

# NAIS

## COMPACT SIZE SIDE LIMIT SWITCHES

# ML (AZ7) Limit Switches

Lamp attached- and terminal mold models also available.



Short roller lever type



### FEATURES

#### 1. Long life

High efficiency coil spring switching mechanism for long life: More than 10<sup>7</sup> mechanical operations.

#### 2. Great mechanical strength while being compact and lightweight

The attachment pitch is 25.4mm (1.000inch). Also, the outer cover cap uses a strong plastic with excellent mechanical characteristics. An M4 bolt can be used for the attachment.

#### 3. The overtravel (O.T.) is large with great shock absorption

#### 4. The switch itself is constructed to be dust-proof and oil resistant

The switch itself is closed flush with the diaphragm and the compressed rubber ring, so that the terminal mold model is perfectly flush with the terminal parts.

#### 5. Large insulation distance (contact gap is 1mm .039inch)

#### 6. Uses first-class construction materials (ammonialess phynol.)

### TYPICAL APPLICATIONS

Used in sequence control of food processing machines, automatic packaging machines, conveyers, and processors. Ideal for light industry machinery when installation pace is limited and a protective construction is sought.

## PRODUCT TYPE

### 1. Standard type

Actuator	Part No.
Short push plunger	AZ7100
Push plunger	AZ7110
Hinge lever	AZ7120
Roller lever	AZ7121
One-way roller lever	AZ7124
Hinge short lever	AZ7140
Short roller lever	AZ7141
One-way short roller lever	AZ7144
Panel mount push plunger	AZ7310
Panel mount roller plunger	AZ7311
Panel mount cross roller plunger	AZ7312
Flexible rod	AZ7166

### 3. Epoxy-sealed terminal type

Actuator	Cord outlet direction	
	NC	COM
	Part No.	
Short push plunger	AZ7400	AZ74041
Push plunger	AZ7405	AZ7406
Hinge lever	AZ7410	AZ7411
Roller lever	AZ7415	AZ7416
One-way roller lever	AZ7420	AZ7421
Hinge short lever	AZ7425	AZ7426
Short roller lever	AZ7430	AZ7431
One-way short roller lever	AZ7435	AZ7436
Panel mount push plunger	AZ7440	AZ7441
Panel mount roller plunger	AZ7445	AZ7446
Panel mount cross roller plunger	AZ7450	AZ7451
Flexible rod	AZ7460	AZ74601

### 2. Neon lamp wired type

Actuator	AC100V	AC200V
	Part No.	
Short push plunger	AZ740041	AZ740042
Push plunger	AZ740541	AZ740542
Hinge lever	AZ741041	AZ741042
Roller lever	AZ741541	AZ741542
One-way roller lever	AZ742041	AZ742042
Hinge short lever	AZ742541	AZ742542
Short roller lever	AZ743041	AZ743042
One-way short roller lever	AZ743541	AZ743542
Panel mount push plunger	AZ744041	AZ744042
Panel mount roller plunger	AZ744541	AZ744542
Panel mount cross roller plunger	AZ745041	AZ745042
AZ746041	AZ746041	AZ746042

## STANDARDS

Standards	Applicable product	Part No.
UL	File No. : E-122222 Ratings : 10A 250V AC Product type : Standard type only	Order by standard part No.
CSA	File No. : LR55880 Ratings : 10A 250V AC Product type : Standard type only	
TÜV	File No. : J9551204 Ratings : AC-15 2A/250V onwards Product type : Standard type only	

## SPECIFICATIONS

### 1. Contact Rating

Rated control voltage	Load	Resistive load (cosφ≅1)	Inductive load (cosφ≅0.4)	Motor or lamp load	
				N.C. contact	N.O. contact
125V AC		10A	6A	3A	1.5A
250V AC		10A	4A	1.5A	1A
115V DC		0.4A	0.05A	-	-

### 2 Contact Characteristics

Contact arrangement		1 Form C
Initial contact resistance, max.		15mΩ* (By voltage drop 6 to 8V DC at rated current)
Initial insulation resistance (At 500V DC)		Min. 100 MΩ
Initial breakdown voltage		1,500 Vrms for 1 min Between non-consecutive terminals 2,000 Vrms for 1 min Between dead metal parts and each terminal 2,000 Vrms for 1 min Between ground and each terminal
Shock resistance	In the free position	Max. 98m/s <sup>2</sup> {10G}
	In the full operating position	Max. 294m/s <sup>2</sup> {30G}
Vibration resistance		55 Hz, double amplitude of 1.5 mm
Expected life (Min. operation)	Mechanical	10 <sup>7</sup> (at 50 cpm)
	Electrical	2 × 10 <sup>5</sup> (at 20 cpm)
Ambient temperature/Ambient humidity		-20 to +60°C -4 to +140°F/Max. 95% R.H. (at 20°C 68°F)
Max. operating speed		120 cpm

\*The resistance of a copper wire is not included.

### 3.EN60947-5-1 performance

Item	Rating
Rated insulation voltage (Ui)	250VAC
Rated impulse withstand voltage (Uimp)	2.5kV
Switching over voltage	2.5kV
Rated enclosed thermal current (Ithe)	10A
Conditional short-circuit current	100A
Short-circuit protection device	10A fuse
Protective construction	IP64 (switch)
Pollution degree	3

### 4. Operating characteristics

Characteristics	Actuator					
	O.F. (N{gf}) max.	R.F. (N{gf}) min.	Pretravel (P.T.), max. mm inch	Movement Differential (M.D.), max. mm inch	Overtravel (O.T.), min. mm inch	Operating Position (O.P.) mm inch
Short push plunger	5.88 {600}	0.98 {100}	2.0 .079	0.8 .031	0.8 .031	30±0.8 1.181±.031
Push plunger	5.88 {600}	0.98 {100}	2.0 .079	0.8 .031	5.0 .197	44±1.2 1.732±.047
Hinge lever	1.47 {150}	0.39 {40}	13.5 .531	3.2 .126	4.0 .157	25±2.0 .984±.079
Roller lever	1.77 {180}	0.49 {50}	11.0 .433	2.4 .094	3.0 .118	40±1.9 1.575±.75
One-way roller lever	1.96 {200}	0.59 {60}	11.0 .433	2.4 .094	3.0 .118	50±2.0 1.969±.079
Hinge short lever	2.16 {200}	0.59 {60}	8.5 .335	2.0 .079	2.5 .098	25±1.3 .984±.051
Short roller lever	2.35 {240}	0.78 {80}	6.5 .256	1.5 .059	2.0 .079	40±1.6 1.575±.063
One-way short roller lever	2.75 {280}	0.98 {100}	6.5 .256	1.5 .059	2.0 .079	50±1.6 1.969±.063
Panel mount push plunger	5.88 {600}	0.98 {100}	2.0 .079	0.8 .031	6.0 .236	21.8±0.8 .858±.031
Panel mount roller plunger	5.88 {600}	0.98 {100}	2.0 .079	0.8 .031	6.0 .236	33.3±1.2 1.311±.047
Panel mount cross roller plunger	5.88 {600}	0.98 {100}	2.0 .079	0.8 .031	6.0 .236	33.3±1.2 1.311±.047
Flexible rod	1.18 {120}	-	25 .984	-	11 .433	36 1.417 (T.T.)

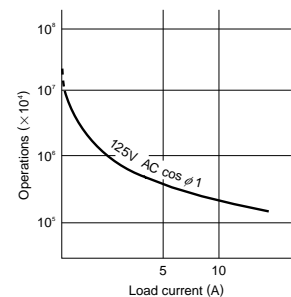
Note) For the operating characteristics, refer to the TECHNICAL INFORMATION.

### 5. Protective characteristics

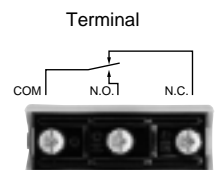
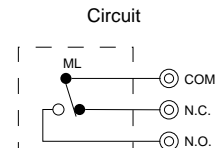
Protective construction	Screw terminal type	Epoxy-sealed terminal type
IEC		
IP60	○	○
IP64	-	○

## DATA

### 1. Life curve



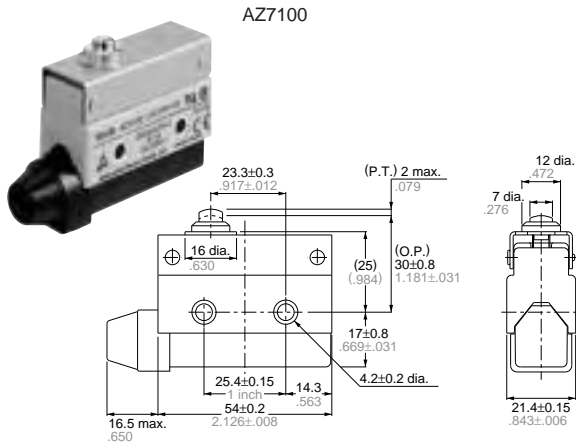
## WIRING DIAGRAM



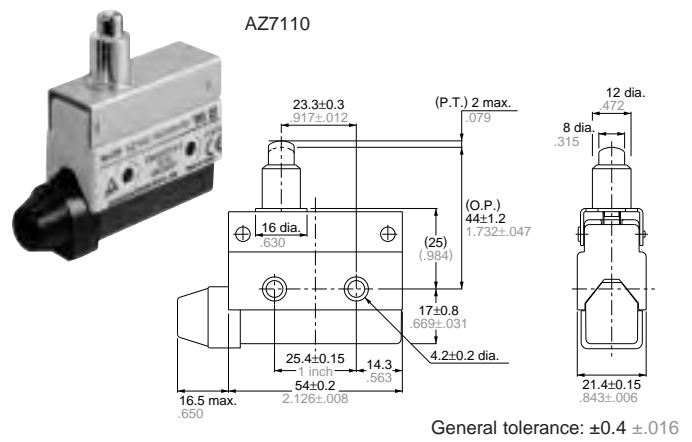
**DIMENSIONS**

mm inch

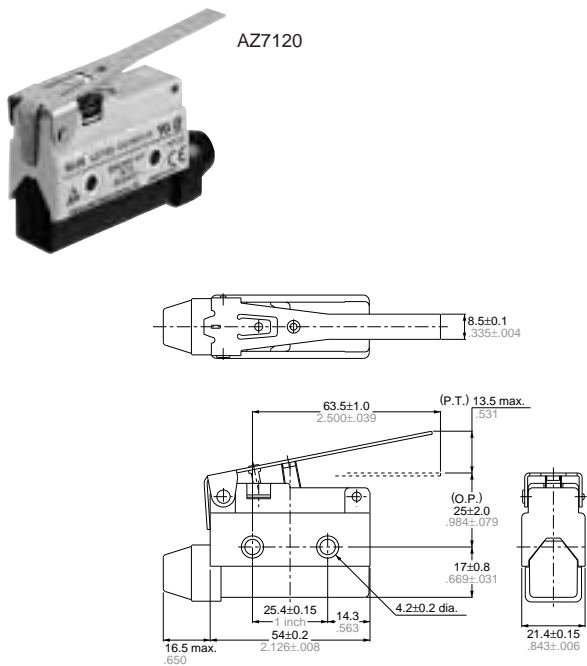
• Short push plunger type



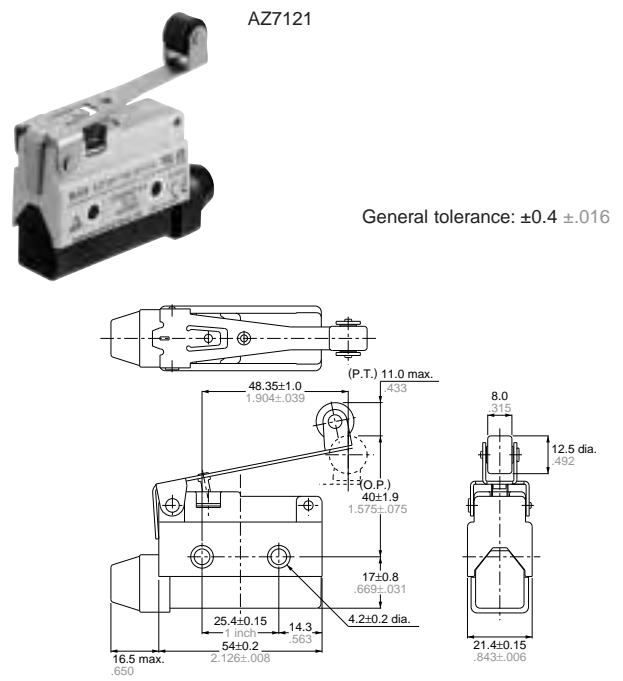
• Push plunger type



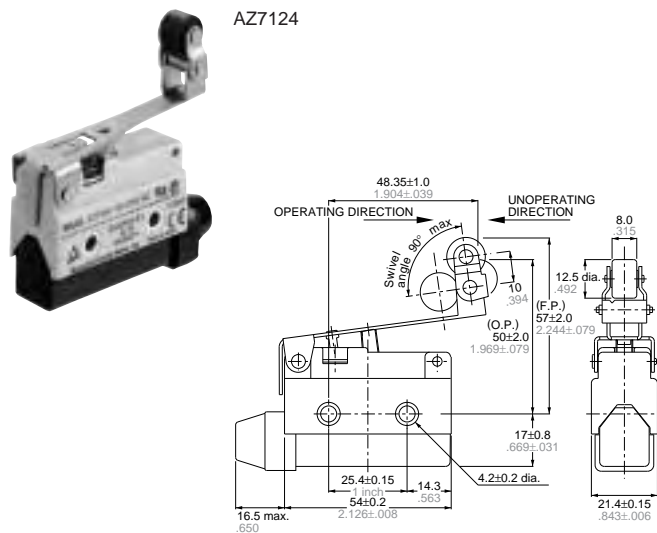
• Hinge lever type



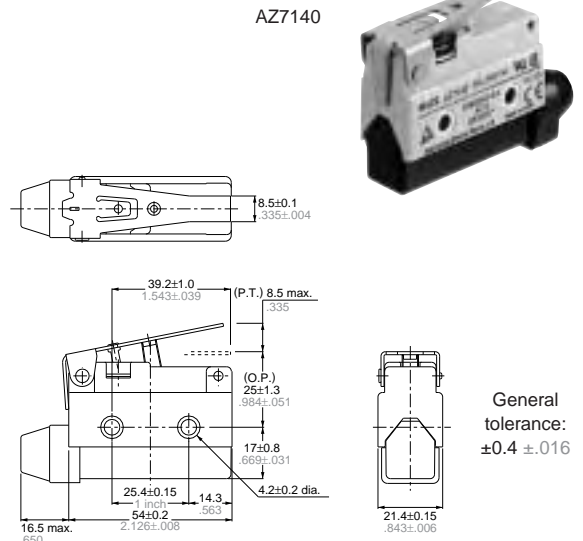
• Roller lever type



• One-way roller lever type

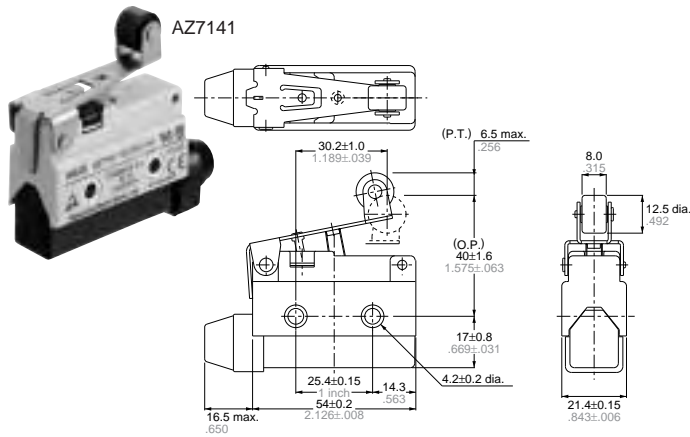


• Hinge short lever type



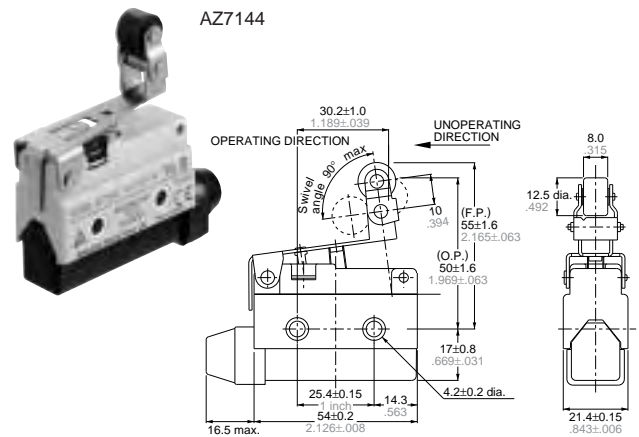
# ML (AZ7)

## • Short roller lever type



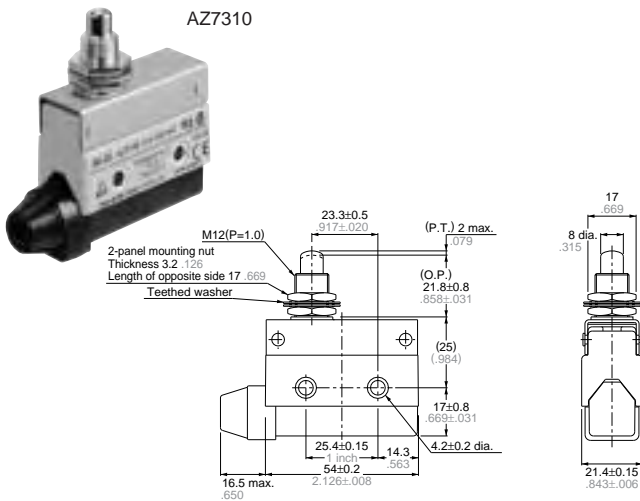
## • One-way short roller lever type

mm inch

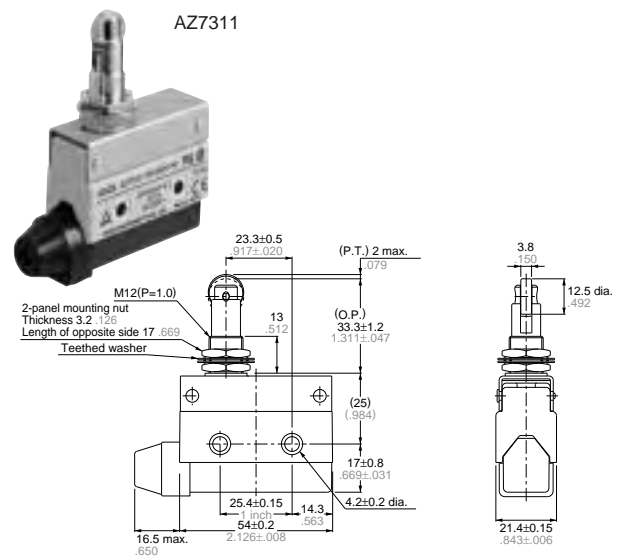


General tolerance:  $\pm 0.4 \pm .016$

## • Panel mount push plunger type

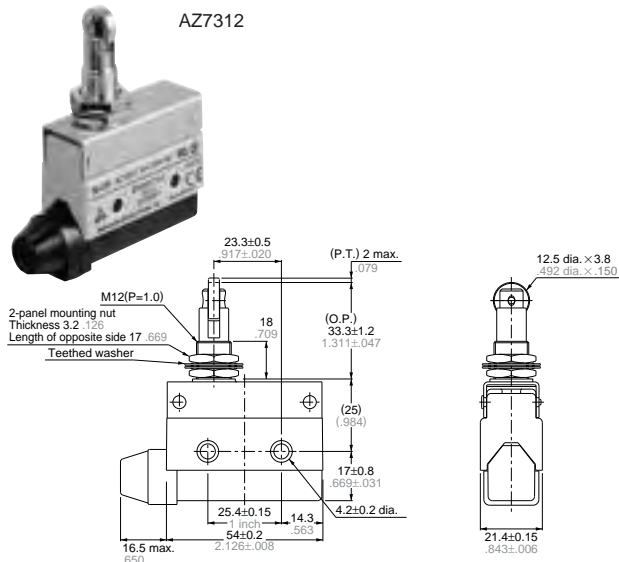


## • Panel mount roller plunger type

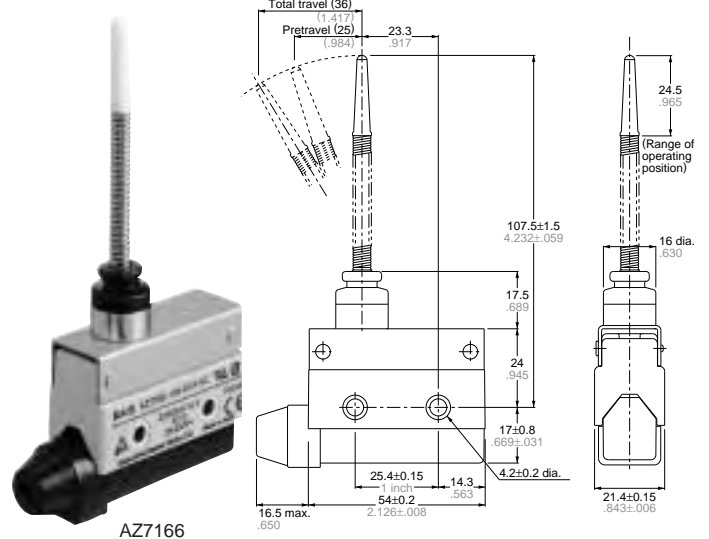


General tolerance:  $\pm 0.4 \pm .016$

## • Panel mount cross roller plunger type



## • Flexible rod type



General tolerance:  $\pm 0.4 \pm .016$

## Epoxy-Sealed Terminal type

The waterproof type (IP64) has its terminals sealed with epoxy resin.

### 1. Type of product

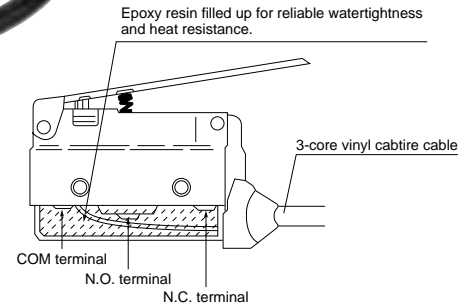
All the Standard type have this Epoxy-Sealed Terminal types.

### 2. Appearance

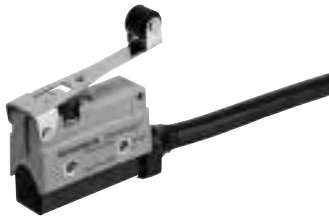
The dimensions are the same as those of the standard type.

The cord outlet is located either at the N.C. or COM side.

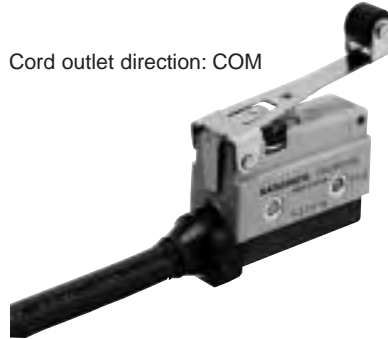
The cord is 1 m 3.281ft. long.



Cord outlet direction: N.C.



Cord outlet direction: COM



### • Cord specifications

Type	Vinyl cabtire cable (VCT)(3 × 1.25mm <sup>2</sup> )
Cord length	1m 3.281ft.
Lead colors	Black: COM Red: N.C. White: N.O.

## Neon lamp wired type

This type has the terminals molded and is equipped with a neon lamp for monitoring.

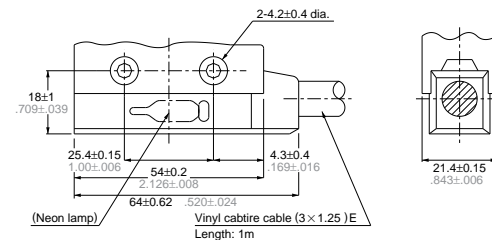
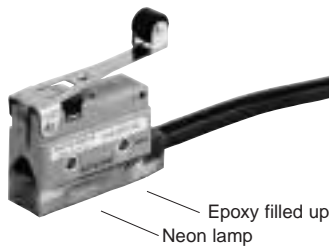
### 1. Type of product

All the products of this type are generally equipped with the neon lamp.

### 2. Appearance

The cord outlet is located at the N.C. side. The cord is 1 m 3.281ft. long.

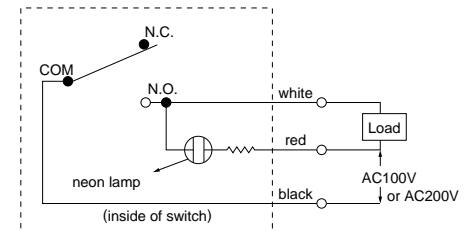
Terminal dimensions mm inch



When load operates, the lamp is lit.

### 3. Neon lamp wired type

#### Lamp lighting circuit wiring diagram



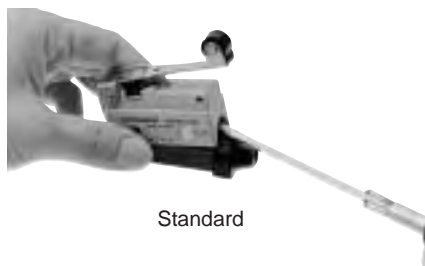
- The 100V type and 200V type are differently code-named.
- Be sure to connect the load and power supply as follows.



- This is only for N.O. type.

## CAUTIONS

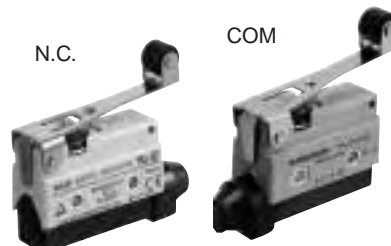
1. When the switch is to be used in places where oil or water is abundant, bore a drain hole in the bottom of the terminal cover.
2. Avoid places where highly acid or alkaline fluids are used or high temperatures prevail.



Standard

### 3. Wiring

- (1) Remove the terminal cover with a flat head screwdriver.
  - (2) Insert the lead wire through the knock-out of the terminal cover.
  - (3) Connect the lead wire to the terminal.
- When connecting the terminals with the fasten lug, those with the insulation



sleeve are recommended.

- (4) The terminal cover can be mounted in both directions. In this case, fasten the terminal cover in the opposite direction.

- For epoxy-sealed terminal units, there are two cord outlet directions; N.C. side and COM side.
- For the neon lamp wired type, the cord outlet direction is on the N.C. side.

### 4. Flexible rod type

- (1) Touch the target to the tip of the plastic part.
- (2) Avoid pushing the tip of actuating spring in the direction of axis. In places with splashing oil or water and very dusty areas, mount the limit switch with the actuating spring in the vertical direction.