

HIGH CONTACT CAPACITY, PRECISE OPERATION

AM1 (NZ BASIC) SWITCHES

FEATURES

- 10 A High current switching capacity and high precision
- Wide allowance of operating speed
- Versatile variety of actuators
- UL/C-UL approved

TYPICAL APPLICATION

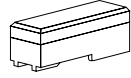
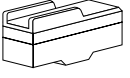
- General industrial machinery
- Medical equipment
- Measuring instruments
- Transportation equipment
- Home electric appliances

We have introduced Cadmium free type products to reduce the material which is not good for our environment. (The suffix "F" should be added to the part number.) If you are still using Cadmium containing parts, which don't have "F" on the suffix of the part number, please use Cadmium free parts from now on. The life of the Cadmium free parts may be shorter than the Cadmium containing parts based on the load condition, so please evaluate the Cadmium free parts with your actual application before use.

RoHS Directive compatibility information
<http://www.nais-e.com/>

ORDERING INFORMATION

Ex. AM 1 5 0 1 K F

Type of switch	Upper body cover shape & terminal		Basic specifications	Actuators	Contact
NZ basic (AM1) switch	Upper body cover shape		0: Standard type 1: Oil tight type 3: Reversed action type 4: One way type	0: Pin plunger 1: Hinge lever (leaf spring) 3: Hinge roller lever (roller, leaf, spring) 4: Hinge short roller lever 5: Overtravel plunger 6: Compact overtravel plunger 7: Panel mount plunger 811: Panel mount roller plunger 812: Panel mount cross roller plunger	F: Cadmium free
	1: Flat, solder terminal 3: Flat, screw terminal 5: Grooved, solder terminal 7: Grooved, screw terminal	<div>Flat</div>  <div>Grooved</div> 			

Remarks: Not every combination is available. Please refer to the following table, "PRODUCT TYPES".

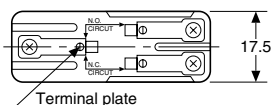
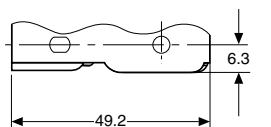
TERMINAL VARIATION

Standard types, reversed action types and oil tight types are available in two terminal designs, solder and screw terminals, as shown in the above columns:

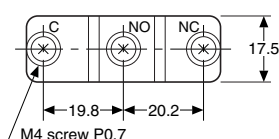
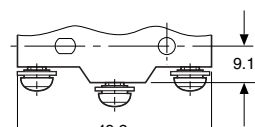
Differences in dimension between solder and screw terminals are as follows;

mm

Solder terminal



Screw terminal



PRODUCT TYPES

1. Standard type

Actuator	Solder terminal	Screw terminal
Pin plunger	AM1100KF	AM1300KF
Over travel plunger	AM1105KF	AM1305KF
Compact over travel plunger	AM1106KF	AM1306KF
Panel mount plunger	AM1107KF	AM1307KF
Panel mount roller plunger	AM110811KF	AM130811KF
Panel mount cross roller plunger	AM110812KF	AM130812KF
Flexible leaf lever	AM1101KF	AM1301KF
Flexible roller leaf lever	AM1103KF	AM1303KF
Rigid lever	AM1501KF	AM1701KF
Rigid short roller lever	AM1504KF	AM1704KF
Rigid roller lever	AM1503KF	AM1703KF
One way type•Rigid short roller lever	AM1544KF	AM1744KF
One way type•Rigid roller lever	AM1543KF	AM1743KF
Reversed action type•Rigid lever	AM1531KF	AM1731KF
Reversed action type •Rigid short roller lever	AM1534KF	AM1734KF
Reversed action type•Rigid roller lever	AM1533KF	AM1733KF

2. Oil tight types

Actuator	Solder terminal	Screw terminal
Rigid lever	AM1511KF	AM1711KF
Rigid short roller lever	AM1514KF	AM1714KF
Rigid roller lever	AM1513KF	AM1713KF

Remarks: 1. Standard part number indicates UL/C-UL mark.
2. Standard packing for inner carton: 20cps.

SPECIFICATIONS

1. Contact Rating

Type	Voltage	Resistive load ($\cos \phi = 1$)	Inductive load ($\cos \phi = 0.6$ to 0.7)	Motor or lamp load	
				N.C.	N.O.
Standard types One way types Reversed action types	125 V AC	10 A	6 A	3 A	1.5 A
	250 V AC	10 A	6 A	2 A	1 A
	480 V AC	1 A	0.5 A	—	—
	125 V DC	0.5 A	0.05 A	—	—
	250 V DC	0.25 A	0.03 A	—	—
Oil tight types	125 V AC	10 A	6 A	3 A	1.5 A
	250 V AC	10 A	6 A	2 A	1.0 A
	125 V DC	0.5 A	0.05 A	—	—

2. Characteristics

Item			Specifications
Expected life	Mechanical	Pin plunger types (O.T.: specified value)	Min. 2×10^7 (60 cpm) (at rated overtravel) (Oil tight: Min. 1.5×10^6)
		Other types (O.T.: specified value)	Min. 5×10^6 (60 cpm) (at rated overtravel) (Oil tight: Min. 1.5×10^6)
	Electrical (O.T.: Max.)		Min. 5×10^5 (20 cpm) (at rated load) (Oil tight: Min. 1.5×10^5)
Insulation resistance			Min. 100 MΩ(at 500 V DC)
Dielectric strength	Between open terminals		1,000 Vrms for 1 min.
	Between each terminal and other exposed metal parts		2,000 Vrms for 1 min.
	Between each terminal and ground		2,000 Vrms for 1 min.
Contact resistance (initial) (by voltage drop, 1 A, 6–8 V DC)			Max. 50 mΩ
Vibration resistance (Pin plunger type)			Single amplitude: 0.75 mm, 10 to 55 Hz (contact opening: max. 1 msec.)
Shock resistance	Pin plunger types		Min. 300 m/s ² (contact opening: max. 1 msec.)
	Other types		Min. 50 m/s ² (contact opening: max. 1 msec.)
Allowable operating speed (at no load)			0.1 to 1,000 mm/sec. (at pin plunger position)
Max. operating cycle rate (at no load)			240 cpm
Ambient temperature			–25°C to +80°C (no freezing at low temperature)
Weight			Approx. 20 to 55 g

OPERATING CHARACTERISTICS

Standard types

Types of actuator	Pin plunger	Overtravel plunger	Compact overtravel plunger	Panel mount plunger
Operating force, max.	3.63 N			
Release force, min.	1.12 N			
Pretravel, max. mm	0.4			
Movement differential, max. mm	0.05			
Overtravel, min. mm	0.13	1.5	1.5	5.6
Operating position, mm	15.9±0.4	28.2±0.5	21.2±0.5	21.8±0.8

Types of actuator	Panel mount roller plunger	Panel mount cross roller plunger	Flexible leaf lever	Flexible roller leaf lever
Operating force, max.	3.63 N		1.47 N	
Release force, min.	1.12 N		0.14 N	
Pretravel, max. mm	0.4		4	
Movement differential, max. mm	0.05		1.3	
Overtravel, min. mm	3.6		1.6	
Operating position, mm	33.3±1.2		17.5±0.8	28.6±0.8

Standard types (cont' d)

Types of actuator	Rigid lever	Rigid short roller lever	Rigid roller lever
Operating force, max.	0.69 N	1.57 N	0.98 N
Release force, min.	0.14 N	0.42 N	0.2 N
Pretravel, max. mm	10	4.5	7.5
Movement differential, max. mm	1.3	0.7	1.3
Overtravel, min. mm	5.6	2.4	3.6
Operating position, mm	19.1±0.7	30.2±0.4	30.2±0.7

One way types

Types of actuator	Rigid short roller lever	Rigid roller lever
Operating force, max.	2.23 N	1.67 N
Release force, min.	0.42 N	0.42 N
Pretravel, max. mm	3.5	4.5
Movement differential, max. mm	0.4	0.5
Overtravel, min. mm	1.5	2.4
Free position, max. mm	31.8	43.3
Operating position, mm	30.2±0.4	41.3±0.4

Reversed action types

Types of actuator	Rigid lever	Rigid short roller lever	Rigid roller lever
Operating force, max.	1.67 N	5.30 N	2.35 N
Release force, min.	0.27 N	1.67 N	0.56 N
Pretravel, max. mm	5.0	2.5	3.6
Movement differential, max. mm	0.9	0.4	0.7
Overtravel, min. mm	5.6	2.0	4.0
Operating position, mm	19.1±0.8	30.2±0.5	30.2±0.8

Oil tight types

Types of actuator	Rigid lever	Rigid short roller lever	Rigid roller lever
Operating force, max.	0.69 N	1.67 N	0.98 N
Release force, min.	0.14 N	0.42 N	0.20 N
Pretravel, max. mm	10	4.5	7.5
Movement differential, max. mm	1.5	0.7	1.3
Overtravel, min. mm	5.6	2.4	3.6
Operating position, mm	19.1±0.7	30.2±0.4	30.2±0.7

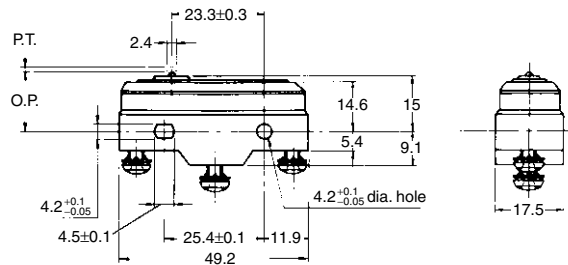
DIMENSIONS

1. Standard types

Pin plunger



AM1100KF (Solder terminal)
AM1300KF (Screw terminal)

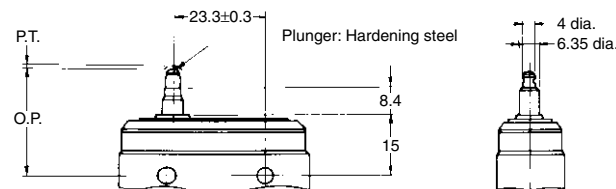


Operating force, max.	3.63 N
Release force, min.	1.12 N
Pretravel, max. mm	0.4
Movement differential, max. mm	0.05
Overtravel, min. mm	0.13
Operating position, mm	15.9 ± 0.4

Overtravel plunger



AM1105KF (Solder terminal)
AM1305KF (Screw terminal)

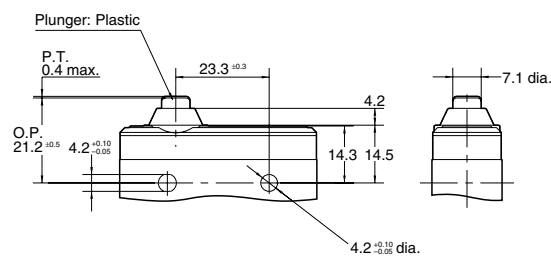


Operating force, max.	3.63 N
Release force, min.	1.12 N
Pretravel, max. mm	0.4
Movement differential, max. mm	0.05
Overtravel, min. mm	1.5
Operating position, mm	28.2 ± 0.5

Compact over plunger



AM1106KF (Solder terminal)
AM1306KF (Screw terminal)

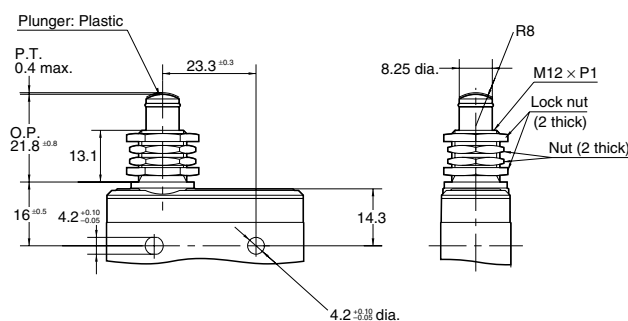


Operating force, max.	3.63 N
Release force, min.	1.12 N
Pretravel, max. mm	0.4
Movement differential, max. mm	0.05
Overtravel, min. mm	1.5
Operating position, mm	21.2 ± 0.5

Panel mount plunger



AM1107KF (Solder terminal)
AM1307KF (Screw terminal)

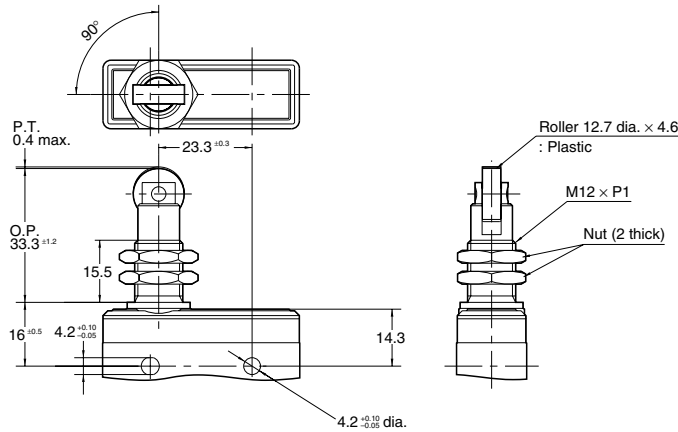


Operating force, max.	3.63 N
Release force, min.	1.12 N
Pretravel, max. mm	0.4
Movement differential, max. mm	0.05
Overtravel, min. mm	5.6
Operating position, mm	21.8 ± 0.8

AM1

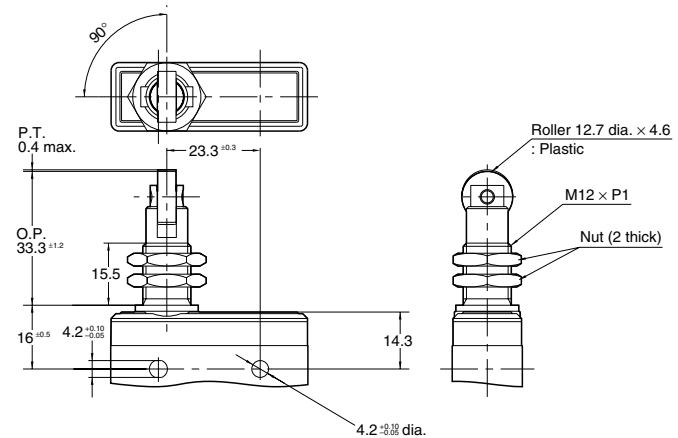
Panel mount roller plunger

mm General tolerance: ±0.4



Operating force, max.	3.63 N
Release force, min.	1.12 N
Pretravel, max. mm	0.4
Movement differential, max. mm	0.05
Overtravel, min. mm	3.6
Operating position, mm	33.3±1.2

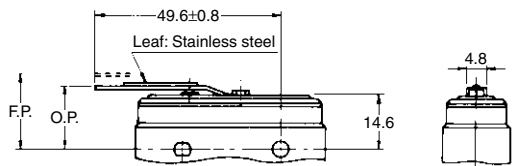
Panel mount cross roller plunger



Operating force, max.	3.63 N
Release force, min.	1.12 N
Pretravel, max. mm	0.4
Movement differential, max. mm	0.05
Overtravel, min. mm	3.6
Operating position, mm	33.3±1.2

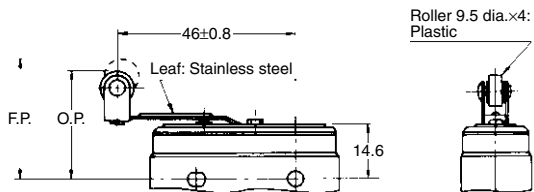
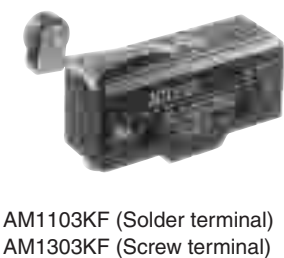
Dimensions and Operating characteristics are the same as those of Panel mount roller plunger type. However, the roller joins the switch body at an angle of 90°.

Flexible leaf lever



Operating force, max.	1.47 N
Release force, min.	0.14 N
Pretravel, max. mm	4
Movement differential, max. mm	1.3
Overtravel, min. mm	1.6
Operating position, mm	17.5±0.8

Flexible roller leaf lever



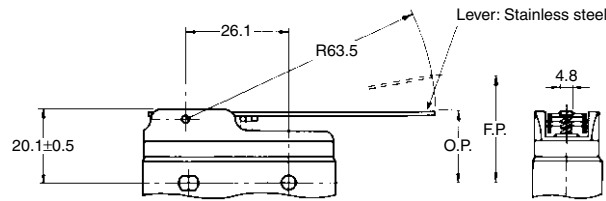
Operating force, max.	1.47 N
Release force, min.	0.14 N
Pretravel, max. mm	4
Movement differential, max. mm	1.3
Overtravel, min. mm	1.6
Operating position, mm	28.6±0.8

Rigid lever

mm General tolerance: ± 0.4



AM1501KF (Solder terminal)
AM1701KF (Screw terminal)

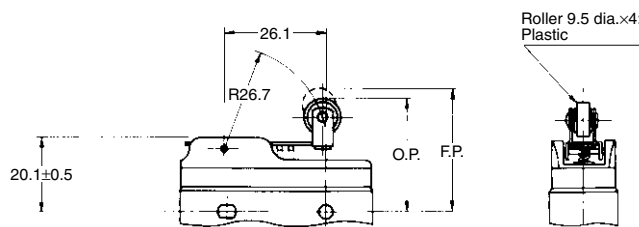


Operating force, max.	0.69 N
Release force, min.	0.14 N
Pretravel, max. mm	10
Movement differential, max. mm	1.3
Overtravel, min. mm	5.6
Operating position, mm	19.1±0.7

Rigid short roller lever



AM1504KF (Solder terminal)
AM1704KF (Screw terminal)

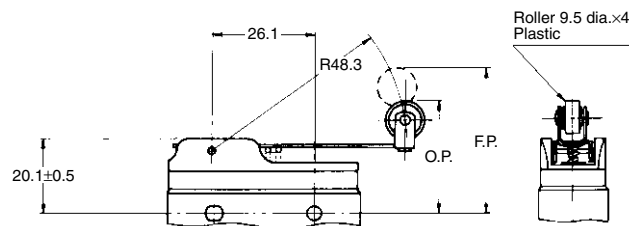


Operating force, max.	1.57 N
Release force, min.	0.42 N
Pretravel, max. mm	4.5
Movement differential, max. mm	0.7
Overtravel, min. mm	2.4
Operating position, mm	30.2±0.4

Rigid roller lever



AM1503KF (Solder terminal)
AM1703KF (Screw terminal)



Operating force, max.	0.98 N
Release force, min.	0.2 N
Pretravel, max. mm	7.5
Movement differential, max. mm	1.3
Overtravel, min. mm	3.6
Operating position, mm	30.2±0.7

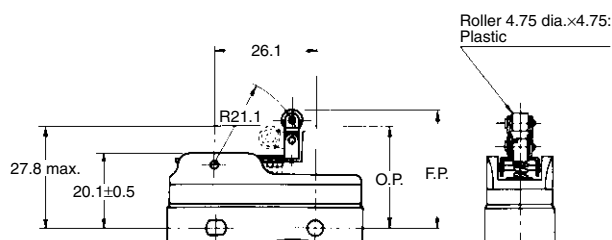
2. One way types

This type is operated only to one direction, not to the reversed direction by the construction of the roller lever, pivoting away from the cam on the return stroke.

Rigid short roller lever



AM1544KF (Solder terminal)
AM1744KF (Screw terminal)

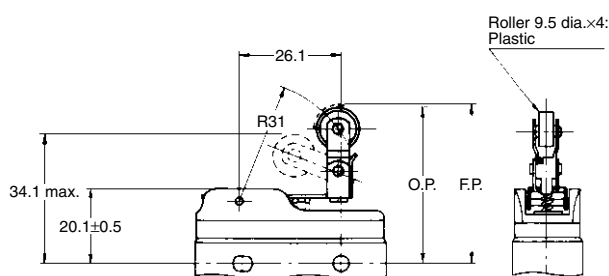


Operating force, max.	2.23 N
Release force, min.	0.42 N
Pretravel, max. mm	3.5
Movement differential, max. mm	0.4
Overtravel, min. mm	1.5
Operating position, mm	30.2±0.4

AM1

Rigid roller lever

mm General tolerance: ± 0.4



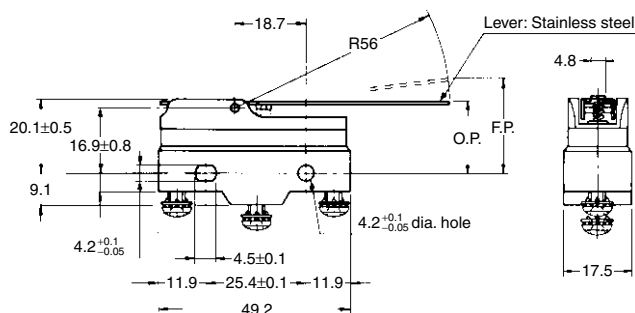
AM1543KF (Solder terminal)
AM1743KF (Screw terminal)

Operating force, max.	1.67 N
Release force, min.	0.42 N
Pretravel, max. mm	4.5
Movement differential, max. mm	0.5
Overtravel, min. mm	2.4
Operating position, mm	41.3±0.4

3. Reversed action types

When the actuator is operated, the switching mechanism returns to the free position. Extraordinary force by pushing the plunger too much is not put on the switching mechanism, which means stability in life.

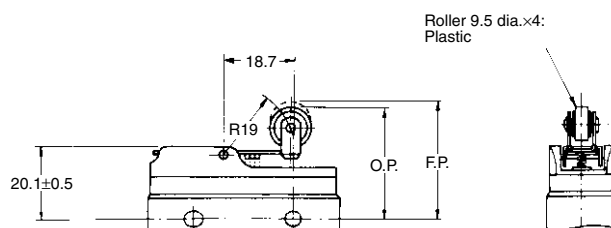
Rigid lever



AM1531KF (Solder terminal)
AM1731KF (Screw terminal)

Operating force, max.	1.67 N
Release force, min.	0.27 N
Pretravel, max. mm	5.0
Movement differential, max. mm	0.9
Overtravel, min. mm	5.6
Operating position, mm	19.1±0.8

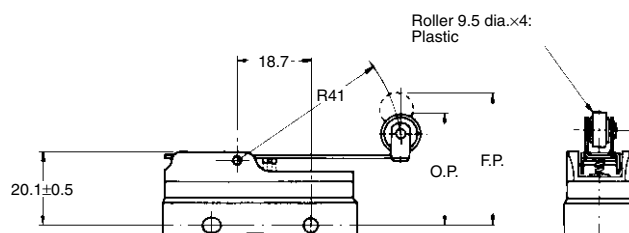
Rigid short roller lever



AM1534KF (Solder terminal)
AM1734KF (Screw terminal)

Operating force, max.	5.30 N
Release force, min.	1.67 N
Pretravel, max. mm	2.5
Movement differential, max. mm	0.4
Overtravel, min. mm	2.0
Operating position, mm	30.2±0.5

Rigid roller lever



AM1533KF (Solder terminal)
AM1733KF (Screw terminal)

Operating force, max.	2.35 N
Release force, min.	0.56 N
Pretravel, max. mm	3.6
Movement differential, max. mm	0.7
Overtravel, min. mm	4.0
Operating position, mm	30.2±0.8

4. Oil tight types

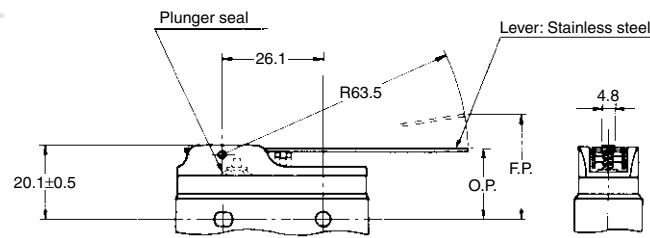
mm General tolerance: ± 0.4

The pushbutton part is sealed with the rubber cap and the connected part between the cap and body is also coated with resin so that these parts are kept away from foreign matters. This type has resistance to oil.

Rigid lever



AM1511KF (Solder terminal)
AM1711KF (Screw terminal)

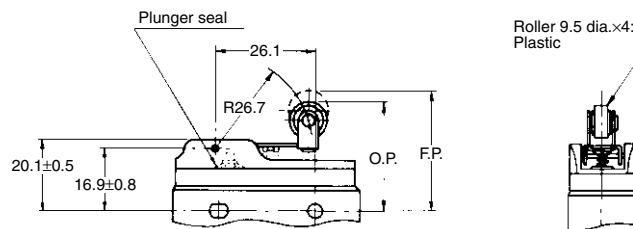


Operating force, max.	0.69 N
Release force, min.	0.14 N
Pretravel, max. mm	10
Movement differential, max. mm	1.5
Overtravel, min. mm	5.6
Operating position, mm	19.1±0.7

Rigid short roller lever



AM1514KF (Solder terminal)
AM1714KF (Screw terminal)

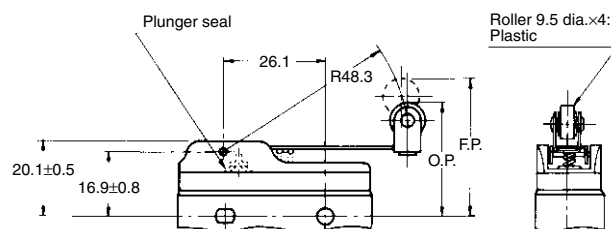


Operating force, max.	1.67 N
Release force, min.	0.42 N
Pretravel, max. mm	4.5
Movement differential, max. mm	0.7
Overtravel, min. mm	2.4
Operating position, mm	30.2±0.4

Rigid roller lever



AM1513KF (Solder terminal)
AM1713KF (Screw terminal)



Operating force, max.	0.98 N
Release force, min.	0.20 N
Pretravel, max. mm	7.5
Movement differential, max. mm	1.3
Overtravel, min. mm	3.6
Operating position, mm	30.2±0.7

NOTES

1. Regarding fastening of switch body

1) In fastening the switch body, use M4 mounting screws to attach switches with the torque 1.5 N·m or less.

2) After mounting and wiring, the insulation distance between ground and each terminal should be confirmed as sufficient.

2. Adjustment of the operating device

The operating device should be positioned so that it applies no stress to the pushbutton or actuator when the switch is in the open position. If this condition is exceeded, the mechanical and electrical performance will be impaired. In addition, the force applied by the operating device should be in a perpendicular direction. Even if the pushbutton is used in the full total travel position, there will be no influence on the life of the switch.

3. Soldering operations

Soldering should be done in less than 5 seconds, with a 60 watt iron (tip temperature = 350°C max.). Care should be taken not to apply force to the terminal during soldering.

4. Avoid using switches in the following conditions:

- In corrosive gases such as hydrogen sulfide.
- In flammable or explosive gases such as gasoline or thinner etc.
- In a dusty environment.
- In an ambient humidity over 85%.
- In conditions where the perpendicular operating speed is less than 0.1 mm/sec. or more than 1,000 mm/sec.
- In a silicon atmosphere.

5. Others

Caution should be taken not to drop switches.