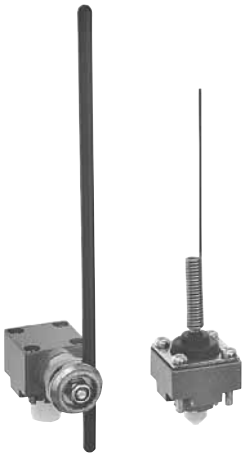
Components
IP66, UL Type 4X
40mm

⊖ "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.

LSTE41

LSTE52



LSTE72 LSTE91

LSTE40

LSA40X41

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

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

Components
IP66, UL Type 4X
40mm

⊖ "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.

LSTE50

LSA40X52

LSA40X71

LSA40X61

LSC40XB11

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

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

Notes

Technical data
Metal limit switches
30mm, 40mm & 60mm

Metal limit switches Technical data

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

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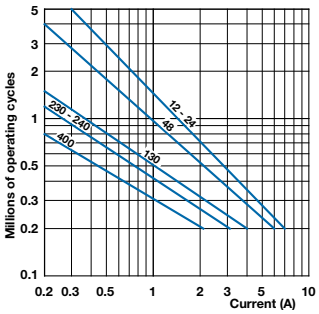
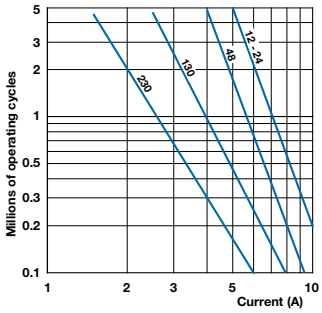
Electrical Data

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
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) $\theta \leq 40$ °C		A	10
Short-circuit protection $U_e \leq 500$ V a.c. - gG (gl) type fuses		A	10
Rated operational current I_e / AC-15 (according to IEC 947-5-1)	 24 V - 50/60 Hz 130 V - 50/60 Hz 230 V - 50/60 Hz 240 V - 50/60 Hz 400 V - 50/60 Hz	 A A A A A	 10 5.5 3.1 3 1.8
I_e / DC-13 (according to IEC 947-5-1)	24 V - d.c. 110 V - d.c. 250 V - d.c.	A A A	2.8 0.6 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 of operations	30, 25, 10 } LS | 40, 60 | M { 11– 13; 21 – 23; 31 – 33 41 – 44; 51 – 54; 61 – 72 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

Limit switches
Miniature pre-wired
30mm & 35mm
Metal & plastic casings

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.

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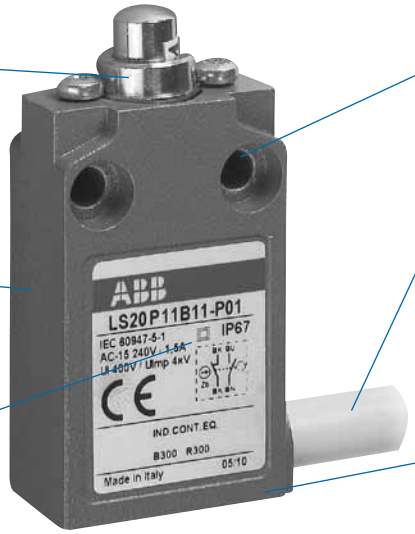
A variety of operating heads:
- Plain plunger
- Roller plunger
- Roller lever, adjustable or not, etc.

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 lenghts 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 0 2**

Limit Switch, prewired LS2

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 casing ..... M

Operating heads:
Codes ..... 10...98

Snap action:
B ..... Zb Snap

Dependent (slow) action:
D ..... Zb Non-overlapping late make

Contact types:
11 ..... 1 N.O. + 1 N.C. contacts

U ..... cable UL 62 - PVC (black)

Cable length:
01 ..... 1 m
02 ..... 2 m
03 ..... 3 m

Plastic casing UL Type 1 & metal casing - UL Type 4 & 4X
Pre-wired, 30mm

Movement to be detected:

On end	30° Cam Trans.	On end

For Plastic Casing:
Cable: 4 x 0.75 mm² / 4 x AWG 18
Length: 1 m①
(Other lengths see ordering details)

For Metal Casing:
Cable: 5 x 0.75 mm² / 5 x AWG 18
Length: 1 m①
(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

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Additional technical data

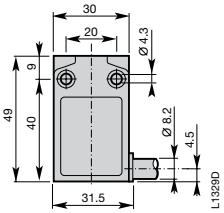
Cable output left / right code 0
Cable output bottom code 1
} Does not affect pricing.
Plastic casing ..... P
Metal casing ..... M

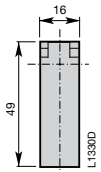
Type to be completed with the above codes Δ

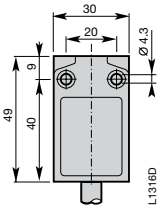
B11 = Snap action contacts	Catalog number	LS2ΔΔ11B11-U01	LS2ΔΔ12B11-U01	LS2ΔΔ16B11-U01	LS2ΔΔ21B11-U01
13 BN 21 BK Zb 14 BU 22 BK	Operation diagram	0 1.0 1.9 4.0 5.0 mm	0 1.7 3.3 6.9 8.7 mm	0 1.0 1.9 4.0 5.0 mm	0 1.0 1.9 4.0 5.0 mm
D11 = Non-overlapping Slow action contacts	Catalog number	LS2ΔΔ11D11-U 01	LS2ΔΔ12D11-U01	LS2ΔΔ16D11-U01	LS2ΔΔ21D11-U01
13 BN 21 BK Zb 14 BU 22 BK	Operation diagram	0 1.9 3.4 5.0 mm (3.2)	0 3.3 5.9 8.7 mm (5.5)	0 1.9 3.4 5.0 mm (3.2)	0 1.9 3.4 5.0 mm (3.2)
Weight ② (packing per unit) oz		4.40	4.58	4.40	4.93

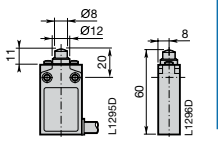
Closed contact / Open contact

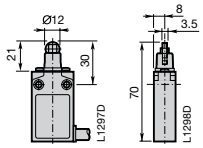
Dimensions (mm)

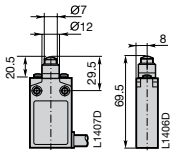


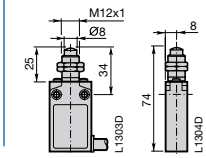












- Tightening torque of nuts : 5 N.m
- Distance between nuts : 9 mm
- Nuts thickness : 3 mm

① Other cable lengths available. Replace last two digits "01" with: 02-2m, 05-5m, 10-10m.
② add 1.76 oz with metal casing.

Plastic casing UL Type 1 & metal casing - UL Type 4 & 4X
Pre-wired, 30mm

Movement to be detected:

30° Cam Translation Movement	Multidirectional

For Plastic Casing:
Cable: 4 x 0.75 mm² / 4 x AWG 18
Length: 1 m①
(Other lengths see ordering details)

For Metal Casing:
Cable: 5 x 0.75 mm² / 5 x AWG 18
Length: 1 m①
(Other lengths see ordering details)




8

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	0.1 m/s	1.5 m/s	1.5 m/s	1.0 m/s
Min. force / torque: - actuation	10 N	0.08 N.m	0.08 N.m	0.10 N.m
- positive opening operation	30 N	0.28 N.m	0.28 N.m	–

Additional Technical Data

Cable output left / right code 0
Cable output bottom code 1
} Does not affect pricing.

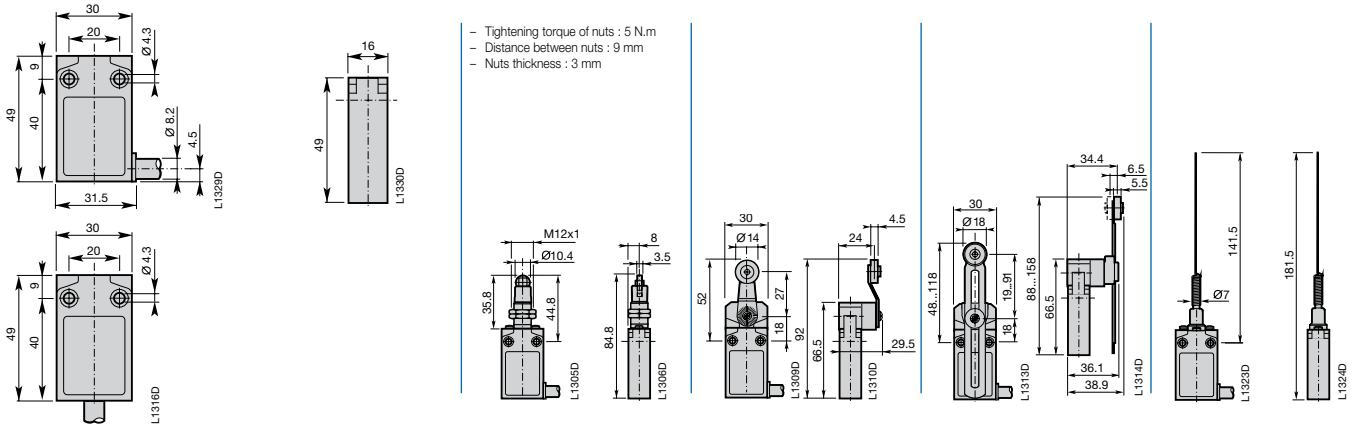
Plastic casing ..... P
Metal casing ..... M

Type to be completed with the above codes Δ

B11 = Snap action contacts	Catalog number	LS2ΔΔ22B11-U01	LS2ΔΔ41B11-U01	LS2ΔΔ 51B11- U 01	LS2ΔΔ 91B11- U 01
13 BN 21 BK Zb 14 BU 22 BK	Operation diagram	0 1.7 3.3 6.9 8.7 mm	0 14° 26° 58° 74°	0 14° 26° 58° 74°	0 5° 14°
D11 = Non-overlapping Slow action contacts	Catalog number	LS2ΔΔ22D11-U01	LS2ΔΔ41D11-U01	LS2ΔΔ51D11-U 01	-
13 BN 21 BK Zb 14 BU 22 BK	Operation diagram	0 3.3 5.9 8.7 mm, 5.5	0 27° 49° 74°, 45°	0 27° 49° 74°, 45°	-
Weight ② (packing per unit)	oz	5.11	6.17	6.70	6.70

Closed contact / Open contact

Dimensions (mm)



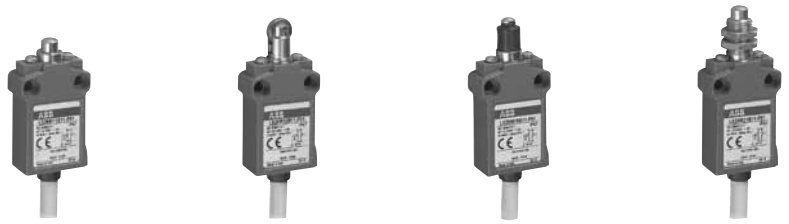
① Other cable lengths available. Replace last two digits "01" with: 02-2m, 05-5m, 10-10m.
② add 1.76 oz with metal casing.

Plastic casing UL Type 1 & metal casing - UL Type 4 & 4X
Pre-wired, 35mm

Movement to be detected: | On end | 30° Cam Trans. | On end

For Plastic Casing:
Cable: 4 x 0.75 mm² / 4 x AWG 18
Length: 1 m①
(Other lengths see ordering details)

For Metal Casing:
Cable: 5 x 0.75 mm² / 5 x AWG 18
Length: 1 m①
(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

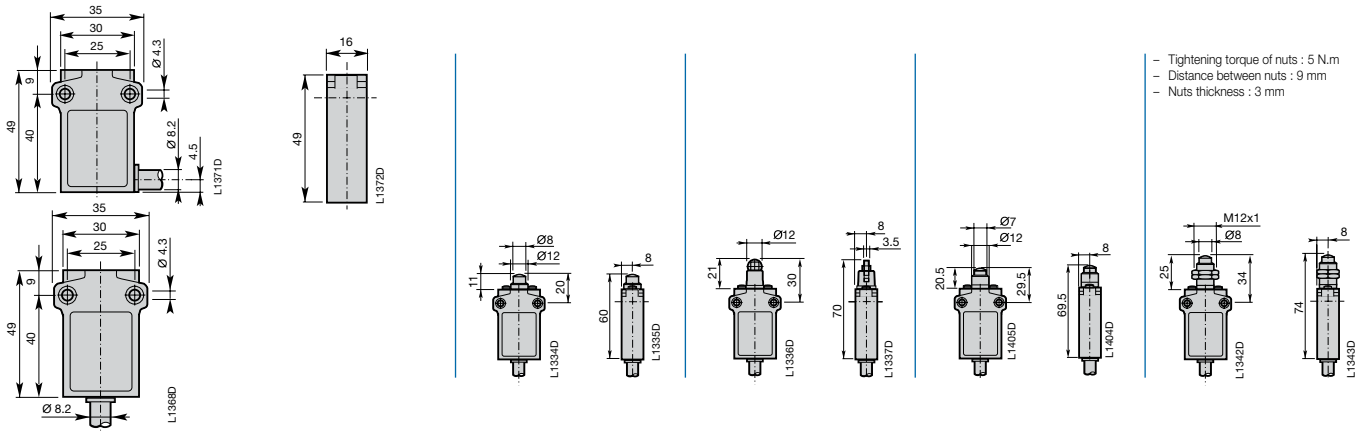
Cable output left / right code 5
Cable output bottom code 6
} Does not affect pricing.
Plastic casing ..... P
Metal casing ..... M

Type to be completed with the above codes Δ

B11 = Snap action contacts	Catalog number	LS2ΔΔ11B11-U01	LS2ΔΔ12B11-U01	LS2ΔΔ16B11-U01	LS2ΔΔ21B11-U01
13 BN 21 BK Zb 14 BU 22 BK	Operation diagram	0 1.0 1.9 4.0 5.0 mm	0 1.7 3.3 6.9 8.7 mm	0 1.0 1.9 4.0 5.0 mm	0 1.0 1.9 4.0 5.0 mm
D11 = Non-overlapping Slow action contacts	Catalog number	LS2ΔΔ11D11-U01	LS2ΔΔ12D11-U01	LS2ΔΔ16D11-U01	LS2ΔΔ21D11-U01
13 BN 21 BK Zb 14 BU 22 BK	Operation diagram	0 1.9 3.4 5.0 mm (3.2)	0 3.3 5.9 8.7 mm (5.5)	0 1.9 3.4 5.0 mm (3.2)	0 1.9 3.4 5.0 mm (3.2)
Weight ② (packing per unit)	oz	4.40	4.58	4.40	4.93

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 1.76 oz with metal casing.

Plastic casing UL Type 1 & metal casing - UL Type 4 & 4X
Pre-wired, 35mm

Movement to be detected:

30° Cam Translation			Multidirectional

For Plastic Casing:
Cable: 4 x 0.75 mm² / 4 x AWG 18
Length: 1 m①
(Other lengths see ordering details)

For Metal Casing:
Cable: 5 x 0.75 mm² / 5 x AWG 18
Length: 1 m①
(Other lengths see ordering details)



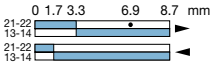
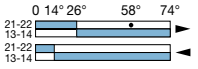
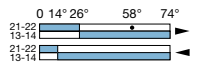
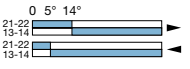
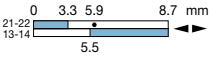
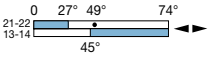
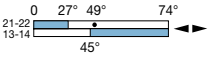

Actuator	Metal Roller plunger with fixing nuts	ø14 plastic roller lever	Adjustable ø18 plastic roller lever	Spring rod
(N.C. contact with positive opening operation)	⊕	⊕	⊕	-
Maximum actuation speed	0.1 m/s	1.5 m/s	1.5 m/s	1.0 m/s
Min. force / torque: - actuation	10 N	0.08 N.m	0.08 N.m	0.10 N.m
- positive opening operation	30 N	0.28 N.m	0.28 N.m	-

Additional Technical Data

Cable output left / right code 5
Cable output bottom code 6
} Does not affect pricing.

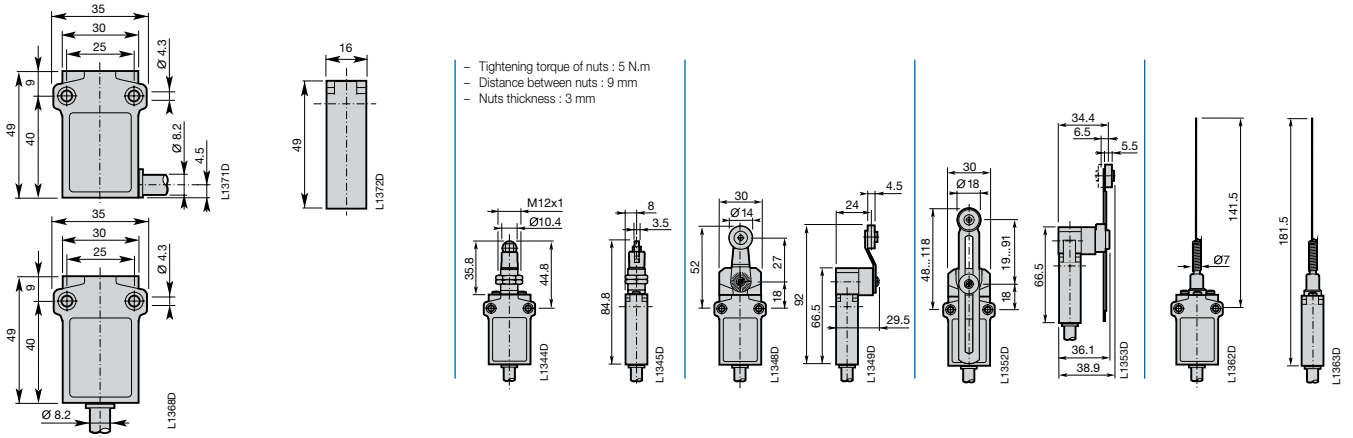
Plastic casing ..... P
Metal casing ..... M

Type to be completed with the above codes Δ

B11 = Snap action contacts	Catalog number	LS2ΔΔ22B11-U01	LS2ΔΔ41B11-U01	LS2ΔΔ51B11-U01	LS2ΔΔ91B11-U01
13 BN 21 BK Zb 14 BU 22 BK	Operation diagram				
D11 = Non-overlapping Slow action contacts	Catalog number	LS2ΔΔ22D11-U01	LS2ΔΔ41D11-U01	LS2ΔΔ51D11-U01	-
13 BN 21 BK Zb 14 BU 22 BK	Operation diagram				-
Weight ② (packing per unit)	oz	7.05	7.05	8.11	8.28

Closed contact / Open contact-

Dimensions (mm)



① Other cable lengths available. Replace last two digits "01" with: 02-2m, 05-5m, 10-10m.
② add 1.76 oz with metal casing.

Technical data
Miniature pre-wired
30mm & 35mm
Metal & plastic casings

8

Miniature limit switches

Technical data

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)	**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 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

				Plastic Casing	Metal Casing
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} (according to IEC 60947-1 and EN 60947-1)			**kV**	6	
Conventional enclosed thermal current I_{the} (according to IEC 60947-5-1 and EN 60947-5-1) $\theta \leq 40$ °C			**A**	10	
Short-circuit protection gG type fuses			**A**	10	
Rated operational current					
I_e / 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_e / 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	15 / 10 / > 5 } LS 3x / 7x P { 10...12 ; 30...38 / 13 ; 41...46 ; 51...55 ; 61...78 / 14 ; 91...92 ; 98	15 / 10 / > 5 } LS 3x / 7x M { 11...12 ; 31...38 / 13 ; 41...46 ; 51...55 ; 61...78 / 14 ; 91...92 ; 98
			Millions of operations	15 / 10 / > 5 } LS 4x P { 11 ; 12 ; 31...33 / 13 ; 41...44 ; 51...55 ; 61...74 / 14 ; 19 ; 34...36 ; 91...93	30 / 25 / 10 } LS 4x M { 11...13 ; 21...23 ; 31...33 / 41...44 ; 51...55 ; 61...74 / 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	

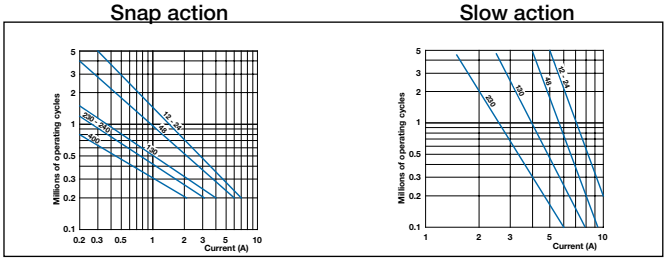
Connecting data of contact blocks

Connecting terminals		M3.5 (+,–) pozidriv 2 screw with cable clamp
Connecting capacity	1 or 2 x **mm² / AWG**	0.5 mm² / AWG 20 to 2.5 mm² / AWG 14
Terminal marking		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

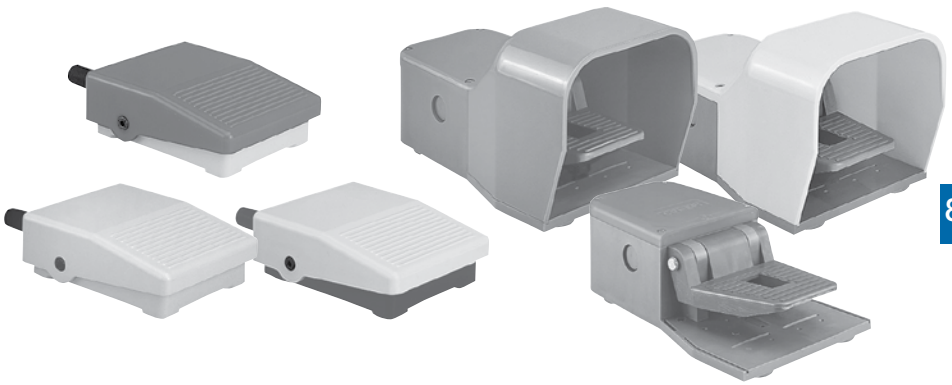
Snap action / Slow action



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

Foot switches



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.

Plastic Foot switches

General information
IPM Mini foot switches, IPS Foot switches with covers
Description

Application

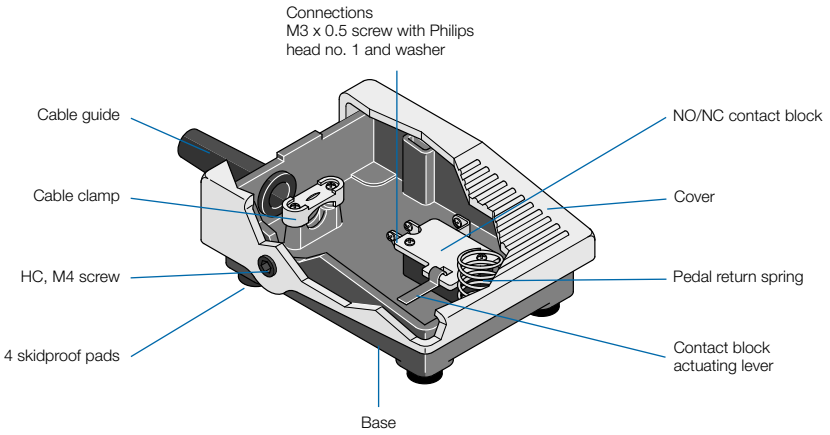
Foot switch-operated machines such as: shearing machines, folding machines, spinning lathes, machine tools, wrapping machines, riveting presses, etc.

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

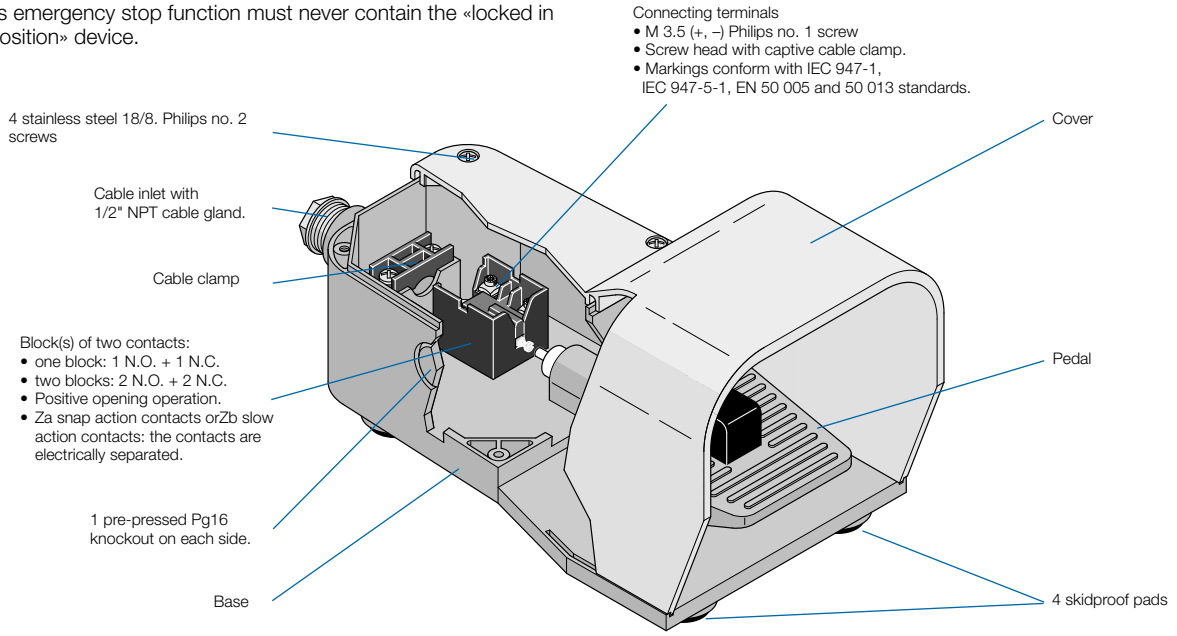
- Reduced dimensions: 100 x 75 x 34 mm.
- Materials: cover and base made of self-extinguishing ABS.
- Color choice: black or grey base; black, grey, yellow or red cover.



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.



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.

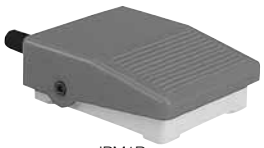
Foot switches
Mini foot switches, IP 40


IPM1R


IPM1Y


IPM1G


IPM1B


IPM1R

IPM Mini foot switches

NC / NO / C N.O. + N.C. contact block	Cover color	Unit weight in kg Packing 1 piece	Catalog number
Black base			
1	Yellow	0.130	IPM1Y
1	Grey	0.130	IPM1G
1	Black	0.130	IPM1B
1	Red	0.130	IPM1R
Grey base			
1	Yellow	0.130	IPM2Y
1	Grey	0.130	IPM2G
1	Black	0.130	IPM2B
1	Red	0.130	IPM2R

Catalog number explanation

IPM 1 Y

Mini foot switch

Base color
1 - black
2 - grey

Cover color
Y - yellow
G - grey
B - black
R - red

8

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 Packing 1 piece	Catalog number
Snap action		Non-overlapping slow action			
Za	Za Za	Zb	Zb Zb		
Free movement					
1	—	—	—	1.100	IPSΔ1A11
—	—	1	—	1.100	IPSΔ1D11
—	1 + 1	—	—	1.100	IPSΔ1A22
—	—	—	1 + 1	1.100	IPSΔ1D22
Locked in neutral position					
1	—	—	—	1.100	IPSΔ2A11
—	—	1	—	1.100	IPSΔ2D11
—	1 + 1	—	—	1.100	IPSΔ2A22
—	—	—	1 + 1	1.100	IPSΔ2D22
Latched in low position					
1	—	—	—	1.100	IPSΔ3A11
—	—	1	—	1.100	IPSΔ3D11
—	1 + 1	—	—	1.100	IPSΔ3A22
—	—	—	1 + 1	1.100	IPSΔ3D22
Free movement foot switch with half-red cover					
1	—	—	—	0.800	IPSZ1A11
—	—	1	—	0.800	IPSZ1D11
—	1 + 1	—	—	0.800	IPSZ1A22
—	—	—	1 + 1	0.800	IPSZ1D22
Foot switch latched in low position with half-red cover					
1	—	—	—	0.800	IPSZ3A11
—	—	1	—	0.800	IPSZ3D11
—	1 + 1	—	—	0.800	IPSZ3A22
—	—	—	1 + 1	0.800	IPSZ3D22

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

IPS Y 1 A 11

Plain foot switch with cover

Cover color
Y - yellow
G - grey
R - red
Z - half-red cover ①

1 - Free movement
2 - Foot switch locked in neutral position
3 - Foot switch latched in low position

A - Za Snap action
D - Zb Slow action non-overlapping late make

Contact blocks
11 - 1 N.O. contact + 1 N.C. contact
22 - 2 N.O. contacts + 2 N.C. contacts

① Incompatible with locked in neutral position function.

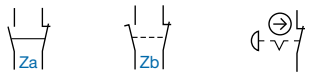
Components
Double Insulation - Protection Cover in ABS - IP65

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

IPSXG

IPSXZ

IPSXCD11

Contact blocks  B11 D11 C11	Positive opening operation	Catalog number
Protection cover for foot switch		
Grey cover	—	IPSXG
Yellow cover	—	IPSXY
Red cover	—	IPSXR
Half red cover	—	IPSXZ
Contact block for IPS... foot switches		
1NC & 1NO (Za) snap action 1 — —	⊖	IPSXCA11
1NC & 1NO (Zb) slow action non-overlapping late make — 1 —	⊖	IPSXCD11

8

Notes

Technical data
Foot switches

Technical data

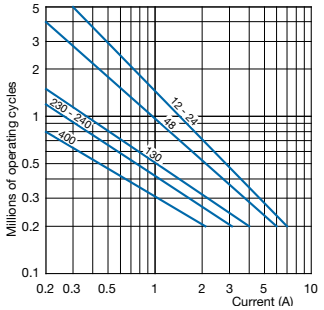
General technical data

		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 – for storage	 °C °C	 – 10 ... + 70 – 25 ... + 80	 – 10 ... + 70 – 30 ... + 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	1.2	0.25
Operating angle	Degree	2 to 4	15
Cable inlet		Cable guide ø min. 6mm; ø max. 8.5 mm	Pg 16

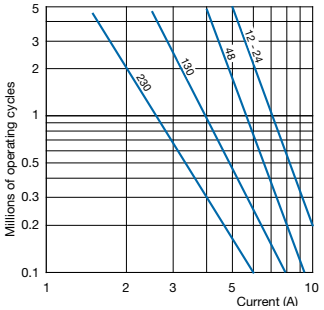
8 Electrical data

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_e < 500 V a.c. - gG (gl) type fuses		A	10	10
Rated operational current		A 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	A	—	10
	130 V	A	—	5.5
	230 V	A	—	3.1
	240 V	A	—	3
	400 V	A	—	1.8
DC-13 acc. to IEC 947-5-1	24 V	A	—	2.8
	110 V	A	—	0.6
	250 V	A	—	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 mm²	—	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



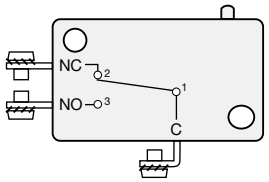
DC-13		Snap action	Slow action
		Power breaking for a durability of 5 million operating cycles	
Voltage	24 V	9.5 W	12 W
Voltage	48 V	6.8 W	9 W
Voltage	110 V	3.6 W	6 W

Technical data & approximate dimensions
Mini-footswitches

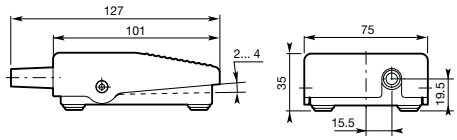
IPM Mini foot switches

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



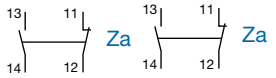
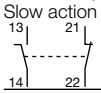
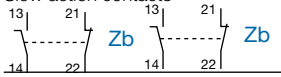
Dimensions (mm)



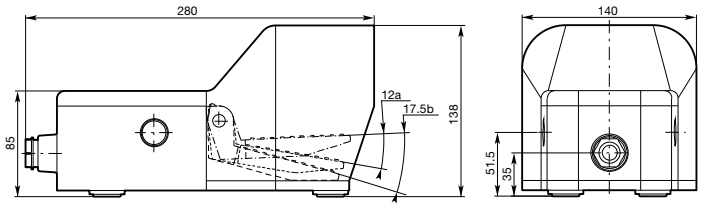
8

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
	⊖ (Positive opening operation of the N.C. contact)	⊖	⊖	⊖
Snap action contacts 	Catalog number	IPS1A22	IPS2A22	IPS3A22
	⊖ (Positive opening operation of the N.C. contact)	⊖	⊖	⊖
Non-overlapping Slow action contacts 	Catalog number	IPS1D11	IPS2D11	IPS3D11
	⊖ (Positive opening operation of the N.C. contact)	⊖	⊖	⊖
Non-overlapping Slow action contacts 	Catalog number	IPS1D22	IPS2D22	IPS3D22
	⊖ (Positive opening operation of the N.C. contact)	⊖	⊖	⊖
Weight (packing per unit)	kg	1.10	1.10	1.10

Dimensions (mm)

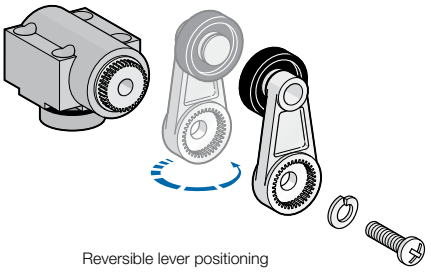


Plain foot switch
a = pre-travel
b = total travel

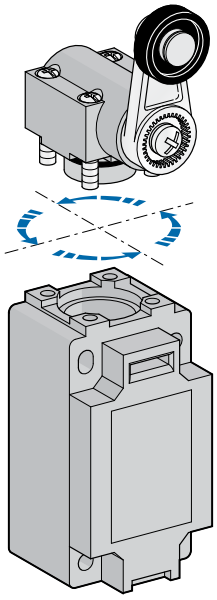
General technical data
Limit switches

General Technical data

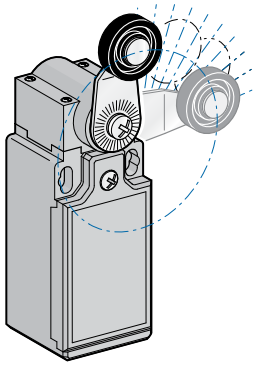
Technical data
Implementation

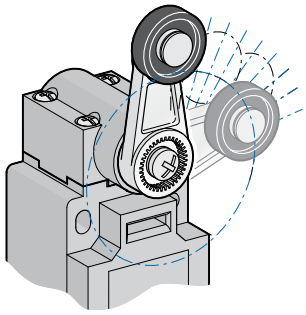


Reversible lever positioning

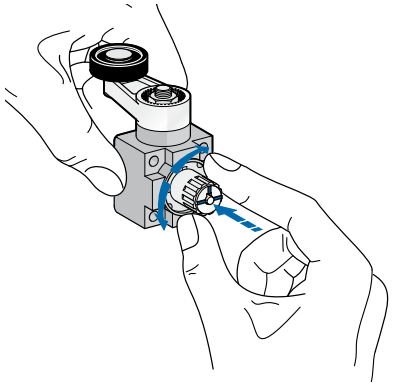


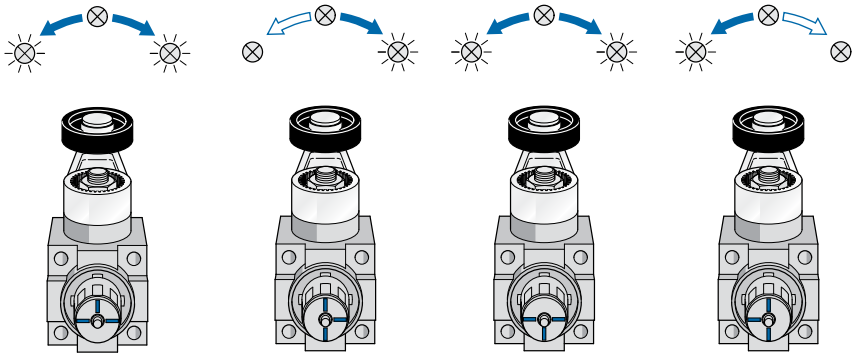
90° head orientation





Free position adjustment of lever





Technical data
Terminology

Double insulation ⧈

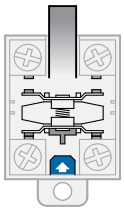
Class II materials, according to IEC 536, are designed with double insulation. This measure consists in doubling the functional insulation with an additional layer of insulation so as to eliminate the risk of electric shock and thus not having to protect elsewhere. No conductive part of “double insulated”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

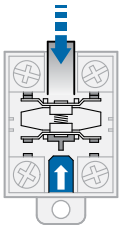
Positive opening operation ⊖

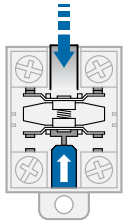
A control switch, with one or more break-contact elements, has a positive opening operation when the switch actuator ensures full contact opening of the break-contact. For the part of travel that separates the contacts, there must be a positive drive, with no resilient member (e.g. springs), between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

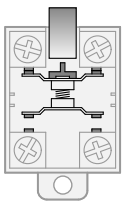

State of rest

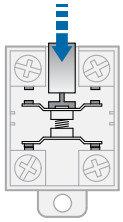

Contact change


Positive opening

Slow action

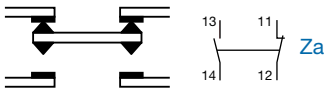
Slow action contacts are characterized by a release position that is the same as the operating position. The switch actuator's speed directly conditions the travel speed of contacts.


State of rest

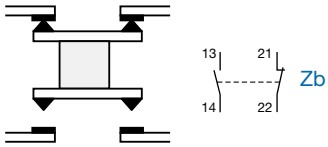

Completely closed

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.



Contacts with the same polarity



The 2 moving contacts are electrically separated

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

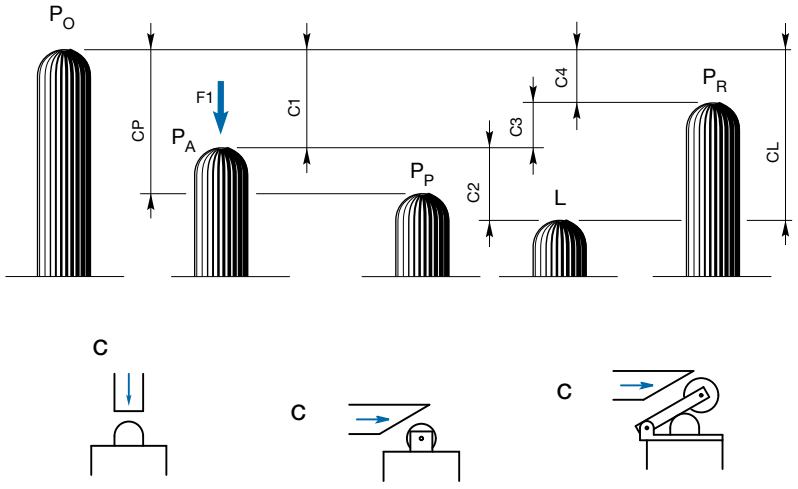


Diagram in millimeters

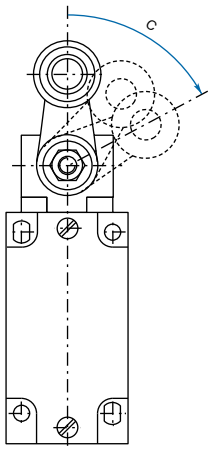


Diagram in degrees

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.

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.

C_1 Pre-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.

C_2 Over-travel
Distance between the operating position P_A and the max. travel position L.

C_L Max. travel
Distance between the free position P_O and the max. travel position L.

C_3 Differential travel (C1-C4)
Travel difference of the switch actuator between the operating position P_A and the release position P_R.

C_4 Release travel
Distance between the release position P_R and the free position P_O.

Diagram for snap action contacts:

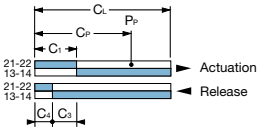
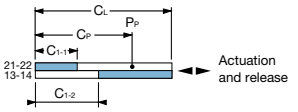


Diagram for non-overlapping slow action contacts:



Note: for slow action contacts, $C_3 = 0$, C_{1-1} = pre-travel of contact 21-22, C_{1-2} = pre-travel of contact 13-14.

Examples:

LS45M13B11
(snap action contacts)

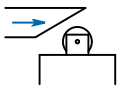
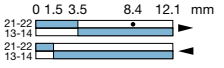


Diagram in millimeters/cam travel



LS45M41B11
(snap action contacts)

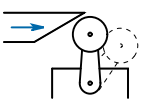
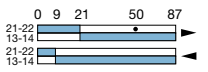


Diagram in degrees/lever rotation



LS45M11D11
(non-overlapping slow action contacts)

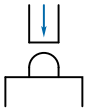
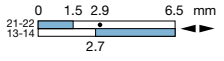
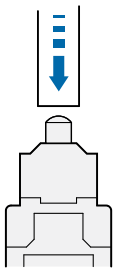


Diagram in millimeters/plunger travel

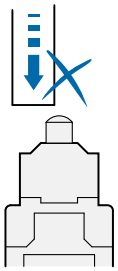


Technical data
Utilization precautions

Plain plunger

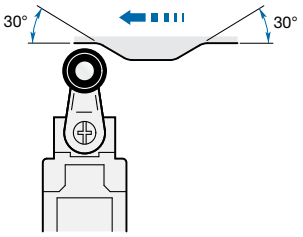


Correct

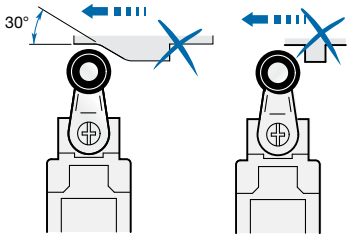


Incorrect

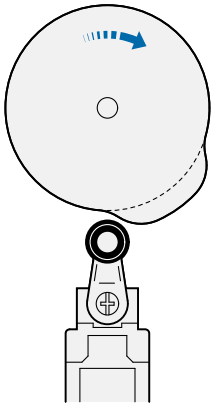
Roller plunger or roller lever



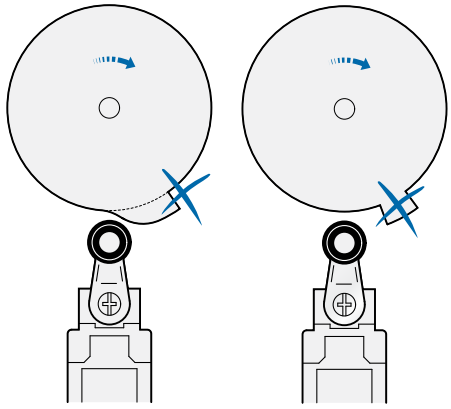
Correct



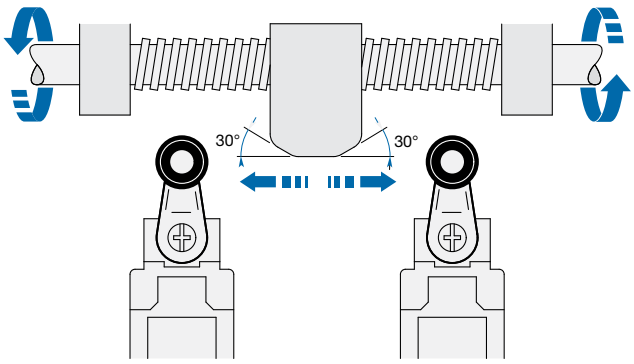
Incorrect



Correct



Incorrect

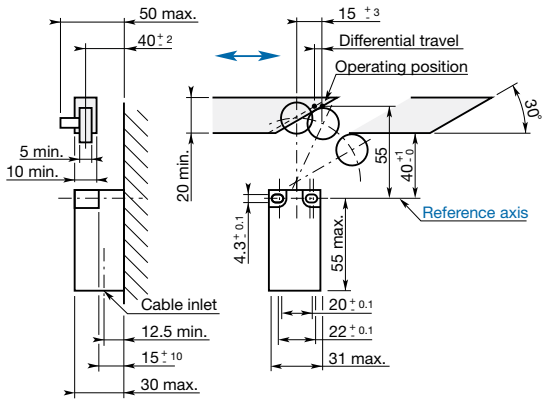


For a relatively slow movement of the switch actuator, a limit switch with a snap action contact block is preferred.

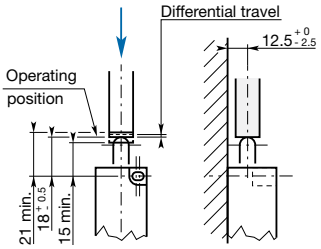
Technical data
EN 50047 standard

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).

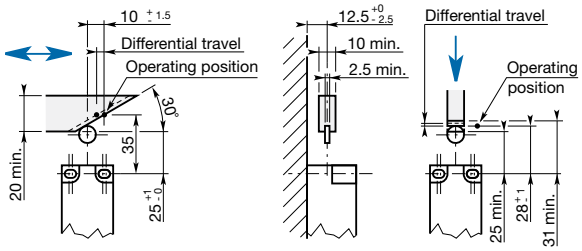
A Shape
Roller lever operating heads



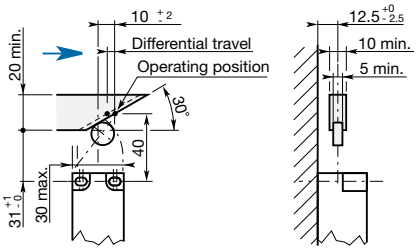
B Shape
Rounded plunger operating heads



C Shape
Roller plunger operating heads



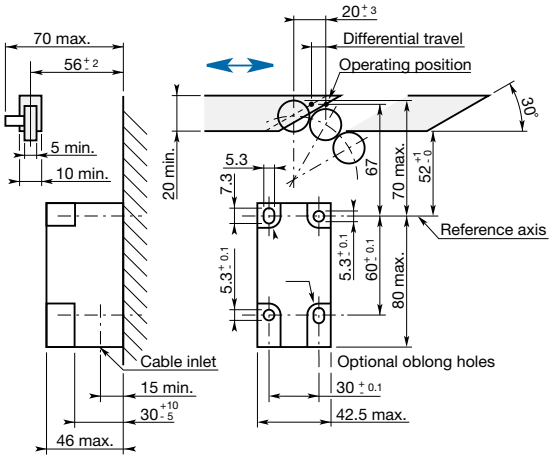
E Shape
Roller lever operating heads



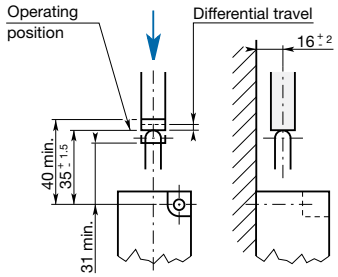
Technical data
EN 50041 standard

The European Committee for Electrotechnical Standardization (CENELEC), which groups together 18 European countries, publishes EN standards. The present standard defines dimensions and mechanical data for limit switches (42.5 x 80 mm).

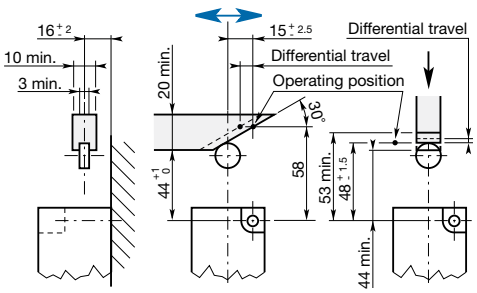
A Shape
Roller lever operating heads



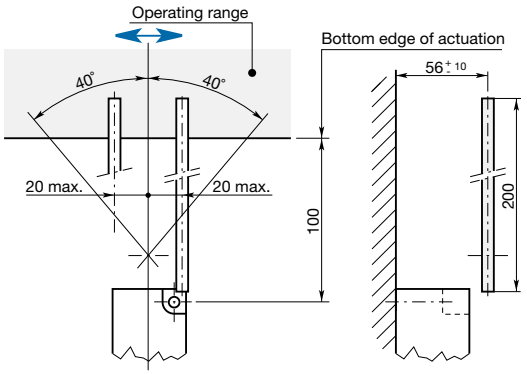
B Shape
Rounded plunger operating heads



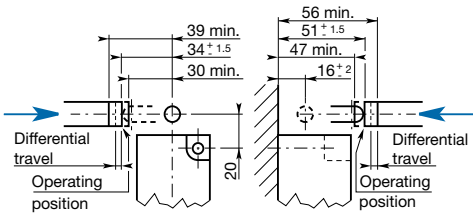
C Shape
Roller plunger operating heads



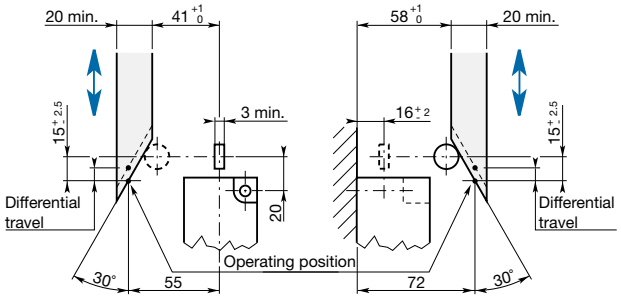
D Shape
Rod operating heads



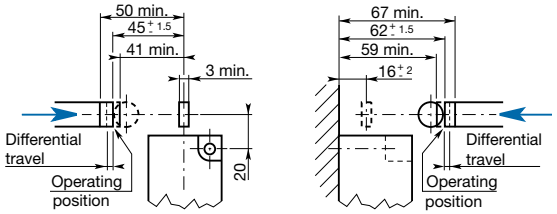
F Shape
Rounded lateral plunger operating heads



G Shape
Lateral roller plunger operating heads - Lateral actuation



Lateral roller plunger operating heads - Front actuation



Notes