

# NAIS

**HIGH CONTACT CAPACITY,  
PRECISE OPERATION**

# NZ BASIC (AM1) SWITCHES



### FEATURES

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

### TYPICAL APPLICATION

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

## ORDERING INFORMATION

Ex. AM 1 5 0 1 K

Type of switch	Upper body cover shape & terminal	Basic specifications	Actuators				
NZ basic (AM1) switch	1: Flat, solder terminal 3: Flat, screw terminal 5: Grooved, solder terminal 7: Grooved, screw terminal  Upper body cover shape <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <th>Flat</th> <th>Grooved</th> </tr> <tr> <td></td> <td></td> </tr> </table>	Flat	Grooved			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
Flat	Grooved						

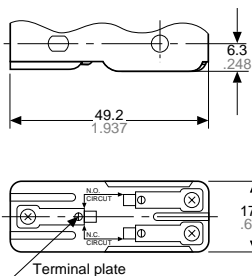
## TERMINAL VARIATION

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:

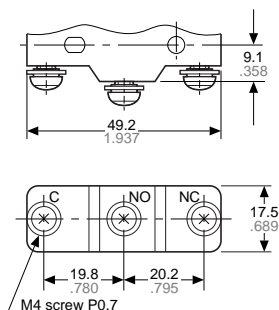
Differences in dimension between solder and screw terminals are as follows;

mm inch

Solder terminal



Screw terminal



# AM1

## PRODUCT TYPES

### 1. Standard type

Actuator	Solder terminal	Screw terminal
Pin plunger	AM1100K	AM1300K
Over travel plunger	AM1105K	AM1305K
Compact over travel plunger	AM1106K	AM1306K
Panel mount plunger	AM1107K	AM1307K
Panel mount roller plunger	AM110811K	AM130811K
Panel mount cross roller plunger	AM110812K	AM130812K
Flexible leaf lever	AM1101K	AM1301K
Flexible roller leaf lever	AM1103K	AM1303K
Rigid lever	AM1501K	AM1701K
Rigid short roller lever	AM1504K	AM1704K
Rigid roller lever	AM1503K	AM1703K
One way type•Rigid short roller lever	AM1544K	AM1744K
One way type•Rigid roller lever	AM1543K	AM1743K
Reversed action type•Rigid lever	AM1531K	AM1731K
Reversed action type •Rigid short roller lever	AM1534K	AM1734K
Reversed action type•Rigid roller lever	AM1533K	AM1733K

### 2. Oil tight types

Actuator	Solder terminal	Screw terminal
Rigid lever	AM1511K	AM1711K
Rigid short roller lever	AM1514K	AM1714K
Rigid roller lever	AM1513K	AM1713K

Remarks: 1. Standard part number indicates UL/CSA 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	15 A	10 A	4 A	2 A
	250 V AC	15 A	10 A	3 A	1.5 A
	480 V AC	3 A	2 A	1.5 A	0.75 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	15 A	10 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
		Other types
	Electrical (at max. overtravel)	
Insulation resistance		
Dielectric strength	Between open terminals	
	Between each terminal and other exposed metal parts	
	Between each terminal and ground	
Contact resistance (initial) (by voltage drop, 1 A, 6–8 V DC)		
Vibration resistance (Pin plunger type)		
Shock resistance	Pin plunger types	
	Other types	
Allowable operating speed (at no load)		
Max. operating cycle rate (at no load)		
Ambient temperature		
Ambient humidity		
Weight		

## OPERATING CHARACTERISTICS

### Standard types

Types of actuator	Pin plunger	Overtravel plunger	Compact overtravel plunger	Panel mount plunger
Operating force, max.	3.63 N {370 gf}			
Release force, min.	1.12 N {114 gf}			
Pretravel, max. mm inch	0.4 .016			
Movement differential, max. mm inch	0.05 .002			
Overtravel, min. mm inch	0.13 .005	1.5 .059	1.5 .059	5.6 .220
Operating position, mm inch	15.9±0.4 .626±.016	28.2±0.5 1.110±.020	21.2±0.5 .835±.020	21.8±0.8 .858±.031

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 {370 gf}		1.47 N {150 gf}	
Release force, min.	1.12 N {114 gf}		0.14 N {14 gf}	
Pretravel, max. mm inch	0.4 .016		4 .157	
Movement differential, max. mm inch	0.05 .002		1.3 .051	
Overtravel, min. mm inch	3.6 .142		1.6 .063	
Operating position, mm inch	33.3±1.2 1.311±.047		17.5±0.8 .689±.031	28.6±0.8 1.126±.031

### Standard types (cont' d)

Types of actuator	Rigid lever	Rigid short roller lever	Rigid roller lever
Operating force, max.	0.69 N {70 gf}	1.57 N {160 gf}	0.98 N {100 gf}
Release force, min.	0.14 N {14 gf}	0.42 N {43 gf}	0.2 N {20 gf}
Pretravel, max. mm inch	10 .394	4.5 .177	7.5 .295
Movement differential, max. mm inch	1.3 .051	0.7 .028	1.3 .051
Overtravel, min. mm inch	5.6 .220	2.4 .094	3.6 .142
Operating position, mm inch	19.1±0.7 .752±.028	30.2±0.4 1.189±.016	30.2±0.7 1.189±.028

### One way types

Types of actuator	Rigid short roller lever	Rigid roller lever
Operating force, max.	2.23 N {227 gf}	1.67 N {170 gf}
Release force, min.	0.42 N {43 gf}	0.42 N {43 gf}
Pretravel, max. mm inch	3.5 .138	4.5 .177
Movement differential, max. mm inch	0.4 .016	0.5 .020
Overtravel, min. mm inch	1.5 .059	2.4 .094
Free position, max. mm inch	31.8 1.252	43.3 1.705
Operating position, mm inch	30.2±0.4 1.189±.016	41.3±0.4 1.626±.016

### Reversed action types

Types of actuator	Rigid lever	Rigid short roller lever	Rigid roller lever
Operating force, max.	1.67 N {170 gf}	5.30 N {540 gf}	2.35 N {240 gf}
Release force, min.	0.27 N {28 gf}	1.67 N {170 gf}	0.56 N {57 gf}
Pretravel, max. mm inch	5.0 .197	2.5 .098	3.6 .142
Movement differential, max. mm inch	0.9 .035	0.4 .016	0.7 .028
Overtravel, min. mm inch	5.6 .220	2.0 .079	4.0 .157
Operating position, mm inch	19.1±0.8 .752±.031	30.2±0.5 1.189±.020	30.2±0.8 1.189±.031

### Oil tight types

Types of actuator	Rigid lever	Rigid short roller lever	Rigid roller lever
Operating force, max.	0.69 N {70 gf}	1.67 N {170 gf}	0.98 N {100 gf}
Release force, min.	0.14 N {14 gf}	0.42 N {43 gf}	0.20 N {20 gf}
Pretravel, max. mm inch	10 .394	4.5 .177	7.5 .295
Movement differential, max. mm inch	1.5 .059	0.7 .028	1.3 .051
Overtravel, min. mm inch	5.6 .220	2.4 .094	3.6 .142
Operating position, mm inch	19.1±0.7 .752±.028	30.2±0.4 1.189±.016	30.2±0.7 1.189±.028

# AM1

## DIMENSIONS

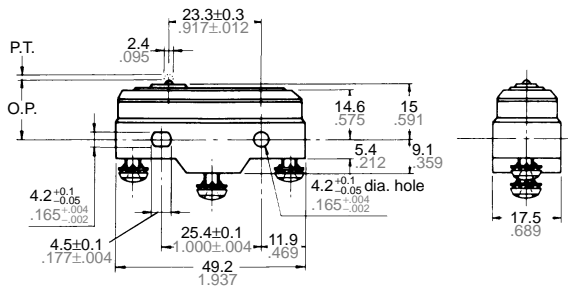
mm inch General tolerance:  $\pm 0.4 \pm 0.16$

### 1. Standard types

#### Pin plunger



AM1100K (Solder terminal)  
AM1300K (Screw terminal)

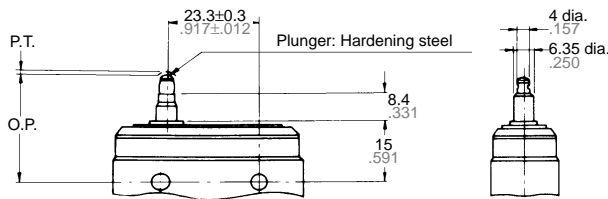


Operating force, max.	3.63 N {370 gf}
Release force, min.	1.12 N {114 gf}
Pretravel, max. mm inch	0.4 .016
Movement differential, max. mm inch	0.05 .002
Overtravel, min. mm inch	0.13 .005
Operating position, mm inch	15.9 ± 0.4 .626 ± 0.016

#### Overtravel plunger



AM1105K (Solder terminal)  
AM1305K (Screw terminal)

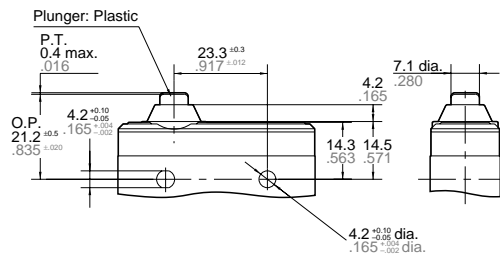


Operating force, max.	3.63 N {370 gf}
Release force, min.	1.12 N {114 gf}
Pretravel, max. mm inch	0.4 .016
Movement differential, max. mm inch	0.05 .002
Overtravel, min. mm inch	1.5 .059
Operating position, mm inch	28.2 ± 0.5 1.110 ± 0.020

#### Compact over plunger



AM1106K (Solder terminal)  
AM1306K (Screw terminal)

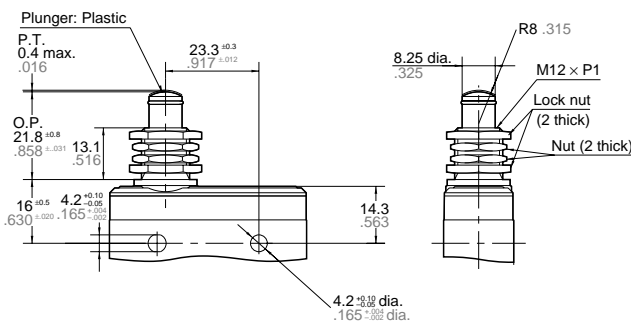


Operating force, max.	3.63 N {370 gf}
Release force, min.	1.12 N {114 gf}
Pretravel, max. mm inch	0.4 .016
Movement differential, max. mm inch	0.05 .002
Overtravel, min. mm inch	1.5 .059
Operating position, mm inch	21.2 ± 0.5 .835 ± 0.020

#### Panel mount plunger



AM1107K (Solder terminal)  
AM1307K (Screw terminal)



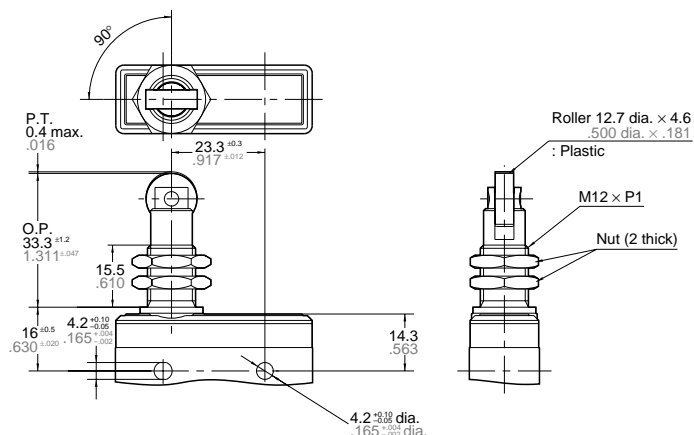
Operating force, max.	3.63 N {370 gf}
Release force, min.	1.12 N {114 gf}
Pretravel, max. mm inch	0.4 .016
Movement differential, max. mm inch	0.05 .002
Overtravel, min. mm inch	5.6 .220
Operating position, mm inch	21.8 ± 0.8 .858 ± 0.031

## Panel mount roller plunger

mm inch General tolerance:  $\pm 0.4 \pm 0.16$



AM110811K (Solder terminal)  
AM130811K (Screw terminal)

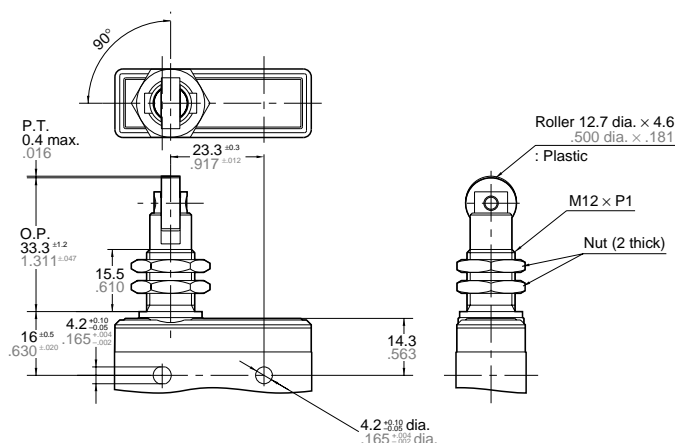


Operating force, max.	3.63 N {370 gf}
Release force, min.	1.12 N {114 gf}
Pretravel, max. mm inch	0.4 .016
Movement differential, max. mm inch	0.05 .002
Overtravel, min. mm inch	3.6 .142
Operating position, mm inch	33.3 $\pm$ 1.2 1.311 $\pm$ 0.047

## Panel mount cross roller plunger



AM110812K (Solder terminal)  
AM130812K (Screw terminal)



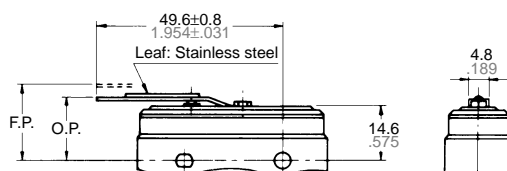
Operating force, max.	3.63 N {370 gf}
Release force, min.	1.12 N {114 gf}
Pretravel, max. mm inch	0.4 .016
Movement differential, max. mm inch	0.05 .002
Overtravel, min. mm inch	3.6 .142
Operating position, mm inch	33.3 $\pm$ 1.2 1.311 $\pm$ 0.047

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



AM1101K (Solder terminal)  
AM1301K (Screw terminal)

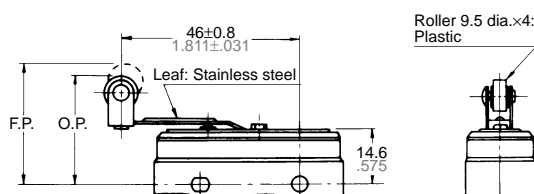


Operating force, max.	1.47 N {150 gf}
Release force, min.	0.14 N {14 gf}
Pretravel, max. mm inch	4 .157
Movement differential, max. mm inch	1.3 .051
Overtravel, min. mm inch	1.6 .063
Operating position, mm inch	17.5 $\pm$ 0.8 .689 $\pm$ 0.031

## Flexible roller leaf lever



AM1103K (Solder terminal)  
AM1303K (Screw terminal)



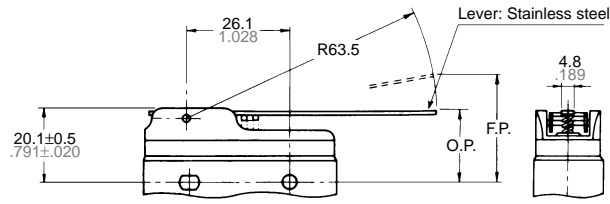
Operating force, max.	1.47 N {150 gf}
Release force, min.	0.14 N {14 gf}
Pretravel, max. mm inch	4 .157
Movement differential, max. mm inch	1.3 .051
Overtravel, min. mm inch	1.6 .063
Operating position, mm inch	28.6 $\pm$ 0.8 1.126 $\pm$ 0.031

# AM1

## Rigid lever



AM1501K (Solder terminal)  
AM1701K (Screw terminal)



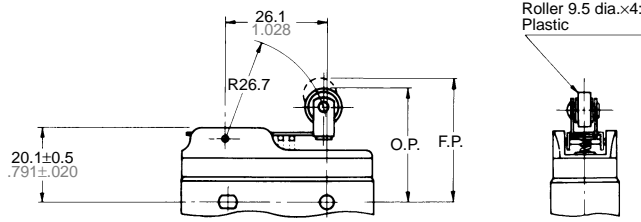
mm inch General tolerance: ±0.4 ±.016

Operating force, max.	0.69 N {70 gf}
Release force, min.	0.14 N {14 gf}
Pretravel, max. mm inch	10 .394
Movement differential, max. mm inch	1.3 .051
Overtravel, min. mm inch	5.6 .220
Operating position, mm inch	19.1±0.7 .752±.028

## Rigid short roller lever



AM1504K (Solder terminal)  
AM1704K (Screw terminal)

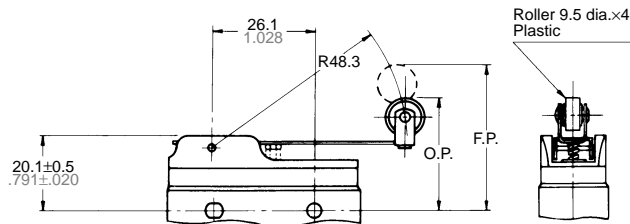


Operating force, max.	1.57 N {160 gf}
Release force, min.	0.42 N {43 gf}
Pretravel, max. mm inch	4.5 .177
Movement differential, max. mm inch	0.7 .028
Overtravel, min. mm inch	2.4 .094
Operating position, mm inch	30.2±0.4 1.189±.016

## Rigid roller lever



AM1503K (Solder terminal)  
AM1703K (Screw terminal)



Operating force, max.	0.98 N {100 gf}
Release force, min.	0.2 N {20 gf}
Pretravel, max. mm inch	7.5 .295
Movement differential, max. mm inch	1.3 .051
Overtravel, min. mm inch	3.6 .142
Operating position, mm inch	30.2±0.7 1.189±.028

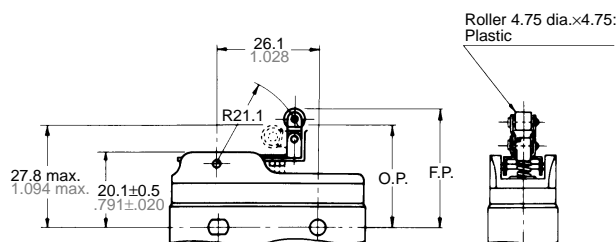
## 2. One way types

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



AM1544K (Solder terminal)  
AM1744K (Screw terminal)



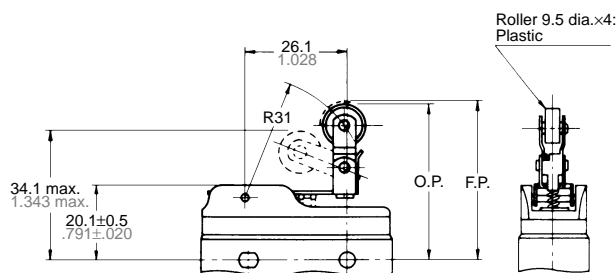
Operating force, max.	2.23 N {227 gf}
Release force, min.	0.42 N {43 gf}
Pretravel, max. mm inch	3.5 .138
Movement differential, max. mm inch	0.4 .016
Overtravel, min. mm inch	1.5 .059
Operating position, mm inch	30.2±0.4 1.189±.016

## Rigid roller lever

mm inch General tolerance:  $\pm 0.4 \pm 0.16$



AM1543K (Solder terminal)  
AM1743K (Screw terminal)



Operating force, max.	1.67 N {170 gf}
Release force, min.	0.42 N {43 gf}
Pretravel, max. mm inch	4.5 .177
Movement differential, max. mm inch	0.5 .020
Overtravel, min. mm inch	2.4 .094
Operating position, mm inch	41.3±0.4 1.626±0.016

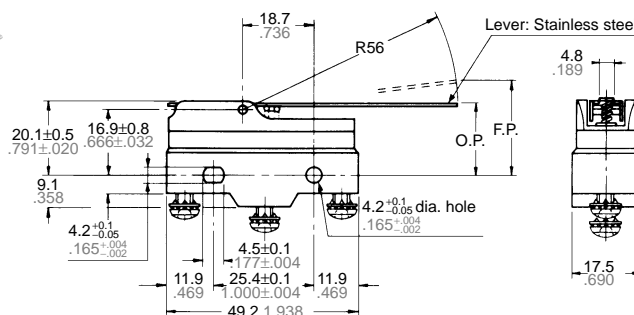
## 3. Reversed action types

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



AM1531K (Solder terminal)  
AM1731K (Screw terminal)

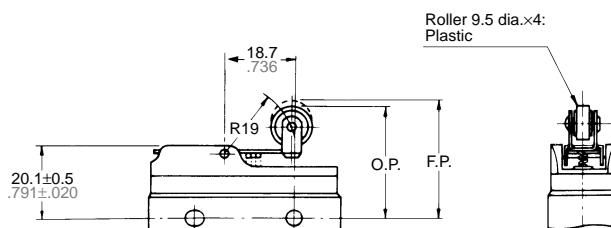


Operating force, max.	1.67 N {170 gf}
Release force, min.	0.27 N {28 gf}
Pretravel, max. mm inch	5.0 .197
Movement differential, max. mm inch	0.9 .035
Overtravel, min. mm inch	5.6 .220
Operating position, mm inch	19.1±0.8 .752±0.031

### Rigid short roller lever



AM1534K (Solder terminal)  
AM1734K (Screw terminal)

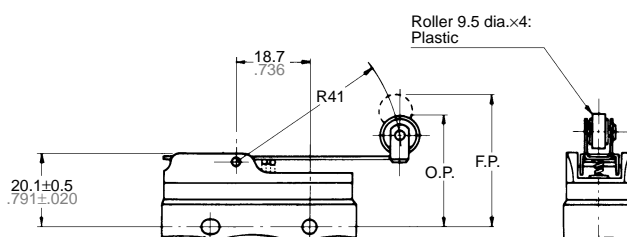


Operating force, max.	5.30 N {540 gf}
Release force, min.	1.67 N {170 gf}
Pretravel, max. mm inch	2.5 .098
Movement differential, max. mm inch	0.4 .016
Overtravel, min. mm inch	2.0 .079
Operating position, mm inch	30.2±0.5 1.189±0.020

### Rigid roller lever



AM1533K (Solder terminal)  
AM1733K (Screw terminal)



Operating force, max.	2.35 N {240 gf}
Release force, min.	0.56 N {57 gf}
Pretravel, max. mm inch	3.6 .142
Movement differential, max. mm inch	0.7 .028
Overtravel, min. mm inch	4.0 .157
Operating position, mm inch	30.2±0.8 1.189±0.031

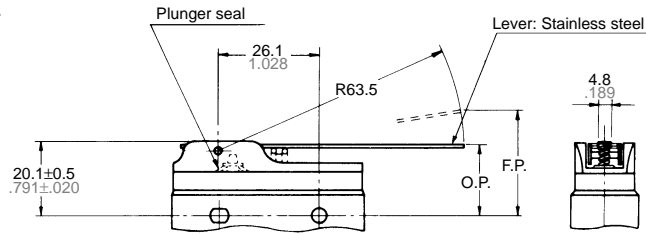
# AM1

## 4. Oil tight types

mm inch General tolerance:  $\pm 0.4 \pm 0.16$

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 off from foreign matters. This type has resistance to oil.

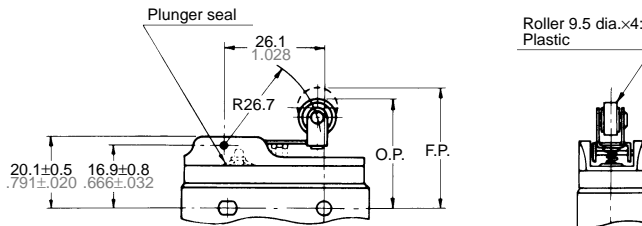
Rigid lever



Operating force, max.	0.69 N {70 gf}
Release force, min.	0.14 N {14 gf}
Pretravel, max. mm inch	10 .394
Movement differential, max. mm inch	1.5 .059
Overtravel, min. mm inch	5.6 .220
Operating position, mm inch	19.1±0.7 .752±.028

AM1511K (Solder terminal)  
AM1711K (Screw terminal)

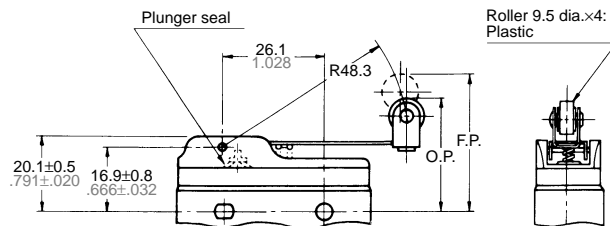
Rigid short roller lever



Operating force, max.	1.67 N {170 gf}
Release force, min.	0.42 N {43 gf}
Pretravel, max. mm inch	4.5 .177
Movement differential, max. mm inch	0.7 .028
Overtravel, min. mm inch	2.4 .094
Operating position, mm inch	30.2±0.4 1.189±.016

AM1514K (Solder terminal)  
AM1714K (Screw terminal)

Rigid roller lever



Operating force, max.	0.98 N {100 gf}
Release force, min.	0.20 N {20 gf}
Pretravel, max. mm inch	7.5 .295
Movement differential, max. mm inch	1.3 .051
Overtravel, min. mm inch	3.6 .142
Operating position, mm inch	30.2±0.7 1.189±.028

AM1513K (Solder terminal)  
AM1713K (Screw terminal)



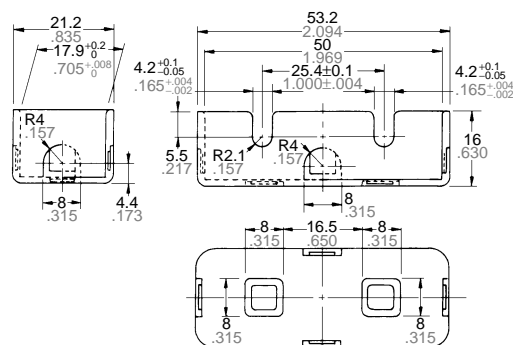
## TERMINAL COVER FOR NZ BASIC SWITCHES

### Terminal cover

(for the standard type with soldering terminal)



AA7000

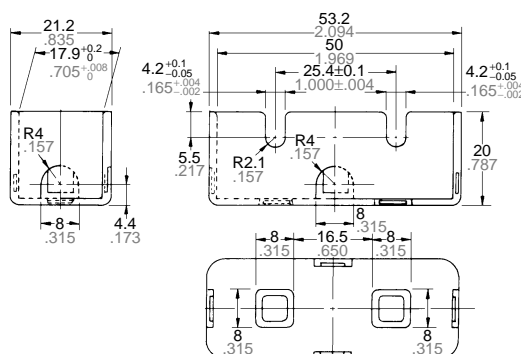


### Terminal cover

(for the standard type with screw terminal)



AA8000



1. Terminal cover can protect switches from external force and the leakage between terminals can be avoided. Also it can be a simple safety protector because the direct touch of fingers to terminals can be avoided.
2. Nylon 66 is used for higher durability.
3. The height of terminal cover for the solder types is lower than terminal cover for the screw types.
4. AA7000 and AA8000 have 6 knock-out portions. Lead wire can be taken out from any desired portion.

## 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 {15 kg·cm} 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 662°F 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 the 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.