

Limit switches, AL and K244 series

■ Description

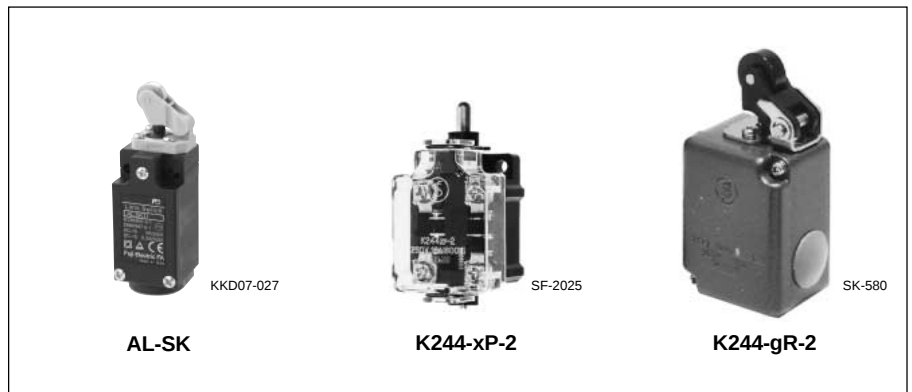
FUJI AL and K244 series limit switches have wide application in such industrial equipment as machine tools, printing machines, and transfer machines. These switches feature a sturdy aluminum die-cast housing that is highly resistant to oil, water, and dust, and long mechanical life — 10 million operations minimum.

AL series

AL and AL-S series limit switches feature a forced contact opening mechanism.

Under abnormal conditions, the mechanism forces the contacts open to prevent pitting and fusing.

Gold-plated silver contacts with scrubbing action have high reliability.



K244 series

The K244 series is provided with four kinds of contact operating action: standard normal stroke, snap action, make-before-break, and extended stroke.

WK244 of the K244 series has bifurcated contacts, while HK244 features a scrubbing action mechanism. These limit switches can be used in low-level circuits of 3V, 5mA.

■ Selection guide

Basic type	AL Standard	AL-S Compact type	K244 Standard	HK244 For low-level circuit	WK244 For low-level circuit
Rated voltage (max.)	550V AC, 250V DC*1		550V AC/DC		
Rated thermal current	10A (5A*1)		10A		
Operating cycles per hour	7,200		3,000		
Expected life (operations)	Mechanical Electrical	10 millions 100,000 (at 125V AC, 5A res. load for snap action type)	10 millions 1 million*2 (at 220V AC, 10A res. load)	10 millions 400,000 (at 220V AC, 10A res. load)	10 millions 500,000 (at 220V AC, 2.5A res. load)
Contact arrangement	1NO+1NC		1NO+1NC, 2NO+2NC		
Contact	Single button		Single button		Bifurcated
Degree of protection (IEC)	IP67		—		
Features	Forced contact opening mechanism as standard		A wide variety of contact operating action		
	Highly reliable gold-plated silver contacts		Sealed types for oily and wet environments		
Page	05/2		05/16	05/23	05/23

*1: For snap action type

*2: 400,000 for snap action type

Limit Switches

AL and AL-S

General information

Forced contact opening limit switches, AL and AL-S series

■ Description

The AL and AL-S series limit switches feature a forced contact opening mechanism. This mechanism prevents contact welding and subsequent malfunctioning. These series therefore result in extremely dependable system controls.

The AL series is available in standard sizes and the AL-S series is compact versions of the AL types.

■ Features

- The forced contact opening mechanism is provided so as to overcome contact problems.
- Gold-plated contacts and a self cleaning action ensure contact reliability.
- Sealed construction
Double oil seals prevent moving parts and contacts from being contaminated by exterior oil, grime and grease, an advantage in dirty industrial locations.
- Operational mode indicator can replace existing cover with lamp indicator cover when required. An LED or neon lamp is used depending on supply voltage.
- Contact mechanical design
Contact operating mechanisms can be selected according to the application-snap, overlap and normal actions
- Conform to IEC Standard

■ Contact ratings

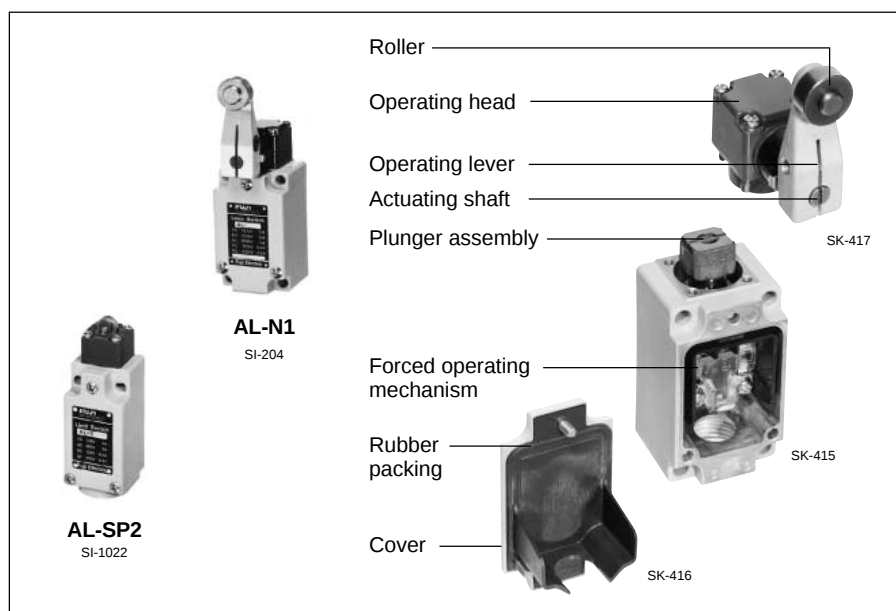
Contact action	Thermal current (A)	Make and break current *			DC		
		AC Voltage (V)	Resistive (A)	Inductive (A)	Voltage (V)	Resistive (A)	Inductive (A)
Snap	5	125	5	3	30 or less	5	3
		250	3	2	125	0.4	0.05
		500	1	0.6	250	0.2	0.03
Normal Overlap	10	24	10	10	24	7	7
		110	10	10	110	1.5	0.9
		220	10	10	220	0.63	0.28
		440	5	5	440	0.28	0.14
		550	3	3	550	0.22	0.1

*: When NO and NC contacts are wired in the same potential.

■ UL listed (File No. E44592)

Contact ratings

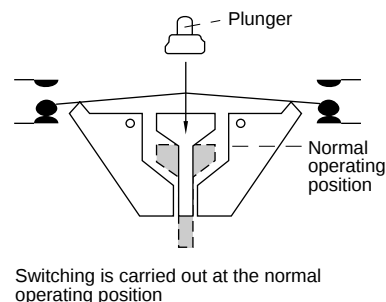
AC (B300) Voltage (V)	Operational current (A)		DC Voltage (V)	Operational current (Res. load) (A)
	Make	Break		
120	30	3	30	5
240	15	1.5	125	0.4
			250	0.2



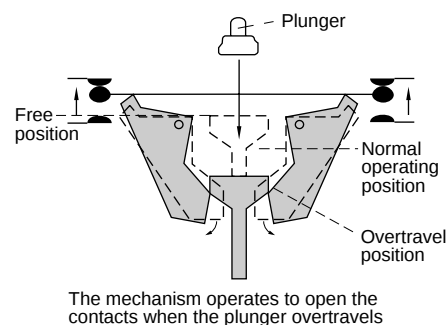
■ Forced contact opening mechanism

This mechanism does not operate under normal conditions. However, when the switch plunger overtravels under abnormal conditions the mechanism comes into operation and forcibly opens the NC contacts thus preventing contact welding.

This action improves the dependability of electrical systems.



Normal operating condition



Abnormal condition

■ Technical data

Insulation resistance:

Over 100MΩ at 500V DC

Life expectancy

Mechanical: Over 10 million operations

Electrical: Snap action type

100,000 operations at

125V AC 5A res. load

Normal action type

100,000 operations at

110V AC 10A res. load

Allowable ambient temperature:

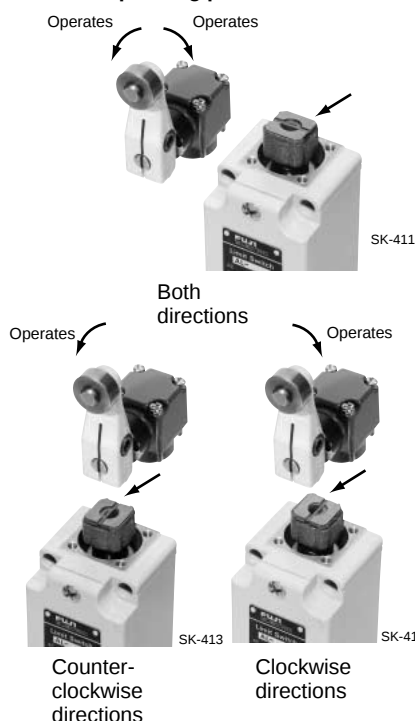
-10°C to +80°C

Degree of protection: IEC IP67

■ Directional contact operation

AL-N1, AL-N2 and AL-N3 can be modified in their operational directions. They will switch in both directions, or in only one direction, either clockwise or counterclockwise. The adjustment is easily carried out by removing the operating head and changing the plunger as shown in the photograph. After the plunger has been reassembled, replace the head and tighten the screws. Check operation by moving the arm in the desired direction.

Standard operating position



■ Changing direction of operating head

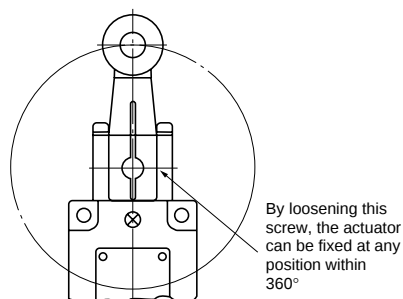
The operating head direction can be changed through 90° after having removed the screw. Care must be taken because the contact action changes according to the direction of the plunger assembly. Check for correct assembly after each step has been completed. Limit switches with adjustable head direction are AL-N1, AL-N2, AL-N3, AL-SN1, AL-SN2 and AL-SN3. In the case of AL-P2 and AL-SP2, the head direction of a top push roller plunger type can be shifted 90° in either direction.



■ Adjustment of operating lever

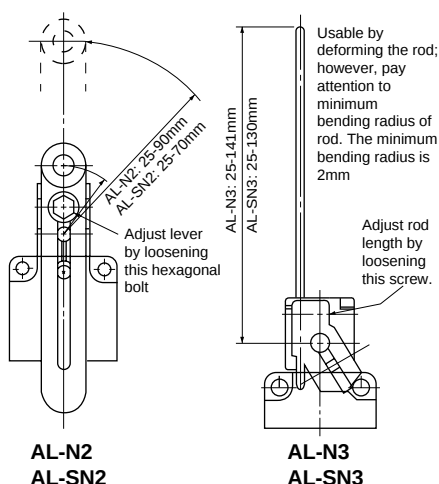
Loosen the locking screw, turn over the lever and then retighten at the required position.

Type:
AL-N1, AL-N2, AL-N3, AL-SN1,
AL-SN2, AL-SN3, AL-F1.



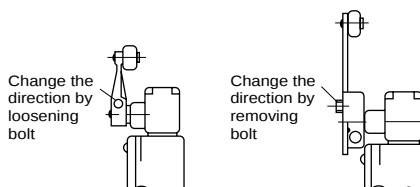
■ Adjustment of lever length

Loosen the adjustment screw, adjust the length and retighten.



■ Roller installable on inner side

AL-N1, SN1 AL-N2, SN2, SN5



■ Dimensions:

See pages 05/13 to 05/15.

■ Ordering information

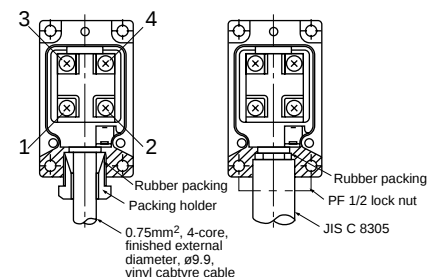
Specify the following:

1. Type number or ordering code

■ Cable connection

Refer to the wiring diagram for connection.

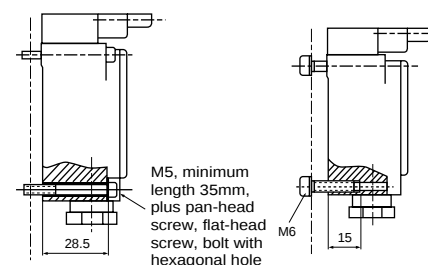
When connecting to conduit remove the plastic packing piece.



Contact: 1-2 Normally closed
3-4 Normally open

■ Mounting

AL type limit switches can be attached either from the front or the back. In the case of front mounting type clamp at 4 positions using M5 screws. When attaching from the back of the panel tighten at 4 positions by means of M6 screws. The thread depth of the switch body is 15mm.



Front mounting

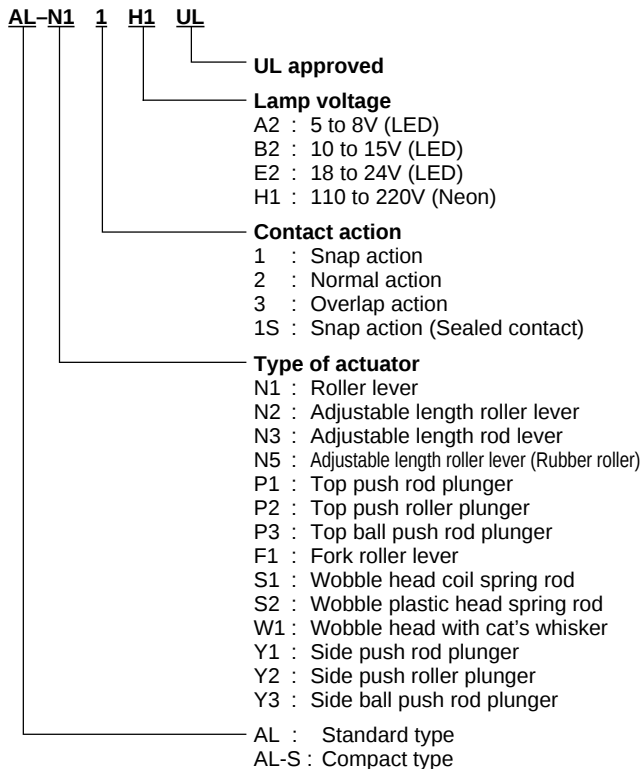
Rear mounting

Limit Switches

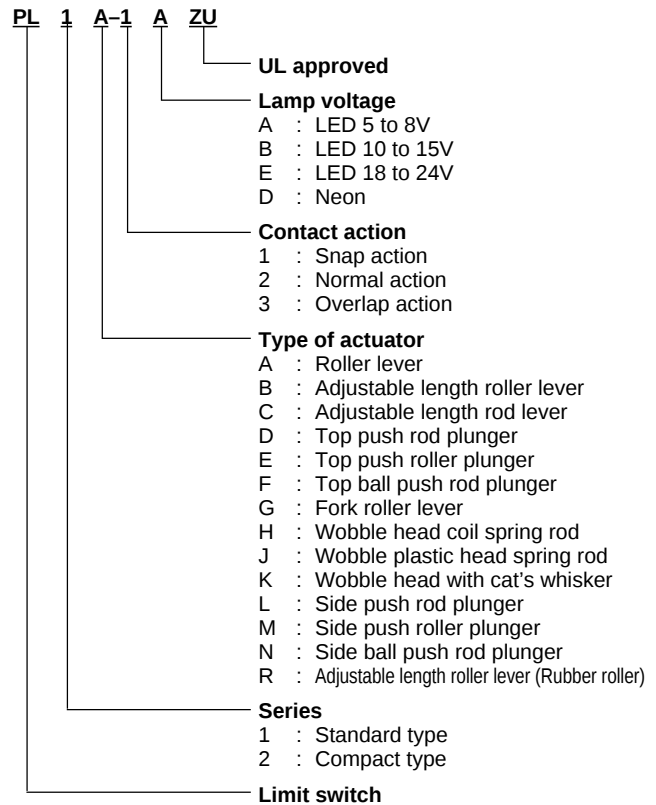
AL and AL-S

General information

■ Type number nomenclature

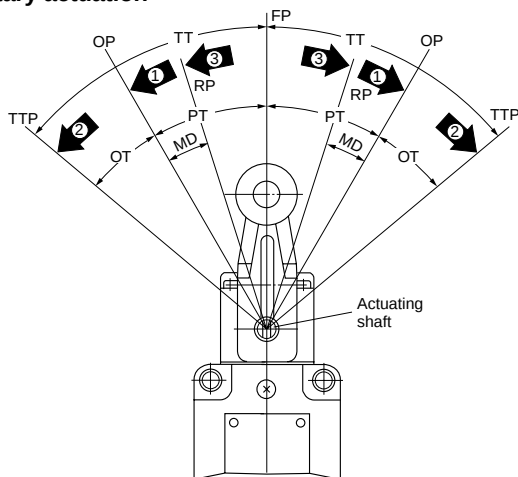


■ Ordering code



■ Operating and definitions (for snap action type)

● Rotary actuation



FP: Free Position

This is the position where there is no load on the actuator.

OP: Operating Position

This is the position where the actuator travels from the free position to NO contact closes.

TTP: Total Travel Position

This is the furthest position where the actuator can travel to after passing the OP without damage to the limit switch.

RP: Release Position

This is the position where the contact resets after the actuator has travelled from OP.

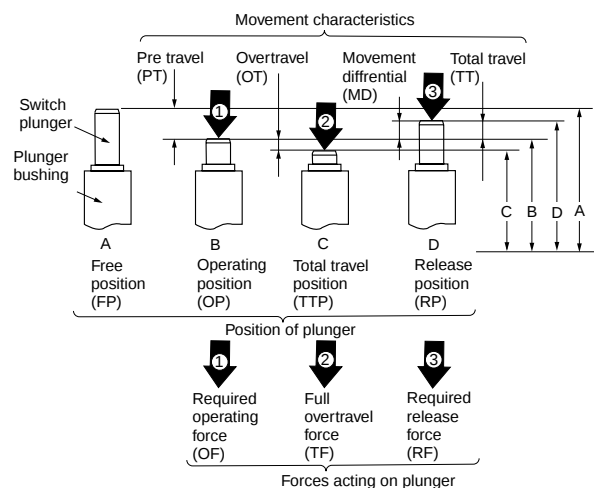
PT: Preoperating Travel

This indicates the travelling angle or distance from FP to OP.

OT: Overtravel

This indicates the travelling angle or distance from OP to TTP.

● Plunger actuation



TT: Total Travel

This indicates the travelling angle or distance from FP to TTP.

MD: Movement Differential (Travel to Reset)

This indicates the travelling angle or distance from OP to the position where the contact resets.

OF: Required Operating Force ①

This indicates the minimum operating force which is required for the contact to close.

RF: Required Resetting Force ③

This indicates the force required for the contact to reset.

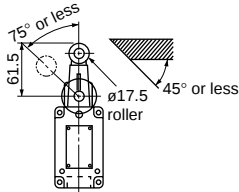
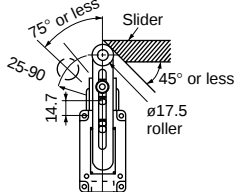
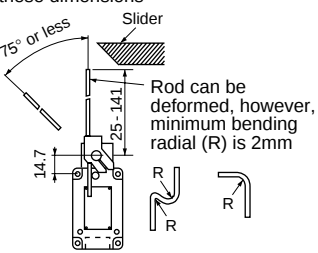
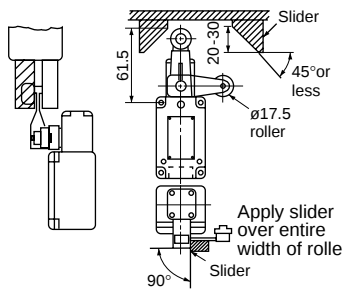
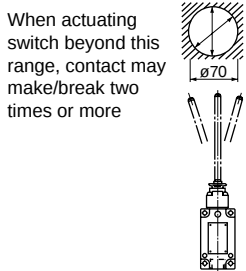
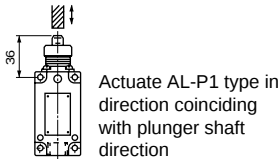
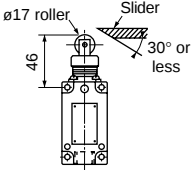
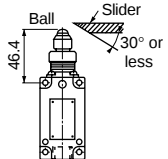
TF: Full Overtravel Force ②

This indicates the force required for the actuator to travel from FP to TTP.

■ Actuating slider face angle and approach speed

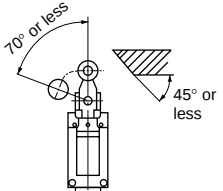
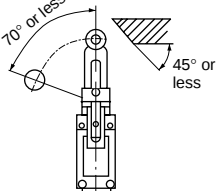
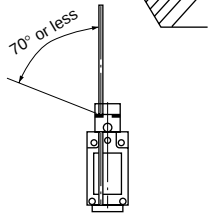
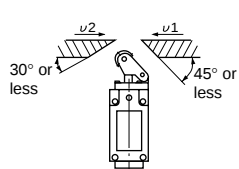
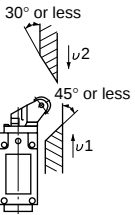
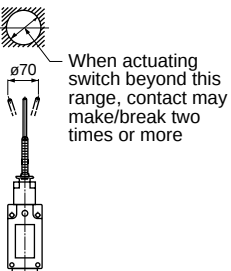
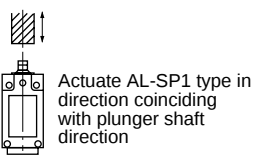
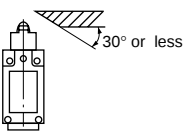
● Standard type

Type		AL-N1		AL-N2		AL-N3	AL-F1	AL-S1	AL-P1	AL-P2	AL-P3
Slider angle (degree)		30	45	30	45	—	45	—	—	30	30
Slider approach speed	Maximum (meter/second)	0.5	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.3
	Minimum (millimeter/second)	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1

AL-N1	AL-N2	AL-N3	AL-F1
	Determine slider depth within range of these dimensions 	Determine slider depth within range of these dimensions 	
AL-S1	AL-P1	AL-P2	AL-P3
When actuating switch beyond this range, contact may make/break two times or more 			

● Compact type

Type		AL-SN1		AL-SN2, SN5		AL-SN3	AL-SK1	AL-SK2	AL-SS1	AL-SP1	AL-SP2
Slider angle (degree)		30	45	30	45	—	30	45	—	—	30
Slider approach speed	Maximum (meter/second)	0.5	0.2	0.2	0.1	0.2	v_1 : 0.6 v_2 : 0.2	0.5	0.2	0.2	0.3
	Minimum (millimeter/second)	0.1	0.1	0.2	0.2	0.2	v_1 : 0.1 v_2 : 0.1	0.1	0.2	0.1	0.1

AL-SN1	AL-SN2, SN5	AL-SN3	AL-SK1
			
AL-SK2	AL-SS1	AL-SP1	AL-SP2
	When actuating switch beyond this range, contact may make/break two times or more 	Actuate AL-SP1 type in direction coinciding with plunger shaft direction 	

Limit Switches

AL and AL-S

■ AL series

Description



SI-204

Roller lever

- The angle from the free position to the maximum travel position is 75°
- Spring return
- The most popular limit switch which is best suited for machine tools, automatic machines, conveyor control and similar applications.

Type	Ordering code
AL-N11	PL1A-1
AL-N12	PL1A-2
AL-N13	PL1A-3
AL-N11UL	PL1A-1ZU



SI-203

Adjustable length roller lever

- The lever length can be adjusted between 25mm and 90mm.
- Spring return
- The graduated scales on the lever facilitate adjustment

Type	Ordering code
AL-N21	PL1B-1
AL-N22	PL1B-2
AL-N23	PL1B-3
AL-N21UL	PL1B-1ZU



SI-202

Adjustable length rod lever

- The ø3.2mm stainless steel rod can be extended up to 141mm max.
- Spring return
- The rod can be used by bending. (Radial 2mm min.)

Type	Ordering code
AL-N31	PL1C-1
AL-N32	PL1C-2
AL-N33	PL1C-3
AL-N31UL	PL1C-1ZU



SI-209

Top push rod plunger

- Operated by a vertical rod plunger
- Momentary action

Type	Ordering code
AL-P11	PL1D-1
AL-P12	PL1D-2
AL-P13	PL1D-3
AL-P11UL	PL1D-1ZU



SI-207

Top push roller plunger

- This is a limit switch where the roller is attached to the plunger.
- The direction of the roller can be shifted 90°.
- This feature makes it highly suitable for the control of precision machinery.
- Momentary action

Type	Ordering code
AL-P21	PL1E-1
AL-P22	PL1E-2
AL-P23	PL1E-3
AL-P21UL	PL1E-1ZU

Description



SI-208

Top ball push rod plunger

- The ball rod can be operated from any direction.
- The ball turns smoothly at all times.
- Best suited for detecting objects which travel horizontally from left to right or right to left while turning.

Type	Ordering code
AL-P31	PL1F-1
AL-P32	PL1F-2
AL-P33	PL1F-3
AL-P31UL	PL1F-1ZU



SI-205

Fork roller lever

- The angle of the lever is 90°
- Maintained
- This limit switch is used when detecting the direction in which the lever inclines — i.e. in the right or left.

Type	Ordering code
AL-F11	PL1G-1
AL-F11UL	PL1G-1ZU



SI-211

Side push rod plunger

- Push rod is attached to the side of the operating head.
- The operating head can be changed 90° in direction.
- Momentary action
- This limit switch is used to detect the end limit of low speed transfer.

Type	Ordering code
AL-Y11	PL1H-1
AL-Y11UL	PL1H-1ZU



SI-212

Side push roller plunger

- The push roller is attached to the side of the operating head.
- Momentary action
- This is used to detect the position, speed and direction in high precision machinery and equipment.

Type	Ordering code
AL-Y21	PL1J-1
AL-Y21UL	PL1J-1ZU



SI-210

Side ball push rod plunger

- The ball rod is attached to the side of the operating head.
- The ball turns smoothly in operation.
- Momentary action
- This limit switch is used to detect objects which travel horizontally from left to right or right to left while turning.

Type	Ordering code
AL-Y31	PL1K-1
AL-Y31UL	PL1K-1ZU

■ AL series

Description



Wobble head coil spring rod

- Operates by forces from any directions.
- Used in packing and other conveyors.

Type	Ordering code
AL-S11	PL1H-1
AL-S11UL	PL1H-1ZU

SI-200



Wobble plastic head spring rod

- The length of rod is 140mm from the head.
- Operates by forces from any directions.

Type	Ordering code
AL-S21	PL1M-1
AL-S21UL	PL1M-1ZU

SI-201

Description



Wobble head with cat's whisker

- The length of the stainless steel rod is 190mm from the head.
- Can be operated from any direction.
- Require little torque

Type	Ordering code
AL-W11	PL1N-1
AL-W11UL	PL1N-1ZU

SI-199

Limit Switches

AL and AL-S

■ Operating characteristics

Standard type (Snap action)

Type	AL-N11 AL-N11S	AL-N21 ^{*1} AL-N21S ^{*1}	AL-N31 ^{*2} AL-N31S ^{*2}	AL-P11 AL-P11S	AL-P21 AL-P21S	AL-P31 AL-P31S	AL-F11 AL-F11S
Required operating force OF (max.)	9N	9N	2.9N	15N	15N	15N	9.5N
Required resetting force RF (min.)	0.5N	0.5N	0.15N	8.2N	8.2N	8.2N	—
Preoperating travel PT (min.)	12°	12°	12°	2mm	2mm	2mm	55°
Overtravel OT (min.)	65°	65°	65°	5mm	5mm	5mm	35°
Movement differential (Travel to reset) MD (max.)	7°	7°	7°	1mm	1mm	1mm	—
Total travel TT (min.)	75°	75°	75°	—	—	—	90°±10°

Notes: ^{*1} At lever length 38mm

^{*2} At rod lever length 135mm

Type	AL-Y11 AL-Y11S	AL-Y21 AL-Y21S	AL-Y31 AL-Y31S	AL-S11 AL-S11S	AL-S21 AL-S21S	AL-W11 AL-W11S
Required operating force OF (max.)	40N	40N	40N	1.5N	1.5N	1.5N
Required resetting force RF (min.)	8.9N	8.9N	8.9N	—	—	—
Preoperating travel PT (min.)	2.8mm	2.8mm	2.8mm	30mm	30mm	40mm
Overtravel OT (min.)	4mm	4mm	4mm	—	—	—
Movement differential (Travel to reset) MD (max.)	1mm	1mm	1mm	—	—	—

Standard type (Normal action, overlap action)

	Normal action			Overlap action		
Type	AL-N12 ^{*1} AL-N22	AL-N32 ^{*2}	AL-P12 AL-P22 AL-P32AL	AL-N13 ^{*1} AL-N23	AL-N33 ^{*2}	AL-P13 AL-P23 AL-P33
Required operating force OF (max.)	11N	3.1N	18N	11N	3.1N	18N
Movement to NC contact open	28°	28°	3.5mm	45°	45°	5mm
Movement to NO contact closed	45°	45°	5mm	28°	28°	3.5mm
Total travel TT (min., max.)	75°	75°	7mm	75°	75°	7mm

Notes: ^{*1} At lever length 38mm

^{*2} At rod lever length 135mm

■ AL-S series/Compact-size

Description										
 KKD07-032	Top push rod plunger - Operated by a vertical rod plunger. - Momentary action									
	<table> <tr> <th>Type</th><th>Ordering code</th></tr> <tr> <td>AL-SP11</td><td>PL2D-1</td></tr> <tr> <td>AL-SP12</td><td>PL2D-2</td></tr> <tr> <td>AL-SP13</td><td>PL2D-3</td></tr> <tr> <td>AL-SP11UL</td><td>PL2D-1ZU</td></tr> </table>	Type	Ordering code	AL-SP11	PL2D-1	AL-SP12	PL2D-2	AL-SP13	PL2D-3	AL-SP11UL
Type	Ordering code									
AL-SP11	PL2D-1									
AL-SP12	PL2D-2									
AL-SP13	PL2D-3									
AL-SP11UL	PL2D-1ZU									
 SI-1022	Top push roller plunger - This is a limit switch where the roller is attached to the plunger. - The direction of the roller can be shifted 90° - Momentary action									
	<table> <tr> <th>Type</th><th>Ordering code</th></tr> <tr> <td>AL-SP21</td><td>PL2E-1</td></tr> <tr> <td>AL-SP22</td><td>PL2E-2</td></tr> <tr> <td>AL-SP23</td><td>PL2E-3</td></tr> <tr> <td>AL-SP21UL</td><td>PL2E-1ZU</td></tr> </table>	Type	Ordering code	AL-SP21	PL2E-1	AL-SP22	PL2E-2	AL-SP23	PL2E-3	AL-SP21UL
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AL-SP21	PL2E-1									
AL-SP22	PL2E-2									
AL-SP23	PL2E-3									
AL-SP21UL	PL2E-1ZU									
 KKD07-027	Top roller lever plunger - This limit switch is used to detect objects which travel horizontally from left to right or right to left while turning. - Used in packing and other conveyors.									
	<table> <tr> <th>Type</th><th>Ordering code</th></tr> <tr> <td>AL-SK11</td><td>PL2P-1</td></tr> <tr> <td>AL-SK12</td><td>PL2P-2</td></tr> <tr> <td>AL-SK13</td><td>PL2P-3</td></tr> <tr> <td>AL-SK11UL</td><td>PL2P-1ZU</td></tr> </table>	Type	Ordering code	AL-SK11	PL2P-1	AL-SK12	PL2P-2	AL-SK13	PL2P-3	AL-SK11UL
Type	Ordering code									
AL-SK11	PL2P-1									
AL-SK12	PL2P-2									
AL-SK13	PL2P-3									
AL-SK11UL	PL2P-1ZU									
 KKD07-043	Reversing top roller lever plunger This type is designed to detect the movements in the vertical direction.									
	<table> <tr> <th>Type</th><th>Ordering code</th></tr> <tr> <td>AL-SK21</td><td>PL2Q-1</td></tr> <tr> <td>AL-SK22</td><td>PL2Q-2</td></tr> <tr> <td>AL-SK23</td><td>PL2Q-3</td></tr> <tr> <td>AL-SK21UL</td><td>PL2Q-1ZU</td></tr> </table>	Type	Ordering code	AL-SK21	PL2Q-1	AL-SK22	PL2Q-2	AL-SK23	PL2Q-3	AL-SK21UL
Type	Ordering code									
AL-SK21	PL2Q-1									
AL-SK22	PL2Q-2									
AL-SK23	PL2Q-3									
AL-SK21UL	PL2Q-1ZU									
 KKD07-031	Adjustable length rubber roller lever (ø40) - The lever length can be adjusted between 30mm and 76mm - Spring return - The graduated scales on the lever facilitate adjustment									
	<table> <tr> <th>Type</th><th>Ordering code</th></tr> <tr> <td>AL-SN51</td><td>PL2C-1</td></tr> </table>	Type	Ordering code	AL-SN51	PL2C-1					
Type	Ordering code									
AL-SN51	PL2C-1									

Description						
 KKD07-028	Roller lever - The angle from the free position to the maximum travel position is 70° - Spring return					
	<table> <tr> <th>Type</th><th>Ordering code</th></tr> <tr> <td>AL-SN11</td><td>PL2A-1</td></tr> <tr> <td>AL-SN11UL</td><td>PL2A-1ZU</td></tr> </table>	Type	Ordering code	AL-SN11	PL2A-1	AL-SN11UL
Type	Ordering code					
AL-SN11	PL2A-1					
AL-SN11UL	PL2A-1ZU					
 KKD07-029	Adjustable length roller lever - The lever length can be adjusted between 25mm and 76mm. - Spring return - The graduated scales on the lever facilitate adjustment					
	<table> <tr> <th>Type</th><th>Ordering code</th></tr> <tr> <td>AL-SN21</td><td>PL2B-1</td></tr> <tr> <td>AL-SN21UL</td><td>PL2B-1ZU</td></tr> </table>	Type	Ordering code	AL-SN21	PL2B-1	AL-SN21UL
Type	Ordering code					
AL-SN21	PL2B-1					
AL-SN21UL	PL2B-1ZU					
 KKD07-030	Adjustable length rod lever - The ø3.2mm stainless steel rod can be extended up to 130mm max. - Spring return - The rod can be used by bending. (Radial 2mm min.)					
	<table> <tr> <th>Type</th><th>Ordering code</th></tr> <tr> <td>AL-SN31</td><td>PL2C-1</td></tr> <tr> <td>AL-SN31UL</td><td>PL2C-1ZU</td></tr> </table>	Type	Ordering code	AL-SN31	PL2C-1	AL-SN31UL
Type	Ordering code					
AL-SN31	PL2C-1					
AL-SN31UL	PL2C-1ZU					
 SI-1016	Wobble head coil spring rod - The length of rod is 113mm from the head. - Can be operated from any direction. - Require little torque					
	<table> <tr> <th>Type</th><th>Ordering code</th></tr> <tr> <td>AL-SS11</td><td>PL2H-1</td></tr> <tr> <td>AL-SS11UL</td><td>PL2H-1ZU</td></tr> </table>	Type	Ordering code	AL-SS11	PL2H-1	AL-SS11UL
Type	Ordering code					
AL-SS11	PL2H-1					
AL-SS11UL	PL2H-1ZU					

Limit Switches

AL and AL-S

■ Operating characteristics

Compact type (Snap action)

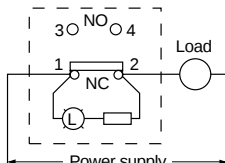
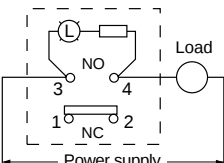
Type	AL-SP11	AL-SP21	AL-SK11	AL-SK21	AL-SN11 *1	AL-SN21 *1	AL-SN31	AL-SN51 *2	AL-SS11
Required operating force OF (max.)	4.5N	8.5N	4N	4N	7N	7N	7N	7N	1.5N
Required resetting force RF (min.)	2N	4.5N	1.8N	1.8N	0.5N	0.5N	0.5N	0.5N	—
Preoperating travel PT (min.)	2mm	2mm	2.5mm	2.5mm	30°	30°	30°	30°	30mm
Overtravel OT (min.)	4mm	3mm	5mm	5mm	40°	40°	40°	40°	—
Movement differential (Travel to reset) MD (max.)	1mm	1mm	1.8mm	1.8mm	8°	8°	8°	8°	—

Notes: *1 At lever or rod level length 25mm

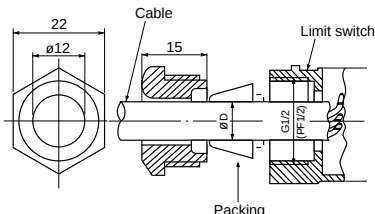
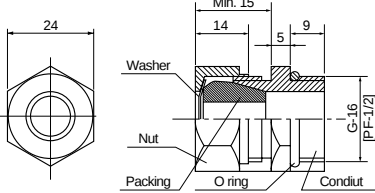
*2 At lever or rod level length 30mm

Compact type (Normal action, overlap action)

	Normal action			Overlap action		
Type	AL-SP12	AL-SP22	AL-SK□2	AL-SP13	AL-SP23	AL-SK□3
Required operating force OF (max.)	7N	10.5N	6.3N	7N	10.5N	6.3N
Movement to NC contact open	1.5mm	1.5mm	2mm	3mm	3mm	4mm
Movement to NO contact closed	3mm	3mm	4mm	1.5mm	1.5mm	2mm
Total travel TT (min., max.)	6mm	6mm	8mm	6mm	6mm	8mm

Description		Standard/Compact Type	Ordering code	UL approved Type	Ordering code	
 SI-314 Standard type	With indicating lamp • The indicating lamp can be fitted to all the AL limit switches. • Neon lamp or LED, and stabilizing resistor are attached inside the housing so that the lamp lights or goes out when the switch is operating. • The nylon cover makes the signal highly visible. • Indicating lamps do not affect the switch dimensions or operating characteristics. • The wiring connections for snap action type are shown below.	AL-N1□■	PL1A-□■	AL-N11■UL	PL1A-1■ZU	
		AL-N2□■	PL1B-□■	AL-N21■UL	PL1B-1■ZU	
		AL-N3□■	PL1C-□■	AL-N31■UL	PL1C-1■ZU	
		AL-P1□■	PL1D-□■	AL-P11■UL	PL1D-1■ZU	
		AL-P2□■	PL1E-□■	AL-P21■UL	PL1E-1■ZU	
		AL-P3□■	PL1F-□■	AL-P31■UL	PL1F-1■ZU	
		AL-F1□■	PL1G-□■	AL-F11■UL	PL1G-1■ZU	
		AL-Y1□■	PL1L-□■	AL-Y11■UL	PL1L-1■ZU	
		AL-Y2□■	PL1M-□■	AL-Y21■UL	PL1M-1■ZU	
		AL-T3□■	PL1N-□■	AL-T31■UL	PL1N-1■ZU	
		AL-S1□■	PL1H-□■	AL-S11■UL	PL1H-1■ZU	
		AL-S2□■	PL1J-□■	AL-S21■UL	PL1J-1■ZU	
		AL-W1□■	PL1K-□■	AL-W11■UL	PL1K-1■ZU	
 KKD07-028 Compact type	 Power supply The lamp lights when NO contact closes  Power supply The lamp lights when NO contact opens	AL-SP1□■	PL2D-□■	AL-SP11■UL	PL2D-1■ZU	
		AL-SP2□■	PL2E-□■	AL-SP11■UL	PL2E-1■ZU	
		AL-SK1□■	PL2P-□■	AL-SK11■UL	PL2P-1■ZU	
		AL-SK2□■	PL2Q-□■	AL-SK21■UL	PL2Q-1■ZU	
		AL-SN1□■	PL2A-□■	AL-SN11■UL	PL2A-1■ZU	
		AL-SN2□■	PL2B-□■	AL-SN21■UL	PL2B-1■ZU	
		AL-SN3□■	PL2C-□■	AL-SN31■UL	PL2C-1■ZU	
		AL-SS1□■	PL2H-□■	AL-SS11■UL	PL2H-1■ZU	
		Replace the □ mark by the contact action code Replace the ■ mark by the lamp voltage code				

■ Accessories

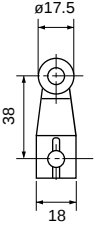
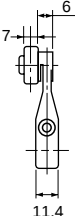
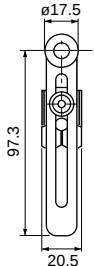
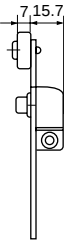
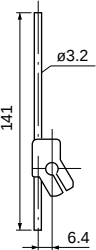
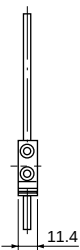
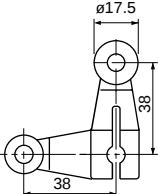
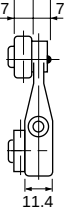
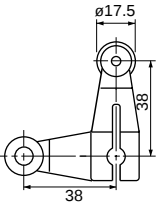
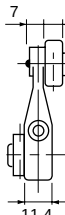
Description		Operating	Type	Ordering code
Standard type sealed conduit (Plastic)		Cable dia. $\varnothing 7.5 - \varnothing 11.5$ (for AL type) ($\varnothing D$) $\varnothing 7 - \varnothing 11$ (for AL-S type)	ALX-016 ALX-510	PL1XW-A PL1XW-B
Complete type sealed conduit (Metal)		Cable dia. $\varnothing 6 - \varnothing 9$ ($\varnothing D$) $\varnothing 8 - \varnothing 11$ $\varnothing 12 - \varnothing 14$ (for AL type, AL-S type, AL1-S type)	ALX-013 ALX-014 ALX-015	PL1XW-C PL1XW-D PL1XW-E
Lamp cover for AL series		For snap action LED lamp 6V DC LED lamp 12V DC LED lamp 24V DC Neon lamp 110/220V AC For normal action LED lamp 6V DC LED lamp 12V DC LED lamp 24V DC Neon lamp 110/220V AC	ALX-011A ALX-011B ALX-011E ALX-011H ALX-012A ALX-012B ALX-012E ALX-012H	PL1XL-1A PL2XL-1B PL1XL-1C PL1XL-1D PL1XL-2A PL1XL-2B PL1XL-2C PL1XL-2D
Lamp cover for AL-S series		For snap action LED lamp 6V DC LED lamp 12V DC LED lamp 24V DC Neon lamp 110/220V AC For normal action LED lamp 6V DC LED lamp 12V DC LED lamp 24V DC Neon lamp 110/220V AC	ALX-507A ALX-507B ALX-507E ALX-507H ALX-508A ALX-508B ALX-508E ALX-508H	PL2XL-1A PL2XL-1B PL2XL-1C PL2XL-1D PL2XL-2A PL2XL-2B PL2XL-2C PL2XL-2D

Limit Switches

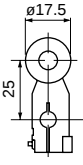
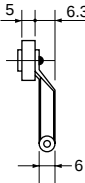
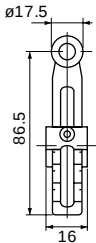
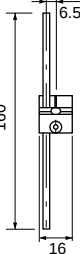
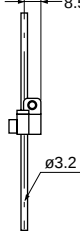
AL and AL-S

■ Actuators

● For AL series

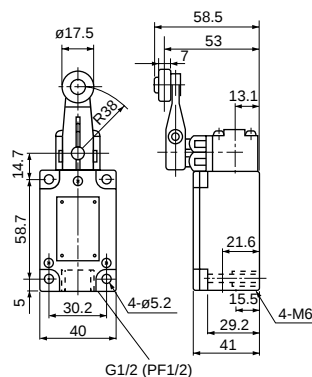
Description	Type		
Roller lever	ALX-001		
			Stainless steel roller
SI-177			
Adjustable length roller lever	ALX-003		
			Stainless steel roller
SI-173			
Adjustable length rod lever	ALX-005		
			Stainless steel rod
SI-171			
Fork roller lever	ALX-007		
			Stainless steel roller
SI-175			
Fork roller lever	ALX-009		
			Stainless steel roller
SI-176			

● For AL-S series

Description	Type		
Roller lever	ALX-501		
			Stainless steel roller
SI-316			
Adjustable length roller lever	ALX-503		
			Stainless steel roller
KKD07-033			
Adjustable length rod lever	ALX-505		
			Stainless steel rod
KKD07-034			

■ Dimensions, mm (AL series)

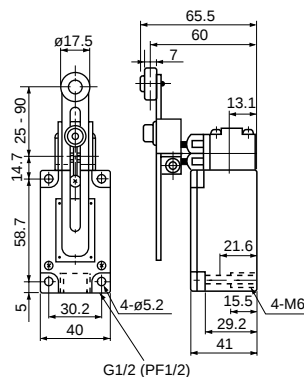
**Roller lever
AL-N1**



Mass: 265g

Stainless steel roller

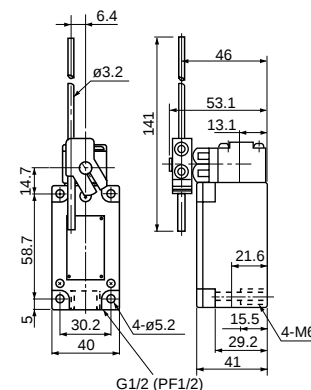
**Adjustable length roller lever
AL-N2**



Mass: 305g

Stainless steel roller

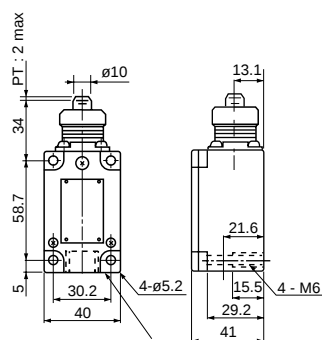
**Adjustable length rod lever
AL-N3**



Mass: 260g

Stainless steel rod

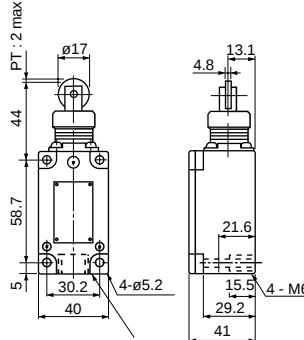
**Top push rod plunger
AL-P1**



Mass: 165g

Stainless steel plunger

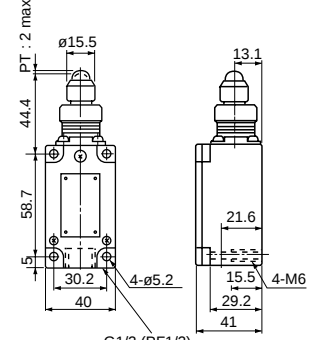
**Top push roller plunger
AL-P2**



Mass: 200g

Stainless steel roller

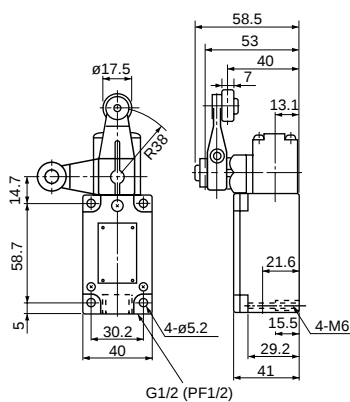
**Top ball push rod plunger
AL-P3**



Mass: 200g

Stainless steel ball

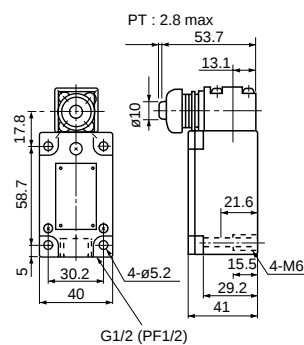
**Fork roller lever
AL-F1**



Mass: 310g

Stainless steel roller

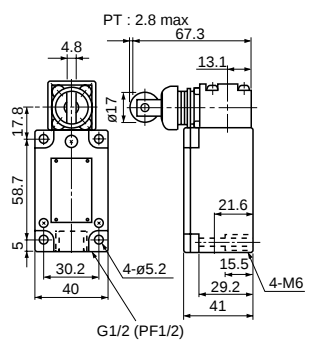
**Side push rod plunger
AL-Y1**



Mass: 275g

Stainless steel plunger

**Side push roller plunger
AL-Y2**



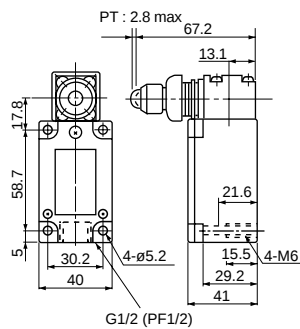
Mass: 285g

Stainless steel roller

Limit Switches

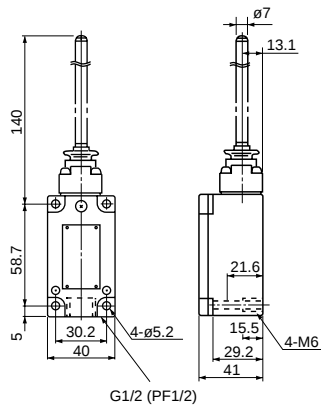
AL and AL-S

■ Dimensions, mm (AL series)
Side ball push rod plunger
AL-Y3



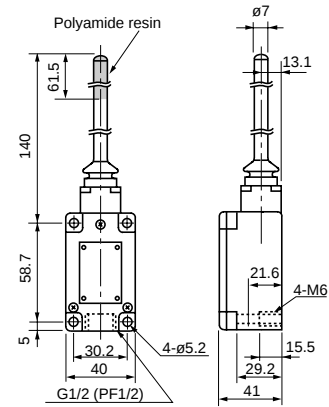
Mass: 285g
Stainless steel ball

Wobble head coil spring rod
AL-S1



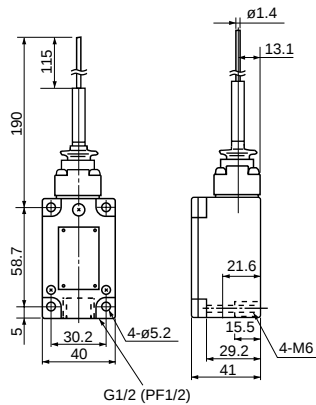
Mass: 220g
Stainless steel coil spring

Wobble plastic head spring rod
AL-S2



Mass: 210g
Stainless steel coil spring

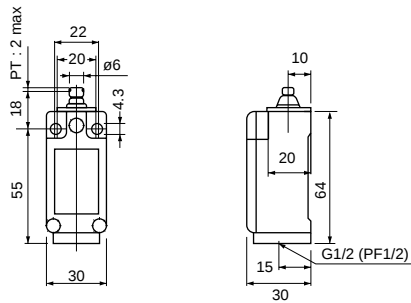
Wobble head with cat's whisker
AL-W1



Mass: 210g
Stainless steel coil spring

■ Dimensions, mm (AL-S series/Compact size)

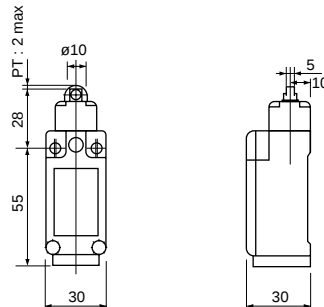
**Top push rod plunger
AL-SP1**



Mass: 55g

Polyamide
resin plunger

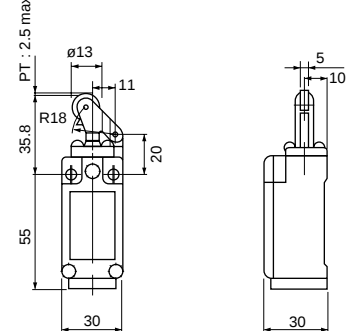
**Top push roller plunger
AL-SP2**



Mass: 60g

Stainless steel
roller

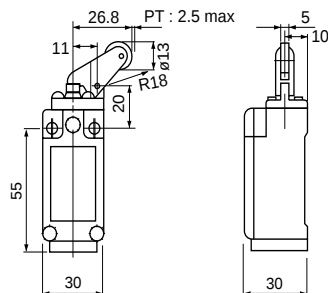
**Top roller lever plunger
AL-SK1**



Mass: 65g

Stainless steel
roller

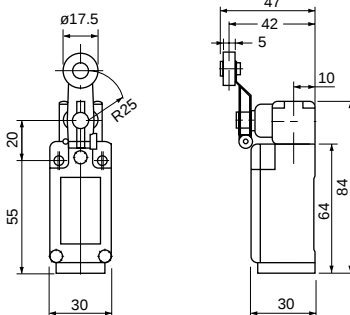
**Reversing top roller lever plunger
AL-SK2**



Mass: 65g

Stainless
steel roller

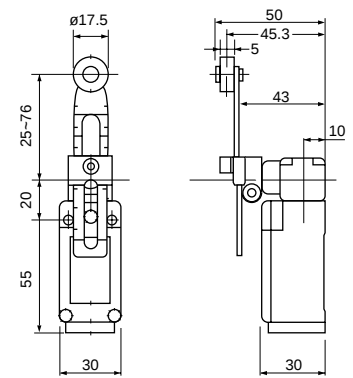
**Roller lever
AL-SN1**



Mass: 100g

Stainless steel
roller

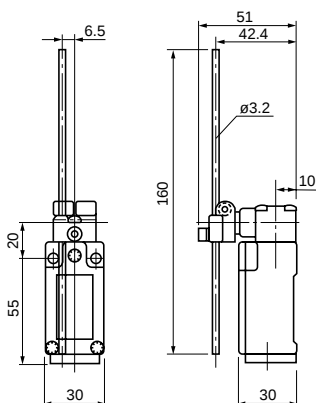
**Adjustable length roller lever
AL-SN2**



Mass: 120g

Stainless steel
roller

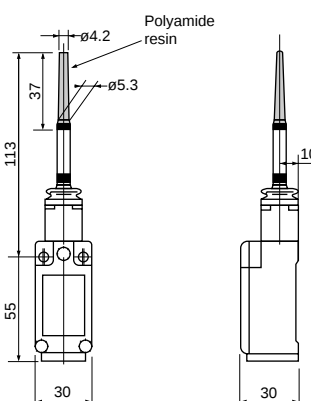
**Adjustable length rod lever
AL-SN3**



Mass: 105g

Stainless
steel rod

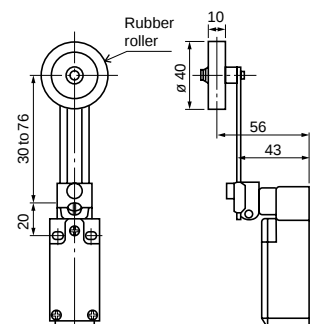
**Wobble plastic head spring rod
AL-SS1**



Mass: 80g

Stainless steel
coil spring

**Adjustable length rubber roller lever
AL-SN51**



Mass: 130g

Rubber roller

Limit Switches

K244

General information

Momentary-contact limit switches

K244 series

■ **Description**

FUJI K244 type limit switches have an excellent performance.

K244 limit switches employ a highly dependable and long lasting double break silver alloy contact system.

These can be expected to perform more than 10 million mechanical operations and a rate of 3,000 operations per hour.

The large variety of operating types such as standard stroke, snap-action type, make-before-break type and extended stroke type, etc. allow you to select a suitable limit switch that fully meets your requirements.

K244 limit switches are widely used for industrial machinery such as machine tools, printing machines, conveyors, automatic machines and door interlocking and similar applications.

The aluminum die-cast housing can also be supplied in an oil and water proof version.

■ **Technical data**

Insulation resistance:
Over 100MΩ at 500V DC

Dielectric strength:
2500V AC rms 1 minute

Max. operating cycle:
3000 cycles per hour

Life expectancy

Mechanical: 10 million operations

Electrical:

- K244-2, 2U and 2V
3.3 million operations at 24 to 550V AC 3A
- K244-2S
1.3 million operations at 24 to 550V AC 3A

■ **Ordering information**

Specify the following:

1. Type number or ordering code

Example

Limit switch PL

With enclosure 5

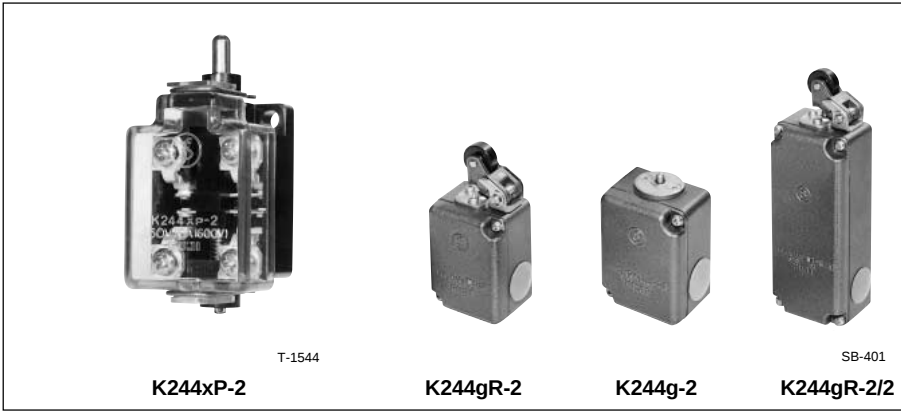
Standard contact N

Cast-metal clad enclosure G

With top roller lever plunger R

Contact, normal action 1NO+1NC 22

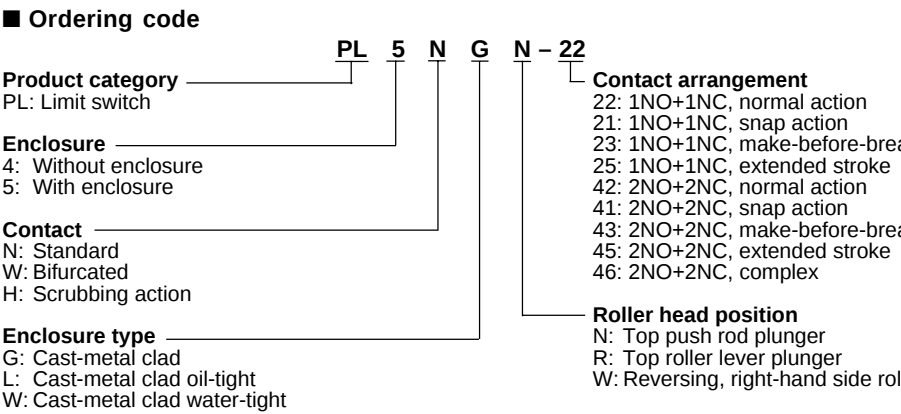
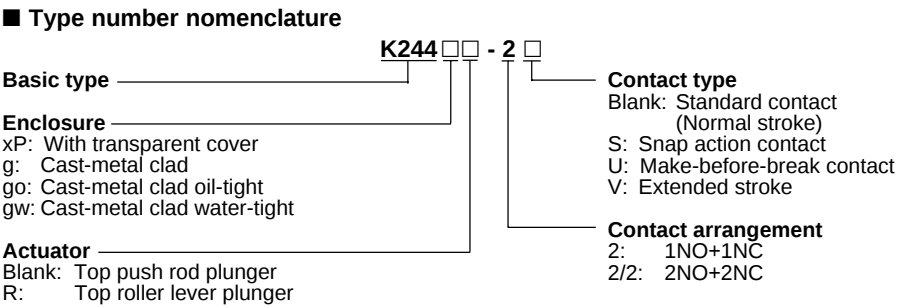
Ordering code PL5NGR22



■ **Ratings**

Type	Thermal current (A)	Making current (A)	Breaking current *1		DC Voltage (V)	Current (A)	
			AC Voltage (V)	Current (A)		Resistive	Inductive
K244-2 K244-2U K244-2V	10	50	24	10	24	10	10
			110	10	110	2.2	1.3
			220	10	220	0.9	0.4
			440	10	440	0.4	0.2
			550	10	550	0.32*2	0.15*2
K244-2S	10	50	24	10	24	7	7
			110	10	110	1.5	0.9
			220	10	220	0.63	0.28
			440	10	440	0.28	0.14
			550	10	550	0.22*2	0.1*2

Notes: *1 When NO and NC contacts are wired in the same potential.
*2 Value of the breaking current when opposite contacts are not applied with potential.



■ Actuating slider face angles and approach speeds

Although K244 limit switches have an excellent performance they should not be operated at an extremely high speed or extremely low speeds, since these conditions will cause contact trouble and reduce the mechanical life expectancy of the devices. The slider face angles and approach speeds should be kept within the following recommendations.

● Push rod plunger type

This type of switch obtains the movement from the vertical travel of the rod.

Speed : Max. 1m/sec
Min. 0.015m/sec

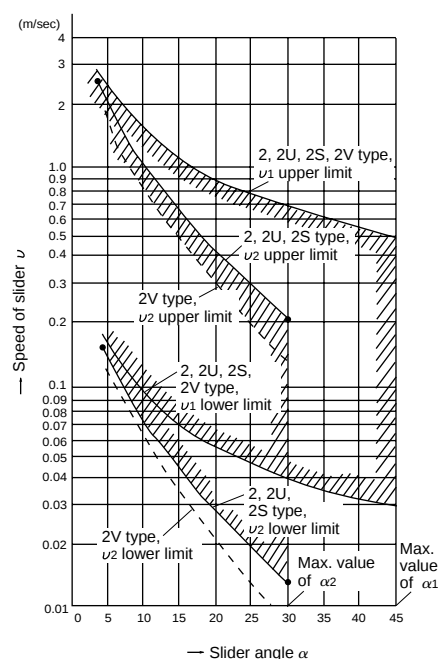
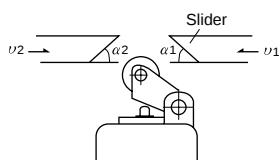
Snap-action types can be used at speeds less than the minimum value.

● Roller lever type

The actuating slider face angles and speeds should be within the following range.

The maximum angle of the slider face:
 $\alpha_1=45^\circ$ $\alpha_2=30^\circ$

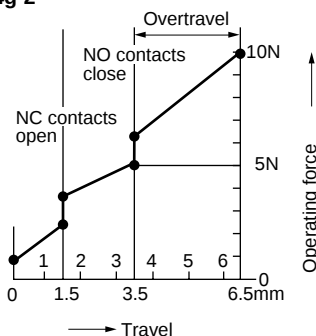
Snap-action type switches can be used at speeds less than the minimum value.



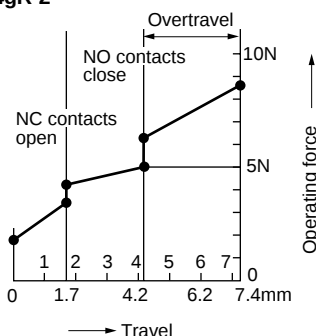
■ Travel operating force curve (Typical example)

The curve indicates forces to operate the contact.

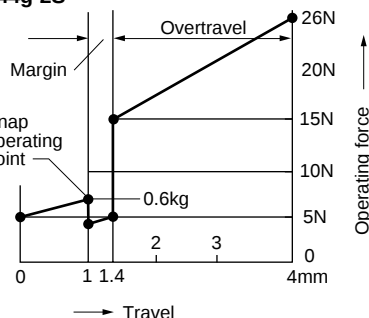
Standard type K244g-2



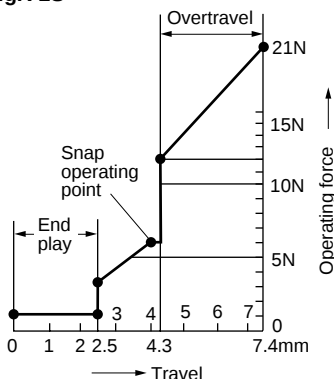
K244gR-2



Snap action contact type K244g-2S



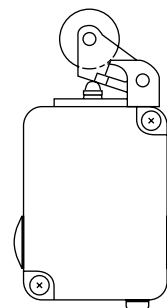
K244gR-2S



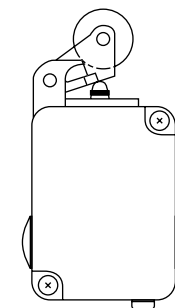
■ Changing direction of operating roller head

Roller head positions can be shifted by 90° in each direction. The head is attached at the standard position when shipped from factory.

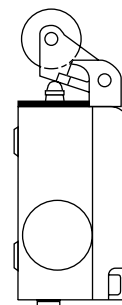
Standard



l type



f type



■ Cable connection

Threaded conduit entrances are provided at 3 locations—left, right and lower side of the limit switch housing. Knockout the plug to carry out wiring. Do not remove plugs from holes not requiring wiring.

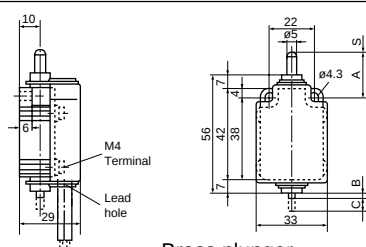
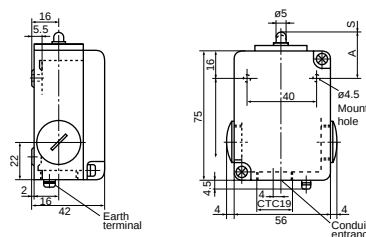
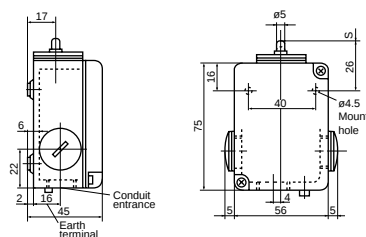


Limit Switches

K244

Standard type

■ K244 series/Standard

Description	Contact arrangement	Ter- minal No.	Travel ■ Contact closed □ Contact open	Type	Ordering code	Dimensions, mm																				
Top push rod plunger with transparent plastic cover  SF2025	1NO+1NC		S (mm) 1.5 1-2 3-4 0 2 3.5 6.3	K244xp-2	PL4NN-22	 Brass plunger <table><tr><td></td><td>-2</td><td>-2S</td><td>-2U</td><td>-2V</td></tr><tr><td>A</td><td>21</td><td>19</td><td>21</td><td>21</td></tr><tr><td>B</td><td>1.5</td><td>1.5</td><td>1.5</td><td>1.0</td></tr><tr><td>C</td><td>6.5</td><td>1.4</td><td>6</td><td>8.5</td></tr></table> Mass: 60g		-2	-2S	-2U	-2V	A	21	19	21	21	B	1.5	1.5	1.5	1.0	C	6.5	1.4	6	8.5
	-2	-2S	-2U	-2V																						
A	21	19	21	21																						
B	1.5	1.5	1.5	1.0																						
C	6.5	1.4	6	8.5																						
Normal stroke		2 4 1 3	1.4 3-4 1-2 0 2 4	K244xp-2S	PL4NN-21																					
Snap-action		2 4 1 3	3 1-2 3-4 0 2 6	K244xp-2U	PL4NN-23																					
Make-before-break		2 4 1 3	Momentary open 1-2 3-4 0 6 8.5	K244xp-2V	PL4NN-25																					
Extended stroke		2 4 1 3																								
Top push rod plunger cast-metal clad  T-1535	1NO+1NC		S (mm) 1.5 1-2 3-4 0 2 3.5 6	K244g-2	PL5NGN-22	 Brass plunger <table><tr><td></td><td>-2</td><td>-2S</td><td>-2U</td><td>-2V</td></tr><tr><td>A</td><td>26</td><td>24</td><td>26</td><td>26</td></tr></table> Mass: 200g		-2	-2S	-2U	-2V	A	26	24	26	26										
	-2	-2S	-2U	-2V																						
A	26	24	26	26																						
Normal stroke		2 4 1 3	1.4 3-4 1-2 0 2 4	K244g-2S	PL5NGN-21																					
Snap-action		2 4 1 3	3 1-2 3-4 0 2 5	K244g-2U	PL5NGN-23																					
Make-before-break		2 4 1 3	Momentary open 1-2 3-4 0 6 8.4	K244g-2V	PL5NGN-25																					
Extended stroke		2 4 1 3																								
Top push rod plunger oiltight and watertight cast-metal clad  T-1535	1NO+1NC		S (mm) 1.4 3-4 1-2 0 2.4	Oiltight K244go-2S	PL5NLN-21	 Brass plunger Mass: 210g																				
Snap-action		2 4 1 3		Watertight K244gw-2S	PL5NWN-21																					

■ Contact action (Typical)

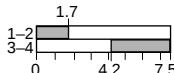
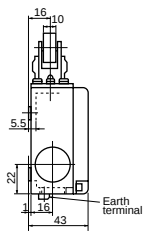
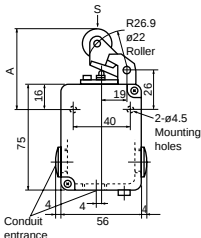
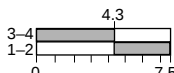
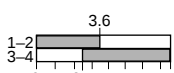
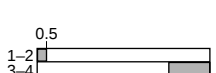
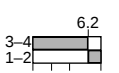
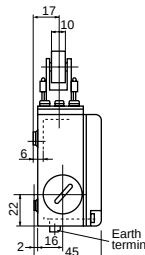
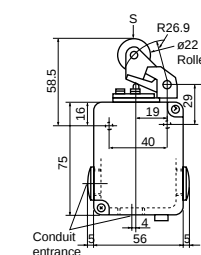
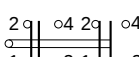
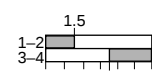
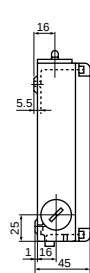
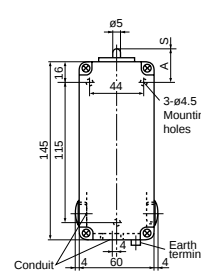
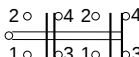
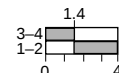
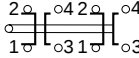
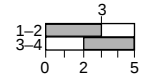
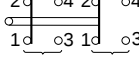
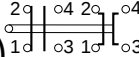
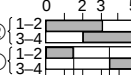
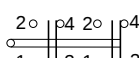
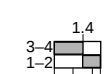
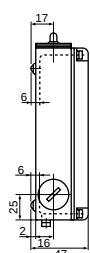
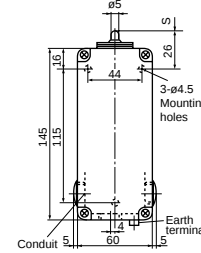
Contact	Standard type (Normal stroke)	Snap action contact	Make-before- break contact	Extended stroke
Contact diagram				
Contact travel	1.5 (mm) 1-2 3-4 0 2 4 6 6.3	1.4 (mm) 3-4 1-2 0 2 4	3 (mm) 1-2 3-4 0 2 4 6	Momentary open (mm) 1-2 3-4 0 2 4 6 8 8.5
■ : Contact closed □ : Contact open				

Limit Switches

K244

Standard type

■ K244 series/Standard

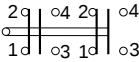
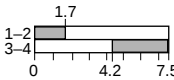
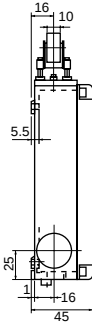
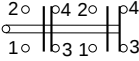
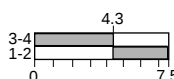
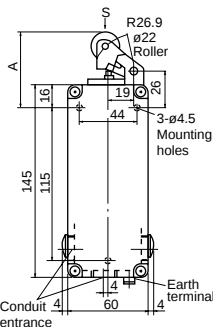
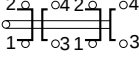
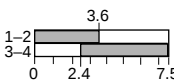
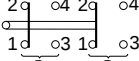
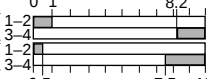
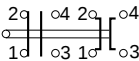
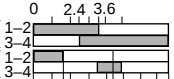
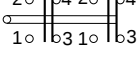
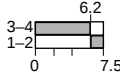
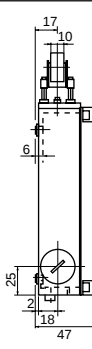
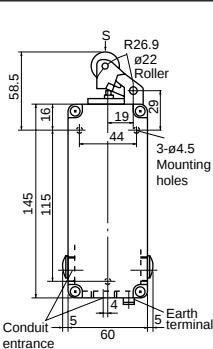
Description	Contact arrangement	Terminal No.	Travel ■ Contact closed □ Contact open	Type	Ordering code	Dimensions, mm											
Top roller lever plunger cast-metal clad																	
	Normal stroke			K244gR-2	PL5NGR-22	 											
	Snap-action			K244gR-2S	PL5NGR-21												
	Make-before-break			K244gR-2U	PL5NGR-23												
	Extended stroke			K244gR-2V	PL5NGR-25												
Phenal-formaldehyde roller																	
<table><tr><td>-2</td><td>-2S</td><td>-2U</td><td>-2V</td></tr><tr><td>A</td><td>55</td><td>55</td><td>55</td><td>57</td></tr></table>							-2	-2S	-2U	-2V	A	55	55	55	57		
-2	-2S	-2U	-2V														
A	55	55	55	57													
Mass: 240g																	
Top roller lever plunger oiltight and watertight cast-metal clad																	
	Snap-action			Oiltight K244goR-2S	PL5NLR-21	 											
				Watertight K244gwR-2S	PL5NWR-21												
Phenal-formaldehyde roller																	
Mass: 250g																	
Top push rod plunger cast-metal clad																	
	Normal stroke			K244g-2/2	PL5NGN-42	 											
	Snap-action			K244g-2S/2S	PL5NGN-41												
	Make-before-break			K244g-2U/2U	PL5NGN-43												
	Extended stroke			K244g-2V/2V	PL5NGN-45												
	Complex (Normal stroke + Make-before-break)			K244g-2/2U	PL5NGN-46												
Brass plunger																	
<table><tr><td>2/2</td><td>2S/2S</td><td>2U/2U</td><td>2V/2V</td><td>2/2U</td></tr><tr><td>A</td><td>26</td><td>24</td><td>26</td><td>26</td><td>26</td></tr></table>							2/2	2S/2S	2U/2U	2V/2V	2/2U	A	26	24	26	26	26
2/2	2S/2S	2U/2U	2V/2V	2/2U													
A	26	24	26	26	26												
Mass: 410g																	
Top push rod plunger oiltight and watertight cast-metal clad																	
	Snap-action			Oiltight K244go-2S/2S	PL5NLN-41	 											
				Watertight K244gw-2S/2S	PL5NWN-41												
Brass plunger																	
Mass: 420g																	

Limit Switches

K244

Standard type

■ K244 series/Standard

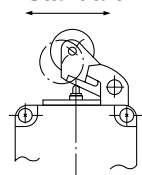
Description	Contact arrangement	Ter- minal No.	Travel ■ Contact closed □ Contact open	Type	Ordering code	Dimensions, mm												
Top roller lever plunger cast-metal clad	2NO+2NC		S (mm)															
 Normal stroke		1-2 3-4		K244gR-2/2	PL5NGR-42													
Snap-action		1-2 3-4		K244gR-2S/2S	PL5NGR-41													
Make-before-break		1-2 3-4		K244gR-2U/2U	PL5NGR-43													
Extended stroke		② 1-2 ③ 3-4 ① 1-2 ③ 3-4		K244gR-2V/2V	PL5NGR-45													
Complex (Normal stroke + Make-before-break)		② 1-2 ③ 3-4 ① 1-2 ③ 3-4		K244gR-2/2U	PL5NGR-46	Phenol-formaldehyde roller <table><tr><td></td><td>2/2</td><td>2S/2S</td><td>2U/2U</td><td>2V/2V</td><td>2/2U</td></tr><tr><td>A</td><td>55</td><td>55</td><td>55</td><td>57</td><td>55</td></tr></table> Mass: 440g		2/2	2S/2S	2U/2U	2V/2V	2/2U	A	55	55	55	57	55
	2/2	2S/2S	2U/2U	2V/2V	2/2U													
A	55	55	55	57	55													
Top roller lever plunger oiltight and watertight cast-metal clad	2NO+2NC		S (mm)															
 Snap-action		1-2 3-4		Oiltight K244goR-2S/2S	PL5NLR-41													
				Watertight K244gwR-2S/2S	PL5NWR-41													
						Phenol-formaldehyde roller Mass: 450g												

Reversing roller lever momentary-contact limit switches, K244g□R

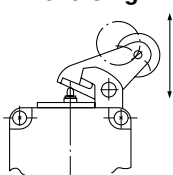
■ Description

These limit switches are designed to detect the movements in the vertical direction. The switch body is identical to the standard type except that one roller is extended from the housing. The performance is the same as for the standard type.

● Standard



● Reversing

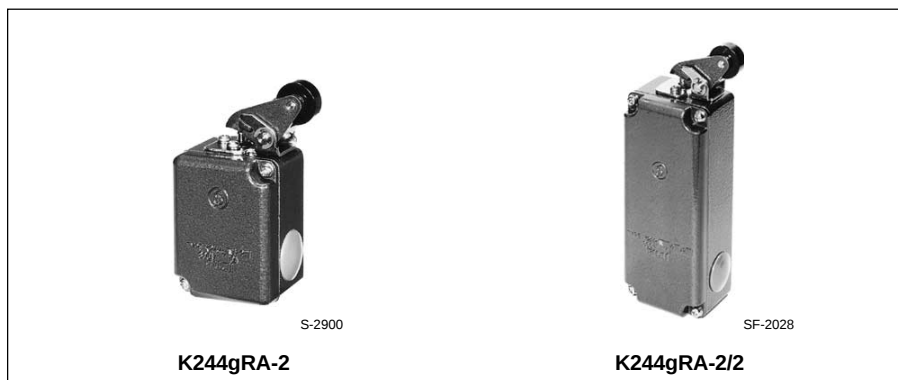
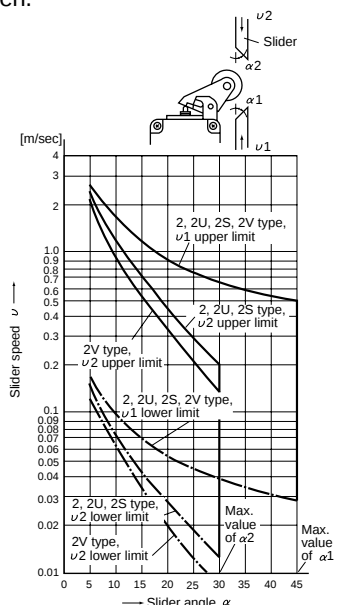


Right side roller

■ Actuating slider face angles and approach speeds

K244 limit switches have an outstanding performance and will have a long service life under normal conditions. They are designed to carry out 3,000 operations per hour but if they are operated at an extremely high speeds or on the contrary at extremely low speeds contact trouble could develop which would reduce the mechanical life expectancy of the devices.

Reversing roller levers are provided with sliders in their vertical direction. The slider face angles and approach speeds should be kept within the range shown by curves. The maximum angle of the actuating slider is $\alpha_1=45^\circ$, $\alpha_2=30^\circ$ and under. Snap-action types can be used at speeds less than the minimum value given.



■ Ratings

Type	Thermal current (A)	Making current (A)	Breaking current *1		DC Voltage (V)	Current (A)	
			AC Voltage (V)	Current (A)		Resistive	Inductive
K244gRA-2 K244gRA-2U K244gRA-2V	10	50	24	10	24	10	10
			110	10	110	2.2	1.3
			220	10	220	0.9	0.4
			440	10	440	0.4	0.2
K244gRA-2S	10	50	550	10	550	0.32	0.15*2
			24	10	24	7	7
			110	10	110	1.5	0.9
			220	10	220	0.63	0.28
			440	10	440	0.28	0.14
			550	10	550	0.22	0.1*2

Notes: *1 When NO and NC contacts are wired in the same polarity.

*2 Opposite contacts are not permitted to carry potential.

■ Ordering information

Specify the following

1. Type number or ordering code

Example

Limit switch PL
With enclosure 5
Standard contact N
Cast-metal clad enclosure G
With reversing roller plunger W
Contact 1NO+1NC, snap-action -21
Ordering code PL5NGW-21

■ Ordering code: See page 05/16.

■ Travel operating force:

See page 05/17.

■ Cable connection: See page 05/17.

■ Type number nomenclature

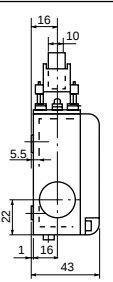
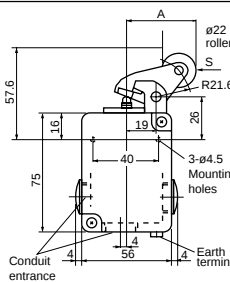
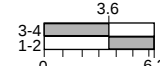
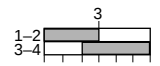
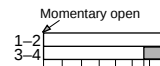
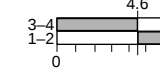
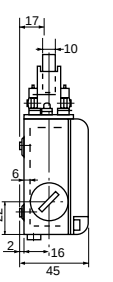
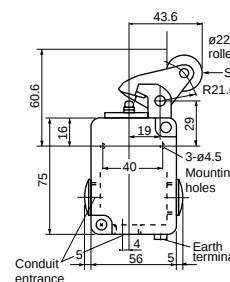
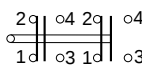
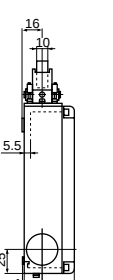
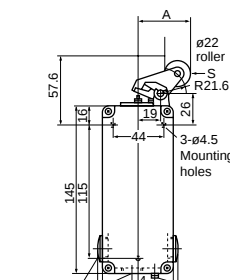
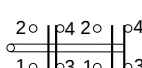
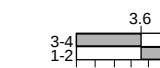
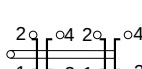
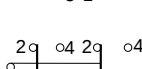
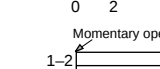
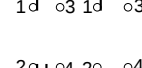
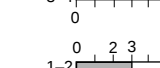
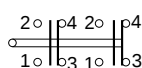
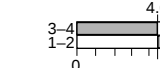
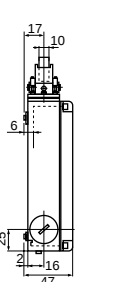
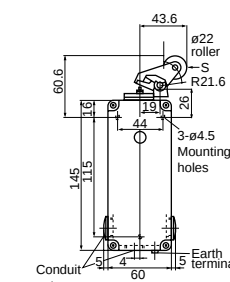
Basic type	K244	□	□	□	- 2	□
Enclosure	g:	Cast-metal clad				
	go:	Cast-metal clad oil-tight				
	gw:	Cast-metal clad water-tight				
Actuator	R:	Top roller lever plunger				
	A:	Reversing roller				
Contact type	Blank:	Standard contact				
	(Normal stroke)					
	S:	Snap-action contact				
	U:	Make-before-break contact				
	V:	Extended stroke contact				
Contact arrangement	2:	1NO+1NC				
	2/2:	2NO+2NC				

■ Technical data: Same as standard type, see page 05/16.

Limit Switches

K244 reversing roller type

■ K244 series/Reversing roller

Description	Contact arrangement	Terminal No.	Travel ■ Contact closed □ Contact open	Type	Ordering code	Dimensions, mm
Reversing top roller lever plunger cast-metal clad	1NO+1NC					
 S-2900	Normal stroke				K244gRA-2 PL5NGW-22	 
	Snap-action				K244gRA-2S PL5NGW-21	
	Make-before-break				K244gRA-2U PL5NGW-23	
	Extended stroke				K244gRA-2V PL5NGW-25	
						-2 -2S -2U -2V
						A 43.6 43.6 43.6 45.8
						Mass: 240g Phenal-formaldehyde roller
Reversing top roller lever plunger oiltight and watertight cast-metal clad	1NO+1NC					
 S-2900	Snap-action			Oiltight K244goRA-2S PL5NLW-21		 
				Watertight K244gwRA-2S PL5NWW-21		
Reversing top roller lever plunger cast-metal clad	2NO+2NC					
 SF-2028	Normal stroke				K244gRA-2/2 PL5NGW-42	 
	Snap-action				K244gRA-2S/2S PL5NGW-41	
	Make-before-break				K244gRA-2U/2U PL5NGW-43	
	Extended stroke				K244gRA-2V/2V PL5NGW-45	
	Complex (Normal stroke + Make-before-break)				K244gRA-2/2U PL5NGW-46	
						Phenal-formaldehyde roller
						2/2 2S/2S 2U/2U 2V/2V 2/2U
						A 43.6 43.6 43.6 45.8 43.6
						Mass: 440g
Reversing top roller lever plunger oiltight and watertight cast-metal clad	2NO+2NC					
 SF-2028	Snap-action			Oiltight K244goRA-2S/2S PL5NLW-41		 
				Watertight K244gwRA-2S/2S PL5NWW-41		
						Mass: 450g

Momentary-contact limit switches for low voltage circuit HK244 and WK244

■ Description

HK244 and WK244 limit switches have been developed for use in low voltage and low current circuits. They will operate effectively in 3 Volts AC or DC, 5mA circuits although they are recommended that they are used in 48 Volts or 110 Volts circuits for best results.

HK244 limit switches

HK244 limit switches are provided with pure silver contacts. The movable contact carries out a scrubbing action during make/break operation ensuring good connections at all times. The switch body is molded from a high performance resin, and versions with transparent plastic covers and with aluminum die-cast housing are also available.

WK244 limit switches

The bifurcated contact is made of pure silver and like the HK244 series they are also suitable for use with low voltage circuits. The dimensions and operating strokes are similar to the standard type.

■ Ordering information

Specify the following:
1. Type number or ordering code

Example

Limit switch PL
With enclosure 5
Scrubbing contact H
Cast-metal clad enclosure G
Top roller lever plunger R
Contact 1NO+1NC, normal stroke -22
Ordering code PL5HGR-22

■ Dimensions, mm

Same as standard type limit switch K244 series. See page 05/18 to 05/20, 05/22.

■ Ordering code: See page 05/16.



■ Ratings

HK244

Thermal current (A)	Making current (A)	Breaking current *1		DC Voltage (V)	Current (A)	
		AC Voltage (V)	Current (A)		Resistive	Inductive
10	50	24	10	24	7	7
		110	10	110	1.5	0.9
		220	10	220	0.63	0.28
		440	10	440	0.28	0.14
		550	10	550	0.22*2	0.1*2

WK244

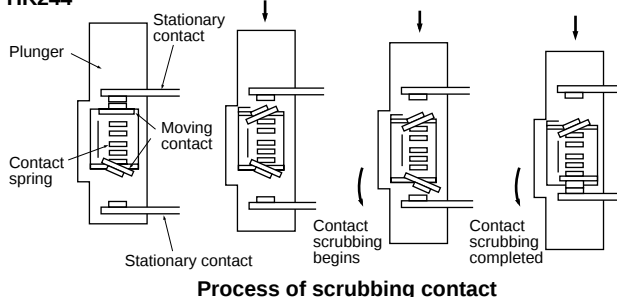
Thermal current (A)	Making current (A)	Breaking current *1		DC Voltage (V)	Current (A)	
		AC Voltage (V)	Current (A)		Resistive	Inductive
10	12.5	110	2.5	110	1.5	0.2
		220	2.5	220	0.63	—

Notes: *1 When NO and NC contacts are wired in same polarity.

*2 Opposite contacts are not permitted to carry potential.

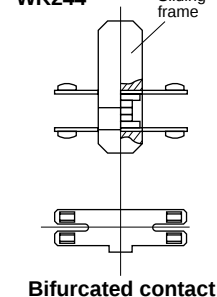
■ Contacts

HK244



Process of scrubbing contact

WK244



Bifurcated contact

■ Technical data

HK244

Insulation resistance: Over 100MΩ at 500VDC
Dielectric strength: 2500V AC rms 1 minute
Max. operating cycle: 3000 cycles per hour
Life expectancy Mechanical: 10 million operations
Electrical: 1.3 million operations at 24 to 550V AC 3A
Allowable ambient temperature: -5° to +60°C

WK244

Insulation resistance: Over 100MΩ at 500VDC
Dielectric strength: 2500VAC rms 1 minute
Max. operating cycle: 3000 cycles per hour
Life expectancy Mechanical: 10 million operations
Electrical: 1 million operations at 220V AC 1.5A
Allowable ambient temperature: -5° to +60°C

Limit Switches

HK244 and WK244

■ HK244 and WK244 series

Description	Contact arrangement	Travel (mm) of HK series (WK series: Same as standard series, pages 05/115 to 05/117)	HK series With scrubbing contact action Type	Ordering code	WK series With bifurcated contact Type	Ordering code	Dimensions (Same as K244)
Top push rod plunger transparent plastic cover	1NO+1NC						
Normal stroke			HK244xp-2	PL4HGN-22	WK244xp-2	PL4WGN-22	Page 05/18
Make-before-break			HK244xp-2U	PL4HGN-23	WK244xp-2U	PL4WGN-23	Page 05/18
Top push rod plunger cast-metal clad	1NO+1NC						
Normal stroke			HK244g-2	PL5HGN-22	WK244g-2	PL5WGN-22	Page 05/18
Make-before-break			HK244g-2U	PL5HGN-23	WK244g-2U	PL5WGN-23	Page 05/18
Top roller lever plunger cast-metal clad	1NO+1NC						
Normal stroke			HK244gR-2	PL5HGR-22	WK244gR-2	PL5WGR-22	Page 05/19
Make-before-break			HK244gR-2U	PL5HGR-23	WK244gR-2U	PL5WGR-23	Page 05/19
Reversing top roller lever plunger cast-metal clad	1NO+1NC						
Normal stroke			HK244gRA-2	PL5HGW-22	WK244gRA-2	PL5WGW-22	Page 05/22
Make-before-break			HK244gRA-2U	PL5HGW-23	WK244gRA-2U	PL5WGW-23	Page 05/22
Top push rod plunger cast-metal clad	2NO+2NC						
Normal stroke			HK244g-2/2	PL5HGN-41	WK244g-2/2	PL5WGN-41	Page 05/19
Make-before-break			HK244g-2U/2U	PL5HGN-43	WK244g-2U/2U	PL5WGN-43	Page 05/19
Complex (Normal stroke + Make-before-break)			HK244g-2/2U	PL5HGN-46	WK244g-2/2U	PL5WGN-46	Page 05/19
Top roller lever plunger cast-metal clad	2NO+2NC						
Normal stroke			HK244gR-2/2	PL5HGR-41	WK244gR-2/2	PL5WGR-41	Page 05/20
Make-before-break			HK244gR-2U/2U	PL5HGR-43	WK244gR-2U/2U	PL5WGR-43	Page 05/20
Complex (Normal stroke + Make-before-break)			HK244gR-2/2U	PL5HGR-46	WK244gR-2/2U	PL5WGR-46	Page 05/20
Reversing top roller lever plunger cast-metal clad	2NO+2NC						
Normal stroke			HK244gRA-2/2	PL5HGW-41	WK244gRA-2/2	PL5WGW-41	Page 05/22
Make-before-break			HK244gRA-2U/2U	PL5HGW-43	WK244gRA-2U/2U	PL5WGW-43	Page 05/22
Complex (Normal stroke + Make-before-break)			HK244gRA-2/2U	PL5HGW-46	WK244gRA-2/2U	PL5WGW-46	Page 05/22

Contact closed
 Contact open